

REGIONAL DISTRICT OF NANAIMO

Water Service Area Annual Report 2018



Melrose Terrace Water Service Area

June 2019

REGIONAL DISTRICT OF NANAIMO

Water & Utility Services Department

6300 Hammond Bay Rd, Nanaimo, BC Canada V9T 6N2 | Ph 250-390-6560 | Fax 250-390-1542



Table of Contents

1.0	Introduction	1
2.0	Melrose Terrace Water Service Area	1
2.1	Groundwater Wells.....	1
2.2	Reservoirs	1
2.3	Distribution System.....	1
3.0	Water Sampling and Testing Program	1
4.0	Water Quality - Source Water and Distribution System	2
5.0	Water Quality Inquiries and Complaints.....	3
6.0	Groundwater Production and Consumption	3
7.0	Maintenance Program	4
8.0	Operator Certification.....	4
9.0	Water Service Area Projects	4
9.1	2018 Completed Studies & Projects	4
9.2	2019 Proposed Projects & Upgrades	4
10.0	Emergency Response Plan	5
11.0	Cross Connection Control	5
12.0	Cyber Security	5
13.0	Closing.....	6

Appendix A - Map of Melrose Terrace Water Service Area

Appendix B - Water Quality Testing Results

Appendix C - Emergency Response Plan

1.0 Introduction

The following annual report describes the Melrose Water Service Area and summarizes the water quality and production data from 2018. This report also includes a summary of inquiries and complaints, completed and proposed maintenance activities, Operator Certification, the Emergency Response Plan, and the Cross Connection Control Program.

This report is to be submitted to Island Health by the spring of 2019.

2.0 Melrose Terrace 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, west 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 before entering the distribution system. A portable generator is available in the event of a power outage. 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 m³ (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.

Note: 'PVC' is poly-vinylchloride (plastic)



Melrose Pumphouse and Reservoir

3.0 Water Sampling and Testing Program

Water sampling and testing is carried out weekly in the distribution system. Notably, the chlorine residual levels are tested weekly to ensure the absence of bacterial regrowth in the water mains. 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, TDS, Monthly- Iron and Manganese
Monthly	BC Centre for Disease Control	Total coliforms, E.Coli
Annual Source Water Testing (every Fall)	Bureau Veritas (formerly Maxxam)	Complete potability testing of raw well water, including T-Ammonia
Annual System Water Testing (every Spring)	Bureau Veritas (formerly Maxxam)	Complete potability testing of distribution system, including T-Ammonia

4.0 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 in the Regional Services section, under “Water & Utility Services” then “WaterSmart 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. Bacteriological results are posted on the Vancouver Island Health Authority (VIHA) website at: http://www.healthspace.ca/Clients/VIHA/VIHA_Website.nsf/Water-Samples-Frameset?OpenPage , then click on [Qualicum Beach](#), then click [Melrose Terrace Community Water System](#).



Melrose Road

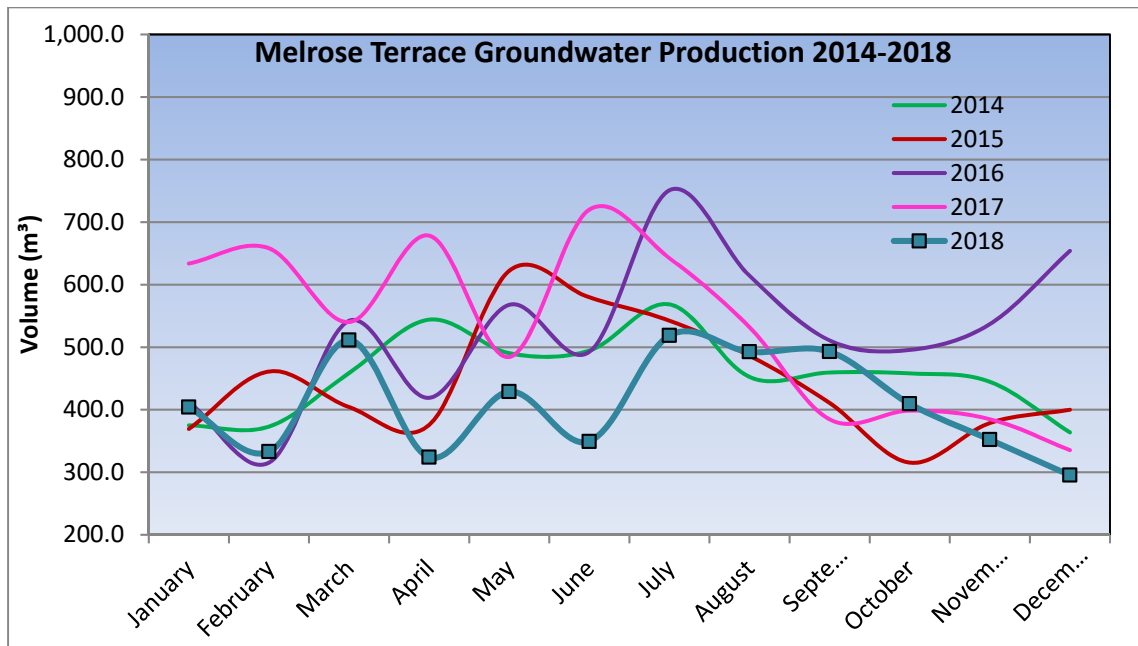
5.0 Water Quality Inquiries and Complaints

No complaints or inquiries were received from the Melrose water service area in 2018. A summary of the water system incidents in 2018 is given in the table below.

Activity in 2018	Date(s)	History/Notes
Boil Water Advisories	None	None, ever.
High Turbidity Events	None	None, ever.
Equipment Malfunction	None	None.
Water Main Breaks	None	None.
Pump Failures	None	Temp power outages.

6.0 Groundwater Production and Consumption

The monthly groundwater production in the Melrose system for the past 5 years is shown in the chart below. Groundwater production in 2018 fell to lower levels in the spring, but average levels in the summer months compared to previous years. Summer production levels did not dissipate as early as usual, indicating increased spans of high temperatures later in the summer.



In the Fall/Winter of 2018, the average usage per home in the Melrose Terrace water service area was approximately 0.34 cubic metres per day (74.8 imperial gallons). In the summer, the average water usage was 0.46 cubic metres per day (101.2 imperial gallons). Based on these figures, the annual consumption per capita is estimated to be 158 L/day (based on 2.4 people per household). This consumption is **46% less** than the RDN system average of 294 L/day/capita in 2018.

7.0 Maintenance Program

Weekly pump station inspections are carried out 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 a year in the Spring.

The water storage reservoir is drained and cleaned once a year. Twenty-four hour on-call coverage is in place to respond to water system emergencies and alarms.

8.0 Operator Certification

The Regional District Water & Utility Services staff are comprised of one Manager, one Project Engineer, one Engineering Technologist, one Engineering Technician, one Chief Operator, and seven certified operators. The operators receive ongoing training and certification in:

- | | | |
|----------------------------|---|----------------------------|
| ✓ Water Treatment | ✓ Chlorine Handling | ✓ Confined Space Awareness |
| ✓ Water Distribution | ✓ WHMIS (Workplace Hazardous Material Information System) | ✓ Traffic Control |
| ✓ Wastewater Collection | ✓ TDG (Transportation of Dangerous Goods) | ✓ Fall Protection |
| ✓ Cross Connection Control | | ✓ First Aid |
| ✓ Asbestos Awareness | | |

9.0 Water Service Area Projects

9.1 2018 Completed Studies & Projects

- Corresponded with residents regarding well level and water conservation;
- Completed irrigation checks for high-water users;
- Performed well conditioning;
- Completed Water Conservation Evaluation Report;
- Advised residents regarding water leak repairs;
- Completed Cross Connection Control Bylaw in draft format;
- Completed regular flushing and reservoir cleaning projects;
- Enforced outdoor sprinkling regulations;
- Updated the online GIS Water Map update for aquifer and watershed info;
- Maintained a high level of water quality;
- Continued quality control through regular testing and monitoring of water system;
- Began a Water Systems SCADA Master Plan project;
- Initiated new Drinking Water and Watershed Protection Action Plan preparation;
- Began a Water Systems Condition Assessment project.

9.2 2019 Proposed Projects & Upgrades

- Continue watermain flushing program and hydrant maintenance;
- Adopt Cross Connection Control Bylaw;
- Implement a Water Systems SCADA Master Plan;
- Begin well protection plan;
- Complete Water Systems Condition Assessment project;
- Begin DWWP Water Conservation Plan development;
- Implement new Drinking Water and Watershed Protection Action Plan;
- Continue to offer numerous water-saving incentives via rebates;
- Develop Cross Connection Control educational material.

10.0 Emergency Response Plan

The Regional District Emergency Response Plan (ERP) contains procedures and contact information to efficiently respond to water system emergencies such as contamination of water supply, loss of supply, pump failure, and drought management. The ERP was reviewed and updated in 2018, and copies are available on our website, at each RDN office, in each pumphouse, and in each Water Services vehicle. A copy of the ERP is also attached to this report in Appendix C.

11.0 Cross Connection Control

In 2017, a more robust Cross Connection Control Plan was prepared that fully defines the CCC program, including standard operating procedures, plumbing code references, reporting procedures, survey schedules, backflow prevention standards, detailed installation schematics, blank test forms, testing reminders, and non-compliance letters. A minimum of two RDN Operators are certified in Backflow Assembly Testing at all times. The RDN Manager of Water Services is the designated Cross Connection Control Manager.

In 2019, a stand-alone Cross Connection Control Bylaw will be adopted that contains definitions, authorizations, applications, liability, rules, regulations, testing requirements, and reporting requirements. The bylaw will address retrofits, prohibitions, special circumstances, reclaimed water use, alternate water sources, failure to comply, inspections, testing, offences, penalties and more. A webpage will be established on the Water Services website that will educate RDN customers about cross connections and list the relevant links to current standards and resources.

12.0 Cyber Security

The RDN uses a multi-level approach to cyber-security. Corporate network security is employed via a universal threat management gateway that implements various methods of data security, which includes daily definition updates to block known cyber threats. In addition, all RDN PC's are protected with anti-virus software. RDN water systems are connected to the corporate network via IP-Sec VPN's for remote management by information technology and equipment operators. Future infrastructure upgrades will see our water systems located on segregated networks to limit the vulnerability from cybersecurity threats.

13.0 Closing

An annual report for the year 2019 will be prepared and submitted to Island Health in the spring of 2020. Annual reports are also available on our website at <https://www.rdn.bc.ca/melrose-terrace>.



Melrose Road

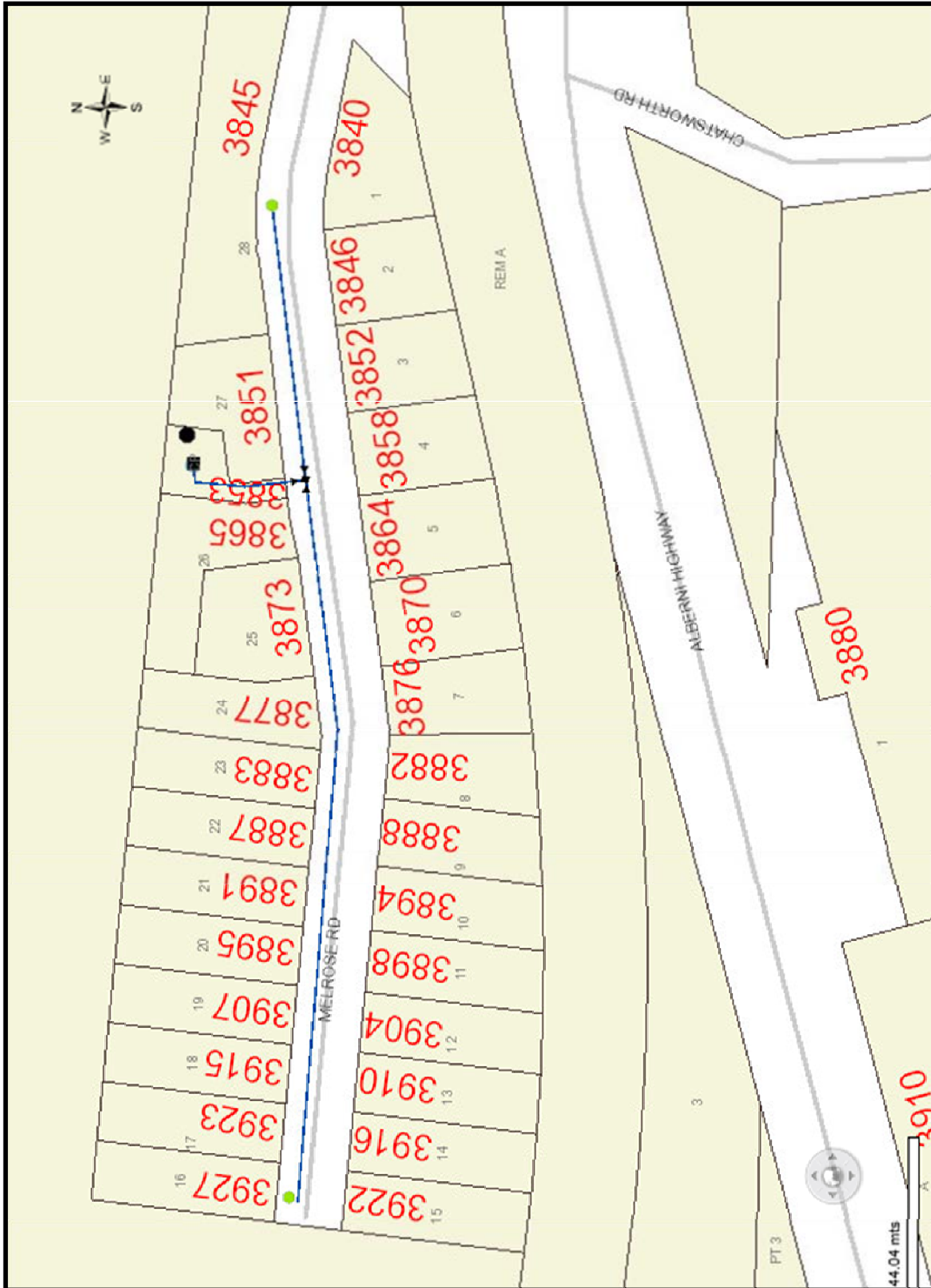
APPENDIX A

MAP OF MELROSE TERRACE

WATER SERVICE AREA

MELROSE TERRACE

WATER SERVICE AREA



APPENDIX B

WATER QUALITY TESTING RESULTS

MELROSE TERRACE COMMUNITY WATER SYSTEM



Facility Location:

3887 Melrose Place
Qualicum Beach

Facility Information: Facility Type: 15-300 (DWC)

Facility Sampling History:

<u>Location</u>	<u>Date</u>	<u>Total Coliform</u>	<u>E. Coli</u>
3927 Melrose Place, 3927 Melrose Place	3-Dec-2018	L1	L1
3927 Melrose Place, 3927 Melrose Place	7-Nov-2018	L1	L1
3927 Melrose Place, 3927 Melrose Place	1-Oct-2018	L1	L1
3927 Melrose Place, 3927 Melrose Place	5-Sep-2018	L1	L1
3927 Melrose Place, 3927 Melrose Place	7-Aug-2018	L1	L1
3927 Melrose Place, 3927 Melrose Place	3-Jul-2018	L1	L1
3927 Melrose Place, 3927 Melrose Place	5-Jun-2018	L1	L1
3927 Melrose Place, 3927 Melrose Place	1-May-2018	L1	L1
3927 Melrose Place, 3927 Melrose Place	4-Apr-2018	L1	L1
3927 Melrose Place, 3927 Melrose Place	5-Mar-2018	L1	L1
3927 Melrose Place, 3927 Melrose Place	5-Feb-2018	L1	L1

Interpreting Sample Reports

In VIHA, the results of drinking water sampling are reported using the following coding system:

- L1 Less than 1 (no detectable bacteria) - Meaning: No bacteria present
- OG Overgrown - Meaning: Too many background bacteria to give an accurate count
- EST Estimated Count
- A Sample not tested; Too long in transit
- C Sample leaked/broken in transit
- D Sample not tested; No collection date given
- T Sample submitted unsatisfactory. Exceeded 30 hours holding time, please resample.
- NS No sample received with requisition

CDWG=Canadian Drinking Water Guidelines
OG= Operational Guidance Value

MAC=Maximum Acceptable Concentration
AO= Asthetic Objective.



Red font indicates non-compliance with Canadian Drinking Water Guidelines

	Units	CDWG		May 13 2014	May 19 2015	May 10 2016	May 8 2017	May 7 2018	
Miscellaneous Inorganics									
Fluoride	mg/L	1.5	MAC	0.05	0.042	0.039	0.038	0.038	
Alkalinity (total as CaCO ₃)	mg/L			84	84.9	102	110	109	
Anions									
Dissolved Sulphate	mg/L	500	AO	1.2	0.82	0.83	0.98	1.3	
Dissolved Chloride	mg/L	250	AO	78	87	82	79	69	
Nitrite	mg/L	1	MAC	<0.05	<0.0050	<0.0050	<0.0050	<0.005	
Miscellaneous									
Apparent Colour	Colour Unit			<5	<5	10	10	5	
Nutrients									
Total Ammonia	mg/L			<0.02	0.024	0.011	0.15	0.044	
Physical Properties									
Conductivity	µS/cm			458	468	472	460	455	
pH	pH	7.0:10.5	AO	7	7.95	7.66	8.06	7.96	
TDS	mg/L	500	AO	290	294	306	304	272	
Turbidity	NTU			<0.5	0.12	0.14	0.13	0.17	
Microbiological Parameters									
E.coli	MPN/100mL	<1	MAC	<1.0	<1.0	<1.0	<1.0	<1.0	
Total Coliforms	MPN/100mL	<1	MAC	<1.0	<1.0	<1.0	<1.0	<1.0	
Calculated Parameters									
Total Hardness (CaCO ₃)	mg/L			140	144	146	152	144	
Nitrate	mg/L	10	MAC	<0.05	<0.020	<0.020	0.029	0.024	
Elements									
Total Mercury	mg/L	0.001	MAC	<0.00001	<0.00001	<0.00001	<0.00001	<0.000002	
Total Metals									
Total Aluminum	mg/L	0.1	OG	<0.025	<0.003	<0.003	<0.003	<0.003	
Total Antimony	mg/L	0.006	MAC	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	
Total Arsenic	mg/L	0.01	MAC	<0.00025	<0.0001	<0.0001	<0.0001	<0.0001	
Total Barium	mg/L	1	MAC	0.0264	0.03	0.0328	0.038	0.031	
Total Beryllium	mg/L			<0.00025	<0.0001	<0.0001	<0.0001	<0.0001	
Total Bismuth	mg/L			<0.0005	<0.001	<0.001	<0.001	<0.001	
Total Boron	mg/L	5	MAC	<0.010	<0.050	<0.050	<0.050	<0.050	
Total Cadmium	mg/L	0.005	MAC	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	
Total Chromium	mg/L	0.05	MAC	<0.0025	<0.001	<0.001	<0.001	<0.001	
Total Cobalt	mg/L			<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	
Total Copper	mg/L	1	AO	0.0062	0.00147	0.00167	0.00218	0.00219	
Total Iron	mg/L	0.3	AO	0.135	0.0693	0.0704	0.0456	0.0689	
Total Lead	mg/L	0.01	MAC	0.0007	0.0004	0.00029	0.00043	0.0004	
Total Manganese	mg/L	0.05	AO	<0.0050	0.0028	0.0027	0.0021	0.0029	
Total Molybdenum	mg/L			<0.00025	<0.001	<0.001	<0.001	<0.001	
Total Nickel	mg/L			<0.0010	<0.001	<0.001	<0.001	<0.001	
Total Selenium	mg/L	0.05	MAC	<0.0005	<0.0001	<0.0001	<0.0001	<0.0001	
Total Silicon	mg/L			14.3	14.8	15.2	22.1	15.2	
Total Silver	mg/L			<0.00025	<0.00002	<0.00002	<0.00002	<0.00002	
Total Strontium	mg/L			0.0692	0.0691	0.0787	0.0913	0.0774	
Total Thallium	mg/L			<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	
Total Tin	mg/L			<0.0005	<0.005	<0.005	0.0088	<0.005	
Total Titanium	mg/L			<0.0025	<0.005	<0.005	<0.005	<0.005	
Total Uranium	mg/L	0.02	MAC	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001	
Total Vanadium	mg/L			<0.0005	<0.005	<0.005	<0.005	<0.005	
Total Zinc	mg/L	5	AO	0.0892	0.0603	0.0316	0.0342	0.0212	
Total Zirconium	mg/L				<0.0005	<0.0005	<0.0001	<0.0001	
Total Calcium	mg/L			36.4	37.8	36.8	38.8	37.1	
Total Magnesium	mg/L			12.7	12	13.1	13.5	12.4	
Total Potassium	mg/L			<0.5	0.426	0.469	0.51	0.45	
Total Sodium	mg/L	200	AO	35.4	29	31.1	31.4	29.7	
Total Sulphur	mg/L				<3.0	<3.0	<3.0	<3.0	

CDWG=Canadian Drinking Water Guidelines
 OG= Operational Guidance Value

 MAC=Maximum Acceptable Concentration
 AO= Asthetic Objective.


Red font indicates non-compliance with Canadian Drinking Water Guidelines

	Units	CDWG		November 4 2014	October 26 2015	October 12 2016	September 18 2017	October 25 2018	
Miscellaneous Inorganics									
Fluoride	mg/L	1.5	MAC	0.06	0.042	0.03	0.04	0.036	
Alkalinity (total as CaCO ₃)	mg/L			72	71.6	79.2	89.8	92.5	
Anions									
Dissolved Sulphate	mg/L	500	AO	1.7	1.83	1.2	<1.0	<1.0	
Dissolved Chloride	mg/L	250	AO	70.6	76	75	66	57	
Nitrite	mg/L	1	MAC	<0.05	<0.0050	<0.050	0.0094	<0.0050	
Miscellaneous									
Apparent Colour	Colour Unit			520	80	400	300	100	
Nutrients									
Total Ammonia	mg/L			0.2	0.23	0.33	0.23	0.24	
Physical Properties									
Conductivity	µS/cm			406	408	401	388	371	
pH	pH	7.0:10.5	OG	7	7.77	7.71	7.61	7.81	
TDS	mg/L	500	AO	214	264	290	236	250	
Turbidity	NTU			15	16.6	20.1	47	28	
Microbiological Parameters									
E.coli	MPN/100mL	<1	MAC	<1.0	<1.0	<1.0	<1.0	<1.0	
Total Coliforms	MPN/100mL	<1	MAC	<1.0	<1.0	<1.0	<1.0	<1.0	
Calculated Parameters									
Total Hardness (CaCO ₃)	mg/L			140	143	136	142	135	
Nitrate	mg/L	10	MAC	0.05	<0.020	<0.20	0.023	<0.020	
Elements									
Total Mercury	mg/L	0.001	MAC	<0.00001	<0.00001	<0.00001	<0.00001	<0.000002	
Total Metals									
Total Aluminum	mg/L	0.1	OG	<0.005	<0.003	<0.003	0.0037	0.0044	
Total Antimony	mg/L	0.006	MAC	<0.0001	<0.0005	<0.0005	<0.0005	<0.0005	
Total Arsenic	mg/L	0.01	MAC	0.00034	0.00022	0.00032	0.00046	0.00032	
Total Barium	mg/L	1	MAC	0.0302	0.0297	0.0302	0.0329	0.0293	
Total Beryllium	mg/L			<0.00005	<0.0001	<0.0001	<0.0001	<0.0001	
Total Bismuth	mg/L			<0.0001	<0.001	<0.001	<0.001	<0.001	
Total Boron	mg/L	5	MAC	0.005	<0.05	<0.050	<0.050	<0.050	
Total Cadmium	mg/L	0.005	MAC	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	
Total Chromium	mg/L	0.05	MAC	0.0006	<0.001	<0.001	<0.001	<0.001	
Total Cobalt	mg/L			<0.0001	<0.0005	<0.0005	<0.0002	<0.0002	
Total Copper	mg/L	1	AO	0.0018	0.00158	0.00111	0.00783	0.00126	
Total Iron	mg/L	0.3	AO	9.54	9.43	9.81	16.3	8.59	
Total Lead	mg/L	0.01	MAC	0.0003	0.00024	<0.0002	0.00033	0.00021	
Total Manganese	mg/L	0.05	AO	0.265	0.247	0.259	0.271	0.259	
Total Molybdenum	mg/L			<0.00005	<0.001	<0.001	<0.001	<0.001	
Total Nickel	mg/L			<0.0002	<0.001	<0.001	<0.001	<0.001	
Total Selenium	mg/L	0.05	MAC	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Total Silicon	mg/L			15	16.5	13.6	15.7	14.8	
Total Silver	mg/L			<0.00005	<0.00002	<0.00002	<0.00002	<0.00002	
Total Strontium	mg/L			0.0737	0.0648	0.0755	0.0705	0.0675	
Total Thallium	mg/L			<0.00001	<0.00005	<0.00005	<0.00001	<0.00001	
Total Tin	mg/L			0.0007	<0.005	<0.005	<0.005	<0.005	
Total Titanium	mg/L			0.0006	<0.005	<0.005	<0.005	<0.005	
Total Uranium	mg/L	0.02	MAC	<0.00001	<0.0001	<0.0001	<0.0001	<0.0001	
Total Vanadium	mg/L			0.0015	<0.005	<0.005	<0.005	<0.005	
Total Zinc	mg/L	5	AO	0.187	0.0647	0.0158	0.0752	0.0272	
Total Zirconium	mg/L				<0.0005	<0.0005	0.00015	0.00012	
Total Calcium	mg/L			36.9	36.6	33.9	35.8	34.9	
Total Magnesium	mg/L			12.8	12.5	12.5	12.8	11.5	
Total Potassium	mg/L			0.4	0.465	0.454	0.454	0.418	
Total Sodium	mg/L	200	AO	17.1	18.5	17.3	17.2	17.4	
Total Sulphur	mg/L				<3.0	<3.0	<3.0	<3.0	



Regional District of Nanaimo - Water Services Department

Melrose Terrace Water Analysis - 2018 Monthly Report



Date	Sample Location (Address)	Health Department		In-House									
		E. coli *	Total Coliform *	E.coli *	Total Coliform *	Temp. (°C)	pH	Free Chlorine Residual (mg/L)	Total Dissolved Solids (mg/L)	Salinity (%)	Conductivity (µS/cm)	Total Iron (mg/L)	Manganese (mg/L)
3-Dec-18	3927 Melrose	0	0	0	0	8	7.42	0.02	225.0	0.22	465.0	0.07	0.014
10-Dec-18	3927 Melrose			0	0	8	7.46	0.02	225.0	0.26	540.0		
17-Dec-18	3927 Melrose			0	0	7	7.73	0.01	226.0	0.23	467.0		
	Average	0	0	0	0	7.7	7.5	0.02	225.3	0.24	490.7	0.07	0.014
	Maximum	0	0	0	0	8	7.73	0.02	226.0	0.26	540.0	0.07	0.014
	Minimum	0	0	0	0	7	7.42	0.01	225.0	0.22	465.0	0.07	0.014

Red font indicates non-compliance with Canadian Drinking Water Guidelines

Aesthetic Objective for Iron is ≤0.3 mg/L

Aesthetic Objective for Manganese is ≤0.05mg/L

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

Yellow Column Coliform tests are completed by Health Department

Blue column 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 - Water Services Department

Melrose Terrace Water Analysis - 2018 Monthly Report



Date	Sample Location (Address)	Health Department		In-House									
		E. coli *	Total Coliform *	E.coli *	Total Coliform *	Temp. (°C)	pH	Free Chlorine Residual (mg/L)	Total Dissolved Solids (mg/L)	Salinity (%)	Conductivity (µS/cm)	Total Iron (mg/L)	Manganese (mg/L)
7-Nov-18	3927 Melrose	0	0	0	0	12	7.06	0.02	234.0	0.23	483.0	0.03	0.017
14-Nov-18	3927 Melrose			0	0	11	7.31	0.02	234.0	0.22	485.0		
19-Nov-18	3927 Melrose			0	0	11	7.32	0.02	229.0	0.23	475.0		
27-Nov-18	3927 Melrose			0	0	8	7.17	0.01	229.0	0.23	473.0		
	Average	0	0	0	0	10.5	7.22	0.02	231.5	0.23	479.0	0.03	0.017
	Maximum	0	0	0	0	12	7.32	0.02	234.0	0.23	485.0	0.03	0.017
	Minimum	0	0	0	0	8	7.06	0.01	229.0	0.22	473.0	0.03	0.017

Red font indicates non-compliance with Canadian Drinking Water Guidelines

Aesthetic Objective for Iron is ≤0.3 mg/L

Aesthetic Objective for Manganese is ≤0.05mg/L

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

Yellow Column Coliform tests are completed by Health Department

Blue column 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 - Water Services Department

Melrose Terrace Water Analysis - 2018 Monthly Report



Date	Sample Location (Address)	Health Department		In-House									
		E. coli *	Total Coliform *	E.coli *	Total Coliform *	Temp. (°C)	pH	Free Chlorine Residual (mg/L)	Total Dissolved Solids (mg/L)	Salinity (%)	Conductivity (µS/cm)	Total Iron (mg/L)	Manganese (mg/L)
1-Oct-18	3927 Melrose	0	0	0	0	16	7.18	0.03	228.0	0.23	472.0	0.07	0.022
9-Oct-19	3927 Melrose			0	0	14	6.72	0.01	223.0	0.22	462.0		
15-Oct-18	3927 Melrose			0	0	14	7.04	0.01	226.0	0.23	467.0		
22-Oct-18	3927 Melrose			0	0	14	7.26	0.02	231.0	0.23	477.0		
30-Oct-18	3927 Melrose			0	0	12	7.27	0.01	236.0	0.23	488.0		
	Average	0	0	0	0	14.0	7.1	0.02	228.8	0.23	473.2	0.07	0.022
	Maximum	0	0	0	0	16	7.27	0.03	236.0	0.23	488.0	0.07	0.022
	Minimum	0	0	0	0	12	6.72	0.01	223.0	0.22	462.0	0.07	0.022

Red font indicates non-compliance with Canadian Drinking Water Guidelines

Aesthetic Objective for Iron is ≤0.3 mg/L

Aesthetic Objective for Manganese is ≤0.05mg/L

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

Yellow Column Coliform tests are completed by Health Department

Blue column 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 - Water Services Department

Melrose Terrace Water Analysis - 2018 Monthly Report



Date	Sample Location (Address)	Health Department		In-House									
		E. coli *	Total Coliform *	E.coli *	Total Coliform *	Temp. (°C)	pH	Free Chlorine Residual (mg/L)	Total Dissolved Solids (mg/L)	Salinity (%)	Conductivity (µS/cm)	Total Iron (mg/L)	Manganese (mg/L)
5-Sep-18	3927 Melrose	0	0	0	0	18	7.17	0.00	230.0	0.23	476.0	0.06	0.019
10-Sep-18	3927 Melrose			0	0	18	7.03	0.01	223.0	0.22	462.0		
17-Sep-18	3927 Melrose			0	0	18	7.21	0.02	223.0	0.22	461.0		
24-Sep-18	3927 Melrose			0	0	16	7.12	0.01	229.0	0.23	474.0		
	Average	0	0	0	0	17.5	7.1	0.01	226.3	0.23	468.3	0.06	0.019
	Maximum	0	0	0	0	18	7.21	0.02	230.0	0.23	476.0	0.06	0.019
	Minimum	0	0	0	0	16	7.03	0.00	223.0	0.22	461.0	0.06	0.019

Red font indicates non-compliance with Canadian Drinking Water Guidelines

Aesthetic Objective for Iron is ≤0.3 mg/L

Aesthetic Objective for Manganese is ≤0.05mg/L

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

Yellow Column Coliform tests are completed by Health Department

Blue column 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 - Water Services Department

Melrose Terrace Water Analysis - 2018 Monthly Report



Date	Sample Location (Address)	Health Department		In-House									
		E. coli *	Total Coliform *	E.coli *	Total Coliform *	Temp. (°C)	pH	Free Chlorine Residual (mg/L)	Total Dissolved Solids (mg/L)	Salinity (%)	Conductivity (µS/cm)	Total Iron (mg/L)	Manganese (mg/L)
7-Aug-18	3927 Melrose	0	0	0	0	20	6.98	0.02	234.0	0.23	464.0	0.03	0.010
13-Aug-18	3927 Melrose			0	0	18.5	6.90	0.03	228.0	0.23	471.0		
20-Aug-18	3927 Melrose			0	0	19	7.38	0.05	232.0	0.23	479.0		
29-Aug-18	3927 Melrose			0	0	20	7.22	0.02	228.0	0.23	473.0		
	Average	0	0	0	0	19.4	7.1	0.03	230.5	0.23	471.8	0.03	0.01
	Maximum	0	0	0	0	20	7.38	0.05	234.0	0.23	479.0	0.03	0.01
	Minimum	0	0	0	0	18.5	6.9	0.02	228.0	0.23	464.0	0.03	0.01

Red font indicates non-compliance with Canadian Drinking Water Guidelines

Aesthetic Objective for Iron is ≤0.3 mg/L

Aesthetic Objective for Manganese is ≤0.05mg/L

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

Yellow Column Coliform tests are completed by Health Department

Blue column 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 - Water Services Department

Melrose Terrace Water Analysis - 2018 Monthly Report



Date	Sample Location (Address)	Health Department		In-House									
		E. coli *	Total Coliform *	E.coli *	Total Coliform *	Temp. (°C)	pH	Free Chlorine Residual (mg/L)	Total Dissolved Solids (mg/L)	Salinity (%)	Conductivity (µS/cm)	Total Iron (mg/L)	Manganese (mg/L)
3-Jul-18	3927 Melrose	0	0	0	0	15	7.04	0.04	231.0	0.23	477.0	0.05	0.015
9-Jul-18	3927 Melrose			0	0	16	7.07	0.07	231.0	0.23	478.0		
16-Jul-18	3927 Melrose			0	0	16	7.15	0.05	228.0	0.23	471.0		
24-Jul-18	3927 Melrose			0	0	18	6.92	0.02	229.0	0.23	472.0		
30-Jul-18	3927 Melrose			0	0	18	6.92	0.02	233.0	0.23	481.0		
	Average	0	0	0	0	16.6	7.0	0.04	230.4	0.23	475.8	0.05	0.015
	Maximum	0	0	0	0	18	7.15	0.07	233.0	0.23	481.0	0.05	0.015
	Minimum	0	0	0	0	15	6.92	0.02	228.0	0.23	471.0	0.05	0.015

Red font indicates non-compliance with Canadian Drinking Water Guidelines

Aesthetic Objective for Iron is ≤0.3 mg/L

Aesthetic Objective for Manganese is ≤0.05mg/L

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

Yellow Column Coliform tests are completed by Health Department

Blue column 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 - Water Services Department

Melrose Terrace Water Analysis - 2018 Monthly Report



Date	Sample Location (Address)	Health Department		In-House									
		E. coli *	Total Coliform *	E.coli *	Total Coliform *	Temp. (°C)	pH	Free Chlorine Residual (mg/L)	Total Dissolved Solids (mg/L)	Salinity (%)	Conductivity (µS/cm)	Total Iron (mg/L)	Manganese (mg/L)
5-Jun-18	3927 Melrose	0	0	0	0	14	6.82	0.02	230.0	0.23	475.0		
11-Jun-18	3927 Melrose			0	0	15	7.04	0.04	227.0	0.23	470.0	0.07	0.000
18-Jun-18	3927 Melrose			0	0	17	6.86	0.02	233.0	0.23	481.0		
25-Jun-18	3927 Melrose			0	0	15	7.10	0.05	230.0	0.23	477.0		
	Average	0	0	0	0	15.3	7.0	0.03	230.0	0.23	475.8	0.07	0.000
	Maximum	0	0	0	0	17	7.1	0.05	233.0	0.23	481.0	0.07	0.000
	Minimum	0	0	0	0	14	6.82	0.02	227.0	0.23	470.0	0.07	0.000

Red font indicates non-compliance with Canadian Drinking Water Guidelines

Aesthetic Objective for Iron is ≤0.3 mg/L

Aesthetic Objective for Manganese is ≤0.05mg/L

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

Yellow Column Coliform tests are completed by Health Department

Blue column 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 - Water Services Department

Melrose Terrace Water Analysis - 2018 Monthly Report



Date	Sample Location (Address)	Health Department		In-House									
		E. coli *	Total Coliform *	E.coli *	Total Coliform *	Temp. (°C)	pH	Free Chlorine Residual (mg/L)	Total Dissolved Solids (mg/L)	Salinity (%)	Conductivity (µS/cm)	Total Iron (mg/L)	Manganese (mg/L)
1-May-18	3927 Melrose	0	0	0	0	10	6.87	0.02	228.0	0.23	472.0		
7-May-18	3927 Melrose			0	0	11	6.77	0.02	258.0	0.26	531.0	0.05	0.001
14-May-18	3927 Melrose			0	0	13	6.78	0.05	227.0	0.23	470.0		
22-May-18	3927 Melrose			0	0	14	6.78	0.03	226.0	0.23	469.0		
29-May-18	3927 Melrose			0	0	15	6.81	0.04	226.0	0.23	469.0		
	Average	0	0	0	0	12.6	6.80	0.03	233.0	0.24	482.2	0.05	0.001
	Maximum	0	0	0	0	15	6.87	0.05	258.0	0.26	531.0	0.05	0.001
	Minimum	0	0	0	0	10	6.77	0.02	226.0	0.23	469.0	0.05	0.001

Red font indicates non-compliance with Canadian Drinking Water Guidelines

Aesthetic Objective for Iron is ≤0.3 mg/L

Aesthetic Objective for Manganese is ≤0.05mg/L

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

Yellow Column Coliform tests are completed by Health Department

Blue column 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 - Water Services Department

Melrose Terrace Water Analysis - 2018 Monthly Report



Date	Sample Location (Address)	Health Department		In-House									
		E. coli *	Total Coliform *	E.coli *	Total Coliform *	Temp. (°C)	pH	Free Chlorine Residual (mg/L)	Total Dissolved Solids (mg/L)	Salinity (%)	Conductivity (µS/cm)	Total Iron (mg/L)	Manganese (mg/L)
4-Apr-18	3927 Melrose	0	0	0	0	7	6.59	0.02	244.0	0.24	505.0	0.04	0.007
9-Apr-18	3927 Melrose			0	0	8	6.69	0.01	229.0	0.23	473.0		
16-Apr-18	3927 Melrose			0	0	9	6.49	0.02	227.0	0.23	469.0		
24-Apr-18	3927 Melrose			0	0	9	6.91	0.02	228.0	0.23	471.0		
	Average	0	0	0	0	8.3	6.7	0.02	232.0	0.23	479.5	0.04	0.007
	Maximum	0	0	0	0	9	6.91	0.02	244.0	0.24	505.0	0.04	0.007
	Minimum	0	0	0	0	7	6.49	0.01	227.0	0.23	469.0	0.04	0.007

Red font indicates non-compliance with Canadian Drinking Water Guidelines

Aesthetic Objective for Iron is ≤0.3 mg/L

Aesthetic Objective for Manganese is ≤0.05mg/L

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

Yellow Column Coliform tests are completed by Health Department

Blue column 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 - Water Services Department

Melrose Terrace Water Analysis - 2018 Monthly Report



Date	Sample Location (Address)	Health Department		In-House									
		E. coli *	Total Coliform *	E.coli *	Total Coliform *	Temp. (°C)	pH	Free Chlorine Residual (mg/L)	Total Dissolved Solids (mg/L)	Salinity (%)	Conductivity (µS/cm)	Total Iron (mg/L)	Manganese (mg/L)
5-Mar-18	3927 Melrose	0	0	0	0	6	6.89	0.01	222.0	0.22	460.0	0.05	0.019
12-Mar-18	3927 Melrose			0	0	6	6.92	0.01	226.0	0.23	466.0		
20-Mar-18	3927 Melrose			0	0	7	6.80	0.01	230.0	0.23	472.0		
27-Mar-18	3927 Melrose			0	0	7	6.82	0.06	226.0	0.23	469.0		
	Average	0	0	0	0	6.5	6.9	0.02	226.0	0.23	466.8	0.05	0.019
	Maximum	0	0	0	0	7	6.92	0.06	230.0	0.23	472.0	0.05	0.019
	Minimum	0	0	0	0	6	6.8	0.01	222.0	0.22	460.0	0.05	0.019

Red font indicates non-compliance with Canadian Drinking Water Guidelines

Aesthetic Objective for Iron is ≤0.3 mg/L

Aesthetic Objective for Manganese is ≤0.05mg/L

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

Yellow Column Coliform tests are completed by Health Department

Blue column 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 - Water Services Department

Melrose Terrace Water Analysis - 2018 Monthly Report



Date	Sample Location (Address)	Health Department		In-House									
		E. coli *	Total Coliform *	E.coli *	Total Coliform *	Temp. (°C)	pH	Free Chlorine Residual (mg/L)	Total Dissolved Solids (mg/L)	Salinity (%)	Conductivity (µS/cm)	Total Iron (mg/L)	Manganese (mg/L)
5-Feb-18	3927 Melrose	0	0	0	0	7	6.90	0.02	234.0	0.23	483.0	0.10	0.029
14-Feb-18	3927 Melrose			0	0		6.84	0.03	239.0	0.24	493.0		
20-Feb-18	3927 Melrose			0	0	7	6.78	0.01	238.0	0.24	490.0		
27-Feb-18	3927 Melrose			0	0	6	6.66	0.01	234.0	0.23	488.0		
	Average	0	0	0	0	6.7	6.8	0.02	236.3	0.24	488.5	0.10	0.029
	Maximum	0	0	0	0	7	6.9	0.03	239.0	0.24	493.0	0.10	0.029
	Minimum	0	0	0	0	6	6.66	0.01	234.0	0.23	483.0	0.10	0.029

Red font indicates non-compliance with Canadian Drinking Water Guidelines

Aesthetic Objective for Iron is ≤0.3 mg/L

Aesthetic Objective for Manganese is ≤0.05mg/L

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

Yellow Column Coliform tests are completed by Health Department

Blue column 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 - Water Services Department

Melrose Terrace Water Analysis - 2018 Monthly Report



Date	Sample Location (Address)	Health Department		In-House									
		E. coli *	Total Coliform *	E.coli *	Total Coliform *	Temp. (°C)	pH	Free Chlorine Residual (mg/L)	Total Dissolved Solids (mg/L)	Salinity (%)	Conductivity (µS/cm)	Total Iron (mg/L)	Manganese (mg/L)
2-Jan-18	3927 Melrose	0	0	0	0		6.83	0.05	234.0	0.23	484.0	0.02	0.024
8-Jan-18	3927 Melrose			0	0		7.01	0.02	234.0	0.23	483.0		
15-Jan-18	3927 Melrose			0	0	6	6.79	0.02	233.0	0.23	480.0		
22-Jan-18	3927 Melrose			0	0	7	6.79	0.02	232.0	0.23	479.0		
29-Jan-18	3927 Melrose			0	0		6.73		234.0	0.23	483.0		
	Average	0	0	0	0	7	6.8	0.03	233.4	0.23	481.8	0.02	0.024
	Maximum	0	0	0	0	7	7.01	0.05	234.0	0.23	484.0	0.02	0.024
	Minimum	0	0	0	0	6	6.73	0.02	232.0	0.23	479.0	0.02	0.024

Red font indicates non-compliance with Canadian Drinking Water Guidelines

Aesthetic Objective for Iron is ≤0.3 mg/L

Aesthetic Objective for Manganese is ≤0.05mg/L

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

Yellow Column Coliform tests are completed by Health Department

Blue column 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.