Wajed Shah
Drinking Water Officer
Office of Drinking Water
Environment and Climate Change
Unit B – 284 Reimer Avenue
Steinbach, MB R5G 0R5

March 21, 2025

Mr. Shah,

Re: 2024 Kleefeld Public Water System Report

Please find attached our annual Public Water System Report for the Community of Kleefeld.

This report will be posted on our website at **www.hanovermb.ca** by March 31, 2025 and hard copies will made available from our R.M.'s office at 28 Westland Drive in Mitchell, Manitoba. We will also notify residents that this report is available through our Facebook page.

If you have any questions or concerns, please contact Rob Driedger.

Sincerely,

Rob Driedger, C.E.T.
Manager of Engineering & Utilities
Phone: 204-346-7121
E-Mail: rob.driedger@hanovermb.ca

Kleefeld Public Water System
Annual Report

2024

Rural Municipality of Hanover
March 1, 2025

Kleefeld Public Water System Annual Report

2024

March 1, 2025

Name of Public Water System: Kleefeld Public Water System

Name of legal owner: The Rural Municipality of Hanover

Contact: Rob Driedger, C.E.T., Manager of Engineering & Utilities
Phone: (204) 346-7121
E-Mail: rob.driedger@hanovermb.ca

Website: www.hanovermb.ca

Water Systems Emergency #: (204) 326-4488

Name of Operators: Barry Broesky, Utility Operator, Class II
Phone: (204) 371-0484
E-Mail: barry.broesky@hanovermb.ca

Rob Friesen, Utility Operator, Class II
Phone: (204) 371-8236
E-Mail: rob.friesen@hanovermb.ca

Table of Contents

e. Monochloramine and UV Reports
f. Incident Advisory Notification Plan
g. Boil Water Advisory Documents

Introduction

The 2024 Annual Report for the Town of Kleefeld summarizes the Water utility's ability to produce safe potable water and to meet Provincial regulations.

1. Description of Water System

The Kleefeld Public Water System provides potable drinking water to approximately 2090 residents within the community. Treated water produced at the water plant meets all aesthetic objectives as set forth in the Guidelines for *Canadian Drinking Water Quality.*

1.1 Water Supply Source

The Kleefeld Public Water System receives groundwater from one main drilled well as a well as a back-up well. Both wells draw from a water source at roughly 170 feet to 180 feet below the ground surface. Then main well in use at the time produces water at approximately 8.0 L/sec and this raw water is pumped to the water treatment plant reservoir. The raw water does contain some iron and manganese that it picks up in the rock aquifer.

1.2 Intake Structures

Not applicable.

1.3 Water Treatment Process

As the raw water enters the water treatment plant it is immediately treated with Chlorine and UV for disinfection along with HIB-5, which is an iron sequester which keeps any iron particles from settling out of the water causing staining in the piping. Once treated, the water is then stored in a 600,000 litre reservoir from where it can then be distributed throughout the watermain system.

1.4 Distribution System

Treated water from the reservoir is pumped through the mains into the distribution system via a 3hp jockey pump, 2-10hp duty pumps and a 30hp duty fire pump. The pumps distribute the water at pressures of around 55psi through 50mm, 100mm, 150mm, 200mm and 250mm watermains throughout the community. The watermains currently consists of either an AC or poly high density pipe construction.

1.5 Storage Reservoirs

As indicated above the storage reservoir is 600,000 litre concrete reservoir.

1.6 Number of Connections, Population Served and Types of Water Users

There are currently has 587 water connections with an estimated population in the community of 2090 people.

1.7 Classification and Certification

The Kleefeld Water Treatment Plant is classified as a Class 1 Water Treatment Facility and is currently operated by three utility operators with certification under the Environmental Act's Water and Wasterwater Facility Operators Regulation. *(See Appendix A – Operator Certification)*
In addition the plant is regulated under license number PWS-21-655-01 and complies with The Drinking Water Safety Act.

2. Disinfection System in Use

2.1 Type of Disinfection System Used

The Kleefeld Public Water System disinfects by adding 12% sodium hypochlorite solution to the water via a chlorinator pump. This produces a monochloramination disinfection that is complimented by two Ultra Violet Reactors that were installed in the summer of 2020.

2.2 Equipment Redundancy and Monitoring Requirements

As required by the *Drinking Water Safety Act*, the Kleefeld Public Water System ensures continuous disinfection as maintained at the plant by keeping stock of all spare parts required for the chlorinator. In addition, a complete spare chlorinator is kept at the plant.

Disinfectant residuals are monitored daily at the water treatment plant and periodically in the distribution system and recorded on the appropriate monitoring forms. Monthly monochloramine and UV report forms are sent to the regional Drinking Water Officer at the end of each month.

2.3 Disinfectant Residual Overall Performance Results

For 2024, the Kleefeld Public Water System was compliant in the audited time period. 100% of the daily monochloramine residual tests taken in 2024 were over the 0.3 mg/L limit.

3. List of Water Quality Standards

The Province of Manitoba has adopted a number of water quality standards from the *Guidelines for Canadian Drinking Water Quality,* developed by Health Canada. The parameters are health-based and they express the maximum acceptable concentration for a groundwater supply source. Concentration values in excess constitute a health-related issue and require corrective actions. The results for the Kleefeld Public Water System are summarized in the following table. It should be noted that of the four Barium tests taken from the mid-point of the distribution system, and the Nitrate Nitrite sample from a dead end with in the distribution system, during 2024. The general chemistry results were taken in 2023.

Table : 1 Water Quality Results

SOURCE	PARAMETER	STANDARD	FREQUENCY	TEST RESULTS
GROUND WATER	Total Coliform	No TC	Bi-Weekly	100%
	E. Coli	No EC	Bi-Weekly	100%
	Monochloramine	A monochloramine residual of at least 0.3 mg/L at all times at any point in the distribution system	Daily	100%
	Ultraviolet Disinfection	95% of water produced per month is disinfected within validated conditions	Continuous monitoring of UV dosage for each operating UV unit	100%
	Barium	2.0 mg/l	One sample taken Quarterly at the mid-point in the distribution system each year	1.8
	Nitrate	45 mg/l	One sample taken during July or August every year at a dead end sampling location in the distribution system	0.0438
	Nitrite	3 mg/l		0.0174

Table : 2 Water Quality Results General Chemistry

SOURCE	PARAMETER	STANDARD	FREQUENCY	TEST RESULTS
GROUND WATER	Arsenic	Less then or equal to 0.01 mg/L	One Raw and one treated sample done once every three years. (These results were taken Aug. 2023)	raw – 3.46 µg/L treated – 2.06 µg/L
	Benzene	Less then or equal to 0.005 mg/L		raw - <0.00050 mg/L
	Ethylbenzene	Less then or equal to 0.14 mg/L		raw - <0.00050 mg/L
	Flouride	Less then or equal to 1.5 mg/L		raw - 0.307 mg/L treated - 0.299 mg/L
	Lead	Less then or equal to 0.005 mg/L in the water distribution system		raw -< 0.050 µg/L treated - <0.050 µg/L
	Manganese	Less then or equal to 0.12 mg/L		raw – 2.99 µg/L treated – 2.07 µg/L
	Trichloroethylene	Less then or equal to 0.005 mg/L		raw - <0.00050 mg/L
	Tetrachloroethylene	Less then or equal to 0.01 mg/L		raw - <0.00050 mg/L
	Toluene	Less then or equal to 0.06 mg/L		raw - <0.00050 mg/L
	Total Xylenes	Less then or equal to 0.09 mg/L		raw - <0.00050 mg/L
	Uranium	Less then or equal to 0.02 mg/L		raw - <0.000010 treated - <0.000010

4. Water System Failures and Corrective Actions in 2024

August 15 we had a depressurization of the Water Distribution system. A result of our distribution pumps not turning back on when the generator started. We believe that the pumps did not turn on because of a setting issue on the VFDs that has since been recitfied. While sampling the distribution system we had two failed results that were due to rain water contaminating the samples we took at outside taps. After resampling at the same locations and getting the required results back we were able to lift the boil water advisory August 21, 2024

5. Additional Records Required

See appendix for Boil Water Notices and Rescind letters

6. **Drinking Water Safety Order on your System and Actions Taken in Response**

   None

7. **Warnings Issues or Charges Laid on the System in Accordance with the Drinking Water Safety Act**

   None

8. **Water Quality Advisories**

   None

9. **Major Expenses Incurred in 2024**

   Instillation of new truck fill station at the Kleefeld WTP at a cost of $50,000.00

10. **Future System Expansion and/or Increased Population**

    The community of Kleefeld continues to see rapid growth. Developments in the West and North side of town continue to expand and will grow in 2025. There has also been a permit taken out for a new development on the south side of Kleefeld. Brookridge Meadows Subdivision by Kleefeld Developments was issued a permit to construct or alter public water system on December 30th 2024. The permit is located in Appendix H. The R.M of Hanover with the assistance of Friesen Drillers has applied for a new Water Rights License with the province and we are waiting a response.

11. **Appendix**
    a. Operators Certification
    b. Testing Summary
    c. Analyses
    d. Operating License for Public Water System
    e. Monochloramine and UV Reports
    f. Incident Advisory Notification Plan
    g. Boil Water Documentation
    h. Construction Permits

Appendix A

Operator Certification

Water and Wastewater Facility Operators Certification Program

This is to certify

Barry A. Broesky

has qualified as a

Water Treatment	*Class II*
Water Distribution	*Class II*
Wastewater Treatment	*Class II*
Wastewater Collection	*Class II*

Operator

in accordance with the Water and Wastewater Facility Operators Regulation under *The Environment Act.*

Dated at Winnipeg, Manitoba **this** 7th **day of** April 2020.

Certificate No.: 2009-312
Expires: 2025 April 7
Operator ID: 00107

S. Kailley

Director
Manitoba Conservation and Climate

Manitoba

Water and Wastewater Facility Operators Certification Program

This is to certify

Robert J. Friesen

has qualified as a

Water Treatment	*Class II*
Water Distribution	*Class II*
Wastewater Treatment	*Class II*
Wastewater Collection	*Class II*

Operator

in accordance with the Water and Wastewater Facility Operators Regulation under *The Environment Act.*

Dated at Winnipeg, Manitoba **this** 9th **day of** December 2020.

Certificate No.: 2015-260
Expires: 2025 December 9
Operator ID: 02505

S. Kaiser

Director
Manitoba Conservation and Climate

Manitoba

Appendix B

Testing Summary

ALS Kleefeld Bacterial Barium/Nitrate/Nitrite Samples

	Batch			Sample				Anions and Nutrients		Field Tests				Microbiological Tests		Total Metals
	Received Date	Site	Evaluation	e-COC #	Matrix	Sample Name	Sampling Date	ALS ID	Nitrate (as N) mg/L	Nitrite (as N) mg/L	ammonia, free, field mg/L	Chlorine, mono, field mg/L	Chlorine, total, field mg/L	Temperature, as received °C	Coliforms, Escherichia coli [E. coli] MPN/100mL	Coliforms, total MPN/100mL	Barium, total µg/L
WP2400719-001 (1)	10-01-2024	104.00	Within Limit		Water/Drinking Water	KLEEFELD 1 - RAW	09-01-2024	WP2400719-001						15.3	<1	<1	
WP2400719-002 (1)	10-01-2024	104.00	Within Limit		Water/Drinking Water	KLEEFELD 2 - TREATED	09-01-2024	WP2400719-002						15.3	<1	<1	
WP2400719-003 (1)	10-01-2024	104.00	Within Limit		Water/Drinking Water	KLEEFELD 3 - DISTRIBUTION @ Main Street	09-01-2024	WP2400719-003				1.51	3.0	15.3	<1	<1	
WP2401761-001 (1)	24-01-2024	104.00	Within Limit		Water/Drinking Water	KLEEFELD 1 - RAW	23-01-2024	WP2401761-001						13.1	<1	<1	
WP2401761-002 (1)	24-01-2024	104.00	Within Limit		Water/Drinking Water	KLEEFELD 2 - TREATED	23-01-2024	WP2401761-002						13.1	<1	<1	
WP2401761-003 (1)	24-01-2024	104.00	Within Limit		Water/Drinking Water	KLEEFELD 3 - DISTRIBUTION @ Main St	23-01-2024	WP2401761-003			0.00	3.10	4.6	13.1	<1	<1	
WP2402945-001 (1)	07-02-2024	104.00	Within Limit		Water/Drinking Water	KLEEFELD 1 - RAW	06-02-2024	WP2402945-001						12.7	<1	<1	
WP2402945-002 (1)	07-02-2024	104.00	Within Limit		Water/Drinking Water	KLEEFELD 2 - TREATED	06-02-2024	WP2402945-002						12.7	<1	<1	
WP2402945-003 (1)	07-02-2024	104.00	Within Limit		Water/Drinking Water	KLEEFELD 3 - DISTRIBUTION @ MAIN STREET	06-02-2024	WP2402945-003			0.07	2.98	4.2	12.7	<1	<1	
WP2404120-001 (1)	21-02-2024	104.00	Within Limit		Water/Drinking Water	KLEEFELD 1 - RAW	20-02-2024	WP2404120-001						9.9	<1	<1	
WP2404120-002 (1)	21-02-2024	104.00	Within Limit		Water/Drinking Water	KLEEFELD 2 - TREATED	20-02-2024	WP2404120-002						9.9	<1	<1	
WP2404120-003 (1)	21-02-2024	104.00	Within Limit		Water/Drinking Water	KLEEFELD 3 - DISTRIBUTION @ MAIN STREET	20-02-2024	WP2404120-003			0.09	2.05	3.7	9.9	<1	<1	
WP2405412-001 (1)	06-03-2024	104.00	Within Limit		Water/Drinking Water	KLEEFELD 1 - RAW	05-03-2024	WP2405412-001						13.8	<1	<1	
WP2405412-002 (1)	06-03-2024	104.00	Within Limit		Water/Drinking Water	KLEEFELD 2 - TREATED	05-03-2024	WP2405412-002						13.8	<1	<1	
WP2405412-003 (1)	06-03-2024	104.00	Within Limit		Water/Drinking Water	KLEEFELD 3 - DISTRIBUTION @ MAIN ST	05-03-2024	WP2405412-003			0.10	1.83	.5	13.8	<1	<1	
WP2406582-001 (1)	20-03-2024	104.00	Within Limit		Water/Drinking Water	KLEEFELD 1 - RAW	19-03-2024	WP2406582-001						13.1	<1	<1	
WP2406582-002 (1)	20-03-2024	104.00	Within Limit		Water/Drinking Water	KLEEFELD 2 - TREATED	19-03-2024	WP2406582-002						13.1	<1	<1	
WP2406582-003 (1)	20-03-2024	104.00	Within Limit		Water/Drinking Water	KLEEFELD 3 - DISTRIBUTION @ COTTONWOOD RD	19-03-2024	WP2406582-003				0.74	1.12	13.1	<1	<1	
WP2407619-001 (1)	03-04-2024	104.00	Within Limit		Water/Drinking Water	KLEEFELD 1 - RAW	01-04-2024	WP2407619-001						15.6	<1	<1	
WP2407619-002 (1)	03-04-2024	104.00	Within Limit		Water/Drinking Water	KLEEFELD 2 - TREATED	02-04-2024	WP2407619-002						15.6	<1	<1	
WP2407619-003 (1)	03-04-2024	104.00	Within Limit		Water/Drinking Water	KLEEFELD 3 - DISTRIBUTION @ MAIN ST	02-04-2024	WP2407619-003			0.04	1.88	3.1	15.6	<1	<1	
WP2408833-001 (1)	17-04-2024	104.00	Within Limit		Water/Drinking Water	KLEEFELD 1 - RAW	16-04-2024	WP2408833-001						14.8	<1	<1	
WP2408833-002 (1)	17-04-2024	104.00	Within Limit		Water/Drinking Water	KLEEFELD 2 - TREATED	16-04-2024	WP2408833-002						14.8	<1	<1	
WP2408833-003 (1)	17-04-2024	104.00	Within Limit		Water/Drinking Water	KLEEFELD 3 - DISTRIBUTION @	16-04-2024	WP2408833-003			0.14	1.07	4.1	14.8	<1	<1	
WP2409230-001 (1)	23-04-2024	104.00	Within Limit		Water/Drinking Water	KLEEFELD 3 - DISTRIBUTION @ KLEEFELD PARK	22-04-2024	WP2409230-001			0.16	2.80	5.8	8.1	<1	<1	
WP2409402-001 (1)	24-04-2024	104.00	Within Limit		Water/Drinking Water	KLEEFELD 3 - DISTRIBUTION @ KLEEFELD PARK	23-04-2024	WP2409402-001			0.16	2.73	3.8	18.8	<1	<1	
WP2410031-001 (1)	01-05-2024	104.00	Within Limit		Water/Drinking Water	KLEEFELD 1 - RAW	30-04-2024	WP2410031-001						15.6	<1	<1	
WP2410031-002 (1)	01-05-2024	104.00	Within Limit		Water/Drinking Water	KLEEFELD 2 - TREATED	30-04-2024	WP2410031-002						15.6	<1	<1	
WP2410031-003 (1)	01-05-2024	104.00	Within Limit		Water/Drinking Water	KLEEFELD 3 - DISTRIBUTION @ MAIN ST	30-04-2024	WP2410031-003			0.09	2.91	3.6	15.6	<1	<1	
WP2411821-001 (1)	15-05-2024	104.00	Within Limit		Water/Drinking Water	KLEEFELD 1 - RAW	14-05-2024	WP2411821-001						17.6	<1	<1	
WP2411821-002 (1)	15-05-2024	104.00	Within Limit		Water/Drinking Water	KLEEFELD 2 - TREATED	14-05-2024	WP2411821-002						17.6	<1	<1	
WP2411821-003 (1)	15-05-2024	104.00	Within Limit		Water/Drinking Water	KLEEFELD 3 - DISTRIBUTION @ Main St	14-05-2024	WP2411821-003			0.04	3.27	4.5	17.6	<1	<1	
WP2413603-001 (1)	29-05-2024	104.00	Within Limit		Water/Drinking Water	KLEEFELD 1 - RAW	28-05-2024	WP2413603-001						20.9	<1	<1	
WP2413603-002 (1)	29-05-2024	104.00	Within Limit		Water/Drinking Water	KLEEFELD 2 - TREATED	28-05-2024	WP2413603-002						20.9	<1	<1	
WP2413603-003 (1)	29-05-2024	104.00	Within Limit		Water/Drinking Water	KLEEFELD 3 - DISTRIBUTION @ MAIN ST	28-05-2024	WP2413603-003			0.21	2.44	3.5	20.9	<1	<1	
WP2419978-001 (1)	19-06-2024	104.00	Within Limit		Water/Drinking Water	KLEEFELD 3 - DISTRIBUTION @ 35 Becki Cove	19-06-2024	WP2419978-001			0.00	2.73	3.7	20.2	<1	<1	
WP2419982-001 (1)	19-06-2024	104.00	Within Limit		Water/Drinking Water	KLEEFELD 3 - DISTRIBUTION @ 27 Becki Cove	19-06-2024	WP2419982-001			0.00	2.85	3.9	20.6	<1	<1	
WP2419984-001 (1)	19-06-2024	104.00	Within Limit		Water/Drinking Water	KLEEFELD 3 - DISTRIBUTION @ 22 ASPEN DRIVE	19-06-2024	WP2419984-001			0.00	1.38	3.1	21.5	<1	<1	
WP2419985-001 (1)	19-06-2024	104.00	Within Limit		Water/Drinking Water	KLEEFELD 3 - DISTRIBUTION @	19-06-2024	WP2419985-001			0.03	2.49	3.8	20.8	<1	<1	
WP2419983-001 (1)	19-06-2024	104.00	Within Limit		Water/Drinking Water	KLEEFELD 3 - DISTRIBUTION @ 24 Aspen Bay	19-06-2024	WP2419983-001			0.00	2.13	3.3	20.8	<1	<1	
WP2419980-001 (1)	19-06-2024	104.00	Within Limit		Water/Drinking Water	KLEEFELD 3 - DISTRIBUTION @ 16 Aspen Bay	19-06-2024	WP2419980-001			0.00	2.15	4.3	20.9	<1	<1	
WP2420080-001 (1)	20-06-2024	104.00	Within Limit		Water/Drinking Water	KLEEFELD 3 - DISTRIBUTION @ 27 BECKI COVE	20-06-2024	WP2420080-001			0.00	2.73	4.7	19.4	<1	<1	
WP2420081-001 (1)	20-06-2024	104.00	Within Limit		Water/Drinking Water	KLEEFELD 3 - DISTRIBUTION @ 35 BECKI COVE	20-06-2024	WP2420081-001			0.00	2.90	4.8	19.3	<1	<1	
WP2420082-001 (1)	20-06-2024	104.00	Within Limit		Water/Drinking Water	KLEEFELD 3 - DISTRIBUTION @ RESERVOIR #3	20-06-2024	WP2420082-001						16.8	<1	<1	
WP2420088-001 (1)	20-06-2024	104.00	Within Limit		Water/Drinking Water	KLEEFELD 3 - DISTRIBUTION @ 16 ASPEN BAY	20-06-2024	WP2420088-001				2.11	4.3	16.9	<1	<1	
WP2420089-001 (1)	20-06-2024	104.00	Within Limit		Water/Drinking Water	KLEEFELD 3 - DISTRIBUTION @ 21 BECKI COVE	20-06-2024	WP2420089-001			0.00	2.88	4.6	19.4	<1	<1	
WP2420090-001 (1)	20-06-2024	104.00	Within Limit		Water/Drinking Water	KLEEFELD 3 - DISTRIBUTION @ 24 ASPEN BAY	20-06-2024	WP2420090-001			0.00	1.95	4.2	20.2	<1	<1	
WP2420092-001 (1)	20-06-2024	104.00	Within Limit		Water/Drinking Water	KLEEFELD 3 - DISTRIBUTION @ 22 ASPEN BAY	20-06-2024	WP2420092-001			0.00	1.18	4.0	19.9	<1	<1	
WP2422236-001 (1)	18-09-2024	Kleefeld- PWS 10	No Spec		Water/Water	Kleefeld 3 - Distribution dead end	17-09-2024	WP2422236-001	0.0438	0.0174							
WP2423243-001 (1)	02-10-2024	Kleefeld- PWS 10	No Spec		Water/Water	Kleefeld 1 - Raw	01-10-2024	WP2423243-001									1800
WP2423243-002 (1)	02-10-2024	Kleefeld- PWS 10	No Spec		Water/Water	Kleefeld 2 - Treated	01-10-2024	WP2423243-002									1840
WP2423243-003 (1)	02-10-2024	Kleefeld- PWS 10	No Spec		Water/Water	Kleefeld 3 - Distribution mid-point @ 22 Aspen Bay	01-10-2024	WP2423243-003									1800

Duracan Kleefeld Bacteria samples

	Batch				Sample			Field Tests			Microbiological Tests	
	Received Date	Site	Job #	Evaluation	Matrix	Sample Name	Sampling Date	ammonia, free, field mg/L	Chlorine, mono, field mg/L	Chlorine, total, field mg/L	Coliforms, Escherichia coli [E. coli] MPN/100mL	Coliforms, total MPN/100mL
D3883	12-06-2024	104.00	104.00	Within Limit	Water/Drinking Water	KLEEFELD 1 - RAW	11-06-2024				<1	<1
D3883	12-06-2024	104.00	104.00	Within Limit	Water/Drinking Water	KLEEFELD 2 - TREATED	11-06-2024				<1	<1
D3883	12-06-2024	104.00	104.00	Within Limit	Water/Drinking Water	KLEEFELD 3 - DISTRIBUTION @ Main Street	11-06-2024	0.00	2.72	3.8	<1	<1
D4824	26-06-2024	104.00	104.00	Within Limit	Water/Drinking Water	KLEEFELD 1 - RAW	25-06-2024				<1	<1
D4824	26-06-2024	104.00	104.00	Within Limit	Water/Drinking Water	KLEEFELD 2 - TREATED	25-06-2024				<1	<1
D4824	26-06-2024	104.00	104.00	Within Limit	Water/Drinking Water	KLEEFELD 3 - DISTRIBUTION @ Main St	25-06-2024	0.06	2.68	4.0	<1	<1
D5729	10-07-2024	104.00	104.00	Within Limit	Water/Drinking Water	KLEEFELD 1 - RAW	06-02-2024				<1	<1
D5729	10-07-2024	104.00	104.00	Within Limit	Water/Drinking Water	KLEEFELD 2 - TREATED	06-02-2024				<1	<1
D5729	10-07-2024	104.00	104.00	Within Limit	Water/Drinking Water	KLEEFELD 3 - DISTRIBUTION @ MAIN STREET	06-02-2024	0.00	2.92	5.2	<1	<1
D6538	24-07-2024	104.00	104.00	Within Limit	Water/Drinking Water	KLEEFELD 1 - RAW	23-07-2024				<1	<1
D6538	24-07-2024	104.00	104.00	Within Limit	Water/Drinking Water	KLEEFELD 2 - TREATED	23-07-2024				<1	<1
D6538	24-07-2024	104.00	104.00	Within Limit	Water/Drinking Water	KLEEFELD 3 - DISTRIBUTION @ MAIN STREET	23-07-2024	0.01	3.11	4.4	<1	<1
D7570	08-08-2024	104.00	104.00	Within Limit	Water/Drinking Water	KLEEFELD 1 - Reservoir Cleaning Cell #2	07-08-2024				<1	<1
D7570	08-08-2024	104.00	104.00	Within Limit	Water/Drinking Water	KLEEFELD 2 - Reservoir Cleaning Cell #2	07-08-2024				<1	<1
D7934	14-08-2024	104.00	104.00	Within Limit	Water/Drinking Water	KLEEFELD 1 - Reservoir cleaning Cell #1	14-08-2024				<1	<1
D7934	14-08-2024	104.00	104.00	Within Limit	Water/Drinking Water	KLEEFELD 2 - Reservoir cleaning Cell #1	14-08-2024				<1	<1
D8464	21-08-2024	104.00	104.00	Within Limit	Water/Drinking Water	KLEEFELD 1 - RAW	20-08-2024				<1	<1
D8464	21-08-2024	104.00	104.00	Within Limit	Water/Drinking Water	KLEEFELD 2 - TREATED	20-08-2024				<1	<1
D8464	21-08-2024	104.00	104.00	Within Limit	Water/Drinking Water	KLEEFELD 3 - DISTRIBUTION @ MAIN ST	20-08-2024	0.00	1.59	2.0	<1	<1
D9340	04-09-2024	104.00	104.00	Within Limit	Water/Drinking Water	KLEEFELD 1 - RAW	03-09-2024				<1	<1
D9340	04-09-2024	104.00	104.00	Within Limit	Water/Drinking Water	KLEEFELD 2 - TREATED	03-09-2024				<1	<1
D9340	04-09-2024	104.00	104.00	Within Limit	Water/Drinking Water	KLEEFELD 3 - DISTRIBUTION @ MAIN ST	03-09-2024	0.00	3.14	3.4	<1	<1
D10227	18-09-2024	104.00	104.00	Within Limit	Water/Drinking Water	KLEEFELD 1 - RAW	17-09-2024				<1	<1
D10227	18-09-2024	104.00	104.00	Within Limit	Water/Drinking Water	KLEEFELD 2 - TREATED	17-09-2024				<1	<1
D10227	18-09-2024	104.00	104.00	Within Limit	Water/Drinking Water	KLEEFELD 3 - DISTRIBUTION @ MAIN ST	17-09-2024	0.00	2.75	4.2	<1	<1
D10987	02-10-2024	104.00	104.00	Within Limit	Water/Drinking Water	KLEEFELD 1 - RAW	01-10-2024				<1	<1
D10987	02-10-2024	104.00	104.00	Within Limit	Water/Drinking Water	KLEEFELD 2 - TREATED	01-10-2024				<1	<1
D10987	02-10-2024	104.00	104.00	Within Limit	Water/Drinking Water	KLEEFELD 3 - DISTRIBUTION @ Main St	01-10-2024	0.00	2.71	3.4	<1	<1
D11655	16-10-2024	104.00	104.00	Within Limit	Water/Drinking Water	KLEEFELD 1 - RAW	15-10-2024				<1	<1
D11655	16-10-2024	104.00	104.00	Within Limit	Water/Drinking Water	KLEEFELD 2 - TREATED	15-10-2024				<1	<1
D11655	16-10-2024	104.00	104.00	Within Limit	Water/Drinking Water	KLEEFELD 3 - DISTRIBUTION @ MAIN ST	15-10-2024	0.00	1.91	3.1	<1	<1
D12332	30-10-2024	104.00	104.00	Within Limit	Water/Drinking Water	KLEEFELD 1 - RAW	29-10-2024				<1	<1
D12332	30-10-2024	104.00	104.00	Within Limit	Water/Drinking Water	KLEEFELD 2 - TREATED	29-10-2024				<1	<1
D12332	30-10-2024	104.00	104.00	Within Limit	Water/Drinking Water	KLEEFELD 3 - DISTRIBUTION @ MAIN ST	29-10-2024	0.4	1.70	3.0	<1	<1
D13016	13-11-2024	104.00	104.00	Within Limit	Water/Drinking Water	KLEEFELD 1 - RAW	12-11-2024				<1	<1
D13016	13-11-2024	104.00	104.00	Within Limit	Water/Drinking Water	KLEEFELD 2 - TREATED	12-11-2024				<1	<1
D13016	13-11-2024	104.00	104.00	Within Limit	Water/Drinking Water	KLEEFELD 3 - DISTRIBUTION @ MAIN ST	12-11-2024	0.00	1.57	1.6	<1	<1
D13745	27-11-2024	104.00	104.00	Within Limit	Water/Drinking Water	KLEEFELD 1 - RAW	26-11-2024				<1	<1
D13745	27-11-2024	104.00	104.00	Within Limit	Water/Drinking Water	KLEEFELD 2 - TREATED	26-11-2024				<1	<1
D13745	27-11-2024	104.00	104.00	Within Limit	Water/Drinking Water	KLEEFELD 3 - DISTRIBUTION @ MAIN ST	26-11-2024	0.00	1.22	1.4	<1	<1
D14384	11-12-2024	104.00	104.00	Within Limit	Water/Drinking Water	KLEEFELD 1 - RAW	10-12-2024				<1	<1
D14384	11-12-2024	104.00	104.00	Within Limit	Water/Drinking Water	KLEEFELD 2 - TREATED	10-12-2024				<1	<1
D14384	11-12-2024	104.00	104.00	Within Limit	Water/Drinking Water	KLEEFELD 3 - DISTRIBUTION @ MAIN ST	10-12-2024	0.00	1.73	2.1	<1	<1
D14899	23-12-2024	104.00	104.00	Within Limit	Water/Drinking Water	KLEEFELD 1 - RAW	22-12-2024				<1	<1
D14899	23-12-2024	104.00	104.00	Within Limit	Water/Drinking Water	KLEEFELD 2 - TREATED	22-12-2024				<1	<1
D14899	23-12-2024	104.00	104.00	Within Limit	Water/Drinking Water	KLEEFELD 3 - DISTRIBUTION @ MAIN ST	22-12-2024	0.00	1.88	3.2	<1	<1

Appendix C

Analyses

ALS Canada Ltd.

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CERTIFICATE OF ANALYSIS (GUIDELINE EVALUATION)

Work Order	: **WP2320500**	Page	: 1 of 6
Client	: **Manitoba Conservation & Climate**	Laboratory	: ALS Environmental - Winnipeg
Contact	: Sarah Belisle	Account Manager	: Sheriza Rajack-Ahamed
Address	: 14 Fultz Boulevard Winnipeg MB Canada R3Y 0L6	Address	: 1329 Niakwa Road East, Unit 12 Winnipeg, Manitoba Canada R2J 3T4
Telephone	: 204 945 5776	Telephone	: +1 204 255 9720
Project	: 104.00	Date Samples Received	: 23-Aug-2023 10:09
PO	: ----	Date Analysis Commenced	: 23-Aug-2023
C-O-C number	: ----	Issue Date	: 30-Aug-2023 08:03
Sampler	: ----		
Site	: Kleefeld- PWS 104.00 Op Id: 7793		
Quote number	: WTP Chemistry		
No. of samples received	: 4		
No. of samples analysed	: 4		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Guideline Comparison

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Gerry Vera	Analyst	Organics, Winnipeg, Manitoba
Lee McTavish		Inorganics, Winnipeg, Manitoba
Lee McTavish		Metals, Winnipeg, Manitoba
Matthew Bouch		Inorganics, Winnipeg, Manitoba

No Breaches Found

General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.
Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

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. Guidelines 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.

Key : LOR: Limit of Reporting (detection limit).

Unit	*Description*
-	no units
%	percent
% T/cm	% transmittance per centimetre
µg/L	micrograms per litre
µS/cm	microsiemens per centimetre
AU/cm	absorbance units per centimetre
CU	colour units (1 cu = 1 mg/l pt)
meq/L	milliequivalents per litre
mg/L	milligrams per litre
NTU	nephelometric turbidity units
pH units	pH units

>: greater than.
<: less than.
Red shading is applied where the result or the LOR is greater than the Guideline Upper Limit (or lower than the Guideline Lower Limit, if applicable).
For drinking water samples, Red shading is applied where the result for E.coli, fecal or total coliforms is greater than or equal to the Guideline Upper Limit.

Analytical Results Evaluation

Matrix: **Water**

Analyte	CAS Number	Method/Lab	Unit	Client sample ID	KLEEFELD 1 - RAW WELL 1	KLEEFELD 1 - RAW WELL 2 - BACKUP	KLEEFELD 2 - TREATED	KLEEFELD 3 - DISTRIBUTION MID-POINT 22 ASPEN BAY	----	----	----
				Sampling date/time	22-Aug-2023 09:45	22-Aug-2023 10:00	22-Aug-2023 10:15	22-Aug-2023 14:00	----	----	----
				Sub-Matrix	Water	Water	Water	Water	----	----	----
					WP2320500-001	WP2320500-002	WP2320500-003	WP2320500-004	--------	--------	--------
Physical Tests											
Absorbance, UV (@ 254nm)	----	E404/WP			0.101	0.0890	0.104	----	----	----	----
Alkalinity, bicarbonate (as CaCO3)	----	E290/WP	mg/L		362	363	363	----	----	----	----
Alkalinity, carbonate (as CaCO3)	----	E290/WP			<1.0	<1.0	<1.0	----	----	----	----
Alkalinity, hydroxide (as CaCO3)	----	E290/WP	mg/L		<1.0	<1.0	<1.0	----	----	----	----
Alkalinity, total (as CaCO3)	----	E290/WP			362	363	363	----	----	----	----
Colour, true	----	E329/WP	CU		13.3	6.3	5.5	----	----	----	----
Conductivity	----	E100/WP			639	636	659	----	----	----	----
Hardness (as CaCO3), from total Ca/Mg	----	EC100A/WP	mg/L		317	322	316	----	----	----	----
Langelier index (@ 4°C)	----	EC105A/WP			0.474	0.484	0.547	----	----	----	----
Langelier index (@ 60°C)	----	EC105A/WP	-		1.24	1.25	1.31	----	----	----	----
pH	----	E108/WP			7.79	7.79	7.86	----	----	----	----
Solids, total dissolved [TDS]	----	E162-L/WP	mg/L		371	370	354	----	----	----	----
Turbidity	----	E121/WP			22.3	19.5	1.10	----	----	----	----
pH, saturation (@ 4°C)	----	EC105A/WP	pH units		7.32	7.30	7.31	----	----	----	----
Transmittance, UV (@ 254nm)	----	E404/WP			79.2	81.5	78.7	----	----	----	----
pH, saturation (@ 60°C)	----	EC105A/WP	pH units		6.55	6.54	6.55	----	----	----	----
Anions and Nutrients											
Ammonia, total (as N)	7664-41-7	E303/WP			1.20	1.12	0.638	----	----	----	----
Bromide	24959-67-9	E235.Br-L/WP	mg/L		<0.050	<0.050	<0.050	----	----	----	----
Chloride	16887-00-6	E235.Cl-L/WP			4.13	4.13	11.6	----	----	----	----
Fluoride	16984-48-8	E235.F/WP	mg/L		0.307	0.302	0.299	----	----	----	----
Nitrate (as N)	14797-55-8	E235.NO3-L/WP			<0.0050	<0.0050	0.0354	----	----	----	----
Nitrite (as N)	14797-65-0	E235.NO2-L/WP	mg/L		<0.0010	<0.0010	0.0159	----	----	----	----
Sulfate (as SO4)	14808-79-8	E235.SO4/WP			<0.30	<0.30	<0.30	----	----	----	----
Organic / Inorganic Carbon											
Carbon, dissolved organic [DOC]	----	E358-L/WP	mg/L		4.81	4.90	5.00	----	----	----	----

Analytical Results Evaluation

Matrix: **Water**

Analyte	CAS Number	Method/Lab	Unit	Client sample ID	KLEEFELD 1 - RAW WELL 1	KLEEFELD 1 - RAW WELL 2 - BACKUP	KLEEFELD 2 - TREATED	KLEEFELD 3 - DISTRIBUTION MID-POINT 22 ASPEN BAY	----	----	----
				Sampling date/time	22-Aug-2023 09:45	22-Aug-2023 10:00	22-Aug-2023 10:15	22-Aug-2023 14:00	----	----	----
				Sub-Matrix	Water	Water	Water	Water	----	----	----
					WP2320500-001	WP2320500-002	WP2320500-003	WP2320500-004	--------	--------	--------
Organic / Inorganic Carbon											
Carbon, total organic [TOC]	----	E355-L/WP			4.99	4.82	4.27	----	----	----	----
Ion Balance											
Anion sum	----	EC101A/WP	meq/L		7.37	7.39	7.60	----	----	----	----
Cation sum (total)	----	EC101A/WP			7.70	7.76	7.89	----	----	----	----
Ion balance (cations/anions)	----	EC101A/WP	%		104	105	104	----	----	----	----
Ion balance (APHA)	----	EC101A/WP			2.19	2.44	1.87	----	----	----	----
Total Metals											
Aluminum, total	7429-90-5	E420/WP	µg/L		<3.0	123	<3.0	<3.0	----	----	----
Antimony, total	7440-36-0	E420/WP			<0.10	<0.10	<0.10	<0.10	----	----	----
Arsenic, total	7440-38-2	E420/WP	µg/L		3.46	3.66	2.06	1.40	----	----	----
Barium, total	7440-39-3	E420/WP			2030	2040	1820	1850	----	----	----
Beryllium, total	7440-41-7	E420/WP	µg/L		<0.020	<0.020	<0.020	<0.020	----	----	----
Bismuth, total	7440-69-9	E420/WP			<0.050	<0.050	<0.050	<0.050	----	----	----
Boron, total	7440-42-8	E420/WP	µg/L		143	144	149	144	----	----	----
Cadmium, total	7440-43-9	E420/WP			<0.0050	<0.0050	<0.0050	<0.0050	----	----	----
Calcium, total	7440-70-2	E420/WP	µg/L		65400	66800	65100	66100	----	----	----
Cesium, total	7440-46-2	E420/WP			0.013	0.028	0.010	0.013	----	----	----
Chromium, total	7440-47-3	E420/WP	µg/L		<0.50	1.87	<0.50	<0.50	----	----	----
Cobalt, total	7440-48-4	E420/WP			<0.10	0.29	<0.10	<0.10	----	----	----
Copper, total	7440-50-8	E420/WP	µg/L		<0.50	0.61	83.8	24.6	----	----	----
Iron, total	7439-89-6	E420/WP			2040	2200	897	504	----	----	----
Lead, total	7439-92-1	E420/WP	µg/L		<0.050	0.150	<0.050	0.222	----	----	----
Lithium, total	7439-93-2	E420/WP			16.8	16.5	16.2	16.4	----	----	----
Magnesium, total	7439-95-4	E420/WP	µg/L		37400	37800	37400	37200	----	----	----
Manganese, total	7439-96-5	E420/WP			2.99	5.77	2.07	1.53	----	----	----
Molybdenum, total	7439-98-7	E420/WP	µg/L		1.86	2.01	1.96	1.96	----	----	----

Analytical Results Evaluation

Matrix: **Water**

Analyte	CAS Number	Method/Lab	Unit	Client sample ID	KLEEFELD 1 - RAW WELL 1	KLEEFELD 1 - RAW WELL 2 - BACKUP	KLEEFELD 2 - TREATED	KLEEFELD 3 - DISTRIBUTION MID-POINT 22 ASPEN BAY	----	----	----
				Sampling date/time	22-Aug-2023 09:45	22-Aug-2023 10:00	22-Aug-2023 10:15	22-Aug-2023 14:00	----	----	----
				Sub-Matrix	Water	Water	Water	Water	----	----	----
					WP2320500-001	WP2320500-002	WP2320500-003	WP2320500-004	--------	--------	--------
Total Metals											
Nickel, total	7440-02-0	E420/WP	µg/L		0.50	5.49	0.54	0.76	----	----	----
Phosphorus, total	7723-14-0	E420/WP	µg/L		1780	244	1440	849	----	----	----
Potassium, total	7440-09-7	E420/WP	µg/L		4320	4390	4280	4300	----	----	----
Rubidium, total	7440-17-7	E420/WP	µg/L		3.23	3.36	2.95	3.12	----	----	----
Selenium, total	7782-49-2	E420/WP	µg/L		0.073	0.074	0.122	0.051	----	----	----
Silicon, total	7440-21-3	E420/WP	µg/L		8110	8290	7980	8030	----	----	----
Silver, total	7440-22-4	E420/WP	µg/L		<0.010	<0.010	<0.010	<0.010	----	----	----
Sodium, total	7440-23-5	E420/WP	µg/L		25200	23700	31600	32100	----	----	----
Strontium, total	7440-24-6	E420/WP	µg/L		469	473	466	452	----	----	----
Sulfur, total	7704-34-9	E420/WP	µg/L		<500	<500	<500	<500	----	----	----
Tellurium, total	13494-80-9	E420/WP	µg/L		<0.20	<0.20	<0.20	<0.20	----	----	----
Thallium, total	7440-28-0	E420/WP	µg/L		<0.010	<0.010	<0.010	<0.010	----	----	----
Thorium, total	7440-29-1	E420/WP	µg/L		<0.10	<0.10	<0.10	<0.10	----	----	----
Tin, total	7440-31-5	E420/WP	µg/L		<0.10	<0.10	<0.10	0.16	----	----	----
Titanium, total	7440-32-6	E420/WP	µg/L		<0.30	4.66	<0.30	<0.30	----	----	----
Tungsten, total	7440-33-7	E420/WP	µg/L		<0.10	<0.10	<0.10	<0.10	----	----	----
Uranium, total	7440-61-1	E420/WP	µg/L		<0.010	0.017	<0.010	<0.010	----	----	----
Vanadium, total	7440-62-2	E420/WP	µg/L		<0.50	0.51	<0.50	<0.50	----	----	----
Zinc, total	7440-66-6	E420/WP	µg/L		<3.0	59.3	4.3	7.0	----	----	----
Zirconium, total	7440-67-7	E420/WP	µg/L		<0.20	0.22	<0.20	<0.20	----	----	----
Volatile Organic Compounds											
Benzene	71-43-2	E611D/WP	mg/L		<0.00050	<0.00050	----	----	----	----	----
Bromodichloromethane	75-27-4	E611D/WP	mg/L		<0.00050	<0.00050	----	----	----	----	----
Bromoform	75-25-2	E611D/WP	mg/L		<0.00050	<0.00050	----	----	----	----	----
Chloroform	67-66-3	E611D/WP	mg/L		<0.00050	<0.00050	----	----	----	----	----
Dibromochloromethane	124-48-1	E611D/WP	mg/L		<0.00050	<0.00050	----	----	----	----	----
Dichloromethane	75-09-2	E611D/WP	mg/L		<0.0010	<0.0010	----	----	----	----	----

Analytical Results Evaluation

Matrix: **Water**

Analyte	CAS Number	Method/Lab	Unit	Client sample ID: KLEEFELD 1 - RAW WELL 1	KLEEFELD 1 - RAW WELL 2 - BACKUP	KLEEFELD 2 - TREATED	KLEEFELD 3 - DISTRIBUTION MID-POINT 22 ASPEN BAY	----	----	----
				Sampling date/time: 22-Aug-2023 09:45	22-Aug-2023 10:00	22-Aug-2023 10:15	22-Aug-2023 14:00	----	----	----
				Sub-Matrix: Water	Water	Water	Water	----	----	----
				WP2320500-001	WP2320500-002	WP2320500-003	WP2320500-004	--------	--------	--------
Volatile Organic Compounds										
Ethylbenzene	100-41-4	E611D/WP	mg/L	<0.00050	<0.00050	----	----	----	----	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611D/WP	mg/L	<0.00050	<0.00050	----	----	----	----	----
Tetrachloroethylene	127-18-4	E611D/WP	mg/L	<0.00050	<0.00050	----	----	----	----	----
Toluene	108-88-3	E611D/WP	mg/L	<0.00050	<0.00050	----	----	----	----	----
Trichloroethane, 1,1,1-	71-55-6	E611D/WP	mg/L	<0.00050	<0.00050	----	----	----	----	----
Trichloroethane, 1,1,2-	79-00-5	E611D/WP	mg/L	<0.00050	<0.00050	----	----	----	----	----
Trichloroethylene	79-01-6	E611D/WP	mg/L	<0.00050	<0.00050	----	----	----	----	----
Xylene, m+p-	179601-23-1	E611D/WP	mg/L	<0.00040	<0.00040	----	----	----	----	----
Xylene, o-	95-47-6	E611D/WP	mg/L	<0.00030	<0.00030	----	----	----	----	----
Xylenes, total	1330-20-7	E611D/WP	mg/L	<0.00050	<0.00050	----	----	----	----	----
BTEX, total	----	E611D/WP	mg/L	<0.0010	<0.0010	----	----	----	----	----
Volatile Organic Compounds Surrogates										
Bromofluorobenzene, 4-	460-00-4	E611D/WP	%	88.4	87.0	----	----	----	----	----
Difluorobenzene, 1,4-	540-36-3	E611D/WP	%	105	104	----	----	----	----	----

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

Key:

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	:**WP2320500**	Page	: 1 of 14
Client	:**Manitoba Conservation & Climate**	Laboratory	: ALS Environmental - Winnipeg
Contact	:Sarah Belisle	Account Manager	: Sheriza Rajack-Ahamed
Address	:14 Fultz Boulevard Winnipeg MB Canada R3Y 0L6	Address	: 1329 Niakwa Road East, Unit 12 Winnipeg, Manitoba Canada R2J 3T4
Telephone	:----	Telephone	: +1 204 255 9720
Project	:104.00	Date Samples Received	: 23-Aug-2023 10:09
PO	:----	Issue Date	: 30-Aug-2023 08:03
C-O-C number	:----		
Sampler	:----		
Site	:Kleefeld- PWS 104.00 Op Id: 7793		
Quote number	:WTP Chemistry		
No. of samples received	:4		
No. of samples analysed	:4		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- Quality Control Sample Frequency Outliers occur - please see following pages for full details.

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Ammonia in Water by Colour										
Amber glass total (sulfuric acid)										
KLEEFELD 1 - RAW WELL 1	E303	22-Aug-2023	24-Aug-2023	28 days	2 days	✓	24-Aug-2023	28 days	2 days	✓
Anions and Nutrients : Ammonia in Water by Colour										
Amber glass total (sulfuric acid)										
KLEEFELD 1 - RAW WELL 2 - BACKUP	E303	22-Aug-2023	24-Aug-2023	28 days	2 days	✓	24-Aug-2023	28 days	2 days	✓
Anions and Nutrients : Ammonia in Water by Colour										
Amber glass total (sulfuric acid)										
KLEEFELD 2 - TREATED	E303	22-Aug-2023	24-Aug-2023	28 days	2 days	✓	24-Aug-2023	28 days	2 days	✓
Anions and Nutrients : Bromide in Water by IC (Low Level)										
HDPE										
KLEEFELD 1 - RAW WELL 1	E235.Br-L	22-Aug-2023	23-Aug-2023	28 days	1 days	✓	23-Aug-2023	28 days	1 days	✓
Anions and Nutrients : Bromide in Water by IC (Low Level)										
HDPE										
KLEEFELD 1 - RAW WELL 2 - BACKUP	E235.Br-L	22-Aug-2023	23-Aug-2023	28 days	1 days	✓	23-Aug-2023	28 days	1 days	✓
Anions and Nutrients : Bromide in Water by IC (Low Level)										
HDPE										
KLEEFELD 2 - TREATED	E235.Br-L	22-Aug-2023	23-Aug-2023	28 days	1 days	✓	23-Aug-2023	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC (Low Level)										
HDPE										
KLEEFELD 1 - RAW WELL 1	E235.Cl-L	22-Aug-2023	23-Aug-2023	28 days	1 days	✓	23-Aug-2023	28 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Chloride in Water by IC (Low Level)										
HDPE										
KLEEFELD 1 - RAW WELL 2 - BACKUP	E235.Cl-L	22-Aug-2023	23-Aug-2023	28 days	1 days	✓	23-Aug-2023	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC (Low Level)										
HDPE										
KLEEFELD 2 - TREATED	E235.Cl-L	22-Aug-2023	23-Aug-2023	28 days	1 days	✓	23-Aug-2023	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
KLEEFELD 1 - RAW WELL 1	E235.F	22-Aug-2023	23-Aug-2023	28 days	1 days	✓	23-Aug-2023	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
KLEEFELD 1 - RAW WELL 2 - BACKUP	E235.F	22-Aug-2023	23-Aug-2023	28 days	1 days	✓	23-Aug-2023	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
KLEEFELD 2 - TREATED	E235.F	22-Aug-2023	23-Aug-2023	28 days	1 days	✓	23-Aug-2023	28 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE										
KLEEFELD 1 - RAW WELL 1	E235.NO3-L	22-Aug-2023	23-Aug-2023	3 days	1 days	✓	23-Aug-2023	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE										
KLEEFELD 1 - RAW WELL 2 - BACKUP	E235.NO3-L	22-Aug-2023	23-Aug-2023	3 days	1 days	✓	23-Aug-2023	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE										
KLEEFELD 2 - TREATED	E235.NO3-L	22-Aug-2023	23-Aug-2023	3 days	1 days	✓	23-Aug-2023	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE										
KLEEFELD 1 - RAW WELL 1	E235.NO2-L	22-Aug-2023	23-Aug-2023	3 days	1 days	✓	23-Aug-2023	3 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE										
KLEEFELD 1 - RAW WELL 2 - BACKUP	E235.NO2-L	22-Aug-2023	23-Aug-2023	3 days	1 days	✓	23-Aug-2023	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE										
KLEEFELD 2 - TREATED	E235.NO2-L	22-Aug-2023	23-Aug-2023	3 days	1 days	✓	23-Aug-2023	3 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
KLEEFELD 1 - RAW WELL 1	E235.SO4	22-Aug-2023	23-Aug-2023	28 days	1 days	✓	23-Aug-2023	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
KLEEFELD 1 - RAW WELL 2 - BACKUP	E235.SO4	22-Aug-2023	23-Aug-2023	28 days	1 days	✓	23-Aug-2023	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
KLEEFELD 2 - TREATED	E235.SO4	22-Aug-2023	23-Aug-2023	28 days	1 days	✓	23-Aug-2023	28 days	1 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (lab preserved)										
KLEEFELD 1 - RAW WELL 1	E358-L	22-Aug-2023	24-Aug-2023	3 days	2 days	✓	25-Aug-2023	28 days	1 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (lab preserved)										
KLEEFELD 1 - RAW WELL 2 - BACKUP	E358-L	22-Aug-2023	24-Aug-2023	3 days	2 days	✓	25-Aug-2023	28 days	1 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (lab preserved)										
KLEEFELD 2 - TREATED	E358-L	22-Aug-2023	24-Aug-2023	3 days	2 days	✓	25-Aug-2023	28 days	1 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid)										
KLEEFELD 1 - RAW WELL 1	E355-L	22-Aug-2023	23-Aug-2023	28 days	1 days	✓	23-Aug-2023	28 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) KLEEFELD 1 - RAW WELL 2 - BACKUP	E355-L	22-Aug-2023	23-Aug-2023	28 days	1 days	✓	23-Aug-2023	28 days	1 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) KLEEFELD 2 - TREATED	E355-L	22-Aug-2023	23-Aug-2023	28 days	1 days	✓	23-Aug-2023	28 days	1 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE KLEEFELD 1 - RAW WELL 1	E290	22-Aug-2023	23-Aug-2023	14 days	1 days	✓	23-Aug-2023	14 days	1 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE KLEEFELD 1 - RAW WELL 2 - BACKUP	E290	22-Aug-2023	23-Aug-2023	14 days	1 days	✓	23-Aug-2023	14 days	1 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE KLEEFELD 2 - TREATED	E290	22-Aug-2023	23-Aug-2023	14 days	1 days	✓	23-Aug-2023	14 days	1 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE KLEEFELD 1 - RAW WELL 1	E329	22-Aug-2023	23-Aug-2023	3 days	1 days	✓	23-Aug-2023	3 days	1 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE KLEEFELD 1 - RAW WELL 2 - BACKUP	E329	22-Aug-2023	23-Aug-2023	3 days	1 days	✓	23-Aug-2023	3 days	1 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE KLEEFELD 2 - TREATED	E329	22-Aug-2023	23-Aug-2023	3 days	1 days	✓	23-Aug-2023	3 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE KLEEFELD 1 - RAW WELL 1	E100	22-Aug-2023	23-Aug-2023	28 days	1 days	✓	23-Aug-2023	28 days	1 days	✓

Matrix: **Water**

Evaluation: ✖ = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Conductivity in Water										
HDPE KLEEFELD 1 - RAW WELL 2 - BACKUP	E100	22-Aug-2023	23-Aug-2023	28 days	1 days	✓	23-Aug-2023	28 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE KLEEFELD 2 - TREATED	E100	22-Aug-2023	23-Aug-2023	28 days	1 days	✓	23-Aug-2023	28 days	1 days	✓
Physical Tests : pH by Meter										
HDPE KLEEFELD 2 - TREATED	E108	22-Aug-2023	23-Aug-2023	0.25 hrs	32 hrs	✖ EHTR-FM	23-Aug-2023	0.25 hrs	32 hrs	✖ EHTR-FM
Physical Tests : pH by Meter										
HDPE KLEEFELD 1 - RAW WELL 1	E108	22-Aug-2023	23-Aug-2023	0.25 hrs	33 hrs	✖ EHTR-FM	23-Aug-2023	0.25 hrs	33 hrs	✖ EHTR-FM
Physical Tests : pH by Meter										
HDPE KLEEFELD 1 - RAW WELL 2 - BACKUP	E108	22-Aug-2023	23-Aug-2023	0.25 hrs	33 hrs	✖ EHTR-FM	23-Aug-2023	0.25 hrs	33 hrs	✖ EHTR-FM
Physical Tests : TDS by Gravimetry (Low Level)										
HDPE KLEEFELD 1 - RAW WELL 1	E162-L	22-Aug-2023	----	----	----		24-Aug-2023	7 days	2 days	✓
Physical Tests : TDS by Gravimetry (Low Level)										
HDPE KLEEFELD 1 - RAW WELL 2 - BACKUP	E162-L	22-Aug-2023	----	----	----		24-Aug-2023	7 days	2 days	✓
Physical Tests : TDS by Gravimetry (Low Level)										
HDPE KLEEFELD 2 - TREATED	E162-L	22-Aug-2023	----	----	----		24-Aug-2023	7 days	2 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE KLEEFELD 1 - RAW WELL 1	E121	22-Aug-2023	----	----	----		23-Aug-2023	3 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Turbidity by Nephelometry										
HDPE KLEEFELD 1 - RAW WELL 2 - BACKUP	E121	22-Aug-2023	----	----	----		23-Aug-2023	3 days	1 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE KLEEFELD 2 - TREATED	E121	22-Aug-2023	----	----	----		23-Aug-2023	3 days	1 days	✓
Physical Tests : UV Absorbance and Transmittance by Spectrometry										
HDPE KLEEFELD 1 - RAW WELL 1	E404	22-Aug-2023	----	----	----		23-Aug-2023	3 days	1 days	✓
Physical Tests : UV Absorbance and Transmittance by Spectrometry										
HDPE KLEEFELD 1 - RAW WELL 2 - BACKUP	E404	22-Aug-2023	----	----	----		23-Aug-2023	3 days	1 days	✓
Physical Tests : UV Absorbance and Transmittance by Spectrometry										
HDPE KLEEFELD 2 - TREATED	E404	22-Aug-2023	----	----	----		23-Aug-2023	3 days	1 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) KLEEFELD 1 - RAW WELL 1	E420	22-Aug-2023	25-Aug-2023	180 days	3 days	✓	25-Aug-2023	180 days	3 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) KLEEFELD 1 - RAW WELL 2 - BACKUP	E420	22-Aug-2023	25-Aug-2023	180 days	3 days	✓	25-Aug-2023	180 days	3 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) KLEEFELD 2 - TREATED	E420	22-Aug-2023	25-Aug-2023	180 days	3 days	✓	25-Aug-2023	180 days	3 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) KLEEFELD 3 - DISTRIBUTION MID-POINT 22 ASPEN BAY	E420	22-Aug-2023	25-Aug-2023	180 days	3 days	✓	25-Aug-2023	180 days	3 days	✓

Matrix: **Water**

Evaluation: ✗ = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Volatile Organic Compounds : VOCs (Eastern Canada List) by Headspace GC-MS										
Glass vial (sodium bisulfate)										
KLEEFELD 1 - RAW WELL 1	E611D	22-Aug-2023	24-Aug-2023	14 days	2 days	✓	24-Aug-2023	14 days	2 days	✓
Volatile Organic Compounds : VOCs (Eastern Canada List) by Headspace GC-MS										
Glass vial (sodium bisulfate)										
KLEEFELD 1 - RAW WELL 2 - BACKUP	E611D	22-Aug-2023	24-Aug-2023	14 days	2 days	✓	24-Aug-2023	14 days	2 days	✓

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended

Rec. HT: ALS recommended hold time (see units).

Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Alkalinity Species by Titration	E290	1100911	1	10	10.0	5.0	✓
Ammonia in Water by Colour	E303	1101546	1	20	5.0	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	1099485	0	3	0.0	5.0	×
Chloride in Water by IC (Low Level)	E235.Cl-L	1099481	1	18	5.5	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	1099662	1	10	10.0	5.0	✓
Conductivity in Water	E100	1100910	1	11	9.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	1100971	1	19	5.2	5.0	✓
Fluoride in Water by IC	E235.F	1099480	1	19	5.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	1099483	0	4	0.0	5.0	×
Nitrite in Water by IC (Low Level)	E235.NO2-L	1099484	0	4	0.0	5.0	×
pH by Meter	E108	1100912	1	11	9.0	5.0	✓
Sulfate in Water by IC	E235.SO4	1099482	1	18	5.5	5.0	✓
TDS by Gravimetry (Low Level)	E162-L	1099960	1	18	5.5	5.0	✓
Total Metals in Water by CRC ICPMS	E420	1103435	1	8	12.5	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	1099628	1	10	10.0	5.0	✓
Turbidity by Nephelometry	E121	1099544	1	6	16.6	5.0	✓
UV Absorbance and Transmittance by Spectrometry	E404	1099673	1	17	5.8	5.0	✓
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	1101590	1	11	9.0	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	1100911	1	10	10.0	5.0	✓
Ammonia in Water by Colour	E303	1101546	1	20	5.0	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	1099485	1	3	33.3	5.0	✓
Chloride in Water by IC (Low Level)	E235.Cl-L	1099481	1	18	5.5	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	1099662	1	10	10.0	5.0	✓
Conductivity in Water	E100	1100910	1	11	9.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	1100971	1	19	5.2	5.0	✓
Fluoride in Water by IC	E235.F	1099480	1	19	5.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	1099483	1	4	25.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	1099484	1	4	25.0	5.0	✓
pH by Meter	E108	1100912	1	11	9.0	5.0	✓
Sulfate in Water by IC	E235.SO4	1099482	1	18	5.5	5.0	✓
TDS by Gravimetry (Low Level)	E162-L	1099960	1	18	5.5	5.0	✓
Total Metals in Water by CRC ICPMS	E420	1103435	1	8	12.5	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	1099628	1	10	10.0	5.0	✓
Turbidity by Nephelometry	E121	1099544	1	6	16.6	5.0	✓
UV Absorbance and Transmittance by Spectrometry	E404	1099673	1	17	5.8	5.0	✓

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Control Samples (LCS) - Continued							
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	1101590	1	11	9.0	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	1100911	1	10	10.0	5.0	✓
Ammonia in Water by Colour	E303	1101546	1	20	5.0	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	1099485	1	3	33.3	5.0	✓
Chloride in Water by IC (Low Level)	E235.Cl-L	1099481	1	18	5.5	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	1099662	1	10	10.0	5.0	✓
Conductivity in Water	E100	1100910	1	11	9.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	1100971	1	19	5.2	5.0	✓
Fluoride in Water by IC	E235.F	1099480	1	19	5.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	1099483	1	4	25.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	1099484	1	4	25.0	5.0	✓
Sulfate in Water by IC	E235.SO4	1099482	1	18	5.5	5.0	✓
TDS by Gravimetry (Low Level)	E162-L	1099960	1	18	5.5	5.0	✓
Total Metals in Water by CRC ICPMS	E420	1103435	1	8	12.5	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	1099628	1	10	10.0	5.0	✓
Turbidity by Nephelometry	E121	1099544	1	6	16.6	5.0	✓
UV Absorbance and Transmittance by Spectrometry	E404	1099673	1	17	5.8	5.0	✓
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	1101590	1	11	9.0	5.0	✓
Matrix Spikes (MS)							
Ammonia in Water by Colour	E303	1101546	1	20	5.0	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	1099485	0	3	0.0	5.0	×
Chloride in Water by IC (Low Level)	E235.Cl-L	1099481	1	18	5.5	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	1100971	1	19	5.2	5.0	✓
Fluoride in Water by IC	E235.F	1099480	1	19	5.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	1099483	0	4	0.0	5.0	×
Nitrite in Water by IC (Low Level)	E235.NO2-L	1099484	0	4	0.0	5.0	×
Sulfate in Water by IC	E235.SO4	1099482	1	18	5.5	5.0	✓
Total Metals in Water by CRC ICPMS	E420	1103435	1	8	12.5	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	1099628	1	10	10.0	5.0	✓
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	1101590	1	11	9.0	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Description
Conductivity in Water	E100 ALS Environmental - Winnipeg	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 ALS Environmental - Winnipeg	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
Turbidity by Nephelometry	E121 ALS Environmental - Winnipeg	Water	APHA 2130 B (mod)	Turbidity is measured by the nephelometric method, by measuring the intensity of light scatter under defined conditions.
TDS by Gravimetry (Low Level)	E162-L ALS Environmental - Winnipeg	Water	APHA 2540 C (mod)	Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, with evaporation of the filtrate at 180 ± 2°C for 16 hours or to constant weight, with gravimetric measurement of the residue.
Bromide in Water by IC (Low Level)	E235.Br-L ALS Environmental - Winnipeg	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Chloride in Water by IC (Low Level)	E235.Cl-L ALS Environmental - Winnipeg	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235.F ALS Environmental - Winnipeg	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC (Low Level)	E235.NO2-L ALS Environmental - Winnipeg	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC (Low Level)	E235.NO3-L ALS Environmental - Winnipeg	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 ALS Environmental - Winnipeg	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Description
Alkalinity Species by Titration	E290 ALS Environmental - Winnipeg	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia in Water by Colour	E303 ALS Environmental - Winnipeg	Water	APHA 4500 NH3-NITROGEN (AMMONIA)	This analysis is carried out using procedures adapted from APHA Method 4500 NH3 "NITROGEN (AMMONIA)". Ammonia is determined using the automated phenate colourimetric method.
Colour (True) by Spectrometer (5 CU)	E329 ALS Environmental - Winnipeg	Water	APHA 2120 C (mod)	Colour (True Colour) is determined by filtering a sample through a 0.45 micron membrane filter followed by analysis of the filtrate using the platinum-cobalt colourimetric method. Colour measurements can be highly pH dependent, and apply to the pH of the sample as received (at time of testing), without pH adjustment.
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L ALS Environmental - Winnipeg	Water	APHA 5310 B (mod)	Total Organic Carbon (Non-Purgeable), also known as NPOC (total), is a direct measurement of TOC after an acidified sample has been purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO_2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of total carbon (TC) is comprised of IC (which is common), this method is more accurate and more reliable than the TOC by subtraction method (i.e. TC minus TIC).
Dissolved Organic Carbon by Combustion (Low Level)	E358-L ALS Environmental - Winnipeg	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO_2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
UV Absorbance and Transmittance by Spectrometry	E404 ALS Environmental - Winnipeg	Water	APHA 5910 B (mod)	UV Absorbance is determined by first filtering a sample through a 0.45 micron filter, followed by UV absorbance measurement in a quartz cell at 254 nm. The analysis is carried out without pH adjustment.
Total Metals in Water by CRC ICPMS	E420 ALS Environmental - Winnipeg	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
VOCs (Eastern Canada List) by Headspace GC-MS	E611D ALS Environmental - Winnipeg	Water	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Hardness (Calculated) from Total Ca/Mg	EC100A ALS Environmental - Winnipeg	Water	APHA 2340B	"Hardness (as CaCO3), from total Ca/Mg" is calculated from the sum of total Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations. Hardness from total Ca/Mg is normally comparable to Dissolved Hardness in non-turbid waters.
Ion Balance using Total Metals	EC101A ALS Environmental - Winnipeg	Water	APHA 1030E	Cation Sum (using total metals), Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).
Saturation Index using Laboratory pH (Ca-T)	EC105A ALS Environmental - Winnipeg	Water	APHA 2330B	Langelier Index provides an indication of scale formation potential at a given pH and temperature, and is calculated as per APHA 2330B Saturation Index. Positive values indicate oversaturation with respect to CaCO3. Negative values indicate undersaturation of CaCO3. This calculation uses laboratory pH measurements and provides estimates of Langelier Index at temperatures of 4, 15, 20, 25, 66, and 77°C. Ryznar Stability Index is an alternative index used for scale formation and corrosion potential.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 ALS Environmental - Winnipeg	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Preparation for Total Organic Carbon by Combustion	EP355 ALS Environmental - Winnipeg	Water		Preparation for Total Organic Carbon by Combustion
Preparation for Dissolved Organic Carbon for Combustion	EP358 ALS Environmental - Winnipeg	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
VOCs Preparation for Headspace Analysis	EP581 ALS Environmental - Winnipeg	Water	EPA 5021A (mod)	Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler. An aliquot of the headspace is then injected into the GC/MS-FID system.

QUALITY CONTROL REPORT

Work Order	:**WP2320500**	Page	: 1 of 14
Client	:Manitoba Conservation & Climate	Laboratory	:ALS Environmental - Winnipeg
Contact	:Sarah Belisle	Account Manager	:Sheriza Rajack-Ahamed
Address	:104.00 - Kleefeld- PWS 28 Westland Drive Mitchell MB Canada R5G 2N9	Address	:1329 Niakwa Road East, Unit 12 Winnipeg, Manitoba Canada R2J 3T4
Telephone	:	Telephone	:+1 204 255 9720
Project	:104.00	Date Samples Received	:23-Aug-2023 10:09
PO	:----	Date Analysis Commenced	:23-Aug-2023
C-O-C number	:----	Issue Date	:30-Aug-2023 08:03
Sampler	:----		
Site	:Kleefeld- PWS 104.00 Op Id: 7793		
Quote number	:WTP Chemistry		
No. of samples received	:4		
No. of samples analysed	:4		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Gerry Vera	Analyst	Winnipeg Organics, Winnipeg, Manitoba
Lee McTavish		Winnipeg Inorganics, Winnipeg, Manitoba
Lee McTavish		Winnipeg Metals, Winnipeg, Manitoba
Matthew Bouch		Winnipeg Inorganics, Winnipeg, Manitoba

General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percent Difference
# = Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Physical Tests (QC Lot: 1099544)											
WP2320502-003	Anonymous	Turbidity	----	E121	0.10	NTU	1.48	1.33	10.7%	15%	----
Physical Tests (QC Lot: 1099662)											
WP2320448-001	Anonymous	Colour, true	----	E329	5.0	CU	24.3	25.1	0.8	Diff <2x LOR	----
Physical Tests (QC Lot: 1099673)											
WP2320256-001	Anonymous	Absorbance, UV (@ 254nm)	----	E404	0.0050	AU/cm	0.0560	0.0560	0.00%	20%	----
Physical Tests (QC Lot: 1099960)											
WP2320427-001	Anonymous	Solids, total dissolved [TDS]	----	E162-L	3.0	mg/L	317	316	0.158%	20%	----
Physical Tests (QC Lot: 1100910)											
WP2320427-001	Anonymous	Conductivity	----	E100	2.0	µS/cm	550	551	0.182%	10%	----
Physical Tests (QC Lot: 1100911)											
WP2320427-001	Anonymous	Alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	343	348	1.39%	20%	----
Physical Tests (QC Lot: 1100912)											
WP2320427-001	Anonymous	pH	----	E108	0.10	pH units	8.49	8.48	0.118%	4%	----
Anions and Nutrients (QC Lot: 1099480)											
WP2320433-001	Anonymous	Fluoride	16984-48-8	E235.F	0.020	mg/L	0.078	0.077	0.0009	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1099481)											
WP2320433-001	Anonymous	Chloride	16887-00-6	E235.Cl-L	0.10	mg/L	1.94	1.90	2.57%	20%	----
Anions and Nutrients (QC Lot: 1099482)											
WP2320433-001	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	10.2	10.2	0.203%	20%	----
Anions and Nutrients (QC Lot: 1101546)											
WP2320448-002	Anonymous	Ammonia, total (as N)	7664-41-7	E303	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 1099628)											
WP2320500-001	KLEEFELD 1 - RAW WELL 1	Carbon, total organic [TOC]	----	E355-L	0.50	mg/L	4.99	4.72	0.28	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 1100971)											
WP2320502-001	Anonymous	Carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	2.92	2.60	0.32	Diff <2x LOR	----
Total Metals (QC Lot: 1103435)											
WP2320448-003	Anonymous	Aluminum, total	7429-90-5	E420	0.0030	mg/L	<3.0 µg/L	<0.0030	0	Diff <2x LOR	----
		Antimony, total	7440-36-0	E420	0.00010	mg/L	<0.10 µg/L	<0.00010	0	Diff <2x LOR	----
		Arsenic, total	7440-38-2	E420	0.00010	mg/L	0.33 µg/L	0.00030	0.00003	Diff <2x LOR	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Total Metals (QC Lot: 1103435) - continued											
WP2320448-003	Anonymous	Barium, total	7440-39-3	E420	0.00010	mg/L	21.7 µg/L	0.0215	0.861%	20%	----
		Beryllium, total	7440-41-7	E420	0.000020	mg/L	<0.020 µg/L	<0.000020	0	Diff <2x LOR	----
		Bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.050 µg/L	<0.000050	0	Diff <2x LOR	----
		Boron, total	7440-42-8	E420	0.010	mg/L	98 µg/L	0.094	0.004	Diff <2x LOR	----
		Cadmium, total	7440-43-9	E420	0.0000050	mg/L	0.0071 µg/L	0.0000058	0.0000013	Diff <2x LOR	----
		Calcium, total	7440-70-2	E420	0.050	mg/L	21100 µg/L	20.2	4.07%	20%	----
		Cesium, total	7440-46-2	E420	0.000010	mg/L	<0.010 µg/L	<0.000010	0	Diff <2x LOR	----
		Chromium, total	7440-47-3	E420	0.00050	mg/L	<0.50 µg/L	<0.00050	0	Diff <2x LOR	----
		Cobalt, total	7440-48-4	E420	0.00010	mg/L	<0.10 µg/L	<0.00010	0	Diff <2x LOR	----
		Copper, total	7440-50-8	E420	0.00050	mg/L	7.46 µg/L	0.00734	1.56%	20%	----
		Iron, total	7439-89-6	E420	0.010	mg/L	<10 µg/L	<0.010	0	Diff <2x LOR	----
		Lead, total	7439-92-1	E420	0.000050	mg/L	0.524 µg/L	0.000506	3.46%	20%	----
		Lithium, total	7439-93-2	E420	0.0010	mg/L	20.7 µg/L	0.0199	4.16%	20%	----
		Magnesium, total	7439-95-4	E420	0.0050	mg/L	12300 µg/L	12.0	2.62%	20%	----
		Manganese, total	7439-96-5	E420	0.00010	mg/L	4.78 µg/L	0.00465	2.69%	20%	----
		Molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.095 µg/L	0.000093	0.000002	Diff <2x LOR	----
		Nickel, total	7440-02-0	E420	0.00050	mg/L	0.59 µg/L	0.00057	0.00002	Diff <2x LOR	----
		Phosphorus, total	7723-14-0	E420	0.050	mg/L	<50 µg/L	<0.050	0	Diff <2x LOR	----
		Potassium, total	7440-09-7	E420	0.050	mg/L	5010 µg/L	4.94	1.39%	20%	----
		Rubidium, total	7440-17-7	E420	0.00020	mg/L	1.30 µg/L	0.00114	0.00016	Diff <2x LOR	----
		Selenium, total	7782-49-2	E420	0.000050	mg/L	0.239 µg/L	0.000156	0.000083	Diff <2x LOR	----
		Silicon, total	7440-21-3	E420	0.10	mg/L	5620 µg/L	5.52	1.72%	20%	----
		Silver, total	7440-22-4	E420	0.000010	mg/L	<0.010 µg/L	<0.000010	0	Diff <2x LOR	----
		Sodium, total	7440-23-5	E420	0.050	mg/L	17500 µg/L	17.3	1.34%	20%	----
		Strontium, total	7440-24-6	E420	0.00020	mg/L	99.7 µg/L	0.0986	1.07%	20%	----
		Sulfur, total	7704-34-9	E420	0.50	mg/L	600 µg/L	<0.50	0.10	Diff <2x LOR	----
		Tellurium, total	13494-80-9	E420	0.00020	mg/L	<0.20 µg/L	<0.00020	0	Diff <2x LOR	----
		Thallium, total	7440-28-0	E420	0.000010	mg/L	<0.010 µg/L	<0.000010	0	Diff <2x LOR	----
		Thorium, total	7440-29-1	E420	0.00010	mg/L	<0.10 µg/L	<0.00010	0	Diff <2x LOR	----
		Tin, total	7440-31-5	E420	0.00010	mg/L	<0.10 µg/L	<0.00010	0	Diff <2x LOR	----
		Titanium, total	7440-32-6	E420	0.00030	mg/L	<0.30 µg/L	<0.00030	0	Diff <2x LOR	----
		Tungsten, total	7440-33-7	E420	0.00010	mg/L	<0.10 µg/L	<0.00010	0	Diff <2x LOR	----
		Uranium, total	7440-61-1	E420	0.000010	mg/L	0.061 µg/L	0.000062	0.000001	Diff <2x LOR	----
		Vanadium, total	7440-62-2	E420	0.00050	mg/L	1.32 µg/L	0.00131	0.00001	Diff <2x LOR	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Total Metals (QC Lot: 1103435) - continued											
WP2320448-003	Anonymous	Zinc, total	7440-66-6	E420	0.0030	mg/L	28.3 µg/L	0.0281	0.0002	Diff <2x LOR	----
		Zirconium, total	7440-67-7	E420	0.00020	mg/L	<0.20 µg/L	<0.00020	0	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 1101590)											
WP2320256-001	Anonymous	Benzene	71-43-2	E611D	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		Bromodichloromethane	75-27-4	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Bromoform	75-25-2	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Chloroform	67-66-3	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dibromochloromethane	124-48-1	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichloromethane	75-09-2	E611D	1.0	µg/L	<0.0010 mg/L	<1.0	0	Diff <2x LOR	----
		Ethylbenzene	100-41-4	E611D	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		Methyl-tert-butyl ether [MTBE]	1634-04-4	E611D	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		Tetrachloroethylene	127-18-4	E611D	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		Toluene	108-88-3	E611D	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		Trichloroethane, 1,1,1-	71-55-6	E611D	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		Trichloroethane, 1,1,2-	79-00-5	E611D	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		Trichloroethylene	79-01-6	E611D	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		Xylene, m+p-	179601-23-1	E611D	0.40	µg/L	<0.00040 mg/L	<0.40	0	Diff <2x LOR	----
		Xylene, o-	95-47-6	E611D	0.30	µg/L	<0.00030 mg/L	<0.30	0	Diff <2x LOR	----

Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 1099544)						
Turbidity	----	E121	0.1	NTU	<0.10	----
Physical Tests (QCLot: 1099662)						
Colour, true	----	E329	5	CU	<5.0	----
Physical Tests (QCLot: 1099673)						
Absorbance, UV (@ 254nm)	----	E404	0.005	AU/cm	<0.0050	----
Physical Tests (QCLot: 1099960)						
Solids, total dissolved [TDS]	----	E162-L	3	mg/L	<3.0	----
Physical Tests (QCLot: 1100910)						
Conductivity	----	E100	1	µS/cm	<1.0	----
Physical Tests (QCLot: 1100911)						
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Anions and Nutrients (QCLot: 1099480)						
Fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 1099481)						
Chloride	16887-00-6	E235.Cl-L	0.1	mg/L	<0.10	----
Anions and Nutrients (QCLot: 1099482)						
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 1099483)						
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 1099484)						
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 1099485)						
Bromide	24959-67-9	E235.Br-L	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 1101546)						
Ammonia, total (as N)	7664-41-7	E303	0.01	mg/L	<0.010	----
Organic / Inorganic Carbon (QCLot: 1099628)						
Carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 1100971)						
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Total Metals (QCLot: 1103435)						
Aluminum, total	7429-90-5	E420	0.003	mg/L	<0.0030	----
Antimony, total	7440-36-0	E420	0.0001	mg/L	<0.00010	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 1103435) - continued						
Arsenic, total	7440-38-2	E420	0.0001	mg/L	<0.00010	----
Barium, total	7440-39-3	E420	0.0001	mg/L	<0.00010	----
Beryllium, total	7440-41-7	E420	0.00002	mg/L	<0.000020	----
Bismuth, total	7440-69-9	E420	0.00005	mg/L	<0.000050	----
Boron, total	7440-42-8	E420	0.01	mg/L	<0.010	----
Cadmium, total	7440-43-9	E420	0.000005	mg/L	<0.0000050	----
Calcium, total	7440-70-2	E420	0.05	mg/L	<0.050	----
Cesium, total	7440-46-2	E420	0.00001	mg/L	<0.000010	----
Chromium, total	7440-47-3	E420	0.0005	mg/L	<0.00050	----
Cobalt, total	7440-48-4	E420	0.0001	mg/L	<0.00010	----
Copper, total	7440-50-8	E420	0.0005	mg/L	<0.00050	----
Iron, total	7439-89-6	E420	0.01	mg/L	<0.010	----
Lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	----
Lithium, total	7439-93-2	E420	0.001	mg/L	<0.0010	----
Magnesium, total	7439-95-4	E420	0.005	mg/L	<0.0050	----
Manganese, total	7439-96-5	E420	0.0001	mg/L	<0.00010	----
Molybdenum, total	7439-98-7	E420	0.00005	mg/L	<0.000050	----
Nickel, total	7440-02-0	E420	0.0005	mg/L	<0.00050	----
Phosphorus, total	7723-14-0	E420	0.05	mg/L	<0.050	----
Potassium, total	7440-09-7	E420	0.05	mg/L	<0.050	----
Rubidium, total	7440-17-7	E420	0.0002	mg/L	<0.00020	----
Selenium, total	7782-49-2	E420	0.00005	mg/L	<0.000050	----
Silicon, total	7440-21-3	E420	0.1	mg/L	<0.10	----
Silver, total	7440-22-4	E420	0.00001	mg/L	<0.000010	----
Sodium, total	7440-23-5	E420	0.05	mg/L	<0.050	----
Strontium, total	7440-24-6	E420	0.0002	mg/L	<0.00020	----
Sulfur, total	7704-34-9	E420	0.5	mg/L	<0.50	----
Tellurium, total	13494-80-9	E420	0.0002	mg/L	<0.00020	----
Thallium, total	7440-28-0	E420	0.00001	mg/L	<0.000010	----
Thorium, total	7440-29-1	E420	0.0001	mg/L	<0.00010	----
Tin, total	7440-31-5	E420	0.0001	mg/L	<0.00010	----
Titanium, total	7440-32-6	E420	0.0003	mg/L	<0.00030	----
Tungsten, total	7440-33-7	E420	0.0001	mg/L	<0.00010	----
Uranium, total	7440-61-1	E420	0.00001	mg/L	<0.000010	----
Vanadium, total	7440-62-2	E420	0.0005	mg/L	<0.00050	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 1103435) - continued						
Zinc, total	7440-66-6	E420	0.003	mg/L	<0.0030	----
Zirconium, total	7440-67-7	E420	0.0002	mg/L	<0.00020	----
Volatile Organic Compounds (QCLot: 1101590)						
Benzene	71-43-2	E611D	0.5	µg/L	<0.50	----
Bromodichloromethane	75-27-4	E611D	0.5	µg/L	<0.50	----
Bromoform	75-25-2	E611D	0.5	µg/L	<0.50	----
Chloroform	67-66-3	E611D	0.5	µg/L	<0.50	----
Dibromochloromethane	124-48-1	E611D	0.5	µg/L	<0.50	----
Dichloromethane	75-09-2	E611D	0.5	µg/L	<0.50	----
Ethylbenzene	100-41-4	E611D	1	µg/L	<1.0	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611D	0.5	µg/L	<0.50	----
Tetrachloroethylene	127-18-4	E611D	0.5	µg/L	<0.50	----
Toluene	108-88-3	E611D	0.5	µg/L	<0.50	----
Trichloroethane, 1,1,1-	71-55-6	E611D	0.5	µg/L	<0.50	----
Trichloroethane, 1,1,2-	79-00-5	E611D	0.5	µg/L	<0.50	----
Trichloroethylene	79-01-6	E611D	0.5	µg/L	<0.50	----
Xylene, m+p-	179601-23-1	E611D	0.5	µg/L	<0.50	----
Xylene, o-	95-47-6	E611D	0.4	µg/L	<0.40	----
			0.3	µg/L	<0.30	----

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 1099544)									
Turbidity	----	E121	0.1	NTU	200 NTU	103	85.0	115	----
Physical Tests (QCLot: 1099662)									
Colour, true	----	E329	5	CU	250 CU	98.4	85.0	115	----
Physical Tests (QCLot: 1099673)									
Absorbance, UV (@ 254nm)	----	E404	0.005	AU/cm	0.463 AU/cm	102	85.0	115	----
Physical Tests (QCLot: 1099960)									
Solids, total dissolved [TDS]	----	E162-L	3	mg/L	1000 mg/L	95.8	85.0	115	----
Physical Tests (QCLot: 1100910)									
Conductivity	----	E100	1	µS/cm	1412 µS/cm	101	90.0	110	----
Physical Tests (QCLot: 1100911)									
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	100 mg/L	101	85.0	115	----
Physical Tests (QCLot: 1100912)									
pH	----	E108	----	pH units	7 pH units	100	98.0	102	----
Anions and Nutrients (QCLot: 1099480)									
Fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 1099481)									
Chloride	16887-00-6	E235.Cl-L	0.1	mg/L	100 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 1099482)									
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 1099483)									
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 1099484)									
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	99.1	90.0	110	----
Anions and Nutrients (QCLot: 1099485)									
Bromide	24959-67-9	E235.Br-L	0.05	mg/L	0.5 mg/L	98.9	85.0	115	----
Anions and Nutrients (QCLot: 1101546)									
Ammonia, total (as N)	7664-41-7	E303	0.01	mg/L	0.25 mg/L	97.7	85.0	115	----
Organic / Inorganic Carbon (QCLot: 1099628)									
Carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	102	80.0	120	----
Organic / Inorganic Carbon (QCLot: 1100971)									

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report: Spike Concentration	Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High	Qualifier
Organic / Inorganic Carbon (QCLot: 1100971) - continued									
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	101	80.0	120	----
Total Metals (QCLot: 1103435)									
Aluminum, total	7429-90-5	E420	0.003	mg/L	2 mg/L	111	80.0	120	----
Antimony, total	7440-36-0	E420	0.0001	mg/L	1 mg/L	113	80.0	120	----
Arsenic, total	7440-38-2	E420	0.0001	mg/L	1 mg/L	113	80.0	120	----
Barium, total	7440-39-3	E420	0.0001	mg/L	0.25 mg/L	114	80.0	120	----
Beryllium, total	7440-41-7	E420	0.00002	mg/L	0.1 mg/L	106	80.0	120	----
Bismuth, total	7440-69-9	E420	0.00005	mg/L	1 mg/L	111	80.0	120	----
Boron, total	7440-42-8	E420	0.01	mg/L	1 mg/L	109	80.0	120	----
Cadmium, total	7440-43-9	E420	0.000005	mg/L	0.1 mg/L	111	80.0	120	----
Calcium, total	7440-70-2	E420	0.05	mg/L	50 mg/L	108	80.0	120	----
Cesium, total	7440-46-2	E420	0.00001	mg/L	0.05 mg/L	108	80.0	120	----
Chromium, total	7440-47-3	E420	0.0005	mg/L	0.25 mg/L	112	80.0	120	----
Cobalt, total	7440-48-4	E420	0.0001	mg/L	0.25 mg/L	111	80.0	120	----
Copper, total	7440-50-8	E420	0.0005	mg/L	0.25 mg/L	110	80.0	120	----
Iron, total	7439-89-6	E420	0.01	mg/L	1 mg/L	102	80.0	120	----
Lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	108	80.0	120	----
Lithium, total	7439-93-2	E420	0.001	mg/L	0.25 mg/L	95.4	80.0	120	----
Magnesium, total	7439-95-4	E420	0.005	mg/L	50 mg/L	113	80.0	120	----
Manganese, total	7439-96-5	E420	0.0001	mg/L	0.25 mg/L	111	80.0	120	----
Molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.25 mg/L	111	80.0	120	----
Nickel, total	7440-02-0	E420	0.0005	mg/L	0.5 mg/L	110	80.0	120	----
Phosphorus, total	7723-14-0	E420	0.05	mg/L	10 mg/L	113	80.0	120	----
Potassium, total	7440-09-7	E420	0.05	mg/L	50 mg/L	107	80.0	120	----
Rubidium, total	7440-17-7	E420	0.0002	mg/L	0.1 mg/L	118	80.0	120	----
Selenium, total	7782-49-2	E420	0.00005	mg/L	1 mg/L	106	80.0	120	----
Silicon, total	7440-21-3	E420	0.1	mg/L	10 mg/L	105	80.0	120	----
Silver, total	7440-22-4	E420	0.00001	mg/L	0.1 mg/L	101	80.0	120	----
Sodium, total	7440-23-5	E420	0.05	mg/L	50 mg/L	106	80.0	120	----
Strontium, total	7440-24-6	E420	0.0002	mg/L	0.25 mg/L	107	80.0	120	----
Sulfur, total	7704-34-9	E420	0.5	mg/L	50 mg/L	107	80.0	120	----
Tellurium, total	13494-80-9	E420	0.0002	mg/L	0.1 mg/L	107	80.0	120	----
Thallium, total	7440-28-0	E420	0.00001	mg/L	1 mg/L	109	80.0	120	----
Thorium, total	7440-29-1	E420	0.0001	mg/L	0.1 mg/L	103	80.0	120	----
Tin, total	7440-31-5	E420	0.0001	mg/L	0.5 mg/L	111	80.0	120	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Total Metals (QCLot: 1103435) - continued									
Titanium, total	7440-32-6	E420	0.0003	mg/L	0.25 mg/L	110	80.0	120	----
Tungsten, total	7440-33-7	E420	0.0001	mg/L	0.1 mg/L	109	80.0	120	----
Uranium, total	7440-61-1	E420	0.00001	mg/L	0.005 mg/L	106	80.0	120	----
Vanadium, total	7440-62-2	E420	0.0005	mg/L	0.5 mg/L	113	80.0	120	----
Zinc, total	7440-66-6	E420	0.003	mg/L	0.5 mg/L	110	80.0	120	----
Zirconium, total	7440-67-7	E420	0.0002	mg/L	0.1 mg/L	103	80.0	120	----
Volatile Organic Compounds (QCLot: 1101590)									
Benzene	71-43-2	E611D	0.5	µg/L	100 µg/L	89.6	70.0	130	----
Bromodichloromethane	75-27-4	E611D	0.5	µg/L	100 µg/L	80.5	70.0	130	----
Bromoform	75-25-2	E611D	0.5	µg/L	100 µg/L	75.9	70.0	130	----
Chloroform	67-66-3	E611D	0.5	µg/L	100 µg/L	86.6	70.0	130	----
Dibromochloromethane	124-48-1	E611D	0.5	µg/L	100 µg/L	78.8	70.0	130	----
Dichloromethane	75-09-2	E611D	1	µg/L	100 µg/L	82.2	70.0	130	----
Ethylbenzene	100-41-4	E611D	0.5	µg/L	100 µg/L	103	70.0	130	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611D	0.5	µg/L	100 µg/L	102	70.0	130	----
Tetrachloroethylene	127-18-4	E611D	0.5	µg/L	100 µg/L	92.8	70.0	130	----
Toluene	108-88-3	E611D	0.5	µg/L	100 µg/L	97.2	70.0	130	----
Trichloroethane, 1,1,1-	71-55-6	E611D	0.5	µg/L	100 µg/L	94.9	70.0	130	----
Trichloroethane, 1,1,2-	79-00-5	E611D	0.5	µg/L	100 µg/L	85.6	70.0	130	----
Trichloroethylene	79-01-6	E611D	0.5	µg/L	100 µg/L	88.8	70.0	130	----
Xylene, m+p-	179601-23-1	E611D	0.4	µg/L	200 µg/L	105	70.0	130	----
Xylene, o-	95-47-6	E611D	0.3	µg/L	100 µg/L	93.1	70.0	130	----

Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 1099480)										
WP2320433-001	Anonymous	Fluoride	16984-48-8	E235.F	1.03 mg/L	1 mg/L	103	75.0	125	----
Anions and Nutrients (QCLot: 1099481)										
WP2320433-001	Anonymous	Chloride	16887-00-6	E235.Cl-L	101 mg/L	100 mg/L	101	75.0	125	----
Anions and Nutrients (QCLot: 1099482)										
WP2320433-001	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	99.6 mg/L	100 mg/L	99.6	75.0	125	----
Anions and Nutrients (QCLot: 1101546)										
WP2320448-002	Anonymous	Ammonia, total (as N)	7664-41-7	E303	0.214 mg/L	0.25 mg/L	85.8	75.0	125	----
Organic / Inorganic Carbon (QCLot: 1099628)										
WP2320500-002	KLEEFELD 1 - RAW WELL 2 - BACKUP	Carbon, total organic [TOC]	----	E355-L	4.88 mg/L	5 mg/L	97.5	70.0	130	----
Organic / Inorganic Carbon (QCLot: 1100971)										
WP2320502-002	Anonymous	Carbon, dissolved organic [DOC]	----	E358-L	5.10 mg/L	5 mg/L	102	70.0	130	----
Total Metals (QCLot: 1103435)										
WP2320448-003	Anonymous	Aluminum, total	7429-90-5	E420	0.199 mg/L	0.2 mg/L	99.7	70.0	130	----
		Antimony, total	7440-36-0	E420	0.0198 mg/L	0.02 mg/L	99.2	70.0	130	----
		Arsenic, total	7440-38-2	E420	0.0202 mg/L	0.02 mg/L	101	70.0	130	----
		Barium, total	7440-39-3	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		Beryllium, total	7440-41-7	E420	0.0402 mg/L	0.04 mg/L	100	70.0	130	----
		Bismuth, total	7440-69-9	E420	0.0102 mg/L	0.01 mg/L	102	70.0	130	----
		Boron, total	7440-42-8	E420	0.102 mg/L	0.1 mg/L	102	70.0	130	----
		Cadmium, total	7440-43-9	E420	0.00398 mg/L	0.004 mg/L	99.6	70.0	130	----
		Calcium, total	7440-70-2	E420	ND mg/L	4 mg/L	ND	70.0	130	----
		Cesium, total	7440-46-2	E420	0.00986 mg/L	0.01 mg/L	98.6	70.0	130	----
		Chromium, total	7440-47-3	E420	0.0404 mg/L	0.04 mg/L	101	70.0	130	----
		Cobalt, total	7440-48-4	E420	0.0201 mg/L	0.02 mg/L	100	70.0	130	----
		Copper, total	7440-50-8	E420	0.0189 mg/L	0.02 mg/L	94.3	70.0	130	----
		Iron, total	7439-89-6	E420	2.09 mg/L	2 mg/L	105	70.0	130	----
		Lead, total	7439-92-1	E420	0.0198 mg/L	0.02 mg/L	99.0	70.0	130	----
		Lithium, total	7439-93-2	E420	0.0955 mg/L	0.1 mg/L	95.5	70.0	130	----
		Magnesium, total	7439-95-4	E420	ND mg/L	1 mg/L	ND	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Total Metals (QCLot: 1103435) - continued										
WP2320448-003	Anonymous	Manganese, total	7439-96-5	E420	0.0201 mg/L	0.02 mg/L	100	70.0	130	----
		Molybdenum, total	7439-98-7	E420	0.0208 mg/L	0.02 mg/L	104	70.0	130	----
		Nickel, total	7440-02-0	E420	0.0391 mg/L	0.04 mg/L	97.7	70.0	130	----
		Phosphorus, total	7723-14-0	E420	10.4 mg/L	10 mg/L	104	70.0	130	----
		Potassium, total	7440-09-7	E420	ND mg/L	4 mg/L	ND	70.0	130	----
		Rubidium, total	7440-17-7	E420	0.0204 mg/L	0.02 mg/L	102	70.0	130	----
		Selenium, total	7782-49-2	E420	0.0434 mg/L	0.04 mg/L	108	70.0	130	----
		Silicon, total	7440-21-3	E420	9.93 mg/L	10 mg/L	99.3	70.0	130	----
		Silver, total	7440-22-4	E420	0.00402 mg/L	0.004 mg/L	101	70.0	130	----
		Sodium, total	7440-23-5	E420	ND mg/L	2 mg/L	ND	70.0	130	----
		Strontium, total	7440-24-6	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		Sulfur, total	7704-34-9	E420	20.5 mg/L	20 mg/L	103	70.0	130	----
		Tellurium, total	13494-80-9	E420	0.0388 mg/L	0.04 mg/L	97.0	70.0	130	----
		Thallium, total	7440-28-0	E420	0.00393 mg/L	0.004 mg/L	98.3	70.0	130	----
		Thorium, total	7440-29-1	E420	0.0201 mg/L	0.02 mg/L	101	70.0	130	----
		Tin, total	7440-31-5	E420	0.0202 mg/L	0.02 mg/L	101	70.0	130	----
		Titanium, total	7440-32-6	E420	0.0405 mg/L	0.04 mg/L	101	70.0	130	----
		Tungsten, total	7440-33-7	E420	0.0207 mg/L	0.02 mg/L	103	70.0	130	----
		Uranium, total	7440-61-1	E420	0.00398 mg/L	0.004 mg/L	99.5	70.0	130	----
		Vanadium, total	7440-62-2	E420	0.102 mg/L	0.1 mg/L	102	70.0	130	----
		Zinc, total	7440-66-6	E420	0.400 mg/L	0.4 mg/L	100.0	70.0	130	----
		Zirconium, total	7440-67-7	E420	0.0436 mg/L	0.04 mg/L	109	70.0	130	----
Volatile Organic Compounds (QCLot: 1101590)										
WP2320256-001	Anonymous	Benzene	71-43-2	E611D	92.6 µg/L	100 µg/L	92.6	60.0	140	----
		Bromodichloromethane	75-27-4	E611D	84.7 µg/L	100 µg/L	84.7	60.0	140	----
		Bromoform	75-25-2	E611D	79.0 µg/L	100 µg/L	79.0	60.0	140	----
		Chloroform	67-66-3	E611D	89.1 µg/L	100 µg/L	89.1	60.0	140	----
		Dibromochloromethane	124-48-1	E611D	82.1 µg/L	100 µg/L	82.1	60.0	140	----
		Dichloromethane	75-09-2	E611D	85.4 µg/L	100 µg/L	85.4	60.0	140	----
		Ethylbenzene	100-41-4	E611D	104 µg/L	100 µg/L	104	60.0	140	----
		Methyl-tert-butyl ether [MTBE]	1634-04-4	E611D	103 µg/L	100 µg/L	103	60.0	140	----
		Tetrachloroethylene	127-18-4	E611D	91.0 µg/L	100 µg/L	91.0	60.0	140	----
		Toluene	108-88-3	E611D	96.9 µg/L	100 µg/L	96.9	60.0	140	----
		Trichloroethane, 1,1,1-	71-55-6	E611D	96.8 µg/L	100 µg/L	96.8	60.0	140	----
		Trichloroethane, 1,1,2-	79-00-5	E611D	88.7 µg/L	100 µg/L	88.7	60.0	140	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Volatile Organic Compounds (QCLot: 1101590) - continued										
WP2320256-001	Anonymous	Trichloroethylene	79-01-6	E611D	90.7 µg/L	100 µg/L	90.7	60.0	140	----
		Xylene, m+p-	179601-23-1	E611D	210 µg/L	200 µg/L	105	60.0	140	----
		Xylene, o-	95-47-6	E611D	94.7 µg/L	100 µg/L	94.7	60.0	140	----

Manitoba
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Chain of Custody (COC)
Manitoba Drinking Water Systems

Regular Service (default):	☐ Regular Service (is 5-7 Days):
Unless otherwise requested	☐ 1 Day, rush / priority ☐ 2 Day, rush / priority ☐ 3 Day, rush / priority

Report to Operator (email PDF):		**Report to Owner (email PDF):**		**Email PDF copy to:**	
Contact:	Barry Broesky	Contact:	Rob Driedger	DWO:	Sarah Belisle
Address:	28 Westland Drive, Mitchell, MB R5G 2N9	Address:	28 Westland Drive, Mitchell, MB R5G 2N9	DWO Address:	Unit B-284 Reimer Ave., Steinbach, MB R5G
Phone:	(204) 371-0484	Phone:	(204) 346-7121	DWO Phone:	(204) 371-5065
Email:	barry.broesky@hanovermb.ca; rob.driedger@hanovermb.ca; rob.friesen@hanovermb.ca	Email:	rob.driedger@hanovermb.ca	DWO Email:	Sarah.Belisle@gov.mb.ca
				Additional Email:	Joern.Muenster@gov.mb.ca; Melanie.Betsill@gov.mb.ca;

If an update in Owner or Operator contact information is required, please contact your Drinking Water Officer

Client / Project Information:	**Lab:**	**Account:**	Agency Code: 382	Report Type: EMS (Lab-MWS)	Project: DWQ-C

Operation Name:	KLEEFELD - PWS	Expected Sample Time:	**February-2023**
Operation Code:	104.00		
Operation ID:	7793		
Sampled by:	Rob Driedger		

Please record Free & Total Chlorine residuals for Distribution By-product Sampling

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

Sample Number	Station Number	Sample Identification	~~Free~~ MWD Chlorine (mg/L)	Total Chlorine (mg/L)	Sample Date dd-mmm-yyyy	Sample Time hh:mm	Sample Matrix	Sample Type	MB-CH-PWS-V2013	MB-MET-T-CCMS	MB-VOC-PWS-V2013	# of Containers
2302SB5005	MB05OED031	Kleefeld 1 - Raw Well 1			22-Aug-2023	9:45	6	1	X		X	6
2302SB5006	MB05OED031	Kleefeld 1 - Raw Well 2 - backup			22-Aug-2023	10:00	6	1	X		X	6
2302SB5007	MB05OED032	Kleefeld 2 - Treated			22-Aug-2023	10:15	10	1	X			4
2302SB5008	MB05OED033	Kleefeld 3 - Distribution mid-point 22 Aspen bay	1.30	5.1	22-Aug-2023	2:00	9	1		X		1

Environmental Division Winnipeg
Work Order Reference
WP2320500
Telephone : +1 204 255 9720

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.

Sample Matrix: 6-Raw Water, 9-Distributed Water,
Sample Type: 1-Grab Sample

Relinquished By:		Date & Time	AUG 23 2023	Validated By (lab use only):	Date & Tir
				Sample Condition (lab use only)	
Received By: (lab use only)		Date & Time: (lab use only)	~~AUG 32 2023~~	Temperature	Samples Received in Good Conditio

Appendix D

Operating License for Public Water System

Manitoba
Environment and Climate
Office of Drinking Water
Box 19 – 14 Fultz Boulevard, Winnipeg, Manitoba R3Y 0L6

OPERATING LICENCE FOR A PUBLIC WATER SYSTEM

LICENCE NUMBER: PWS-21-655-01

THE DRINKING WATER SAFETY ACT CHAPTER D101, C.C.S.M.

WATER SYSTEM CODE: **104.00**

OPERATION ID: **7793**

EFFECTIVE DATE: **JUNE 1, 2023**

EXPIRY DATE: **MAY 31, 2028**

IN ACCORDANCE WITH THE DRINKING WATER SAFETY ACT, THIS OPERATING LICENCE IS ISSUED PURSUANT TO SUBSECTION 8(1) TO:

RURAL MUNICIPALITY OF HANOVER: "THE LICENSEE"

FOR THE OPERATION OF THE **KLEEFELD PUBLIC WATER SYSTEM**, WHICH INCLUDES SECURE WELLS, TREATMENT FACILITIES, WATER STORAGE RESERVOIRS, AND DISTRIBUTION LINES, SUBJECT TO THE ATTACHED TERMS AND CONDITIONS.

THIS LICENCE DOES NOT AFFECT THE LICENSEE'S OBLIGATIONS WITH RESPECT TO COMPLIANCE WITH ALL APPLICABLE MUNICIPAL, PROVINCIAL, AND FEDERAL LEGISLATION. THIS LICENCE SUPERSEDES ALL PREVIOUS LICENCES FOR THIS PUBLIC WATER SYSTEM.

Digitally signed by Sacha Janzen
Date: 2023.10.31 11:34:32 -05'00'

DATE: October 31, 2023

Sacha Janzen
A/Director, Office of Drinking Water

TERMS AND CONDITIONS

1. GENERAL

1.1. The Licensee shall operate the public water system in accordance with all applicable requirements of The Drinking Water Safety Act and its regulations, and the requirements of this licence. In the event that specific terms and conditions of this licence imposed under the authority of subsection 8(3) of the Act exceed the general requirements of the Act and regulations, the specific requirements of this licence shall apply.

1.2. The Licensee shall obtain approval from the Office of Drinking Water prior to making any significant alterations to the water source, the water treatment process, the water storage facilities, or the water distribution system.

1.3. This licence may be amended by the director where, in the opinion of the director, an amendment is necessary and the amendment will not negatively impact the safety of water obtained from the water system, or effective environmental management.

1.4. The Licensee may request an amendment to this licence by submitting an amendment application to the Office of Drinking Water.

1.5. This licence may be suspended or cancelled by the director for any of the reasons identified in Section 11 of Manitoba Regulation 40/2007, Drinking Water Safety Regulation or due to a failure to comply with any term or condition of this licence.

1.6. The Licensee shall provide written notice to the Office of Drinking Water of any change in ownership of the water system within seven days of the transfer of ownership.

1.7. The Licensee shall provide written notice to the Office of Drinking Water of any changes in the operational status of the water system, such as a permanent cessation of service, or changing the length of service from year-round to seasonal or the opposite.

1.8. The director of the Office of Drinking Water, medical officer of health or drinking water officer may enter any water system facility as necessary to carry out the provisions of The Drinking Water Safety Act and its regulations.

1.9. The Licensee shall post a copy of the first page of this licence at the water treatment facility.

1.10. The Licensee shall keep a copy of this licence in its entirety at a location established by the drinking water officer and ensure all operators are familiar with its terms and conditions.

1.11. The Licensee shall apply for renewal of this licence at least 60 days prior to its expiry.

2. OPERATION - GENERAL

2.1. The Licensee shall operate all water system facilities, control systems, equipment, any reservoirs/cisterns and/or distribution lines as efficiently as possible, inspect them on a regular basis, maintain them in good working order, and ensure that the water system is protected from the risks associated with contamination.

2.2. The Licensee shall ensure that all chemicals and components that may come into contact with potable water are certified safe for potable water use through AWWA Standards, ANSI/NSF Standard 60 or 61, Health Canada, or other standards acceptable to the director.

2.3. No alternate water source shall be brought into service without the consent of the drinking water officer and the maintenance of adequate cross connection control between the alternate source and the primary source.

2.4. The Licensee shall follow the requirements as specified in *Operational Guideline ODW-OG-02 Seasonal Water Systems Start-up Shut-down Procedures* for any portion(s) of the distribution system that operate on a seasonal basis.

2.5. The Licensee shall have re-assessments of the water system infrastructure and water supply sources completed by a qualified person, who is not an employee of the water system, in accordance with assessment checklist GW by March 1, 2021, and every five years thereafter. The Licensee may instead have the assessment completed by a qualified professional engineer, who is not an employee of the water system, in accordance with terms of reference for engineering assessments.

2.6. The Licensee shall, upon request from the Office of Drinking Water, submit or re-submit a compliance plan, in a form satisfactory to the director, to address any non-compliance issues identified at the time.

3. OPERATION – EMERGENCIES

3.1. The Licensee shall ensure that disinfection is undertaken following construction, repair or maintenance activities on the water system, in accordance with applicable AWWA standards, or Manitoba Water Services Board specifications, or any other standards approved by the director. A copy of all associated test results must be kept available for review by the Office of Drinking Water for a minimum of 24 months.

3.2. The Licensee shall ensure that all equipment used for disinfection is maintained in effective working order and keep available for immediate use all spare parts and chemical supplies as may be necessary to ensure continuous disinfection, including a spare disinfection unit, if necessary.

3.3. The Licensee shall immediately notify the Office of Drinking Water of any condition that may affect the ability of the water system to produce or deliver safe drinking water including but not limited to treatment upsets or bypass conditions, contamination of the source water or treated water, a disinfection system failure, or a distribution system failure.

3.4. If a medical officer of health, the director of the Office of Drinking Water, or a drinking water officer issues a water advisory on the water system, the Licensee shall provide notice of the advisory to all water users in accordance with the advisory notification plan or by a method acceptable to the issuer.

4. WATER QUALITY/TREATMENT STANDARDS

4.1. The Licensee shall operate the water system in a manner that achieves the water quality/treatment standards specified in Table 1, as determined through the monitoring requirements specified in Table 2:

Table 1: Water Quality/Treatment Standards

Parameter	Quality Standard
Total coliform	Less than one total coliform bacteria detectable per 100 mL in all treated and distributed water
E. coli	Less than one *E. coli* bacteria detectable per 100 mL in all treated and distributed water
Ultraviolet Disinfection	95% of water produced per month is disinfected within validated conditions
Monochloramine	A monochloramine residual of at least 0.3 mg/L at all times at any point in the water distribution system
Arsenic	Less than or equal to 0.01 mg/L
Barium	Less than or equal to 2.0 mg/L
Benzene	Less than or equal to 0.005 mg/L
Ethylbenzene	Less than or equal to 0.14 mg/L
Fluoride	Less than or equal to 1.5 mg/L
Lead	Less than or equal to 0.005 mg/L based on a sample(s) collected at a cold water tap or other appropriate location where water may be used for drinking or food preparation
Manganese	Less than or equal to 0.12 mg/L
Nitrate	Less than or equal to 45 mg/L measured as nitrate (10 mg/L measured as nitrogen)
Nitrite	Less than or equal to 3 mg/L measured as nitrite (1 mg/L measured as nitrogen)
Trichloroethylene	Less than or equal to 0.005 mg/L
Tetrachloroethylene	Less than or equal to 0.01 mg/L
Toluene	Less than or equal to 0.06 mg/L
Total Xylenes	Less than or equal to 0.09 mg/L
Uranium	Less than or equal to 0.02 mg/L

4.2. If a bacteriological standard is not met, the Licensee shall immediately undertake the applicable corrective actions as listed in "Schedule A" of Manitoba Regulation 41/2007, Drinking Water Quality Standards Regulation.

4.3. If a microbial, chemical, radiological, or physical standard is not met, the Licensee shall immediately undertake the applicable corrective actions specified in "Schedule C" of Manitoba Regulation 41/2007, the Drinking Water Quality Standards Regulation.

4.4. The Licensee shall maintain in effective working order ultraviolet (UV) light disinfection equipment and controls for primary disinfection that result in greater than or equal to 95% of the water produced per month undergoing UV light disinfection within validated conditions and at a minimum dose of 40 mJ/cm^2.

5. WATER QUALITY MONITORING

5.1. The Licensee shall ensure monitoring is completed as set out in Table 2.

Table 2: Monitoring Schedule

Parameter	Monitoring Requirement
Bacteriological (total coliform and *E. coli*)	Biweekly sampling program with each set of samples consisting of one raw, one treated, and a minimum of one distribution sample Consecutive sample sets to be separated by at least 12 days
Ultraviolet Disinfection	Daily operation verification of continuous UV unit monitoring
UV Transmittance (UVT)	One sample per week of water entering the UV disinfection units
Monochloramine (treated water)	One sample per day of water entering the distribution system
Monochloramine (distribution system)	At the same times and location(s) as bacteriological distribution system sampling
Total Chlorine (treated water)	One sample per week of water entering the distribution system
Total Chlorine (distribution system)	At the same times and location(s) as bacteriological distribution system sampling
Free Ammonia (treated water)	One sample per week of water entering the distribution system
Free Ammonia (distribution system)	At the same times and location(s) as bacteriological distribution system sampling
Nitrite and Nitrate (distribution system)	One sample taken during July or August every year at a dead end sampling location in the distribution system
General Chemistry (parameter list provided by Office of Drinking Water)	One raw and one treated water sample once every three years
Total Metals (distribution system)	One sample taken at the same time(s) as general chemistry sampling at a mid-point in the distribution system
Barium	One raw, one treated, and one distribution water sample every year
Lead	As per the instructions of the drinking water officer
Manganese	Monitoring included in the general chemistry and total metals analysis
Other Parameters	As per the instructions of the drinking water officer

5.2. The Licensee shall ensure that an accredited laboratory, as specified in section 35 of Manitoba Regulation 40/2007 the Drinking Water Safety Regulation, undertake the following analysis required in Table 2:

a) bacteriological (total coliform and *E. coli*)
b) barium
c) nitrite and nitrate
d) general chemistry
e) manganese
f) total metals
g) any other parameter required by the drinking water officer

and that all samples are collected, handled, and submitted in a manner that is satisfactory to the accredited laboratory.

5.3. The Licensee shall ensure that parameters listed in Table 2 but not specified in clause 5.2 are measured utilizing certified water quality monitoring equipment and methods approved by the latest edition of *Standard Methods for the Examination of Water and Wastewater* published jointly by the American Public Health Association, the American Water Works Association and the Water Environment Federation.

5.4. The Licensee shall ensure that all water quality monitoring equipment is properly maintained and calibrated by a qualified person according to manufacturer recommendations and that records are maintained to that effect.

5.5. The Licensee shall ensure that sampling within the distribution system takes place at varied locations acceptable to the drinking water officer.

6. RECORD-KEEPING AND REPORTING

6.1. The Licensee shall maintain in a secure location all construction drawings for the life of the water system components.

6.2. The Licensee shall retain in chronological order for a minimum of 24 months all information specified in subsection 34(2) of Manitoba Regulation 40/2007, Drinking Water Safety Regulation.

6.3. The Licensee shall ensure the information identified in clause 6.2 is available for inspection by any member of the public during normal business hours at the office of the water supplier or at a location convenient to the users of the system.

6.4. The Licensee shall record disinfectant residual measurements on the monthly disinfection report or other forms satisfactory to the director.

6.5. The Licensee shall record other measurements as specified in *Table 2: Monitoring Schedule* on the monthly report forms or other forms satisfactory to the director.

6.6. The Licensee shall record UV alarms and maintenance procedures performed on the water system and its supporting equipment on the monthly UV report forms or other forms satisfactory to the director.

6.7. The Licensee shall record validated UV condition verifications on the monthly report forms or other forms satisfactory to the director.

6.8. The Licensee shall keep one copy of all monthly report forms required in this licence, and forward the original copy to the drinking water officer within seven days after the end of each calendar month.

6.9. The Licensee shall record all distribution system measurements specified in *Table 2: Monitoring Schedule* on the chain of custody form (laboratory submission form) which accompanies the bacteriological sample bottles to the laboratory.

6.10. The Licensee shall ensure that water metering devices at the water treatment plant or storage reservoir are maintained in good working order and that flow meter readings are recorded on a daily basis and such records are made available for inspection by a drinking water officer.

6.11. The Licensee shall submit an annual report to the director by March 31st of each year on the operation of the water system in the immediately preceding calendar year. The report shall include the information as set out in subsection 32(2) of Manitoba Regulation 40/2007, Drinking Water Safety Regulation.

6.12. The Licensee shall inform the public, in a form satisfactory to the director, when an annual report has been prepared and identify how a free copy can be obtained.

6.13. The Licensee shall make a copy of each annual report available to the public at no charge on an internet website within two weeks of the issuance of the report, unless otherwise approved by the director. The annual report shall remain available to the public for at least one year.

6.14. The Licensee shall maintain and submit an advisory notification plan to the drinking water officer by May 1st of each year. The plan must include a detailed description of communication tools and methods to be used to notify the public of a drinking water emergency, considering key contacts, fan-outs, critical customers, susceptible or difficult-to-reach sub-groups, and template notices where applicable.

Appendix E

Monochloramine and UV Reports

Manitoba

Monthly Chloramination Report

Water System Name: KLEEFELD **Water System Code:** 104.0

Month: JANUARY **Year:** 2024 **Type of Measurement Device:** ELECTRONIC

Operator-in-charge (Print): BARRY BROESKY **Other Operators (Print):** ROB FRIESEN

Daily Consumption Units: m^3 STEPH DOSAL

Flow Meter for Daily Consumption: (circle choice) Raw (Treated) No Metering

Date	Time	Initials	Residuals (mg/L)		Daily Consumption
			Mono	Total	
1	8:15	B.B	2.66		204
2	7:00	B.B	2.63		234
3	7:00	B.B.	2.57		214
4	7:00	B B	2.53		211
5	6:45	B.B	2.64	4.2	222
6	7:15	B B	2.60		222
7	9:30	B.B	2.78		280
8	7:00	R.F.	2.99		221
9	8:00	R.F.	2.63		233
10	7:00	R.F.	2.83		210
11	7:00	R.F.	2.73		208
12	7:00	R.F.	2.61	4.7	228
13	7:30	R.F.	2.03		216
14	11:30	R.F.	2.66		290
15	7:30	R.F.	2.23		191
16	7:00	R.F.	2.91		217

Date	Time	Initials	Residuals (mg/L)		Daily Consumption
			Mono	Total	
17	6:15	R.F.	3.04		210
18	8:00	R.F.	2.73		232
19	8:00	R.F.	2.83	4.7	214
20	7:30	B.B	2.73		205
21	10:00	B B	3.00		266
22	6:30	B B.	2.96		215
23	7:00	B.B.	2.82		230
24	8:00	R.F.	3.15		226
25	7:00	R.F.	2.90		198
26	8:30	R.F.	3.53	4.2	249
27	9:00	R.F.	3.14		210
28	9:00	R.F.	3.26		247
29	7:00	B B.	3.00		207
30	7:00	B.B.	2.93		228
31	7:00	B.B.	2.80		218
				Total Monthly Consumption	6,956

Ammonia in Treated Water

Date	Time	Initials	Ammonia (mg/L)
5	7:00	B.B	0.00
12	7:00	R.F.	0.01

Date	Time	Initials	Ammonia (mg/L)
19	8:00	R.F.	0.00
26	8:30	R.F.	0.00

Date	Time	Initials	Ammonia (mg/L)

Residuals at Distribution Sample Locations

Date	Time	Initials	Location	Residuals (mg/L)		
				Mono	Total	Ammonia
9	8:30	R.F.	Main Street	1.51	3.6	0.0
23	9:45	B.B.	7 Main St.	3.10	4.6	0.00

Submitted by (Print): BARRY BROESKY **Signature:** T Barry Broesky

PLEASE REFER TO OPERATING LICENCE FOR APPLICABLE TREATMENT STANDARDS AND MONITORING REQUIREMENTS.
PLEASE CONTACT YOUR DRINKING WATER OFFICER WITH ANY COMMENTS, QUESTIONS OR CONCERNS.

Monthly Ultraviolet (UV) Report

Water System Name: KLEEFELD Water System Code: 104.0

Month: JANUARY Year: 2024

Operator-in-charge (Print): BARRY BRODSKY Other Operators (Print): ROB FRIESEN

Unit: mJ/cm2 STEPH DOOM

Date	Time	Operator Initials	UV Dose mJ/cm2	Number of Alarms (A) or Warnings (W)
1	8:30	B.B	64.27	-
2	7:00	B.B	63.52	-
3	7:00	B.B	63.52	-
4	7:15	B.B	63.52	-
5	7:00	B.B	63.52	-
6	7:30	B.B	63.49	-
7	9:45	B.B	63.49	-
8	7:00	R.F.	63.49	-
9	8:00	R.F.	64.06	-
10	7:00	R.F.	63.49	-
11	7:00	R.F.	63.49	-
12	7:00	R.F.	63.06	-
13	7:30	R.F.	63.69	-
14	11:30	R.F.	63.69	-
15	7:30	R.F.	63.69	-
16	7:00	R.F.	63.69	-

Date	Time	Operator Initials	UV Dose mJ/cm2	Number of Alarms (A) or Warnings (W)
17	6:15	R.F.	63.69	-
18	8:00	R.F.	63.69	-
19	~~7:45~~ 8:00	~~B.B~~ R.F.	~~63.64~~ ~~64.27~~	-
20	7:45	B.B.	~~64.27~~ ~~63.69~~	-
21	10:00	B.B	63.69	-
22	6:45	B.B.	63.69	-
23	7:15	B.B.	63.69	-
24	8:00	R.F.	63.69	-
25	7:00	R.F.	63.69	-
26	8:30	R.F.	63.69	-
27	9:00	R.F.	63.69	-
28	9:00	R.F.	63.69	-
29	7:15	B.B.	63.69	-
30	7:15	B.B	63.69	-
31	7:15	B.B.	63.69	-

Date	UVT readings and Alarm or Warning History and actions taken to resolve
5	UVT TEST: 80.5
12	UVT TEST: 81.7
19	UVT TEST: 81.2
26	UVT TEST: 81.0

Submitted by (Print): BARRY BRODSKY Signature: B Brodsky

PLEASE REFER TO OPERATING LICENCE FOR APPLICABLE TREATMENT STANDARDS AND MONITORING REQUIREMENTS.
PLEASE CONTACT YOUR DRINKING WATER OFFICER WITH ANY COMMENTS, QUESTIONS OR CONCERNS.

Manitoba

Monthly Chloramination Report

Water System Name: KLEEFELD **Water System Code:** 1040

Month: FEBRUARY **Year:** 2024 **Type of Measurement Device:** ELECTRONIC

Operator-in-charge (Print): BARRY BROESKY **Other Operators (Print):** ROB FRIESEN

Daily Consumption Units: m^3 STEPH DUVAL

Flow Meter for Daily Consumption: (circle choice) Raw (Treated) No Metering

Date	Time	Initials	Residuals (mg/L)		Daily Consumption
			Mono	Total	
1	7:00	B.B.	2.88		218
2	7:00	B.B.	2.91	4.0	214
3	7:00	B.B.	3.12		222
4	8:45	B.B.	2.88		270
5	8:00	R.F.	3.01		242
6	8:30	R.F.	2.96		225
7	7:00	R.F.	2.99		207
8	8:00	R.F.	3.16		224
9	8:30	R.F.	2.65	4.0	229
10	9:00	R.F.	3.08		218
11	5:30	R.F.	3.16		230
12	7:00	B.B.	3.04		244
13	7:00	B.B.	2.82		236
14	7:00	B.B.	2.15		221
15	7:00	B.B.	2.34		219
16	7:00	B.B.	2.57	3.2	227

Date	Time	Initials	Residuals (mg/L)		Daily Consumption
			Mono	Total	
17	7:15	B.B	2.57		209
18	9:00	B.B.	2.72		252
19	6:45	B.B.	2.76		189
20	8:00	R.F	3.01		273
21	8:00	R.F.	3.37		220
22	7:00	R.F.	3.16		206
23	8:00	R.F.	2.87	3.9	220
24	8:00	R.F.	3.04		216
25	5:30	R.F.	3.02		221
26	8:45	S.D	2.93		263
27	7:15	S.D.	2.46		200
28	7:00	S.D.	2.04		221
29	7:00	B.B.	3.08		215
30					
31					
				Total Monthly Consumption	6,336

Ammonia in Treated Water

Date	Time	Initials	Ammonia (mg/L)
2	7:00	B.B.	0.00
9	8:30	R.F.	0.00

Date	Time	Initials	Ammonia (mg/L)
16	7:00	B.B.	0.00
23	8:00	R.F.	0.06

Date	Time	Initials	Ammonia (mg/L)

Residuals at Distribution Sample Locations

Date	Time	Initials	Location	Residuals (mg/L)		
				Mono	Total	Ammonia
6	8:45	R.F.	Main Street	2.98	4.2	0.07
20	8:45	R.F.	Main Street	2.05	3.7	0.09

Submitted by (Print): BARRY BROESKY **Signature:**

PLEASE REFER TO OPERATING LICENCE FOR APPLICABLE TREATMENT STANDARDS AND MONITORING REQUIREMENTS.
PLEASE CONTACT YOUR DRINKING WATER OFFICER WITH ANY COMMENTS, QUESTIONS OR CONCERNS.

Monthly Ultraviolet (UV) Report

Water System Name: KLEEFELD Water System Code: 104.0

Month: FEBRUARY Year: 2024

Operator-in-charge (Print): BARRY BROESKY Other Operators (Print): RUB FRIESEN

Unit: mj/cm2 STEPH DUVAL

Date	Time	Operator Initials	UV Dose mJ/cm2	Number of Alarms (A) or Warnings (W)
1	7:15	B.B.	64.44	--
2	7:15	B.B.	63.69	--
3	7:15	B.B.	63.52	--
4	9:00	B.B.	64.27	--
5	8:00	R.F.	63.52	--
6	8:30	R.F.	64.10	--
7	7:00	R.F.	64.27	--
8	8:00	R.F.	63.52	--
9	8:30	R.F.	64.10	--
10	9:00	R.F.	64.10	--
11	5:30	R.F.	63.52	--
12	7:00	B.B.	63.52	--
13	7:15	B.B.	63.52	--
14	7:15	B.B.	63.52	--
15	7:00	B.B.	63.52	--
16	7:00	B.B.	69.38	--

Date	Time	Operator Initials	UV Dose mJ/cm2	Number of Alarms (A) or Warnings (W)
17	7:30	B.B.	63.60	--
18	9:15	B.B.	63.60	--
19	7:00	B.B.	63.60	--
20	8:00	R.F.	63.60	--
21	8:00	R.F.	63.60	--
22	7:00	R.F.	63.60	--
23	8:00	R.F.	63.60	--
24	8:00	R.F.	63.60	--
25	5:30	R.F.	63.60	--
26	8:30	S.D.	63.59	--
27	7:15	S.D.	63.59	--
28	7:00	S.D.	63.59	--
29	7:15	B.B.	62.83	--
30				
31				

Date	UVT readings and Alarm or Warning History and actions taken to resolve
2	UVT TEST : 80.8
9	UVT TEST : 80.9
16	UVT TEST 81.3
23	UVTTEST 81.2

Submitted by (Print): BARRY BROESKY Signature:

PLEASE REFER TO OPERATING LICENCE FOR APPLICABLE TREATMENT STANDARDS AND MONITORING REQUIREMENTS.
PLEASE CONTACT YOUR DRINKING WATER OFFICER WITH ANY COMMENTS, QUESTIONS OR CONCERNS.

Manitoba

Monthly Chloramination Report

Water System Name: KLEEFELD **Water System Code:** 104.0

Month: MARCH **Year:** 2024 **Type of Measurement Device:** ELECTRONIC

Operator-in-charge (Print): BARRY BROESKY **Other Operators (Print):** ROB FRIESEN

Daily Consumption Units: m^3 STEPH DUVAL

Flow Meter for Daily Consumption: (circle choice) Raw (Treated) No Metering

Date	Time	Initials	Residuals (mg/L)		Daily Consumption
			Mono	Total	
1	7:00	B.B.	3.08	3.8	217
2	7:30	B.B.	2.81		215
3	9:30	B.B.	2.99		271
4	7:00	R.F.	2.82		221
5	8:00	R.F.	2.58		249
6	8:00	R.F.	2.61		230
7	8:00	R.F.	2.81		233
8	8:00	R.F.	2.88	3.1	210
9	8:30	R.F.	3.16	~~3.1~~	227
10	11:00	R.F.	3.07		269
11	7:00	B.B.	2.99		195
12	7:00	B.B.	3.10		233
13	7:00	B.B.	3.08		225
14	7:~~65~~	B.B.	3.10		227
15	7:00	B.B.	3.01	4.0	229
16	7:15	B.B.	2.93		222

Date	Time	Initials	Residuals (mg/L)		Daily Consumption
			Mono	Total	
17	9:30	B.B.	3.04		277
18	8:00	R.F.	3.09		243
19	8:00	R.F.	3.19		228
20	7:00	R.F.	3.04		215
21	7:00	R.F.	3.03		222
22	7:00	R.F.	3.21	3.7	234
23	9:00	R.F.	3.32		233
24	11:30	R.F.	3.07		301
25	8:00	R.F.	2.99		190
26	8:00	R.F.	3.16		229
27	6:30	R.F.	3.10		200
28	8:00	R.F.	3.06	4.5	232
29	5:30	R.F.	3.59		198
30	6:15	B.B.	3.04		230
31	9:00	B.B.	3.04		259
				Total Monthly Consumption	7164

Ammonia in Treated Water

Date	Time	Initials	Ammonia (mg/L)
1	7:00	B.B.	0.00
8	8:00	R.F.	0.21

Date	Time	Initials	Ammonia (mg/L)
15	7:00	B.B.	0.00
22	7:00	R.F.	0.00

Date	Time	Initials	Ammonia (mg/L)
28	8:00	R.F.	0.00

Residuals at Distribution Sample Locations

Date	Time	Initials	Location	Residuals (mg/L)		
				Mono	Total	Ammonia
5	8:30	R.F.	Main St.	1.83	3.5	0.10
19	9:45	B.B.	MAIN ST.	3.11	4.2	0.00

Submitted by (Print): BARRY BROESKY **Signature:**

PLEASE REFER TO OPERATING LICENCE FOR APPLICABLE TREATMENT STANDARDS AND MONITORING REQUIREMENTS.
PLEASE CONTACT YOUR DRINKING WATER OFFICER WITH ANY COMMENTS, QUESTIONS OR CONCERNS.

Monthly Ultraviolet (UV) Report

Water System Name: KLEEFELD Water System Code: 104.0

Month: MARCH Year: 2024

Operator-in-charge (Print): BARRY BROESKY Other Operators (Print): ROB FRIESEN

STEPH DUVAL

Unit: mj/cm2

Date	Time	Operator Initials	UV Dose mJ/cm2	Number of Alarms (A) or Warnings (W)
1	7:15	B B	63.59	–
2	7:30	B B	63.49	–
3	9:30	B B	63.49	–
4	7:00	R.F.	63.44	–
5	8:00	R.F.	141.65	–
6	8:00	R.F.	63.49	–
7	8:00	R.F.	63.49	–
8	8:00	R.F.	63.49	–
9	8:30	R.F.	63.49	–
10	11:00	R.F.	65.16	–
11	7:15	B.B.	65.16	–
12	7:15	B B	65.16	–
13	7:00	B B	65.16	–
14	7:30	B.B.	65.16	–
15	7:15	B.B	65.16	–
16	7:30	B.B.	63.45	–

Date	Time	Operator Initials	UV Dose mJ/cm2	Number o Alarms (A) or Warnings (W)
17	9:30	B B	64.20	–
18	8:00	R.F.	64.20	–
19	8:00	R.F.	64.61	–
20	7:00	R.F.	64.20	–
21	7:00	R.F.	64.20	–
22	7:00	R.F.	64.02	–
23	7:00	R.F.	63.45	–
24	11:30	R.F.	63.45	–
25	8:00	R.F.	63.45	–
26	8:00	R.F.	63.45	–
27	6:30	R.F.	63.45	–
28	7:00	R.F.	63.45	–
29	5:30	R.F.	63.45	–
30	6:30	B.B.	64.60	–
31	9:00	B.B.	64.60	–

Date	UVT readings and Alarm or Warning History and actions taken to resolve
1	UVT TEST: 80.5
8	UVT TEST: 85.2
15	UVT TEST: 79.9
22	UVT TEST: 79.2
28	UVT TEST 74.9

Submitted by (Print): BARRY BROESKY Signature:

PLEASE REFER TO OPERATING LICENCE FOR APPLICABLE TREATMENT STANDARDS AND MONITORING REQUIREMENTS.
PLEASE CONTACT YOUR DRINKING WATER OFFICER WITH ANY COMMENTS, QUESTIONS OR CONCERNS.

Manitoba

Monthly Chloramination Report

Water System Name: Kleefeld Water System Code: 104.0

Month: April Year: 2024 Type of Measurement Device: Electronic

Operator-in-charge (Print): Rob Froesen Other Operators (Print): Barry Broesky

Steph Douse

Daily Consumption Units: m3

Flow Meter for Daily Consumption: (circle choice) Raw **(Treated)** No Metering

Date	Time	Initials	Residuals (mg/L) Mono	Total	Daily Consumption
1	7:30	R.F.	3.16		214
2	8:30	R.F.	3.22		253
3	8:00	R.F	3.29		222
4	8:00	R.F.	3.20		224
5	8:00	R.F.	3.20	4.0	235
6	8:30	R.F.	3.05		227
7	11:00	R.F.	3.27		286
8	7:00	B.B.	2.96		190
9	7:00	BB	2.89		244
10	7:15	B.B.	2.70		233
11	7:00	B.B	2.64		222
12	7:15	B.B.	2.88	3.4	239
13	6:30	B.B.	2.91		218
14	10:45	B.B.	3.00		312
15	8:00	R.F	2.97		195
16	8:00	R.F.	3.02		246

Date	Time	Initials	Residuals (mg/L) Mono	Total	Daily Consumption
17	8:00	R.F.	2.97		219
18	6:30	R.F.	2.94		222
19	7:00	R.F.	3.00	3.9	241
20	9:30	R.F.	3.13		267
21	11:15	R.F.	3.21		297
22	7:00	B.B.	2.87		190
23	6:45	B.B.	2.77		237
24	7:00	B.B.	2.84		247
25	7:00	B.B.	2.88		234
26	7:30	B.B.	2.86	3.6	254
27	6:30	B.B.	2.75		214
28	10:30	B.B.	2.58		289
29	7:30	R.F	3.07		203
30	8:30	R.F.	2.85		247
31					
				Total Monthly Consumption	

Ammonia in Treated Water

Date	Time	Initials	Ammonia (mg/L)
5	8:00	R.F	0.00
12	7:15	B.B.	0.08

Date	Time	Initials	Ammonia (mg/L)
19	7:00		0.01
26	7:30	B.B.	0.14

Date	Time	Initials	Ammonia (mg/L)

Residuals at Distribution Sample Locations

Date	Time	Initials	Location	Residuals (mg/L) Mono	Total	Ammonia
2	9:00	R.F	Main Street	1.88	3.1	0.04
16	8:45	R.F.	Main Street	3.07	4.1	0.14
30	8:45	R.F.	Main Street	2.91	3.6	0.09

Submitted by (Print): Rob Froesen Signature: [signature]

PLEASE REFER TO OPERATING LICENCE FOR APPLICABLE TREATMENT STANDARDS AND MONITORING REQUIREMENTS.
PLEASE CONTACT YOUR DRINKING WATER OFFICER WITH ANY COMMENTS, QUESTIONS OR CONCERNS.

Manitoba

Monthly Ultraviolet (UV) Report

Water System Name: Kleefeld **Water System Code:** 104.0

Month: April **Year:** 2024

Operator-in-charge (Print): Rob Fresh **Other Operators (Print):** Barry Brearley, Steph Duval

Unit: mj/cm^2

Date	Time	Operator Initials	UV Dose mJ/cm2	Number of Alarms (A) or Warnings (W)
1	7:30	R.F.	64.60	–
2	8:30	R.F.	64.60	–
3	8:00	R.F.	64.60	–
4	8:00	R.F.	64.60	–
5	8:00	R.F.	64.60	–
6	8:30	R.F.	63.64	–
7	11:00	R.F.	63.64	
8	7:15	B.B.	63.64	–
9	7:00	B.B.	63.64	–
10	7:30	B.B.	63.64	–
11	7:15	B.B.	63.64	–
12	7:30	B.B.	63.64	–
13	6:45	B.B.	62.93	–
14	11:00	B.B.	62.93	–
15	8:00	R.F.	62.93	–
16	8:30	R.F.	62.17	–

Date	Time	Operator Initials	UV Dose mJ/cm2	Number of Alarms (A) or Warnings (W)
17	8:00	R.F.	62.17	–
18	6:30	R.F.	62.17	–
19	7:00	R.F.	62.17	–
20	9:30	R.F.	63.94	–
21	11:15	R.F.	63.94	
22	7:00	B.B.	63.94	–
23	7:00	B.B.	63.94	–
24	7:00	B.B.	62.41	–
25	7:15	B.B.	62.41	–
26	7:30	B.B.	63.18	–
27	6:30	B.B.	63.50	–
28	10:30	B.B.	61.99	–
29	7:30	R.F.	63.50	–
30	8:30	R.F.	63.50	–
31				

Date	UVT readings and Alarm or Warning History and actions taken to resolve
5	UVT TEST - 81.5
12	UVT TEST: 81.7
19	UVT TEST: 82.6
26	UVT TEST: 80.6

Submitted by (Print): Rob Fresh **Signature:**

PLEASE REFER TO OPERATING LICENCE FOR APPLICABLE TREATMENT STANDARDS AND MONITORING REQUIREMENTS.
PLEASE CONTACT YOUR DRINKING WATER OFFICER WITH ANY COMMENTS, QUESTIONS OR CONCERNS.

Manitoba

Monthly Chloramination Report

Water System Name: Kleefeld Water System Code: 104.0

Month: May Year: 2024 Type of Measurement Device: Electronic

Operator-in-charge (Print): Rob Friesen Other Operators (Print): Barry Biesky, Colleen Mowat

Daily Consumption Units: m^3

Flow Meter for Daily Consumption: (circle choice) Raw (Treated) No Metering

Date	Time	Initials	Residuals (mg/L) Mono	Residuals (mg/L) Total	Daily Consumption
1	8:30	R.F.	2.94		252
2	8:00	R.F.	2.89		224
3	7:30	R.F.	2.75	3.6	228
4	9:00	R.F.	2.94		237
5	11:30	R.F.	2.90		301
6	7:00	B.B.	2.81		224
7	6:45	B.B.	1.32		265
8	7:00	B.B.	1.68		242
9	7:00	B.B.	2.05		256
10	7:00	B.B.	2.91	3.8	572
11	5:45	B.B.	3.01		463
12	9:45	B.B.	3.15		361
13	8:00	R.F.	3.26		288
14	7:45	R.F.	3.16		277
15	7:00	R.F.	3.38		269
16	7:00	R.F.	3.09		250

Date	Time	Initials	Residuals (mg/L) Mono	Residuals (mg/L) Total	Daily Consumption
17	10:15	R.F.	3.18	4.7	293
18	8:30	R.F.	3.29		217
19	11:00	R.F.	3.35		291
20	9:00	R.F.	2.87		201
21	7:00	B.B.	3.19		326
22	7:00	B.B.	3.16		273
23	7:00	B.B.	3.15		260
24	7:00	B.B.	2.63	3.5	251
25	6:15	B.B.	2.75		214
26	7:15	B.B.	2.95		263
27	8:00	R.F.	2.51		297
28	9:00	CM	2.94		281
29	8:30	R.F.	2.90		297
30	8:00	R.F.	2.95		282
31	8:00	R.F.	2.97	3.9	259
				Total Monthly Consumption	8705

Ammonia in Treated Water

Date	Time	Initials	Ammonia (mg/L)
3	7:30	R.F.	0.05
10	7:00	B.B.	0.26

Date	Time	Initials	Ammonia (mg/L)
17	10:15	R.F.	0.16
24	7:00	B.B.	0.08

Date	Time	Initials	Ammonia (mg/L)
31	8:00	R.F.	0.12

Residuals at Distribution Sample Locations

Date	Time	Initials	Location	Residuals (mg/L) Mono	Residuals (mg/L) Total	Residuals (mg/L) Ammonia
14	9:30	R.F.	Main St.	3.27	4.5	0.04
28	8:20	R.F.	Main St.	2.44	3.5	0.21

Submitted by (Print): Rob Friesen Signature:

PLEASE REFER TO OPERATING LICENCE FOR APPLICABLE TREATMENT STANDARDS AND MONITORING REQUIREMENTS.
PLEASE CONTACT YOUR DRINKING WATER OFFICER WITH ANY COMMENTS, QUESTIONS OR CONCERNS.

Manitoba

Monthly Ultraviolet (UV) Report

Water System Name: Kleefeld **Water System Code:** 104.0

Month: May **Year:** 2024

Operator-in-charge (Print): Rob Friesen **Other Operators (Print):** Barry Borecky, Colleen Mowat

Unit: mJ/cm^2

Date	Time	Operator Initials	UV Dose mJ/cm2	Number of Alarms (A) or Warnings (W)
1	8:30	R.F.	63.50	—
2	8:00	R.F.	62.75	—
3	7:30	R.F.	64.66	—
4	9:00	R.F.	62.19	—
5	11:30	R.F.	63.64	—
6	7:15	B.B.	63.64	—
7	7:00	B.B.	63.64	—
8	7:30	B.B.	62.13	—
9	7:15	B.B.	62.89	—
10	7:15	B.B.	62.89	—
11	6:00	B.B.	62.07	—
12	9:45	B.B.	62.83	—
13	8:00	CM. RF.	63.59	—
14	7:45	R.F.	62.07	—
15	7:00	R.F.	63.59	—
16	7:00	R.F.	63.59	—

Date	Time	Operator Initials	UV Dose mJ/cm2	Number of Alarms (A) or Warnings (W)
17	10:15	R.F.	63.59	—
18	8:30	R.F.	62.32	—
19	11:00	R.F.	63.09	—
20	9:00	R.F.	63.85	—
21	7:00	B.B.	62.32	—
22	7:00	B.B.	62.32	—
23	7:00	B.B.	62.32	—
24	7:15	B.B.	62.32	—
25	6:30	B.B.	62.04	—
26	7:30	B.B.	62.04	—
27	8:00	R.F.	62.04	—
28	8:00	CM	63.14	—
29	8:30	R.F.	62.04	—
30	8:00	R.F.	62.04	—
31	8:00	R.F.	62.04	—

Date	UVT readings and Alarm or Warning History and actions taken to resolve
3	UVT Test: 81.5
10	UVT Test: 81.2
17	UVT Test: 82.3
24	UVT Test: 81.0
31	UVT Test: 80.9

Submitted by (Print): Rob Friesen **Signature:**

PLEASE REFER TO OPERATING LICENCE FOR APPLICABLE TREATMENT STANDARDS AND MONITORING REQUIREMENTS.
PLEASE CONTACT YOUR DRINKING WATER OFFICER WITH ANY COMMENTS, QUESTIONS OR CONCERNS.

Monthly Chloramination Report

Water System Name: Kleefeld Water System Code: 104.0

Month: June Year: 2024 Type of Measurement Device: Electronic

Operator-in-charge (Print): Rob Friesen Other Operators (Print): Barry Braesky, Steph Durand

Daily Consumption Units: m^3

Flow Meter for Daily Consumption: (circle choice) Raw (Treated) No Metering

Date	Time	Initials	Residuals (mg/L)		Daily Consumption
			Mono	Total	
1	9:00	R.F.	2.96		264
2	11:15	R.F.	3.05		378
3	7:00	B.B.	3.12		256
4	7:45	B.B.	3.13		287
5	7:00	B.B.	2.96		241
6	7:30	B.B.	3.13		296
7	7:30	B.B.	3.14	3.9	253
8	6:45	B.B.	2.94		289
9	10:00	B.B.	3.23		376
10	7:30	R.F.	3.09		290
11	8:00	R.F.	2.88		330
12	8:00	R.F.	1.80		587
13	8:00	R.F.	2.37		405
14	8:00	R.F.	2.75	3.9	600
15	9:00	R.F.	3.09		535
16	11:30	R.F.	2.89		378

Date	Time	Initials	Residuals (mg/L)		Daily Consumption
			Mono	Total	
17	7:00	B.B.	2.87		259
18	7:00	B.B.	2.89		395
19	7:00	B.B.	2.83		254
20	7:00	B.B.	2.86		354
21	7:00	B.B.	2.82	4.2	323
22	6:45	B.B.	2.99		408
23	6:30	B.B.	2.96		323
24	7:30	R.F.	2.91		322
25	9:30	R.F.	2.60		419
26	7:15	R.F.	1.40		294
27	7:00	R.F.	1.99		279
28	6:30	R.F.	2.49	3.1	267
29	6:30	R.F.	2.75		243
30	11:00	R.F.	2.72		303
31					
				Total Monthly Consumption	10,208

Ammonia in Treated Water

Date	Time	Initials	Ammonia (mg/L)
7	7:30	B.B.	0.21
14	8:00	R.F.	0.07

Date	Time	Initials	Ammonia (mg/L)
21	7:00	B.B.	0.12
28	6:30	R.F.	0.01

Date	Time	Initials	Ammonia (mg/L)

Residuals at Distribution Sample Locations

Date	Time	Initials	Location	Residuals (mg/L)		
				Mono	Total	Ammonia
11	8:30	R.F.	Main Street	2.72	3.8	0.25
26	10:00	R.F.	Main Street	2.68	4.0	0.06

Submitted by (Print): Rob Friesen Signature:

PLEASE REFER TO OPERATING LICENCE FOR APPLICABLE TREATMENT STANDARDS AND MONITORING REQUIREMENTS.
PLEASE CONTACT YOUR DRINKING WATER OFFICER WITH ANY COMMENTS, QUESTIONS OR CONCERNS.

Manitoba

Monthly Ultraviolet (UV) Report

Water System Name: Kleefeld Water System Code: C104.0

Month: June Year: 2024

Operator-in-charge (Print): Rob Friesen Other Operators (Print): Barry Broesky, Steph Duval

Unit: mj/cm²

Date	Time	Operator Initials	UV Dose mJ/cm2	Number of Alarms (A) or Warnings (W)
1	9:00	R.F.	62.02	-
2	11:15	R.F.	62.02	-
3	7:30	B.B.	62.02	-
4	8:00	B.B.	61.47	-
5	7:00	B.B.	62.02	-
6	7:30	B.B.	62.02	-
7	7:30	B.B.	62.02	-
8	7:00	B.B.	61.17	-
9	10:15	B.B.	60.40	-
10	7:30	R.F.	60.40	-
11	8:00	R.F.	61.94	-
12	8:00	R.F.	60.40	-
13	8:00	R.F.	60.40	-
14	8:00	R.F.	59.63	-
15	~~7:30~~ 7:00	R.F.	59.63	-
16	11:30	R.F.	59.63	-

Date	Time	Operator Initials	UV Dose mJ/cm2	Number of Alarms (A) or Warnings (W)
17	7:15	B.B.	60.40	-
18	7:00	B.B.	60.40	-
19	7:00	B.B.	60.40	-
20	7:00	B.B.	60.40	-
21	7:15	B.B.	61.17	-
22	7:00	B.B.	60.93	-
23	6:30	B.B.	62.48	-
24	7:30	R.F.	60.93	-
25	9:30	R.F.	60.93	-
26	7:15	R.F.	60.93	-
27	7:00	R.F.	60.39	-
28	6:30	R.F.	60.39	-
29	6:30	R.F.	61.17	-
30	11:00	R.F.	60.40	-
31				

Date	UVT readings and Alarm or Warning History and actions taken to resolve
7	UVT TEST: 80.0
14	UVT TEST: 81.8
21	UVT TEST: 82.8
28	UVT TEST: 79.8

Submitted by (Print): Rob Friesen Signature:

PLEASE REFER TO OPERATING LICENCE FOR APPLICABLE TREATMENT STANDARDS AND MONITORING REQUIREMENTS.
PLEASE CONTACT YOUR DRINKING WATER OFFICER WITH ANY COMMENTS, QUESTIONS OR CONCERNS.

Manitoba

onthly Chloramination Report

ater System Name: KLEEFELD Water System Code: 104.0

onth: JULY Year: 2024 Type of Measurement Device: ELECTRONIC

perator-in-charge (Print): BARRY BROESKY Other Operators (Print): ROB FRIESEN, STEPH DUVAL

ily Consumption Units: m^3

ow Meter for Daily Consumption: (circle choice) Raw (Treated) No Metering

Date	Time	Initials	Residuals (mg/L) Mono	Residuals (mg/L) Total	Daily Consumption
1	8:30	R.F.	2.87		205
2	8:00	R.F.	2.07		273
3	7:45	R.F.	2.19		246
4	7:00	R.F.	1.73		239
5	8:00	R.F.	2.66	3.7	281
6	7:15	B.B.	2.72		295
7	9:45	B.B.	1.98		362
8	8:00	R.F.	1.75		286
9	8:00	R.F.	2.31		323
10	8:00	R.F.	3.16		344
11	8:00	R.F.	3.05		607
12	7:30	R.F.	3.26	4.9	537
13	6:30	R.F.	[illegible]		363
14	11:30	R.F.	3.24		465
15	7:00	B.B.	3.16		289
16	7:00	B.B.	3.17		279
17	7:00	B.B.	3.10		245
18	7:00	B.B.	3.14		279
19	6:45	B.B.	2.11	2.7	349
20	6:30	B.B.	2.41		306
21	6:30	B.B.	2.85		318
22	8:00	R.F.	3.20		364
23	8:00	R.F.	3.18		260
24	8:30	R.F.	3.18		295
25	8:30	R.F.	3.01		[illegible]328
26	8:00	B.B.	2.19	4.2	353
27	9:30	R.F.	3.17		369
28	11:00	R.F.	3.26		449
29	7:00	B.B.	3.41		400
30	6:45	B.B.	3.45		399
31	7:15	B.B.	3.50		476
				Total Monthly Consumption	10,584

Ammonia in Treated Water

Date	Time	Initials	Ammonia (mg/L)
5	8:00	R.F.	0.00
12	7:30	R.F.	0.00

Date	Time	Initials	Ammonia (mg/L)
19	7:00	B.B.	0.00
26	8:00	B.B.	0.02

Date	Time	Initials	Ammonia (mg/L)

Residuals at Distribution Sample Locations

Date	Time	Initials	Location	Residuals (mg/L) Mono	Residuals (mg/L) Total	Residuals (mg/L) Ammonia
9	9:00	R.F.	Main Street	2.94	5.2	0.06
23	9:00	R.F.	Main Street	3.11	4.4	0.01

Submitted by (Print): BARRY BROESKY Signature: [signature]

PLEASE REFER TO OPERATING LICENCE FOR APPLICABLE TREATMENT STANDARDS AND MONITORING REQUIREMENTS.
'LEASE CONTACT YOUR DRINKING WATER OFFICER WITH ANY COMMENTS, QUESTIONS OR CONCERNS.

Manitoba

Monthly Ultraviolet (UV) Report

Water System Name: KLEEFELD Water System Code: 104.0

Month: JULY Year: 2024

Operator-in-charge (Print): BARRY BROESKY Other Operators (Print): ROB FRIESEN, STEPH DUVAL

Unit: mj/cm2

Date	Time	Operator Initials	UV Dose mJ/cm2	Number of Alarms (A) or Warnings (W)
1	8:30	R.F.	61.93	–
2	8:00	R.F.	61.93	–
3	7:45	R.F.	61.93	–
4	7:00	R.F.	61.93	–
5	8:00	R.F.	61.93	–
6	7:30	B.B.	61.38	–
7	10:15	B.B.	60.40	–
8	8:00	R.F.	60.40	–
9	8:00	R.F.	60.94	–
10	8:00	R.F.	59.62	–
11	9:30	R.F.	56.45	–
12	7:30	R.F.	56.45	–
13	6:30	R.F.	59.02	–
14	11:30	R.F.	59.02	–
15	7:15	B.B.	59.81	–
16	7:15	B.B.	59.81	–

Date	Time	Operator Initials	UV Dose mJ/cm2	Number of Alarms (A) or Warnings (W)
17	7:00	B.B.	59.81	–
18	7:15	B.B.	63.64	–
19	7:00	B.B.	58.23	–
20	6:30	B.B.	58.25	–
21	6:45	B.B.	56.65	–
22	8:00	R.F.	56.65	–
23	8:00	R.F.	55.84	–
24	9:30	R.F.	55.84	–
25	8:30	R.F.	55.84	–
26	8:00	B.B.	54.19	–
27	9:30	R.F.	54.30	–
28	11:00	R.F.	54.30	–
29	7:15	B.B.	52.62	–
30	7:00	B.B.	52.62	–
31	7:30	B.B.	52.62	–

Date	UVT readings and Alarm or Warning History and actions taken to resolve
5	UVT TEST : 76.6
12	UVT TEST : 81.5
19	UVT TEST : 81.6
26	UVT TEST : 82.1

Submitted by (Print): BARRY BROESKY Signature:

PLEASE REFER TO OPERATING LICENCE FOR APPLICABLE TREATMENT STANDARDS AND MONITORING REQUIREMENTS.
PLEASE CONTACT YOUR DRINKING WATER OFFICER WITH ANY COMMENTS, QUESTIONS OR CONCERNS.

Monthly Chloramination Report

Water System Name: KLEEFELD Water System Code: 104.0

Month: August Year: 2024 Type of Measurement Device: ELECTRONIC

Operator-in-charge (Print): BARRY BROESKY Other Operators (Print): ROB FRIESEN

Daily Consumption Units: m^3 STEPH DUVAL

Flow Meter for Daily Consumption: (circle choice) Raw (Treated) No Metering

Date	Time	Initials	Residuals (mg/L) Mono	Residuals (mg/L) Total	Daily Consumption
1	7:45	B.B.	3.46		460
2	7:00	B.B.	2.99	3.4	602
3	6:45	B.B.	3.35		465
4	8:30	B.B.	3.58		411
5	7:15	B.B.	3.18		249
6	8:15	R.F.	3.23		408
7	7:00	R.F.	3.51		351
8	8:30	R.F.	3.46		348
9	8:00	R.F.	3.17	3.4	277
10	6:30	R.F.	3.06		279
11	11:00	R.F.	3.30		527
12	10:00	B.B.	3.48		440
13	7:15	B.B.	3.63		421
14	6:45	B.B.	3.62		463
15	6:45	B.B.	3.08		393
16	6:45	B.B.	2.93	3.6	275

Date	Time	Initials	Residuals (mg/L) Mono	Residuals (mg/L) Total	Daily Consumption
17	7:00	B.B.	2.97		273
18	9:30	B.B.	3.16		378
19	7:30	R.F.	3.34		325
20	8:00	R.F.	2.04		382
21	7.30	R.F.	3.14		400
22	8:00	R.F.	3.48		347
23	8:00	R.F.	3.34	4.8	304
24	9:30	RF.	3.34		407
25	7.30	R.F.	3.33		354
26	7:00	B.B.	2.57		420
27	7:00	B.B.	2.60		369
28	7:30	CM	2.77		321
29	7:30	CM	2.80		301
30	7:00	CM	3.12	3.0	278
31	5:45	B.B.	3.06		303
				Total Monthly Consumption	11,531

Ammonia in Treated Water

Date	Time	Initials	Ammonia (mg/L)
2	7:00	B.B.	0.00
9	8:00	R.F.	0.04

Date	Time	Initials	Ammonia (mg/L)
16	6:45	B.B.	0.01
23	8:00	R.F.	0.00

Date	Time	Initials	Ammonia (mg/L)
30	7:00	C.M.	0.01

Residuals at Distribution Sample Locations

Date	Time	Initials	Location	Residuals (mg/L) Mono	Residuals (mg/L) Total	Residuals (mg/L) Ammonia
6	9:30	R.F.	Main Street	3.14	4.2	0.0
20	9:30	R.F.	Main Street	1.59	2.0	0.0

Submitted by (Print): BARRY BROESKY Signature:

PLEASE REFER TO OPERATING LICENCE FOR APPLICABLE TREATMENT STANDARDS AND MONITORING REQUIREMENTS.
PLEASE CONTACT YOUR DRINKING WATER OFFICER WITH ANY COMMENTS, QUESTIONS OR CONCERNS.

Monthly Ultraviolet (UV) Report

Water System Name: KLEEFELD Water System Code: 104.0

Month: AUGUST Year: 2024

Operator-in-charge (Print): BARRY BROESKY Other Operators (Print): ROB FRIESEN

Unit: mj/cm2 STEPH DUVAL

Date	Time	Operator Initials	UV Dose mJ/cm2	Number of Alarms (A) or Warnings (W)
1	8:00	B.B.	52.62	-
2	7:15	B.B.	52.62	-
3	7:00	B.B.	52.56	-
4	8:45	B.B.	52.56	-
5	7:30	B.B.	52.56	-
6	8:15	R.F.	51.71	-
7	7:00	R.F.	47.31	-
8	8:30	R.F.	47.32	-
9	8:00	R.F.	47.32	-
10	6:30	R.F.	47.32	-
11	11:00	R.F.	47.32	-
12	10:00	B.B.	47.32	-
13	7:15	B.B.	42.69	-
14	6:45	B.B.	42.69	-
15	7:00	B.B.	42.69	-
16	7:00	B.B.	42.69	-

Date	Time	Operator Initials	UV Dose mJ/cm2	Number o Alarms (A or Warnings (W)
17	7:00	B.B.	52.52	-
18	9:30	B.B.	56.65	-
19	7:30	R.F.	54.19	-
20	8:00	R.F.	54.19	-
21	7:30	R.F.	54.19	-
22	8:00	R.F.	54.19	-
23	8:00	R.F.	52.52	-
24	9:30	R.F.	54.19	-
25	7:30	R.F.	54.19	-
26	7:15	B.B.	54.19	-
27	7:15	B.B.	54.19	-
28	7:15	CM	54.19	-
29	7:30	CM	52.52	-
30	7:00 ~~6:45~~	CM	52.14	-
31	~~6:45~~ 6:00	B.B.	52.52	

Date	UVT readings and Alarm or Warning History and actions taken to resolve
2	UVT TEST: 81.8
9	UVT TEST: 81.5
16	UVT TEST: 81.6
23	UVTEST: 82.5
30	UVT Test: 81.9

Submitted by (Print): BARRY BROESKY Signature: [signature]

PLEASE REFER TO OPERATING LICENCE FOR APPLICABLE TREATMENT STANDARDS AND MONITORING REQUIREMENTS.
PLEASE CONTACT YOUR DRINKING WATER OFFICER WITH ANY COMMENTS, QUESTIONS OR CONCERNS.

Manitoba

Monthly Chloramination Report

Water System Name: KLEEFELD **Water System Code:** 104.0

Month: SEPTEMBER **Year:** 2024 **Type of Measurement Device:** ELECTRONIC

Operator-in-charge (Print): BARRY BROESKY **Other Operators (Print):** ROB FRIESEN

Daily Consumption Units: m^3 COLLEEN MONAS

Flow Meter for Daily Consumption: (circle choice) Raw (Treated) No Metering

Date	Time	Initials	Residuals (mg/L)		Daily Consumption
			Mono	Total	
1	8:30	B.B.	3.14		336
2	6:30	B.B.	3.29		288
3	8:00	R.F.	3.19		4142
4	8:00	R.F.	2.55		461
5	8:00	R.F.	2.75		247
6	7:30	R.F.	3.38	4.4	338
7	9:30	R.F.	3.08		362
8	12:00	R.F.	3.39		465
9	7:00	B.B.	1.71		319
10	7:00	CM	3.15		431
11	7:00	CM	2.99		380
12	7:00	B.B.	3.82		634
13	7:15	B.B.	1.13	1.46	574
14	6:30	B.B.	3.16		549
15	9:00	B.B.	3.23		357
16	7:00	R.F.	3.34		341

Date	Time	Initials	Residuals (mg/L)		Daily Consumption
			Mono	Total	
17	8:00	R.F.	2.83		325
18	7:00	R.F.	1.77		247
19	7:00	R.F.	2.02		240
20	8:00	R.F.	1.53	1.8	281
21	9:15	R.F.	1.55		248
22	12:00	R.F.	1.30		315
23	7:00	B.B.	1.11		210
24	7:15	B.B.	1.94		257
25	6:45	B.B.	1.17		254
26	6:45	B.B.	1.94		244
27	7:00	B.B.	1.77	2.1	272
28	7:15	B.B.	2.60		261
29	8:00	B.B.	2.17		192
30	6:00	B.B.	2.18		239
31					

Total Monthly Consumption ~~[illegible]~~ 10,209

Ammonia in Treated Water

Date	Time	Initials	Ammonia (mg/L)
6	7:30	R.F.	0.02
13	7:15	B.B.	0.00

Date	Time	Initials	Ammonia (mg/L)
20	8:00	R.F.	0.00
27	7:00	B.B.	0.02

Date	Time	Initials	Ammonia (mg/L)

Residuals at Distribution Sample Locations

Date	Time	Initials	Location	Residuals (mg/L)		
				Mono	Total	Ammonia
03	9:15	R.F.	Main Street	3.13	4.4	0.00
17	9:00	R.F.	Main Street	2.75	4.2	0.00

Submitted by (Print): BARRY BROESKY **Signature:** [signature]

PLEASE REFER TO OPERATING LICENCE FOR APPLICABLE TREATMENT STANDARDS AND MONITORING REQUIREMENTS.
PLEASE CONTACT YOUR DRINKING WATER OFFICER WITH ANY COMMENTS, QUESTIONS OR CONCERNS.

Manitoba

Monthly Ultraviolet (UV) Report

Water System Name: KLEEFELD **Water System Code:** 104.0

Month: SEPTEMBER **Year:** 2024

Operator-in-charge (Print): BARRY BROESKY **Other Operators (Print):** ROB FRIESEN

Unit: mj/cm2 COLLEEN MOWAT

Date	Time	Operator Initials	UV Dose mJ/cm2	Number of Alarms (A) or Warnings (W)
1	8:45	B.B.	52.58	-
2	6:45	B.B.	52.58	-
3	8:00	R.F.	52.58	-
4	8:00	R.F.	51.73	-
5	7:00	R.F.	51.73	-
6	7:30	R.F.	51.73	-
7	9:30	R.F.	52.50	-
8	~~7:45~~	~~B.B.~~	~~52.50~~	-
9	7:45	CM	52.50	-
10	7:00	CM	51.65	-
11	7:00	CM	52.50	-
12	7:15	B.B.	52.50	-
13	7:15	B.B.	51.65	-
14	6:45	B.B.	52.52	-
15	9:00		52.52	-
16	7:00	R.F.	52.52	-

Date	Time	Operator Initials	UV Dose mJ/cm2	Number of Alarms (A) or Warnings (W)
17	8:00	R.F.	52.52	-
18	7:00	R.F.	52.52	-
19	7:00	R.F.	52.99	-
20	8:00	R.F.	52.52	-
21	9:15	R.F.	52.52	-
22	12:00	R.F.	52.52	-
23	7:00	B.B.	52.62	-
24	7:30	B.B.	52.62	-
25	7:00	B.B.	52.62	-
26	7:00	B.B.	52.62	-
27	7:00	B.B.	52.62	-
28	7:30	B.B.	52.40	-
29	8:15	B.B.	52.40	-
30	6:15	B.B.	52.40	-
31				

Date	UVT readings and Alarm or Warning History and actions taken to resolve
6	UVT TEST - 81.5
13	UVT TEST - 81.6
20	UVT TEST - 82.1
27	UVT TEST: 80.8

Submitted by (Print): BARRY BROESKY **Signature:**

PLEASE REFER TO OPERATING LICENCE FOR APPLICABLE TREATMENT STANDARDS AND MONITORING REQUIREMENTS.
PLEASE CONTACT YOUR DRINKING WATER OFFICER WITH ANY COMMENTS, QUESTIONS OR CONCERNS.

Manitoba

Monthly Chloramination Report

Water System Name: Kleefeld **Water System Code:** 104.0

Month: October **Year:** 2024 **Type of Measurement Device:** Electronic

Operator-in-charge (Print): Rob Friesen **Other Operators (Print):** Barry Broesky, Colleen Mowatt

Daily Consumption Units: m^3

Flow Meter for Daily Consumption: (circle choice) Raw Treated No Metering

Date	Time	Initials	Residuals (mg/L) Mono	Residuals (mg/L) Total	Daily Consumption
1	7:00	R.F.	2.80		308
2	7:00	R.F.	1.94		281
3	7:00	R.F.	2.09		271
4	7:30	R.F.	1.16	1.5	289
5	6:30	R.F.	2.05		264
6	11:30	R.F.	1.62		347
7	7:15	B.B.	1.16		221
8	7:00	CM	1.96		256
9	6:45	B.B.	1.90		272
10	8:00	CM	3.13		604
11	7:30	CM	1.91	2.4	514
12	6:30	B.B.	2.74		251
13	9:00	B.B.	2.49		303
14	5:30	B.B.	2.13		220
15	7:00	R.F.	1.98		317
16	7:00	R.F.	2.04		254
17	7:00	R.F.	1.40		246
18	8:00	R.F.	2.36	3.4	264
19	9:15	R.F.	1.84		250
20	9:15	R.F.	1.88		272
21	7:15	B.B.	2.04		235
22	7:00	B.B.	1.51		250
23	7:00	B.B.	2.18		240
24	6:45	B.B.	1.63		243
25	7:00	B.B.	1.39	1.4	241
26	6:30	B.B.	1.11		247
27	9:15	B.B.	1.33		283
28	7:15	R.F.	2.20		237
29	7:15	R.F.	1.66		244
30	7:00	R.F.	1.94		246
31	7:00	R.F.	1.25		242
				Total Monthly Consumption	8712

Ammonia in Treated Water

Date	Time	Initials	Ammonia (mg/L)
4	7:30	R.F.	0.00
11	8:00	CM	0.00

Date	Time	Initials	Ammonia (mg/L)
18	8:00	R.F.	0.00
25	7:00	B.B.	0.00

Date	Time	Initials	Ammonia (mg/L)

Residuals at Distribution Sample Locations

Date	Time	Initials	Location	Residuals (mg/L) Mono	Residuals (mg/L) Total	Residuals (mg/L) Ammonia
1	8:45	R.F.	Main Street	2.71	3.4	0.00
15	9:20	R.F.	Main Street	1.91	3.1	0.00
29	8:00	R.F.	Main Street	1.70	3.0	0.01

Submitted by (Print): Rob Friesen **Signature:**

PLEASE REFER TO OPERATING LICENCE FOR APPLICABLE TREATMENT STANDARDS AND MONITORING REQUIREMENTS.
PLEASE CONTACT YOUR DRINKING WATER OFFICER WITH ANY COMMENTS, QUESTIONS OR CONCERNS.

Manitoba

Monthly Ultraviolet (UV) Report

Water System Name: Kleefeld **Water System Code:** 104.0

Month: October **Year:** 2024

Operator-in-charge (Print): Rob Friesen **Other Operators (Print):** Barry Breesky, Colleen Mowatt

Unit: mJ/cm²

Date	Time	Operator Initials	UV Dose mJ/cm2	Number of Alarms (A) or Warnings (W)
1	7:00	R.F.	52.40	–
2	7:00	R.F.	52.40	–
3	7:00	R.F.	51.55	–
4	7:30	C.M.	52.40	–
5	6:30	R.F.	52.40	–
6	11:30	R.F.	52.40	–
7	7:30	B.B.	53.98	–
8	7:00	CM	53.13	–
9	7:00	B.B.	54.83	–
10	8:00	CM	54.83	–
11	7:30	CM	54.83	–
12	7:00	B.B.	52.89	–
13	9:00	B.B.	56.23	–
14	5:30	B.B.	56.23	–
15	7:00	R.F.	56.23	–
16	7:00	R.F.	54.58	–

Date	Time	Operator Initials	UV Dose mJ/cm2	Number of Alarms (A) or Warnings (W)
17	7:00	R.F.	54.58	–
18	8:00	R.F.	54.58	–
19	9:15	R.F.	54.58	–
20	9:15	R.F.	54.58	–
21	7:15	B.B.	54.58	–
22	7:15	B.B.	54.58	–
23	7:00	B.B.	54.58	–
24	6:45	B.B.	54.58	–
25	7:00	B.B.	54.58	–
26	7:00	B.B.	54.45	–
27	9:30	B.B.	52.77	–
28	7:15	R.F.	52.77	–
29	7:15	R.F.	52.77	–
30	7:00	R.F.	52.77	–
31	7:00	R.F.	52.77	–

Date	UVT readings and Alarm or Warning History and actions taken to resolve
4	UVT Test: 83.8
11	UVT Test: 83.1
18	UVT Test: 83.1
25	UVT Test: 82.7

Submitted by (Print): Rob Friesen **Signature:**

PLEASE REFER TO OPERATING LICENCE FOR APPLICABLE TREATMENT STANDARDS AND MONITORING REQUIREMENTS.
PLEASE CONTACT YOUR DRINKING WATER OFFICER WITH ANY COMMENTS, QUESTIONS OR CONCERNS.

Manitoba

Monthly Chloramination Report

Water System Name: KLEEFELD **Water System Code:** 104.0

Month: NOVEMBER **Year:** 2024 **Type of Measurement Device:** ELECTRONIC

Operator-in-charge (Print): BARRY BROESKY **Other Operators (Print):** ROB FRIESEN

Daily Consumption Units: m^3 COLLEEN MOWAT

Flow Meter for Daily Consumption: (circle choice) Raw (Treated) No Metering

Date	Time	Initials	Residuals (mg/L)		Daily Consumption
			Mono	Total	
1	7:00	R.F.	1.38	2.4	292
2	9:00	R.F.	1.66		261
3	12:00	R.F.	2.10		338
4	7:00	B.B.	2.28		200
5	7:00	B.B.	1.88		275
6	7:15	B.B.	2.31		256
7	6:45	B.B.	1.63		254
8	7:00	B.B.	2.26	3.1	267
9	6:00	B.B.	2.11		235
10	9:30	B.B.	1.22		308
11	8:00	B.B.	1.32		229
12	7:00	R.F.	1.45		290
13	7:00	R.F.	1.63		263
14	7:00	R.F.	2.03		251
15	7:00	R.F.	1.5	2.0	249
16	9:00	R.F.	1.28		256

Date	Time	Initials	Residuals (mg/L)		Daily Consumption
			Mono	Total	
17	5:30	R.F.			240
18	7:00	B.B.	0.33		280
19	6:45	B.B.	0.36		276
20	6:45	B.B.	1.04		243
21	7:00	B.B.	1.31		252
22	7:00	B.B.	1.50	2.4	247
23	6:00	B.B.	1.36		252
24	9:00	B.B.	1.38		299
25	7:00	R.F.	1.06		247
26	7:30	CM	1.04		290
27	7:00	R.F.	1.15		262
28	7:00	R.F.	1.41		261
29	7:00	R.F.	1.18	1.4	300
30	9:00	R.F.	1.51		274
31					
				Total Monthly Consumption	7,887

Ammonia in Treated Water

Date	Time	Initials	Ammonia (mg/L)
1	7:00	R.F.	0.08
8	7:00	B.B.	0.00

Date	Time	Initials	Ammonia (mg/L)
15	7:00	R.F.	0.00
22	7:00	B.B.	0.03

Date	Time	Initials	Ammonia (mg/L)
29	7:00	R.F.	0.01

Residuals at Distribution Sample Locations

Date	Time	Initials	Location	Residuals (mg/L)		
				Mono	Total	Ammonia
12	10:00	RF	Main Street	1.57	1.6	0.00
26	8:00	RF	Main St.	1.22	1.4	0.00

Submitted by (Print): BARRY BROESKY **Signature:**

PLEASE REFER TO OPERATING LICENCE FOR APPLICABLE TREATMENT STANDARDS AND MONITORING REQUIREMENTS.
PLEASE CONTACT YOUR DRINKING WATER OFFICER WITH ANY COMMENTS, QUESTIONS OR CONCERNS.

Manitoba

Monthly Ultraviolet (UV) Report

Water System Name: KLEEFELD **Water System Code:** 104.0

Month: NOVEMBER **Year:** 2024

Operator-in-charge (Print): BARRY BROESKY **Other Operators (Print):** ROB FRIESEN

Unit: mj/cm² COLLEEN MOWAT

Date	Time	Operator Initials	UV Dose mJ/cm2	Number of Alarms (A) or Warnings (W)
1	7:00	K.F.	52.77	-
2	9:00	R.F.	52.77	-
3	12:00	R.F.	51.83	-
4	7:15	B.B.	53.13	-
5	7:15	B.B.	53.13	-
6	7:30	B.B.	53.13	-
7	7:00	B.B.	53.98	-
8	7:15	B.B.	53.13	-
9	6:15	B.B.	52.40	-
10	9:30	B.B.	52.40	-
11	8:00	B.B.	52.40	-
12	7:00	R.F.	51.55	-
13	7:00	R.F.	52.40	-
14	7:00	R.F.	52.40	-
15	7:00	R.F.	52.40	-
16	9:00	R.F.	52.40	-

Date	Time	Operator Initials	UV Dose mJ/cm2	Number of Alarms (A) or Warnings (W)
17	5:30	R.F.		-
18	7:00	B.B.	52.38	-
19	7:00	B.B.	52.38	-
20	7:00	B.B.	52.38	-
21	7:15	B.B.	52.38	-
22	7:00	B.B.	51.53	-
23	6:15	B.B.	51.63	-
24	9:15	B.B.	51.63	-
25	7:00	R.F.	51.63	-
26	7:15	OK	53.45	-
27	7:00	R.F.	52.418	-
28	7:00	R.F.	52.418	-
29	7:30	R.F.	52.48	-
30	9:00	R.F.	51.68	-
31	~~11:15~~	~~R.F.~~	~~52.418~~	~~-~~

Date	UVT readings and Alarm or Warning History and actions taken to resolve
1	93.8 - UVT Test
8	UVT TEST: 80.8
15	UVT TEST: 80.6
22	UVT TEST: 81.4
29	UVT TEST: 81.3

Submitted by (Print): BARRY BROESKY **Signature:**

PLEASE REFER TO OPERATING LICENCE FOR APPLICABLE TREATMENT STANDARDS AND MONITORING REQUIREMENTS.
PLEASE CONTACT YOUR DRINKING WATER OFFICER WITH ANY COMMENTS, QUESTIONS OR CONCERNS.

Manitoba

Monthly Chloramination Report

Water System Name: KLEEFELD **Water System Code:** 104.0

Month: DECEMBER **Year:** 2024 **Type of Measurement Device:** ELECTRONIC

Operator-in-charge (Print): BARRY BROESKY **Other Operators (Print):** ROB FRIESEN

Daily Consumption Units: m^3 STEPH DUVAL

Flow Meter for Daily Consumption: (circle choice) Raw (Treated) No Metering

Date	Time	Initials	Residuals (mg/L)		Daily Consumption
			Mono	Total	
1	11:15	R.F.	1.92		362
2	7:00	B.B.	1.82		256
3	7:00	B.B.	1.26		260
4	7:15	B.B	1.70		271
5	7:00	B.B.	1.15		260
6	6:45	B.B.	1.36	1.8	261
7	5:45	B.B.	1.64		242
8	9:00	B.B	1.41		293
9	7:00	R.F.	1.87		251
10	8:30	R.F.	1.53		285
11	8:00	R.F.	1.10		236
12	8:00	R.F.	1.59		237
13	8:00	R.F.	1.57	1.6	243
14	8:00	R.F.	1.17		247
15	7:00	R.F.	1.03		267
16	7:00	B.B.	1.16		281

Date	Time	Initials	Residuals (mg/L)		Daily Consumption
			Mono	Total	
17	7:00	B.B.	1.10		273
18	7:30	B.B.	1.37		256
19	8:00	B.B.	1.05		265
20	8:00	B.B	1.33	2.30	252
21	6:15	B.B.	1.30		232
22	6:45	B.B.	1.29		270
23	6:15	B.B.	1.64		268
24	6:15	B.B.	1.42		276
25	5:30	B.B.	2.18		281
26	7:45	B.B.	2.45		248
27	6:45	B.B.	2.76	4.0	243
28	9:30	R.F.	2.94		313
29	11:00	R.F.	3.10		308
30	8:00	R.F.	3.01		226
31	8:00	R.F.	2.90		287
				Total Monthly Consumption	8250

Ammonia in Treated Water

Date	Time	Initials	Ammonia (mg/L)
6	6:45	B.B	0.00
13	8:00	R.F.	0.00

Date	Time	Initials	Ammonia (mg/L)
20	8:00	B.B	0.00
27	7:00	B.B.	0.02

Date	Time	Initials	Ammonia (mg/L)

Residuals at Distribution Sample Locations

Date	Time	Initials	Location	Residuals (mg/L)		
				Mono	Total	Ammonia
10	14:45	B.B.	MAIN ST.	1.73	2.1	0.00
22	14:45	B.B.	MAIN ST.	1.88	3.2	0.00

Submitted by (Print): BARRY BROESKY **Signature:**

PLEASE REFER TO OPERATING LICENCE FOR APPLICABLE TREATMENT STANDARDS AND MONITORING REQUIREMENTS.
PLEASE CONTACT YOUR DRINKING WATER OFFICER WITH ANY COMMENTS, QUESTIONS OR CONCERNS.

Manitoba

Monthly Ultraviolet (UV) Report

Water System Name: KLEEFELD **Water System Code:** 104.0

Month: DECEMBER **Year:** 2024

Operator-in-charge (Print): BARRY BROESKY **Other Operators (Print):** ROB FRIESEN

Unit: mj/cm2 STEPH DUVAL

Date	Time	Operator Initials	UV Dose mJ/cm2	Number of Alarms (A) or Warnings (W)
1	~~7:00~~ 11:15	~~B.B.~~ R.F.	52.48	-
2	7:30	R.B.	51.63	-
3	7:00	B.B.	51.63	-
4	7:30	B.B	51.63	-
5	7:30	B.B	64.35	-
6	7:00	B.B	64.35	-
7	6:00	B.B.	64.20	-
8	9:00	B.B.	62.69	-
9	7:00	R.F.	63.45	-
10	8:30	R.F.	63.45	-
11	8:00	R.F.	61.93	-
12	8:00	R.F.	61.93	-
13	8:00	R.F.	60.40	-
14	8:00	R.F.	61.93	-
15	7:00	R.F.	61.93	-
16	7:00	B.B.	62.15	-

Date	Time	Operator Initials	UV Dose mJ/cm2	Number of Alarms (A) or Warning (W)
17	7:00	B B	61.35	-
18	7:00	B. B	61.35	-
19	7:30	B. B	61.35	-
20	8:00	B. B	61.35	-
21	6:30	B.B	59.74	-
22	7:00	B.B.	59.74	-
23	6:30	B.B.	59.74	-
24	6:30	B.B	59.74	-
25	5:45	B B.	59.74	-
26	7:45	B B	59.74	-
27	7:00	B.B.	58.16	-
28	9:30	R.F.	58.08	-
29	11:00	R.F.	58.16	-
30	8:00	R.F.	58.08	-
31	8:00	R.F.	58.08	-

Date	UVT readings and Alarm or Warning History and actions taken to resolve
6	UVT TEST: 79.9
13	UVT TEST: 85.4
20	UVT TEST: 81.1
27	UVT TEST: 80.4

Submitted by (Print): BARRY BROESKY **Signature:**

PLEASE REFER TO OPERATING LICENCE FOR APPLICABLE TREATMENT STANDARDS AND MONITORING REQUIREMENTS.
PLEASE CONTACT YOUR DRINKING WATER OFFICER WITH ANY COMMENTS, QUESTIONS OR CONCERNS.

Appendix F

INCIDENT ADVISORY NOTIFICATION PLAN

Hanover MUNICIPALITY

Incident

Operators
204-371-8236
204-371-0484
204-392-8285

Engineering and Utilities Manager
204-346-7121

CAO
204-346-7122

Media Release

(If necessary)

Drinking Water officer
204-408-8807
204-346-6346
1-855-944-4888

Medical Officer of Health (MOH) if necessary

Public Health Inspector (PHI) if necessary

- Analyze incident
- Relate to Municipal ERP
- Decide on actions

Boil Water Advisory Issued

YES

NO

Execute actions and emergency repairs

Provide alternate water source (if necessary)

Make system operational

Evaluate with DWO,MOH as required

1.Start system 2. Lessons Learned

3.Staff Training 4. Modify ERP

If necessary, notify customers via:

- Municipal Website
- Phone calls (critical customers)
- Canvasing (isolated incidents)
- Municipal social media pages

Appendix G

BOIL WATER ADVISORY DOCUMENTATION

Manitoba
Environment and Climate Change
Office of Drinking Water
Unit B – 284 Reimer Avenue, Steinbach, Manitoba, Canada R5G 0R5
T 204-371-5065 F 204-326-2472
http://www.manitoba.ca/drinkingwater

August 15, 2024 Code: 104.00

Rural Municipality of Hanover
Rob Driedger, Manager of Engineering & Utilities
28 Westland Drive
Mitchell, MB R5G 2N9
rob.driedger@hanovermb.ca

RE: BOIL WATER ADVISORY ISSUED TO KLEEFELD PUBLIC WATER SYSTEM

Dear Rob Driedger,

A power outage, on August 15, 2024 has led to the loss of water pressure in the **Kleefeld distribution system**. Distribution depressurization can compromise the safety of the water supply; therefore, a boil water advisory has been issued to ensure public health protection.

Section 17(2) of *The Drinking Water Safety Act* states that:

> *A boil water advisory may be issued by the director or a drinking water officer, without Medical Officer of Health consultation if the person issuing the advisory reasonably believes that water from a water system is or may be unsafe for domestic purposes unless it is boiled or otherwise disinfected and public health would be better protected by quickly issuing an advisory. The Medical Officer of Health has been notified of the advisory via copy of this letter.*

I am requesting that you as owner of the water supply immediately advise all water users affected by the boil water advisory, reaching as many individuals and organizations in the fastest and most feasible way possible, by distributing the attached notice. Emphasis should be placed on public facilities with vulnerable users such as hospitals, personal care homes, day cares, and schools. In addition, a copy of the notice must be posted on your website and updated accordingly.

Water users must be advised that all water used for consumption be brought to a rolling boil for at least one minute. This includes water used for drinking, preparing food, making ice, washing vegetables and fruit, brushing teeth, and making infant formula. As an alternative, individuals may also choose to use a known safe source of water such as bottled water. Water may be used for general domestic purposes including hand washing, bathing and showering (provided the water is not swallowed), dishwashing and laundry.

Copies of the following Fact Sheets should be made available to the public:

- Boil Water Advisory Fact Sheet #1 – Boil Water Advisory For Drinking Water Only
- Boil Water Advisory Fact Sheet #3 – Boil Water Advisory for Commercial/Public Facilities

Fact sheets can be obtained from your Regional Drinking Water Officer, or are available at www.manitoba.ca/drinkingwater.

This Boil Water Advisory will remain in effect until the following actions are taken:

- The power has been restored;
- There has been sufficient time or flushing following restoration of water services to ensure that any remaining potentially contaminated water in the distribution system has been eliminated;
- One set of bacteriological tests, including a minimum of three distribution samples from the affected area with results meeting regulatory standards;
- Comply with any other directives issued by the Office of Drinking Water or Medical Officer of Health.

Once the above conditions are met to the satisfaction of the Medical Officer of Health the advisory will be rescinded. The Office of Drinking Water needs to be contacted to confirm rescind conditions have been met prior to removing notices. At that time you will be issued a rescind letter to give notice to all water users that the conditions that led to the issuance of the advisory have been successfully addressed, the advisory has been rescinded and the water is safe for consumption.

Should you have any questions, please contact Adam Frieling at 204-371-3885.

Sincerely,

Digitally signed by Sarah Belisle
Date: 2024.08.15 08:55:10 -05'00'

Senior Drinking Water Officer

cc:
Dr. Davinder Singh – Regional Medical Officer of Health
Dr. Mahmoud Khodaveisi – Regional Medical Officer of Health
Sacha Janzen – A/Director, Office of Drinking Water
Marc Balcaen – A/Manager, Field Operations, Office of Drinking Water
Adam Frieling – Regional Drinking Water Officer, Office of Drinking Water
Public Health Inspector - healthprotection@gov.mb.ca
Southern Health Emergency Preparedness Program (DisasterManagement@southernhealth.ca)

PUBLIC NOTICE

BOIL WATER ADVISORY
FOR THE KLEEFELD PUBLIC WATER SYSTEM

Issued by the Medical Officer of Health, Manitoba Health and
the Office of Drinking Water, Manitoba Environment and Climate Change

August 15, 2024

A power outage, on August 15, 2024 has led to the loss of water pressure in the Kleefeld distribution system. Distribution depressurization can compromise the safety of the water supply; therefore, a boil water advisory has been issued to ensure public health protection.

RECOMMENDATIONS

Until further notice, all water used for consumption should be brought to a rolling boil for at least one minute before it is used for:

- Drinking and ice making
- Preparing beverages, such as infant formula
- Preparing food, including washing fruits and vegetables
- Brushing teeth

It is **not** necessary to boil tap water used for other household purposes, such as laundry or washing dishes. Adults and older children that are able to avoid swallowing the water can wash, bathe, or shower. Young children should be sponge bathed. If boiling is not practical, an alternate and safe supply of water should be used for consumptive purposes; i.e. bottled water. Boil Water Advisory Fact Sheet #1 - Boil Water Advisory For Manitoba Water System Users contains additional information on water use and can be found on the website below.

All commercial, public and permitted facilities (ex: restaurants, health care facilities, day cares, personal care homes and other private facilities that provide food and water services) must follow water use recommendations from the Boil Water Advisory Fact Sheet #3 – Boil Water Advisory For Commercial/Public Facilities. A copy of this Fact Sheet is available on the website below.

To avoid burn injuries from hot water, caution should be taken. Please keep young children away from boiling water. Place kettles and pots away from counter and stove edges.

Please share this information with other people who use the tap water, especially those who may not have received this notice directly (ex: renters, tenants, staff, or clients). This notice can also be posted in common areas where people tend to gather.

DURATION

The Boil Water Advisory will remain in effect until the water supplied by this water system no longer presents a risk to public health. You will be notified when the advisory has been rescinded.

If you have any questions or concerns, please contact water system at 204-346-7121 or the Regional Drinking Water Officer at 204-371-3885, or Health Links at 204-788-8200 (toll free at 1-888-315-9257).

To review Fact Sheets on water use, please go to www.manitoba.ca/drinkingwater **or** http://www.gov.mb.ca/health/publichealth/environmentalhealth/water.html

Manitoba
Health, Seniors and Active Living
Dr. Mahmoud Khodaveisi
Medical Officer of Health
180 Centennaire Dr. Southport MB R0H 1N1
www.manitoba.ca

August 21, 2024 Code: 104.00

Rural Municipality of Hanover
Rob Driedger, Manager of Engineering & Utilities
28 Westland Drive
Mitchell, MB R5G 2N9
rob.driedger@hanovermb.ca

Re: BOIL WATER ADVISORY ISSUED TO KLEEFELD WATER SYSTEM

Dear Rob Driedger:

Drinking Water Officer, Adam Freiling has advised me that the Kleefeld water system has met all conditions for rescinding the boil water advisory and that bacteriological testing results meet regulatory standards.

I am therefore rescinding the boil water advisory that was placed on the Kleefeld water system on August 16, 2024.

Please ensure all water users are notified that the advisory has been rescinded and that normal water usage can be resumed. A copy of this letter can be provided as notification. Notices posted in public locations such as washrooms are to be removed.

Should you have any questions, please contact Adam Freiling, Regional Drinking Water Officer at 204-371-3885.

Sincerely,

Dr. Dr. Mahmoud Khodaveisi
Medical Officer of Health
Southern Health – Santé Sud

cc:
Sacha Janzen – A/Director, Office of Drinking Water
Dr. Davinder Singh- Medical Officer of Health
Marc Balcaen – A/Manager, Field Operations, Office of Drinking Water
Adam Freiling - Drinking Water Officer, Office of Drinking Water
healthprotection@gov.mb.ca – Public Health Inspector
Southern Health-Santé Sud Emergency Preparedness Program
(DisasterManagement@southernhealth.ca)

Appendix H

Construction Permits

Manitoba

Office of Drinking Water

Permit to Construct or Alter Public Water System

PERMIT NUMBER: PWS-24-P43

The Drinking Water Safety Act CCSM Cap c. 36

WATER SYSTEM CODE: **104.00**

EFFECTIVE DATE: **30 December 2024**

EXPIRY DATE: **01 January 2027**

In accordance with The Drinking Water Safety Act, this permit is issued pursuant to Subsection 7(1) to:

Kleefeld Developments: "The Permittee"

Alteration of the Kleefeld Public Water System consisting of approximately 1500 meters of watermain extensions located south of Briarwood Avenue and south of Kleefeld, Manitoba in the Rural Municipality of Hanover, as part of the Brookridge Meadows subdivision (84 residential single-family lots); as specified in the permit application and follow-up technical correspondence, subject to the attached terms and conditions.

The proposed work was reviewed for compliance with The Drinking Water Safety Act and Office of Drinking Water guidelines, and general conformance with drinking water industry standards. Other aspects of the work including structural, mechanical, electrical and workplace safety are not the subject of this Permit. This Permit does not affect The Permittee's obligations with respect to compliance with all applicable municipal, provincial and federal legislation including requirements under The Environment Act, The Water Rights Act and The Ground Water and Water Well Act.

DATE: 30 December 2024

Original signed by...
Sacha Janzen
Acting Director

TERMS AND CONDITIONS

1. General

1.1. The Permittee shall perform the approved alteration of the water system works in accordance with the documents submitted, all applicable requirements of The Drinking Water Safety Act and its regulations, and the requirements of this Permit. In the event of an inconsistency between the specific requirements of terms and conditions of this Permit imposed on the authority of subsection 7(3) of The Act and the general requirements of The Act and regulations, the specific requirements of this Permit shall apply.

1.2. This Permit may be amended by the Director where in the opinion of the Director, an amendment is necessary to provide for the safety of water obtained from the water system or for the purposes of effective environmental management.

1.3. The Permittee may request an amendment to this Permit by submitting an amendment application to the Office of Drinking Water.

1.4. The Permittee shall ensure that any change in design or installation that materially impact the effectiveness of the water system works are submitted by the design engineer in writing to the Office of Drinking Water and are approved prior to the change being completed.

1.5. This Permit may be suspended or cancelled by the Director for any of the reasons identified in Section 6 of Manitoba Regulation 40/2007 Drinking Water Safety Regulation or due to a failure to comply with any term or condition of this Permit.

1.6. The Permittee shall provide written notice to the Office of Drinking Water of any change in title/ownership of the water system within 30 days of the transfer of title/ownership.

2. Construction – General

2.1. The Permittee shall ensure that measures are taken to prevent adverse environmental effects from the approved alteration of the water system works including damage to land, vegetation and watercourses.

2.2. The Permittee shall complete construction of the approved water system works by the expiry date indicated on the Permit. If construction will not be completed by the expiry date of the Permit, the Permittee shall request an amendment to the Permit.

2.3. The Permittee shall immediately notify the Drinking Water Officer upon recognizing that construction work may result in depressurization within the distribution system, or any other concern about the safety of the municipal water supply.

2.4. The Permittee shall ensure that minimum horizontal separation of 3m, measured between closest pipe edges, is maintained between water lines, and any raw or non-potable water pipelines, sewer mains, or oil or gas pipelines where piping runs parallel.

2.5. The Permittee shall ensure that minimum vertical separation of 0.45m is maintained at any water line crossings of raw or non-potable water pipelines, sewer mains, or oil or gas pipelines, with the water line located above wherever possible. If the treated water pipeline must cross below a sewage forcemain, the water pipeline must be encased in watermain-grade pipe at, and at least 3m beyond, the crossing. Vertical separation must be increased to 1.0m where an HDPE water line must cross below an oil or gas pipeline, and encasing the water line in watermain-grade PVC pipe at, and at least 3m beyond, the crossing. Where a water line must cross below another utility pipeline, special care and attention are required to pipe installation to ensure adequate structural support of the pipe. Any water line joints must be located as far as possible from the crossing.

2.6. The Permittee shall ensure that the maximum water demand exerted will not adversely affect the ability to maintain a minimum pressure of 140 kPa in the distribution system.

3. Construction – Materials

3.1 The Permittee shall ensure that all components and materials for the approved water system works including piping and associated appurtenances are ANSI/NSF Standard 61 certified, CSA certified, meet applicable AWWA Standards, or meet other potable water standards approved by the Director.

3.2 The Permittee shall ensure that all chemicals potentially in contact with potable water including sodium hypochlorite solutions are ANSI/NSF Standard 60 or ANSI/NSF Standard 61 certified, meet applicable AWWA Standards, or meet other potable water standards approved by the Director.

3.3 The Permittee shall ensure that all materials used in the construction of the approved water system works are kept as clean as possible during construction in order to prevent contamination.

4. Disinfection of Works

4.1 The Permittee shall ensure that the water pipelines, service lines and associated appurtenances are disinfected before being placed into service in accordance with AWWA Standard C651 or RM of Hanover Standard Construction Specifications (latest), and that a copy of all associated test results are maintained as water system records for a minimum of 24 months.

Manitoba

Office of Drinking Water
14 Fultz Blvd
Winnipeg MB R3Y 0L6
T 204-794-1435
Anjanie.Gorcharan@gov.mb.ca
www.manitoba.ca/drinkingwater

Justin Taplin, P.Eng.
Sison Blackburn Consulting Inc.
60 South Landing Drive, Unit 1
Oak Bluff, Manitoba
R4G 0C4
jtaplin@sbcinc.ca
(no hard copy to follow)

30 December 2024
PWS 104.00 Kleefeld
ODW permit # PWS-24-P43

Hello:

Re: Kleefeld Developments – Kleefeld PWS, Brookridge Meadows Subdivision Watermain Extensions – Application for a Permit to Construct or Alter under The Drinking Water Safety Act

The Office of Drinking Water received a permit application for alterations to the Kleefeld Public Water System consisting of approximately consisting of approximately 1500 meters of watermain extensions located south of Briarwood Avenue and south of Kleefeld, Manitoba in the Rural Municipality of Hanover, as part of the Brookridge Meadows subdivision (84 residential single-family lots). The following comments address approval requirements and other regulatory considerations for the project.

- As per Clause 2.3 of the Permit, the Drinking Water Officer must be immediately notified if construction work is expected to result in depressurization in the distribution system or any other concern over the safety of the water supply to the community, and any major interruption of the treated water due to connection of the new watermains to the existing watermains.
- Water pipeline separation requirements from sewer lines and gas lines are identified in Clauses 2.4 and 2.5 of the Permit.
- As per Clause 2.6, the water system must have the ability to maintain a minimum pressure of 140 kPa in the distribution system.
- As per Clause 4.1, watermains and service lines must be disinfected and tested in accordance with AWWA Standard C651 or RM of Hanover Standard Construction Specifications (latest).
- Approval is required for future development phases.

Other Regulatory Considerations

- Backflow prevention requirements for service connections are addressed under the Manitoba Plumbing Code and CSA B64.10 Selection and Installation of Backflow Preventers. Thermal expansion within plumbing systems must be considered if backflow prevention devices are required to protect the public water supply.
- Requirements for water service lines fall under the Manitoba Plumbing Code and local standards or by-laws. Application of water-sewer main separation standards to water-sewer service lines is recommended.
- Alterations to the wastewater collection system are proposed. The Environmental Approvals Branch of Department of Environment and Climate Change should be contacted to ensure approval requirements under The Public Health Act are met.

The Permit to Construct or Alter issued for the proposed distribution system works pursuant to Section 7 of The Drinking Water Safety Act is enclosed (Permit # PWS-24-P43). Appeals of any terms or conditions must be made in writing to the Minister within 14 days as per Section 16 of The Drinking Water Safety Act. The notice of appeal must state the reason for the appeal and the facts relied upon. An appeal of a director's decision does not stay the decision pending the appeal, unless the minister orders a stay.

Thank you for your cooperation. Contact us if you have any questions.

Sincerely,
Original signed by…
Anjanie Gorcharan, P.Eng.
Approvals Engineer

CC:

- Wajed Shah, Drinking Water Officer, Office of Drinking Water, (wajed.shah@gov.mb.ca), *via email only.*
- Colin Nakata, A/ Supervisor, Drinking Water Officer, Office of Drinking Water, (colin.nakata@gov.mb.ca), *via email only.*
- Cory Vitt, P.Eng., Senior Approvals Engineer, Office of Drinking Water, (cory.vitt@gov.mb.ca), *via email only.*
- Rob Driedger, C.E.T., Manager of Engineering and Utilities, RM of Hanover, (rob.driedger@hanovermb.ca), *via email only.*
- Representatives, Kleefeld Developments, (abe@kleefelddevelopments.com).

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