Quality Assurance

Overview:

This section of the manual contains information on the quality assurance protocols surrounding discrete water quality data. For a full specification document please refer to the portfolio holder.

This portfolio outlines the procedures for both field and office work in regards to the water quality programmes, and outlines the key performance indicators (KPI's). This portfolio will be used to amalgamate the different water quality programmes into a single document, which will enable them to be monitored under the same regulations and standards.

Section 35(2) (a) of the Resource Management Act requires local authorities to monitor the state of environment to the extent that is appropriate to enable the local authority to effectively carry out its functions under the Resource Management Act. This means following the guidelines listed under Section 3 of the Resource Management Act referring to each class of water quality.

Currently the Horizons Regional Council water quality programmes demand a high level of accuracy and quality. This is achieved by setting realistic targets for monitoring periods, realistic targets for water pollutants and nutrients and the ability to represent entire catchments by the selection of monitoring sites. This also feeds Horizons Regional Council's long term goals of providing quality data for a range of parameters on all water bodies throughout the region.

Customer Expectations:

It is expected that all samples are collected on the assigned dates, with the same precision every time. Samples are to be collected in the same position (GPS coordinates have been recorded) each time. Water grab samples are to be sent off to the specified laboratory as soon as practical, so that the analysis results will be accurate and the risk of contamination will be low. All samples must be received by the laboratory within 24 hours of being collected.

Regular meetings are required with the lab by the Catchment Data teams' water quality representative. These meetings are arranged quarterly, and can either be in person or as a conference call. These meetings are used to track any issues that arise between the council and the laboratory, and discuss resolutions or protocols to avoid the issues in the future.

The Catchment Data team also needs to make sure that all laboratory information is up to date including codes, methods, prices, detection limits and the accreditation status of all water quality parameters.

In order to assure the quality and accuracy of sampling results the Catchment Data team must undertake sample retraining every two years. If the team receives a new staff member they must be trained before any sampling can be undertaken.

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Current Operational Standards:

It is expected that the catchment data teams will collect point samples at required monitoring spots adhering to the quality assurance measures outlined in AS/NZS ISO 5667 specifically the sections listed below

Part 2: Guidance on sampling techniques
Part 3: Guidance on preservation and handling of water samples
Part 6: Guidance on sampling of rivers and streams
Part 9: Guidance on sampling from marine waters
Part 10: Guidance on sampling of waste waters
Part 11: Guidance on sampling of groundwater's
Part 12: Guidance on sampling of bottom sediments
Part 15: Guidance on handling of sludge and sediment samples
Part 18: Guidance on sampling of groundwater's at contaminated sites

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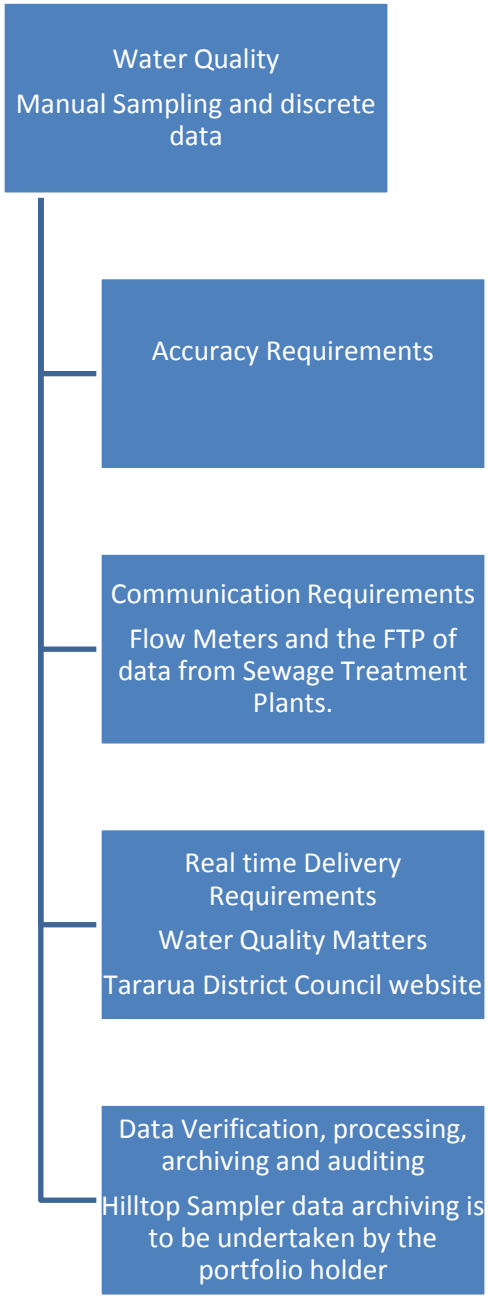

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Archive Data and Delivery Requirements:

Our customers require that all data is archived as soon as practical. Most laboratory results are archived within two weeks, while field notes are archived within five days. Currently the department is implementing an auditing process which will most likely see all of the water quality samples checked once per month by a second contractor.

In regards to the data entry and auditing processes both the Catchment Data team and its customers expect 100% accuracy. If any errors are found the entire months data entries must be checked again. The same level of standard applies to laboratory analytical results. Once the results have been uploaded to hilltop sampler they are checked against the final results report that is sent out. If there are any issues caused by the laboratory they need to rectify them as soon as possible, the same applies to the Catchment Data department's data entry contractors.

All Catchment Data staff as well as contractors are required to generate non-conformance reports using the Hilltop Sampler and Lab Contract database if any issues arise in relation to the water quality programmes. This includes (but is not limited to) incorrect field data entered, laboratory results missing, lost samples and laboratory results reported incorrectly.

Minimum laboratory and handheld meter Requirements:

	Lab	Handheld Meter Limit and Range		
Parameter	**Lab Detection Limit**	**Range**	**Accuracy**	**Resolution**
Algae (cell & colony count)	100MPN/100mL			
Alkalinity bicarbonate	1 mg/L HCO3			
Alkalinity carbonate	1 mg/L CO3			
Alkalinity total by Autotitrator	1 mg/L CaCO3			
Ammonium		0 to 200 mg/L-N,	±10% of reading or 2 mg/L-N	0.01 mg/L
Ammonia Nitrogen high level (NH3 + NH4)	0.4mg/L N			
Ammonia Nitrogen low level (NH3 + NH4)	0.005 mg/L N			
Arsenic Trace by ICP-MS	0.0001mg/L			
Biochemical oxygen demand GFC filtered (CBOD5)	2mg/L O			
Biochemical Oxygen Demand m/f (CBOD5)	2mg/L O			
Boron Trace by ICPMS	0.005mg/L			
Bromide by Ion Chromatography	0.01mg/L			
Cadmium: Trace by ICPMS	0.00005			
Chlorophyll	0.0006mg/L			
Chlorophyll "b"	mg/L			
Conductivity	0.5 mS/m	0 to 200 mS/cm	±0.5% of reading or 0.001 mS/cm	0.001 mS/cm to 0.1 mS/cm
Colilert - Total Coliforms 18 hrs MPN	1 MPN/100mL			
Disolved Organic Phosphorus	0.01 mg/L			
Dissolved organic carbon	0.1mg/L			
Dissolved Oxygen by Winkler titration	mg/L			

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Dissolved Oxygen %	%	0 to 500%	0 to 200% (± 2%)	1% or 0.1% air saturation
Dissolved Oxygen mg/L	mg/L O	0 to 50 mg/L	0 to 20 mg/L (± 2%)	0.1 or 0.01 mg/L
Dry weight % Sludge	%w/w			
Enterococci by CFU	10cfu/100mL			
Enterococci by MPN	2MPN/100mL			
Escherichia coli-18 hours	1 MPN/100mL			
Iron Trace by ICPMS	0.002mg/L			
Iron:Soluble Trace by ICPMS	0.002mg/L			
Kjeldahl Nitrogen Soluble	0.1mg/L N			
Magnesium: Acid Soluble by ICPMS	0.001mg/L			
Manganese Trace by ICPMS	0.0005mg/L			
MPN E.coli (MUG Method)	2MPN/100mL			
Nickel: Soluble Trace by ICPMS	0.0001mg/L			
Nitrate & Nitrite by Calculation	mg/L NO3NO2			
Nitrate & Nitrite Nitrogen by Calculation	0.004mg/L N			
Nitrate & Nitrite Nitrogen by Cd Reduction/SFA	0.005mg/L N			
Nitrate Nitrogen by Ion Chromatography	0.002mg/L N			
Nitrate Nitrogen by Ion Chromatography	0.002 mg/L N	0 to 200 mg/L-N,	±10% of reading or 2 mg/L-N	0.01 mg/L
ORP	mV	--1999 to +1999 mV	±20 mV in redox standards	0.1 mV
pH	0.1 pH Unit	0 to 14 units	±0.2 units	0.01 units
Potassium: Acid Soluble by ICPMS	0.1			
Salinity	Ppt	0 to 70 ppt	±1.0% of reading or 0.1 ppt	0.01 ppt
Soluble Acid Hydrolysis Phosphorous	0.005mg/L P			
Soluble Reactive Phosphorus	0.005 mg/L			
Sulfide (Methylene blue method)	0.1 mg/L			
Suspended solids: High Level by 125 mm GF/C	1mg/L			
Suspended solids: Low Level by 47mm GF/C	0.2 mg/L			
Temperature	oC	--5 to 70°C	±0.2°	0.1°C
Total Dissolved Phosphorus	0.01mg/L			
Total Kjeldahl Nitrogen (High Level)	0.1 mg/L N			
Total nitrogen by Calculation	0.1 mg/L N			
Total nitrogen by Persulphate Digestion/SFA	0.02mg/L			
Total organic carbon	0.1mg/L O			
Total Phosphorus by Persulphate Digestion	0.01 mg/L			
Turbidity by Hach Meter	0.1 NTU			
Turbidity by Hach Meter (Infrared light souce) (FNU)	0.5 FNU			
Turbidity by Hach Meter (Infrared light souce) (NTU)	0.5 NTU			
Volatile matter	%w/w			