Town of Niverville - Spruce Drive Water Plant
ATTN: RYAN DYCK
Niverville Spruce Drive - PWS
Box 267
Niverville MB R0A 1E0

Date Received: 06-DEC-18
Report Date: 17-DEC-18 12:00 (MT)
Version: FINAL

Client Phone: 204-388-4600

Certificate of Analysis

Lab Work Order #: L2206654

Project P.O. #: Contract#: 5648 (MICROCHEM)
Job Reference: NIVERVILLE SRPUCE DRIVE - PWS - 151.25
C of C Numbers:
Legal Site Desc: 42862

Hua Wo
Chemistry Laboratory Manager

ANALYTICAL REPORT

Physical Tests (WATER)

Analyte	Unit	Guide Limit #1	Guide Limit #2	ALS ID: L2206654-1 Sampled Date: 06-DEC-18 Sampled Time: 07:50 Sample ID: NIVERVILLE SPRUCE DRIVE 1 - RAW		ALS ID: L2206654-2 Sampled Date: 06-DEC-18 Sampled Time: 07:40 Sample ID: NIVERVILLE SPRUCE DRIVE 2 - TREATED	
Colour, True	CU	15	-	6.7		<5.0	
Conductivity	umhos/cm	-	-	1190		200	
Hardness (as CaCO3)	mg/L	-	-	162	HTC	20.7	HTC
Langelier Index (4 C)	No Unit	-	-	0.16		-1.8	
Langelier Index (60 C)	No Unit	-	-	0.92		-0.99	
pH	pH units	7.00-10.5	-	7.93		7.50	
Total Dissolved Solids	mg/L	500	-	698		115	
Transmittance, UV (254 nm)	%T/cm	-	-	91.6		95.7	
Turbidity	NTU	-	-	3.75		<0.10	

Federal Guidelines for Canadian Drinking Water Quality (FEB, 2017)
#1: GCDWQ - Aesthetic Objective/Other Value
#2: GCDWQ - Maximum Acceptable Concentrations (MACs)

Anions and Nutrients (WATER)

Analyte	Unit	Guide Limit #1	Guide Limit #2	ALS ID: L2206654-1 Sampled Date: 06-DEC-18 Sampled Time: 07:50 Sample ID: NIVERVILLE SPRUCE DRIVE 1 - RAW		ALS ID: L2206654-2 Sampled Date: 06-DEC-18 Sampled Time: 07:40 Sample ID: NIVERVILLE SPRUCE DRIVE 2 - TREATED	
Alkalinity, Total (as CaCO3)	mg/L	-	-	278		46.7	
Ammonia, Total (as N)	mg/L	-	-	0.68		<0.010	
Bicarbonate (HCO3)	mg/L	-	-	339		57.0	
Bromide (Br)	mg/L	-	-	0.204		<0.010	
Carbonate (CO3)	mg/L	-	-	<0.60		<0.60	
Chloride (Cl)	mg/L	250	-	202		31.7	
Fluoride (F)	mg/L	-	1.5	0.84		0.113	
Hydroxide (OH)	mg/L	-	-	<0.34		<0.34	
Nitrate (as N)	mg/L	-	10	<0.025	DLM	0.0056	
Nitrite (as N)	mg/L	-	1	<0.0050	DLM	<0.0010	
Sulfate (SO4)	mg/L	500	-	36.8		4.83	

Federal Guidelines for Canadian Drinking Water Quality (FEB, 2017)
#1: GCDWQ - Aesthetic Objective/Other Value
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Organic / Inorganic Carbon (WATER)

Analyte	Unit	Guide Limit #1	Guide Limit #2	ALS ID: L2206654-1 Sampled Date: 06-DEC-18 Sampled Time: 07:50 Sample ID: NIVERVILLE SPRUCE DRIVE 1 - RAW		ALS ID: L2206654-2 Sampled Date: 06-DEC-18 Sampled Time: 07:40 Sample ID: NIVERVILLE SPRUCE DRIVE 2 - TREATED	
Dissolved Organic Carbon	mg/L	-	-	1.36		<0.50	
Total Organic Carbon	mg/L	-	-	1.31		<0.50	

Federal Guidelines for Canadian Drinking Water Quality (FEB, 2017)
#1: GCDWQ - Aesthetic Objective/Other Value
#2: GCDWQ - Maximum Acceptable Concentrations (MACs)

Detection Limit for result exceeds Guide Limit. Assessment against Guide Limit cannot be made.
Analytical result for this parameter exceeds Guide Limit listed on this report.
* Please refer to the Reference Information section for an explanation of any qualifiers noted.

ANALYTICAL REPORT

Total Metals (WATER)

Analyte	Unit	Guide Limit #1	Guide Limit #2	ALS ID: L2206654-1 Sampled Date: 06-DEC-18 Sampled Time: 07:50 Sample ID: NIVERVILLE SPRUCE DRIVE 1 - RAW	ALS ID: L2206654-2 Sampled Date: 06-DEC-18 Sampled Time: 07:40 Sample ID: NIVERVILLE SPRUCE DRIVE 2 - TREATED
Aluminum (Al)-Total	mg/L	0.1	-	<0.0030	<0.0030
Antimony (Sb)-Total	mg/L	-	0.006	<0.00010	<0.00010
Arsenic (As)-Total	mg/L	-	0.01	0.00334	0.00122
Barium (Ba)-Total	mg/L	-	1	0.0454	0.00647
Beryllium (Be)-Total	mg/L	-	-	<0.00010	<0.00010
Bismuth (Bi)-Total	mg/L	-	-	<0.000050	<0.000050
Boron (B)-Total	mg/L	-	5	0.560	0.344
Cadmium (Cd)-Total	mg/L	-	0.005	<0.0000050	<0.0000050
Calcium (Ca)-Total	mg/L	-	-	33.1	4.50
Cesium (Cs)-Total	mg/L	-	-	<0.000010	<0.000010
Chromium (Cr)-Total	mg/L	-	0.05	0.00020	0.00066
Cobalt (Co)-Total	mg/L	-	-	0.00013	<0.00010
Copper (Cu)-Total	mg/L	1	2	0.00267	0.0130
Iron (Fe)-Total	mg/L	0.3	-	0.422	0.051
Lead (Pb)-Total	mg/L	-	0.01	0.000203	<0.000050
Lithium (Li)-Total	mg/L	-	-	0.0548	0.0082
Magnesium (Mg)-Total	mg/L	-	-	19.3	2.29
Manganese (Mn)-Total	mg/L	0.05	-	0.00684	0.00093
Molybdenum (Mo)-Total	mg/L	-	-	0.00414	0.000564
Nickel (Ni)-Total	mg/L	-	-	<0.00050	0.00107
Phosphorus (P)-Total	mg/L	-	-	<0.050	<0.050
Potassium (K)-Total	mg/L	-	-	10.2	1.39
Rubidium (Rb)-Total	mg/L	-	-	0.00494	0.00070
Selenium (Se)-Total	mg/L	-	0.05	<0.000050	<0.000050
Silicon (Si)-Total	mg/L	-	-	5.11	0.73
Silver (Ag)-Total	mg/L	-	-	<0.000010	<0.000010
Sodium (Na)-Total	mg/L	200	-	195	32.6
Strontium (Sr)-Total	mg/L	-	-	0.500	0.0626
Tellurium (Te)-Total	mg/L	-	-	<0.00020	<0.00020
Thallium (Tl)-Total	mg/L	-	-	<0.000010	<0.000010
Thorium (Th)-Total	mg/L	-	-	<0.00010	<0.00010
Tin (Sn)-Total	mg/L	-	-	<0.00010	<0.00010
Titanium (Ti)-Total	mg/L	-	-	<0.00030	<0.00030

Federal Guidelines for Canadian Drinking Water Quality (FEB, 2017)
#1: GCDWQ - Aesthetic Objective/Other Value
#2: GCDWQ - Maximum Acceptable Concentrations (MACs)

Detection Limit for result exceeds Guide Limit. Assessment against Guide Limit cannot be made.
Analytical result for this parameter exceeds Guide Limit listed on this report.
* Please refer to the Reference Information section for an explanation of any qualifiers noted.

ANALYTICAL REPORT

Total Metals (WATER)

				ALS ID	L2206654-1	L2206654-2
				Sampled Date	06-DEC-18	06-DEC-18
				Sampled Time	07:50	07:40
				Sample ID	NIVERVILLE SPRUCE DRIVE 1 - RAW	NIVERVILLE SPRUCE DRIVE 2 - TREATED
Analyte	Unit	Guide Limit #1	Guide Limit #2			
Tungsten (W)-Total	mg/L	-	-		<0.00010	<0.00010
Uranium (U)-Total	mg/L	-	0.02		0.000280	0.000035
Vanadium (V)-Total	mg/L	-	-		<0.00050	<0.00050
Zinc (Zn)-Total	mg/L	5	-		0.0059	0.0078
Zirconium (Zr)-Total	mg/L	-	-		<0.000060	<0.000060

Federal Guidelines for Canadian Drinking Water Quality (FEB, 2017)
#1: GCDWQ - Aesthetic Objective/Other Value
#2: GCDWQ - Maximum Acceptable Concentrations (MACs)

Volatile Organic Compounds (WATER)

				ALS ID	L2206654-1
				Sampled Date	06-DEC-18
				Sampled Time	07:50
				Sample ID	NIVERVILLE SPRUCE DRIVE 1 - RAW
Analyte	Unit	Guide Limit #1	Guide Limit #2		
Benzene	mg/L	-	0.005		<0.00050
1,1-dichloroethene	mg/L	-	0.014		<0.00050
Dichloromethane	mg/L	-	0.05		<0.00050
Ethylbenzene	mg/L	0.0016	0.14		<0.00050
MTBE	mg/L	0.015	-		<0.00050
Tetrachloroethene	mg/L	-	0.01		<0.00050
Toluene	mg/L	0.024	0.06		<0.00050
Trichloroethene	mg/L	-	0.005		<0.00050
o-Xylene	mg/L	-	-		<0.00050
M+P-Xylenes	mg/L	-	-		<0.00040
Xylenes (Total)	mg/L	0.02	0.09		<0.00064
Surrogate: 4-Bromofluorobenzene (SS)	%	-	-		85.6
Surrogate: 1,4-Difluorobenzene (SS)	%	-	-		100.3

Federal Guidelines for Canadian Drinking Water Quality (FEB, 2017)
#1: GCDWQ - Aesthetic Objective/Other Value
#2: GCDWQ - Maximum Acceptable Concentrations (MACs)

Detection Limit for result exceeds Guide Limit. Assessment against Guide Limit cannot be made.
Analytical result for this parameter exceeds Guide Limit listed on this report.
* Please refer to the Reference Information section for an explanation of any qualifiers noted.

Reference Information

Qualifiers for Individual Parameters Listed:

Qualifier	Description
HTC	Hardness was calculated from Total Ca and/or Mg concentrations and may be biased high (dissolved Ca/Mg results unavailable).
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-CO3CO3-CALC-WP	Water	Alkalinity, Carbonate	CALCULATION
The Alkalinity of water is a measure of its acid neutralizing capacity.Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. The fraction of alkalinity contributed by carbonate is calculated and reported as mg CO3 2-/L.			
ALK-HCO3HCO3-CALC-WP	Water	Alkalinity, Bicarbonate	CALCULATION
The Alkalinity of water is a measure of its acid neutralizing capacity.Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. The fraction of alkalinity contributed by bicarbonate is calculated and reported as mg HCO3-/L			
ALK-OHOH-CALC-WP	Water	Alkalinity, Hydroxide	CALCULATION
The Alkalinity of water is a measure of its acid neutralizing capacity.Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. The fraction of alkalinity contributed by hydroxide is calculated and reported as mg OH-/L.			
ALK-TITR-WP	Water	Alkalinity, Total (as CaCO3)	APHA 2320B
The Alkalinity of water is a measure of its acid neutralizing capacity. Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. Total alkalinity is determined by titration with a strong standard mineral acid to the successive HCO3- and H2CO3 endpoints indicated electrometrically.			
BR-L-IC-N-WP	Water	Bromide in Water by IC (Low Level)	EPA 300.1 (mod)-LR
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
C-DOC-HTC-WP	Water	Dissolved Organic Carbon by Combustion	APHA 5310 B-WP
Filtered (0.45 um) sample is acidified and purged to remove inorganic carbon, then injected into a heated reaction chamber where organic carbon is oxidized to CO2 which is then transported in the carrier gas stream and measured via a non-dispersive infrared analyzer.			
C-TOC-HTC-WP	Water	Total Organic Carbon by Combustion	APHA 5310 B-WP
Sample is acidified and purged to remove inorganic carbon, then injected into a heated reaction chamber where organic carbon is oxidized to CO2 which is then transported in the carrier gas stream and measured via a non-dispersive infrared analyzer.			
CL-L-IC-N-WP	Water	Chloride in Water by IC (Low Level)	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
COLOUR-TRUE-WP	Water	Colour, True	APHA 2120C
True Colour is measured spectrophotometrically by comparison to platinum-cobalt standards using the single wavelength method (450 - 465 nm) after filtration of sample through a 0.45 um filter. Colour measurements can be highly pH dependent, and apply to the pH of the sample as received (at time of testing), without pH adjustment. Concurrent measurement of sample pH is recommended.			
EC-SCREEN-WP	Water	Conductivity Screen (Internal Use Only)	APHA 2510
Qualitative analysis of conductivity where required during preparation of other test eg. IC, TDS, TSS, etc			
EC-WP	Water	Conductivity	APHA 2510B
Conductivity of an aqueous solution refers to its ability to carry an electric current. Conductance of a solution is measured between two spatially fixed and chemically inert electrodes.			
ETL-LANGELIER-4-WP	Water	Langelier Index 4C	Calculated
ETL-LANGELIER-60-WP	Water	Langelier Index 60C	Calculated
F-IC-N-WP	Water	Fluoride in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
HARDNESS-CALC-WP	Water	Hardness Calculated	APHA 2340B
Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.			

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Method Reference**
IONBALANCE-CALC-WP	Water	Ion Balance Calculation	APHA 1030E

Cation Sum, Anion Sum, and Ion Balance (as % difference) are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Because all aqueous solutions are electrically neutral, the calculated ion balance (% difference of cations minus anions) should be near-zero.

Cation and Anion Sums are the total meq/L concentration of major cations and anions. Dissolved species are used where available. Minor ions are included where data is present. Ion Balance (as % difference) cannot be calculated accurately for waters with very low electrical conductivity (EC), and is reported as "Low EC" where EC < 100 uS/cm (umhos/cm). Ion Balance is calculated as:

Ion Balance (%) = [Cation Sum-Anion Sum] / [Cation Sum+Anion Sum]

MET-T-CCMS-WP	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod.)

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

NH3-COL-WP	Water	Ammonia by colour	APHA 4500 NH3 F

Ammonia in water samples forms indophenol when reacted with hypochlorite and phenol. The intensity is amplified by the addition of sodium nitroprusside and measured colourmetrically.

NO2-L-IC-N-WP	Water	Nitrite in Water by IC (Low Level)	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

NO3-L-IC-N-WP	Water	Nitrate in Water by IC (Low Level)	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

PH-WP	Water	pH	APHA 4500H

The pH of a sample is the determination of the activity of the hydrogen ions by potentiometric measurement using a standard hydrogen electrode and a reference electrode.

SO4-IC-N-WP	Water	Sulfate in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

TDS-WP	Water	Total Dissolved Solids (TDS)	APHA 2540 SOLIDS C,E

A well-mixed sample is filtered through a glass fiber filter paper. The filtrate is then evaportaed to dryness in a pre-weighed vial and dried at 180 – 2C. The increase in vial weight represents the total dissolved solids.

TURBIDITY-WP	Water	Turbidity	APHA 2130B (modified)

Turbidity in aqueous matrices is determined by the nephelometric method.

UV-%TRANS-WP	Water	UV Transmittance (Calculated)	APHA 5910B

Test method is adapted from APHA Method 5910B. A sample is filtered through a 0.45 um polyethersulfone (PES) filter and its UV Absorbance is measured in a quartz cell at 254 nm. UV Transmittance is calculated from the UV Absorbance result and reported as UV Transmittance per cm. The analysis is carried out without pH adjustment.

VOC+F1-HSMS-WP	Water	VOC plus F1 by GCMS	EPA 8260C / EPA 5021A

In this method samples are analyzed using a headspace autosampler interfaced to a dual column gas chromatograph with MS and Flame Ionization detectors.

XYLENES-SUM-CALC-WP	Water	Sum of Xylene Isomer Concentrations	CALCULATED RESULT

Total xylenes represents the sum of o-xylene and m&p-xylene.

**ALS test methods may incorporate modifications from specified reference methods to improve performance.

Chain of Custody Numbers:

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WP	ALS ENVIRONMENTAL - WINNIPEG, MANITOBA, CANADA

Reference Information

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, fitness for a particular purpose, or non-infringement. ALS assumes no responsibility for errors or omissions in the information. Guideline limits are not adjusted for the hardness, pH or temperature of the sample (the most conservative values are used). Measurement uncertainty is not applied to test results prior to comparison with specified criteria values.

Manitoba Conservation Water Stewardship
Office of Drinking Water
1007 Century Street, Winnipeg, Manitoba,
Canada R3H 0W4

Chain of Custody (COC)
Manitoba Drinking Water Systems
ONLY FOR: Regulatory General Chemistı

L2206654-COFC

Report to Operator (email pdf):		**Owner billing (Email):**		**Regular Service (default):**	**Regular Service** (is 5-7 Days):
Contact:	Ryan Dyck	Contact:	G. Jim Buys		
Address:	Box 267, Niverville, MB R0A 1E0	Address:	Box 267, Niverville, MB R0A 1E0	**Unless otherwise requested:**	☐ **1 Day, rush / priority**
Phone:	204-392-3012	Phone:	204-388-4600		☐ **2 Day, rush / priority**
Email:	ryan@whereyoubelong.ca	Email:	cao@whereyoubelong.ca		☐ **3 Day, rush / priority**
Operator contact update (if different then above): Please Also Include		**Owner contact update (if different then above):**		**Email pdf copy to:** Colin Nakata	
Contact:	Andrew Rempel	Contact:	Eric King	DWO:	Sarah Belisle
Address:	Box 267, Niverville MB R0A 1E0	Address:	Box 267, Niverville MB R0A 1E0	DWO Address:	Unit B - 284 Reimer Ave, Steinbach MB R5G 0R5
Phone:	204-388-4600 ext 117	Phone:	204-388-4600	DWO Phone:	204-371-5065
Email:	Operations@whereyoubelong.ca	Email:	eric.king@whereyoubelong.ca.	DWO Email:	sarah.belisle@gov.mb.ca

Account:		ODW Report type:	**EMS (Lab-MWS)**	**Client / Project Information:**	
Agency Code:	**382**	Project:	**DWQ-C**	Operation Name:	Niverville Spruce Drive - PWS
Lab:	ALS	Lab Work Order # / Job # (lab use only)		Operation Code (com code):	151.25
				Operation Id:	42862
				Sampled by:	Andrew Rempel

Lab Sample # (lab use only)	**Sample Number** (YYMMJJ9999)	**Station Number** (MB99XXD999) / (MB99XXY999)	**Sample Identification**	**Date** dd-mmm-yyyy	**Time** hh:mm	**Sample Matrix**	**Sample Type**	MB-CH-PWS-V2013	MB-VOC-PWS-V2013	Number of Containers
	1803SB0044	MB05OED101	Niverville Spruce Drive 1 - Raw	06-12-2018	7:50 Am	6	1	X	X	7
	1803SB0045	MB05OED102	Niverville Spruce Drive 2 - Treated	06-12-2018	7:40 am	10	1	X		7

Analysis Request

Sample Matrix:	Sample Type:
6-Raw Water, 10-Treated Water	1-Grab Sample

Failure to complete all portions of this form may delay analysis.
Please fill in this form LEGIBLY.
By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified by the Laboratory.
For ALL other testing, please use Laboratory specific forms.

DO NOT COPY or RE-USE this form. Sample Numbers are unique to the Office of Drinking Water and provided by DWO.

Relinquished By:	~~Landmark~~ ~~Transfer~~ Andrew Rempel	Date & Time: Dec 6/18 8:30 am	Gave to Landmark Transfer	Received By: (lab use only)	CO	Date & Time: (lab use only)	12/06/18 9:00	Sample Condition (lab use only)	
								Temperature	Samples Received in Good Condition? Y / N (if no provide details)
Relinquished By:		Date & Time:		Received By: (lab use only)		Date & Time: (lab use only)		9.3	

Operator mandatory | Operator optional | Operator to fill, if information above has changed | Opr to fill, Lab specific | pre-filled by DWO

Note: Cyanide and Mercury are not required and have been removed from the list.
Please use the Rev. July 29, 2013 Water System Chemistry List.