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Dear Kate and Huma

OHAKEA: SURFACE WATER AND GROUNDWATER MONITORING FOR PFAS, APRIL 2023

1.0 Introduction

Monitoring for per- and polyfluoroalkyl substances (PFAS) concentrations in groundwater and surface water was conducted between 3 and 5 April 2023 in accordance with the RNZAF Base Ohakea PFAS Investigation: Long Term Monitoring Plan (LTMP) (PDP, 2020a). This is the sixth round of monitoring following the implementation of the LTMP (PDP, 2020a). Previous monitoring rounds, undertaken in October 2020, March 2021, October 2021, March 2022 and September 2022 are reported in PDP (2020b), PDP (2021), PDP (2022a), PDP (2022b) and PDP (2023) respectively.

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 (PDP, 2019).

The scope of work included:

- The collection of groundwater samples from 19 groundwater wells or taps;
- The collection of surface water from 4 locations;
- The collection of 8 quality assurance/quality control (QA/QC) samples, including analysis of two duplicate samples; and
- Preparation of this report.

This letter reports the results of the monitoring undertaken at RNZAF Base Ohakea ("Ohakea" or the "base") at these sample locations, including a comparison with the findings of previous monitoring rounds (PDP, 2020b; PDP, 2021; PDP, 2022a; PDP, 2022b; PDP, 2023).

2.0 Methodology

2.1 Sampling Methodology

Sampling was undertaken by PDP field staff between 3 and 5 April 2023. Sampling was undertaken in accordance with procedures in Sampling and Analysis of Per- and Poly-fluorinated Substances (Ministry for the Environment (MfE), 2018).

All samples were couriered to AsureQuality laboratory under standard 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 A.

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

Table 1: Groundwater Monitoring Locations

Location		HRC Bore ID	Sampling Point	Rationale	Sampled
RNZAF Base Ohakea	MW4	323153	Monitoring Well	Key source area (historic fire training area (FTA)).	03/04/23
	WS1	323085	Tap	Farm bore downgradient of FTA and near site boundary with a long existing monitoring record.	04/04/23
	GW6	-	Well	Open well downgradient of key source areas and historically elevated PFAS concentrations.	04/04/23
	MW6	-	Monitoring Well	Key source area (run-up pit).	03/04/23
	MW9	-	Monitoring Well	Key source area (diversion tank for hangar deluge systems).	03/04/23
	WS2	313096	Tap	North-western plume edge (base drinking water supply).	04/04/23
	GW111.1	323183	Monitoring Well	Downgradient of FTA.	04/04/23
	GW111.2	323185	Monitoring Well	Downgradient of FTA. Deeper well (~40 m) to monitor the vertical extent of PFAS.	04/04/23
	GW111.3	323187	Monitoring Well	Downgradient of FTA. Deeper well (~95 m) to monitor the vertical extent of PFAS, targeting the deeper aquifer resource that may be used for groundwater abstraction.	04/04/23

Table 1: Groundwater Monitoring Locations

Location		HRC Bore ID	Sampling Point	Rationale	Sampled
Other (non-NZDF) private and public land	GW67	323173	Tap	North-eastern plume edge.	Not Sampled (Refer section 2.2)
	GW31	323091	Tap	Eastern plume edge.	04/04/23
	GW53	-	Tap	Eastern plume edge.	04/04/23
	GW65	323019	Tap	Southern plume edge.	05/04/23
	GW106	323175	Monitoring Well	Plume is predicted to approach and then encompass the shallow well into the future.	05/04/23
	GW107	323177	Monitoring Well	Act as a sentinel monitoring location e.g., to monitor the predicted maximum lateral edge of the future plume.	05/04/23
	GW108	323179	Monitoring Well	Plume is predicted to approach and then encompass the shallow well into the future.	05/04/23
	GW109	323181	Monitoring Well	Plume is predicted to approach and then encompass the shallow well into the future.	03/04/23
	GW112.1	-	Monitoring Well	Well near the centre of the main plume.	04/04/23
	GW112.2	-	Monitoring Well	Well near the centre of the main plume. Deeper well (~55 m) to monitor the vertical extent of PFAS.	04/04/23

Table 2: Surface Water Monitoring Locations

Location	Rationale	Sampled
SW6	Previous high PFAS concentrations leaving the base.	03/04/23
SW33	Resurgence of high PFAS concentrations on the Makowhai Stream downstream of the base. Accessible from the road.	05/04/23
SW36	Makowhai Stream just upstream from confluence with the Rangitikei River. To assess the maximum extent of PFAS in the Makowhai Stream.	05/04/23
SW4	Upstream location to assess whether PFAS is present in the Makowhai Stream before entering the base boundary.	05/04/23

2.2 Variations from Monitoring Plan

GW67 was not sampled as the pump was not working during the April 2023 monitoring round. The landowner was unable to fix the pump while the field staff were conducting the monitoring round.

2.3 Field Measurements

2.3.1 Water Level Measurements

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

Pressure transducer loggers were installed in all five of the nested wells (GW111.1, GW111.2, GW111.3, GW112.1 and GW112.2) during the October 2021 monitoring round, to continuously record groundwater pressures (levels) in the monitoring wells. The logger data was downloaded during the April 2023 monitoring round. Two loggers (from GW111.3 and GW112.2) were found to be faulty and were consequently removed from the monitoring wells and sent to Solinst for assessment. Both loggers were confirmed as having faulty electrical components, but the data was able to be retrieved. Both loggers have been reinstalled.

It is recommended that the vertical heights of the monitoring wells are surveyed relative to a common datum before a complete assessment is made. This will allow an accurate assessment and comparison of the groundwater levels within each well. Surveying of the wells was proposed to be undertaken during the April 2023 round; however, a surveyor was not available during the groundwater monitoring round. This will be reattempted during the September monitoring round.

2.3.2 Field Parameters

Using a YSI ProDSS multi-meter, and in accordance with the MfE (2018) guideline, 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 periodically throughout the monitoring round. Field sheets for each sample location are presented in Appendix C.

2.4 Antecedent Weather Conditions and Flow Conditions

The preceding two weeks had a cumulative rainfall of 40.1 mm. The majority of this rain (32.4 mm) fell on two separate days - 13 days (Tuesday 21 March, 16.2 mm) and six days (Tuesday 28 March, 16.2 mm) prior to the commencement of sampling. 13.6 mm of rain fell on the first day of sampling (3 April). The Rangitikei River and surrounding streams where surface water samples were collected were clear during the sampling round. The stream at SW4 and the drain at SW6 were observed to be flowing which allowed for samples to be collected.

2.5 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).
- Two field blank samples.
- Two 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 by AsureQuality Laboratory in Wellington. The results of the QA/QC sampling are reported in Appendix D and further discussed in Section 3.3.

3.0 Sample Results and Comparison to Selected Guideline Values

3.1 Selected Guidelines Values

Table 3 below shows the reference guideline values against which the results have been compared.

The *Water Services (Drinking Water Standards for New Zealand) Regulations 2022* came into effect on 14 November 2022. The updated standards include maximum allowable values (MAVs) for PFOA and the sum of PFOS+PFHxS. These MAVs are the same as the guideline values previously used in this monitoring report, therefore the PFOA and Sum of Total PFOS + PFHxS guideline concentrations have not changed from criterion in previous reports. The reference in Table 3 has been updated to reflect these new standards.

The Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG) (2018) draft default guideline values (DGVs) for PFOS in freshwater for 99%, 95%, 90% and 80% species protection were updated in May 2023[1]. The draft DGVs for PFOA have not been updated. The updated draft DGVs have increased compared to the previous values. The draft DGVs and the reference in Table 3 has been updated to reflect these new guidelines.

The draft PFAS National Environmental Management Plan (NEMP) version 3.0 has been released (November 2022) for consultation (HEPA, 2022). The relevant guidelines provided in the current version 2.0 of the NEMP are the same as those provided in the draft version 3.0. For the purposes of this report, the current NEMP version 2.0 is used, however it is noted that the ecological water quality guideline values provided in Table 5 of the NEMP 3.0 (HEPA, 2022) recommend a comparison to the ANZG (formerly ANZECC) exposure scenario for 99% species protection for slightly to moderately disturbed ecosystems. Therefore, the results from the April 2023 monitoring round have also been compared to the 99% species protection values. This is a more conservative guideline value than has historically been used in previous reports, first being used for comparison in the previous monitoring round (September, 2022). The recently updated draft DGV for 99% species protection for Total PFOS is 0.0091 µg/L[2].

[1] https://www.waterquality.gov.au/anz-guidelines/guideline-values/default/water-quality-toxicants/toxicants/draft-pfos-fresh-2023

[2] The previous draft DGV for 99% species protection for Total PFOS was 0.00023 µg/L.

Table 3: Environmental and Human Health Guidelines – Water

Media	Sum of Total PFOS + PFHxS	PFOA	Total PFHxS	Total PFOS	Source
Drinking Water	0.07 µg/L	0.56 µg/L	-	-	Drinking water standard [1]
Ecological Freshwater Guideline 95% ecosystem protection	-	220 µg/L [2]	-	0.48 µg/L [3]	ANZG
Ecological Freshwater Guideline – 99% ecosystem protection	-	19 µg/L [2]	-	0.0091 µg/L [3]	ANZG

Notes:

1. *Water Services (Drinking Water Standards for New Zealand) Regulations 2022, for PFOA, and Sum of Total PFOS + PFHxS.*
2. *Australian and New Zealand Guidelines for Fresh and Marine Water Quality – technical draft guideline values* as reproduced in *PFAS National Environmental Management Plan Version 2.0 – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.*
3. *ANZG 2023, Toxicant default guideline values for aquatic ecosystem protection: Perfluorooctane sulfonate (PFOS) in freshwater. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. CC BY 4.0. Australian and New Zealand Governments and Australian state and territory governments, Canberra, ACT, Australia.*

3.2 Sample Results and Comparison to Guideline Values

The analysis and discussion of sample results relates to concentrations of total perfluorooctane sulfonate (PFOS), total perfluorohexane sulfonate (PFHxS), the Sum of Total PFOS + PFHxS and perfluorooctanoic acid (PFOA), these are the compounds for which there is an applicable New Zealand and/or Australian guideline. When discussed as a collective, these will herein be referred to as 'the core PFAS compounds'. The sample analytical results for the core PFAS compounds are presented in Tables 4 and 5 with sample locations and results shown in Figure 2.

3.2.1 Groundwater Monitoring Wells

The results of the laboratory analyses for the core PFAS compounds in groundwater samples collected in April 2023 are provided in Table 4. PFAS results from all sampling rounds, and for all compounds in the laboratory PFAS suite, are presented in Table E-1, Appendix E.

Table 4: Groundwater Monitoring Results (April 2023 Sampling Round)

	Core PFAS Compounds (µg/L)		
Location	**Sum of Total PFOS + PFHxS**	**PFOA**	**Total PFOS**
WS1	0.23	0.031	0.042
WS2	0.0062	0.0015	0.0030
MW4	2.5	0.30	1.9
GW6	0.13	0.014	0.079
MW6	7.4	0.45	5.1
MW9	1.8	0.45	1.0
GW111.1	0.19	0.052	0.11
GW111.2	<0.001	<0.001	<0.001
GW111.3	<0.001	<0.001	<0.001
GW31	0.087	0.012	0.028
GW53	<0.001	<0.001	<0.001
GW65	<0.001	<0.001	<0.001
GW67	Not Sampled		
GW106	<0.001	<0.001	<0.001
GW107	<0.001	<0.001	<0.001
GW108	<0.001	<0.001	<0.001
GW109	<0.001	<0.001	<0.001
GW112.1	0.55	0.089	0.24
GW112.2	<0.001	<0.001	<0.001
Guideline Values	**Sum of Total PFOS + PFHxS**	**PFOA**	**Total PFOS**
Drinking Water [1]	0.07 µg/L	0.56 µg/L	-
Ecological Freshwater Guideline 95% ecosystem protection [2]	-	220 µg/L [2]	0.48 µg/L [3]
Ecological Freshwater Guideline 99% ecosystem protection [2]	-	19 µg/L [2]	0.0091 µg/L [3]

Notes:

1. *Water Services (Drinking Water Standards for New Zealand) Regulations 2022 (June 2022).*
2. *Australian and New Zealand Guidelines for Fresh and Marine Water Quality – technical draft guideline values* as reproduced in *PFAS National Environmental Management Plan Version 2.0 – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.*
3. *ANZG 2023, Toxicant default guideline values for aquatic ecosystem protection: Perfluorooctane sulfonate (PFOS) in freshwater. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. CC BY 4.0. Australian and New Zealand Governments and Australian state and territory governments, Canberra, ACT, Australia.*

For the April 2023 monitoring round a total of 18 groundwater samples were collected. The analytical results are summarised as follows:

- The Sum of Total PFOS + PFHxS was reported above the NZ Drinking Water Standard of 0.07 µg/L at eight locations. These were: WS1 (0.23 µg/L), MW4 (2.5 µg/L), GW6 (0.13 µg/L), MW6 (7.4 µg/L), MW9 (1.8 µg/L), GW111.1 (0.19 µg/L), GW31 (0.087 µg/L) and GW112.1 (0.55 µg/L). None of these wells are currently used for drinking water supply.
- Total PFOS exceeded the ANZG for the protection of 99% of freshwater species (0.0091 µg/L) in seven locations. These include MW4 (1.9 µg/L), MW6 (5.1 µg/L), GW111.1 (0.11 µg/L), GW112.1 (0.24 µg/L), MW9 (1 µg/L), WS1 (0.042 µg/L and, GW6 (0.079 µg/L).
- Groundwater samples exceeded the ANZG for the protection of 95% of freshwater species (0.48 µg/L) at three locations. These include: MW4 (1.9 µg/L), MW6 (5.1 µg/L) and MW9 (1 µg/L).
- The core PFAS compounds were detected at concentrations above the laboratory limit of reporting (LOR) but below the relevant guideline values at one location, WS2.
- The core PFAS compounds were not reported (i.e., below the laboratory LOR) at nine locations (GW111.2, GW111.3, GW53, GW65, GW106, GW107, GW108, GW109, and GW112.2).

3.2.2 Surface Water

The results of the laboratory analyses for the core PFAS compounds in surface water samples collected in April 2023 are provided in Table 5. PFAS results from all sampling rounds, and for all compounds in the laboratory PFAS suite, are presented in Table E-2, Appendix E.

Table 5: Surface Water Monitoring Results (April 2023 Sampling Round)

	Core PFAS Compounds (µg/L)		
Location	**Sum of Total PFOS + PFHxS**	**PFOA**	**Total PFOS**
SW4	0.0056	0.0022	0.0039
SW6	1.4	0.17	0.90
SW33	0.16	0.023	0.099
SW36	0.044	0.0064	0.018
Guideline Values	**Sum of Total PFOS + PFHxS**	**PFOA**	**Total PFOS**
Ecological Freshwater Guideline 95% ecosystem protection [1]	-	220 µg/L [1]	0.48 µg/L [2]
Ecological Freshwater Guideline 99% ecosystem protection [1]	-	19 µg/L [1]	0.0091 µg/L [2]

Notes:

1. *Australian and New Zealand Guidelines for Fresh and Marine Water Quality – technical draft guideline values* as reproduced in *PFAS National Environmental Management Plan Version 2.0 – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.*
2. *ANZG 2023, Toxicant default guideline values for aquatic ecosystem protection: Perfluorooctane sulfonate (PFOS) in freshwater. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. CC BY 4.0. Australian and New Zealand Governments and Australian state and territory governments, Canberra, ACT, Australia.*

For the April 2023 monitoring round a total of four surface water samples were collected. The analytical results are summarised as follows:

- SW6, SW33 and SW36 reported concentrations of PFOS above the ANZG for the protection of 99% of freshwater species.
- The concentration of Total PFOS in SW6 (0.9 µg/L) exceeded the 95% protection scenario. The 95% protection scenario is considered the most relevant guideline at the location of SW6 as this is a stormwater drain and is therefore considered a highly disturbed system.
- The core PFAS compounds were detected at concentrations above the LOR but below the 99% ecosystem protection guideline values at one location, SW4.

3.3 Quality Assurance/Quality Control Programme

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 D, and a summary is provided below.

- %RPDs for the PFAS compounds in the field duplicates ranged from 0 to 19% which is within the acceptable %RPD for duplicate samples.
- No PFAS compounds were detected above the laboratory LOR in the field blank samples, the trip blank samples or the equipment rinsate blanks.
- The results of the QA/QC assessment meet the data quality objectives for the sampling programme.

4.0 Discussion

4.1 Groundwater

In general, PFAS concentrations for the April 2023 monitoring round are within the historical ranges previously recorded at these locations. Time series plots showing a comparison of the sum of PFOS + PFHxS over time at select sampling locations is provided on Figure 3A.

4.1.1 On-base Monitoring Locations

With respect to previous monitoring at and downgradient of key PFAS source areas:

- Concentrations of the core PFAS compounds at GW6 have increased from the previous monitoring round and are all equal to, or higher than the highest concentrations previously recorded at this location. The Sum of Total PFOS and PFHxS was reported above the drinking water standard for the first time at this location since 2018. The reason for this increase is unknown.
- Concentrations of the core PFAS compounds at MW6 have decreased since the September 2022 monitoring and are at the lower end of historic ranges at this location.
- Concentrations of the core PFAS compounds at WS1 are slightly higher than previous rounds (being the highest recorded since sampling began at this location in 2018), but they are considered to be consistent with previous results.
- At MW9, concentrations of the core PFAS compounds have increased from those observed during September 2022 but remain within historic ranges for this location.

- At WS2 and MW4, concentrations of the core PFAS compounds remain within their historical ranges.
- This was the fifth monitoring round at GW111.1 and GW111.3 and the sixth round at GW111.2.
  - The Sum of Total PFOS + PFHxS in GW111.1 (0.19 µg/L) has decreased slightly to the September 2022 monitoring round and is only slightly above the lowest concentration (0.17 µg/L) detected in March 2021.
  - PFAS was not reported above the LOR in GW111.2
  - All PFAS compounds in GW111.3 were reported below the LOR, which is in agreement with the predicted groundwater conditions at this location. Two earlier monitoring rounds (October 2021 and March 2022) reported low levels of the Sum of Total PFHxS + PFOS in GW111.3. The source of PFAS during these sampling events is unknown and these results are not in line with the model predictions. Additional sampling rounds (as prescribed by the LTMP) will provide more information on PFAS concentrations at this location.

4.1.2 Off-base Monitoring Locations

Wells GW31, GW112.1 and GW112.2 are located within the main plume approximately 1 km downgradient of the base:

- At GW31, the Sum of Total PFOS and PFHxS was again reported above the drinking water standards (and within their historical ranges), consistent with previous monitoring rounds up to September 2022 when all PFAS compounds were reported below the LOR. The result from the September 2022 monitoring round was unexpected but was likely a result of the landowner switching to the new Sanson reticulated water supply prior to sampling. The landowner was present during this April 2023 monitoring round and confirmed that the sample was taken from the tap that accessed the bore.
- This was the fifth monitoring round at GW112.1 and GW112.2.
  - Similar to the September 2022 monitoring round, the core PFAS compounds were reported above the LOR (Sum of Total PFOS + PFHxS of 0.55 µg/L, total PFOS of 0.24 µg/L and PFOA of 0.089 µg/L) in the shallow well GW112.1 (screened from 3.5 to 9.5 m bgl). This remains in general agreement with, albeit lower than, the output from the PFAS groundwater model which predicted concentrations of the Sum of Total PFOS + PFHxS at this location and depth of ~0.8 µg/L to 1.4 µg/L.
  - PFAS compounds in GW112.2 were all reported below the LOR. This is consistent with the results from the September 2022 sampling round. This further confirms the theory that the anomalous sample results in March 2021 were likely the result of the inadvertent switching of samples GW112.1 and GW112.2 either in the field or in the laboratory.

Wells GW106, GW108 and GW109 have been installed downgradient of the main plume to monitor plume migration. The plume is predicted to approach and then encompass these wells into the future.

- No PFAS compounds have been reported in any monitoring rounds to date at GW106 and GW109.
- No PFAS compounds were reported at GW108 during the April 2023 monitoring round. A PFBA concentration was detected in the March 2021 and March 2022 monitoring rounds. The concentrations of PFBA detected at GW108 are only slightly above the LOR and PFBA has not been detected in the September monitoring rounds. Consequently, it is not certain that these results are representative of the groundwater conditions at this location. The PFAS plume (as Sum of Total PFOS + PFHxS) is modelled to reach GW108 in the future and it is possible that the detection of PFBA is an indicator of the leading edge of the plume, or it may be from another source and/or a laboratory or sampling related errors.

Wells GW53, GW65, GW67 and GW107 are sampled to monitor lateral plume extent:

- At GW53, GW65 and GW107 no PFAS has been reported in any monitoring rounds to date.
- GW67 was unable to be sampled as the landowner was unable to fix the pump during the monitoring round.

A comparison of the sampling results to the PFAS groundwater model (PDP, 2019) developed for the area continues to show relatively good agreement. The April 2023 results agree with the model prediction for GW106 (no PFAS detected); GW112 (PFAS present in the shallow aquifer but not the deeper aquifers) and GW111, (PFAS present in the shallow aquifer but not the deeper aquifer). As noted in Section 4.1.1, very low concentrations of PFAS have been detected in GW111.3 during the previous monitoring rounds. These results are unexpected and given the remaining sampling results, may be the result of sampling or laboratory related errors. Additional sampling as scheduled under the LTMP is required to determine actual groundwater conditions at this location.

PFBA historically detected in GW108 in the March 2021 and 2022 monitoring rounds was not reported in this monitoring round, nor the October 2020 or September 2021 and 2022 monitoring rounds. While it is possible that the low PFBA detected during the summer monitoring rounds may be the beginning of the PFAS plume encroaching on this location as theorised by the model, it is not certain at this stage. Further monitoring as scheduled under the LTMP is required to determine actual groundwater conditions at this location.

No obvious seasonal or rainfall induced patterns in PFAS concentrations at groundwater sampling locations are evident to date.

4.2 Transect

A comparison of select PFAS concentrations along a transect running northeast – southwest from the Base to GW106 has been undertaken. This direction generally follows the predicted shallow groundwater flow path[3]. Figure 4 shows the location of the transect A-A' and provides a plot showing the change in concentration of the sum of PFOS + PFHxS at select wells in the vicinity of this transect. The transect commences at GW67 which is immediately up hydraulic gradient from the Base, then passes through the fire training area (MW4, cross and downgradient WS1), the shallow wells GW111.1 and GW112.1 before terminating at GW106. The last six rounds of sampling are shown (note that there are only five rounds of data for GW67, GW106, GW111.1 and GW112.1). As expected, the plot shows the concentration of the sum of PFOS + PFHxS generally decreases with distance away from the Base.

4.3 Surface Water

A comparison of the concentration of total PFOS over time at select surface water sampling locations is provided on Figure 3B. Depending on the environment at the sample location, either the ANZG for the protection of 95% or 99% of freshwater species is shown on the time series plots. Thus, at SW6 which is a stormwater drain, the 95% draft DGV is shown. At all other locations the 99% draft DGV is shown.

The concentrations of the core PFAS compounds in the sample collected from SW33 in April 2023 are slightly higher than those reported during the September 2022 monitoring round (with the Sum of Total PFOS + PFHxS being at the highest recorded concentrations since February 2018) but are considered to be within historical ranges for this sample location.

Lower concentrations of the core PFAS compounds continue to be measured at SW36, after concentrations were reported above the laboratory LOR for the first time in March 2021

[3] It is important to keep in mind that the exact groundwater flow path is unknown and is likely to change seasonally depending on hydrologic conditions.

The core PFAS compounds were detected above the laboratory LOR at SW4, the upgradient sample location, during the April 2023 monitoring round. Detections of the core PFAS compounds above the laboratory LOR have only been reported in one monitoring round (March 2021) when the sample was collected from a stagnant pool. This is the first time that core PFAS compounds have been reported above the LOR when the stream has been flowing. The reason for this is unknown, and further monitoring as scheduled under the LTMP is required to determine actual surface water conditions at this location.

The concentrations of the core PFAS compounds in SW6 are lower than those reported in September 2022, but they remain within the historical ranges for this location.

The results from the April 2023 surface water sampling round are generally in agreement with those predicted by the PFAS groundwater model. No obvious seasonal or rainfall induced patterns in PFAS concentrations at surface water sample locations are evident to date.

5.0 Summary and Recommendations

Monitoring for per- and poly-fluoroalkyl substances (PFAS) in groundwater and surface water was conducted between 3 and 5 April 2023 in accordance with the RNZAF Base Ohakea PFAS Investigation: Long Term Monitoring Plan (PDP, 2020a). Eighteen groundwater and four surface water samples were collected from locations on, and adjacent to the base. In summary:

- The results from the April 2023 monitoring round are generally consistent with the results from the September 2022 monitoring round.
- PFAS has been detected at concentrations above the guideline values in eight groundwater samples collected in April 2023:
  - Two off-base groundwater sample (GW31 and GW112.1) exceed the NZ Drinking Water Standard (these wells are not currently being used for drinking water supply) and the ANZG ecological guideline value for the protection of freshwater species at the 99% level.
  - Six on-base groundwater samples exceed the NZ Drinking Water Standard (none of the wells are used for drinking water supply) and the ANZG for the protection of freshwater species at the 99% level. Three of these samples also exceed the ANZG for the protection of freshwater species at the 95% level.

A comparison of the April 2023 monitoring results with those from previous monitoring rounds shows the current groundwater and surface water PFAS concentrations are generally within the historical ranges recorded for these locations and in relatively good agreement with the PFAS groundwater model predictions (PDP, 2019a).

Concentrations of the core PFAS compounds at GW6 have increased from the previous monitoring round and are all equal to, or higher than the highest concentrations recorded previously at this location. No obvious seasonal or rainfall induced pattern is evident at this location to date. GW6 is also a large open well, with a large volume of water in it (i.e., it is not practicable to purge the amount of water needed to be completely confident that the sample is representing aquifer groundwater). As such, it is possible that this well does not represent true groundwater conditions at this location, but rather the water that has accumulated in the well itself. Additional sampling rounds (as scheduled in the LTMP) will allow a better understanding of the PFAS concentrations at this location.

Low concentrations of PFOS have previously been reported in GW111.2 (October 2021) and GW111.3 (October 2021 and March 2022). The presence of PFAS in these deeper wells does not fit with the model predictions. However, results from the current (and previous – September 2022) round of sampling did not report PFAS above the LOR in GW111.2 or GW111.3. This is consistent with the model predictions at these locations. Additional sampling rounds (as scheduled in the LTMP) will allow a better understanding

of the PFAS concentrations and will help to determine if the previous detections of PFAS are representative of the aquifer at these depths.

GW108 has historically reported PFBA during the March 2022 and March 2023 monitoring rounds. PFBA was not reported above the laboratory LOR during the current monitoring round. The model predicts movement of the plume towards GW108 and the detections may reflect seasonal variation in PFAS concentrations in the groundwater. However, it is not clear at this stage that these detections are representative of the shallow groundwater conditions.

No changes to the LTMP are recommended at this time. However, it is recommended that the vertical heights of the nested monitoring wells (GW111.1, GW111.2, GW111.3, GW112.1 and GW112.2) are surveyed relative to a common datum. This will allow an accurate assessment and comparison of the groundwater levels within each well.

6.0 References

ANZG, 2018. *Australian and New Zealand Guidelines for Fresh and Marine Water Quality.* https://www.waterquality.gov.au/anz-guidelines/guideline-values/default/water-quality-toxicants/search

HEPA, 2020. *PFAS National Environmental Management Plan Version 2.0*. Heads of EPAs Australia and New Zealand, January 2020.

HEPA, 2022. *Draft PFAS National Environmental Management Plan Version 3.0*. Heads of EPAs Australia and New Zealand, November 2022.

MfE, 2018. *Sampling and Analysis of Per- and Poly-fluorinated Substances.*

PDP, 2019. *RNZAF Base Ohakea PFAS Investigation: Comprehensive Site Investigation Report.* Pattle Delamore Partners (2019).

PDP, 2020a. *RNZAF Base Ohakea PFAS Investigation: Long Term Monitoring Plan (LTMP).* Pattle Delamore Partners (2020).

PDP, 2020b. *Ohakea: Surface Water and Groundwater Monitoring For PFAS, October 2020.* Pattle Delamore Partners (2020).

PDP, 2021. *Ohakea: Surface Water and Groundwater Monitoring For PFAS, March 2021.* Pattle Delamore Partners (2021).

PDP, 2022a. *Ohakea: Surface Water and Groundwater Monitoring For PFAS, October 2021.* Pattle Delamore Partners (2022).

PDP, 2022b. *Ohakea: Surface Water and Groundwater Monitoring For PFAS, March 2022.* Pattle Delamore Partners (2022).

PDP, 2023. *Ohakea: Surface Water and Groundwater Monitoring For PFAS, September 2022.* Pattle Delamore Partners (2023).

Water Services (Drinking Water Standards for New Zealand) Regulations 2022.

7.0 Limitations

This report has been prepared by Pattle Delamore Partners Limited (PDP) on the basis of information provided by New Zealand Defence Force and Horizons Regional Council. PDP has not independently verified the provided information and has relied upon it being accurate and sufficient for use by PDP in preparing the report. PDP accepts no responsibility for errors or omissions in, or the currency or sufficiency of, the provided information.

This report has been prepared by PDP on the specific instructions of New Zealand Defence Force and Horizons Regional Council for the limited purposes described in the report. PDP accepts no liability if the report is used for a different purpose or if it is used or relied on by any other person. Any such use or reliance will be solely at their own risk.

This assessment is limited to collection and analysis of groundwater and surface water samples from discrete sampling locations. Interpretations of subsurface conditions, including contaminant concentrations, are not guaranteed at distance away from the specific points of sampling.

This document has been prepared based on the March sampling and analysis round and the results from laboratory analysis. The site conditions as described in this document have been interpreted from, and are subject to, this information and its limitations and accordingly PDP does not represent that its interpretation accurately represents the full site conditions.

The laboratory test results provide an approximation of the concentration of the tested analytes and are subject to the inherent limitations of the laboratory techniques used for the tests.

Yours faithfully

PATTLE DELAMORE PARTNERS LIMITED

Prepared by

Tom Harvey

Environmental Geologist

Reviewed by

James Conway

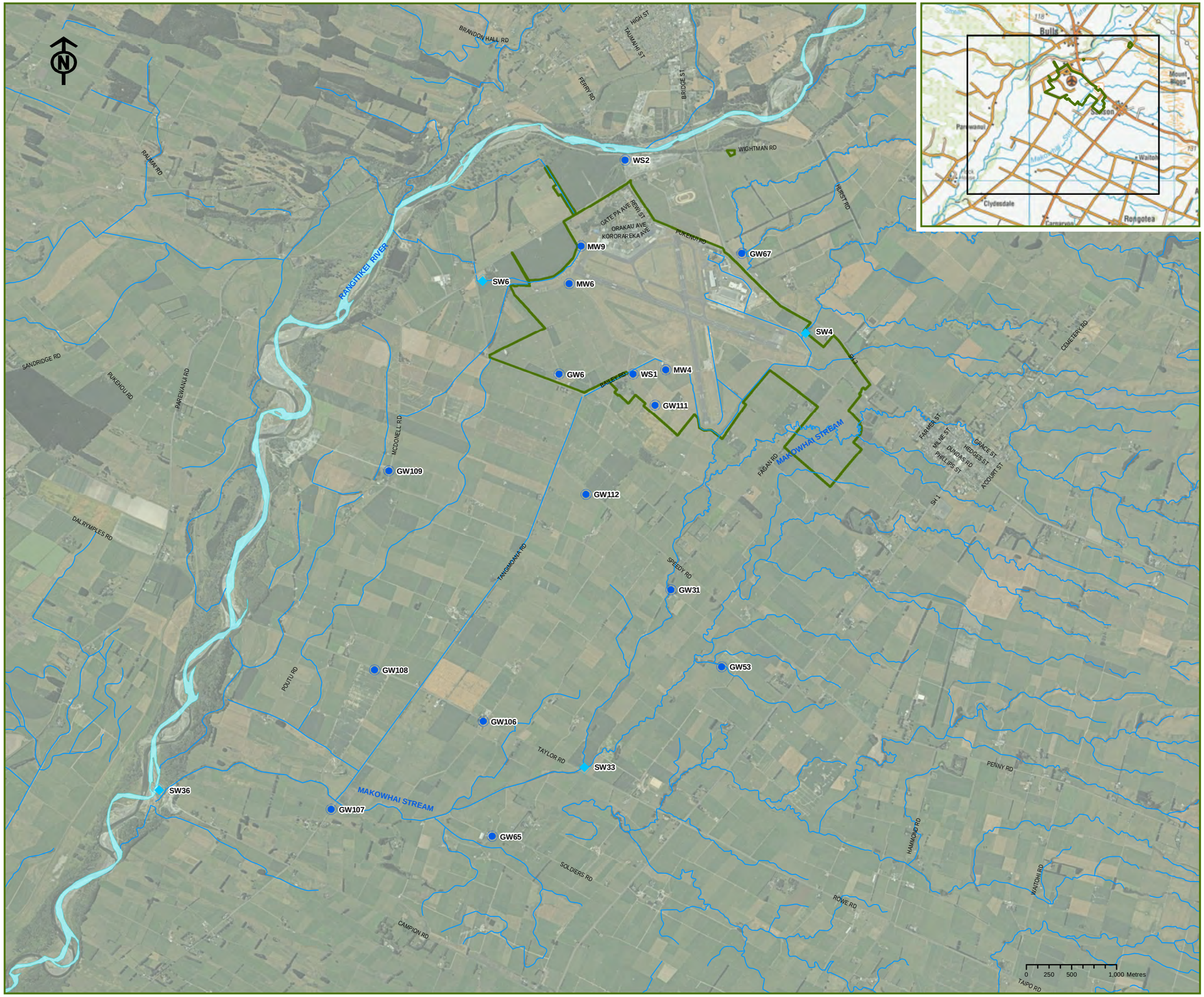
Service Leader – Contaminated Land

Approved by

Nerena Rhodes

Technical Director – Contaminated Land

Copy to: Dr Huma Saeed
Scientist - Groundwater
Horizons Regional Council
PALMERSTON NORTH



TE OPE KĀTUA O AOTEAROA DEFENCE FORCE

horizons REGIONAL COUNCIL

KEY :

Sample Type:

- Groundwater
- Surface water
- River/Streams/Drains
- RNZAF Base Ohakea Boundary

SOURCE:
Aerial imagery (flown 2020-2021) sourced from the LINZ data service https://data.linz.govt.nz/services;key=21407b1e26a04dc0a0de87cfd6381cc2/wmts/1.0.0/layer/110729/WMTSCapabilities.xml and licensed for re-use under the Creative Commons Attribution 4.0 International.
Cadastral andTopographic information supplied by LINZ.

NO.	REVISION HISTORY	DATE
A	FINAL	OCT 2023

PROJECT NAME:

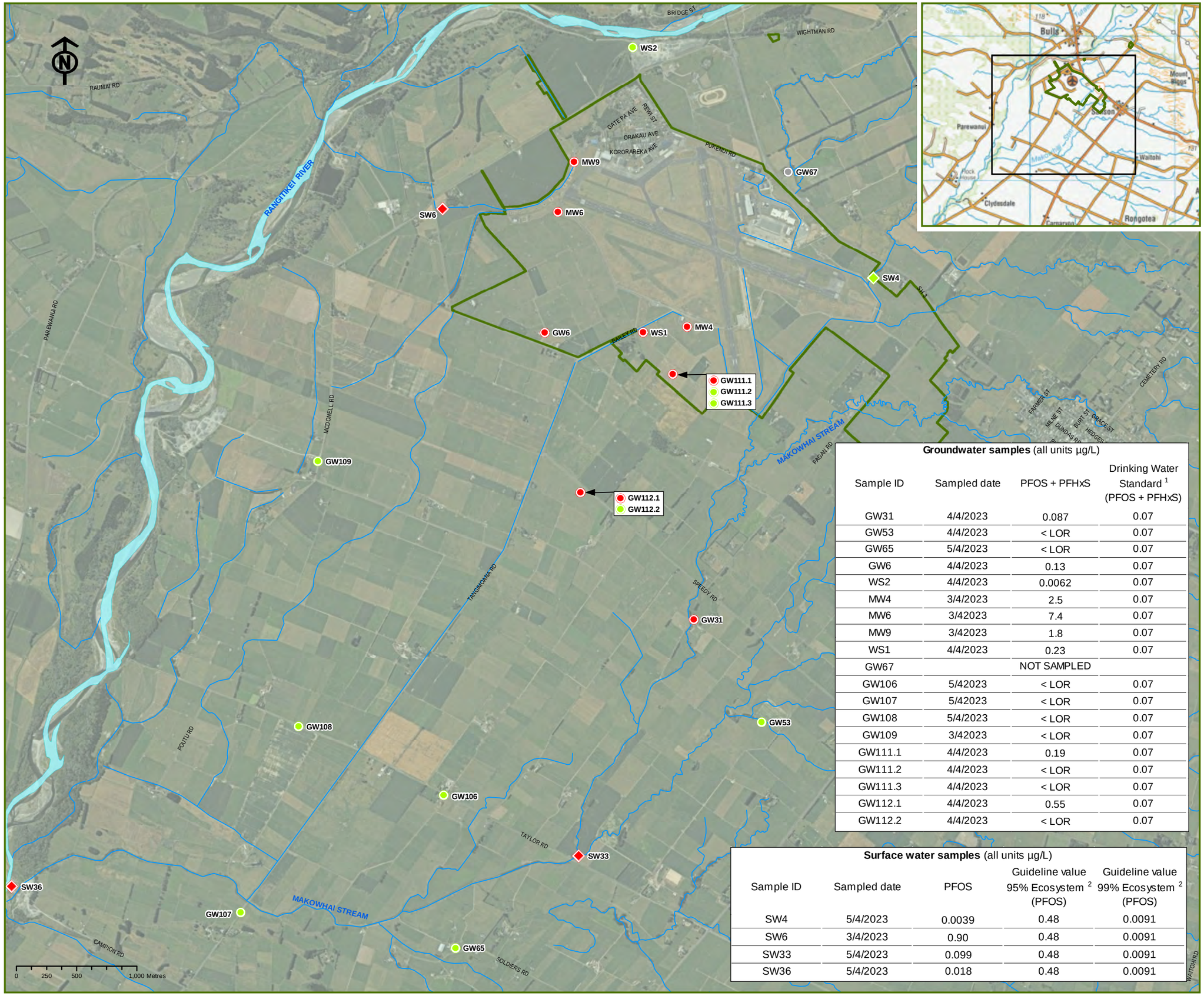
RNZAF BASE OHAKEA
PFAS INVESTIGATION:
LONG TERM
MONITORING PLAN

FIGURE TITLE:

SAMPLE LOCATION PLAN:
APRIL 2023

SCALE:		FIGURE NO.:	ISSUE NO.:
1:40,000	(A3)	1	A

A02744122GIS006_SampleLocationPlan_April231



Groundwater samples (all units µg/L)

Sample ID	Sampled date	PFOS + PFHxS	Drinking Water Standard [1] (PFOS + PFHxS)
GW31	4/4/2023	0.087	0.07
GW53	4/4/2023	< LOR	0.07
GW65	5/4/2023	< LOR	0.07
GW6	4/4/2023	0.13	0.07
WS2	4/4/2023	0.0062	0.07
MW4	3/4/2023	2.5	0.07
MW6	3/42023	7.4	0.07
MW9	3/42023	1.8	0.07
WS1	4/4/2023	0.23	0.07
GW67		NOT SAMPLED	
GW106	5/42023	< LOR	0.07
GW107	5/42023	< LOR	0.07
GW108	5/4/2023	< LOR	0.07
GW109	3/42023	< LOR	0.07
GW111.1	4/4/2023	0.19	0.07
GW111.2	4/4/2023	< LOR	0.07
GW111.3	4/4/2023	< LOR	0.07
GW112.1	4/4/2023	0.55	0.07
GW112.2	4/4/2023	< LOR	0.07

Surface water samples (all units µg/L)

Sample ID	Sampled date	PFOS	Guideline value 95% Ecosystem [2] (PFOS)	Guideline value 99% Ecosystem [2] (PFOS)
SW4	5/4/2023	0.0039	0.48	0.0091
SW6	3/4/2023	0.90	0.48	0.0091
SW33	5/4/2023	0.099	0.48	0.0091
SW36	5/4/2023	0.018	0.48	0.0091

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KEY :

Above relevant guidelines

- Groundwater
- Surface water

Below relevant guidelines

- Groundwater
- Surface water

Not sampled

- Groundwater
- River/Streams/Drains
- RNZAF Base Ohakea Boundary
- <LOR — Below laboratory limit of reporting.
- Concentration Exceeds Relevant Guideline/Standard

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

GUIDELINES USED:
1. Water Services (Drinking Water Standards for New Zealand) Regulations 2022.
2. ANZG 2023, Toxicant default guideline values for aquatic ecosystem protection: Perfluorooctane sulfonate (PFOS) in freshwater. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. Australian and New Zealand Governments and Australian state and territory governments, Canberra, ACT, Australia.

SOURCE:
Aerial imagery (flown 2020-2021) sourced from the LINZ data service https://data.linz.govt.nz and licensed for re-use under the Creative Commons Attribution 4.0 International.
Cadastral andTopographic information supplied by LINZ.

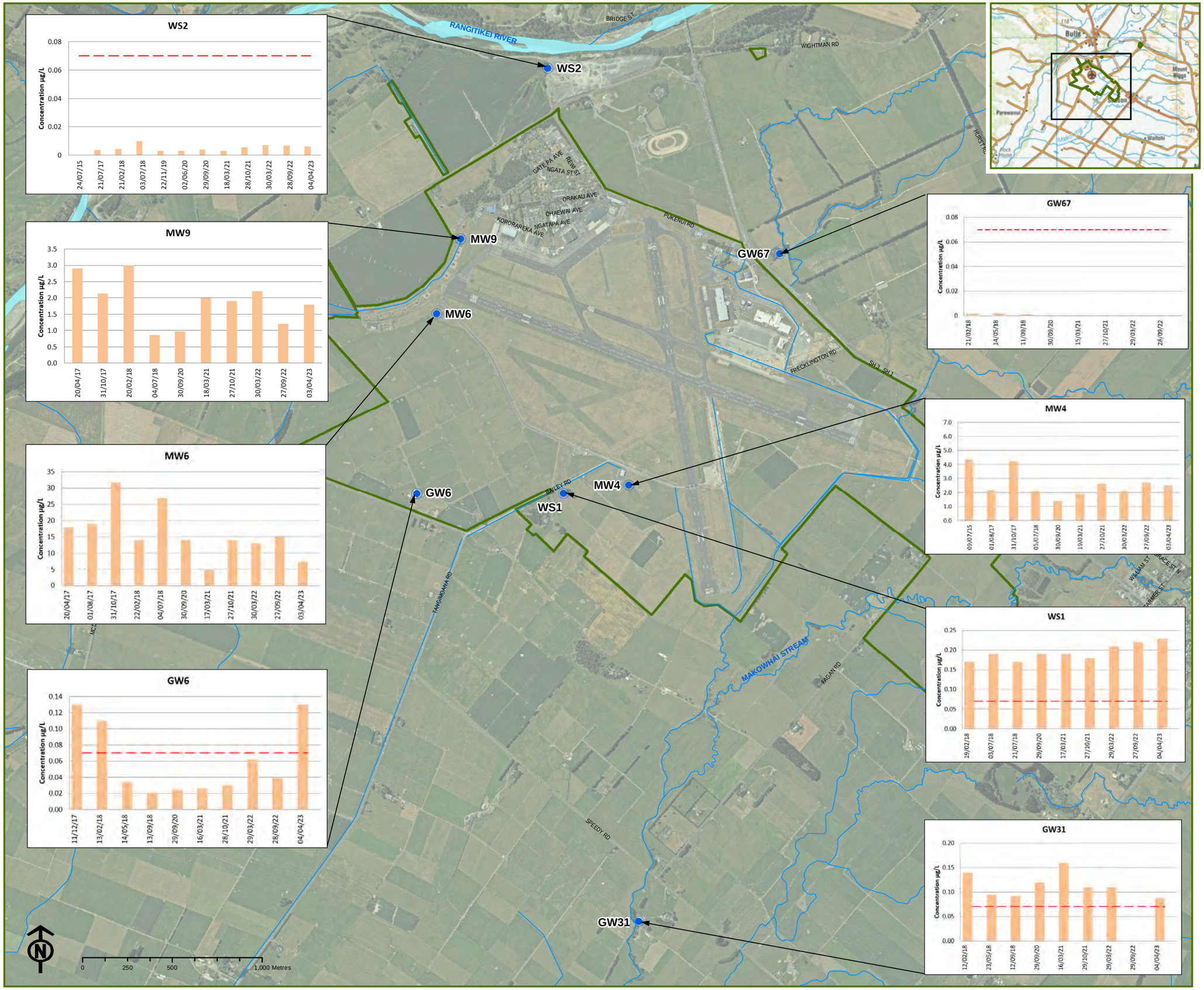
NO.	REVISION HISTORY	DATE
A	FINAL	OCT 2023

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

FIGURE TITLE:
SAMPLE EXCEEDENCES APRIL 2023

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

A02744122GIS007_SampleExc_April23



TE OPE KĀTUA O AOTEAROA DEFENCE FORCE

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MAP KEY :

Sample Type:

- Groundwater
- River/Streams/Drains
- RNZAF Base Ohakea Boundary

CHART KEY:

- Sum of PFOS+PFHxS (µg/L)
- NZ Drinking Water Standards (2022) for the sum of PFOS+PFHxS (µg/L)

NOTE:
1. Only sample locations with five or more sampling rounds have been shown.

2. The NZ Drinking Water Standard is only shown for sample locations that are currently, or were historically used as a potable supply.

SOURCE:
Aerial imagery (flown 2020-2021) sourced from the LINZ data service https://data.linz.govt.nz and licensed for re-use under the Creative Commons Attribution 4.0 International.
Cadastral andTopographic information supplied by LINZ.

NO.	REVISION HISTORY	DATE
A	FINAL	OCT 2023

PROJECT NAME:

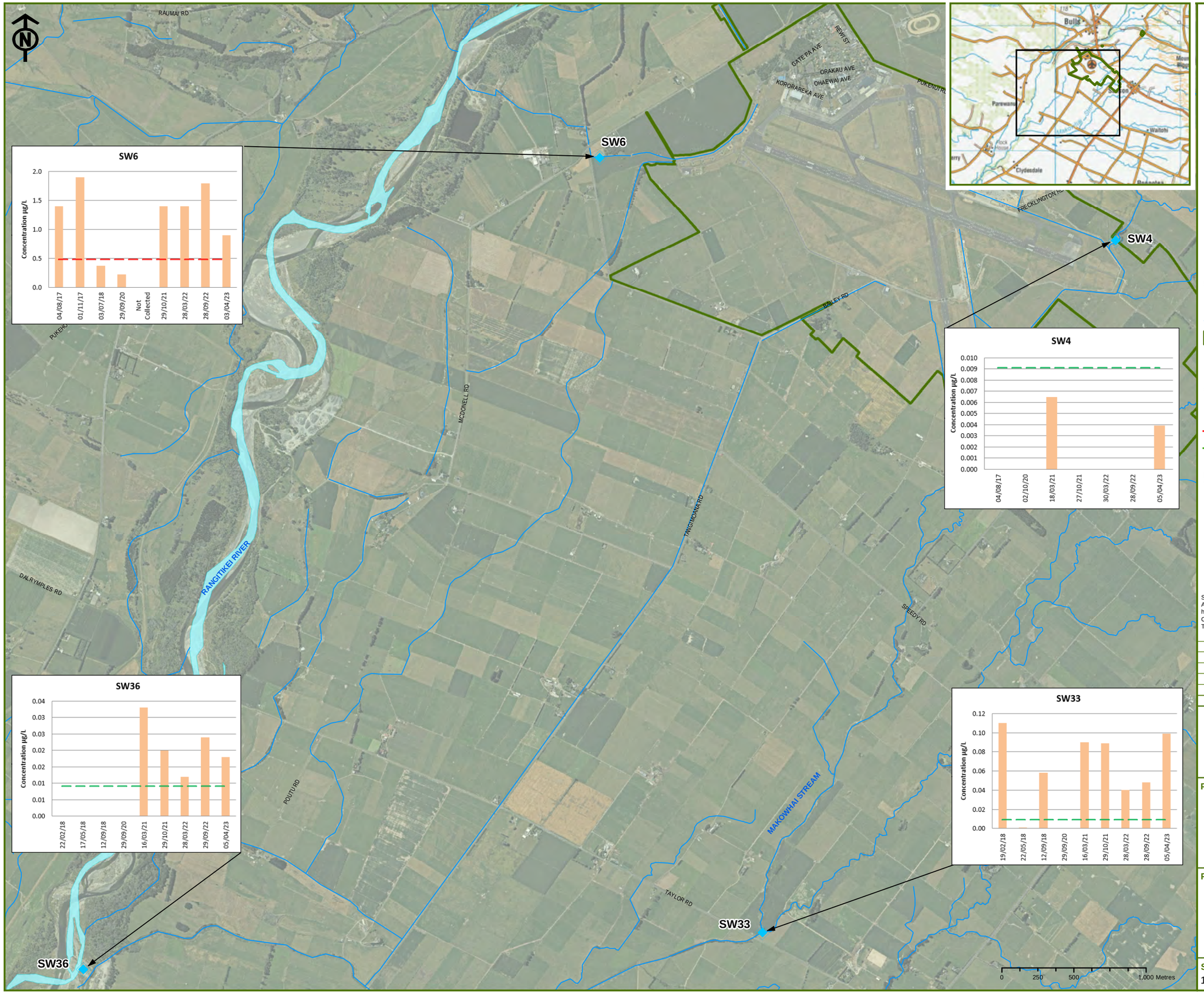
RNZAF BASE OHAKEA PFAS INVESTIGATION: LONG TERM MONITORING PLAN

FIGURE TITLE:

GROUNDWATER: CONCENTRATIONS OF PFOS+PFHXS OVER TIME FOR SELECT LOCATIONS: APRIL 2023

SCALE:	FIGURE NO.:	ISSUE NO.:
1:20,000 (A3)	3A	A

A02744122GIS008_Time_Series_GW_April23



TE OPE KĀTUA O AOTEAROA DEFENCE FORCE

horizons REGIONAL COUNCIL

MAP KEY :

Sample Type:

- Surface water
- River/Streams/Drains
- RNZAF Base Ohakea Boundary

CHART KEY:

- Total PFOS (µg/L)
- ANZG 95% Draft default guideline value for total PFOS (µg/L)
- ANZG 99% Draft default guideline value for total PFOS (µg/L)

NOTE:
1. Only sample locations with five or more sampling rounds have been shown

SOURCE:
Aerial imagery (flown 2020-2021) sourced from the LINZ data service https://data.linz.govt.nz and licensed for re-use under the Creative Commons Attribution 4.0 International.Cadastral and Topographic information supplied by LINZ.

NO.	REVISION HISTORY	DATE
A	FINAL	OCT 2023

PROJECT NAME:

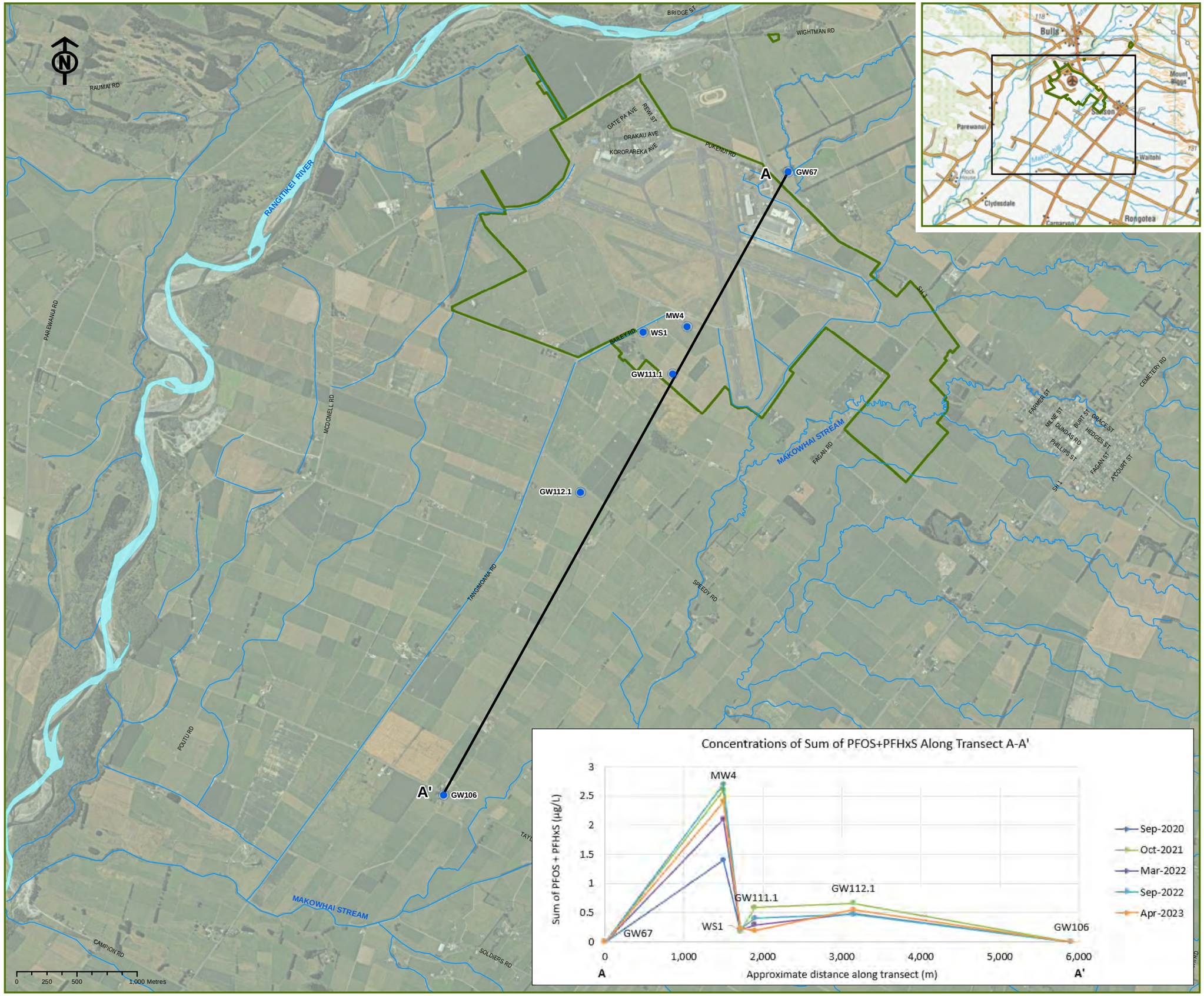
RNZAF BASE OHAKEA PFAS INVESTIGATION: LONG TERM MONITORING PLAN

FIGURE TITLE:

SURFACE WATER: CONCENTRATIONS OF PFOS OVER TIME FOR SELECT LOCATIONS: APRIL 2023

SCALE:	FIGURE NO.:	ISSUE NO.:
1:25,000 (A3)	3B	A

A02744122GIS009_Time_Series_SW_April23



TE OPE KĀTUA O AOTEAROA DEFENCE FORCE

horizons REGIONAL COUNCIL

KEY :

Sample Type:

- Groundwater
- River/Streams/Drains
- RNZAF Base Ohakea Boundary

SOURCE:
Aerial imagery (flown 2020-2021) sourced from the LINZ data service https://data.linz.govt.nz/services;key=21407b1e26a04dc0a0de87cfd6381cc2/wmts/1.0.0/layer/110729/WMTSCapabilities.xml and licensed for re-use under the Creative Commons Attribution 4.0 International.
Cadastral andTopographic information supplied by LINZ.

NO.	REVISION HISTORY	DATE
A	FINAL	OCT 2023

pdp

PROJECT NAME:

RNZAF BASE OHAKEA
PFAS INVESTIGATION:
LONG TERM
MONITORING PLAN

FIGURE TITLE:

GROUNDWATER
TRANSECT LINE

SCALE:		FIGURE NO.:	ISSUE NO.:
1:30,000	(A3)	4	A

A02744122GIS0010_Transec_April23

Appendix A: Laboratory Results

AsureQuality Limited | 1C Quadrant Drive | Waiwhetu | Lower Hutt 5010 | Wellington | New Zealand
PO Box 31242 | Lower Hutt 5040 | Wellington | New Zealand
t. +64 4 570 8800 | e. cswellington@asurequality.com | w. www.asurequality.com

Certificate of Analysis

Submission Reference: A02744123
Final Report

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

PO Number: OHA_PFAS

Report Issued: 20-Apr-2023 **AsureQuality Reference: 23-98920** **Sample(s) Received:** 04-Apr-2023 08:00

Testing Period: 04-Apr-2023 to 20-Apr-2023
Date of analysis is available on request.

Results

The tests were performed on the samples as received.

Customer Sample Name: OHA_SW6_030423 **Lab ID:** 23-98920-1

Sample Condition: Acceptable **Sampled Date**: 03-Apr-2023

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Non Potable Water - High Level			
Perfluoroalkylsulfonic acids			
PFPrS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	0.030	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	0.034	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	0.053	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	0.42	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	0.47	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)	0.38	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	0.52	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	0.90	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)
PFECHS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	0.34	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	0.24	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	0.15	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	0.17	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	0.12	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)

Test	Result	Unit	Method Reference
PFDoDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	<0.050	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	0.14	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
10:2 FTS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX)	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	103	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	95	%	AsureQuality Method (LC-MS/MS)
M8PFOS	110	%	AsureQuality Method (LC-MS/MS)
M4PFBA	98	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	103	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	96	%	AsureQuality Method (LC-MS/MS)
MPFHpA	99	%	AsureQuality Method (LC-MS/MS)
M8PFOA	99	%	AsureQuality Method (LC-MS/MS)
M9PFNA	104	%	AsureQuality Method (LC-MS/MS)
M6PFDA	93	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	104	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	93	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	34	%	AsureQuality Method (LC-MS/MS)
MPFOSA	99	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	92	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	97	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	103	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	92	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	93	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	95	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
M4:2FTS	102	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	96	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	97	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	87	%	AsureQuality Method (LC-MS/MS)

QC Results

Blank

Relates to sample(s) 23-98920-1

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Non Potable 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)
PFECHS	<0.025	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)
PFTrDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	<0.050	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)
10:2 FTS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX)	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	106	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	98	%	AsureQuality Method (LC-MS/MS)
M8PFOS	103	%	AsureQuality Method (LC-MS/MS)
M4PFBA	102	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	102	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	98	%	AsureQuality Method (LC-MS/MS)
MPFHpA	101	%	AsureQuality Method (LC-MS/MS)
M8PFOA	96	%	AsureQuality Method (LC-MS/MS)
M9PFNA	103	%	AsureQuality Method (LC-MS/MS)
M6PFDA	103	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	103	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	107	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	85	%	AsureQuality Method (LC-MS/MS)
MPFOSA	100	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	100	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	103	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	108	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	94	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	101	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	99	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	112	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	92	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	100	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	114	%	AsureQuality Method (LC-MS/MS)

Analysis Summary

Wellington Laboratory

Analysis	Method	Accreditation	Authorised by
Poly- and Perfluorinated Alkyl Substances (PFAS) in Non Potable 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)

Sum F-53B = The numerical sum of 9Cl-PF3ONS (F-53B major) and 11Cl-PF3OUdS (F-53B minor)

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 Non Potable 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
PFECHS	0.025 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
P37DMOA	0.050 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
10:2 FTS	0.025 µg/L
Telomere Carboxylic acids	
FPrPA (3:3FTA)	0.10 µg/L
FPePA (5:3FTA)	0.025 µg/L

FHpPA (7:3FTA)	0.025 µg/L
Miscellaneous	
F-53B (major)	0.10 µg/L
F-53B (minor)	0.050 µg/L
Sum F-53B	0.1 µg/L
ADONA	0.025 µg/L
HFPO-DA (GenX)	0.050 µg/L

Analyte Definitions

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

Analyte	Full Name
Perfluoroalkylsulfonic acids	
PFPrS	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
PFECHS	Perfluoro-4-ethylcyclohexanesulfonic 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
PFTrDA	Perfluoro-n-tridecanoic acid
PFTeDA	Perfluoro-n-tetradecanoic acid
P37DMOA	Perfluoro-3,7-dimethyloctanoic 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
10:2 FTS	1H,1H,2H,2H-perfluorododecanesulfonic acid
Telomere Carboxylic acids	
FPrPA (3:3FTA)	3-Perfluoropropyl propanoic acid

Analyte	Full Name
FPePA (5:3FTA)	3-Perfluoropentyl propanoic acid
FHpPA (7:3FTA)	3-Perfluoroheptyl propanoic acid
Miscellaneous	
F-53B (major)	9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid
F-53B (minor)	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid
Sum F-53B	Sum of F-53B components (major + minor)
ADONA	Dodecafluoro-3H-4,8-dioxanonanoic acid
HFPO-DA (GenX)	Tetrafluoro-2-(heptafluoropropoxy)propanoic 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
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
M3HFPO-DA	Tetrafluoro-2-(heptafluoropropoxy)-13C3-propanoic acid

LOR = Limit of Reporting LOD = Limit of Detection NR = Not Reportable

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Certificate of Analysis

Submission Reference: A02744122
Final Report

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

PO Number: OHA_PFAS

Report Issued: 20-Apr-2023 **AsureQuality Reference: 23-99037** **Sample(s) Received:** 04-Apr-2023 08:00

Testing Period: 04-Apr-2023 to 20-Apr-2023
Date of analysis is available on request.

Results

The tests were performed on the samples as received.

Customer Sample Name: OHA_MW4_030423 **Lab ID:** 23-99037-1

Sample Condition: Acceptable **Sampled Date**: 03-Apr-2023

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Non Potable Water - High Level			
Perfluoroalkylsulfonic acids			
PFPrS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	0.032	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	0.036	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	0.077	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	0.54	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	0.62	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	0.030	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	0.59	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	1.3	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	1.9	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	2.5	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)
PFECHS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	0.17	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	0.66	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	0.44	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	0.24	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	0.30	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	0.17	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)

Test	Result	Unit	Method Reference
PFDoDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	<0.050	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	0.40	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
10:2 FTS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX)	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	107	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	101	%	AsureQuality Method (LC-MS/MS)
M8PFOS	112	%	AsureQuality Method (LC-MS/MS)
M4PFBA	97	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	106	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	103	%	AsureQuality Method (LC-MS/MS)
MPFHpA	106	%	AsureQuality Method (LC-MS/MS)
M8PFOA	99	%	AsureQuality Method (LC-MS/MS)
M9PFNA	106	%	AsureQuality Method (LC-MS/MS)
M6PFDA	103	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	112	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	104	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	75	%	AsureQuality Method (LC-MS/MS)
MPFOSA	101	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	92	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	96	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	115	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	102	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	99	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	101	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
M4:2FTS	103	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	92	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	98	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	122	%	AsureQuality Method (LC-MS/MS)

QC Results

Blank

Relates to sample(s) 23-99037-1

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Non Potable 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)
PFECHS	<0.025	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)
PFTrDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	<0.050	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)
10:2 FTS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX)	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	106	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	98	%	AsureQuality Method (LC-MS/MS)
M8PFOS	103	%	AsureQuality Method (LC-MS/MS)
M4PFBA	102	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	102	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	98	%	AsureQuality Method (LC-MS/MS)
MPFHpA	101	%	AsureQuality Method (LC-MS/MS)
M8PFOA	96	%	AsureQuality Method (LC-MS/MS)
M9PFNA	103	%	AsureQuality Method (LC-MS/MS)
M6PFDA	103	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	103	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	107	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	85	%	AsureQuality Method (LC-MS/MS)
MPFOSA	100	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	100	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	103	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	108	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	94	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	101	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	99	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	112	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	92	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	100	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	114	%	AsureQuality Method (LC-MS/MS)

Analysis Summary

Wellington Laboratory

Analysis	Method	Accreditation	Authorised by
Poly- and Perfluorinated Alkyl Substances (PFAS) in Non Potable 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)

Sum F-53B = The numerical sum of 9Cl-PF3ONS (F-53B major) and 11Cl-PF3OUdS (F-53B minor)

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 Non Potable 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
PFECHS	0.025 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
P37DMOA	0.050 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
10:2 FTS	0.025 µg/L
Telomere Carboxylic acids	
FPrPA (3:3FTA)	0.10 µg/L
FPePA (5:3FTA)	0.025 µg/L

FHpPA (7:3FTA)	0.025 µg/L
Miscellaneous	
F-53B (major)	0.10 µg/L
F-53B (minor)	0.050 µg/L
Sum F-53B	0.1 µg/L
ADONA	0.025 µg/L
HFPO-DA (GenX)	0.050 µg/L

Analyte Definitions

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

Analyte	Full Name
Perfluoroalkylsulfonic acids	
PFPrS	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
PFECHS	Perfluoro-4-ethylcyclohexanesulfonic 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
PFTrDA	Perfluoro-n-tridecanoic acid
PFTeDA	Perfluoro-n-tetradecanoic acid
P37DMOA	Perfluoro-3,7-dimethyloctanoic 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
10:2 FTS	1H,1H,2H,2H-perfluorododecanesulfonic acid
Telomere Carboxylic acids	
FPrPA (3:3FTA)	3-Perfluoropropyl propanoic acid

Analyte	Full Name
FPePA (5:3FTA)	3-Perfluoropentyl propanoic acid
FHpPA (7:3FTA)	3-Perfluoroheptyl propanoic acid
Miscellaneous	
F-53B (major)	9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid
F-53B (minor)	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid
Sum F-53B	Sum of F-53B components (major + minor)
ADONA	Dodecafluoro-3H-4,8-dioxanonanoic acid
HFPO-DA (GenX)	Tetrafluoro-2-(heptafluoropropoxy)propanoic 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
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
M3HFPO-DA	Tetrafluoro-2-(heptafluoropropoxy)-13C3-propanoic acid

LOR = Limit of Reporting LOD = Limit of Detection NR = Not Reportable

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Certificate of Analysis

Submission Reference: A02744122
Final Report

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

PO Number: OHA_PFAS

Report Issued: 20-Apr-2023 **AsureQuality Reference: 23-99043** **Sample(s) Received:** 04-Apr-2023 08:00

Testing Period: 04-Apr-2023 to 20-Apr-2023
Date of analysis is available on request.

Results

The tests were performed on the samples as received.

Customer Sample Name: OHA_MW6_030423 **Lab ID:** 23-99043-1

Sample Condition: Acceptable **Sampled Date**: 03-Apr-2023

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Non Potable Water - High Level			
Perfluoroalkylsulfonic acids			
PFPrS	0.030	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	0.11	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	0.12	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	0.28	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	2.0	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	2.3	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	0.087	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	0.097	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	1.7	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	3.3	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	5.1	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	7.4	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)
PFECHS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	0.37	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	1.1	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	0.78	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	0.39	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	0.45	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	0.41	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)

Test	Result	Unit	Method Reference
PFDoDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	<0.050	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	0.32	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
10:2 FTS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX)	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	103	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	97	%	AsureQuality Method (LC-MS/MS)
M8PFOS	99	%	AsureQuality Method (LC-MS/MS)
M4PFBA	97	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	103	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	103	%	AsureQuality Method (LC-MS/MS)
MPFHpA	102	%	AsureQuality Method (LC-MS/MS)
M8PFOA	102	%	AsureQuality Method (LC-MS/MS)
M9PFNA	97	%	AsureQuality Method (LC-MS/MS)
M6PFDA	95	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	96	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	98	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	69	%	AsureQuality Method (LC-MS/MS)
MPFOSA	98	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	98	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	103	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	98	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	88	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	97	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	99	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
M4:2FTS	105	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	94	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	91	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	83	%	AsureQuality Method (LC-MS/MS)

QC Results

Blank

Relates to sample(s) 23-99043-1

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Non Potable 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)
PFECHS	<0.025	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)
PFTrDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	<0.050	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)
10:2 FTS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX)	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	106	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	98	%	AsureQuality Method (LC-MS/MS)
M8PFOS	103	%	AsureQuality Method (LC-MS/MS)
M4PFBA	102	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	102	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	98	%	AsureQuality Method (LC-MS/MS)
MPFHpA	101	%	AsureQuality Method (LC-MS/MS)
M8PFOA	96	%	AsureQuality Method (LC-MS/MS)
M9PFNA	103	%	AsureQuality Method (LC-MS/MS)
M6PFDA	103	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	103	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	107	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	85	%	AsureQuality Method (LC-MS/MS)
MPFOSA	100	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	100	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	103	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	108	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	94	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	101	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	99	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	112	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	92	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	100	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	114	%	AsureQuality Method (LC-MS/MS)

Analysis Summary

Wellington Laboratory

Analysis	Method	Accreditation	Authorised by
Poly- and Perfluorinated Alkyl Substances (PFAS) in Non Potable 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)

Sum F-53B = The numerical sum of 9Cl-PF3ONS (F-53B major) and 11Cl-PF3OUdS (F-53B minor)

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 Non Potable 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
PFECHS	0.025 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
P37DMOA	0.050 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
10:2 FTS	0.025 µg/L
Telomere Carboxylic acids	
FPrPA (3:3FTA)	0.10 µg/L
FPePA (5:3FTA)	0.025 µg/L

FHpPA (7:3FTA)	0.025 µg/L
Miscellaneous	
F-53B (major)	0.10 µg/L
F-53B (minor)	0.050 µg/L
Sum F-53B	0.1 µg/L
ADONA	0.025 µg/L
HFPO-DA (GenX)	0.050 µg/L

Analyte Definitions

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

Analyte	Full Name
Perfluoroalkylsulfonic acids	
PFPrS	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
PFECHS	Perfluoro-4-ethylcyclohexanesulfonic 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
PFTrDA	Perfluoro-n-tridecanoic acid
PFTeDA	Perfluoro-n-tetradecanoic acid
P37DMOA	Perfluoro-3,7-dimethyloctanoic 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
10:2 FTS	1H,1H,2H,2H-perfluorododecanesulfonic acid
Telomere Carboxylic acids	
FPrPA (3:3FTA)	3-Perfluoropropyl propanoic acid

Analyte	Full Name
FPePA (5:3FTA)	3-Perfluoropentyl propanoic acid
FHpPA (7:3FTA)	3-Perfluoroheptyl propanoic acid
Miscellaneous	
F-53B (major)	9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid
F-53B (minor)	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid
Sum F-53B	Sum of F-53B components (major + minor)
ADONA	Dodecafluoro-3H-4,8-dioxanonanoic acid
HFPO-DA (GenX)	Tetrafluoro-2-(heptafluoropropoxy)propanoic 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
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
M3HFPO-DA	Tetrafluoro-2-(heptafluoropropoxy)-13C3-propanoic acid

LOR = Limit of Reporting LOD = Limit of Detection NR = Not Reportable

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Certificate of Analysis

Submission Reference: A02744122
Final Report

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

PO Number: OHA_PFAS

Report Issued: 20-Apr-2023 **AsureQuality Reference: 23-99049** **Sample(s) Received:** 04-Apr-2023 08:00

Testing Period: 04-Apr-2023 to 20-Apr-2023
Date of analysis is available on request.

Results

The tests were performed on the samples as received.

Customer Sample Name: OHA-MW9_030423 **Lab ID:** 23-99049-1

Sample Condition: Acceptable **Sampled Date**: 03-Apr-2023

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Non Potable Water - High Level			
Perfluoroalkylsulfonic acids			
PFPrS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	0.045	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	0.048	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	0.090	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	0.72	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	0.81	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	0.030	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	0.039	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	0.45	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	0.56	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	1.0	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	1.8	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)
PFECHS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	0.40	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	1.5	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	0.85	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	0.45	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	0.45	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	0.27	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)

Test	Result	Unit	Method Reference
PFDoDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	<0.050	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	1.7	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
10:2 FTS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX)	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	109	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	102	%	AsureQuality Method (LC-MS/MS)
M8PFOS	115	%	AsureQuality Method (LC-MS/MS)
M4PFBA	104	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	114	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	105	%	AsureQuality Method (LC-MS/MS)
MPFHpA	108	%	AsureQuality Method (LC-MS/MS)
M8PFOA	110	%	AsureQuality Method (LC-MS/MS)
M9PFNA	113	%	AsureQuality Method (LC-MS/MS)
M6PFDA	117	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	99	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	101	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	71	%	AsureQuality Method (LC-MS/MS)
MPFOSA	100	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	93	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	101	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	111	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	102	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	100	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	101	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
M4:2FTS	99	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	105	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	111	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	91	%	AsureQuality Method (LC-MS/MS)

QC Results

Blank

Relates to sample(s) 23-99049-1

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Non Potable 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)
PFECHS	<0.025	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)
PFTrDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	<0.050	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)
10:2 FTS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX)	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	106	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	98	%	AsureQuality Method (LC-MS/MS)
M8PFOS	103	%	AsureQuality Method (LC-MS/MS)
M4PFBA	102	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	102	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	98	%	AsureQuality Method (LC-MS/MS)
MPFHpA	101	%	AsureQuality Method (LC-MS/MS)
M8PFOA	96	%	AsureQuality Method (LC-MS/MS)
M9PFNA	103	%	AsureQuality Method (LC-MS/MS)
M6PFDA	103	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	103	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	107	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	85	%	AsureQuality Method (LC-MS/MS)
MPFOSA	100	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	100	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	103	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	108	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	94	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	101	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	99	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	112	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	92	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	100	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	114	%	AsureQuality Method (LC-MS/MS)

Analysis Summary

Wellington Laboratory

Analysis	Method	Accreditation	Authorised by
Poly- and Perfluorinated Alkyl Substances (PFAS) in Non Potable 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)

Sum F-53B = The numerical sum of 9Cl-PF3ONS (F-53B major) and 11Cl-PF3OUdS (F-53B minor)

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 Non Potable 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
PFECHS	0.025 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
P37DMOA	0.050 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
10:2 FTS	0.025 µg/L
Telomere Carboxylic acids	
FPrPA (3:3FTA)	0.10 µg/L
FPePA (5:3FTA)	0.025 µg/L

FHpPA (7:3FTA)	0.025 µg/L
Miscellaneous	
F-53B (major)	0.10 µg/L
F-53B (minor)	0.050 µg/L
Sum F-53B	0.1 µg/L
ADONA	0.025 µg/L
HFPO-DA (GenX)	0.050 µg/L

Analyte Definitions

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

Analyte	Full Name
Perfluoroalkylsulfonic acids	
PFPrS	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
PFECHS	Perfluoro-4-ethylcyclohexanesulfonic 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
PFTrDA	Perfluoro-n-tridecanoic acid
PFTeDA	Perfluoro-n-tetradecanoic acid
P37DMOA	Perfluoro-3,7-dimethyloctanoic 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
10:2 FTS	1H,1H,2H,2H-perfluorododecanesulfonic acid
Telomere Carboxylic acids	
FPrPA (3:3FTA)	3-Perfluoropropyl propanoic acid

Analyte	Full Name
FPePA (5:3FTA)	3-Perfluoropentyl propanoic acid
FHpPA (7:3FTA)	3-Perfluoroheptyl propanoic acid
Miscellaneous	
F-53B (major)	9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid
F-53B (minor)	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid
Sum F-53B	Sum of F-53B components (major + minor)
ADONA	Dodecafluoro-3H-4,8-dioxanonanoic acid
HFPO-DA (GenX)	Tetrafluoro-2-(heptafluoropropoxy)propanoic 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
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
M3HFPO-DA	Tetrafluoro-2-(heptafluoropropoxy)-13C3-propanoic acid

LOR = Limit of Reporting LOD = Limit of Detection NR = Not Reportable

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Certificate of Analysis

Submission Reference: A02744123
Final Report

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

PO Number: OHA_PFAS

Report Issued: 21-Apr-2023 **AsureQuality Reference: 23-99054** **Sample(s) Received:** 04-Apr-2023 08:00

Testing Period: 04-Apr-2023 to 21-Apr-2023
Date of analysis is available on request.

Results

The tests were performed on the samples as received.

Customer Sample Name: OHA_GW109_030423 **Lab ID:** 23-99054-1

Sample Condition: Acceptable **Sampled Date**: 03-Apr-2023

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

Test	Result	Unit	Method Reference
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)
P37DMOA	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)
10:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	NR	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	NR	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	NR	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	NR (P)	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	128	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	145	%	AsureQuality Method (LC-MS/MS)
M8PFOS	215 (R)	%	AsureQuality Method (LC-MS/MS)
M4PFBA	93	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	108	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	112	%	AsureQuality Method (LC-MS/MS)
MPFHpA	118	%	AsureQuality Method (LC-MS/MS)
M8PFOA	116	%	AsureQuality Method (LC-MS/MS)
M9PFNA	140	%	AsureQuality Method (LC-MS/MS)
M6PFDA	192 (R)	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	246 (R)	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	234 (R)	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	143	%	AsureQuality Method (LC-MS/MS)
MPFOSA	110	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	142	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	135	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	218 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	169 (R)	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	107	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	89	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
M4:2FTS	154 (R)	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	80	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	148	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	92	%	AsureQuality Method (LC-MS/MS)

P = Partial result - one or more individual components could not be reported

R = Recovery outside method limits

Customer Sample Name: OHA_GWKQD_030423 **Lab ID:** 23-99054-2

Sample Condition: Acceptable **Sampled Date**: 03-Apr-2023

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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)
PFECHS	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)
P37DMOA	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)

Test	Result	Unit	Method Reference
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)
10:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	NR	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	NR	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	NR	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	NR (P)	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	125	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	156 (R)	%	AsureQuality Method (LC-MS/MS)
M8PFOS	238 (R)	%	AsureQuality Method (LC-MS/MS)
M4PFBA	111	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	112	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	116	%	AsureQuality Method (LC-MS/MS)
MPFHpA	118	%	AsureQuality Method (LC-MS/MS)
M8PFOA	126	%	AsureQuality Method (LC-MS/MS)
M9PFNA	152 (R)	%	AsureQuality Method (LC-MS/MS)
M6PFDA	197 (R)	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	238 (R)	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	324 (R)	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	76	%	AsureQuality Method (LC-MS/MS)
MPFOSA	127	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	154 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	160 (R)	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	281 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	190 (R)	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	128	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	105	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	110	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	83	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	182 (R)	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	101	%	AsureQuality Method (LC-MS/MS)

P = Partial result - one or more individual components could not be reported

R = Recovery outside method limits

QC Results

Blank

Relates to sample(s) 23-99054-1, 23-99054-2

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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)
PFECHS	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)
P37DMOA	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)

Test	Result	Unit	Method Reference
8:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
10:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	NR	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	NR	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	NR	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	NR (P)	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	91	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	69	%	AsureQuality Method (LC-MS/MS)
M8PFOS	50	%	AsureQuality Method (LC-MS/MS)
M4PFBA	98	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	100	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	89	%	AsureQuality Method (LC-MS/MS)
MPFHpA	83	%	AsureQuality Method (LC-MS/MS)
M8PFOA	72	%	AsureQuality Method (LC-MS/MS)
M9PFNA	60	%	AsureQuality Method (LC-MS/MS)
M6PFDA	58	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	51	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	40	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	65	%	AsureQuality Method (LC-MS/MS)
MPFOSA	93	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	221 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	260 (R)	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	55	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	57	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	124	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	114	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	105	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	55	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	81	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	83	%	AsureQuality Method (LC-MS/MS)

P = Partial result - one or more individual components could not be reported

R = Recovery outside method limits

Analysis Summary

Wellington Laboratory

Analysis	Method	Accreditation	Authorised by
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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)

Sum F-53B = The numerical sum of 9Cl-PF3ONS (F-53B major) and 11Cl-PF3OUdS (F-53B minor)

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 Potable Water - AsureQuality Method (LC-MS/MS)

Analyte	LOR
Perfluoroalkylsulfonic acids	
PFPrS	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
PFECHS	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
P37DMOA	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
10:2 FTS	0.0010 µg/L
Telomere Carboxylic acids	
FPrPA (3:3FTA)	0.0010 µg/L
FPePA (5:3FTA)	0.0010 µg/L

FHpPA (7:3FTA)	NR µg/L
Miscellaneous	
F-53B (major)	NR µg/L
F-53B (minor)	NR µg/L
Sum F-53B	NR µg/L
ADONA	0.0010 µg/L
HFPO-DA (GenX)	0.0010 µg/L

Analyte Definitions

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

Analyte	Full Name
Perfluoroalkylsulfonic acids	
PFPrS	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
PFECHS	Perfluoro-4-ethylcyclohexanesulfonic 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
PFTrDA	Perfluoro-n-tridecanoic acid
PFTeDA	Perfluoro-n-tetradecanoic acid
P37DMOA	Perfluoro-3,7-dimethyloctanoic 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
10:2 FTS	1H,1H,2H,2H-perfluorododecanesulfonic acid
Telomere Carboxylic acids	
FPrPA (3:3FTA)	3-Perfluoropropyl propanoic acid

Analyte	Full Name
FPePA (5:3FTA)	3-Perfluoropentyl propanoic acid
FHpPA (7:3FTA)	3-Perfluoroheptyl propanoic acid
Miscellaneous	
F-53B (major)	9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid
F-53B (minor)	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid
Sum F-53B	Sum of F-53B components (major + minor)
ADONA	Dodecafluoro-3H-4,8-dioxanonanoic acid
HFPO-DA (GenX)	Tetrafluoro-2-(heptafluoropropoxy)propanoic 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
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
M3HFPO-DA	Tetrafluoro-2-(heptafluoropropoxy)-13C3-propanoic acid

LOR = Limit of Reporting LOD = Limit of Detection NR = Not Reportable

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Certificate of Analysis

Submission Reference: A02744122
Final Report

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

PO Number: OHA_PFAS

Report Issued: 21-Apr-2023 **AsureQuality Reference: 23-100740** **Sample(s) Received:** 05-Apr-2023 12:00

Testing Period: 05-Apr-2023 to 21-Apr-2023
Date of analysis is available on request.

Results

The tests were performed on the samples as received.

Customer Sample Name: OHA_WS2_040423 **Lab ID:** 23-100740-1

Sample Condition: Acceptable **Sampled Date**: 04-Apr-2023

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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)	0.0032	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	0.0032	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)	0.0012	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	0.0018	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	0.0030	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	0.0062	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)
PFECHS	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	0.0035	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	0.0038	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	0.0023	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	0.0016	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	0.0015	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)

Test	Result	Unit	Method Reference
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)
P37DMOA	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)
10:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	NR	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	NR	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	NR	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	NR (P)	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	139	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	192 (R)	%	AsureQuality Method (LC-MS/MS)
M8PFOS	328 (R)	%	AsureQuality Method (LC-MS/MS)
M4PFBA	113	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	117	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	122	%	AsureQuality Method (LC-MS/MS)
MPFHpA	134	%	AsureQuality Method (LC-MS/MS)
M8PFOA	135	%	AsureQuality Method (LC-MS/MS)
M9PFNA	159 (R)	%	AsureQuality Method (LC-MS/MS)
M6PFDA	230 (R)	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	215 (R)	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	373 (R)	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	139	%	AsureQuality Method (LC-MS/MS)
MPFOSA	140	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	102	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	112	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	253 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	186 (R)	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	133	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	118	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
M4:2FTS	151 (R)	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	77	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	146	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	129	%	AsureQuality Method (LC-MS/MS)

P = Partial result - one or more individual components could not be reported

R = Recovery outside method limits

QC Results

Blank

Relates to sample(s) 23-100740-1

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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)
PFECHS	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)
P37DMOA	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)
10:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	NR	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	NR	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	NR	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	NR (P)	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	91	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	69	%	AsureQuality Method (LC-MS/MS)
M8PFOS	50	%	AsureQuality Method (LC-MS/MS)
M4PFBA	98	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	100	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	89	%	AsureQuality Method (LC-MS/MS)
MPFHpA	83	%	AsureQuality Method (LC-MS/MS)
M8PFOA	72	%	AsureQuality Method (LC-MS/MS)
M9PFNA	60	%	AsureQuality Method (LC-MS/MS)
M6PFDA	58	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	51	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	40	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	65	%	AsureQuality Method (LC-MS/MS)
MPFOSA	93	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	221 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	260 (R)	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	55	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	57	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	124	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	114	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	105	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	55	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	81	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	83	%	AsureQuality Method (LC-MS/MS)

P = Partial result - one or more individual components could not be reported

R = Recovery outside method limits

Analysis Summary

Wellington Laboratory

Analysis	Method	Accreditation	Authorised by
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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)

Sum F-53B = The numerical sum of 9Cl-PF3ONS (F-53B major) and 11Cl-PF3OUdS (F-53B minor)

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 Potable Water - AsureQuality Method (LC-MS/MS)

Analyte	LOR
Perfluoroalkylsulfonic acids	
PFPrS	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
PFECHS	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
P37DMOA	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
10:2 FTS	0.0010 µg/L
Telomere Carboxylic acids	
FPrPA (3:3FTA)	0.0010 µg/L
FPePA (5:3FTA)	0.0010 µg/L

FHpPA (7:3FTA)	NR µg/L
Miscellaneous	
F-53B (major)	NR µg/L
F-53B (minor)	NR µg/L
Sum F-53B	NR µg/L
ADONA	0.0010 µg/L
HFPO-DA (GenX)	0.0010 µg/L

Analyte Definitions

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

Analyte	Full Name
Perfluoroalkylsulfonic acids	
PFPrS	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
PFECHS	Perfluoro-4-ethylcyclohexanesulfonic 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
PFTrDA	Perfluoro-n-tridecanoic acid
PFTeDA	Perfluoro-n-tetradecanoic acid
P37DMOA	Perfluoro-3,7-dimethyloctanoic 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
10:2 FTS	1H,1H,2H,2H-perfluorododecanesulfonic acid
Telomere Carboxylic acids	
FPrPA (3:3FTA)	3-Perfluoropropyl propanoic acid

Analyte	Full Name
FPePA (5:3FTA)	3-Perfluoropentyl propanoic acid
FHpPA (7:3FTA)	3-Perfluoroheptyl propanoic acid
Miscellaneous	
F-53B (major)	9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid
F-53B (minor)	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid
Sum F-53B	Sum of F-53B components (major + minor)
ADONA	Dodecafluoro-3H-4,8-dioxanonanoic acid
HFPO-DA (GenX)	Tetrafluoro-2-(heptafluoropropoxy)propanoic 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
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
M3HFPO-DA	Tetrafluoro-2-(heptafluoropropoxy)-13C3-propanoic acid

LOR = Limit of Reporting LOD = Limit of Detection NR = Not Reportable

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Certificate of Analysis

Submission Reference: A02744122
Final Report

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

PO Number: OHA_PFAS

Report Issued: 21-Apr-2023 **AsureQuality Reference: 23-100756** **Sample(s) Received:** 05-Apr-2023 12:00

Testing Period: 05-Apr-2023 to 21-Apr-2023
Date of analysis is available on request.

Results

The tests were performed on the samples as received.

Customer Sample Name: OHA_GW6_040423 **Lab ID:** 23-100756-1

Sample Condition: Acceptable **Sampled Date**: 04-Apr-2023

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable Water			
Perfluoroalkylsulfonic acids			
PFPrS	0.0028	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	0.0038	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	0.0081	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	0.0072	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	0.047	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	0.054	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	0.0022	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	0.0027	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	0.035	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	0.041	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	0.079	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	0.13	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)
PFECHS	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	0.019	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	0.039	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	0.032	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	0.016	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	0.014	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	0.0058	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)

Test	Result	Unit	Method Reference
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)
P37DMOA	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	0.0013	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
10:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	NR	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	NR	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	NR	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	NR (P)	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	111	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	155 (R)	%	AsureQuality Method (LC-MS/MS)
M8PFOS	252 (R)	%	AsureQuality Method (LC-MS/MS)
M4PFBA	33	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	57	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	52	%	AsureQuality Method (LC-MS/MS)
MPFHpA	79	%	AsureQuality Method (LC-MS/MS)
M8PFOA	78	%	AsureQuality Method (LC-MS/MS)
M9PFNA	98	%	AsureQuality Method (LC-MS/MS)
M6PFDA	183 (R)	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	317 (R)	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	562 (R)	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	925 (R)	%	AsureQuality Method (LC-MS/MS)
MPFOSA	86	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	152 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	159 (R)	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	286 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	168 (R)	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	137	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	108	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
M4:2FTS	429 (R)	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	107	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	235 (R)	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	44	%	AsureQuality Method (LC-MS/MS)

P = Partial result - one or more individual components could not be reported

R = Recovery outside method limits

QC Results

Blank

Relates to sample(s) 23-100756-1

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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)
PFECHS	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)
P37DMOA	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)
10:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	NR	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	NR	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	NR	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	NR (P)	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	91	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	69	%	AsureQuality Method (LC-MS/MS)
M8PFOS	50	%	AsureQuality Method (LC-MS/MS)
M4PFBA	98	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	100	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	89	%	AsureQuality Method (LC-MS/MS)
MPFHpA	83	%	AsureQuality Method (LC-MS/MS)
M8PFOA	72	%	AsureQuality Method (LC-MS/MS)
M9PFNA	60	%	AsureQuality Method (LC-MS/MS)
M6PFDA	58	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	51	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	40	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	65	%	AsureQuality Method (LC-MS/MS)
MPFOSA	93	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	221 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	260 (R)	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	55	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	57	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	124	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	114	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	105	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	55	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	81	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	83	%	AsureQuality Method (LC-MS/MS)

P = Partial result - one or more individual components could not be reported

R = Recovery outside method limits

Analysis Summary

Wellington Laboratory

Analysis	Method	Accreditation	Authorised by
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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)

Sum F-53B = The numerical sum of 9Cl-PF3ONS (F-53B major) and 11Cl-PF3OUdS (F-53B minor)

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 Potable Water - AsureQuality Method (LC-MS/MS)

Analyte	LOR
Perfluoroalkylsulfonic acids	
PFPrS	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
PFECHS	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
P37DMOA	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
10:2 FTS	0.0010 µg/L
Telomere Carboxylic acids	
FPrPA (3:3FTA)	0.0010 µg/L
FPePA (5:3FTA)	0.0010 µg/L

FHpPA (7:3FTA)	NR µg/L
Miscellaneous	
F-53B (major)	NR µg/L
F-53B (minor)	NR µg/L
Sum F-53B	NR µg/L
ADONA	0.0010 µg/L
HFPO-DA (GenX)	0.0010 µg/L

Analyte Definitions

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

Analyte	Full Name
Perfluoroalkylsulfonic acids	
PFPrS	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
PFECHS	Perfluoro-4-ethylcyclohexanesulfonic 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
PFTrDA	Perfluoro-n-tridecanoic acid
PFTeDA	Perfluoro-n-tetradecanoic acid
P37DMOA	Perfluoro-3,7-dimethyloctanoic 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
10:2 FTS	1H,1H,2H,2H-perfluorododecanesulfonic acid
Telomere Carboxylic acids	
FPrPA (3:3FTA)	3-Perfluoropropyl propanoic acid

Analyte	Full Name
FPePA (5:3FTA)	3-Perfluoropentyl propanoic acid
FHpPA (7:3FTA)	3-Perfluoroheptyl propanoic acid
Miscellaneous	
F-53B (major)	9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid
F-53B (minor)	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid
Sum F-53B	Sum of F-53B components (major + minor)
ADONA	Dodecafluoro-3H-4,8-dioxanonanoic acid
HFPO-DA (GenX)	Tetrafluoro-2-(heptafluoropropoxy)propanoic 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
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
M3HFPO-DA	Tetrafluoro-2-(heptafluoropropoxy)-13C3-propanoic acid

LOR = Limit of Reporting LOD = Limit of Detection NR = Not Reportable

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Certificate of Analysis

Submission Reference: A02744123
Final Report

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

PO Number: OHA_PFAS

Report Issued: 21-Apr-2023 **AsureQuality Reference: 23-100765** **Sample(s) Received:** 05-Apr-2023 12:00

Testing Period: 05-Apr-2023 to 21-Apr-2023
Date of analysis is available on request.

Results

The tests were performed on the samples as received.

Customer Sample Name: OHA_GW53_040423 **Lab ID:** 23-100765-1

Sample Condition: Acceptable **Sampled Date**: 04-Apr-2023

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

Test	Result	Unit	Method Reference
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)
P37DMOA	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)
10:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	NR	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	NR	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	NR	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	NR (P)	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	93	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	86	%	AsureQuality Method (LC-MS/MS)
M8PFOS	86	%	AsureQuality Method (LC-MS/MS)
M4PFBA	95	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	100	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	91	%	AsureQuality Method (LC-MS/MS)
MPFHpA	96	%	AsureQuality Method (LC-MS/MS)
M8PFOA	84	%	AsureQuality Method (LC-MS/MS)
M9PFNA	85	%	AsureQuality Method (LC-MS/MS)
M6PFDA	90	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	98	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	74	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	108	%	AsureQuality Method (LC-MS/MS)
MPFOSA	91	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	142	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	159 (R)	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	83	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	68	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	95	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	91	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
M4:2FTS	122	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	67	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	110	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	76	%	AsureQuality Method (LC-MS/MS)

P = Partial result - one or more individual components could not be reported

R = Recovery outside method limits

QC Results

Blank

Relates to sample(s) 23-100765-1

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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)
PFECHS	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)
P37DMOA	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)
10:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	NR	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	NR	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	NR	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	NR (P)	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	91	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	69	%	AsureQuality Method (LC-MS/MS)
M8PFOS	50	%	AsureQuality Method (LC-MS/MS)
M4PFBA	98	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	100	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	89	%	AsureQuality Method (LC-MS/MS)
MPFHpA	83	%	AsureQuality Method (LC-MS/MS)
M8PFOA	72	%	AsureQuality Method (LC-MS/MS)
M9PFNA	60	%	AsureQuality Method (LC-MS/MS)
M6PFDA	58	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	51	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	40	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	65	%	AsureQuality Method (LC-MS/MS)
MPFOSA	93	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	221 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	260 (R)	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	55	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	57	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	124	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	114	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	105	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	55	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	81	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	83	%	AsureQuality Method (LC-MS/MS)

P = Partial result - one or more individual components could not be reported

R = Recovery outside method limits

Analysis Summary

Wellington Laboratory

Analysis	Method	Accreditation	Authorised by
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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)

Sum F-53B = The numerical sum of 9Cl-PF3ONS (F-53B major) and 11Cl-PF3OUdS (F-53B minor)

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 Potable Water - AsureQuality Method (LC-MS/MS)

Analyte	LOR
Perfluoroalkylsulfonic acids	
PFPrS	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
PFECHS	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
P37DMOA	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
10:2 FTS	0.0010 µg/L
Telomere Carboxylic acids	
FPrPA (3:3FTA)	0.0010 µg/L
FPePA (5:3FTA)	0.0010 µg/L

FHpPA (7:3FTA)	NR µg/L
Miscellaneous	
F-53B (major)	NR µg/L
F-53B (minor)	NR µg/L
Sum F-53B	NR µg/L
ADONA	0.0010 µg/L
HFPO-DA (GenX)	0.0010 µg/L

Analyte Definitions

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

Analyte	Full Name
Perfluoroalkylsulfonic acids	
PFPrS	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
PFECHS	Perfluoro-4-ethylcyclohexanesulfonic 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
PFTrDA	Perfluoro-n-tridecanoic acid
PFTeDA	Perfluoro-n-tetradecanoic acid
P37DMOA	Perfluoro-3,7-dimethyloctanoic 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
10:2 FTS	1H,1H,2H,2H-perfluorododecanesulfonic acid
Telomere Carboxylic acids	
FPrPA (3:3FTA)	3-Perfluoropropyl propanoic acid

Analyte	Full Name
FPePA (5:3FTA)	3-Perfluoropentyl propanoic acid
FHpPA (7:3FTA)	3-Perfluoroheptyl propanoic acid
Miscellaneous	
F-53B (major)	9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid
F-53B (minor)	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid
Sum F-53B	Sum of F-53B components (major + minor)
ADONA	Dodecafluoro-3H-4,8-dioxanonanoic acid
HFPO-DA (GenX)	Tetrafluoro-2-(heptafluoropropoxy)propanoic 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
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
M3HFPO-DA	Tetrafluoro-2-(heptafluoropropoxy)-13C3-propanoic acid

LOR = Limit of Reporting LOD = Limit of Detection NR = Not Reportable

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Certificate of Analysis

Submission Reference: A02744123
Final Report

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

PO Number: OHA_PFAS

Report Issued: 21-Apr-2023 **AsureQuality Reference: 23-100773** **Sample(s) Received:** 05-Apr-2023 12:00

Testing Period: 05-Apr-2023 to 21-Apr-2023
Date of analysis is available on request.

Results

The tests were performed on the samples as received.

Customer Sample Name: OHA_WS1_040423 **Lab ID:** 23-100773-1

Sample Condition: Acceptable **Sampled Date**: 04-Apr-2023

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable Water			
Perfluoroalkylsulfonic acids			
PFPrS	0.014	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	0.027	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	0.028	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	0.036	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	0.15	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	0.19	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	0.0028	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	0.0041	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	0.030	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	0.0075	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	0.042	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	0.23	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)
PFECHS	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	0.026	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	0.14	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	0.11	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	0.040	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	0.031	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	0.0082	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)

Test	Result	Unit	Method Reference
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)
P37DMOA	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	0.0013	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	0.097	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
10:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	NR	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	NR	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	NR	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	NR (P)	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	116	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	138	%	AsureQuality Method (LC-MS/MS)
M8PFOS	218 (R)	%	AsureQuality Method (LC-MS/MS)
M4PFBA	88	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	94	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	93	%	AsureQuality Method (LC-MS/MS)
MPFHpA	106	%	AsureQuality Method (LC-MS/MS)
M8PFOA	100	%	AsureQuality Method (LC-MS/MS)
M9PFNA	127	%	AsureQuality Method (LC-MS/MS)
M6PFDA	175 (R)	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	156 (R)	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	314 (R)	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	158 (R)	%	AsureQuality Method (LC-MS/MS)
MPFOSA	128	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	170 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	184 (R)	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	227 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	161 (R)	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	122	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	109	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
M4:2FTS	143	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	70	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	144	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	83	%	AsureQuality Method (LC-MS/MS)

P = Partial result - one or more individual components could not be reported

R = Recovery outside method limits

QC Results

Blank

Relates to sample(s) 23-100773-1

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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)
PFECHS	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)
P37DMOA	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)
10:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	NR	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	NR	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	NR	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	NR (P)	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	91	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	69	%	AsureQuality Method (LC-MS/MS)
M8PFOS	50	%	AsureQuality Method (LC-MS/MS)
M4PFBA	98	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	100	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	89	%	AsureQuality Method (LC-MS/MS)
MPFHpA	83	%	AsureQuality Method (LC-MS/MS)
M8PFOA	72	%	AsureQuality Method (LC-MS/MS)
M9PFNA	60	%	AsureQuality Method (LC-MS/MS)
M6PFDA	58	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	51	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	40	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	65	%	AsureQuality Method (LC-MS/MS)
MPFOSA	93	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	221 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	260 (R)	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	55	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	57	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	124	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	114	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	105	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	55	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	81	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	83	%	AsureQuality Method (LC-MS/MS)

P = Partial result - one or more individual components could not be reported

R = Recovery outside method limits

Analysis Summary

Wellington Laboratory

Analysis	Method	Accreditation	Authorised by
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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)

Sum F-53B = The numerical sum of 9Cl-PF3ONS (F-53B major) and 11Cl-PF3OUdS (F-53B minor)

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 Potable Water - AsureQuality Method (LC-MS/MS)

Analyte	LOR
Perfluoroalkylsulfonic acids	
PFPrS	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
PFECHS	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
P37DMOA	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
10:2 FTS	0.0010 µg/L
Telomere Carboxylic acids	
FPrPA (3:3FTA)	0.0010 µg/L
FPePA (5:3FTA)	0.0010 µg/L

FHpPA (7:3FTA)	NR µg/L
Miscellaneous	
F-53B (major)	NR µg/L
F-53B (minor)	NR µg/L
Sum F-53B	NR µg/L
ADONA	0.0010 µg/L
HFPO-DA (GenX)	0.0010 µg/L

Analyte Definitions

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

Analyte	Full Name
Perfluoroalkylsulfonic acids	
PFPrS	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
PFECHS	Perfluoro-4-ethylcyclohexanesulfonic 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
PFTrDA	Perfluoro-n-tridecanoic acid
PFTeDA	Perfluoro-n-tetradecanoic acid
P37DMOA	Perfluoro-3,7-dimethyloctanoic 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
10:2 FTS	1H,1H,2H,2H-perfluorododecanesulfonic acid
Telomere Carboxylic acids	
FPrPA (3:3FTA)	3-Perfluoropropyl propanoic acid

Analyte	Full Name
FPePA (5:3FTA)	3-Perfluoropentyl propanoic acid
FHpPA (7:3FTA)	3-Perfluoroheptyl propanoic acid
Miscellaneous	
F-53B (major)	9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid
F-53B (minor)	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid
Sum F-53B	Sum of F-53B components (major + minor)
ADONA	Dodecafluoro-3H-4,8-dioxanonanoic acid
HFPO-DA (GenX)	Tetrafluoro-2-(heptafluoropropoxy)propanoic 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
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
M3HFPO-DA	Tetrafluoro-2-(heptafluoropropoxy)-13C3-propanoic acid

LOR = Limit of Reporting LOD = Limit of Detection NR = Not Reportable

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Certificate of Analysis

Submission Reference: A02744123
Final Report

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

PO Number: OHA_PFAS

Report Issued: 21-Apr-2023 **AsureQuality Reference: 23-100778** **Sample(s) Received:** 05-Apr-2023 12:00

Testing Period: 05-Apr-2023 to 21-Apr-2023
Date of analysis is available on request.

Results

The tests were performed on the samples as received.

Customer Sample Name: OHA_GW112.1_040423 **Lab ID:** 23-100778-1

Sample Condition: Acceptable **Sampled Date**: 04-Apr-2023

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Non Potable Water - High Level			
Perfluoroalkylsulfonic acids			
PFPrS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	0.027	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)	0.041	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	0.27	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	0.31	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)	0.095	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	0.14	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	0.24	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	0.55	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)
PFECHS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	0.12	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	0.42	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	0.39	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	0.17	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	0.089	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	0.031	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)

Test	Result	Unit	Method Reference
PFDoDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	<0.050	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	0.11	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
10:2 FTS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX)	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	103	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	97	%	AsureQuality Method (LC-MS/MS)
M8PFOS	104	%	AsureQuality Method (LC-MS/MS)
M4PFBA	97	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	104	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	104	%	AsureQuality Method (LC-MS/MS)
MPFHpA	105	%	AsureQuality Method (LC-MS/MS)
M8PFOA	101	%	AsureQuality Method (LC-MS/MS)
M9PFNA	110	%	AsureQuality Method (LC-MS/MS)
M6PFDA	95	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	107	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	104	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	95	%	AsureQuality Method (LC-MS/MS)
MPFOSA	99	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	99	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	98	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	102	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	99	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	100	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	96	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
M4:2FTS	102	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	94	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	100	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	98	%	AsureQuality Method (LC-MS/MS)

Customer Sample Name: OHA_GW112.2_040423 **Lab ID:** 23-100778-2

Sample Condition: Acceptable **Sampled Date**: 04-Apr-2023

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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)
PFECHS	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)
P37DMOA	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)

Test	Result	Unit	Method Reference
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)
10:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	NR	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	NR	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	NR	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	NR (P)	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	100	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	108	%	AsureQuality Method (LC-MS/MS)
M8PFOS	128	%	AsureQuality Method (LC-MS/MS)
M4PFBA	87	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	94	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	93	%	AsureQuality Method (LC-MS/MS)
MPFHpA	101	%	AsureQuality Method (LC-MS/MS)
M8PFOA	91	%	AsureQuality Method (LC-MS/MS)
M9PFNA	110	%	AsureQuality Method (LC-MS/MS)
M6PFDA	134	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	142	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	168 (R)	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	96	%	AsureQuality Method (LC-MS/MS)
MPFOSA	116	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	214 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	229 (R)	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	136	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	112	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	155 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	130	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	129	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	68	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	126	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	80	%	AsureQuality Method (LC-MS/MS)

P = Partial result - one or more individual components could not be reported

R = Recovery outside method limits

Customer Sample Name: Dupl.of 23-100778-1A **Lab ID:** 23-100778-3

Sample Description: 21649405_Duplicate

Sample Condition: Acceptable **Sampled Date**: 04-Apr-2023

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Non Potable Water - High Level			
Perfluoroalkylsulfonic acids			
PFPrS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	0.027	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
PFPeS	0.026	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	0.043	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	0.25	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	0.29	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)	0.098	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	0.15	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	0.25	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	0.54	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)
PFECHS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	0.12	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	0.44	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	0.41	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	0.17	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	0.085	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	0.031	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)
PFTrDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	<0.050	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	0.11	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
10:2 FTS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.10	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
ADONA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX)	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	102	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	100	%	AsureQuality Method (LC-MS/MS)
M8PFOS	104	%	AsureQuality Method (LC-MS/MS)
M4PFBA	95	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	105	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	96	%	AsureQuality Method (LC-MS/MS)
MPFHpA	102	%	AsureQuality Method (LC-MS/MS)
M8PFOA	98	%	AsureQuality Method (LC-MS/MS)
M9PFNA	103	%	AsureQuality Method (LC-MS/MS)
M6PFDA	97	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	105	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	112	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	112	%	AsureQuality Method (LC-MS/MS)
MPFOSA	97	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	100	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	100	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	105	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	98	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	101	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	99	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	100	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	93	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	90	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	105	%	AsureQuality Method (LC-MS/MS)

QC Results

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Relates to sample(s) 23-100778-1, 23-100778-3

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

Test	Result	Unit	Method Reference
PFDS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFECHS	<0.025	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)
PFTrDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	<0.050	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)
10:2 FTS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX)	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	106	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	98	%	AsureQuality Method (LC-MS/MS)
M8PFOS	103	%	AsureQuality Method (LC-MS/MS)
M4PFBA	102	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	102	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	98	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
MPFHpA	101	%	AsureQuality Method (LC-MS/MS)
M8PFOA	96	%	AsureQuality Method (LC-MS/MS)
M9PFNA	103	%	AsureQuality Method (LC-MS/MS)
M6PFDA	103	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	103	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	107	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	85	%	AsureQuality Method (LC-MS/MS)
MPFOSA	100	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	100	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	103	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	108	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	94	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	101	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	99	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	112	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	92	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	100	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	114	%	AsureQuality Method (LC-MS/MS)

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Relates to sample(s) 23-100778-2

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

Test	Result	Unit	Method Reference
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)
P37DMOA	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)
10:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	NR	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	NR	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	NR	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	NR (P)	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	91	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	69	%	AsureQuality Method (LC-MS/MS)
M8PFOS	50	%	AsureQuality Method (LC-MS/MS)
M4PFBA	98	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	100	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	89	%	AsureQuality Method (LC-MS/MS)
MPFHpA	83	%	AsureQuality Method (LC-MS/MS)
M8PFOA	72	%	AsureQuality Method (LC-MS/MS)
M9PFNA	60	%	AsureQuality Method (LC-MS/MS)
M6PFDA	58	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	51	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	40	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	65	%	AsureQuality Method (LC-MS/MS)
MPFOSA	93	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	221 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	260 (R)	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
DNEtFOSAA	55	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	57	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	124	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	114	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	105	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	55	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	81	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	83	%	AsureQuality Method (LC-MS/MS)

P = Partial result - one or more individual components could not be reported

R = Recovery outside method limits

Analysis Summary

Wellington Laboratory

Analysis	Method	Accreditation	Authorised by
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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)

Sum F-53B = The numerical sum of 9Cl-PF3ONS (F-53B major) and 11Cl-PF3OUdS (F-53B minor)

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

Poly- and Perfluorinated Alkyl Substances (PFAS) in Non Potable 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)

Sum F-53B = The numerical sum of 9Cl-PF3ONS (F-53B major) and 11Cl-PF3OUdS (F-53B minor)

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 Potable Water - AsureQuality Method (LC-MS/MS)

Analyte	LOR
Listing applies to samples: 23-100778-2	
Perfluoroalkylsulfonic acids	
PFPrS	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
PFECHS	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
P37DMOA	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
10:2 FTS	0.0010 µg/L
Telomere Carboxylic acids	
FPrPA (3:3FTA)	0.0010 µg/L

FPePA (5:3FTA)	0.0010 µg/L
FHpPA (7:3FTA)	NR µg/L
Miscellaneous	
F-53B (major)	NR µg/L
F-53B (minor)	NR µg/L
Sum F-53B	NR µg/L
ADONA	0.0010 µg/L
HFPO-DA (GenX)	0.0010 µg/L

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

Analyte	LOR
Listing applies to samples: 23-100778-1, 23-100778-3	
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
PFECHS	0.025 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
P37DMOA	0.050 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
10:2 FTS	0.025 µg/L
Telomere Carboxylic acids	
FPrPA (3:3FTA)	0.10 µg/L
FPePA (5:3FTA)	0.025 µg/L
FHpPA (7:3FTA)	0.025 µg/L
Miscellaneous	
F-53B (major)	0.10 µg/L
F-53B (minor)	0.050 µg/L
Sum F-53B	0.1 µg/L
ADONA	0.025 µg/L
HFPO-DA (GenX)	0.050 µg/L

Analyte Definitions

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

Analyte	Full Name
Listing applies to samples: 23-100778-2	
Perfluoroalkylsulfonic acids	
PFPrS	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
PFECHS	Perfluoro-4-ethylcyclohexanesulfonic 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
PFTrDA	Perfluoro-n-tridecanoic acid
PFTeDA	Perfluoro-n-tetradecanoic acid
P37DMOA	Perfluoro-3,7-dimethyloctanoic 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	

Analyte	Full Name
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
10:2 FTS	1H,1H,2H,2H-perfluorododecanesulfonic acid
Telomere Carboxylic acids	
FPrPA (3:3FTA)	3-Perfluoropropyl propanoic acid
FPePA (5:3FTA)	3-Perfluoropentyl propanoic acid
FHpPA (7:3FTA)	3-Perfluoroheptyl propanoic acid
Miscellaneous	
F-53B (major)	9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid
F-53B (minor)	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid
Sum F-53B	Sum of F-53B components (major + minor)
ADONA	Dodecafluoro-3H-4,8-dioxanonanoic acid
HFPO-DA (GenX)	Tetrafluoro-2-(heptafluoropropoxy)propanoic 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
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
M3HFPO-DA	Tetrafluoro-2-(heptafluoropropoxy)-13C3-propanoic acid

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

Analyte	Full Name
Listing applies to samples: 23-100778-1, 23-100778-3	
Perfluoroalkylsulfonic acids	
PFPrS	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

Analyte	Full Name
mono-PFOS (5)	Total Perfluoromethylheptane sulfonic acids
L-PFOS (5)	Linear Perfluorooctanesulfonic acid
PFNS	Perfluoro-1-nonanesulfonic acid
PFDS	Perfluoro-1-decanesulfonic acid
PFECHS	Perfluoro-4-ethylcyclohexanesulfonic 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
PFTrDA	Perfluoro-n-tridecanoic acid
PFTeDA	Perfluoro-n-tetradecanoic acid
P37DMOA	Perfluoro-3,7-dimethyloctanoic 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
10:2 FTS	1H,1H,2H,2H-perfluorododecanesulfonic acid
Telomere Carboxylic acids	
FPrPA (3:3FTA)	3-Perfluoropropyl propanoic acid
FPePA (5:3FTA)	3-Perfluoropentyl propanoic acid
FHpPA (7:3FTA)	3-Perfluoroheptyl propanoic acid
Miscellaneous	
F-53B (major)	9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid
F-53B (minor)	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid
Sum F-53B	Sum of F-53B components (major + minor)
ADONA	Dodecafluoro-3H-4,8-dioxanonanoic acid
HFPO-DA (GenX)	Tetrafluoro-2-(heptafluoropropoxy)propanoic 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

Analyte	Full Name
MPFDoDA	Perfluoro-n-[1,2-13C2]dodecanoic acid
MPFTeDA	Perfluoro-n-[1,2-13C2]tetradecanoic acid
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
M3HFPO-DA	Tetrafluoro-2-(heptafluoropropoxy)-13C3-propanoic acid

LOR = Limit of Reporting LOD = Limit of Detection NR = Not Reportable

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Certificate of Analysis

Submission Reference: A02744123
Final Report

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

PO Number: OHA_PFAS

Report Issued: 21-Apr-2023 **AsureQuality Reference: 23-100787** **Sample(s) Received:** 05-Apr-2023 12:00

Testing Period: 05-Apr-2023 to 21-Apr-2023
Date of analysis is available on request.

Results

The tests were performed on the samples as received.

Customer Sample Name: OHA_GW31_040423 **Lab ID:** 23-100787-1

Sample Condition: Acceptable **Sampled Date**: 04-Apr-2023

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable Water			
Perfluoroalkylsulfonic acids			
PFPrS	0.0042	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	0.0081	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	0.0075	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	0.011	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	0.048	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	0.059	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	0.0011	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	0.0020	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	0.018	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	0.0085	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	0.028	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	0.087	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)
PFECHS	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	0.040	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	0.11	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	0.072	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	0.027	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	0.012	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	0.0026	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)

Test	Result	Unit	Method Reference
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)
P37DMOA	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	0.0033	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
10:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	NR	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	NR	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	NR	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	NR (P)	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	114	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	153 (R)	%	AsureQuality Method (LC-MS/MS)
M8PFOS	271 (R)	%	AsureQuality Method (LC-MS/MS)
M4PFBA	68	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	91	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	93	%	AsureQuality Method (LC-MS/MS)
MPFHpA	109	%	AsureQuality Method (LC-MS/MS)
M8PFOA	105	%	AsureQuality Method (LC-MS/MS)
M9PFNA	133	%	AsureQuality Method (LC-MS/MS)
M6PFDA	196 (R)	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	281 (R)	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	485 (R)	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	278 (R)	%	AsureQuality Method (LC-MS/MS)
MPFOSA	147	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	302 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	314 (R)	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	250 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	170 (R)	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	214 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	140	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
M4:2FTS	170 (R)	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	71	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	151 (R)	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	87	%	AsureQuality Method (LC-MS/MS)

P = Partial result - one or more individual components could not be reported

R = Recovery outside method limits

Customer Sample Name: OHA_GWKQE_040423 **Lab ID:** 23-100787-2

Sample Condition: Acceptable **Sampled Date**: 04-Apr-2023

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable Water			
Perfluoroalkylsulfonic acids			
PFPrS	0.0042	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	0.0080	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	0.0077	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	0.011	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	0.048	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	0.059	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	0.0011	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	0.0022	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	0.017	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	0.0070	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	0.026	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	0.085	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)
PFECHS	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	0.039	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	0.11	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	0.071	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	0.027	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	0.012	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	0.0026	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)
P37DMOA	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)

Test	Result	Unit	Method Reference
Telomere Sulfonic acids			
4:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	0.0031	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
10:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	NR	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	NR	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	NR	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	NR (P)	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	117	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	146	%	AsureQuality Method (LC-MS/MS)
M8PFOS	226 (R)	%	AsureQuality Method (LC-MS/MS)
M4PFBA	71	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	93	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	95	%	AsureQuality Method (LC-MS/MS)
MPFHpA	118	%	AsureQuality Method (LC-MS/MS)
M8PFOA	107	%	AsureQuality Method (LC-MS/MS)
M9PFNA	122	%	AsureQuality Method (LC-MS/MS)
M6PFDA	164 (R)	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	151 (R)	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	217 (R)	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	102	%	AsureQuality Method (LC-MS/MS)
MPFOSA	122	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	155 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	177 (R)	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	154 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	137	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	149	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	133	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	170 (R)	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	82	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	151 (R)	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	73	%	AsureQuality Method (LC-MS/MS)

P = Partial result - one or more individual components could not be reported

R = Recovery outside method limits

Customer Sample Name: Dupl.of 23-100787-2A **Lab ID:** 23-100787-3

Sample Description: 21649432_Duplicate

Sample Condition: Acceptable **Sampled Date**: 04-Apr-2023

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable Water			
Perfluoroalkylsulfonic acids			
PFPrS	0.0040	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	0.0079	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
PFPeS	0.0073	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	0.011	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	0.048	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	0.059	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	0.0021	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	0.017	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	0.0076	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	0.027	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	0.086	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)
PFECHS	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	0.039	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	0.073	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	0.027	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	0.012	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	0.0024	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)
P37DMOA	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	0.0030	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
10:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	NR	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	NR	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	NR	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	NR (P)	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
ADONA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	117	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	149	%	AsureQuality Method (LC-MS/MS)
M8PFOS	249 (R)	%	AsureQuality Method (LC-MS/MS)
M4PFBA	73	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	97	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	96	%	AsureQuality Method (LC-MS/MS)
MPFHpA	115	%	AsureQuality Method (LC-MS/MS)
M8PFOA	107	%	AsureQuality Method (LC-MS/MS)
M9PFNA	129	%	AsureQuality Method (LC-MS/MS)
M6PFDA	179 (R)	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	198 (R)	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	295 (R)	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	227 (R)	%	AsureQuality Method (LC-MS/MS)
MPFOSA	147	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	360 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	348 (R)	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	177 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	139	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	193 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	131	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	155 (R)	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	74	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	139	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	85	%	AsureQuality Method (LC-MS/MS)

P = Partial result - one or more individual components could not be reported

R = Recovery outside method limits

QC Results

Blank

Relates to sample(s) 23-100787-1, 23-100787-2, 23-100787-3

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFECHS	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)
P37DMOA	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)
10:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	NR	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	NR	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	NR	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	NR (P)	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	91	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	69	%	AsureQuality Method (LC-MS/MS)
M8PFOS	50	%	AsureQuality Method (LC-MS/MS)
M4PFBA	98	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
M5PFPeA	100	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	89	%	AsureQuality Method (LC-MS/MS)
MPFHpA	83	%	AsureQuality Method (LC-MS/MS)
M8PFOA	72	%	AsureQuality Method (LC-MS/MS)
M9PFNA	60	%	AsureQuality Method (LC-MS/MS)
M6PFDA	58	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	51	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	40	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	65	%	AsureQuality Method (LC-MS/MS)
MPFOSA	93	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	221 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	260 (R)	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	55	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	57	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	124	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	114	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	105	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	55	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	81	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	83	%	AsureQuality Method (LC-MS/MS)

P = Partial result - one or more individual components could not be reported

R = Recovery outside method limits

Analysis Summary

Wellington Laboratory

Analysis	Method	Accreditation	Authorised by
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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)

Sum F-53B = The numerical sum of 9Cl-PF3ONS (F-53B major) and 11Cl-PF3OUdS (F-53B minor)

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 Potable Water - AsureQuality Method (LC-MS/MS)

Analyte	LOR
Perfluoroalkylsulfonic acids	
PFPrS	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
PFECHS	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
P37DMOA	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
10:2 FTS	0.0010 µg/L
Telomere Carboxylic acids	
FPrPA (3:3FTA)	0.0010 µg/L
FPePA (5:3FTA)	0.0010 µg/L

FHpPA (7:3FTA)	NR µg/L
Miscellaneous	
F-53B (major)	NR µg/L
F-53B (minor)	NR µg/L
Sum F-53B	NR µg/L
ADONA	0.0010 µg/L
HFPO-DA (GenX)	0.0010 µg/L

Analyte Definitions

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

Analyte	Full Name
Perfluoroalkylsulfonic acids	
PFPrS	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
PFECHS	Perfluoro-4-ethylcyclohexanesulfonic 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
PFTrDA	Perfluoro-n-tridecanoic acid
PFTeDA	Perfluoro-n-tetradecanoic acid
P37DMOA	Perfluoro-3,7-dimethyloctanoic 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
10:2 FTS	1H,1H,2H,2H-perfluorododecanesulfonic acid
Telomere Carboxylic acids	
FPrPA (3:3FTA)	3-Perfluoropropyl propanoic acid

Analyte	Full Name
FPePA (5:3FTA)	3-Perfluoropentyl propanoic acid
FHpPA (7:3FTA)	3-Perfluoroheptyl propanoic acid
Miscellaneous	
F-53B (major)	9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid
F-53B (minor)	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid
Sum F-53B	Sum of F-53B components (major + minor)
ADONA	Dodecafluoro-3H-4,8-dioxanonanoic acid
HFPO-DA (GenX)	Tetrafluoro-2-(heptafluoropropoxy)propanoic 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
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
M3HFPO-DA	Tetrafluoro-2-(heptafluoropropoxy)-13C3-propanoic acid

LOR = Limit of Reporting LOD = Limit of Detection NR = Not Reportable

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Certificate of Analysis

Submission Reference: A02744122
Final Report

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

PO Number: OHA_PFAS

Report Issued: 01-May-2023 **AsureQuality Reference: 23-100792** **Sample(s) Received:** 05-Apr-2023 12:00

Testing Period: 05-Apr-2023 to 01-May-2023
Date of analysis is available on request.

Results

The tests were performed on the samples as received.

Customer Sample Name: OHA_GW111.1_040423 **Lab ID:** 23-100792-1

Sample Condition: Acceptable **Sampled Date**: 04-Apr-2023

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable Water			
Perfluoroalkylsulfonic acids			
PFPrS	0.0019	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	0.0073	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	0.0068	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	0.012	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	0.072	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	0.084	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	0.0018	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	0.0032	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	0.043	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	0.063	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	0.11	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	0.19	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)
PFECHS	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	0.070	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	0.24	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	0.16	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	0.080	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	0.052	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	0.015	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)

Test	Result	Unit	Method Reference
PFDoDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	<0.0010	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	0.0035	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
10:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	NR	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	109	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	109	%	AsureQuality Method (LC-MS/MS)
M8PFOS	110	%	AsureQuality Method (LC-MS/MS)
M4PFBA	106	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	98	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	101	%	AsureQuality Method (LC-MS/MS)
MPFHpA	111	%	AsureQuality Method (LC-MS/MS)
M8PFOA	117	%	AsureQuality Method (LC-MS/MS)
M9PFNA	106	%	AsureQuality Method (LC-MS/MS)
M6PFDA	106	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	59	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	46	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	95	%	AsureQuality Method (LC-MS/MS)
MPFOSA	99	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	59	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	64	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	69	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	75	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	55	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	63	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
M4:2FTS	101	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	113	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	106	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	72	%	AsureQuality Method (LC-MS/MS)

Customer Sample Name: OHA_GW111.2_040423 **Lab ID:** 23-100792-2

Sample Condition: Acceptable **Sampled Date**: 04-Apr-2023

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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)
PFECHS	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)
P37DMOA	<0.0010	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)

Test	Result	Unit	Method Reference
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)
10:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	NR	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	104	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	99	%	AsureQuality Method (LC-MS/MS)
M8PFOS	89	%	AsureQuality Method (LC-MS/MS)
M4PFBA	101	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	100	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	100	%	AsureQuality Method (LC-MS/MS)
MPFHpA	103	%	AsureQuality Method (LC-MS/MS)
M8PFOA	111	%	AsureQuality Method (LC-MS/MS)
M9PFNA	105	%	AsureQuality Method (LC-MS/MS)
M6PFDA	89	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	45	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	43	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	376 (R)	%	AsureQuality Method (LC-MS/MS)
MPFOSA	49	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	33	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	39	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	43	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	49	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	36	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	32	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	109	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	179 (R)	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	96	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	89	%	AsureQuality Method (LC-MS/MS)

R = Recovery outside method limits

Customer Sample Name: OHA_GW111.3_040423 **Lab ID:** 23-100792-3

Sample Condition: Acceptable **Sampled Date**: 04-Apr-2023

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

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	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFECHS	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	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	<0.0010	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)
10:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	NR	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
HFPO-DA (GenX)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	99	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	82	%	AsureQuality Method (LC-MS/MS)
M8PFOS	75	%	AsureQuality Method (LC-MS/MS)
M4PFBA	108	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	102	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	100	%	AsureQuality Method (LC-MS/MS)
MPFHpA	101	%	AsureQuality Method (LC-MS/MS)
M8PFOA	108	%	AsureQuality Method (LC-MS/MS)
M9PFNA	98	%	AsureQuality Method (LC-MS/MS)
M6PFDA	82	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	49	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	61	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	112	%	AsureQuality Method (LC-MS/MS)
MPFOSA	99	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	75	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	69	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	74	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	73	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	85	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	88	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	102	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	120	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	80	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	100	%	AsureQuality Method (LC-MS/MS)

Customer Sample Name: OHA_GWKPZ_040423 **Lab ID:** 23-100792-4

Sample Condition: Acceptable **Sampled Date**: 04-Apr-2023

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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)
PFECHS	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
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	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	<0.0010	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)
10:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	NR	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	113	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	111	%	AsureQuality Method (LC-MS/MS)
M8PFOS	111	%	AsureQuality Method (LC-MS/MS)
M4PFBA	103	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	105	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	104	%	AsureQuality Method (LC-MS/MS)
MPFHpA	106	%	AsureQuality Method (LC-MS/MS)
M8PFOA	123	%	AsureQuality Method (LC-MS/MS)
M9PFNA	112	%	AsureQuality Method (LC-MS/MS)
M6PFDA	108	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	80	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	83	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	141	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
MPFOSA	105	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	77	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	72	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	92	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	93	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	84	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	80	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	103	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	110	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	99	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	86	%	AsureQuality Method (LC-MS/MS)

Customer Sample Name: OHA_GWKQA_040423 **Lab ID:** 23-100792-5

Sample Condition: Acceptable **Sampled Date**: 04-Apr-2023

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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)
PFECHS	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	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	<0.0010	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)

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)
10:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	NR	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	98	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	88	%	AsureQuality Method (LC-MS/MS)
M8PFOS	79	%	AsureQuality Method (LC-MS/MS)
M4PFBA	105	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	104	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	100	%	AsureQuality Method (LC-MS/MS)
MPFHpA	98	%	AsureQuality Method (LC-MS/MS)
M8PFOA	106	%	AsureQuality Method (LC-MS/MS)
M9PFNA	92	%	AsureQuality Method (LC-MS/MS)
M6PFDA	99	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	59	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	47	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	167 (R)	%	AsureQuality Method (LC-MS/MS)
MPFOSA	65	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	36	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	33	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	67	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	77	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	37	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	37	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	99	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	117	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	103	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	87	%	AsureQuality Method (LC-MS/MS)

R = Recovery outside method limits

Customer Sample Name: OHA_GWKQB_040423 **Lab ID:** 23-100792-6

Sample Condition: Acceptable **Sampled Date**: 04-Apr-2023

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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)
PFECHS	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	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	<0.0010	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)
10:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	NR	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
Miscellaneous			
F-53B (major)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	82	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	61	%	AsureQuality Method (LC-MS/MS)
M8PFOS	56	%	AsureQuality Method (LC-MS/MS)
M4PFBA	97	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	94	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	89	%	AsureQuality Method (LC-MS/MS)
MPFHpA	81	%	AsureQuality Method (LC-MS/MS)
M8PFOA	76	%	AsureQuality Method (LC-MS/MS)
M9PFNA	75	%	AsureQuality Method (LC-MS/MS)
M6PFDA	70	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	45	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	46	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	128	%	AsureQuality Method (LC-MS/MS)
MPFOSA	91	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	67	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	72	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	56	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	63	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	76	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	74	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	89	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	88	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	73	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	79	%	AsureQuality Method (LC-MS/MS)

QC Results

Blank

Relates to sample(s) 23-100792-1, 23-100792-2, 23-100792-3, 23-100792-4, 23-100792-5, 23-100792-6

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

Test	Result	Unit	Method Reference
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)
PFECHS	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	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	<0.0010	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)
10:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	NR	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	100	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	100	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
M8PFOS	100	%	AsureQuality Method (LC-MS/MS)
M4PFBA	100	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	100	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	100	%	AsureQuality Method (LC-MS/MS)
MPFHpA	100	%	AsureQuality Method (LC-MS/MS)
M8PFOA	100	%	AsureQuality Method (LC-MS/MS)
M9PFNA	100	%	AsureQuality Method (LC-MS/MS)
M6PFDA	100	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	100	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	100	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	100	%	AsureQuality Method (LC-MS/MS)
MPFOSA	100	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	100	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	100	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	100	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	100	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	100	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	100	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	100	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	100	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	100	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	100	%	AsureQuality Method (LC-MS/MS)

Analysis Summary

Wellington Laboratory

Analysis	Method	Accreditation	Authorised by
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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)

Sum F-53B = The numerical sum of 9Cl-PF3ONS (F-53B major) and 11Cl-PF3OUdS (F-53B minor)

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 Potable Water - AsureQuality Method (LC-MS/MS)

Analyte	LOR
Perfluoroalkylsulfonic acids	
PFPrS	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
PFECHS	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	0.0010 µg/L
P37DMOA	0.0010 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
10:2 FTS	0.0010 µg/L
Telomere Carboxylic acids	
FPrPA (3:3FTA)	0.0010 µg/L
FPePA (5:3FTA)	0.0010 µg/L

FHpPA (7:3FTA)	NR µg/L
Miscellaneous	
F-53B (major)	0.0010 µg/L
F-53B (minor)	0.0010 µg/L
Sum F-53B	0.0010 µg/L
ADONA	0.0010 µg/L
HFPO-DA (GenX)	0.0010 µg/L

Analyte Definitions

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

Analyte	Full Name
Perfluoroalkylsulfonic acids	
PFPrS	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
PFECHS	Perfluoro-4-ethylcyclohexanesulfonic 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
PFTrDA	Perfluoro-n-tridecanoic acid
PFTeDA	Perfluoro-n-tetradecanoic acid
P37DMOA	Perfluoro-3,7-dimethyloctanoic 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
10:2 FTS	1H,1H,2H,2H-perfluorododecanesulfonic acid
Telomere Carboxylic acids	
FPrPA (3:3FTA)	3-Perfluoropropyl propanoic acid

Analyte	Full Name
FPePA (5:3FTA)	3-Perfluoropentyl propanoic acid
FHpPA (7:3FTA)	3-Perfluoroheptyl propanoic acid
Miscellaneous	
F-53B (major)	9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid
F-53B (minor)	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid
Sum F-53B	Sum of F-53B components (major + minor)
ADONA	Dodecafluoro-3H-4,8-dioxanonanoic acid
HFPO-DA (GenX)	Tetrafluoro-2-(heptafluoropropoxy)propanoic 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
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
M3HFPO-DA	Tetrafluoro-2-(heptafluoropropoxy)-13C3-propanoic acid

LOR = Limit of Reporting LOD = Limit of Detection NR = Not Reportable

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Certificate of Analysis

Submission Reference: A02744123
Final Report

James Conway
Pattle Delamore Partners Limited
P O Box 9528
Auckland 1149
New Zealand

PO Number: OHA_PFAS

Report Issued: 01-May-2023 **AsureQuality Reference: 23-101851** **Sample(s) Received:** 06-Apr-2023 08:30

Testing Period: 06-Apr-2023 to 01-May-2023
Date of analysis is available on request.

Results

The tests were performed on the samples as received.

Customer Sample Name: OHA_SW36_050423 **Lab ID:** 23-101851-1

Sample Condition: Acceptable **Sampled Date**: 05-Apr-2023

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable Water			
Perfluoroalkylsulfonic acids			
PFPrS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	0.0027	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	0.0026	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	0.0043	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	0.022	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	0.026	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)	0.010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	0.0075	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	0.018	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	0.044	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)
PFECHS	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	0.014	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	0.051	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	0.036	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	0.016	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	0.0064	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	0.0029	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)

Test	Result	Unit	Method Reference
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)
P37DMOA	<0.0010	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)
10:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	NR	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	127	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	135	%	AsureQuality Method (LC-MS/MS)
M8PFOS	132	%	AsureQuality Method (LC-MS/MS)
M4PFBA	97	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	109	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	112	%	AsureQuality Method (LC-MS/MS)
MPFHpA	125	%	AsureQuality Method (LC-MS/MS)
M8PFOA	128	%	AsureQuality Method (LC-MS/MS)
M9PFNA	126	%	AsureQuality Method (LC-MS/MS)
M6PFDA	119	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	85	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	87	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	228 (R)	%	AsureQuality Method (LC-MS/MS)
MPFOSA	102	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	59	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	53	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	99	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	98	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	60	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	58	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
M4:2FTS	164 (R)	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	127	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	133	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	80	%	AsureQuality Method (LC-MS/MS)

R = Recovery outside method limits

QC Results

Blank

Relates to sample(s) 23-101851-1

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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)
PFECHS	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	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	<0.0010	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)
10:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	NR	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	100	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	100	%	AsureQuality Method (LC-MS/MS)
M8PFOS	100	%	AsureQuality Method (LC-MS/MS)
M4PFBA	100	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	100	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	100	%	AsureQuality Method (LC-MS/MS)
MPFHpA	100	%	AsureQuality Method (LC-MS/MS)
M8PFOA	100	%	AsureQuality Method (LC-MS/MS)
M9PFNA	100	%	AsureQuality Method (LC-MS/MS)
M6PFDA	100	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	100	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	100	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	100	%	AsureQuality Method (LC-MS/MS)
MPFOSA	100	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	100	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	100	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	100	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	100	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	100	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	100	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	100	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	100	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	100	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	100	%	AsureQuality Method (LC-MS/MS)

Analysis Summary

Wellington Laboratory

Analysis	Method	Accreditation	Authorised by
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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)

Sum F-53B = The numerical sum of 9Cl-PF3ONS (F-53B major) and 11Cl-PF3OUdS (F-53B minor)

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 Potable Water - AsureQuality Method (LC-MS/MS)

Analyte	LOR
Perfluoroalkylsulfonic acids	
PFPrS	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
PFECHS	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
P37DMOA	0.0010 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
10:2 FTS	0.0010 µg/L
Telomere Carboxylic acids	
FPrPA (3:3FTA)	0.0010 µg/L
FPePA (5:3FTA)	0.0010 µg/L

FHpPA (7:3FTA)	NR µg/L
Miscellaneous	
F-53B (major)	0.0010 µg/L
F-53B (minor)	0.0010 µg/L
Sum F-53B	0.0010 µg/L
ADONA	0.0010 µg/L
HFPO-DA (GenX)	0.0010 µg/L

Analyte Definitions

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

Analyte	Full Name
Perfluoroalkylsulfonic acids	
PFPrS	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
PFECHS	Perfluoro-4-ethylcyclohexanesulfonic 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
PFTrDA	Perfluoro-n-tridecanoic acid
PFTeDA	Perfluoro-n-tetradecanoic acid
P37DMOA	Perfluoro-3,7-dimethyloctanoic 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
10:2 FTS	1H,1H,2H,2H-perfluorododecanesulfonic acid
Telomere Carboxylic acids	
FPrPA (3:3FTA)	3-Perfluoropropyl propanoic acid

Analyte	Full Name
FPePA (5:3FTA)	3-Perfluoropentyl propanoic acid
FHpPA (7:3FTA)	3-Perfluoroheptyl propanoic acid
Miscellaneous	
F-53B (major)	9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid
F-53B (minor)	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid
Sum F-53B	Sum of F-53B components (major + minor)
ADONA	Dodecafluoro-3H-4,8-dioxanonanoic acid
HFPO-DA (GenX)	Tetrafluoro-2-(heptafluoropropoxy)propanoic 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
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
M3HFPO-DA	Tetrafluoro-2-(heptafluoropropoxy)-13C3-propanoic acid

LOR = Limit of Reporting LOD = Limit of Detection NR = Not Reportable

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Certificate of Analysis

Submission Reference: A02744123
Final Report

James Conway
Pattle Delamore Partners Limited
P O Box 9528
Auckland 1149
New Zealand

PO Number: OHA_PFAS

Report Issued: 01-May-2023 **AsureQuality Reference: 23-101895** **Sample(s) Received:** 06-Apr-2023 08:30

Testing Period: 06-Apr-2023 to 01-May-2023
Date of analysis is available on request.

Results

The tests were performed on the samples as received.

Customer Sample Name: OHA_GW106_050423 **Lab ID:** 23-101895-1

Sample Condition: Acceptable **Sampled Date**: 05-Apr-2023

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

Test	Result	Unit	Method Reference
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)
P37DMOA	<0.0010	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)
10:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	NR	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	110	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	93	%	AsureQuality Method (LC-MS/MS)
M8PFOS	93	%	AsureQuality Method (LC-MS/MS)
M4PFBA	82	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	95	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	95	%	AsureQuality Method (LC-MS/MS)
MPFHpA	101	%	AsureQuality Method (LC-MS/MS)
M8PFOA	107	%	AsureQuality Method (LC-MS/MS)
M9PFNA	108	%	AsureQuality Method (LC-MS/MS)
M6PFDA	98	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	77	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	84	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	321 (R)	%	AsureQuality Method (LC-MS/MS)
MPFOSA	101	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	114	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	101	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	74	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	89	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	105	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	95	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
M4:2FTS	139	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	114	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	104	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	75	%	AsureQuality Method (LC-MS/MS)

R = Recovery outside method limits

QC Results

Blank

Relates to sample(s) 23-101895-1

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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)
PFECHS	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	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	<0.0010	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)
10:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	NR	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	100	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	100	%	AsureQuality Method (LC-MS/MS)
M8PFOS	100	%	AsureQuality Method (LC-MS/MS)
M4PFBA	100	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	100	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	100	%	AsureQuality Method (LC-MS/MS)
MPFHpA	100	%	AsureQuality Method (LC-MS/MS)
M8PFOA	100	%	AsureQuality Method (LC-MS/MS)
M9PFNA	100	%	AsureQuality Method (LC-MS/MS)
M6PFDA	100	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	100	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	100	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	100	%	AsureQuality Method (LC-MS/MS)
MPFOSA	100	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	100	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	100	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	100	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	100	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	100	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	100	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	100	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	100	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	100	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	100	%	AsureQuality Method (LC-MS/MS)

Analysis Summary

Wellington Laboratory

Analysis	Method	Accreditation	Authorised by
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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)

Sum F-53B = The numerical sum of 9Cl-PF3ONS (F-53B major) and 11Cl-PF3OUdS (F-53B minor)

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 Potable Water - AsureQuality Method (LC-MS/MS)

Analyte	LOR
Perfluoroalkylsulfonic acids	
PFPrS	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
PFECHS	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
P37DMOA	0.0010 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
10:2 FTS	0.0010 µg/L
Telomere Carboxylic acids	
FPrPA (3:3FTA)	0.0010 µg/L
FPePA (5:3FTA)	0.0010 µg/L

FHpPA (7:3FTA)	NR µg/L
Miscellaneous	
F-53B (major)	0.0010 µg/L
F-53B (minor)	0.0010 µg/L
Sum F-53B	0.0010 µg/L
ADONA	0.0010 µg/L
HFPO-DA (GenX)	0.0010 µg/L

Analyte Definitions

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

Analyte	Full Name
Perfluoroalkylsulfonic acids	
PFPrS	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
PFECHS	Perfluoro-4-ethylcyclohexanesulfonic 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
PFTrDA	Perfluoro-n-tridecanoic acid
PFTeDA	Perfluoro-n-tetradecanoic acid
P37DMOA	Perfluoro-3,7-dimethyloctanoic 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
10:2 FTS	1H,1H,2H,2H-perfluorododecanesulfonic acid
Telomere Carboxylic acids	
FPrPA (3:3FTA)	3-Perfluoropropyl propanoic acid

Analyte	Full Name
FPePA (5:3FTA)	3-Perfluoropentyl propanoic acid
FHpPA (7:3FTA)	3-Perfluoroheptyl propanoic acid
Miscellaneous	
F-53B (major)	9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid
F-53B (minor)	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid
Sum F-53B	Sum of F-53B components (major + minor)
ADONA	Dodecafluoro-3H-4,8-dioxanonanoic acid
HFPO-DA (GenX)	Tetrafluoro-2-(heptafluoropropoxy)propanoic 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
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
M3HFPO-DA	Tetrafluoro-2-(heptafluoropropoxy)-13C3-propanoic acid

LOR = Limit of Reporting LOD = Limit of Detection NR = Not Reportable

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Certificate of Analysis

Submission Reference: A02744123
Final Report

James Conway
Pattle Delamore Partners Limited
P O Box 9528
Auckland 1149
New Zealand

PO Number: OHA_PFAS

Report Issued: 01-May-2023 **AsureQuality Reference: 23-101916** **Sample(s) Received:** 06-Apr-2023 08:30

Testing Period: 06-Apr-2023 to 01-May-2023
Date of analysis is available on request.

Results

The tests were performed on the samples as received.

Customer Sample Name: OHA_GW108_050423 **Lab ID:** 23-101916-1

Sample Condition: Acceptable **Sampled Date**: 05-Apr-2023

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

Test	Result	Unit	Method Reference
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)
P37DMOA	<0.0010	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)
10:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	NR	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	119	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	113	%	AsureQuality Method (LC-MS/MS)
M8PFOS	106	%	AsureQuality Method (LC-MS/MS)
M4PFBA	84	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	102	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	98	%	AsureQuality Method (LC-MS/MS)
MPFHpA	106	%	AsureQuality Method (LC-MS/MS)
M8PFOA	118	%	AsureQuality Method (LC-MS/MS)
M9PFNA	119	%	AsureQuality Method (LC-MS/MS)
M6PFDA	105	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	82	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	71	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	209 (R)	%	AsureQuality Method (LC-MS/MS)
MPFOSA	79	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	52	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	48	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	87	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	81	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	64	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	61	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
M4:2FTS	165 (R)	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	115	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	96	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	90	%	AsureQuality Method (LC-MS/MS)

R = Recovery outside method limits

Customer Sample Name: Dupl.of 23-101916-1A **Lab ID:** 23-101916-2

Sample Description: 21657104_Duplicate

Sample Condition: Acceptable **Sampled Date**: 05-Apr-2023

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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)
PFECHS	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)
P37DMOA	<0.0010	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)

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)
10:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	NR	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	124	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	123	%	AsureQuality Method (LC-MS/MS)
M8PFOS	125	%	AsureQuality Method (LC-MS/MS)
M4PFBA	85	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	103	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	98	%	AsureQuality Method (LC-MS/MS)
MPFHpA	115	%	AsureQuality Method (LC-MS/MS)
M8PFOA	123	%	AsureQuality Method (LC-MS/MS)
M9PFNA	123	%	AsureQuality Method (LC-MS/MS)
M6PFDA	113	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	61	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	69	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	238 (R)	%	AsureQuality Method (LC-MS/MS)
MPFOSA	64	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	39	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	41	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	72	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	83	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	45	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	42	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	156 (R)	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	123	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	101	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	88	%	AsureQuality Method (LC-MS/MS)

R = Recovery outside method limits

QC Results

Blank

Relates to sample(s) 23-101916-1, 23-101916-2

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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)
PFECHS	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	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	<0.0010	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)

Test	Result	Unit	Method Reference
8:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
10:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	NR	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	100	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	100	%	AsureQuality Method (LC-MS/MS)
M8PFOS	100	%	AsureQuality Method (LC-MS/MS)
M4PFBA	100	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	100	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	100	%	AsureQuality Method (LC-MS/MS)
MPFHpA	100	%	AsureQuality Method (LC-MS/MS)
M8PFOA	100	%	AsureQuality Method (LC-MS/MS)
M9PFNA	100	%	AsureQuality Method (LC-MS/MS)
M6PFDA	100	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	100	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	100	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	100	%	AsureQuality Method (LC-MS/MS)
MPFOSA	100	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	100	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	100	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	100	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	100	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	100	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	100	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	100	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	100	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	100	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	100	%	AsureQuality Method (LC-MS/MS)

Analysis Summary

Wellington Laboratory

Analysis	Method	Accreditation	Authorised by
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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)

Sum F-53B = The numerical sum of 9Cl-PF3ONS (F-53B major) and 11Cl-PF3OUdS (F-53B minor)

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 Potable Water - AsureQuality Method (LC-MS/MS)

Analyte	LOR
Perfluoroalkylsulfonic acids	
PFPrS	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
PFECHS	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
P37DMOA	0.0010 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
10:2 FTS	0.0010 µg/L
Telomere Carboxylic acids	
FPrPA (3:3FTA)	0.0010 µg/L
FPePA (5:3FTA)	0.0010 µg/L

FHpPA (7:3FTA)	NR µg/L
Miscellaneous	
F-53B (major)	0.0010 µg/L
F-53B (minor)	0.0010 µg/L
Sum F-53B	0.0010 µg/L
ADONA	0.0010 µg/L
HFPO-DA (GenX)	0.0010 µg/L

Analyte Definitions

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

Analyte	Full Name
Perfluoroalkylsulfonic acids	
PFPrS	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
PFECHS	Perfluoro-4-ethylcyclohexanesulfonic 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
PFTrDA	Perfluoro-n-tridecanoic acid
PFTeDA	Perfluoro-n-tetradecanoic acid
P37DMOA	Perfluoro-3,7-dimethyloctanoic 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
10:2 FTS	1H,1H,2H,2H-perfluorododecanesulfonic acid
Telomere Carboxylic acids	
FPrPA (3:3FTA)	3-Perfluoropropyl propanoic acid

Analyte	Full Name
FPePA (5:3FTA)	3-Perfluoropentyl propanoic acid
FHpPA (7:3FTA)	3-Perfluoroheptyl propanoic acid
Miscellaneous	
F-53B (major)	9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid
F-53B (minor)	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid
Sum F-53B	Sum of F-53B components (major + minor)
ADONA	Dodecafluoro-3H-4,8-dioxanonanoic acid
HFPO-DA (GenX)	Tetrafluoro-2-(heptafluoropropoxy)propanoic 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
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
M3HFPO-DA	Tetrafluoro-2-(heptafluoropropoxy)-13C3-propanoic acid

LOR = Limit of Reporting LOD = Limit of Detection NR = Not Reportable

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Certificate of Analysis

Submission Reference: A02744123
Final Report

James Conway
Pattle Delamore Partners Limited
P O Box 9528
Auckland 1149
New Zealand

PO Number: OHA_PFAS

Report Issued: 26-Apr-2023 **AsureQuality Reference: 23-101933** **Sample(s) Received:** 06-Apr-2023 08:30

Testing Period: 06-Apr-2023 to 26-Apr-2023
Date of analysis is available on request.

Results

The tests were performed on the samples as received.

Customer Sample Name: OHA_GW65_050423 **Lab ID:** 23-101933-1

Sample Condition: Acceptable **Sampled Date**: 05-Apr-2023

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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)
PFECHS	<0.0010	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)

Test	Result	Unit	Method Reference
PFDoDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	<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	<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)
10:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	108	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	114	%	AsureQuality Method (LC-MS/MS)
M8PFOS	114	%	AsureQuality Method (LC-MS/MS)
M4PFBA	103	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	101	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	106	%	AsureQuality Method (LC-MS/MS)
MPFHpA	109	%	AsureQuality Method (LC-MS/MS)
M8PFOA	105	%	AsureQuality Method (LC-MS/MS)
M9PFNA	108	%	AsureQuality Method (LC-MS/MS)
M6PFDA	99	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	119	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	72	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	70	%	AsureQuality Method (LC-MS/MS)
MPFOSA	89	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	27 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	40	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	74	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	87	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	44	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	62	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
M4:2FTS	123	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	140	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	122	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	83	%	AsureQuality Method (LC-MS/MS)

R = Recovery outside method limits

QC Results

Blank

Relates to sample(s) 23-101933-1

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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)
PFECHS	<0.0010	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	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	<0.0010	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)
10:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	92	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	87	%	AsureQuality Method (LC-MS/MS)
M8PFOS	78	%	AsureQuality Method (LC-MS/MS)
M4PFBA	103	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	98	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	99	%	AsureQuality Method (LC-MS/MS)
MPFHpA	103	%	AsureQuality Method (LC-MS/MS)
M8PFOA	92	%	AsureQuality Method (LC-MS/MS)
M9PFNA	95	%	AsureQuality Method (LC-MS/MS)
M6PFDA	80	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	80	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	56	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	25 (R)	%	AsureQuality Method (LC-MS/MS)
MPFOSA	76	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	31	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	46	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	82	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	84	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	49	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	63	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	105	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	93	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	85	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	82	%	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 Potable 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)

Sum F-53B = The numerical sum of 9Cl-PF3ONS (F-53B major) and 11Cl-PF3OUdS (F-53B minor)

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 Potable Water - AsureQuality Method (LC-MS/MS)

Analyte	LOR
Perfluoroalkylsulfonic acids	
PFPrS	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
PFECHS	0.0010 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	0.0010 µg/L
P37DMOA	0.0010 µg/L
Perfluorooctanesulfonamides	
PFOSA	0.0010 µg/L
NEtFOSA-M	NR 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
10:2 FTS	0.0010 µg/L
Telomere Carboxylic acids	
FPrPA (3:3FTA)	0.0010 µg/L
FPePA (5:3FTA)	0.0010 µg/L

FHpPA (7:3FTA)	0.0010 µg/L
Miscellaneous	
F-53B (major)	0.0010 µg/L
F-53B (minor)	0.0010 µg/L
Sum F-53B	0.0010 µg/L
ADONA	0.0010 µg/L
HFPO-DA (GenX)	0.0010 µg/L

Analyte Definitions

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

Analyte	Full Name
Perfluoroalkylsulfonic acids	
PFPrS	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
PFECHS	Perfluoro-4-ethylcyclohexanesulfonic 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
PFTrDA	Perfluoro-n-tridecanoic acid
PFTeDA	Perfluoro-n-tetradecanoic acid
P37DMOA	Perfluoro-3,7-dimethyloctanoic 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
10:2 FTS	1H,1H,2H,2H-perfluorododecanesulfonic acid
Telomere Carboxylic acids	
FPrPA (3:3FTA)	3-Perfluoropropyl propanoic acid

Analyte	Full Name
FPePA (5:3FTA)	3-Perfluoropentyl propanoic acid
FHpPA (7:3FTA)	3-Perfluoroheptyl propanoic acid
Miscellaneous	
F-53B (major)	9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid
F-53B (minor)	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid
Sum F-53B	Sum of F-53B components (major + minor)
ADONA	Dodecafluoro-3H-4,8-dioxanonanoic acid
HFPO-DA (GenX)	Tetrafluoro-2-(heptafluoropropoxy)propanoic 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
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
M3HFPO-DA	Tetrafluoro-2-(heptafluoropropoxy)-13C3-propanoic acid

LOR = Limit of Reporting LOD = Limit of Detection NR = Not Reportable

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Certificate of Analysis

Submission Reference: A02744123
Final Report

James Conway
Pattle Delamore Partners Limited
P O Box 9528
Auckland 1149
New Zealand

PO Number: OHA_PFAS

Report Issued: 26-Apr-2023 **AsureQuality Reference: 23-101942** **Sample(s) Received:** 06-Apr-2023 08:30

Testing Period: 06-Apr-2023 to 26-Apr-2023
Date of analysis is available on request.

Results

The tests were performed on the samples as received.

Customer Sample Name: OHA_SW33_050423 **Lab ID:** 23-101942-1

Sample Condition: Acceptable **Sampled Date**: 05-Apr-2023

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable Water			
Perfluoroalkylsulfonic acids			
PFPrS	0.0017	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	0.0051	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	0.0048	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	0.0076	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	0.049	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	0.057	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	0.0018	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	0.0022	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	0.037	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	0.060	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	0.099	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	0.16	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)
PFECHS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	0.037	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	0.16	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	0.11	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	0.043	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	0.023	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	0.0087	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)

Test	Result	Unit	Method Reference
PFDoDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	<0.0010	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)
10:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	105	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	116	%	AsureQuality Method (LC-MS/MS)
M8PFOS	126	%	AsureQuality Method (LC-MS/MS)
M4PFBA	78	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	88	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	100	%	AsureQuality Method (LC-MS/MS)
MPFHpA	114	%	AsureQuality Method (LC-MS/MS)
M8PFOA	104	%	AsureQuality Method (LC-MS/MS)
M9PFNA	108	%	AsureQuality Method (LC-MS/MS)
M6PFDA	117	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	157 (R)	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	157 (R)	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	160 (R)	%	AsureQuality Method (LC-MS/MS)
MPFOSA	93	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	50	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	57	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	125	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	113	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	84	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	83	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
M4:2FTS	179 (R)	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	145	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	118	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	87	%	AsureQuality Method (LC-MS/MS)

R = Recovery outside method limits

QC Results

Blank

Relates to sample(s) 23-101942-1

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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)
PFECHS	<0.0010	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	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	<0.0010	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)
10:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	92	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	87	%	AsureQuality Method (LC-MS/MS)
M8PFOS	78	%	AsureQuality Method (LC-MS/MS)
M4PFBA	103	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	98	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	99	%	AsureQuality Method (LC-MS/MS)
MPFHpA	103	%	AsureQuality Method (LC-MS/MS)
M8PFOA	92	%	AsureQuality Method (LC-MS/MS)
M9PFNA	95	%	AsureQuality Method (LC-MS/MS)
M6PFDA	80	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	80	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	56	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	25 (R)	%	AsureQuality Method (LC-MS/MS)
MPFOSA	76	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	31	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	46	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	82	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	84	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	49	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	63	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	105	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	93	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	85	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	82	%	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 Potable 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)

Sum F-53B = The numerical sum of 9Cl-PF3ONS (F-53B major) and 11Cl-PF3OUdS (F-53B minor)

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 Potable Water - AsureQuality Method (LC-MS/MS)

Analyte	LOR
Perfluoroalkylsulfonic acids	
PFPrS	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
PFECHS	0.0010 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	0.0010 µg/L
P37DMOA	0.0010 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
10:2 FTS	0.0010 µg/L
Telomere Carboxylic acids	
FPrPA (3:3FTA)	0.0010 µg/L
FPePA (5:3FTA)	0.0010 µg/L

FHpPA (7:3FTA)	0.0010 µg/L
Miscellaneous	
F-53B (major)	0.0010 µg/L
F-53B (minor)	0.0010 µg/L
Sum F-53B	0.0010 µg/L
ADONA	0.0010 µg/L
HFPO-DA (GenX)	0.0010 µg/L

Analyte Definitions

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

Analyte	Full Name
Perfluoroalkylsulfonic acids	
PFPrS	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
PFECHS	Perfluoro-4-ethylcyclohexanesulfonic 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
PFTrDA	Perfluoro-n-tridecanoic acid
PFTeDA	Perfluoro-n-tetradecanoic acid
P37DMOA	Perfluoro-3,7-dimethyloctanoic 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
10:2 FTS	1H,1H,2H,2H-perfluorododecanesulfonic acid
Telomere Carboxylic acids	
FPrPA (3:3FTA)	3-Perfluoropropyl propanoic acid

Analyte	Full Name
FPePA (5:3FTA)	3-Perfluoropentyl propanoic acid
FHpPA (7:3FTA)	3-Perfluoroheptyl propanoic acid
Miscellaneous	
F-53B (major)	9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid
F-53B (minor)	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid
Sum F-53B	Sum of F-53B components (major + minor)
ADONA	Dodecafluoro-3H-4,8-dioxanonanoic acid
HFPO-DA (GenX)	Tetrafluoro-2-(heptafluoropropoxy)propanoic 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
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
M3HFPO-DA	Tetrafluoro-2-(heptafluoropropoxy)-13C3-propanoic acid

LOR = Limit of Reporting LOD = Limit of Detection NR = Not Reportable

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Certificate of Analysis

Submission Reference: A02744122
Final Report

James Conway
Pattle Delamore Partners Limited
P O Box 9528
Auckland 1149
New Zealand

PO Number: OHA_PFAS

Report Issued: 26-Apr-2023 **AsureQuality Reference: 23-101946** **Sample(s) Received:** 06-Apr-2023 08:30

Testing Period: 06-Apr-2023 to 26-Apr-2023
Date of analysis is available on request.

Results

The tests were performed on the samples as received.

Customer Sample Name: OHA_SW4_050423 **Lab ID:** 23-101946-1

Sample Condition: Acceptable **Sampled Date**: 05-Apr-2023

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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)	0.0017	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	0.0017	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)	0.0015	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	0.0024	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	0.0039	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	0.0056	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)
PFECHS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	0.0091	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	0.014	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	0.0096	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	0.0054	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	0.0022	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	0.0014	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)

Test	Result	Unit	Method Reference
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)
P37DMOA	<0.0010	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	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)
10:2 FTS	NR	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	NR	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.0010 (P)	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	109	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	128	%	AsureQuality Method (LC-MS/MS)
M8PFOS	133	%	AsureQuality Method (LC-MS/MS)
M4PFBA	64	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	84	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	92	%	AsureQuality Method (LC-MS/MS)
MPFHpA	113	%	AsureQuality Method (LC-MS/MS)
M8PFOA	106	%	AsureQuality Method (LC-MS/MS)
M9PFNA	126	%	AsureQuality Method (LC-MS/MS)
M6PFDA	122	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	164 (R)	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	207 (R)	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	243 (R)	%	AsureQuality Method (LC-MS/MS)
MPFOSA	108	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	137	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	132	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	137	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	124	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	121	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	105	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
M4:2FTS	337 (R)	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	161 (R)	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	137	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	76	%	AsureQuality Method (LC-MS/MS)

P = Partial result - one or more individual components could not be reported

R = Recovery outside method limits

Customer Sample Name: OHA_SWKQC_050423 **Lab ID:** 23-101946-2

Sample Condition: Acceptable **Sampled Date**: 05-Apr-2023

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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)
PFECHS	<0.0010	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	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	<0.0010	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)

Test	Result	Unit	Method Reference
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)
10:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	105	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	116	%	AsureQuality Method (LC-MS/MS)
M8PFOS	132	%	AsureQuality Method (LC-MS/MS)
M4PFBA	96	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	96	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	103	%	AsureQuality Method (LC-MS/MS)
MPFHpA	106	%	AsureQuality Method (LC-MS/MS)
M8PFOA	109	%	AsureQuality Method (LC-MS/MS)
M9PFNA	118	%	AsureQuality Method (LC-MS/MS)
M6PFDA	128	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	154 (R)	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	132	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	62	%	AsureQuality Method (LC-MS/MS)
MPFOSA	109	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	104	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	105	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	137	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	120	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	109	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	98	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	95	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	119	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	128	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	82	%	AsureQuality Method (LC-MS/MS)

R = Recovery outside method limits

QC Results

Blank

Relates to sample(s) 23-101946-1, 23-101946-2

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

Test	Result	Unit	Method Reference
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)
PFECHS	<0.0010	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	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	<0.0010	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)
10:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)

Miscellaneous			
F-53B (major)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	92	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	87	%	AsureQuality Method (LC-MS/MS)
M8PFOS	78	%	AsureQuality Method (LC-MS/MS)
M4PFBA	103	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	98	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	99	%	AsureQuality Method (LC-MS/MS)
MPFHpA	103	%	AsureQuality Method (LC-MS/MS)
M8PFOA	92	%	AsureQuality Method (LC-MS/MS)
M9PFNA	95	%	AsureQuality Method (LC-MS/MS)
M6PFDA	80	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	80	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	56	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	25 (R)	%	AsureQuality Method (LC-MS/MS)
MPFOSA	76	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	31	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	46	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	82	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	84	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	49	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	63	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	105	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	93	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	85	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	82	%	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 Potable 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)

Sum F-53B = The numerical sum of 9Cl-PF3ONS (F-53B major) and 11Cl-PF3OUdS (F-53B minor)

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 Potable Water - AsureQuality Method (LC-MS/MS)

Analyte	LOR
Perfluoroalkylsulfonic acids	
PFPrS	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
PFECHS	0.0010 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	NR µg/L
PFTrDA	NR µg/L
PFTeDA	NR µg/L
P37DMOA	0.0010 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	0.0010 µg/L
8:2 FTS	0.0010 µg/L
10:2 FTS	NR µg/L
Telomere Carboxylic acids	
FPrPA (3:3FTA)	0.0010 µg/L
FPePA (5:3FTA)	0.0010 µg/L

FHpPA (7:3FTA)	0.0010 µg/L
Miscellaneous	
F-53B (major)	0.0010 µg/L
F-53B (minor)	NR µg/L
Sum F-53B	0.0010 µg/L
ADONA	0.0010 µg/L
HFPO-DA (GenX)	0.0010 µg/L

Analyte Definitions

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

Analyte	Full Name
Perfluoroalkylsulfonic acids	
PFPrS	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
PFECHS	Perfluoro-4-ethylcyclohexanesulfonic 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
PFTrDA	Perfluoro-n-tridecanoic acid
PFTeDA	Perfluoro-n-tetradecanoic acid
P37DMOA	Perfluoro-3,7-dimethyloctanoic 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
10:2 FTS	1H,1H,2H,2H-perfluorododecanesulfonic acid
Telomere Carboxylic acids	
FPrPA (3:3FTA)	3-Perfluoropropyl propanoic acid

Analyte	Full Name
FPePA (5:3FTA)	3-Perfluoropentyl propanoic acid
FHpPA (7:3FTA)	3-Perfluoroheptyl propanoic acid
Miscellaneous	
F-53B (major)	9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid
F-53B (minor)	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid
Sum F-53B	Sum of F-53B components (major + minor)
ADONA	Dodecafluoro-3H-4,8-dioxanonanoic acid
HFPO-DA (GenX)	Tetrafluoro-2-(heptafluoropropoxy)propanoic 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
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
M3HFPO-DA	Tetrafluoro-2-(heptafluoropropoxy)-13C3-propanoic acid

LOR = Limit of Reporting LOD = Limit of Detection NR = Not Reportable

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Certificate of Analysis

Submission Reference: A02744123
Final Report

James Conway
Pattle Delamore Partners Limited
P O Box 9528
Auckland 1149
New Zealand

PO Number: OHA_PFAS

Report Issued: 26-Apr-2023 **AsureQuality Reference: 23-102044** **Sample(s) Received:** 06-Apr-2023 08:30

Testing Period: 06-Apr-2023 to 26-Apr-2023
Date of analysis is available on request.

Results

The tests were performed on the samples as received.

Customer Sample Name: OHA_GW107_050423 **Lab ID:** 23-102044-1

Sample Condition: Acceptable **Sampled Date**: 05-Apr-2023

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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)
PFECHS	<0.0010	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)

Test	Result	Unit	Method Reference
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)
P37DMOA	<0.0010	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)
10:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	99	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	99	%	AsureQuality Method (LC-MS/MS)
M8PFOS	100	%	AsureQuality Method (LC-MS/MS)
M4PFBA	85	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	90	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	99	%	AsureQuality Method (LC-MS/MS)
MPFHpA	101	%	AsureQuality Method (LC-MS/MS)
M8PFOA	93	%	AsureQuality Method (LC-MS/MS)
M9PFNA	98	%	AsureQuality Method (LC-MS/MS)
M6PFDA	88	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	114	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	149	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	588 (R)	%	AsureQuality Method (LC-MS/MS)
MPFOSA	83	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	131	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	97	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	106	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	98	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	118	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	95	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
M4:2FTS	149	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	120	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	113	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	74	%	AsureQuality Method (LC-MS/MS)

R = Recovery outside method limits

Customer Sample Name: OHA_GWKPY_050423 **Lab ID:** 23-102044-2

Sample Condition: Acceptable **Sampled Date**: 05-Apr-2023

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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)
PFECHS	<0.0010	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)
P37DMOA	<0.0010	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)

Test	Result	Unit	Method Reference
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)
10:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	105	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	113	%	AsureQuality Method (LC-MS/MS)
M8PFOS	122	%	AsureQuality Method (LC-MS/MS)
M4PFBA	101	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	103	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	107	%	AsureQuality Method (LC-MS/MS)
MPFHpA	107	%	AsureQuality Method (LC-MS/MS)
M8PFOA	112	%	AsureQuality Method (LC-MS/MS)
M9PFNA	111	%	AsureQuality Method (LC-MS/MS)
M6PFDA	111	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	107	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	63	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	11 (R)	%	AsureQuality Method (LC-MS/MS)
MPFOSA	98	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	48	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	65	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	94	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	102	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	69	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	77	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	97	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	146	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	107	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	93	%	AsureQuality Method (LC-MS/MS)

R = Recovery outside method limits

Customer Sample Name: OHA_GWKQF_050423 **Lab ID:** 23-102044-3

Sample Condition: Acceptable **Sampled Date**: 05-Apr-2023

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

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)
PFECHS	<0.0010	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	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	<0.0010	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)
10:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
HFPO-DA (GenX)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	94	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	96	%	AsureQuality Method (LC-MS/MS)
M8PFOS	100	%	AsureQuality Method (LC-MS/MS)
M4PFBA	89	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	88	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	97	%	AsureQuality Method (LC-MS/MS)
MPFHpA	94	%	AsureQuality Method (LC-MS/MS)
M8PFOA	95	%	AsureQuality Method (LC-MS/MS)
M9PFNA	96	%	AsureQuality Method (LC-MS/MS)
M6PFDA	90	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	86	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	93	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	72	%	AsureQuality Method (LC-MS/MS)
MPFOSA	101	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	139	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	133	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	97	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	89	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	104	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	103	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	96	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	100	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	96	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	70	%	AsureQuality Method (LC-MS/MS)

Customer Sample Name: Dupl.of 23-102044-3A **Lab ID:** 23-102044-4

Sample Description: 21658405_Duplicate

Sample Condition: Acceptable **Sampled Date**: 05-Apr-2023

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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)
PFECHS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
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	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	<0.0010	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)
10:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	96	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	113	%	AsureQuality Method (LC-MS/MS)
M8PFOS	122	%	AsureQuality Method (LC-MS/MS)
M4PFBA	90	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	86	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	93	%	AsureQuality Method (LC-MS/MS)
MPFHpA	96	%	AsureQuality Method (LC-MS/MS)
M8PFOA	100	%	AsureQuality Method (LC-MS/MS)
M9PFNA	102	%	AsureQuality Method (LC-MS/MS)
M6PFDA	100	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	149	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
MPFDoDA	233 (R)	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	375 (R)	%	AsureQuality Method (LC-MS/MS)
MPFOSA	114	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	268 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	203 (R)	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	139	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	121	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	166 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	136	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	95	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	104	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	103	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	81	%	AsureQuality Method (LC-MS/MS)

R = Recovery outside method limits

QC Results

Blank

Relates to sample(s) 23-102044-1, 23-102044-2, 23-102044-3, 23-102044-4

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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)
PFECHS	<0.0010	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)

Test	Result	Unit	Method Reference
PFTrDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	<0.0010	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)
10:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Carboxylic acids			
FPrPA (3:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FPePA (5:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
FHpPA (7:3FTA)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
ADONA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
HFPO-DA (GenX)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	92	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	87	%	AsureQuality Method (LC-MS/MS)
M8PFOS	78	%	AsureQuality Method (LC-MS/MS)
M4PFBA	103	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	98	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	99	%	AsureQuality Method (LC-MS/MS)
MPFHpA	103	%	AsureQuality Method (LC-MS/MS)
M8PFOA	92	%	AsureQuality Method (LC-MS/MS)
M9PFNA	95	%	AsureQuality Method (LC-MS/MS)
M6PFDA	80	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	80	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	56	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	25 (R)	%	AsureQuality Method (LC-MS/MS)
MPFOSA	76	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	31	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	46	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	82	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	84	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
DNEtFOSE	49	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	63	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	105	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	93	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	85	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	82	%	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 Potable 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)

Sum F-53B = The numerical sum of 9Cl-PF3ONS (F-53B major) and 11Cl-PF3OUdS (F-53B minor)

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 Potable Water - AsureQuality Method (LC-MS/MS)

Analyte	LOR
Perfluoroalkylsulfonic acids	
PFPrS	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
PFECHS	0.0010 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
P37DMOA	0.0010 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
10:2 FTS	0.0010 µg/L
Telomere Carboxylic acids	
FPrPA (3:3FTA)	0.0010 µg/L
FPePA (5:3FTA)	0.0010 µg/L

FHpPA (7:3FTA)	0.0010 µg/L
Miscellaneous	
F-53B (major)	0.0010 µg/L
F-53B (minor)	0.0010 µg/L
Sum F-53B	0.0010 µg/L
ADONA	0.0010 µg/L
HFPO-DA (GenX)	0.0010 µg/L

Analyte Definitions

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

Analyte	Full Name
Perfluoroalkylsulfonic acids	
PFPrS	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
PFECHS	Perfluoro-4-ethylcyclohexanesulfonic 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
PFTrDA	Perfluoro-n-tridecanoic acid
PFTeDA	Perfluoro-n-tetradecanoic acid
P37DMOA	Perfluoro-3,7-dimethyloctanoic 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
10:2 FTS	1H,1H,2H,2H-perfluorododecanesulfonic acid
Telomere Carboxylic acids	
FPrPA (3:3FTA)	3-Perfluoropropyl propanoic acid

Analyte	Full Name
FPePA (5:3FTA)	3-Perfluoropentyl propanoic acid
FHpPA (7:3FTA)	3-Perfluoroheptyl propanoic acid
Miscellaneous	
F-53B (major)	9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid
F-53B (minor)	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid
Sum F-53B	Sum of F-53B components (major + minor)
ADONA	Dodecafluoro-3H-4,8-dioxanonanoic acid
HFPO-DA (GenX)	Tetrafluoro-2-(heptafluoropropoxy)propanoic 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
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
M3HFPO-DA	Tetrafluoro-2-(heptafluoropropoxy)-13C3-propanoic acid

LOR = Limit of Reporting LOD = Limit of Detection NR = Not Reportable

Appendix B: GW Level Measurements

Appendix B: April 2023 Well Details and Water Level

Monitoring Well Ref	GW106	GW107	GW108	GW109	GW6	MW4	MW6	MW9
Total Depth of Well (m below TOC [1])	6.84	10.72	3.87	7.83	9.45	9.91	4.46	4.42
Diameter (mm)	50	50	50	50	1070	50	40	40
TOC [1] (m below ground level)	0.05	0.08	0.04	0.04	0.67 m agl [2]	0.00	0.09	0.06
Date	**5/4/2023**			**3/4/2023**	**4/4/2023**	**3/4/2023**		
Depth to Water (m below ground level)	2.40	2.96	1.74	4.66	4.22	6.38	3.48	1.78
Water depth (m below TOC)	2.35	2.88	1.70	4.62	4.89	6.38	3.39	1.72

Monitoring Well Ref	GW111.1	GW111.2	GW111.3	GW112.1	GW112.2
Total Depth of Well (m below TOC [1])	11.49	38.0	81.0	10.32	50.0
Diameter (mm)	50	50	50	50	50
TOC [1] (m below ground level)	0.48 m agl [2]	0.49 m agl [2]	0.50 m agl [2]	0.55 m agl [2]	1.08 m agl [2]
Date	**4/4/2023**				
Depth to Water (m below ground level)	6.40	8.01	5.09	1.07	0.41 agl [2]
Water depth (m below TOC)	6.88	8.50	5.58	1.62	0.67

Notes:
1. TOC = top of casing.
2. agl = above ground level.

Appendix C: Field Sheets

Table D-1: QA/QC Water Sampling Results - Duplicates - Per- and Poly-Fluoroalkyl Substances (PFAS) [1]

Sample Location	GW31	GW31	**%RPD (GW31 and GWKQE)**	GW111.3	GW111.3	**%RPD (GW111.3 and GWKPZ)**
Sample Name	OHA_GW31_040423	OHA_GWKQE_040423		OHA_GW111.3_040423	OHA_GWKPZ_040423	
Laboratory Reference	3277680	3277680		3288820	3288820	
Monitoring Zone	Off base	Off base		On Base	On base	
Sampled Date	4/04/2023	4/04/2023		4/04/2023	4/04/2023	
PFPrS	0.0042	0.0042	0	<0.001	<0.001	0
PFBS	0.0081	0.008	1	<0.001	<0.001	0
PFPeS	0.0075	0.0077	3	<0.001	<0.001	0
di-PFHxS	<0.001	<0.001	0	<0.001	<0.001	0
Mono-PFHxS	0.011	0.011	0	<0.001	<0.001	0
L-PFHxS	0.048	0.048	0	<0.001	<0.001	0
Total PFHxS	0.059	0.059	0	<0.001	<0.001	0
PFHpS	0.0011	0.0011	0	<0.001	<0.001	0
di-PFOS	0.002	0.0022	10	<0.001	<0.001	0
Mono-PFOS	0.018	0.017	6	<0.001	<0.001	0
L-PFOS	0.0085	0.007	19	<0.001	<0.001	0
Total PFOS	0.028	0.026	7	<0.001	<0.001	0
Sum of PFHxS and PFOS	0.087	0.085	2	<0.001	<0.001	0
PFBA	0.04	0.039	3	<0.001	<0.001	0
PFPeA	0.11	0.11	0	<0.001	<0.001	0
PFHxA	0.072	0.071	1	<0.001	<0.001	0
PFHpA	0.027	0.027	0	<0.001	<0.001	0
PFOA	0.012	0.012	0	<0.001	<0.001	0
PFNA	0.0026	0.0026	0	<0.001	<0.001	0
PFDA	<0.001	<0.001	0	<0.001	<0.001	0
PFUnDA	<0.001	<0.001	0	<0.001	<0.001	0
PFTeDA	-	-		<0.001	<0.001	0
PFDoDA	<0.001	<0.001	0	<0.001	<0.001	0
FOSA	<0.001	<0.001	0	<0.001	<0.001	0
MeFOSA	<0.001	<0.001	0	<0.001	<0.001	0
MeFOSAA	<0.001	<0.001	0	<0.001	<0.001	0
EtFOSAA	<0.001	<0.001	0	<0.001	<0.001	0
4:2 FTS	<0.001	<0.001	0	<0.001	<0.001	0
6:2 FTS	0.0033	0.0031	6	<0.001	<0.001	0
8:2 FTS	<0.001	<0.001	0	<0.001	<0.001	0
10:2 FTS	<0.001	<0.001	0	<0.001	<0.001	0
FPrPA	<0.001	<0.001	0	<0.001	<0.001	0
EtFOSA	<0.001	<0.001	0	<0.001	<0.001	0
EtFOSE	<0.001	<0.001	0	<0.001	<0.001	0
FPePA	<0.001	<0.001	0	<0.001	<0.001	0
F-53B minor	-	-	-	<0.001	<0.001	0
HFPO-DA*	<0.001	<0.001	0	<0.001	<0.001	0
Sum F-53B	-	-	-	<0.001	<0.001	0
ADONA	<0.001	<0.001	0	<0.001	<0.001	0
P37DMOA	-	-	-	<0.001	<0.001	0
F-53B major	-	-	-	<0.001	<0.001	0

Notes:

1. Results in µg/L.

-	No value available
<0.001	Below the limit of reporting
%RPD	Relative Percent Difference

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

Location: Ohakea / Woodbourne (circle as appropriate)

Land owner: NZDF

Address: On-base

Weather: Cloudy

Sample point: tap / well / surface water

Description of sample point: –

Distance of sample point from bore: – (m)

Sampling equipment: Peri Pump

QA/QA Sample Codes: –

Duplicate –

Trip Blank –

Field Blank –

Rinsate Blank (include description of equipment cleaned e.g. dipper) ~~Bucket + Dipper~~ –

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

Job Number: ~~A02684802~~ A0274422

Sample Code (Name): MW8

Date and time: 3/4/23

Coordinates (NZTM): E

N

Sampled By: BL (Clean hands)

Tom (Dirty hands)

Site Photos taken? ☑ Yes ☐ No

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

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

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

11 x 30 ÷ 250 = 0.6L

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	–	10:20	–	16.4	6.50	548		2.87	6.377	28.22
During	1	11:21	0.8	16.1	6.31	562		1.16	6.38	28.12
During	4	11:24	1.35	16.1	6.31	563		0.91	6.38	46.68
During	8	11:28	2.0	16.1	6.31	562		0.79	6.385	18.39
During	10	11:30	2.6	16.0	6.31	563		0.70	6.385	17.54
During	14	11:34	3.2	16.0	6.32	562		0.65	6.385	22.87
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 d^2 / 4000) + flow through cell volume.
Where d = internal diameter of sample tube in **mm**
Water sample internal ø = 6mm ≈ 30mL per meter

Comments

DTW 6.377
DTB 9.914.

6.377

11 x 30 ÷ 250 = 580 = 0.6 Tubing in 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 NA

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)

Land owner: NZDF

Address: On-base

Weather: Rain

Sample point: tap / well / surface water

Description of sample point: —

Distance of sample point from bore: — (m)

Sampling equipment: Peri. pump

QA/QA Sample Codes: —

Duplicate —

Trip Blank —

Field Blank —

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

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

Job Number: ~~A02684802~~ A0274412R

Sample Code (Name): MW6

Date and time: 3/4/23

Coordinates (NZTM): E

N

Sampled By: TH (Clean hands)

BT (Dirty hands)

Site Photos taken? ☐ Yes ☑ No

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

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

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

0.4L → 4.46 x 30 + 250

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	0	12.18	CUM	17.5	6.27	245.1	—	7.76	3.40	CL
During	4	12.22	0.4	17.6	6.05	240.2	—	7.15	3.415	CL
During	8	12.26	0.8	17.7	6.02	240.9	—	7.16	3.42	CL
During	12	12.30	1.2	17.8	6.02	243.7	—	7.15	3.435	CL
During	16	12.34	1.6	17.7	6.02	243.7	—	7.12	3.44	CL
During										
During										
During										
During										
During										
During										

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

Comments DTW = 3.39
DTB = 4.46

Sample Train Volume Calculation (L)
(length of sample tube x 3.141 x d^2 / 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: NA

Shake test – foam produced? ☐ Yes ☑ No

COC form completed and checked? ☑ Yes

Letter given to landowner? ☐ Yes NA

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)

Land owner: NZDF

Address: On-base

Weather: Rain

Sample point: tap / well / surface water

Description of sample point: Monitoring Well

Distance of sample point from bore: – (m)

Sampling equipment: Low Flow

QA/QA Sample Codes:

Duplicate –

Trip Blank –

Field Blank –

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

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

Job Number: ~~A02684802~~ A02744172

Sample Code (Name): MW4

Date and time: 3/4/23

Coordinates (NZTM): E

N

Sampled By: Tom H (Clean hands)

Bryn (Dirty hands)

Site Photos taken? ☐ Yes ☑ No

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

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

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

Sample Train = 0.4L

30 x 4.42 + 25 = 0.4L

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		13.15	Cell	17.6	5.83	325.7	–	3.20	1.74	CL
During	4	13.19	0.4	17.8	5.75	319.5	–	1.26	1.76	CL
During	8	13.23	0.8	18.0	5.76	317.4	–	0.92	1.78	CL
During	13	13.28	1.2	18.0	5.76	317.9	–	0.78	1.79	CL
During	18	13.33	1.6	18.1	5.78	314.6	–	0.73	1.805	CL
During	23	13.38	2.0	18.1	5.81	324.5	–	0.75	1.83	CL
During	26	13.41	2.4	18.1	5.82	328.9	–	0.64	1.86	CL
During	29	13.44	2.8	18.1	5.83	329.6	–	0.56	1.87	CL
During	32	13.47	3.2	18.1	5.83	341.8	–	0.52	1.89	CL
During										
During										

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

Comments DTW = 1.7m btoc

PTB = 4.42 btoc

Sample Train Volume Calculation (L)
(length of sample tube x 3.141 x d^2 / 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: NA

Shake test – foam produced?	☐ Yes	☑ No			
COC form completed and checked?	☑ Yes		Letter given to landowner?	☐ Yes	NA
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)

Land owner: NZDF

Address: Barley Road

Weather: Sunny

Sample point: tap / well / surface water

Description of sample point: –

Distance of sample point from bore: – (m)

Sampling equipment: Transfer bottle

QA/QA Sample Codes: –

Duplicate

Trip Blank ~~Bucket~~ –

Field Blank –

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

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

Job Number: ~~A02684802~~ A027441122

Sample Code (Name): WSI

Date and time: 04/04/23 7:30

Coordinates (NZTM): E

N

Sampled By: Brm (Clean hands)

Tom (Dirty hands)

Site Photos taken? ☐ Yes ☑ No

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

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

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

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	–	7:30	–	12.5	6.95	44.2	–	11.55	–	295.83
During										
During										
During										
During										
During										
During										
During										
During										
During										
During										

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

Comments

Sample Train Volume Calculation (L)
(length of sample tube x 3.141 x d^2 / 4000) + flow through cell volume.
Where d = internal diameter of sample tube in **mm**

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

Water clear.
Taken from bucket.

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	NA
Location field sheet completed?	☐ Yes	☑ N/A	Well field sheet completed?	☑ Yes	☐ N/A
Stabilisation criteria field sheet completed?	☐ Yes	NA			

* = 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)

Land owner: NZDF

Address: Quarry

Weather: Fine

Sample point: tap / well / surface water

Description of sample point: –

Distance of sample point from bore: – (m)

Sampling equipment: Tap

QA/QA Sample Codes: –

Duplicate: –

Trip Blank: –

Field Blank: –

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

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

Job Number: A02684802 A02427122

Sample Code (Name): WS2

Date and time: 04/04/23 3:30

Coordinates (NZTM): E

N

Sampled By: Tom (Clean hands)

Bryn (Dirty hands)

Site Photos taken? ☐ Yes ☑ No

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

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

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

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	–	3:30	–	15.2	6.52	517	–	3.35	–	290.35
During										
During										
During										
During										
During										
During										
During										
During										
During										
During										

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

Comments

Sample Train Volume Calculation (L)
(length of sample tube x 3.141 x d^2 / 4000) + flow through cell volume.
Where d = internal diameter of sample tube in **mm**

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

Clear water

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	NA
Location field sheet completed?	☐ Yes	☑ N/A	Well field sheet completed?	☑ Yes	☐ N/A
Stabilisation criteria field sheet completed?	☑ Yes	NA			

* = 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)

Land owner: NZDF

Address: Access off Fagan Road

Weather:

Sample point: tap / well / surface water

Description of sample point: A –

Distance of sample point from bore: – (m)

Sampling equipment: mighty gripper

QA/QA Sample Codes:

Duplicate –

Trip Blank –

Field Blank –

Rinsate Blank (include description of equipment cleaned e.g. dipper) WW SWKQC mighty gripper.

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

Job Number: A02684802 A02744122

Sample Code (Name): SWK

Date and time: 05/04/23 1347

Coordinates (NZTM): E

N

Sampled By: Tom (Clean hands)

Bry (Dirty hands)

Site Photos taken? ☐ Yes ☑ No

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

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

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

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	–	13.47	–	14.3	7.08	368.5	–	6.01	–	18.06
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 d^2 / 4000) + flow through cell volume.
Where d = internal diameter of sample tube in **mm**
Water sample internal ø = 6mm ≈ 30mL per meter

Comments

lots of water

Rinsate from mighty gripper collected here.

Analyses Required: PFAS suite

Serial number of water quality sensor unit: NA

Shake test – foam produced? ☐ Yes ☑ No

COC form completed and checked? ☑ Yes

Letter given to landowner? ☐ Yes NA

Location field sheet completed? ☐ Yes ☑ N/A

Well field sheet completed? ☑ Yes ☐ N/A

Stabilisation criteria field sheet completed? ☑ Yes NA

* = 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)

Land owner: NZDF

Address: Tangimoana Road

Weather: Cloudy

Sample point: tap / well / surface water

Description of sample point: –

Distance of sample point from bore: – (m)

Sampling equipment: Mighty Gripper

QA/QA Sample Codes:

Duplicate –

Trip Blank –

Field Blank –

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

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

Job Number: ~~A02684802~~ A0274422

Sample Code (Name): SW6.

Date and time: 3/4/23

Coordinates (NZTM): E

N

Sampled By: TH (Clean hands)

BT (Dirty hands)

Site Photos taken? ☐ Yes ☑ No

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

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

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

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	–	15.16	–	15.1	6.51	244	–	2.90	–	26.80
During										
During										
During										
During										
During										
During										
During										
During										
During										
During										

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

Comments Low Water
Lots of algae on surface

Sample Train Volume Calculation (L)
(length of sample tube x 3.141 x d^2 / 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: NA

Shake test – foam produced?	☐ Yes	☑ No			
COC form completed and checked?	☑ Yes		Letter given to landowner?	☐ Yes	NA
Location field sheet completed?	☐ Yes	☑ N/A	Well field sheet completed?	☑ Yes	☐ N/A
Stabilisation criteria field sheet completed?	☐ Yes	NA			

* = 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)

Land owner: –

Address: Taylor Road

Weather: Fine/windy

Sample point: tap / well / surface water

Description of sample point: Stream

Distance of sample point from bore: – (m)

Sampling equipment: Mighty Gripper

QA/QA Sample Codes: –

Duplicate

Trip Blank –

Field Blank –

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

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

Job Number: ~~A02684802~~ AC274412 3

Sample Code (Name): SW33

Date and time: 5/4/23

Coordinates (NZTM): E

N

Sampled By: BT (Clean hands)

TH (Dirty hands)

Site Photos taken? ☐ Yes ☑ No

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

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

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

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	–	14.41	–	16.7	7.28	376	–	95.1	–	10.83
During										
During										
During										
During										
During										
During										
During										
During										
During										
During										

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

Comments

Sample Train Volume Calculation (L)
(length of sample tube x 3.141 x d^2 / 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		Letter given to landowner?	☐ Yes	N/A
Location field sheet completed?	☐ Yes	☑ N/A	Well field sheet completed?	☑ Yes	☐ N/A
Stabilisation criteria 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)

Land owner: –

Address: Campion Road Quarry

Weather:

Sample point: tap / well / surface water

Description of sample point: Stream

Distance of sample point from bore: (m)

Sampling equipment: Mighty Gripper

QA/QA Sample Codes: –

Duplicate

Trip Blank –

Field Blank –

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

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

Job Number: ~~A02684802~~ A0274423

Sample Code (Name): SW36

Date and time: 5/4/23

Coordinates (NZTM): E

N

Sampled By: BT (Clean hands)

FH (Dirty hands)

Site Photos taken? ☐ Yes ☑ No

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

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

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

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	–	14.18	–	17.0	2.48	741	–	14.13	–	16.10
During										
During										
During										
During										
During										
During										
During										
During										
During										
During										

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

Comments

Sample Train Volume Calculation (L)
(length of sample tube x 3.141 x d^2 / 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: NA

Shake test – foam produced? ☐ Yes ☑ No

COC form completed and checked? ☑ Yes

Letter given to landowner? ☐ Yes NA

Location field sheet completed? ☐ Yes ☑ N/A

Well field sheet completed? ☑ Yes ☐ N/A

Stabilisation criteria field sheet completed? ☐ Yes NA

* = 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)

Land owner: NZDF

Address: Tangimoana Road

Weather: Fine

Sample point: tap / well / surface water

Description of sample point: Open Well

Distance of sample point from bore: ~ (m)

Sampling equipment: Low Flow

QA/QA Sample Codes:

Duplicate: -

Trip Blank: ✓

Field Blank: -

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

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

Job Number: ~~A02684802~~ A02744122

Sample Code (Name): GW6

Date and time: 04/04/23 9:39

Coordinates (NZTM): E

N

Sampled By: TH (Clean hands)

BT (Dirty hands)

Site Photos taken? ☐ Yes ☑ No

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

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

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

1 L

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	9 -	9:41	-	15.7	6.39	420		7.18	4.858	26.62
During	3	9:44	1	15.6	6.48	426		3.27	4.88	29.56
During	6	9:47	2	15.7	6.52	464.8		2.08	4.88	32.33
During	9	9:50	3	15.7	6.55	444.6		2.06	4.88	36.44
During	11	9:52	4	15.6	6.53	455.7		1.93	4.88	41.99
During	13	9:55	5	15.7	6.57	459.1		1.66	4.88	48.81
During	16	9:57	6	15.6	6.55	452.7		1.82	4.88	55.82
During										
During										
During										
During										

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

Comments

Sample Train Volume Calculation (L)
(length of sample tube x 3.141 x d^2 / 4000) + flow through cell volume.
Where d = internal diameter of sample tube in **mm**

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

Open well.
tubing in well.

DTW 4.885
DTB ~~4.9~~ 4.85

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)

Land owner: –

Address: Speedy Road

Weather: Fine

Sample point: tap / well / surface water

Description of sample point: –

Distance of sample point from bore: – (m)

Sampling equipment: transfer bottle

QA/QA Sample Codes:

Duplicate: GWKQ6

Trip Blank: –

Field Blank: –

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

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

Job Number: ~~A02684802~~ A0294 44123

Sample Code (Name): GW31 3:00

Date and time: 3:00 4/4/23

Coordinates (NZTM): E

N

Sampled By: Tom (Clean hands)

Bryn (Dirty hands)

Site Photos taken? ☑ Yes ☐ No

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

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

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

NA

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	–	15:00	–	17.6	6.50	549	–	7.18	–	388.17
During										
During										
During										
During										
During										
During										
During										
During										
During										
During										

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

Comments

Sample Train Volume Calculation (L)
(length of sample tube x 3.141 x d^2 / 4000) + flow through cell volume.
Where d = internal diameter of sample tube in **mm**

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

Clear

Water tank. Bore is middle hose. Confirmed taken from bore. bore is back hose (not the one with the attached yellow cord and not the one with a blue stripe.)

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	NA
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)

Land owner: –

Address: Access off SH1

Weather: Fine

Sample point: tap / well / surface water

Description of sample point: Artesian well

Distance of sample point from bore: (m)

Sampling equipment: transfer bottle

QA/QA Sample Codes:

Duplicate –

Trip Blank –

Field Blank –

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

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

Job Number: ~~A02684802~~ A0274423

Sample Code (Name): GW53

Date and time: 04/04/23 2:02

Coordinates (NZTM): E

N

Sampled By: BM (Clean hands)

TM (Dirty hands)

Site Photos taken? ☐ Yes ☑ No

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

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

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

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	–	2:02	~~1260~~	15.	6.73	723	✓	5.40	–	11.70
During										
During										
During										
During										
During										
During										
During										
During										
During										
During										

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

Comments

clear

Sample Train Volume Calculation (L)
(length of sample tube x 3.141 x d^2 / 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		Letter given to landowner?	☐ Yes	N/A
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)

Land owner: –

Address: Soldiers Road

Weather: Fine / Windy

Sample point: tap / well / surface water

Description of sample point: From tank.

Distance of sample point from bore: (m)

Sampling equipment: Transfer Bottle

QA/QA Sample Codes:

Duplicate –

Trip Blank –

Field Blank –

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

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

Job Number: ~~A02684802~~ A0274423

Sample Code (Name): SW55

Date and time: 8/4/23

Coordinates (NZTM): E

N

Sampled By: TH (Clean hands)

BT (Dirty hands)

Site Photos taken? ☐ Yes ☑ No

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

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

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

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	–	13.12	–	14.7	6.86	1012	–	6.03	–	5098
During										
During										
During										
During										
During										
During										
During										
During										
During										
During										

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

Comments: Sampled from tank. See previous rounds for description

Sample Train Volume Calculation (L)
(length of sample tube x 3.141 x d^2 / 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		Letter given to landowner?	☐ Yes N/A
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)

Land owner: –

Address: Taylor Road

Weather: Cloudy / windy

Sample point: tap / well / surface water

Description of sample point: –

Distance of sample point from bore: – (m)

Sampling equipment: Peri Pump

QA/QA Sample Codes: –

Duplicate –

Trip Blank –

Field Blank –

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

Job Number: ~~A02684802~~ A027444123

Sample Code (Name): GW106

Date and time: 5/4/23

Coordinates (NZTM): E

N

Sampled By: BT (Clean hands)

TH (Dirty hands)

Site Photos taken? ☐ Yes ☑ No

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

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

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

0.5 L

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

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	0	10.36	Cell	17.3	5.56	739	–	4.72	2.355	CL
During	2	10.58	0.5	16.7	6.28	750	–	1.77	2.36	CL
During	4	11.00	1.0	16.7	6.21	760	–	1.30	2.36	CL
During	6	11.02	1.5	16.8	6.17	760	–	1.02	–	CL
During	8	11.04	2.0	16.7	6.17	760	–	0.87	–	CL
During	10	11.06	2.5	16.8	6.15	759	–	0.77	–	CL
During	12	11.08	3.0	16.7	6.15	759	–	0.71	–	CL
During			3.5							
During			4.0							
During										
During										

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

Comments DTW = 2.351
DTB = 6.84

Sample Train Volume Calculation (L)
(length of sample tube x 3.141 x d^2 / 4000) + flow through cell volume.
Where d = internal diameter of sample tube in **mm**

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

Minor amounts of orange/red sediment in measuring jug.

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 N/A
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)

Land owner: –

Address: Tuyuroa Road

Weather:

Sample point: tap / well / surface water

Description of sample point: –

Distance of sample point from bore: – (m)

Sampling equipment: Peri Pump

QA/QA Sample Codes:

Duplicate –

Trip Blank GWKPY

Field Blank GWKQF

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

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

Job Number: ~~A02684802~~ A02744123

Sample Code (Name): GW107

Date and time: 5/4/23

Coordinates (NZTM): E

N

Sampled By: TH (Clean hands)

BT (Dirty hands)

Site Photos taken? ☐ Yes ☑ No

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

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

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

6x30 + 250 = 430 ml 500ml sample train

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	–	8:10	–	15.5	7.32	160.5		5.57	2.88	22.73
During	2	8:12	0.6	15.3	6.85	310.10		3.20	2.88	27.43
During	3	8:13	1.2	15.2	6.58	603		1.93	2.88	40.89
During	5	8:15	1.8	15.1	6.61	655		1.54	2.88	42.16
During	6	8:16	2.4	15.1	6.66	666		1.25	2.88	42.16
During	8	8:18	3.0	15.0	6.69	672		1.06	2.88	42.22
During	10	8:20	3.6	15.0	6.70	673		0.99	2.88	43.36
During	12	8:22	4.2	15.0	6.72	674		0.91	2.88	43.02
During										
During										
During										

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

Comments DTW = 2.88 m bTOC
DTB = 10.72 m bTOC

Sample Train Volume Calculation (L)
(length of sample tube x 3.141 x d^2 / 4000) + flow through cell volume.
Where d = internal diameter of sample tube in **mm**

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

5.5m tubing put in well - was removed last year. Fairly murky water

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	N/A
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)

Land owner: –

Address: Taylor Road

Weather: Fine / cloudy / breezy

Sample point: tap / well / surface water

Description of sample point: –

Distance of sample point from bore: – (m)

Sampling equipment: Peri Pump

QA/QA Sample Codes:

Duplicate –

Trip Blank –

Field Blank –

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

Job Number: ~~A02684802~~ 4027664123

Sample Code (Name): GW105

Date and time: 5/4/23

Coordinates (NZTM): E

N

Sampled By: BT (Clean hands)

TH (Dirty hands)

Site Photos taken? ☐ Yes ☑ No

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

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

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

0.5L → 3.87 x 30 + 250

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

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	0	10.07	Cell	17.6	6.77	330	–	6.70	1.72	CL
During	3	10.10	0.5	17.1	6.17	318.9	–	3.79	1.725	CL *
During	6	10.13	1.0	16.6	5.99	329.5	–	2.74	1.75	CL
During	8	10.15	1.5	16.6	5.95	329.8	–	2.06	1.755	CL
During	11	10.18	2.0	16.6	5.93	350.7	–	1.74	1.755	CL
During	15	10.22	2.5	16.7	5.92	372.9	–	1.46	1.755	CL
During	18	10.25	3.0	16.6	5.93	385.1	–	1.38	1.755	CL
During	21	10.28	3.5	16.8	5.94	394.1	–	1.50	1.755	CL
During	24	10.31	4.0	16.8	5.95	398.0	–	1.42	* –	CL
During	27	10.34	4.5	16.8	5.95	400.8	–	1.40	–	CL
During			5.0							

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

Comments DTB = 3.87
DTW = 1.695
*Stopped @ 0.5L - hole in sil.con tubing - replaced WL dropped so had to lower speed on pump

Sample Train Volume Calculation (L)
(length of sample tube x 3.141 x d^2 / 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		Letter given to landowner?	☐ Yes	N/A
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)

Land owner: –

Address: Hardy McDowell Road

Weather: Cloudy

Sample point: tap / well / surface water

Description of sample point: –

Distance of sample point from bore: – (m)

Sampling equipment: Peri. pump

QA/QA Sample Codes:

Duplicate –

Trip Blank –

Field Blank –

Rinsate Blank (include description of equipment cleaned e.g. dipper) ~~GWK20 – Dipper~~ GWK20 – Rinsate dipper

Job Number: ~~A02684802~~ A02744+123

Sample Code (Name): GW109

Date and time: 3.3.2023

Coordinates (NZTM): E

N

Sampled By: TH (Clean hands)

BT (Dirty hands)

Site Photos taken? ☐ Yes ☐ No

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

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

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

7.83 × 30 + 250 = 500ml

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	–	3:45	–	13.0	6.66	403.3		4.96	4.62	54.62
During	2	3:47	0.5	15.7	6.18	406.3		1.95	4.62	73.14
During	4	3:49	1.0	15.7	6.05	405.4		1.37	4.62	72.18
During	6	3:51	1.5	15.7	5.97	405.7		1.02	4.62	84.67
During	8	3:53	2.0	15.7	5.95	405.1		0.88	4.62	105.71
During	10	3:55	2.5	15.7	5.93	405.3		0.79	4.62	102.84
During	12	3.57	3.0	15.7	5.92	404.1		0.76	4.62	72.27
During										
During										
During										
During										

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

Comments DTW = 4.62
DTB = 7.83

Sample Train Volume Calculation (L)
(length of sample tube x 3.141 x d^2 / 4000) + flow through cell volume.
Where d = internal diameter of sample tube in **mm**

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

Stuff in flow through cell.

Water clear throughout.

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 N/A

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)

Land owner: NZDF

Address: Bailey Road

Weather: Sunny

Sample point: tap / well / surface water

Description of sample point: –

Distance of sample point from bore: – (m)

Sampling equipment: –

QA/QA Sample Codes:

Duplicate –

Trip Blank –

Field Blank –

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

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

Job Number: A02684802 A02744122

Sample Code (Name): GW111.1

Date and time: 04/04/23 12:20

Coordinates (NZTM): E

N

Sampled By: Bruce (Clean hands)

Tom (Dirty hands)

Site Photos taken? ☐ Yes ☑ No

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

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

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

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	–	1222	–	*15.8	6.72	324.5		5.54	6.88	15.74
During	2	1224	0.6	15.4	6.32	313.9		3.24	6.88	18.55
During	4	1226	1.2	15.4	6.16	311.9		2.75	6.88	15.73
During	7	1229	1.8	15.3	6.08	310.2		2.55	6.88	15.85
During	9	1231	2.4 *	15.5	6.03	310.0		2.49	6.88	18.63
During	11	1233	3.0	15.4	6.00	309.9		2.43	6.88	15.29
During	13	1235	3.6	15.1	5.98	309.8		2.42	6.88	19.67
During	15	1237	4.2	15.0	5.96	309.3		2.40	6.88	21.14
During	17	1239	4.8	15.0	5.95	309		2.38	6.88	20.64
During										
During										

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

Comments

Sample Train Volume Calculation (L)
(length of sample tube x 3.141 x d^2 / 4000) + flow through cell volume.
Where d = internal diameter of sample tube in **mm**

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

BAD DTW 6.88

DTB 11.49

11 x 30 + 250 = 580

* Sun came out.

Sample train 0.6 L

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	☑ N/A
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)

Land owner: NZDF

Address: 5 Bailey Road

Weather: Sunny

Sample point: tap / well / surface water

Description of sample point: –

Distance of sample point from bore: – (m)

Sampling equipment: Peri Pump / Bladder Pump

QA/QA Sample Codes: –

Duplicate

Trip Blank –

Field Blank –

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

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

Job Number: ~~A02684802~~ A0 27444/22

Sample Code (Name): CH111.2

Date and time: 04/04/23 11.48

Coordinates (NZTM): E

N

Sampled By: Tom (Clean hands)

Brm (Dirty hands)

Site Photos taken? ☐ Yes ☑ No

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

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

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

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		11.48	–	14.7	7.86	725		6.24	8.50	Cl
During		11.51	1.5	14.1	7.24	774		1.89	8.50	
During		11.53	3	14.0	6.98	787		1.09	8.50	
During		11.55	4.5	14.0	6.80	784		0.84	8.50	
During		11.58	6	14.0	6.65	786		0.77	8.50	
During		12.00	7.5	13.9	6.56	784		0.74	8.50	
During		12.03	9	13.9	6.46	781		0.71	8.50	
During		12.05	10.5	13.9	6.40	780		0.68	8.50	
During		12.07	12	13.9	6.34	780		0.66	8.50	
During		12.09	13.5	13.9	6.32	777		0.64	8.50	
During		12.11	15	13.9	6.30	776		0.62	8.50	Cl

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

Comments DTW = 8.50
DTB = 38

Sample Train Volume Calculation (L)
(length of sample tube x 3.141 x d^2 / 4000) + flow through cell volume.
Where d = internal diameter of sample tube in **mm**

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

Sample train 1.5 L (from previous sampling rounds)

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	N/A
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)

Land owner: NZDF

Address: Bailey Road

Weather: fine

Sample point: tap / well / surface water

Description of sample point: –

Distance of sample point from bore: – (m)

Sampling equipment: bladder pump

QA/QA Sample Codes:

Duplicate: GWKP2

Trip Blank: GWKQB

Field Blank: GWKQA

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

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

Job Number: ~~A02684802~~ A02744122

Sample Code (Name): GW111.3

Date and time: 04/04/23

Coordinates (NZTM): E

N

Sampled By: ~~Tom~~ Bryn (Clean hands)

~~Bryn~~ Tom (Dirty hands)

Site Photos taken? ☐ Yes ☑ No

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

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

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

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	–	11:00	–	15.0	6.35	583		5.55	5.58	CL
During	5	11:05	2.5	14.1	7.31	768		1.21	5.58	↓
During	10	11:10	5	14.1	7.61	771		0.76	5.58	
During	15	11:15	7.5	14.0	7.58	775		0.63	5.58	
During	20	11:20	10	14.0	7.55	781		0.56	5.58	
During	25	11:25	12.5	13.9	7.51	790		0.56	5.58	CL
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 d^2 / 4000) + flow through cell volume.
Where d = internal diameter of sample tube in **mm**

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

Comments

replaced level logger

DTW 5.58

Supply train 2.5L (taken from previous year)

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	N/A
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)

Land owner: –

Address: Speedy Road

Weather: Sunny

Sample point: tap / well / surface water

Description of sample point: –

Distance of sample point from bore: ✓ (m)

Sampling equipment: Peri Pump

QA/QA Sample Codes:

Duplicate –

Trip Blank –

Field Blank –

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

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

Job Number: ~~A02684802~~ A027444123

Sample Code (Name): GW112.1

Date and time: 04/04/2023 9:02

Coordinates (NZTM): E

N

Sampled By: ~~Tom~~ BT (Clean hands)

~~BT~~ Tom (Dirty hands)

Site Photos taken? ☐ Yes ☑ No

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

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

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

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	–	9:02	–	15.5	6.74	412.6		5.75	1.62	215.25
During	4	9:06	0.6	15.5	6.25	399.7		1.91	1.62	162.44
During	7	9:09	1.2	15.5	6.05	388.4		0.98	1.63	83.66
During	9	9:11	1.8	15.6	6.01	387.3		0.883	1.63	122.86
During	12	9:14	2.4	15.6	5.97	386.2		0.71	1.63	96.87
During	14	9:16	3.0	15.6	5.95	385.6		0.65	1.63	92.55
During	17	9:19	3.6	15.6	5.94	384.9		0.60	1.63	90.59
During										
During										
During										
During										

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

Comments

Sample Train Volume Calculation (L)
(length of sample tube x 3.141 x d^2 / 4000) + flow through cell volume.
Where d = internal diameter of sample tube in **mm**

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

DTW 1.62.
DTB 10.32

NAPL water red colour
red ppt

11 x 30 = 330
330 + 250 = 580mL
sample every 0.6 L

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	N/A
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)

Land owner: –

Address: Speedy Road

Weather: Sunny

Sample point: tap / well / surface water

Description of sample point: –

Distance of sample point from bore: – (m)

Sampling equipment: bladder pump

QA/QA Sample Codes:

Duplicate –

Trip Blank –

Field Blank –

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

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

Job Number: ~~A02684802~~ A027744123

Sample Code (Name): GW112.2

Date and time: 04/04/23 8:30

Coordinates (NZTM): E

N

Sampled By: Tom (Clean hands)

Bryn (Dirty hands)

Site Photos taken? ☐ Yes ☑ No

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

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

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

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	0	0824	–	14.4	6.58	927		5.23	0.67	CL
During	3	0827	2	14.1	6.61	989		2.26	0.67	↓
During	7	0831	4	13.9	6.68	941		1.17	0.65	↓
During	10	0834	6	13.9	6.70	910		0.88	0.65	↓
During	13	0839	8	13.8	6.71	907		0.77	0.65	↓
During	16	0842	10	13.8	6.72	904		0.71	0.65	↓
During	19	0844	12	13.8	6.72	904		0.65	0.65	CL
During										
During										
During										
During										

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

Comments DTW = 0.67

Sample Train Volume Calculation (L)
(length of sample tube x 3.141 x d^2 / 4000) + flow through cell volume.
Where d = internal diameter of sample tube in **mm**

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

logger present + downloaded

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 D: QA/QC Results

Table D-1: QA/QC Water Sampling Results - Duplicates - Per- and Poly-Fluoroalkyl Substances (PFAS) [1]

Sample Location	GW31	GW31	**%RPD (GW31 and GWKQE)**	GW111.3	GW111.3	**%RPD (GW111.3 and GWKPZ)**
Sample Name	OHA_GW31_040423	OHA_GWKQE_040423		OHA_GW111.3_040423	OHA_GWKPZ_040423	
Laboratory Reference	3277680	3277680		3288820	3288820	
Monitoring Zone	Off base	Off base		On Base	On base	
Sampled Date	4/04/2023	4/04/2023		4/04/2023	4/04/2023	
PFPrS	0.0042	0.0042	0	<0.001	<0.001	0
PFBS	0.0081	0.008	1	<0.001	<0.001	0
PFPeS	0.0075	0.0077	3	<0.001	<0.001	0
di-PFHxS	<0.001	<0.001	0	<0.001	<0.001	0
Mono-PFHxS	0.011	0.011	0	<0.001	<0.001	0
L-PFHxS	0.048	0.048	0	<0.001	<0.001	0
Total PFHxS	0.059	0.059	0	<0.001	<0.001	0
PFHpS	0.0011	0.0011	0	<0.001	<0.001	0
di-PFOS	0.002	0.0022	10	<0.001	<0.001	0
Mono-PFOS	0.018	0.017	6	<0.001	<0.001	0
L-PFOS	0.0085	0.007	19	<0.001	<0.001	0
Total PFOS	0.028	0.026	7	<0.001	<0.001	0
Sum of PFHxS and PFOS	0.087	0.085	2	<0.001	<0.001	0
PFBA	0.04	0.039	3	<0.001	<0.001	0
PFPeA	0.11	0.11	0	<0.001	<0.001	0
PFHxA	0.072	0.071	1	<0.001	<0.001	0
PFHpA	0.027	0.027	0	<0.001	<0.001	0
PFOA	0.012	0.012	0	<0.001	<0.001	0
PFNA	0.0026	0.0026	0	<0.001	<0.001	0
PFDA	<0.001	<0.001	0	<0.001	<0.001	0
PFUnDA	<0.001	<0.001	0	<0.001	<0.001	0
PFTeDA	-	-		<0.001	<0.001	0
PFDoDA	<0.001	<0.001	0	<0.001	<0.001	0
FOSA	<0.001	<0.001	0	<0.001	<0.001	0
MeFOSA	<0.001	<0.001	0	<0.001	<0.001	0
MeFOSAA	<0.001	<0.001	0	<0.001	<0.001	0
EtFOSAA	<0.001	<0.001	0	<0.001	<0.001	0
4:2 FTS	<0.001	<0.001	0	<0.001	<0.001	0
6:2 FTS	0.0033	0.0031	6	<0.001	<0.001	0
8:2 FTS	<0.001	<0.001	0	<0.001	<0.001	0
10:2 FTS	<0.001	<0.001	0	<0.001	<0.001	0
FPrPA	<0.001	<0.001	0	<0.001	<0.001	0
EtFOSA	<0.001	<0.001	0	<0.001	<0.001	0
EtFOSE	<0.001	<0.001	0	<0.001	<0.001	0
FPePA	<0.001	<0.001	0	<0.001	<0.001	0
F-53B minor	-	-	-	<0.001	<0.001	0
HFPO-DA*	<0.001	<0.001	0	<0.001	<0.001	0
Sum F-53B	-	-	-	<0.001	<0.001	0
ADONA	<0.001	<0.001	0	<0.001	<0.001	0
P37DMOA	-	-	-	<0.001	<0.001	0
F-53B major	-	-	-	<0.001	<0.001	0

Notes:

1. Results in µg/L.

-	No value available
<0.001	Below the limit of reporting
%RPD	Relative Percent Difference

Table D-2: QA/QC Water Sampling Results - Blanks - Per- and Poly-Fluoroalkyl Substances (PFAS) [1]

Sample Location	Ohakea - on base			Ohakea - off base		
Sample Name	OHA_GWKQA_040423	OHA_SWKQC_050423	OHA_GWKQB_040423	OHA_GWKQF_050423	OHA_GWKQD_030423	OHA_GWKPY_050423
Lab Report Number	3288820	3283471	3288820	3283490	3277682	3283490
Sample Type	Field Blank	Rinsate	Trip Blank	Field Blank	Rinsate	Trip Blank
Sample Date	4/04/2023	5/04/2023	4/04/2023	5/04/2023	3/04/2023	5/04/2023
PFPrS	<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
PFPeS	<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
Mono-PFHxS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
L-PFHxS	<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
PFHpS	<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
Mono-PFOS	<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
Total PFOS	<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
PFECHS	-	<0.001	-	<0.001	-	<0.001
PFBA	<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
PFHxA	<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
PFOA	<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
PFDA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
PFUnDA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
PFTrDA	-	-	-	-	-	-
PFTeDA	<0.001	<0.001	<0.001	<0.001	-	-
PFDoDA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
FOSA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
MeFOSA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
MeFOSAA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
EtFOSAA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
4:2 FTS	<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
8:2 FTS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
10:2 FTS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
FPrPA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
EtFOSA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
EtFOSE	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
FPePA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
FHpPA	-	<0.001	-	<0.001	-	<0.001
F-53B minor	<0.001	<0.001	<0.001	<0.001	-	<0.001
HFPO-DA*	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sum F-53B	<0.001	<0.001	<0.001	<0.001	-	<0.001
ADONA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
P37DMOA	<0.001	<0.001	<0.001	<0.001	-	<0.001
F-53B major	<0.001	<0.001	<0.001	<0.001	-	<0.001

Notes:

1. Results in µg/L.

-	Not Reported
<0.001	Below the limit of reporting

Appendix E: Sample Results Tables

Table E-1: Groundwater Sampling Results - Per- and Poly-Fluoroalkyl Substances (PFAS) [1]

	PFAS in Groundwater								Guidelines		
Sample Name	MW4-1	MW4	MW4	MW4	OHA_FTA_MW4_5_300920	OHA_FTA_MW4_6_190321	OHA_FTA_MW4_7_271021	OHA_FTA_MW4_8_300322	NZ Drinking Water Standard, MoH 2022 [2]	ANZ WQG 99% Species Protection - Technical Draft Default Guideline Values [3]	ANZ WQG 95% Species Protection - Technical Draft Default Guideline Values [3]
Location	MW4	MW4	MW4	MW4	MW4	MW4	MW4	MW4			
Sample Date	7/9/2015	8/1/2017	10/31/2017	7/5/2018	9/30/2020	3/19/2021	10/27/2021	3/30/2022			
Lab Report Number	ES1526105	841470	937355	1186580	2132127	2314824	2590573	2788510			
Monitoring Zone	On-base	On-base	On-base	On-base	On-base	On-base	On-base	On-base			
Sample Results											
PFPrS	-	0.0072	0.011	0.011	<0.025	<0.025	<0.025	<0.025	-	-	-
PFBS	0.05	0.032	0.043	0.034	0.025	0.034	0.033	0.035	-	-	-
PFPeS	-	0.022	0.065	0.051	0.029	0.046	0.048	0.046	-	-	-
di-PFHxS	-	<0.001	0.0017	0.0011	<0.025	<0.025	<0.025	<0.025	-	-	-
Mono-PFHxS	-	0.1	0.14	0.081	0.061	0.083	0.091	0.098	-	-	-
L-PFHxS	-	0.54	0.76	0.49	0.35	0.46	0.6	0.6	-	-	-
Total PFHxS[4]	1.35	0.64	0.9	0.57	0.41	0.54	0.69	0.7	-	-	-
PFHpS	-	0.032	0.059	0.032	<0.025	<0.025	<0.025	<0.025	-	-	-
di-PFOS	-	0.025	0.066	0.027	<0.025	0.029	0.032	0.026	-	-	-
Mono-PFOS	-	0.45	1.1	0.5	0.33	0.46	0.68	0.49	-	-	-
L-PFOS	-	1	2.1	1	0.69	0.91	1.2	0.9	-	-	-
Total PFOS[4]	**3.02**	**1.5**	**3.3**	**1.5**	**1**	**1.4**	**1.9**	**1.4**	-	0.0091 [6]	0.48 [6]
Sum of PFHxS and PFOS[5]	-	-	-	2.1	1.4	1.9	2.6	2.1	0.07	-	-
PFECHS	-	-	-	-	-	<0.025	<0.025	<0.025	-	-	-
PFBA	-	0.21	0.29	0.2	0.17	0.17	0.27	0.21	-	-	-
PFPeA	-	1	1.7	1	0.65	0.79	1.1	0.87	-	-	-
PFHxA	2.09	0.99	0.96	0.74	0.41	0.51	0.73	0.6	-	-	-
PFHpA	0.71	0.34	0.43	0.32	0.22	0.26	0.37	0.33	-	-	-
PFOA	0.54	0.26	0.48	0.3	0.19	0.25	0.38	0.29	0.56	19	220
PFNA	0.32	0.16	0.35	0.18	0.1	0.13	0.24	0.17	-	-	-
PFDA	-	0.0021	0.0053	0.0048	<0.025	<0.025	<0.025	<0.025	-	-	-
PFUnDA	<0.05	<0.005	0.003	-	<0.025	<0.025	<0.025	<0.025	-	-	-
PFTrDA	<0.05	-	-	-	<0.1	<0.1	<0.1	<0.1	-	-	-
PFTeDA	<0.5	-	-	-	<0.1	<0.1	<0.1	<0.1	-	-	-
PFDoDA	<0.05	<0.005	<0.001	-	<0.1	<0.1	<0.1	<0.1	-	-	-
FOSA	<0.02	<0.001	0.0032	0.004	<0.025	<0.025	<0.025	<0.025	-	-	-
MeFOSA	<0.5	<0.005	<0.005	-	<0.1	<0.1	<0.1	<0.1	-	-	-
MeFOSAA	-	<0.005	<0.005	-	<0.025	<0.025	<0.025	<0.025	-	-	-
EtFOSAA	-	<0.005	<0.005	-	<0.025	<0.025	<0.025	<0.025	-	-	-
4:2 FTS	-	<0.005	0.0054	0.0031	<0.025	<0.025	<0.025	<0.025	-	-	-
6:2 FTS	5.6	0.88	1.6	0.86	0.45	0.45	1.1	0.53	-	-	-
8:2 FTS	<0.1	0.036	0.077	0.066	<0.1	<0.1	<0.1	<0.1	-	-	-
10:2 FTS	-	-	-	-	-	<0.025	<0.025	<0.025	-	-	-
FPrPA	-	-	-	-	-	<0.1	<0.1	<0.1	-	-	-
EtFOSA	<0.05	<0.005	<0.005	-	<0.1	<0.1	<0.1	<0.1	-	-	-
EtFOSE	<0.5	<0.005	<0.005	-	<0.1	<0.1	<0.1	<0.1	-	-	-
FPePA	-	-	-	-	-	<0.025	<0.025	<0.025	-	-	-
FHpPA	-	-	-	-	-	<0.025	<0.025	<0.025	-	-	-
F-53B minor	-	-	-	-	-	<0.05	<0.05	<0.05	-	-	-
HFPO-DA	-	-	-	-	-	<0.05	<0.05	<0.05	-	-	-
Sum F-53B	-	-	-	-	-	<0.1	<0.1	<0.1	-	-	-
ADONA	-	-	-	-	-	<0.025	<0.025	<0.025	-	-	-
P37DMOA	-	-	-	-	-	<0.05	<0.05	<0.05	-	-	-
F-53B major	-		-	-	-	<0.1	<0.1	<0.1	-	-	-

Notes:

1. Results in µg/L.

2. Ministry of Health (MoH, 2022) Water Services (Drinking Water Standards for New Zealand) Regulations 2022, PFOA, and sum of PFOS + PFHxS.

3. Australian and New Zealand Guidelines for Fresh and Marine Water Quality – technical draft guideline values in PFAS National Environmental Management Plan 2.0 – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.

4. 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.

5. Summations are made by adding compounds Total PFOS, Total PFHxS together. Where one compound is below detection, it is not included in the summation.

6. ANZG 2023, Toxicant default guideline values for aquatic ecosystem protection: Perfluorooctane sulfonate (PFOS) in freshwater. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. CC BY 4.0. Australian and New Zealand Governments and Australian state and territory governments, Canberra, ACT, Australia.

-	Parameter not tested / no guideline value available.
0.3	Concentration exceeds 99% ecological guidelines.
1.2	Concentration exceeds 95% ecological guidelines.
3.6	Concentration exceeds drinking water standard.

Table E-1: Groundwater Sampling Results - Per- and Poly-Fluoroalkyl Substances (PFAS) [1]

	PFAS in Groundwater								Guidelines		
Sample Name	OHA_FTA_MW4_9_270922	OHA_MW4_030423	MW6	MW6	MW6	OHA_MW6	MW6	OHA_RUP_MW6_6_300920	NZ Drinking Water Standard, MoH 2022 [2]	ANZ WQG 99% Species Protection - Technical Draft Default Guideline Values [3]	ANZ WQG 95% Species Protection - Technical Draft Default Guideline Values [3]
Location	MW4	MW4	MW6	MW6	MW6	MW6	MW6	MW6			
Sample Date	9/27/2022	4/3/2023	4/20/2017	8/1/2017	10/31/2017	2/22/2018	7/4/2018	9/30/2020			
Lab Report Number	3008321	3276254	1327497	841470	937355	1055089	1186580	2132127			
Monitoring Zone	On-base	On-base	On-base	On-base	On-base	On-base	On-base	On-base			
Sample Results											
PFPrS	<0.025	<0.025	0.11	0.21	0.66	0.17	0.22	0.063	-	-	-
PFBS	0.032	0.032	0.56	0.76	1.8	0.43	0.72	0.22	-	-	-
PFPeS	0.045	0.036	0.81	0.81	2.3	0.66	0.77	0.26	-	-	-
di-PFHxS	<0.025	<0.025	0.014	0.02	0.052	0.025	0.015	<0.025	-	-	-
Mono-PFHxS	0.11	0.077	1.1	1.9	4.1	1.8	1.7	0.62	-	-	-
L-PFHxS	0.62	0.54	5.3	8.1	22	4.1	11	4.2	-	-	-
Total PFHxS[4]	0.73	0.62	6.4	10	26	5.9	13	4.8	-	-	-
PFHpS	<0.025	<0.025	0.34	0.6	0.49	0.38	0.34	0.15	-	-	-
di-PFOS	0.026	0.03	0.31	0.23	0.27	0.39	0.27	0.13	-	-	-
Mono-PFOS	0.72	0.59	4.9	2.8	2.4	3.3	4.5	2.9	-	-	-
L-PFOS	1.3	1.3	6.6	5.9	3	4.5	9.7	6.5	-	-	-
Total PFOS[4]	**2**	**1.9**	**12**	**8.9**	**5.7**	**8.2**	**14**	**9.5**	-	0.0091 [6]	0.48 [6]
Sum of PFHxS and PFOS[5]	2.7	2.5	18	-	-	14	27	14	0.07	-	-
PFECHS	<0.025	<0.025	-	-	-	-	-	-	-	-	-
PFBA	0.24	0.17	1.1	1.1	1.3	0.66	1.2	1.4	-	-	-
PFPeA	0.95	0.66	3.6	4	6.8	2.5	4.1	3.2	-	-	-
PFHxA	0.61	0.44	2.8	4.4	7	2	4	2.2	-	-	-
PFHpA	0.36	0.24	0.9	1.5	2.5	0.93	1.9	1	-	-	-
PFOA	0.37	0.3	1.3	1.8	1.7	0.89	2.2	1.1	0.56	19	220
PFNA	0.23	0.17	0.75	0.86	0.37	0.66	1.3	0.75	-	-	-
PFDA	<0.025	<0.025	0.016	0.029	0.013	0.012	0.045	<0.025	-	-	-
PFUnDA	<0.025	<0.025	-	0.0057	0.0043	<0.005	-	<0.025	-	-	-
PFTrDA	<0.1	<0.1	-	-	-	-	-	<0.1	-	-	-
PFTeDA	<0.1	<0.1	-	-	-	-	-	<0.1	-	-	-
PFDoDA	<0.1	<0.1	-	<0.005	<0.001	-	-	<0.1	-	-	-
FOSA	<0.025	<0.025	0.0014	<0.001	<0.001	0.0085	<0.001	<0.025	-	-	-
MeFOSA	<0.1	<0.1	-	<0.005	<0.005	-	-	<0.1	-	-	-
MeFOSAA	<0.025	<0.025	-	<0.005	<0.005	<0.005	-	<0.025	-	-	-
EtFOSAA	<0.025	<0.025	-	<0.005	<0.005	<0.005	-	<0.025	-	-	-
4:2 FTS	<0.025	<0.025	<0.001	<0.005	<0.005	<0.005	<0.001	<0.025	-	-	-
6:2 FTS	0.73	0.4	0.53	0.74	0.33	1.7	0.46	0.23	-	-	-
8:2 FTS	<0.1	<0.1	0.0089	0.0064	<0.005	0.04	0.0069	<0.1	-	-	-
10:2 FTS	<0.025	<0.025	-	-	-	-	-	-	-	-	-
FPrPA	<0.1	<0.1	-	-	-	-	-	-	-	-	-
EtFOSA	<0.1	<0.1	-	<0.005	<0.005	-	-	<0.1	-	-	-
EtFOSE	<0.1	<0.1	-	<0.005	<0.005	<0.025	-	<0.1	-	-	-
FPePA	<0.025	<0.025	-	-	-	-	-	-	-	-	-
FHpPA	<0.025	<0.025	-	-	-	-	-	-	-	-	-
F-53B minor	<0.05	<0.05	-	-	-	-	-	-	-	-	-
HFPO-DA	<0.05	<0.05	-	-	-	-	-	-	-	-	-
Sum F-53B	<0.1	<0.1	-	-	-	-	-	-	-	-	-
ADONA	<0.025	<0.025	-	-	-	-	-	-	-	-	-
P37DMOA	<0.05	<0.05	-	-	-	-	-	-	-	-	-
F-53B major	<0.1	<0.1	-	-	-	-	-	-	-	-	-

Notes:

1. Results in µg/L.

2. Ministry of Health (MoH, 2022) Water Services (Drinking Water Standards for New Zealand) Regulations 2022, PFOA, and sum of PFOS + PFHxS.

3. Australian and New Zealand Guidelines for Fresh and Marine Water Quality – technical draft guideline values in PFAS National Environmental Management Plan 2.0 – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.

4. 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.

5. Summations are made by adding compounds Total PFOS, Total PFHxS together. Where one compound is below detection, it is not included in the summation.

6. ANZG 2023, Toxicant default guideline values for aquatic ecosystem protection: Perfluorooctane sulfonate (PFOS) in freshwater. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. CC BY 4.0. Australian and New Zealand Governments and Australian state and territory governments, Canberra, ACT, Australia.

-	Parameter not tested / no guideline value available.
0.3	Concentration exceeds 99% ecological guidelines.
1.2	Concentration exceeds 95% ecological guidelines.
3.6	Concentration exceeds drinking water standard.

Table E-1: Groundwater Sampling Results - Per- and Poly-Fluoroalkyl Substances (PFAS) [1]

	PFAS in Groundwater								Guidelines		
Sample Name	OHA_RUP_MW6_7_170321	OHA_RUP_MW6_8_271021	OHA_RUP_MW6_9_300322	OHA_RUP_MW6_10_270922	OHA_MW6_030423	OHA_BAI_GW111.1_1_170321	OHA_BAI_GW111.1_2_281021	OHA_BAI_GW111.1_3_300322	NZ Drinking Water Standard, MoH 2022 [2]	ANZ WQG 99% Species Protection - Technical Draft Default Guideline Values [3]	ANZ WQG 95% Species Protection - Technical Draft Default Guideline Values [3]
Location	MW6	MW6	MW6	MW6	MW6	GW111.1	GW111.1	GW111.1			
Sample Date	3/17/2021	10/27/2021	3/30/2022	9/27/2022	4/3/2023	3/17/2021	10/28/2021	3/30/2022			
Lab Report Number	2314824	2590573	2788509	3008307	3276245	2390370	2593741	2787340			
Monitoring Zone	On-base	On-base	On-base	On-base	On-base	On-base	On-base	On-base			
Sample Results											
PFPrS	0.028	0.1	0.053	0.16	0.03	<0.025	<0.025	0.0023	-	-	-
PFBS	0.11	0.33	0.19	0.46	0.11	<0.025	<0.025	0.0083	-	-	-
PFPeS	0.12	0.38	0.24	0.64	0.12	<0.025	<0.025	0.0083	-	-	-
di-PFHxS	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.001	-	-	-
Mono-PFHxS	0.25	0.77	0.57	1.3	0.28	<0.025	0.032	0.012	-	-	-
L-PFHxS	1.6	5.7	3.8	7.7	2	0.083	0.2	0.076	-	-	-
Total PFHxS[4]	1.8	6.5	4.4	9	2.3	0.083	0.23	0.088	-	-	-
PFHpS	0.06	0.24	0.15	0.24	0.087	<0.025	<0.025	0.0022	-	-	-
di-PFOS	0.075	0.18	0.15	0.17	0.097	<0.025	<0.025	0.0036	-	-	-
Mono-PFOS	1.1	2.7	2.5	2.3	1.7	0.035	0.15	0.061	-	-	-
L-PFOS	1.7	4.6	5.5	3.4	3.3	0.05	0.21	0.14	-	-	-
Total PFOS[4]	**2.9**	**7.5**	**8.2**	**5.9**	**5.1**	**0.085**	**0.36**	**0.2**	-	0.0091 [6]	0.48 [6]
Sum of PFHxS and PFOS[5]	4.7	14	13	15	7.4	0.17	0.59	0.29	0.07	-	-
PFECHS	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.001	-	-	-
PFBA	0.35	0.57	0.57	0.61	0.37	0.11	0.15	0.079	-	-	-
PFPeA	1.1	1.7	2	2.2	1.1	0.39	0.86	0.26	-	-	-
PFHxA	0.78	1.6	1.4	2.2	0.78	0.28	0.47	0.2	-	-	-
PFHpA	0.37	0.69	0.63	0.9	0.39	0.15	0.17	0.092	-	-	-
PFOA	0.35	0.97	0.68	1	0.45	0.073	0.13	0.064	0.56	19	220
PFNA	0.28	0.61	0.55	0.49	0.41	<0.025	0.048	0.017	-	-	-
PFDA	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.001	-	-	-
PFUnDA	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.001	-	-	-
PFTrDA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.001	-	-	-
PFTeDA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-
PFDoDA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.001	-	-	-
FOSA	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.001	-	-	-
MeFOSA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.001	-	-	-
MeFOSAA	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.001	-	-	-
EtFOSAA	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.001	-	-	-
4:2 FTS	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.001	-	-	-
6:2 FTS	0.84	<1	0.78	0.32	0.32	<0.05	0.15	0.012	-	-	-
8:2 FTS	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.001	-	-	-
10:2 FTS	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.001	-	-	-
FPrPA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.001	-	-	-
EtFOSA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.001	-	-	-
EtFOSE	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.001	-	-	-
FPePA	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.001	-	-	-
FHpPA	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.001	-	-	-
F-53B minor	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.001	-	-	-
HFPO-DA	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.001	-	-	-
Sum F-53B	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.001	-	-	-
ADONA	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.001	-	-	-
P37DMOA	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.001	-	-	-
F-53B major	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.001	-	-	-

Notes:

1. Results in µg/L.

2. Ministry of Health (MoH, 2022) Water Services (Drinking Water Standards for New Zealand) Regulations 2022, PFOA, and sum of PFOS + PFHxS.

3. Australian and New Zealand Guidelines for Fresh and Marine Water Quality – technical draft guideline values in PFAS National Environmental Management Plan 2.0 – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.

4. 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.

5. Summations are made by adding compounds Total PFOS, Total PFHxS together. Where one compound is below detection, it is not included in the summation.

6. ANZG 2023, Toxicant default guideline values for aquatic ecosystem protection: Perfluorooctane sulfonate (PFOS) in freshwater. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. CC BY 4.0. Australian and New Zealand Governments and Australian state and territory governments, Canberra, ACT, Australia.

-	Parameter not tested / no guideline value available.
0.3	Concentration exceeds 99% ecological guidelines.
1.2	Concentration exceeds 95% ecological guidelines.
3.6	Concentration exceeds drinking water standard.

Table E-1: Groundwater Sampling Results - Per- and Poly-Fluoroalkyl Substances (PFAS) [1]

	PFAS in Groundwater								Guidelines		
Sample Name	OHA_BAI_GW111.1_4_280922	OHA_GW111.1_040423	OHA_BAI_GW111.2_1_040221	OHA_BAI_GW111.2_2_170321	OHA_BAI_GW111.2_3_281021	OHA_BAI_GW111.2_4_300322	OHA_BAI_GW111.2_5_270922	OHA_GW111.2_040423	NZ Drinking Water Standard, MoH 2022 [2]	ANZ WQG 99% Species Protection - Technical Draft Default Guideline Values [3]	ANZ WQG 95% Species Protection - Technical Draft Default Guideline Values [3]
Location	GW111.1	GW111.1	GW111.2	GW111.2	GW111.2	GW111.2	GW111.2	GW111.2			
Sample Date	9/28/2022	4/4/2023	2/4/2021	3/17/2021	10/28/2021	3/30/2022	9/28/2022	4/4/2023			
Lab Report Number	3021350	3288820	2256089	2390370	2593741	2787340	3021350	3288820			
Monitoring Zone	On-base	On-base	On-base	On-base	On-base	On-base	On-base	On-base			
Sample Results											
PFPrS	0.0031	0.0019	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
PFBS	0.011	0.0073	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
PFPeS	0.014	0.0068	<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	-	-	-
Mono-PFHxS	0.03	0.012	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
L-PFHxS	0.14	0.072	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
Total PFHxS[4]	0.17	0.084	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
PFHpS	0.0045	0.0018	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
di-PFOS	0.0061	0.0032	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
Mono-PFOS	0.087	0.043	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
L-PFOS	0.14	0.063	<0.001	<0.001	0.0012	<0.001	<0.001	<0.001	-	-	-
Total PFOS[4]	**0.23**	**0.11**	<0.001	<0.001	0.0012	<0.001	<0.001	<0.001	-	0.0091 [6]	0.48 [6]
Sum of PFHxS and PFOS[5]	0.4	0.19	<0.001	<0.001	0.0012	<0.001	<0.001	<0.001	0.07	-	-
PFECHS	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-	-
PFBA	0.11	0.07	<0.001	<0.001	<0.001	-	<0.001	<0.001	-	-	-
PFPeA	0.53	0.24	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
PFHxA	0.33	0.16	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
PFHpA	0.16	0.08	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
PFOA	0.084	0.052	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.56	19	220
PFNA	0.044	0.015	<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	-	-	-
PFUnDA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
PFTrDA	-	-	-	-	-	-	-	-	-	-	-
PFTeDA	<0.001	<0.001	-	-	-	<0.001	-	-	-	-	-
PFDoDA	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	-	-	-
FOSA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
MeFOSA	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	-	-	-
MeFOSAA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
EtFOSAA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
4:2 FTS	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
6:2 FTS	0.25	0.0035	<0.001	<0.001	0.0024	<0.001	<0.001	<0.001	-	-	-
8:2 FTS	0.0032	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
10:2 FTS	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	-	-	-
FPrPA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
EtFOSA	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	-	-	-
EtFOSE	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	-	-	-
FPePA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
FHpPA	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-	-
F-53B minor	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
HFPO-DA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
Sum F-53B	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
ADONA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
P37DMOA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
F-53B major	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-

Notes:

1. Results in µg/L.

2. Ministry of Health (MoH, 2022) Water Services (Drinking Water Standards for New Zealand) Regulations 2022, PFOA, and sum of PFOS + PFHxS.

3. Australian and New Zealand Guidelines for Fresh and Marine Water Quality – technical draft guideline values in PFAS National Environmental Management Plan 2.0 – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.

4. 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.

5. Summations are made by adding compounds Total PFOS, Total PFHxS together. Where one compound is below detection, it is not included in the summation.

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-	Parameter not tested / no guideline value available.
0.3	Concentration exceeds 99% ecological guidelines.
1.2	Concentration exceeds 95% ecological guidelines.
3.6	Concentration exceeds drinking water standard.

Table E-1: Groundwater Sampling Results - Per- and Poly-Fluoroalkyl Substances (PFAS) [1]

	PFAS in Groundwater								Guidelines		
Sample Name	OHA_BAI_GW111.3_1_170321	OHA_BAI_GW111.3_2_281021	OHA_BAI_GW111.3_3_300322	OHA_BAI_GW111.3_4_270922	OHA_GW111.3_040423	MW9	MW9	OHA_MW9	NZ Drinking Water Standard, MoH 2022 [2]	ANZ WQG 99% Species Protection - Technical Draft Default Guideline Values [3]	ANZ WQG 95% Species Protection - Technical Draft Default Guideline Values [3]
Location	GW111.3	GW111.3	GW111.3	GW111.3	GW111.3	MW9	MW9	MW9			
Sample Date	3/17/2021	10/28/2021	3/30/2022	9/27/2022	4/4/2023	4/20/2017	11/1/2017	2/20/2018			
Lab Report Number	2390370	2593741	2787340	3021350	3288820	1327497	937355	1055089			
Monitoring Zone	On-base	On-base	On-base	On-base	On-base	On-base	On-base	On-base			
Sample Results											
PFPrS	<0.001	<0.001	<0.001	<0.001	<0.001	0.019	0.018	0.031	-	-	-
PFBS	<0.001	<0.001	<0.001	<0.001	<0.001	0.12	0.072	0.093	-	-	-
PFPeS	<0.001	<0.001	<0.001	<0.001	<0.001	0.16	0.11	0.14	-	-	-
di-PFHxS	<0.001	<0.001	<0.001	<0.001	<0.001	0.003	0.0025	0.003	-	-	-
Mono-PFHxS	<0.001	<0.001	<0.001	<0.001	<0.001	0.21	0.16	0.26	-	-	-
L-PFHxS	<0.001	<0.001	<0.001	<0.001	<0.001	1.5	1.1	1.3	-	-	-
Total PFHxS[4]	<0.001	<0.001	<0.001	<0.001	<0.001	1.7	1.3	1.6	-	-	-
PFHpS	<0.001	<0.001	<0.001	<0.001	<0.001	0.072	0.06	0.071	-	-	-
di-PFOS	<0.001	<0.001	<0.001	<0.001	<0.001	0.055	0.057	0.078	-	-	-
Mono-PFOS	<0.001	<0.001	<0.001	<0.001	<0.001	0.62	0.46	0.72	-	-	-
L-PFOS	<0.001	0.0021	0.0027	<0.001	<0.001	0.52	0.31	0.58	-	-	-
Total PFOS[4]	<0.001	0.0021	0.0027	<0.001	<0.001	**1.2**	**0.83**	**1.4**	-	0.0091 [6]	0.48 [6]
Sum of PFHxS and PFOS[5]	<0.001	0.0021	0.0027	<0.001	<0.001	2.9	-	3	0.07	-	-
PFECHS	<0.001	<0.001	<0.001	<0.001	-	-	-	-	-	-	-
PFBA	<0.001	<0.001	-	<0.001	<0.001	0.69	0.57	0.54	-	-	-
PFPeA	<0.001	<0.001	<0.001	<0.001	<0.001	3.5	2.9	2.6	-	-	-
PFHxA	<0.001	<0.001	<0.001	<0.001	<0.001	1.8	1.5	1.5	-	-	-
PFHpA	<0.001	<0.001	<0.001	<0.001	<0.001	1	0.57	0.68	-	-	-
PFOA	<0.001	<0.001	<0.001	<0.001	<0.001	0.67	0.52	0.67	0.56	19	220
PFNA	<0.001	<0.001	<0.001	<0.001	<0.001	0.36	0.34	0.41	-	-	-
PFDA	<0.001	<0.001	<0.001	<0.001	<0.001	0.0014	<0.001	<0.001	-	-	-
PFUnDA	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.005	-	-	-
PFTrDA	-	-	-	-	-	-	-	-	-	-	-
PFTeDA	-	<0.001	<0.001	<0.001	<0.001	-	-	-	-	-	-
PFDoDA	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	-	-	-	-
FOSA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
MeFOSA	-	<0.001	<0.001	<0.001	<0.001	-	<0.005	-	-	-	-
MeFOSAA	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.005	<0.005	-	-	-
EtFOSAA	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.005	<0.005	-	-	-
4:2 FTS	<0.001	<0.001	<0.001	<0.001	<0.001	0.012	0.0095	0.011	-	-	-
6:2 FTS	<0.001	0.0037	<0.001	<0.001	<0.001	1.9	3.6	1.7	-	-	-
8:2 FTS	<0.001	<0.001	<0.001	<0.001	<0.001	0.0035	<0.005	<0.005	-	-	-
10:2 FTS	-	<0.001	<0.001	<0.001	<0.001	-	-	-	-	-	-
FPrPA	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-	-	-	-
EtFOSA	-	<0.001	<0.001	<0.001	<0.001	-	<0.005	-	-	-	-
EtFOSE	-	<0.001	<0.001	<0.001	<0.001	-	<0.005	<0.025	-	-	-
FPePA	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-	-	-	-
FHpPA	<0.001	<0.001	<0.001	<0.001	-	-	-	-	-	-	-
F-53B minor	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-	-	-	-
HFPO-DA	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-	-	-	-
Sum F-53B	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-	-	-	-
ADONA	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-	-	-	-
P37DMOA	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-	-	-	-
F-53B major	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-	-	-	-

Notes:

1. Results in µg/L.

2. Ministry of Health (MoH, 2022) Water Services (Drinking Water Standards for New Zealand) Regulations 2022, PFOA, and sum of PFOS + PFHxS.

3. Australian and New Zealand Guidelines for Fresh and Marine Water Quality – technical draft guideline values in PFAS National Environmental Management Plan 2.0 – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.

4. 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.

5. Summations are made by adding compounds Total PFOS, Total PFHxS together. Where one compound is below detection, it is not included in the summation.

6. ANZG 2023, Toxicant default guideline values for aquatic ecosystem protection: Perfluorooctane sulfonate (PFOS) in freshwater. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. CC BY 4.0. Australian and New Zealand Governments and Australian state and territory governments, Canberra, ACT, Australia.

-	Parameter not tested / no guideline value available.
0.3	Concentration exceeds 99% ecological guidelines.
1.2	Concentration exceeds 95% ecological guidelines.
3.6	Concentration exceeds drinking water standard.

Table E-1: Groundwater Sampling Results - Per- and Poly-Fluoroalkyl Substances (PFAS) [1]

	PFAS in Groundwater								Guidelines		
Sample Name	MW9	OHA_DTK_MW9_5_300920	OHA_DTK_MW9_6_180321	OHA_DTK_MW9_7_271021	OHA_DTK_MW9_8_300322	OHA_DTK_MW9_9_270922	OHA_MW9_030423	OHA_WS1	NZ Drinking Water Standard, MoH 2022 [2]	ANZ WQG 99% Species Protection - Technical Draft Default Guideline Values [3]	ANZ WQG 95% Species Protection - Technical Draft Default Guideline Values [3]
Location	MW9	MW9	MW9	MW0	MW9	MW9	MW9	WS1			
Sample Date	7/4/2018	9/30/2020	3/18/2021	10/27/2021	3/30/2022	9/27/2022	4/3/2023	2/19/2018			
Lab Report Number	1186581	2132127	2314824	2590573	2786745	3019529	3276265	1055089			
Monitoring Zone	On-base	On-base	On-base	On-base	On-base	On-base	On-base	On-base			
Sample Results											
PFPrS	0.0091	<0.025	<0.025	<0.025	0.022	0.0094	<0.025	0.01	-	-	-
PFBS	0.028	0.034	0.064	0.046	0.049	0.02	0.045	0.022	-	-	-
PFPeS	0.043	0.038	0.069	0.057	0.074	0.029	0.048	0.02	-	-	-
di-PFHxS	<0.001	<0.025	<0.025	<0.025	0.0015	<0.001	<0.025	<0.001	-	-	-
Mono-PFHxS	0.058	0.071	0.14	0.1	0.14	0.053	0.09	0.027	-	-	-
L-PFHxS	0.42	0.47	0.91	0.79	0.89	0.42	0.72	0.11	-	-	-
Total PFHxS[4]	0.48	0.54	1	0.89	1	0.47	0.81	0.14	-	-	-
PFHpS	0.021	<0.025	0.034	0.029	0.042	0.02	0.03	0.0022	-	-	-
di-PFOS	0.013	<0.025	0.045	0.042	0.049	0.023	0.039	0.0029	-	-	-
Mono-PFOS	0.18	0.19	0.52	0.46	0.55	0.32	0.45	0.02	-	-	-
L-PFOS	0.19	0.24	0.46	0.53	0.59	0.34	0.56	0.0077	-	-	-
Total PFOS[4]	**0.38**	**0.43**	**1**	**1**	**1.2**	**0.68**	**1**	**0.031**	-	0.0091 [6]	0.48 [6]
Sum of PFHxS and PFOS[5]	0.86	0.97	2	1.9	2.2	1.2	1.8	0.17	0.07	-	-
PFECHS	-	-	<0.025	<0.025	<0.001	<0.001	<0.025	-	-	-	-
PFBA	0.45	0.57	0.51	0.52	0.59	0.39	0.4	0.019	-	-	-
PFPeA	1.7	2.1	2.3	2	2.1	1	1.5	0.11	-	-	-
PFHxA	0.92	1	1.3	1	1.1	0.49	0.85	0.09	-	-	-
PFHpA	0.44	0.43	0.56	0.49	0.56	0.29	0.45	0.028	-	-	-
PFOA	0.36	0.33	0.48	0.47	0.51	0.3	0.45	0.02	0.56	19	220
PFNA	0.23	0.13	0.26	0.26	0.28	0.21	0.27	0.0064	-	-	-
PFDA	0.0011	<0.025	<0.025	<0.025	0.0015	0.0013	<0.025	<0.001	-	-	-
PFUnDA	<0.001	<0.025	<0.025	<0.025	<0.001	<0.001	<0.025	<0.001	-	-	-
PFTrDA	<0.025	<0.1	<0.1	<0.1	<0.001	-	<0.1	-	-	-	-
PFTeDA	<0.1	<0.1	<0.1	<0.1	<0.001	-	<0.1	-	-	-	-
PFDoDA	<0.025	<0.1	<0.1	<0.1	<0.001	<0.001	<0.1	-	-	-	-
FOSA	<0.001	<0.025	<0.025	<0.025	<0.001	<0.001	<0.025	<0.001	-	-	-
MeFOSA	<0.005	<0.1	<0.1	<0.1	<0.001	<0.001	<0.1	<0.005	-	-	-
MeFOSAA	<0.001	<0.025	<0.025	<0.025	<0.001	<0.001	<0.025	<0.005	-	-	-
EtFOSAA	<0.001	<0.025	<0.025	<0.025	<0.001	<0.001	<0.025	<0.005	-	-	-
4:2 FTS	0.004	<0.025	<0.025	<0.025	0.0018	-	<0.025	<0.005	-	-	-
6:2 FTS	1.5	1.1	3.2	2.3	2.6	0.98	1.7	0.12	-	-	-
8:2 FTS	0.0022	<0.1	<0.1	<0.1	0.0043	0.0027	<0.1	<0.005	-	-	-
10:2 FTS	-	-	<0.025	<0.025	<0.001	<0.001	<0.025	-	-	-	-
FPrPA	-	-	<0.1	<0.1	<0.001	<0.001	<0.1	-	-	-	-
EtFOSA	<0.005	<0.1	<0.1	<0.1	<0.001	<0.001	<0.1	<0.005	-	-	-
EtFOSE	<0.005	<0.1	<0.1	<0.1	<0.001	<0.001	<0.1	<0.005	-	-	-
FPePA	-	-	<0.025	<0.025	0.0032	0.0029	<0.025	-	-	-	-
FHpPA	-	-	<0.025	<0.025	<0.001	<0.001	<0.025	-	-	-	-
F-53B minor	-	-	<0.05	<0.05	<0.001	<0.001	<0.05	-	-	-	-
HFPO-DA	-	-	<0.05	<0.05	<0.001	<0.001	<0.05	-	-	-	-
Sum F-53B	-	-	<0.1	<0.1	<0.001	<0.001	<0.1	-	-	-	-
ADONA	-	-	<0.025	<0.025	<0.001	<0.001	<0.025	-	-	-	-
P37DMOA	-	-	<0.05	<0.05	<0.001	<0.001	<0.05	-	-	-	-
F-53B major	-	-	<0.1	<0.1	<0.001	<0.001	<0.1	-	-	-	-

Notes:

1. Results in µg/L.

2. Ministry of Health (MoH, 2022) Water Services (Drinking Water Standards for New Zealand) Regulations 2022, PFOA, and sum of PFOS + PFHxS.

3. Australian and New Zealand Guidelines for Fresh and Marine Water Quality – technical draft guideline values in PFAS National Environmental Management Plan 2.0 – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.

4. 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.

5. Summations are made by adding compounds Total PFOS, Total PFHxS together. Where one compound is below detection, it is not included in the summation.

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-	Parameter not tested / no guideline value available.
0.3	Concentration exceeds 99% ecological guidelines.
1.2	Concentration exceeds 95% ecological guidelines.
3.6	Concentration exceeds drinking water standard.

Table E-1: Groundwater Sampling Results - Per- and Poly-Fluoroalkyl Substances (PFAS) [1]

	PFAS in Groundwater								Guidelines		
Sample Name	WS01	WS1	OHA_FTA_WS1_4_290920	OHA_FTA_WS1_5_170321	OHA_FTA_WS1_6_271021	OHA_FTA_WS1_7_290322	OHA_FTA_WS1_8_270922	OHA_WS1_040423	NZ Drinking Water Standard, MoH 2022 [2]	ANZ WQG 99% Species Protection - Technical Draft Default Guideline Values [3]	ANZ WQG 95% Species Protection - Technical Draft Default Guideline Values [3]
Location	WS1	WS1	WS1	WS1	WS1	WS1	WS1	WS1			
Sample Date	7/3/2018	7/21/2018	9/29/2020	3/17/2021	10/27/2021	3/29/2022	9/27/2022	04/042023			
Lab Report Number	1186578	1326866	2096316	2318531	2590573	2775976	3009068	3277679			
Monitoring Zone	On-base	On-base	On-base	On-base	On-base	On-base	On-base	On-base			
Sample Results											
PFPrS	0.0098	0.0097	0.012	0.013	<0.025	0.014	0.014	0.014	-	-	-
PFBS	0.024	0.023	0.026	0.026	0.026	0.027	0.026	0.027	-	-	-
PFPeS	0.021	0.023	0.023	0.024	0.026	0.028	0.026	0.028	-	-	-
di-PFHxS	<0.001	<0.001	<0.001	<0.001	<0.025	<0.001	<0.001	<0.001	-	-	-
Mono-PFHxS	0.029	0.03	0.035	0.033	0.037	0.034	0.034	0.036	-	-	-
L-PFHxS	0.12	0.12	0.12	0.13	0.14	0.14	0.14	0.15	-	-	-
Total PFHxS[4]	0.15	0.15	0.16	0.16	0.18	0.17	0.17	0.19	-	-	-
PFHpS	0.0026	0.0034	0.0023	0.0018	<0.025	0.003	0.0028	0.0028	-	-	-
di-PFOS	0.0031	0.0024	0.0041	0.0029	<0.025	0.0032	0.0034	0.0041	-	-	-
Mono-PFOS	0.022	0.013	0.021	0.019	<0.025	0.025	0.031	0.03	-	-	-
L-PFOS	0.011	0.0071	0.0073	0.011	<0.025	0.013	0.017	0.0075	-	-	-
Total PFOS[4]	**0.036**	**0.022**	**0.032**	**0.033**	<0.025	**0.041**	**0.051**	0.042	-	0.0091 [6]	0.48 [6]
Sum of PFHxS and PFOS[5]	0.19	0.17	0.19	0.19	0.18	0.21	0.22	0.23	0.07	-	-
PFECHS	-	-	-	<0.001	<0.025	<0.001	<0.001	-	-	-	-
PFBA	0.018	0.018	0.018	0.018	<0.1	0.023	0.023	0.026	-	-	-
PFPeA	0.1	0.1	0.093	0.089	0.11	0.11	0.12	0.14	-	-	-
PFHxA	0.092	0.097	0.088	0.082	0.093	0.098	0.097	0.11	-	-	-
PFHpA	0.027	0.025	0.029	0.03	0.036	0.035	0.035	0.04	-	-	-
PFOA	0.022	0.018	0.021	0.024	0.029	0.028	0.029	0.031	0.56	19	220
PFNA	0.0078	0.0056	0.0062	0.0065	<0.025	0.0084	0.0097	0.0082	-	-	-
PFDA	<0.001	<0.001	<0.001	<0.001	<0.025	<0.001	<0.001	<0.001	-	-	-
PFUnDA	<0.001	<0.001	<0.001	<0.001	<0.025	<0.001	<0.001	<0.001	-	-	-
PFTrDA	<0.025	-	-	-	<0.1	-	-	-	-	-	-
PFTeDA	<0.1	-	-	-	<0.1	<0.001	-	-	-	-	-
PFDoDA	<0.025	<0.005	<0.001	<0.001	<0.1	<0.001	<0.001	<0.001	-	-	-
FOSA	<0.001	<0.001	<0.001	<0.001	<0.025	<0.001	<0.001	<0.001	-	-	-
MeFOSA	-	<0.005	<0.001	-	<0.1	<0.001	<0.001	<0.001	-	-	-
MeFOSAA	<0.001	<0.005	<0.001	<0.001	<0.025	<0.001	<0.001	<0.001	-	-	-
EtFOSAA	<0.001	<0.005	<0.001	<0.001	<0.025	<0.001	<0.001	<0.001	-	-	-
4:2 FTS	<0.001	<0.001	<0.001	<0.001	<0.025	0.0012	0.0012	0.0013	-	-	-
6:2 FTS	0.11	0.12	0.089	0.1	<1	0.13	0.13	0.097	-	-	-
8:2 FTS	<0.001	<0.001	<0.001	<0.001	<0.1	<0.001	<0.001	<0.001	-	-	-
10:2 FTS	-	-	-	<0.001	<0.025	<0.001	<0.001	<0.001	-	-	-
FPrPA	-	-	-	<0.001	<0.1	<0.001	<0.001	<0.001	-	-	-
EtFOSA	-	<0.005	<0.001	-	<0.1	<0.001	<0.001	<0.001	-	-	-
EtFOSE	-	<0.005	<0.001	-	<0.1	<0.001	<0.001	<0.001	-	-	-
FPePA	-	-	-	<0.001	<0.025	<0.001	<0.001	<0.001	-	-	-
FHpPA	-	-	-	<0.001	<0.025	<0.001	<0.001	-	-	-	-
F-53B minor	-	-	-	<0.001	<0.05	<0.001	<0.001	-	-	-	-
HFPO-DA	-	-	-	<0.001	<0.05	<0.001	<0.001	<0.001	-	-	-
Sum F-53B	-	-	-	<0.001	<0.1	<0.001	<0.001	-	-	-	-
ADONA	-	-	-	<0.001	<0.025	<0.001	<0.001	<0.001	-	-	-
P37DMOA	-	-	-	<0.001	<0.05	<0.001	<0.001	-	-	-	-
F-53B major	-	-	-	<0.001	<0.1	<0.001	<0.001	-	-	-	-

Notes:

1. Results in µg/L.

2. Ministry of Health (MoH, 2022) Water Services (Drinking Water Standards for New Zealand) Regulations 2022, PFOA, and sum of PFOS + PFHxS.

3. Australian and New Zealand Guidelines for Fresh and Marine Water Quality – technical draft guideline values in PFAS National Environmental Management Plan 2.0 – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.

4. 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.

5. Summations are made by adding compounds Total PFOS, Total PFHxS together. Where one compound is below detection, it is not included in the summation.

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-	Parameter not tested / no guideline value available.
0.3	Concentration exceeds 99% ecological guidelines.
1.2	Concentration exceeds 95% ecological guidelines.
3.6	Concentration exceeds drinking water standard.

Table E-1: Groundwater Sampling Results - Per- and Poly-Fluoroalkyl Substances (PFAS) [1]

	PFAS in Groundwater								Guidelines		
Sample Name	WS2-1	WS2	OHA_WS2	WS02	OHA_QRY_WS2_5_221119	OHA_QRY_WS2_6_020620	OHA_QRY_WS2_7_290920	OHA_QRY_WS2_8_181120	NZ Drinking Water Standard, MoH 2022 [2]	ANZ WQG 99% Species Protection - Technical Draft Default Guideline Values [3]	ANZ WQG 95% Species Protection - Technical Draft Default Guideline Values [3]
Location	WS2	WS2	WS2	WS2	WS2	WS2	WS2	WS2			
Sample Date	7/24/2015	7/21/2017	2/21/2018	7/3/2018	11/22/2019	6/2/2020	9/29/2020	11/18/2020			
Lab Report Number	ES1526917	1326866	1055089	1186581	1740590	1983524	2096325	2172205			
Monitoring Zone	On-base	On-base	On-base	On-base	On-base	On-base	On-base	On-base			
Sample Results											
PFPrS	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
PFBS	<0.02	<0.001	<0.001	0.0011	<0.001	<0.001	<0.001	<0.001	-	-	-
PFPeS	-	<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	-	-	-
Mono-PFHxS	-	<0.001	<0.001	0.0011	<0.001	<0.001	<0.001	<0.001	-	-	-
L-PFHxS	-	0.0038	0.0033	0.0053	0.0031	0.0021	0.0024	0.0041	-	-	-
Total PFHxS[4]	<0.02	0.0038	0.0033	0.0064	0.0031	0.0021	0.0024	0.0041	-	-	-
PFHpS	-	<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	-	-	-
Mono-PFOS	-	<0.001	0.001	0.0016	<0.001	<0.001	<0.001	<0.001	-	-	-
L-PFOS	-	<0.001	<0.001	0.0025	<0.001	0.0011	0.0016	<0.001	-	-	-
Total PFOS[4]	<0.02	<0.001	0.001	0.0041	<0.001	0.0011	0.0016	<0.001	-	0.0091 [6]	0.48 [6]
Sum of PFHxS and PFOS[5]	-	0.0038	0.0043	0.01	0.0031	0.0032	0.004	0.0041	0.07	-	-
PFECHS	-	-	-	-	-	-	-	-	-	-	-
PFBA	-	<0.005	<0.005	<0.005	0.0033	<0.005	0.0029	0.0035	-	-	-
PFPeA	-	0.0072	0.0049	0.0076	0.0043	0.0027	0.0025	0.0041	-	-	-
PFHxA	<0.02	0.004	0.0031	0.0055	0.0031	0.0017	0.0016	0.003	-	-	-
PFHpA	<0.02	0.002	0.0017	0.0028	0.0016	0.0011	<0.001	0.0019	-	-	-
PFOA	<0.02	0.0018	0.0014	0.0024	0.0012	0.0036	<0.001	0.0015	0.56	19	220
PFNA	<0.02	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
PFDA	<0.02	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
PFUnDA	<0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-	-
PFTrDA	<0.05	-	-	-	<0.001	<0.001	-	-	-	-	-
PFTeDA	<0.5	-	-	-	<0.001	<0.001	-	-	-	-	-
PFDoDA	<0.05	<0.005	-	-	<0.001	<0.001	<0.001	-	-	-	-
FOSA	<0.02	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
MeFOSA	<0.5	<0.005	<0.005	-	<0.001	<0.001	-	-	-	-	-
MeFOSAA	-	<0.005	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
EtFOSAA	-	<0.005	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
4:2 FTS	-	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
6:2 FTS	<0.1	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
8:2 FTS	<0.1	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
10:2 FTS	-	-	-	-	-	-	-	-	-	-	-
FPrPA	-	-	-	-	-	-	-	-	-	-	-
EtFOSA	<0.05	<0.005	<0.005	-	<0.001	<0.001	-	-	-	-	-
EtFOSE	<0.5	<0.005	<0.005	<0.005	<0.001	<0.001	-	<0.001	-	-	-
FPePA	-	-	-	-	-	-	-	-	-	-	-
FHpPA	-	-	-	-	-	-	-	-	-	-	-
F-53B minor	-	-	-	-	-	-	-	-	-	-	-
HFPO-DA	-	-	-	-	-	-	-	-	-	-	-
Sum F-53B	-	-	-	-	-	-	-	-	-	-	-
ADONA	-	-	-	-	-	-	-	-	-	-	-
P37DMOA	-	-	-	-	-	-	-	-	-	-	-
F-53B major	-	-	-	-	-	-	-	-	-	-	-

Notes:

1. Results in µg/L.

2. Ministry of Health (MoH, 2022) Water Services (Drinking Water Standards for New Zealand) Regulations 2022, PFOA, and sum of PFOS + PFHxS.

3. Australian and New Zealand Guidelines for Fresh and Marine Water Quality – technical draft guideline values in PFAS National Environmental Management Plan 2.0 – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.

4. 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.

5. Summations are made by adding compounds Total PFOS, Total PFHxS together. Where one compound is below detection, it is not included in the summation.

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-	Parameter not tested / no guideline value available.
0.3	Concentration exceeds 99% ecological guidelines.
1.2	Concentration exceeds 95% ecological guidelines.
3.6	Concentration exceeds drinking water standard.

Table E-1: Groundwater Sampling Results - Per- and Poly-Fluoroalkyl Substances (PFAS) [1]

	PFAS in Groundwater								Guidelines		
Sample Name	OHA_QRY_WS2_9_180321	OHA_QRY_WS2_10_220621	OHA_QRY_WS2_11_281021	OHA_QRY_WS2_12_300322	OHA_QRY_WS2_14_280922	OHA_WS2_040423	OHA_ADJ_GW106_1_160321	OHA_ADJ_GW106_2_291021	NZ Drinking Water Standard, MoH 2022 [2]	ANZ WQG 99% Species Protection - Technical Draft Default Guideline Values [3]	ANZ WQG 95% Species Protection - Technical Draft Default Guideline Values [3]
Location	WS2	WS2	WS2	WS2	WS2	WS2	GW106	GW106			
Sample Date	3/18/2021	6/22/2021	10/28/2021	3/30/2022	9/28/2022	4/4/2023	3/16/2021	10/29/2021			
Lab Report Number	2327922	2434042	2593734	2786751	3019773	3277677	2316433	2590583			
Monitoring Zone	On-base	On-base	On-base	On-base	On-base	On-base	Off-base	Off-base			
Sample Results											
PFPrS	<0.001	<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	-	-	-
PFPeS	<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	-	-	-
Mono-PFHxS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
L-PFHxS	0.0029	0.0027	0.0044	0.0037	0.0036	0.0032	<0.001	<0.001	-	-	-
Total PFHxS[4]	0.0029	0.0027	0.0044	0.0037	0.0036	0.0032	<0.001	<0.001	-	-	-
PFHpS	<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	-	-	-
Mono-PFOS	<0.001	<0.001	0.0011	0.0013	0.0016	0.0012	<0.001	<0.001	-	-	-
L-PFOS	<0.001	<0.001	<0.001	0.002	0.0017	0.0018	<0.001	<0.001	-	-	-
Total PFOS[4]	<0.001	<0.001	0.0011	0.0033	0.0033	0.003	<0.001	<0.001	-	0.0091 [6]	0.48 [6]
Sum of PFHxS and PFOS[5]	0.0029	0.0027	0.0055	0.007	0.0069	0.0062	<0.001	<0.001	0.07	-	-
PFECHS	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	-	-	-
PFBA	0.0034	<0.005	0.0039	0.0048	0.0037	0.0035	<0.002	<0.001	-	-	-
PFPeA	0.004	0.0032	0.0048	0.0052	0.0039	0.0038	<0.001	<0.001	-	-	-
PFHxA	0.0026	0.002	0.0034	0.0036	0.0027	0.0023	<0.001	<0.001	-	-	-
PFHpA	0.0015	0.0014	0.0017	0.0019	0.0017	0.0016	<0.001	<0.001	-	-	-
PFOA	0.0012	0.0013	0.0016	0.0017	0.0015	0.0015	<0.001	<0.001	0.56	19	220
PFNA	<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	-	-	-
PFUnDA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
PFTrDA	-	<0.001	-	<0.001	-	-	-	<0.001	-	-	-
PFTeDA	-	-	-	<0.001	<0.001	-	-	<0.001	-	-	-
PFDoDA	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
FOSA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
MeFOSA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
MeFOSAA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
EtFOSAA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
4:2 FTS	<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	-	-	-
8:2 FTS	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
10:2 FTS	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
FPrPA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
EtFOSA	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
EtFOSE	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
FPePA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
FHpPA	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	-	-	-
F-53B minor	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	-	-	-
HFPO-DA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
Sum F-53B	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	-	-	-
ADONA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
P37DMOA	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	-	-	-
F-53B major	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	-	-	-

Notes:

1. Results in µg/L.

2. Ministry of Health (MoH, 2022) Water Services (Drinking Water Standards for New Zealand) Regulations 2022, PFOA, and sum of PFOS + PFHxS.

3. Australian and New Zealand Guidelines for Fresh and Marine Water Quality – technical draft guideline values in PFAS National Environmental Management Plan 2.0 – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.

4. 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.

5. Summations are made by adding compounds Total PFOS, Total PFHxS together. Where one compound is below detection, it is not included in the summation.

6. ANZG 2023, Toxicant default guideline values for aquatic ecosystem protection: Perfluorooctane sulfonate (PFOS) in freshwater. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. CC BY 4.0. Australian and New Zealand Governments and Australian state and territory governments, Canberra, ACT, Australia.

-	Parameter not tested / no guideline value available.
0.3	Concentration exceeds 99% ecological guidelines.
1.2	Concentration exceeds 95% ecological guidelines.
3.6	Concentration exceeds drinking water standard.

Table E-1: Groundwater Sampling Results - Per- and Poly-Fluoroalkyl Substances (PFAS) [1]

	PFAS in Groundwater								Guidelines		
Sample Name	OHA_ADJ_GW106_3_290322	OHA_ADJ_GW106_4_290922	OHA_GW106_050423	OHA_ADJ_GW107_1_011020	OHA_ADJ_GW107_2_291021	OHA_ADJ_GW107_3_300322	OHA_ADJ_GW107_4_300922	OHA_GW107_050423	NZ Drinking Water Standard, MoH 2022 [2]	ANZ WQG 99% Species Protection - Technical Draft Default Guideline Values [3]	ANZ WQG 95% Species Protection - Technical Draft Default Guideline Values [3]
Location	GW106	GW106	GW106	GW107	GW107	GW107	GW107	GW107			
Sample Date	3/29/2022	9/29/2022	4/5/2023	10/1/2020	10/29/2021	3/30/2022	9/30/2022	4/5/2023			
Lab Report Number	2780982	3011677	3288825	2096735	2590579	2786744	3020439	3283490			
Monitoring Zone	Off-base	Off-base	Off-base	Off-base	Off-base	Off-base	Off-base	Off-base			
Sample Results											
PFPrS	<0.001	<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	-	-	-
PFPeS	<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	-	-	-
Mono-PFHxS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
L-PFHxS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
Total PFHxS[4]	<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	-	-	-
di-PFOS	<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	-	-	-
L-PFOS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
Total PFOS[4]	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	0.0091 [6]	0.48 [6]
Sum of PFHxS and PFOS[5]	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.07	-	-
PFECHS	<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	-	-	-
PFPeA	<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	-	-	-
PFHpA	<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	0.56	19	220
PFNA	<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	-	-	-
PFUnDA	<0.001	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	-	-	-
PFTrDA	<0.001	-	-	-	<0.001	<0.001	-	-	-	-	-
PFTeDA	-	-	-	-	-	<0.001	-	-	-	-	-
PFDoDA	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	-	-	-
FOSA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
MeFOSA	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	-	-	-
MeFOSAA	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	-	-	-
EtFOSAA	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	-	-	-
4:2 FTS	<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	-	-	-
8:2 FTS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
10:2 FTS	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	-	-	-
FPrPA	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	-	-	-
EtFOSA	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	-	-	-
EtFOSE	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
FPePA	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	-	-	-
FHpPA	<0.001	<0.001	-	-	<0.001	<0.001	<0.001	<0.001	-	-	-
F-53B minor	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	-	-	-
HFPO-DA	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	-	-	-
Sum F-53B	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	-	-	-
ADONA	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	-	-	-
P37DMOA	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	-	-	-
F-53B major	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	-	-	-

Notes:

1. Results in µg/L.

2. Ministry of Health (MoH, 2022) Water Services (Drinking Water Standards for New Zealand) Regulations 2022, PFOA, and sum of PFOS + PFHxS.

3. Australian and New Zealand Guidelines for Fresh and Marine Water Quality – technical draft guideline values in PFAS National Environmental Management Plan 2.0 – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.

4. 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.

5. Summations are made by adding compounds Total PFOS, Total PFHxS together. Where one compound is below detection, it is not included in the summation.

6. ANZG 2023, Toxicant default guideline values for aquatic ecosystem protection: Perfluorooctane sulfonate (PFOS) in freshwater. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. CC BY 4.0. Australian and New Zealand Governments and Australian state and territory governments, Canberra, ACT, Australia.

-	Parameter not tested / no guideline value available.
0.3	Concentration exceeds 99% ecological guidelines.
1.2	Concentration exceeds 95% ecological guidelines.
3.6	Concentration exceeds drinking water standard.

Table E-1: Groundwater Sampling Results - Per- and Poly-Fluoroalkyl Substances (PFAS) [1]

	PFAS in Groundwater								Guidelines		
Sample Name	OHA_ADJ_GW108_1_011020	OHA_ADJ_GW108_2_150321	OHA_ADJ_GW108_3_291021	OHA_ADJ_GW108_4_290322	OHA_ADJ_GW108_5_290922	OHA_GW108_050423	OHA_ADJ_GW109_1_011020	OHA_ADJ_GW109_2_150321	NZ Drinking Water Standard, MoH 2022 [2]	ANZ WQG 99% Species Protection - Technical Draft Default Guideline Values [3]	ANZ WQG 95% Species Protection - Technical Draft Default Guideline Values [3]
Location	GW108	GW108	GW108	GW108	GW108	GW108	GW109	GW109			
Sample Date	10/1/2020	3/15/2021	10/29/2021	3/29/2022	9/29/2022	4/5/2023	10/1/2020	3/15/2021			
Lab Report Number	2096735	2313652	2590569	2780972	3011674	3288826	2096735	2313643			
Monitoring Zone	Off-base	Off-base	Off-base	Off-base	Off-base	Off-base	Off-base	Off-base			
Sample Results											
PFPrS	<0.001	<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	-	-	-
PFPeS	<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	-	-	-
Mono-PFHxS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
L-PFHxS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
Total PFHxS[4]	<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	-	-	-
di-PFOS	<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	-	-	-
L-PFOS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
Total PFOS[4]	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	0.0091 [6]	0.48 [6]
Sum of PFHxS and PFOS[5]	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.07	-	-
PFECHS	-	<0.001	<0.001	<0.001	<0.001	-	-	<0.001	-	-	-
PFBA	<0.001	0.0011	<0.001	0.002	<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	-	-	-
PFHxA	<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	-	-	-
PFOA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.56	19	220
PFNA	<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	-	-	-
PFUnDA	-	<0.001	<0.001	<0.001	-	<0.001	-	<0.001	-	-	-
PFTrDA	-	-	<0.001	<0.001	-	-	-	-	-	-	-
PFTeDA	-	-	<0.001	-	-	-	-	-	-	-	-
PFDoDA	-	<0.001	<0.001	<0.001	-	<0.001	-	-	-	-	-
FOSA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
MeFOSA	-	-	<0.001	-	<0.001	<0.001	-	-	-	-	-
MeFOSAA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
EtFOSAA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
4:2 FTS	<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	-	-	-
8:2 FTS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
10:2 FTS	-	-	<0.001	<0.001	-	<0.001	-	-	-	-	-
FPrPA	-	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	-	-	-
EtFOSA	-	-	<0.001	-	<0.001	<0.001	-	-	-	-	-
EtFOSE	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-	-
FPePA	-	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	-	-	-
FHpPA	-	<0.001	<0.001	<0.001	<0.001	-	-	<0.001	-	-	-
F-53B minor	-	<0.001	<0.001	<0.001	-	<0.001	-	<0.001	-	-	-
HFPO-DA	-	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	-	-	-
Sum F-53B	-	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	-	-	-
ADONA	-	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	-	-	-
P37DMOA	-	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	-	-	-
F-53B major	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	-	-	-

Notes:

1. Results in µg/L.

2. Ministry of Health (MoH, 2022) Water Services (Drinking Water Standards for New Zealand) Regulations 2022, PFOA, and sum of PFOS + PFHxS.

3. Australian and New Zealand Guidelines for Fresh and Marine Water Quality – technical draft guideline values in PFAS National Environmental Management Plan 2.0 – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.

4. 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.

5. Summations are made by adding compounds Total PFOS, Total PFHxS together. Where one compound is below detection, it is not included in the summation.

6. ANZG 2023, Toxicant default guideline values for aquatic ecosystem protection: Perfluorooctane sulfonate (PFOS) in freshwater. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. CC BY 4.0. Australian and New Zealand Governments and Australian state and territory governments, Canberra, ACT, Australia.

-	Parameter not tested / no guideline value available.
0.3	Concentration exceeds 99% ecological guidelines.
1.2	Concentration exceeds 95% ecological guidelines.
3.6	Concentration exceeds drinking water standard.

Table E-1: Groundwater Sampling Results - Per- and Poly-Fluoroalkyl Substances (PFAS) [1]

	PFAS in Groundwater								Guidelines		
Sample Name	OHA_ADJ_GW109_3_291021	OHA_ADJ_GW109_4_290322	OHA_ADJ_GW109_5_280922	OHA_GW109_030423	OHA_ADJ_GW112.1_1_180321	OHA_ADJ_GW112.1_2_281021	OHA_ADJ_GW112.1_3_290322	OHA_ADJ_GW112.1_4_280922	NZ Drinking Water Standard, MoH 2022 [2]	ANZ WQG 99% Species Protection - Technical Draft Default Guideline Values [3]	ANZ WQG 95% Species Protection - Technical Draft Default Guideline Values [3]
Location	GW109	GW109	GW109	GW109	GW112.1	GW112.1	GW112.1	GW112.1			
Sample Date	10/29/2021	3/29/2022	9/28/2022	4/3/2023	3/18/2021	10/28/2021	3/29/2022	9/28/2022			
Lab Report Number	2593930	2780975	3007288	3277682	2335132	2593744	2785103	3020548			
Monitoring Zone	Off-base	Off-base	Off-base	Off-base	Off-base	Off-base	Off-base	Off-base			
Sample Results											
PFPrS	<0.001	<0.001	<0.001	<0.001	<0.001	0.012	<0.025	<0.025	-	-	-
PFBS	<0.001	<0.001	<0.001	<0.001	<0.001	0.028	0.028	0.031	-	-	-
PFPeS	<0.001	<0.001	<0.001	<0.001	<0.001	0.033	0.028	0.028	-	-	-
di-PFHxS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.025	<0.025	-	-	-
Mono-PFHxS	<0.001	<0.001	<0.001	<0.001	<0.001	0.052	0.045	0.043	-	-	-
L-PFHxS	<0.001	<0.001	<0.001	<0.001	<0.001	0.25	0.25	0.24	-	-	-
Total PFHxS[4]	<0.001	<0.001	<0.001	<0.001	<0.001	0.3	0.3	0.28	-	-	-
PFHpS	<0.001	<0.001	<0.001	<0.001	<0.001	0.0076	<0.025	<0.025	-	-	-
di-PFOS	<0.001	<0.001	<0.001	<0.001	<0.001	0.011	<0.025	<0.025	-	-	-
Mono-PFOS	<0.001	<0.001	<0.001	<0.001	<0.001	0.14	0.088	0.093	-	-	-
L-PFOS	<0.001	<0.001	<0.001	<0.001	<0.001	0.21	0.094	0.1	-	-	-
Total PFOS[4]	<0.001	<0.001	<0.001	<0.001	<0.001	**0.36**	**0.18**	**0.19**	-	0.0091 [6]	0.48 [6]
Sum of PFHxS and PFOS[5]	<0.001	<0.001	<0.001	<0.001	<0.001	0.66	0.48	0.47	0.07	-	-
PFECHS	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.025	<0.025	-	-	-
PFBA	<0.001	<0.001	<0.001	<0.001	<0.001	0.11	<0.2	0.12	-	-	-
PFPeA	<0.001	<0.001	<0.001	<0.001	<0.001	0.42	0.42	0.44	-	-	-
PFHxA	<0.001	<0.001	<0.001	<0.001	<0.001	0.33	0.34	0.34	-	-	-
PFHpA	<0.001	<0.001	<0.001	<0.001	<0.001	0.17	0.16	0.16	-	-	-
PFOA	<0.001	<0.001	<0.001	<0.001	<0.001	0.094	0.093	0.086	0.56	19	220
PFNA	<0.001	<0.001	<0.001	<0.001	<0.001	0.037	0.026	0.03	-	-	-
PFDA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.025	<0.025	-	-	-
PFUnDA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.025	<0.025	-	-	-
PFTrDA	-	<0.001	-	-	-	-	<0.1	<0.1	-	-	-
PFTeDA	<0.001	-	<0.001	-	-	-	<0.1	<0.1	-	-	-
PFDoDA	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.1	<0.1	-	-	-
FOSA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.025	<0.025	-	-	-
MeFOSA	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.1	<0.1	-	-	-
MeFOSAA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.025	<0.025	-	-	-
EtFOSAA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.025	<0.025	-	-	-
4:2 FTS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.025	<0.025	-	-	-
6:2 FTS	<0.001	<0.001	<0.001	<0.001	<0.001	0.1	0.11	0.12	-	-	-
8:2 FTS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.1	<0.1	-	-	-
10:2 FTS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.025	<0.025	-	-	-
FPrPA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.1	<0.1	-	-	-
EtFOSA	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.1	<0.1	-	-	-
EtFOSE	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.1	<0.1	-	-	-
FPePA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.025	<0.025	-	-	-
FHpPA	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.025	<0.025	-	-	-
F-53B minor	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.05	<0.05	-	-	-
HFPO-DA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.05	<0.05	-	-	-
Sum F-53B	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.1	<0.1	-	-	-
ADONA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.025	<0.025	-	-	-
P37DMOA	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.05	<0.05	-	-	-
F-53B major	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.1	<0.1	-	-	-

Notes:

1. Results in µg/L.

2. Ministry of Health (MoH, 2022) Water Services (Drinking Water Standards for New Zealand) Regulations 2022, PFOA, and sum of PFOS + PFHxS.

3. Australian and New Zealand Guidelines for Fresh and Marine Water Quality – technical draft guideline values in PFAS National Environmental Management Plan 2.0 – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.

4. 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.

5. Summations are made by adding compounds Total PFOS, Total PFHxS together. Where one compound is below detection, it is not included in the summation.

6. ANZG 2023, Toxicant default guideline values for aquatic ecosystem protection: Perfluorooctane sulfonate (PFOS) in freshwater. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. CC BY 4.0. Australian and New Zealand Governments and Australian state and territory governments, Canberra, ACT, Australia.

-	Parameter not tested / no guideline value available.
0.3	Concentration exceeds 99% ecological guidelines.
1.2	Concentration exceeds 95% ecological guidelines.
3.6	Concentration exceeds drinking water standard.

Table E-1: Groundwater Sampling Results - Per- and Poly-Fluoroalkyl Substances (PFAS) [1]

	PFAS in Groundwater								Guidelines		
Sample Name	OHA_GW112.1_040423	OHA_ADJ_GW112.2_1_180321	OHA_ADJ_GW112.2_2_281021	OHA_ADJ_GW112.2_3_280322	OHA_ADJ_GW112.2_4_280922	OHA_GW112.2_040423	OHA_ADJ_GW31_1_120218	OHA_ADJ_GW31_2_230518	NZ Drinking Water Standard, MoH 2022 [2]	ANZ WQG 99% Species Protection - Technical Draft Default Guideline Values [3]	ANZ WQG 95% Species Protection - Technical Draft Default Guideline Values [3]
Location	GW112.1	GW112.2	GW112.2	GW112.2	GW112.2	GW112.2	GW31	GW31			
Sample Date	4/4/2023	3/18/2021	10/28/2021	3/28/2022	9/28/2022	4/4/2023	2/12/2018	5/23/2018			
Lab Report Number	3277686	2335132	2593744	2785781	3020548	3277686	1032528	1153593			
Monitoring Zone	Off-base	Off-base	Off-base	Off-base	Off-base	Off-base	Off-base	Off-base			
Sample Results											
PFPrS	<0.025	0.012	<0.001	<0.001	<0.001	<0.001	0.0033	0.0038	-	-	-
PFBS	0.027	0.03	<0.001	<0.001	<0.001	<0.001	0.011	0.01	-	-	-
PFPeS	<0.025	0.035	<0.001	<0.001	<0.001	<0.001	0.014	0.0089	-	-	-
di-PFHxS	<0.025	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
Mono-PFHxS	0.041	0.056	<0.001	<0.001	<0.001	<0.001	0.016	0.013	-	-	-
L-PFHxS	0.27	0.29	<0.001	<0.001	<0.001	<0.001	0.064	0.055	-	-	-
Total PFHxS[4]	0.31	0.35	<0.001	<0.001	<0.001	<0.001	0.08	0.068	-	-	-
PFHpS	<0.025	0.0075	<0.001	<0.001	<0.001	<0.001	0.0014	0.0011	-	-	-
di-PFOS	<0.025	0.012	<0.001	<0.001	<0.001	<0.001	0.0042	0.002	-	-	-
Mono-PFOS	0.095	0.16	<0.001	<0.001	<0.001	<0.001	0.033	0.016	-	-	-
L-PFOS	0.14	0.21	<0.001	<0.001	<0.001	<0.001	0.023	0.0079	-	-	-
Total PFOS[4]	**0.24**	**0.38**	<0.001	<0.001	<0.001	<0.001	**0.06**	**0.026**	-	0.0091 [6]	0.48 [6]
Sum of PFHxS and PFOS[5]	0.55	0.73	<0.001	<0.001	<0.001	<0.001	0.14	0.094	0.07	-	-
PFECHS	<0.025	<0.001	<0.001	<0.001	<0.001	-	-	-	-	-	-
PFBA	0.12	0.11	<0.001	<0.001	<0.001	<0.001	0.055	0.035	-	-	-
PFPeA	0.42	0.4	<0.001	<0.001	<0.001	<0.001	0.21	0.097	-	-	-
PFHxA	0.39	0.34	<0.001	<0.001	<0.001	<0.001	0.14	0.074	-	-	-
PFHpA	0.17	0.17	<0.001	<0.001	<0.001	<0.001	0.053	0.027	-	-	-
PFOA	0.089	0.092	<0.001	<0.001	<0.001	<0.001	0.024	0.013	0.56	19	220
PFNA	0.031	0.041	<0.001	<0.001	<0.001	<0.001	0.0059	0.0021	-	-	-
PFDA	<0.025	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
PFUnDA	<0.025	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
PFTrDA	<0.1	-	-	<0.001	-	-	-	<0.025	-	-	-
PFTeDA	<0.1	-	-	-	-	-	-	<0.1	-	-	-
PFDoDA	<0.1	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.025	-	-	-
FOSA	<0.025	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
MeFOSA	<0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.025	<0.005	-	-	-
MeFOSAA	<0.025	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	-	-	-
EtFOSAA	<0.025	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	-	-	-
4:2 FTS	<0.025	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	-	-	-
6:2 FTS	0.11	0.066	0.0052	<0.001	<0.001	<0.001	0.036	0.0092	-	-	-
8:2 FTS	<0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	-	-	-
10:2 FTS	<0.025	-	<0.001	<0.001	<0.001	<0.001	-	-	-	-	-
FPrPA	<0.1	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-	-	-
EtFOSA	<0.1	-	<0.001	-	<0.001	<0.001	<0.025	<0.001	-	-	-
EtFOSE	<0.1	-	<0.001	<0.001	<0.001	<0.001	<0.025	<0.005	-	-	-
FPePA	<0.025	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-	-	-
FHpPA	<0.025	<0.001	<0.001	<0.001	<0.001	-	-	-	-	-	-
F-53B minor	<0.05	<0.001	<0.001	<0.001	<0.001	-	-	-	-	-	-
HFPO-DA	<0.05	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-	-	-
Sum F-53B	<0.1	<0.001	<0.001	<0.001	<0.001	-	-	-	-	-	-
ADONA	<0.025	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-	-	-
P37DMOA	<0.05	<0.001	<0.001	<0.001	<0.001	-	-	-	-	-	-
F-53B major	<0.1	<0.001	<0.001	<0.001	<0.001	-	-	-	-	-	-

Notes:

1. Results in µg/L.

2. Ministry of Health (MoH, 2022) Water Services (Drinking Water Standards for New Zealand) Regulations 2022, PFOA, and sum of PFOS + PFHxS.

3. Australian and New Zealand Guidelines for Fresh and Marine Water Quality – technical draft guideline values in PFAS National Environmental Management Plan 2.0 – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.

4. 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.

5. Summations are made by adding compounds Total PFOS, Total PFHxS together. Where one compound is below detection, it is not included in the summation.

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-	Parameter not tested / no guideline value available.
0.3	Concentration exceeds 99% ecological guidelines.
1.2	Concentration exceeds 95% ecological guidelines.
3.6	Concentration exceeds drinking water standard.

Table E-1: Groundwater Sampling Results - Per- and Poly-Fluoroalkyl Substances (PFAS) [1]

	PFAS in Groundwater								Guidelines		
Sample Name	OHA_ADJ_GW31_3_12918	OHA_ADJ_GW31_4_290920	OHA_ADJ_GW31_5_160321	OHA_ADJ_GW31_6_291021	OHA_ADJ_GW31_7_290322	OHA_ADJ_GW31_8_290922	OHA_GW31_040423	OHA_ADJ_GW53_1_150218			
Location	GW31	GW31	GW31	GW31	GW31	GW31	GW31	GW53			
Sample Date	9/12/2018	9/29/2020	3/16/2021	10/29/2021	3/29/2022	9/29/2022	4/4/2023	2/15/2018	NZ Drinking Water Standard, MoH 2022 [2]	ANZ WQG 99% Species Protection - Technical Draft Default Guideline Values [3]	ANZ WQG 95% Species Protection - Technical Draft Default Guideline Values [3]
Lab Report Number	1252502	2096319	2316425	2593739	2786750	3007286	3277680	1040534			
Monitoring Zone	Off-base	Off-base	Off-base	Off-base	Off-base	Off-base	Off-base	Off-base			
Sample Results											
PFPrS	0.0058	0.0045	0.0042	0.0054	0.0046	<0.001	0.0042	<0.001	-	-	-
PFBS	0.0095	0.01	0.011	0.009	0.0095	<0.001	0.0081	<0.001	-	-	-
PFPeS	0.0084	0.0085	0.0096	0.0083	0.0085	<0.001	0.0075	<0.001	-	-	-
di-PFHxS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
Mono-PFHxS	0.014	0.016	0.017	0.013	0.013	<0.001	0.011	<0.001	-	-	-
L-PFHxS	0.056	0.063	0.073	0.059	0.058	<0.001	0.048	<0.001	-	-	-
Total PFHxS[4]	0.07	0.079	0.09	0.072	0.071	<0.001	0.059	<0.001	-	-	-
PFHpS	0.0011	0.0015	0.0016	0.0013	0.0013	<0.001	0.0011	<0.001	-	-	-
di-PFOS	<0.001	0.0034	0.0034	0.0026	0.0025	<0.001	0.002	<0.001	-	-	-
Mono-PFOS	0.016	0.028	0.037	0.025	0.024	<0.001	0.018	<0.001	-	-	-
L-PFOS	0.0058	0.013	0.028	0.011	0.015	<0.001	0.0085	<0.001	-	-	-
Total PFOS[4]	**0.022**	**0.044**	**0.068**	**0.039**	**0.042**	<0.001	**0.028**	<0.001	-	0.0091 [6]	0.48 [6]
Sum of PFHxS and PFOS[5]	0.092	0.12	0.16	0.11	0.11	<0.001	0.087	<0.001	0.07	-	-
PFECHS	-	-	<0.001	<0.001	<0.001	<0.001	-	-	-	-	-
PFBA	0.035	0.047	0.06	0.042	0.047	<0.001	0.04	<0.005	-	-	-
PFPeA	0.083	0.15	0.25	0.13	0.15	<0.001	0.11	<0.001	-	-	-
PFHxA	0.067	0.12	0.17	0.083	0.1	<0.001	0.072	<0.001	-	-	-
PFHpA	0.024	0.042	0.063	0.031	0.036	<0.001	0.027	<0.001	-	-	-
PFOA	0.011	0.019	0.025	0.016	0.017	<0.001	0.012	<0.001	0.56	19	220
PFNA	0.0014	0.0039	0.0076	0.0029	0.0041	<0.001	0.0026	<0.001	-	-	-
PFDA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
PFUnDA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
PFTrDA	<0.005	-	-	-	<0.001	-	-	<0.025	-	-	-
PFTeDA	<0.005	-	-	<0.001	-	<0.001	-	-	-	-	-
PFDoDA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.025	-	-	-
FOSA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
MeFOSA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.025	-	-	-
MeFOSAA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
EtFOSAA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
4:2 FTS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
6:2 FTS	0.0052	0.0049	0.0052	0.0036	0.0038	<0.001	0.0033	<0.001	-	-	-
8:2 FTS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
10:2 FTS	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-	-
FPrPA	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-	-
EtFOSA	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.025	-	-	-
EtFOSE	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.025	-	-	-
FPePA	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-	-
FHpPA	-	-	<0.001	<0.001	<0.001	<0.001	-	-	-	-	-
F-53B minor	-	-	<0.001	<0.001	<0.001	<0.001	-	-	-	-	-
HFPO-DA	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-	-
Sum F-53B	-	-	<0.001	<0.001	<0.001	<0.001	-	-	-	-	-
ADONA	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-	-
P37DMOA	-	-	<0.001	<0.001	<0.001	<0.001	-	-	-	-	-
F-53B major	-	-	<0.001	<0.001	<0.001	<0.001	-	-	-	-	-

Notes:

1. Results in µg/L.
2. Ministry of Health (MoH, 2022) Water Services (Drinking Water Standards for New Zealand) Regulations 2022, PFOA, and sum of PFOS + PFHxS.
3. Australian and New Zealand Guidelines for Fresh and Marine Water Quality – technical draft guideline values in PFAS National Environmental Management Plan 2.0 – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.
4. 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.
5. Summations are made by adding compounds Total PFOS, Total PFHxS together. Where one compound is below detection, it is not included in the summation.
6. ANZG 2023, Toxicant default guideline values for aquatic ecosystem protection: Perfluorooctane sulfonate (PFOS) in freshwater. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. CC BY 4.0. Australian and New Zealand Governments and Australian state and territory governments, Canberra, ACT, Australia.

-	Parameter not tested / no guideline value available.
0.3	Concentration exceeds 99% ecological guidelines.
1.2	Concentration exceeds 95% ecological guidelines.
3.6	Concentration exceeds drinking water standard.

Table E-1: Groundwater Sampling Results - Per- and Poly-Fluoroalkyl Substances (PFAS) [1]

	PFAS in Groundwater								Guidelines		
Sample Name	OHA_ADJ_GW53_2_150518	OHA_ADJ_GW53_3_10918	OHA_ADJ_GW53_4_300920	OHA_ADJ_GW53_5_160321	OHA_ADJ_GW53_6_291021	OHA_ADJ_GW53_7_290322	OHA_ADJ_GW53_8_290922	OHA_GW53_040423			
Location	GW53	GW53	GW53	GW53	GW53	GW53	GW53	GW53			
Sample Date	5/15/2018	9/10/2018	9/30/2020	3/16/2021	10/29/2021	3/29/2022	9/29/2022	4/4/2023	NZ Drinking Water Standard, MoH 2022 [2]	ANZ WQG 99% Species Protection - Technical Draft Default Guideline Values [3]	ANZ WQG 95% Species Protection - Technical Draft Default Guideline Values [3]
Lab Report Number	1139707	1244388	2096317	2316429	2593735	2780973	3011675	3277675			
Monitoring Zone	Off-base	Off-base	Off-base	Off-base	Off-base	Off-base	Off-base	Off-base			
Sample Results											
PFPrS	<0.001	<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	-	-	-
PFPeS	<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	-	-	-
Mono-PFHxS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
L-PFHxS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
Total PFHxS[4]	<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	-	-	-
di-PFOS	<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	-	-	-
L-PFOS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
Total PFOS[4]	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	0.0091 [6]	0.48 [6]
Sum of PFHxS and PFOS[5]	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.07	-	-
PFECHS	-	-	-	<0.001	<0.001	<0.001	<0.001	-	-	-	-
PFBA	<0.005	<0.005	<0.001	<0.002	<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	-	-	-
PFHxA	<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	-	-	-
PFOA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.56	19	220
PFNA	<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	-	-	-
PFUnDA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
PFTrDA	<0.025	-	-	-	-	-	-	-	-	-	-
PFTeDA	-	-	-	-	<0.001	-	<0.001	-	-	-	-
PFDoDA	<0.025	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	-	-	-
FOSA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
MeFOSA	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
MeFOSAA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
EtFOSAA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
4:2 FTS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
6:2 FTS	<0.01	<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	-	-	-
10:2 FTS	-	-	-	<0.001	<0.001	-	<0.001	<0.001	-	-	-
FPrPA	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
EtFOSA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
EtFOSE	<0.005	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
FPePA	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
FHpPA	-	-	-	<0.001	<0.001	<0.001	<0.001	-	-	-	-
F-53B minor	-	-	-	<0.001	<0.001	-	<0.001	-	-	-	-
HFPO-DA	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
Sum F-53B	-	-	-	<0.001	<0.001	<0.001	<0.001	-	-	-	-
ADONA	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
P37DMOA	-	-	-	<0.001	<0.001	<0.001	<0.001	-	-	-	-
F-53B major	-	-	-	<0.001	<0.001	<0.001	<0.001	-	-	-	-

Notes:

1. Results in µg/L.
2. Ministry of Health (MoH, 2022) Water Services (Drinking Water Standards for New Zealand) Regulations 2022, PFOA, and sum of PFOS + PFHxS.
3. Australian and New Zealand Guidelines for Fresh and Marine Water Quality – technical draft guideline values in PFAS National Environmental Management Plan 2.0 – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.
4. 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.
5. Summations are made by adding compounds Total PFOS, Total PFHxS together. Where one compound is below detection, it is not included in the summation.
6. ANZG 2023, Toxicant default guideline values for aquatic ecosystem protection: Perfluorooctane sulfonate (PFOS) in freshwater. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. CC BY 4.0. Australian and New Zealand Governments and Australian state and territory governments, Canberra, ACT, Australia.

-	Parameter not tested / no guideline value available.
0.3	Concentration exceeds 99% ecological guidelines.
1.2	Concentration exceeds 95% ecological guidelines.
3.6	Concentration exceeds drinking water standard.

Table E-1: Groundwater Sampling Results - Per- and Poly-Fluoroalkyl Substances (PFAS) [1]

	PFAS in Groundwater								Guidelines		
Sample Name	OHA_ADJ_GW6_1_111217	OHA_ADJ_GW6_2_130218	OHA_ADJ_GW6_3_140518	OHA_ADJ_GW6_4_13918	OHA_ADJ_GW6_5_290920	OHA_ADJ_GW6_6_160321	OHA_ADJ_GW6_7_281021	OHA_ADJ_GW6_8_290322			
Location	GW6	GW6	GW6	GW6	GW6	GW6	GW6	GW6			
Sample Date	12/11/2017	2/13/2018	5/14/2018	9/13/2018	9/29/2020	3/16/2021	10/28/2021	3/29/2022	NZ Drinking Water Standard, MoH 2022 [2]	ANZ WQG 99% Species Protection - Technical Draft Default Guideline Values [3]	ANZ WQG 95% Species Protection - Technical Draft Default Guideline Values [3]
Lab Report Number	989127	1032179	1133549	1260155	2096315	2313648	2590577	2780968			
Monitoring Zone	On-base	On-base	On-base	On-base	On-base	On-base	On-base	On-base			
Sample Results											
PFPrS	0.0022	0.0034	-	0.004	0.0025	0.0016	0.0025	-	-	-	-
PFBS	0.0067	0.0065	0.0022	0.0038	0.0027	0.0023	0.0028	0.0021	-	-	-
PFPeS	0.0054	0.0056	0.0013	0.0038	0.0039	0.0031	0.0033	0.0042	-	-	-
di-PFHxS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
Mono-PFHxS	0.011	0.0097	0.002	0.0026	0.0023	0.0035	0.0026	0.004	-	-	-
L-PFHxS	0.066	0.054	0.014	0.014	0.014	0.014	0.013	0.027	-	-	-
Total PFHxS[4]	0.077	0.064	0.016	0.017	0.016	0.018	0.016	0.031	-	-	-
PFHpS	0.0018	0.0023	<0.001	<0.001	<0.001	<0.001	<0.001	0.0014	-	-	-
di-PFOS	0.0027	0.0022	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
Mono-PFOS	0.026	0.025	0.0089	0.003	0.0044	0.0038	0.0051	0.014	-	-	-
L-PFOS	0.023	0.023	0.0092	0.0014	0.0042	0.0043	0.009	0.017	-	-	-
Total PFOS[4]	**0.052**	**0.05**	**0.018**	0.0044	0.0086	0.0081	**0.014**	**0.031**	-	0.0091 [6]	0.48 [6]
Sum of PFHxS and PFOS[5]	0.13	0.11	0.034	0.021	0.025	0.026	0.03	0.062	0.07	-	-
PFECHS	-	-	-	-	-	<0.001	<0.001	<0.001	-	-	-
PFBA	0.025	0.02	-	<0.01	-	0.011	0.0053	-	-	-	-
PFPeA	0.057	0.044	0.0035	0.0037	0.003	<0.001	0.0068	0.018	-	-	-
PFHxA	0.044	0.038	0.0039	0.0053	0.0038	0.0072	0.0078	0.017	-	-	-
PFHpA	0.02	0.016	0.0018	0.0021	0.0024	0.003	0.0033	0.0091	-	-	-
PFOA	0.014	0.014	0.0022	0.0018	0.0019	0.0031	0.0019	0.0088	0.56	19	220
PFNA	0.0038	0.0034	<0.001	<0.001	<0.001	<0.001	<0.001	0.0033	-	-	-
PFDA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
PFUnDA	<0.005	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	-	-	-
PFTrDA	-	-	<0.025	<0.005	-	-	<0.001	<0.001	-	-	-
PFTeDA	-	-	<0.025	<0.005	-	-	-	-	-	-	-
PFDoDA	-	<0.001	<0.025	<0.001	-	-	<0.001	<0.001	-	-	-
FOSA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
MeFOSA	-	-	<0.005	<0.001	<0.001	-	<0.001	<0.001	-	-	-
MeFOSAA	<0.005	<0.025	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
EtFOSAA	<0.005	<0.025	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
4:2 FTS	<0.005	<0.001	<0.001	-	-	-	-	-	-	-	-
6:2 FTS	0.023	0.0032	<0.01	0.001	-	-	0.0013	<0.001	-	-	-
8:2 FTS	<0.005	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	-	-	-
10:2 FTS	-	-	-	-	-	-	<0.001	<0.001	-	-	-
FPrPA	-	-	-	-	-	<0.001	<0.001	<0.001	-	-	-
EtFOSA	-	-	<0.001	<0.001	<0.001	-	<0.001	<0.001	-	-	-
EtFOSE	-	<0.025	<0.005	<0.001	<0.001	-	<0.001	<0.001	-	-	-
FPePA	-	-	-	-	-	<0.001	<0.001	<0.001	-	-	-
FHpPA	-	-	-	-	-	<0.001	<0.001	<0.001	-	-	-
F-53B minor	-	-	-	-	-	<0.001	<0.001	<0.001	-	-	-
HFPO-DA	-	-	-	-	-	<0.001	<0.001	<0.001	-	-	-
Sum F-53B	-	-	-	-	-	<0.001	<0.001	<0.001	-	-	-
ADONA	-	-	-	-	-	<0.001	<0.001	<0.001	-	-	-
P37DMOA	-	-	-	-	-	<0.001	<0.001	<0.001	-	-	-
F-53B major	-	-	-	-	-	<0.001	<0.001	<0.001	-	-	-

Notes:

1. Results in µg/L.
2. Ministry of Health (MoH, 2022) Water Services (Drinking Water Standards for New Zealand) Regulations 2022, PFOA, and sum of PFOS + PFHxS.
3. Australian and New Zealand Guidelines for Fresh and Marine Water Quality – technical draft guideline values in PFAS National Environmental Management Plan 2.0 – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.
4. 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.
5. Summations are made by adding compounds Total PFOS, Total PFHxS together. Where one compound is below detection, it is not included in the summation.
6. ANZG 2023, Toxicant default guideline values for aquatic ecosystem protection: Perfluorooctane sulfonate (PFOS) in freshwater. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. CC BY 4.0. Australian and New Zealand Governments and Australian state and territory governments, Canberra, ACT, Australia.

-	Parameter not tested / no guideline value available.
0.3	Concentration exceeds 99% ecological guidelines.
1.2	Concentration exceeds 95% ecological guidelines.
3.6	Concentration exceeds drinking water standard.

Table E-1: Groundwater Sampling Results - Per- and Poly-Fluoroalkyl Substances (PFAS) [1]

	PFAS in Groundwater								Guidelines		
Sample Name	OHA_ADJ_GW6_9_280922	OHA_GW6_040423	OHA_ADJ_GW65_1_210218	OHA_ADJ_GW65_2_170518	OHA_ADJ_GW65_3_11918	OHA_ADJ_GW65_4_290920	OHA_ADJ_GW65_5_150321	OHA_ADJ_GW65_6_291021			
Location	GW6	GW6	GW65	GW65	GW65	GW65	GW65	GW65			
Sample Date	9/28/2022	4/4/2023	2/21/2018	5/17/2018	9/11/2018	9/29/2020	3/15/2021	10/29/2021	NZ Drinking Water Standard, MoH 2022 [2]	ANZ WQG 99% Species Protection - Technical Draft Default Guideline Values [3]	ANZ WQG 95% Species Protection - Technical Draft Default Guideline Values [3]
Lab Report Number	3007292	3277674	1047797	1142284	1244707	2096328	2313647	2593738			
Monitoring Zone	On-base	On-base	Off-base	Off-base	Off-base	Off-base	Off-base	Off-base			
Sample Results											
PFPrS	0.0019	0.0028	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
PFBS	0.0026	0.0038	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
PFPeS	0.003	0.0081	<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	-	-	-
Mono-PFHxS	0.0035	0.0072	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
L-PFHxS	0.02	0.047	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
Total PFHxS[4]	0.024	0.054	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
PFHpS	<0.001	0.0022	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
di-PFOS	<0.001	0.0027	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
Mono-PFOS	0.011	0.035	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
L-PFOS	0.0041	0.041	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
Total PFOS[4]	**0.015**	**0.079**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	0.0091 [6]	0.48 [6]
Sum of PFHxS and PFOS[5]	0.039	0.13	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.07	-	-
PFECHS	<0.001	-	-	-	-	-	<0.001	<0.001	-	-	-
PFBA	0.0061	0.019	<0.005	<0.01	<0.005	<0.001	<0.001	<0.001	-	-	-
PFPeA	0.009	0.039	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
PFHxA	0.01	0.032	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
PFHpA	0.0047	0.016	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
PFOA	0.003	0.014	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.56	19	220
PFNA	<0.001	0.0058	<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	-	-	-
PFUnDA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
PFTrDA	-	-	-	<0.025	<0.001	-	-	-	-	-	-
PFTeDA	-	-	-	-	<0.005	-	-	<0.001	-	-	-
PFDoDA	<0.001	<0.001	-	<0.025	<0.001	<0.001	<0.001	<0.001	-	-	-
FOSA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
MeFOSA	<0.001	<0.001	-	<0.005	<0.005	<0.001	-	<0.001	-	-	-
MeFOSAA	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
EtFOSAA	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
4:2 FTS	-	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
6:2 FTS	<0.001	0.0013	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
8:2 FTS	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
10:2 FTS	<0.001	<0.001	-	-	-	-	-	<0.001	-	-	-
FPrPA	<0.001	<0.001	-	-	-	-	<0.001	<0.001	-	-	-
EtFOSA	<0.001	<0.001	-	<0.001	<0.005	<0.001	-	<0.001	-	-	-
EtFOSE	<0.001	<0.001	-	<0.005	<0.001	<0.001	-	<0.001	-	-	-
FPePA	<0.001	<0.001	-	-	-	-	<0.001	<0.001	-	-	-
FHpPA	<0.001	-	-	-	-	-	<0.001	<0.001	-	-	-
F-53B minor	<0.001	-	-	-	-	-	<0.001	<0.001	-	-	-
HFPO-DA	<0.001	<0.001	-	-	-	-	<0.001	<0.001	-	-	-
Sum F-53B	<0.001	-	-	-	-	-	<0.001	<0.001	-	-	-
ADONA	<0.001	<0.001	-	-	-	-	<0.001	<0.001	-	-	-
P37DMOA	<0.001	-	-	-	-	-	<0.001	<0.001	-	-	-
F-53B major	<0.001	-	-	-	-	-	<0.001	<0.001	-	-	-

Notes:

1. Results in µg/L.
2. Ministry of Health (MoH, 2022) Water Services (Drinking Water Standards for New Zealand) Regulations 2022, PFOA, and sum of PFOS + PFHxS.
3. Australian and New Zealand Guidelines for Fresh and Marine Water Quality – technical draft guideline values in PFAS National Environmental Management Plan 2.0 – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.
4. 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.
5. Summations are made by adding compounds Total PFOS, Total PFHxS together. Where one compound is below detection, it is not included in the summation.
6. ANZG 2023, Toxicant default guideline values for aquatic ecosystem protection: Perfluorooctane sulfonate (PFOS) in freshwater. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. CC BY 4.0. Australian and New Zealand Governments and Australian state and territory governments, Canberra, ACT, Australia.

-	Parameter not tested / no guideline value available.
0.3	Concentration exceeds 99% ecological guidelines.
1.2	Concentration exceeds 95% ecological guidelines.
3.6	Concentration exceeds drinking water standard.

Table E-1: Groundwater Sampling Results - Per- and Poly-Fluoroalkyl Substances (PFAS) [1]

	PFAS in Groundwater								Guidelines		
Sample Name	OHA_ADJ_GW65_7_290322	OHA_ADJ_GW65_8_290922	OHA_GW65_050423	OHA_ADJ_GW67_1_210218	OHA_ADJ_GW67_2_140518	OHA_ADJ_GW67_3_110918	OHA_ADJ_GW67_4_300920	OHA_ADJ_GW67_5_170321	NZ Drinking Water Standard, MoH 2022 [2]	ANZ WQG 99% Species Protection - Technical Draft Default Guideline Values [3]	ANZ WQG 95% Species Protection - Technical Draft Default Guideline Values [3]
Location	GW65	GW65	GW65	GW67	GW67	GW67	GW67	GW67			
Sample Date	3/29/2022	9/29/2022	4/5/2023	2/21/2018	5/14/2018	9/11/2018	9/30/2020	3/17/2021			
Lab Report Number	2780969	3011675	3283483	1047809	1134445	1244090	2096741	2317694			
Monitoring Zone	Off-base	Off-base	Off-base	Off-base	Off-base	Off-base	Off-base	Off-base			
Sample Results											
PFPrS	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	0.0013	-	-	-
PFBS	<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	-	-	-
di-PFHxS	<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	-	-	-
L-PFHxS	<0.001	<0.001	<0.001	0.0016	0.0018	0.0012	<0.001	<0.001	-	-	-
Total PFHxS[4]	<0.001	<0.001	<0.001	0.0016	0.0018	0.0012	<0.001	<0.001	-	-	-
PFHpS	<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	-	-	-
Mono-PFOS	<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	-	-	-
Total PFOS[4]	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	0.0091 [6]	0.48 [6]
Sum of PFHxS and PFOS[5]	<0.001	<0.001	<0.001	0.0016	0.0018	0.0012	<0.001	<0.001	0.07	-	-
PFECHS	<0.001	<0.001	<0.001	-	-	-	-	<0.001	-	-	-
PFBA	<0.001	<0.001	<0.001	-	-	-	<0.001	0.0072	-	-	-
PFPeA	<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	-	-	-
PFHpA	<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	0.56	19	220
PFNA	<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	-	-	-
PFUnDA	<0.001	-	<0.001	<0.001	<0.001	<0.001	-	<0.001	-	-	-
PFTrDA	<0.001	-	-	-	<0.025	<0.005	-	-	-	-	-
PFTeDA	-	-	<0.001	-	<0.025	<0.005	-	-	-	-	-
PFDoDA	<0.001	<0.001	<0.001	-	<0.025	<0.001	-	<0.001	-	-	-
FOSA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
MeFOSA	<0.001	<0.001	<0.001	-	<0.005	<0.005	-	-	-	-	-
MeFOSAA	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	-	-	-
EtFOSAA	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	-	-	-
4:2 FTS	<0.001	<0.001	<0.001	<0.005	<0.001	-	-	<0.001	-	-	-
6:2 FTS	<0.001	<0.001	<0.001	<0.005	<0.01	<0.001	<0.001	<0.001	-	-	-
8:2 FTS	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	-	-	-
10:2 FTS	<0.001	<0.001	<0.001	-	-	-	-	<0.001	-	-	-
FPrPA	<0.001	<0.001	<0.001	-	-	-	-	<0.001	-	-	-
EtFOSA	<0.001	<0.001	-	-	<0.001	<0.005	-	-	-	-	-
EtFOSE	<0.001	<0.001	<0.001	-	<0.005	<0.001	<0.001	-	-	-	-
FPePA	<0.001	<0.001	<0.001	-	-	-	-	<0.001	-	-	-
FHpPA	<0.001	<0.001	<0.001	-	-	-	-	<0.001	-	-	-
F-53B minor	<0.001	<0.001	<0.001	-	-	-	-	<0.001	-	-	-
HFPO-DA	<0.001	<0.001	<0.001	-	-	-	-	<0.001	-	-	-
Sum F-53B	<0.001	<0.001	<0.001	-	-	-	-	<0.001	-	-	-
ADONA	<0.001	<0.001	<0.001	-	-	-	-	<0.001	-	-	-
P37DMOA	<0.001	<0.001	<0.001	-	-	-	-	<0.001	-	-	-
F-53B major	<0.001	<0.001	<0.001	-	-	-	-	<0.001	-	-	-

Notes:

1. Results in µg/L.
2. Ministry of Health (MoH, 2022) Water Services (Drinking Water Standards for New Zealand) Regulations 2022, PFOA, and sum of PFOS + PFHxS.
3. Australian and New Zealand Guidelines for Fresh and Marine Water Quality – technical draft guideline values in PFAS National Environmental Management Plan 2.0 – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.
4. 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.
5. Summations are made by adding compounds Total PFOS, Total PFHxS together. Where one compound is below detection, it is not included in the summation.
6. ANZG 2023, Toxicant default guideline values for aquatic ecosystem protection: Perfluorooctane sulfonate (PFOS) in freshwater. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. CC BY 4.0. Australian and New Zealand Governments and Australian state and territory governments, Canberra, ACT, Australia.

-	Parameter not tested / no guideline value available.
0.3	Concentration exceeds 99% ecological guidelines.
1.2	Concentration exceeds 95% ecological guidelines.
3.6	Concentration exceeds drinking water standard.

Table E-1: Groundwater Sampling Results - Per- and Poly-Fluoroalkyl Substances (PFAS) [1]

	PFAS in Groundwater								Guidelines		
Sample Name	OHA_ADJ_GW67_6_271021	OHA_ADJ_GW67_7_290322	OHA_ADJ_GW67_8_280922						NZ Drinking Water Standard, MoH 2022 [2]	ANZ WQG 99% Species Protection - Technical Draft Default Guideline Values [3]	ANZ WQG 95% Species Protection - Technical Draft Default Guideline Values [3]
Location	GW67	GW67	GW67								
Sample Date	10/27/2021	3/29/2022	9/28/2022								
Lab Report Number	2618128	2780991	2999090								
Monitoring Zone	Off-base	Off-base	Off-base								
Sample Results											
PFPrS	<0.001	<0.001	<0.025						-	-	-
PFBS	<0.001	<0.001	<0.025						-	-	-
PFPeS	<0.001	<0.001	<0.025						-	-	-
di-PFHxS	<0.001	<0.001	<0.025						-	-	-
Mono-PFHxS	<0.001	<0.001	<0.025						-	-	-
L-PFHxS	<0.001	<0.001	<0.025						-	-	-
Total PFHxS[4]	<0.001	<0.001	<0.025						-	-	-
PFHpS	<0.001	<0.001	<0.025						-	-	-
di-PFOS	<0.001	<0.001	<0.025						-	-	-
Mono-PFOS	<0.001	<0.001	<0.025						-	-	-
L-PFOS	<0.001	<0.001	<0.025						-	-	-
Total PFOS[4]	<0.001	<0.001	<0.025						-	0.0091 [6]	0.48 [6]
Sum of PFHxS and PFOS[5]	<0.001	<0.001	<0.025						0.07	-	-
PFECHS	<0.001	<0.001	<0.025						-	-	-
PFBA	-	0.0087	<0.1						-	-	-
PFPeA	<0.001	<0.001	<0.1						-	-	-
PFHxA	<0.001	<0.001	<0.025						-	-	-
PFHpA	<0.001	<0.001	<0.025						-	-	-
PFOA	<0.001	<0.001	<0.025						0.56	19	220
PFNA	<0.001	<0.001	<0.025						-	-	-
PFDA	<0.001	<0.001	<0.025						-	-	-
PFUnDA	<0.001	<0.001	<0.025						-	-	-
PFTrDA	-	<0.001	<0.1						-	-	-
PFTeDA	<0.001	-	<0.1						-	-	-
PFDoDA	<0.001	<0.001	<0.1						-	-	-
FOSA	<0.001	<0.001	<0.025						-	-	-
MeFOSA	<0.001	<0.001	<0.1						-	-	-
MeFOSAA	<0.001	<0.001	<0.025						-	-	-
EtFOSAA	<0.001	<0.001	<0.025						-	-	-
4:2 FTS	<0.001	-	<0.025						-	-	-
6:2 FTS	-	<0.001	<0.05						-	-	-
8:2 FTS	<0.001	<0.001	<0.1						-	-	-
10:2 FTS	<0.001	<0.001	<0.025						-	-	-
FPrPA	<0.001	<0.001	<0.1						-	-	-
EtFOSA	<0.001	<0.001	<0.1						-	-	-
EtFOSE	<0.001	<0.001	<0.1						-	-	-
FPePA	<0.001	<0.001	<0.025						-	-	-
FHpPA	<0.001	<0.001	<0.025						-	-	-
F-53B minor	<0.001	<0.001	<0.05						-	-	-
HFPO-DA	<0.001	<0.001	<0.05						-	-	-
Sum F-53B	<0.001	<0.001	<0.1						-	-	-
ADONA	<0.001	<0.001	<0.025						-	-	-
P37DMOA	<0.001	<0.001	<0.05						-	-	-
F-53B major	<0.001	<0.001	<0.1						-	-	-

Notes:

1. Results in µg/L.
2. Ministry of Health (MoH, 2022) Water Services (Drinking Water Standards for New Zealand) Regulations 2022, PFOA, and sum of PFOS + PFHxS.
3. Australian and New Zealand Guidelines for Fresh and Marine Water Quality – technical draft guideline values in PFAS National Environmental Management Plan 2.0 – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.
4. 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.
5. Summations are made by adding compounds Total PFOS, Total PFHxS together. Where one compound is below detection, it is not included in the summation.
6. ANZG 2023, Toxicant default guideline values for aquatic ecosystem protection: Perfluorooctane sulfonate (PFOS) in freshwater. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. CC BY 4.0. Australian and New Zealand Governments and Australian state and territory governments, Canberra, ACT, Australia.

-	Parameter not tested / no guideline value available.
0.3	Concentration exceeds 99% ecological guidelines.
1.2	Concentration exceeds 95% ecological guidelines.
3.6	Concentration exceeds drinking water standard.

Table E-2: Surface Water Sampling Results - Per- and Poly-Fluoroalkyl Substances (PFAS) [1]

	PFAS Samples in Surface Water							Guidelines	
Field_ID	OHA_ADJ_SW33_1_190218	OHA_ADJ_SW33_2_220518	OHA_ADJ_SW33_3_12918	OHA_ADJ_SW33_4_290920	OHA_ADJ_SW33_5_160321	OHA_ADJ_SW33_6_291021	OHA_ADJ_SW33_7_280322	ANZ WQG for 95% Species Protection - Technical Draft Default Guideline Values [2]	ANZ WQG for 99% Species Protection - Technical Draft Default Guideline Values [2]
Location_Code	SW33	SW33	SW33	SW33	SW33	SW33	SW33		
Sampled_Date_Time	2/19/2018	5/22/2018	9/12/2018	9/29/2020	3/16/2021	10/29/2021	3/28/2022		
Lab_Report_Number	1047510	1147417	1248198	2094714	2316431	2590572	2785715		
Sample Results									
PFPrS	0.0036	<0.001	0.0034	<0.025	0.002	0.0035	0.0018	-	-
PFBS	0.012	<0.001	0.0077	<0.025	0.0062	0.0072	0.0037	-	-
PFPeS	0.012	<0.001	0.0075	<0.025	0.0058	0.0077	0.004	-	-
di-PFHxS	<0.001	<0.001	<0.001	<0.025	<0.001	<0.001	<0.001	-	-
Mono-PFHxS	0.019	<0.001	0.012	<0.025	0.0088	0.012	0.0058	-	-
L-PFHxS	0.11	0.0015	0.067	<0.025	0.049	0.074	0.033	-	-
Total PFHxS [4]	0.13	0.0015	0.079	<0.025	0.058	0.086	0.039	-	-
PFHpS	0.0033	<0.001	0.0017	<0.025	0.0013	0.002	<0.001	-	-
di-PFOS	0.0046	<0.001	0.0025	<0.025	0.0021	0.0028	0.0013	-	-
Mono-PFOS	0.06	<0.001	0.032	<0.025	0.036	0.041	0.019	-	-
L-PFOS	0.047	0.0013	0.024	<0.025	0.052	0.045	0.02	-	-
Total PFOS [4]	**0.11**	0.0013	**0.058**	<0.025	**0.09**	**0.089**	**0.04**	0.48 [3]	0.0091 [3]
Sum of PFHxS and PFOS [5]	0.24	0.0028	0.14	<0.025	0.15	0.18	0.079	-	-
PFECHS	-	-	-	-	<0.001	<0.001	<0.001	-	-
PFBA	0.087	-	0.044	<0.2	0.043	0.061	0.025	-	-
PFPeA	0.4	0.0037	0.16	<0.1	0.17	0.27	0.085	-	-
PFHxA	0.29	0.0033	0.13	<0.025	0.13	0.18	0.061	-	-
PFHpA	0.11	0.0013	0.049	<0.025	0.054	0.074	0.024	-	-
PFOA	0.051	<0.001	0.021	<0.025	0.021	0.027	0.01	220	19
PFNA	0.018	<0.001	0.0055	<0.025	0.0092	0.0091	0.0033	-	-
PFDA	<0.001	<0.001	<0.001	<0.025	<0.001	<0.001	<0.001	-	-
PFUnDA	<0.001	<0.001	<0.001	<0.025	<0.001	<0.001	<0.001	-	-
PFTrDA	-	<0.005	-	<0.1	-	<0.001	<0.001	-	-
PFTeDA	-	<0.025	-	<0.1	-	<0.001	<0.001	-	-
PFDoDA	-	<0.005	-	<0.1	<0.001	<0.001	<0.001	-	-
FOSA	<0.001	<0.001	<0.001	<0.025	<0.001	<0.001	<0.001	-	-
MeFOSA	-	<0.001	<0.005	<0.1	<0.001	<0.001	<0.001	-	-
MeFOSAA	<0.005	<0.001	<0.001	<0.025	<0.001	<0.001	<0.001	-	-
EtFOSAA	<0.005	<0.001	<0.001	<0.025	<0.001	<0.001	<0.001	-	-
4:2 FTS	<0.005	<0.001	-	<0.025	<0.001	-	-	-	-
6:2 FTS	0.0051	0.0016	0.017	<0.05	<0.001	0.0051	0.0022	-	-
8:2 FTS	<0.005	<0.001	<0.001	<0.1	<0.001	<0.001	<0.001	-	-
10:2 FTS	-	-	-	-	<0.001	<0.001	<0.001	-	-
FPrPA	-	-	-	-	<0.001	<0.001	<0.001	-	-
EtFOSA	-	<0.001	<0.005	<0.1	<0.001	<0.001	<0.001	-	-
EtFOSE	<0.025	<0.005	<0.005	<0.1	<0.001	<0.001	<0.001	-	-
FPePA	-	-	-	-	<0.001	<0.001	<0.001	-	-
FHpPA	-	-	-	-	<0.001	<0.001	<0.001	-	-
F-53B minor	-	-	-	-	<0.001	<0.001	<0.001	-	-
HFPO-DA	-	-	-	-	<0.001	<0.001	<0.001	-	-
Sum F-53B	-	-	-	-	<0.001	<0.001	<0.001	-	-
ADONA	-	-	-	-	<0.001	<0.001	<0.001	-	-
P37DMOA	-	-	-	-	<0.001	<0.001	<0.001	-	-
F-53B major	-	-	-	-	<0.001	<0.001	<0.001	-	-

Notes:

1. Results in µg/L.
2. Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZ WQG) – technical draft guideline values in PFAS National Environmental Management Plan – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.
3. ANZG 2023, Toxicant default guideline values for aquatic ecosystem protection: Perfluorooctane sulfonate (PFOS) in freshwater. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. CC BY 4.0. Australian and New Zealand Governments and Australian state and territory governments, Canberra, ACT, Australia.
4. 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.
5. 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.
3.6	Concentration exceeds 99% ecological guidelines.

Table E-2: Surface Water Sampling Results - Per- and Poly-Fluoroalkyl Substances (PFAS) [1]

	PFAS Samples in Surface Water							Guidelines	
Field_ID	OHA_ADJ_SW33_8_280922	OHA_SW33_050423	OHA_ADJ_SW36_1_220218	OHA_ADJ_SW36_2_170518	OHA_ADJ_SW36_3_120918	OHA_ADJ_SW36_4_290920	OHA_ADJ_SW36_5_160321		
Location_Code	OHA_ADJ_SW33	OHA_ADJ_SW33	SW36	SW36	SW36	SW36	SW36	ANZECC 95% Species Protection - Technical Draft Default Guideline Values [2]	ANZ WQG for 99% Species Protection - Technical Draft Default Guideline Values [2]
Sampled_Date_Time	9/28/2022	4/5/2023	2/22/2018	5/17/2018	9/12/2018	9/29/2020	3/16/2021		
Lab_Report_Number	3019751	3283482	1047802	1142104	1251329	2094717	2370192		
Sample Results									
PFPrS	0.0022	0.0017	<0.001	<0.001	<0.001	<0.025	<0.001	-	-
PFBS	0.0051	0.0051	<0.001	<0.001	<0.001	<0.025	0.0017	-	-
PFPeS	0.0052	0.0048	<0.001	<0.001	<0.001	<0.025	0.0019	-	-
di-PFHxS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.025	<0.001	-	-
Mono-PFHxS	0.008	0.0076	<0.001	<0.001	<0.001	<0.025	0.003	-	-
L-PFHxS	0.044	0.049	<0.001	<0.001	<0.001	<0.025	0.018	-	-
Total PFHxS [4]	0.052	0.057	<0.001	<0.001	<0.001	<0.025	0.021	-	-
PFHpS	0.0012	0.0018	<0.001	<0.001	<0.001	<0.025	<0.001	-	-
di-PFOS	0.0016	0.0022	<0.001	<0.001	<0.001	<0.025	<0.001	-	-
Mono-PFOS	0.029	0.037	<0.001	<0.001	<0.001	<0.025	0.017	-	-
L-PFOS	0.017	0.06	<0.001	<0.001	<0.001	<0.025	0.016	-	-
Total PFOS [4]	**0.048**	**0.099**	<0.001	<0.001	<0.001	<0.025	**0.033**	0.48 [3]	0.0091 [3]
Sum of PFHxS and PFOS [5]	0.1	0.16	<0.001	<0.001	<0.001	<0.025	0.054	-	-
PFECHS	<0.001	<0.001	-	-	-	-	<0.001	-	-
PFBA	0.034	0.037	<0.005	<0.01	<0.005	<0.2	0.019	-	-
PFPeA	0.13	0.16	<0.001	<0.001	<0.001	<0.1	0.072	-	-
PFHxA	0.091	0.11	<0.001	<0.001	<0.001	<0.025	0.05	-	-
PFHpA	0.037	0.043	<0.001	<0.001	<0.001	<0.025	0.026	-	-
PFOA	0.015	0.023	<0.001	<0.001	<0.001	<0.025	0.012	220	19
PFNA	0.0044	0.0087	<0.001	<0.001	<0.001	<0.025	0.0048	-	-
PFDA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.025	<0.001	-	-
PFUnDA	<0.001	<0.001	<0.001	<0.001	<0.005	<0.025	<0.001	-	-
PFTrDA	-	-	-	<0.025	<0.005	<0.1	-	-	-
PFTeDA	-	<0.001	-	<0.1	-	<0.1	-	-	-
PFDoDA	<0.001	<0.001	-	<0.025	<0.005	<0.1	<0.001	-	-
FOSA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.025	<0.001	-	-
MeFOSA	<0.001	<0.001	-	<0.005	<0.005	<0.1	<0.001	-	-
MeFOSAA	<0.001	<0.001	<0.005	<0.001	<0.005	<0.025	<0.001	-	-
EtFOSAA	<0.001	<0.001	<0.005	<0.001	<0.005	<0.025	<0.001	-	-
4:2 FTS	-	<0.001	<0.005	<0.001	<0.001	<0.025	<0.001	-	-
6:2 FTS	0.0034	<0.001	<0.005	<0.001	<0.001	<0.05	<0.001	-	-
8:2 FTS	<0.001	<0.001	<0.005	<0.001	<0.005	<0.1	<0.001	-	-
10:2 FTS	<0.001	<0.001	-	-	-	-	<0.001	-	-
FPrPA	<0.001	<0.001	-	-	-	-	<0.001	-	-
EtFOSA	<0.001	<0.001	-	<0.001	<0.005	<0.1	<0.001	-	-
EtFOSE	<0.001	<0.001	-	<0.005	<0.005	<0.1	<0.001	-	-
FPePA	<0.001	<0.001	-	-	-	-	<0.001	-	-
FHpPA	<0.001	<0.001	-	-	-	-	<0.001	-	-
F-53B minor	<0.001	<0.001	-	-	-	-	<0.001	-	-
HFPO-DA	<0.001	<0.001	-	-	-	-	<0.001	-	-
Sum F-53B	<0.001	<0.001	-	-	-	-	<0.001	-	-
ADONA	<0.001	<0.001	-	-	-	-	<0.001	-	-
P37DMOA	<0.001	<0.001	-	-	-	-	<0.001	-	-
F-53B major	<0.001	<0.001	-	-	-	-	<0.001	-	-

Notes:

1. Results in µg/L.
2. Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZ WQG) – technical draft guideline values in PFAS National Environmental Management Plan – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.
3. ANZG 2023, Toxicant default guideline values for aquatic ecosystem protection: Perfluorooctane sulfonate (PFOS) in freshwater. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. CC BY 4.0. Australian and New Zealand Governments and Australian state and territory governments, Canberra, ACT, Australia.
4. 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.
5. 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.
3.6	Concentration exceeds 99% ecological guidelines.

Table E-2: Surface Water Sampling Results - Per- and Poly-Fluoroalkyl Substances (PFAS) [1]

	PFAS Samples in Surface Water							Guidelines	
Field_ID	OHA_ADJ_SW36_7_291021	OHA_ADJ_SW36_8_280322	OHA_ADJ_SW36_9_290922	OHA_SW36_050423	SW6	SW6	SW6	ANZECC 95% Species Protection - Technical Draft Default Guideline Values [2]	ANZ WQG for 99% Species Protection - Technical Draft Default Guideline Values [2]
Location_Code	SW36	SW36	OHA_ADJ_SW36	OHA_ADJ_SW36	SW6	SW6	SW6		
Sampled_Date_Time	10/29/2021	3/28/2022	9/29/2022	4/5/2023	8/4/2017	11/1/2017	7/3/2018		
Lab_Report_Number	2590570	2785749	3041553	3288819	841470	937355	1186578		
Sample Results									
PFPrS	0.0014	<0.001	0.0013	<0.001	0.023	0.042	0.013	-	-
PFBS	0.0026	0.0016	0.0029	0.0027	0.079	0.12	0.037	-	-
PFPeS	0.0028	0.0015	0.003	0.0026	0.083	0.18	0.045	-	-
di-PFHxS	<0.001	<0.001	<0.001	<0.001	0.002	0.0039	<0.001	-	-
Mono-PFHxS	0.0039	0.0022	0.0047	0.0043	0.3	0.28	0.073	-	-
L-PFHxS	0.023	0.012	0.027	0.022	1.6	1.8	0.48	-	-
Total PFHxS [4]	0.027	0.014	0.032	0.026	1.9	2.1	0.55	-	-
PFHpS	<0.001	<0.001	<0.001	<0.001	0.066	0.13	0.027	-	-
di-PFOS	<0.001	<0.001	<0.001	<0.001	0.036	0.096	0.013	-	-
Mono-PFOS	0.011	0.0061	0.015	0.01	0.52	0.82	0.15	-	-
L-PFOS	0.0095	0.0058	0.0086	0.0075	0.86	1	0.21	-	-
Total PFOS[4]	**0.02**	**0.012**	**0.024**	**0.018**	**1.4**	**1.9**	**0.37**	0.48 [3]	0.0091 [3]
Sum of PFHxS and PFOS [5]	0.047	0.026	0.056	0.044	-	-	0.92	-	-
PFECHS	<0.001	<0.001	<0.001	-	-	-	-	-	-
PFBA	0.017	0.013	0.017	0.014	0.23	0.32	0.11	-	-
PFPeA	0.06	0.024	0.051	0.051	1.1	1.5	0.44	-	-
PFHxA	0.039	0.018	0.038	0.036	1	0.96	0.32	-	-
PFHpA	0.018	0.0073	0.018	0.016	0.32	0.47	0.16	-	-
PFOA	0.0079	0.0031	0.0079	0.0064	0.61	0.73	0.19	220	19
PFNA	0.0026	0.0011	0.0022	0.0029	0.15	0.32	0.092	-	-
PFDA	<0.001	<0.001	<0.001	<0.001	0.0012	0.002	0.0011	-	-
PFUnDA	<0.001	<0.001	<0.001	<0.001	<0.005	0.0012	<0.001	-	-
PFTrDA	<0.001	<0.001	-	-	-	-	<0.025	-	-
PFTeDA	<0.001	<0.001	-	-	-	-	<0.1	-	-
PFDoDA	<0.001	<0.001	-	<0.001	<0.005	<0.001	<0.025	-	-
FOSA	<0.001	<0.001	<0.001	<0.001	<0.001	0.0012	<0.001	-	-
MeFOSA	<0.001	<0.001	<0.001	<0.001	<0.005	<0.005	<0.005	-	-
MeFOSAA	<0.001	<0.001	<0.001	<0.001	<0.005	<0.005	<0.001	-	-
EtFOSAA	<0.001	<0.001	<0.001	<0.001	<0.005	<0.005	<0.001	-	-
4:2 FTS	-	-	-	<0.001	0.0059	0.0053	<0.001	-	-
6:2 FTS	<0.001	<0.001	<0.001	<0.001	0.81	1.5	0.33	-	-
8:2 FTS	<0.001	<0.001	<0.001	<0.001	<0.005	0.0054	<0.001	-	-
10:2 FTS	<0.001	<0.001	-	<0.001	-	-	-	-	-
FPrPA	<0.001	<0.001	<0.001	<0.001	-	-	-	-	-
EtFOSA	<0.001	<0.001	<0.001	<0.001	<0.005	<0.005	<0.005	-	-
EtFOSE	<0.001	<0.001	<0.001	<0.001	<0.005	<0.005	<0.005	-	-
FPePA	<0.001	<0.001	<0.001	<0.001	-	-	-	-	-
FHpPA	<0.001	<0.001	<0.001	-	-	-	-	-	-
F-53B minor	<0.001	<0.001	-	<0.001	-	-	-	-	-
HFPO-DA	<0.001	<0.001	<0.001	<0.001	-	-	-	-	-
Sum F-53B	<0.001	<0.001	<0.001	<0.001	-	-	-	-	-
ADONA	<0.001	<0.001	<0.001	<0.001	-	-	-	-	-
P37DMOA	<0.001	<0.001	<0.001	<0.001	-	-	-	-	-
F-53B major	<0.001	<0.001	<0.001	<0.001		-		-	-

Notes:

1. Results in µg/L.
2. Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZ WQG) – technical draft guideline values in PFAS National Environmental Management Plan – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.
3. ANZG 2023, Toxicant default guideline values for aquatic ecosystem protection: Perfluorooctane sulfonate (PFOS) in freshwater. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. CC BY 4.0. Australian and New Zealand Governments and Australian state and territory governments, Canberra, ACT, Australia.
4. 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.
5. 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.
3.6	Concentration exceeds 99% ecological guidelines.

Table E-2: Surface Water Sampling Results - Per- and Poly-Fluoroalkyl Substances (PFAS) [1]

	PFAS Samples in Surface Water							Guidelines	
Field_ID	OHA_DPB_SW6_4_290920	OHA_DPB_SW6_6_291021	OHA_DPB_SW6_7_280322	OHA_DPB_SW6_8_280922	OHA_SW6_030423	SW4	OHA_SHW_SW4_2_021020	ANZECC 95% Species Protection - Technical Draft Default Guideline Values [2]	ANZ WQG for 99% Species Protection - Technical Draft Default Guideline Values [2]
Location_Code	SW6	SW6	SW6	OHA_DPB_SW6	OHA_DPB_SW6	SW4	SW4		
Sampled_Date_Time	9/29/2020	10/29/2021	3/28/2022	9/28/2022	4/3/2023	8/4/2017	10/2/2020		
Lab_Report_Number	2094713	2590926	2785776	3008365	3276244	841470	2094371		
Sample Results									
PFPrS	<0.025	<0.025	0.029	0.026	<0.025	<0.001	<0.001	-	-
PFBS	<0.025	0.053	0.063	0.089	0.03	<0.001	<0.001	-	-
PFPeS	<0.025	0.057	0.092	0.12	0.034	<0.001	<0.001	-	-
di-PFHxS	<0.025	<0.025	0.0021	<0.025	<0.025	<0.001	<0.001	-	-
Mono-PFHxS	0.03	0.11	0.16	0.23	0.053	<0.001	<0.001	-	-
L-PFHxS	0.19	0.86	0.95	1.4	0.42	<0.001	<0.001	-	-
Total PFHxS [4]	0.22	0.97	1.1	1.6	0.47	<0.001	<0.001	-	-
PFHpS	<0.025	0.046	0.05	0.061	<0.025	<0.001	<0.001	-	-
di-PFOS	<0.025	0.039	0.051	0.059	<0.025	<0.001	<0.001	-	-
Mono-PFOS	0.093	0.58	0.64	0.89	0.38	<0.001	<0.001	-	-
L-PFOS	0.13	0.83	0.69	0.82	0.52	<0.001	<0.001	-	-
Total PFOS[4]	**0.22**	**1.4**	**1.4**	**1.8**	**0.9**	<0.001	<0.001	0.48 [3]	0.0091 [3]
Sum of PFHxS and PFOS [5]	0.44	2.4	2.5	3.4	1.4	-	<0.001	-	-
PFECHS	-	<0.025	<0.001	<0.025	<0.025	-	-	-	-
PFBA	<0.2	0.16	0.22	0.24	<0.1	0.0054	0.0095	-	-
PFPeA	0.22	0.62	0.86	0.9	0.34	<0.001	<0.001	-	-
PFHxA	0.14	0.39	0.62	0.68	0.24	<0.001	0.001	-	-
PFHpA	0.073	0.23	0.31	0.38	0.15	<0.001	<0.001	-	-
PFOA	0.065	0.34	0.36	0.51	0.17	<0.001	<0.001	220	19
PFNA	0.029	0.18	0.17	0.22	0.12	<0.001	<0.001	-	-
PFDA	<0.025	<0.025	0.0014	<0.025	<0.025	<0.001	<0.001	-	-
PFUnDA	<0.025	<0.025	0.0011	<0.025	<0.025	<0.005	<0.001	-	-
PFTrDA	<0.1	<0.1	<0.001	<0.1	<0.1	-	<0.001	-	-
PFTeDA	<0.1	<0.1	<0.001	<0.1	<0.1	-	<0.001	-	-
PFDoDA	<0.1	<0.1	<0.001	<0.1	<0.1	<0.005	<0.001	-	-
FOSA	<0.025	<0.025	<0.001	<0.025	<0.025	<0.001	<0.001	-	-
MeFOSA	<0.1	<0.1	<0.001	<0.1	<0.1	-	-	-	-
MeFOSAA	<0.025	<0.025	<0.001	<0.025	<0.025	<0.005	<0.001	-	-
EtFOSAA	<0.025	<0.025	<0.001	<0.025	<0.025	<0.005	<0.001	-	-
4:2 FTS	<0.025	<0.025	-	<0.025	<0.025	<0.005	-	-	-
6:2 FTS	0.053	0.62	0.44	0.7	0.14	<0.005	<0.001	-	-
8:2 FTS	<0.1	<0.1	<0.001	<0.1	<0.1	<0.005	<0.001	-	-
10:2 FTS	-	<0.025	<0.001	<0.025	<0.025	-	-	-	-
FPrPA	-	<0.1	0.0022	<0.1	<0.1	-	-	-	-
EtFOSA	<0.1	<0.1	<0.001	<0.1	<0.1	-	-	-	-
EtFOSE	<0.1	<0.1	<0.001	<0.1	<0.1	<0.005	-	-	-
FPePA	-	<0.025	0.005	<0.025	<0.025	-	-	-	-
FHpPA	-	<0.025	<0.001	<0.025	<0.025	-	-	-	-
F-53B minor	-	<0.05	<0.001	<0.05	<0.05	-	-	-	-
HFPO-DA	-	<0.05	<0.001	<0.05	<0.05	-	-	-	-
Sum F-53B	-	<0.1	<0.001	<0.1	<0.1	-	-	-	-
ADONA	-	<0.025	<0.001	<0.025	<0.025	-	-	-	-
P37DMOA	-	<0.05	<0.001	<0.05	<0.05	-	-	-	-
F-53B major	<0.001	<0.1	<0.1	<0.1	<0.1	-	-	-	-

Notes:

1. Results in µg/L.
2. Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZ WQG) – technical draft guideline values in PFAS National Environmental Management Plan – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.
3. ANZG 2023, Toxicant default guideline values for aquatic ecosystem protection: Perfluorooctane sulfonate (PFOS) in freshwater. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. CC BY 4.0. Australian and New Zealand Governments and Australian state and territory governments, Canberra, ACT, Australia.
4. 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.
5. 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.
3.6	Concentration exceeds 99% ecological guidelines.

Table E-2: Surface Water Sampling Results - Per- and Poly-Fluoroalkyl Substances (PFAS) [1]

	PFAS Samples in Surface Water							Guidelines	
Field_ID	OHA_SHW_SW4_3_180321	OHA_SHW_SW4_4_271021	OHA_SHW_SW4_5_300322	OHA_SHW_SW4_6_280922	OHA_SW4_050423			ANZECC 95% Species Protection - Technical Draft Default Guideline Values [2]	ANZ WQG for 99% Species Protection - Technical Draft Default Guideline Values [2]
Location_Code	SW4	SW4	SW4	OHA_SHW_SW4	OHA_SHW_SW4				
Sampled_Date_Time	3/18/2021	10/27/2021	3/30/2022	9/28/2022	4/5/2023				
Lab_Report_Number	2327926	2576268	2786753	3009070	3283471				
Sample Results									
PFPrS	<0.001	<0.001	<0.001	<0.001	<0.001			-	-
PFBS	0.0012	<0.001	<0.001	<0.001	<0.001			-	-
PFPeS	<0.001	<0.001	<0.001	<0.001	<0.001			-	-
di-PFHxS	<0.001	<0.001	<0.001	<0.001	<0.001			-	-
Mono-PFHxS	<0.001	<0.001	<0.001	<0.001	<0.001			-	-
L-PFHxS	0.005	<0.001	<0.001	<0.001	0.0017			-	-
Total PFHxS [4]	0.005	<0.001	<0.001	<0.001	0.0017			-	-
PFHpS	<0.001	<0.001	<0.001	<0.001	<0.001			-	-
di-PFOS	<0.001	<0.001	<0.001	<0.001	<0.001			-	-
Mono-PFOS	0.0029	<0.001	<0.001	<0.001	0.0015			-	-
L-PFOS	0.0036	<0.001	<0.001	<0.001	0.0024			-	-
Total PFOS [4]	0.0065	<0.001	<0.001	<0.001	0.0039			0.48 [3]	0.0091 [3]
Sum of PFHxS and PFOS [5]	0.012	<0.001	<0.001	<0.001	0.0056			-	-
PFECHS	<0.001	<0.001	<0.001	<0.001	<0.001			-	-
PFBA	0.037	0.0085	0.0061	0.008	0.0091			-	-
PFPeA	0.096	0.0035	0.0013	0.0018	0.014			-	-
PFHxA	0.079	0.0016	<0.001	<0.001	0.0096			-	-
PFHpA	0.048	0.0011	<0.001	<0.001	0.0054			-	-
PFOA	0.013	<0.001	<0.001	<0.001	0.0022			220	19
PFNA	0.0039	<0.001	<0.001	<0.001	0.0014			-	-
PFDA	<0.001	<0.001	<0.001	<0.001	<0.001			-	-
PFUnDA	<0.001	<0.001	<0.001	<0.001	<0.001			-	-
PFTrDA	<0.005	-	<0.001	-	-			-	-
PFTeDA	-	-	<0.001	-	-			-	-
PFDoDA	<0.005	<0.001	<0.001	<0.001	-			-	-
FOSA	<0.001	<0.001	<0.001	<0.001	<0.001			-	-
MeFOSA	<0.005	<0.001	<0.001	<0.001	<0.001			-	-
MeFOSAA	<0.001	<0.001	<0.001	<0.001	<0.001			-	-
EtFOSAA	<0.001	<0.001	<0.001	<0.001	<0.001			-	-
4:2 FTS	<0.001	-	-	-	-			-	-
6:2 FTS	0.0096	-	<0.001	<0.001	<0.001			-	-
8:2 FTS	<0.001	<0.001	<0.001	<0.001	<0.001			-	-
10:2 FTS	<0.001	<0.001	<0.001	<0.001	-			-	-
FPrPA	<0.001	<0.001	<0.001	<0.001	<0.001			-	-
EtFOSA	<0.005	<0.001	<0.001	<0.001	<0.001			-	-
EtFOSE	<0.005	<0.001	<0.001	<0.001	<0.001			-	-
FPePA	<0.001	<0.001	<0.001	<0.001	<0.001			-	-
FHpPA	<0.001	<0.001	<0.001	<0.001	<0.001			-	-
F-53B minor	<0.001	<0.001	<0.001	<0.001	-			-	-
HFPO-DA	<0.001	<0.001	<0.001	<0.001	<0.001			-	-
Sum F-53B	<0.001	<0.001	<0.001	<0.001	<0.001			-	-
ADONA	<0.001	<0.001	<0.001	<0.001	<0.001			-	-
P37DMOA	<0.001	<0.001	<0.001	<0.001	<0.001			-	-
F-53B major	-	<0.001	<0.001	<0.001	<0.001			-	-

Notes:

1. Results in µg/L.
2. Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZ WQG) – technical draft guideline values in PFAS National Environmental Management Plan – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.
3. ANZG 2023, Toxicant default guideline values for aquatic ecosystem protection: Perfluorooctane sulfonate (PFOS) in freshwater. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. CC BY 4.0. Australian and New Zealand Governments and Australian state and territory governments, Canberra, ACT, Australia.
4. 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.
5. 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.
3.6	Concentration exceeds 99% ecological guidelines.