



Ohakea: Surface Water and Groundwater Monitoring for PFAS, October 2020

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Dear Kate and Stephen

OHAKEA: SURFACE WATER AND GROUNDWATER MONITORING FOR PFAS, OCTOBER 2020

1.0 Introduction

Monitoring for per- and polyfluoroalkyl substances (PFAS) concentrations in groundwater and surface water was conducted between 29 September and 2 October 2020¹ in accordance with the RNZAF Base Ohakea PFAS Investigation: Long Term Monitoring Plan (LTMP) (PDP, 2020). This is the first round of monitoring to be conducted following the implementation of the LTMP (PDP, 2020).

The objectives of monitoring are to:

- ✦ Track the concentrations of PFAS in surface water and groundwater at representative locations over time to enable stakeholders to monitor plume development; and
- ✦ Support validation of the groundwater model produced by PDP (2019).

The scope of work included:

- ✦ The collection of groundwater samples from 13 groundwater wells or taps;
- ✦ The collection of surface water from 4 locations;
- ✦ The collection of 11 quality assurance/quality control (QA/QC) samples; and
- ✦ Preparation of this report.

This letter reports the results of all monitoring undertaken at RNZAF Base Ohakea (“Ohakea” or the “base”) at these sample locations, including a comparison with the findings of the previous monitoring round (undertaken as part of a previous sampling investigation (PDP, 2019)).

¹ For ease of reporting, the current monitoring round is referred to as the October 2020 monitoring round.



2.0 Methodology

2.1 Monitoring Well Installation

In agreement with New Zealand Defence Force (NZDF) and Horizons Regional Council (HRC), the LTMP proposed a total of nine new monitoring wells to be installed to investigate the potential future extent of the PFAS plume extending from the base and to validate the groundwater model predictions (for further information on these bores please refer the LTMP (PDP, 2020)). During July 2020, four boreholes were drilled to depths ranging from 10 to 15 m below ground level (bgl) to install shallow groundwater monitoring wells (GW106, GW107, GW108 and GW109). Logs and photos from the drilling are provided in Appendix A.

Due to very wet ground conditions and concerns with access, the remaining five wells were unable to be drilled in July. These are scheduled for installation in January 2021.

2.2 Sampling Methodology

Sampling was undertaken by PDP field staff between 29 September and 2 October 2020. Sampling was undertaken in accordance with procedures in Sampling and Analysis of Per- and Poly-fluorinated Substances (MfE, 2018).

All samples were couriered to AsureQuality laboratory under chain of custody documentation following collection. All samples were analysed by AsureQuality for a suite of PFAS compounds. Copies of the laboratory reports and chain of custody documentation are provided in Appendix B.

The groundwater monitoring locations are described in Table 1, and the surface water monitoring locations are described in Table 2.

Table 1: Groundwater Monitoring Locations

Location		Rationale	Sampled
RNZAF Base Ohakea	MW4	Key source area (historic fire training area (FTA))	30/09/20
	WS1	Downgradient of FTA and near site boundary with a long existing monitoring record	29/09/20
	GW6	Downgradient of key source areas and historically elevated PFAS concentrations	29/09/20
	MW6	Key source area (run-up pit)	30/09/20
	MW9	Key source area (diversion tank for hangar deluge systems)	30/09/20
	WS2	North western plume edge (base drinking water supply)	29/09/20
	Nested_1	Downgradient of FTA. Deeper wells to determine the vertical extent of PFAS.	Not installed
Other (non-NZDF) private and public land	GW67	North eastern plume edge	30/09/20
	GW31	Eastern plume edge	29/09/20
	GW53	Eastern plume edge	30/09/20
	GW65	Southern plume edge	29/09/20
	GW106	Plume is predicted to approach and then encompass the proposed shallow well into the future.	Not sampled
	GW107	Act as a sentinel monitoring location e.g. to monitor the predicted maximum lateral edge of the future plume.	1/10/20
	GW108	Plume is predicted to approach and then encompass the proposed shallow well into the future.	1/10/20
	GW109	Plume is predicted to approach and then encompass the proposed shallow well into the future.	1/10/20
	Nested_2	Deeper well to determine the vertical extent of PFAS.	Not installed

Table 2: Surface Water Monitoring Locations

Location	Rationale	Sampled
SW6	Previous high PFAS concentrations leaving the base	29/09/20
SW33	Resurgence of high PFAS concentrations on the Makowhai Stream downstream of the base. Accessible from the road.	29/09/20
SW36	Makowhai Stream just upstream from confluence with the Rangitikei River. To determine the maximum extent of PFAS in the Makowhai.	29/09/20
SW4	Upstream location to determine if PFAS is present in the Makowhai before entering the base boundary.	2/10/20

2.3 Variations from the Monitoring Plan

Samples were not able to be collected from GW106 during the October 2020 monitoring round because the well head was underwater due to heavy rainfall prior to and during the sampling event (refer to Section 2.5). To minimise the potential for this to occur in future, the surrounding ground surface will be recontoured.

2.4 Field Measurements

2.4.1 Water Level Measurement

A summary of the groundwater level measurements recorded in the monitoring wells as part of the groundwater sampling programme is presented in Appendix C.

2.4.2 Field Parameters

Using a YSI ProDSS multi-meter, and in accordance with MfE (2018), field measurements were recorded for the following stabilisation criteria: electrical conductivity, pH, dissolved oxygen, temperature and turbidity. Prior to use, the ProDSS was calibrated for pH and electrical conductivity and checked throughout the monitoring round. Part way through the monitoring round it was noted that the dissolved oxygen sensor was working intermittently. As a result, dissolved oxygen parameters were not measured at every sample location and dissolved oxygen readings that were able to be recorded may not be reliable and should be treated as such. The three main stabilisation criteria (electrical conductivity, pH and temperature) remained acceptable throughout the monitoring round. Field sheets for each sample location are presented in Appendix D.

2.5 Antecedent Weather Conditions and Flow Conditions

The preceding two weeks had a cumulative rainfall of 102 mm, with 53.6 mm of this falling within the three days prior to sampling. Given the significant rainfall prior to sampling, the Rangitikei River and surrounding streams where surface water samples were collected were significantly swollen.

2.6 Quality Assurance Sampling

As part of the sampling programme, the following QA/QC samples were collected:

- ∴ Two duplicate samples;
- ∴ Two equipment rinsate blanks. One for the surface water sampling equipment (mighty gripper) and one for the groundwater monitoring equipment (water level dipper);
- ∴ Four field blank samples; and
- ∴ Three trip blank samples.

All QA/QC samples were collected in accordance with the methodology outlined in MfE (2018). All analysis of the QA/QC samples was undertaken byASUREQuality Laboratory in Wellington. The results of QA/QC sampling are reported in Appendix E and further discussed in Section 3.3.

3.0 Sample Results and Comparison with Selected Guideline Values

The sample analytical results are presented in the attached Tables 3 and 4 with sample locations shown in Figure 1. It should be noted that due to the turbid nature of the surface water samples collected, the reporting limit able to be achieved by the laboratory for surface water was higher during this monitoring round than previous monitoring rounds (<0.025 compared to <0.001 µg/L).

3.1 Selected Guideline Values

Table 5 below shows the reference guideline values against which the results have been compared.

Media	Sum of Total PFOS + PFHxS	PFOA	Total PFHxS	Total PFOS	Source
Drinking Water	0.07 µg/L	0.56 µg/L	-	-	MoH ¹ AGDoH ²
Ecological Freshwater Guideline 90% ecosystem protection	-	632 µg/L	-	2 µg/L	HEPA ³
Ecological Freshwater Guideline 95% ecosystem protection	-	220 µg/L	-	0.13 µg/L	HEPA ³
Ecological Freshwater Guideline – 99% ecosystem protection	-	19 µg/L	-	0.00023 µg/L	HEPA ^{3,4}

Notes:

1. Ministry of Health (MoH, 2017) Interim Guidance Level for Drinking Water, PFOA, PFOS and PFHxS.
2. Australian Government Department of Health (AGDoH, 2017) Health Based Guidance Values for PFAS for Use in Site Investigations in Australia.
3. Australian and New Zealand Guidelines for Fresh and Marine Water Quality – technical draft guideline values in PFAS National Environmental Management Plan Version 2.0 – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.
4. The 99% ecosystem protection guideline has been shown for completeness. However, this guideline has not been compared to in the results.

3.2 Sample Results and Comparison to Guideline Values

The analysis and discussion of sample results relates to concentrations of Total PFOS, Total PFHxS and the sum of Total PFOS and PFHxS. When discussed as a collective, these will herein be referred to as ‘the core PFAS compounds’. The full suite of analytes are shown in the results tables (Tables 3 and 4).

3.2.1 Groundwater Monitoring Wells

The results of the laboratory analyses for PFAS in groundwater samples, including all results from previous sampling, are presented in Table 3.

For the October 2020 monitoring round a total of 13 groundwater samples were collected. The analytical results are summarised as follows:

- The Sum of Total PFOS and PFHxS was reported above the MOH interim drinking water guideline value of 0.07 µg/L at five locations. These include: GW31 (0.12 µg/L), MW9 (0.97 µg/L), MW4 (1.4 µg/L), WS1 (0.19 µg/L) and MW6 (14 µg/L). None of these wells are currently used for drinking water supply.

- ∴ Concentrations of Total PFOS exceeded the ANZECC ecological guideline value of 0.13 µg/L for the protection of 95% of freshwater species at three locations. These include: MW4 (1 µg/L), MW9 (0.43 µg/L) and MW6 (9.5 µg/L).
- ∴ The concentration of Total PFOS in MW9 (9.5 µg/L) also exceeded the ANZECC ecological guideline value of 2 µg/L for the protection of 90% of freshwater species.
- ∴ The core PFAS compounds were detected at concentrations above the laboratory limit of reporting (LOR) but below the relevant guideline values at GW6 and WS2.
- ∴ The core PFAS compounds were not detected (i.e., below the laboratory LOR) at GW53, GW65, GW67, GW107, GW108 and GW109.

3.2.2 Surface Water

The results of the laboratory analysis for PFAS in the surface water samples, including the results from previous sampling, are presented in Table 4.

For the October 2020 monitoring round, a total of 4 surface water samples were collected. The analytical results are summarised as follows:

- ∴ The Sum of Total PFOS and PFHxS for SW6 was reported at 0.44 µg/L. The concentration of Total PFOS (0.22 µg/L) exceeded the ANZECC ecological guideline value for the protection of 95% of freshwater species of 0.13 µg/L at SW6.
- ∴ The core PFAS compounds were not detected at SW4, SW33 and SW36.

3.3 Quality Assurance/Quality Control Programme

In order to determine the precision of the sampling and laboratory analysis, the similarity between the laboratory duplicates and blind field duplicate samples was quantified by calculating the Relative Percent Difference (%RPD) for each individual parameter detected in both the primary and duplicate samples. It is important to recognise that the results are from the laboratory analysis of chemicals that are present at very low concentrations and as such, the variation in the results may be attributed in part to the analytical method rather than sample collection methodology. The results of the QA/QC assessment are presented in Appendix E, and a summary is provided below.

- ∴ %RPDs for blind field duplicates ranged from 0 to 26% meaning all PFAS compounds were below the acceptable %RPD of 30% in the two duplicate samples taken during September 2020 monitoring round.
- ∴ No PFAS compounds were detected above the laboratory LOR in the field blank samples or the equipment rinsate blanks.
- ∴ The results of QA/QC assessment meet the data quality objectives for the sampling programme.

4.0 Discussion

4.1 Groundwater

In general, PFAS concentrations for the October 2020 monitoring round are either similar to or slightly below the concentrations previously recorded at these locations. MW4 and MW6 both recorded the lowest concentrations of the core PFAS compounds in the October 2020 monitoring round when compared to previous monitoring rounds.

With respect to previous monitoring at groundwater sample locations, the analytical results are as follows:

- ∴ GW6 – Concentrations of the core PFAS compounds remain similar (and below the MOH interim drinking water guidelines) to those measured in the last two monitoring rounds (May and September 2018). These levels are an order of magnitude lower than those recorded in the first two monitoring rounds (December 2017 and February 2018).
- ∴ MW4 – Concentrations of Total PFOS has been variable to date, exceeding the ANZECC ecological guideline for the protection of 90% of freshwater species in July 2015 and July 2018. In August 2017, October 2017 and October 2020 it exceeded the ANZECC ecological guideline for the protection of 95% of freshwater species. Total PFHxS and the Sum of Total PFOS and PFHxS concentrations show the same pattern, being higher in July 2015 and July 2018. Continued sampling in accordance with the LTMP will help to establish whether there is a relationship between seasonal groundwater level and PFAS concentration at this location.
- ∴ MW9 – Concentrations of the core PFAS compounds remain at levels similar to the last monitoring round in July 2018. These levels are an order of magnitude lower than previous monitoring rounds (April and October 2017 and February 2018) but still exceed the MOH interim drinking water guideline value for the Sum of Total PFOS and PFHxS and the ANZECC ecological guideline for the protection of 95% of freshwater species for Total PFOS.
- ∴ MW6 – All the core PFAS compounds remain within their historical ranges, with the Sum of Total PFOS and PFHxS exceeding the MOH interim drinking water guideline value and Total PFOS exceeding the ANZECC ecological guideline for the protection of 90% of freshwater species.
- ∴ WS1 and GW31 - All the core PFAS compounds remain within their historical ranges at these locations, with the Sum of Total PFOS and PFHxS exceeding the MOH interim drinking water guideline value.
- ∴ GW67 and WS2 - All the core PFAS compounds remain within their historical ranges and below relevant guidelines.
- ∴ GW53 and GW65 – None of the core PFAS compounds have been detected in any monitoring rounds to date.
- ∴ This was the first monitoring round at GW107, GW108 and GW109.

At GW6 and MW9, concentrations of the core PFAS compounds decreased by an order of magnitude during 2018. Additional sampling at these locations (as prescribed by the LTMP) will help to determine if the observed decreases are part of an ongoing trend.

A comparison of the sampling results to the PFAS groundwater model (PDP, 2019a) developed for the area shows a relatively good agreement. Based on the model's prediction, the newly installed wells (GW107, GW108 and GW109), which all returned PFAS concentrations of < LOR, were not expected to contain PFAS compounds at this time.

4.2 Surface Water

At SW6, concentrations of the core PFAS compounds are consistently elevated (and have historically exceeded the ANZECC ecological guideline for the protection of 95% of freshwater species), however the last two monitoring rounds in July 2018 and October 2020 were an order of magnitude lower than the earlier two monitoring rounds (August and November 2017). This is the same pattern observed in groundwater samples collected from GW6 and MW9. The current monitoring round has the lowest concentrations of the key PFAS compounds to date. However, the concentrations observed may have been influenced by the antecedent weather conditions.

At SW33, concentrations of the core PFAS compounds have fluctuated over more than two orders of magnitude, with elevated concentrations detected in February and September 2018, and low concentrations detected in May 2018 and October 2020.

At SW4 and SW36 none of the core PFAS compounds have been detected in monitoring rounds to date.

Results from the surface water sampling are generally in agreement with those predicted by the PFAS groundwater model (PDP, 2019).

5.0 Summary

Monitoring for per- and polyfluoroalkyl substances (PFAS) in groundwater and surface water was conducted between 29 September and 2 October 2020 in accordance with the RNZAF Base Ohakea PFAS Investigation: Long Term Monitoring Plan (PDP, 2020). Thirteen groundwater and four surface water samples were collected from locations on, and adjacent to the base. In summary:

- ∴ PFAS has been detected at levels above the relevant guideline values in five groundwater samples and one surface water sample in the October 2020 monitoring round.
- ∴ One off-base groundwater sample exceeds the MOH interim drinking water guidelines, the groundwater well is not currently being used for drinking water supply.
- ∴ Four on-base groundwater samples exceed the MOH interim drinking water guidelines (none of the wells are used for drinking water supply), and the ANZECC ecological guideline value for the protection of freshwater species at the 95% level. One of these samples also exceeds the ANZECC guideline value for 90% species protection.
- ∴ One surface water sample exceeds the ANZECC ecological guideline value for the protection of freshwater species at the 95% level.

A comparison of the October 2020 monitoring results with those from previous monitoring rounds shows the current concentrations are generally within the historic ranges recorded for these locations.

At three on-base locations (GW6, MW9 and SW6), there was an order of magnitude decrease in concentrations of the core PFAS compounds measured in 2018, with concentrations remaining low in subsequent monitoring at these locations.

The surface water and groundwater results from the October 2020 monitoring round are in relatively good agreement with the PFAS groundwater model predictions (PDP, 2019a). Based on the model's prediction, the newly installed wells (GW107, GW108 and GW109), which all returned PFAS concentrations of < LOR, were not predicted to contain PFAS compounds.

One sample (GW106) could not be collected due to heavy rain in the lead up to sampling which flooded the area around the well. To prevent reduced the likelihood of this happening again, recontouring of the land surface around the well head is planned for January 2021.

Drilling of the remaining shallow and deep wells is scheduled for January 2021. Sampling of these wells will be included in the March 2021 monitoring round.

No changes to the LTMP are recommended as a result of this monitoring round.

6.0 References

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Yours faithfully

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Table 3: Groundwater Samoline Results - Per- and Poly-Fluoroalkyl Substances (PFAS)¹

Sample Location	GW31	GW31	GW31	GW31	GW53	GW53	GW53	GW53	GW53	GW65	GW65	GW65	GW65	Interim Guidance Level for Drinking Water, MoH 2017 ^{2,3}	ANZECC 90% Species Protection Technical Draft Default Guideline Values ⁴	ANZECC 95% Species Protection Technical Draft Default Guideline Values ⁴
Sample Name	OHA_ADJ_GW31_1_120218	OHA_ADJ_GW31_2_230518	OHA_ADJ_GW31_3_120918	OHA_ADJ_GW31_4_290920	OHA_ADJ_GW53_1_150218	OHA_ADJ_GW53_2_150518	OHA_ADJ_GW53_3_100918	OHA_ADJ_GW53_4_300920	OHA_ADJ_GW65_1_210218	OHA_ADJ_GW65_2_170518	OHA_ADJ_GW65_3_110918	OHA_ADJ_GW65_4_290920				
Laboratory Reference	1032528	1153593	1252502	2096319	1040534	1139707	1244388	2096317	1047797	1142284	1244707	2096328				
Monitoring Zone	Off base															
Sample Date	12/02/2018	23/05/2018	12/09/2018	29/09/2020	15/02/2018	15/05/2018	10/09/2018	30/09/2020	21/02/2018	17/05/2018	11/09/2018	29/09/2020				
L-PFHs	0.064	0.055	0.056	0.063	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-	
Mono-PFHs	0.016	0.013	0.014	0.016	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-	
di-PFHs	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-	
Total PFHs ⁵	0.08	0.068	0.07	0.079	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-	
L-PFOS	0.023	0.0079	0.0058	0.013	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-	
Mono-PFOS	0.033	0.016	0.016	0.028	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-	
di-PFOS	0.0042	0.002	<0.001	0.0034	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-	
Total PFOS ⁵	0.06	0.026	0.022	0.044	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	2	0.13	
Sum of PFHs and PFOS ⁶	0.14	0.094	0.092	0.12	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.07	-	-	
PFOA	0.024	0.013	0.011	0.019	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.56	632	220	
PFBA	0.055	0.035	0.035	0.047	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.001	-	-	
PFHxA	0.14	0.074	0.067	0.12	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	
PFPeA	0.21	0.097	0.083	0.15	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	
PFHpA	0.053	0.027	0.024	0.042	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	
PFDA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	
PFNA	0.0059	0.0021	0.0014	0.0039	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	
PFDoDA	<0.001	<0.025	<0.001	<0.001	<0.025	<0.025	<0.001	<0.001	-	<0.025	<0.001	<0.001	<0.001	-	-	
PFTDA	-	<0.1	<0.005	-	-	-	-	-	-	-	<0.005	-	<0.005	-	-	
PFTDA	-	<0.025	<0.005	-	<0.025	<0.025	-	-	-	<0.025	-	<0.005	-	-	-	
PFUnDA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	
PFBS	0.011	0.01	0.0095	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	
PFPS	0.0033	0.0038	0.0058	0.0045	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	
PFPeS	0.014	0.0089	0.0084	0.0085	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	
PFHpS	0.0014	0.0011	0.0011	0.0015	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	
PFNS	<0.005	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	-	-	
PFDS	<0.005	<0.001	<0.001	-	<0.005	<0.001	<0.001	-	<0.005	<0.001	<0.001	<0.001	<0.001	-	-	
4:2 FTS	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	-	-	
6:2 FTS	0.036	0.0092	0.0052	0.0049	<0.001	<0.01	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	-	-	
8:2 FTS	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	-	-	
PFOSA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	
NMeFOSA-M	<0.025	<0.005	<0.001	<0.001	<0.025	<0.005	<0.001	<0.001	-	<0.005	<0.005	<0.001	<0.001	-	-	
NMeFOSA	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	-	-	
NMeFOSE-M	<0.025	<0.005	<0.001	<0.001	<0.025	<0.005	<0.001	<0.001	-	<0.005	<0.001	<0.001	<0.001	-	-	
NEtFOSA-M	<0.025	<0.001	<0.001	<0.001	<0.025	<0.001	<0.001	<0.001	-	<0.001	<0.005	<0.001	<0.001	-	-	
NEtFOSA	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	-	-	
NEtFOSE-M	<0.025	<0.005	<0.001	<0.001	<0.025	<0.005	<0.001	<0.001	-	<0.005	<0.001	<0.001	<0.001	-	-	

Notes:
 1. Results in µg/L.
 2. Ministry of Health (MoH, 2017) Interim Guidance Level for Drinking Water, PFOA, PFOS and PFHxS.
 3. Australian Government Department of Health (AGDoh, 2017) Health Based Guidance Values for PFAS for Use in Site Investigations in Australia.
 4. Australian and New Zealand Guidelines for Fresh and Marine Water Quality – technical draft guideline values in PFAS National Environmental Management Plan – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2018.
 5. Total PFOS, PFHxS are calculated by summing monoethyl, dimethyl and linear isomers. Where an isomer is below the detection limit it is not added to the summation. This is following the method in the reported lab results.
 6. Summations are made by adding compounds Total PFOS, Total PFHxS together. Where one compound is below detection, it is not included in the summation.

-	Parameter not tested / no guideline value available
0.3	Concentration exceeds 95% ecological guidelines.
1.2	Concentration exceeds 90% ecological guidelines.
3.6	Concentration exceeds interim drinking water guidelines

Table 3 Cont: Groundwater Sampling Results - Per- and Poly-Fluoroalkyl Substances (PFAS) ¹

Sample Location	GW6	GW6	GW6	GW6	GW6	WS2	Interim Guidance Level for Drinking Water, MoH 2017 ^{2,3}	ANZECC 90% Species Protection - Technical Draft Default Guideline Values ⁴	ANZECC 95% Species Protection - Technical Draft Default Guideline Values ⁴						
Sample Name	OHA_ADJ_GW6_1_111217	OHA_ADJ_GW6_2_130218	OHA_ADJ_GW6_3_140518	OHA_ADJ_GW6_4_130918	OHA_ADJ_GW6_5_290920	OHA_QRY_WS2_1_240715	OHA_QRY_WS2_2_210717	OHA_QRY_WS2_3_210218	OHA_QRY_WS2_4_030718	OHA_QRY_WS2_5_221119	OHA_QRY_WS2_6_020620	OHA_QRY_WS2_7_290920			
Laboratory Reference	989127	1032179	1133549	1260155	2096315	E51536917	1326866	1055089	1186581	1740590	1983524	2096325			
Monitoring Zone	On base	Off base	Off base	Off base	Off base	Off base	Off base	Off base							
Sample Date	11/12/2017	13/02/2018	14/05/2018	13/09/2018	29/09/2020	24/07/2015	21/07/2017	21/02/2018	3/07/2018	22/11/2019	2/06/2020	29/09/2020			
L-PFHs	0.066	0.054	0.014	0.014	0.014	-	0.0038	0.0033	0.0053	0.0031	0.0021	0.0024	-	-	-
Mono-PFHs	0.011	0.0097	0.002	0.0026	0.0023	-	<0.001	<0.001	0.0011	<0.001	<0.001	<0.001	-	-	-
di-PFHs	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
Total PFHs ⁵	0.077	0.064	0.016	0.017	0.016	<0.02	0.0038	0.0033	0.0064	0.0031	0.0021	0.0024	-	-	-
L-PFOS	0.023	0.023	0.0092	0.0014	0.0042	-	<0.001	<0.001	0.0025	<0.001	0.0011	0.0016	-	-	-
Mono-PFOS	0.026	0.025	0.0089	0.003	0.0044	-	<0.001	0.001	0.0016	<0.001	<0.001	<0.001	-	-	-
di-PFOS	0.0027	0.0022	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
Total PFOS ⁵	0.052	0.05	0.018	0.0044	0.0086	<0.02	<0.001	0.001	0.0041	<0.001	0.0011	0.0016	-	2	0.13
Sum of PFHs and PFOS ⁶	0.13	0.11	0.034	0.021	0.025	-	0.0038	0.0043	0.01	0.0031	0.0032	0.004	0.07	-	-
PFOA	0.014	0.014	0.0022	0.0018	0.0019	<0.02	0.0018	0.0014	0.0024	0.0012	0.0036	<0.001	0.56	632	220
PFBA	0.025	0.02	-	<0.01	-	-	<0.005	<0.005	<0.005	0.0033	<0.005	0.0029	-	-	-
PFHxA	0.044	0.038	0.0039	0.0053	0.0038	<0.02	0.004	0.0031	0.0055	0.0031	0.0017	0.0016	-	-	-
PFPeA	0.057	0.044	0.0035	0.0037	0.003	-	0.0072	0.0049	0.0076	0.0043	0.0027	0.0025	-	-	-
PFHpA	0.02	0.016	0.0018	0.0021	0.0024	<0.02	0.002	0.0017	0.0028	0.0016	0.0011	<0.001	-	-	-
PFDA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.02	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
PFNA	0.0038	0.0034	<0.001	<0.001	<0.001	<0.02	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
PFDoDA	-	<0.001	<0.025	<0.001	-	<0.05	<0.005	-	-	<0.001	<0.001	<0.001	-	-	-
PFTeDA	-	-	<0.025	<0.005	-	<0.5	-	-	-	<0.001	<0.001	-	-	-	-
PFTyDA	-	-	<0.025	<0.005	-	<0.05	-	-	-	<0.001	<0.001	-	-	-	-
PFUnDA	<0.005	<0.001	<0.001	<0.001	<0.001	<0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
PFBS	0.0067	0.0065	0.0022	0.0038	0.0027	<0.02	<0.001	<0.001	0.0011	<0.001	<0.001	<0.001	-	-	-
PFPrS	0.0022	0.0034	-	0.004	0.0025	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
PFPeS	0.0054	0.0056	0.0013	0.0038	0.0039	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
PFHpS	0.0018	0.0023	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
PFNS	<0.005	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	-	-	-
PFDS	-	<0.005	<0.001	<0.001	-	<0.02	<0.005	<0.005	<0.001	<0.001	<0.001	-	-	-	-
4:2 FTS	<0.005	<0.001	<0.001	-	-	<0.01	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	-	-	-
6:2 FTS	0.023	0.0032	<0.01	0.001	-	<0.1	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	-	-	-
8:2 FTS	<0.005	<0.001	<0.001	<0.001	-	<0.1	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	-	-	-
PFOSA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.02	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
NMeFOSA-M	-	-	<0.005	<0.001	<0.001	<0.5	<0.005	<0.005	<0.005	<0.001	<0.001	<0.001	-	-	-
NMeFOSAA	<0.001	<0.025	<0.001	<0.001	<0.001	-	<0.005	<0.005	<0.001	<0.001	<0.001	<0.001	-	-	-
NMeFOSE-M	-	<0.025	<0.005	<0.001	<0.001	<0.5	<0.005	<0.005	<0.005	<0.001	<0.001	<0.001	-	-	-
NEFOSA-M	-	-	<0.001	<0.001	<0.001	<0.05	<0.005	<0.005	<0.005	<0.001	<0.001	<0.001	-	-	-
NEFOSAA	<0.005	<0.025	<0.001	<0.001	<0.001	-	<0.005	<0.005	<0.001	<0.001	<0.001	<0.001	-	-	-
NEFOSE-M	-	<0.025	<0.005	<0.001	<0.001	-	<0.005	<0.005	<0.005	<0.001	<0.001	<0.001	-	-	-

Notes:
 1. Results in µg/L.
 2. Ministry of Health (MoH, 2017) Interim Guidance Level for Drinking Water, PFOA, PFOS and PFHxS.
 3. Australian Government Department of Health (AGDH, 2017) Health Based Guidance Values for PFAS for Use in Site Investigations in Australia.
 4. Australian and New Zealand Guidelines for Fresh and Marine Water Quality – technical draft guideline values in PFAS National Environmental Management Plan – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2018.
 5. Total PFOS, PFHxS are calculated by summing monoethyl, dimethyl and linear isomers. Where an isomer is below the detection limit it is not added to the summation. This is following the method in the reported lab results.
 6. Summations are made by adding compounds Total PFOS, Total PFHxS together. Where one compound is below detection, it is not included in the summation.

-	Parameter not tested / no guideline value available
0.3	Concentration exceeds 95% ecological guidelines.
1.2	Concentration exceeds 90% ecological guidelines.
3.6	Concentration exceeds interim drinking water guidelines

Table 3 Cont: Groundwater Sampling Results - Per- and Poly-Fluoroalkyl Substances (PFAS) ¹

Sample Location	MW4	MW4	MW4	MW4	MW4	MW9	MW9	MW9	MW9	MW9	Interim Guidance Level for Drinking Water, MoH 2017 ^{2,3}	ANZECC 90% Species Protection - Technical Draft Default Guideline Values ⁴	ANZECC 95% Species Protection - Technical Draft Default Guideline Values ⁴
Sample Name	OHA_FTA_MW4_1_090715	OHA_FTA_MW4_2_010817	OHA_FTA_MW4_3_311017	OHA_FTA_MW4_4_050718	OHA_FTA_MW4_5_300920	OHA_DTK_MW9_1_200417	OHA_DTK_MW9_2_311017	OHA_DTK_MW9_3_200218	OHA_DTK_MW9_4_040718	OHA_DTK_MW9_5_300920			
Laboratory Reference	ES1326105	841470	937355	1185580	2116892	1327497	937355	1055089	1186581	2116892			
Monitoring Zone	On base												
Sample Date	9/07/2015	1/08/2017	31/10/2017	5/07/2018	30/09/2020	20/04/2017	31/10/2017	20/02/2018	4/07/2018	30/09/2020			
L-PFHxS	-	0.54	0.76	0.49	0.35	1.5	1.1	1.3	0.42	0.47	-	-	-
Mono-PFHxS	-	0.1	0.14	0.081	0.061	0.21	0.16	0.26	0.058	0.071	-	-	-
di-PFHxS	-	<0.001	0.0017	0.0011	<0.025	0.003	0.0025	0.003	<0.001	<0.025	-	-	-
Total PFHxS ⁵	1.35	0.64	0.9	0.57	0.41	1.7	1.3	1.6	0.48	0.54	-	-	-
L-PFOS	-	1	2.1	1	0.69	0.52	0.31	0.58	0.19	0.24	-	-	-
Mono-PFOS	-	0.45	1.1	0.5	0.33	0.62	0.46	0.72	0.18	0.19	-	-	-
di-PFOS	-	0.025	0.066	0.027	<0.025	0.055	0.057	0.078	0.013	<0.025	-	-	-
Total PFOS ⁵	3.02	1.5	3.3	1.5	1	1.2	0.83	1.4	0.38	0.43	-	2	0.13
Sum of PFHxS and PFOS ⁶	4.37	2.14	4.2	2.07	1.4	2.9	2.13	3	0.86	0.97	0.07	-	-
PFOA	0.54	0.26	0.48	0.3	0.19	0.67	0.52	0.67	0.36	0.33	0.56	632	220
PFBA	-	0.21	0.29	0.2	0.17	0.69	0.57	0.54	0.45	0.57	-	-	-
PFHxA	2.09	0.99	0.96	0.74	0.41	1.8	1.5	1.5	0.92	1	-	-	-
PFPeA	-	1	1.7	1	0.65	3.5	2.9	2.6	1.7	2.1	-	-	-
PFHpA	0.71	0.34	0.43	0.32	0.22	1	0.57	0.68	0.44	0.43	-	-	-
PFDA	<0.02	0.0021	0.0053	0.0048	<0.025	0.0014	<0.001	<0.001	0.0011	<0.025	-	-	-
PFNA	0.32	0.16	0.35	0.18	0.1	0.36	0.34	0.41	0.23	0.13	-	-	-
PFDoDA	<0.05	<0.005	<0.001	-	<0.1	-	<0.001	-	<0.025	<0.1	-	-	-
PFTeDA	<0.5	-	-	-	<0.1	-	-	-	<0.1	<0.1	-	-	-
PFTyDA	<0.05	-	-	-	<0.1	-	-	-	<0.025	<0.1	-	-	-
PFUnDA	<0.05	<0.005	0.003	-	<0.025	-	<0.001	<0.005	<0.001	<0.025	-	-	-
PFBS	0.05	0.032	0.043	0.034	0.025	0.12	0.072	0.093	0.028	0.034	-	-	-
PFPrS	-	0.0072	0.011	0.011	<0.025	0.019	0.018	0.031	0.0091	<0.025	-	-	-
PFPeS	-	0.022	0.065	0.051	0.029	0.16	0.11	0.14	0.043	0.038	-	-	-
PFHpS	-	0.032	0.059	0.032	<0.025	0.072	0.06	0.071	0.021	<0.025	-	-	-
PFNS	-	<0.005	<0.005	-	<0.05	<0.001	<0.005	<0.005	<0.001	<0.05	-	-	-
PFDS	<0.02	<0.005	-	<0.001	<0.1	<0.001	-	<0.005	<0.001	<0.1	-	-	-
4:2 FTS	-	<0.005	0.0054	0.0031	<0.025	0.012	0.0095	0.011	0.004	<0.025	-	-	-
6:2 FTS	5.6	0.88	1.6	0.86	0.45	1.9	3.6	1.7	1.5	1.1	-	-	-
8:2 FTS	<0.1	0.036	0.077	0.066	<0.1	0.0035	<0.005	<0.005	0.0022	<0.1	-	-	-
PFOSA	<0.02	<0.001	0.0032	0.004	<0.025	<0.001	<0.001	<0.001	<0.001	<0.025	-	-	-
NMeFOSA-M	<0.5	<0.005	<0.005	-	<0.1	-	<0.005	-	<0.005	<0.1	-	-	-
NMeFOSAA	-	<0.005	<0.005	-	<0.025	-	<0.005	<0.005	<0.001	<0.025	-	-	-
NMeFOSE-M	<0.5	<0.005	<0.005	-	<0.1	-	<0.005	<0.025	<0.005	<0.1	-	-	-
NEFOSA-M	<0.05	<0.005	<0.005	-	<0.1	-	<0.005	<0.005	<0.005	<0.1	-	-	-
NEFOSAA	-	<0.005	<0.005	-	<0.025	-	<0.005	<0.005	<0.001	<0.025	-	-	-
NEFOSE-M	<0.5	<0.005	<0.005	-	<0.1	-	<0.005	<0.025	<0.005	<0.1	-	-	-

Notes:

1. Results in µg/L.
2. Ministry of Health (MoH, 2017) Interim Guidance Level for Drinking Water, PFOA, PFOS and PFHxS.
3. Australian Government Department of Health (AGDoh, 2017) Health Based Guidance Values for PFAS for Use in Site Investigations in Australia.
4. Australian and New Zealand Guidelines for Fresh and Marine Water Quality – technical draft guideline values in PFAS National Environmental Management Plan – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2018.
5. Total PFOS, PFHxS are calculated by summing monoethyl, dimethyl and linear isomers. Where an isomer is below the detection limit it is not added to the summation. This is following the method in the reported lab results.
6. Summations are made by adding compounds Total PFOS, Total PFHxS together. Where one compound is below detection, it is not included in the summation.

-	Parameter not tested / no guideline value available
0.3	Concentration exceeds 95% ecological guidelines.
1.2	Concentration exceeds 90% ecological guidelines.
3.6	Concentration exceeds interim drinking water guidelines

Table3 Cont: Groundwater Sampling Results - Per- and Poly-Fluoroalkyl Substances (PFAS) ¹

Sample Location	MW6	MW6	OHA	MW6	MW6	MW6	MW6	WS1	WS1	WS1	WS1	Interim Guidance Level for Drinking Water, MoH 2017 ^{2,3}	ANZECC 90% Species Protection - Technical Draft Default Guideline Values ⁴	ANZECC 95% Species Protection - Technical Draft Default Guideline Values ⁴
Sample Name	OHA_RUP_MW6_1_200417	OHA_RUP_MW6_2_010817	OHA_RUP_MW6_3_311017	OHA_RUP_MW6_4_220218	OHA_RUP_MW6_5_040718	OHA_RUP_MW6_6_300920	OHA_FTA_WS1_1_190218	OHA_FTA_WS1_2_030718	OHA_FTA_WS1_3_210718	OHA_FTA_WS1_4_290920				
Laboratory Reference	1327497	841470	937355	1055089	1186580	2116892	1055089	1186578	1326866	2096316				
Monitoring Zone	On base													
Sample Date	20/04/2017	1/08/2017	31/10/2017	22/02/2018	4/07/2018	30/09/2020	19/02/2018	3/07/2018	21/07/2018	29/09/2020				
L-PFHs	5.3	8.1	22	4.1	11	4.2	0.11	0.12	0.12	0.12	-	-	-	-
Mono-PFHs	1.1	1.9	4.1	1.8	1.7	0.62	0.027	0.029	0.03	0.035	-	-	-	-
di-PFHs	0.014	0.02	0.052	0.025	0.015	<0.025	<0.001	<0.001	<0.001	<0.001	-	-	-	-
Total PFHs ⁵	6.4	10	26	5.9	13	4.8	0.14	0.15	0.15	0.16	-	-	-	-
L-PFOS	6.6	5.9	3	4.5	9.7	6.5	0.0077	0.011	0.0071	0.0073	-	-	-	-
Mono-PFOS	4.9	2.8	2.4	3.3	4.5	2.9	0.02	0.022	0.013	0.021	-	-	-	-
di-PFOS	0.31	0.23	0.27	0.39	0.27	0.13	0.0029	0.0031	0.0024	0.0041	-	-	-	-
Total PFOS ⁵	12	8.9	5.7	8.2	14	9.5	0.031	0.036	0.022	0.032	-	2	-	0.13
Sum of PFHs and PFOS ⁶	18	18.9	31.7	14	27	14	0.17	0.19	0.17	0.19	0.07	-	-	-
PFQA	1.3	1.8	1.7	0.89	2.2	1.1	0.02	0.022	0.018	0.021	0.56	632	-	220
PFBA	1.1	1.1	1.3	0.66	1.2	1.4	0.019	0.018	0.018	0.018	-	-	-	-
PFHxA	2.8	4.4	7	2	4	2.2	0.09	0.092	0.097	0.088	-	-	-	-
PFPeA	3.6	4	6.8	2.5	4.1	3.2	0.11	0.1	0.1	0.093	-	-	-	-
PFHpA	0.9	1.5	2.5	0.93	1.9	1	0.028	0.027	0.025	0.029	-	-	-	-
PFDA	0.016	0.029	0.013	0.012	0.045	<0.025	<0.001	<0.001	<0.001	<0.001	-	-	-	-
PFNA	0.75	0.86	0.37	0.66	1.3	0.75	0.0064	0.0078	0.0056	0.0062	-	-	-	-
PFDoDA	-	<0.005	<0.001	-	-	<0.1	-	<0.025	<0.005	<0.001	-	-	-	-
PFTeDA	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-
PFTyDA	-	-	-	-	-	<0.1	-	<0.025	-	-	-	-	-	-
PFUnDA	-	0.0057	0.0043	<0.005	-	<0.025	<0.001	<0.001	<0.001	<0.001	-	-	-	-
PFBS	0.56	0.76	1.8	0.43	0.72	0.22	0.022	0.024	0.023	0.026	-	-	-	-
PFPrS	0.11	0.21	0.66	0.17	0.22	0.063	0.01	0.0098	0.0097	0.012	-	-	-	-
PFPeS	0.81	0.81	2.3	0.66	0.77	0.26	0.02	0.021	0.023	0.023	-	-	-	-
PFHpS	0.34	0.6	0.49	0.38	0.34	0.15	0.0022	0.0026	0.0034	0.0023	-	-	-	-
PFNS	0.0025	0.0091	<0.005	<0.005	-	<0.05	<0.005	<0.001	<0.001	<0.001	-	-	-	-
PFDS	<0.001	<0.005	-	<0.005	<0.001	<0.1	<0.005	<0.001	<0.005	-	-	-	-	-
4:2 FTS	<0.001	<0.005	<0.005	<0.005	<0.001	<0.025	<0.005	<0.001	<0.001	<0.001	-	-	-	-
6:2 FTS	0.53	0.74	0.33	1.7	0.46	0.23	0.12	0.11	0.12	0.089	-	-	-	-
8:2 FTS	0.0089	0.0064	<0.005	0.04	0.0069	<0.1	<0.005	<0.001	<0.001	<0.001	-	-	-	-
PFOSA	0.0014	<0.001	<0.001	0.0085	<0.001	<0.025	<0.001	<0.001	<0.001	<0.001	-	-	-	-
NMeFOSA-M	-	<0.005	<0.005	-	-	<0.1	<0.005	-	<0.005	<0.001	-	-	-	-
NMeFOSAA	-	<0.005	<0.005	<0.005	-	<0.025	<0.005	<0.001	<0.005	<0.001	-	-	-	-
NMeFOSE-M	-	<0.005	<0.005	<0.025	-	<0.1	<0.005	-	<0.005	<0.001	-	-	-	-
NEFOSA-M	-	<0.005	<0.005	-	-	<0.1	<0.005	-	<0.005	<0.001	-	-	-	-
NEFOSAA	-	<0.005	<0.005	<0.005	-	<0.025	<0.005	<0.001	<0.005	<0.001	-	-	-	-
NEFOSE-M	-	<0.005	<0.005	<0.025	-	<0.1	<0.005	-	<0.005	<0.001	-	-	-	-

Notes:

1. Results in µg/L.
2. Ministry of Health (MoH, 2017) Interim Guidance Level for Drinking Water, PFQA, PFOS and PFHs.
3. Australian Government Department of Health (AGDoh, 2017) Health Based Guidance Values for PFAS for Use in Site Investigations in Australia.
4. Australian and New Zealand Guidelines for Fresh and Marine Water Quality – technical draft guideline values in PFAS National Environmental Management Plan – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2018.
5. Total PFOS, PFHs are calculated by summing monoethyl, dimethyl and linear isomers. Where an isomer is below the detection limit it is not added to the summation. This is following the method in the reported lab results.
6. Summations are made by adding compounds Total PFOS, Total PFHs together. Where one compound is below detection, it is not included in the summation.

-	Parameter not tested / no guideline value
0.3	Concentration exceeds 95% ecological guidelines.
1.2	Concentration exceeds 90% ecological guidelines.
3.6	Concentration exceeds interim drinking water guidelines

Table 3 Cont: Groundwater Sampling Results - Per- and Poly-Fluoroalkyl Substances (PFAS) ¹

Sample Location	GW67	GW67	GW67	GW67	GW107	GW108	GW109	Interim Guidance Level for Drinking Water, MoH 2017 ^{2,3}	ANZECC 90% Species Protection - Technical Draft Default Guideline Values ⁴	ANZECC 95% Species Protection - Technical Draft Default Guideline Values ⁴
Sample Name	OHA_ADJ_GW67_1_210218	OHA_ADJ_GW67_2_140518	OHA_ADJ_GW67_3_110918	OHA_ADJ_GW67_4_300920	OHA_ADJ_GW107_1_011020	OHA_ADJ_GW108_1_011020	OHA_ADJ_GW109_1_011020			
Laboratory Reference	1047809	1134445	1244990	2096741	2096735	2096735	2096735			
Monitoring Zone	Off base	Off base	Off base							
Sample Date	21/02/2018	14/05/2018	11/09/2018	30/09/2020	1/10/2020	1/10/2020	1/10/2020			
L-PFHs	0.0016	0.0018	0.0012	<0.001	<0.001	<0.001	<0.001	-	-	-
Mono-PFHs	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
di-PFHs	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
Total PFHs ⁵	0.0016	0.0018	0.0012	<0.001	<0.001	<0.001	<0.001	-	-	-
L-PFOS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
Mono-PFOS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
di-PFOS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
Total PFOS ⁵	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	2	0.13
Sum of PFHs and PFOS ⁶	0.0016	0.0018	0.0012	<0.001	<0.001	<0.001	<0.001	0.07	-	-
PFQA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.56	632	220
PFBA	-	-	-	-	-	-	-	-	-	-
PFHxA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
PFPeA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
PFHpA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
PFDA	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	-	-	-
PFNA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
PFDoDA	-	<0.025	<0.001	-	-	-	-	-	-	-
PFTeDA	-	<0.025	<0.005	-	-	-	-	-	-	-
PFTyDA	-	<0.025	<0.005	-	-	-	-	-	-	-
PFUnDA	<0.001	<0.001	<0.001	-	-	-	-	-	-	-
PFBS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
PFPrS	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	-	-	-
PFPeS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
PFHpS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
PFNS	<0.005	<0.001	<0.001	-	-	-	-	-	-	-
PFDS	<0.005	<0.001	<0.001	-	-	-	-	-	-	-
4:2 FTS	<0.005	<0.001	-	-	<0.001	<0.001	<0.001	-	-	-
6:2 FTS	<0.005	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
8:2 FTS	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
PFOSA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
NMeFOSA-M	-	<0.005	<0.005	-	-	-	-	-	-	-
NMeFOSAA	<0.005	<0.001	<0.001	<0.001	-	-	-	-	-	-
NMeFOSE-M	-	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
NEFOSA-M	-	<0.001	<0.005	-	-	-	-	-	-	-
NEFOSAA	<0.005	<0.001	<0.001	<0.001	-	-	-	-	-	-
NEFOSE-M	-	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-

Notes:

1. Results in µg/L.
2. Ministry of Health (MoH, 2017) Interim Guidance Level for Drinking Water, PFQA, PFOS and PFHs.
3. Australian Government Department of Health (AGDoh, 2017) Health Based Guidance Values for PFAS for Use in Site Investigations in Australia.
4. Australian and New Zealand Guidelines for Fresh and Marine Water Quality – technical draft guideline values in PFAS National Environmental Management Plan – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2018.
5. Total PFOS, PFHs are calculated by summing monoethyl, dimethyl and linear isomers. Where an isomer is below the detection limit it is not added to the summation. This is following the method in the reported lab results.
6. Summations are made by adding compounds Total PFOS, Total PFHs together. Where one compound is below detection, it is not included in the summation.

-	Parameter not tested / no guideline value
0.3	Concentration exceeds 95% ecological guidelines.
1.2	Concentration exceeds 90% ecological guidelines.
3.6	Concentration exceeds interim drinking water guidelines

Table 4: Surface Water Sampling Results - Per- and Poly-Fluoroalkyl Substances (PFAS) ¹

Sample Location	SW33	SW33	SW33	SW33	SW36	SW36	SW36	SW36	ANZECC 90% Species Protection for Freshwater - Technical Draft Default Guideline Values ⁴	ANZECC 95% Species Protection for Freshwater - Technical Draft Default Guideline Values ⁴
Sample Name	OHA_ADJ_SW33_1_190218	OHA_ADJ_SW33_2_220518	OHA_ADJ_SW33_3_120918	OHA_ADJ_SW33_4_290920	OHA_ADJ_SW36_1_220218	OHA_ADJ_SW36_2_170518	OHA_ADJ_SW36_3_120918	OHA_ADJ_SW36_4_290920		
Laboratory Reference	1047510	1147417	1248198	2094714	1047802	1142104	1251329	2094717		
Monitoring Zone	Off base									
Sample Date	19/02/2018	22/05/2018	12/09/2018	29/09/2020	22/02/2018	17/05/2018	12/09/2018	29/09/2020		
L-PFHxS	0.11	0.0015	0.067	<0.025	<0.001	<0.001	<0.001	<0.025	-	-
Mono-PFHxS	0.019	<0.001	0.012	<0.025	<0.001	<0.001	<0.001	<0.025	-	-
di-PFHxS	<0.001	<0.001	<0.001	<0.025	<0.001	<0.001	<0.001	<0.025	-	-
Total PFHxS ⁵	0.13	0.0015	0.079	<0.025	<0.001	<0.001	<0.001	<0.025	-	-
L-PFOS	0.047	0.0013	0.024	<0.025	<0.001	<0.001	<0.001	<0.025	-	-
Mono-PFOS	0.06	<0.001	0.032	<0.025	<0.001	<0.001	<0.001	<0.025	-	-
di-PFOS	0.0046	<0.001	0.0025	<0.025	<0.001	<0.001	<0.001	<0.025	-	-
Total PFOS ⁵	0.11	0.0013	0.058	<0.025	<0.001	<0.001	<0.001	<0.025	2	0.13
Sum of PFHxS and PFOS ⁶	0.24	0.0028	0.14	<0.025	<0.001	<0.001	<0.001	<0.025	-	-
PFOA	0.051	<0.001	0.021	<0.025	<0.001	<0.001	<0.001	<0.025	632	220
PFBA	0.087	-	0.044	<0.2	<0.005	<0.01	<0.005	<0.2	-	-
PFHxA	0.29	0.0033	0.13	<0.025	<0.001	<0.001	<0.001	<0.025	-	-
PFPeA	0.4	0.0037	0.16	<0.1	<0.001	<0.001	<0.001	<0.1	-	-
PFHpA	0.11	0.0013	0.049	<0.025	<0.001	<0.001	<0.001	<0.025	-	-
PFDA	<0.001	<0.001	<0.001	<0.025	<0.001	<0.001	<0.001	<0.025	-	-
PFNA	0.018	<0.001	0.0055	<0.025	<0.001	<0.001	<0.001	<0.025	-	-
PFDoDA	-	<0.005	-	<0.1	-	<0.025	<0.005	<0.1	-	-
PFTeDA	-	<0.025	-	<0.1	-	<0.1	<0.1	<0.1	-	-
PFTrDA	-	<0.005	-	<0.1	-	<0.025	<0.005	<0.1	-	-
PFUnDA	<0.001	<0.001	<0.001	<0.025	<0.001	<0.001	<0.005	<0.025	-	-
PFBS	0.012	<0.001	0.0077	<0.025	<0.001	<0.001	<0.001	<0.025	-	-
PFPrS	0.0036	<0.001	0.0034	<0.025	<0.001	<0.001	<0.001	<0.025	-	-
PFPeS	0.012	<0.001	0.0075	<0.025	<0.001	<0.001	<0.001	<0.025	-	-
PFHpS	0.0033	<0.001	0.0017	<0.025	<0.001	<0.001	<0.001	<0.025	-	-
PFNS	<0.005	<0.001	<0.001	<0.05	<0.005	<0.001	<0.001	<0.05	-	-
PFDS	<0.005	<0.001	<0.001	<0.1	<0.005	<0.001	<0.001	<0.1	-	-
4:2 FTS	<0.005	<0.001	-	<0.025	<0.005	<0.001	<0.001	<0.025	-	-
6:2 FTS	0.0051	0.0016	0.017	<0.05	<0.005	<0.001	<0.001	<0.05	-	-
8:2 FTS	<0.005	<0.001	<0.001	<0.1	<0.005	<0.001	<0.005	<0.1	-	-
PFOSA	<0.001	<0.001	<0.001	<0.025	<0.001	<0.001	<0.001	<0.025	-	-
NMeFOSA-M	-	<0.001	<0.005	<0.1	-	<0.005	<0.005	<0.1	-	-
NMeFOSAA	<0.005	<0.001	<0.001	<0.025	<0.005	<0.001	<0.005	<0.025	-	-
NMeFOSE-M	<0.025	<0.005	<0.005	<0.1	-	<0.005	<0.005	<0.1	-	-
NETFOSA-M	-	<0.001	<0.005	<0.1	-	<0.001	<0.005	<0.1	-	-
NETFOSAA	<0.005	<0.001	<0.001	<0.025	<0.005	<0.001	<0.005	<0.025	-	-
NETFOSE-M	<0.025	<0.005	<0.005	<0.1	-	<0.005	<0.005	<0.1	-	-

Notes:

1. Results in µg/L.
2. Ministry of Health (MoH, 2017) Interim Guidance Level for Drinking Water, PFOA, PFOS and PFHxS.
3. Australian Government Department of Health (AGDoH, 2017) Health Based Guidance Values for PFAS for Use in Site Investigations in Australia.
4. Australian and New Zealand Guidelines for Fresh and Marine Water Quality – technical draft guideline values in PFAS National Environmental Management Plan – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2018.
5. Total PFOS, PFHxS are calculated by summing monoethyl, dimethyl and linear isomers. Where an isomer is below the detection limit it is not added to the summation. This is following the method in the reported lab results.
6. Summations are made by adding compounds Total PFOS, Total PFHxS together. Where one compound is below detection, it is not included in the summation.

- Parameter not tested / no guideline value available

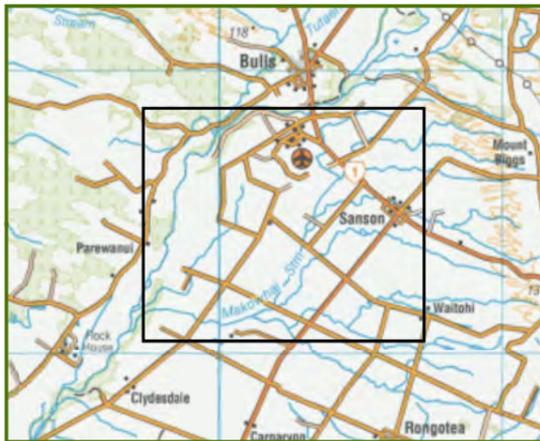
Table 4 Cont: Surface Water Sampling Results - Per- and Poly-Fluoroalkyl Substances (PFAS) ¹

Sample Location	SW6	SW6	SW6	SW6	SW4	SW4	ANZECC 90% Species Protection for Freshwater - Technical Draft Default Guideline Values ⁴	ANZECC 95% Species Protection for Freshwater - Technical Draft Default Guideline Values ⁴
Sample Name	OHA_DPB_SW6_1_040817	OHA_DPB_SW6_4_011117	OHA_DPB_SW6_1_030718	OHA_DPB_SW6_4_290920	OHA_SHW_SW4_1_040817	OHA_SHW_SW4_2_021020		
Laboratory Reference	841470	937355	1186578	2094713	841470	2094371		
Monitoring Zone	Off base	Off base	Off base	Off base	On base	On base		
Sample Date	4/08/2017	1/11/2017	3/07/2018	29/09/2020	4/08/2017	2/10/2020		
L-PFHxS	1.6	1.8	0.48	0.19	<0.001	<0.001	-	-
Mono-PFHxS	0.3	0.28	0.073	0.03	<0.001	<0.001	-	-
di-PFHxS	0.002	0.0039	<0.001	<0.025	<0.001	<0.001	-	-
Total PFHxS ⁵	1.9	2.1	0.55	0.22	<0.001	<0.001	-	-
L-PFOS	0.86	1	0.21	0.13	<0.001	<0.001	-	-
Mono-PFOS	0.52	0.82	0.15	0.093	<0.001	<0.001	-	-
di-PFOS	0.036	0.096	0.013	<0.025	<0.001	<0.001	-	-
Total PFOS ⁵	1.4	1.9	0.37	0.22	<0.001	<0.001	2	0.13
Sum of PFHxS and PFOS ⁶	3.3	4	0.92	0.44	-	<0.001	-	-
PFOA	0.61	0.73	0.19	0.065	<0.001	<0.001	632	220
PFBA	0.23	0.32	0.11	<0.2	0.0054	0.0095	-	-
PFHxA	1	0.96	0.32	0.14	<0.001	0.001	-	-
PFPeA	1.1	1.5	0.44	0.22	<0.001	<0.001	-	-
PFHpA	0.32	0.47	0.16	0.073	<0.001	<0.001	-	-
PFDA	0.0012	0.002	0.0011	<0.025	<0.001	<0.001	-	-
PFNA	0.15	0.32	0.092	0.029	<0.001	<0.001	-	-
PFDODA	<0.005	<0.001	<0.025	<0.1	<0.005	<0.001	-	-
PFTeDA	-	-	<0.1	<0.1	-	<0.001	-	-
PFTrDA	-	-	<0.025	<0.1	-	<0.001	-	-
PFUnDA	<0.005	0.0012	<0.001	<0.025	<0.005	<0.001	-	-
PFBS	0.079	0.12	0.037	<0.025	<0.001	<0.001	-	-
PFPrS	0.023	0.042	0.013	<0.025	<0.001	<0.001	-	-
PFPeS	0.083	0.18	0.045	<0.025	<0.001	<0.001	-	-
PFHpS	0.066	0.13	0.027	<0.025	<0.001	<0.001	-	-
PFNS	<0.005	<0.005	<0.001	<0.05	<0.005	<0.001	-	-
PFDS	<0.005	-	<0.001	<0.1	<0.005	-	-	-
4:2 FTS	0.0059	0.0053	<0.001	<0.025	<0.005	-	-	-
6:2 FTS	0.81	1.5	0.33	0.053	<0.005	<0.001	-	-
8:2 FTS	<0.005	0.0054	<0.001	<0.1	<0.005	<0.001	-	-
PFOSA	<0.001	0.0012	<0.001	<0.025	<0.001	<0.001	-	-
NMeFOSA-M	<0.005	<0.005	<0.005	<0.1	-	-	-	-
NMeFOSAA	<0.005	<0.005	<0.001	<0.025	<0.005	<0.001	-	-
NMeFOSE-M	<0.005	<0.005	<0.005	<0.1	<0.005	<0.001	-	-
NEtFOSA-M	<0.005	<0.005	<0.005	<0.1	-	-	-	-
NEtFOSAA	<0.005	<0.005	<0.001	<0.025	<0.005	<0.001	-	-
NEtFOSE-M	<0.005	<0.005	<0.005	<0.1	<0.005	-	-	-

Notes:

1. Results in µg/L.
2. Ministry of Health (MoH, 2017) Interim Guidance Level for Drinking Water, PFOA, PFOS and PFHxS.
3. Australian Government Department of Health (AGDoH, 2017) Health Based Guidance Values for PFAS for Use in Site Investigations in Australia.
4. Australian and New Zealand Guidelines for Fresh and Marine Water Quality – technical draft guideline values in PFAS National Environmental Management Plan – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2018.
5. Total PFOS, PFHxS are calculated by summing monoethyl, dimethyl and linear isomers. Where an isomer is below the detection limit it is not added to the summation. This is following the method in the reported lab results.
6. Summations are made by adding compounds Total PFOS, Total PFHxS together. Where one compound is below detection, it is not included in the summation.

-	Parameter not tested / no guideline value available
3.6	Concentration exceeds 95% ecological guidelines.



- KEY :**
- Groundwater
 - ◆ Surface water
 - Groundwater (Sample not able to be collected)
 - Proposed Monitoring Wells
 - River/Streams/Drains
 - RNZAF Base Ohakea Boundary

SOURCE:
Aerial imagery flown 2015-16 and 2019, supplied by NZDF.
Cadastral and Topographic information supplied by LINZ.

NO.	REVISION HISTORY	DATE
A	FINAL	FEB 2021



PROJECT NAME:
RNZAF BASE OHAKEA
PFAS INVESTIGATION:
LONG TERM
MONITORING PLAN

FIGURE TITLE:
SAMPLE LOCATION PLAN:
OCTOBER 2020

SCALE: 1:30,000 (A3)	FIGURE NO.: 1	ISSUE NO.: A
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- KEY :**
- Groundwater (Above relevant guidelines)
 - ◆ Surface water (Above relevant guidelines)
 - Groundwater (Below relevant guidelines)
 - ◆ Surface water (Below relevant guidelines)
 - River/Streams/Drains
 - ▭ RNZAF Base Ohakea Boundary
 - ▭ <LOR (Below laboratory limit of reporting)
 - ▭ Concentration equal to or exceeds guideline

NOTE: Groundwater wells are not currently used for drinking water supply.

GUIDELINES USED:
 1. Interim Guidance Level for Drinking Water (MoH, 2017). Sourced from Australian Government Department of Health - Health Based Guidance Values for PFAS (2017).
 2. Draft ANZECC Australian and New Zealand Water Quality Guidelines reported in PFAS National Environmental Management Plan (HEPA 2020).

SOURCE:
 Aerial imagery flown 2015-16 and 2019, supplied by NZDF. Cadastral and Topographic information supplied by LINZ.

Groundwater samples (all units µg/L)			
Sample ID	Sampled date	PFOS + PFHxS	Guideline value - Drinking water ¹ (PFOS + PFHxS)
GW31	29/09/2020	0.12	0.07
GW53	30/09/2020	<LOR	0.07
GW65	29/09/2020	<LOR	0.07
GW6	29/09/2020	0.025	0.07
WS2	29/09/2020	0.004	0.07
MW4	30/09/2020	1.4	0.07
MW9	30/09/2020	0.97	0.07
MW6	30/09/2020	14	0.07
WS1	29/09/2020	0.19	0.07
GW67	30/09/2020	<LOR	0.07
GW107	1/10/2020	<LOR	0.07
GW108	1/10/2020	<LOR	0.07
GW109	1/10/2020	<LOR	0.07

Surface water samples (all units µg/L)				
Sample ID	Sampled date	PFOS	Guideline value 90% Ecosystem ² (PFOS)	Guideline value 95% Ecosystem ² (PFOS)
SW4	2/10/2020	<LOR	2.0	0.13
SW6	29/09/2020	0.22	2.0	0.13
SW33	29/09/2020	<LOR	2.0	0.13
SW36	29/09/2020	<LOR	2.0	0.13

A	FINAL	FEB 2020
NO.	REVISION HISTORY	DATE



PROJECT NAME:
 RNZAF BASE OHAKEA
 PFAS INVESTIGATION:
 LONG TERM
 MONITORING PLAN

FIGURE TITLE:
 SAMPLE EXCEEDENCES
 OCTOBER 2020

SCALE: 1:30,000 (A3) **FIGURE NO.:** 2 **ISSUE NO.:** A



Appendix A: Borelogs and Photos from Drilling

MONITORING WELL

Job No.: A02744113
 Test No.: GW106
 Sheet: 2 of 2
 Date: 02/07/20
 Ground Level mRL: Ground

Client:
New Zealand Defence Force
Project:
Ohakea PFAS Monitoring Well Installation

Coordinates:
1800936mE, 5542110mN (NZTM)

Interpretation	Geological Description	Graphic Log	Depth (m)	RL (m)	PID (ppm)	Samples	Depth Remarks	Installation	Water
	Soil and Rock logged in accordance with New Zealand Geotechnical Society field description of soil and rock. 2005.								
	[CONT] GRAVEL, with minor sand; dark grey. Gravel, fine to coarse, subround to rounded, greywacke; sand, coarse.		11					Bentonite	
	Silty GRAVEL, with some sand; dark grey. Gravel, fine to coarse, subround to rounded, greywacke; sand, fine to coarse.								
	Core Loss								
	SAND, with some silt and gravel; dark grey. Tightly packed; sand, fine to coarse; gravel, fine to medium, rounded, greywacke.								
	Silty GRAVEL, with some sand; dark grey. Gravel, fine to coarse, subround to rounded, greywacke; sand, fine to coarse.		12						
	Core Loss								
	GRAVEL, with minor silt and sand; dark grey. Gravel, fine to coarse, subround to rounded, greywacke; sand, fine to medium.		13						
	Core Loss								
	SAND, with minor gravel, with trace silt; dark grey. Sand, fine to coarse; gravel, fine to coarse, subround to rounded, greywacke.		14						
	EOH: 15.00m		15					15.00m	
			16						
			17						
			18						
			19						

Remarks			Investigation Type		Water	
Hand clear to 1.5 m			<input type="checkbox"/> Hand Auger	▼ Standing Water Level		
			<input type="checkbox"/> Test Pit	← In flow		
			<input checked="" type="checkbox"/> Machine Hole	▷ Out flow		
Contractor: McMillan Drilling	Rig/Plant Used: Geoprobe 8140LS Rotary Sonic	Driller: Brian McMahan, Phil McSweeney	Logged By: JEQC	Checked By: TH	Hole Depth: 15.00 m	

MONITORING WELL

Job No.: A02744113
Test No.: GW107
Sheet: 1 of 2
Date: 01/07/20
Ground Level mRL: Ground

Client:
New Zealand Defence Force
Project:
Ohakea PFAS Monitoring Well Installation

Coordinates:
1799251mE, 5541135mN (NZTM)

Interpretation	Geological Description	Graphic Log	Depth (m)	RL (m)	PID (ppm)	Samples	Depth Remarks	Installation	Water
	Soil and Rock logged in accordance with New Zealand Geotechnical Society field description of soil and rock. 2005.								
	Gravelly SILT, with some sand; dark brown. Firm, moist; gravel, fine to medium, rounded, greywacke; sand, fine to coarse.		0 - 1					Cement (Flush Toby) 0.30m	
	SAND, with minor silt, with trace gravel; dark greyish brown. Loosely packed, moist; sand, medium; gravel, medium, rounded, greywacke; FILL.		1 - 2						
	Core Loss		2 - 2.5						
	SAND, with minor silt, with trace gravel; dark greyish brown. Loosely packed, moist; sand, medium; gravel, medium, rounded, greywacke; FILL.		2.5 - 3						
	Sandy SILT, with trace gravel; dark brown. Firm, moist to wet; sand, fine to medium; gravel, fine to medium, rounded, greywacke.		3 - 3.5						
	SAND, with minor gravel; dark brownish grey. Tightly packed, moist; sand, fine to medium; gravel, fine, rounded, greywacke.		3.5 - 4.5					Bentonite	
	Core Loss		4.5 - 5						
	SAND, with minor gravel; dark brownish grey. Tightly packed, moist; sand, fine to medium; gravel, fine, rounded, greywacke.		5 - 6						
	Sandy GRAVEL; dark grey. Tightly packed; gravel, fine to coarse, subround to rounded, greywacke; sand, fine to coarse; trace organics (wood). Driller's comment: drilled this run without water..		6 - 7					6.30m Blinding Sand 0.50m	
	Core Loss		7 - 7.5						
	GRAVEL; dark grey. Gravel, fine to coarse, subround to rounded, greywacke, cobbles up to 80 mm; Driller's comment: drilled this run with water - suspect fines being washed out..		7.5 - 9					7.00m Graded (2-3mm) Filter Pack Slotted pipe: 4.00m	

05/07/2020 00:00

Remarks Hand clear to 1.5 m		Investigation Type <input type="checkbox"/> Hand Auger <input type="checkbox"/> Test Pit <input checked="" type="checkbox"/> Machine Hole		Water ▼ Standing Water Level ↔ In flow ↔ Out flow	
Contractor: McMillan Drilling	Rig/Plant Used: Geoprobe 8140LS Rotary Sonic	Driller: Brian McMahon, Phil McSweeney	Logged By: JEQC	Checked By: TH	Hole Depth: 15.00 m

MONITORING WELL

Job No.: A02744113
 Test No.: GW107
 Sheet: 2 of 2
 Date: 01/07/20
 Ground Level mRL: Ground

Client:
New Zealand Defence Force

Project:
Ohakea PFAS Monitoring Well Installation

Coordinates:
1799251mE, 5541135mN (NZTM)

Interpretation	Geological Description	Graphic Log	Depth (m)	RL (m)	PID (ppm)	Samples	Depth Remarks	Installation		Water
	Soil and Rock logged in accordance with New Zealand Geotechnical Society field description of soil and rock. 2005.									
	[CONT] GRAVEL; dark grey. Gravel, fine to coarse, subround to rounded, greywacke, cobbles up to 80 mm; Driller's comment: drilled this run with water - suspect fines being washed out.							Graded (2-3mm) Filter Pack		
	Gravelly SILT, with some sand; dark greyish green. Stiff; gravel, fine to coarse, rounded, greywacke; sand, fine to silty							10.90m	Slotted pipe: 4.00m	
	Silty GRAVEL, with some sand; dark grey. Gravel, fine to coarse, subround to rounded, greywacke, cobbles up to 90 mm; sand, fine to coarse.		11					Blinding Sand 1.10m	11.00m	
	SAND, with some gravel; dark grey. Tightly packed; sand, fine to coarse; gravel, fine, subround to rounded, greywacke.		12							
	SAND, with minor silt; dark grey. Tightly packed; sand, fine to medium.		13						Bentonite	
	Core Loss									
	SAND, with minor silt; dark grey. Tightly packed; sand, fine to medium.		14							
	ORGANIC SILT, with trace gravel; dark brown. Stiff; gravel, fine, rounded, greywacke.									
	Gravelly SAND, with trace silt; dark grey. Sand, fine to coarse; gravel, fine, rounded, greywacke.									
	EOH: 15.00m		15						15.00m	
			16							
			17							
			18							
			19							

Remarks		Investigation Type		Water	
Hand clear to 1.5 m		<input type="checkbox"/> Hand Auger <input type="checkbox"/> Test Pit <input checked="" type="checkbox"/> Machine Hole		<input checked="" type="checkbox"/> Standing Water Level <input type="checkbox"/> In flow <input type="checkbox"/> Out flow	
Contractor: McMillan Drilling	Rig/Plant Used: Geoprobe 8140LS Rotary Sonic	Driller: Brian McMahan, Phil McSweeney	Logged By: JEQC	Checked By: TH	Hole Depth: 15.00 m

MONITORING WELL

Job No.: A02744113
 Test No.: GW108
 Sheet: 1 of 2
 Date: 04/07/20
 Ground Level mRL: Ground

Client:
New Zealand Defence Force
Project:
Ohakea PFAS Monitoring Well Installation

Coordinates:
1799732mE, 5542679mN (NZTM)

Interpretation	Geological Description	Graphic Log	Depth (m)	RL (m)	PID (ppm)	Samples	Depth Remarks	Installation	Water
	SILT, with some clay; dark brown. Firm, moist, low plasticity; contains rootlets.							Cement (Flush Toby) 0.30m	
	CLAY & SILT, with trace gravel; brownish grey mottled orange. Stiff, moist, moderate plasticity; gravel, fine to medium, subround to rounded, greywacke.							Bentonite 1.00m	Plain (impervious) pipe: 1.50m
	Clayey silty GRAVEL; brownish grey, mottled orange. Firm, moist, plastic; gravel, fine to coarse, subround to rounded, greywacke, cobbles up to 90 mm.		1					Blinding Sand 1.20m	
	GRAVEL, with minor silt and sand; brownish grey. Gravel, fine to coarse, subround to rounded, greywacke; sand, fine; Driller's comms: suspect fines being washed out.								
	Core loss		2						
	GRAVEL, with minor silt and sand; brownish grey. Gravel, fine to coarse, subround to rounded, greywacke; sand, fine.							Graded (2-3mm) Filter Pack 4.00m	Slotted pipe: 2.50m
	Gravelly SILT; brownish grey. Stiff; gravel, fine to medium, subround to rounded, greywacke.		4					Blinding Sand 4.20m	
	ORGANIC SILT; dark brown. Stiff.								
	CLAY & SILT, with trace sand; bluish grey. Stiff, plastic; sand, fine.								
			5						
	SAND, with trace silt; dark grey. Tightly packed; sand, fine to medium.		6						
			7					Bentonite	
	PEAT (FIBROUS); dark brown. Firm; contains wood fragments.								
	PEAT (AMORPHOUS); dark brown. Soft - firm; contains wood fragments.								
	ORGANIC SILT, with some sand; dark brown. Firm; sand, medium.		8						
	PEAT (AMORPHOUS); dark brown. Soft - firm; contains wood fragments.								
	ORGANIC SILT & CLAY; dark greyish brown. Stiff, plastic.								
	CLAY & SILT; greenish grey. Firm, plastic.		9						
	SAND, with some silt; dark grey. Tightly packed, non-plastic; sand, fine to medium.								
	Core loss								
	SAND, with some silt; dark grey.								

05/07/2020 00:00

Remarks	Investigation Type	Water
Hand clear to 1.2 m	<input type="checkbox"/> Hand Auger <input type="checkbox"/> Test Pit <input checked="" type="checkbox"/> Machine Hole	▼ Standing Water Level ◁ In flow ▷ Out flow

Contractor: McMillan Drilling	Rig/Plant Used: Geoprobe 8140LS Rotary Sonic	Driller: Brian McMahon, Phil McSweeney	Logged By: JEQC	Checked By: TH	Hole Depth: 12.00 m
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MONITORING WELL

Job No.: A02744113
 Test No.: GW108
 Sheet: 2 of 2
 Date: 04/07/20
 Ground Level mRL: Ground

Client:
 New Zealand Defence Force
Project:
 Ohakea PFAS Monitoring Well Installation

Coordinates:
 1799732mE, 5542679mN (NZTM)

Interpretation	Geological Description	Graphic Log	Depth (m)	RL (m)	PID (ppm)	Samples	Depth Remarks	Installation	Water
	Soil and Rock logged in accordance with New Zealand Geotechnical Society field description of soil and rock. 2005.								
	Tightly packed, non-plastic; sand, fine to medium.								
	Sandy CLAY & SILT; dark greyish brown. Firm, plastic; sand, fine to medium.								
	SAND, with some clay and silt; dark grey. Tightly packed; sand, fine to coarse.								
	Sandy CLAY & SILT; dark greyish brown. Firm, plastic; sand, fine to medium.								
	Core loss SAND, with some silt, with trace gravel; dark grey. Sand, fine to coarse; gravel, fine to medium, rounded, greywacke.		11						
	EOH: 12.00m		12					12.00m	
			13						
			14						
			15						
			16						
			17						
			18						
			19						

Remarks		Investigation Type		Water	
Hand clear to 1.2 m		<input type="checkbox"/> Hand Auger <input type="checkbox"/> Test Pit <input checked="" type="checkbox"/> Machine Hole		<input checked="" type="checkbox"/> Standing Water Level <input type="checkbox"/> In flow <input type="checkbox"/> Out flow	

Contractor: McMillan Drilling	Rig/Plant Used: Geoprobe 8140LS Rotary Sonic	Driller: Brian McMahan, Phil McSweeney	Logged By: JEQC	Checked By: TH	Hole Depth: 12.00 m
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MONITORING WELL

Job No.: A02744113
 Test No.: GW109
 Sheet: 1 of 1
 Date: 04/07/20
 Ground Level mRL: Ground

Client:
 New Zealand Defence Force
 Project:
 Ohakea PFAS Monitoring Well Installation

Coordinates:
 1799892mE, 5544883mN (NZTM)

Interpretation	Geological Description	Graphic Log	Depth (m)	RL (m)	PID (ppm)	Samples	Depth Remarks	Installation	Water
	Soil and Rock logged in accordance with New Zealand Geotechnical Society field description of soil and rock. 2005.								
	Gravelly SILT; dark brown. Firm, moist; gravel, fine to coarse, subround to rounded, greywacke, cobbles up to 100 mm; contains roots.							Cement (Flush Toby) 0.30m	
	SILT, with some clay, with minor gravel; dark brown. Stiff, moist; gravel, fine, rounded, greywacke.							Bentonite	Plain (impervious) pipe: 2.00m
	CLAY & SILT; brownish grey mottled orange. Stiff, moist, plastic.		1					1.60m	
	CLAY & SILT, with minor gravel; brownish grey mottled orange. Gravel, fine to coarse, rounded, greywacke.							Blinding Sand 0.80m	
	Silty GRAVEL, with some sand; greyish brown. Gravel, fine to coarse, subround to rounded, greywacke; sand, fine to coarse; Drilled without water.		2						
	GRAVEL; dark grey. Gravel, fine to coarse, subangular to rounded, greywacke, cobbles up to 110 mm; Drilled with water. Driller's comms: suspect fines washed out during drilling.		3						
			4						
	Core loss								
	GRAVEL: dark grey. Gravel, fine to coarse, subangular to rounded, greywacke, some iron staining.		5					Graded (2-3mm) Filter Pack	Slotted pipe: 6.00m
			6						
			7						
	Core loss								
	EOH: 10.50m		8					8.20m	8.00m
								Blinding Sand 0.40m	
			9						
			10					Bentonite	
								10.50m	

05/07/2020 00:00

Remarks			Investigation Type		Water	
Hand clear to 1.2 m			<input type="checkbox"/> Hand Auger <input type="checkbox"/> Test Pit <input checked="" type="checkbox"/> Machine Hole		<input checked="" type="checkbox"/> Standing Water Level <input type="checkbox"/> In flow <input type="checkbox"/> Out flow	
Contractor: McMillan Drilling	Rig/Plant Used: Geoprobe 8140LS Rotary Sonic	Driller: Brian McMahon, Phil McSweeney	Logged By: JEQC	Checked By: TH	Hole Depth: 10.50 m	



Photograph 1: Monitoring Well GW106



Photograph 2: GW106: 0.00-2.32m



Photograph 3: GW106: 2.32-4.44m



Photograph 4: GW106: 4.44-7.48m



Photograph 5: GW106: 7.48-9.92m



Photograph 6: GW106: 9.92-13.56m



Photograph 7: GW106: 13.56-15.08m



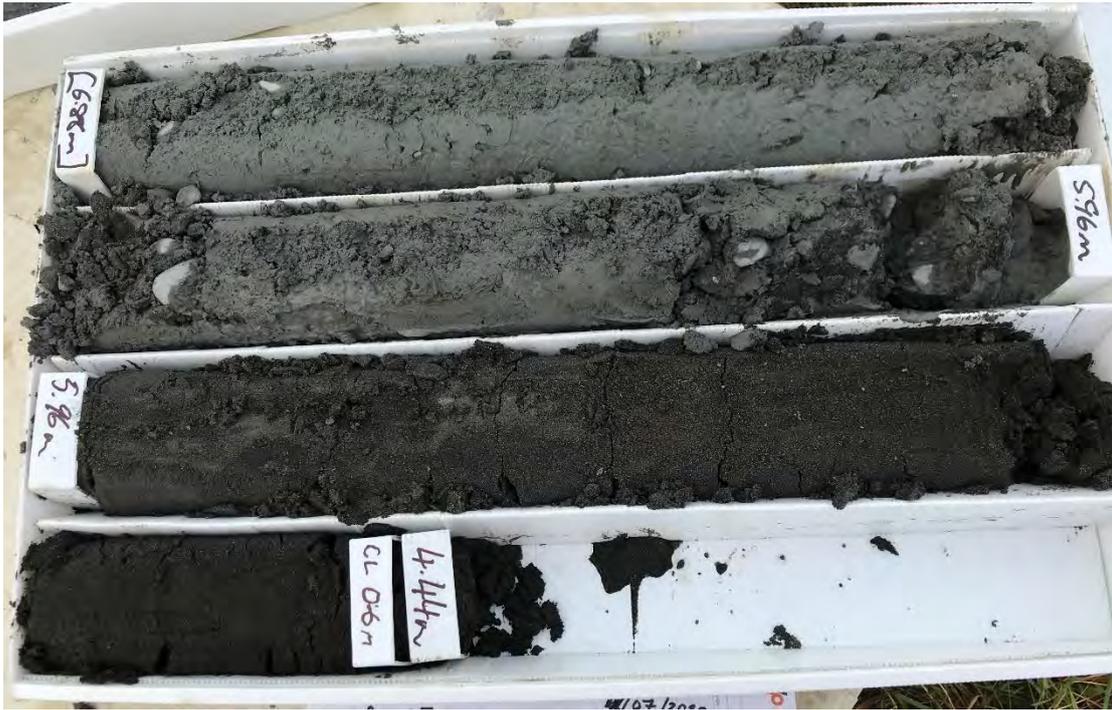
Photograph 8: Monitoring Well GW107



Photograph 9: GW107: 0.00-2.32m



Photograph 10: GW107: 2.32-4.44m



Photograph 11: GW107: 4.44-6.88m



Photograph 12: GW107: 6.88-9.30m



Photograph 13: GW107: 9.30-11.44m



Photograph 14: GW107: 11.44-13.56m



Photograph 15: GW107: 13.56-15.08m



Photograph 16: Monitoring Well GW108



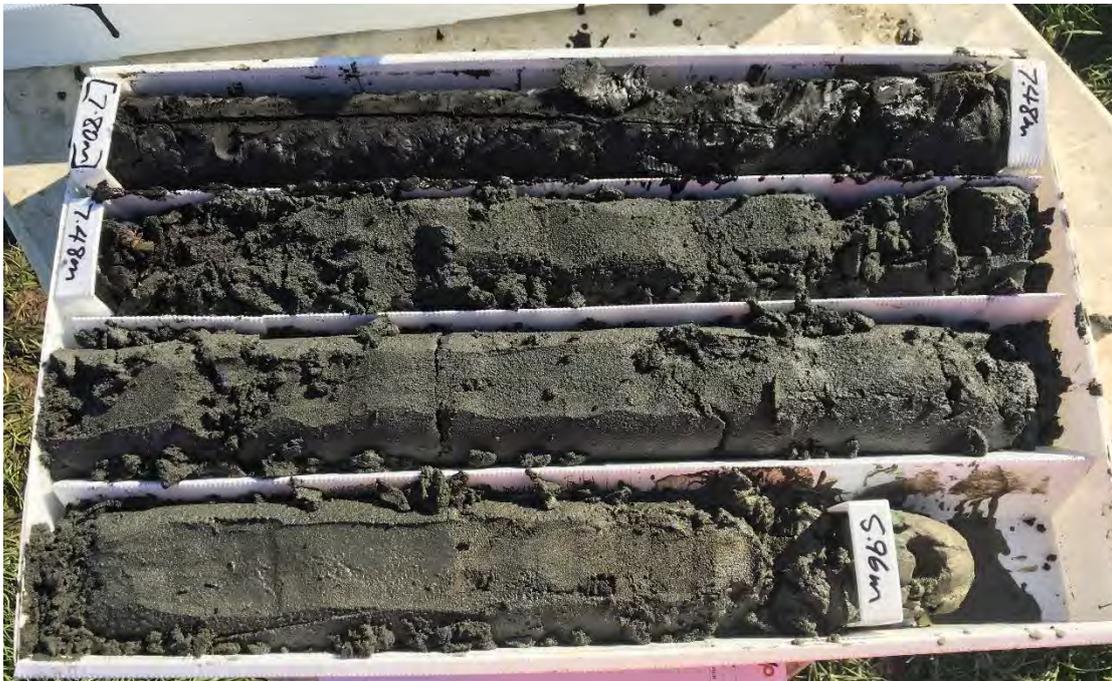
Photograph 17: GW108: 0.00-1.72m



Photograph 18: GW108: 1.72-3.84m



Photograph 19: GW108: 3.84-5.96m



Photograph 20: GW108: 5.96-7.80m



Photograph 21: GW108: 7.80-10.52m



Photograph 22: GW108: 10.52-12.04m



Photograph 23: Monitoring Well GW109



Photograph 24: GW109: 0.00-1.72m



Photograph 25: GW109: 1.72-3.84m



Photograph 26: GW109: 3.84-6.28m



Photograph 27: GW108: 6.28-9.00m



Photograph 28: GW108: 9.00-10.52m



Appendix B: Laboratory Reports and Chain of Custody Forms

Certificate of Analysis

Submission Reference: A02744114
Final Report

Nerena Rhodes
Pattle Delamore Partners Limited
P O Box 9528
Auckland 1149
New Zealand

PO Number: OHA_PFAS

Report Issued: 15-Oct-2020

AsureQuality Reference: **20-263717**

Sample(s) Received: 30-Sep-2020 08:00

Testing Period: 30-Sep-2020 to 15-Oct-2020

Results

The tests were performed on the samples as received.

Customer Sample Name: OHA_ADJ_GW6_5_290920 **Lab ID:** 20-263717-1

Sample Condition: Acceptable **Sampled Date:** 29-Sep-2020

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPoS	0.0025	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	0.0027	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	0.0039	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	0.0023	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	0.014	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	0.016	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	0.0044	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	0.0042	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	0.0086	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	0.0030	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	0.0038	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	0.0024	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	0.0019	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFTTrDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	NR	µg/L	AsureQuality Method (LC-MS/MS)

AsureQuality has used reasonable skill, care, and effort to provide an accurate analysis of the sample(s) which form(s) the subject of this report. However, the accuracy of this analysis is reliant on, and subject to, the sample(s) provided by you and your responsibility as to transportation of the sample(s). AsureQuality's standard terms of business apply to the analysis set out in this report.

Test	Result	Unit	Method Reference
Perfluorooctanesulfonamides			
PFOSA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	NR	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	NR	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	NR	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	107	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	115	%	AsureQuality Method (LC-MS/MS)
M8PFOS	166 (R)	%	AsureQuality Method (LC-MS/MS)
M4PFBA	25 (R)	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	54	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	47	%	AsureQuality Method (LC-MS/MS)
MPFHpA	58	%	AsureQuality Method (LC-MS/MS)
M8PFOA	84	%	AsureQuality Method (LC-MS/MS)
M9PFNA	82	%	AsureQuality Method (LC-MS/MS)
M6PFDA	125	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	152 (R)	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	203 (R)	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	855 (R)	%	AsureQuality Method (LC-MS/MS)
MPFOSA	80	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	85	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	71	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	147	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	115	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	72	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	71	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	298 (R)	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	289 (R)	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	290 (R)	%	AsureQuality Method (LC-MS/MS)

R = Recovery outside method limits

Customer Sample Name: OHA_ADJ_GWKAB_1_290920

Lab ID: 20-263717-2

Sample Condition: Acceptable

Sampled Date: 29-Sep-2020

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPtS	0.0046	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	0.010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	0.0089	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	0.016	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
L-PFHxS (1)	0.064	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	0.080	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	0.0017	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	0.0029	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	0.025	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	0.013	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	0.041	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	0.12	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	0.049	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	0.16	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	0.12	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	0.044	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	0.018	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	0.0035	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFTTrDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	0.0051	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	109	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	121	%	AsureQuality Method (LC-MS/MS)
M8PFOS	167 (R)	%	AsureQuality Method (LC-MS/MS)
M4PFBA	85	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	93	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	102	%	AsureQuality Method (LC-MS/MS)
MPFHpA	100	%	AsureQuality Method (LC-MS/MS)
M8PFOA	119	%	AsureQuality Method (LC-MS/MS)
M9PFNA	116	%	AsureQuality Method (LC-MS/MS)
M6PFDA	142	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	177 (R)	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	155 (R)	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
MPFTeDA	383 (R)	%	AsureQuality Method (LC-MS/MS)
MPFOA	118	%	AsureQuality Method (LC-MS/MS)
DNEtFOA	86	%	AsureQuality Method (LC-MS/MS)
DNMeFOA	87	%	AsureQuality Method (LC-MS/MS)
DNEtFOAA	126	%	AsureQuality Method (LC-MS/MS)
DNMeFOAA	124	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	79	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	81	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	118	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	120	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	131	%	AsureQuality Method (LC-MS/MS)

R = Recovery outside method limits

Customer Sample Name: OHA_ADJ_GWKAC_1_290920

Lab ID: 20-263717-3

Sample Condition: Acceptable

Sampled Date: 29-Sep-2020

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPrS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFTTrDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOA-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOA-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	104	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	96	%	AsureQuality Method (LC-MS/MS)
M8PFOS	82	%	AsureQuality Method (LC-MS/MS)
M4PFBA	105	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	103	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	104	%	AsureQuality Method (LC-MS/MS)
MPFHpA	102	%	AsureQuality Method (LC-MS/MS)
M8PFOA	106	%	AsureQuality Method (LC-MS/MS)
M9PFNA	90	%	AsureQuality Method (LC-MS/MS)
M6PFDA	90	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	67	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	42	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	0 (R)	%	AsureQuality Method (LC-MS/MS)
MPFOSA	89	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	54	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	50	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	71	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	79	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	59	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	64	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	101	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	110	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	91	%	AsureQuality Method (LC-MS/MS)

R = Recovery outside method limits

Customer Sample Name: OHA_ADJ_GWKAD_1_290920

Lab ID: 20-263717-4

Sample Condition: Acceptable

Sampled Date: 29-Sep-2020

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPoS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
mono-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDODA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFTTrDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	111	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	103	%	AsureQuality Method (LC-MS/MS)
M8PFOS	89	%	AsureQuality Method (LC-MS/MS)
M4PFBA	113	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	116	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	118	%	AsureQuality Method (LC-MS/MS)
MPFHpA	105	%	AsureQuality Method (LC-MS/MS)
M8PFOA	110	%	AsureQuality Method (LC-MS/MS)
M9PFNA	101	%	AsureQuality Method (LC-MS/MS)
M6PFDA	92	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	83	%	AsureQuality Method (LC-MS/MS)
MPFDODA	47	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	61	%	AsureQuality Method (LC-MS/MS)
MPFOSA	78	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	40	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	39	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
DNEtFOSAA	76	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	87	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	44	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	51	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	110	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	120	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	107	%	AsureQuality Method (LC-MS/MS)

QC Results

Blank

Relates to sample(s) 20-263717-1, 20-263717-2, 20-263717-3, 20-263717-4

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPtS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFTTrDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
NMeFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	96	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	71	%	AsureQuality Method (LC-MS/MS)
M8PFOS	45	%	AsureQuality Method (LC-MS/MS)
M4PFBA	109	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	101	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	105	%	AsureQuality Method (LC-MS/MS)
MPFHpA	90	%	AsureQuality Method (LC-MS/MS)
M8PFOA	79	%	AsureQuality Method (LC-MS/MS)
M9PFNA	61	%	AsureQuality Method (LC-MS/MS)
M6PFDA	50	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	36	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	36	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	0 (R)	%	AsureQuality Method (LC-MS/MS)
MPFOSA	84	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	54	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	61	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	47	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	47	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	66	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	81	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	100	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	89	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	63	%	AsureQuality Method (LC-MS/MS)

R = Recovery outside method limits

Analysis Summary

Wellington Laboratory

Analysis	Method	Accreditation	Authorised by
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
DX-PFCS01, 03-SUITE_B	AsureQuality Method (LC-MS/MS)	IANZ	Amelie Sellier

di-PFHxS (1) = Concentration determined using a branched di-PFHxS isomer standard (399>80 transition)

mono-PFHxS (1) = Concentration determined using a branched mono-PFHxS isomer standard (399>80 transition)

L-PFHxS (1) = Concentration determined using the linear PFHxS isomer standard (399>80 transition)

Total PFHxS (3) = The numerical sum of di-PFHxS (1), mono-PFHxS (1), and L-PFHxS (1)

di-PFOS (5) = Concentration determined using a branched di-PFOS isomer standard (499>80 transition)

mono-PFOS (5) = Concentration determined using a branched mono-PFOS isomer standard (499>80 transition)

L-PFOS (5) = Concentration determined using the linear PFOS isomer standard (499>230 transition)

Total PFOS (7) = The numerical sum of di-PFOS (5), mono-PFOS (5), and L-PFOS (5)

Sum PFHxS+PFOS (1) = The numerical sum of Total PFHxS (3) and Total PFOS (7)

For all Totals, where a component is detected below the LOR, the value of zero is used in the calculation of the sum. The result represents the lower-bound concentration present in the sample.

Reported results are corrected for internal standard recovery

Results that are prefixed with '<' indicate the lowest level at which the analyte can be reported, and that in this case the analyte was not observed above this limit.

NR = Not Reportable

Amelie Sellier

Scientist

Accreditation



Appendix

Analyte LOR Summary

Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - AsureQuality Method (LC-MS/MS)

Analyte	LOR
Perfluoroalkylsulfonic acids	
PFPPrS	0.0010 µg/L
PFBS	0.0010 µg/L
PFPeS	0.0010 µg/L
di-PFHxS (1)	0.0010 µg/L
mono-PFHxS (1)	0.0010 µg/L
L-PFHxS (1)	0.0010 µg/L
Total PFHxS (3)	0.0010 µg/L
PFHpS	0.0010 µg/L
di-PFOS (5)	0.0010 µg/L
mono-PFOS (5)	0.0010 µg/L
L-PFOS (5)	0.0010 µg/L
Total PFOS (7)	0.0010 µg/L
Sum PFHxS+PFOS (1)	0.0010 µg/L
PFNS	0.0010 µg/L
PFDS	NR µg/L
Perfluoroalkylcarboxylic acids	
PFBA	NR µg/L
PFPeA	0.0010 µg/L
PFHxA	0.0010 µg/L
PFHpA	0.0010 µg/L
PFOA	0.0010 µg/L
PFNA	0.0010 µg/L
PFDA	0.0010 µg/L
PFUnDA	0.0010 µg/L
PFDoDA	NR µg/L
PFTrDA	NR µg/L
PFTeDA	NR µg/L
Perfluorooctanesulfonamides	
PFOSA	0.0010 µg/L
NEtFOSA-M	0.0010 µg/L
NMeFOSA-M	0.0010 µg/L
Perfluorooctanesulfonamidoacetic acids	
NEtFOSAA	0.0010 µg/L
NMeFOSAA	0.0010 µg/L
Perfluorooctanesulfonamidoethanols	
NEtFOSE-M	0.0010 µg/L
NMeFOSE-M	0.0010 µg/L
Telomere Sulfonic acids	
4:2 FTS	NR µg/L
6:2 FTS	NR µg/L
8:2 FTS	NR µg/L

Analyte Definitions

Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - AsureQuality Method (LC-MS/MS)

Analyte	Full Name
Perfluoroalkylsulfonic acids	
PFPPrS	Perfluoro-1-propanesulfonic acid
PFBS	Perfluoro-1-butanesulfonic acid
PFPeS	Perfluoro-1-pentanesulfonic acid
di-PFHxS (1)	Total Perfluorodimethylbutane sulfonic acids
mono-PFHxS (1)	Total Perfluoromethylpentane sulfonic acids
L-PFHxS (1)	Linear Perfluorohexanesulfonic acid
PFHpS	Perfluoro-1-heptanesulfonic acid
di-PFOS (5)	Total Perfluorodimethylhexane sulfonic acids
mono-PFOS (5)	Total Perfluoromethylheptane sulfonic acids
L-PFOS (5)	Linear Perfluorooctanesulfonic acid
PFNS	Perfluoro-1-nonanesulfonic acid
PFDS	Perfluoro-1-decanesulfonic acid
Perfluoroalkylcarboxylic acids	
PFBA	Perfluoro-n-butanoic acid
PFPeA	Perfluoro-n-pentanoic acid
PFHxA	Perfluoro-n-hexanoic acid
PFHpA	Perfluoro-n-heptanoic acid
PFOA	Perfluoro-n-octanoic acid
PFNA	Perfluoro-n-nonanoic acid
PFDA	Perfluoro-n-decanoic acid
PFUnDA	Perfluoro-n-undecanoic acid
PFDODA	Perfluoro-n-dodecanoic acid
PFTTrDA	Perfluoro-n-tridecanoic acid
PFTeDA	Perfluoro-n-tetradecanoic acid
Perfluorooctanesulfonamides	
PFOSA	Perfluoro-1-octanesulfonamide
NEtFOSA-M	N-ethylperfluoro-1-octanesulfonamide
NMeFOSA-M	N-methylperfluoro-1-octanesulfonamide
Perfluorooctanesulfonamidoacetic acids	
NEtFOSAA	N-ethylperfluoro-1-octanesulfonamidoacetic acid
NMeFOSAA	N-methylperfluoro-1-octanesulfonamidoacetic acid
Perfluorooctanesulfonamidoethanols	
NEtFOSE-M	2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol
NMeFOSE-M	2-(N-methylperfluoro-1-octanesulfonamido)-ethanol
Telomere Sulfonic acids	
4:2 FTS	1H,1H,2H,2H-perfluoro-1-hexanesulfonic acid
6:2 FTS	1H,1H,2H,2H-perfluoro-1-octanesulfonic acid
8:2 FTS	1H,1H,2H,2H-perfluoro-1-decanesulfonic acid
Internal Standards	
M3PFBS	Perfluoro-1-[2,3,4-13C3]butanesulfonic acid
M3PFHxS	Perfluoro-1-[1,2,3-13C3]hexanesulfonic acid
M8PFOS	Perfluoro-1-[13C8]octanesulfonic acid
M4PFBA	Perfluoro-n-[1,2,3,4-13C4]butanoic acid
M5PFPeA	Perfluoro-n-[1,2,3,4,5-13C5]pentanoic acid
M5PFHxA	Perfluoro-n-[1,2,3,4,6-13C5]hexanoic acid
MPFHpA	Perfluoro-n-[1,2,3,4-13C4]heptanoic acid
M8PFOA	Perfluoro-n-[13C8]octanoic acid
M9PFNA	Perfluoro-n-[13C9]nonanoic acid
M6PFDA	Perfluoro-n-[1,2,3,4,5,6-13C6]decanoic acid
M7PFUnDA	Perfluoro-n-[1,2,3,4,5,6,7-13C7]undecanoic acid
MPFDODA	Perfluoro-n-[1,2-13C2]dodecanoic acid
MPFTeDA	Perfluoro-n-[1,2-13C2]tetradecanoic acid

Analyte	Full Name
MPFOSA	Perfluoro-1-[13C8]octanesulfonamide
DNEtFOSA	N-ethyl-D5-perfluoro-1-octanesulfonamide
DNMeFOSA	N-methyl-D3-perfluoro-1-octanesulfonamide
DNEtFOSAA	N-ethyl-D5-perfluoro-1-octanesulfonamidoacetic acid
DNMeFOSAA	N-methyl-D3-perfluoro-1-octanesulfonamidoacetic acid
DNEtFOSE	2-(N-ethyl-D5-perfluoro-1-octanesulfonamido)ethan-D4-ol
DNMeFOSE	2-(N-methyl-D3-perfluoro-1-octanesulfonamido)ethan-D4-ol
M4:2FTS	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-hexane sulfonic acid
M6:2FTS	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonic acid
M8:2FTS	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonic acid

LOR = Limit of Reporting

LOD = Limit of Detection

NR = Not Reportable

Certificate of Analysis

Submission Reference: A02744115
Final Report

Nerena Rhodes
Pattle Delamore Partners Limited
P O Box 9528
Auckland 1149
New Zealand

PO Number: OHA_PFAS

Report Issued: 14-Oct-2020

AsureQuality Reference: **20-263867**

Sample(s) Received: 30-Sep-2020 08:00

Testing Period: 30-Sep-2020 to 14-Oct-2020

Results

The tests were performed on the samples as received.

Customer Sample Name: OHA_ADJ_SW36_4_290920 **Lab ID:** 20-263867-1

Sample Condition: Acceptable

Sampled Date: 29-Sep-2020

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - High Level			
Perfluoroalkylsulfonic acids			
PFPrS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.20	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTTrDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)

AsureQuality has used reasonable skill, care, and effort to provide an accurate analysis of the sample(s) which form(s) the subject of this report. However, the accuracy of this analysis is reliant on, and subject to, the sample(s) provided by you and your responsibility as to transportation of the sample(s). AsureQuality's standard terms of business apply to the analysis set out in this report.

Test	Result	Unit	Method Reference
Perfluorooctanesulfonamides			
PFOSA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	104	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	106	%	AsureQuality Method (LC-MS/MS)
M8PFOS	111	%	AsureQuality Method (LC-MS/MS)
M4PFBA	110	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	106	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	106	%	AsureQuality Method (LC-MS/MS)
MPPFHpA	106	%	AsureQuality Method (LC-MS/MS)
M8PFOA	110	%	AsureQuality Method (LC-MS/MS)
M9PFNA	105	%	AsureQuality Method (LC-MS/MS)
M6PFDA	113	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	108	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	113	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	114	%	AsureQuality Method (LC-MS/MS)
MPFOSA	112	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	110	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	109	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	112	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	109	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	110	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	107	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	99	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	110	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	107	%	AsureQuality Method (LC-MS/MS)

QC Results

Blank

Relates to sample(s) 20-263867-1

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - High Level			
Perfluoroalkylsulfonic acids			
PFPrS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
mono-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.20	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTTrDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	101	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	106	%	AsureQuality Method (LC-MS/MS)
M8PFOS	111	%	AsureQuality Method (LC-MS/MS)
M4PFBA	107	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	107	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	111	%	AsureQuality Method (LC-MS/MS)
MPFHpA	107	%	AsureQuality Method (LC-MS/MS)
M8PFOA	110	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
M9PFNA	110	%	AsureQuality Method (LC-MS/MS)
M6PFDA	109	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	118	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	114	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	124	%	AsureQuality Method (LC-MS/MS)
MPFOSA	116	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	110	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	105	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	112	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	111	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	112	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	107	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	103	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	110	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	103	%	AsureQuality Method (LC-MS/MS)

Analysis Summary

Wellington Laboratory

Analysis	Method	Accreditation	Authorised by
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - High Level			
DX-PFCS01, 05-HIGHLEVEL	AsureQuality Method (LC-MS/MS)	IANZ	Amelie Sellier

di-PFHxS (1) = Concentration determined using a branched di-PFHxS isomer standard (399>80 transition)

mono-PFHxS (1) = Concentration determined using a branched mono-PFHxS isomer standard (399>80 transition)

L-PFHxS (1) = Concentration determined using the linear PFHxS isomer standard (399>80 transition)

Total PFHxS (3) = The numerical sum of di-PFHxS (1), mono-PFHxS (1), and L-PFHxS (1)

di-PFOS (5) = Concentration determined using a branched di-PFOS isomer standard (499>80 transition)

mono-PFOS (5) = Concentration determined using a branched mono-PFOS isomer standard (499>80 transition)

L-PFOS (5) = Concentration determined using the linear PFOS isomer standard (499>230 transition)

Total PFOS (7) = The numerical sum of di-PFOS (5), mono-PFOS (5), and L-PFOS (5)

Sum PFHxS+PFOS (1) = The numerical sum of Total PFHxS (3) and Total PFOS (7)

For all Totals, where a component is detected below the LOR, the value of zero is used in the calculation of the sum. The result represents the lower-bound concentration present in the sample.

Reported results are corrected for internal standard recovery

Results that are prefixed with '<' indicate the lowest level at which the analyte can be reported, and that in this case the analyte was not observed above this limit.

Amelie Sellier

Scientist

Accreditation



Appendix

Analyte LOR Summary

Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - High Level - AsureQuality Method (LC-MS/MS)

Analyte	LOR
Perfluoroalkylsulfonic acids	
PFPrS	0.025 µg/L
PFBS	0.025 µg/L
PFPeS	0.025 µg/L
di-PFHxS (1)	0.025 µg/L
mono-PFHxS (1)	0.025 µg/L
L-PFHxS (1)	0.025 µg/L
Total PFHxS (3)	0.025 µg/L
PFHpS	0.025 µg/L
di-PFOS (5)	0.025 µg/L
mono-PFOS (5)	0.025 µg/L
L-PFOS (5)	0.025 µg/L
Total PFOS (7)	0.025 µg/L
Sum PFHxS+PFOS (1)	0.025 µg/L
PFNS	0.050 µg/L
PFDS	0.10 µg/L
Perfluoroalkylcarboxylic acids	
PFBA	0.10 µg/L
PFPeA	0.10 µg/L
PFHxA	0.025 µg/L
PFHpA	0.025 µg/L
PFOA	0.025 µg/L
PFNA	0.025 µg/L
PFDA	0.025 µg/L
PFUnDA	0.025 µg/L
PFDoDA	0.10 µg/L
PFTrDA	0.10 µg/L
PFTeDA	0.10 µg/L
Perfluorooctanesulfonamides	
PFOSA	0.025 µg/L
NEtFOSA-M	0.10 µg/L
NMeFOSA-M	0.10 µg/L
Perfluorooctanesulfonamidoacetic acids	
NEtFOSAA	0.025 µg/L
NMeFOSAA	0.025 µg/L
Perfluorooctanesulfonamidoethanols	
NEtFOSE-M	0.10 µg/L
NMeFOSE-M	0.10 µg/L
Telomere Sulfonic acids	
4:2 FTS	0.025 µg/L
6:2 FTS	0.050 µg/L
8:2 FTS	0.10 µg/L

Analyte Definitions

Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - High Level - AsureQuality Method (LC-MS/MS)

Analyte	Full Name
Perfluoroalkylsulfonic acids	
PFPPrS	Perfluoro-1-propanesulfonic acid
PFBS	Perfluoro-1-butanesulfonic acid
PFPeS	Perfluoro-1-pentanesulfonic acid
di-PFHxS (1)	Total Perfluorodimethylbutane sulfonic acids
mono-PFHxS (1)	Total Perfluoromethylpentane sulfonic acids
L-PFHxS (1)	Linear Perfluorohexanesulfonic acid
PFHpS	Perfluoro-1-heptanesulfonic acid
di-PFOS (5)	Total Perfluorodimethylhexane sulfonic acids
mono-PFOS (5)	Total Perfluoromethylheptane sulfonic acids
L-PFOS (5)	Linear Perfluorooctanesulfonic acid
PFNS	Perfluoro-1-nonanesulfonic acid
PFDS	Perfluoro-1-decanesulfonic acid
Perfluoroalkylcarboxylic acids	
PFBA	Perfluoro-n-butanoic acid
PFPeA	Perfluoro-n-pentanoic acid
PFHxA	Perfluoro-n-hexanoic acid
PFHpA	Perfluoro-n-heptanoic acid
PFOA	Perfluoro-n-octanoic acid
PFNA	Perfluoro-n-nonanoic acid
PFDA	Perfluoro-n-decanoic acid
PFUnDA	Perfluoro-n-undecanoic acid
PFDODA	Perfluoro-n-dodecanoic acid
PFTTrDA	Perfluoro-n-tridecanoic acid
PFTeDA	Perfluoro-n-tetradecanoic acid
Perfluorooctanesulfonamides	
PFOSA	Perfluoro-1-octanesulfonamide
NEtFOSA-M	N-ethylperfluoro-1-octanesulfonamide
NMeFOSA-M	N-methylperfluoro-1-octanesulfonamide
Perfluorooctanesulfonamidoacetic acids	
NEtFOSAA	N-ethylperfluoro-1-octanesulfonamidoacetic acid
NMeFOSAA	N-methylperfluoro-1-octanesulfonamidoacetic acid
Perfluorooctanesulfonamidoethanols	
NEtFOSE-M	2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol
NMeFOSE-M	2-(N-methylperfluoro-1-octanesulfonamido)-ethanol
Telomere Sulfonic acids	
4:2 FTS	1H,1H,2H,2H-perfluoro-1-hexanesulfonic acid
6:2 FTS	1H,1H,2H,2H-perfluoro-1-octanesulfonic acid
8:2 FTS	1H,1H,2H,2H-perfluoro-1-decanesulfonic acid
Internal Standards	
M3PFBS	Perfluoro-1-[2,3,4-13C3]butanesulfonic acid
M3PFHxS	Perfluoro-1-[1,2,3-13C3]hexanesulfonic acid
M8PFOS	Perfluoro-1-[13C8]octanesulfonic acid
M4PFBA	Perfluoro-n-[1,2,3,4-13C4]butanoic acid
M5PFPeA	Perfluoro-n-[1,2,3,4,5-13C5]pentanoic acid
M5PFHxA	Perfluoro-n-[1,2,3,4,6-13C5]hexanoic acid
MPFHpA	Perfluoro-n-[1,2,3,4-13C4]heptanoic acid
M8PFOA	Perfluoro-n-[13C8]octanoic acid
M9PFNA	Perfluoro-n-[13C9]nonanoic acid
M6PFDA	Perfluoro-n-[1,2,3,4,5,6-13C6]decanoic acid
M7PFUnDA	Perfluoro-n-[1,2,3,4,5,6,7-13C7]undecanoic acid
MPFDODA	Perfluoro-n-[1,2-13C2]dodecanoic acid
MPFTeDA	Perfluoro-n-[1,2-13C2]tetradecanoic acid

Analyte	Full Name
MPFOSA	Perfluoro-1-[13C8]octanesulfonamide
DNEtFOSA	N-ethyl-D5-perfluoro-1-octanesulfonamide
DNMeFOSA	N-methyl-D3-perfluoro-1-octanesulfonamide
DNEtFOSAA	N-ethyl-D5-perfluoro-1-octanesulfonamidoacetic acid
DNMeFOSAA	N-methyl-D3-perfluoro-1-octanesulfonamidoacetic acid
DNEtFOSE	2-(N-ethyl-D5-perfluoro-1-octanesulfonamido)ethan-D4-ol
DNMeFOSE	2-(N-methyl-D3-perfluoro-1-octanesulfonamido)ethan-D4-ol
M4:2FTS	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-hexane sulfonic acid
M6:2FTS	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonic acid
M8:2FTS	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonic acid

LOR = Limit of Reporting

LOD = Limit of Detection

NR = Not Reportable

Certificate of Analysis

Submission Reference: A02744115
Final Report

Nerena Rhodes
Pattle Delamore Partners Limited
P O Box 9528
Auckland 1149
New Zealand

PO Number: OHA_PFAS

Report Issued: 15-Oct-2020

AsureQuality Reference: **20-263890**

Sample(s) Received: 30-Sep-2020 08:00

Testing Period: 30-Sep-2020 to 15-Oct-2020

Results

The tests were performed on the samples as received.

Customer Sample Name: OHA_ADJ_GW31_4_290920

Lab ID: 20-263890-1

Sample Condition: Acceptable

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPoS	0.0045	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	0.010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	0.0085	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	0.016	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	0.063	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	0.079	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	0.0015	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	0.0034	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	0.028	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	0.013	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	0.044	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	0.12	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	0.047	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	0.15	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	0.12	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	0.042	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	0.019	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	0.0039	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFTTrDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	NR	µg/L	AsureQuality Method (LC-MS/MS)

AsureQuality has used reasonable skill, care, and effort to provide an accurate analysis of the sample(s) which form(s) the subject of this report. However, the accuracy of this analysis is reliant on, and subject to, the sample(s) provided by you and your responsibility as to transportation of the sample(s). AsureQuality's standard terms of business apply to the analysis set out in this report.

Test	Result	Unit	Method Reference
Perfluorooctanesulfonamides			
PFOSA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	0.0049	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	108	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	116	%	AsureQuality Method (LC-MS/MS)
M8PFOS	125	%	AsureQuality Method (LC-MS/MS)
M4PFBA	82	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	100	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	108	%	AsureQuality Method (LC-MS/MS)
MPFHpA	103	%	AsureQuality Method (LC-MS/MS)
M8PFOA	106	%	AsureQuality Method (LC-MS/MS)
M9PFNA	99	%	AsureQuality Method (LC-MS/MS)
M6PFDA	112	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	101	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	79	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	277 (R)	%	AsureQuality Method (LC-MS/MS)
MPFOSA	83	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	48	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	58	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	90	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	97	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	54	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	61	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	131	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	116	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	108	%	AsureQuality Method (LC-MS/MS)

R = Recovery outside method limits

QC Results

Blank

Relates to sample(s) 20-263890-1

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPtS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDODA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFTTrDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	96	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	71	%	AsureQuality Method (LC-MS/MS)
M8PFOS	45	%	AsureQuality Method (LC-MS/MS)
M4PFBA	109	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	101	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	105	%	AsureQuality Method (LC-MS/MS)
MPFHpA	90	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
M8PFOA	79	%	AsureQuality Method (LC-MS/MS)
M9PFNA	61	%	AsureQuality Method (LC-MS/MS)
M6PFDA	50	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	36	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	36	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	0 (R)	%	AsureQuality Method (LC-MS/MS)
MPFOA	84	%	AsureQuality Method (LC-MS/MS)
DNEtFOA	54	%	AsureQuality Method (LC-MS/MS)
DNMeFOA	61	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	47	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	47	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	66	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	81	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	100	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	89	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	63	%	AsureQuality Method (LC-MS/MS)

R = Recovery outside method limits

Analysis Summary

Wellington Laboratory

Analysis	Method	Accreditation	Authorised by
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
DX-PFCS01, 03-SUITE_B	AsureQuality Method (LC-MS/MS)	IANZ	Amelie Sellier

di-PFHxS (1) = Concentration determined using a branched di-PFHxS isomer standard (399>80 transition)

mono-PFHxS (1) = Concentration determined using a branched mono-PFHxS isomer standard (399>80 transition)

L-PFHxS (1) = Concentration determined using the linear PFHxS isomer standard (399>80 transition)

Total PFHxS (3) = The numerical sum of di-PFHxS (1), mono-PFHxS (1), and L-PFHxS (1)

di-PFOS (5) = Concentration determined using a branched di-PFOS isomer standard (499>80 transition)

mono-PFOS (5) = Concentration determined using a branched mono-PFOS isomer standard (499>80 transition)

L-PFOS (5) = Concentration determined using the linear PFOS isomer standard (499>230 transition)

Total PFOS (7) = The numerical sum of di-PFOS (5), mono-PFOS (5), and L-PFOS (5)

Sum PFHxS+PFOS (1) = The numerical sum of Total PFHxS (3) and Total PFOS (7)

For all Totals, where a component is detected below the LOR, the value of zero is used in the calculation of the sum. The result represents the lower-bound concentration present in the sample.

Reported results are corrected for internal standard recovery

Results that are prefixed with '<' indicate the lowest level at which the analyte can be reported, and that in this case the analyte was not observed above this limit.

NR = Not Reportable



Amelie Sellier

Scientist

Accreditation



Appendix

Analyte LOR Summary

Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - AsureQuality Method (LC-MS/MS)

Analyte	LOR
Perfluoroalkylsulfonic acids	
PFPPrS	0.0010 µg/L
PFBS	0.0010 µg/L
PFPeS	0.0010 µg/L
di-PFHxS (1)	0.0010 µg/L
mono-PFHxS (1)	0.0010 µg/L
L-PFHxS (1)	0.0010 µg/L
Total PFHxS (3)	0.0010 µg/L
PFHpS	0.0010 µg/L
di-PFOS (5)	0.0010 µg/L
mono-PFOS (5)	0.0010 µg/L
L-PFOS (5)	0.0010 µg/L
Total PFOS (7)	0.0010 µg/L
Sum PFHxS+PFOS (1)	0.0010 µg/L
PFNS	0.0010 µg/L
PFDS	NR µg/L
Perfluoroalkylcarboxylic acids	
PFBA	0.0010 µg/L
PFPeA	0.0010 µg/L
PFHxA	0.0010 µg/L
PFHpA	0.0010 µg/L
PFOA	0.0010 µg/L
PFNA	0.0010 µg/L
PFDA	0.0010 µg/L
PFUnDA	0.0010 µg/L
PFDoDA	0.0010 µg/L
PFTrDA	NR µg/L
PFTeDA	NR µg/L
Perfluorooctanesulfonamides	
PFOSA	0.0010 µg/L
NEtFOSA-M	0.0010 µg/L
NMeFOSA-M	0.0010 µg/L
Perfluorooctanesulfonamidoacetic acids	
NEtFOSAA	0.0010 µg/L
NMeFOSAA	0.0010 µg/L
Perfluorooctanesulfonamidoethanols	
NEtFOSE-M	0.0010 µg/L
NMeFOSE-M	0.0010 µg/L
Telomere Sulfonic acids	
4:2 FTS	0.0010 µg/L
6:2 FTS	0.0010 µg/L
8:2 FTS	0.0010 µg/L

Analyte Definitions

Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - AsureQuality Method (LC-MS/MS)

Analyte	Full Name
Perfluoroalkylsulfonic acids	
PFPPrS	Perfluoro-1-propanesulfonic acid
PFBS	Perfluoro-1-butanesulfonic acid
PFPeS	Perfluoro-1-pentanesulfonic acid
di-PFHxS (1)	Total Perfluorodimethylbutane sulfonic acids
mono-PFHxS (1)	Total Perfluoromethylpentane sulfonic acids
L-PFHxS (1)	Linear Perfluorohexanesulfonic acid
PFHpS	Perfluoro-1-heptanesulfonic acid
di-PFOS (5)	Total Perfluorodimethylhexane sulfonic acids
mono-PFOS (5)	Total Perfluoromethylheptane sulfonic acids
L-PFOS (5)	Linear Perfluorooctanesulfonic acid
PFNS	Perfluoro-1-nonanesulfonic acid
PFDS	Perfluoro-1-decanesulfonic acid
Perfluoroalkylcarboxylic acids	
PFBA	Perfluoro-n-butanoic acid
PFPeA	Perfluoro-n-pentanoic acid
PFHxA	Perfluoro-n-hexanoic acid
PFHpA	Perfluoro-n-heptanoic acid
PFOA	Perfluoro-n-octanoic acid
PFNA	Perfluoro-n-nonanoic acid
PFDA	Perfluoro-n-decanoic acid
PFUnDA	Perfluoro-n-undecanoic acid
PFDODA	Perfluoro-n-dodecanoic acid
PFTTrDA	Perfluoro-n-tridecanoic acid
PFTeDA	Perfluoro-n-tetradecanoic acid
Perfluorooctanesulfonamides	
PFOSA	Perfluoro-1-octanesulfonamide
NEtFOSA-M	N-ethylperfluoro-1-octanesulfonamide
NMeFOSA-M	N-methylperfluoro-1-octanesulfonamide
Perfluorooctanesulfonamidoacetic acids	
NEtFOSAA	N-ethylperfluoro-1-octanesulfonamidoacetic acid
NMeFOSAA	N-methylperfluoro-1-octanesulfonamidoacetic acid
Perfluorooctanesulfonamidoethanols	
NEtFOSE-M	2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol
NMeFOSE-M	2-(N-methylperfluoro-1-octanesulfonamido)-ethanol
Telomere Sulfonic acids	
4:2 FTS	1H,1H,2H,2H-perfluoro-1-hexanesulfonic acid
6:2 FTS	1H,1H,2H,2H-perfluoro-1-octanesulfonic acid
8:2 FTS	1H,1H,2H,2H-perfluoro-1-decanesulfonic acid
Internal Standards	
M3PFBS	Perfluoro-1-[2,3,4-13C3]butanesulfonic acid
M3PFHxS	Perfluoro-1-[1,2,3-13C3]hexanesulfonic acid
M8PFOS	Perfluoro-1-[13C8]octanesulfonic acid
M4PFBA	Perfluoro-n-[1,2,3,4-13C4]butanoic acid
M5PFPeA	Perfluoro-n-[1,2,3,4,5-13C5]pentanoic acid
M5PFHxA	Perfluoro-n-[1,2,3,4,6-13C5]hexanoic acid
MPFHpA	Perfluoro-n-[1,2,3,4-13C4]heptanoic acid
M8PFOA	Perfluoro-n-[13C8]octanoic acid
M9PFNA	Perfluoro-n-[13C9]nonanoic acid
M6PFDA	Perfluoro-n-[1,2,3,4,5,6-13C6]decanoic acid
M7PFUnDA	Perfluoro-n-[1,2,3,4,5,6,7-13C7]undecanoic acid
MPFDODA	Perfluoro-n-[1,2-13C2]dodecanoic acid
MPFTeDA	Perfluoro-n-[1,2-13C2]tetradecanoic acid

Analyte	Full Name
MPFOSA	Perfluoro-1-[13C8]octanesulfonamide
DNEtFOSA	N-ethyl-D5-perfluoro-1-octanesulfonamide
DNMeFOSA	N-methyl-D3-perfluoro-1-octanesulfonamide
DNEtFOSAA	N-ethyl-D5-perfluoro-1-octanesulfonamidoacetic acid
DNMeFOSAA	N-methyl-D3-perfluoro-1-octanesulfonamidoacetic acid
DNEtFOSE	2-(N-ethyl-D5-perfluoro-1-octanesulfonamido)ethan-D4-ol
DNMeFOSE	2-(N-methyl-D3-perfluoro-1-octanesulfonamido)ethan-D4-ol
M4:2FTS	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-hexane sulfonic acid
M6:2FTS	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonic acid
M8:2FTS	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonic acid

LOR = Limit of Reporting

LOD = Limit of Detection

NR = Not Reportable

Certificate of Analysis

Submission Reference: A02744114
Final Report

Nerena Rhodes
Pattle Delamore Partners Limited
P O Box 9528
Auckland 1149
New Zealand

PO Number: OHA_PFAS

Report Issued: 15-Oct-2020

AsureQuality Reference: **20-263903**

Sample(s) Received: 30-Sep-2020 08:00

Testing Period: 30-Sep-2020 to 15-Oct-2020

Results

The tests were performed on the samples as received.

Customer Sample Name: OHA_FTA_WS1_4_290920 **Lab ID:** 20-263903-1

Sample Condition: Acceptable

Sampled Date: 29-Sep-2020

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPrS	0.012	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	0.026	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	0.023	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	0.035	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	0.12	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	0.16	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	0.0023	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	0.0041	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	0.021	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	0.0073	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	0.032	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	0.19	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	0.018	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	0.093	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	0.088	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	0.029	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	0.021	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	0.0062	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFTTrDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	NR	µg/L	AsureQuality Method (LC-MS/MS)

AsureQuality has used reasonable skill, care, and effort to provide an accurate analysis of the sample(s) which form(s) the subject of this report. However, the accuracy of this analysis is reliant on, and subject to, the sample(s) provided by you and your responsibility as to transportation of the sample(s). AsureQuality's standard terms of business apply to the analysis set out in this report.

Test	Result	Unit	Method Reference
Perfluorooctanesulfonamides			
PFOSA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	0.089	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	108	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	113	%	AsureQuality Method (LC-MS/MS)
M8PFOS	121	%	AsureQuality Method (LC-MS/MS)
M4PFBA	98	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	98	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	108	%	AsureQuality Method (LC-MS/MS)
MPPHpA	104	%	AsureQuality Method (LC-MS/MS)
M8PFOA	112	%	AsureQuality Method (LC-MS/MS)
M9PFNA	104	%	AsureQuality Method (LC-MS/MS)
M6PFDA	122	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	135	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	92	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	100	%	AsureQuality Method (LC-MS/MS)
MPFOSA	105	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	78	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	80	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	115	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	114	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	68	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	77	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	119	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	114	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	118	%	AsureQuality Method (LC-MS/MS)

QC Results

Blank

Relates to sample(s) 20-263903-1

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPrS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
mono-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFTTrDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	96	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	71	%	AsureQuality Method (LC-MS/MS)
M8PFOS	45	%	AsureQuality Method (LC-MS/MS)
M4PFBA	109	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	101	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	105	%	AsureQuality Method (LC-MS/MS)
MPFHpA	90	%	AsureQuality Method (LC-MS/MS)
M8PFOA	79	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
M9PFNA	61	%	AsureQuality Method (LC-MS/MS)
M6PFDA	50	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	36	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	36	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	0 (R)	%	AsureQuality Method (LC-MS/MS)
MPFOSA	84	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	54	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	61	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	47	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	47	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	66	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	81	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	100	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	89	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	63	%	AsureQuality Method (LC-MS/MS)

R = Recovery outside method limits

Analysis Summary

Wellington Laboratory

Analysis	Method	Accreditation	Authorised by
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
DX-PFCS01, 03-SUITE_B	AsureQuality Method (LC-MS/MS)	IANZ	Amelie Sellier

di-PFHxS (1) = Concentration determined using a branched di-PFHxS isomer standard (399>80 transition)

mono-PFHxS (1) = Concentration determined using a branched mono-PFHxS isomer standard (399>80 transition)

L-PFHxS (1) = Concentration determined using the linear PFHxS isomer standard (399>80 transition)

Total PFHxS (3) = The numerical sum of di-PFHxS (1), mono-PFHxS (1), and L-PFHxS (1)

di-PFOS (5) = Concentration determined using a branched di-PFOS isomer standard (499>80 transition)

mono-PFOS (5) = Concentration determined using a branched mono-PFOS isomer standard (499>80 transition)

L-PFOS (5) = Concentration determined using the linear PFOS isomer standard (499>230 transition)

Total PFOS (7) = The numerical sum of di-PFOS (5), mono-PFOS (5), and L-PFOS (5)

Sum PFHxS+PFOS (1) = The numerical sum of Total PFHxS (3) and Total PFOS (7)

For all Totals, where a component is detected below the LOR, the value of zero is used in the calculation of the sum. The result represents the lower-bound concentration present in the sample.

Reported results are corrected for internal standard recovery

Results that are prefixed with '<' indicate the lowest level at which the analyte can be reported, and that in this case the analyte was not observed above this limit.

NR = Not Reportable

Amelie Sellier

Scientist

Accreditation



Appendix

Analyte LOR Summary

Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - AsureQuality Method (LC-MS/MS)

Analyte	LOR
Perfluoroalkylsulfonic acids	
PFPPrS	0.0010 µg/L
PFBS	0.0010 µg/L
PFPeS	0.0010 µg/L
di-PFHxS (1)	0.0010 µg/L
mono-PFHxS (1)	0.0010 µg/L
L-PFHxS (1)	0.0010 µg/L
Total PFHxS (3)	0.0010 µg/L
PFHpS	0.0010 µg/L
di-PFOS (5)	0.0010 µg/L
mono-PFOS (5)	0.0010 µg/L
L-PFOS (5)	0.0010 µg/L
Total PFOS (7)	0.0010 µg/L
Sum PFHxS+PFOS (1)	0.0010 µg/L
PFNS	0.0010 µg/L
PFDS	NR µg/L
Perfluoroalkylcarboxylic acids	
PFBA	0.0010 µg/L
PFPeA	0.0010 µg/L
PFHxA	0.0010 µg/L
PFHpA	0.0010 µg/L
PFOA	0.0010 µg/L
PFNA	0.0010 µg/L
PFDA	0.0010 µg/L
PFUnDA	0.0010 µg/L
PFDoDA	0.0010 µg/L
PFTrDA	NR µg/L
PFTeDA	NR µg/L
Perfluorooctanesulfonamides	
PFOSA	0.0010 µg/L
NEtFOSA-M	0.0010 µg/L
NMeFOSA-M	0.0010 µg/L
Perfluorooctanesulfonamidoacetic acids	
NEtFOSAA	0.0010 µg/L
NMeFOSAA	0.0010 µg/L
Perfluorooctanesulfonamidoethanols	
NEtFOSE-M	0.0010 µg/L
NMeFOSE-M	0.0010 µg/L
Telomere Sulfonic acids	
4:2 FTS	0.0010 µg/L
6:2 FTS	0.0010 µg/L
8:2 FTS	0.0010 µg/L

Analyte Definitions

Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - AsureQuality Method (LC-MS/MS)

Analyte	Full Name
Perfluoroalkylsulfonic acids	
PFPPrS	Perfluoro-1-propanesulfonic acid
PFBS	Perfluoro-1-butanesulfonic acid
PFPeS	Perfluoro-1-pentanesulfonic acid
di-PFHxS (1)	Total Perfluorodimethylbutane sulfonic acids
mono-PFHxS (1)	Total Perfluoromethylpentane sulfonic acids
L-PFHxS (1)	Linear Perfluorohexanesulfonic acid
PFHpS	Perfluoro-1-heptanesulfonic acid
di-PFOS (5)	Total Perfluorodimethylhexane sulfonic acids
mono-PFOS (5)	Total Perfluoromethylheptane sulfonic acids
L-PFOS (5)	Linear Perfluorooctanesulfonic acid
PFNS	Perfluoro-1-nonanesulfonic acid
PFDS	Perfluoro-1-decanesulfonic acid
Perfluoroalkylcarboxylic acids	
PFBA	Perfluoro-n-butanoic acid
PFPeA	Perfluoro-n-pentanoic acid
PFHxA	Perfluoro-n-hexanoic acid
PFHpA	Perfluoro-n-heptanoic acid
PFOA	Perfluoro-n-octanoic acid
PFNA	Perfluoro-n-nonanoic acid
PFDA	Perfluoro-n-decanoic acid
PFUnDA	Perfluoro-n-undecanoic acid
PFDODA	Perfluoro-n-dodecanoic acid
PFTTrDA	Perfluoro-n-tridecanoic acid
PFTeDA	Perfluoro-n-tetradecanoic acid
Perfluorooctanesulfonamides	
PFOSA	Perfluoro-1-octanesulfonamide
NEtFOSA-M	N-ethylperfluoro-1-octanesulfonamide
NMeFOSA-M	N-methylperfluoro-1-octanesulfonamide
Perfluorooctanesulfonamidoacetic acids	
NEtFOSAA	N-ethylperfluoro-1-octanesulfonamidoacetic acid
NMeFOSAA	N-methylperfluoro-1-octanesulfonamidoacetic acid
Perfluorooctanesulfonamidoethanols	
NEtFOSE-M	2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol
NMeFOSE-M	2-(N-methylperfluoro-1-octanesulfonamido)-ethanol
Telomere Sulfonic acids	
4:2 FTS	1H,1H,2H,2H-perfluoro-1-hexanesulfonic acid
6:2 FTS	1H,1H,2H,2H-perfluoro-1-octanesulfonic acid
8:2 FTS	1H,1H,2H,2H-perfluoro-1-decanesulfonic acid
Internal Standards	
M3PFBS	Perfluoro-1-[2,3,4-13C3]butanesulfonic acid
M3PFHxS	Perfluoro-1-[1,2,3-13C3]hexanesulfonic acid
M8PFOS	Perfluoro-1-[13C8]octanesulfonic acid
M4PFBA	Perfluoro-n-[1,2,3,4-13C4]butanoic acid
M5PFPeA	Perfluoro-n-[1,2,3,4,5-13C5]pentanoic acid
M5PFHxA	Perfluoro-n-[1,2,3,4,6-13C5]hexanoic acid
MPFHpA	Perfluoro-n-[1,2,3,4-13C4]heptanoic acid
M8PFOA	Perfluoro-n-[13C8]octanoic acid
M9PFNA	Perfluoro-n-[13C9]nonanoic acid
M6PFDA	Perfluoro-n-[1,2,3,4,5,6-13C6]decanoic acid
M7PFUnDA	Perfluoro-n-[1,2,3,4,5,6,7-13C7]undecanoic acid
MPFDODA	Perfluoro-n-[1,2-13C2]dodecanoic acid
MPFTeDA	Perfluoro-n-[1,2-13C2]tetradecanoic acid

Analyte	Full Name
MPFOSA	Perfluoro-1-[13C8]octanesulfonamide
DNEtFOSA	N-ethyl-D5-perfluoro-1-octanesulfonamide
DNMeFOSA	N-methyl-D3-perfluoro-1-octanesulfonamide
DNEtFOSAA	N-ethyl-D5-perfluoro-1-octanesulfonamidoacetic acid
DNMeFOSAA	N-methyl-D3-perfluoro-1-octanesulfonamidoacetic acid
DNEtFOSE	2-(N-ethyl-D5-perfluoro-1-octanesulfonamido)ethan-D4-ol
DNMeFOSE	2-(N-methyl-D3-perfluoro-1-octanesulfonamido)ethan-D4-ol
M4:2FTS	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-hexane sulfonic acid
M6:2FTS	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonic acid
M8:2FTS	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonic acid

LOR = Limit of Reporting

LOD = Limit of Detection

NR = Not Reportable

Certificate of Analysis

Submission Reference: A02744115
Final Report

Nerena Rhodes
Pattle Delamore Partners Limited
P O Box 9528
Auckland 1149
New Zealand

PO Number: OHA_PFAS

Report Issued: 15-Oct-2020

AsureQuality Reference: **20-263913**

Sample(s) Received: 30-Sep-2020 08:00

Testing Period: 30-Sep-2020 to 15-Oct-2020

Results

The tests were performed on the samples as received.

Customer Sample Name: OHA_ADJ_GW65_4_290920 **Lab ID:** 20-263913-1

Sample Condition: Acceptable

Sampled Date: 29-Sep-2020

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPoS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFTTrDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	NR	µg/L	AsureQuality Method (LC-MS/MS)

AsureQuality has used reasonable skill, care, and effort to provide an accurate analysis of the sample(s) which form(s) the subject of this report. However, the accuracy of this analysis is reliant on, and subject to, the sample(s) provided by you and your responsibility as to transportation of the sample(s). AsureQuality's standard terms of business apply to the analysis set out in this report.

Test	Result	Unit	Method Reference
Perfluorooctanesulfonamides			
PFOSA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	111	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	122	%	AsureQuality Method (LC-MS/MS)
M8PFOS	129	%	AsureQuality Method (LC-MS/MS)
M4PFBA	107	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	104	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	107	%	AsureQuality Method (LC-MS/MS)
MPPFHpA	101	%	AsureQuality Method (LC-MS/MS)
M8PFOA	116	%	AsureQuality Method (LC-MS/MS)
M9PFNA	108	%	AsureQuality Method (LC-MS/MS)
M6PFDA	118	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	127	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	102	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	191 (R)	%	AsureQuality Method (LC-MS/MS)
MPFOSA	104	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	70	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	81	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	97	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	100	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	62	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	70	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	111	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	125	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	105	%	AsureQuality Method (LC-MS/MS)

R = Recovery outside method limits

QC Results

Blank

Relates to sample(s) 20-263913-1

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPtS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDODA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFTTrDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	96	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	71	%	AsureQuality Method (LC-MS/MS)
M8PFOS	45	%	AsureQuality Method (LC-MS/MS)
M4PFBA	109	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	101	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	105	%	AsureQuality Method (LC-MS/MS)
MPFHpA	90	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
M8PFOA	79	%	AsureQuality Method (LC-MS/MS)
M9PFNA	61	%	AsureQuality Method (LC-MS/MS)
M6PFDA	50	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	36	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	36	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	0 (R)	%	AsureQuality Method (LC-MS/MS)
MPFOA	84	%	AsureQuality Method (LC-MS/MS)
DNEtFOA	54	%	AsureQuality Method (LC-MS/MS)
DNMeFOA	61	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	47	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	47	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	66	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	81	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	100	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	89	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	63	%	AsureQuality Method (LC-MS/MS)

R = Recovery outside method limits

Analysis Summary

Wellington Laboratory

Analysis	Method	Accreditation	Authorised by
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
DX-PFCS01, 03-SUITE_B	AsureQuality Method (LC-MS/MS)	IANZ	Amelie Sellier

di-PFHxS (1) = Concentration determined using a branched di-PFHxS isomer standard (399>80 transition)

mono-PFHxS (1) = Concentration determined using a branched mono-PFHxS isomer standard (399>80 transition)

L-PFHxS (1) = Concentration determined using the linear PFHxS isomer standard (399>80 transition)

Total PFHxS (3) = The numerical sum of di-PFHxS (1), mono-PFHxS (1), and L-PFHxS (1)

di-PFOS (5) = Concentration determined using a branched di-PFOS isomer standard (499>80 transition)

mono-PFOS (5) = Concentration determined using a branched mono-PFOS isomer standard (499>80 transition)

L-PFOS (5) = Concentration determined using the linear PFOS isomer standard (499>230 transition)

Total PFOS (7) = The numerical sum of di-PFOS (5), mono-PFOS (5), and L-PFOS (5)

Sum PFHxS+PFOS (1) = The numerical sum of Total PFHxS (3) and Total PFOS (7)

For all Totals, where a component is detected below the LOR, the value of zero is used in the calculation of the sum. The result represents the lower-bound concentration present in the sample.

Reported results are corrected for internal standard recovery

Results that are prefixed with '<' indicate the lowest level at which the analyte can be reported, and that in this case the analyte was not observed above this limit.

NR = Not Reportable



Amelie Sellier

Scientist

Accreditation



Appendix

Analyte LOR Summary

Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - AsureQuality Method (LC-MS/MS)

Analyte	LOR
Perfluoroalkylsulfonic acids	
PFPoS	0.0010 µg/L
PFBS	0.0010 µg/L
PFPeS	0.0010 µg/L
di-PFHxS (1)	0.0010 µg/L
mono-PFHxS (1)	0.0010 µg/L
L-PFHxS (1)	0.0010 µg/L
Total PFHxS (3)	0.0010 µg/L
PFHpS	0.0010 µg/L
di-PFOS (5)	0.0010 µg/L
mono-PFOS (5)	0.0010 µg/L
L-PFOS (5)	0.0010 µg/L
Total PFOS (7)	0.0010 µg/L
Sum PFHxS+PFOS (1)	0.0010 µg/L
PFNS	0.0010 µg/L
PFDS	NR µg/L
Perfluoroalkylcarboxylic acids	
PFBA	0.0010 µg/L
PFPeA	0.0010 µg/L
PFHxA	0.0010 µg/L
PFHpA	0.0010 µg/L
PFOA	0.0010 µg/L
PFNA	0.0010 µg/L
PFDA	0.0010 µg/L
PFUnDA	0.0010 µg/L
PFDoDA	0.0010 µg/L
PFTrDA	NR µg/L
PFTeDA	NR µg/L
Perfluorooctanesulfonamides	
PFOSA	0.0010 µg/L
NEtFOSA-M	0.0010 µg/L
NMeFOSA-M	0.0010 µg/L
Perfluorooctanesulfonamidoacetic acids	
NEtFOSAA	0.0010 µg/L
NMeFOSAA	0.0010 µg/L
Perfluorooctanesulfonamidoethanols	
NEtFOSE-M	0.0010 µg/L
NMeFOSE-M	0.0010 µg/L
Telomere Sulfonic acids	
4:2 FTS	0.0010 µg/L
6:2 FTS	0.0010 µg/L
8:2 FTS	0.0010 µg/L

Analyte Definitions

Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - AsureQuality Method (LC-MS/MS)

Analyte	Full Name
Perfluoroalkylsulfonic acids	
PFPPrS	Perfluoro-1-propanesulfonic acid
PFBS	Perfluoro-1-butanesulfonic acid
PFPeS	Perfluoro-1-pentanesulfonic acid
di-PFHxS (1)	Total Perfluorodimethylbutane sulfonic acids
mono-PFHxS (1)	Total Perfluoromethylpentane sulfonic acids
L-PFHxS (1)	Linear Perfluorohexanesulfonic acid
PFHpS	Perfluoro-1-heptanesulfonic acid
di-PFOS (5)	Total Perfluorodimethylhexane sulfonic acids
mono-PFOS (5)	Total Perfluoromethylheptane sulfonic acids
L-PFOS (5)	Linear Perfluorooctanesulfonic acid
PFNS	Perfluoro-1-nonanesulfonic acid
PFDS	Perfluoro-1-decanesulfonic acid
Perfluoroalkylcarboxylic acids	
PFBA	Perfluoro-n-butanoic acid
PFPeA	Perfluoro-n-pentanoic acid
PFHxA	Perfluoro-n-hexanoic acid
PFHpA	Perfluoro-n-heptanoic acid
PFOA	Perfluoro-n-octanoic acid
PFNA	Perfluoro-n-nonanoic acid
PFDA	Perfluoro-n-decanoic acid
PFUnDA	Perfluoro-n-undecanoic acid
PFDODA	Perfluoro-n-dodecanoic acid
PFTTrDA	Perfluoro-n-tridecanoic acid
PFTeDA	Perfluoro-n-tetradecanoic acid
Perfluorooctanesulfonamides	
PFOSA	Perfluoro-1-octanesulfonamide
NEtFOSA-M	N-ethylperfluoro-1-octanesulfonamide
NMeFOSA-M	N-methylperfluoro-1-octanesulfonamide
Perfluorooctanesulfonamidoacetic acids	
NEtFOSAA	N-ethylperfluoro-1-octanesulfonamidoacetic acid
NMeFOSAA	N-methylperfluoro-1-octanesulfonamidoacetic acid
Perfluorooctanesulfonamidoethanols	
NEtFOSE-M	2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol
NMeFOSE-M	2-(N-methylperfluoro-1-octanesulfonamido)-ethanol
Telomere Sulfonic acids	
4:2 FTS	1H,1H,2H,2H-perfluoro-1-hexanesulfonic acid
6:2 FTS	1H,1H,2H,2H-perfluoro-1-octanesulfonic acid
8:2 FTS	1H,1H,2H,2H-perfluoro-1-decanesulfonic acid
Internal Standards	
M3PFBS	Perfluoro-1-[2,3,4-13C3]butanesulfonic acid
M3PFHxS	Perfluoro-1-[1,2,3-13C3]hexanesulfonic acid
M8PFOS	Perfluoro-1-[13C8]octanesulfonic acid
M4PFBA	Perfluoro-n-[1,2,3,4-13C4]butanoic acid
M5PFPeA	Perfluoro-n-[1,2,3,4,5-13C5]pentanoic acid
M5PFHxA	Perfluoro-n-[1,2,3,4,6-13C5]hexanoic acid
MPFHpA	Perfluoro-n-[1,2,3,4-13C4]heptanoic acid
M8PFOA	Perfluoro-n-[13C8]octanoic acid
M9PFNA	Perfluoro-n-[13C9]nonanoic acid
M6PFDA	Perfluoro-n-[1,2,3,4,5,6-13C6]decanoic acid
M7PFUnDA	Perfluoro-n-[1,2,3,4,5,6,7-13C7]undecanoic acid
MPFDODA	Perfluoro-n-[1,2-13C2]dodecanoic acid
MPFTeDA	Perfluoro-n-[1,2-13C2]tetradecanoic acid

Analyte	Full Name
MPFOSA	Perfluoro-1-[13C8]octanesulfonamide
DNEtFOSA	N-ethyl-D5-perfluoro-1-octanesulfonamide
DNMeFOSA	N-methyl-D3-perfluoro-1-octanesulfonamide
DNEtFOSAA	N-ethyl-D5-perfluoro-1-octanesulfonamidoacetic acid
DNMeFOSAA	N-methyl-D3-perfluoro-1-octanesulfonamidoacetic acid
DNEtFOSE	2-(N-ethyl-D5-perfluoro-1-octanesulfonamido)ethan-D4-ol
DNMeFOSE	2-(N-methyl-D3-perfluoro-1-octanesulfonamido)ethan-D4-ol
M4:2FTS	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-hexane sulfonic acid
M6:2FTS	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonic acid
M8:2FTS	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonic acid

LOR = Limit of Reporting

LOD = Limit of Detection

NR = Not Reportable

Certificate of Analysis

Submission Reference: A02744115
Final Report

Nerena Rhodes
Pattle Delamore Partners Limited
P O Box 9528
Auckland 1149
New Zealand

PO Number: OHA_PFAS

Report Issued: 14-Oct-2020

AsureQuality Reference: **20-263925**

Sample(s) Received: 30-Sep-2020 08:00

Testing Period: 30-Sep-2020 to 14-Oct-2020

Results

The tests were performed on the samples as received.

Customer Sample Name: OHA_ADJ_SW33_4_290920 **Lab ID:** 20-263925-1

Sample Condition: Acceptable

Sampled Date: 29-Sep-2020

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - High Level			
Perfluoroalkylsulfonic acids			
PFPoS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.20	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTTrDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)

AsureQuality has used reasonable skill, care, and effort to provide an accurate analysis of the sample(s) which form(s) the subject of this report. However, the accuracy of this analysis is reliant on, and subject to, the sample(s) provided by you and your responsibility as to transportation of the sample(s). AsureQuality's standard terms of business apply to the analysis set out in this report.

Test	Result	Unit	Method Reference
Perfluorooctanesulfonamides			
PFOSA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	102	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	100	%	AsureQuality Method (LC-MS/MS)
M8PFOS	106	%	AsureQuality Method (LC-MS/MS)
M4PFBA	108	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	106	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	109	%	AsureQuality Method (LC-MS/MS)
MPPHpA	102	%	AsureQuality Method (LC-MS/MS)
M8PFOA	104	%	AsureQuality Method (LC-MS/MS)
M9PFNA	96	%	AsureQuality Method (LC-MS/MS)
M6PFDA	105	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	106	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	111	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	120	%	AsureQuality Method (LC-MS/MS)
MPFOSA	109	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	110	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	104	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	110	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	107	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	109	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	108	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	97	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	105	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	102	%	AsureQuality Method (LC-MS/MS)

QC Results

Blank

Relates to sample(s) 20-263925-1

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - High Level			
Perfluoroalkylsulfonic acids			
PFPrS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
mono-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.20	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTTrDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	101	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	106	%	AsureQuality Method (LC-MS/MS)
M8PFOS	111	%	AsureQuality Method (LC-MS/MS)
M4PFBA	107	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	107	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	111	%	AsureQuality Method (LC-MS/MS)
MPFHpA	107	%	AsureQuality Method (LC-MS/MS)
M8PFOA	110	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
M9PFNA	110	%	AsureQuality Method (LC-MS/MS)
M6PFDA	109	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	118	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	114	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	124	%	AsureQuality Method (LC-MS/MS)
MPFOSA	116	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	110	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	105	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	112	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	111	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	112	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	107	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	103	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	110	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	103	%	AsureQuality Method (LC-MS/MS)

Analysis Summary

Wellington Laboratory

Analysis	Method	Accreditation	Authorised by
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - High Level			
DX-PFCS01, 05-HIGHLEVEL	AsureQuality Method (LC-MS/MS)	IANZ	Amelie Sellier

di-PFHxS (1) = Concentration determined using a branched di-PFHxS isomer standard (399>80 transition)

mono-PFHxS (1) = Concentration determined using a branched mono-PFHxS isomer standard (399>80 transition)

L-PFHxS (1) = Concentration determined using the linear PFHxS isomer standard (399>80 transition)

Total PFHxS (3) = The numerical sum of di-PFHxS (1), mono-PFHxS (1), and L-PFHxS (1)

di-PFOS (5) = Concentration determined using a branched di-PFOS isomer standard (499>80 transition)

mono-PFOS (5) = Concentration determined using a branched mono-PFOS isomer standard (499>80 transition)

L-PFOS (5) = Concentration determined using the linear PFOS isomer standard (499>230 transition)

Total PFOS (7) = The numerical sum of di-PFOS (5), mono-PFOS (5), and L-PFOS (5)

Sum PFHxS+PFOS (1) = The numerical sum of Total PFHxS (3) and Total PFOS (7)

For all Totals, where a component is detected below the LOR, the value of zero is used in the calculation of the sum. The result represents the lower-bound concentration present in the sample.

Reported results are corrected for internal standard recovery

Results that are prefixed with '<' indicate the lowest level at which the analyte can be reported, and that in this case the analyte was not observed above this limit.

Amelie Sellier

Scientist

Accreditation



Appendix

Analyte LOR Summary

Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - High Level - AsureQuality Method (LC-MS/MS)

Analyte	LOR
Perfluoroalkylsulfonic acids	
PFPrS	0.025 µg/L
PFBS	0.025 µg/L
PFPeS	0.025 µg/L
di-PFHxS (1)	0.025 µg/L
mono-PFHxS (1)	0.025 µg/L
L-PFHxS (1)	0.025 µg/L
Total PFHxS (3)	0.025 µg/L
PFHpS	0.025 µg/L
di-PFOS (5)	0.025 µg/L
mono-PFOS (5)	0.025 µg/L
L-PFOS (5)	0.025 µg/L
Total PFOS (7)	0.025 µg/L
Sum PFHxS+PFOS (1)	0.025 µg/L
PFNS	0.050 µg/L
PFDS	0.10 µg/L
Perfluoroalkylcarboxylic acids	
PFBA	0.10 µg/L
PFPeA	0.10 µg/L
PFHxA	0.025 µg/L
PFHpA	0.025 µg/L
PFOA	0.025 µg/L
PFNA	0.025 µg/L
PFDA	0.025 µg/L
PFUnDA	0.025 µg/L
PFDoDA	0.10 µg/L
PFTrDA	0.10 µg/L
PFTeDA	0.10 µg/L
Perfluorooctanesulfonamides	
PFOSA	0.025 µg/L
NEtFOSA-M	0.10 µg/L
NMeFOSA-M	0.10 µg/L
Perfluorooctanesulfonamidoacetic acids	
NEtFOSAA	0.025 µg/L
NMeFOSAA	0.025 µg/L
Perfluorooctanesulfonamidoethanols	
NEtFOSE-M	0.10 µg/L
NMeFOSE-M	0.10 µg/L
Telomere Sulfonic acids	
4:2 FTS	0.025 µg/L
6:2 FTS	0.050 µg/L
8:2 FTS	0.10 µg/L

Analyte Definitions

Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - High Level - AsureQuality Method (LC-MS/MS)

Analyte	Full Name
Perfluoroalkylsulfonic acids	
PFPPrS	Perfluoro-1-propanesulfonic acid
PFBS	Perfluoro-1-butanesulfonic acid
PFPeS	Perfluoro-1-pentanesulfonic acid
di-PFHxS (1)	Total Perfluorodimethylbutane sulfonic acids
mono-PFHxS (1)	Total Perfluoromethylpentane sulfonic acids
L-PFHxS (1)	Linear Perfluorohexanesulfonic acid
PFHpS	Perfluoro-1-heptanesulfonic acid
di-PFOS (5)	Total Perfluorodimethylhexane sulfonic acids
mono-PFOS (5)	Total Perfluoromethylheptane sulfonic acids
L-PFOS (5)	Linear Perfluorooctanesulfonic acid
PFNS	Perfluoro-1-nonanesulfonic acid
PFDS	Perfluoro-1-decanesulfonic acid
Perfluoroalkylcarboxylic acids	
PFBA	Perfluoro-n-butanoic acid
PFPeA	Perfluoro-n-pentanoic acid
PFHxA	Perfluoro-n-hexanoic acid
PFHpA	Perfluoro-n-heptanoic acid
PFOA	Perfluoro-n-octanoic acid
PFNA	Perfluoro-n-nonanoic acid
PFDA	Perfluoro-n-decanoic acid
PFUnDA	Perfluoro-n-undecanoic acid
PFDODA	Perfluoro-n-dodecanoic acid
PFTTrDA	Perfluoro-n-tridecanoic acid
PFTeDA	Perfluoro-n-tetradecanoic acid
Perfluorooctanesulfonamides	
PFOSA	Perfluoro-1-octanesulfonamide
NEtFOSA-M	N-ethylperfluoro-1-octanesulfonamide
NMeFOSA-M	N-methylperfluoro-1-octanesulfonamide
Perfluorooctanesulfonamidoacetic acids	
NEtFOSAA	N-ethylperfluoro-1-octanesulfonamidoacetic acid
NMeFOSAA	N-methylperfluoro-1-octanesulfonamidoacetic acid
Perfluorooctanesulfonamidoethanols	
NEtFOSE-M	2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol
NMeFOSE-M	2-(N-methylperfluoro-1-octanesulfonamido)-ethanol
Telomere Sulfonic acids	
4:2 FTS	1H,1H,2H,2H-perfluoro-1-hexanesulfonic acid
6:2 FTS	1H,1H,2H,2H-perfluoro-1-octanesulfonic acid
8:2 FTS	1H,1H,2H,2H-perfluoro-1-decanesulfonic acid
Internal Standards	
M3PFBS	Perfluoro-1-[2,3,4-13C3]butanesulfonic acid
M3PFHxS	Perfluoro-1-[1,2,3-13C3]hexanesulfonic acid
M8PFOS	Perfluoro-1-[13C8]octanesulfonic acid
M4PFBA	Perfluoro-n-[1,2,3,4-13C4]butanoic acid
M5PFPeA	Perfluoro-n-[1,2,3,4,5-13C5]pentanoic acid
M5PFHxA	Perfluoro-n-[1,2,3,4,6-13C5]hexanoic acid
MPFHpA	Perfluoro-n-[1,2,3,4-13C4]heptanoic acid
M8PFOA	Perfluoro-n-[13C8]octanoic acid
M9PFNA	Perfluoro-n-[13C9]nonanoic acid
M6PFDA	Perfluoro-n-[1,2,3,4,5,6-13C6]decanoic acid
M7PFUnDA	Perfluoro-n-[1,2,3,4,5,6,7-13C7]undecanoic acid
MPFDODA	Perfluoro-n-[1,2-13C2]dodecanoic acid
MPFTeDA	Perfluoro-n-[1,2-13C2]tetradecanoic acid

Analyte	Full Name
MPFOSA	Perfluoro-1-[13C8]octanesulfonamide
DNEtFOSA	N-ethyl-D5-perfluoro-1-octanesulfonamide
DNMeFOSA	N-methyl-D3-perfluoro-1-octanesulfonamide
DNEtFOSAA	N-ethyl-D5-perfluoro-1-octanesulfonamidoacetic acid
DNMeFOSAA	N-methyl-D3-perfluoro-1-octanesulfonamidoacetic acid
DNEtFOSE	2-(N-ethyl-D5-perfluoro-1-octanesulfonamido)ethan-D4-ol
DNMeFOSE	2-(N-methyl-D3-perfluoro-1-octanesulfonamido)ethan-D4-ol
M4:2FTS	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-hexane sulfonic acid
M6:2FTS	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonic acid
M8:2FTS	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonic acid

LOR = Limit of Reporting

LOD = Limit of Detection

NR = Not Reportable

Certificate of Analysis

Submission Reference: A02744115
Final Report

Nerena Rhodes
Pattle Delamore Partners Limited
P O Box 9528
Auckland 1149
New Zealand

PO Number: OHA_PFAS

Report Issued: 14-Oct-2020

AsureQuality Reference: **20-263935**

Sample(s) Received: 30-Sep-2020 08:00

Testing Period: 30-Sep-2020 to 14-Oct-2020

Results

The tests were performed on the samples as received.

Customer Sample Name: OHA_DPB_SW6_4_290920 **Lab ID:** 20-263935-1

Sample Condition: Acceptable

Sampled Date: 29-Sep-2020

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - High Level			
Perfluoroalkylsulfonic acids			
PFPoS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	0.030	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	0.19	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	0.22	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	0.093	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	0.13	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	0.22	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	0.44	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.20	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	0.22	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	0.14	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	0.073	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	0.065	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	0.029	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTTrDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)

AsureQuality has used reasonable skill, care, and effort to provide an accurate analysis of the sample(s) which form(s) the subject of this report. However, the accuracy of this analysis is reliant on, and subject to, the sample(s) provided by you and your responsibility as to transportation of the sample(s). AsureQuality's standard terms of business apply to the analysis set out in this report.

Test	Result	Unit	Method Reference
Perfluorooctanesulfonamides			
PFOSA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	0.053	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	105	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	105	%	AsureQuality Method (LC-MS/MS)
M8PFOS	108	%	AsureQuality Method (LC-MS/MS)
M4PFBA	106	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	105	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	111	%	AsureQuality Method (LC-MS/MS)
MPPFHpA	109	%	AsureQuality Method (LC-MS/MS)
M8PFOA	104	%	AsureQuality Method (LC-MS/MS)
M9PFNA	105	%	AsureQuality Method (LC-MS/MS)
M6PFDA	111	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	120	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	112	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	119	%	AsureQuality Method (LC-MS/MS)
MPFOSA	114	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	106	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	112	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	110	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	110	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	108	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	104	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	102	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	107	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	105	%	AsureQuality Method (LC-MS/MS)

QC Results

Blank

Relates to sample(s) 20-263935-1

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - High Level			
Perfluoroalkylsulfonic acids			
PFPrS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
mono-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.20	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTTrDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	101	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	106	%	AsureQuality Method (LC-MS/MS)
M8PFOS	111	%	AsureQuality Method (LC-MS/MS)
M4PFBA	107	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	107	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	111	%	AsureQuality Method (LC-MS/MS)
MPFHpA	107	%	AsureQuality Method (LC-MS/MS)
M8PFOA	110	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
M9PFNA	110	%	AsureQuality Method (LC-MS/MS)
M6PFDA	109	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	118	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	114	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	124	%	AsureQuality Method (LC-MS/MS)
MPFOSA	116	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	110	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	105	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	112	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	111	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	112	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	107	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	103	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	110	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	103	%	AsureQuality Method (LC-MS/MS)

Analysis Summary

Wellington Laboratory

Analysis	Method	Accreditation	Authorised by
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - High Level			
DX-PFCS01, 05-HIGHLEVEL	AsureQuality Method (LC-MS/MS)	IANZ	Amelie Sellier

di-PFHxS (1) = Concentration determined using a branched di-PFHxS isomer standard (399>80 transition)

mono-PFHxS (1) = Concentration determined using a branched mono-PFHxS isomer standard (399>80 transition)

L-PFHxS (1) = Concentration determined using the linear PFHxS isomer standard (399>80 transition)

Total PFHxS (3) = The numerical sum of di-PFHxS (1), mono-PFHxS (1), and L-PFHxS (1)

di-PFOS (5) = Concentration determined using a branched di-PFOS isomer standard (499>80 transition)

mono-PFOS (5) = Concentration determined using a branched mono-PFOS isomer standard (499>80 transition)

L-PFOS (5) = Concentration determined using the linear PFOS isomer standard (499>230 transition)

Total PFOS (7) = The numerical sum of di-PFOS (5), mono-PFOS (5), and L-PFOS (5)

Sum PFHxS+PFOS (1) = The numerical sum of Total PFHxS (3) and Total PFOS (7)

For all Totals, where a component is detected below the LOR, the value of zero is used in the calculation of the sum. The result represents the lower-bound concentration present in the sample.

Reported results are corrected for internal standard recovery

Results that are prefixed with '<' indicate the lowest level at which the analyte can be reported, and that in this case the analyte was not observed above this limit.

Amelie Sellier

Scientist

Accreditation



Appendix

Analyte LOR Summary

Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - High Level - AsureQuality Method (LC-MS/MS)

Analyte	LOR
Perfluoroalkylsulfonic acids	
PFPrS	0.025 µg/L
PFBS	0.025 µg/L
PFPeS	0.025 µg/L
di-PFHxS (1)	0.025 µg/L
mono-PFHxS (1)	0.025 µg/L
L-PFHxS (1)	0.025 µg/L
Total PFHxS (3)	0.025 µg/L
PFHpS	0.025 µg/L
di-PFOS (5)	0.025 µg/L
mono-PFOS (5)	0.025 µg/L
L-PFOS (5)	0.025 µg/L
Total PFOS (7)	0.025 µg/L
Sum PFHxS+PFOS (1)	0.025 µg/L
PFNS	0.050 µg/L
PFDS	0.10 µg/L
Perfluoroalkylcarboxylic acids	
PFBA	0.10 µg/L
PFPeA	0.10 µg/L
PFHxA	0.025 µg/L
PFHpA	0.025 µg/L
PFOA	0.025 µg/L
PFNA	0.025 µg/L
PFDA	0.025 µg/L
PFUnDA	0.025 µg/L
PFDoDA	0.10 µg/L
PFTrDA	0.10 µg/L
PFTeDA	0.10 µg/L
Perfluorooctanesulfonamides	
PFOSA	0.025 µg/L
NEtFOSA-M	0.10 µg/L
NMeFOSA-M	0.10 µg/L
Perfluorooctanesulfonamidoacetic acids	
NEtFOSAA	0.025 µg/L
NMeFOSAA	0.025 µg/L
Perfluorooctanesulfonamidoethanols	
NEtFOSE-M	0.10 µg/L
NMeFOSE-M	0.10 µg/L
Telomere Sulfonic acids	
4:2 FTS	0.025 µg/L
6:2 FTS	0.050 µg/L
8:2 FTS	0.10 µg/L

Analyte Definitions

Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - High Level - AsureQuality Method (LC-MS/MS)

Analyte	Full Name
Perfluoroalkylsulfonic acids	
PFPPrS	Perfluoro-1-propanesulfonic acid
PFBS	Perfluoro-1-butanesulfonic acid
PFPeS	Perfluoro-1-pentanesulfonic acid
di-PFHxS (1)	Total Perfluorodimethylbutane sulfonic acids
mono-PFHxS (1)	Total Perfluoromethylpentane sulfonic acids
L-PFHxS (1)	Linear Perfluorohexanesulfonic acid
PFHpS	Perfluoro-1-heptanesulfonic acid
di-PFOS (5)	Total Perfluorodimethylhexane sulfonic acids
mono-PFOS (5)	Total Perfluoromethylheptane sulfonic acids
L-PFOS (5)	Linear Perfluorooctanesulfonic acid
PFNS	Perfluoro-1-nonanesulfonic acid
PFDS	Perfluoro-1-decanesulfonic acid
Perfluoroalkylcarboxylic acids	
PFBA	Perfluoro-n-butanoic acid
PFPeA	Perfluoro-n-pentanoic acid
PFHxA	Perfluoro-n-hexanoic acid
PFHpA	Perfluoro-n-heptanoic acid
PFOA	Perfluoro-n-octanoic acid
PFNA	Perfluoro-n-nonanoic acid
PFDA	Perfluoro-n-decanoic acid
PFUnDA	Perfluoro-n-undecanoic acid
PFDODA	Perfluoro-n-dodecanoic acid
PFTTrDA	Perfluoro-n-tridecanoic acid
PFTeDA	Perfluoro-n-tetradecanoic acid
Perfluorooctanesulfonamides	
PFOSA	Perfluoro-1-octanesulfonamide
NEtFOSA-M	N-ethylperfluoro-1-octanesulfonamide
NMeFOSA-M	N-methylperfluoro-1-octanesulfonamide
Perfluorooctanesulfonamidoacetic acids	
NEtFOSAA	N-ethylperfluoro-1-octanesulfonamidoacetic acid
NMeFOSAA	N-methylperfluoro-1-octanesulfonamidoacetic acid
Perfluorooctanesulfonamidoethanols	
NEtFOSE-M	2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol
NMeFOSE-M	2-(N-methylperfluoro-1-octanesulfonamido)-ethanol
Telomere Sulfonic acids	
4:2 FTS	1H,1H,2H,2H-perfluoro-1-hexanesulfonic acid
6:2 FTS	1H,1H,2H,2H-perfluoro-1-octanesulfonic acid
8:2 FTS	1H,1H,2H,2H-perfluoro-1-decanesulfonic acid
Internal Standards	
M3PFBS	Perfluoro-1-[2,3,4-13C3]butanesulfonic acid
M3PFHxS	Perfluoro-1-[1,2,3-13C3]hexanesulfonic acid
M8PFOS	Perfluoro-1-[13C8]octanesulfonic acid
M4PFBA	Perfluoro-n-[1,2,3,4-13C4]butanoic acid
M5PFPeA	Perfluoro-n-[1,2,3,4,5-13C5]pentanoic acid
M5PFHxA	Perfluoro-n-[1,2,3,4,6-13C5]hexanoic acid
MPFHpA	Perfluoro-n-[1,2,3,4-13C4]heptanoic acid
M8PFOA	Perfluoro-n-[13C8]octanoic acid
M9PFNA	Perfluoro-n-[13C9]nonanoic acid
M6PFDA	Perfluoro-n-[1,2,3,4,5,6-13C6]decanoic acid
M7PFUnDA	Perfluoro-n-[1,2,3,4,5,6,7-13C7]undecanoic acid
MPFDODA	Perfluoro-n-[1,2-13C2]dodecanoic acid
MPFTeDA	Perfluoro-n-[1,2-13C2]tetradecanoic acid

Analyte	Full Name
MPFOSA	Perfluoro-1-[13C8]octanesulfonamide
DNEtFOSA	N-ethyl-D5-perfluoro-1-octanesulfonamide
DNMeFOSA	N-methyl-D3-perfluoro-1-octanesulfonamide
DNEtFOSAA	N-ethyl-D5-perfluoro-1-octanesulfonamidoacetic acid
DNMeFOSAA	N-methyl-D3-perfluoro-1-octanesulfonamidoacetic acid
DNEtFOSE	2-(N-ethyl-D5-perfluoro-1-octanesulfonamido)ethan-D4-ol
DNMeFOSE	2-(N-methyl-D3-perfluoro-1-octanesulfonamido)ethan-D4-ol
M4:2FTS	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-hexane sulfonic acid
M6:2FTS	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonic acid
M8:2FTS	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonic acid

LOR = Limit of Reporting

LOD = Limit of Detection

NR = Not Reportable

Certificate of Analysis

Submission Reference: A02744114
Final Report

Nerena Rhodes
Pattle Delamore Partners Limited
P O Box 9528
Auckland 1149
New Zealand

PO Number: OHA_PFAS

Report Issued: 15-Oct-2020

AsureQuality Reference: **20-264010**

Sample(s) Received: 30-Sep-2020 08:00

Testing Period: 30-Sep-2020 to 15-Oct-2020

Results

The tests were performed on the samples as received.

Customer Sample Name: OHA_QRY_WS2_7_290920 Lab ID: 20-264010-1

Sample Condition: Acceptable Sampled Date: 29-Sep-2020

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPoS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	0.0024	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	0.0024	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	0.0016	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	0.0016	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	0.0040	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	0.0029	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	0.0025	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	0.0016	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFTTrDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	NR	µg/L	AsureQuality Method (LC-MS/MS)

AsureQuality has used reasonable skill, care, and effort to provide an accurate analysis of the sample(s) which form(s) the subject of this report. However, the accuracy of this analysis is reliant on, and subject to, the sample(s) provided by you and your responsibility as to transportation of the sample(s). AsureQuality's standard terms of business apply to the analysis set out in this report.

Test	Result	Unit	Method Reference
Perfluorooctanesulfonamides			
PFOSA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	NR	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	NR	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	NR	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	117	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	136	%	AsureQuality Method (LC-MS/MS)
M8PFOS	170 (R)	%	AsureQuality Method (LC-MS/MS)
M4PFBA	106	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	104	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	110	%	AsureQuality Method (LC-MS/MS)
MPPHpA	111	%	AsureQuality Method (LC-MS/MS)
M8PFOA	119	%	AsureQuality Method (LC-MS/MS)
M9PFNA	117	%	AsureQuality Method (LC-MS/MS)
M6PFDA	139	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	114	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	61	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	284 (R)	%	AsureQuality Method (LC-MS/MS)
MPFOSA	38	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	18 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	19 (R)	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	43	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	63	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	16 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	15 (R)	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	116	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	121	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	121	%	AsureQuality Method (LC-MS/MS)

R = Recovery outside method limits

QC Results

Blank

Relates to sample(s) 20-264010-1

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPtS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDODA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFTTrDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	96	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	71	%	AsureQuality Method (LC-MS/MS)
M8PFOS	45	%	AsureQuality Method (LC-MS/MS)
M4PFBA	109	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	101	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	105	%	AsureQuality Method (LC-MS/MS)
MPFHpA	90	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
M8PFOA	79	%	AsureQuality Method (LC-MS/MS)
M9PFNA	61	%	AsureQuality Method (LC-MS/MS)
M6PFDA	50	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	36	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	36	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	0 (R)	%	AsureQuality Method (LC-MS/MS)
MPFOA	84	%	AsureQuality Method (LC-MS/MS)
DNEtFOA	54	%	AsureQuality Method (LC-MS/MS)
DNMeFOA	61	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	47	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	47	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	66	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	81	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	100	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	89	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	63	%	AsureQuality Method (LC-MS/MS)

R = Recovery outside method limits

Analysis Summary

Wellington Laboratory

Analysis	Method	Accreditation	Authorised by
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
DX-PFCS01, 03-SUITE_B	AsureQuality Method (LC-MS/MS)	IANZ	Amelie Sellier

di-PFHxS (1) = Concentration determined using a branched di-PFHxS isomer standard (399>80 transition)

mono-PFHxS (1) = Concentration determined using a branched mono-PFHxS isomer standard (399>80 transition)

L-PFHxS (1) = Concentration determined using the linear PFHxS isomer standard (399>80 transition)

Total PFHxS (3) = The numerical sum of di-PFHxS (1), mono-PFHxS (1), and L-PFHxS (1)

di-PFOS (5) = Concentration determined using a branched di-PFOS isomer standard (499>80 transition)

mono-PFOS (5) = Concentration determined using a branched mono-PFOS isomer standard (499>80 transition)

L-PFOS (5) = Concentration determined using the linear PFOS isomer standard (499>230 transition)

Total PFOS (7) = The numerical sum of di-PFOS (5), mono-PFOS (5), and L-PFOS (5)

Sum PFHxS+PFOS (1) = The numerical sum of Total PFHxS (3) and Total PFOS (7)

For all Totals, where a component is detected below the LOR, the value of zero is used in the calculation of the sum. The result represents the lower-bound concentration present in the sample.

Reported results are corrected for internal standard recovery

Results that are prefixed with '<' indicate the lowest level at which the analyte can be reported, and that in this case the analyte was not observed above this limit.

NR = Not Reportable



Amelie Sellier

Scientist

Accreditation



Appendix

Analyte LOR Summary

Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - AsureQuality Method (LC-MS/MS)

Analyte	LOR
Perfluoroalkylsulfonic acids	
PFPPrS	0.0010 µg/L
PFBS	0.0010 µg/L
PFPeS	0.0010 µg/L
di-PFHxS (1)	0.0010 µg/L
mono-PFHxS (1)	0.0010 µg/L
L-PFHxS (1)	0.0010 µg/L
Total PFHxS (3)	0.0010 µg/L
PFHpS	0.0010 µg/L
di-PFOS (5)	0.0010 µg/L
mono-PFOS (5)	0.0010 µg/L
L-PFOS (5)	0.0010 µg/L
Total PFOS (7)	0.0010 µg/L
Sum PFHxS+PFOS (1)	0.0010 µg/L
PFNS	0.0010 µg/L
PFDS	NR µg/L
Perfluoroalkylcarboxylic acids	
PFBA	0.0010 µg/L
PFPeA	0.0010 µg/L
PFHxA	0.0010 µg/L
PFHpA	0.0010 µg/L
PFOA	0.0010 µg/L
PFNA	0.0010 µg/L
PFDA	0.0010 µg/L
PFUnDA	0.0010 µg/L
PFDoDA	0.0010 µg/L
PFTTrDA	NR µg/L
PFTeDA	NR µg/L
Perfluorooctanesulfonamides	
PFOSA	0.0010 µg/L
NEtFOSA-M	NR µg/L
NMeFOSA-M	NR µg/L
Perfluorooctanesulfonamidoacetic acids	
NEtFOSAA	0.0010 µg/L
NMeFOSAA	0.0010 µg/L
Perfluorooctanesulfonamidoethanols	
NEtFOSE-M	NR µg/L
NMeFOSE-M	NR µg/L
Telomere Sulfonic acids	
4:2 FTS	0.0010 µg/L
6:2 FTS	0.0010 µg/L
8:2 FTS	0.0010 µg/L

Analyte Definitions

Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - AsureQuality Method (LC-MS/MS)

Analyte	Full Name
Perfluoroalkylsulfonic acids	
PFPPrS	Perfluoro-1-propanesulfonic acid
PFBS	Perfluoro-1-butanesulfonic acid
PFPeS	Perfluoro-1-pentanesulfonic acid
di-PFHxS (1)	Total Perfluorodimethylbutane sulfonic acids
mono-PFHxS (1)	Total Perfluoromethylpentane sulfonic acids
L-PFHxS (1)	Linear Perfluorohexanesulfonic acid
PFHpS	Perfluoro-1-heptanesulfonic acid
di-PFOS (5)	Total Perfluorodimethylhexane sulfonic acids
mono-PFOS (5)	Total Perfluoromethylheptane sulfonic acids
L-PFOS (5)	Linear Perfluorooctanesulfonic acid
PFNS	Perfluoro-1-nonanesulfonic acid
PFDS	Perfluoro-1-decanesulfonic acid
Perfluoroalkylcarboxylic acids	
PFBA	Perfluoro-n-butanoic acid
PFPeA	Perfluoro-n-pentanoic acid
PFHxA	Perfluoro-n-hexanoic acid
PFHpA	Perfluoro-n-heptanoic acid
PFOA	Perfluoro-n-octanoic acid
PFNA	Perfluoro-n-nonanoic acid
PFDA	Perfluoro-n-decanoic acid
PFUnDA	Perfluoro-n-undecanoic acid
PFDODA	Perfluoro-n-dodecanoic acid
PFTTrDA	Perfluoro-n-tridecanoic acid
PFTeDA	Perfluoro-n-tetradecanoic acid
Perfluorooctanesulfonamides	
PFOSA	Perfluoro-1-octanesulfonamide
NEtFOSA-M	N-ethylperfluoro-1-octanesulfonamide
NMeFOSA-M	N-methylperfluoro-1-octanesulfonamide
Perfluorooctanesulfonamidoacetic acids	
NEtFOSAA	N-ethylperfluoro-1-octanesulfonamidoacetic acid
NMeFOSAA	N-methylperfluoro-1-octanesulfonamidoacetic acid
Perfluorooctanesulfonamidoethanols	
NEtFOSE-M	2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol
NMeFOSE-M	2-(N-methylperfluoro-1-octanesulfonamido)-ethanol
Telomere Sulfonic acids	
4:2 FTS	1H,1H,2H,2H-perfluoro-1-hexanesulfonic acid
6:2 FTS	1H,1H,2H,2H-perfluoro-1-octanesulfonic acid
8:2 FTS	1H,1H,2H,2H-perfluoro-1-decanesulfonic acid
Internal Standards	
M3PFBS	Perfluoro-1-[2,3,4-13C3]butanesulfonic acid
M3PFHxS	Perfluoro-1-[1,2,3-13C3]hexanesulfonic acid
M8PFOS	Perfluoro-1-[13C8]octanesulfonic acid
M4PFBA	Perfluoro-n-[1,2,3,4-13C4]butanoic acid
M5PFPeA	Perfluoro-n-[1,2,3,4,5-13C5]pentanoic acid
M5PFHxA	Perfluoro-n-[1,2,3,4,6-13C5]hexanoic acid
MPFHpA	Perfluoro-n-[1,2,3,4-13C4]heptanoic acid
M8PFOA	Perfluoro-n-[13C8]octanoic acid
M9PFNA	Perfluoro-n-[13C9]nonanoic acid
M6PFDA	Perfluoro-n-[1,2,3,4,5,6-13C6]decanoic acid
M7PFUnDA	Perfluoro-n-[1,2,3,4,5,6,7-13C7]undecanoic acid
MPFDODA	Perfluoro-n-[1,2-13C2]dodecanoic acid
MPFTeDA	Perfluoro-n-[1,2-13C2]tetradecanoic acid

Analyte	Full Name
MPFOSA	Perfluoro-1-[13C8]octanesulfonamide
DNEtFOSA	N-ethyl-D5-perfluoro-1-octanesulfonamide
DNMeFOSA	N-methyl-D3-perfluoro-1-octanesulfonamide
DNEtFOSAA	N-ethyl-D5-perfluoro-1-octanesulfonamidoacetic acid
DNMeFOSAA	N-methyl-D3-perfluoro-1-octanesulfonamidoacetic acid
DNEtFOSE	2-(N-ethyl-D5-perfluoro-1-octanesulfonamido)ethan-D4-ol
DNMeFOSE	2-(N-methyl-D3-perfluoro-1-octanesulfonamido)ethan-D4-ol
M4:2FTS	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-hexane sulfonic acid
M6:2FTS	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonic acid
M8:2FTS	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonic acid

LOR = Limit of Reporting

LOD = Limit of Detection

NR = Not Reportable

Certificate of Analysis

Submission Reference: A02744114
Amended Report

Nerena Rhodes
Pattle Delamore Partners Limited
P O Box 9528
Auckland 1149
New Zealand

PO Number: OHA_PFAS

Report Issued: 11-Nov-2020

AsureQuality Reference: **20-265677**

Sample(s) Received: 01-Oct-2020 08:00

Testing Period: 01-Oct-2020 to 30-Oct-2020

Comments

Amended Report: Customer Sample Name amended for sample 20-265677-2.

Results

The tests were performed on the samples as received.

Customer Sample Name: OHA_FTA_MW4_5_300920 Lab ID: 20-265677-1

Sample Condition: Acceptable Sampled Date: 30-Sep-2020

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - High Level			
Perfluoroalkylsulfonic acids			
PFPoS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	0.029	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	0.061	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	0.35	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	0.41	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	0.33	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	0.69	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	1.0	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	1.4	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	0.17	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	0.65	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	0.41	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	0.22	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	0.19	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)

AsureQuality has used reasonable skill, care, and effort to provide an accurate analysis of the sample(s) which form(s) the subject of this report. However, the accuracy of this analysis is reliant on, and subject to, the sample(s) provided by you and your responsibility as to transportation of the sample(s). AsureQuality's standard terms of business apply to the analysis set out in this report.

Test	Result	Unit	Method Reference
PFUnDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTTrDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTTeDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	0.45	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	109	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	109	%	AsureQuality Method (LC-MS/MS)
M8PFOS	112	%	AsureQuality Method (LC-MS/MS)
M4PFBA	108	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	106	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	107	%	AsureQuality Method (LC-MS/MS)
MPFHpA	106	%	AsureQuality Method (LC-MS/MS)
M8PFOA	114	%	AsureQuality Method (LC-MS/MS)
M9PFNA	110	%	AsureQuality Method (LC-MS/MS)
M6PFDA	113	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	106	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	108	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	112	%	AsureQuality Method (LC-MS/MS)
MPFOSA	111	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	106	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	104	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	106	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	111	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	111	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	108	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	100	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	104	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	101	%	AsureQuality Method (LC-MS/MS)

Customer Sample Name: OHA_RUP_MW6_6_300920

Lab ID: 20-265677-2

Sample Condition: Acceptable

Sampled Date: 30-Sep-2020

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - High Level			
Perfluoroalkylsulfonic acids			
PFPtS	0.063	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	0.22	µg/L	AsureQuality Method (LC-MS/MS)

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Test	Result	Unit	Method Reference
PFPeS	0.26	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	0.62	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	4.2	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	4.8	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	0.15	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	0.13	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	2.9	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	6.5	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	9.5	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	14	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	1.4	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	3.2	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	2.2	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	1.0	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	1.1	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	0.75	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFDODA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTTrDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	0.23	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	112	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	107	%	AsureQuality Method (LC-MS/MS)
M8PFOS	106	%	AsureQuality Method (LC-MS/MS)
M4PFBA	107	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	112	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	109	%	AsureQuality Method (LC-MS/MS)
MPFHpA	106	%	AsureQuality Method (LC-MS/MS)
M8PFOA	107	%	AsureQuality Method (LC-MS/MS)
M9PFNA	106	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
M6PFDA	104	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	110	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	104	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	99	%	AsureQuality Method (LC-MS/MS)
MPFOSA	108	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	106	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	106	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	106	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	109	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	115	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	109	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	104	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	101	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	101	%	AsureQuality Method (LC-MS/MS)

Customer Sample Name: OHA_DTK_MW9_5_300920

Lab ID: 20-265677-3

Sample Condition: Acceptable

Sampled Date: 30-Sep-2020

Test	Result	Unit	Method Reference
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Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - High Level**Perfluoroalkylsulfonic acids**

PFPrS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	0.034	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	0.038	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	0.071	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	0.47	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	0.54	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	0.19	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	0.24	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	0.43	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	0.97	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)

Perfluoroalkylcarboxylic acids

PFBA	0.57	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	2.1	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	1.0	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	0.43	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	0.33	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	0.13	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTTrDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)

Perfluorooctanesulfonamides

PFOSA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
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Test	Result	Unit	Method Reference
NEtFOSA-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	1.1	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	108	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	104	%	AsureQuality Method (LC-MS/MS)
M8PFOS	110	%	AsureQuality Method (LC-MS/MS)
M4PFBA	107	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	105	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	105	%	AsureQuality Method (LC-MS/MS)
MPFHpA	106	%	AsureQuality Method (LC-MS/MS)
M8PFOA	107	%	AsureQuality Method (LC-MS/MS)
M9PFNA	111	%	AsureQuality Method (LC-MS/MS)
M6PFDA	112	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	97	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	120	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	135	%	AsureQuality Method (LC-MS/MS)
MPFOSA	109	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	109	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	104	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	108	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	110	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	115	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	112	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	103	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	101	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	106	%	AsureQuality Method (LC-MS/MS)

Customer Sample Name: OHA_ADJ_GWKAE_1_300920

Lab ID: 20-265677-4

Sample Condition: Acceptable

Sampled Date: 30-Sep-2020

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - High Level			
Perfluoroalkylsulfonic acids			
PFPrS	0.060	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	0.21	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	0.27	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	0.62	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	4.3	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	4.9	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	0.17	µg/L	AsureQuality Method (LC-MS/MS)

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Report Number 2132127 cancels Report Number 2116892.

Test	Result	Unit	Method Reference
di-PFOS (5)	0.15	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	3.3	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	8.4	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	12	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	17	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	1.3	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	3.2	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	2.3	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	1.1	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	1.2	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	0.85	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTTrDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	0.24	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	105	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	104	%	AsureQuality Method (LC-MS/MS)
M8PFOS	103	%	AsureQuality Method (LC-MS/MS)
M4PFBA	105	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	104	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	103	%	AsureQuality Method (LC-MS/MS)
MPFHpA	100	%	AsureQuality Method (LC-MS/MS)
M8PFOA	104	%	AsureQuality Method (LC-MS/MS)
M9PFNA	101	%	AsureQuality Method (LC-MS/MS)
M6PFDA	102	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	117	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	110	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	123	%	AsureQuality Method (LC-MS/MS)
MPFOSA	104	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	103	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
DNMeFOSA	104	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	106	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	111	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	109	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	104	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	102	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	100	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	97	%	AsureQuality Method (LC-MS/MS)

QC Results

Blank

Relates to sample(s) 20-265677-1, 20-265677-2, 20-265677-3, 20-265677-4

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - High Level			
Perfluoroalkylsulfonic acids			
PFPPrS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFDODA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTTrDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)

Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	104	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	106	%	AsureQuality Method (LC-MS/MS)
M8PFOS	100	%	AsureQuality Method (LC-MS/MS)
M4PFBA	102	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	101	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	103	%	AsureQuality Method (LC-MS/MS)
MPFHpA	104	%	AsureQuality Method (LC-MS/MS)
M8PFOA	110	%	AsureQuality Method (LC-MS/MS)
M9PFNA	107	%	AsureQuality Method (LC-MS/MS)
M6PFDA	101	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	105	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	107	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	97	%	AsureQuality Method (LC-MS/MS)
MPFOSA	104	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	100	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	100	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	108	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	112	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	109	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	106	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	100	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	100	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	93	%	AsureQuality Method (LC-MS/MS)

Analysis Summary

Wellington Laboratory

Analysis	Method	Accreditation	Authorised by
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - High Level			
DX-PFCS01, 05-HIGHLEVEL	AsureQuality Method (LC-MS/MS)	IANZ	Amelie Sellier

di-PFHxS (1) = Concentration determined using a branched di-PFHxS isomer standard (399>80 transition)

mono-PFHxS (1) = Concentration determined using a branched mono-PFHxS isomer standard (399>80 transition)

L-PFHxS (1) = Concentration determined using the linear PFHxS isomer standard (399>80 transition)

Total PFHxS (3) = The numerical sum of di-PFHxS (1), mono-PFHxS (1), and L-PFHxS (1)

di-PFOS (5) = Concentration determined using a branched di-PFOS isomer standard (499>80 transition)

mono-PFOS (5) = Concentration determined using a branched mono-PFOS isomer standard (499>80 transition)

L-PFOS (5) = Concentration determined using the linear PFOS isomer standard (499>230 transition)

Total PFOS (7) = The numerical sum of di-PFOS (5), mono-PFOS (5), and L-PFOS (5)

Sum PFHxS+PFOS (1) = The numerical sum of Total PFHxS (3) and Total PFOS (7)

For all Totals, where a component is detected below the LOR, the value of zero is used in the calculation of the sum. The result represents the lower-bound concentration present in the sample.

Reported results are corrected for internal standard recovery

Results that are prefixed with '<' indicate the lowest level at which the analyte can be reported, and that in this case the analyte was not observed above this limit.

Amelie Sellier

Scientist

Accreditation



Appendix

Analyte LOR Summary

Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - High Level - AsureQuality Method (LC-MS/MS)

Analyte	LOR
Perfluoroalkylsulfonic acids	
PFPrS	0.025 µg/L
PFBS	0.025 µg/L
PFPeS	0.025 µg/L
di-PFHxS (1)	0.025 µg/L
mono-PFHxS (1)	0.025 µg/L
L-PFHxS (1)	0.025 µg/L
Total PFHxS (3)	0.025 µg/L
PFHpS	0.025 µg/L
di-PFOS (5)	0.025 µg/L
mono-PFOS (5)	0.025 µg/L
L-PFOS (5)	0.025 µg/L
Total PFOS (7)	0.025 µg/L
Sum PFHxS+PFOS (1)	0.025 µg/L
PFNS	0.050 µg/L
PFDS	0.10 µg/L
Perfluoroalkylcarboxylic acids	
PFBA	0.10 µg/L
PFPeA	0.10 µg/L
PFHxA	0.025 µg/L
PFHpA	0.025 µg/L
PFOA	0.025 µg/L
PFNA	0.025 µg/L
PFDA	0.025 µg/L
PFUnDA	0.025 µg/L
PFDoDA	0.10 µg/L
PFTrDA	0.10 µg/L
PFTeDA	0.10 µg/L
Perfluorooctanesulfonamides	
PFOSA	0.025 µg/L
NEtFOSA-M	0.10 µg/L
NMeFOSA-M	0.10 µg/L
Perfluorooctanesulfonamidoacetic acids	
NEtFOSAA	0.025 µg/L
NMeFOSAA	0.025 µg/L
Perfluorooctanesulfonamidoethanols	
NEtFOSE-M	0.10 µg/L
NMeFOSE-M	0.10 µg/L
Telomere Sulfonic acids	
4:2 FTS	0.025 µg/L
6:2 FTS	0.050 µg/L
8:2 FTS	0.10 µg/L

Analyte Definitions

Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - High Level - AsureQuality Method (LC-MS/MS)

Analyte	Full Name
Perfluoroalkylsulfonic acids	
PFPPrS	Perfluoro-1-propanesulfonic acid
PFBS	Perfluoro-1-butanesulfonic acid
PFPeS	Perfluoro-1-pentanesulfonic acid
di-PFHxS (1)	Total Perfluorodimethylbutane sulfonic acids
mono-PFHxS (1)	Total Perfluoromethylpentane sulfonic acids
L-PFHxS (1)	Linear Perfluorohexanesulfonic acid
PFHpS	Perfluoro-1-heptanesulfonic acid
di-PFOS (5)	Total Perfluorodimethylhexane sulfonic acids
mono-PFOS (5)	Total Perfluoromethylheptane sulfonic acids
L-PFOS (5)	Linear Perfluorooctanesulfonic acid
PFNS	Perfluoro-1-nonanesulfonic acid
PFDS	Perfluoro-1-decanesulfonic acid
Perfluoroalkylcarboxylic acids	
PFBA	Perfluoro-n-butanoic acid
PFPeA	Perfluoro-n-pentanoic acid
PFHxA	Perfluoro-n-hexanoic acid
PFHpA	Perfluoro-n-heptanoic acid
PFOA	Perfluoro-n-octanoic acid
PFNA	Perfluoro-n-nonanoic acid
PFDA	Perfluoro-n-decanoic acid
PFUnDA	Perfluoro-n-undecanoic acid
PFDODA	Perfluoro-n-dodecanoic acid
PFTTrDA	Perfluoro-n-tridecanoic acid
PFTeDA	Perfluoro-n-tetradecanoic acid
Perfluorooctanesulfonamides	
PFOSA	Perfluoro-1-octanesulfonamide
NEtFOSA-M	N-ethylperfluoro-1-octanesulfonamide
NMeFOSA-M	N-methylperfluoro-1-octanesulfonamide
Perfluorooctanesulfonamidoacetic acids	
NEtFOSAA	N-ethylperfluoro-1-octanesulfonamidoacetic acid
NMeFOSAA	N-methylperfluoro-1-octanesulfonamidoacetic acid
Perfluorooctanesulfonamidoethanols	
NEtFOSE-M	2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol
NMeFOSE-M	2-(N-methylperfluoro-1-octanesulfonamido)-ethanol
Telomere Sulfonic acids	
4:2 FTS	1H,1H,2H,2H-perfluoro-1-hexanesulfonic acid
6:2 FTS	1H,1H,2H,2H-perfluoro-1-octanesulfonic acid
8:2 FTS	1H,1H,2H,2H-perfluoro-1-decanesulfonic acid
Internal Standards	
M3PFBS	Perfluoro-1-[2,3,4-13C3]butanesulfonic acid
M3PFHxS	Perfluoro-1-[1,2,3-13C3]hexanesulfonic acid
M8PFOS	Perfluoro-1-[13C8]octanesulfonic acid
M4PFBA	Perfluoro-n-[1,2,3,4-13C4]butanoic acid
M5PFPeA	Perfluoro-n-[1,2,3,4,5-13C5]pentanoic acid
M5PFHxA	Perfluoro-n-[1,2,3,4,6-13C5]hexanoic acid
MPFHpA	Perfluoro-n-[1,2,3,4-13C4]heptanoic acid
M8PFOA	Perfluoro-n-[13C8]octanoic acid
M9PFNA	Perfluoro-n-[13C9]nonanoic acid
M6PFDA	Perfluoro-n-[1,2,3,4,5,6-13C6]decanoic acid
M7PFUnDA	Perfluoro-n-[1,2,3,4,5,6,7-13C7]undecanoic acid
MPFDODA	Perfluoro-n-[1,2-13C2]dodecanoic acid
MPFTeDA	Perfluoro-n-[1,2-13C2]tetradecanoic acid

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Report Number 2132127 cancels Report Number 2116892.

Analyte	Full Name
MPFOSA	Perfluoro-1-[13C8]octanesulfonamide
DNEtFOSA	N-ethyl-D5-perfluoro-1-octanesulfonamide
DNMeFOSA	N-methyl-D3-perfluoro-1-octanesulfonamide
DNEtFOSAA	N-ethyl-D5-perfluoro-1-octanesulfonamidoacetic acid
DNMeFOSAA	N-methyl-D3-perfluoro-1-octanesulfonamidoacetic acid
DNEtFOSE	2-(N-ethyl-D5-perfluoro-1-octanesulfonamido)ethan-D4-ol
DNMeFOSE	2-(N-methyl-D3-perfluoro-1-octanesulfonamido)ethan-D4-ol
M4:2FTS	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-hexane sulfonic acid
M6:2FTS	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonic acid
M8:2FTS	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonic acid

LOR = Limit of Reporting

LOD = Limit of Detection

NR = Not Reportable

Certificate of Analysis

Submission Reference: A02744115
Final Report

Nerena Rhodes
Pattle Delamore Partners Limited
P O Box 9528
Auckland 1149
New Zealand

PO Number: OHA_PFAS

Report Issued: 15-Oct-2020

AsureQuality Reference: **20-265678**

Sample(s) Received: 01-Oct-2020 08:00

Testing Period: 01-Oct-2020 to 15-Oct-2020

Results

The tests were performed on the samples as received.

Customer Sample Name: OHA_ADJ_GW67_4_300920 **Lab ID:** 20-265678-1

Sample Condition: Acceptable

Sampled Date: 30-Sep-2020

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPoS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFTTrDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	NR	µg/L	AsureQuality Method (LC-MS/MS)

AsureQuality has used reasonable skill, care, and effort to provide an accurate analysis of the sample(s) which form(s) the subject of this report. However, the accuracy of this analysis is reliant on, and subject to, the sample(s) provided by you and your responsibility as to transportation of the sample(s). AsureQuality's standard terms of business apply to the analysis set out in this report.

Test	Result	Unit	Method Reference
Perfluorooctanesulfonamides			
PFOSA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	NR	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	NR	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	99	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	147	%	AsureQuality Method (LC-MS/MS)
M8PFOS	198 (R)	%	AsureQuality Method (LC-MS/MS)
M4PFBA	34	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	62	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	74	%	AsureQuality Method (LC-MS/MS)
MPFHpA	96	%	AsureQuality Method (LC-MS/MS)
M8PFOA	126	%	AsureQuality Method (LC-MS/MS)
M9PFNA	148	%	AsureQuality Method (LC-MS/MS)
M6PFDA	179 (R)	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	242 (R)	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	226 (R)	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	0 (R)	%	AsureQuality Method (LC-MS/MS)
MPFOSA	83	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	73	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	86	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	150	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	149	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	49	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	52	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	238 (R)	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	194 (R)	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	175 (R)	%	AsureQuality Method (LC-MS/MS)

R = Recovery outside method limits

Customer Sample Name: OHA_ADJ_GWKAK_1_300920

Lab ID: 20-265678-2

Sample Condition: Acceptable

Sampled Date: 30-Sep-2020

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPtS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
L-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFTTrDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	NR	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	100	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	117	%	AsureQuality Method (LC-MS/MS)
M8PFOS	130	%	AsureQuality Method (LC-MS/MS)
M4PFBA	96	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	93	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	101	%	AsureQuality Method (LC-MS/MS)
MPFHpA	98	%	AsureQuality Method (LC-MS/MS)
M8PFOA	117	%	AsureQuality Method (LC-MS/MS)
M9PFNA	126	%	AsureQuality Method (LC-MS/MS)
M6PFDA	156 (R)	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	170 (R)	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	185 (R)	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
MPFTeDA	0 (R)	%	AsureQuality Method (LC-MS/MS)
MPFOA	142	%	AsureQuality Method (LC-MS/MS)
DNEtFOA	196 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOA	202 (R)	%	AsureQuality Method (LC-MS/MS)
DNEtFOAA	161 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOAA	148	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	172 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	143	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	95	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	113	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	128	%	AsureQuality Method (LC-MS/MS)

R = Recovery outside method limits

Customer Sample Name: OHA_ADJ_GWKAG_1_300920

Lab ID: 20-265678-3

Sample Condition: Acceptable

Sampled Date: 30-Sep-2020

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPrS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFTTrDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOA-M	NR	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOA-M	NR	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	98	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	95	%	AsureQuality Method (LC-MS/MS)
M8PFOS	86	%	AsureQuality Method (LC-MS/MS)
M4PFBA	103	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	100	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	100	%	AsureQuality Method (LC-MS/MS)
MPFHpA	94	%	AsureQuality Method (LC-MS/MS)
M8PFOA	99	%	AsureQuality Method (LC-MS/MS)
M9PFNA	98	%	AsureQuality Method (LC-MS/MS)
M6PFDA	94	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	85	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	62	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	0 (R)	%	AsureQuality Method (LC-MS/MS)
MPFOSA	112	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	54	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	61	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	74	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	76	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	76	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	81	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	90	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	106	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	88	%	AsureQuality Method (LC-MS/MS)

R = Recovery outside method limits

Customer Sample Name: OHA_ADJ_GWKAF_1_300920

Lab ID: 20-265678-4

Sample Condition: Acceptable

Sampled Date: 30-Sep-2020

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPoS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
mono-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDODA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFTTrDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	NR	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	94	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	102	%	AsureQuality Method (LC-MS/MS)
M8PFOS	104	%	AsureQuality Method (LC-MS/MS)
M4PFBA	92	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	86	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	89	%	AsureQuality Method (LC-MS/MS)
MPFHpA	93	%	AsureQuality Method (LC-MS/MS)
M8PFOA	102	%	AsureQuality Method (LC-MS/MS)
M9PFNA	107	%	AsureQuality Method (LC-MS/MS)
M6PFDA	127	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	161 (R)	%	AsureQuality Method (LC-MS/MS)
MPFDODA	133	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	0 (R)	%	AsureQuality Method (LC-MS/MS)
MPFOSA	139	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	92	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	132	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
DNEtFOSAA	136	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	135	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	129	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	122	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	87	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	106	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	130	%	AsureQuality Method (LC-MS/MS)

R = Recovery outside method limits

Customer Sample Name: OHA_ADJ_GWKAJ_1_300920 Lab ID: 20-265678-5

Sample Condition: Acceptable Sampled Date: 30-Sep-2020

Test	Result	Unit	Method Reference
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Poly- and Perfluorinated Alkyl Substances (PFAS) in Water

Perfluoroalkylsulfonic acids			
PFPoS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDODA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	NR	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
NMeFOSE-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	109	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	130	%	AsureQuality Method (LC-MS/MS)
M8PFOS	146	%	AsureQuality Method (LC-MS/MS)
M4PFBA	98	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	99	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	104	%	AsureQuality Method (LC-MS/MS)
MPFHpA	110	%	AsureQuality Method (LC-MS/MS)
M8PFOA	125	%	AsureQuality Method (LC-MS/MS)
M9PFNA	133	%	AsureQuality Method (LC-MS/MS)
M6PFDA	157 (R)	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	163 (R)	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	172 (R)	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	0 (R)	%	AsureQuality Method (LC-MS/MS)
MPFOSA	138	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	143	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	158 (R)	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	180 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	167 (R)	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	137	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	115	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	99	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	121	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	141	%	AsureQuality Method (LC-MS/MS)

R = Recovery outside method limits

QC Results

Blank

Relates to sample(s) 20-265678-1, 20-265678-2, 20-265678-3, 20-265678-4, 20-265678-5

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPrS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
Total PFOS (7)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFTTrDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	NR	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	107	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	124	%	AsureQuality Method (LC-MS/MS)
M8PFOS	136	%	AsureQuality Method (LC-MS/MS)
M4PFBA	107	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	105	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	105	%	AsureQuality Method (LC-MS/MS)
MPFHpA	110	%	AsureQuality Method (LC-MS/MS)
M8PFOA	126	%	AsureQuality Method (LC-MS/MS)
M9PFNA	138	%	AsureQuality Method (LC-MS/MS)
M6PFDA	144	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	135	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	118	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	0 (R)	%	AsureQuality Method (LC-MS/MS)
MPFOSA	73	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	74	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
DNMeFOSA	72	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	104	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	121	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	63	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	59	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	105	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	120	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	137	%	AsureQuality Method (LC-MS/MS)

R = Recovery outside method limits

Analysis Summary

Wellington Laboratory

Analysis	Method	Accreditation	Authorised by
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
DX-PFCS01_03-SUITE_B	AsureQuality Method (LC-MS/MS)	IANZ	Amelie Sellier

di-PFHxS (1) = Concentration determined using a branched di-PFHxS isomer standard (399>80 transition)
 mono-PFHxS (1) = Concentration determined using a branched mono-PFHxS isomer standard (399>80 transition)
 L-PFHxS (1) = Concentration determined using the linear PFHxS isomer standard (399>80 transition)
 Total PFHxS (3) = The numerical sum of di-PFHxS (1), mono-PFHxS (1), and L-PFHxS (1)
 di-PFOS (5) = Concentration determined using a branched di-PFOS isomer standard (499>80 transition)
 mono-PFOS (5) = Concentration determined using a branched mono-PFOS isomer standard (499>80 transition)
 L-PFOS (5) = Concentration determined using the linear PFOS isomer standard (499>230 transition)
 Total PFOS (7) = The numerical sum of di-PFOS (5), mono-PFOS (5), and L-PFOS (5)
 Sum PFHxS+PFOS (1) = The numerical sum of Total PFHxS (3) and Total PFOS (7)

For all Totals, where a component is detected below the LOR, the value of zero is used in the calculation of the sum. The result represents the lower-bound concentration present in the sample.

Reported results are corrected for internal standard recovery

Results that are prefixed with '<' indicate the lowest level at which the analyte can be reported, and that in this case the analyte was not observed above this limit.

NR = Not Reportable

Amelie Sellier
 Scientist

Accreditation



Appendix

Analyte LOR Summary

Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - AsureQuality Method (LC-MS/MS)

Analyte	LOR
Perfluoroalkylsulfonic acids	
PFPPrS	0.0010 µg/L
PFBS	0.0010 µg/L
PFPeS	0.0010 µg/L
di-PFHxS (1)	0.0010 µg/L
mono-PFHxS (1)	0.0010 µg/L
L-PFHxS (1)	0.0010 µg/L
Total PFHxS (3)	0.0010 µg/L
PFHpS	0.0010 µg/L
di-PFOS (5)	0.0010 µg/L
mono-PFOS (5)	0.0010 µg/L
L-PFOS (5)	0.0010 µg/L
Total PFOS (7)	0.0010 µg/L
Sum PFHxS+PFOS (1)	0.0010 µg/L
PFNS	NR µg/L
PFDS	NR µg/L
Perfluoroalkylcarboxylic acids	
PFBA	0.0010 µg/L
PFPeA	0.0010 µg/L
PFHxA	0.0010 µg/L
PFHpA	0.0010 µg/L
PFOA	0.0010 µg/L
PFNA	0.0010 µg/L
PFDA	0.0010 µg/L
PFUnDA	NR µg/L
PFDoDA	NR µg/L
PFTTrDA	NR µg/L
PFTeDA	NR µg/L
Perfluorooctanesulfonamides	
PFOSA	0.0010 µg/L
NEtFOSA-M	NR µg/L
NMeFOSA-M	NR µg/L
Perfluorooctanesulfonamidoacetic acids	
NEtFOSAA	0.0010 µg/L
NMeFOSAA	0.0010 µg/L
Perfluorooctanesulfonamidoethanols	
NEtFOSE-M	0.0010 µg/L
NMeFOSE-M	0.0010 µg/L
Telomere Sulfonic acids	
4:2 FTS	NR µg/L
6:2 FTS	0.0010 µg/L
8:2 FTS	0.0010 µg/L

Analyte Definitions

Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - AsureQuality Method (LC-MS/MS)

Analyte	Full Name
Perfluoroalkylsulfonic acids	
PFPPrS	Perfluoro-1-propanesulfonic acid
PFBS	Perfluoro-1-butanesulfonic acid
PFPeS	Perfluoro-1-pentanesulfonic acid
di-PFHxS (1)	Total Perfluorodimethylbutane sulfonic acids
mono-PFHxS (1)	Total Perfluoromethylpentane sulfonic acids
L-PFHxS (1)	Linear Perfluorohexanesulfonic acid
PFHpS	Perfluoro-1-heptanesulfonic acid
di-PFOS (5)	Total Perfluorodimethylhexane sulfonic acids
mono-PFOS (5)	Total Perfluoromethylheptane sulfonic acids
L-PFOS (5)	Linear Perfluorooctanesulfonic acid
PFNS	Perfluoro-1-nonanesulfonic acid
PFDS	Perfluoro-1-decanesulfonic acid
Perfluoroalkylcarboxylic acids	
PFBA	Perfluoro-n-butanoic acid
PFPeA	Perfluoro-n-pentanoic acid
PFHxA	Perfluoro-n-hexanoic acid
PFHpA	Perfluoro-n-heptanoic acid
PFOA	Perfluoro-n-octanoic acid
PFNA	Perfluoro-n-nonanoic acid
PFDA	Perfluoro-n-decanoic acid
PFUnDA	Perfluoro-n-undecanoic acid
PFDODA	Perfluoro-n-dodecanoic acid
PFTTrDA	Perfluoro-n-tridecanoic acid
PFTeDA	Perfluoro-n-tetradecanoic acid
Perfluorooctanesulfonamides	
PFOSA	Perfluoro-1-octanesulfonamide
NEtFOSA-M	N-ethylperfluoro-1-octanesulfonamide
NMeFOSA-M	N-methylperfluoro-1-octanesulfonamide
Perfluorooctanesulfonamidoacetic acids	
NEtFOSAA	N-ethylperfluoro-1-octanesulfonamidoacetic acid
NMeFOSAA	N-methylperfluoro-1-octanesulfonamidoacetic acid
Perfluorooctanesulfonamidoethanols	
NEtFOSE-M	2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol
NMeFOSE-M	2-(N-methylperfluoro-1-octanesulfonamido)-ethanol
Telomere Sulfonic acids	
4:2 FTS	1H,1H,2H,2H-perfluoro-1-hexanesulfonic acid
6:2 FTS	1H,1H,2H,2H-perfluoro-1-octanesulfonic acid
8:2 FTS	1H,1H,2H,2H-perfluoro-1-decanesulfonic acid
Internal Standards	
M3PFBS	Perfluoro-1-[2,3,4-13C3]butanesulfonic acid
M3PFHxS	Perfluoro-1-[1,2,3-13C3]hexanesulfonic acid
M8PFOS	Perfluoro-1-[13C8]octanesulfonic acid
M4PFBA	Perfluoro-n-[1,2,3,4-13C4]butanoic acid
M5PFPeA	Perfluoro-n-[1,2,3,4,5-13C5]pentanoic acid
M5PFHxA	Perfluoro-n-[1,2,3,4,6-13C5]hexanoic acid
MPFHpA	Perfluoro-n-[1,2,3,4-13C4]heptanoic acid
M8PFOA	Perfluoro-n-[13C8]octanoic acid
M9PFNA	Perfluoro-n-[13C9]nonanoic acid
M6PFDA	Perfluoro-n-[1,2,3,4,5,6-13C6]decanoic acid
M7PFUnDA	Perfluoro-n-[1,2,3,4,5,6,7-13C7]undecanoic acid
MPFDODA	Perfluoro-n-[1,2-13C2]dodecanoic acid
MPFTeDA	Perfluoro-n-[1,2-13C2]tetradecanoic acid

Analyte	Full Name
MPFOSA	Perfluoro-1-[13C8]octanesulfonamide
DNEtFOSA	N-ethyl-D5-perfluoro-1-octanesulfonamide
DNMeFOSA	N-methyl-D3-perfluoro-1-octanesulfonamide
DNEtFOSAA	N-ethyl-D5-perfluoro-1-octanesulfonamidoacetic acid
DNMeFOSAA	N-methyl-D3-perfluoro-1-octanesulfonamidoacetic acid
DNEtFOSE	2-(N-ethyl-D5-perfluoro-1-octanesulfonamido)ethan-D4-ol
DNMeFOSE	2-(N-methyl-D3-perfluoro-1-octanesulfonamido)ethan-D4-ol
M4:2FTS	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-hexane sulfonic acid
M6:2FTS	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonic acid
M8:2FTS	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonic acid

LOR = Limit of Reporting

LOD = Limit of Detection

NR = Not Reportable

Certificate of Analysis

Submission Reference: A02744115
Final Report

Nerena Rhodes
Pattle Delamore Partners Limited
P O Box 9528
Auckland 1149
New Zealand

PO Number: OHA_PFAS

Report Issued: 15-Oct-2020

AsureQuality Reference: **20-265680**

Sample(s) Received: 01-Oct-2020 08:00

Testing Period: 01-Oct-2020 to 15-Oct-2020

Results

The tests were performed on the samples as received.

Customer Sample Name: OHA_ADJ_GW53_4_300920 **Lab ID:** 20-265680-1

Sample Condition: Acceptable

Sampled Date: 30-Sep-2020

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPoS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFTTrDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	NR	µg/L	AsureQuality Method (LC-MS/MS)

AsureQuality has used reasonable skill, care, and effort to provide an accurate analysis of the sample(s) which form(s) the subject of this report. However, the accuracy of this analysis is reliant on, and subject to, the sample(s) provided by you and your responsibility as to transportation of the sample(s). AsureQuality's standard terms of business apply to the analysis set out in this report.

Test	Result	Unit	Method Reference
Perfluorooctanesulfonamides			
PFOSA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	109	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	110	%	AsureQuality Method (LC-MS/MS)
M8PFOS	115	%	AsureQuality Method (LC-MS/MS)
M4PFBA	100	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	102	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	106	%	AsureQuality Method (LC-MS/MS)
MPPHpA	100	%	AsureQuality Method (LC-MS/MS)
M8PFOA	107	%	AsureQuality Method (LC-MS/MS)
M9PFNA	102	%	AsureQuality Method (LC-MS/MS)
M6PFDA	111	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	96	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	60	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	172 (R)	%	AsureQuality Method (LC-MS/MS)
MPFOSA	73	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	38	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	42	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	55	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	70	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	35	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	42	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	108	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	116	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	109	%	AsureQuality Method (LC-MS/MS)

R = Recovery outside method limits

QC Results

Blank

Relates to sample(s) 20-265680-1

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPtS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDODA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFTTrDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	96	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	71	%	AsureQuality Method (LC-MS/MS)
M8PFOS	45	%	AsureQuality Method (LC-MS/MS)
M4PFBA	109	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	101	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	105	%	AsureQuality Method (LC-MS/MS)
MPFHpA	90	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
M8PFOA	79	%	AsureQuality Method (LC-MS/MS)
M9PFNA	61	%	AsureQuality Method (LC-MS/MS)
M6PFDA	50	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	36	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	36	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	0 (R)	%	AsureQuality Method (LC-MS/MS)
MPFOA	84	%	AsureQuality Method (LC-MS/MS)
DNEtFOA	54	%	AsureQuality Method (LC-MS/MS)
DNMeFOA	61	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	47	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	47	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	66	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	81	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	100	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	89	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	63	%	AsureQuality Method (LC-MS/MS)

R = Recovery outside method limits

Analysis Summary

Wellington Laboratory

Analysis	Method	Accreditation	Authorised by
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
DX-PFCS01, 03-SUITE_B	AsureQuality Method (LC-MS/MS)	IANZ	Amelie Sellier

di-PFHxS (1) = Concentration determined using a branched di-PFHxS isomer standard (399>80 transition)
 mono-PFHxS (1) = Concentration determined using a branched mono-PFHxS isomer standard (399>80 transition)
 L-PFHxS (1) = Concentration determined using the linear PFHxS isomer standard (399>80 transition)
 Total PFHxS (3) = The numerical sum of di-PFHxS (1), mono-PFHxS (1), and L-PFHxS (1)
 di-PFOS (5) = Concentration determined using a branched di-PFOS isomer standard (499>80 transition)
 mono-PFOS (5) = Concentration determined using a branched mono-PFOS isomer standard (499>80 transition)
 L-PFOS (5) = Concentration determined using the linear PFOS isomer standard (499>230 transition)
 Total PFOS (7) = The numerical sum of di-PFOS (5), mono-PFOS (5), and L-PFOS (5)
 Sum PFHxS+PFOS (1) = The numerical sum of Total PFHxS (3) and Total PFOS (7)

For all Totals, where a component is detected below the LOR, the value of zero is used in the calculation of the sum. The result represents the lower-bound concentration present in the sample.

Reported results are corrected for internal standard recovery

Results that are prefixed with '<' indicate the lowest level at which the analyte can be reported, and that in this case the analyte was not observed above this limit.

NR = Not Reportable



Amelie Sellier
 Scientist

Accreditation



Appendix

Analyte LOR Summary

Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - AsureQuality Method (LC-MS/MS)

Analyte	LOR
Perfluoroalkylsulfonic acids	
PFPPrS	0.0010 µg/L
PFBS	0.0010 µg/L
PFPeS	0.0010 µg/L
di-PFHxS (1)	0.0010 µg/L
mono-PFHxS (1)	0.0010 µg/L
L-PFHxS (1)	0.0010 µg/L
Total PFHxS (3)	0.0010 µg/L
PFHpS	0.0010 µg/L
di-PFOS (5)	0.0010 µg/L
mono-PFOS (5)	0.0010 µg/L
L-PFOS (5)	0.0010 µg/L
Total PFOS (7)	0.0010 µg/L
Sum PFHxS+PFOS (1)	0.0010 µg/L
PFNS	0.0010 µg/L
PFDS	NR µg/L
Perfluoroalkylcarboxylic acids	
PFBA	0.0010 µg/L
PFPeA	0.0010 µg/L
PFHxA	0.0010 µg/L
PFHpA	0.0010 µg/L
PFOA	0.0010 µg/L
PFNA	0.0010 µg/L
PFDA	0.0010 µg/L
PFUnDA	0.0010 µg/L
PFDoDA	0.0010 µg/L
PFTTrDA	NR µg/L
PFTeDA	NR µg/L
Perfluorooctanesulfonamides	
PFOSA	0.0010 µg/L
NEtFOSA-M	0.0010 µg/L
NMeFOSA-M	0.0010 µg/L
Perfluorooctanesulfonamidoacetic acids	
NEtFOSAA	0.0010 µg/L
NMeFOSAA	0.0010 µg/L
Perfluorooctanesulfonamidoethanols	
NEtFOSE-M	0.0010 µg/L
NMeFOSE-M	0.0010 µg/L
Telomere Sulfonic acids	
4:2 FTS	0.0010 µg/L
6:2 FTS	0.0010 µg/L
8:2 FTS	0.0010 µg/L

Analyte Definitions

Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - AsureQuality Method (LC-MS/MS)

Analyte	Full Name
Perfluoroalkylsulfonic acids	
PFPPrS	Perfluoro-1-propanesulfonic acid
PFBS	Perfluoro-1-butanesulfonic acid
PFPeS	Perfluoro-1-pentanesulfonic acid
di-PFHxS (1)	Total Perfluorodimethylbutane sulfonic acids
mono-PFHxS (1)	Total Perfluoromethylpentane sulfonic acids
L-PFHxS (1)	Linear Perfluorohexanesulfonic acid
PFHpS	Perfluoro-1-heptanesulfonic acid
di-PFOS (5)	Total Perfluorodimethylhexane sulfonic acids
mono-PFOS (5)	Total Perfluoromethylheptane sulfonic acids
L-PFOS (5)	Linear Perfluorooctanesulfonic acid
PFNS	Perfluoro-1-nonanesulfonic acid
PFDS	Perfluoro-1-decanesulfonic acid
Perfluoroalkylcarboxylic acids	
PFBA	Perfluoro-n-butanoic acid
PFPeA	Perfluoro-n-pentanoic acid
PFHxA	Perfluoro-n-hexanoic acid
PFHpA	Perfluoro-n-heptanoic acid
PFOA	Perfluoro-n-octanoic acid
PFNA	Perfluoro-n-nonanoic acid
PFDA	Perfluoro-n-decanoic acid
PFUnDA	Perfluoro-n-undecanoic acid
PFDODA	Perfluoro-n-dodecanoic acid
PFTTrDA	Perfluoro-n-tridecanoic acid
PFTeDA	Perfluoro-n-tetradecanoic acid
Perfluorooctanesulfonamides	
PFOSA	Perfluoro-1-octanesulfonamide
NEtFOSA-M	N-ethylperfluoro-1-octanesulfonamide
NMeFOSA-M	N-methylperfluoro-1-octanesulfonamide
Perfluorooctanesulfonamidoacetic acids	
NEtFOSAA	N-ethylperfluoro-1-octanesulfonamidoacetic acid
NMeFOSAA	N-methylperfluoro-1-octanesulfonamidoacetic acid
Perfluorooctanesulfonamidoethanols	
NEtFOSE-M	2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol
NMeFOSE-M	2-(N-methylperfluoro-1-octanesulfonamido)-ethanol
Telomere Sulfonic acids	
4:2 FTS	1H,1H,2H,2H-perfluoro-1-hexanesulfonic acid
6:2 FTS	1H,1H,2H,2H-perfluoro-1-octanesulfonic acid
8:2 FTS	1H,1H,2H,2H-perfluoro-1-decanesulfonic acid
Internal Standards	
M3PFBS	Perfluoro-1-[2,3,4-13C3]butanesulfonic acid
M3PFHxS	Perfluoro-1-[1,2,3-13C3]hexanesulfonic acid
M8PFOS	Perfluoro-1-[13C8]octanesulfonic acid
M4PFBA	Perfluoro-n-[1,2,3,4-13C4]butanoic acid
M5PFPeA	Perfluoro-n-[1,2,3,4,5-13C5]pentanoic acid
M5PFHxA	Perfluoro-n-[1,2,3,4,6-13C5]hexanoic acid
MPFHpA	Perfluoro-n-[1,2,3,4-13C4]heptanoic acid
M8PFOA	Perfluoro-n-[13C8]octanoic acid
M9PFNA	Perfluoro-n-[13C9]nonanoic acid
M6PFDA	Perfluoro-n-[1,2,3,4,5,6-13C6]decanoic acid
M7PFUnDA	Perfluoro-n-[1,2,3,4,5,6,7-13C7]undecanoic acid
MPFDODA	Perfluoro-n-[1,2-13C2]dodecanoic acid
MPFTeDA	Perfluoro-n-[1,2-13C2]tetradecanoic acid

Analyte	Full Name
MPFOSA	Perfluoro-1-[13C8]octanesulfonamide
DNEtFOSA	N-ethyl-D5-perfluoro-1-octanesulfonamide
DNMeFOSA	N-methyl-D3-perfluoro-1-octanesulfonamide
DNEtFOSAA	N-ethyl-D5-perfluoro-1-octanesulfonamidoacetic acid
DNMeFOSAA	N-methyl-D3-perfluoro-1-octanesulfonamidoacetic acid
DNEtFOSE	2-(N-ethyl-D5-perfluoro-1-octanesulfonamido)ethan-D4-ol
DNMeFOSE	2-(N-methyl-D3-perfluoro-1-octanesulfonamido)ethan-D4-ol
M4:2FTS	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-hexane sulfonic acid
M6:2FTS	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonic acid
M8:2FTS	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonic acid

LOR = Limit of Reporting

LOD = Limit of Detection

NR = Not Reportable

Certificate of Analysis

Submission Reference: A02744115
Final Report

Nerena Rhodes
Pattle Delamore Partners Limited
P O Box 9528
Auckland 1149
New Zealand

PO Number: OHA_PFAS

Report Issued: 15-Oct-2020

AsureQuality Reference: **20-266545**

Sample(s) Received: 02-Oct-2020 07:50

Testing Period: 02-Oct-2020 to 15-Oct-2020

Results

The tests were performed on the samples as received.

Customer Sample Name: OHA_ADJ_GW107_1_011020

Lab ID: 20-266545-1

Sample Condition: Acceptable

Sampled Date: 01-Oct-2020

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPoS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFTTrDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	NR	µg/L	AsureQuality Method (LC-MS/MS)

AsureQuality has used reasonable skill, care, and effort to provide an accurate analysis of the sample(s) which form(s) the subject of this report. However, the accuracy of this analysis is reliant on, and subject to, the sample(s) provided by you and your responsibility as to transportation of the sample(s). AsureQuality's standard terms of business apply to the analysis set out in this report.

Test	Result	Unit	Method Reference
Perfluorooctanesulfonamides			
PFOSA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	NR	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	NR	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	117	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	148	%	AsureQuality Method (LC-MS/MS)
M8PFOS	198 (R)	%	AsureQuality Method (LC-MS/MS)
M4PFBA	86	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	96	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	100	%	AsureQuality Method (LC-MS/MS)
MPFHpA	105	%	AsureQuality Method (LC-MS/MS)
M8PFOA	131	%	AsureQuality Method (LC-MS/MS)
M9PFNA	143	%	AsureQuality Method (LC-MS/MS)
M6PFDA	202 (R)	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	278 (R)	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	385 (R)	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	0 (R)	%	AsureQuality Method (LC-MS/MS)
MPFOSA	159 (R)	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	124	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	150	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	217 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	202 (R)	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	152 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	125	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	136	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	143	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	162 (R)	%	AsureQuality Method (LC-MS/MS)

R = Recovery outside method limits

Customer Sample Name: OHA_ADJ_GW108_1_011020

Lab ID: 20-266545-2

Sample Condition: Acceptable

Sampled Date: 01-Oct-2020

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPtS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
L-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFTTrDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	NR	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	NR	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	NR	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	98	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	135	%	AsureQuality Method (LC-MS/MS)
M8PFOS	186 (R)	%	AsureQuality Method (LC-MS/MS)
M4PFBA	61	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	79	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	92	%	AsureQuality Method (LC-MS/MS)
MPFHpA	97	%	AsureQuality Method (LC-MS/MS)
M8PFOA	117	%	AsureQuality Method (LC-MS/MS)
M9PFNA	134	%	AsureQuality Method (LC-MS/MS)
M6PFDA	174 (R)	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	263 (R)	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	437 (R)	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
MPFTeDA	0 (R)	%	AsureQuality Method (LC-MS/MS)
MPFOSA	178 (R)	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	366 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	344 (R)	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	216 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	206 (R)	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	283 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	200 (R)	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	119	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	119	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	145	%	AsureQuality Method (LC-MS/MS)

R = Recovery outside method limits

Customer Sample Name: OHA_ADJ_GW109_1_011020 Lab ID: 20-266545-3

Sample Condition: Acceptable Sampled Date: 01-Oct-2020

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPrS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFTTrDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	NR	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	NR	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	102	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	126	%	AsureQuality Method (LC-MS/MS)
M8PFOS	154 (R)	%	AsureQuality Method (LC-MS/MS)
M4PFBA	86	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	89	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	93	%	AsureQuality Method (LC-MS/MS)
MPFHpA	96	%	AsureQuality Method (LC-MS/MS)
M8PFOA	114	%	AsureQuality Method (LC-MS/MS)
M9PFNA	126	%	AsureQuality Method (LC-MS/MS)
M6PFDA	161 (R)	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	213 (R)	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	231 (R)	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	0 (R)	%	AsureQuality Method (LC-MS/MS)
MPFOSA	124	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	103	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	116	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	172 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	166 (R)	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	93	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	81	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	97	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	110	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	141	%	AsureQuality Method (LC-MS/MS)

R = Recovery outside method limits

Customer Sample Name: OHA_ADJ_GWKAH_1_011020

Lab ID: 20-266545-4

Sample Condition: Acceptable

Sampled Date: 01-Oct-2020

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPoS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPoS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
mono-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFDODA	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFTTrDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	NR	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	NR	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	NR	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	106	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	139	%	AsureQuality Method (LC-MS/MS)
M8PFOS	182 (R)	%	AsureQuality Method (LC-MS/MS)
M4PFBA	87	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	88	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	98	%	AsureQuality Method (LC-MS/MS)
MPFHpA	103	%	AsureQuality Method (LC-MS/MS)
M8PFOA	124	%	AsureQuality Method (LC-MS/MS)
M9PFNA	143	%	AsureQuality Method (LC-MS/MS)
M6PFDA	184 (R)	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	247 (R)	%	AsureQuality Method (LC-MS/MS)
MPFDODA	356 (R)	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	0 (R)	%	AsureQuality Method (LC-MS/MS)
MPFOSA	163 (R)	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	258 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	250 (R)	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
DNEtFOSAA	223 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	193 (R)	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	219 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	180 (R)	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	85	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	111	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	140	%	AsureQuality Method (LC-MS/MS)

R = Recovery outside method limits

Customer Sample Name: OHA_ADJ_GWKAI_1_011020

Lab ID: 20-266545-5

Sample Condition: Acceptable

Sampled Date: 01-Oct-2020

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPoS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFDODA	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	NR	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	NR	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
NMeFOSE-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	97	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	118	%	AsureQuality Method (LC-MS/MS)
M8PFOS	137	%	AsureQuality Method (LC-MS/MS)
M4PFBA	93	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	93	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	99	%	AsureQuality Method (LC-MS/MS)
MPFHpA	97	%	AsureQuality Method (LC-MS/MS)
M8PFOA	112	%	AsureQuality Method (LC-MS/MS)
M9PFNA	126	%	AsureQuality Method (LC-MS/MS)
M6PFDA	163 (R)	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	235 (R)	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	274 (R)	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	0 (R)	%	AsureQuality Method (LC-MS/MS)
MPFOSA	175 (R)	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	290 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	282 (R)	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	198 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	175 (R)	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	242 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	190 (R)	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	84	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	100	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	132	%	AsureQuality Method (LC-MS/MS)

R = Recovery outside method limits

Customer Sample Name: Duplicate of 20-266545-5A **Lab ID:** 20-266545-6

Sample Description: OHA_ADJ_GWKAL_1_011020 Duplicate

Sample Condition: Acceptable

Sampled Date: 01-Oct-2020

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPrS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
PFNS	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFTTrDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	NR	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	NR	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	NR	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	97	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	125	%	AsureQuality Method (LC-MS/MS)
M8PFOS	159 (R)	%	AsureQuality Method (LC-MS/MS)
M4PFBA	83	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	85	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	94	%	AsureQuality Method (LC-MS/MS)
MPFHpA	95	%	AsureQuality Method (LC-MS/MS)
M8PFOA	108	%	AsureQuality Method (LC-MS/MS)
M9PFNA	127	%	AsureQuality Method (LC-MS/MS)
M6PFDA	173 (R)	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	229 (R)	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	347 (R)	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	0 (R)	%	AsureQuality Method (LC-MS/MS)
MPFOSA	172 (R)	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	335 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	326 (R)	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	213 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	178 (R)	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	260 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	180 (R)	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
M4:2FTS	79	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	96	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	124	%	AsureQuality Method (LC-MS/MS)

R = Recovery outside method limits

QC Results

Blank

Relates to sample(s) 20-266545-1, 20-266545-2, 20-266545-3, 20-266545-4, 20-266545-5, 20-266545-6

Test	Result	Unit	Method Reference
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Poly- and Perfluorinated Alkyl Substances (PFAS) in Water

Perfluoroalkylsulfonic acids

PFPoS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	NR	µg/L	AsureQuality Method (LC-MS/MS)

Perfluoroalkylcarboxylic acids

PFBA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFTTrDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	NR	µg/L	AsureQuality Method (LC-MS/MS)

Perfluorooctanesulfonamides

PFOSA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	NR	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	NR	µg/L	AsureQuality Method (LC-MS/MS)

Perfluorooctanesulfonamidoacetic acids

NEtFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)

Perfluorooctanesulfonamidoethanols

NEtFOSE-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
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Test	Result	Unit	Method Reference
NMeFOSE-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	107	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	124	%	AsureQuality Method (LC-MS/MS)
M8PFOS	136	%	AsureQuality Method (LC-MS/MS)
M4PFBA	107	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	105	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	105	%	AsureQuality Method (LC-MS/MS)
MPFHpA	110	%	AsureQuality Method (LC-MS/MS)
M8PFOA	126	%	AsureQuality Method (LC-MS/MS)
M9PFNA	138	%	AsureQuality Method (LC-MS/MS)
M6PFDA	144	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	135	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	118	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	0 (R)	%	AsureQuality Method (LC-MS/MS)
MPFOSA	73	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	74	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	72	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	104	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	121	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	63	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	59	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	105	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	120	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	137	%	AsureQuality Method (LC-MS/MS)

R = Recovery outside method limits

Analysis Summary

Wellington Laboratory

Analysis	Method	Accreditation	Authorised by
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
DX-PFCS01, 03-SUITE_B	AsureQuality Method (LC-MS/MS)	IANZ	Amelie Sellier

di-PFHxS (1) = Concentration determined using a branched di-PFHxS isomer standard (399>80 transition)

mono-PFHxS (1) = Concentration determined using a branched mono-PFHxS isomer standard (399>80 transition)

L-PFHxS (1) = Concentration determined using the linear PFHxS isomer standard (399>80 transition)

Total PFHxS (3) = The numerical sum of di-PFHxS (1), mono-PFHxS (1), and L-PFHxS (1)

di-PFOS (5) = Concentration determined using a branched di-PFOS isomer standard (499>80 transition)

mono-PFOS (5) = Concentration determined using a branched mono-PFOS isomer standard (499>80 transition)

L-PFOS (5) = Concentration determined using the linear PFOS isomer standard (499>230 transition)

Total PFOS (7) = The numerical sum of di-PFOS (5), mono-PFOS (5), and L-PFOS (5)

Sum PFHxS+PFOS (1) = The numerical sum of Total PFHxS (3) and Total PFOS (7)

For all Totals, where a component is detected below the LOR, the value of zero is used in the calculation of the sum. The result represents the lower-bound concentration present in the sample.

Reported results are corrected for internal standard recovery

Results that are prefixed with '<' indicate the lowest level at which the analyte can be reported, and that in this case the analyte was not observed above this limit.

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NR = Not Reportable



Amelie Sellier

Scientist

Accreditation



Appendix

Analyte LOR Summary

Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - AsureQuality Method (LC-MS/MS)

Analyte	LOR
Perfluoroalkylsulfonic acids	
PFPPrS	0.0010 µg/L
PFBS	0.0010 µg/L
PFPeS	0.0010 µg/L
di-PFHxS (1)	0.0010 µg/L
mono-PFHxS (1)	0.0010 µg/L
L-PFHxS (1)	0.0010 µg/L
Total PFHxS (3)	0.0010 µg/L
PFHpS	0.0010 µg/L
di-PFOS (5)	0.0010 µg/L
mono-PFOS (5)	0.0010 µg/L
L-PFOS (5)	0.0010 µg/L
Total PFOS (7)	0.0010 µg/L
Sum PFHxS+PFOS (1)	0.0010 µg/L
PFNS	NR µg/L
PFDS	NR µg/L
Perfluoroalkylcarboxylic acids	
PFBA	0.0010 µg/L
PFPeA	0.0010 µg/L
PFHxA	0.0010 µg/L
PFHpA	0.0010 µg/L
PFOA	0.0010 µg/L
PFNA	0.0010 µg/L
PFDA	NR µg/L
PFUnDA	NR µg/L
PFDoDA	NR µg/L
PFTrDA	NR µg/L
PFTeDA	NR µg/L
Perfluorooctanesulfonamides	
PFOSA	0.0010 µg/L
NEtFOSA-M	NR µg/L
NMeFOSA-M	NR µg/L
Perfluorooctanesulfonamidoacetic acids	
NEtFOSAA	NR µg/L
NMeFOSAA	NR µg/L
Perfluorooctanesulfonamidoethanols	
NEtFOSE-M	0.0010 µg/L
NMeFOSE-M	0.0010 µg/L
Telomere Sulfonic acids	
4:2 FTS	0.0010 µg/L
6:2 FTS	0.0010 µg/L
8:2 FTS	0.0010 µg/L

Analyte Definitions

Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - AsureQuality Method (LC-MS/MS)

Analyte	Full Name
Perfluoroalkylsulfonic acids	
PFPPrS	Perfluoro-1-propanesulfonic acid
PFBS	Perfluoro-1-butanesulfonic acid
PFPeS	Perfluoro-1-pentanesulfonic acid
di-PFHxS (1)	Total Perfluorodimethylbutane sulfonic acids
mono-PFHxS (1)	Total Perfluoromethylpentane sulfonic acids
L-PFHxS (1)	Linear Perfluorohexanesulfonic acid
PFHpS	Perfluoro-1-heptanesulfonic acid
di-PFOS (5)	Total Perfluorodimethylhexane sulfonic acids
mono-PFOS (5)	Total Perfluoromethylheptane sulfonic acids
L-PFOS (5)	Linear Perfluorooctanesulfonic acid
PFNS	Perfluoro-1-nonanesulfonic acid
PFDS	Perfluoro-1-decanesulfonic acid
Perfluoroalkylcarboxylic acids	
PFBA	Perfluoro-n-butanoic acid
PFPeA	Perfluoro-n-pentanoic acid
PFHxA	Perfluoro-n-hexanoic acid
PFHpA	Perfluoro-n-heptanoic acid
PFOA	Perfluoro-n-octanoic acid
PFNA	Perfluoro-n-nonanoic acid
PFDA	Perfluoro-n-decanoic acid
PFUnDA	Perfluoro-n-undecanoic acid
PFDODA	Perfluoro-n-dodecanoic acid
PFTTrDA	Perfluoro-n-tridecanoic acid
PFTeDA	Perfluoro-n-tetradecanoic acid
Perfluorooctanesulfonamides	
PFOSA	Perfluoro-1-octanesulfonamide
NEtFOSA-M	N-ethylperfluoro-1-octanesulfonamide
NMeFOSA-M	N-methylperfluoro-1-octanesulfonamide
Perfluorooctanesulfonamidoacetic acids	
NEtFOSAA	N-ethylperfluoro-1-octanesulfonamidoacetic acid
NMeFOSAA	N-methylperfluoro-1-octanesulfonamidoacetic acid
Perfluorooctanesulfonamidoethanols	
NEtFOSE-M	2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol
NMeFOSE-M	2-(N-methylperfluoro-1-octanesulfonamido)-ethanol
Telomere Sulfonic acids	
4:2 FTS	1H,1H,2H,2H-perfluoro-1-hexanesulfonic acid
6:2 FTS	1H,1H,2H,2H-perfluoro-1-octanesulfonic acid
8:2 FTS	1H,1H,2H,2H-perfluoro-1-decanesulfonic acid
Internal Standards	
M3PFBS	Perfluoro-1-[2,3,4-13C3]butanesulfonic acid
M3PFHxS	Perfluoro-1-[1,2,3-13C3]hexanesulfonic acid
M8PFOS	Perfluoro-1-[13C8]octanesulfonic acid
M4PFBA	Perfluoro-n-[1,2,3,4-13C4]butanoic acid
M5PFPeA	Perfluoro-n-[1,2,3,4,5-13C5]pentanoic acid
M5PFHxA	Perfluoro-n-[1,2,3,4,6-13C5]hexanoic acid
MPFHpA	Perfluoro-n-[1,2,3,4-13C4]heptanoic acid
M8PFOA	Perfluoro-n-[13C8]octanoic acid
M9PFNA	Perfluoro-n-[13C9]nonanoic acid
M6PFDA	Perfluoro-n-[1,2,3,4,5,6-13C6]decanoic acid
M7PFUnDA	Perfluoro-n-[1,2,3,4,5,6,7-13C7]undecanoic acid
MPFDODA	Perfluoro-n-[1,2-13C2]dodecanoic acid
MPFTeDA	Perfluoro-n-[1,2-13C2]tetradecanoic acid

Analyte	Full Name
MPFOSA	Perfluoro-1-[13C8]octanesulfonamide
DNEtFOSA	N-ethyl-D5-perfluoro-1-octanesulfonamide
DNMeFOSA	N-methyl-D3-perfluoro-1-octanesulfonamide
DNEtFOSAA	N-ethyl-D5-perfluoro-1-octanesulfonamidoacetic acid
DNMeFOSAA	N-methyl-D3-perfluoro-1-octanesulfonamidoacetic acid
DNEtFOSE	2-(N-ethyl-D5-perfluoro-1-octanesulfonamido)ethan-D4-ol
DNMeFOSE	2-(N-methyl-D3-perfluoro-1-octanesulfonamido)ethan-D4-ol
M4:2FTS	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-hexane sulfonic acid
M6:2FTS	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonic acid
M8:2FTS	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonic acid

LOR = Limit of Reporting

LOD = Limit of Detection

NR = Not Reportable

Certificate of Analysis

Submission Reference: A02744114
Final Report

Nerena Rhodes
Pattle Delamore Partners Limited
P O Box 9528
Auckland 1149
New Zealand

PO Number: OHA_PFAS

Report Issued: 14-Oct-2020

AsureQuality Reference: **20-268692**

Sample(s) Received: 05-Oct-2020 07:50

Testing Period: 05-Oct-2020 to 14-Oct-2020

Results

The tests were performed on the samples as received.

Customer Sample Name: OHA_SHW_SW4_2_021020 **Lab ID:** 20-268692-1

Sample Condition: Acceptable

Sampled Date: 02-Oct-2020

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPoS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	0.0095	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFTTrDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)

AsureQuality has used reasonable skill, care, and effort to provide an accurate analysis of the sample(s) which form(s) the subject of this report. However, the accuracy of this analysis is reliant on, and subject to, the sample(s) provided by you and your responsibility as to transportation of the sample(s). AsureQuality's standard terms of business apply to the analysis set out in this report.

Test	Result	Unit	Method Reference
Perfluorooctanesulfonamides			
PFOSA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	NR	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	NR	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	NR	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	113	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	135	%	AsureQuality Method (LC-MS/MS)
M8PFOS	138	%	AsureQuality Method (LC-MS/MS)
M4PFBA	64	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	86	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	102	%	AsureQuality Method (LC-MS/MS)
MPFHpA	107	%	AsureQuality Method (LC-MS/MS)
M8PFOA	120	%	AsureQuality Method (LC-MS/MS)
M9PFNA	126	%	AsureQuality Method (LC-MS/MS)
M6PFDA	117	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	96	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	111	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	112	%	AsureQuality Method (LC-MS/MS)
MPFOSA	92	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	121	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	104	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	141	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	123	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	87	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	68	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	244 (R)	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	167 (R)	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	110	%	AsureQuality Method (LC-MS/MS)

R = Recovery outside method limits

Customer Sample Name: OHA_DPC_SW82_1_021020

Lab ID: 20-268692-2

Sample Condition: Acceptable

Sampled Date: 02-Oct-2020

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPoS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
L-PFHxS (1)	0.0030	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	0.0030	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	0.0017	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	0.0022	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	0.0039	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	0.0069	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	0.013	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	0.013	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	0.011	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	0.0048	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	0.0020	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFTTrDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	NR	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	NR	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	NR	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	0.018	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	111	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	128	%	AsureQuality Method (LC-MS/MS)
M8PFOS	136	%	AsureQuality Method (LC-MS/MS)
M4PFBA	64	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	88	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	96	%	AsureQuality Method (LC-MS/MS)
MPFHpA	106	%	AsureQuality Method (LC-MS/MS)
M8PFOA	121	%	AsureQuality Method (LC-MS/MS)
M9PFNA	127	%	AsureQuality Method (LC-MS/MS)
M6PFDA	118	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	93	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	114	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
MPFTeDA	167 (R)	%	AsureQuality Method (LC-MS/MS)
MPFOSA	106	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	136	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	123	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	157 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	122	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	96	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	70	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	252 (R)	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	158 (R)	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	100	%	AsureQuality Method (LC-MS/MS)

R = Recovery outside method limits

Customer Sample Name: OHA_MAK_SW83_1_021020

Lab ID: 20-268692-3

Sample Condition: Acceptable

Sampled Date: 02-Oct-2020

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPrS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	0.0092	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	0.0016	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFTTrDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	NR	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	NR	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	NR	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	NR	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	106	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	124	%	AsureQuality Method (LC-MS/MS)
M8PFOS	140	%	AsureQuality Method (LC-MS/MS)
M4PFBA	55	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	79	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	92	%	AsureQuality Method (LC-MS/MS)
MPFHpA	100	%	AsureQuality Method (LC-MS/MS)
M8PFOA	115	%	AsureQuality Method (LC-MS/MS)
M9PFNA	120	%	AsureQuality Method (LC-MS/MS)
M6PFDA	125	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	141	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	190 (R)	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	235 (R)	%	AsureQuality Method (LC-MS/MS)
MPFOSA	101	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	207 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	176 (R)	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	150	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	124	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	161 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	122	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	254 (R)	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	164 (R)	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	133	%	AsureQuality Method (LC-MS/MS)

R = Recovery outside method limits

Customer Sample Name: OHA_ADJ_SWKAL_1_021020

Lab ID: 20-268692-4

Sample Condition: Acceptable

Sampled Date: 02-Oct-2020

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPoS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	0.0030	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	0.0030	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
mono-PFOS (5)	0.0017	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	0.0023	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	0.0040	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	0.0070	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	0.013	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	0.013	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	0.011	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	0.0042	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	0.0020	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDODA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFTTrDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	NR	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	NR	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	NR	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	0.023	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	114	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	130	%	AsureQuality Method (LC-MS/MS)
M8PFOS	151 (R)	%	AsureQuality Method (LC-MS/MS)
M4PFBA	61	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	87	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	99	%	AsureQuality Method (LC-MS/MS)
MPFHpA	105	%	AsureQuality Method (LC-MS/MS)
M8PFOA	117	%	AsureQuality Method (LC-MS/MS)
M9PFNA	129	%	AsureQuality Method (LC-MS/MS)
M6PFDA	139	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	119	%	AsureQuality Method (LC-MS/MS)
MPFDODA	156 (R)	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	198 (R)	%	AsureQuality Method (LC-MS/MS)
MPFOSA	98	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	139	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	118	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
DNEtFOSAA	166 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	143	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	109	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	84	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	247 (R)	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	174 (R)	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	151 (R)	%	AsureQuality Method (LC-MS/MS)

R = Recovery outside method limits

Customer Sample Name: OHA_ADJ_SWKAM_1_021020 Lab ID: 20-268692-5

Sample Condition: Acceptable Sampled Date: 02-Oct-2020

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPoS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDODA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFTTrDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	NR	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	NR	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
NMeFOSE-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	102	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	105	%	AsureQuality Method (LC-MS/MS)
M8PFOS	109	%	AsureQuality Method (LC-MS/MS)
M4PFBA	98	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	97	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	102	%	AsureQuality Method (LC-MS/MS)
MPFHpA	98	%	AsureQuality Method (LC-MS/MS)
M8PFOA	107	%	AsureQuality Method (LC-MS/MS)
M9PFNA	104	%	AsureQuality Method (LC-MS/MS)
M6PFDA	122	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	131	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	143	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	108	%	AsureQuality Method (LC-MS/MS)
MPFOSA	110	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	108	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	110	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	129	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	118	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	114	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	101	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	95	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	101	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	123	%	AsureQuality Method (LC-MS/MS)

QC Results

Blank

Relates to sample(s) 20-268692-1, 20-268692-2, 20-268692-3, 20-268692-4, 20-268692-5

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPrS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
Sum PFHxS+PFOS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFTTrDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	NR	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	NR	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	102	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	104	%	AsureQuality Method (LC-MS/MS)
M8PFOS	117	%	AsureQuality Method (LC-MS/MS)
M4PFBA	101	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	98	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	102	%	AsureQuality Method (LC-MS/MS)
MPFHpA	94	%	AsureQuality Method (LC-MS/MS)
M8PFOA	98	%	AsureQuality Method (LC-MS/MS)
M9PFNA	102	%	AsureQuality Method (LC-MS/MS)
M6PFDA	105	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	101	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	88	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	107	%	AsureQuality Method (LC-MS/MS)
MPFOSA	92	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	83	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	89	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
DNEtFOSAA	88	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	91	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	86	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	94	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	101	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	99	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	102	%	AsureQuality Method (LC-MS/MS)

Analysis Summary

Wellington Laboratory

Analysis	Method	Accreditation	Authorised by
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
DX-PFCS01, 03-SUITE_B	AsureQuality Method (LC-MS/MS)	IANZ	Amelie Sellier

di-PFHxS (1) = Concentration determined using a branched di-PFHxS isomer standard (399>80 transition)

mono-PFHxS (1) = Concentration determined using a branched mono-PFHxS isomer standard (399>80 transition)

L-PFHxS (1) = Concentration determined using the linear PFHxS isomer standard (399>80 transition)

Total PFHxS (3) = The numerical sum of di-PFHxS (1), mono-PFHxS (1), and L-PFHxS (1)

di-PFOS (5) = Concentration determined using a branched di-PFOS isomer standard (499>80 transition)

mono-PFOS (5) = Concentration determined using a branched mono-PFOS isomer standard (499>80 transition)

L-PFOS (5) = Concentration determined using the linear PFOS isomer standard (499>230 transition)

Total PFOS (7) = The numerical sum of di-PFOS (5), mono-PFOS (5), and L-PFOS (5)

Sum PFHxS+PFOS (1) = The numerical sum of Total PFHxS (3) and Total PFOS (7)

For all Totals, where a component is detected below the LOR, the value of zero is used in the calculation of the sum. The result represents the lower-bound concentration present in the sample.

Reported results are corrected for internal standard recovery

Results that are prefixed with '<' indicate the lowest level at which the analyte can be reported, and that in this case the analyte was not observed above this limit.

NR = Not Reportable

Amelie Sellier

Scientist

Accreditation



Appendix

Analyte LOR Summary

Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - AsureQuality Method (LC-MS/MS)

Analyte	LOR
Perfluoroalkylsulfonic acids	
PFPPrS	0.0010 µg/L
PFBS	0.0010 µg/L
PFPeS	0.0010 µg/L
di-PFHxS (1)	0.0010 µg/L
mono-PFHxS (1)	0.0010 µg/L
L-PFHxS (1)	0.0010 µg/L
Total PFHxS (3)	0.0010 µg/L
PFHpS	0.0010 µg/L
di-PFOS (5)	0.0010 µg/L
mono-PFOS (5)	0.0010 µg/L
L-PFOS (5)	0.0010 µg/L
Total PFOS (7)	0.0010 µg/L
Sum PFHxS+PFOS (1)	0.0010 µg/L
PFNS	0.0010 µg/L
PFDS	NR µg/L
Perfluoroalkylcarboxylic acids	
PFBA	0.0010 µg/L
PFPeA	0.0010 µg/L
PFHxA	0.0010 µg/L
PFHpA	0.0010 µg/L
PFOA	0.0010 µg/L
PFNA	0.0010 µg/L
PFDA	0.0010 µg/L
PFUnDA	0.0010 µg/L
PFDoDA	0.0010 µg/L
PFTTrDA	0.0010 µg/L
PFTeDA	0.0010 µg/L
Perfluorooctanesulfonamides	
PFOSA	0.0010 µg/L
NEtFOSA-M	NR µg/L
NMeFOSA-M	NR µg/L
Perfluorooctanesulfonamidoacetic acids	
NEtFOSAA	0.0010 µg/L
NMeFOSAA	0.0010 µg/L
Perfluorooctanesulfonamidoethanols	
NEtFOSE-M	NR µg/L
NMeFOSE-M	0.0010 µg/L
Telomere Sulfonic acids	
4:2 FTS	NR µg/L
6:2 FTS	0.0010 µg/L
8:2 FTS	0.0010 µg/L

Analyte Definitions

Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - AsureQuality Method (LC-MS/MS)

Analyte	Full Name
Perfluoroalkylsulfonic acids	
PFPPrS	Perfluoro-1-propanesulfonic acid
PFBS	Perfluoro-1-butanesulfonic acid
PFPeS	Perfluoro-1-pentanesulfonic acid
di-PFHxS (1)	Total Perfluorodimethylbutane sulfonic acids
mono-PFHxS (1)	Total Perfluoromethylpentane sulfonic acids
L-PFHxS (1)	Linear Perfluorohexanesulfonic acid
PFHpS	Perfluoro-1-heptanesulfonic acid
di-PFOS (5)	Total Perfluorodimethylhexane sulfonic acids
mono-PFOS (5)	Total Perfluoromethylheptane sulfonic acids
L-PFOS (5)	Linear Perfluorooctanesulfonic acid
PFNS	Perfluoro-1-nonanesulfonic acid
PFDS	Perfluoro-1-decanesulfonic acid
Perfluoroalkylcarboxylic acids	
PFBA	Perfluoro-n-butanoic acid
PFPeA	Perfluoro-n-pentanoic acid
PFHxA	Perfluoro-n-hexanoic acid
PFHpA	Perfluoro-n-heptanoic acid
PFOA	Perfluoro-n-octanoic acid
PFNA	Perfluoro-n-nonanoic acid
PFDA	Perfluoro-n-decanoic acid
PFUnDA	Perfluoro-n-undecanoic acid
PFDODA	Perfluoro-n-dodecanoic acid
PFTTrDA	Perfluoro-n-tridecanoic acid
PFTeDA	Perfluoro-n-tetradecanoic acid
Perfluorooctanesulfonamides	
PFOSA	Perfluoro-1-octanesulfonamide
NEtFOSA-M	N-ethylperfluoro-1-octanesulfonamide
NMeFOSA-M	N-methylperfluoro-1-octanesulfonamide
Perfluorooctanesulfonamidoacetic acids	
NEtFOSAA	N-ethylperfluoro-1-octanesulfonamidoacetic acid
NMeFOSAA	N-methylperfluoro-1-octanesulfonamidoacetic acid
Perfluorooctanesulfonamidoethanols	
NEtFOSE-M	2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol
NMeFOSE-M	2-(N-methylperfluoro-1-octanesulfonamido)-ethanol
Telomere Sulfonic acids	
4:2 FTS	1H,1H,2H,2H-perfluoro-1-hexanesulfonic acid
6:2 FTS	1H,1H,2H,2H-perfluoro-1-octanesulfonic acid
8:2 FTS	1H,1H,2H,2H-perfluoro-1-decanesulfonic acid
Internal Standards	
M3PFBS	Perfluoro-1-[2,3,4-13C3]butanesulfonic acid
M3PFHxS	Perfluoro-1-[1,2,3-13C3]hexanesulfonic acid
M8PFOS	Perfluoro-1-[13C8]octanesulfonic acid
M4PFBA	Perfluoro-n-[1,2,3,4-13C4]butanoic acid
M5PFPeA	Perfluoro-n-[1,2,3,4,5-13C5]pentanoic acid
M5PFHxA	Perfluoro-n-[1,2,3,4,6-13C5]hexanoic acid
MPFHpA	Perfluoro-n-[1,2,3,4-13C4]heptanoic acid
M8PFOA	Perfluoro-n-[13C8]octanoic acid
M9PFNA	Perfluoro-n-[13C9]nonanoic acid
M6PFDA	Perfluoro-n-[1,2,3,4,5,6-13C6]decanoic acid
M7PFUnDA	Perfluoro-n-[1,2,3,4,5,6,7-13C7]undecanoic acid
MPFDODA	Perfluoro-n-[1,2-13C2]dodecanoic acid
MPFTeDA	Perfluoro-n-[1,2-13C2]tetradecanoic acid

Analyte	Full Name
MPFOSA	Perfluoro-1-[13C8]octanesulfonamide
DNEtFOSA	N-ethyl-D5-perfluoro-1-octanesulfonamide
DNMeFOSA	N-methyl-D3-perfluoro-1-octanesulfonamide
DNEtFOSAA	N-ethyl-D5-perfluoro-1-octanesulfonamidoacetic acid
DNMeFOSAA	N-methyl-D3-perfluoro-1-octanesulfonamidoacetic acid
DNEtFOSE	2-(N-ethyl-D5-perfluoro-1-octanesulfonamido)ethan-D4-ol
DNMeFOSE	2-(N-methyl-D3-perfluoro-1-octanesulfonamido)ethan-D4-ol
M4:2FTS	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-hexane sulfonic acid
M6:2FTS	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonic acid
M8:2FTS	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonic acid

LOR = Limit of Reporting

LOD = Limit of Detection

NR = Not Reportable



Appendix C: Groundwater Level Measurements

Appendix C: October 2020 Well Details and Water Level

Monitoring Well Ref	GW106 ¹	GW107	GW108	GW109	GW6	MW4	MW6	MW9
Total Depth of Well (m below TOC ²)	7.2	10.7	4.9	7.9	6.9	9.9	4.5	4.5
Diameter (mm)	50	50	50	50	1.07	50	40	40
TOC (m bgl)	0.04	0.08	0.00	0.00	0.67 m agl ³	0.00	0.09	0.06
Date	Not Sampled	1/10/2020			29/09/2020	30/09/2020		
Depth to Water (m below ground level)	NA	4.93	1.18	4.42	5.80	7.17	3.10	1.70
Water depth (m below TOC)	NA	4.93	1.18	4.42	6.47	7.17	3.01	1.64

Notes:

1. GW106 not sampled due to flooded ground surrounding well
2. TOC = top of casing.
3. agl = above ground level.



Appendix D: Field Sheets

NZDF PFAS SAMPLING FORM (separate form for each primary sample)

Location: Ohakea / Woodbourne (circle as appropriate)

Job Number: A02684802 A02744115

Land owner: _____

Sample Code (Name): GW107

Address: _____

Date and time: 1.10.20

Weather: Fine

Coordinates: E
(NZTM) N

Sample point: tap / well / surface water

Sampled By: TH (Clean hands)
BT (Dirty hands)

Description of sample point: GW well

Distance of sample point from bore: _____ (m)

Site Photos taken? Yes No

Sampling equipment: Geopump - low flow

Water use: _____
Drinking water / Stock watering / Fodder irrigation / Non-potable

QA/QA Sample Codes: -
Duplicate _____

Animals observed on site: _____
Chickens / cows / sheep / pigs / goats

Trip Blank GWKAI

Minimum volume between readings: 1 sample train volume (see formula below)

Field Blank GWKAA

Rinsate Blank (include description of equipment cleaned e.g. dipper) -

Key Stabilisation Criteria:
pH ± 0.1, EC ± 3%, T ± 3%, turbidity ± 10% of prior reading and ± 10 for values greater than 10 NTU

NOTE: purge until well has stabilised using field parameters below (3 consecutive readings)

TRANSFER FINAL READINGS TO STABILISATION FIELD SHEET

	Time Elapsed	Time	Volume Removed (L)	Water Temp. (°C)	pH	EC ((µS/cm)	ORP (mV)	Dissolved Oxygen (mg/L)	Water Level (m)*	Turbidity (NTU) / Water Appearance†
Before	0	804	0	14.4	7.62	593		5.86		10.30
During	5	809	2.25	14.5	6.95	615		4.56		13.39
During	10	814	5	14.6	6.92	693		1.10		56.60
During	15	819	7	14.6	6.92	696		0.37		43.8
During	20	824	9	14.5	6.93	697		0.12		36.77
During	25	829	11	14.6	6.92	698		0.09		42.0
During	30	834	13	14.6	6.93	698		0.06		72.63
During										
During										
During										
During										

† CL=clear, CO=cloudy, TU=turbid, SI=silty, SA=sandy

Sample Train Volume Calculation (L)
(length of sample tube x 3.141 x d² / 4000) + flow through cell volume.
Where d = internal diameter of sample tube in mm
Water sample internal ø = 6mm ≈ 30mL per meter

Comments DWL = 4.93
Purge depth: 6m
DFB: 10.73
FNU did not stabilise

Analyses Required: PFAS suite

Serial number of water quality sensor unit: _____

Shake test – foam produced? Yes No

COC form completed and checked? Yes No Letter given to landowner? Yes No

Location field sheet completed? Yes N/A Well field sheet completed? Yes N/A

Stabilisation criteria field sheet completed? Yes No

* = needs to be recorded each time you take a set of parameters

NZDF PFAS SAMPLING FORM (separate form for each primary sample)

Location: Ohakea / Woodbourne (circle as appropriate)

Job Number: A02684802 A02744115

Land owner: _____

Sample Code (Name): GL108

Address: _____

Date and time: 1.10.20

Weather: Fine

Coordinates: E

(NZTM) N

Sample point: tap / well / surface water

Sampled By: BT (Clean hands)

Description of sample point: GL well

TH (Dirty hands)

Distance of sample point from bore: _____ (m)

Site Photos taken? Yes No

Sampling equipment: Geopump - low flow

Water use: Drinking water / Stock watering / Fodder irrigation / Non-potable

QA/QA Sample Codes: -

Animals observed on site: Chickens / cows / sheep / pigs / goats

Duplicate _____

Minimum volume between readings: **1 sample train volume** (see formula below)

Trip Blank -

Field Blank -

Rinsate Blank (include description of equipment cleaned e.g. dipper) -

Key Stabilisation Criteria:

pH ± 0.1, EC ± 3%, T ± 3%, turbidity ± 10% of prior reading and ± 10 for values greater than 10 NTU

NOTE: purge until well has stabilised using field parameters below (3 consecutive readings)

TRANSFER FINAL READINGS TO STABILISATION FIELD SHEET

	Time Elapsed	Time	Volume Removed (L)	Water Temp. (°C)	pH	EC ((µS/cm)	ORP (mV)	Dissolved Oxygen (mg/L)	Water Level (m)*	Turbidity (NTU) / Water Appearance†
Before	0	9.31	0.11	14.6	6.59	550		1.65	1.24	28.12
During	5	9.36	1.75	13.1	6.28	561		0.13	1.27	14.46
During	10	9.41	2.75	13.1	6.27	545		0.04	1.27	11.24
During	15	9.46	4	13.2	6.26	541		-0.01	1.28	7.75
During	20	9.51	5.25	13.1	6.24	537		-0.03	1.28	5.96
During	25	9.56	6.50	13.1	6.23	537		-0.05	1.28	6.92
During										
During										
During										
During										
During										

† CL=clear, CO=cloudy, TU=turbid, SI=silty, SA=sandy

Sample Train Volume Calculation (L)

(length of sample tube x 3.141 x d² / 4000) + flow through cell volume. Where d = internal diameter of sample tube in mm

Comments OTW: 1.18
OTB: 4.90

Water sample internal ø = 6mm ≈ 30mL per meter

Analyses Required: PFAS suite

Serial number of water quality sensor unit: _____

Shake test – foam produced? Yes No

COC form completed and checked? Yes No Letter given to landowner? Yes

Location field sheet completed? Yes N/A Well field sheet completed? Yes N/A

Stabilisation criteria field sheet completed? Yes

* = needs to be recorded each time you take a set of parameters

NZDF PFAS SAMPLING FORM (separate form for each primary sample)

Location: Ohakea / Woodbourne (circle as appropriate)

Job Number: A02684802 A02744115

Land owner: _____

Sample Code (Name): GW109

Address: _____

Date and time: 1.10.20

Weather: Fine

Coordinates: E _____
N _____

Sample point: tap / well / surface water

Sampled By: TH (Clean hands)
BT (Dirty hands)

Description of sample point: GW well

Distance of sample point from bore: _____ (m)

Site Photos taken? Yes No

Sampling equipment: Geopump - low flow

Water use: _____
Drinking water / Stock watering / Fodder irrigation / Non-potable

QA/QA Sample Codes: _____
Duplicate _____

Animals observed on site: _____
Chickens / cows / sheep / pigs / goats

Trip Blank _____

Minimum volume between readings: 1 sample train volume (see formula below)

Field Blank _____

Rinsate Blank (include description of equipment cleaned e.g. dipper) _____

Key Stabilisation Criteria:

pH ± 0.1, EC ± 3%, T ± 3%, turbidity ± 10% of prior reading and ± 10 for values greater than 10 NTU

NOTE: purge until well has stabilised using field parameters below (3 consecutive readings)

TRANSFER FINAL READINGS TO STABILISATION FIELD SHEET

	Time Elapsed	Time	Volume Removed (L)	Water Temp. (°C)	pH	EC ((µS/cm)	ORP (mV)	Dissolved Oxygen (mg/L)	Water Level (m)*	Turbidity (NTU) / Water Appearance†
Before	0	10.23	cell	15.0	6.17	376.7			4.42	86.91
During	5	10.28	2	14.8	6.15	372.3	0.08	-1		36.77
During	10	10.33	3.5	14.9	6.14	370.0	0.01	-1		50.00
During	15	10.38	5	14.9	6.12	371.2	-0.02	-1		44.53
During	20	10.43	7.5	14.9	6.13	371.2	-0.04	-1		27.3
During										
During										
During										
During										
During										
During										

† CL=clear, CO=cloudy, TU=turbid, SI=silty, SA=sandy

Sample Train Volume Calculation (L)
(length of sample tube x 3.141 x d² / 4000) + flow through cell volume.
Where d = internal diameter of sample tube in mm
Water sample internal ø = 6mm ≈ 30mL per meter

Comments OTW: 4.42
DTB: 7.85
Intake = 6m

DO gone at start of sampling. Came back part way through.

Analyses Required: PFAS suite

Serial number of water quality sensor unit: _____

Shake test – foam produced? Yes No

COC form completed and checked? Yes No Letter given to landowner? Yes No

Location field sheet completed? Yes N/A Well field sheet completed? Yes N/A

Stabilisation criteria field sheet completed? Yes No

* = needs to be recorded each time you take a set of parameters

NZDF PFAS SAMPLING FORM (separate form for each primary sample)

Location: Ohakea / Woodbourne (circle as appropriate)

Job Number: A02684802 A02744115

Land owner: _____

Sample Code (Name): GW31

Address: _____

Date and time: 29.9.20

Weather: Cold, rain, hail, wind

Coordinates: E _____
(NZTM) N _____

Sample point: tap / well / surface water

Sampled By: TH (Clean hands)

Description of sample point: Tap from sheds behind farm house

BT (Dirty hands)

Distance of sample point from bore: _____ (m)

Site Photos taken? Yes No

Sampling equipment: transfer bottle

Water use: Drinking water / Stock watering /
 Fodder irrigation / Non-potable

QA/QA Sample Codes: Duplicate GWKAB

Animals observed on site: Chickens / cows / sheep / pigs / goats _____

Trip Blank GWKAD

Minimum volume between readings: 1 sample train volume (see formula below)

Field Blank GWKAC

Rinsate Blank (include description of equipment cleaned e.g. dipper) _____

Key Stabilisation Criteria:
pH ± 0.1, EC ± 3%, T ± 3%, turbidity ± 10% of prior reading and ± 10 for values greater than 10 NTU

NOTE: purge until well has stabilised using field parameters below (3 consecutive readings)

TRANSFER FINAL READINGS TO STABILISATION FIELD SHEET

	Time Elapsed	Time	Volume Removed (L)	Water Temp. (°C)	pH	EC ((µS/cm)	ORP (mV)	Dissolved Oxygen (mg/L)	Water Level (m)*	Turbidity (NTU) / Water Appearance†
Before	-	-	-	14.4	6.49	514	-	2.52	-	59.3
During										
During										
During										
During										
During										
During										
During										
During										
During										

† CL=clear, CO=cloudy, TU=turbid, SI=silty, SA=sandy

Sample Train Volume Calculation (L)
(length of sample tube x 3.141 x d² / 4000) + flow through cell volume.
Where d = internal diameter of sample tube in mm

Comments Farmer set up tap to sample for us!

Water sample internal ø = 6mm ≈ 30mL per meter

Analyses Required: PFAS suite

Serial number of water quality sensor unit: _____

Shake test – foam produced? Yes No

COC form completed and checked? Yes

Letter given to landowner? Yes

Location field sheet completed? Yes N/A

Well field sheet completed? Yes N/A

Stabilisation criteria field sheet completed? Yes

* = needs to be recorded each time you take a set of parameters

NZDF PFAS SAMPLING FORM (separate form for each primary sample)

Location: Ohakea / Woodbourne (circle as appropriate)

Job Number: A02684802 A02764115

Land owner: _____

Sample Code (Name): GLWS3

Address: _____

Date and time: 28.9.20

Weather: Fine

Coordinates: E

(NZTM) N

Sample point: tap / well / surface water

Sampled By: BT (Clean hands)

Description of sample point: Artesian Well

TH (Dirty hands)

Distance of sample point from bore: _____ (m)

Site Photos taken? Yes No

Sampling equipment: transfer bottle

Water use: Drinking water / Stock watering / Fodder irrigation / Non-potable

QA/QA Sample Codes: -

Animals observed on site: Chickens / cows / sheep / pigs / goats _____

Duplicate _____

Minimum volume between readings: 1 sample train volume (see formula below)

Trip Blank _____

Field Blank _____

Rinsate Blank (include description of equipment cleaned e.g. dipper) _____

Key Stabilisation Criteria:

pH ± 0.1, EC ± 3%, T ± 3%, turbidity ± 10% of prior reading and ± 10 for values greater than 10 NTU

NOTE: purge until well has stabilised using field parameters below (3 consecutive readings)

TRANSFER FINAL READINGS TO STABILISATION FIELD SHEET

	Time Elapsed	Time	Volume Removed (L)	Water Temp. (°C)	pH	EC ((µS/cm)	ORP (mV)	Dissolved Oxygen (mg/L)	Water Level (m)*	Turbidity (NTU) / Water Appearance†
Before	-	-	-	13	6.66	736	-	2.45	-	0.75
During										
During										
During										
During										
During										
During										
During										
During										
During										
During										

† CL=clear, CO=cloudy, TU=turbid, SI=silty, SA=sandy

Sample Train Volume Calculation (L)

(length of sample tube x 3.141 x d² / 4000) + flow through cell volume.

Where d = internal diameter of sample tube in mm

Water sample internal ø = 6mm ≈ 30mL per meter

Comments Artesian well - bubbling over. Used transfer bottle to collect water. Sample point inaccessible with vehicle - farmer escorted us. Needed to climb electric fence to get to well

Analyses Required: PFAS suite

Serial number of water quality sensor unit: _____

Shake test – foam produced? Yes No

COC form completed and checked? Yes Letter given to landowner? Yes

Location field sheet completed? Yes N/A Well field sheet completed? Yes N/A

Stabilisation criteria field sheet completed? Yes

* = needs to be recorded each time you take a set of parameters

NZDF PFAS SAMPLING FORM (separate form for each primary sample)

Location: Ohakea / Woodbourne (circle as appropriate)

Job Number: A02684802 A02744115

Land owner: _____

Sample Code (Name): 29.9.20 QW65

Address: _____

Date and time: 29.9.20

Weather: Cold, rain, hail, wind

Coordinates: E
N

Sample point: tap / well / surface water

Sampled By: TH BT (Clean hands)
_____ (Dirty hands)

Description of sample point: tap at top of water tank

Distance of sample point from bore: _____ (m)

Site Photos taken? Yes No

Sampling equipment: transfer bottle

Water use: Drinking water / Stock watering / Fodder irrigation / Non-potable

QA/QA Sample Codes: _____

Animals observed on site: Chickens / cows / sheep / pigs / goats _____

Duplicate: _____

Minimum volume between readings: 1 sample train volume (see formula below)

Trip Blank: _____

Field Blank: _____

Rinsate Blank (include description of equipment cleaned e.g. dipper) _____

Key Stabilisation Criteria:
pH ± 0.1, EC ± 3%, T ± 3%, turbidity ± 10% of prior reading and ± 10 for values greater than 10 NTU

NOTE: purge until well has stabilised using field parameters below (3 consecutive readings)

TRANSFER FINAL READINGS TO STABILISATION FIELD SHEET

	Time Elapsed	Time	Volume Removed (L)	Water Temp. (°C)	pH	EC ((µS/cm)	ORP (mV)	Dissolved Oxygen (mg/L)	Water Level (m)*	Turbidity (NTU) / Water Appearance†
Before	—	—	—	12.9	7.97	984		0.46		4.89
During										
During										
During										
During										
During										
During										
During										
During										
During										
During										

† CL=clear, CO=cloudy, TU=turbid, SI=silty, SA=sandy

Sample Train Volume Calculation (L)
(length of sample tube x 3.141 x d² / 4000) + flow through cell volume.
Where d = internal diameter of sample tube in mm

Comments: Farmer turned on pump filter. sampled from top of water tank before sand filter.

Water sample internal ø = 6mm ≈ 30mL per meter

Analyses Required: PFAS suite

Serial number of water quality sensor unit: _____

Shake test – foam produced? Yes No

COC form completed and checked? Yes

Letter given to landowner? Yes

Location field sheet completed? Yes

N/A

Well field sheet completed? Yes

N/A

Stabilisation criteria field sheet completed? Yes

* = needs to be recorded each time you take a set of parameters

NZDF PFAS SAMPLING FORM (separate form for each primary sample)

Location: Ohakea / Woodbourne (circle as appropriate)

Job Number: A02684802 A0274415

Land owner: _____

Sample Code (Name): GW07

Address: _____

Date and time: 30.9.20

Weather: Fine

Coordinates: E _____
(NZTM) N _____

Sample point: tap / well / surface water

Sampled By: BT (Clean hands)
TH (Dirty hands)

Description of sample point: 1 up behind garage.

Distance of sample point from bore: _____ (m)

Site Photos taken? Yes No

Sampling equipment: transfer bottle

Water use: Drinking water / Stock watering /
 Fodder irrigation / Non-potable

QA/QA Sample Codes: _____

Animals observed on site: Chickens / cows / sheep / pigs / goats _____

Duplicate: _____

Minimum volume between readings: 1 sample train volume (see formula below)

Trip Blank: _____

Field Blank: _____

Rinsate Blank (include description of equipment cleaned e.g. dipper) _____

Key Stabilisation Criteria:

NOTE: purge until well has stabilised using field parameters below (3 consecutive readings)

pH ± 0.1, EC ± 3%, T ± 3%, turbidity ± 10% of prior reading and ± 10 for values greater than 10 NTU

TRANSFER FINAL READINGS TO STABILISATION FIELD SHEET

	Time Elapsed	Time	Volume Removed (L)	Water Temp. (°C)	pH	EC ((µS/cm)	ORP (mV)	Dissolved Oxygen (mg/L)	Water Level (m)*	Turbidity (NTU) / Water Appearance†
Before	—	—	—	11.4	6.57	2057	—	—	—	8.45
During										
During										
During										
During										
During										
During										
During										
During										
During										
During										

† CL=clear, CO=cloudy, TU=turbid, SI=silty, SA=sandy
 Comments: Farmers needed to turn on pump for tap to work. PO not working.

Sample Train Volume Calculation (L)
 (length of sample tube x 3.141 x d² / 4000) + flow through cell volume.
 Where d = internal diameter of sample tube in mm
 Water sample internal ø = 6mm ≈ 30mL per meter

Analyses Required: PFAS suite

Serial number of water quality sensor unit: _____

Shake test – foam produced? Yes No

COC form completed and checked? Yes No Letter given to landowner? Yes No

Location field sheet completed? Yes N/A Well field sheet completed? Yes N/A

Stabilisation criteria field sheet completed? Yes No

* = needs to be recorded each time you take a set of parameters

NZDF PFAS SAMPLING FORM (separate form for each primary sample)

Location: Ohakea / Woodbourne (circle as appropriate)

Job Number: A02684802 A02744115

Land owner: _____

Sample Code (Name): 8W35

Address: _____

Date and time: 29.9.20

Weather: rain cold windy

Coordinates: E _____
(NZTM) N _____

Sample point: tap / well / surface water

Sampled By: TH (Clean hands)
BT (Dirty hands)

Description of sample point: Makawhai

Distance of sample point from bore: _____ (m)

Site Photos taken? Yes No

Sampling equipment: transfer bottle /
mighty gripper

Water use: _____
Drinking water / Stock watering /
Fodder irrigation / Non-potable

QA/QA Sample Codes: _____
Duplicate _____

Animals observed on site: _____
Chickens / cows / sheep / pigs /
goats _____

Trip Blank _____

Minimum volume between readings: 1 sample train volume
(see formula below)

Field Blank _____

Rinsate Blank (include description of equipment cleaned e.g. dipper) _____

Key Stabilisation Criteria:

pH ± 0.1, EC ± 3%, T ± 3%, turbidity ± 10% of prior reading and ± 10 for values greater than 10 NTU

NOTE: purge until well has stabilised using field parameters below (3 consecutive readings)

TRANSFER FINAL READINGS TO STABILISATION FIELD SHEET

	Time Elapsed	Time	Volume Removed (L)	Water Temp. (°C)	pH	EC ((µS/cm)	ORP (mV)	Dissolved Oxygen (mg/L)	Water Level (m)*	Turbidity (NTU) / Water Appearance†
Before	<u>✓</u>	<u>—</u>	<u>—</u>	<u>11.3</u>	<u>8.15</u>	<u>305.3</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>36.64</u>
During										
During										
During										
During										
During										
During										
During										
During										
During										
During										

† CL=clear, CO=cloudy, TU=turbid, SI=silty, SA=sandy

Sample Train Volume Calculation (L)

(length of sample tube x 3.141 x d² / 4000) + flow through cell volume.
Where d = internal diameter of sample tube in mm

Comments OO playing up.

Water sample internal ø = 6mm ≈ 30mL per meter

Sampled in quarry from access road in Makawhai Stream just up from confluence @ Mangitikei River

Analyses Required: PFAS suite

Serial number of water quality sensor unit: _____

Shake test – foam produced? Yes No

COC form completed and checked? Yes Letter given to landowner? Yes

Location field sheet completed? Yes N/A Well field sheet completed? Yes N/A

Stabilisation criteria field sheet completed? Yes

* = needs to be recorded each time you take a set of parameters

NZDF PFAS SAMPLING FORM (separate form for each primary sample)

Location: Ohakea / Woodbourne (circle as appropriate)

Job Number: A02684802 A02744115

Land owner: _____

Sample Code (Name): SLB3

Address: _____

Date and time: 29.9.20

Weather: cold wind rain

Coordinates: E

(NZTM) N

Sample point: stream tap / well / surface water

Sampled By: BT (Clean hands)

Description of sample point: _____

TH (Dirty hands)

Distance of sample point from bore: _____ (m)

Site Photos taken? Yes No

Sampling equipment: transfer bottle / mighty gripper

Water use: Drinking water / Stock watering / Fodder irrigation / Non-potable

QA/QA Sample Codes: _____

Animals observed on site: Chickens / cows / sheep / pigs / goats

Duplicate: -

Minimum volume between readings: 1 sample train volume (see formula below)

Trip Blank: -

Field Blank: -

Rinsate Blank (include description of equipment cleaned e.g. dipper) -

Key Stabilisation Criteria:
pH ± 0.1, EC ± 3%, T ± 3%, turbidity ± 10% of prior reading and ± 10 for values greater than 10 NTU

NOTE: purge until well has stabilised using field parameters below (3 consecutive readings)

TRANSFER FINAL READINGS TO STABILISATION FIELD SHEET

	Time Elapsed	Time	Volume Removed (L)	Water Temp. (°C)	pH	EC ((µS/cm)	ORP (mV)	Dissolved Oxygen (mg/L)	Water Level (m)*	Turbidity (NTU) / Water Appearance†
Before	-	-	-	10.6	7.56	231.4	-	8.84	-	45.98
During										
During										
During										
During										
During										
During										
During										
During										
During										
During										

† CL=clear, CO=cloudy, TU=turbid, SI=silty, SA=sandy

Sample Train Volume Calculation (L)
(length of sample tube x 3.141 x d² / 4000) + flow through cell volume.
Where d = internal diameter of sample tube in mm

Comments: Sampled from next to bridge on Taylor rd.

Water sample internal ø = 6mm ≈ 30mL per meter

Analyses Required: PFAS suite

Serial number of water quality sensor unit: _____

Shake test – foam produced? Yes No

COC form completed and checked? Yes

Letter given to landowner? Yes

Location field sheet completed? Yes N/A

Well field sheet completed? Yes N/A

Stabilisation criteria field sheet completed? Yes

* = needs to be recorded each time you take a set of parameters

NZDF PFAS SAMPLING FORM (separate form for each primary sample)

Location: Ohakea / Woodbourne (circle as appropriate)

Job Number: A02684802 A02744118

Land owner: _____

Sample Code (Name): SW6

Address: _____

Date and time: 29.9.20

Weather: Cold / windy / rain

Coordinates: E _____
(NZTM) N _____

Sample point: tap / well / surface water

Sampled By: BT (Clean hands)
J/A (Dirty hands)

Description of sample point: _____

Distance of sample point from bore: _____ (m)

Site Photos taken? Yes No

Sampling equipment: transfer bottle / mighty gripper

Water use: _____
Drinking water / Stock watering / Fodder irrigation / Non-potable

QA/QA Sample Codes: -
Duplicate _____

Animals observed on site: _____
Chickens / cows / sheep / pigs / goats

Trip Blank _____

Minimum volume between readings: **1 sample train volume**
(see formula below)

Field Blank _____

Rinsate Blank (include description of equipment cleaned e.g. dipper) _____

Key Stabilisation Criteria:
pH ± 0.1, EC ± 3%, T ± 3%, turbidity ± 10% of prior reading and ± 10 for values greater than 10 NTU

NOTE: purge until well has stabilised using field parameters below (3 consecutive readings)

TRANSFER FINAL READINGS TO STABILISATION FIELD SHEET

	Time Elapsed	Time	Volume Removed (L)	Water Temp. (°C)	pH	EC ((µS/cm)	ORP (mV)	Dissolved Oxygen (mg/L)	Water Level (m)*	Turbidity (NTU) / Water Appearance†
Before	<u>-</u>	<u>-</u>	<u>-</u>	<u>11.6</u>	<u>7.38</u>	<u>137.7</u>	<u>-</u>	<u>8.99</u>	<u>-</u>	<u>12.78</u>
During										
During										
During										
During										
During										
During										
During										
During										
During										
During										

† CL=clear, CO=cloudy, TU=turbid, SI=silty, SA=sandy

Sample Train Volume Calculation (L)
(length of sample tube x 3.141 x d² / 4000) + flow through cell volume.
Where d = internal diameter of sample tube in mm
Water sample internal ø = 6mm ≈ 30mL per meter

Comments: Sampled just upstream from drain confluence with the drain running parallel to road.

Analyses Required: PFAS suite

Serial number of water quality sensor unit: _____

Shake test – foam produced? Yes No

COC form completed and checked? Yes No

Location field sheet completed? Yes N/A

Stabilisation criteria field sheet completed? Yes No

Letter given to landowner? Yes No

Well field sheet completed? Yes N/A

* = needs to be recorded each time you take a set of parameters

NZDF PFAS SAMPLING FORM (separate form for each primary sample)

Location: Ohakea / Woodbourne (circle as appropriate)

Job Number: A02684802 A02744114

Land owner: NZDF

Sample Code (Name): GW6

Address: _____

Date and time: 29.9.20

Weather: Rain, hail, wind, cold.

Coordinates: (NZTM) E

N

Sample point: tap / well / surface water

Sampled By: BT (Clean hands)

TH (Dirty hands)

Description of sample point: open well

Distance of sample point from bore: _____ (m)

Site Photos taken? Yes No

Sampling equipment: Geopump - low flow

Water use: Drinking water / Stock watering / Fodder irrigation / Non-potable

QA/QA Sample Codes: _____

Animals observed on site: Chickens / cows / sheep / pigs / goats _____

Duplicate: _____

Minimum volume between readings: 1 sample train volume (see formula below)

Trip Blank: _____

Field Blank: _____

Rinsate Blank (include description of equipment cleaned e.g. dipper) _____

Key Stabilisation Criteria:
pH ± 0.1, EC ± 3%, T ± 3%, turbidity ± 10% of prior reading and ± 10 for values greater than 10 NTU

TRANSFER FINAL READINGS TO STABILISATION FIELD SHEET

	Time Elapsed	Time	Volume Removed (L)	Water Temp. (°C)	pH	EC ((µS/cm)	ORP (mV)	Dissolved Oxygen (mg/L)	Water Level (m)*	Turbidity (NTU) / Water Appearance†
Before	5 0		0.1	12.0	6.31	779		4.00		4.73
During	5	8.13	0.5	11.6	6.50	799		2.58		4.12
During	10	8.18	2.5	12.7	6.51	798		2.63		58.8
During	15	8.23	3.5	12.8	6.51	797		2.94		143.2
During	20	8.28	5.0	12.6	6.50	797		2.76		12.03
During										
During										
During										
During										
During										
During										
During										

† CL=clear, CO=cloudy, TU=turbid, SI=silty, SA=sandy

Sample Train Volume Calculation (L)

(length of sample tube x 3.141 x d² / 4000) + flow through cell volume.
Where d = internal diameter of sample tube in mm

Water sample internal ø = 6mm ≈ 30mL per meter

Comments OTW: 5.8m

OTB: 6.9m

Well diameter = 1.07m

TOZ = 0.67m

FNU would not stabilise.

Analyses Required: PFAS suite

Serial number of water quality sensor unit: _____

Shake test – foam produced? Yes No

COC form completed and checked? Yes

Letter given to landowner? Yes

Location field sheet completed? Yes

N/A

Well field sheet completed? Yes

N/A

Stabilisation criteria field sheet completed? Yes

* = needs to be recorded each time you take a set of parameters

NZDF PFAS SAMPLING FORM (separate form for each primary sample)

Location: Ohakea / Woodbourne (circle as appropriate)

Job Number: A02684802 A02744114

Land owner: NZDF

Sample Code (Name): MW4

Address: _____

Date and time: 30.9.20

Weather: Fine

Coordinates: E

(NZTM) N

Sample point: tap / well / surface water

Sampled By: BH (Clean hands)

Description of sample point: Monitoring well

BT (Dirty hands)

Distance of sample point from bore: _____ (m)

Site Photos taken? Yes No

Sampling equipment: Leopump - low flow

Water use: Drinking water / Stock watering / Fodder irrigation / Non-potable

QA/QA Sample Codes: -

Animals observed on site: Chickens / cows / sheep / pigs / goats

Duplicate: _____

Minimum volume between readings: **1 sample train volume** (see formula below)

Trip Blank: _____

Field Blank: _____

Rinsate Blank (include description of equipment cleaned e.g. dipper): _____

Key Stabilisation Criteria:

pH ± 0.1, EC ± 3%, T ± 3%, turbidity ± 10% of prior reading and ± 10 for values greater than 10 NTU

NOTE: purge until well has stabilised using field parameters below (3 consecutive readings)

TRANSFER FINAL READINGS TO STABILISATION FIELD SHEET

	Time Elapsed	Time	Volume Removed (L)	Water Temp. (°C)	pH	EC ((µS/cm)	ORP (mV)	Dissolved Oxygen (mg/L)	Water Level (m)*	Turbidity (NTU) / Water Appearance†
Before	0	09.31 9.31	Cell	14.1	7.27	428.2				26.8
During	5	9.36	1.55	14.4	6.64	474.8				35.79
During	10	9.41	2.75	14.4	6.53	526		7.17		69.03
During	15	9.46	4.25	14.5	6.51	544		7.17		68.75
During	20	9.51	6.75	14.7	6.50	559		7.18		66.18
During										
During										
During										
During										
During										
During										

† CL=clear, CO=cloudy, TU=turbid, SI=silty, SA=sandy

Sample Train Volume Calculation (L)
 (length of sample tube x 3.141 x d² / 4000) + flow through cell volume.
 Where d = internal diameter of sample tube in mm
 Water sample internal ø = 6mm ≈ 30mL per meter

Comments DTW: 7.165 m
DTB: 9.92 m
Intake depth: 8 m

Well in open field, fenced off with wooden fence.
DO sensor playing up. No reading shown.

Analyses Required: PFAS suite

Serial number of water quality sensor unit: _____

Shake test – foam produced? Yes No

COC form completed and checked? Yes Letter given to landowner? Yes

Location field sheet completed? Yes N/A Well field sheet completed? Yes N/A

Stabilisation criteria field sheet completed? Yes

* = needs to be recorded each time you take a set of parameters

NZDF PFAS SAMPLING FORM (separate form for each primary sample)

Location: Ohakea / Woodbourne (circle as appropriate)

Job Number: A02684802 A02744114

Land owner: NZDF

Sample Code (Name): MW6

Address: _____

Date and time: _____

Weather: Fine

Coordinates: (NZTM) E
N

Sample point: tap / well surface water

Sampled By: BT (Clean hands)
TH (Dirty hands)

Description of sample point: GW Well

Distance of sample point from bore: _____ (m)

Site Photos taken? Yes No

Sampling equipment: Lea pump - low flow

Water use: Drinking water / Stock watering / Fodder irrigation / Non-potable

QA/QA Sample Codes: Duplicate GWKAE

Animals observed on site: Chickens / cows / sheep / pigs / goats

Trip Blank GWKAG

Minimum volume between readings: 1 sample train volume (see formula below)

Field Blank _____

Rinsate Blank (include description of equipment cleaned e.g. dipper) GWKAK - WL Dipper

Key Stabilisation Criteria:
pH ± 0.1, EC ± 3%, T ± 3%, turbidity ± 10% of prior reading and ± 10 for values greater than 10 NTU

NOTE: purge until well has stabilised using field parameters below (3 consecutive readings)

TRANSFER FINAL READINGS TO STABILISATION FIELD SHEET

	Time Elapsed	Time	Volume Removed (L)	Water Temp. (°C)	pH	EC ((µS/cm)	ORP (mV)	Dissolved Oxygen (mg/L)	Water Level (m)*	Turbidity (NTU) / Water Appearance†
Before	0	12:43	Cell	14.4	6.86	206.1			3.12	11.89
During	5	12:48	1.5	14.3	6.28	202.5			3.19	6.29
During	10	12:53	3.0	14.3	6.22	202.7			3.23	5.80
During	15	12:58	4.5	14.3	6.21	202.7			3.26	5.95
During	20	13:03	5.5	14.4	6.19	202.6			3.28	6.17
During										
During										
During										
During										
During										
During										

† CL=clear, CO=cloudy, TU=turbid, SI=silty, SA=sandy

Sample Train Volume Calculation (L)
(length of sample tube x 3.141 x d² / 4000) + flow through cell volume.
Where d = internal diameter of sample tube in mm
Water sample internal ø = 6mm ≈ 30mL per meter

Comments OTW: 3.10m
PTB: 4.45m
Intake @ 4m

DO sensor not working

Analyses Required: PFAS suite

Serial number of water quality sensor unit: _____

Shake test – foam produced? Yes No

COC form completed and checked? Yes No Letter given to landowner? Yes

Location field sheet completed? Yes N/A Well field sheet completed? Yes N/A

Stabilisation criteria field sheet completed? Yes

* = needs to be recorded each time you take a set of parameters

NZDF PFAS SAMPLING FORM (separate form for each primary sample)

Location: Ohakea / Woodbourne (circle as appropriate)

Job Number: A02684802 A02744114

Land owner: NZDF

Sample Code (Name): MW9

Address: _____

Date and time: 30.9.20

Weather: Force

Coordinates: _____

(NZTM) _____

Sample point: tap / well / surface water

E _____

N _____

Description of sample point: GW well

Sampled By: TH (Clean hands)

BT (Dirty hands)

Distance of sample point from bore: _____ (m)

Site Photos taken? Yes No

Sampling equipment: geopump low flow

Water use: _____
Drinking water / Stock watering / Fodder irrigation / Non-potable

QA/QA Sample Codes: _____

Animals observed on site: _____
Chickens / cows / sheep / pigs / goats

Duplicate _____

Minimum volume between readings: 1 sample train volume (see formula below)

Trip Blank _____

Field Blank LWKAJ

Rinsate Blank (include description of equipment cleaned e.g. dipper) LWKAJ - Mighty Dipper.

Key Stabilisation Criteria:
pH ± 0.1, EC ± 3%, T ± 3%, turbidity ± 10% of prior reading and ± 10 for values greater than 10 NTU

NOTE: purge until well has stabilised using field parameters below (3 consecutive readings)

TRANSFER FINAL READINGS TO STABILISATION FIELD SHEET

	Time Elapsed	Time	Volume Removed (L)	Water Temp. (°C)	pH	EC ((µS/cm)	ORP (mV)	Dissolved Oxygen (mg/L)	Water Level (m)*	Turbidity (NTU) / Water Appearance†
Before	0	1401	1	14.6	6.17	224.9			1.84	275.69
During	5	1406	2	14.3	6.01	245.4			1.88	53.00
During	10	1411	2.75	14.3	6.00	251.8			1.92	34.9
During	15	1416	3.5	14.4	5.98	261.0			1.95	23.0
During	20	1421	4.0	14.5	5.97	266.3			2.0	14.8
During	25	1426	4.75	14.5	5.97	269.0			2.04	20.56
During	30	1431	5.5	14.5	5.96	270.6			2.08	17.48
During										
During										
During										
During										

† CL=clear, CO=cloudy, TU=turbid, SI=silty, SA=sandy

Sample Train Volume Calculation (L)

(length of sample tube x 3.141 x d² / 4000) + flow through cell volume.

Where d = internal diameter of sample tube in mm

Water sample internal ø = 6mm ≈ 30mL per meter

Comments OTW: 1.7

OTB = 4.47

DO sensor not working

First flush was dark red - clogged + started again.

slow recharge

Analyses Required: PFAS suite

Serial number of water quality sensor unit: _____

Shake test – foam produced? Yes No

COC form completed and checked? Yes No Letter given to landowner? Yes

Location field sheet completed? Yes N/A Well field sheet completed? Yes N/A

Stabilisation criteria field sheet completed? Yes

* = needs to be recorded each time you take a set of parameters

NZDF PFAS SAMPLING FORM (separate form for each primary sample)

Location: Ohakea / Woodbourne (circle as appropriate)

Job Number: A02684802 A02744114

Land owner: NZDF

Sample Code (Name): WS1

Address: _____

Date and time: 29.9.20

Weather: Gold. rain, hail, wind.

Coordinates: (NZTM) E
N

Sample point: tap / well / surface water

Sampled By: JH (Clean hands)
BT (Dirty hands)

Description of sample point: tap in shed

Distance of sample point from bore: _____ (m)

Site Photos taken? Yes No

Sampling equipment: transfer bottle

Water use: Drinking water / Stock watering / Fodder irrigation / Non-potable

QA/QA Sample Codes: -

Animals observed on site: Chickens / cows / sheep / pigs / goats

Duplicate: _____

Minimum volume between readings: 1 sample train volume (see formula below)

Trip Blank: _____

Field Blank: _____

Rinsate Blank (include description of equipment cleaned e.g. dipper) _____

Key Stabilisation Criteria:

NOTE: purge until well has stabilised using field parameters below (3 consecutive readings)

pH ± 0.1, EC ± 3%, T ± 3%, turbidity ± 10% of prior reading and ± 10 for values greater than 10 NTU

TRANSFER FINAL READINGS TO STABILISATION FIELD SHEET

	Time Elapsed	Time	Volume Removed (L)	Water Temp. (°C)	pH	EC ((µS/cm)	ORP (mV)	Dissolved Oxygen (mg/L)	Water Level (m)*	Turbidity (NTU) / Water Appearance†
Before	<u>0</u>	<u>-</u>	<u>-</u>	<u>10.5</u>	<u>7.29</u>	<u>448.4</u>	<u>-</u>	<u>9.79</u>	<u>-</u>	<u>3192.3</u>
During										
During										
During										
During										
During										
During										
During										
During										
During										
During										
During										

† CL=clear, CO=cloudy, TU=turbid, SI=silty, SA=sandy

Sample Train Volume Calculation (L)

(length of sample tube x 3.141 x d² / 4000) + flow through cell volume.
Where d = internal diameter of sample tube in mm

Water sample internal ø = 6mm ≈ 30mL per meter

Comments: Cows in paddock that we crossed through to get to shed where tap was.

Analyses Required: PFAS suite

Serial number of water quality sensor unit: _____

Shake test – foam produced? Yes No

COC form completed and checked? Yes Letter given to landowner? Yes

Location field sheet completed? Yes N/A Well field sheet completed? Yes N/A

Stabilisation criteria field sheet completed? Yes

* = needs to be recorded each time you take a set of parameters

NZDF PFAS SAMPLING FORM (separate form for each primary sample)

Location: Ohakea / Woodbourne (circle as appropriate)

Job Number: ~~A02684802~~ A02744114

Land owner: NZDF

Sample Code (Name): W52

Address: _____

Date and time: 29.9.20

Weather: Cold, rain, hail, wind

Coordinates: E

(NZTM) N

Sample point: tap / well / surface water

Sampled By: JH (Clean hands)

BT (Dirty hands)

Description of sample point: tap inside hut in quarry.

Distance of sample point from bore: _____ (m)

Site Photos taken? Yes No

Sampling equipment: transfer bottle.

Water use: Drinking water / Stock watering / Fodder irrigation / Non-potable

QA/QA Sample Codes: -

Animals observed on site: Chickens / cows / sheep / pigs / goats _____

Duplicate _____

Minimum volume between readings: 1 sample train volume (see formula below)

Trip Blank _____

Field Blank _____

Rinsate Blank (include description of equipment cleaned e.g. dipper) _____

Key Stabilisation Criteria:
pH ± 0.1, EC ± 3%, T ± 3%, turbidity ± 10% of prior reading and ± 10 for values greater than 10 NTU

NOTE: purge until well has stabilised using field parameters below (3 consecutive readings)

TRANSFER FINAL READINGS TO STABILISATION FIELD SHEET

	Time Elapsed	Time	Volume Removed (L)	Water Temp. (°C)	pH	EC ((µS/cm)	ORP (mV)	Dissolved Oxygen (mg/L)	Water Level (m)*	Turbidity (NTU) / Water Appearance†
Before	-	-	-	14.0	5.99	551	-	-	-	1.07
During										
During										
During										
During										
During										
During										
During										
During										
During										
During										

† CL=clear, CO=cloudy, TU=turbid, SI=silty, SA=sandy

Sample Train Volume Calculation (L)
(length of sample tube x 3.141 x d² / 4000) + flow through cell volume.
Where d = internal diameter of sample tube in mm

Comments: Tap inside hut. Sampled from hose attached to tap.

Water sample internal ø = 6mm ≈ 30mL per meter

DO sensor faulty - not reading.

Analyses Required: PFAS suite

Serial number of water quality sensor unit: _____

Shake test – foam produced? Yes No

COC form completed and checked? Yes No Letter given to landowner? Yes No

Location field sheet completed? Yes N/A Well field sheet completed? Yes N/A

Stabilisation criteria field sheet completed? Yes No

* = needs to be recorded each time you take a set of parameters

NZDF PFAS SAMPLING FORM (separate form for each primary sample)

Location: Ohakea / Woodbourne (circle as appropriate)

Job Number: A02684802 A02764114

Land owner: _____

Sample Code (Name): SW4

Address: _____

Date and time: 2.10.20

Weather: Fine

Coördinates: E
(NZTM) N

Sample point: tap / well / surface water

Sampled By: DH (Clean hands)
BT (Dirty hands)

Description of sample point: _____

Distance of sample point from bore: _____ (m)

Site Photos taken? Yes No

Sampling equipment: transfer bottle /
weighty gripper

Water use: Drinking water / Stock watering /
Fodder irrigation / Non-potable

QA/QA Sample Codes: -
Duplicate _____

Animals observed on site: Chickens / cows / sheep / pigs /
goats

Trip Blank _____

Minimum volume between readings: **1 sample train volume**
(see formula below)

Field Blank SWKAM

Rinsate Blank (include description of equipment cleaned e.g. dipper) _____

Key Stabilisation Criteria:

pH ± 0.1, EC ± 3%, T ± 3%, turbidity ± 10% of prior reading and ± 10 for values greater than 10 NTU

NOTE: purge until well has stabilised using field parameters below (3 consecutive readings)

TRANSFER FINAL READINGS TO STABILISATION FIELD SHEET

	Time Elapsed	Time	Volume Removed (L)	Water Temp. (°C)	pH	EC ((µS/cm)	ORP (mV)	Dissolved Oxygen (mg/L)	Water Level (m)*	Turbidity (NTU) / Water Appearance†
Before	-	-	-	11.7	6.49	372.3	-	-	-	19.31
During										
During										
During										
During										
During										
During										
During										
During										
During										

† CL=clear, CO=cloudy, TU=turbid, SI=silty, SA=sandy

Sample Train Volume Calculation (L)
(length of sample tube x 3.141 x d² / 4000) + flow through cell volume.
Where d = internal diameter of sample tube in mm
Water sample internal ø = 6mm ≈ 30mL per meter

Comments: DO not working.
Had to access sampling
point through ASMP gate. Down there by FH employee +
then needed to walk across paddocks to get to
stream.

Analyses Required: PFAS suite

Serial number of water quality sensor unit: _____

Shake test – foam produced? Yes No

COC form completed and checked? Yes Letter given to landowner? Yes

Location field sheet completed? Yes N/A Well field sheet completed? Yes N/A

Stabilisation criteria field sheet completed? Yes

* = needs to be recorded each time you take a set of parameters



Appendix E: QA/QC Sample Results

Table E-1: QA/QC Water Sampling Results - Per- and Poly-Fluoroalkyl Substances (PFAS) ¹

Sample Location	GW31	GW31	%RPD (GW31 and GWKAB)	MW6	MW6	%RPD (MW6 and GWKAE)
Sample Name	OHA_ADJ_GWKAB_1_290920	OHA_ADJ_GW31_4_290920		OHA_ADJ_GWKAE_1_300920	OHA_RUP_MW6_5_300920	
Laboratory Reference	2096315	2096319		2132127	2132127	
Monitoring Zone	Off base	Off base		On base	On base	
Sampled Date	29/09/2020	29/09/2020		30/09/2020	30/09/2020	
L-PFHxS	0.064	0.063	2	4.3	4.2	2
Mono-PFHxS	0.016	0.016	0	0.62	0.62	0
di-PFHxS	<0.001	<0.001	0	<0.025	<0.025	0
Total PFHxS	0.08	0.079	1	4.9	4.8	2
L-PFOS	0.013	0.013	0	8.4	6.5	26
Mono-PFOS	0.025	0.028	11	3.3	2.9	13
di-PFOS	0.0029	0.0034	16	0.15	0.13	14
Total PFOS	0.041	0.044	7	12	9.5	23
Sum of PFHxS and PFOS	0.12	0.12	0	17	14	19
PFOA	0.018	0.019	5	1.2	1.1	9
PFBA	0.049	0.047	4	1.3	1.4	7
PFHxA	0.12	0.12	0	2.3	2.2	4
PFPeA	0.16	0.15	6	3.2	3.2	0
PFHpA	0.044	0.042	5	1.1	1	10
PFDA	<0.001	<0.001	0	<0.025	<0.025	0
PFNA	0.0035	0.0039	11	0.85	0.75	13
PFDoDA	<0.001	<0.001	0	<0.1	<0.1	0
PFTeDA	-	-	-	<0.1	<0.1	0
PFTrDA	-	-	-	<0.1	<0.1	0
PFUnDA	<0.001	<0.001	0	<0.025	<0.025	0
PFBS	0.01	0.01	0	0.21	0.22	5
PFPrS	0.0046	0.0045	2	0.06	0.063	5
PFPeS	0.0089	0.0085	5	0.27	0.26	4
PFHpS	0.0017	0.0015	13	0.17	0.15	13
PFNS	<0.001	<0.001	0	<0.05	<0.05	0
PFDS	-	-	-	<0.1	<0.1	0
4:2 FTS	<0.001	<0.001	0	<0.025	<0.025	0
6:2 FTS	0.0051	0.0049	4	0.24	0.23	4
8:2 FTS	<0.001	<0.001	0	<0.1	<0.1	0
PFOSA	<0.001	<0.001	0	<0.025	<0.025	0
NMeFOSA-M	<0.001	<0.001	0	<0.1	<0.1	0
NMeFOSAA	<0.001	<0.001	0	<0.025	<0.025	0
NMeFOSE-M	<0.001	<0.001	0	<0.1	<0.1	0
NEtFOSA-M	<0.001	<0.001	0	<0.1	<0.1	0
NEtFOSAA	<0.001	<0.001	0	<0.025	<0.025	0
NEtFOSE-M	<0.001	<0.001	0	<0.1	<0.1	0

Notes:

1. Results in µg/L.

-	No value available
<0.001	Below the limit of reporting

NEW ZEALAND DEFENCE FORCE - SURFACE AND GROUNDWATER MONITORING FOR PFAS - RNZAF BASE OHAKEA
 Table E-2: QA/QC Water Sampling Results - Blanks - Per- and Poly-Fluoroalkyl Substances (PFAS) ¹

Sample Name	OHA_ADJ_GWKAC_1_290920	OHA_ADJ_GWKAD_1_290920	OHA_ADJ_GWKAF_1_300920	OHA_ADJ_GWKAG_1_300920	OHA_ADJ_GWKAH_1_011020	OHA_ADJ_GWKAI_1_011020	OHA_ADJ_GWKAJ_1_300920	OHA_ADJ_GWKAK_1_300920	OHA_ADJ_SWKAM_1_021020
Laboratory Reference	2096315	2096315	2096741	2096741	2096735	2096735	2096741	2096741	2094371
Sample Type	Field Blank	Trip Blank	Field Blank	Trip Blank	Field Blank	Trip Blank	Rinsate Blank - mighty gripper	Rinsate Blank - water level dipper	Field Blank
Sampled Date	29/09/2020	29/09/2020	30/09/2020	30/09/2020	1/10/2020	1/10/2020	30/09/2020	30/09/2020	2/10/2020
L-PFHxS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Mono-PFHxS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
di-PFHxS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Total PFHxS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
L-PFOS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Mono-PFOS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
di-PFOS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Total PFOS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sum of PFHxS and PFOS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
PFOA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
PFBA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
PFHxA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
PFPeA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
PFHpA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
PFDA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
PFNA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
PFDoDA	<0.001	<0.001	<0.001	<0.001	-	-	<0.001	<0.001	<0.001
PFTeDA	-	-	-	-	-	-	-	-	<0.001
PFTrDA	-	-	-	-	-	-	-	-	<0.001
PFUnDA	<0.001	<0.001	<0.001	<0.001	-	-	<0.001	<0.001	<0.001
PFBS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
PFPrS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
PFPeS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
PFHpS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
PFNS	<0.001	<0.001	-	-	-	-	-	-	<0.001
PFDS	-	-	-	-	-	-	-	-	-
4:2 FTS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
6:2 FTS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
8:2 FTS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
PFOSA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
NMeFOSA-M	<0.001	<0.001	-	-	-	-	-	-	-
NMeFOSAA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
NMeFOSE-M	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
NEtFOSA-M	<0.001	<0.001	-	-	-	-	-	-	-
NEtFOSAA	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001
NEtFOSE-M	<0.001	<0.001	<0.001	<0.001	-	-	<0.001	<0.001	-

Notes:

1. Results in µg/L.

-	No value available
<0.001	Below the limit of reporting



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