

AFFCO NEW ZEALAND - RANGIURU

Stormwater Monitoring Survey 2020

FINAL

Prepared for AFFCO New Zealand Ltd

April 2020



argoenvironmental

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Stormwater Monitoring Report 2020

FINAL

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By

argoenvironmental

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DOCUMENT REVISION SCHEDULE

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Rev0	April 2020	Final	Luke Gowing (Director)

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ARGO ENVIRONMENTAL LIMITED

Auckland Office

Level 2, 10 O'Connell Street, Auckland Central, New Zealand

P.O. Box 105774, Auckland 1143, New Zealand

Tel +64 9 367 0631, Email: admin@argoenv.com.

EXECUTIVE SUMMARY

AFFCO New Zealand Limited operates a meat processing facility at Rangioru in the Bay of Plenty. The facility discharges treated wastewater to the Kaituna River. AFFCO is applying to renew Consent 02 4925 which authorises the discharge of Defrost, Cooling Water and Stormwater and expires on 30th June 2020. BoPRC have requested further information in relation to the quality of the stormwater discharge. This report presents the results of further investigation of the quality of the stormwater discharged by AFFCO Rangioru via the stormwater treatment system to the Kaituna River.

The majority of trace metals and SVOC/VOC concentrations are at or below the detection limits of the analyses (for both dissolved and total concentrations) or below their respective ANZECC (2000) default trigger values. Total copper concentration at the inflow site to the pond marginally exceeds the ANZECC (2000) default trigger value. However, both total and dissolved copper concentrations at the outflow site to the Kaituna River are below the ANZECC (2000) default trigger value.

Total and dissolved zinc concentrations exceed trigger values which is typical for discharges throughout New Zealand that discharge stormwater from Zincoalume roofs.

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1. Introduction

AFFCO New Zealand Limited (AFFCO) operates a meat processing facility at Rangiuru, about 5 km east of Te Puke. The plant is located on land between State Highway 2 and the Kaituna River; and the site is owned and occupied by AFFCO New Zealand Limited.

AFFCO Rangiuru is applying to renew Consent 02 4925 which authorises the discharge of Defrost, Cooling Water and Stormwater and expires on 30th June 2020. AFFCO currently discharge defrost, cooling water and stormwater to the River via a stormwater detention pond. The location of the stormwater treatment system is shown in Figure 1.1.

An application for renewal of this Consent was made in December 2019. The BoPRC have requested further information in relation to the quality of the stormwater discharge (email from A Suren 5/2/2020).

This report presents the results of further investigation of the quality of the stormwater discharged by AFFCO Rangiuru via the existing stormwater treatment system to the Kaituna River.



Figure 1-1: AFFCO Rangiuru Plant stormwater detention pond showing discharge point and sampling locations

2. Methodology

Grab samples of stormwater were collected on 4th March 2020 from two locations: discharge from site into stormwater detention pond (Site 1) and discharge from stormwater detention pond to the Kaituna River (Site 2). Table 2-1 presents a summary of the site information and the sampling site locations are shown in Figure 2-1.

Table 2-1: Laboratory, bottle type and parameters sampled

Site	Description	GPS co-ordinates
1	Discharge from site into stormwater detention pond	37°47'40.5" 176°22'53.8"
2	Discharge from stormwater detention pond to the Kaituna River	37°47'43.0" 176°22'49.9"

The samples were collected following the onset of the first significant rain (defined as exceeding 5 mm of rain) following at least 72 hours of dry weather. Figure 2.1 presents the rainfall data recorded by BoPRC at the Te Matai Bridge approximately 2 km west of the AFFCO site¹.

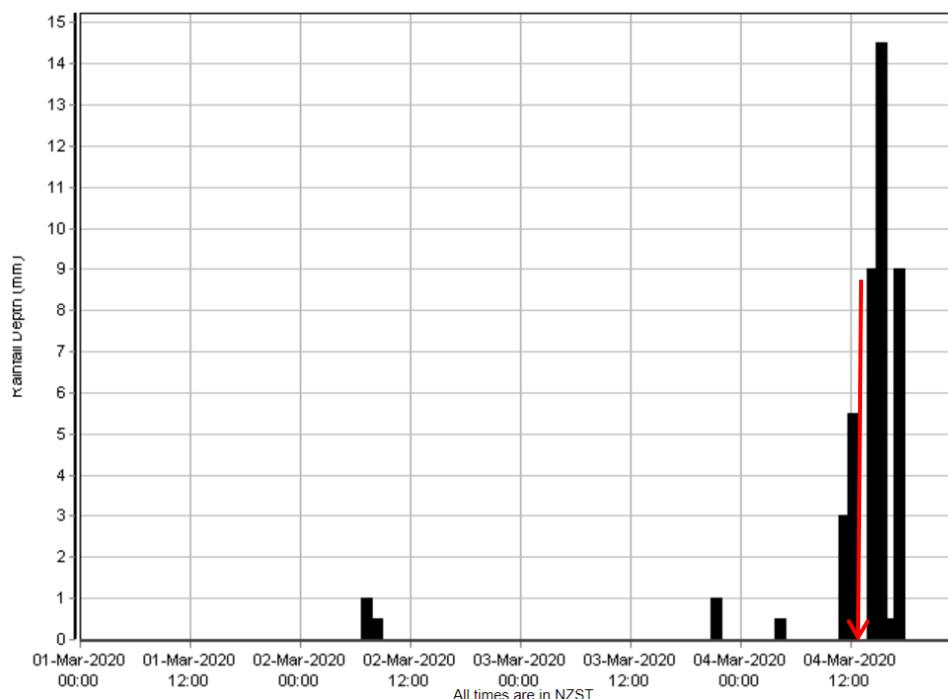


Figure 2-1: BoPRC rainfall data for Te Matai showing time of sampling (arrow)

Samples collected were analysed for the range of common stormwater determinands (see Appendix A). Sample analysis was undertaken by Watercare Laboratory (Auckland). Following collection all samples were kept cool and prior to couriering placed in chillybins provided with frozen gel pads.

Sample data has been compared to Australia and New Zealand Guidelines for Fresh and Marine Water Quality, 2000 (ANZECC, 2000) which provide fresh and marine water quality guidelines for New Zealand and Australia. The guidelines provide a framework for applying levels of protection for toxicants to different ecosystem conditions – the 95% level of species protection has been applied as it considered to be a conservative approach for this assessment.

¹ <https://monitoring.boprc.govt.nz/MonitoredSites/cgi-bin/hydwebserver.cgi/sites/details?site=187&treecatchment=22>

3. Results

Table 3-1 and Table 3-2 summarise the results for the 2020 survey. The key points to note are:

General Parameters

- Total suspended solids (TSS) decreases between stormwater pond inflow and outflow (3.9 & 2.0 g/m³).
- Turbidity decreases between stormwater pond inflow and outflow (2.2 & 0.85 NTU) and are below the ANZECC (2000) default trigger value of 5.6 NTU (lowland rivers).
- Total hardness is low (16-14 g/m³) and similar to the concentration at which the ANZECC (2000) default trigger values for hardness dependant trace metals (i.e., cadmium, chromium, copper, lead, nickel zinc) have been calculated (30 g/m³).

Trace Metals

- Dissolved and total cadmium concentrations are below the detection limits of the analysis (<0.00005 g/m³) at both sites and below the ANZECC (2000) default trigger value of 0.0002 g/m³.
- Dissolved and total chromium concentrations at both sites are below the detection limits of the analysis or just above (<0.0005-0.00051 g/m³) and below the default trigger value of 0.001 g/m³.
- Total copper concentration at the inflow site (0.0016 g/m³) marginally exceeds the ANZECC (2000) default trigger value of 0.0014 g/m³. However, dissolved copper concentrations, which are a better indicator of the bio-availability of the metal, at the inflow site (0.0012 g/m³), and both total and dissolved copper concentrations at the outflow site (0.00099 & 0.00078 g/m³ respectively), are below the ANZECC (2000) default trigger value.
- Total and dissolved lead concentrations at both sites (<0.0001 - 0.00063 g/m³) are below the ANZECC (2000) default trigger value of 0.0034 g/m³.
- Total and dissolved nickel concentrations at both sites are below the detection limits of the analysis (<0.001 g/m³) and below ANZECC (2000) default trigger value of 0.011 g/m³.
- Total and dissolved zinc concentrations at both sites (0.013 - 0.064 g/m³) exceed the ANZECC (2000) default trigger value of 0.008 g/m³.

Organic toxicants

- All of the volatile organic carbon (VOC) and semi-volatile organic carbon (SVOC) compounds analysed for in the current survey are below the detection limits of the analysis (ranging from <0.001 to <0.00008 g/m³) and are below their respective ANZECC (2000) trigger values (where available).

Table 3-1: A comparison of general parameter and total and dissolved trace metal data with ANZECC (2000) trigger values (all results g/m³ unless stated) for stormwater samples collected

Parameter	Sites		ANZECC(2000) trigger values ¹
	1	2	
Turbidity	2.2	0.85	5.6
TSS	3.9	2.0	-
Total Hardness	16	14	-
Cadmium (dissolved /total)	<0.00005/<0.00005	<0.00005/<0.00005	0.0002
Chromium (dissolved/total)	<0.0005/0.00051	<0.0005/<0.0005	0.001
Copper (dissolved/total)	0.0012/0.0016	0.00078/0.00099	0.0014
Lead (dissolved/total)	<0.0001/0.00063	<0.0001/0.00013	0.0034
Nickel (dissolved/total)	<0.0001/<0.0001	<0.0001/<0.0001	0.011
Zinc (dissolved/total)	0.052/0.064	0.013/0.012	0.008

Note: cBOD₅ = carbonaceous biochemical oxygen demand. ¹ANZECC (2000) default trigger values for the protection of 95% of species in slightly to moderately disturbed New Zealand lowland rivers. ²MPN/100mL. MfE (2002) Alert and Action mode median concentrations.

Table 3-2: A comparison of selected VOC & SVOC data with ANZECC (2000) trigger values where available (all results g/m³ unless stated) for stormwater samples

Type	Parameter	Sites		ANZECC(2000) trigger values ¹
		1	2	
Chloroethanes	1,1,2-trichloroethane	<0.0001	<0.0001	-
	Hexachloroethane	<0.0005	<0.0005	0.36
Aromatic	Benzene	<0.0001	<0.0001	0.95
Hydrocarbons	o-xylene	<0.0001	<0.0001	0.35
	p-xylene	<0.0001	<0.0001	0.2
PAHs	Naphthalene	<0.0002	<0.0002	0.016
Nitrobenzenes	Nitrobenzene	<0.001	<0.001	0.55
Nitrotoluene	2,4-dinitrotoluene	<0.0005	<0.0005	0.06-
Chlorobenzenes	1,2-dichlorobenzene	<0.0005	<0.0005	0.16
	1,3-dichlorobenzene	<0.0005	<0.0005	0.26
	1,4-dichlorobenzene	<0.0005	<0.0005	0.06
	1,2,4-trichlorobenzene	<0.0005	<0.0005	0.17

Note: ¹ANZECC (2000) default trigger values for the protection of 95% of species in slightly to moderately disturbed New Zealand lowland rivers. ID - Insufficient data to derive a reliable trigger value. - = trigger value not available.

4. Summary

This Report presents the results of stormwater monitoring at two sites in the stormwater detention pond (inflow and outflow) at AFFCO Rangioru conducted in March 2020. In summary:

- Turbidity and total suspended solids concentrations are low with turbidity values below the ANZECC (2000) default trigger value for lowland Rivers.
- Cadmium, chromium and nickel are at or below the detection limits of the analyses (for both dissolved and total concentrations) and below their respective ANZECC (2000) default trigger values. Total and dissolved lead concentrations are below default trigger value
- Total copper concentration at the inflow site to the pond marginally exceeds the ANZECC (2000) default trigger value. However, dissolved copper concentrations, a better indicator of the bio-availability of the metal at the inflow site and both total and dissolved copper concentrations at the outflow site, are below the ANZECC (2000) default trigger value.
- Total and dissolved zinc concentrations exceed trigger values which is typical for discharges throughout New Zealand that discharge stormwater from Zinalume roofs.
- All of the VOC / SVOC compounds are below the detection limits of the analysis and below ANZECC (2000) default trigger values (where available).

Appendix A Laboratory Data

Certificate of Analysis

Laboratory Reference:200306-130

Attention:	Luke Gowing	Final Report:	357955-0
Client:	ARGO ENVIRONMENTAL	Report Issue Date:	16-Mar-2020
Address:	101 Customs Street East, Auckland Central, 1010	Received Date:	06-Mar-2020
Client Reference:	AFFCO Rangiuru Inlet and Discharge	Quote Reference :	8561
Purchase Order:	AFFCO RANGIURU		

Sample Details

	WATERS	WATERS
Lab Sample ID:	200306-130-1	200306-130-2
Client Sample ID:		
Sample Date/Time	04/03/2020 12:40	04/03/2020 13:20
Description:	Inlet to Pond	Discharge End of Pond

Chemistry Detailed

Semi Volatile Organic Contaminants by Gas Chromatography-Mass Spectrometry (Trace level)

Contaminant	Unit	200306-130-1	200306-130-2
1,2,4-trichlorobenzene, Trace level	mg/L	<0.0005	<0.0005
1,2-dichlorobenzene, Trace level	mg/L	<0.0005	<0.0005
1,3-dichlorobenzene, Trace level	mg/L	<0.0005	<0.0005
1,4-dichlorobenzene, Trace level	mg/L	<0.0005	<0.0005
2,4-dinitrotoluene, Trace level	mg/L	<0.0005	<0.0005
2,6-dinitrotoluene, Trace level	mg/L	<0.0015	<0.0015
2-chloronaphthalene, Trace level	mg/L	<0.0002	<0.0002
2-methylnaphthalene, Trace level	mg/L	<0.0002	<0.0002
4-bromophenylphenylether, Trace level	mg/L	<0.001	<0.001
4-chlorophenylphenyl ether, Trace level	mg/L	<0.001	<0.001
bis(2-chloroethoxy)methane, Trace level	mg/L	<0.0015	<0.0015
bis(2-chloroethyl)ether, Trace level	mg/L	<0.0015	<0.0015
bis(2-chloroisopropyl)ether, Trace level	mg/L	<0.0015	<0.0015
Dibenzofuran, Trace level	mg/L	<0.0005	<0.0005
Diphenylhydrazine, Trace level	mg/L	<0.001	<0.001
Hexachlorobenzene, Trace level	mg/L	<0.0005	<0.0005
Hexachlorobutadiene, Trace level	mg/L	<0.0005	<0.0005
Hexachlorocyclopentadiene, Trace level	mg/L	<0.0005	<0.0005
Hexachloroethane, Trace level	mg/L	<0.0005	<0.0005
Isophorone, Trace level	mg/L	<0.0005	<0.0005
Nitrobenzene, Trace level	mg/L	<0.001	<0.001
n-nitrosodi-n-propylamine, Trace level	mg/L	<0.0015	<0.0015
n-nitrosodiphenylamine, Trace level	mg/L	<0.0005	<0.0005

General Testing

Parameter	Unit	200306-130-1	200306-130-2
Total Suspended Solids	mg/L	3.9	2.0
Turbidity	NTU	2.2	0.85

Metals

Dissolved Metals by ICP-MS—Trace

Contaminant	Unit	200306-130-1	200306-130-2
Cadmium (Dissolved)	mg/L	<0.00005	<0.00005
Chromium (Dissolved)	mg/L	<0.0005	<0.0005
Copper (Dissolved)	mg/L	0.0012	0.00078
Lead (Dissolved)	mg/L	<0.0001	<0.0001
Nickel (Dissolved)	mg/L	<0.0001	<0.0001

Sample Details (continued)		WATERS	WATERS
Lab Sample ID:		200306-130-1	200306-130-2
Client Sample ID:			
Sample Date/Time:		04/03/2020 12:40	04/03/2020 13:20
Description:		Inlet to Pond	Discharge End of Pond

Metals

Dissolved Metals by ICP-MS—Trace

Zinc (Dissolved)	mg/L	0.052	0.013
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Total Metals by ICP-MS—Trace (Default Digest)

Cadmium (Total)	mg/L	<0.00005	<0.00005
Calcium (Total)	mg/L	3.3	2.6
Chromium (Total)	mg/L	0.00051	<0.0005
Copper (Total)	mg/L	0.0016	0.00099
Lead (Total)	mg/L	0.00063	0.00013
Magnesium (Total)	mg/L	1.9	1.8
Nickel (Total)	mg/L	<0.0001	<0.0001
Total Hardness (as CaCO3)	mg/L	16	14
Zinc (Total)	mg/L	0.064	0.012

Organics

VOC by Gas Chromatography-Mass Spectrometry (Trace level)

1-1-1-2-tetrachloroethane, Trace level	mg/L	<0.0001	<0.0001
1-1-1-trichloroethane, Trace level	mg/L	<0.0001	<0.0001
1-1-2-2-tetrachloroethane, Trace level	mg/L	<0.0001	<0.0001
1-1-2-trichloroethane, Trace level	mg/L	<0.0001	<0.0001
1-1-dichloroethane, Trace level	mg/L	<0.0001	<0.0001
1-1-dichloroethene, Trace level	mg/L	<0.0005	<0.0005
1-1-dichloropropene, Trace level	mg/L	<0.0001	<0.0001
1-2-3-trichlorobenzene, Trace level	mg/L	<0.0001	<0.0001
1-2-3-trichloropropane, Trace level	mg/L	<0.0001	<0.0001
1-2-4-trichlorobenzene, Trace level	mg/L	<0.0001	<0.0001
1-2-4-trimethylbenzene, Trace level	mg/L	<0.0001	<0.0001
1-2-dibromo-3-chloropropane, Trace level	mg/L	<0.0001	<0.0001
1-2-dibromoethane, Trace level	mg/L	<0.0001	<0.0001
1-2-dichlorobenzene, Trace level	mg/L	<0.0001	<0.0001
1-2-dichloroethane, Trace level	mg/L	<0.0001	<0.0001
1-2-dichloropropane, Trace level	mg/L	<0.0001	<0.0001
1-3-5-trimethylbenzene, Trace level	mg/L	<0.0001	<0.0001
1-3-dichlorobenzene, Trace level	mg/L	<0.0001	<0.0001
1-3-dichloropropane, Trace level	mg/L	<0.0001	<0.0001
1-4-dichlorobenzene, Trace level	mg/L	<0.0001	<0.0001
2-2-dichloropropane, Trace level	mg/L	<0.0005	<0.0005
2-chlorotoluene, Trace level	mg/L	<0.0001	<0.0001
4-chlorotoluene, Trace level	mg/L	<0.0001	<0.0001
benzene, Trace level	mg/L	<0.0001	<0.0001
bromobenzene, Trace level	mg/L	<0.0001	<0.0001
bromodichloromethane, Trace level	mg/L	<0.0001	<0.0001
bromoform, Trace level	mg/L	<0.0001	<0.0001
bromomethane, Trace level	mg/L	<0.0005	<0.0005
carbon tetrachloride, Trace level	mg/L	<0.0001	<0.0001
chlorobenzene, Trace level	mg/L	<0.0001	<0.0001
chloroform, Trace level	mg/L	<0.0001	<0.0001
chloromethane, Trace level	mg/L	<0.0005	<0.0005
cis-1-2-dichloroethylene, Trace level	mg/L	<0.0001	<0.0001
cis-1-3-dichloropropene, Trace level	mg/L	<0.0001	<0.0001
dibromochloromethane, Trace level	mg/L	<0.0001	<0.0001
dibromomethane, Trace level	mg/L	<0.0001	<0.0001
dichlorodifluoromethane, Trace level	mg/L	<0.0005	<0.0005
ethylbenzene, Trace level	mg/L	<0.0001	<0.0001
ethylchloride, Trace level	mg/L	<0.0001	<0.0001

Sample Details (continued)	WATERS	WATERS
Lab Sample ID:	200306-130-1	200306-130-2
Client Sample ID:		
Sample Date/Time:	04/03/2020 12:40	04/03/2020 13:20
Description:	Inlet to Pond	Discharge End of Pond

Organics

VOC by Gas Chromatography-Mass Spectrometry (Trace level)

fluorotrichloromethane, Trace level	mg/L	<0.0001	<0.0001
Hexachlorobutadiene, Trace level	mg/L	<0.0001	<0.0001
iso-propylbenzene, Trace level	mg/L	<0.0001	<0.0001
m- & p-xylene, Trace level	mg/L	<0.0001	<0.0001
methylene chloride, Trace level	mg/L	<0.0005	<0.0005
Naphthalene, Trace level	mg/L	<0.0001	<0.0001
n-butylbenzene, Trace level	mg/L	<0.0001	<0.0001
n-propylbenzene, Trace level	mg/L	<0.0001	<0.0001
o-xylene, Trace level	mg/L	<0.0001	<0.0001
p-isopropyl toluene, Trace level	mg/L	<0.0001	<0.0001
sec-butylbenzene, Trace level	mg/L	<0.0001	<0.0001
styrene, Trace level	mg/L	<0.0001	<0.0001
tert-butyl benzene, Trace level	mg/L	<0.0001	<0.0001
tetrachloroethylene, Trace level	mg/L	<0.0001	<0.0001
THM Ratio, Trace level		0	0
toluene, Trace level	mg/L	<0.0001	<0.0001
trans-1-2-dichloroethene, Trace level	mg/L	<0.0001	<0.0001
trans-1-3-dichloropropene, Trace level	mg/L	<0.0001	<0.0001
trichloroethylene, Trace level	mg/L	<0.0001	<0.0001
vinyl chloride, Trace level	mg/L	<0.0001	<0.0001

Results marked with * are not accredited to International Accreditation New Zealand

Where samples have been supplied by the client they are tested as received. A dash indicates no test performed.

Reference Methods

The sample(s) referred to in this report were analysed by the following method(s)

Analyte	Method Reference	MDL	Samples	Location
Chemistry Detailed				
Semi Volatile Organic Contaminants by Gas Chromatography-Mass Spectrometry (Trace level)				
1,2,4-trichlorobenzene, Trace level	SPE GC-MSD, USEPA 8270	0.0005 mg/L	All	Auckland
1,2-dichlorobenzene, Trace level	SPE GC-MSD, USEPA 8270	0.0005 mg/L	All	Auckland
1,3-dichlorobenzene, Trace level	SPE GC-MSD, USEPA 8270	0.0005 mg/L	All	Auckland
1,4-dichlorobenzene, Trace level	SPE GC-MSD, USEPA 8270	0.0005 mg/L	All	Auckland
2,4-dinitrotoluene, Trace level	SPE GC-MSD, USEPA 8270	0.0005 mg/L	All	Auckland
2,6-dinitrotoluene, Trace level	SPE GC-MSD, USEPA 8270	0.002 mg/L	All	Auckland
2-chloronaphthalene, Trace level	SPE GC-MSD, USEPA 8270	0.0002 mg/L	All	Auckland
2-methylnaphthalene, Trace level	SPE GC-MSD, USEPA 8270	0.0002 mg/L	All	Auckland
4-bromophenylphenylether, Trace level	SPE GC-MSD, USEPA 8270	0.001 mg/L	All	Auckland
4-chlorophenylphenyl ether, Trace level	SPE GC-MSD, USEPA 8270	0.001 mg/L	All	Auckland
bis(2-chloroethoxy)methane, Trace level	SPE GC-MSD, USEPA 8270	0.002 mg/L	All	Auckland
bis(2-chloroethyl)ether, Trace level	SPE GC-MSD, USEPA 8270	0.002 mg/L	All	Auckland
bis(2-chloroisopropyl)ether, Trace level	SPE GC-MSD, USEPA 8270	0.002 mg/L	All	Auckland
Dibenzofuran, Trace level	SPE GC-MSD, USEPA 8270	0.0005 mg/L	All	Auckland
Diphenylhydrazine, Trace level	SPE GC-MSD, USEPA 8270	0.001 mg/L	All	Auckland
Hexachlorobenzene, Trace level	SPE GC-MSD, USEPA 8270	0.0005 mg/L	All	Auckland
Hexachlorobutadiene, Trace level	SPE GC-MSD, USEPA 8270	0.0005 mg/L	All	Auckland
Hexachlorocyclopentadiene, Trace level	SPE GC-MSD, USEPA 8270	0.0005 mg/L	All	Auckland
Hexachloroethane, Trace level	SPE GC-MSD, USEPA 8270	0.0005 mg/L	All	Auckland
Isophorone, Trace level	SPE GC-MSD, USEPA 8270	0.0005 mg/L	All	Auckland
Nitrobenzene, Trace level	SPE GC-MSD, USEPA 8270	0.001 mg/L	All	Auckland
n-nitrosodi-n-propylamine, Trace level	SPE GC-MSD, USEPA 8270	0.002 mg/L	All	Auckland
n-nitrosodiphenylamine, Trace level	SPE GC-MSD, USEPA 8270	0.0005 mg/L	All	Auckland

General Testing				
Total Suspended Solids by Gravimetry	APHA (online edition) 2540 D / 2540 E	0.2 mg/L	All	Auckland
Turbidity by Nephelometry	APHA (online edition) 2130 B (modified)	0.05 NTU	All	Auckland
Metals				
Dissolved Metals by ICP-MS—Trace				
Cadmium (Dissolved)	APHA (online edition) 3125 B by ICPMS	0.00005 mg/L	All	Auckland
Chromium (Dissolved)	APHA (online edition) 3125 B by ICPMS	0.0005 mg/L	All	Auckland
Copper (Dissolved)	APHA (online edition) 3125 B by ICPMS	0.0002 mg/L	All	Auckland
Lead (Dissolved)	APHA (online edition) 3125 B by ICPMS	0.00010 mg/L	All	Auckland
Nickel (Dissolved)	APHA (online edition) 3125 B by ICPMS	0.00010 mg/L	All	Auckland
Zinc (Dissolved)	APHA (online edition) 3125 B by ICPMS	0.001 mg/L	All	Auckland
Total Metals by ICP-MS—Trace (Default Digest)				
Cadmium (Total)	APHA (online edition) 3125 B by ICPMS	0.00005 mg/L	All	Auckland
Calcium (Total)	APHA (online edition) 3125 B by ICPMS	0.010 mg/L	All	Auckland
Chromium (Total)	APHA (online edition) 3125 B by ICPMS	0.0005 mg/L	All	Auckland
Copper (Total)	APHA (online edition) 3125 B by ICPMS	0.0002 mg/L	All	Auckland
Lead (Total)	APHA (online edition) 3125 B by ICPMS	0.00010 mg/L	All	Auckland
Magnesium (Total)	APHA (online edition) 3125 B by ICPMS	0.001 mg/L	All	Auckland
Nickel (Total)	APHA (online edition) 3125 B by ICPMS	0.00010 mg/L	All	Auckland
Total Hardness (as CaCO ₃)	APHA (online edition) 3125 B by ICPMS	0.03 mg/L	All	Auckland
Zinc (Total)	APHA (online edition) 3125 B by ICPMS	0.001 mg/L	All	Auckland
Organics				
VOC by Gas Chromatography-Mass Spectrometry (Trace level)				
1-1-1-2-tetrachloroethane, Trace level	APHA (online edition) 6200 B (Purge and Trap) Modified	0.00010 mg/L	All	Auckland
1-1-1-trichloroethane, Trace level	APHA (online edition) 6200 B (Purge and Trap) Modified	0.00010 mg/L	All	Auckland
1-1-2-2-tetrachloroethane, Trace level	APHA (online edition) 6200 B (Purge and Trap) Modified	0.00010 mg/L	All	Auckland
1-1-2-trichloroethane, Trace level	APHA (online edition) 6200 B (Purge and Trap) Modified	0.00010 mg/L	All	Auckland
1-1-dichloroethane, Trace level	APHA (online edition) 6200 B (Purge and Trap) Modified	0.00010 mg/L	All	Auckland
1-1-dichloroethene, Trace level	APHA (online edition) 6200 B (Purge and Trap) Modified	0.0005 mg/L	All	Auckland
1-1-dichloropropene, Trace level	APHA (online edition) 6200 B (Purge and Trap) Modified	0.00010 mg/L	All	Auckland
1-2-3-trichlorobenzene, Trace level	APHA (online edition) 6200 B (Purge and Trap) Modified	0.00010 mg/L	All	Auckland
1-2-3-trichloropropane, Trace level	APHA (online edition) 6200 B (Purge and Trap) Modified	0.00010 mg/L	All	Auckland
1-2-4-trichlorobenzene, Trace level	APHA (online edition) 6200 B (Purge and Trap) Modified	0.00010 mg/L	All	Auckland
1-2-4-trimethylbenzene, Trace level	APHA (online edition) 6200 B (Purge and Trap) Modified	0.00010 mg/L	All	Auckland
1-2-dibromo-3-chloropropane, Trace level	APHA (online edition) 6200 B (Purge and Trap) Modified	0.00010 mg/L	All	Auckland
1-2-dibromoethane, Trace level	APHA (online edition) 6200 B (Purge and Trap) Modified	0.00010 mg/L	All	Auckland
1-2-dichlorobenzene, Trace level	APHA (online edition) 6200 B (Purge and Trap) Modified	0.00010 mg/L	All	Auckland
1-2-dichloroethane, Trace level	APHA (online edition) 6200 B (Purge and Trap) Modified	0.00010 mg/L	All	Auckland
1-2-dichloropropane, Trace level	APHA (online edition) 6200 B (Purge and Trap) Modified	0.00010 mg/L	All	Auckland
1-3-5-trimethylbenzene, Trace level	APHA (online edition) 6200 B (Purge and Trap) Modified	0.00010 mg/L	All	Auckland
1-3-dichlorobenzene, Trace level	APHA (online edition) 6200 B (Purge and Trap) Modified	0.00010 mg/L	All	Auckland
1-3-dichloropropane, Trace level	APHA (online edition) 6200 B (Purge and Trap) Modified	0.00010 mg/L	All	Auckland
1-4-dichlorobenzene, Trace level	APHA (online edition) 6200 B (Purge and Trap) Modified	0.00010 mg/L	All	Auckland
2-2-dichloropropane, Trace level	APHA (online edition) 6200 B (Purge and Trap) Modified	0.0005 mg/L	All	Auckland
2-chlorotoluene, Trace level	APHA (online edition) 6200 B (Purge and Trap) Modified	0.00010 mg/L	All	Auckland
4-chlorotoluene, Trace level	APHA (online edition) 6200 B (Purge and Trap) Modified	0.00010 mg/L	All	Auckland

Organics

VOC by Gas Chromatography-Mass Spectrometry (Trace level)

benzene, Trace level	APHA (online edition) 6200 B (Purge and Trap) Modified	0.00010 mg/L	All	Auckland
bromobenzene, Trace level	APHA (online edition) 6200 B (Purge and Trap) Modified	0.00010 mg/L	All	Auckland
bromodichloromethane, Trace level	APHA (online edition) 6200 B (Purge and Trap) Modified	0.00010 mg/L	All	Auckland
bromoform, Trace level	APHA (online edition) 6200 B (Purge and Trap) Modified	0.00010 mg/L	All	Auckland
bromomethane, Trace level	APHA (online edition) 6200 B (Purge and Trap) Modified	0.0005 mg/L	All	Auckland
carbon tetrachloride, Trace level	APHA (online edition) 6200 B (Purge and Trap) Modified	0.00010 mg/L	All	Auckland
chlorobenzene, Trace level	APHA (online edition) 6200 B (Purge and Trap) Modified	0.00010 mg/L	All	Auckland
chloroform, Trace level	APHA (online edition) 6200 B (Purge and Trap) Modified	0.00010 mg/L	All	Auckland
chloromethane, Trace level	APHA (online edition) 6200 B (Purge and Trap) Modified	0.0005 mg/L	All	Auckland
cis-1-2-dichloroethylene, Trace level	APHA (online edition) 6200 B (Purge and Trap) Modified	0.00010 mg/L	All	Auckland
cis-1-3-dichloropropene, Trace level	APHA (online edition) 6200 B (Purge and Trap) Modified	0.00010 mg/L	All	Auckland
dibromochloromethane, Trace level	APHA (online edition) 6200 B (Purge and Trap) Modified	0.00010 mg/L	All	Auckland
dibromomethane, Trace level	APHA (online edition) 6200 B (Purge and Trap) Modified	0.00010 mg/L	All	Auckland
dichlorodifluoromethane, Trace level	APHA (online edition) 6200 B (Purge and Trap) Modified	0.0005 mg/L	All	Auckland
ethylbenzene, Trace level	APHA (online edition) 6200 B (Purge and Trap) Modified	0.00010 mg/L	All	Auckland
ethylchloride, Trace level	APHA (online edition) 6200 B (Purge and Trap) Modified	0.00010 mg/L	All	Auckland
fluorotrichloromethane, Trace level	APHA (online edition) 6200 B (Purge and Trap) Modified	0.00010 mg/L	All	Auckland
Hexachlorobutadiene, Trace level	APHA (online edition) 6200 B (Purge and Trap) Modified	0.00010 mg/L	All	Auckland
iso-propylbenzene, Trace level	APHA (online edition) 6200 B (Purge and Trap) Modified	0.00010 mg/L	All	Auckland
m- & p-xylene, Trace level	APHA (online edition) 6200 B (Purge and Trap) Modified	0.00010 mg/L	All	Auckland
methylene chloride, Trace level	APHA (online edition) 6200 B (Purge and Trap) Modified	0.0005 mg/L	All	Auckland
Naphthalene, Trace level	APHA (online edition) 6200 B (Purge and Trap) Modified	0.00010 mg/L	All	Auckland
n-butylbenzene, Trace level	APHA (online edition) 6200 B (Purge and Trap) Modified	0.00010 mg/L	All	Auckland
n-propylbenzene, Trace level	APHA (online edition) 6200 B (Purge and Trap) Modified	0.00010 mg/L	All	Auckland
o-xylene, Trace level	APHA (online edition) 6200 B (Purge and Trap) Modified	0.00010 mg/L	All	Auckland
p-isopropyl toluene, Trace level	APHA (online edition) 6200 B (Purge and Trap) Modified	0.00010 mg/L	All	Auckland
sec-butylbenzene, Trace level	APHA (online edition) 6200 B (Purge and Trap) Modified	0.00010 mg/L	All	Auckland
styrene, Trace level	APHA (online edition) 6200 B (Purge and Trap) Modified	0.00010 mg/L	All	Auckland
tert-butyl benzene, Trace level	APHA (online edition) 6200 B (Purge and Trap) Modified	0.00010 mg/L	All	Auckland
tetrachloroethylene, Trace level	APHA (online edition) 6200 B (Purge and Trap) Modified	0.00010 mg/L	All	Auckland
THM Ratio, Trace level	APHA (online edition) 6200 B (Purge and Trap) Modified		All	Auckland
toluene, Trace level	APHA (online edition) 6200 B (Purge and Trap) Modified	0.00010 mg/L	All	Auckland
trans-1-2-dichloroethene, Trace level	APHA (online edition) 6200 B (Purge and Trap) Modified	0.00010 mg/L	All	Auckland
trans-1-3-dichloropropene, Trace level	APHA (online edition) 6200 B (Purge and Trap) Modified	0.00010 mg/L	All	Auckland
trichloroethylene, Trace level	APHA (online edition) 6200 B (Purge and Trap) Modified	0.00010 mg/L	All	Auckland
vinyl chloride, Trace level	APHA (online edition) 6200 B (Purge and Trap) Modified	0.00010 mg/L	All	Auckland

Preparations

Preparations

0.45 µm Filtration for Dissolved Metals	APHA (online edition) 3010B (modified)	All	Auckland
Digest for Total Metals in Liquids	In House (4:1 Nitric:Hydrochloric Acid, 95°C 2 hours)	All	Auckland

*The method detection limit (MDL) listed is the limit attainable in a relatively clean matrix. If dilutions are required for analysis the detection limit may be higher.
For more information please contact the Operations Manager.*

Samples, with suitable preservation and stability of analytes, will be held by the laboratory for a period of two weeks after results have been reported, unless otherwise advised by the submitter.

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Zum Nguyen
KTP Signatory



Auckland

52 Aintree Ave,
PO Box 107028,
Auckland Airport
Auckland, 2150

T: (09) 539 7600
F: (09) 539 7601

Queenstown

74 Glenda Drive,
PO Box 2614
Wakatipu
Queenstown,

T: (03) 409 0559

Invercargill

142 Esk Street
PO Box 747
Invercargill, 9840

T: (03) 214 4040
F: (03) 214 4041

ARGO ENVIRONMENTAL LIMITED

Auckland Office (New Zealand)

Level 2, O'Connell Street, Auckland Central, Auckland 0101

PO Box 105774, Auckland 1143, New Zealand

Tel +64 9 367 0631, Email: admin@argoenv.com, Web www.argoenv.com

Nadi Office (Fiji)

Unit 14, Port Denarau Complex, Denarau