

Food & Water Testing

ANALYTICAL REPORT

REPORT CODE **AR-24-NC-026499-02 #** REPORT DATE **11/10/2024**

This amended report supersedes Analytical Report number AR-24-NC-026499-01, dated 28/08/2024.

Attention Veolia Water Services (ANZ) Pty Ltd
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Copy to: Soria (francisco.soria@veolia.com), Lado (maria.lado@veolia.com)

Contact for your orders: James Thornton **Order code:** EUNZCH-00187274

Contract: Shotover WWTP

Submission Reference: Shotover and Project Pure Sludge **Purchase Order Number:** 7300390040

Order Comment: If the percent recoveries were greater than the upper control limit (200%), quantified results for the analyte in associated samples are estimated with a positive bias.
 If the percent recoveries were lower than the lower control limit (10%), quantified results for the analyte in associated samples are estimated with a negative bias.

Comments: Nickel result added

SAMPLE CODE **817-2024-00093726**

Sample Name Shotover WWTP Sludge

Reception Date & Time: 16/08/2024 13:40

Analysis Started on: 16/08/2024

Analysis Ending Date: 11/10/2024

Product Type Sludge

Sampled Date & Time 16/08/2024 13:00

Sampler(s) Veolia

Sampling Purpose Monitoring

RESULTS

LOQ

	RESULTS		LOQ
②NW499 Arsenic - Total			
Arsenic (As)	5.41	mg/kg	0.05
②NW504 Cadmium - Total			
Cadmium (Cd)	0.37	mg/kg	0.01
②NW507 Chromium - Total			
Chromium (Cr)	16.6	mg/kg	0.2
②NW509 Copper - Total			
Copper (Cu)	191	mg/kg	0.3
③NU122 Dry Matter (DM)			
Dry matter	18.5	%	0.1
③ZM0VI Enumeration (MPN) of Escherichia coli			
Escherichia coli	>1100	MPN/g	3
②NW510 Iron - Total			
Iron (Fe)	3380	mg/kg	3
②NW511 Lead - Total			
Lead (Pb)	5.0	mg/kg	0.1
②NW515 Mercury - Total			
Mercury (Hg)	0.3	mg/kg	0.1
②NW517 Nickel - Total			
Nickel (Ni)	12.1	mg/kg	0.2
③NW07P Per- and Polyfluoroalkyl Substances (PFAS)			
13C2-10:2 FTSA (surr.)	113	%	N/A

Food & Water Testing

	RESULTS		LOQ
③ NW07P Per- and Polyfluoroalkyl Substances (PFAS)			
13C2-4:2 FTSA (surr.)	192	%	N/A
13C2-6:2 FTSA (surr.)	327	%	N/A
13C2-8:2 FTSA (surr.)	495	%	N/A
13C2-PFDoDA (surr.)	113	%	N/A
13C2-PFTeDA (surr.)	58	%	N/A
13C2-PFUnDA (surr.)	90	%	N/A
13C3-PFBS (surr.)	149	%	N/A
13C4-PFBA (surr.)	38	%	N/A
13C4-PFHpA (surr.)	119	%	N/A
13C5-PFHxA (surr.)	84	%	N/A
13C5-PFNA (surr.)	128	%	N/A
13C5-PFPeA (surr.)	0	%	N/A
13C6-PFDA (surr.)	81	%	N/A
13C8-FOSA (surr.)	37	%	N/A
13C8-PFOA (surr.)	149	%	N/A
13C8-PFOS (surr.)	0	%	N/A
18O2-PFHxS (surr.)	104	%	N/A
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2FTSA) ***	<5	µg/kg	0.01
1H.1H.2H.2H-perfluorododecane sulfonic acid (10:2FTSA) ****	<5	µg/kg	0.01
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2FTSA) ***	<5	µg/kg	0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2FTSA) ***	<5	µg/kg	0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE) ***	<5	µg/kg	0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE) ***	<5	µg/kg	0.05
D3-N-MeFOSA (surr.)	136	%	N/A
D3-N-MeFOSAA (surr.)	134	%	N/A
D5-N-EtFOSA (surr.)	88	%	N/A
D5-N-EtFOSAA (surr.)	239	%	N/A
D7-N-MeFOSE (surr.)	0	%	N/A
D9-N-EtFOSE (surr.)	90	%	N/A
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA) ***	<5	µg/kg	0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (NEtFOSAA) **, ***	<5	µg/kg	0.05
N-methylperfluoro-1-octanesulfonamide (N-MeFOSA) ***	<5	µg/kg	0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA) **, ***	<5	µg/kg	0.05
Perfluorodecanoic acid (PFDA) ***	<5	µg/kg	0.01
Perfluorheptanoic acid (PFHpA) ***	<5	µg/kg	0.01
Perfluorhexanesulfonic acid (PFHxS) **, ***	<5	µg/kg	0.01

Food & Water Testing

	RESULTS		LOQ
③ NW07P Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluorobutanesulfonic acid (PFBS) ***	<5	µg/kg	0.01
Perfluorobutanoic acid (PFBA) ***	<5	µg/kg	0.05
Perfluorodecanesulfonic acid (PFDS) ****	<5	µg/kg	0.01
Perfluorododecanoic acid (PFDoDA) ***	<5	µg/kg	0.01
Perfluoroheptanesulfonic acid (PFHpS) ****	<5	µg/kg	0.01
Perfluorohexanoic acid (PFHxA) ***	<5	µg/kg	0.01
Perfluorononanesulfonic acid (PFNS) ****	<5	µg/kg	0.01
Perfluorononanoic acid (PFNA) ***	<5	µg/kg	0.01
Perfluorooctane sulfonamide (FOSA) ***	<5	µg/kg	0.05
Perfluorooctanesulfonic acid (PFOS) **, ***	<5	µg/kg	0.01
Perfluorooctanoic acid (PFOA) ***	<5	µg/kg	0.01
Perfluoropentanesulfonic acid (PFPeS) ****	<5	µg/kg	0.01
Perfluoropentanoic acid (PFPeA) ***	<5	µg/kg	0.01
Perfluoropropanesulfonic acid (PFPrS) ****	<5	µg/kg	0.01
Perfluorotetradecanoic acid (PFTeDA) ***	<5	µg/kg	0.01
Perfluorotridecanoic acid (PFTrDA) ****	<5	µg/kg	0.01
Perfluoroundecanoic acid (PFUnDA) ***	<5	µg/kg	0.01
Sum (PFHxS + PFOS)	<5	µg/kg	0.01
Sum of PFASs	<5	µg/kg	0.01
Sum of PFHxS + PFOS + PFOA	<5	µg/kg	0.01
Sum of PFOS + PFOA	<5	µg/kg	0.01
③ NU012 pH			
pH	6.3		1
② NU266 Phosphorus			
Phosphorus	0.5	%	0.1
② NU278 Potassium			
Potassium	0.2	%	0.1
② NW519 Potassium - Total			
Potassium (K)	8430	mg/kg	10
② NU361 Total Nitrogen			
Total nitrogen	1.5	%	0.1
② NW330 Volatile Solids			
Volatile Solids	14	%	1
② NW528 Zinc - Total			
Zinc (Zn)	294	mg/kg	1

Food & Water Testing

SAMPLE CODE	817-2024-00093727
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Sample Name	Project Pure WWTP Sludge		
Reception Date & Time:	16/08/2024 13:40		
Analysis Started on:	16/08/2024	Analysis Ending Date:	11/10/2024
Product Type	Sludge	Sampled Date & Time	16/08/2024 09:30
Sampler(s)	Veolia	Sampling Purpose	Monitoring

	RESULTS	LOQ
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②NW499	Arsenic - Total		
	Arsenic (As)	3.28	mg/kg
			0.05
②NW504	Cadmium - Total		
	Cadmium (Cd)	0.64	mg/kg
			0.01
②NW507	Chromium - Total		
	Chromium (Cr)	11.9	mg/kg
			0.2
②NW509	Copper - Total		
	Copper (Cu)	167	mg/kg
			0.3
③NU122	Dry Matter (DM)		
	Dry matter	19.7	%
			0.1
③ZM0VI	Enumeration (MPN) of Escherichia coli		
	Escherichia coli	>1100	MPN/g
			3
②NW510	Iron - Total		
	Iron (Fe)	3100	mg/kg
			3
②NW511	Lead - Total		
	Lead (Pb)	8.0	mg/kg
			0.1
②NW515	Mercury - Total		
	Mercury (Hg)	0.6	mg/kg
			0.1
②NW517	Nickel - Total		
	Nickel (Ni)	9.0	mg/kg
			0.2
③NW07P	Per- and Polyfluoroalkyl Substances (PFAS)		
	13C2-10:2 FTSA (surr.)	75	%
			N/A
	13C2-4:2 FTSA (surr.)	160	%
			N/A
	13C2-6:2 FTSA (surr.)	191	%
			N/A
	13C2-8:2 FTSA (surr.)	412	%
			N/A
	13C2-PFDoDA (surr.)	75	%
			N/A
	13C2-PFTeDA (surr.)	24	%
			N/A
	13C2-PFUnDA (surr.)	55	%
			N/A
	13C3-PFBS (surr.)	204	%
			N/A
	13C4-PFBA (surr.)	30	%
			N/A
	13C4-PFHpA (surr.)	135	%
			N/A
	13C5-PFHxA (surr.)	103	%
			N/A
	13C5-PFNA (surr.)	117	%
			N/A
	13C5-PFPeA (surr.)	0	%
			N/A
	13C6-PFDA (surr.)	69	%
			N/A
	13C8-FOSA (surr.)	40	%
			N/A
	13C8-PFOA (surr.)	157	%
			N/A
	13C8-PFOS (surr.)	0	%
			N/A
	18O2-PFHxS (surr.)	115	%
			N/A
	1H.1H.2H.2H-perfluorodecanesul fonic acid (8:2FTSA) ***	<5	µg/kg
			0.01

Food & Water Testing

	RESULTS		LOQ
③ NW07P Per- and Polyfluoroalkyl Substances (PFAS)			
1H.1H.2H.2H-perfluorododecane sulfonic acid (10:2FTSA) ****	<5	µg/kg	0.01
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2FTSA) ***	<5	µg/kg	0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2FTSA) ***	<5	µg/kg	0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE) ***	<5	µg/kg	0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE) ***	<5	µg/kg	0.05
D3-N-MeFOSA (surr.)	123	%	N/A
D3-N-MeFOSAA (surr.)	102	%	N/A
D5-N-EtFOSA (surr.)	205	%	N/A
D5-N-EtFOSAA (surr.)	221	%	N/A
D7-N-MeFOSE (surr.)	94	%	N/A
D9-N-EtFOSE (surr.)	69	%	N/A
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA) ***	<5	µg/kg	0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (NEtFOSAA) **, ***	<5	µg/kg	0.05
N-methylperfluoro-1-octanesulfonamide (N-MeFOSA) ***	<5	µg/kg	0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA) **, ***	<5	µg/kg	0.05
Perfluorodecanoic acid (PFDA) ***	<5	µg/kg	0.01
Perfluorheptanoic acid (PFHpA) ***	<5	µg/kg	0.01
Perfluorhexanesulfonic acid (PFHxS) **, ***	<5	µg/kg	0.01
Perfluorobutanesulfonic acid (PFBS) ***	<5	µg/kg	0.01
Perfluorobutanoic acid (PFBA) ***	<5	µg/kg	0.05
Perfluorodecanesulfonic acid (PFDS) ****	<5	µg/kg	0.01
Perfluorododecanoic acid (PFDoDA) ***	<5	µg/kg	0.01
Perfluoroheptanesulfonic acid (PFHpS) ****	<5	µg/kg	0.01
Perfluorohexanoic acid (PFHxA) ***	<5	µg/kg	0.01
Perfluorononanesulfonic acid (PFNS) ****	<5	µg/kg	0.01
Perfluorononanoic acid (PFNA) ***	<5	µg/kg	0.01
Perfluorooctane sulfonamide (FOSA) ***	<5	µg/kg	0.05
Perfluorooctanesulfonic acid (PFOS) **, ***	<5	µg/kg	0.01
Perfluorooctanoic acid (PFOA) ***	<5	µg/kg	0.01
Perfluoropentanesulfonic acid (PFPeS) ****	<5	µg/kg	0.01

Food & Water Testing

	RESULTS		LOQ
③ NW07P Per- and Polyfluoroalkyl Substances (PFAS)			
	Perfluoropentanoic acid (PFPeA) ^{<5} ***	µg/kg	0.01
	Perfluoropropanesulfonic acid (PFPrS) ^{<5} ****	µg/kg	0.01
	Perfluorotetradecanoic acid (PFTeDA) ^{<5} ***	µg/kg	0.01
	Perfluorotridecanoic acid (PFTrDA) ^{<5} ****	µg/kg	0.01
	Perfluoroundecanoic acid (PFUnDA) ^{<5} ***	µg/kg	0.01
	Sum (PFHxS + PFOS) ^{<5}	µg/kg	0.01
	Sum of PFASs ^{<5}	µg/kg	0.01
	Sum of PFHxS + PFOS + PFOA ^{<5}	µg/kg	0.01
	Sum of PFOS + PFOA ^{<5}	µg/kg	0.01
③ NU012 pH			
	pH 6.2		1
② NU266 Phosphorus			
	Phosphorus 0.3	%	0.1
② NU278 Potassium			
	Potassium 0.1	%	0.1
② NW519 Potassium - Total			
	Potassium (K) 5830	mg/kg	10
② NU361 Total Nitrogen			
	Total nitrogen 1.5	%	0.1
② NW330 Volatile Solids			
	Volatile Solids 16	%	1
② NW528 Zinc - Total			
	Zinc (Zn) 325	mg/kg	1

REPORT INFORMATION

PFAS note:

** Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear/branched standard.

*** Isotope dilution is used for calibration of each native compound for which an extract labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.

**** Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

LIST OF METHODS

NU012 pH: Internal Method, Electrometry [pH Electrode]	NU122 Dry Matter (DM): Internal Method, Gravimetry [Dried at 105°C]
NU266 Phosphorus: Internal Method, ICP-OES [Microwave digestion]	NU278 Potassium: Internal Method, ICP-OES [Microwave digestion]
NU361 Total Nitrogen: Internal Method, Combustion [Combustion elemental analyser: Thermal conductivity detection]	NW07P Per- and Polyfluoroalkyl Substances (PFAS): Internal Method, LC-MS/MS
NW330 Volatile Solids: APHA Online Edition 2540 G	NW499 Arsenic - Total: APHA Online Edition 3125 B mod.
NW504 Cadmium - Total: APHA Online Edition 3125 B mod.	NW507 Chromium - Total: APHA Online Edition 3125 B mod.
NW509 Copper - Total: APHA Online Edition 3125 B mod.	NW510 Iron - Total: APHA Online Edition 3125 B mod.
NW511 Lead - Total: APHA Online Edition 3125 B mod.	NW515 Mercury - Total: APHA Online Edition 3125 B mod.
NW517 Nickel - Total: APHA Online Edition 3125 B mod.	NW519 Potassium - Total: APHA Online Edition 3125 B mod.

Food & Water Testing

NW528 Zinc - Total: APHA Online Edition 3125 B mod.

 ZM0VI **Escherichia coli E (Sludge) [NZ] <3 >1 100 /MPN/g (1-3)**
LTB Broth-M: US-EPA 1680 mod.

Signature



David Hoekendijk Team Lead KTP

EXPLANATORY NOTE

- ① Test is not accredited
- ② Test is subcontracted within Eurofins group and is accredited
- ③ Test is subcontracted within Eurofins group and is not accredited
- ④ Test is subcontracted outside Eurofins group and is accredited
- ⑤ Test is subcontracted outside Eurofins group and is not accredited
- ⑥ Test result is provided by the customer and is not accredited
- ⑦ Tested at the sampling point by Eurofins and is not accredited
- ⑧ Tested at the sampling point by Eurofins and is accredited
- ⑨ Test is RLP accredited
- ⑩ Test is subcontracted within Eurofins group and is RLP accredited

N/A means Not Applicable

Not Detected means not detected at or above the Limit of Quantification (LOQ)

LOQ means Limit of Quantification and the unit of LOQ is the same as the result unit

✘ (Unsatisfactory) means does not meet the specification

✓ (Satisfactory) means meets the specification

MAV means Maximum Allowable Value

The Customer acknowledges and accepts that: (a) where Eurofins is not responsible for sampling, the test result(s) in this report apply only to the sample as received. Customer is solely responsible for the sampling process and warrants that the sample provided to Eurofins is representative of the lot / batch from which the samples were drawn; and (b) Eurofins expresses no opinion and accepts no liability in respect of the Customer's production process or homogeneity of the product.

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The tests are identified by a five-digit code, their description is available on request.

Accreditation does not apply to comments or graphical representations.

Unless otherwise stated, all tests in this analytical report (except for subcontracted tests) are performed at 43 Detroit Drive, Rolleston, Christchurch, NEW ZEALAND.

The laboratory is not responsible for the information provided by the customer which can affect the validity of the results, for example: sampling information such as date/time, field data etc.

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END OF REPORT