



Certificate of Analysis

Client: 4SIGHT Consulting Limited	Lab No: 2642341	SPV1
Contact: C Oakey	Date Received: 24-Jun-2021	
C/- 4SIGHT Consulting Limited	Date Reported: 06-Jul-2021	
PO Box 911310	Quote No: 66824	
Victoria Street West	Order No: AA1146 Eastland Port-Dunstan Rd	
Auckland 1142	Client Reference: AA1146 Eastland Port-Dunstan Rd Surface Water	
	Submitted By: Shanna Hickling	

Sample Type: Aqueous

Sample Name:	MLYSW Site 1	MLWSW Site 2	MLYSW Site 3		
Lab Number:	2642341.1	2642341.2	2642341.3		

Individual Tests

Parameter	Unit	MLYSW Site 1	MLWSW Site 2	MLYSW Site 3		
Volatile Suspended Solids	g/m ³	20	15	10	-	-
Total Suspended Solids	g/m ³	102	31	23	-	-
Dissolved Copper	g/m ³	0.0007	0.0014	0.0016	-	-
Dissolved Lead	g/m ³	< 0.00010	< 0.00005	< 0.00005	-	-
Dissolved Zinc	g/m ³	< 0.0010	< 0.005	< 0.005	-	-
Dissolved Inorganic Nitrogen*	g/m ³	< 0.11	0.96	1.13	-	-
Total Nitrogen	g/m ³	0.39	2.7	2.5	-	-
Total Ammoniacal-N	g/m ³	< 0.10 #1	0.65	0.67	-	-
Nitrate-N + Nitrite-N	g/m ³	0.003	0.32	0.46	-	-
Total Kjeldahl Nitrogen (TKN)	g/m ³	0.38	2.3	2.1	-	-
Dissolved Reactive Phosphorus	g/m ³	0.062	0.71	0.75	-	-
Carbonaceous Biochemical Oxygen Demand (cBOD ₅)	g O ₂ /m ³	12	3	3	-	-
Total Phenols	g/m ³	< 0.02	< 0.02	< 0.02	-	-
Tannin	g/m ³	3.3	1.7	1.4	-	-
Absorbance at 440 nm	AU cm ⁻¹	0.048	0.031	0.030	-	-
Transmittance at 440 nm*	%T, 1 cm cell	89.5	93.2	93.4	-	-

Total Petroleum Hydrocarbons in Water

Parameter	Unit	MLYSW Site 1	MLWSW Site 2	MLYSW Site 3		
C7 - C9	g/m ³	< 0.10	< 0.10	< 0.10	-	-
C10 - C14	g/m ³	< 0.2	< 0.2	< 0.2	-	-
C15 - C36	g/m ³	< 0.4	< 0.4	< 0.4	-	-
Total hydrocarbons (C7 - C36)	g/m ³	< 0.7	< 0.7	< 0.7	-	-

Analyst's Comments

#1 Severe matrix interferences required that a dilution be performed prior to analysis of this sample, resulting in a detection limit higher than that normally achieved for the NH4N analysis.

Summary of Methods

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively simple matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis. A detection limit range indicates the lowest and highest detection limits in the associated suite of analytes. A full listing of compounds and detection limits are available from the laboratory upon request. Unless otherwise indicated, analyses were performed at Hill Laboratories, 28 Duke Street, Frankton, Hamilton 3204.

Sample Type: Aqueous

Test	Method Description	Default Detection Limit	Sample No
Individual Tests			
Filtration, Glass Fibre	Sample filtration through glass fibre filter.	-	1-3
Filtration, Unpreserved	Sample filtration through 0.45µm membrane filter.	-	1-3
Volatile Suspended Solids	Filtration (GF/C, 1.2 µm). Ashing 550°C, 30 min. Gravimetric. APHA 2540 E (modified) 23 rd ed. 2017.	3 g/m ³	1-3



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Sample Type: Aqueous			
Test	Method Description	Default Detection Limit	Sample No
Total Suspended Solids	Filtration using Whatman 934 AH, Advantec GC-50 or equivalent filters (nominal pore size 1.2 - 1.5µm), gravimetric determination. APHA 2540 D (modified) 23 rd ed. 2017.	3 g/m ³	1-3
Filtration for dissolved metals analysis	Sample filtration through 0.45µm membrane filter and preservation with nitric acid. APHA 3030 B 23 rd ed. 2017.	-	1-3
Dissolved Copper	Filtered sample, ICP-MS, trace level. APHA 3125 B 23 rd ed. 2017.	0.0005 g/m ³	1
Dissolved Copper	Filtered sample, ICP-MS, ultratrace level. APHA 3125 B 23 rd ed. 2017.	0.0002 g/m ³	2-3
Dissolved Lead	Filtered sample, ICP-MS, trace level. APHA 3125 B 23 rd ed. 2017.	0.00010 g/m ³	1
Dissolved Lead	Filtered sample, ICP-MS, ultratrace level. APHA 3125 B 23 rd ed. 2017.	0.00005 g/m ³	2-3
Dissolved Zinc	Filtered sample, ICP-MS, trace level. APHA 3125 B 23 rd ed. 2017.	0.0010 g/m ³	1-3
Dissolved Inorganic Nitrogen*	Calculation: NH ₄ -N + NO ₃ -N + NO ₂ -N. In-house calculation.	0.010 g/m ³	1-3
Total Nitrogen	Calculation: TKN + Nitrate-N + Nitrite-N. Please note: The Default Detection Limit of 0.05 g/m ³ is only attainable when the TKN has been determined using a trace method utilising duplicate analyses. In cases where the Detection Limit for TKN is 0.10 g/m ³ , the Default Detection Limit for Total Nitrogen will be 0.11 g/m ³ . In-house calculation.	0.05 g/m ³	1-3
Total Ammoniacal-N	Phenol/hypochlorite colourimetry. Flow injection analyser. (NH ₄ -N = NH ₄ ⁺ -N + NH ₃ -N). APHA 4500-NH ₃ H (modified) 23 rd ed. 2017.	0.010 g/m ³	1-3
Nitrate-N + Nitrite-N	Total oxidised nitrogen. Automated cadmium reduction, flow injection analyser. APHA 4500-NO ₃ I (modified) 23 rd ed. 2017.	0.002 g/m ³	1-3
Total Kjeldahl Nitrogen (TKN)	Total Kjeldahl digestion, phenol/hypochlorite colorimetry. Discrete Analyser. APHA 4500-N _{org} D (modified) 4500 NH ₃ F (modified) 23 rd ed. 2017.	0.10 g/m ³	1-3
Dissolved Reactive Phosphorus	Filtered sample. Molybdenum blue colourimetry. Flow injection analyser. APHA 4500-P G (modified) 23 rd ed. 2017.	0.004 g/m ³	1-3
Carbonaceous Biochemical Oxygen Demand (cBOD ₅)	Incubation 5 days, DO meter, nitrification inhibitor added, seeded. APHA 5210 B (modified) 23 rd ed. 2017.	2 g O ₂ /m ³	1-3
Total Phenols	In-line distillation, segmented flow colorimetry. NB: Does not detect 4-methylphenol. APHA 5530 B & D (modified) 23 rd ed. 2017 & Skalar Method I497-001 (modified).	0.02 g/m ³	1-3
Tannin	Colorimetric with Folin phenol reagent, tannic acid used for calibration. APHA 5550 B (modified) 23 rd ed. 2017.	0.10 g/m ³	1-3
Absorbance at 440 nm	Filtered sample. Spectrophotometry, 1cm cell. APHA 5910 B 23 rd ed. 2017.	0.002 AU cm ⁻¹	1-3
Transmittance at 440 nm*	Calculation from Absorbance at the specified wavelength.	0.5 %T, 1 cm cell	1-3
Total Petroleum Hydrocarbons in Water			
C7 - C9	Solvent extraction, GC-FID analysis. In-house based on US EPA 8015.	0.10 g/m ³	1-3
C10 - C14	Solvent extraction, GC-FID analysis. In-house based on US EPA 8015.	0.2 g/m ³	1-3
C15 - C36	Solvent extraction, GC-FID analysis. In-house based on US EPA 8015.	0.4 g/m ³	1-3
Total hydrocarbons (C7 - C36)	Calculation: Sum of carbon bands from C7 to C36. In-house based on US EPA 8015.	0.7 g/m ³	1-3

These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Testing was completed between 26-Jun-2021 and 06-Jul-2021. For completion dates of individual analyses please contact the laboratory.

Samples are held at the laboratory after reporting for a length of time based on the stability of the samples and analytes being tested (considering any preservation used), and the storage space available. Once the storage period is completed, the samples are discarded unless otherwise agreed with the customer. Extended storage times may incur additional charges.

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Kim Harrison MSc
Client Services Manager - Environmental



Certificate of Analysis

Client:	4SIGHT Consulting Limited	Lab No:	2642340	SPV1
Contact:	C Oakey C/- 4SIGHT Consulting Limited PO Box 911310 Victoria Street West Auckland 1142	Date Received:	24-Jun-2021	
		Date Reported:	30-Jun-2021	
		Quote No:	83367	
		Order No:	AA1146 - Matawhero Logyard [Duns	
		Client Reference:	AA1146 - Matawhero Logyard [Dunstan Rd]	
		Submitted By:	Shanna Hickling	

Sample Type: Aqueous

Sample Name:	MLYGW01	MLYGW02	MLY STD01		
Lab Number:	2642340.1	2642340.2	2642340.3		
Individual Tests					
pH	pH Units	-	-	7.0	-
Electrical Conductivity (EC)	mS/m	-	-	93.2	-
Total Nitrogen	g/m ³	0.27	0.22	0.49	-
Nitrate-N + Nitrite-N	g/m ³	< 0.002	0.006	0.22	-
Total Kjeldahl Nitrogen (TKN)	g/m ³	0.27	0.22	0.27	-
Total Petroleum Hydrocarbons in Water					
C7 - C9	g/m ³	< 0.10	< 0.10	< 0.10	-
C10 - C14	g/m ³	< 0.2	< 0.2	< 0.2	-
C15 - C36	g/m ³	< 0.4	< 0.4	< 0.4	-
Total hydrocarbons (C7 - C36)	g/m ³	< 0.7	< 0.7	< 0.7	-

Summary of Methods

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively simple matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis. A detection limit range indicates the lowest and highest detection limits in the associated suite of analytes. A full listing of compounds and detection limits are available from the laboratory upon request. Unless otherwise indicated, analyses were performed at Hill Laboratories, 28 Duke Street, Frankton, Hamilton 3204.

Sample Type: Aqueous

Test	Method Description	Default Detection Limit	Sample No
Individual Tests			
Filtration, Unpreserved	Sample filtration through 0.45µm membrane filter.	-	1-3
pH	pH meter. APHA 4500-H ⁺ B 23 rd ed. 2017. Note: It is not possible to achieve the APHA Maximum Storage Recommendation for this test (15 min) when samples are analysed upon receipt at the laboratory, and not in the field. Samples and Standards are analysed at an equivalent laboratory temperature (typically 18 to 22 °C). Temperature compensation is used.	0.1 pH Units	3
Electrical Conductivity (EC)	Conductivity meter, 25°C. APHA 2510 B 23 rd ed. 2017.	0.1 mS/m	3
Total Nitrogen	Calculation: TKN + Nitrate-N + Nitrite-N. Please note: The Default Detection Limit of 0.05 g/m ³ is only attainable when the TKN has been determined using a trace method utilising duplicate analyses. In cases where the Detection Limit for TKN is 0.10 g/m ³ , the Default Detection Limit for Total Nitrogen will be 0.11 g/m ³ . In-house calculation.	0.05 g/m ³	1-3
Nitrate-N + Nitrite-N	Total oxidised nitrogen. Automated cadmium reduction, flow injection analyser. APHA 4500-NO ₃ ⁻ I (modified) 23 rd ed. 2017.	0.002 g/m ³	1-3
Total Kjeldahl Nitrogen (TKN)	Total Kjeldahl digestion, phenol/hypochlorite colorimetry. Discrete Analyser. APHA 4500-N _{org} D (modified) 4500 NH ₃ F (modified) 23 rd ed. 2017.	0.10 g/m ³	1-3
Total Petroleum Hydrocarbons in Water			
C7 - C9	Solvent extraction, GC-FID analysis. In-house based on US EPA 8015.	0.10 g/m ³	1-3
C10 - C14	Solvent extraction, GC-FID analysis. In-house based on US EPA 8015.	0.2 g/m ³	1-3



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Sample Type: Aqueous			
Test	Method Description	Default Detection Limit	Sample No
C15 - C36	Solvent extraction, GC-FID analysis. In-house based on US EPA 8015.	0.4 g/m ³	1-3
Total hydrocarbons (C7 - C36)	Calculation: Sum of carbon bands from C7 to C36. In-house based on US EPA 8015.	0.7 g/m ³	1-3

These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Testing was completed between 25-Jun-2021 and 30-Jun-2021. For completion dates of individual analyses please contact the laboratory.

Samples are held at the laboratory after reporting for a length of time based on the stability of the samples and analytes being tested (considering any preservation used), and the storage space available. Once the storage period is completed, the samples are discarded unless otherwise agreed with the customer. Extended storage times may incur additional charges.

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Friday, 23 July 2021

4Sight Consulting (on behalf of Eastland Port).
Auckland Office.

Attn: Christine Oakley

TRACE RESIN ACID ANALYSIS – MLY GW01, GW02, STD01, SW Site1-3 – 23 June 2021.

CLIENT'S ORDER NUMBER: AA1146 EPL Compliance Programme.

WORK PERFORMED BY: Murray Robinson & Michael Robertson

WORK CHECKED BY: Kim McGrouther

APPROVED BY:  **(SIGN)**

DATE OF ISSUE: 23 July 2021

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New Zealand Forest Research Institute Limited – A Crown Research Institute of New Zealand

DATE SAMPLES RECEIVED 24/06/2021

SAMPLE DESCRIPTION Six water samples in 1L glass bottles (450°C muffled bottles supplied by Scion) – sent to Scion by Libby Dalcom 23/06/2021.

SAMPLE IDENTIFICATION MLY GW01 23/06/21 10:45 1L
Light brown water, light brown sediment.

MLY GW02 23/06/21 11:20 1L
Clear water, very little sediment.

MLY STD01 23/06/21 10:15 1L
Light brown water, no sediment.

MLY SW Site 1 23/06/21 10:07 1L
Brown water, layer of sediment.

MLY SW Site 2 23/06/21 09:40 1L
Light brown water, very little sediment.

MLY SW Site 3 23/06/21 09:49 1L
Light brown water, very little sediment.

SAMPLING PROCEDURE

This report relates only to the items tested as received and therefore does not necessarily represent the sample from which it was taken.

DATE OF TESTING 29/06/2021

METHODS

In-house method using unfiltered, pH 9-buffered liquid/liquid extraction with dichloromethane (DCM), followed by gas chromatography - mass spectrometry (GC/MS) analysis.

RESULTS:**RESIN ACIDS (µg/L)**

Sample name	MLY GW01 23/06/21	MLY GW02 23/06/21	MLY STD01 23/06/21	MLY SWSite1 23/06/21	MLY SWSite2 23/06/21	MLY SWSite3 23/06/21
Pimaric acid	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Sandaracopimaric acid	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Isopimaric acid	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Palustric acid	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Levopimaric Acid	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Dehydroabietic acid	n.d.	n.d.	n.d.	2.3	n.d.	n.d.
Abietic acid	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Neoabietic acid	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Pimarenic acid	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Sandaracopimarenic acid	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Isopimarenic acid	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
13-Abietenic acid	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Pimaranic acid	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Isopimaranic acid	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Abietanic acid	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Seco-1-dehydroabietic acid	n.d.	n.d.	n.d.	4.3	n.d.	n.d.
Seco-2-dehydroabietic acid	n.d.	n.d.	n.d.	4.2	n.d.	n.d.
12-Chlorodehydroabietic acid	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
14-Chlorodehydroabietic acid	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
12,14-Dichlorodehydroabietic acid	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
7-Oxodehydroabietic acid	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Total Resin Acids	n.d.	n.d.	n.d.	10.8	n.d.	n.d.

n.d. = not detected, method detection limit is 0.1µg/L

All results presented are from duplicate sample analysis and concentrations are in µg/L. Compounds are quantified if they have a response 2.5 times higher than the average blank.



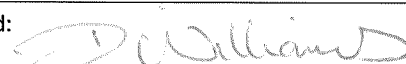
Time	Comments
	^{Medians} Site 1 - Flow Flow. But No Debris, Very Minimal foam.
	Very light turbid colour.
	Site 2 - Drain slightly higher than normal banks.
	Quite clear. No Debris
	Site 3 - " "
	The Drain: Slightly turbid, Medium flow in.
	Bore 1 - Good constant flow. 30L then
	Sampled
	Bore 2 - Good Slow Recovery but all good.
	6L then Sampled.

Surface Water (Fresh) Sampling Form

Job Information				Equipment			
Date: 23/6/21		Time: Arrive: 0930 Depart:		Water quality equipment description: YSI Pro		Calibration Records Filed? <input checked="" type="radio"/> Y <input type="radio"/> N <input type="radio"/> NA	
Project Name: EPL Outsourced Compliance Programme			Project Number: AA1146	Interface Probe Number: 138		Calibration Records Filed? <input checked="" type="radio"/> Y <input type="radio"/> N <input type="radio"/> NA	
Site Location: MLY		Operator: DW BT		Sampling Equipment Type: Grabb			
Weather: Overcast Light Rain		Rainfall event start time/date:		Event Rainfall Depth:		Number of dry days before sampling: 1	
Reason for sampling: Standard Compliance Programme (Circle frequency: Monthly/2 Monthly/ <u>Quarterly</u> /6 Monthly) or Additional Monitoring (describe):							

Sample Details					Water Quality Parameters					Observations			
EPL Site Number	Lab Sample ID	Sample Time	Approx Depth (m)	Approx Stream Flow Rate	Temp (°C)	DO (%)	DO (mg/L)	EC (µS/cm)	pH	Debris Present (Y/N: type)	Foams/Scums (Y/N)	Clarity (Clear/Lightly Turbid/Turbid/Very Turbid)	Photos Reference
Site 1		1007			12.0	17.1	1.83			N	N	Turbid	
Site 2		0940			12.2	48.3	4.95			N	N	Lightly turbid	
Site 3		0949			11.9	51.9	5.58			N	N	Lightly turbid	
STD01		1015			13.9	28.3	2.89			N	N	Light	

Additional Information:

Field Quality Control Checks				
Was pre-cleaning sampling equipment used for these samples?	<input checked="" type="radio"/> Y	<input type="radio"/> N	Consistent with COC form?	<input checked="" type="radio"/> Y <input type="radio"/> N
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="radio"/> Y	<input type="radio"/> N	COC Filled out?	<input checked="" type="radio"/> Y <input type="radio"/> N
Sampling has been undertaken in accordance with the Site Specific Sampling Protocol and SOPs?	<input checked="" type="radio"/> Y	<input type="radio"/> N	Signed:	



Groundwater Well Sampling Form

Job Information	
Date: 23.6.21	Time: Arrive: 1045 Depart:
Project Name: EPL Outsourced Compliance Programme	Project Number: AA1146
Site Location: MLY	Operator: DW BT
Well ID: GW01	Weather: Light Rain

Equipment	
Water quality equipment description:	Calibration records filed? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Interface Probe Number: 138	Calibration records filed? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Purging Equipment Type? (Please circle)	Bailer Type: Plastic Teflon Pump Type: Peristaltic <u>Submersible</u> Micro-purge Other:

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	<u>50mm</u>	50mm	50mm	50mm	<u>100mm</u>	100mm	100mm	Volume of water in a well: $V = \pi \times r^2 \times h$ $V =$ Volume in litres $\pi = 3.142$ $r =$ radius in m
Bore Diameter	<u>50mm</u>	<u>100mm</u>	125mm	150mm	200mm	125mm	200mm	250mm	
Conversion Factor (L/m)	0.93	3.73	5.06	6.68	10.8	10.8	14.2	20.2	
Total Well depth (-) Water Level (=) Water Column $9.5m - 4.10m = 5.39m$									
Water Column (x) Conversion Factor (=) Litres per 1 Well Volume $m \times = L$									
h = Height of water column in m									

Water Quality Parameters										
Beginning Purging Time:			Ending Purging Time:				Fill Time:	Discharge Time:		
Litres	Time	DO (mg/L)	Cond. (µS/cm)	pH	Redox (mV)	Temp (°C)	DTW (mbTPC)	Comments		
30	1045	0.83				15.4		3.4%		
Stabilisation Criteria		±10% ¹	±3% or ±5% if <100*	± 0.1*	± 10mV ¹	± 0.1*	Example Comments: clear / slightly cloudy / turbid / very turbid / colour / no odour / slight odour / strong odour / describe odour (hydrocarbon/solvent/organic)			
*Based on MFE National Protocol for SOE Groundwater Sampling in NZ, 2006, ¹ Based on Vic EPA (Australia) 669. Low Flow: Max flow rate = 0.5 L/min Max drawdown = 0.2 cm -- Well stable when 3 consecutive readings (either 3 min or 0.5L apart)										
Total Well Volume							Did field parameters stabilise?		<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N
Actual amount of water removed prior to sampling							Was the well dry purged?		<input checked="" type="checkbox"/> Y	<input checked="" type="checkbox"/> N

Field Quality Control Checks					
Was pre-cleaning sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N	Consistent with COC form?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N	COC Filled out?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N
Sampling has been undertaken in accordance with the Site Specific Sampling Protocol and SOPs?	<input checked="" type="checkbox"/> Y	<input checked="" type="checkbox"/> N	Signed: DW		



Groundwater Well Sampling Form

Job Information	
Date: 23/6/21	Time: Arrive: 12:00 Depart:
Project Name: EPL Outsourced Compliance Programme	Project Number: AA1146
Site Location: MLY	Operator: DW BT
Well ID: GW02	Weather: Light Rain

Equipment	
Water quality equipment description: YSI 600 Pro	Calibration records filed? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Interface Probe Number: 138	Calibration records filed? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Purging Equipment Type? (Please circle)	Bailer Type: Plastic Teflon Pump Type: Peristaltic <u>Submersible</u> Micro-purge Other:

Well Gauging and Purge Volume Calculations									
Casing Diameter	25mm	50mm	50mm	50mm	50mm	<u>100mm</u>	100mm	100mm	Volume of water in a well: $V = \pi \times r^2 \times h$ $V =$ Volume in litres $\pi = 3.142$ $r =$ radius in m
Bore Diameter	<u>50mm</u>	100mm	125mm	150mm	200mm	125mm	200mm	250mm	
Conversion Factor (L/m)	0.93	3.73	5.06	6.68	10.8	10.8	14.2	20.2	
Total Well depth (-) Water Level (=) Water Column									
4.30 - 1.17 = 3.13									
Water Column (x) Conversion Factor (=) Litres per 1 Well Volume									
m x = L									

Water Quality Parameters										
Beginning Purging Time:			Ending Purging Time:				Fill Time:	Discharge Time:		
Litres	Time	DO (mg/L)	Cond. (µS/cm)	pH	Redox (mV)	Temp (°C)	DTW (mbTPC)	Comments		
6	1120	4.97				16.1				
Stabilisation Criteria		±10% ¹	±3% or ±5% if <100*	± 0.1*	± 10mV ¹	± 0.1*	Example Comments: clear / slightly cloudy / turbid / very turbid / colour / no odour / slight odour / strong odour / describe odour (hydrocarbon/solvent/organic)			
*Based on MfE National Protocol for SOE Groundwater Sampling in NZ, 2006, ¹ Based on Vic EPA (Australia) 669. Low Flow: Max flow rate = 0.5 L/min Max drawdown = 0.2 cm -- Well stable when 3 consecutive readings (either 3 min or 0.5L apart)										
Total Well Volume							Did field parameters stabilise?		<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N
Actual amount of water removed prior to sampling 6 Litres							Was the well dry purged?		<input checked="" type="checkbox"/> Y	<input checked="" type="checkbox"/> N

Field Quality Control Checks			
Was pre-cleaning sampling equipment used for these samples?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N	Consistent with COC form? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Was pre-cleaning sampling equipment properly protected from contamination?	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N	COC Filled out? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Sampling has been undertaken in accordance with the Site Specific Sampling Protocol and SOPs?	<input checked="" type="checkbox"/> Y	<input checked="" type="checkbox"/> N	Signed: