Adam Freiling
Senior Drinking Water Officer
Office of Drinking Water
Conservation and Water Stewardship
Unit B – 284 Reimer Avenue
Steinbach, MB R5G 0R5

March 1, 2024

Mr. Freiling,

Re: 2023 Kleefeld Public Water System Report

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

This report was posted on our website at **www.hanovermb.ca** on March 10, 2024 and hard copies were made available from our R.M.'s office at 28 Westland Drive in Mitchell, Manitoba. We notified 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

2023

Rural Municipality of Hanover
March 1, 2024

Kleefeld Public Water System Annual Report

2023

March 1, 2024

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

Introduction

The 2023 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 15.2 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 but these metals do not pose any health concerns.

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 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 two 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 2023, the Kleefeld Public Water System was compliant in the audited time period.

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 2023. 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%
	Monochloromine	A monochlormine residual of at least 1.0 mg/l in water entering the distribution system and at least 0.3 mg/l at all tunes 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 in the months of February, May, August, and November each year	2.11 mg/l 1.72 mg/l 1.76 mg/l 1.96 mg/l
	Nitrate	45 mg/l	One sample taken during July or August every year at a dead end sampling location in the distribution system	0.0418 mg/l
	Nitrite	3 mg/l		0.0239 mg/l

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 0.01 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 2023

None

5. Additional Records Required

Re Assessment of the WTP is currently being done. Will be completed in 2024. As per section 2.5 of the Operating License.

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 2023**

   None

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 2024. The R.M of Hanover with the assistance of Friesen Drillers has applied for a new Water Rights License with the province.

11. **Appendix**
    a. Operators Certification
    b. Testing Summary
    c. Analyses
    d. Operating License for Public Water System
    e. Monochloramine and UV Reports

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. Kohlen

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. Kailey

Director
Manitoba Conservation and Climate

Manitoba

Appendix B

Testing Summary

	Sample				Field Tests				Microbiological Tests	
	Sample Type Name	Name	Sampling Date	ALS ID	ammonia, free, field mg/L	Chlorine, free, field mg/L	Chlorine, total, field mg/L	Temperature, as received °C	Coliforms, Escherichia coli [E. coli] MPN/100mL	Coliforms, total MPN/100mL
L2744778-1 (1)	Water	KLEEFELD 1 - RAW	10-01-2023	L2744778-1				10.4	0	0
L2744778-2 (1)	Water	KLEEFELD 2 - TREATED	10-01-2023	L2744778-2				10.4	0	0
L2744778-3 (1)	Water	KLEEFELD 3 - DISTRIBUTION @ MAIN ST	10-01-2023	L2744778-3	<0.010	2.01	3.90	10.4	0	0
L2745666-1 (1)	Water	KLEEFELD 1 - RAW	24-01-2023	L2745666-1				8.8	0	0
L2745666-2 (1)	Water	KLEEFELD 2 - TREATED	24-01-2023	L2745666-2				8.8	0	0
L2745666-3 (1)	Water	KLEEFELD 3 - DISTRIBUTION @ MAIN ST	24-01-2023	L2745666-3	<0.010	2.57	3.60	8.8	0	0
L2746626-1 (1)	Water	KLEEFELD 1 - RAW	07-02-2023	L2746626-1				8.6	0	0
L2746626-2 (1)	Water	KLEEFELD 2 - TREATED	07-02-2023	L2746626-2				8.6	0	0
L2746626-3 (1)	Water	KLEEFELD 3 - DISTRIBUTION @ MAIN ST	07-02-2023	L2746626-3		1.74	3.10	8.6	0	0
L2747552-1 (1)	Water	KLEEFELD 1 - RAW	21-02-2023	L2747552-1				7.6	0	0
L2747552-2 (1)	Water	KLEEFELD 2 - TREATED	21-02-2023	L2747552-2				7.6	0	0
L2747552-3 (1)	Water	KLEEFELD 3 - DISTRIBUTION @ MAIN STREET	21-02-2023	L2747552-3	0.050	2.16	4.00	7.6	0	0
L2748559-1 (1)	Water	KLEEFELD 1 - RAW	07-03-2023	L2748559-1				12.3	0	0
L2748559-2 (1)	Water	KLEEFELD 2 - TREATED	07-03-2023	L2748559-2				12.3	0	0
L2748559-3 (1)	Water	KLEEFELD 3 - DISTRIBUTION @	07-03-2023	L2748559-3	0.050	1.84	3.20	12.3	0	0
L2749307-1 (1)	Water	KLEEFELD 1 - RAW	21-03-2023	L2749307-1				13.1	0	0
L2749307-2 (1)	Water	KLEEFELD 2 - TREATED	21-03-2023	L2749307-2				13.1	0	0
L2749307-3 (1)	Water	KLEEFELD 3 - DISTRIBUTION @ MAIN ST	21-03-2023	L2749307-3	0.180	1.82	3.10	13.1	0	0
WP2304106-001 (1)	Water/Drinking Water	KLEEFELD 1 - RAW	04-04-2023	WP2304106-001				11.2	<1	<1
WP2304106-002 (1)	Water/Drinking Water	KLEEFELD 2 - TREATED	04-04-2023	WP2304106-002				11.2	<1	<1
WP2304106-003 (1)	Water/Drinking Water	KLEEFELD 3 - DISTRIBUTION @ Main Stret	04-04-2023	WP2304106-003	0.0	1.74	5.2	11.2	<1	<1
WP2305365-001 (1)	Water/Drinking Water	KLEEFELD 1 - RAW	18-04-2023	WP2305365-001	0.0			11.9	<1	<1
WP2305365-002 (1)	Water/Drinking Water	KLEEFELD 2 - TREATED	18-04-2023	WP2305365-002				11.9	<1	<1
WP2305365-003 (1)	Water/Drinking Water	KLEEFELD 3 - DISTRIBUTION @ Main Street	18-04-2023	WP2305365-003		1.91	4.4	11.9	<1	<1
WP2305925-001 (1)	Water/Drinking Water	KLEEFELD 3 - DISTRIBUTION @	25-04-2023	WP2305925-001	0.00	1.96	3.90	12.5	<1	<1
WP2306136-001 (1)	Water/Drinking Water	KLEEFELD 3 - DISTRIBUTION @ Kleefeld Park	26-04-2023	WP2306136-001	0.00	2.17	4.10	16.4	<1	<1
WP2306676-001 (1)	Water/Drinking Water	KLEEFELD 1 - RAW	02-05-2023	WP2306676-001				17.6	<1	<1
WP2306676-002 (1)	Water/Drinking Water	KLEEFELD 2 - TREATED	02-05-2023	WP2306676-002				17.6	<1	<1
WP2306676-003 (1)	Water/Drinking Water	KLEEFELD 3 - DISTRIBUTION @MAIN STREET	02-05-2023	WP2306676-003	0.0	2.22	4.4	17.6	<1	<1
WP2308378-001 (1)	Water/Drinking Water	KLEEFELD 1 - RAW	16-05-2023	WP2308378-001				17.9	<1	<1
WP2308378-002 (1)	Water/Drinking Water	KLEEFELD 2 - TREATED	16-05-2023	WP2308378-002				17.9	<1	<1
WP2308378-003 (1)	Water/Drinking Water	KLEEFELD 3 - DISTRIBUTION @ MAIN STREET	16-05-2023	WP2308378-003	0.03	1.59	5	17.9	<1	<1
WP2310116-001 (1)	Water/Drinking Water	KLEEFELD 1 - RAW	30-05-2023	WP2310116-001				20.4	<1	<1
WP2310116-002 (1)	Water/Drinking Water	KLEEFELD 2 - TREATED	30-05-2023	WP2310116-002				20.4	<1	<1
WP2310116-003 (1)	Water/Drinking Water	KLEEFELD 3 - DISTRIBUTION @ MAIN STREET	30-05-2023	WP2310116-003	0.01	2.69	5.0	20.4	<1	<1
WP2311899-001 (1)	Water/Drinking Water	KLEEFELD 1 - RAW	13-06-2023	WP2311899-001				15.8	<1	<1
WP2311899-002 (1)	Water/Drinking Water	KLEEFELD 2 - TREATED	13-06-2023	WP2311899-002				15.8	<1	<1
WP2311899-003 (1)	Water/Drinking Water	KLEEFELD 3 - DISTRIBUTION @ MAIN STREET	13-06-2023	WP2311899-003	0.05	3.28	4.5	15.8	<1	<1
WP2313566-001 (1)	Water/Drinking Water	KLEEFELD 1 - RAW	27-06-2023	WP2313566-001				20.4	<1	<1
WP2313566-002 (1)	Water/Drinking Water	KLEEFELD 2 - TREATED	27-06-2023	WP2313566-002				20.4	<1	<1
WP2313566-003 (1)	Water/Drinking Water	KLEEFELD 3 - DISTRIBUTION @ Main Street	27-06-2023	WP2313566-003	0.00	3.59	5.2	20.4	<1	<1
WP2315141-001 (1)	Water/Drinking Water	KLEEFELD 1 - RAW	11-07-2023	WP2315141-001				20	<1	<1
WP2315141-002 (1)	Water/Drinking Water	KLEEFELD 2 - TREATED	11-07-2023	WP2315141-002				20	<1	<1
WP2315141-003 (1)	Water/Drinking Water	KLEEFELD 3 - DISTRIBUTION @ Main Street	11-07-2023	WP2315141-003	0.00	2.93	4.2	20	<1	<1
WP2316960-001 (1)	Water/Drinking Water	KLEEFELD 1 - RAW	25-07-2023	WP2316960-001				21.6	<1	<1
WP2316960-002 (1)	Water/Drinking Water	KLEEFELD 2 - TREATED	25-07-2023	WP2316960-002				21.6	<1	<1
WP2316960-003 (1)	Water/Drinking Water	KLEEFELD 3 - DISTRIBUTION @ Main Street	25-07-2023	WP2316960-003	0.0	2.99	4.6	21.6	<1	<1
WP2318624-001 (1)	Water/Drinking Water	KLEEFELD 1 - RAW	08-08-2023	WP2318624-001				16.9	<1	<1
WP2318624-002 (1)	Water/Drinking Water	KLEEFELD 2 - TREATED	08-08-2023	WP2318624-002					<1	<1
WP2318624-003 (1)	Water/Drinking Water	KLEEFELD 3 - DISTRIBUTION @ Main St.	08-08-2023	WP2318624-003	0.00	3.29	4.5	16.9	<1	<1
WP2320485-001 (1)	Water/Drinking Water	KLEEFELD 1 - RAW	22-08-2023	WP2320485-001				15.4	<1	<1
WP2320485-002 (1)	Water/Drinking Water	KLEEFELD 2 - TREATED	22-08-2023	WP2320485-002				15.4	<1	<1
WP2320485-003 (1)	Water/Drinking Water	KLEEFELD 3 - DISTRIBUTION @ MAIN STREET	22-08-2023	WP2320485-003	0.05	2.88	4.8	15.4	<1	<1
WP2322125-001 (1)	Water/Drinking Water	KLEEFELD 1 - RAW	05-08-2023	WP2322125-001				17.8	<1	<1
WP2322125-002 (1)	Water/Drinking Water	KLEEFELD 2 - TREATED	05-08-2023	WP2322125-002				17.8	<1	<1
WP2322125-003 (1)	Water/Drinking Water	KLEEFELD 3 - DISTRIBUTION @ MAIN STREET	05-08-2023	WP2322125-003	0.0	4.23	4.9	17.8	<1	<1
WP2323804-001 (1)	Water/Drinking Water	KLEEFELD 1 - RAW	19-09-2023	WP2323804-001				20.1	<1	<1
WP2323804-002 (1)	Water/Drinking Water	KLEEFELD 2 - TREATED	19-09-2023	WP2323804-002				20.1	<1	<1
WP2323804-003 (1)	Water/Drinking Water	KLEEFELD 3 - DISTRIBUTION @ Main Street	19-09-2023	WP2323804-003	0.0	3.13	4.4	20.1	<1	<1
WP2325367-001 (1)	Water/Drinking Water	KLEEFELD 1 - RAW	03-10-2023	WP2325367-001				15.7	<1	<1
WP2325367-002 (1)	Water/Drinking Water	KLEEFELD 2 - TREATED	03-10-2023	WP2325367-002				15.7	<1	<1
WP2325367-003 (1)	Water/Drinking Water	KLEEFELD 3 - DISTRIBUTION @ Main Street	03-10-2023	WP2325367-003	0.02	2.75	4.4	15.7	<1	<1
WP2326781-001 (1)	Water/Drinking Water	KLEEFELD 1 - RAW	17-10-2023	WP2326781-001				17	<1	<1
WP2326781-002 (1)	Water/Drinking Water	KLEEFELD 2 - TREATED	17-10-2023	WP2326781-002				17	<1	<1
WP2326781-003 (1)	Water/Drinking Water	KLEEFELD 3 - DISTRIBUTION @ Main St	17-10-2023	WP2326781-003	0.00	3.20	4.5	17	<1	<1
WP2328248-001 (1)	Water/Drinking Water	KLEEFELD 1 - RAW	31-10-2023	WP2328248-001				10	<1	<1
WP2328248-002 (1)	Water/Drinking Water	KLEEFELD 2 - TREATED	31-10-2023	WP2328248-002				10	<1	<1
WP2328248-003 (1)	Water/Drinking Water	KLEEFELD 3 - DISTRIBUTION @ MAIN STREET	31-10-2023	WP2328248-003	0.0	2.23	4.4	10	<1	<1
WP2329703-001 (1)	Water/Drinking Water	KLEEFELD 1 - RAW	14-11-2023	WP2329703-001				10.4	<1	<1
WP2329703-002 (1)	Water/Drinking Water	KLEEFELD 2 - TREATED	14-11-2023	WP2329703-002				10.4	<1	<1
WP2329703-003 (1)	Water/Drinking Water	KLEEFELD 3 - DISTRIBUTION @	14-11-2023	WP2329703-003					<1	<1
WP2331076-001 (1)	Water/Drinking Water	KLEEFELD 1 - RAW	28-11-2023	WP2331076-001				16.1	<1	<1
WP2331076-002 (1)	Water/Drinking Water	KLEEFELD 2 - TREATED	28-11-2023	WP2331076-002				16.1	<1	<1
WP2331076-003 (1)	Water/Drinking Water	KLEEFELD 3 - DISTRIBUTION @ Main Street	28-11-2023	WP2331076-003	0.00	2.60	4.5	16.1	<1	<1
WP2332408-001 (1)	Water/Drinking Water	KLEEFELD 1 - RAW	12-12-2023	WP2332408-001				10.9	<1	<1
WP2332408-002 (1)	Water/Drinking Water	KLEEFELD 2 - TREATED	12-12-2023	WP2332408-002				10.9	<1	<1
WP2332408-003 (1)	Water/Drinking Water	KLEEFELD 3 - DISTRIBUTION @ MAIN LT.	12-12-2023	WP2332408-003		3.12	4.5	10.9	<1	<1
WP2333458-001 (1)	Water/Drinking Water	KLEEFELD 1 - RAW	27-12-2023	WP2333458-001				11.5	<1	<1
WP2333458-002 (1)	Water/Drinking Water	KLEEFELD 2 - TREATED	27-12-2023	WP2333458-002				11.5	<1	<1
WP2333458-003 (1)	Water/Drinking Water	KLEEFELD 3 - DISTRIBUTION @ Main St	27-12-2023	WP2333458-003	0.00	1.99	4.8	11.5	<1	<1

	WP2320491-001 (1)			WP2320495-001 (1)	WP2331383-001 (1)
Sample					
Sample Type Name	Water/Water	Water/Water	Water/Water	Water/Water	Water/Water
Name	KLEEFELD 3 - DISTRIBUTION DEAD END HANOVER RD.	KLEEFELD 3 - DISTRIBUTION DEAD END HANOVER RD.	KLEEFELD 3 - DISTRIBUTION DEAD END HANOVER RD.	KLEEFELD 3 - DISTRIBUTION MID-POINT 22 ASPEN BAY	KLEEFELD 3 - DISTRIBUTION MID-POINT
Sampling Date	22-08-2023	7-02-2023	31-05-2023	22-08-2023	01-12-2023
ALS ID	WP2320491-001	L2746562	L2750981	WP2320495-001	WP2331383-001
Anions and Nutrients					
Nitrate (as N) mg/L	0.0418				
Nitrite (as N) mg/L	0.0239				
Total Metals					
Barium, total µg/L		2110	1720	1760	1960

Appendix C

Analyses

ALS Canada Ltd.

right solutions.
right partner.

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:

ALS Canada Ltd.

right solutions.
right partner.

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 Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
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 Descriptions
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 Descriptions
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 CO2. 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 CO2. 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	1	µg/L	<1.0	----
Ethylbenzene	100-41-4	E611D	0.5	µg/L	<0.50	----
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	0.4	µg/L	<0.40	----
Xylene, o-	95-47-6	E611D	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	Recovery (%)	Recovery Limits (%)		
					Concentration	LCS	Low	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**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					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**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
					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

Environment, Climate and Parks
Office of Drinking Water
1007 Century Street, Winnipeg, Manitoba,
Canada R3H 0W4

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 Friesen		

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	Mund Free 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.

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

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.

Relinquished By:		Date & Time	AUG 23 2023	Validated By (lab use only):	Date & Ti
				Sample Condition (lab use only)	
Received By: (lab use only)		Date & Time: (lab use only)	AUG 32 2023 10:00	Temperature 15.6	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: 164.0

Month: JANUARY Year: 2023 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	9:30	R.F.	2.10		222
2	8:30	R.F.	1.88		200
3	7:00	B.B.	2.16		230
4	7:00	B.B.	2.26		215
5	7:00	B.B.	2.32		225
6	7:00	B.B.	2.40	4.0	213
7	7:00	B.B.	2.31		184
8	7:45	B.B.	2.19		229
9	7:00	B.B.	2.07		228
10	7:00	B.B.	2.14		232
11	6:30	B.B.	1.96		215
12	8:00	R.F.	1.87		219
13	9:00	R.F.	2.07	3.6	243
14	9:00	R.F.	1.96		202
15	6:00	R.F.	2.15		201
16	7:00	B.B.	1.95		228

Date	Time	Initials	Residuals (mg/L)		Daily Consumption
			Mono	Total	
17	7:00	B.B.	2.25		213
18	6:30	B.B.	2.32		208
19	6:45	B.B.	2.33		206
20	7:45	B.B.	2.39	3.9	218
21	7:00	B.B.	2.50		194
22	9:30	B.B.	1.47		241
23	6:45	B.B.	2.21		203
24	7:30	B.B.	2.63		217
25	6:15	B.B.	2.56		195
26	7:00	B.B.	2.49		210
27	8:15	B.B.	2.66	3.7	206
28	5:30	R.F.	2.30		182
29	5:45	R.F.	2.49		217
30	7:00	B.B.	2.58		228
31	7:00	B.B.	2.76		214
				Total Monthly Consumption	6,904

Ammonia in Treated Water

Date	Time	Initials	Ammonia (mg/L)
6	7:00	B.B.	0.00
13	9:00	R.F.	0.00

Date	Time	Initials	Ammonia (mg/L)
20	7:45	B.B.	0.00
27	8:15	B.B.	0.00

Date	Time	Initials	Ammonia (mg/L)

Residuals at Distribution Sample Locations

Date	Time	Initials	Location	Residuals (mg/L)		
				Mono	Total	Ammonia
10	10:00	B.B.	77 MAIN ST.	2.01	3.9	0.00
24	9:15	B.B.	MAIN ST.	2.57	3.6	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: JANUARY **Year:** 2023

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	9:30	R.F.	59.63	-
2	8:30	R.F.	59.63	-
3	7:15	B.B.	59.63	-
4	7:15	B.B.	58.81	-
5	7:00	B.B.	59.63	-
6	7:15	B.B.	59.63	-
7	7:15	B.B.	59.66	-
8	8:00	B.B.	59.66	-
9	7:15	B.B.	59.66	-
10	7:15	B.B.	59.66	-
11	6:45	B.B.	59.66	-
12	8:00	R.F.	61.94	-
13	9:00	R.F.	58.09	-
14	9:00	R.F.	58.88	-
15	6:00	R.F.	63.49	-
16	7:30	B.B.	59.66	-

Date	Time	Operator Initials	UV Dose mJ/cm2	Number of Alarms (A) or Warnings (W)
17	7:15	B.B.	59.66	-
18	6:45	B.B.	61.98	-
19	7:00	B.B.	61.98	-
20	8:00	B.B.	61.98	-
21	7:30	B.B.	62.02	-
22	9:30	B.B.	62.02	-
23	7:00	B.B.	62.02	-
24	7:30	B.B.	64.29	-
25	6:30	B.B.	62.78	-
26	7:00	B.B.	62.02	-
27	8:30	B.B.	63.54	-
28	5:30	R.F.	61.97	-
29	5:45	R.F.	62.73	-
30	7:15	B.B.	62.73	-
31	7:15	B.B.	63.48	-

Date	UVT readings and Alarm or Warning History and actions taken to resolve
6	UVT TEST : 78.6
13	UVT TEST : 78.8
20	UVT TEST: 78.2
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.

Manitoba

Monthly Chloramination Report

Water System Name: KLEEFELD Water System Code: 104.0

Month: FEBRUARY Year: 2023 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	6:30	B.B.	2.16		211
2	7:00	B.B.	2.42		231
3	6:45	B.B.	2.77	3.6	204
4	6:30	B.B.	2.60		192
5	9:00	B.B.	2.52		238
6	8:00	R.F.	2.65		211
7	8:30	R.F.	2.64		224
8	7:00	R.F.	2.51		218
9	8:00	R.F.	2.42		197
10	7:00	R.F.	2.75	3.8	188
11	8:00	R.F.	2.50		196
12	6:00	R.F.	2.46		218
13	7:00	B.B.	2.45		229
14	7:00	B.B.	2.66		215
15	7:00	B.B.	2.64		215
16	7:00	B.B.	2.76		206

Date	Time	Initials	Residuals (mg/L)		Daily Consumption
			Mono	Total	
17	7:15	B.B.	2.74	3.8	215
18	6:15	B.B.	2.56		180
19	10:00	B.B.	~~2.55~~ 2.45		251
20	7:15	B.B.	2.48		160
21	8:30	R.F.	2.445		252
22	8:00	R.F.	2.47		208
23	8:00	R.F.	2.6		217
24	8:00	R.F.	2.48	4.3	212
25	9:00	R.F.	2.49		231
26	6:00	R.F.	2.37		218
27	8:15	S.D.	2.57		265
28	10:45	S.D.	2.32		239
29	~~9:15~~	~~S.D.~~	~~2.27~~		~~193~~
30					
31					
				Total Monthly Consumption	6,041

Ammonia in Treated Water

Date	Time	Initials	Ammonia (mg/L)
3	6:45	B.B.	0.00
10	7:00	R.F.	0.00

Date	Time	Initials	Ammonia (mg/L)
17	7:15	B.B.	0.00
24	8:00	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
7	9:00	R.F.	Main Street	1.74	3.1	0.0
21	9:00	R.F.	Main Street	2.16	4.0	0.05

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: FEBRUARY Year: 2023

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	6:45	B.B.	63.48	-
2	7:15	B.B.	63.48	-
3	7:00	B.B.	63.48	-
4	6:45	B.B.	63.48	-
5	9:15	B.B.	63.48	-
6	8:00	R.F.	63.48	-
7	8:30	R.F.	63.48	-
8	7:00	R.F.	52.36	-
9	8:00	R.F.	54.03	-
10	7:00	R.F.	55.67	-
11	8:00	R.F.	55.67	-
12	6:00	R.F.		-
13	7:15	B.B	58.08	-
14	7:30	B.B	58.08	-
15	7:30	B.B	57.28	-
16	7:00	B.B.	56.48	-

Date	Time	Operator Initials	UV Dose mJ/cm2	Number of Alarms (A) or Warnings (W)
17	7:30	B.B.	58.08	-
18	6:15	B.B.	56.49	-
19	10:15	B.B.	58.09	-
20	7:45	B.B	56.49	-
21	9:00	R.F.	58.09	-
22	8:00	R.F.	56.49	-
23	8:00	S.D.	56.49	-
24	8:00	R.F.	56.49	-
25	9:00	R.F.	56.49	-
26	6:00	R.F.	58.49	-
27	8:15	S.D.	58.09	-
28	10:45	S.D.	58.09	-
29	9:15	S.D.	58.09	-
30				
31				

Date	UVT readings and Alarm or Warning History and actions taken to resolve
3	UVT TEST: 80.4
10	UVT TEST: 75.1
17	UVT TEST: 78.6
24	UVT TEST: 79.9

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: March Year: 2023 Type of Measurement Device: Electronic

Operator-in-charge (Print): Rob Friesen Other Operators (Print): Barry Brearley

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	9:15	S.D.	2.27		193
2	8:00	B.B.	2.17		192
3	6:30	B.B.	2.11	3.2	194
4	7:00	B.B.	2.26		196
5	9:30	B.B.	2.18		262
6	7:00	R.F.	2.25		193
7	8:30	R.F.	2.22		232
8	7:30	R.F.	2.32		194
9	8:30	R.F.	2.25		228
10	8:30	R.F.	2.37	3.7	217
11	9:30	R.F.	2.23		211
12	6:00	R.F.	2.04		192
13	7:00	B.B.	2.26		236
14	7:00	B.B.	1.93		214
15	7:15	B.B.	1.96		218
16	7:30	B.B.	1.92		235

Date	Time	Initials	Residuals (mg/L)		Daily Consumption
			Mono	Total	
17	7:15	B.B.	2.21	3.2	246
18	6:45	B.B.	1.97		203
19	9:00	B.B.	1.72		243
20	7:00	B.B.	1.43		208
21	7:30	B.B.	1.60		224
22	7:30	R.F.	1.82		215
23	7:30	R.F.	2.01		202
24	7:00	R.F.	1.72	2.9	204
25	5:45	R.F.	1.61		190
26	5:45	R.F.	1.93		225
27	6:45	B.B.	1.96		247
28	7:00	B.B.	2.38		229
29	7:00	B.B.	1.93		233
30	7:00	R.F.	1.78		235
31	7:00	B.B.	1.52	2.7	216
				Total Monthly Consumption	6,727

Ammonia in Treated Water

Date	Time	Initials	Ammonia (mg/L)
3	6:30	B.B.	0.02
10	8:30	R.F.	0.10

Date	Time	Initials	Ammonia (mg/L)
~~17~~	~~7:15~~	B.B.	0.02
24	7:00	R.F.	0.29

Date	Time	Initials	Ammonia (mg/L)
~~Rob~~			~~0.20~~
31	7:00	B.B.	0.20

Residuals at Distribution Sample Locations

Date	Time	Initials	Location	Residuals (mg/L)		
				Mono	Total	Ammonia
7	9:00	R.F.	Main Street	1.84	3.2	0.05
21	13:30	B.B.	MAIN St.	1.82	3.1	0.18

Submitted by (Print): Rob Friesen Signature:

USE REFER TO OPERATING LICENCE FOR APPLICABLE TREATMENT STANDARDS AND MONITORING REQUIREMENTS.
E 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: March **Year:** 2023

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

Unit: mJ/cm^2

Date	Time	Operator Initials	UV Dose mJ/cm2	Number of Alarms (A) or Warnings (W)
1	9:15	S.D.	58.09	-
2	8:00	B.B.	58.09	-
3	6:45	B.B.	58.09	-
4	7:00	B.B.	58.27	-
5	10:00	B.B.	58.27	-
6	7:00	R.F.	58.27	-
7	8:30	R.F.	59.34	-
8	7:30	R.F.	58.27	-
9	8:30	R.F.	57.47	-
10	8:30	R.F.	63.69	-
11	9:30	R.F.	64.55	-
12	6:00	R.F.	64.55	-
13	7:00	B.B.	64.55	-
14	7:15	B.B.	64.55	-
15	7:30	B.B.	64.55	-
16	7:30	B.B.	64.55	-

Date	Time	Operator Initials	UV Dose mJ/cm2	Number of Alarms (A) or Warnings (W)
17	7:30	B.B.	64.55	-
18	7:00	B.B.	63.49	-
19	9:30	B.B.	63.49	-
20	7:15	B.B.	63.49	-
21	7:30	B.B.	63.49	-
22	7:30	R.F.	67.18	-
23	7:30	R.F.	63.49	-
24	7:00	R.F.	63.49	-
25	5:45	R.F.	63.49	-
26	5:45	R.F.	63.49	-
27	~~6:45~~ 7:00	B.B.	63.49	-
28	7:00	B.B.	63.49	-
29	7:00	B.B.	63.49	-
30	7:00	R.F.	63.49	-
31	7:30	B.B.	63.49	-

Date	UVT readings and Alarm or Warning History and actions taken to resolve
3	UVT TEST: 77.4
10	UVT TEST: 75
17	UVT TEST: 80.5
24	UVT TEST: 78.6
31	UVT TEST: 78.8

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.

Monthly Chloramination Report

Water System Name: Kleefeld Water System Code: 1041.0

Month: April Year: 2023 Type of Measurement Device: Electronic

Operator-in-charge (Print): Rob Friesen Other Operators (Print): Barry Brodsky, Steph Dunn

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	7:15	B.B.	1.56		204
2	9:00	B.B.	1.50		233
3	8:30	R.F.	1.93		218
4	8:30	R.F.	2.03		216
5	7:00	R.F.	1.66		189
6	7:00	R.F.	1.51	3.6	226
7	8:30	R.F.	1.42	3.4	223
8	10:30	R.F.	[illegible]		246
9	7:00	R.F.	1.03		171
10	7:00	B.B.	1.07		216
11	7:00	B.B.	1.04		231
12	7:00	B.B.	1.02		201
13	7:00	B.B.	1.01		207
14	7:00	B.B.	1.20	1.8	218
15	4:45	B.B.	1.46		190
16	10:15	B.B.	2.13		277

Date	Time	Initials	Residuals (mg/L)		Daily Consumption
			Mono	Total	
17	6:30	R.F.	2.31		178
18	8:30	R.F.	2.45		237
19	8:00	R.F.	2.30		220
20	8:30	R.F.	2.27		216
21	8:00	R.F.	2.08	3.9	210
22	9:00	R.F.	2.29		275
23	6:30	R.F.	2.31		208
24	7:00	B.B.	2.13		228
25	7:00	B.B.	2.20		217
26	7:00	B.B.	2.28		205
27	7:00	B.B.	2.38		215
28	7:30	B.B.	2.48	4.0	220
29	6:15	B.B.	2.54		185
30	8:00	B.B.	2.65		247
31					
				Total Monthly Consumption	6477

Ammonia in Treated Water

Date	Time	Initials	Ammonia (mg/L)
6	7:00	R.F.	0.00
14	7:00	B.B.	0.12

Date	Time	Initials	Ammonia (mg/L)
21	8:00	R.F.	0.0
28	7:30	B.B.	0.00

Date	Time	Initials	Ammonia (mg/L)

Residuals at Distribution Sample Locations

Date	Time	Initials	Location	Residuals (mg/L)		
				Mono	Total	Ammonia
4	9:00	R.F.	Main Street	1.74	5.2	0.0
18	9:00	R.F.	Main Street	1.91	4.4	0.0

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: April Year: 2023

Operator-in-charge (Print): Rob Friesen 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	B.B.	62.47	-
2	9:15	B.B.	63.47	-
3	8:30	R.F.	63.47	-
4	8:30	R.F.	63.47	-
5	7:00	R.F.	63.47	-
6	7:00	R.F.	63.87	-
7	8:30	R.F.	63.47	-
8	10:30	R.F.	63.47	-
9	7:00	R.F.	63.47	-
10	7:15	B.B	59.81	-
11	7:15	B.B	62.13	-
12	7:15	B.B	63.64	-
13	7:15	B.B.	62.13	-
14	7:30	B.B	62.13	-
15	5:00	B.B	61.99	-
16	10:30	B.B.	61.99	-

Date	Time	Operator Initials	UV Dose mJ/cm2	Number of Alarms (A) or Warnings (W)
17	6:30	R.F.	61.99	-
18	8:30	R.F.	61.99	-
19	8:00	R.F	61.99	-
20	8:00	R.F.	61.99	-
21	8:00	R.F.	63.50	-
22	9:00	R.F.	63.57	-
23	6:30	R.F.	61.99	-
24	7:15	B.B.	63.57	-
25	7:15	B.B.	62.05	-
26	7:15	B.B.	62.05	-
27	7:15	B.B.	63.57	-
28	7:45	B.B.	63.57	-
29	6:30	B.B.	61.97	-
30	8:00	B.B.	61.97	-
31				

Date	UVT readings and Alarm or Warning History and actions taken to resolve
6	81.5 - UVT Test
14	UVT TEST: 80.6
21	81.1 - UVT TEST
28	UVT TEST: 80.5

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: May **Year:** 2023 **Type of Measurement Device:** Electronic

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

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	7:00	R.F.	2.05		236
2	7:00	R.F.	2.26		217
3	8:00	R.F.	2.38		239
4	8:00	R.F.	2.17		237
5	8:30	R.F.	1.05	1.25	241
6	6:00	R.F.	1.07		209
7	6:30	R.F.	1.33		258
8	7:00	B.B.	1.29		256
9	6:45	B.B.	1.76		215
10	6:45	B.B.	2.27		242
11	6:45	B.B.	2.09		492
12	7:30	B.B.	1.78	4.8	558
13	7:15	B.B.	1.74		257
14	9:00	B.B.	1.94		345
15	8:15	R.F.	1.85		329
16	8:00	R.F.	2.47		325

Date	Time	Initials	Residuals (mg/L)		Daily Consumption
			Mono	Total	
17	7:00	R.F.	2.44		294
18	8:00	R.F.	2.15		241
19	8:00	R.F.	2.17	4.6	225
20	6:00	R.F.	1.95		252
21	6:00	R.F.	1.62		315
22	6:00	R.F.	1.47		299
23	6:45	B.B.	1.02		479
24	6:45	B.B.	1.04		343
25	6:45	B.B.	1.34		306
26	7:00	B.B.	1.54	3.5	400
27	7:00	B.B.	2.19		467
28	10:15	B.B.	2.82		595
29	8:00	R.F.	2.92		489
30	8:00	R.F.	3.17		349
31	8:00	R.F.	2.87		269
				Total Monthly Consumption	9979

Ammonia in Treated Water

Date	Time	Initials	Ammonia (mg/L)
~~2~~	~~9:15~~	~~R.F.~~	
5	8:30	R.F.	0.16

Date	Time	Initials	Ammonia (mg/L)
12	7:30	B.B.	0.00
19	8:00	R.F.	0.08

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

Residuals at Distribution Sample Locations

Date	Time	Initials	Location	Residuals (mg/L)		
				Mono	Total	Ammonia
2	9:15	R.F.	Main Street	2.22	4.4	0.0
16	8:45	R.F.	Main Street	1.59	5.0	0.03
30	8:45	R.F.	Main Street	2.69	5.0	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.

Monthly Ultraviolet (UV) Report

Water System Name: Kleefeld Water System Code: 104.0

Month: May Year: 2023

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

Unit: mj/cm² Steph Dunn

Date	Time	Operator Initials	UV Dose mJ/cm2	Number of Alarms (A) or Warnings (W)
1	7:00	R.F.	63.49	-
2	7:00	R.F.	61.97	-
3	8:00	R.F.	63.49	-
4	8:00	R.F.	61.97	-
5	8:30	R.F.	61.42	-
6	6:00	R.F.	61.97	-
7	6:30	R.F.	61.97	-
8	7:30	B.B.	63.48	-
9	7:00	B.B.	61.97	-
10	7:00	B.B.	61.97	-
11	7:00	B.B.	61.97	-
12	7:45	B.B.	61.97	-
13	7:30	B.B.	62.01	-
14	9:15	B.B.	62.01	-
15	8:15	R.F.	62.01	-
16	8:00	R.F.	62.01	-

Date	Time	Operator Initials	UV Dose mJ/cm2	Number of Alarms (A) or Warnings (W)
17	7:00	R.F.	62.01	-
18	8:00	R.F.	62.01	-
19	8:00	R.F.	62.77	-
20	6:00	R.F.	62.13	-
21	6:00	R.F.	62.13	-
22	6:00	R.F.	62.13	-
23	7:00	B.B.	63.64	-
24	7:00	B.B.	62.13	-
25	7:00	B.B.	56.63	-
26	7:20	B.B.	55.82	-
27	7:30	B.B.	55.72	-
28	10:30	B.B.	55.72	-
29	8:00	R.F.	56.53	-
30	8:30	R.F.	56.75	-
31	8:00	R.F.	56.53	-

Date	UVT readings and Alarm or Warning History and actions taken to resolve
5	UVT TEST : 80.5
12	UVT TEST : 80.8
19	UVT TEST : 81.5
26	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.

Manitoba

Monthly Chloramination Report

Water System Name: KLEEFELD Water System Code: 104.0

Month: JUNE Year: 2023 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	8:00	R.F.	3.03		295
2	8:00	R.F.	2.91	4.7	370
3	9:00	R.F.	3.01		520
4	6:30	R.F.	3.45		431
5	7:30	B.B.	2.68		412
6	7:00	B.B.	2.37		442
7	7:00	B.B.	3.14		483
8	6:45	B.B.	2.88		264
9	8:30	B.B.	2.60	4.7	384
10	6:45	B.B.	3.07		285
11	10:00	B.B.	3.21		455
12	8:30	R.F.	2.31		514
13	8:30	R.F.	3.28		582
14	7:00	R.F.	3.27		431
15	8:30	R.F.	1.32		740
16	7:00	R.F.	2.78	4.5	569

Date	Time	Initials	Residuals (mg/L)		Daily Consumption
			Mono	Total	
17	9:00	R.F.	3.49		491
18	5:30	R.F.	3.52		368
19	7:00	B.B.	3.50		637
20	7:00	B.B.	3.20		676
21	7:00	B.B.	3.52		644
22	7:00	B.B.	3.51		496
23	7:00	B.B.	3.31	4.9	286
24	6:15	B.B.	3.23		372
25	7:15	B.B.	3.14		342
26	7:45	R.F.	3.10		398
27	8:30	R.F.	3.22		424
28	8:00	R.F.	3.06		343
29	8:00	R.F.	2.87		306
30	9:45	B.B.	2.78	5.0	327
31					
				Total Monthly Consumption	13,287

Ammonia in Treated Water

Date	Time	Initials	Ammonia (mg/L)
2	8:00	R.F.	0.00
9	8:30	B.B.	0.08

Date	Time	Initials	Ammonia (mg/L)
16	8:30	R.F.	0.31
23	7:00	B.B.	0.10

Date	Time	Initials	Ammonia (mg/L)
30	9:45	B.B.	0.26

Residuals at Distribution Sample Locations

Date	Time	Initials	Location	Residuals (mg/L)		
				Mono	Total	Ammonia
13	8:45	R.F.	Main Street	3.28	4.5	0.05
27	9:00	R.F.	Main Street	3.59	5.2	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: JUNE Year: 2023

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	R.F.	56.53	-
2	8:00	R.F.	55.72	-
3	9:00	R.F.	56.50	-
4	6:30	R.F.	56.50	-
5	7:45	B.B.	56.50	-
6	7:15	B.B.	57.01	-
7	7:15	B.B.	56.50	-
8	7:00	B.B.	56.50	-
9	8:30	B.B.	56.50	-
10	7:00	B.B.	56.46	-
11	10:00	B.B.	56.46	-
12	8:30	R.F.	55.65	-
13	8:30	R.F.	55.65	-
14	7:00	R.F.	55.65	-
15	7:30	R.F.	55.65	-
16	7:00	R.F.	55.65	-

Date	Time	Operator Initials	UV Dose mJ/cm2	Number of Alarms (A) or Warnings (W)
17	7:00	R.F.	55.65	-
18	5:30	R.F.	55.65	-
19	7:30	B.B.	55.92	-
20	7:15	B.B.	55.92	-
21	7:00	B.B.	56.73	-
22	7:15	B.B.	57.25	-
23	7:00	B.B.	55.92	-
24	6:30	B.B.	55.74	-
25	7:30	B.B.	55.74	-
26	7:45	R.F.	55.74	-
27	8:30	R.F.	55.74	-
28	8:00	R.F.	55.74	-
29	8:00	R.F.	55.74	-
30	9:45	B.B.	55.74	-
31				

Date	UVT readings and Alarm or Warning History and actions taken to resolve
2	78.5 - UVT
9	UVT TEST: 79.1
16	UVT TEST: 77.1
23	UVT TEST: 81.0
30	UVT TEST: 76.5

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: July Year: 2023 Type of Measurement Device: Electronic

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

Stephi Duval

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	6:30	B.B.	3.32		393
2	9:30	B.B.	3.22		527
3	7:30	B.B.	3.25		453
4	6:30	B.B.	3.39		579
5	7:00	B.B.	3.07		426
6	8:00	B.B.	3.25		426
7	8:30	B.B.	3.25	4.5	402
8	7:00	B.B.	3.03		275
9	9:30	B.B	3.04		452
10	7:30	R.F.	1.97		344
11	7:45	R.F.	2.81		318
12	7:00	R.F.	3.30		366
13	6:30	R.F.	2.01		594
14	6:30	R.F.	3.38	4.3	452
15	9:00	R.F.	3.00		337
16	5:30	R.F.	3.14		247

Date	Time	Initials	Residuals (mg/L)		Daily Consumption
			Mono	Total	
17	7:45	R.F.	2.94		279
18	6:45	R.F.	2.86		283
19	6:00	R.F.	3.10		263
20	8:00	R.F.	3.03		289
21	7:30	R.F.	2.72	4.6	265
22	6:00	R.F.	2.95		281
23	6:00	R.F.	2.83		311
24	7:30	R.F.	3.13		356
25	7:45	R.F.	3.05		452
26	6:30	R.F.	2.92		219
27	6:30	R.F.	3.11		308
28	8:00	R.F.	3.13	4.3	367
29	9:00	R.F.	3.21		352
30	5:30	R.F.	3.08		307
31	8:30	R.F.	3.23		459
				Total Monthly Consumption	11,382

Ammonia in Treated Water

Date	Time	Initials	Ammonia (mg/L)
7	8:30	B.B.	0.12
14	6:30	R.F.	0.00

Date	Time	Initials	Ammonia (mg/L)
21	7:30	R.F.	0.03
28	8:00	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
11	1:30	R.F.	Main Street	2.93	4.2	0.00
26	9:30	R.F.	Main Street	2.99	4.6	0.00

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: July Year: 2023

Operator-in-charge (Print): Rob Friesen Other Operators (Print): Berry Broesky

Unit: mj/cm^2 Steph Duval

Date	Time	Operator Initials	UV Dose mJ/cm2	Number of Alarms (A) or Warnings (W)
1	6:45	B.B.	56.59	-
2	9:30	B.B	56.59	-
3	7:30	B.B.	56.08	-
4	7:00	B.B.	56.89	-
5	7:00	B.B.	56.89	-
6	8:15	B.B.	56.08	-
7	8:45	B.B.	56.08	-
8	7:15	B.B.	55.69	-
9	9:45	B.B.	57.01	-
10	7:30	R.F.	56.20	-
11	7:[illegible]45	R.F.	56.20	-
12	7:00	R.F.	56.20	-
13	6:30	R.F.	56.20	-
14	6:30	R.F.	57.01	-
15	9:00	R.F.	56.38	-
16	5:30	R.F.	56.38	-

Date	Time	Operator Initials	UV Dose mJ/cm2	Number of Alarms (A) or Warnings (W)
17	7:45	R.F.	56.90	-
18	6:45	R.F.	56.38	-
19	6:00	R.F.	56.38	-
20	8:00	R.F.	56.38	-
21	7:30	R.F.	56.38	-
22	6:00	R.F.	57.36	-
23	6:00	R.F.	57.36	-
24	7:30	R.F.	57.36	-
25	8:00	R.F.	57.36	-
26	6:30	R.F.	57.36	-
27	6:30	R.F.	57.36	-
28	8:00	R.F.	57.36	-
29	9:00	R.F.	59.84	-
30	6:30	R.F.	58.19	-
31	8:30	R.F.	59.84	-

Date	UVT readings and Alarm or Warning History and actions taken to resolve
7	UVT TEST: 80.6
14	UVT TEST: 77.3
21	UVT TEST: 74.5
28	UVT TEST: 74.8

Submitted by (Print): Rob Friesen 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: AUGUST Year: 2023 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	8:00	R.F.	2.53		451
2	7:00	R.F.	3.02		280
3	7:00	B.B.	3.47		381
4	7:00	B.B.	3.37	3.6	393
5	7:00	B.B.	3.18		379
6	9:00	B.B.	3.20		437
7	7:00	B.B.	3.29		378
8	6:00	B.B.	3.26		476
9	6:00	B.B.	2.59		274
10	7:45	B.B.	2.91		447
11	7:00	B.B.	3.42	4.4	461
12	6:00	B.B.	3.10		224
13	9:00	B.B.	3.00		296
14	6:00	B.B.	2.94		232
15	7:45	B.B.	3.10		330
16	7:45	B.B.	3.39		313

Date	Time	Initials	Residuals (mg/L)		Daily Consumption
			Mono	Total	
17	7:15	B.B.	3.12		261
18	7:30	B.B.	3.17	4.6	335
19	8:45	R.F.	2.71		407
20	6:00	R.F.	3.55		293
21	7:00	R.F.	2.91		339
22	7:00	R.F.	3.18		288
23	8:15	R.F.	2.81		260
24	8:00	R.F.	1.32		261
25	8:00	R.F.	1.20	2.9	297
26	9:30	R.F.	1.17		295
27	6:00	R.F.	1.10		274
28	7:45	B.B.	1.16		366
29	7:00	B.B.	1.17		355
30	7:00	B.B.	1.22		329
31	7:00	B.B.	1.27		322
				Total Monthly Consumption	10,436

Ammonia in Treated Water

Date	Time	Initials	Ammonia (mg/L)
4	7:00	B.B.	0.00
11	7:00	B.B.	0.00

Date	Time	Initials	Ammonia (mg/L)
18	7:30	B.B.	0.00
25	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
8	9:15	B.B.	MAIN ST.	3.29	4.5	0.00
22	10:45	R.F.	Main St.	2.88	4.8	0.05

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: AUGUST Year: 2023

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	R.F.	57.36	-
2	7:00	R.F.		-
3	7:15	B.B.	58.19	-
4	7:15	B.B.	58.49	-
5	7:15	B.B.	57.08	-
6	9:00	B.B.	59.23	-
7	7:45	B.B.	59.23	-
8	6:30	B.B.	57.89	-
9	6:00	B.B.	58.70	-
10	8:00	B.B.	57.08	-
11	7:00	B.B.	58.70	-
12	6:15	B.B.	58.98	-
13	9:15	B.B.	58.98	-
14	6:15	B.B.	60.53	-
15	7:45	B.B.	58.12	-
16	7:45	B.B.	58.12	-
17	7:15	B.B.	58.12	-
18	7:30	B.B.	57.81	-
19	8:45	R.F.	56.46	-
20	6:00	R.F.	56.46	-
21	7:00	R.F.	56.46	-
22	7:00	R.F.	57.26	-
23	8:00	R.F.	57.26	-
24	8:00	R.F.	57.26	-
25	8:00	R.F.	82.43	-
26	9:30	R.F.	84.99	-
27	6:00	R.F.	87.29	-
28	8:00	B.B.	84.99	-
29	7:15	B.B.	84.99	-
30	7:15	B.B.	60.40	-
31	7:15	B.B.	58.21	-

Date	UVT readings and Alarm or Warning History and actions taken to resolve
4	UVT TEST : 75.9
11	UVT TEST : 83.8
18	UVT TEST : 79.1
24	UVT TEST : 73.8

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: 2023 Type of Measurement Device: ELECTRONIC

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

STEPH DUVAL

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	7:00	B.B.	2.40	2.9	325
2	6:30	B.B.	3.03		368
3	8:00	B.B.	3.29		468
4	7:30	B.B.	3.39		432
5	9:15	R.F.	3.44		472
6	6.00	R.F.	3.37		202
7	7:30	R.F.	3.46		281
8	8:00	R.F.	3.31	4.5	256
9	9:30	R.F.	3.19		274
10	6:30	R.F.	2.78		244
11	7:00	B.B.	3.25		281
12	7:30	B.B.	2.93		291
13	7:30	B.B.	3.08		252
14	7:15	B.B.	3.49		538
15	7:00	B.B.	3.29	4.6	352
16	7:30	B.B.	3.19		238

Date	Time	Initials	Residuals (mg/L)		Daily Consumption
			Mono	Total	
17	9:00	B.B.	3.18		262
18	8:00	R.F.	3.13		245
19	8:00	R.F.	3.10		263
20	7:00	R.F.	3.18		273
21	7:00	R.F.	2.38		291
22	7:00	R.F.	2.92	4.6	245
23	9:00	R.F.	3.10		229
24	6:00	R.F.	3.13		224
25	7:00	B.B.	3.17		247
26	7:00	B.B.	2.74		239
27	7:00	B.B.	3.19		229
28	7:00	B.B.	3.05		251
29	7:15	B.B.	3.06	4.5	241
30	7:00	B.B.	2.80		230
31					
				Total Monthly Consumption	8,849

Ammonia in Treated Water

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

Date	Time	Initials	Ammonia (mg/L)
15	7:00	B.B.	0.00
22	7:00	R.F.	0.01

Date	Time	Initials	Ammonia (mg/L)
29	7:15	B.B.	0.00

Residuals at Distribution Sample Locations

Date	Time	Initials	Location	Residuals (mg/L)		
				Mono	Total	Ammonia
5	10:00	R.F.	Main Street	4.23	4.9	0.0
19	8:00	R.F.	Main Street	3.13	4.4	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: SEPTEMBER Year: 2023

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

Unit: mJ/cm^2 STEPH DUVAL

Date	Time	Operator Initials	UV Dose mJ/cm2	Number of Alarms (A) or Warnings (W)
1	7:15	B.B	58.21	-
2	6:45	B.B.	56.46	-
3	8:15	B.B.	56.46	-
4	7:30	B.B.	56.46	-
5	9:15	R.F.	55.65	-
6	6:00	R.F.	58.65	-
7	7:30	R.F.	57.15	-
8	8:00	R.F.	56.65	-
9	9:30	R.F.	55.65	-
10	6:30	R.F.	55.65	-
11	7:30	B.B.	55.65	-
12	7:45	B.B.	55.65	-
13	7:30	B.B	56.46	-
14	7:30	B.B	55.65	-
15	7:15	B.B.	55.65	-
16	7:45	B.B.	54.85	-

Date	Time	Operator Initials	UV Dose mJ/cm2	Number of Alarms (A) or Warnings (W)
17	9:15	B.B.	55.67	-
18	8:00	R.F.	55.67	-
19	8:00	R.F.	55.67	-
20	7:00	R.F.	55.67	-
21	7:00	R.F.	55.67	-
22	7:00	R.F.	55.67	-
23	9:00	R.F.	54.17	-
24	6:00	R.F.	55.00	-
25	7:00	B.B.	55.00	-
26	7:15	B.B.	54.17	-
27	7:15	B.B	54.17	-
28	7:15	B.B.	54.17	-
29	7:30	B.B.	54.17	-
30	7:00	B.B.	54.02	-
31				

Date	UVT readings and Alarm or Warning History and actions taken to resolve
1	UVT TEST: 79.1
8	UVT TEST: 80.0
15	UVT TEST: 80.3
22	UVT TEST: 81.5
29	UVT TEST: 80.2

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.

Monthly Chloramination Report

Water System Name: Kleefeld Water System Code: 104.0

Month: October Year: 2023 Type of Measurement Device: Electronic

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

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	7:00	B.B.	3.21		258
2	8:00	R.F.	3.23		277
3	9:30	R.F.	3.14		256
4	8:00	R.F.	3.05		212
5	7:30	R.F.	2.71		224
6	9:00	R.F.	3.45	4.6	242
7	9:45	R.F.	3.27		237
8	6:30	R.F.	3.12		202
9	9:05	R.F.	3.24		229
10	7:00	B.B.	3.04		246
11	7:45	B.B.	3.00		233
12	7:00	B.B.	3.24		406
13	7:00	B.B.	2.10	2.5	411
14	6:30	B.B.	2.88		209
15	9:30	B.B.	2.58		270
16	8:00	R.F.	3.03		238

Date	Time	Initials	Residuals (mg/L)		Daily Consumption
			Mono	Total	
17	7:00	R.F.	3.09		218
18	7:00	R.F.	3.12		227
19	7:00	R.F.	3.05		219
20	7:00	R.F.	3.09	4.4	225
21	7:30	R.F.	3.04		214
22	10:00	R.F.	3.22		277
23	7:45	B.B.	2.95		213
24	7:00	B.B.	2.92		214
25	5:45	B.B.	2.83		212
26	7:00	B.B.	2.77		219
27	7:30	B.B.	3.04	4.5	227
28	9:15	B.B.	2.68		234
29	9:15	B.B.	2.63		243
30	7:15	R.F.	1.71		212
31	8:30	R.F.	2.60		231
				Total Monthly Consumption	7537

Ammonia in Treated Water

Date	Time	Initials	Ammonia (mg/L)
~~03~~	~~10:30~~	~~R.F.~~	~~0.0~~
06	9:00	R.F.	0.0

Date	Time	Initials	Ammonia (mg/L)
13	7:00	B.B.	0.04
20	7:00	R.F.	0.03

Date	Time	Initials	Ammonia (mg/L)
27	7:30	B.B.	0.00

Residuals at Distribution Sample Locations

Date	Time	Initials	Location	Residuals (mg/L)		
				Mono	Total	Ammonia
03	10:30	R.F.	Main Street	2.75	4.4	0.02
17	10:00	B.B.	MAIN St.	3.20	4.5	0.00
31	9:30	R.F.	Main Street	2.23	4.4	0.00

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 Ultraviolet (UV) Report

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

Month: October **Year:** 2023

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

Unit: mJ/cm^2

Date	Time	Operator Initials	UV Dose mJ/cm2	Number of Alarms (A) or Warnings (W)
1	7:15	B.B.	55.66	-
2	8:00	R.F.	54.51	-
3	9:30	R.F.	54.02	-
4	8:00	R.F.	54.02	-
5	7:30	R.F.	51.50	-
6	9:00	R.F.	54.02	-
7	9:45	R.F.	54.02	-
8	6:30	R.F.	54.02	-
9	9:05	R.F.	54.56	-
10	7:30	B.B.	54.07	-
11	8:00	B.B.	54.07	-
12	7:15	B.B.	54.07	-
13	7:15	B.B.	54.07	-
14	6:45	B.B.	54.00	-
15	9:30	B.B.	54.82	-
16	8:00	R.F.	54.00	-

Date	Time	Operator Initials	UV Dose mJ/cm2	Number of Alarms (A) or Warnings (W)
17	7:00	R.F.	54.49	-
18	7:00	R.F.	54.00	-
19	7:00	R.F.	54.00	-
20	7:00	R.F.	54.49	-
21	7:30	R.F.	54.08	-
22	10:00	R.F.	54.57	-
23	8:00	B.B.	54.57	-
24	7:15	B.B.	54.08	-
25	6:00	B.B.	54.08	-
26	7:15	B.B.	54.57	-
27	7:45	B.B.	52.41	-
28	9:15	B.B.	54.03	-
29	9:15	B.B.	52.84	-
30	7:15	R.F.	54.03	-
31	9:00	R.F.	54.03	-

Date	UVT readings and Alarm or Warning History and actions taken to resolve
06	UVT TEST: 80.8
13	UVT TEST: 79.6
20	UVT TEST: 80.9
27	UVT TEST: 80.4

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: 1041.0

Month: November Year: 2023 Type of Measurement Device: Electronic

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

Steph Duval

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	8:30	R.F.	2.85		206
2	8:00	R.F.	3.00		233
3	8:30	R.F.	1.37	4.7	219
4	9:45	R.F.	3.05		227
5	11:15	R.F.	3.11		276
6	7:45	B.B	2.93		205
7	7:00	B.B	2.67		214
8	7:30	B.B	2.47		213
9	7:00	B.B	2.79		208
10	8:00	B.B	2.99	4.3	228
11	6:15	B.B.	2.88		196
12	8:15	B.B.	2.96		247
13	6:45	B.B	2.98		225
14	8:00	R.F.	3.02		259
15	8:15	R.F.	2.97		212
16	8:00	R.F.	2.92		221

Date	Time	Initials	Residuals (mg/L)		Daily Consumption
			Mono	Total	
17	8:00	R.F.	2.92	4.1	222
18	9:00	R.F.	2.99		223
19	11:15	R.F.	2.82		290
20	8:00	B.B.	2.84		197
21	7:00	B.B	3.03		225
22	7:00	B.B	2.91		221
23	7:00	B.B	2.98		223
24	7:00	B.B.	3.19	4.3	354
25	7:15	B.B.	2.93		208
26	9:00	B.B.	3.01		266
27	8:00	R.F.	2.78		238
28	9:00	R.F.	2.78		240
29	8:15	R.F.	3.04		209
30	8:00	R.F.	2.72		213
31					
				Total Monthly Consumption	6898

Ammonia in Treated Water

Date	Time	Initials	Ammonia (mg/L)
03	8:30	R.F.	0.0
10	8:00	B.B.	0.00

Date	Time	Initials	Ammonia (mg/L)
17	8:00	R.F.	0.0
24	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	Total	Ammonia
14	10:20	R.F.	Main Street	2.34	3.7	0.10
27	9:30	R.F.	Main Street	2.60	4.5	0.00

Submitted by (Print): Rob Fransen 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: 1041.0

Month: November Year: 2023

Operator-in-charge (Print): Rob Friesen Other Operators (Print): Barry Breesky

Unit: mj/cm^2 Steph Duval

Date	Time	Operator Initials	UV Dose mJ/cm2	Number of Alarms (A) or Warnings (W)
1	8:30	R.F.	52.36	–
2	8:00	R.F	52.36	–
3	8:30	R.F.	52.86	–
4	9:45	R.F.	55.18	–
5	11:15	R.F.	55.56	–
6	8:00	B.B.	56.43	–
7	7:30	B.B.	56.43	–
8	7:45	B.B.	55.56	–
9	7:15	B.B.	54.68	–
10	8:00	B.B.	55.18	–
11	6:30	B.B.	52.50	–
12	8:30	B.B.	52.50	–
13	7:00	B.B.	52.50	–
14	8:00	R.F.	52.50	–
15	8:15	R.F.	51.25	–
16	8:00	R.F.	52.12	–

Date	Time	Operator Initials	UV Dose mJ/cm2	Number of Alarms (A) or Warnings (W)
17	8:00	R.F.	52.12	–
18	9:00	R.F.	52.50	–
19	11:15	R.F.	52.50	–
20	8:15	B.B.	52.50	–
21	7:15	B.B.	52.50	–
22	7:15	B.B.	52.50	–
23	7:00	B.B.	52.98	–
24	7:15	B.B.	52.50	–
25	7:30	B.B.	52.34	–
26	9:00	B.B.	52.34	–
27	8:00	R.F.	52.34	–
28	7:00	R.F.	52.34	–
29	8:15	R.F.	52.34	–
30	8:00	R.F.	52.34	–
31				

Date	UVT readings and Alarm or Warning History and actions taken to resolve
	UVT TEST. 86.7
10	UVT TEST - 81.5
17	UVT TEST - 81.5
24	UVT TEST - 80.0

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: DECEMBER **Year:** 2023 **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	8:30	R.F.	3.12	4.4	245
2	9:00	R.F.	2.87		214
3	12:00	R.F.	2.87		284
4	7:00	B.B.	2.86		170
5	7:00	B.B.	2.84		221
6	7:00	B.B.	2.84		222
7	7:00	B.B.	2.90		221
8	7:00	B.B.	2.89	4.1	212
9	7:15	B.B.	2.75		236
10	9:30	B.B.	2.87		332
11	8:00	R.F.	2.87		248
12	8:00	R.F.	3.11		246
13	7:00	R.F.	2.93		258
14	7:00	R.F.	2.89		223
15	7:00	R.F.	3.01	4.4	248
16	9:30	R.F.	2.86		229

Date	Time	Initials	Residuals (mg/L)		Daily Consumption
			Mono	Total	
17	6:15	R.F.	2.83		227
18	7:00	B.B.	2.83		274
19	7:00	B.B.	2.85		257
20	7:00	B.B.	2.80		234
21	6:45	B.B.	2.58		216
22	7:30	R.F.	2.56	4.1	240
23	9:30	R.F.	2.79		267
24	6:00	R.F.	2.52		221
25	8:30	R.F.	2.21		257
26	8:30	R.F.	2.22		221
27	7:15	B.B.	1.90		220
28	7:30	B.B.	1.94		239
29	7:45	B.B.	1.95	4.5	213
30	7:00	B.B.	1.97		207
31	9:15	B.B.	2.37		246
				Total Monthly Consumption	7349

Ammonia in Treated Water

Date	Time	Initials	Ammonia (mg/L)
1	8:30	R.F.	0.0
8	7:00	B.B.	0.00

Date	Time	Initials	Ammonia (mg/L)
15	7:00	R.F.	0.00
22	7:30	R.F.	0.00

Date	Time	Initials	Ammonia (mg/L)
29	7:45	B.B.	0.00

Residuals at Distribution Sample Locations

Date	Time	Initials	Location	Residuals (mg/L)		
				Mono	Total	Ammonia
12	11:15	B.B.	MAIN LT.	3.12	4.5	0.00
27	9:30	B.B.	MAIN LT.	1.99	4.8	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:** 2023

Operator-in-charge (Print): BARRY BRAESKY **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	8:30	R.F.	52.74	–
2	9:00	R.F.	52.34	–
3	12:00	R.F.	52.34	–
4	7:15	B.B.	52.74	–
5	7:00	B.B.	52.74	–
6	7:15	B.B.	54.42	–
7	7:30	B.B.	54.42	–
8	7:15	B.B.	54.42	–
9	7:45	B.B.	54.10	1
10	8:00	R.F.	54.10	–
11	8:00	R.F.	54.10	–
12	7:00	R.F.	55.74	–
13	7:00	R.F.	54.92	–
14	7:00	R.F.	54.16	–
15	7:00	R.F.	54.10	–
16	9:00	R.F.	55.74	–

Date	Time	Operator Initials	UV Dose mJ/cm2	Number of Alarms (A) or Warnings (W)
17	6:15	R.F.	55.84	–
18	7:00	B.B.	55.84	–
19	7:00	B.B.	55.84	–
20	7:00	B.B.	55.84	–
21	7:00	B.B.	63.67	–
22	7:30	R.F.	~~64.71~~ 63.67	–
23	9:30	R.F.	63.67	–
24	6:00	R.F.	64.71	–
25	8:30	R.F.	64.71	–
26	8:30	R.F.	64.71	–
27	7:30	B.B.	64.71	–
28	7:45	B.B.	64.71	–
29	7:45	B.B.	64.71	–
30	7:15	B.B.	63.52	–
31	9:15	B.B.	63.52	–

Date	UVT readings and Alarm or Warning History and actions taken to resolve
01	UVT TEST = 82.6
08	UVT TEST: 81.0
09	LOSS OF COMMUNICATION - RESET THE UV
15	UVT TEST: 81.6
~~13~~ 20	SWITCHED TO UV #2
22	UVT TEST: 74.7
29	UVT TEST: 80.8

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

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