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

March 1, 2022

Ms. Belisle,

Re: 2021 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, 2022 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

2021

Rural Municipality of Hanover
March 1, 2022

Kleefeld Public Water System Annual Report

2021

March 1, 2022

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

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Introduction

The 2021 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 2020 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 liter concrete reservoir.

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

There are currently has 577 water connections with an estimated population in the community of 2020 people.

1.7 Classification and Certification

The Kleefeld Public Water System is classified as a Class 1 Water Treatment Facility and is regulated under license number PWS-21-655 and complies with The Drinking Water Safety Act. It is currently operated by two utility operators with certification. *(See Appendix A – Operator Certification)*

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 new 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 2021, 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 2021 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.

Table : 1 Water Quality Results

SOURCE	PARAMETER	STANDARD	FREQUENCY	TEST RESULTS
GROUND WATER	Total Coliform	No TC	Bi-Weekly	99%
	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	1.76 mg/l 1.85 mg/l 1.58 mg/l 1.77 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	0.0436 mg/l
	Nitrite	3 mg/l		0.0330 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. 2020)	raw - 0.00331 mg/L treated - 0.00189 mg/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 - 0.353 mg/L treated - 0.345 mg/L
	Lead	Less then or equal to 0.01 mg/L in the water distribution system		raw -< 0.000050 mg/L treated - 0.000070 mg/L
	Manganese	Less thenor equal to 0.12 mg/L		raw - 0.0308 mg/L treated - 0.00242 mg/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 - <0.00064
	Uranium	Less then or equal to 0.02 mg/L		raw - <0.000010 treated - <0.000010

4. Water System Failures and Corrective Actions in 2021

2021 – Failure to submit the re-assessment of the water system infrastructure and water supply sources report – we are in contact with an engineering firm to get this completed as soon as possible.

2021 – Failure to submit a Advisory Notification plan – The plan is now in place and copies can be made upon request.

July to December 2021 - Failure to take appropriate UV disinfection records in accordance with the operating license – we are currently still in talks with the software developer and Manitoba Water services board to get this rectified as soon

as possible. The UV operation was checked on a daily basis and the operational status of the disinfection system and water safety was not compromised.

5. Additional Records Required

Advisory Notification plan is now in place. Copies can be made upon request.

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 2021

Mechanization of the back-up well.

10. Future System Expansion and/or Increased Population

The community of Kleefeld continues to see rapid growth. Developments in the west side of town continue to expand and will grow the even further in the 2022. 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. Compliance Audit
c. Testing Summary
d. Analyses
e. Operating License for Public Water System
f. 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. Koivula

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

Certificate is the property of Manitoba Conservation and Climate and must be surrendered upon request.

Manitoba

Appendix B

Compliance Audit

Manitoba
Environment, Climate and Parks

February 1, 2022

2021 Annual Compliance Audit

Water System: KLEEFELD - PWS	**Code:** 104.00
Water System Owner: Rural Municipality of Hanover	**Address:** 28 Westland Drive, Mitchell, MB R5G 2N9
Operating Licence: PWS-21-655	**Expiry Date:** May 31, 2023
Water System Assessment Due Date: March 1, 2021	
Public Water System Annual Report Due Date: March 31, 2022	**Advisory Notification Plan Due Date:** May 1, 2022

1) This report documents compliance of the Kleefeld Public Water System for the period from January 1 to December 31, 2021.

2) This report provides specific information on the non-compliance incidents identified in the summary below.

3) Other than the information provided in this report, the water supplier has complied with The Drinking Water Safety Act, its supporting regulations, and the terms and conditions of the water system's current operating licence.

4) This report is based on information submitted by the water supplier, agents of the water supplier, and / or the Province of Manitoba.

5) Where non-compliance items are identified, the issues do not necessarily translate into increased public health risk. The Office of Drinking Water uses processes, including boil water advisories, to notify water users of a public health risk.

Non-compliance with Treatment Standards:

Water system was compliant in the audited time period.

Non-compliance Incidents:

Date	Incident	Outcome
2021	Failure to submit the re-assessment of the water system infrastructure and water supply sources report	Non-compliant
2021	Failure to submit a Advisory Notification Plan	Non-compliant
July	Failure to take appropriate UV disinfection records in accordance with the operating licence	Non-compliant
August	Failure to take appropriate UV disinfection records in accordance with the operating licence	Non-compliant
September	Failure to take appropriate UV disinfection records in accordance with the operating licence	Non-compliant
October	Failure to take appropriate UV disinfection records in accordance with the operating licence	Non-compliant
November	Failure to take appropriate UV disinfection records in accordance with the operating licence	Non-compliant
December	Failure to take appropriate UV disinfection records in accordance with the operating licence	Non-compliant

If you have any questions, please do not hesitate to contact me at (204) 371-5065.

Sincerely,

Sarah Belisle Digitally signed by Sarah Belisle
Date: 2022.02.01 10:27:58 -06'00'

Sarah Belisle
Senior Regional Drinking Water Officer

Appendix C

Testing Summary

DWO Officer	Community Code	TC	EC	BA	NITRATE/ NITRITE	Collection Date	Sample Identification	Sample Number
SARAH	104.00	0	0			12-Jan-21	KLEEFELD 1 - RAW	L-2547593-2
SARAH	104.00	0	0			12-Jan-21	KLEEFELD 2 - TREATED	L-2547593-1
SARAH	104.00	0	0			12-Jan-21	KLEEFELD 3 - DISTRIBUTION @ MAIN ST	I-2547593-3
SARAH	104.00	0	0			26-Jan-21	KLEEFELD 1 - RAW	L-2551888-1
SARAH	104.00	0	0			26-Jan-21	KLEEFELD 2 - TREATED	L-2551888-2
SARAH	104.00	0	0			26-Jan-21	KLEEFELD 3 - DISTRIBUTION @ MAIN ST	L-2551888-3
SARAH	104.00			1.76		09-Feb-21	KLEFELD - DISTRIBTION @ MAIN ST	L-2556237
SARAH	104.00	0	0			24-Feb-21	KLEEFELD 1 - RAW	L-2560997-1
SARAH	104.00	0	0			24-Feb-21	KLEEFELD 1 - TREATED	L-2560997-2
SARAH	104.00	0	0			24-Feb-21	KLEEFELD 2 - DISTRIBTION @ MAIN ST	L-2560997-3
SARAH	104.00	0	0			09-Mar-21	KLEEFELD 1 - RAW	L-2565309-1
SARAH	104.00	0	0			09-Mar-21	KLEEFELD 2 - TREATED	L-2565309-2
SARAH	104.00	0	0			09-Mar-21	KLEEFELD 3 - DISTRIBUTION @ MAIN ST	L-2565309-3
SARAH	104.00	0	0			23-Mar-21	KLEEFELD 1 - RAW	L-2569836-1
SARAH	104.00	0	0			23-Mar-21	KLEEFELD 2 - TREATED	L-2569836-2
SARAH	104.00	0	0			23-Mar-21	KLEEFELD 3 - DISTRIBUTION @ MAIN ST	L-2569836-3
SARAH	104.00	0	0			06-Apr-21	KLEEFELD 1 - RAW	L-2573731-1
SARAH	104.00	0	0			06-Apr-21	KLEEFELD 1 - TREATED	L-2573731-2
SARAH	104.00	0	0			06-Apr-21	KLEEFELD 2 - DISTRIBTION @ MAIN ST	L-2573731-3
SARAH	104.00	0	0			20-Apr-21	KLEEFELD 1 - RAW	L-2578635-1
SARAH	104.00	0	0			20-Apr-21	KLEEFELD 2 - TREATED	L-2578635-2
SARAH	104.00	0	0			20-Apr-21	KLEEFELD 3 - DISTRIBUTION @ MAIN ST	L-2578635-3
SARAH	104.00	0	0			04-May-21	KLEEFELD 1 - RAW	L-2583719-1
SARAH	104.00	0	0			04-May-21	KLEEFELD 2 - TREATED	L-2583719-2
SARAH	104.00	0	0			04-May-21	KLEEFELD 3 - DISTRIBUTION @ MAIN ST	L-2583719-3
SARAH	104.00	0	0			18-May-21	KLEEFELD 1 - RAW	L-2589624-1
SARAH	104.00	0	0			18-May-21	KLEEFELD 2 - TREATED	L-2589624-2
SARAH	104.00	0	0			18-May-21	KLEEFELD 3 - DISTRIBUTION @ MAIN ST	L-2589624-3
SARAH	104.00			1.85		18-May-21	KLEEFELD - DISTRIBUTION @ MAIN ST	L-2589884
SARAH	104.00	0	0			01-Jun-21	KLEEFELD 1 - RAW	L-2595333-1
SARAH	104.00	0	0			01-Jun-21	KLEEFELD 2 - TREATED	L-2595333-2
SARAH	104.00	0	0			01-Jun-21	KLEEFELD 3 - DISTRIBUTION @ MAIN ST	L-2595333-3
SARAH	104.00	0	0			15-Jun-21	KLEEFELD 1 - RAW	L-2605951-1
SARAH	104.00	0	0			15-Jun-21	KLEEFELD 2 - TREATED	L-2605951-2
SARAH	104.00	0	0			15-Jun-21	KLEEFELD 3 - DISTRIBUTION @ MAIN ST	L-2605951-3
SARAH	104.00	0	0			29-Jun-21	KLEEFELD 1 - RAW	L-2608084-1
SARAH	104.00	0	0			29-Jun-21	KLEEFELD 2 - TREATED	L-2608084-2
SARAH	104.00	0	0			29-Jun-21	KLEEFELD 3 - DISTRIBUTION @ MAIN ST	L-2608084-3
SARAH	104.00	0	0			13-Jul-21	KLEEFELD 1 - RAW	L-2613643-1
SARAH	104.00	0	0			13-Jul-21	KLEEFELD 2 - TREATED	L-2613643-2
SARAH	104.00	0	0			13-Jul-21	KLEEFELD 3 - DISTRIBUTION @ MAIN ST	L-2613643-3
SARAH	104.00	0	0			27-Jul-21	KLEEFELD 1 - RAW	L-2619566-1
SARAH	104.00	0	0			27-Jul-21	KLEEFELD 2 - TREATED	L-2619566-2
SARAH	104.00	0	0			27-Jul-21	KLEEFELD 3 - DISTRIBUTION @ MAIN ST	L-2619566-3
SARAH	104.00	0	0			10-Aug-21	KLEEFELD 1 - RAW	L-2625060-1
SARAH	104.00	0	0			10-Aug-21	KLEEFELD 2 - TREATED	L-2625060-2
SARAH	104.00	0	0			10-Aug-21	KLEEFELD 3 - DISTRIBUTION @ MAIN ST	L-2625060-3
SARAH	104.00	0	0			24-Aug-21	KLEEFELD 1 - RAW	L-2631142-1
SARAH	104.00	0	0			24-Aug-21	KLEEFELD 2 - TREATED	L-2631142-2
SARAH	104.00	0	0			24-Aug-21	KLEEFELD 3 - DISTRIBUTION @ MAIN ST	L-2631142-3
SARAH	104.00				0.0436/0.0330	24-Aug-21	KLEEFELD - DISTRIBUTION DEAD END @79 MAIN ST N	L-2631144
SARAH	104.00			1.58		24-Aug-21	KLEEFELD - DISTRIBUTION @ 22 ASPEN BAY	L-2631149
SARAH	104.00	0	0			08-Sep-21	KLEEFELD 1 - RAW	L-2636448-1
SARAH	104.00	0	0			08-Sep-21	KLEEFELD 2 - TREATED	L-2636448-2
SARAH	104.00	0	0			08-Sep-21	KLEEFELD 3 - DISTRIBUTION @ MAIN ST	L-2636448-3
SARAH	104.00	0	0			21-Sep-21	KLEEFELD 1 - RAW	L-2642295-1
SARAH	104.00	0	0			21-Sep-21	KLEEFELD 2 - TREATED	L-2642295-2
SARAH	104.00	0	0			21-Sep-21	KLEEFELD 3 - DISTRIBUTION @ MAIN ST	L-2642295-3
SARAH	104.00	0	0			05-Oct-21	KLEEFELD 1 - RAW	L-2647804-1
SARAH	104.00	0	0			05-Oct-21	KLEEFELD 2 - TREATED	L-2647804-2
SARAH	104.00	0	0			05-Oct-21	KLEEFELD 3 - DISTRIBUTION @ MAIN ST	L-2647804-3
SARAH	104.00	1	0			14-Oct-21	KLEEFELD 2 - DISTRIBUTION @ 71 TANGLEWOOD	L-2651434-1
SARAH	104.00	0	0			14-Oct-21	KLEEFELD 1 - DISTRIBUTION @73 TANGLEWOOD	L-2651434-2
SARAH	104.00	0	0			18-Oct-21	KLEEFELD 2 - DISTRIBUTION @ 71 TANGLEWOOD	L-2652539-3
SARAH	104.00	1	0			19-Oct-21	KLEEFELD 1 - RAW	L-2653102-1
SARAH	104.00	0	0			19-Oct-21	KLEEFELD 2 - TREATED	L-2653102-2
SARAH	104.00	0	0			19-Oct-21	KLEEFELD 3 - DISTRIBUTION @ MAIN ST	L-2653102-3
SARAH	104.00	0	0			02-Nov-21	KLEEFELD 1 - RAW	L-2658556-1
SARAH	104.00	0	0			02-Nov-21	KLEEFELD 2 - TREATED	L-2658556-2
SARAH	104.00	0	0			02-Nov-21	KLEEFELD 3 - DISTRIBUTION @ MAIN ST	L-2658556-3
SARAH	104.00	0	0			16-Nov-21	KLEEFELD 1 - RAW	L-2663369-1
SARAH	104.00	0	0			16-Nov-21	KLEEFELD 2 - TREATED	L-2663369-2
SARAH	104.00	0	0			16-Nov-21	KLEEFELD 3 - DISTRIBUTION @ MAIN ST	L-2663369-3
SARAH	104.00	0	0			09-Feb-21	KLEEFELD 1 - RAW	L-2666240-1
SARAH	104.00	0	0			09-Feb-21	KLEEFELD 1 - TREATED	L-2666240-2
SARAH	104.00	0	0			09-Feb-21	KLEEFELD 2 - DISTRIBTION @ MAIN ST	L-2666240-3
SARAH	104.00	NA	NA			30-Nov-21	KLEEFELD 1 - RAW	L-2668089-1
SARAH	104.00	NA	NA			30-Nov-21	KLEEFELD 2 - TREATED	L-2668089-2
SARAH	104.00	NA	NA			30-Nov-21	KLEEFELD 3 - DISTRIBUTION @ MAIN ST	L-2668089-3
SARAH	104.00			1.77		2-Dec-21	KLEEFELD - DISTRIBUTION @ 22 ASPEN BAY	L-2669010
SARAH	104.00	0	0			06-Dec-21	KLEEFELD 1 - RAW	L-2669820-1
SARAH	104.00	0	0			06-Dec-21	KLEEFELD 2 - TREATED	L-2669820-2
SARAH	104.00	0	0			06-Dec-21	KLEEFELD 3 - DISTRIBUTION @ MAIN ST	L-2669820-3
SARAH	104.00	0	0			14-Dec-21	KLEEFELD 1 - RAW	L-2672692-1
SARAH	104.00	0	0			14-Dec-21	KLEEFELD 2 - TREATED	L-2672692-2
SARAH	104.00	0	0			14-Dec-21	KLEEFELD 3 - DISTRIBUTION @ MAIN ST	L-2672692-3
SARAH	104.00	0	0			29-Dec-21	KLEEFELD 1 - RAW	L-2675886-1
SARAH	104.00	0	0			29-Dec-21	KLEEFELD 2 - TREATED	L-2675886-2

SARAH	104.00	0	0			29-Dec-21	KLEEFELD 3 - DISTRIBUTION @ MAIN ST	L-2675886-3

Appendix D

Analyses

RM of Hanover - Kleefeld PWS
ATTN: BARRY BROESKY
Kleefeld - PWS
28 Westland Drive
Mitchell MB R5G 2N9

Date Received: 28- AUG- 20
Report Date: 04- SEP- 20 13:16 (MT)
Version: FINAL

Client Phone: 204- 371- 0484

Certificate of Analysis

Lab Work Order #: L2495666

Project P.O. #: NOT SUBMITTED
Job Reference: KLEEFELD - PWS 104.00
C of C Numbers:
Legal Site Desc: 7793

Hua Wo
Chemistry Laboratory Manager

ALS Environmental

ANALYTICAL REPORT

Physical Tests (WATER)

Analyte	Unit	Guide Limit #1	Guide Limit #2	ALS ID / Sampled Date / Sampled Time / Sample ID	L2495666-1 27-AUG-20 14:00 KLEEFELD 1 - RAW	L2495666-2 27-AUG-20 14:00 KLEEFELD 2 - TREATED
Colour, True	CU	15	-		123	<5.0
Conductivity	umhos/cm	-	-		628	656
Hardness (as CaCO3)	mg/L	-	-		317 HTC	313 HTC
Langelier Index (4 C)	No Unit	-	-		0.65	0.68
Langelier Index (60 C)	No Unit	-	-		1.4	1.4
pH	pH units	7.00-10.5	-		7.98	8.02
Total Dissolved Solids	mg/L	500	-		358	380
Transmittance, UV (254 nm)	%T/cm	-	-		67.6	77.4
Turbidity	NTU	-	-		14.6	0.65

Federal Guidelines for Canadian Drinking Water Quality (JAN, 2020)
#1: GCDWQ - Aesthetic Objective/Other Value (Jan.2020)
#2: GCDWQ - Maximum Acceptable Concentrations (MACs-Jan.2020)

Anions and Nutrients (WATER)

Analyte	Unit	Guide Limit #1	Guide Limit #2	ALS ID / Sampled Date / Sampled Time / Sample ID	L2495666-1 27-AUG-20 14:00 KLEEFELD 1 - RAW	L2495666-2 27-AUG-20 14:00 KLEEFELD 2 - TREATED	L2495666-3 27-AUG-20 14:30 KLEEFELD 3 - DISTRIBUTION DEAD END
Alkalinity, Total (as CaCO3)	mg/L	-	-		370	372	
Ammonia, Total (as N)	mg/L	-	-		1.13	0.73	
Bicarbonate (HCO3)	mg/L	-	-		451	454	
Bromide (Br)	mg/L	-	-		0.028	0.013	
Carbonate (CO3)	mg/L	-	-		<0.60	<0.60	
Chloride (Cl)	mg/L	250	-		4.44	11.0	
Fluoride (F)	mg/L	-	1.5		0.353	0.345	
Hydroxide (OH)	mg/L	-	-		<0.34	<0.34	
Nitrate (as N)	mg/L	-	10		<0.0050	0.0356	0.0868
Nitrite (as N)	mg/L	-	1		<0.0010	0.0108	0.0260
Sulfate (SO4)	mg/L	500	-		<0.30	<0.30	

Federal Guidelines for Canadian Drinking Water Quality (JAN, 2020)
#1: GCDWQ - Aesthetic Objective/Other Value (Jan.2020)
#2: GCDWQ - Maximum Acceptable Concentrations (MACs-Jan.2020)

Organic / Inorganic Carbon (WATER)

Analyte	Unit	Guide Limit #1	Guide Limit #2	ALS ID / Sampled Date / Sampled Time / Sample ID	L2495666-1 27-AUG-20 14:00 KLEEFELD 1 - RAW	L2495666-2 27-AUG-20 14:00 KLEEFELD 2 - TREATED
Dissolved Organic Carbon	mg/L	-	-		4.42	4.25
Total Organic Carbon	mg/L	-	-		4.24	4.44

Federal Guidelines for Canadian Drinking Water Quality (JAN, 2020)
#1: GCDWQ - Aesthetic Objective/Other Value (Jan.2020)
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Detection Limit for result exceeds Guide Limit. Assessment against Guide Limit cannot be made.
Analytical result for this parameter exceeds Guide Limit listed on this report.
* Please refer to the Reference Information section for an explanation of any qualifiers noted.

ALS Environmental

ANALYTICAL REPORT

Total Metals (WATER)

				ALS ID	L2495666-1	L2495666-2	L2495666-4
				Sampled Date	27-AUG-20	27-AUG-20	27-AUG-20
				Sampled Time	14:00	14:00	15:00
				Sample ID	KLEEFELD 1 - RAW	KLEEFELD 2 - TREATED	KLEEFELD 3 - DISTRIBUTION MID POINT
Analyte	Unit	Guide Limit #1	Guide Limit #2				
Aluminum (Al)-Total	mg/L	0.1	-		<0.0030	<0.0030	0.0131
Antimony (Sb)-Total	mg/L	-	0.006		<0.00010	<0.00010	<0.00010
Arsenic (As)-Total	mg/L	-	0.01		0.00331	0.00189	0.00603
Barium (Ba)-Total	mg/L	-	2		1.80	1.67	3.67
Beryllium (Be)-Total	mg/L	-	-		<0.00010	<0.00010	<0.00010
Bismuth (Bi)-Total	mg/L	-	-		<0.000050	<0.000050	0.000091
Boron (B)-Total	mg/L	-	5		0.155	0.156	0.159
Cadmium (Cd)-Total	mg/L	-	0.005		<0.0000050	<0.0000050	<0.0000050
Calcium (Ca)-Total	mg/L	-	-		64.1	62.8	65.0
Cesium (Cs)-Total	mg/L	-	-		0.000012	0.000012	0.000014
Chromium (Cr)-Total	mg/L	-	0.05		0.00011	<0.00010	0.00130
Cobalt (Co)-Total	mg/L	-	-		<0.00010	<0.00010	0.00012
Copper (Cu)-Total	mg/L	1	2		<0.00050	0.0780	0.197
Iron (Fe)-Total	mg/L	0.3	-		2.01	0.950	8.40
Lead (Pb)-Total	mg/L	-	0.005		<0.000050	0.000070	0.00418
Lithium (Li)-Total	mg/L	-	-		0.0185	0.0185	0.0184
Magnesium (Mg)-Total	mg/L	-	-		38.0	37.8	38.8
Manganese (Mn)-Total	mg/L	0.02	0.12		0.00308	0.00242	0.00339
Molybdenum (Mo)-Total	mg/L	-	-		0.00207	0.00198	0.00220
Nickel (Ni)-Total	mg/L	-	-		0.00052	0.00053	0.00195
Phosphorus (P)-Total	mg/L	-	-		1.82	0.578	4.60
Potassium (K)-Total	mg/L	-	-		4.42	4.50	4.60
Rubidium (Rb)-Total	mg/L	-	-		0.00305	0.00294	0.00311
Selenium (Se)-Total	mg/L	-	0.05		<0.000050	0.000051	0.000064
Silicon (Si)-Total	mg/L	-	-		8.21	8.18	8.33
Silver (Ag)-Total	mg/L	-	-		<0.000010	<0.000010	<0.00010
Sodium (Na)-Total	mg/L	200	-		25.4	29.8	30.6
Strontium (Sr)-Total	mg/L	-	7		0.458	0.454	0.498
Sulfur (S)-Total	mg/L	-	-				<0.50
Tellurium (Te)-Total	mg/L	-	-		<0.00020	<0.00020	<0.00020
Thallium (Tl)-Total	mg/L	-	-		<0.000010	<0.000010	<0.000010
Thorium (Th)-Total	mg/L	-	-		<0.00010	<0.00010	<0.00010
Tin (Sn)-Total	mg/L	-	-		<0.00010	<0.00010	0.00038

Federal Guidelines for Canadian Drinking Water Quality (JAN, 2020)
#1: GCDWQ - Aesthetic Objective/Other Value (Jan.2020)
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Detection Limit for result exceeds Guide Limit. Assessment against Guide Limit cannot be made.
Analytical result for this parameter exceeds Guide Limit listed on this report.
* Please refer to the Reference Information section for an explanation of any qualifiers noted.

ANALYTICAL REPORT

Total Metals (WATER)

				ALS ID	L2495666-1	L2495666-2	L2495666-4
				Sampled Date	27-AUG-20	27-AUG-20	27-AUG-20
				Sampled Time	14:00	14:00	15:00
				Sample ID	KLEEFELD 1 - RAW	KLEEFELD 2 - TREATED	KLEEFELD 3 - DISTRIBUTION MID POINT
Analyte	Unit	Guide Limit #1	Guide Limit #2				
Titanium (Ti)-Total	mg/L	-	-		<0.00030	<0.00030	0.00172
Tungsten (W)-Total	mg/L	-	-		<0.00010	<0.00010	<0.00010
Uranium (U)-Total	mg/L	-	0.02		<0.000010	<0.000010	0.000023
Vanadium (V)-Total	mg/L	-	-		<0.00050	<0.00050	0.00059
Zinc (Zn)-Total	mg/L	5	-		<0.0030	0.0066 RRV	<0.030
Zirconium (Zr)-Total	mg/L	-	-		<0.00020	<0.00020	0.00059

Federal Guidelines for Canadian Drinking Water Quality (JAN, 2020)
#1: GCDWQ - Aesthetic Objective/Other Value (Jan.2020)
#2: GCDWQ - Maximum Acceptable Concentrations (MACs-Jan.2020)

Volatile Organic Compounds (WATER)

				ALS ID	L2495666-1
				Sampled Date	27-AUG-20
				Sampled Time	14:00
				Sample ID	KLEEFELD 1 - RAW
Analyte	Unit	Guide Limit #1	Guide Limit #2		
Benzene	mg/L	-	0.005		<0.00050
1,1-dichloroethene	mg/L	-	0.014		<0.00050
Dichloromethane	mg/L	-	0.05		<0.0050
Ethylbenzene	mg/L	0.0016	0.14		<0.00050
MTBE	mg/L	0.015	-		<0.00050
Tetrachloroethene	mg/L	-	0.01		<0.00050
Toluene	mg/L	0.024	0.06		<0.00050
Trichloroethene	mg/L	-	0.005		<0.00050
o-Xylene	mg/L	-	-		<0.00050
M+P-Xylenes	mg/L	-	-		<0.00040
Xylenes (Total)	mg/L	0.02	0.09		<0.00064
Surrogate: 4-Bromofluorobenzene (SS)	%	-	-		92.5
Surrogate: 1,4-Difluorobenzene (SS)	%	-	-		95.9

Federal Guidelines for Canadian Drinking Water Quality (JAN, 2020)
#1: GCDWQ - Aesthetic Objective/Other Value (Jan.2020)
#2: GCDWQ - Maximum Acceptable Concentrations (MACs-Jan.2020)

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

Reference Information

Qualifiers for Individual Parameters Listed:

Qualifier	Description
RRV	Reported Result Verified By Repeat Analysis
HTC	Hardness was calculated from Total Ca and/or Mg concentrations and may be biased high (dissolved Ca/Mg results unavailable).

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-CO3CO3-CALC-WP	Water	Alkalinity, Carbonate	CALCULATION

The Alkalinity of water is a measure of its acid neutralizing capacity.Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. The fraction of alkalinity contributed by carbonate is calculated and reported as mg CO3 2-/L.

ALK-HCO3HCO3-CALC-WP	Water	Alkalinity, Bicarbonate	CALCULATION

The Alkalinity of water is a measure of its acid neutralizing capacity.Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. The fraction of alkalinity contributed by bicarbonate is calculated and reported as mg HCO3-/L

ALK-OHOH-CALC-WP	Water	Alkalinity, Hydroxide	CALCULATION

The Alkalinity of water is a measure of its acid neutralizing capacity.Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. The fraction of alkalinity contributed by hydroxide is calculated and reported as mg OH-/L.

ALK-TITR-WP	Water	Alkalinity, Total (as CaCO3)	APHA 2320B

The Alkalinity of water is a measure of its acid neutralizing capacity. Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. Total alkalinity is determined by titration with a strong standard mineral acid to the successive HCO3- and H2CO3 endpoints indicated electrometrically.

BR-L-IC-N-WP	Water	Bromide in Water by IC (Low Level)	EPA 300.1 (mod)-LR

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

C-DOC-HTC-WP	Water	Dissolved Organic Carbon by Combustion	APHA 5310 B-WP

Filtered (0.45 um) sample is acidified and purged to remove inorganic carbon, then injected into a heated reaction chamber where organic carbon is oxidized to CO2 which is then transported in the carrier gas stream and measured via a non-dispersive infrared analyzer.

C-TOC-HTC-WP	Water	Total Organic Carbon by Combustion	APHA 5310 B-WP

Sample is acidified and purged to remove inorganic carbon, then injected into a heated reaction chamber where organic carbon is oxidized to CO2 which is then transported in the carrier gas stream and measured via a non-dispersive infrared analyzer.

CL-L-IC-N-WP	Water	Chloride in Water by IC (Low Level)	EPA 300.1 (mod)

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

COLOUR-TRUE-WP	Water	Colour, True	APHA 2120C

True Colour is measured spectrophotometrically by comparison to platinum-cobalt standards using the single wavelength method (450 - 465 nm) after filtration of sample through a 0.45 um filter. Colour measurements can be highly pH dependent, and apply to the pH of the sample as received (at time of testing), without pH adjustment. Concurrent measurement of sample pH is recommended.

EC-SCREEN-WP	Water	Conductivity Screen (Internal Use Only)	APHA 2510

Qualitative analysis of conductivity where required during preparation of other test eg. IC, TDS, TSS, etc

EC-WP	Water	Conductivity	APHA 2510B

Conductivity of an aqueous solution refers to its ability to carry an electric current. Conductance of a solution is measured between two spatially fixed and chemically inert electrodes.

ETL-LANGELIER-4-WP	Water	Langelier Index 4C	Calculated
ETL-LANGELIER-60-WP	Water	Langelier Index 60C	Calculated
F-IC-N-WP	Water	Fluoride in Water by IC	EPA 300.1 (mod)

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

HARDNESS-CALC-WP	Water	Hardness Calculated	APHA 2340B

Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents.

Reference Information

Methods Listed (if applicable):

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

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

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

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

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

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

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

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

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

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

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

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

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

PH-WP	Water	pH	APHA 4500H

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

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

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

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

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

TURBIDITY-WP	Water	Turbidity	APHA 2130B (modified)

Turbidity in aqueous matrices is determined by the nephelometric method.

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

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

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

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

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

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

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

Chain of Custody Numbers:

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

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

Reference Information

GLOSSARY OF REPORT TERMS

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

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

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

ALS Environmental

Quality Control Report

Workorder: L2495666 Report Date: 04-SEP-20

Client: RM of Hanover - Kleefeld PWS
Kleefeld - PWS 28 Westland Drive
Mitchell MB R5G 2N9

Contact: BARRY BROESKY

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
LK-TITR-WP	Water							
Batch R5205048								
WG3394834-25 DUP Alkalinity, Total (as CaCO3)		**L2495601-2** 294	294		mg/L	0.1	20	28-AUG-20
WG3394834-24 LCS Alkalinity, Total (as CaCO3)			107.9		%		85-115	28-AUG-20
WG3394834-21 MB Alkalinity, Total (as CaCO3)			<1.0		mg/L		1	28-AUG-20
R-L-IC-N-WP	Water							
Batch R5208621								
WG3393905-15 DUP Bromide (Br)		**L2495655-1** 0.037	0.039		mg/L	7.2	20	28-AUG-20
WG3393905-19 DUP Bromide (Br)		**L2495666-1** 0.028	0.032		mg/L	14	20	28-AUG-20
WG3393905-14 LCS Bromide (Br)			99.4		%		85-115	28-AUG-20
WG3393905-18 LCS Bromide (Br)			101.0		%		85-115	28-AUG-20
WG3393905-13 MB Bromide (Br)			<0.010		mg/L		0.01	28-AUG-20
WG3393905-17 MB Bromide (Br)			<0.010		mg/L		0.01	28-AUG-20
WG3393905-16 MS Bromide (Br)		**L2495655-1**	99.8		%		75-125	28-AUG-20
WG3393905-20 MS Bromide (Br)		**L2495666-1**	103.6		%		75-125	28-AUG-20
-DOC-HTC-WP	Water							
Batch R5209771								
WG3397334-7 DUP Dissolved Organic Carbon		**L2495603-8** 1.55	1.57		mg/L	1.3	20	02-SEP-20
WG3397334-6 LCS Dissolved Organic Carbon			104.2		%		80-120	02-SEP-20
WG3397334-5 MB Dissolved Organic Carbon			<0.50		mg/L		0.5	02-SEP-20
WG3397334-8 MS Dissolved Organic Carbon		**L2495603-8**	108.0		%		70-130	02-SEP-20
-TOC-HTC-WP	Water							

ALS Environmental

Quality Control Report

Client: RM of Hanover - Kleefeld PWS
Kleefeld - PWS 28 Westland Drive
Mitchell MB R5G 2N9

Contact: BARRY BROESKY

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
-TOC-HTC-WP	Water							
Batch R5209758								
WG3397434-7 DUP Total Organic Carbon		**L2495813-5** 19.9	19.7		mg/L	1.2	20	02-SEP-20
WG3397434-6 LCS Total Organic Carbon			104.2		%		80-120	02-SEP-20
WG3397434-5 MB Total Organic Carbon			<0.50		mg/L		0.5	02-SEP-20
WG3397434-8 MS Total Organic Carbon		**L2495813-5**	N/A	MS-B	%		-	02-SEP-20
L-L-IC-N-WP	Water							
Batch R5208621								
WG3393905-15 DUP Chloride (Cl)		**L2495655-1** 22.0	22.0		mg/L	0.0	20	28-AUG-20
WG3393905-19 DUP Chloride (Cl)		**L2495666-1** 4.44	4.42		mg/L	0.4	20	28-AUG-20
WG3393905-14 LCS Chloride (Cl)			99.6		%		90-110	28-AUG-20
WG3393905-18 LCS Chloride (Cl)			99.7		%		90-110	28-AUG-20
WG3393905-13 MB Chloride (Cl)			<0.10		mg/L		0.1	28-AUG-20
WG3393905-17 MB Chloride (Cl)			<0.10		mg/L		0.1	28-AUG-20
WG3393905-16 MS Chloride (Cl)		**L2495655-1**	106.3		%		75-125	28-AUG-20
WG3393905-20 MS Chloride (Cl)		**L2495666-1**	106.8		%		75-125	28-AUG-20
OLOUR-TRUE-WP	Water							
Batch R5204661								
WG3393567-6 DUP Colour, True		**L2495655-2** <5.0	<5.0	RPD-NA	CU	N/A	20	28-AUG-20
WG3393567-5 LCS Colour, True			100.3		%		85-115	28-AUG-20
WG3393567-4 MB Colour, True			<5.0		CU		5	29-AUG-20
C-WP	Water							

ALS Environmental

Quality Control Report

Workorder: L2495666 Report Date: 04-SEP-20

Client: RM of Hanover - Kleefeld PWS
Kleefeld - PWS 28 Westland Drive
Mitchell MB R5G 2N9

Contact: BARRY BROESKY

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
C-WP	Water							
Batch R5205048								
WG3394834-25 DUP Conductivity		**L2495601-2** 3250	3240		umhos/cm	0.3	10	28-AUG-20
WG3394834-23 LCS Conductivity			99.4		%		90-110	28-AUG-20
WG3394834-21 MB Conductivity			<1.0		umhos/cm		1	28-AUG-20
-IC-N-WP	Water							
Batch R5208621								
WG3393905-15 DUP Fluoride (F)		**L2495655-1** 0.194	0.189		mg/L	2.7	20	28-AUG-20
WG3393905-19 DUP Fluoride (F)		**L2495666-1** 0.353	0.349		mg/L	1.1	20	28-AUG-20
WG3393905-14 LCS Fluoride (F)			102.6		%		90-110	28-AUG-20
WG3393905-18 LCS Fluoride (F)			104.2		%		90-110	28-AUG-20
WG3393905-13 MB Fluoride (F)			<0.020		mg/L		0.02	28-AUG-20
WG3393905-17 MB Fluoride (F)			<0.020		mg/L		0.02	28-AUG-20
WG3393905-16 MS Fluoride (F)		**L2495655-1**	105.6		%		75-125	28-AUG-20
WG3393905-20 MS Fluoride (F)		**L2495666-1**	106.7		%		75-125	28-AUG-20
IET-T-CCMS-WP	Water							
Batch R5208572								
WG3394876-4 DUP		**WG3394876-3**						
Aluminum (Al)-Total		<0.0030	<0.0030	RPD-NA	mg/L	N/A	20	01-SEP-20
Antimony (Sb)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	01-SEP-20
Arsenic (As)-Total		0.00277	0.00280		mg/L	1.2	20	01-SEP-20
Barium (Ba)-Total		0.145	0.144		mg/L	1.0	20	01-SEP-20
Beryllium (Be)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	01-SEP-20
Bismuth (Bi)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	01-SEP-20
Boron (B)-Total		0.137	0.146		mg/L	6.2	20	01-SEP-20
Cadmium (Cd)-Total		<0.0000050	<0.000005(	RPD-NA	mg/L	N/A	20	01-SEP-20
Calcium (Ca)-Total		67.8	71.3		mg/L	5.0	20	01-SEP-20

ALS Environmental

Quality Control Report

Workorder: L2495666 Report Date: 04-SEP-20

Client: RM of Hanover - Kleefeld PWS
Kleefeld - PWS 28 Westland Drive
Mitchell MB R5G 2N9

Contact: BARRY BROESKY

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
IET-T-CCMS-WP	Water							
Batch R5208572								
WG3394876-4 DUP		**WG3394876-3**						
Cesium (Cs)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	01-SEP-20
Chromium (Cr)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	01-SEP-20
Cobalt (Co)-Total		0.00053	0.00051		mg/L	3.0	20	01-SEP-20
Copper (Cu)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	01-SEP-20
Iron (Fe)-Total		1.24	1.25		mg/L	0.9	20	01-SEP-20
Lead (Pb)-Total		0.000052	0.000050		mg/L	4.0	20	01-SEP-20
Lithium (Li)-Total		0.0299	0.0303		mg/L	1.3	20	01-SEP-20
Magnesium (Mg)-Total		51.0	51.9		mg/L	1.8	20	01-SEP-20
Manganese (Mn)-Total		0.0141	0.0142		mg/L	0.6	20	01-SEP-20
Molybdenum (Mo)-Total		0.000584	0.000583		mg/L	0.1	20	01-SEP-20
Nickel (Ni)-Total		0.00154	0.00153		mg/L	0.4	20	01-SEP-20
Potassium (K)-Total		5.17	5.25		mg/L	1.4	20	01-SEP-20
Phosphorus (P)-Total		<0.050	<0.030	RPD-NA	mg/L	N/A	20	01-SEP-20
Rubidium (Rb)-Total		0.00273	0.00279		mg/L	2.0	20	01-SEP-20
Selenium (Se)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	01-SEP-20
Silicon (Si)-Total		5.55	5.65		mg/L	1.8	20	01-SEP-20
Silver (Ag)-Total		0.000013	<0.000010	RPD-NA	mg/L	N/A	20	01-SEP-20
Sodium (Na)-Total		18.6	19.1		mg/L	2.8	20	01-SEP-20
Strontium (Sr)-Total		0.590	0.602		mg/L	2.1	20	01-SEP-20
Sulfur (S)-Total		2.82	2.90		mg/L	3.0	20	01-SEP-20
Tellurium (Te)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	01-SEP-20
Thallium (Tl)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	01-SEP-20
Thorium (Th)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	01-SEP-20
Tin (Sn)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	01-SEP-20
Titanium (Ti)-Total		<0.00030	<0.00030	RPD-NA	mg/L	N/A	20	01-SEP-20
Tungsten (W)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	01-SEP-20
Uranium (U)-Total		0.000913	0.000923		mg/L	1.1	20	01-SEP-20
Vanadium (V)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	01-SEP-20
Zinc (Zn)-Total		<0.0030	<0.0030	RPD-NA	mg/L	N/A	20	01-SEP-20
Zirconium (Zr)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	01-SEP-20
WG3394876-2 LCS								
Aluminum (Al)-Total			101.4		%		80-120	01-SEP-20
Antimony (Sb)-Total			97.5		%		80-120	01-SEP-20

Client: RM of Hanover - Kleefeld PWS
Kleefeld - PWS 28 Westland Drive
Mitchell MB R5G 2N9

Contact: BARRY BROESKY

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
IET-T-CCMS-WP	Water							
Batch R5208572								
WG3394876-2 LCS								
Arsenic (As)-Total			98.8		%		80-120	01-SEP-20
Barium (Ba)-Total			97.8		%		80-120	01-SEP-20
Beryllium (Be)-Total			98.7		%		80-120	01-SEP-20
Bismuth (Bi)-Total			97.4		%		80-120	01-SEP-20
Boron (B)-Total			98.5		%		80-120	01-SEP-20
Cadmium (Cd)-Total			99.0		%		80-120	01-SEP-20
Calcium (Ca)-Total			99.1		%		80-120	01-SEP-20
Cesium (Cs)-Total			93.4		%		80-120	01-SEP-20
Chromium (Cr)-Total			99.6		%		80-120	01-SEP-20
Cobalt (Co)-Total			97.1		%		80-120	01-SEP-20
Copper (Cu)-Total			97.9		%		80-120	01-SEP-20
Iron (Fe)-Total			96.8		%		80-120	01-SEP-20
Lead (Pb)-Total			96.5		%		80-120	01-SEP-20
Lithium (Li)-Total			96.8		%		80-120	01-SEP-20
Magnesium (Mg)-Total			111.5		%		80-120	01-SEP-20
Manganese (Mn)-Total			100.5		%		80-120	01-SEP-20
Molybdenum (Mo)-Total			97.7		%		80-120	01-SEP-20
Nickel (Ni)-Total			100.2		%		80-120	01-SEP-20
Potassium (K)-Total			101.3		%		80-120	01-SEP-20
Phosphorus (P)-Total			103.1		%		80-120	01-SEP-20
Rubidium (Rb)-Total			99.96		%		80-120	01-SEP-20
Selenium (Se)-Total			100.0		%		80-120	01-SEP-20
Silicon (Si)-Total			104.3		%		80-120	01-SEP-20
Silver (Ag)-Total			95.0		%		80-120	01-SEP-20
Sodium (Na)-Total			104.0		%		80-120	01-SEP-20
Strontium (Sr)-Total			97.2		%		80-120	01-SEP-20
Sulfur (S)-Total			102.7		%		80-120	01-SEP-20
Tellurium (Te)-Total			96.0		%		80-120	01-SEP-20
Thallium (Tl)-Total			97.2		%		80-120	01-SEP-20
Thorium (Th)-Total			91.8		%		80-120	01-SEP-20
Tin (Sn)-Total			94.9		%		80-120	01-SEP-20
Titanium (Ti)-Total			96.4		%		80-120	01-SEP-20
Tungsten (W)-Total			96.6		%		80-120	01-SEP-20

Client: RM of Hanover - Kleefeld PWS
Kleefeld - PWS 28 Westland Drive
Mitchell MB R5G 2N9

Contact: BARRY BROESKY

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
IET-T-CCMS-WP	Water							
Batch R5208572								
WG3394876-2 LCS								
Uranium (U)-Total			98.7		%		80-120	01-SEP-20
Vanadium (V)-Total			100.5		%		80-120	01-SEP-20
Zinc (Zn)-Total			98.9		%		80-120	01-SEP-20
Zirconium (Zr)-Total			91.3		%		80-120	01-SEP-20
WG3394876-1 MB								
Aluminum (Al)-Total			<0.0030		mg/L		0.003	01-SEP-20
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	01-SEP-20
Arsenic (As)-Total			<0.00010		mg/L		0.0001	01-SEP-20
Barium (Ba)-Total			<0.00010		mg/L		0.0001	01-SEP-20
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	01-SEP-20
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	01-SEP-20
Boron (B)-Total			<0.010		mg/L		0.01	01-SEP-20
Cadmium (Cd)-Total			<0.000005(		mg/L		0.000005	01-SEP-20
Calcium (Ca)-Total			0.055	B	mg/L		0.05	01-SEP-20
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	01-SEP-20
Chromium (Cr)-Total			<0.00010		mg/L		0.0001	01-SEP-20
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	01-SEP-20
Copper (Cu)-Total			<0.00050		mg/L		0.0005	01-SEP-20
Iron (Fe)-Total			<0.010		mg/L		0.01	01-SEP-20
Lead (Pb)-Total			<0.000050		mg/L		0.00005	01-SEP-20
Lithium (Li)-Total			<0.0010		mg/L		0.001	01-SEP-20
Magnesium (Mg)-Total			0.0074	B	mg/L		0.005	01-SEP-20
Manganese (Mn)-Total			<0.00010		mg/L		0.0001	01-SEP-20
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	01-SEP-20
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	01-SEP-20
Potassium (K)-Total			<0.050		mg/L		0.05	01-SEP-20
Phosphorus (P)-Total			<0.030		mg/L		0.03	01-SEP-20
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	01-SEP-20
Selenium (Se)-Total			<0.000050		mg/L		0.00005	01-SEP-20
Silicon (Si)-Total			<0.10		mg/L		0.1	01-SEP-20
Silver (Ag)-Total			0.000011	B	mg/L		0.00001	01-SEP-20
Sodium (Na)-Total			<0.050		mg/L		0.05	01-SEP-20
Strontium (Sr)-Total			<0.00020		mg/L		0.0002	01-SEP-20
Sulfur (S)-Total			<0.50		mg/L		0.5	01-SEP-20

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
IET-T-CCMS-WP	Water							
Batch R5208572								
WG3394876-1 MB								
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	01-SEP-20
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	01-SEP-20
Thorium (Th)-Total			<0.00010		mg/L		0.0001	01-SEP-20
Tin (Sn)-Total			<0.00010		mg/L		0.0001	01-SEP-20
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	01-SEP-20
Tungsten (W)-Total			<0.00010		mg/L		0.0001	01-SEP-20
Uranium (U)-Total			<0.000010		mg/L		0.00001	01-SEP-20
Vanadium (V)-Total			<0.00050		mg/L		0.0005	01-SEP-20
Zinc (Zn)-Total			0.0031	B	mg/L		0.003	01-SEP-20
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	01-SEP-20
WG3394876-5 MS		**WG3394876-3**						
Aluminum (Al)-Total			93.0		%		70-130	01-SEP-20
Antimony (Sb)-Total			87.9		%		70-130	01-SEP-20
Arsenic (As)-Total			93.6		%		70-130	01-SEP-20
Barium (Ba)-Total			N/A	MS-B	%		-	01-SEP-20
Beryllium (Be)-Total			94.0		%		70-130	01-SEP-20
Bismuth (Bi)-Total			85.2		%		70-130	01-SEP-20
Boron (B)-Total			N/A	MS-B	%		-	01-SEP-20
Cadmium (Cd)-Total			91.3		%		70-130	01-SEP-20
Calcium (Ca)-Total			N/A	MS-B	%		-	01-SEP-20
Cesium (Cs)-Total			88.5		%		70-130	01-SEP-20
Chromium (Cr)-Total			94.1		%		70-130	01-SEP-20
Cobalt (Co)-Total			90.2		%		70-130	01-SEP-20
Copper (Cu)-Total			89.0		%		70-130	01-SEP-20
Iron (Fe)-Total			92.8		%		70-130	01-SEP-20
Lead (Pb)-Total			86.0		%		70-130	01-SEP-20
Lithium (Li)-Total			90.4		%		70-130	01-SEP-20
Magnesium (Mg)-Total			N/A	MS-B	%		-	01-SEP-20
Manganese (Mn)-Total			90.3		%		70-130	01-SEP-20
Molybdenum (Mo)-Total			94.4		%		70-130	01-SEP-20
Nickel (Ni)-Total			89.9		%		70-130	01-SEP-20
Potassium (K)-Total			N/A	MS-B	%		-	01-SEP-20
Phosphorus (P)-Total			98.8		%		70-130	01-SEP-20
Rubidium (Rb)-Total			92.9		%		70-130	01-SEP-20

Client: RM of Hanover - Kleefeld PWS
Kleefeld - PWS 28 Westland Drive
Mitchell MB R5G 2N9

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
IET-T-CCMS-WP	Water							
Batch R5208572								
WG3394876-5 MS		**WG3394876-3**						
Selenium (Se)-Total			94.4		%		70-130	01-SEP-20
Silicon (Si)-Total			89.4		%		70-130	01-SEP-20
Silver (Ag)-Total			88.2		%		70-130	01-SEP-20
Sodium (Na)-Total			N/A	MS-B	%		-	01-SEP-20
Strontium (Sr)-Total			N/A	MS-B	%		-	01-SEP-20
Sulfur (S)-Total			100.1		%		70-130	01-SEP-20
Tellurium (Te)-Total			84.7		%		70-130	01-SEP-20
Thallium (Tl)-Total			87.1		%		70-130	01-SEP-20
Thorium (Th)-Total			90.8		%		70-130	01-SEP-20
Tin (Sn)-Total			89.3		%		70-130	01-SEP-20
Titanium (Ti)-Total			95.2		%		70-130	01-SEP-20
Tungsten (W)-Total			92.1		%		70-130	01-SEP-20
Uranium (U)-Total			90.1		%		70-130	01-SEP-20
Vanadium (V)-Total			96.5		%		70-130	01-SEP-20
Zinc (Zn)-Total			87.0		%		70-130	01-SEP-20
Zirconium (Zr)-Total			91.1		%		70-130	01-SEP-20
H3-COL-WP	Water							
Batch R5208683								
WG3396547-7 DUP		**L2495645-1**						
Ammonia, Total (as N)		<0.010	<0.010	RPD-NA	mg/L	N/A	20	01-SEP-20
WG3396547-6 LCS								
Ammonia, Total (as N)			99.7		%		85-115	01-SEP-20
WG3396547-5 MB								
Ammonia, Total (as N)			<0.010		mg/L		0.01	01-SEP-20
WG3396547-8 MS		**L2495645-1**						
Ammonia, Total (as N)			98.3		%		75-125	01-SEP-20
O2-L-IC-N-WP	Water							
Batch R5208621								
WG3393905-15 DUP		**L2495655-1**						
Nitrite (as N)		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	28-AUG-20
WG3393905-19 DUP		**L2495666-1**						
Nitrite (as N)		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	28-AUG-20
WG3393905-14 LCS								
Nitrite (as N)			99.3		%		90-110	28-AUG-20
WG3393905-18 LCS								

ALS Environmental

Quality Control Report

Client: RM of Hanover - Kleefeld PWS
Kleefeld - PWS 28 Westland Drive
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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
O2-L-IC-N-WP	Water							
Batch R5208621								
WG3393905-18 LCS								
Nitrite (as N)			100.6		%		90-110	28-AUG-20
WG3393905-13 MB								
Nitrite (as N)			<0.0010		mg/L		0.001	28-AUG-20
WG3393905-17 MB								
Nitrite (as N)			<0.0010		mg/L		0.001	28-AUG-20
WG3393905-16 MS		**L2495655-1**						
Nitrite (as N)			105.6		%		75-125	28-AUG-20
WG3393905-20 MS		**L2495666-1**						
Nitrite (as N)			106.6		%		75-125	28-AUG-20
O3-L-IC-N-WP	Water							
Batch R5208621								
WG3393905-15 DUP		**L2495655-1**						
Nitrate (as N)		0.0929	0.0942		mg/L	1.3	20	28-AUG-20
WG3393905-19 DUP		**L2495666-1**						
Nitrate (as N)		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	28-AUG-20
WG3393905-14 LCS								
Nitrate (as N)			99.7		%		90-110	28-AUG-20
WG3393905-18 LCS								
Nitrate (as N)			99.5		%		90-110	28-AUG-20
WG3393905-13 MB								
Nitrate (as N)			<0.0050		mg/L		0.005	28-AUG-20
WG3393905-17 MB								
Nitrate (as N)			<0.0050		mg/L		0.005	28-AUG-20
WG3393905-16 MS		**L2495655-1**						
Nitrate (as N)			106.3		%		75-125	28-AUG-20
WG3393905-20 MS		**L2495666-1**						
Nitrate (as N)			106.0		%		75-125	28-AUG-20
H-WP	Water							
Batch R5205048								
WG3394834-25 DUP		**L2495601-2**						
pH		7.49	7.51	J	pH units	0.02	0.2	28-AUG-20
WG3394834-22 LCS								
pH			7.35		pH units		7.3-7.5	28-AUG-20
O4-IC-N-WP	Water							

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
O4-IC-N-WP	Water							
Batch R5208621								
WG3393905-15 DUP		**L2495655-1**						
Sulfate (SO4)		40.8	40.8		mg/L	0.1	20	28-AUG-20
WG3393905-19 DUP		**L2495666-1**						
Sulfate (SO4)		<0.30	<0.30	RPD-NA	mg/L	N/A	20	28-AUG-20
WG3393905-14 LCS								
Sulfate (SO4)			100.6		%		90-110	28-AUG-20
WG3393905-18 LCS								
Sulfate (SO4)			100.5		%		90-110	28-AUG-20
WG3393905-13 MB								
Sulfate (SO4)			<0.30		mg/L		0.3	28-AUG-20
WG3393905-17 MB								
Sulfate (SO4)			<0.30		mg/L		0.3	28-AUG-20
WG3393905-16 MS		**L2495655-1**						
Sulfate (SO4)			104.4		%		75-125	28-AUG-20
WG3393905-20 MS		**L2495666-1**						
Sulfate (SO4)			104.2		%		75-125	28-AUG-20
DS-WP	Water							
Batch R5207782								
WG3392901-6 DUP		**L2495130-13**						
Total Dissolved Solids		2330	2300		mg/L	1.3	20	28-AUG-20
WG3392901-5 LCS								
Total Dissolved Solids			91.6		%		85-115	28-AUG-20
WG3392901-4 MB								
Total Dissolved Solids			<4.0		mg/L		4	28-AUG-20
Batch R5209595								
WG3395986-3 DUP		**L2495584-1**						
Total Dissolved Solids		336	340		mg/L	1.2	20	02-SEP-20
WG3395986-2 LCS								
Total Dissolved Solids			97.2		%		85-115	02-SEP-20
WG3395986-1 MB								
Total Dissolved Solids			<4.0		mg/L		4	02-SEP-20
URBIDITY-WP	Water							
Batch R5208596								
WG3396454-3 DUP		**L2495603-8**						
Turbidity		0.16	0.15		NTU	3.9	15	01-SEP-20
WG3396454-2 LCS								
Turbidity			100.5		%		85-115	01-SEP-20
WG3396454-1 MB								

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
URBIDITY-WP	Water							
Batch R5208596								
WG3396454-1 MB								
Turbidity			<0.10		NTU		0.1	01-SEP-20
V-%TRANS-WP	Water							
Batch R5204493								
WG3393568-6 DUP		**L2495655-2**						
Transmittance, UV (254 nm)		90.8	91.6		%T/cm	0.9	20	28-AUG-20
WG3393568-4 IRM		**BLANK**						
Transmittance, UV (254 nm)			100.0		%		99.5-100.5	28-AUG-20
WG3393568-5 LCS								
Transmittance, UV (254 nm)			103.0		%		85-115	28-AUG-20
OC+F1-HSMS-WP	Water							
Batch R5208746								
WG3394914-3 DUP		**L2495584-1**						
Benzene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	31-AUG-20
1,1-dichloroethene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	31-AUG-20
Dichloromethane		<0.0050	<0.0050	RPD-NA	mg/L	N/A	30	31-AUG-20
Ethylbenzene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	31-AUG-20
MTBE		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	31-AUG-20
Tetrachloroethene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	31-AUG-20
Toluene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	31-AUG-20
Trichloroethene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	31-AUG-20
M+P-Xylenes		<0.00040	<0.00040	RPD-NA	mg/L	N/A	30	31-AUG-20
o-Xylene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	31-AUG-20
WG3394914-2 LCS								
Benzene			87.5		%		70-130	31-AUG-20
1,1-dichloroethene			87.0		%		70-130	31-AUG-20
Dichloromethane			88.7		%		70-130	31-AUG-20
Ethylbenzene			86.4		%		70-130	31-AUG-20
MTBE			101.1		%		70-130	31-AUG-20
Tetrachloroethene			98.6		%		70-130	31-AUG-20
Toluene			89.0		%		70-130	31-AUG-20
Trichloroethene			87.5		%		70-130	31-AUG-20
M+P-Xylenes			92.4		%		70-130	31-AUG-20
o-Xylene			93.1		%		70-130	31-AUG-20
WG3394914-1 MB								

Client: RM of Hanover - Kleefeld PWS
Kleefeld - PWS 28 Westland Drive
Mitchell MB R5G 2N9

Contact: BARRY BROESKY

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
OC+F1-HSMS-WP	Water							
Batch R5208746								
WG3394914-1 MB								
Benzene			<0.00050		mg/L		0.0005	31-AUG-20
1,1-dichloroethene			<0.00050		mg/L		0.0005	31-AUG-20
Dichloromethane			<0.0050		mg/L		0.005	31-AUG-20
Ethylbenzene			<0.00050		mg/L		0.0005	31-AUG-20
MTBE			<0.00050		mg/L		0.0005	31-AUG-20
Tetrachloroethene			<0.00050		mg/L		0.0005	31-AUG-20
Toluene			<0.00050		mg/L		0.0005	31-AUG-20
Trichloroethene			<0.00050		mg/L		0.0005	31-AUG-20
M+P-Xylenes			<0.00040		mg/L		0.0004	31-AUG-20
o-Xylene			<0.00050		mg/L		0.0005	31-AUG-20
Surrogate: 4-Bromofluorobenzene (SS)			92.1		%		70-130	31-AUG-20
Surrogate: 1,4-Difluorobenzene (SS)			88.7		%		70-130	31-AUG-20

Client: RM of Hanover - Kleefeld PWS
Kleefeld - PWS 28 Westland Drive
Mitchell MB R5G 2N9
Contact: BARRY BROESKY

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
B	Method Blank exceeds ALS DQO. Associated sample results which are < Limit of Reporting or > 5 times blank level are considered reliable.
J	Duplicate results and limits are expressed in terms of absolute difference.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Client: RM of Hanover - Kleefeld PWS
Kleefeld - PWS 28 Westland Drive
Mitchell MB R5G 2N9
Contact: BARRY BROESKY

Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Physical Tests							
Turbidity							
	1	27-AUG-20 14:00	01-SEP-20 10:00	3	5	days	EHT
	2	27-AUG-20 14:00	01-SEP-20 10:00	3	5	days	EHT
pH							
	1	27-AUG-20 14:00	28-AUG-20 12:00	0.25	22	hours	EHTR-FM
	2	27-AUG-20 14:00	28-AUG-20 12:00	0.25	22	hours	EHTR-FM

Legend & Qualifier Definitions:

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended.
EHTR: Exceeded ALS recommended hold time prior to sample receipt.
EHTL: Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.
EHT: Exceeded ALS recommended hold time prior to analysis.
Rec. HT: ALS recommended hold time (see units).

Notes*:
Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes.
Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L2495666 were received on 28-AUG-20 10:45.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes 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 pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

L2495666-COFC

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

Systems

Report to Operator (email PDF):		**Report to Owner (email PDF):**	
Contact:	Barry Broesky	Contact:	Luc Lahaie
Address:	28 Westland Drive, Mitchell, MB R5G 2N9	Address:	28 Westland Drive, Mitchell, MB R5G 2N9
Phone:		Phone:	(204) 326-4488
Email:	barry.broesky@hanovermb.ca	Email:	luc.lahaie@hanovermb.ca

If an update in Owner or Operator contact information is required, please

Client / Project Information:	**Lab:**	**Account:**	Agency Code: 38

Operation Name:	KLEEFELD - PWS
Operation Code:	104.00
Operation ID:	7793
Sampled by:	

Expected Sample Tir

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

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

Sample Number	Station Number	Sample Identification	~~Free Chlorine~~ Mono Chloramine (mg/L)	Total Chlorine (mg/L)	Sampl dd-mn
2007SB5006	MB05OED031	Kleefeld 1 - Raw			27-0
2007SB5007	MB05OED032	Kleefeld 2 - Treated	2.64	3.9	27-08
2007SB5008	MB05OED033	Kleefeld 3 - Distribution Dead end	2.61	3.7	27-08
2007SB5009	MB05OED033	Kleefeld 3 - Distribution Mid-point	0.57	1.6	27-0

Failure to complete all portions of this form may delay analysis.	Sample Matrix: 6-Ra
Please fill in this form LEGIBLY.	Sample Type: 1-Gra

By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified by the Laboratc
For ALL other testing, please use Laboratory specific forms.

Relinquished By:		Date & Time		Validated By (lab use only)	
				Sample Condition (lab use	
Received By: (lab use only)	GE	Date & Time: (lab use only)	Aug 28/20 10:45 AM	Temperature	Samp
				16.0	

RM of Hanover - Kleefeld PWS
ATTN: BARRY BROESKY
Kleefeld - PWS
28 Westland Drive
Mitchell MB R5G 2N9

Date Received: 10- FEB- 21
Report Date: 12- FEB- 21 09:04 (MT)
Version: FINAL

Client Phone: 204- 371- 0484

Certificate of Analysis

Lab Work Order #: L2556237

Project P.O. #:	NOT SUBMITTED
Job Reference:	KLEEFELD - PWS 104.00
C of C Numbers:	
Legal Site Desc:	7793

Hua Wo
Chemistry Laboratory Manager

ALS Environmental

ANALYTICAL REPORT

Total Metals (WATER)

				ALS ID	L2556237-2
				Sampled Date	09-FEB-21
				Sampled Time	14:15
				Sample ID	KLEEFELD 3 - DISTRIBUTION MAIN ST
Analyte	Unit	Guide Limit #1	Guide Limit #2		
Barium (Ba)-Total	mg/L	-	2		1.76

Federal Guidelines for Canadian Drinking Water Quality (JAN, 2021)
#1: GCDWQ - Aesthetic Objective/Other Value (Jan.2020)
#2: GCDWQ - Maximum Acceptable Concentrations (MACs-Jan.2020)

Detection Limit for result exceeds Guide Limit. Assessment against Guide Limit cannot be made.
Analytical result for this parameter exceeds Guide Limit listed on this report.

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Method Reference**
MET-T-CCMS-WP	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020B (mod.)

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

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

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

Chain of Custody Numbers:

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

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

GLOSSARY OF REPORT TERMS

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

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

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

ALS Environmental

Quality Control Report

Workorder: L2556237 Report Date: 12-FEB-21

Client: RM of Hanover - Kleefeld PWS
Kleefeld - PWS 28 Westland Drive
Mitchell MB R5G 2N9

Contact: BARRY BROESKY

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
IET-T-CCMS-WP	Water							
Batch R5373026								
WG3486855-4 DUP		**WG3486855-3**						
Barium (Ba)-Total		0.0156	0.0156		mg/L	0.2	20	11-FEB-21
WG3486855-2 LCS								
Barium (Ba)-Total			96.6		%		80-120	11-FEB-21
WG3486855-1 MB								
Barium (Ba)-Total			<0.00010		mg/L		0.0001	11-FEB-21
WG3486855-5 MS		**WG3486855-3**						
Barium (Ba)-Total			97.7		%		70-130	11-FEB-21

Client: RM of Hanover - Kleefeld PWS
Kleefeld - PWS 28 Westland Drive
Mitchell MB R5G 2N9
Contact: BARRY BROESKY

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes 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 pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

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

L2556237-COFC

ems-

Regular Service (default)
Unless otherwise reques

Report to Operator (email PDF):		Report to Owner (email PDF):		Email PDF copy to:	
Contact:	Barry Broesky	Contact:	Luc Lahaie	DWO:	Sarah Beli:
Address:	28 Westland Drive, Mitchell, MB R5G 2N9	Address:	28 Westland Drive, Mitchell, MB R5G 2N9	DWO Address:	Unit B-284
Phone:		Phone:	(204) 346-7122	DWO Phone:	(204) 371-
Email:	barry.broesky@hanovermb.ca	Email:	luc.lahaie@hanovermb.ca; rob.driedger@hanovermb.ca	DWO Email:	Sarah.Beli:
				Additional Email:	Joern.Mue Nancy.Eid:

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

Client / Project Information:	Lab:	Account:	Agency Code: 382	Report Type: EMS (L
Operation Name:	KLEEFELD - PWS		Expected Sample Time:	Febr
Operation Code:	104.00			
Operation ID:	7793			
Sampled by:	[signature]			

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	Mono ~~Free~~ Chlorine (mg/L)	Total Chlorine (mg/L)	Sample Date dd-mmm-yyyy	Sample Time hh:mm	Sample Matrix	S T
2102SB5005	MB05OED033	Kleefeld 3 - Distribution @ 77 Main St.	1.78	2.7	09-02-2021	14:15	9	

Failure to complete all portions of this form may delay analysis.	Sample Matrix:	6-Raw Water, 9-Distributed Water, :
Please fill in this form LEGIBLY.	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		Validated By (lab use only):	Date & Tim
				Sample Condition (lab use only)	
Received By: (lab use only)	AM	Date & Time: (lab use only)	10 Feb 9am	Temperature 12.8 cooling init	Samples Received in Good Condition

RM of Hanover - Kleefeld PWS
ATTN: BARRY BROESKY
Kleefeld - PWS
28 Westland Drive
Mitchell MB R5G 2N9

Date Received: 19- MAY- 21
Report Date: 26- MAY- 21 07:25 (MT)
Version: FINAL

Client Phone: 204- 371- 0484

Certificate of Analysis

Lab Work Order #: L2589884

Project P.O. #: NOT SUBMITTED
Job Reference: KLEEFELD - PWS 104.00
C of C Numbers:
Legal Site Desc: 7793

Hua Wo
Chemistry Laboratory Manager

ALS Environmental

ANALYTICAL REPORT

Total Metals (WATER)

				ALS ID	L2589884-2
				Sampled Date	18-MAY-21
				Sampled Time	13:15
				Sample ID	KLEEFELD 3 - DISTRIBUTION @ MAIN STREET
Analyte	Unit	Guide Limit #1	Guide Limit #2		
Barium (Ba)-Total	mg/L	-	2		1.85

Federal Guidelines for Canadian Drinking Water Quality (MAR, 2021)
#1: GCDWQ - Aesthetic Objective/Other Value (Jan.2020)
#2: GCDWQ - Maximum Acceptable Concentrations (MACs-Jan.2020)

Detection Limit for result exceeds Guide Limit. Assessment against Guide Limit cannot be made.
Analytical result for this parameter exceeds Guide Limit listed on this report.

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Method Reference**
MET-T-CCMS-WP	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020B (mod.)

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

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

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

Chain of Custody Numbers:

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

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

GLOSSARY OF REPORT TERMS

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

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

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Quality Control Report

Workorder: L2589884 Report Date: 26-MAY-21

Client: RM of Hanover - Kleefeld PWS
Kleefeld - PWS 28 Westland Drive
Mitchell MB R5G 2N9

Contact: BARRY BROESKY

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
IET-T-CCMS-WP	Water							
Batch R5467797								
WG3539698-4 DUP Barium (Ba)-Total		**WG3539698-3** 0.159	0.157		mg/L	1.1	20	25-MAY-21
WG3539698-2 LCS Barium (Ba)-Total			102.6		%		80-120	25-MAY-21
WG3539698-1 MB Barium (Ba)-Total			<0.00010		mg/L		0.0001	25-MAY-21
WG3539698-5 MS Barium (Ba)-Total		**WG3539698-3**	N/A	MS-B	%		-	25-MAY-21

Client: RM of Hanover - Kleefeld PWS
Kleefeld - PWS 28 Westland Drive
Mitchell MB R5G 2N9
Contact: BARRY BROESKY

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes 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 pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

Manitoba

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

L2589884-COFC

ems

Regular Service (default)
Unless otherwise reques

Report to Operator (email PDF):	
Contact:	Barry Broesky
Address:	28 Westland Drive, Mitchell, MB R5G 2N9
Phone:	
Email:	barry.broesky@hanovermb.ca

Report to Owner (email PDF):	
Contact:	Luc Lahaie
Address:	28 Westland Drive, Mitchell, MB R5G 2N9
Phone:	(204) 346-7122
Email:	luc.lahale@hanovermb.ca; rob.driedger@hanovermb.ca

Email PDF copy to:	
DWO:	Sarah Bell
DWO Address:	Unit B-28
DWO Phone:	(204) 371
DWO Email:	Sarah.Bell
Additional Email:	Joern.Mu Nancy.Eid

If an update in Owner or Operator contact information is required, please contact your Drinkin

Client / Project Information:	Lab:	Account:	Agency Code: 382	Report Type: EMS (I
Operation Name:	KLEEFELD - PWS		Expected Sample Time:	M
Operation Code:	104.00			
Operation ID:	7793			
Sampled by:				

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

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

Sample Number	Station Number	Sample Identification	~~Free~~ Chlorine (mg/L)	Total Chlorine (mg/L)	Sample Date dd-mmm-yyyy	Sample Time hh:mm	Sample Matrix	S
2105SB5005	MB05OED033	Kleefeld 3 - Distribution @ Main St.	2.97	4.4	18-05-2021	13:15	9	

L 358,

Failure to complete all portions of this form may delay analysis.	Sample Matrix:	6-Raw Water, 9-Distributed Water,
Please fill in this form LEGIBLY.	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		Validated By (lab use only):	Date & Tin
				Sample Condition (lab use only)	
Received By: (lab use only)	T.L.	Date & Time: (lab use only)	5/19/21 9:11AM	Temperature 7.1 °C	Samples Received in Good Condition

Manitoba

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

L2589884-COFC

ems

Regular Service (default)

Unless otherwise reque

Report to Operator (email PDF):		Report to Owner (email PDF):		Email PDF copy to:	
Contact:	Barry Broesky	Contact:	Luc Lahaie	DWO:	Sarah Bell
Address:	28 Westland Drive, Mitchell, MB R5G 2N9	Address:	28 Westland Drive, Mitchell, MB R5G 2N9	DWO Address:	Unit B-28
Phone:		Phone:	(204) 346-7122	DWO Phone:	(204) 371
Email:	barry.broesky@hanovermb.ca	Email:	luc.lahaie@hanovermb.ca; rob.driedger@hanovermb.ca	DWO Email:	Sarah.Bell
				Additional Email:	Joern.Mu Nancy.Eid

If an update in Owner or Operator contact information is required, please contact your Drinkin

Client / Project Information:	Lab:	Account:	Agency Code: 382	Report Type: EMS (I
Operation Name:	KLEEFELD - PWS		Expected Sample Time:	M
Operation Code:	104.00			
Operation ID:	7793			
Sampled by:				

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	Mono ~~Free~~ Chlorine (mg/L)	Total Chlorine (mg/L)	Sample Date dd-mmm-yyyy	Sample Time hh:mm	Sample Matrix	S
2105SB5005	MB05OED033	Kleefeld 3 - Distribution @ Main St.	2.97	4.4	18-05-2021	13:15	9	

L 258,

Failure to complete all portions of this form may delay analysis.				Sample Matrix:	6-Raw Water, 9-Distributed Water,
Please fill in this form LEGIBLY.				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		Validated By (lab use only):	Date & Tin
				Sample Condition (lab use only)	
Received By: (lab use only)	T.L.	Date & Time: (lab use only)	5/19/21 9:11AM	Temperature 7.1 °C	Samples Received in Good Conditio

RM of Hanover - Kleefeld PWS
ATTN: BARRY BROESKY
Kleefeld - PWS
28 Westland Drive
Mitchell MB R5G 2N9

Date Received: 25- AUG- 21
Report Date: 30- AUG- 21 08:49 (MT)
Version: FINAL

Client Phone: 204- 371- 0484

Certificate of Analysis

Lab Work Order #: L2631149

Project P.O. #:	NOT SUBMITTED
Job Reference:	KLEEFELD - PWS 104.00
C of C Numbers:	
Legal Site Desc:	7793

Hua Wo
Chemistry Laboratory Manager

ANALYTICAL REPORT

Total Metals (WATER)

				ALS ID	L2631149-2
				Sampled Date	24-AUG-21
				Sampled Time	14:15
				Sample ID	KLEEFELD 3 - DISTRIBUTION @ 22 ASPEN BAY
Analyte	Unit	Guide Limit #1	Guide Limit #2		
Barium (Ba)-Total	mg/L	-	2		1.58

Federal Guidelines for Canadian Drinking Water Quality (MAR, 2021)
#1: GCDWQ - Aesthetic Objective/Other Value (Jan.2020)
#2: GCDWQ - Maximum Acceptable Concentrations (MACs-Jan.2020)

Detection Limit for result exceeds Guide Limit. Assessment against Guide Limit cannot be made.
Analytical result for this parameter exceeds Guide Limit listed on this report.

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Method Reference**
MET-T-CCMS-WP	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020B (mod.)

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

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

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

Chain of Custody Numbers:

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

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WP	ALS ENVIRONMENTAL - WINNIPEG, MANITOBA, CANADA

GLOSSARY OF REPORT TERMS

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

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
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Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, fitness for a particular purpose, or non-infringement. ALS assumes no responsibility for errors or omissions in the information. Guideline limits are not adjusted for the hardness, pH or temperature of the sample (the most conservative values are used). Measurement uncertainty is not applied to test results prior to comparison with specified criteria values.

ALS Environmental

Quality Control Report

Workorder: L2631149 Report Date: 30-AUG-21

Client: RM of Hanover - Kleefeld PWS
Kleefeld - PWS 28 Westland Drive
Mitchell MB R5G 2N9

Contact: BARRY BROESKY

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
IET-T-CCMS-WP	Water							
Batch R5571157								
WG3604658-4 DUP Barium (Ba)-Total		**WG3604658-3** 0.0377	0.0376		mg/L	0.3	20	26-AUG-21
WG3604658-2 LCS Barium (Ba)-Total			102.9		%		80-120	26-AUG-21
WG3604658-1 MB Barium (Ba)-Total			<0.00010		mg/L		0.0001	26-AUG-21
WG3604658-5 MS Barium (Ba)-Total		**WG3604658-3**	N/A	MS-B	%		-	26-AUG-21

Client: RM of Hanover - Kleefeld PWS
Kleefeld - PWS 28 Westland Drive
Mitchell MB R5G 2N9
Contact: BARRY BROESKY

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes 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 pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

Manitoba

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

L2631149-COFC

Regular Service (default

Unless otherwise reque

Report to Operator (email PDF):	
Contact:	Barry Broesky
Address:	28 Westland Drive, Mitchell, MB R5G 2N9
Phone:	
Email:	barry.broesky@hanovermb.ca

Report to Owner (email PDF):	
Contact:	Luc Lahaie
Address:	28 Westland Drive, Mitchell, MB R5G 2N9
Phone:	(204) 346-7122
Email:	luc.lahaie@hanovermb.ca; rob.driedger@hanovermb.ca

Email PDF copy to:	
DWO:	Sarah Bell
DWO Address:	Unit B-28
DWO Phone:	(204) 371
DWO Email:	Sarah.Bell
Additional Email:	Joern.Mu Nancy.Eld

If an update in Owner or Operator contact information is required, please contact your Drinkin

Client / Project Information:	Lab:	Account:	Agency Code: 382	Report Type: EMS (I
Operation Name:	KLEEFELD - PWS		Expected Sample Time:	Au
Operation Code:	104.00			
Operation ID:	7793			
Sampled by:				

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

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

Sample Number	Station Number	Sample Identification	Free Chlorine (mg/L)	Total Chlorine (mg/L)	Sample Date dd-mmm-yyyy	Sample Time hh:mm	Sample Matrix	S T
2108SB5016	MB05OED033	Kleefeld 3 - Distribution @ 22 Aspen Bay			24-08-2021	2:15	9	

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

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

Relinquished By:		Date & Time		Validated By (lab use only):	Date & Tim
				Sample Condition (lab use only)	
Received By: (lab use only)	O.A.	Date & Time: (lab use only)	25/8/21, 9:39am	Temperature 12.8°C	Samples Received in Good Condition

RM of Hanover - Kleefeld PWS
ATTN: BARRY BROESKY
Kleefeld - PWS
28 Westland Drive
Mitchell MB R5G 2N9

Date Received: 03- DEC- 21
Report Date: 08- DEC- 21 10:28 (MT)
Version: FINAL

Client Phone: 204- 371- 0484

Certificate of Analysis

Lab Work Order #: L2669010

Project P.O. #: NOT SUBMITTED
Job Reference: KLEEFELD - PWS 104.00
C of C Numbers:
Legal Site Desc: 7793

Kianna Brown
Account Manager

ALS Environmental

ANALYTICAL REPORT

Total Metals (WATER)

				ALS ID	L2669010-2
				Sampled Date	02-DEC-21
				Sampled Time	14:00
				Sample ID	KLEEFELD 3 - DISTRIBUTION @ 22 ASPEN DRIVE
Analyte	Unit	Guide Limit #1	Guide Limit #2		
Barium (Ba)-Total	mg/L	-	2		1.77

Federal Guidelines for Canadian Drinking Water Quality (MAR, 2021)
#1: GCDWQ - Aesthetic Objective/Other Value (Jan.2020)
#2: GCDWQ - Maximum Acceptable Concentrations (MACs-Jan.2020)

Detection Limit for result exceeds Guide Limit. Assessment against Guide Limit cannot be made.
Analytical result for this parameter exceeds Guide Limit listed on this report.

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Method Reference**
MET-T-CCMS-WP	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020B (mod.)

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

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

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

Chain of Custody Numbers:

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

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

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
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< - Less than.
D.L. - The reporting limit.
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ALS Environmental

Quality Control Report

Workorder: L2669010 Report Date: 08-DEC-21

Client: RM of Hanover - Kleefeld PWS
Kleefeld - PWS 28 Westland Drive
Mitchell MB R5G 2N9

Contact: BARRY BROESKY

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
IET-T-CCMS-WP	Water							
Batch R5669076								
WG3669417-4 DUP Barium (Ba)-Total		**WG3669417-3** 0.0629	0.0627		mg/L	0.2	20	03-DEC-21
WG3669417-2 LCS Barium (Ba)-Total			107.0		%		80-120	03-DEC-21
WG3669417-1 MB Barium (Ba)-Total			<0.00010		mg/L		0.0001	03-DEC-21
WG3669417-5 MS Barium (Ba)-Total		**WG3669417-3**	N/A	MS-B	%		-	03-DEC-21

Client: RM of Hanover - Kleefeld PWS
Kleefeld - PWS 28 Westland Drive
Mitchell MB R5G 2N9
Contact: BARRY BROESKY

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

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Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

Manitoba

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

L2669010-COFC

Regular Service (default

Unless otherwise reque

Report to Operator (email PDF):		**Report to Owner (email PDF):**		**Email PDF copy to:**	
Contact:	Barry Broesky	Contact:	Luc Lahaie	DWO:	Sarah Bel
Address:	28 Westland Drive, Mitchell, MB R5G 2N9	Address:	28 Westland Drive, Mitchell, MB R5G 2N9	DWO Address:	Unit B-28
Phone:		Phone:	(204) 346-7122	DWO Phone:	(204) 371
Email:	barry.broesky@hanovermb.ca	Email:	luc.lahaie@hanovermb.ca; rob.driedger@hanovermb.ca	DWO Email:	Sarah.Bel
				Additional Email:	Joern.Mu Nancy.El

If an update in Owner or Operator contact information is required, please contact your Drinkin

Client / Project Information:	**Lab:**	**Account:**	Agency Code: 382	Report Type: EMS (
Operation Name:	KLEEFELD - PWS		Expected Sample Time:	**Nove**
Operation Code:	104.00			
Operation ID:	7793			
Sampled by:				

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

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

Sample Number	Station Number	Sample Identification	~~Free~~ Chlorine (mg/L)	Total Chlorine (mg/L)	Sample Date dd-mmm-yyyy	Sample Time hh:mm	Sample Matrix
2111SB5005	MB05OED033	Kleefeld 3 - Distribution @ 22 ASCEN DR.	0.32	2.2	02-12-2021	14:00	9

Failure to complete all portions of this form may delay analysis.				Sample Matrix:	6-Raw Water, 9-Distributed Water,
Please fill in this form LEGIBLY.				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		Validated By (lab use only):	Date & Ti
				Sample Condition (lab use only)	
Received By: (lab use only)	O. A.	Date & Time: (lab use only)	3/12/21, 8:39am	Temperature 10.0°C	Samples Received In Good Conditic

RM of Hanover - Kleefeld PWS
ATTN: BARRY BROESKY
Kleefeld - PWS
28 Westland Drive
Mitchell MB R5G 2N9

Date Received: 25- AUG- 21
Report Date: 30- AUG- 21 07:30 (MT)
Version: FINAL

Client Phone: 204- 371- 0484

Certificate of Analysis

Lab Work Order #: L2631144

Project P.O. #:	NOT SUBMITTED
Job Reference:	KLEEFELD - PWS 104.00
C of C Numbers:	
Legal Site Desc:	7793

Hua Wo
Chemistry Laboratory Manager

ANALYTICAL REPORT

Anions and Nutrients (WATER)

				ALS ID	L2631144-2
				Sampled Date	24-AUG-21
				Sampled Time	14:30
				Sample ID	KLEEFELD 3 - DISTRIBUTION DEAD END@ 79 MAIN ST N
Analyte	Unit	Guide Limit #1	Guide Limit #2		
Nitrate (as N)	mg/L	-	10		0.0436
Nitrite (as N)	mg/L	-	1		0.0330

Federal Guidelines for Canadian Drinking Water Quality (MAR, 2021)
#1: GCDWQ - Aesthetic Objective/Other Value (Jan.2020)
#2: GCDWQ - Maximum Acceptable Concentrations (MACs-Jan.2020)

Detection Limit for result exceeds Guide Limit. Assessment against Guide Limit cannot be made.
Analytical result for this parameter exceeds Guide Limit listed on this report.

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Method Reference**
NO2-L-IC-N-WP	Water	Nitrite in Water by IC (Low Level)	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
NO3-L-IC-N-WP	Water	Nitrate in Water by IC (Low Level)	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			

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Laboratory Definition Code	Laboratory Location
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Quality Control Report

Workorder: L2631144 Report Date: 30-AUG-21

Client: RM of Hanover - Kleefeld PWS
Kleefeld - PWS 28 Westland Drive
Mitchell MB R5G 2N9

Contact: BARRY BROESKY

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
O2-L-IC-N-WP	Water							
Batch R5570975								
WG3604312-7 DUP Nitrite (as N)		**L2630806-1** <0.0010	<0.0010	RPD-NA	mg/L	N/A	20	25-AUG-21
WG3604312-6 LCS Nitrite (as N)			102.0		%		90-110	25-AUG-21
WG3604312-5 MB Nitrite (as N)			<0.0010		mg/L		0.001	25-AUG-21
WG3604312-8 MS Nitrite (as N)		**L2630806-1**	104.5		%		75-125	25-AUG-21
O3-L-IC-N-WP	Water							
Batch R5570975								
WG3604312-7 DUP Nitrate (as N)		**L2630806-1** 0.0227	0.0226		mg/L	0.5	20	25-AUG-21
WG3604312-6 LCS Nitrate (as N)			102.6		%		90-110	25-AUG-21
WG3604312-5 MB Nitrate (as N)			<0.0050		mg/L		0.005	25-AUG-21
WG3604312-8 MS Nitrate (as N)		**L2630806-1**	104.9		%		75-125	25-AUG-21

Client: RM of Hanover - Kleefeld PWS
Kleefeld - PWS 28 Westland Drive
Mitchell MB R5G 2N9
Contact: BARRY BROESKY

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

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Manitoba

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

L2631144-COFC

Regular Service (default)

Unless otherwise reque

Report to Operator (email PDF):	
Contact:	Barry Broesky
Address:	28 Westland Drive, Mitchell, MB R5G 2N9
Phone:	
Email:	barry.broesky@hanovermb.ca

Report to Owner (email PDF):	
Contact:	Luc Lahaie
Address:	28 Westland Drive, Mitchell, MB R5G 2N9
Phone:	(204) 346-7122
Email:	luc.lahaie@hanovermb.ca; rob.driedger@hanovermb.ca

Email PDF copy to:	
DWO:	Sarah Beli
DWO Address:	Unit B-28
DWO Phone:	(204) 371
DWO Email:	Sarah.Beli
Additional Email:	Joern.Mu Nancy.Eld

If an update in Owner or Operator contact information is required, please contact your Drinkin

Client / Project Information:	Lab:	Account:	Agency Code: 382	Report Type: EMS (I
Operation Name:	KLEEFELD - PWS		Expected Sample Time:	Au
Operation Code:	104.00			
Operation ID:	7793			
Sampled by:				

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

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

Sample Number	Station Number	Sample Identification	Free Chlorine (mg/L)	Total Chlorine (mg/L)	Sample Date dd-mmm-yyyy	Sample Time hh:mm	Sample Matrix	S
2108SB5017	MB05OED033	Kleefeld 3 - Distribution dead end @ 79 Main St. N			24-08-2021	2:30	9	

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		Validated By (lab use only):	Date & Tin
				Sample Condition (lab use only)	AUG 25
Received By: (lab use only)	O.A.	Date & Time: (lab use only)	25/8/21, 9:39am	Temperature 12.8°C	Samples Received in Good Conditio

Appendix E

Operating License for Public Water System

Manitoba
Conservation and Climate
Office of Drinking Water
1007 Century Street, Winnipeg, Manitoba R3H 0W4

OPERATING LICENCE FOR A PUBLIC WATER SYSTEM

LICENCE NUMBER: PWS-21-655

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

WATER SYSTEM CODE: 104.00

OPERATION ID: 7793

EFFECTIVE DATE: JULY 1, 2021

EXPIRY DATE: MAY 31, 2023

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 WELL(S), 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 LICENSES FOR THIS PUBLIC WATER SYSTEM.

DATE: June 28, 2021

Kim Philip, P.Eng.
Director

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 and equipment 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 cross-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.

3.3. The Licensee shall immediately notify the Drinking Water Officer 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.

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 0.01 mg/L in the water distribution system
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 have in place and maintain in effective working order a method or combination of methods designed to achieve primary disinfection at a level acceptable to the Director prior to water entering the distribution system.

4.5. 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	Continuous monitoring of UV dosage for each operating UV unit
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 sample taken quarterly at a mid-point in the distribution system in the months of February, May, August and November each year
Lead	As per the instructions of the Drinking Water Officer
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) nitrate / nitrite
d) general chemistry
e) total metals
f) 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 operate equipment capable of continuously monitoring the validated UV conditions at no more than five-minute intervals in water entering the distribution system.

5.6. In instances where continuous UV monitoring equipment is offline, the Licensee shall ensure that at a minimum of four times per day, UV operating conditions including the calculated dosage and alarm status, are observed at each operating UV unit and that the results are recorded in a form satisfactory to the Director.

5.7. The Licensee shall operate equipment capable of continuously monitoring the UV dosage to ensure compliance with the primary disinfection standard specified in Clause 4.5.

5.8. 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 F

Monochloramine and UV Reports

Monthly Water Chlorination Report

Community: Kleefeld
Month/Year: January 2021

Plant Code: 104.0
Operators: Barry Broesky;Rob Friesen

Date	Time	Operator's Initial	Chlorine Residual (mg/L)			Distribution (Litres)		Raw (Litres)	
			Mono	Free Amonia	Total	Daily	Cumulative	Daily	Cumulative
1	8:00	R.F.	2.88			195,000	558,436,000	176,000	565,464,000
2	9:30	R.F.	2.60			217,000	558,653,000	305,000	565,769,000
3	8:45	R.F.	2.59			195,000	558,848,000	168,000	565,937,000
4	7:00	B.B.	2.75			200,000	559,048,000	198,000	566,135,000
5	5:30	B.B.	2.74			188,000	559,236,000	194,000	566,329,000
6	7:00	B.B.	2.32			214,000	559,450,000	122,000	566,451,000
7	7:45	B.B.	2.85			190,000	559,640,000	280,000	566,731,000
8	7:00	B.B.	2.89	0.00	3.50	198,000	559,838,000	224,000	566,955,000
9	9:15	B.B.	2.58			197,000	560,035,000	162,000	567,117,000
10	8:15	B.B.	2.79			191,000	560,226,000	206,000	567,323,000
11	7:00	B.B.	2.86			211,000	560,437,000	218,000	567,541,000
12	7:00	B.B.	2.84			195,000	560,632,000	178,000	567,719,000
13	6:15	B.B.	2.84			184,000	560,816,000	181,000	567,900,000
14	7:00	B.B.	2.92			213,000	561,029,000	226,000	568,126,000
15	7:00	B.B.	2.87	0.00	4.40	205,000	561,234,000	225,000	568,351,000
16	9:15	R.F.	2.63			229,000	561,463,000	230,000	568,581,000
17	8:15	R.F.	2.71			204,000	561,667,000	193,000	568,774,000
18	7:00	B.B.	2.57			226,000	561,893,000	221,000	568,995,000
19	7:00	B.B.	2.80			200,000	562,093,000	195,000	569,190,000
20	6:00	B.B.	2.87			189,000	562,282,000	198,000	569,388,000
21	6:00	B.B.	2.93			189,000	562,471,000	177,000	569,565,000
22	7:30	B.B.	3.11	0.00	4.20	193,000	562,664,000	221,000	569,786,000
23	7:30	B.B.	2.89			204,000	562,868,000	185,000	569,971,000
24	8:45	B.B.	2.94			204,000	563,072,000	238,000	570,209,000
25	7:00	B.B.	2.74			187,000	563,259,000	164,000	570,373,000
26	7:00	B.B.	2.83			204,000	563,463,000	206,000	570,579,000
27	6:15	B.B.	2.58			178,000	563,641,000	162,000	570,741,000
28	7:00	B.B.	2.75			214,000	563,855,000	227,000	570,968,000
29	7:00	B.B.	2.47	0.00	3.40	214,000	564,069,000	194,000	571,162,000
30	9:30	R.F.	2.81			212,000	564,281,000	255,000	571,417,000
31	9:30	R.F.	2.25			200,000	564,481,000	166,000	571,583,000
						6,240,000		6,295,000	

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Monthly Water Chlorination Report

Community: Kleefeld
Month/Year: Feburary 2021

Plant Code: 104.0
Operators: Barry Broesky;Rob Friesen

Date	Time	Operator's Initial	Chlorine Residual (mg/L)			Distribution (Litres)		Raw (Litres)	
			Mono	ree Amoni	Total	Daily	Cumulative	Daily	Cumulative
1	7:00	B.B.	2.87			200,000	564,681,000	206,000	571,789,000
2	7:00	B.B.	2.97			220,000	564,901,000	234,000	572,023,000
3	6:30	B.B.	2.77			207,000	565,108,000	204,000	572,227,000
4	7:00	B.B.	2.93			210,000	565,318,000	243,000	572,470,000
5	7:00	B.B.	2.81	0.00	3.00	191,000	565,509,000	176,000	572,646,000
6	7:30	B.B.	2.51			188,000	565,697,000	207,000	572,853,000
7	8:00	B.B.	2.07			214,000	565,911,000	184,000	573,037,000
8	7:00	B.B.	1.79			210,000	566,121,000	212,000	573,249,000
9	7:00	B.B.	1.54			205,000	566,326,000	205,000	573,454,000
10	6:30	B.B.	2.30			192,000	566,518,000	200,000	573,654,000
11	7:00	B.B.	2.67			192,000	566,710,000	219,000	573,873,000
12	7:00	B.B.	2.84	0.00	4.20	189,000	566,899,000	159,000	574,032,000
13	9:30	R.F.	1.95			201,000	567,100,000	214,000	574,246,000
14	11:00	R.F.	1.87			230,000	567,330,000	232,000	574,478,000
15	9:00	R.F.	2.39			158,000	567,488,000	153,000	574,631,000
16	7:00	B.B.	3.04			203,000	567,691,000	214,000	574,845,000
17	6:30	B.B.	2.54			202,000	567,893,000	194,000	575,039,000
18	7:00	B.B.	2.84			233,000	568,126,000	258,000	575,297,000
19	7:45	B.B.	2.97	0.00	4.10	211,000	568,337,000	173,000	575,470,000
20	6:45	B.B.	2.98			188,000	568,525,000	230,000	575,700,000
21	9:15	B.B.	2.84			231,000	568,756,000	195,000	575,895,000
22	7:45	B.B.	2.72			219,000	568,975,000	228,000	576,123,000
23	8:00	B.B.	1.65			220,000	569,195,000	213,000	576,336,000
24	8:00	B.B.	2.55			228,000	569,423,000	230,000	576,566,000
25	6:15	B.B.	3.07			201,000	569,624,000	207,000	576,773,000
26	8:00	B.B.	3.02	0.00	4.30	254,000	569,878,000	252,000	577,025,000
27	10:00	R.F.	2.63			210,000	570,088,000	205,000	577,230,000
28	8:15	R.F.	2.66			183,000	570,271,000	179,000	577,409,000
29									
30									
31									
						5,790,000		5,826,000	

Monthly Water Chlorination Report

Community: Kleefeld
Plant Code: 104.0
Month/Year: March 2021
Operators: Barry Broesky;Rob Friesen

Date	Time	Operator's Initial	Chlorine Residual (mg/L)			Distribution (Litres)		Raw (Litres)	
			Mono	Free Amonia	Total	Daily	Cumulative	Daily	Cumulative
1	8:00	B.B.	2.93			208,000	570,479,000	232,000	577,641,000
2	7:45	B.B.	2.21			200,000	570,679,000	184,000	577,825,000
3	6:15	B.B.	2.54			197,000	570,876,000	231,000	578,056,000
4	8:00	B.B.	2.57			225,000	571,101,000	198,000	578,254,000
5	8:00	B.B.	2.60	0.00	4.20	210,000	571,311,000	229,000	578,483,000
6	7:45	B.B.	2.66			177,000	571,488,000	163,000	578,646,000
7	8:30	B.B.	2.55			217,000	571,705,000	238,000	578,884,000
8	7:30	B.B.	2.44			217,000	571,922,000	199,000	579,083,000
9	7:00	B.B.	2.15			212,000	572,134,000	261,000	579,344,000
10	6:15	B.B.	2.34			197,000	572,331,000	169,000	579,513,000
11	7:00	B.B.	2.44			204,000	572,535,000	207,000	579,720,000
12	8:45	B.B.	2.53	0.00	3.80	226,000	572,761,000	214,000	579,934,000
13	7:30	R.F.	2.36			190,000	572,951,000	188,000	580,122,000
14	7:00	R.F.	2.49			200,000	573,151,000	243,000	580,365,000
15	7:00	B.B.	2.35			230,000	573,381,000	194,000	580,559,000
16	7:00	B.B.	2.44			204,000	573,585,000	194,000	580,753,000
17	6:15	B.B.	2.55			187,000	573,772,000	206,000	580,959,000
18	7:00	B.B.	2.83			217,000	573,989,000	222,000	581,181,000
19	8:15	B.B.	2.59	0.00	4.30	216,000	574,205,000	214,000	581,395,000
20	7:30	B.B.	2.22			179,000	574,384,000	191,000	581,586,000
21	10:00	B.B.	2.59			230,000	574,614,000	227,000	581,813,000
22	7:00	B.B.	2.10			169,000	574,783,000	181,000	581,994,000
23	7:00	B.B.	2.35			203,000	574,986,000	186,000	582,180,000
24	6:15	B.B.	2.66			242,000	575,228,000	274,000	582,454,000
25	6:15	B.B.	2.36			189,000	575,417,000	164,000	582,618,000
26	6:30	B.B.	2.20	0.00	4.10	188,000	575,605,000	169,000	582,787,000
27	10:00	R.F.	2.50			239,000	575,844,000	238,000	583,025,000
28	9:00	R.F.	1.87			195,000	576,039,000	204,000	583,229,000
29	7:30	R.F.	2.14			188,000	576,227,000	217,000	583,446,000
30	7:00	R.F.	2.17			180,000	576,407,000	159,000	583,605,000
31	6:30	R.F.	1.81			210,000	576,617,000	204,000	583,809,000
						6,346,000		6,400,000	

Monthly Water Chlorination Report

Community: Kleefeld
Month/Year: April 2021

Plant Code: 104.0
Operators: Barry Broesky;Rob Friesen

Date	Time	Operator's Initial	Chlorine Residual (mg/L)			Distribution (Litres)		Raw (Litres)	
			Mono	Free Amonia	Total	Daily	Cumulative	Daily	Cumulative
1	6:30	R.F.	2.21	0.00	3.20	212,000	576,829,000	233,000	584,042,000
2	8:30	B.B.	2.74			209,000	577,038,000	198,000	584,240,000
3	8:00	B.B.	2.52			184,000	577,222,000	198,000	584,438,000
4	8:30	B.B.	2.15			248,000	577,470,000	225,000	584,663,000
5	6:30	B.B.	2.46			205,000	577,675,000	202,000	584,865,000
6	7:00	B.B.	2.42			223,000	577,898,000	248,000	585,113,000
7	6:15	B.B.	2.61			206,000	578,104,000	202,000	585,315,000
8	7:00	B.B.	2.37			210,000	578,314,000	230,000	585,545,000
9	7:00	B.B.	2.14	0.00	3.70	219,000	578,533,000	33,000	585,578,000
10	9:00	R.F.	2.39			260,000	578,793,000	429,000	586,007,000
11	10:45	R.F.	2.60			229,000	579,022,000	219,000	586,226,000
12	7:00	B.B.	2.32			165,000	579,187,000	160,000	586,386,000
13	7:00	B.B.	2.13			220,000	579,407,000	238,000	586,624,000
14	6:15	B.B.	2.04			195,000	579,602,000	178,000	586,802,000
15	7:00	B.B.	2.24			231,000	579,833,000	273,000	587,075,000
16	7:00	B.B.	2.11	0.00	3.00	181,000	580,014,000	150,000	587,225,000
17	6:45	B.B.	1.93			194,000	580,208,000	189,000	587,414,000
18	8:00	B.B.	2.15			219,000	580,427,000	226,000	587,640,000
19	6:15	B.B.	1.92			191,000	580,618,000	185,000	587,825,000
20	6:15	B.B.	2.89			225,000	580,843,000	255,000	588,080,000
21	6:15	B.B.	2.20			212,000	581,055,000	193,000	588,273,000
22	6:30	B.B.	2.43			210,000	581,265,000	235,000	588,508,000
23	6:15	B.B.	2.65	0.00	4.20	228,000	581,493,000	198,000	588,706,000
24	10:00	R.F.	2.31			252,000	581,745,000	251,000	588,957,000
25	7:30	R.F.	1.96			188,000	581,933,000	189,000	589,146,000
26	7:00	B.B.	2.60			214,000	582,147,000	244,000	589,390,000
27	6:45	B.B.	2.75			196,000	582,343,000	177,000	589,567,000
28	6:15	B.B.	2.54			229,000	582,572,000	214,000	589,781,000
29	7:00	B.B.	2.27			255,000	582,827,000	284,000	590,065,000
30	8:30	B.B.	2.82	0.00	4.30	244,000	583,071,000	244,000	590,309,000
31									
						6,454,000		6,500,000	

Monthly Water Chlorination Report

Community: Kleefeld
Month/Year: May 2021

Plant Code: 104.0
Operators: Barry Broesky;Rob Friesen

Date	Time	Operator's Initial	Chlorine Residual (mg/L)			Distribution (Litres)		Raw (Litres)	
			Mono	Free Amonia	Total	Daily	Cumulative	Daily	Cumulative
1	7:30	B.B.	2.48			184,000	583,255,000	180,000	590,489,000
2	7:30	B.B.	2.70			262,000	583,517,000	283,000	590,772,000
3	6:45	B.B.	2.19			230,000	583,747,000	192,000	590,964,000
4	7:45	B.B.	2.58			229,000	583,976,000	236,000	591,200,000
5	7:45	B.B.	2.79			236,000	584,212,000	230,000	591,430,000
6	7:30	B.B.	2.50			233,000	584,445,000	244,000	591,674,000
7	8:45	B.B.	2.48	0.00	4.00	259,000	584,704,000	246,000	591,920,000
8	7:30	R.F.	1.99			248,000	584,952,000	255,000	592,175,000
9	6:00	R.F.	2.09			280,000	585,232,000	303,000	592,478,000
10	7:45	B.B.	2.72			266,000	585,498,000	241,000	592,719,000
11	7:00	B.B.	1.64			313,000	585,811,000	308,000	593,027,000
12	6:30	B.B.	2.09			361,000	586,172,000	366,000	593,393,000
13	7:00	B.B.	3.34			661,000	586,833,000	681,000	594,074,000
14	7:15	B.B.	2.86	0.00	4.30	389,000	587,222,000	368,000	594,442,000
15	7:15	B.B.	2.42			313,000	587,535,000	320,000	594,762,000
16	9:00	B.B.	2.87			484,000	588,019,000	471,000	595,233,000
17	7:15	B.B.	3.15			442,000	588,461,000	438,000	595,671,000
18	7:00	B.B.	2.88			511,000	588,972,000	517,000	596,188,000
19	6:15	B.B.	3.14			420,000	589,392,000	432,000	596,620,000
20	7:45	B.B.	2.58			365,000	589,757,000	350,000	596,970,000
21	7:15	B.B.	2.98	0.00	4.20	246,000	590,003,000	266,000	597,236,000
22	9:30	R.F.	2.08			248,000	590,251,000	223,000	597,459,000
23	6:30	R.F.	2.38			203,000	590,454,000	252,000	597,711,000
24	9:00	R.F.	2.49			255,000	590,709,000	234,000	597,945,000
25	8:00	B.B.	2.79			344,000	591,053,000	324,000	598,269,000
26	6:00	B.B.	2.52			238,000	591,291,000	275,000	598,544,000
27	7:00	B.B.	2.55			285,000	591,576,000	256,000	598,800,000
28	8:00	B.B.	2.28	0.00	4.80	325,000	591,901,000	311,000	599,111,000
29	7:00	B.B.	2.36			325,000	592,226,000	343,000	599,454,000
30	8:15	B.B.	2.93			357,000	592,583,000	344,000	599,798,000
31	7:30	R.F.	2.11			391,000	592,974,000	393,000	600,191,000
						9,903,000		9,882,000	

Monthly Water Chlorination Report

Community: Kleefeld
Month/Year: June 2021

Plant Code: 104.0
Operators: Barry Broesky;Rob Friesen

Date	Time	Operator's Initial	Chlorine Residual (mg/L)			Distribution (Litres)		Raw (Litres)	
			Mono	Free Amonia	Total	Daily	Cumulative	Daily	Cumulative
1	7:45	B.B.	2.65			461,000	593,435,000	461,000	600,652,000
2	6:15	B.B.	1.26			418,000	593,853,000	420,000	601,072,000
3	7:30	B.B.	2.65			539,000	594,392,000	542,000	601,614,000
4	7:00	B.B.	3.33	0.00	4.40	604,000	594,996,000	628,000	602,242,000
5	9:00	R.F.	3.37			620,000	595,616,000	569,000	602,811,000
6	10:30	R.F.	2.48			500,000	596,116,000	457,000	603,268,000
7	7:00	B.B.	2.96			211,000	596,327,000	306,000	603,574,000
8	7:00	B.B.	2.64			370,000	596,697,000	325,000	603,899,000
9	6:30	B.B.	3.07			355,000	597,052,000	359,000	604,258,000
10	7:00	B.B.	3.60			473,000	597,525,000	470,000	604,728,000
11	7:00	B.B.	2.55	0.00	4.00	235,000	597,760,000	262,000	604,990,000
12	7:15	B.B.	3.05			254,000	598,014,000	262,000	605,252,000
13	9:00	B.B.	2.41			339,000	598,353,000	301,000	605,553,000
14	7:00	B.B.	2.78			324,000	598,677,000	322,000	605,875,000
15	7:00	B.B.	2.89			404,000	599,081,000	399,000	606,274,000
16	6:15	B.B.	2.11			467,000	599,548,000	491,000	606,765,000
17	7:00	B.B.	2.58			402,000	599,950,000	390,000	607,155,000
18	6:45	B.B.	2.87	0.00	4.50	497,000	600,447,000	505,000	607,660,000
19	9:30	R.F.	2.56			430,000	600,877,000	438,000	608,098,000
20	9:15	R.F.	3.17			430,000	601,307,000	430,000	608,528,000
21	7:00	B.B.	2.84			404,000	601,711,000	370,000	608,898,000
22	7:00	B.B.	2.27			456,000	602,167,000	461,000	609,359,000
23	6:15	B.B.	3.12			493,000	602,660,000	524,000	609,883,000
24	6:45	B.B.	3.25			490,000	603,150,000	452,000	610,335,000
25	7:00	B.B.	2.16	0.00	3.70	577,000	603,727,000	603,000	610,938,000
26	8:00	B.B.	2.84			414,000	604,141,000	387,000	611,325,000
27	8:15	B.B.	2.67			387,000	604,528,000	414,000	611,739,000
28	7:00	B.B.	3.35			420,000	604,948,000	394,000	612,133,000
29	6:30	B.B.	3.36			564,000	605,512,000	563,000	612,696,000
30	7:00	R.F.	2.84			635,000	606,147,000	669,000	613,365,000
31									
						13,173,000		**13,174,000**	

Monthly Water Chlorination Report

Community: Kleefeld
Month/Year: July 2021

Plant Code: 104.0
Operators: Barry Broesky;Rob Friesen

Date	Time	Operator's Initial	Chlorine Residual (mg/L)			Distribution (Litres)		Raw (Litres)	
			Mono	Free Amonia	Total	Daily	Cumulative	Daily	Cumulative
1	9:45	R.F.	3.58			642,000	606,789,000	585,000	613,950,000
2	8:00	R.F.	3.60	0.00	4.10	564,000	607,353,000	601,000	614,551,000
3	9:30	R.F.	3.15			708,000	608,061,000	696,000	615,247,000
4	9:30	R.F.	3.07			472,000	608,533,000	455,000	615,702,000
5	7:45	R.F.	2.72			346,000	608,879,000	339,000	616,041,000
6	7:00	R.F.	2.55			442,000	609,321,000	453,000	616,494,000
7	6:00	R.F.	2.24			427,000	609,748,000	437,000	616,931,000
8	7:00	R.F.	3.20			552,000	610,300,000	566,000	617,497,000
9	7:30	R.F.	2.49	0.00	3.90	549,000	610,849,000	523,000	618,020,000
10	10:00	R.F.	1.16			698,000	611,547,000	659,000	618,679,000
11	6:00	R.F.	3.09			561,000	612,108,000	544,000	619,223,000
12	7:00	B.B.	3.33			714,000	612,822,000	698,000	619,921,000
13	7:00	B.B.	1.66			473,000	613,295,000	564,000	620,485,000
14	6:00	B.B.	2.96			498,000	613,793,000	467,000	620,952,000
15	7:00	B.B.	2.52			860,000	614,653,000	684,000	621,636,000
16	7:00	B.B.	3.29	0.00	4.30	609,000	615,262,000	666,000	622,302,000
17	9:00	R.F.	3.55			646,000	615,908,000	711,000	623,013,000
18	9:30	R.F.	3.24			640,000	616,548,000	669,000	623,682,000
19	7:00	B.B.	3.34			577,000	617,125,000	590,000	624,272,000
20	7:00	B.B.	2.90			440,000	617,565,000	432,000	624,704,000
21	6:15	B.B.	2.74			234,000	617,799,000	260,000	624,964,000
22	7:00	B.B.	2.54			232,000	618,031,000	202,000	625,166,000
23	7:45	B.B.	2.73	0.00	4.10	320,000	618,351,000	321,000	625,487,000
24	7:15	B.B.	1.75			414,000	618,765,000	447,000	625,934,000
25	9:00	B.B.	2.67			537,000	619,302,000	529,000	626,463,000
26	7:00	B.B.	2.85			480,000	619,782,000	506,000	626,969,000
27	7:45	B.B.	2.70			383,000	620,165,000	437,000	627,406,000
28	6:15	B.B.	2.51			426,000	620,591,000	482,000	627,888,000
29	7:00	B.B.	2.30			420,000	621,011,000	405,000	628,293,000
30	7:00	B.B.	2.15	0.00	3.70	547,000	621,558,000	546,000	628,839,000
31	9:30	R.F.	1.64			567,000	622,125,000	524,000	629,363,000
						15,978,000		15,998,000	

Monthly Water Chlorination Report

Community: Kleefeld
Month/Year: August 2021

Plant Code: 104.0
Operators: Barry Broesky;Rob Friesen

Date	Time	Operator's Initial	Chlorine Residual (mg/L)			Distribution (Litres)		Raw (Litres)	
			Mono	Free Amonia	Total	Daily	Cumulative	Daily	Cumulative
1	6:00	R.F.	1.59			413,000	622,538,000	444,000	629,807,000
2	9:30	R.F.	1.40			515,000	623,053,000	469,000	630,276,000
3	7:00	B.B.	1.56			552,000	623,605,000	587,000	630,863,000
4	6:30	B.B.	1.60			519,000	624,124,000	549,000	631,412,000
5	7:00	B.B.	1.46			330,000	624,454,000	304,000	631,716,000
6	7:00	B.B.	1.43	0.00	3.00	221,000	624,675,000	220,000	631,936,000
7	7:00	B.B.	1.31			273,000	624,948,000	278,000	632,214,000
8	10:00	B.B.	1.34			489,000	625,437,000	445,000	632,659,000
9	7:00	B.B.	1.50			370,000	625,807,000	389,000	633,048,000
10	7:00	B.B.	1.23			245,000	626,052,000	244,000	633,292,000
11	6:15	B.B.	1.20			227,000	626,279,000	238,000	633,530,000
12	7:15	B.B.	1.39			542,000	626,821,000	562,000	634,092,000
13	7:00	B.B.	1.37	0.00	2.90	233,000	627,054,000	209,000	634,301,000
14	8:30	B.B.	1.36			305,000	627,359,000	295,000	634,596,000
15	11:00	B.B.	1.64			425,000	627,784,000	415,000	635,011,000
16	6:45	B.B.	1.80			319,000	628,103,000	335,000	635,346,000
17	7:30	B.B.	1.83			363,000	628,466,000	350,000	635,696,000
18	6:30	B.B.	1.86			382,000	628,848,000	414,000	636,110,000
19	7:30	B.B.	1.85			313,000	629,161,000	284,000	636,394,000
20	7:00	B.B.	1.81	0.00	3.40	338,000	629,499,000	341,000	636,735,000
21	7:00	B.B.	1.69			214,000	629,713,000	219,000	636,954,000
22	9:15	B.B.	1.75			239,000	629,952,000	224,000	637,178,000
23	7:00	B.B.	1.60			190,000	630,142,000	211,000	637,389,000
24	7:00	B.B.	1.68			207,000	630,349,000	208,000	637,597,000
25	6:15	R.F.	1.06			217,000	630,566,000	218,000	637,815,000
26	6:45	R.F.	1.35			241,000	630,807,000	233,000	638,048,000
27	7:30	R.F.	1.63	0.37	5.40	232,000	631,039,000	235,000	638,283,000
28	9:00	R.F.	1.40			206,000	631,245,000	207,000	638,490,000
29	7:45	R.F.	1.29			199,000	631,444,000	221,000	638,711,000
30	7:30	B.B.	1.70			217,000	631,661,000	210,000	638,921,000
31	7:00	B.B.	1.53			231,000	631,892,000	232,000	639,153,000
						9,767,000		**9,790,000**	

Monthly Water Chlorination Report

Community: Kleefeld
Month/Year: September 2021

Plant Code: 104.0
Operators: Barry Broesky;Rob Friesen

Date	Time	Operator's Initial	Chlorine Residual (mg/L)			Distribution (Litres)		Raw (Litres)	
			Mono	Free Amonia	Total	Daily	Cumulative	Daily	Cumulative
1	6:45	B.B.	1.61			243,000	632,135,000	243,000	639,396,000
2	7:00	B.B.	1.81			230,000	632,365,000	419,000	639,815,000
3	7:00	B.B.	2.11	0.47	4.00	200,000	632,565,000	340,000	640,155,000
4	8:00	B.B.	1.78			203,000	632,768,000	199,000	640,354,000
5	9:45	B.B.	1.49			218,000	632,986,000	203,000	640,557,000
6	8:00	B.B.	1.53			168,000	633,154,000	193,000	640,750,000
7	7:00	B.B.	1.56			235,000	633,389,000	229,000	640,979,000
8	6:45	B.B.	1.36			212,000	633,601,000	205,000	641,184,000
9	7:00	B.B.	1.57			457,000	634,058,000	462,000	641,646,000
10	7:00	B.B.	1.64	0.51	2.00	237,000	634,295,000	473,000	642,119,000
11	10:00	R.F.	1.13			247,000	634,542,000	312,000	642,431,000
12	9:00	R.F.	1.04			208,000	634,750,000	181,000	642,612,000
13	7:00	B.B.	1.12			245,000	634,995,000	259,000	642,871,000
14	7:00	B.B.	1.25			220,000	635,215,000	235,000	643,106,000
15	6:15	B.B.	1.62			246,000	635,461,000	229,000	643,335,000
16	7:00	B.B.	1.51			248,000	635,709,000	237,000	643,572,000
17	7:00	B.B.	1.60	0.55	3.00	220,000	635,929,000	218,000	643,790,000
18	7:30	B.B.	1.43			222,000	636,151,000	229,000	644,019,000
19	8:15	B.B.	1.59			273,000	636,424,000	257,000	644,276,000
20	7:00	B.B.	1.65			285,000	636,709,000	281,000	644,557,000
21	7:00	B.B.	1.67			237,000	636,946,000	245,000	644,802,000
22	6:30	B.B.	1.60			234,000	637,180,000	244,000	645,046,000
23	7:00	B.B.	1.44			256,000	637,436,000	252,000	645,298,000
24	7:45	B.B.	1.70	0.55	2.80	244,000	637,680,000	256,000	645,554,000
25	10:00	R.F.	1.32			242,000	637,922,000	211,000	645,765,000
26	9:15	R.F.	1.45			251,000	638,173,000	264,000	646,029,000
27	7:30	B.B.	1.34			276,000	638,449,000	282,000	646,311,000
28	7:00	B.B.	1.52			261,000	638,710,000	271,000	646,582,000
29	6:30	B.B.	1.56			271,000	638,981,000	264,000	646,846,000
30	6:30	B.B.	1.67			284,000	639,265,000	293,000	647,139,000
31									
						7,195,000		7,986,000	

Monthly Water Chlorination Report

Community: Kleefeld
Plant Code: 104.0
Month/Year: October 2021
Operators: Barry Broesky;Rob Friesen

Date	Time	Operator's Initial	Chlorine Residual (mg/L)			Distribution (Litres)		Raw (Litres)	
			Mono	Free Amonia	Total	Daily	Cumulative	Daily	Cumulative
1	7:00	B.B.	1.61	>0.55	3.20	269,000	639,534,000	263,000	647,402,000
2	6:30	B.B.	1.52			241,000	639,775,000	227,000	647,629,000
3	9:30	B.B.	1.55			306,000	640,081,000	332,000	647,961,000
4	7:00	B.B.	1.39			260,000	640,341,000	228,000	648,189,000
5	7:00	B.B.	1.85			284,000	640,625,000	298,000	648,487,000
6	6:15	B.B.	1.45			267,000	640,892,000	256,000	648,743,000
7	7:00	B.B.	1.47			288,000	641,180,000	287,000	649,030,000
8	7:00	B.B.	1.69	>0.55	2.80	295,000	641,475,000	290,000	649,320,000
9	9:30	R.F.	1.32			232,000	641,707,000	225,000	649,545,000
10	10:00	R.F.	1.31			243,000	641,950,000	253,000	649,798,000
11	9:30	R.F.	1.21			228,000	642,178,000	230,000	650,028,000
12	7:00	B.B.	1.29			228,000	642,406,000	241,000	650,269,000
13	6:15	B.B.	1.50			238,000	642,644,000	250,000	650,519,000
14	7:00	B.B.	1.81			223,000	642,867,000	211,000	650,730,000
15	7:00	B.B.	2.26	0.48	3.30	222,000	643,089,000	227,000	650,957,000
16	7:15	B.B.	1.86			271,000	643,360,000	276,000	651,233,000
17	10:00	B.B.	2.15			242,000	643,602,000	221,000	651,454,000
18	7:15	B.B.	2.08			241,000	643,843,000	251,000	651,705,000
19	7:00	B.B.	2.18			291,000	644,134,000	301,000	652,006,000
20	6:15	B.B.	1.66			208,000	644,342,000	211,000	652,217,000
21	7:00	B.B.	2.78			219,000	644,561,000	220,000	652,437,000
22	7:00	B.B.	2.59	0.32	3.70	193,000	644,754,000	182,000	652,619,000
23	10:00	R.F.	2.25			235,000	644,989,000	219,000	652,838,000
24	6:00	R.F.	2.63			179,000	645,168,000	209,000	653,047,000
25	7:00	B.B.	2.28			252,000	645,420,000	246,000	653,293,000
26	7:00	B.B.	2.71			204,000	645,624,000	193,000	653,486,000
27	6:15	B.B.	2.46			201,000	645,825,000	215,000	653,701,000
28	7:00	B.B.	2.77			461,000	646,286,000	461,000	654,162,000
29	7:00	B.B.	2.68	0.28	3.80	198,000	646,484,000	180,000	654,342,000
30	8:00	B.B.	2.46			197,000	646,681,000	198,000	654,540,000
31	10:00	B.B.	2.62			251,000	646,932,000	227,000	654,767,000
						7,667,000		7,628,000	

Monthly Water Chlorination Report

Community: Kleefeld
Month/Year: November 2021

Plant Code: 104.0
Operators: Barry Broesky;Rob Friesen

Date	Time	Operator's Initial	Chlorine Residual (mg/L)			Distribution (Litres)		Raw (Litres)	
			Mono	Free Amonia	Total	Daily	Cumulative	Daily	Cumulative
1	7:00	B.B.	2.92			183,000	647,115,000	229,000	654,996,000
2	7:00	B.B.	2.82			213,000	647,328,000	178,000	655,174,000
3	6:30	B.B.	2.85			229,000	647,557,000	235,000	655,409,000
4	7:00	B.B.	1.81			231,000	647,788,000	232,000	655,641,000
5	7:00	B.B.	1.37	0.06	2.50	210,000	647,998,000	228,000	655,869,000
6	7:00	B.B.	1.31			202,000	648,200,000	184,000	656,053,000
7	9:00	B.B.	1.27			260,000	648,460,000	281,000	656,334,000
8	7:00	B.B.	1.31			208,000	648,668,000	188,000	656,522,000
9	7:00	B.B.	1.56			200,000	648,868,000	218,000	656,740,000
10	5:45	B.B.	1.72			195,000	649,063,000	207,000	656,947,000
11	9:30	R.F.	1.88			218,000	649,281,000	195,000	657,142,000
12	8:00	R.F.	1.59	0.00	3.10	213,000	649,494,000	212,000	657,354,000
13	8:30	R.F.	1.56			209,000	649,703,000	222,000	657,576,000
14	8:00	R.F.	1.78			199,000	649,902,000	188,000	657,764,000
15	7:00	B.B.	2.34			219,000	650,121,000	239,000	658,003,000
16	7:00	B.B.	2.14			222,000	650,343,000	200,000	658,203,000
17	5:45	B.B.	2.44			196,000	650,539,000	225,000	658,428,000
18	7:00	B.B.	2.45			207,000	650,746,000	219,000	658,647,000
19	7:00	B.B.	2.55	0.05	3.40	193,000	650,939,000	142,000	658,789,000
20	9:30	R.F.	1.78			213,000	651,152,000	216,000	659,005,000
21	11:00	R.F.	1.40			232,000	651,384,000	222,000	659,227,000
22	7:00	B.B.	2.28			203,000	651,587,000	240,000	659,467,000
23	7:00	B.B.	1.95			214,000	651,801,000	219,000	659,686,000
24	6:15	B.B.	2.15			195,000	651,996,000	191,000	659,877,000
25	7:30	B.B.	2.23			229,000	652,225,000	230,000	660,107,000
26	7:30	B.B.	2.44	0.02	3.40	221,000	652,446,000	212,000	660,319,000
27	7:30	B.B.	2.44			182,000	652,628,000	183,000	660,502,000
28	8:30	B.B.	2.36			219,000	652,847,000	190,000	660,692,000
29	7:30	B.B.	2.56			206,000	653,053,000	243,000	660,935,000
30	7:00	B.B.	2.53			198,000	653,251,000	191,000	661,126,000
31									
						6,319,000		6,359,000	

Monthly Water Chlorination Report

Community: Kleefeld
Month/Year: December 2021

Plant Code: 104.0
Operators: Barry Broesky;Rob Friesen

Date	Time	Operator's Initial	Chlorine Residual (mg/L)			Distribution (Litres)		Raw (Litres)	
			Mono	Free Amonia	Total	Daily	Cumulative	Daily	Cumulative
1	6:30	B.B.	2.25			196,000	653,447,000	205,000	661,331,000
2	7:00	B.B.	1.85			199,000	653,646,000	189,000	661,520,000
3	7:30	B.B.	2.21	0.02	3.30	210,000	653,856,000	214,000	661,734,000
4	9:30	R.F.	2.18			213,000	654,069,000	184,000	661,918,000
5	6:00	R.F.	2.52			204,000	654,273,000	254,000	662,172,000
6	7:00	B.B.	2.42			275,000	654,548,000	265,000	662,437,000
7	7:00	B.B.	2.28			273,000	654,821,000	281,000	662,718,000
8	5:45	B.B.	2.23			214,000	655,035,000	209,000	662,927,000
9	7:00	B.B.	2.32			225,000	655,260,000	198,000	663,125,000
10	10:15	B.B.	2.42	0.02	3.60	230,000	655,490,000	237,000	663,362,000
11	7:30	B.B.	2.18			211,000	655,701,000	212,000	663,574,000
12	7:15	B.B.	2.34			199,000	655,900,000	107,000	663,681,000
13	7:00	B.B.	2.80			172,000	656,072,000	252,000	663,933,000
14	7:00	B.B.	2.85			210,000	656,282,000	234,000	664,167,000
15	6:15	B.B.	2.28			184,000	656,466,000	194,000	664,361,000
16	7:00	B.B.	2.14			209,000	656,675,000	187,000	664,548,000
17	6:30	R.F.	2.17	0.02	3.30	200,000	656,875,000	214,000	664,762,000
18	9:30	R.F.	2.10			225,000	657,100,000	197,000	664,959,000
19	6:00	R.F.	1.84			191,000	657,291,000	242,000	665,201,000
20	8:30	R.F.	2.77			245,000	657,536,000	221,000	665,422,000
21	6:30	R.F.	2.63			190,000	657,726,000	209,000	665,631,000
22	6:30	R.F.	2.55			206,000	657,932,000	207,000	665,838,000
23	6:30	R.F.	2.52			215,000	658,147,000	216,000	666,054,000
24	6:30	R.F.	2.37	0.02	3.10	211,000	658,358,000	211,000	666,265,000
25	6:30	R.F.	2.24			244,000	658,602,000	244,000	666,509,000
26	6:30	R.F.	1.91			201,000	658,803,000	210,000	666,719,000
27	9:30	R.F.	1.64			224,000	659,027,000	209,000	666,928,000
28	11:00	R.F.	1.85			227,000	659,254,000	208,000	667,136,000
29	7:30	R.F.	1.90			175,000	659,429,000	192,000	667,328,000
30	6:30	R.F.	1.68			203,000	659,632,000	218,000	667,546,000
31	7:00	B.B.	1.21	0.00	2.50	197,000	659,829,000	197,000	667,743,000
						6,578,000		6,617,000	

Manitoba

Monthly Ultraviolet (UV) Report

Water System Name: KLEEFELD Water System Code: 104.0

Month: JAN. Year: 2021

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.	56.48	–
2	9:30	R.F.	57.65	–
3	8:45	R.F.	57.65	–
4	7:00	B.B.	57.65	–
5	5:30	B.B.	57.65	–
6	7:00	B.B.	57.65	1
7	7:45	B.B.	57.65	–
8	13:00	B.B.	55.96	–
9	9:30	B.B.	57.65	–
10	8:15	B.B.	55.96	–
11	7:00	B.B.	57.65	–
12	9:30	B.B.	57.65	–
13	6:15	B.B.	57.65	–
14	7:00	B.B.	57.65	–
15	10:00	B.B.	57.65	–
16	9:15	R.F.	56.81	–

Date	Time	Operator Initials	UV Dose mJ/cm2	Number of Alarms (A) or Warnings (W)
17	8:15	R.F	57.65	–
18	7:00	B.B.	57.65	–
19	7:00	B.B.	57.65	–
20	6:00	B.B.	57.65	–
21	8:30	B.B.	55.96	–
22	7:30	B.B.	57.65	–
23	7:30	B.B.	58.74	–
24	8:45	B.B.	57.65	–
25	9:45	B.B.	55.96	–
26	7:00	B.B.	57.65	–
27	6:15	B.B.	55.96	–
28	10:30	B.B.	55.96	–
29	10:15	B.B.	57.65	–
30	9:30	R.F.	57.65	–
31	9:30	R.F.	55.96	–

Date	UVT readings and Alarm or Warning History and actions taken to resolve
06	SCADA COMMUNICATION ALARM
08	UVT TEST: 80.3
15	UVT TEST: 80.5
22	UVT TEST: 79.9
29	UVT TEST: 80.0

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: FEB. Year: 2021

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

STEPH DUVAL

Unit: mJ/cm2

Date	Time	Operator Initials	UV Dose mJ/cm2	Number of Alarms (A) or Warnings (W)
1	9:30	B.B	55.96	—
2	9:30	B.B.	56.48	—
3	8:00	B.B	55.96	—
4	7:00	B.B.	55.96	—
5	7:30	B.B.	55.96	—
6	8:00	B.B	55.96	—
7	8:00	B.B.	56.48	—
8	8:30	B.B.	55.96	—
9	14:00	B.B.	57.01	—
10	8:45	B.B.	55.96	—
11	13:00	B.B.	55.10	—
12	9:30	B.B.	55.96	—
13	9:30	R.F.	55.96	—
14	11:00	R.F.	55.96	—
15	9:00	R.F.	55.96	—
16	9:30	B.B.	55.96	—

Date	Time	Operator Initials	UV Dose mJ/cm2	Number of Alarms (A) or Warnings (W)
17	8:30	B.B.	55.96	—
18	13:00	B.B.	55.96	—
19	7:45	B.B.	55.96	—
20	12:00	B.B.	55.96	—
21	9:15	B.B.	55.96	—
22	7:45	B.B.	55.96	—
23	8:15	B.B.	55.96	—
24	8:00	B.B.	55.10	—
25	9.30	B.B.	55.96	—
26	8:00	B.B.	55.96	—
27	10:00	R.F	55.96	—
28	8:15	R.F	55.96	—
29				
30				
31				

Date	UVT readings and Alarm or Warning History and actions taken to resolve
05	UVT TEST : 80.3
12	UVT TEST : 79.7
19	UVT TEST: 80.4
26	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.

Manitoba

Monthly Ultraviolet (UV) Report

Water System Name: Kleefeld Water System Code: 1040

Month: March Year: 2021

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

Steph Duval

Unit: _____

Date	Time	Operator Initials	UV Dose mJ/cm2	Number of Alarms (A) or Warnings (W)
1	11:30	B.B.	56.48	-
2	8:45	B.B.	55.96	-
3	11:00	B.B.	55.96	-
4	8:00	B.B.	55.96	-
5	10:30	B.B.	55.96	-
6	9:30	B.B.	54.23	-
7	11:30	B.B.	57.65	-
8	7:30	B.B.	55.96	-
9	13:30	B.B.	55.96	-
10	10:00	B.B.	56.48	-
11	7:00	B.B.	55.96	-
12	10:00	B.B.	57.88	-
13	7:30	R.F.	56.81	-
14	7:00	R.F.	56.81	-
15	9:30	B.B.	55.96	-
16	7:15	B.B.	56.81	-

Date	Time	Operator Initials	UV Dose mJ/cm2	Number of Alarms (A) or Warnings (W)
17	6:15	B.B.	55.96	-
18	10:00	B.B.	55.96	-
19	8:40	B.B.	57.01	-
20	10:00	B.B.	55.96	-
21	10:00	B.B.	55.96	-
22	11:20	B.B.	55.45	-
23	11:15	B.B.	58.74	-
24	6:10	B.B.	55.96	-
25	11:00	B.B.	55.96	-
26	8:00	B.B.	55.96	-
27	10:00	R.F.	55.96	-
28	9:00	R.F.	55.45	-
29	7:30	R.F.	57.65	-
30	7:00	R.F.	55.96	-
31	6:30	R.F.	56.81	-

Date	UVT readings and Alarm or Warning History and actions taken to resolve
05	UVT TEST: 79.5
12	UVT TEST: 81.1
19	UVT TEST: 80.0
26	UVT TEST: 81.3

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: 2021

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

Unit: mJ/cm²

Date	Time	Operator Initials	UV Dose mJ/cm2	Number of Alarms (A) or Warnings (W)
1	6:30	R.F.	55.96	-
2	8:30	B.B.	55.96	-
3	11:15	B.B.	56.48	-
4	10:45	B.B.	55.96	-
5	3:15	B.B.	57.65	-
6	11:25	B.B.	55.96	-
7	10:00	B.B.	57.69	-
8	11:20	B.B.	56.48	-
9	7:15	B.B.	55.96	1
10	9:00	R.F.	55.96	-
11	10:45	R.F.	55.10	-
12	9:30	B.B.	55.96	-
13	10:30	B.B.	55.96	-
14	9:15	B.B.	55.96	-
15	12:00	B.B.	54.23	-
16	10:30	B.B.	55.96	-

Date	Time	Operator Initials	UV Dose mJ/cm2	Number of Alarms (A) or Warnings (W)
17	6:45	B.B.	55.96	-
18	11:30	B.B.	55.96	-
19	6:45	B.B.	57.65	-
20	10:15	B.B.	55.96	-
21	10:30	B.B.	55.96	-
22	10:00	B.B.	55.96	-
23	9:30	B.B.	55.96	-
24	10:00	R.F.	55.96	-
25	7:30	R.F.	56.81	-
26	12:30	B.B.	55.96	-
27	10:45	B.B.	55.45	-
28	10:00	B.B.	57.65	-
29	12:00	B.B.	55.96	-
30	8:30	B.B.	55.96	-
31				

Date	UVT readings and Alarm or Warning History and actions taken to resolve
02	UVT TEST: 80.6
09	RAW WATER LOW FLOW LOCKOUT (RESET WELL PUMP)
09	UVT TEST: 81.5
16	UVT TEST: 81.4
23	UVT TEST: 81.0
30	UVT TEST: 81.2

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: 1041.0

Month: May Year: 2021

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

Steph Duval

Unit: mJ/cm²

Date	Time	Operator Initials	UV Dose mJ/cm2	Number of Alarms (A) or Warnings (W)
1	11:00	B.B.	57.65	-
2	13:00	B.B.	56.81	-
3	8:45	B.B.	55.96	-
4	10:15	B.B.	57.65	-
5	7:45	B.B.	55.96	-
6	7:30	B.B.	57.65	-
7	8:45	B.B.	57.65	-
8	7:30	R.F.	56.81	-
9	6:00	R.F.	56.81	-
10	10:00	B.B.	57.65	-
11	7:30	B.B.	57.65	-
12	8:30	B.B.	57.65	-
13	7:15	B.B.	55.96	-
14	8:30	B.B.	57.65	-
15	11:45	B.B.	57.65	-
16	9:00	B.B.	57.65	-

Date	Time	Operator Initials	UV Dose mJ/cm2	Number of Alarms (A) or Warnings (W)
17	7:30	B.B.	57.65	-
18	8:30	B.B.	57.65	-
19	10:30	B.B.	58.49	-
20	9:30	B.B.	57.65	-
21	7:30	B.B.	57.65	-
22	9:30	R.F.	57.65	-
23	6:30	R.F	57.65	-
24	9:00	R.F	57.65	-
25	9:30	B.B.	57.65	-
26	11:15	B.B.	53.35	-
27	10:30	B.B.	56.81	-
28	8:15	B.B.	58.49	-
29	10:30	B.B.	55.96	-
30	10:00	B.B.	55.96	-
31	7:30	R.F	57.65	-

Date	UVT readings and Alarm or Warning History and actions taken to resolve
7	UVT TEST: 80.8
14	UVT TEST: 80.8
21	UVT TEST: 81.3
28	UVT TEST: 80.8

Submitted by (Print): Rob Friesen Signature:

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

Manitoba

Monthly Ultraviolet (UV) Report

Water System Name: Kleefeld Water System Code: 104.0

Month: June Year: 2021

Operator-in-charge (Print): Rob Friesen Other Operators (Print): Barry Brodsky, Stark Duval

Unit: ~~mJ~~ mJ/cm²

Date	Time	Operator Initials	UV Dose mJ/cm2	Number of Alarms (A) or Warnings (W)
1	9:45	B.B.	55.96	-
2	11:45	B.B.	57.65	-
3	13:30	B.B.	57.65	-
4	7:00	B.B.	57.65	-
5	9:00	R.F.	57.65	1 W
6	10:30	R.F.	56.48	1 W
7	14:00	B.B.	56.81	-
8	9:00	B.B.	55.96	-
9	13:00	B.B.	55.96	-
10	9:15	B.B.	55.96	-
11	10:30	B.B.	56.81	-
12	12:00	B.B.	57.65	-
13	9:00	B.B.	56.81	-
14	7:00	B.B.	55.96	-
15	12:30	B.B.	55.96	-
16	11:00	B.B.	55.96	-

Date	Time	Operator Initials	UV Dose mJ/cm2	Number of Alarms (A) or Warnings (W)
17	14:45	B.B.	55.96	-
18	9:45	B.B.	57.65	-
19	9:30	R.F.	57.65	-
20	9:15	R.F.	57.65	-
21	7:00	B.B.	57.65	-
22	13:30	B.B.	57.65	-
23	9:45	B.B.	57.65	-
24	7:00	B.B.	57.65	-
25	11:00	B.B.	58.19	-
26	9:00	B.B.	56.81	-
27	11:00	B.B.	58.19	-
28	9:00	B.B.	57.34	-
29	7:00	B.B.	58.19	-
30	7:00	R.F.	56.48	-
31	~~9:45~~	~~R.F.~~	~~57.34~~	-

Date	UVT readings and Alarm or Warning History and actions taken to resolve
4	UVT TEST: 81.6
5	Raw water low flow lockout / Reset well pump
6	Raw water low flow lockout / Reset well pump
11	UVT TEST: 81.1
18	UVT TEST: 80.5
25	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 Ultraviolet (UV) Report

Water System Name: KLEEFELD Water System Code: 104.0

Month: JULY Year: 2021

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

STEPH DUVAL

Unit: mj/cm2

Date	Time	Operator Initials	UV Dose mJ/cm2	Number of Alarms (A) or Warnings (W)
1	9:45	R.F.	57.34	-
2	8:00	R.F.	56.48	-
3	9:30	R.F.	56.48	-
4	9:30	R.F.	56.48	-
5	7:45	R.F.	56.48	-
6	7:00	R.F.	56.48	-
7	6:00	R.F.	56.48	-
8	7:00	R.F.	56.48	-
9	7:30	R.F.	56.48	-
10	10:00	R.F.	56.48	-
11	6:00	R.F.	56.48	-
12	7:30	B.B.	56.48	-
13	11:30	B.B.	56.48	-
14	7:30	B.B.	55.96	-
15	11:30	B.B.	56.48	-
16	9:30	B.B.	57.55	-

Date	Time	Operator Initials	UV Dose mJ/cm2	Number of Alarms (A) or Warnings (W)
17	9:00	R.F.	56.48	-
18	9:30	R.F.	56.48	-
19	7:00	B.B.	56.48	-
20	11:15	B.B.	56.48	-
21	12:30	B.B.	54.23	-
22	7:00	B.B.	55.10	-
23	9:00	B.B.	54.23	-
24	11:30	B.B.	54.73	-
25	9:15	B.B.	54.73	-
26	12:30	B.B.	54.73	-
27	11:00	B.B.	54.73	-
28	11:45	B.B.	54.23	-
29	12:15	B.B.	55.61	-
30	9:45	B.B.	54.73	-
31	9:20	R.F.	56.48	-

Date	UVT readings and Alarm or Warning History and actions taken to resolve
2	UVT TEST: 81.0
9	UVT TEST: 81.5
16	UVT TEST: 81.2
22	UV LOCKED OUT → RESET UV
23	UVT TEST: 78.7
30	UVT TEST: 80.1

Submitted by (Print): BARRY BROESKY Signature:

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

Manitoba

Monthly Ultraviolet (UV) Report

Water System Name: Kleefeld Water System Code: 104.0

Month: August Year: 2021

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

Steph Duval

Unit: mj / cm²

Date	Time	Operator Initials	UV Dose mJ/cm2	Number of Alarms (A) or Warnings (W)
1	6:00	R.F.	56.48	—
2	9:30	R.F.	56.48	—
3	7:15	B.B.	67.01	—
4	11:45	B.B.	56.48	—
5	13:30	B.B.	55.96	—
6	14:30	B.B.	57.01	—
7	11:00	B.B.	56.48	—
8	10:10	B.B.	56.48	—
9	11:45	B.B.	56.48	—
10	11:45	B.B.	57.55	—
11	6:30	B.B.	56.48	—
12	13:30	B.B.	55.96	—
13	14:15	B.B.	57.55	—
14	12:00	B.B.	55.96	—
15	11:15	B.B.	56.48	—
16	12:45	B.B.	55.96	—
17	11:45	B.B.	55.96	—
18	13:00	B.B.	55.96	—
19	13:30	B.B.	55.96	—
20	10:50	B.B.	56.48	—
21	11:45	B.B.	58.19	—
22	11:15	B.B.	55.96	—
23	12:15	B.B.	58.19	—
24	6:15	R.F.	56.48	—
25	6:45	R.F.	56.48	—
26	7:30	R.F.	56.48	—
27	9:00	R.F.	56.48	—
28	7:45	R.F.	56.48	—
29	13:26	B.B.	55.96	—
30	12:15	B.B.	55.96	—
31	11:35	B.B.	55.96	—

Date	UVT readings and Alarm or Warning History and actions taken to resolve
6	UVT TEST: 80.1
13	UVT TEST: 79.9
20	UVT TEST: 81.1
26	UVT TEST: 81.0

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 Ultraviolet (UV) Report

Water System Name: KLEEFELD Water System Code: 104.0

Month: SEPT. Year: 2021

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

STEPH DUVAL

Unit: mj/cm2

Date	Time	Operator Initials	UV Dose mJ/cm2	Number of Alarms (A) or Warnings (W)
1	11:45	B.B.	56.48	–
2	8:40	B.B.	56.48	–
3	9:23	B.B.	55.96	–
4	12:00	B.B.	56.48	–
5	~~9:15~~ 9:50	B.B.	56.48	–
6	11:31	B.B.	56.48	–
7	10:00	B.B.	57.55	–
8	8:30	B.B.	55.96	–
9	13:05	B.B.	56.48	–
10	7:40	B.B.	56.48	–
11	10:00	R.F.	56.81	–
12	9:00	R.F.	56.48	–
13	9:50	B.B.	56.48	–
14	13:55	B.B.	68.70	–
15	16:00	B.B.	69.60	–
16	13:15	B.B.	69.60	–

Date	Time	Operator Initials	UV Dose mJ/cm2	Number of Alarms (A) or Warnings (W)
17	11:45	B.B.	69.56	–
18	11:50	B.B.	69.60	–
19	10:40	B.B.	69.60	–
20	10:25	B.B.	69.56	–
21	12:34	B.B.	70.30	–
22	11:50	B.B.	70.30	–
23	14:30	B.B.	70.3	–
24	14:00	B.B.	68.31	–
25	10:00	R.F.	68.31	–
26	9:15	R.F.	68.31	–
27	13:00	B.B.	69.0	–
28	11:45	B.B.	68.9	–
29	9:05	B.B.	68.31	–
30	6:45	B.B.	68.31	–
31				

Date	UVT readings and Alarm or Warning History and actions taken to resolve
3	UVT TEST: 80.1
10	UVT TEST: 79.9
14	RAW WATER LOW FLOW LOCKOUT - RESET WELL PUMP
17	UVT TEST - 81.1
24	UVT TEST - 80.1

Submitted by (Print): BARRY BROESKY Signature:

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Manitoba

Monthly Ultraviolet (UV) Report

Water System Name: Kleefeld **Water System Code:** 16-1C

Month: October **Year:** 2021

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

Steph Dunn

Unit: mJ/cm2

Date	Time	Operator Initials	UV Dose mJ/cm2	Number of Alarms (A) or Warnings (W)
1	7:30	B.B.	68.31	—
2	6:30	B.B.	68.31	-
3	9:40	B.B.	68.31	-
4	7:15	B.B	69.56	-
5	7:15	B.B	68.31	-
6	6:35	B.B.	68.31	—
7	7:20	B.B	68.31	—
8	11:35	B.B.	68.31	—
9	9:30	R.F	68.31	—
10	10:00	R.F	68.31	-
11	9:30	R.F.	68.31	—
12	14:25	B.B	68.31	—
13	8:25	B.B	68.31	—
14	7:25	B.B.	68.31	—
15	11:10	B.B	68.31	-
16	13:40	B.B.	68.31	-
17	10:15	B.B	68.31	-
18	7:30	B.B.	68.31	-
19	7:05	B.B.	68.31	-
20	13:20	B.B	68.31	-
21	7:15	B.B.	67.57	-
22	7:20	B.B	66.82	-
23	10:00	R.F.	68.31	—
24	6:00	R.F.	67.57	—
25	7:25	B.B.	68.31	-
26	7:30	B.B.	68.31	-
27	6:25	B.B	68.31	-
28	7:00	B.B.	68.31	-
29	7:25	B.B	68.31	-
30	8:00	B.B	67.57	-
31	10:00	B.B	68.31	-

Date	UVT readings and Alarm or Warning History and actions taken to resolve
1	UVT TEST: 79.5
8	UVT TEST: 80.1
15	UVT TEST: 79.9
22	UVT TEST: 79.4
29	UVT TEST 79.9

Submitted by (Print): Rob Friesen **Signature:** [signature]

PLEASE REFER TO OPERATING LICENCE FOR APPLICABLE TREATMENT STANDARDS AND MONITORING REQUIREMENTS.
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Manitoba

Monthly Ultraviolet (UV) Report

Water System Name: KLEEFELD Water System Code: 104.0

Month: NOVEMBER Year: 2021

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

STEPH DUVAL

Unit: mj/cm²

Date	Time	Operator Initials	UV Dose mJ/cm2	Number of Alarms (A) or Warnings (W)
1	7:00	B.B	66.82	—
2	7:40	B.B.	66.82	—
3	6:30	B.B.	66.82	—
4	7:30	B.B	66.82	—
5	7:10	B.B.	66.82	—
6	7:05	B.B.	66.82	—
7	9:00	B.B.	68.31	—
8	7:30	B.B.	66.82	—
9	7:25	B.B	66.82	—
10	6:00	B.B.	66.82	—
11	9:30	R.F.	66.82	—
12	8:00	R.F.	68.05	—
13	8:30	R.F.	66.82	—
14	8:00	R.F.	66.82	—
15	7:35	B.B.	68.31	—
16	8:50	B.B.	66.82	—

Date	Time	Operator Initials	UV Dose mJ/cm2	Number of Alarms (A) or Warnings (W)
17	6:05	B.B.	66.82	—
18	7:05	B.B.	67.57	—
19	7:30	B.B.	66.82	—
20	9:30	R.F	66.82	—
21	11:00	R.F.	66.82	—
22	11:15	B.B.	66.82	—
23	7:05	B.B.	66.82	—
24	6:30	B.B.	66.82	—
25	7:40	B.B.	66.82	—
26	7:50	B.B.	66.82	—
27	7:45	B.B.	65.71	—
28	8:50	B.B.	64.97	—
29	7:50	B.B.	64.97	—
30	7:20	B.B.	64.97	—
31				

Date	UVT readings and Alarm or Warning History and actions taken to resolve
5	UVT TEST: 80.1
12	UVT TEST: 78.9
19	UVT TEST: 79.9
26	UVT TEST: 80.4

Submitted by (Print): BARRY BROESKY Signature:

PLEASE REFER TO OPERATING LICENCE FOR APPLICABLE TREATMENT STANDARDS AND MONITORING REQUIREMENTS.
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Manitoba

Monthly Ultraviolet (UV) Report

Water System Name: KLEEFELD Water System Code: 1040

Month: DECEMBER Year: 2021

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

Unit: mJ/cm2 STEPH DUVAL

Date	Time	Operator Initials	UV Dose mJ/cm2	Number of Alarms (A) or Warnings (W)
1	7:00	B.B.	64.23	-
2	7:00	B.B.	64.23	-
3	7:45	B.B.	65.41	-
4	9:30	R.F.	64.29	-
5	6:00	R.F.	64.29	-
6	7:35	B.B.	64.29	-
7	7:00	B.B.	64.29	-
8	6:00	B.B.	63.54	-
9	7:25	B.B.	64.29	-
10	10:15	B.B.	64.29	-
11	16:15	B.B.	63.54	-
12	7:30	B.B.	64.29	-
13	7:30	B.B.	64.29	-
14	7:30	B.B.	64.29	-
15	6:30	B.B.	64.29	-
16	7:00	B.B.	63.54	-

Date	Time	Operator Initials	UV Dose mJ/cm2	Number of Alarms (A) or Warnings (W)
17	7:00	R.F.	64.83	-
18	9:30	R.F.	63.54	-
19	6:00	R.F.	64.29	-
20	8:30	R.F.	64.29	-
21	2:00	R.F.	63.54	-
22	6:30	R.F.	64.29	-
23	2:00	R.F.	64.29	-
24	6:30	R.F.	64.89	-
25	6:30	R.F.	65.77	-
26	6:30	R.F.	64.11	-
27	9:30	R.F.	63.54	-
28	11:00	R.F.	63.54	-
29	7:30	R.F.	66.37	-
30	6:30	R.F.	63.54	-
31	7:00	B.B.	64.20	-

Date	UVT readings and Alarm or Warning History and actions taken to resolve
3	UVT TEST: 80.9
10	UVT TEST: 80.1
17	UVT TEST: 80.3
24	UVT TEST 79.3
31	UVT TEST: 79.2

Submitted by (Print): BARRY BROESKY Signature:

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