

A large, stylized graphic of a water drop or swirl in light blue and yellow-green, positioned behind the title text.

# MELROSE Water Service Area Annual Report 2009



Prepared by:

**REGIONAL DISTRICT OF NANAIMO**  
*Water Services Department*

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## Table of Contents

1.	Introduction .....	1
2.	Melrose Water Service Area .....	1
2.1	Groundwater Wells .....	1
2.2	Reservoirs.....	1
2.3	Distribution System.....	1
3.	Water Sampling and Testing Program .....	2
4.	Water Quality - Source Water and Distribution System .....	2
5.	Water Quality Inquiries and Complaints .....	2
6.	Groundwater Production and Consumption .....	3
7.	Maintenance Program.....	3
8.	Water System Projects.....	3
8.1	2009 Completed Studies & Projects.....	3
8.2	2010 Proposed Projects & Upgrades.....	4
9.	Emergency Response Plan .....	4
10.	Cross Connection Control .....	4
11.	Closing.....	4

Appendix A - Map of Melrose Water Service Area

Appendix B - Water Quality Testing Results

Appendix C - Emergency Response Plan

**1. Introduction**

The following annual report describes the Melrose Water Service Area and summarizes the water quality and production data from 2009. This report also includes a summary of inquiries and complaints, completed and proposed maintenance activities, the Emergency Response Plan, and the Cross Connection Control Program.

This report is to be submitted to the Vancouver Island Health Authority by the Spring of 2010.

**2. Melrose Water Service Area**

The Melrose Water Service Area was established in April 2005 when the RDN acquired the existing Melrose Terrace Strata Plan VIS3747 water system. The water service area is comprised of 28 residential properties on Melrose Road located near the Alberni Highway southwest of Coombs. The water source for the Melrose Water Service Area comes from one groundwater well located nearby. The water is chlorinated and stored in a single reservoir. The water is then filtered through sand and charcoal filters, and re-chlorinated before entering the distribution system. A map of the Melrose Water Service Area is provided in Appendix A for reference.

**2.1 Groundwater Wells**

One groundwater production well is present at the reservoir site on Melrose Road, west of Coombs, B.C.

Well / Name	Well Depth	Wellhead Protection In Place	Treated/Untreated with Chlorine
#1	26.2 m	Yes	Treated

**2.2 Reservoirs**

One service reservoir (steel structure) is present at 3853 Melrose Road, and has a capacity of 136 m<sup>3</sup> (30,000 imperial gallons).

**2.3 Distribution System**

The water distribution system in Melrose is comprised of 0.3 km of 150mm PVC watermains. There are no fire hydrants located within the system.

### 3. Water Sampling and Testing Program

Water sampling and testing is carried out weekly in the distribution system. The following table includes a summary of all testing:

Timing	Location	Tests
Weekly	RDN (in-house) Laboratory	Total coliforms, E.Coli Temperature, pH, Conductivity Chlorine residual, Salinity Total Dissolved Solids
Weekly (Health Dept. Requirement)	BC Centre for Disease Control	Total, Fecal coliforms
Monthly	RDN (in-house) Laboratory	Iron, Manganese
Annual Source Water Testing	North Island Labs	Complete potability testing of each well
Annual System Water Testing	North Island Labs	Complete potability testing of distribution system

### 4. Water Quality - Source Water and Distribution System

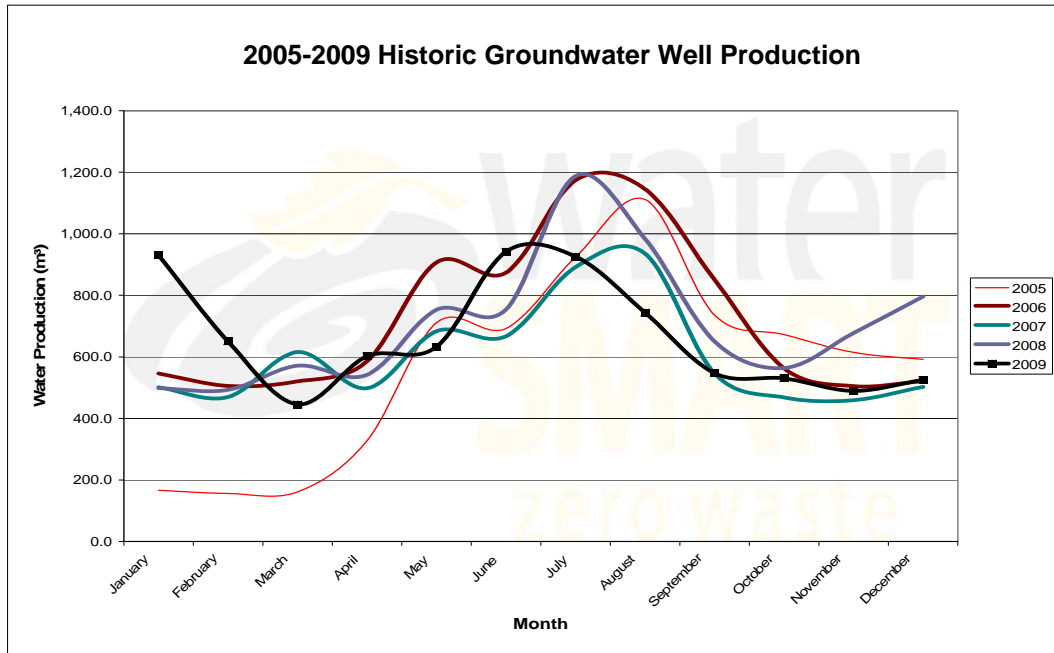
Up-to-date water quality reports and lab data are posted monthly on the RDN website at [www.rdn.bc.ca](http://www.rdn.bc.ca) in the WaterSmart section, under “Communities”. Tables of water quality testing results for both the source water and distribution system are provided at the end of this report under Appendix B.

### 5. Water Quality Inquiries and Complaints

Very few complaints and inquiries were received from the Melrose water service area, and were typically related to power outages.

## 6. Groundwater Production and Consumption

The 2009 monthly groundwater production for the Melrose water service area is shown in the chart below. There are 28 water service connections in the Melrose water service area. Groundwater production in 2009 was typically lower than previous years.



### Consumption

In the Fall/Winter of 2009, the average usage per home in the Melrose water service area was approximately 0.5 cubic metres per day (110 imperial gallons). In the summer, the average water usage was 0.7 cubic metres per day (167 imperial gallons). Based on these figures, the annual consumption per capita is estimated to be 230 L/day (based on 2.4 people per household). This consumption is 33.3% less than the RDN system average of 345 L/day/capita for 2009.

## 7. Maintenance Program

Regular maintenance and inspections are completed around the wellhead area to reduce or eliminate the risk of contamination and system failure, and to ensure the consistent application of chlorine for treatment purposes. Watermains are flushed once annually; in the Spring. There are no fire hydrants on the system.

Twenty-four hour on-call coverage is in place to respond to water system emergencies and alarms.

## 8. Water System Projects

### 8.1 2009 Completed Studies & Projects

- Repaired the Melrose pump house roof;
- Installed a low-pressure alarm at the Melrose pump house;
- Completed keyless door entry installations at the Field Office and pumphouse;
- Carried out a comprehensive water conservation campaign (Team WaterSmart);

- Updated and improved the RDN website at [www.rdn.bc.ca](http://www.rdn.bc.ca);
- Updated the Emergency Response Plan;
- Considered Scada options for implementation;
- Utilized the Auto E-message service to notify member residents of water service disruptions and upcoming maintenance activities;
- Developed a low-flush toilet incentive;
- Maintained a high level of water quality;
- Maintained excellent customer complaint and service request response times;
- Continued quality control through regular testing and monitoring of our water systems; and
- Completed additional educational programs.

## 8.2 2010 Proposed Projects & Upgrades

- Complete the Cross-Connection Control bylaws, and establish a procedure for reviewing commercial and industrial properties for water system risks;
- Install radio-read water meters in the Melrose Water Service Area;
- Clean the service reservoir in the Melrose Water Service Area.

## 9. **Emergency Response Plan**

The Emergency Response Plan (ERP) was reviewed and updated in 2009. A copy of the ERP is attached in Appendix C.

## 10. **Cross Connection Control**

A formalized Cross Connection Control Program was initiated in 2007. Cross connection controls in-place include dual check valves at each service connection, fire hydrant use permits, and water supply bylaws noting discontinued service if a threat to the water supply is perceived by staff.

In 2008, a review and comparison of successful cross-connection control programs in other small water systems nearby was undertaken. A database of commercial customers was set-up in order to keep track of the maintenance history of testable backflow prevention assemblies at each site. Three RDN Operations staff achieved Backflow Prevention Tester's certification.

The program in 2010 will include:

- A survey of existing and potential cross-connections,
- An audit of RDN-owned facilities in each water service area,
- The preparation of a draft bylaw to allow enforcement of the Cross Connection Control Program.

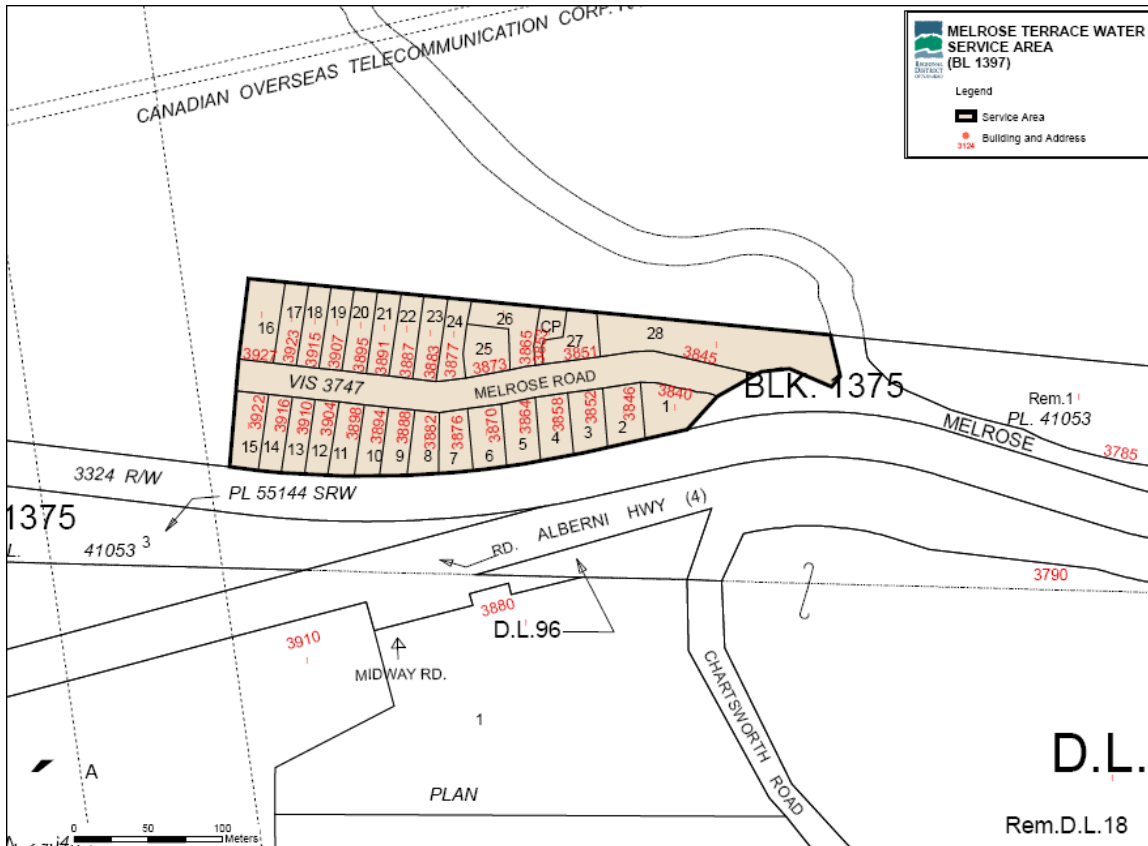
## 11. **Closing**

An annual report for the year 2010 will be prepared and submitted to the Vancouver Island Health Authority in the Spring of 2011. Annual reports are also available on our website at [www.rdn.bc.ca](http://www.rdn.bc.ca) in the WaterSmart section, under "Communities".

**APPENIDX A**

**MAP OF MELROSE  
WATER SERVICE AREA**

# MELROSE WATER SERVICE AREA





## **APPENDIX B**

### **WATER QUALITY TESTING RESULTS**



# Regional District of Nanaimo - Utilities Department

## Melrose Terrace Water Analysis - Monthly Report



Date	Sample Location (Address)	Fecal Coli * Health Dep	Total Coli * Health Dep	Total Coli RDN	E Coli RDN	Temp ° C	pH	Cl <sub>2</sub> ppm	TDS ppm	Sal %	Cond uS/cm	Fe ppm	Mn ppm
06-Jan	3729 Melrose Dr	0	0	0	0	8	6.6	0.16	197	0.2	423	0.05	0.024
13-Jan	Pumphouse			0	0	8	6.4	0.05	193	0.2	413		
20-Jan	3729 Melrose Dr			0	0	5	6.4	0.16	194	0.2	416		
27-Jan	3847 Melrose Dr			0	0	6	6.6	0.03	192	0.2	410		
	<b>Average</b>	0	0	0	0	6.8	6.5	0.10	194.0	0.2	415.5	0.05	0.024
	<b>Maximum</b>	0	0	0	0	8	6.6	0.16	197	0.2	423	0.05	0.024
	<b>Minimum</b>	0	0	0	0	5	6.4	0.03	192	0.2	410	0.05	0.024

Red font indicates non-compliance with Canadian Drinking Water Guidelines / BC Approved Water Quality Guidelines

Coliforms are measured in colony forming units (CFU) per 100 millilitres of water

\* Yellow Column Coliform tests are done by Health Department

Green tests are completed by RDN

**Comments:**

Iron and manganese are found naturally in drinking water. Levels found in these samples are not a health concern.



# Regional District of Nanaimo - Utilities Department

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Date	Sample Location (Address)	Fecal Coli * Health Dep	Total Coli * Health Dep	Total Coli RDN	E Coli RDN	Temp ° C	pH	Cl <sub>2</sub> ppm	TDS ppm	Sal %	Cond uS/cm	Fe ppm	Mn ppm
03-Feb	3729 Melrose Ter	0	0	0	0	5	6.8	1.6	189	0.2	403	1.6	0.054
10-Feb	Pumphouse			0	0	10	6.5	0.02	184	0.2	389		
17-Feb	3847 Melrose Ter			0	0	8	6.6	0.02	188	0.2	397		
24-Feb	Pumphouse			0	0	10	6.7	0.02	188	0.2	400		
	<b>Average</b>	0	0	0	0	8.3	6.7	0.42	187.3	0.2	397.3	1.60	0.054
	<b>Maximum</b>	0	0	0	0	10	6.8	1.6	189	0.2	403	1.6	0.054
	<b>Minimum</b>	0	0	0	0	5	6.5	0.02	184	0.2	389	1.6	0.054

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03-Mar	3729 Melrose Ter	0	0	0	0	11	6.6	0.02	188	0.2	399	0.09	0.022
10-Mar	Pumphouse			0	0	10	6.5	0.02	192	0.2	408		
18-Mar	3847 Melrose Ter			0	0	9	6.7	0.01	193	0.2	408		
25-Mar	3729 Melrose Ter			0	0	10	6.5	0.01	194	0.2	408		
	<b>Average</b>	0	0	0	0	10.0	6.6	0.02	191.8	0.2	405.8	0.09	0.022
	<b>Maximum</b>	0	0	0	0	11	6.7	0.02	194	0.2	408	0.09	0.022
	<b>Minimum</b>	0	0	0	0	9	6.5	0.01	188	0.2	399	0.09	0.022

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Apr-09													
15-Apr	3729 Melrose Ter	0	0										
22-Apr	3847 Melrose Ter			0	0	12	6.6	0.01	194	0.2	407		
29-Apr	Pumphouse					13	6.8	0.01	206	0.2	438		
	<b>Average</b>	0	0	0	0	12.5	6.7	0.01	200.0	0.2	422.5	#DIV/0!	#DIV/0!
	<b>Maximum</b>	0	0	0	0	13	6.8	0.01	206	0.2	438	0	0
	<b>Minimum</b>	0	0	0	0	12	6.6	0.01	194	0.2	407	0	0

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05-May	3729 Melrose Ter	0	0	0	0	13	6.5	0.01	217	0.2	452	0.28	0.144
12-May	Pumphouse			0	0	13	6.4	0.02	217	0.2	455		
27-May	3927 Melrose Ter			0	0	14	6.4	0.03	195	0.2	409		
	<b>Average</b>	0	0	0	0	13.3	6.4	0.02	209.7	0.2	438.7	0.28	0.144
	<b>Maximum</b>	0	0	0	0	14	6.5	0.03	217	0.2	455	0.28	0.144
	<b>Minimum</b>	0	0	0	0	13	6.4	0.01	195	0.2	409	0.28	0.144

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02-Jun	3729 Melrose Ter	0	0	0	0	16	6.3	0.01	187	0.2	391	0.03	0.048
09-Jun	Pumphouse			0	0	16	6.3	0.04	175	0.2	387		
	<b>Average</b>	0	0	0	0	16.0	6.3	0.03	181.0	0.2	389.0	0.03	0.048
	<b>Maximum</b>	0	0	0	0	16	6.3	0.04	187	0.2	391	0.03	0.048
	<b>Minimum</b>	0	0	0	0	16	6.3	0.01	175	0.2	387	0.03	0.048

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07-Jul	3729 Melrose Ter	0	0	0	0	18	6.4	0.03	189	0.2	395	0.06	0.067
15-Jul	Pumphouse			0	0	17	6.4	0.03	183	0.2	383		
	<b>Average</b>	0	0	0	0	17.5	6.4	0.03	186.0	0.2	389.0	0.06	0.067
	<b>Maximum</b>	0	0	0	0	18	6.4	0.03	189	0.2	395	0.06	0.067
	<b>Minimum</b>	0	0	0	0	17	6.4	0.03	183	0.2	383	0.06	0.067

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Date Aug-09	Sample Location (Address)	Fecal Coli * Health Dep	Total Coli * Health Dep	Total Coli RDN	E Coli RDN	Temp ° C	pH	Cl <sub>2</sub> ppm	TDS ppm	Sal %	Cond uS/cm	Fe ppm	Mn ppm
05-Aug	3729 Melrose Ter	0	0	0	0	22	6.7	0.02	183	0.2	390	0.11	0.008
12-Aug	3853 Melrose			0	0	18	6.6	0.02	176	0.2	365		
19-Aug	3729 Melrose Ter			0	0	20	6.6	0.05	178	0.2	376		
25-Aug	Pumphouse			0	0	19	6.6	0.05	182	0.2	382		
	<b>Average</b>	0	0	0	0	19.8	6.6	0.04	179.8	0.2	378.3	0.11	0.008
	<b>Maximum</b>	0	0	0	0	22	6.7	0.05	183	0.2	390	0.11	0.008
	<b>Minimum</b>	0	0	0	0	18	6.6	0.02	176	0.2	365	0.11	0.008

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09-Sep	3729 Melrose Ter	0	0				6.3		180	0.2	377	0.12	0.019
15-Sep	Pumphouse			0	0	18	6.7	0.01	183	0.2	383		
22-Sep	Pumphouse			0	0		6.4	0.03	176	0.2	371		
28-Sep	3729 Melrose Ter			0	0	18	6.8	0.01	179	0.2	376		
	<b>Average</b>	0	0	0	0	18.0	6.6	0.02	179.5	0.2	376.8	0.12	0.019
	<b>Maximum</b>	0	0	0	0	18	6.8	0.03	183	0.2	383	0.12	0.019
	<b>Minimum</b>	0	0	0	0	18	6.3	0.01	176	0.2	371	0.12	0.019

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05-Oct	3729 Melrose Ter	0	0	0	0	16	6.4	0.03	182	0.2	380		
14-Oct	Pumphouse			0	0	13	6.4	0.01	178	0.2	373		0.024
20-Oct	3847 Melrose Ter			0	0		6.6	0.02	168	0.2	351		
28-Oct	3927 Melrose Ter			0	0	13	6.5	0.01	178	0.2	375		
	<b>Average</b>	0	0	0	0	14.0	6.5	0.02	176.5	0.2	369.8	#DIV/0!	0.024
	<b>Maximum</b>	0	0	0	0	16	6.6	0.03	182	0.2	380	0	0.024
	<b>Minimum</b>	0	0	0	0	13	6.4	0.01	168	0.2	351	0	0.024

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04-Nov	3729 Melrose Ter	0	0	0	0	13	6.4	0.01	179	0.2	377	0.05	0.025
10-Nov	Pumphouse			0	0	11	6.2	0.01	176	0.2	372		
17-Nov	3847 Melrose Ter			0	0	9	6.5	0.01	174	0.2	370		
24-Nov	Pumphouse			0	0	10	6.6	0.01	178	0.2	376		
	<b>Average</b>	0	0	0	0	10.8	6.4	0.01	176.8	0.2	373.8	0.05	0.025
	<b>Maximum</b>	0	0	0	0	13	6.6	0.01	179	0.2	377	0.05	0.025
	<b>Minimum</b>	0	0	0	0	9	6.2	0.01	174	0.2	370	0.05	0.025

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# Regional District of Nanaimo - Utilities Department

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Date Dec-09	Sample Location (Address)	Fecal Coli * Health Dep	Total Coli * Health Dep	Total Coli RDN	E Coli RDN	Temp ° C	pH	Cl <sub>2</sub> ppm	TDS ppm	Sal %	Cond uS/cm	Fe ppm	Mn ppm
02-Dec	3729 Melrose Dr	0	0	0	0	10	6.3	0.01	172	0.2	365	0.18	0.035
08-Dec	Pumphouse			0	0	7	6.5	0.01	168	0.2	364		
21-Dec	3729 Melrose Dr			0	0	6	6.8	0.02	173	0.2	371		
29-Dec	Pumphouse			0	0	8	6.8	0.01	174	0.2	372		
	<b>Average</b>	0	0	0	0	7.8	6.6	0.01	171.8	0.2	368.0	0.18	0.035
	<b>Maximum</b>	0	0	0	0	10	6.8	0.02	174	0.2	372	0.18	0.035
	<b>Minimum</b>	0	0	0	0	6	6.3	0.01	168	0.2	364	0.18	0.035

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## Melrose Well Water Analysis Results

**Melrose Well # 1: 3853 Melrose Road**

Canadian Drinking Water Guidelines Package

MAC=Maximum Acceptable Concentration IMAC= Interim Maximum Acceptable Concentration AO= Asthetic Objective

CDWG=Canadian Drinking Water Guidelines

BCAQWG=British Columbia Approved Water Quality Guidelines

**Red font indicates non-compliance with Canadian Drinking Water Guidelines**

\* raw well water



Parameter	Water Quality Guidelines				2002	2003	2004	19-Oct 2005	24-Oct 2006	22-Oct 2007	14-Oct 2008	14-Oct 2009	2010
	Units	CDWG	BCAQWG										
Color	CU	15	</=15	AO				200	<5	200	500	>150	
Conductivity	µS		700	MAC				313	335	333	340	342	
Total Dissolved Solids	mg/L	500	</=500	AO				272	220	246	308	272	
Hardness (CaCO3)	mg/L	80-100	</=500	AO				120	120	130	140	140	
pH	pH units	6.5-8.5	6.5-8.5	AO				7.3	7.1	6.85	7.1	7	
Turbidity	NTU's	5	1	MAC				25.3	38	1.7	24.6	55	
Alkalinity	mg/L							81	76	82	69	66	
Chloride	mg/L	250	</=250	AO				40.6	51.3	48.1	63	59	
Fluoride	mg/L	1.5	1.5	MAC				<1.0	<1.0	<1.0	<1.0	<1.0	
Sulfate	mg/L	500	</=500	AO				<2	<2.0	<2.0	2.6	<2.0	
Nitrate (N)	mg/L	10	10	MAC				<0.1	<0.1	<0.1	<0.1	<0.1	
Nitrite (N)	mg/L	1						<0.1	<0.1	<0.1	<0.1	<0.1	
T-Aluminum	mg/L		0.2	MAC				0.006	<0.01	0.006	<0.005	<0.005	
T-Antimony	mg/L		0.006	MAC				<0.0002	<0.0004	<0.0002	<0.0002	<0.0002	
T-Arsenic	mg/L	0.025	0.025	IMAC				0.0004	<0.0004	0.0004	0.0003	0.0004	
T-Barium	mg/L	1.0	1	MAC				0.022	0.022	0.026	0.02	0.023	
T-Boron	mg/L	5.0	5	MAC				0.007	0.007	0.006	0.005	0.007	
T-Cadmium	mg/L	0.005						<0.00001	<0.00002	<0.00001	<0.00001	<0.00001	
T-Calcium	mg/L							32.3	30.5	34.1	33	33.9	
T-Chromium	mg/L	0.05	0.05	MAC				0.0008	<0.001	0.0011	0.0005	0.0005	
T-Copper	mg/L	1.0	</=1	MAC				0.011	<0.002	<0.001	0.002	0.013	
T-Iron	mg/L	0.3	</=0.3	AO				8.8	8.6	9.4	8.63	9.36	
T-Lead	mg/L	0.01	0.01	MAC				0.0056	0.0006	<0.0001	0.0004	0.0023	
T-Lithium												<0.001	
T-Magnesium	mg/L		</=700	AO				10.4	11	11.4	12.9	13.1	
T-Manganese	mg/L	0.05	</=0.05	AO				0.224	0.232	0.26	0.211	0.219	
T-Mercury	mg/L	0.001	0.001	MAC				<0.0001	<0.0001	<0.0001	<0.01	<0.01	
T-Nickle												<0.001	
T-Phosphorous												0.034	
T-Potassium	mg/L							<0.4	<0.08	<0.4	0.2	0.4	
T-Selenium	mg/L	0.01	0.01	MAC				<0.0002	<0.0004	0.0003	<0.0006	<0.0006	
T-Silver												<0.00001	
T-Sodium	mg/L	200	</=200	AO				7.6	8.3	9.2	8.69	11.5	
T-Uranium	mg/L	0.1	0.1	MAC				<0.0005	<0.001	<0.0005	<0.0004	<0.0004	
T-Zinc	mg/L	5	<5	AO				0.017	0.022	0.007	0.043	0.038	
Total Coliform	cfu/100ml	<1	<1	cfu/100ml				<1	<1	<1	<1	<1	
Fecal Coliform	cfu/100ml	<1	<1	cfu/100ml				<1	<1	<1	<1	<1	
E.coli	cfu/100ml	<1	<1	cfu/100ml				<1	<1	<1	<1	<1	



## **APPENDIX C**

### **EMERGENCY RESPONSE PLAN**



\* Emergency Response Plan not included in Public Copy.