

Food & Water Testing

ANALYTICAL REPORT

REPORT CODE **AR-24-NC-026520-02 #** REPORT DATE **11/10/2024**

This amended report supersedes Analytical Report number AR-24-NC-026520-01, dated 29/08/2024.

Attention Veolia Water Services (ANZ) Pty Ltd
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Contact for your orders:	James Thornton	Order code:	EUNZCH-00187214
Contract:	Shotover WWTP	Purchase Order Number:	7300390040
Submission Reference:	Shotover and Project Pure WWTP Sludge		
Comments:	Nickel result added		

SAMPLE CODE **817-2024-00093504**

Sample Name	Shotover WWTP Sludge	Analysis Ending Date:	11/10/2024
Reception Date & Time:	12/08/2024 13:38	Sampled Date & Time	12/08/2024 09:00
Analysis Started on:	12/08/2024	Sampling Purpose	Monitoring
Product Type	Sludge		
Sampler(s)	Veolia		

RESULTS

LOQ

②NW499 Arsenic - Total				
Arsenic (As)	5.79	mg/kg		0.05
②NW504 Cadmium - Total				
Cadmium (Cd)	0.40	mg/kg		0.01
②NW507 Chromium - Total				
Chromium (Cr)	17.4	mg/kg		0.2
②NW509 Copper - Total				
Copper (Cu)	214	mg/kg		0.3
③NU122 Dry Matter (DM)				
Dry matter	18.9	%		0.1
③ZM0VI Enumeration (MPN) of Escherichia coli				
Escherichia coli	>1100	MPN/g		3
②NW510 Iron - Total				
Iron (Fe)	3190	mg/kg		3
②NW511 Lead - Total				
Lead (Pb)	5.6	mg/kg		0.1
②NW515 Mercury - Total				
Mercury (Hg)	0.4	mg/kg		0.1
②NW517 Nickel - Total				
Nickel (Ni)	11.0	mg/kg		0.2
③NW07P Per- and Polyfluoroalkyl Substances (PFAS)				
13C2-10:2 FTSA (surr.)	81	%		N/A
13C2-4:2 FTSA (surr.)	204	%		N/A
13C2-6:2 FTSA (surr.)	223	%		N/A
13C2-8:2 FTSA (surr.)	441	%		N/A

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	RESULTS		LOQ
③ NW07P Per- and Polyfluoroalkyl Substances (PFAS)			
13C2-PFDoDA (surr.)	81	%	N/A
13C2-PFTeDA (surr.)	37	%	N/A
13C2-PFUnDA (surr.)	62	%	N/A
13C3-PFBS (surr.)	143	%	N/A
13C4-PFBA (surr.)	32	%	N/A
13C4-PFHpA (surr.)	81	%	N/A
13C5-PFHxA (surr.)	77	%	N/A
13C5-PFNA (surr.)	145	%	N/A
13C5-PFPeA (surr.)	51	%	N/A
13C6-PFDA (surr.)	80	%	N/A
13C8-FOSA (surr.)	69	%	N/A
13C8-PFOA (surr.)	120	%	N/A
13C8-PFOS (surr.)	0	%	N/A
18O2-PFHxS (surr.)	108	%	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.)	67	%	N/A
D3-N-MeFOSAA (surr.)	136	%	N/A
D5-N-EtFOSA (surr.)	137	%	N/A
D5-N-EtFOSAA (surr.)	268	%	N/A
D7-N-MeFOSE (surr.)	0	%	N/A
D9-N-EtFOSE (surr.)	162	%	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

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	RESULTS		LOQ
③NW07P Per- and Polyfluoroalkyl Substances (PFAS)			
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
③NU012 pH			
pH	6.7		1
②NU266 Phosphorus			
Phosphorus	0.4	%	0.1
②NU278 Potassium			
Potassium	0.1	%	0.1
②NW519 Potassium - Total			
Potassium (K)	6180	mg/kg	10
②NU361 Total Nitrogen			
Total nitrogen	1.5	%	0.1
②NW330 Volatile Solids			
Volatile Solids	15	%	1
②NW528 Zinc - Total			
Zinc (Zn)	329	mg/kg	1

Food & Water Testing

SAMPLE CODE	817-2024-00093505
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Sample Name	Project Pure WWTP Sludge		
Reception Date & Time:	12/08/2024 13:38		
Analysis Started on:	12/08/2024	Analysis Ending Date:	11/10/2024
Product Type	Sludge	Sampled Date & Time	12/08/2024 13:00
Sampler(s)	Veolia	Sampling Purpose	Monitoring

	RESULTS		LOQ
②NW499 Arsenic - Total			
Arsenic (As)	3.42	mg/kg	0.05
②NW504 Cadmium - Total			
Cadmium (Cd)	0.68	mg/kg	0.01
②NW507 Chromium - Total			
Chromium (Cr)	13.8	mg/kg	0.2
②NW509 Copper - Total			
Copper (Cu)	152	mg/kg	0.3
③NU122 Dry Matter (DM)			
Dry matter	19.8	%	0.1
③ZM0VI Enumeration (MPN) of Escherichia coli			
Escherichia coli	>1100	MPN/g	3
②NW510 Iron - Total			
Iron (Fe)	2700	mg/kg	3
②NW511 Lead - Total			
Lead (Pb)	6.3	mg/kg	0.1
②NW515 Mercury - Total			
Mercury (Hg)	0.5	mg/kg	0.1
②NW517 Nickel - Total			
Nickel (Ni)	8.4	mg/kg	0.2
③NW07P Per- and Polyfluoroalkyl Substances (PFAS)			
13C2-10:2 FTSA (surr.)	91	%	N/A
13C2-4:2 FTSA (surr.)	179	%	N/A
13C2-6:2 FTSA (surr.)	316	%	N/A
13C2-8:2 FTSA (surr.)	495	%	N/A
13C2-PFDoDA (surr.)	91	%	N/A
13C2-PFTeDA (surr.)	44	%	N/A
13C2-PFUnDA (surr.)	78	%	N/A
13C3-PFBS (surr.)	166	%	N/A
13C4-PFBA (surr.)	33	%	N/A
13C4-PFHpA (surr.)	110	%	N/A
13C5-PFHxA (surr.)	90	%	N/A
13C5-PFNA (surr.)	168	%	N/A
13C5-PFPeA (surr.)	0	%	N/A
13C6-PFDA (surr.)	57	%	N/A
13C8-FOSA (surr.)	74	%	N/A
13C8-PFOA (surr.)	172	%	N/A
13C8-PFOS (surr.)	0	%	N/A
18O2-PFHxS (surr.)	109	%	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

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	RESULTS		LOQ
③ NW07P Per- and Polyfluoroalkyl Substances (PFAS)			
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-octanesulfonamido)-ethanol (N-EtFOSE) ***	<5	µg/kg	0.05
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol (N-MeFOSE) ***	<5	µg/kg	0.05
D3-N-MeFOSA (surr.)	87	%	N/A
D3-N-MeFOSAA (surr.)	105	%	N/A
D5-N-EtFOSA (surr.)	189	%	N/A
D5-N-EtFOSAA (surr.)	248	%	N/A
D7-N-MeFOSE (surr.)	0	%	N/A
D9-N-EtFOSE (surr.)	106	%	N/A
N-ethylperfluoro-1-octanesulfonamide (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
Perfluoropentanoic acid (PFPeA) ***	<5	µg/kg	0.01

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	RESULTS		LOQ
③NW07P Per- and Polyfluoroalkyl Substances (PFAS)			
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
③NU012 pH			
pH	5.9		1
②NU266 Phosphorus			
Phosphorus	0.3	%	0.1
②NU278 Potassium			
Potassium	0.1	%	0.1
②NW519 Potassium - Total			
Potassium (K)	6050	mg/kg	10
②NU361 Total Nitrogen			
Total nitrogen	1.5	%	0.1
②NW330 Volatile Solids			
Volatile Solids	17	%	1
②NW528 Zinc - Total			
Zinc (Zn)	296	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.
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.

Food & Water Testing

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.

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END OF REPORT