Flambeau Mining Company
4700 Daybreak Parkway
South Jordan, UT 84095
801-204-2526

January 31, 2022

Mr. Greg Pils
Bureau Director
Wisconsin Department of Natural Resources
101 S. Webster Street, GEF2
Madison, WI 53707-7921

Dear Mr. Pils:

The Flambeau Mining Company (Flambeau) is submitting 5 copies of the attached 2021 Annual Summary Memorandum pursuant to Parts 1-8 of the Flambeau Mine Permit (Docket No. IH-89-14). This submittal also addresses other requirements of the Mining Permit and associated approvals.

Monitoring and evaluations conducted during 2021 continue to document that the Flambeau River remains fully protected and Flambeau remains in full compliance with its permit standards.

If you have any comments or questions regarding this submittal, please contact me at stephen.bourn@riotinto.com.

Sincerely,

Stephen Bourn
President – Flambeau Mining Company

attachments

cc: Terry DuSell, Rusk County Board of Supervisors
Tom Riegel, Town of Grant
Al Christianson, City of Ladysmith
Yvonne Johnson, Rusk County Zoning
Leland Roberts, Flambeau Mining Company
Steve Donohue, Foth Infrastructure & Environment, LLC
Foth File: 17F777.22\4000

Memorandum

2121 Innovation Court, Suite 100
De Pere, WI 54115
(920) 497-2500
foth.com

January 31, 2022

TO: Stephen Bourn, Flambeau Mining Company
Leland Roberts, Flambeau Mining Company

CC: Steve Donohue, Foth Infrastructure & Environment, LLC
Foth Project #: 17F777.22

FR: Nick Glander, Foth Infrastructure & Environment, LLC
Steve Lehrke, Foth Infrastructure & Environment, LLC
Sharon Kozicki, Foth Infrastructure & Environment, LLC

RE: 2021 Annual Summary Memorandum – Reclaimed Flambeau Mine
Flambeau Mining Company

1. Purpose and Need

This 2021 Annual Summary Memorandum documents the work that was completed by Flambeau Mining Company (Flambeau) at the Reclaimed Flambeau Mine Site, Ladysmith, Wisconsin, in 2021, to satisfy the requirements of the Mining Permit (MP). These requirements are summarized in Table 1.

Table 1 – Mine Permit Location Information Key

Condition Number	Location of Information	Condition Requirement
MP, Part 1, Cond. 8	Section 2	*"Submit a report annually to the Department summarizing the activities which took place on the mining site during the year and shall include other additional information specified in this permit and associated plan approvals."*
MP, Part 2, Cond. 4	Section 1	*"Include discussion of all modifications received during the previous year and shall include an inventory of all modifications received subsequent to permit issuance. The annual report shall also discuss deviations from the approved Mining Plan as a result of final engineering refinements of subsequent plan approvals if these deviations do not require modifications, under Part 2, Conditions 2 and 3."*

Condition Number	Location of Information	Condition Requirement
MP, Part 2, Cond. 6	There were no reportable or recordable incidents in 2021.	*"A summary of incidents subject to various Department reporting requirements shall be included in the annual report required under sec. 144.89, Stats."*
MP, Part 2, Cond 7	There were no exploration activities conducted in 2021.	*"The annual report required under sec. 144.89, Stats, shall include a summary of all exploration drilling activities conducted on the mining site during the previous year."*
MP, Part 4, Cond. 9	Section 2 and Attachment A	*"The annual report required in this permit shall summarize the year's monitoring activities and any observed trends in the monitoring data."*

Since 2018, the annual summary is presented in memorandum format as approved by the Wisconsin Department of Natural Resources (Department) in a letter received on December 7, 2018.

In the Request to Modify the Updated Monitoring Plan (November 2018), the monitoring frequency, number of wells, and number of parameters sampled was requested to be reduced. A public informational hearing was conducted by the Department at its service center in Ladysmith, WI on June 20, 2019. After the allotted comment and response period, the request was approved by the Department on October 4, 2019. Subsequent to the approval, there was a 30-day review period. There were no requests for review. The 2020 monitoring reflected the new monitoring plan. An Updated Monitoring Plan (August 2020) and Quality Assurance Project Plan (QAPP) (August 2020) were amended and submitted to the Department in August 2020.

2. 2021 Site Monitoring

Environmental monitoring at the Reclaimed Flambeau Mine, during 2021, included assessing the quality of groundwater and backfill pore water. All data obtained during environmental monitoring continues to show that Flambeau remains in compliance with all permit standards and the Flambeau River remains protected.

2.1 Groundwater Sampling and Analysis

Semi-annual groundwater monitoring was performed in accordance with descriptions provided in the Updated Monitoring Plan, the QAPP, and the Local Agreement. Results of the 2021 monitoring were submitted to the Department's Mine Reclamation Unit on June 28, 2021 and December 22, 2021. Those reports are incorporated by reference.

Figure 1 shows the groundwater potentiometric surface using data obtained during 2021. The map was generated using the shallowest measured water levels, and thus represents shallow groundwater flow in the native formations and in the replaced till and sandstone in the backfilled pit footprint. The potentiometric surface shows a direction of regional shallow groundwater flow toward the Flambeau River.

Figure 2 shows the potentiometric surface using the deeper water level for nested wells, where available, and the water levels for the B completion in the backfill monitoring wells. Beyond the

pit footprint, the groundwater levels generally mimic the shallow groundwater conditions. Within the pit backfill, the surface reflects a general direction of groundwater flow in the backfilled Type I and Type II stockpile materials along the axis of the pit toward the Flambeau River.

Figure 3 shows hydraulic head in the cross section along the axis of the pit. The cross section is interpreted to show predominantly horizontal flow in the backfilled Type I and Type II stockpile materials but with a downward hydraulic gradient at the eastern pit area and an upward hydraulic gradient with convergent groundwater flow near the Flambeau River. These observations are consistent with previous, post-mining years.

2.1.1 Trend Analysis

A detailed analysis of statistical trends occurring in the groundwater and surface water data was performed. Statistical tests evaluated the long-term trends occurring during the post-mining period (October 1997 to the present) and the short-term trends for the most recent five years. Historical trend graphs of the data are also presented.

A detailed discussion of the trend results for each well nest is provided in Attachment A. In general, the number of more notable concentration trends as observed in previous Annual Reports have reduced for both the intervention boundary and in-pit wells, indicating a broader stabilization in the groundwater concentrations. A number of the trends, noted through the Mann-Kendall nonparametric test, are due to slight but consecutive concentration changes (either increasing or decreasing), and not reflective of a substantial overall concentration change. The majority of the observed trends continue to occur in the semi-annual groundwater indicator monitoring parameters.

For the intervention boundary wells, the decreasing trends for MW-1000R (near the immediate southwest boundary and hydraulically downgradient of the reclaimed mine pit) which began approximately in 2013 have stabilized. These decreases were observed for alkalinity, copper, hardness, total dissolved solids (TDS), conductivity and oxidation reduction potential (ORP). No statistical trends are present in the MW-1000R recent five-year datasets.

Increasing trends continue for alkalinity (beginning in 2014) and hardness (beginning in 2011) in MW-1002G (northwest and hydraulically side-gradient to the former mine pit).

In MW-1005 (hydraulically upgradient of the former mine pit), calcium, chloride, and magnesium had increased concentrations from 2016 through 2018, potentially due to application of road salt on State Highway 27 along with rising water levels and evaporative concentration effects. However, concentrations have since remained consistent, without any further substantial increase.

For the MW-1013 in-pit well nest, iron at MW-1013, which previously had an increasing trend and historically exhibited a large degree of variation, again exhibited stronger seasonal variation during 2020 and 2021 with increased concentrations observed during the fall event.

For the in-pit well nest at MW-1014, copper in in MW-1014B remains at lowered concentrations after a substantial decrease in 2019. Copper and manganese continue decreasing trends in this well.

No statistical trends were noted in the five-year datasets for surface water.

2.2 Protection of the Flambeau River

Potential impact to the Flambeau River was estimated by performing a concentration reduction factor (CRF) calculation in the Request to Modify the Updated Monitoring Plan (November 2018). This calculation was initially presented in Appendix L of the Mine Permit Application for the Flambeau Project (December 1989), and then updated with current gradient and concentration data for copper, iron, manganese, and sulfate in a memorandum submitted by Flambeau, to the Department, on October 17, 2000, entitled "Backfilled Pit Water Quality Assessment" (October 2000). The 2021 calculation, updated using the current gradient and concentrations, is incorporated by reference. The results of the 2021 calculation were consistent with the 1989 and 2000 CRF calculations, with the CRF being on the order of 0.00000010 and 0.0000010 milligrams per liter (mg/L) for average and low flow conditions, respectively. This CRF results in negligible, unmeasurable, incremental impacts to the Flambeau River that are 3 to 5 orders of magnitude lower than background concentrations in the Flambeau River indicating that the River remains protected. The 2021 Flambeau River analytical results are summarized in Attachment A.

2.3 Annual Site Inspection

The site was inspected during the 2021 groundwater monitoring events. During these events, there were no areas of erosion or settling observed; vegetative growth appeared normal; and all monitoring devices were functional, with the following exception:

The beaver dam/issue, first observed in 2019, had expanded and was impeding drainage to the weir causing flooding in the local area. The beaver removal began in 2020 and continued in 2021. In spring of 2021, the beaver dam was removed and the trailway was restored. The 2021 beaver issue activities are presented in Section 2.3.1.

2.3.1 Beaver Removal Activities

Prior to commencement of the beaver removal activities, a courtesy notification was made to the Ladysmith Chamber of Commerce (for placement on the City's website), the local newspaper, and caution signs placed at each entry to the property along with warning signs around the immediate trapping area. Animal Logistics Wildlife Management, a state certified trapper, was contracted to remove the beavers from the constructed wetland area. Beaver removal followed the guidelines of the Beaver Removal Work Plan submitted to the Department on August 20, 2020 via electronic mail as a courtesy. Five beavers were removed from the site in 2020.

Site orientation and active beaver trapping resumed on March 22, 2021 and lasted approximately 13 days. Eight additional beavers were removed from the wetland area and disposed or relocated in accordance with regulations. Animal Logistics Wildlife Management was contracted to remove the beaver hut on April 4, 2021. Russ Thompson Excavating was contracted to break the berm and regrade the trailway which occurred beginning April 19, 2021. The revegetation seed was placed after grade and slope were completed using the restoration seed mixture that was approved in the Reclamation Plan. By November the trailway vegetation was reestablished. The trapper continued to conduct routine site inspections for beaver activities throughout 2021. In early November 2021, beaver activity once again was noticed. The signage was reinstalled, and traps were set. One yearling beaver was harvested the next day shortly before the wetland pond froze over.

Ongoing routine inspections for beaver activity will continue in 2022.

2.4 Other Activities

The Flambeau River was voluntarily monitored in the spring and fall for copper, iron, manganese, total hardness, zinc, and total suspended solids (TSS). These results are summarized in Attachment A. The results indicate that the Flambeau River remains protected.

3. References

2020 Annual Summary Memorandum	January 2021
Reclaimed Flambeau Mine Well Abandonment Documentation Submittal	November 2020
2020 Updated Monitoring Plan	August 2020
Reclaimed Flambeau Mine Well Abandonment Work Plan	August 2020
Beaver Removal Work Plan	August 2020
2019 Annual Summary Memorandum	January 2020
2018 Annual Summary Memorandum	January 2019
Request to Modify the Updated Monitoring Plan	November 2018
2017 Annual Report	January 2018
2016 Annual Report	January 2017
Copper Park Business and Recreation Area Supplement Construction Documentation Report	November 2016
2015 Annual Report	January 2016
2015 Flambeau Mining Company Surface Water Monitoring Plan	September 2015
Copper Park Business and Recreation Area Work Plan Supplement	May 2015
Quality Assurance Project Plan	February 2015
2014 Annual Report	January 2015
2013 Annual Report	January 2014
Copper Park Business and Recreation Area Maintenance and Monitoring Plan	February 2013
2012 Annual Report	January 2013
Copper Park Business and Recreation Area Construction Documentation Report	January 2013
2012 Annual Reclamation Report	November 2012

2011 Annual Report	January 2012
2011 Annual Reclamation Report	November 2011
Copper Park Business and Recreation Area Work Plan	May 2011
2010 Annual Report	January 2011
2010 Annual Reclamation Report	November 2010
2009 Annual Report	February 2010
2009 Annual Reclamation Report	November 2009
2008 Annual Report	January 2009
2008 Annual Reclamation Report	November 2008
2008 Monitoring Results and Copper Park Lane Work Plan	October 2008
2007 Annual Report	January 2008
COC Stipulation Monitoring Work Plan	December 2007
Quality Assurance Project Plan – Stipulation Monitoring Work Plan QAPP for the Flambeau Mine	December 2007
2007 Annual Reclamation Report	November 2007
Stipulation and Order	May 2007
2006 Annual Report	January 2007
Biofilter Management Plan	January 2007
2006 Annual Reclamation Report	November 2006
Construction Documentation Report – Flambeau Industrial Outlot	September 2006
2005 Annual Report	January 2006
2005 Annual Reclamation Report	November 2005
2004 Annual Reclamation Report	November 2004
2001 Annual Reclamation Report	November 2001
2000 Annual Report	January 2001
Revised Mining Permit Quality Assurance/Quality Control Plan	August 1991
Updated Monitoring Plan	July 1991

Mining Permit	January 1991
Operational Phase and Long Term Care Quality Assurance Plan	November 1993
Mine Permit Application	December 1989
Local Agreement	August 1988

4. Submittal Summary

Document	Date	Submittee
2020 Annual Summary Memorandum	January 2021	Greg Pils[1]
Environmental Groundwater Monitoring (First half 2021)	June 2021	Greg Pils[1]
Environmental Groundwater Monitoring (Second half 2021)	December 2021	Greg Pils[1]

1. Wisconsin Department of Natural Resources
   Division of External Services
   Bureau of Environmental Analysis & Sustainability

Attachments

Figure 1	November 2021 Potentiometric Surface, Shallow Groundwater Levels
Figure 2	November 2021 Potentiometric Surface, Wells Screened at Mid-Depths
Figure 3	2021 Mine Pit Cross Section A-A' with In-Pit Groundwater Monitoring Wells
Attachment A	Groundwater Quality & Elevation/Surface Water Quality Trends

Figures

38,000 E
39,000 E
40,000 E
41,000 E
42,000 E
43,000 E

43,000 N
42,000 N
41,000 N
40,000 N
39,000 N

1091.08
MW-1002
MW-1002G
1090.93

1088.22
MW-1015A
MW-1015B
1088.38

MW-1014 1124.30
MW-1014A 1121.48
MW-1014B 1117.52
MW-1014C 1111.90

MW-1004 1107.91
MW-1004S 1107.98
MW-1004P 1106.36

ST-9-23
1126.65
ST-9-23A
1126.70

MW-1005 1140.37
MW-1005P 1139.89
MW-1005S 1139.65

MW-1013 1114.20
MW-1013A 1099.33
MW-1013B 1099.82
MW-1013C 1102.58

PZ-S3
1125.22

ST-9-26
1118.29

MW-1010P
1088.21

MW-1000PR
1088.43

MW-1000R
1089.61

OW-39
1100.90

MW-1001 1119.54
MW-1001P 1118.91
MW-1001G 1118.42

1090
1095
1100
1105
1110
1115
1120
1125
1130
1135
1140

N

LEGEND

1125 — POTENTIOMETRIC SURFACE CONTOUR

INFERRED POTENTIOMETRIC SURFACE CONTOUR BASED ON HISTORICAL DATA

MW-1001
1119.54
GROUNDWATER MONITORING WELL AND MEASURED GROUNDWATER ELEVATION (FT MSL) (NOVEMBER 17, 2020)

1119.54 *
ASTERISK DENOTES ELEVATION FROM WELL NEST REPRESENTED BY GROUNDWATER CONTOUR

SLURRY WALL LOCATION

APPROXIMATE LIMITS OF FORMER MINE PIT

NOTE:
FOR THE PURPOSE OF THIS POTENTIOMETRIC SURFACE MAP THE SHALLOWEST, NON DRY WELL OF THE NESTED WELL SET WAS USED TO GENERATE THE POTENTIOMETRIC SURFACE.

FLAMBEAU MINING COMPANY
2021 ANNUAL SUMMARY MEMORANDUM

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Foth Environment Solutions

REVISED	DATE	BY	DESCRIPTION

PREPARED BY:	NMG1	DATE:	JAN. '22
REVIEWED BY:	MAN	DATE:	JAN. '22
APPROVED BY:	SVF	DATE:	JAN. '22

FLAMBEAU MINING COMPANY

FIGURE 1
NOVEMBER 2021
POTENTIOMETRIC SURFACE
SHALLOW GROUNDWATER LEVELS

Scale: 0 250' 500' Date: JANUARY 2022
Drawn By: JOW Project No: 17F777.22

38,000 E
39,000 E
40,000 E
41,000 E
42,000 E
43,000 E

43,000 N
42,000 N
41,000 N
40,000 N
39,000 N

1091.08
MW-1002
MW-1002G
1090.93

1088.22
MW-1015A
MW-1015B
1088.38

MW-1004 1107.91
MW-1004S 1107.98
MW-1004P 1106.36

MW-1013 1114.20
MW-1013A 1099.33
MW-1013B 1099.82
MW-1013C 1102.58

MW-1010P
1088.21
MW-1000PR
1088.43
MW-1000R
1089.61

OW-39
1100.90

ST-9-26
1118.29

PZ-S3
1125.22

MW-1001 1119.54
MW-1001P 1118.91
MW-1001G 1118.42

MW-1014 1124.30
MW-1014A 1121.48
MW-1014B 1117.52
MW-1014C 1111.90

ST-9-23
1126.65
ST-9-23A
1126.70

MW-1005 1140.37
MW-1005P 1139.89
MW-1005S 1139.65

1090
1095
1100
1105
1110
1115
1120
1125
1130
1135

N

LEGEND

1125 — POTENTIOMETRIC SURFACE CONTOUR

INFERRED POTENTIOMETRIC SURFACE CONTOUR BASED ON HISTORICAL DATA

MW-1002G
1090.93
GROUNDWATER MONITORING WELL AND MEASURED GROUNDWATER ELEVATION (FT MSL) (NOVEMBER 17, 2021)

SLURRY WALL LOCATION

APPROXIMATE LIMITS OF FORMER MINE PIT

NOTE:
"B-WELLS" IN THE BACKFILL PIT AND DEEPER WELLS IN AREAS WITH WELL NESTS OUTSIDE OF THE BACKFILLED PIT WERE USED.

FLAMBEAU MINING COMPANY
2021 ANNUAL SUMMARY MEMORANDUM

Foth

Foth Environment Solutions			
REVISED	DATE	BY	DESCRIPTION

PREPARED BY:	NMG1	DATE:	JAN. '22
REVIEWED BY:	MAN	DATE:	JAN. '22
APPROVED BY:	SVF	DATE:	JAN. '22

FLAMBEAU MINING COMPANY

FIGURE 2

NOVEMBER 2021
POTENTIOMETRIC SURFACE
WELLS SCREENED AT MID-DEPTHS

Scale: 0 250' 500' | Date: JANUARY 2022

Drawn By: JOW | Project No: 17F777.22

Tuesday, January 11, 2022 11:03:45 AM Flambeau Mining\17F777\CAD\Figures\2021 Annual Memo
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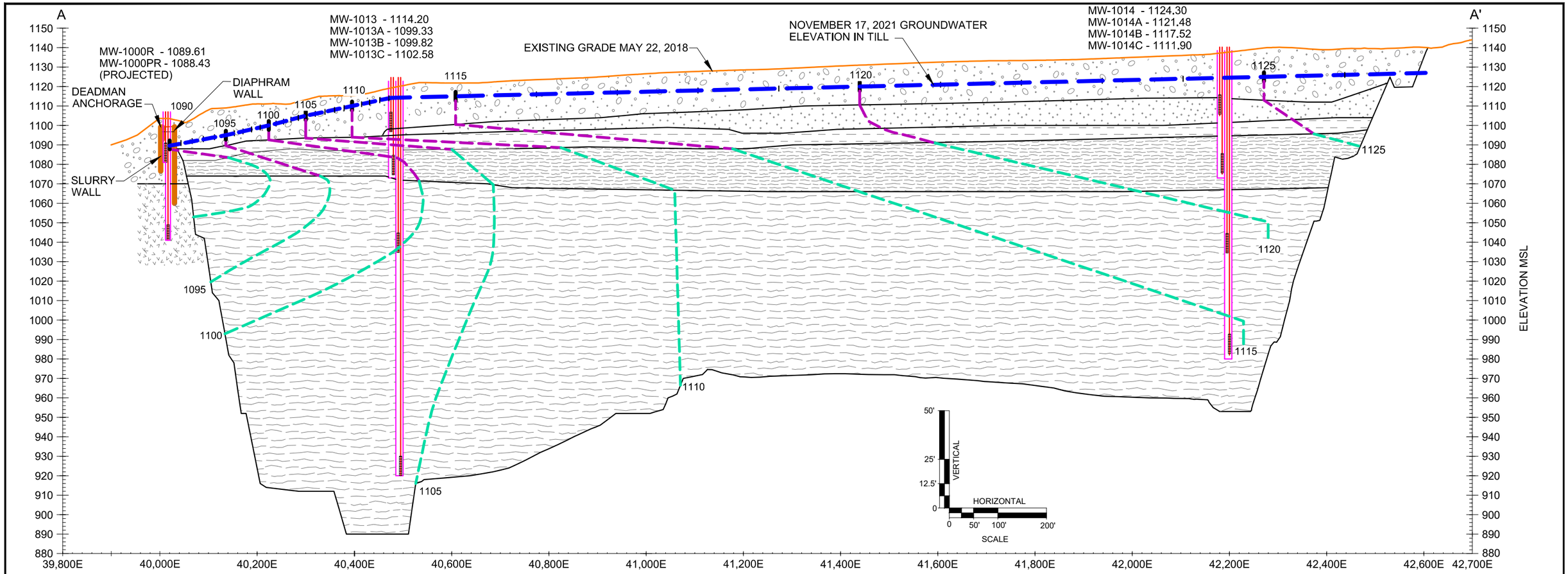
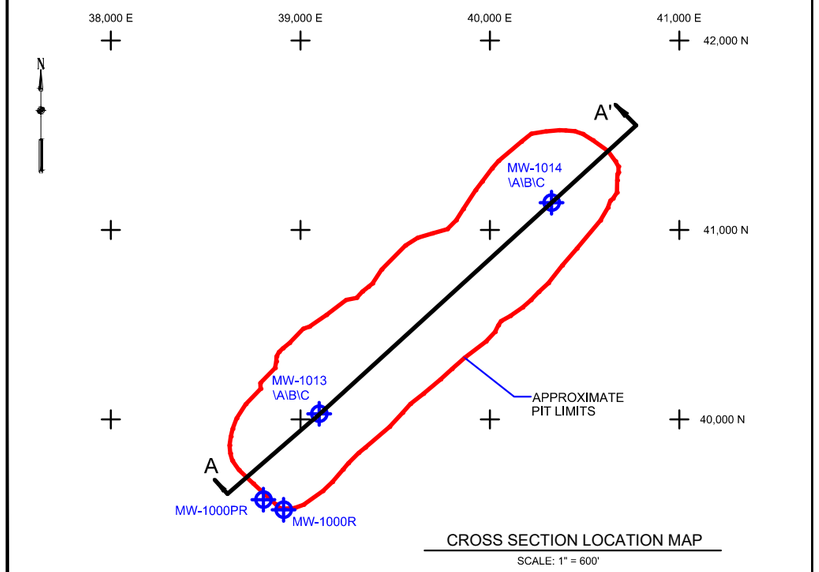


MINE PIT COORDINATES

SECTION A - A'



CROSS SECTION LOCATION MAP

SCALE: 1" = 600'

LEGEND

- TILL
- SANDSTONE
- SAPROLITE
- TYPE I MATERIAL
- TYPE II MATERIAL
- PRECAMBRIAN
- WATER TABLE
- GROUNDWATER EQUIPOTENTIAL LINE IN TYPE I AND II BACKFILL
- GROUNDWATER EQUIPOTENTIAL LINE IN SHALLOW FLOW SYSTEM

Foth Environment Solutions			
REVISED	DATE	BY	DESCRIPTION

PREPARED BY:	NMG1	DATE:	JAN. '22
REVIEWED BY:	MAN	DATE:	JAN. '22
APPROVED BY:		DATE:	

FLAMBEAU MINING COMPANY

FIGURE 3

2021 MINE PIT CROSS SECTION A - A' WITH IN-PIT GROUNDWATER MONITORING WELLS

Scale: 0 250' 500' | Date: JANUARY 2022

Drawn By: JOW | Project No: 17F777.22

FLAMBEAU MINING COMPANY
2021 ANNUAL SUMMARY MEMORANDUM

Tuesday, December 21, 2021 2:14:51 PM Flambeau Mining\17F777\CAD\Figures\2021 Annual Memo
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Attachment A
Groundwater Quality & Elevation/Surface Water Quality Trends

Memorandum

2121 Innovation Court, Suite 100
De Pere, WI 54115
(920) 497-2500
foth.com

January 17, 2022

TO: Stephen Bourn, Flambeau Mining Company
Leland Roberts, Flambeau Mining Company

CC: Steve Donohue, Foth Infrastructure & Environment, LLC
Sharon Kozicki, P.G., Foth Infrastructure & Environment, LLC

FR: Stephen Lehrke, Ph.D., Foth Infrastructure & Environment, LLC

RE: 2021 Annual Memo Report – Groundwater and Surface Water Trends

1. Background

Groundwater and surface water sample results collected during the 2021 monitoring programs were added to the analytical monitoring historical database. These results were statistically tested and graphically displayed to determine whether any significant increasing or decreasing trends are occurring in the groundwater or surface water chemistry. This is done to satisfy the requirements of Part 4, Condition 9 of the Mine Permit, to summarize the monitoring activities and any observed trends. The 2021 surface water samples from the Flambeau River were collected voluntarily by Flambeau Mining Company (Flambeau).

The trend analyses presented in this memorandum (memo) reflect the changes to the long-term groundwater monitoring program as provided in the approved 2020 Updated Monitoring Plan (Foth, 2020)[1]. Analytes previously collected on a quarterly schedule are now collected semi-annually, and analytes collected on an annual basis are now limited to calcium, chloride, lead, magnesium, potassium, and zinc. Groundwater elevation data is also collected semi-annually at the intervention boundary and in-pit wells, along with eight piezometer locations retained for that purpose.

Groundwater quality results, trend graphs, and statistical test results are included as attachments: Attachment 1 presents the semi-annual monitoring parameters, and Attachment 2 presents the annual monitoring parameters. Surface water quality results, trend graphs, and statistical test results are included as Attachment 3. Hydrographs are included as Attachment 4.

Intervention boundary wells included in the trend analyses are MW-1000R, MW-1000PR, MW-1010P, MW-1002, MW-1002G, MW-1004, MW-1004P, MW-1004S, MW-1005, MW-1005P, and MW-1005S. The in-pit wells included in the trend analyses are MW-1013, MW-1013A, MW-1013B, MW-1013C, MW-1014, MW-1014A, MW-1014B, and MW-1014C. Wells MW-1015A and

[1] Foth, 2020. *2020 Updated Monitoring Plan*, Reclaimed Flambeau Mine, Project I.D.: 17F777.20, Flambeau Mining Company, Ladysmith, Wisconsin. August, 2020.

MW-1015B (also included in the analyses) were constructed in January 2001 approximately 1,000 feet northwest of the backfilled pit and adjacent to the compliance boundary.

Statistical trend test methods are described in Section 2 of this memo, with more detailed results provided in Section 3, and a summary of conclusions of the trend results provided in Section 4.

2. Statistical Methods

Groundwater and surface water trends over time were assessed using the non-parametric Mann-Kendall test. This test indicates general increasing or decreasing trends over the time periods evaluated. Two data sets (utilizing two distinct start dates) were assessed: "short-term" trends encompass the results of 2017 through 2021, i.e., the last five years, and "long-term" trends encompass the results from October 1997, when the post-mining period began, through the end of 2021.

Monitoring and long-term trend analyses began in July 1999 for the annual monitoring parameters. Monitoring and long-term trend analyses began in February 1999 for the in-pit wells (i.e., MW-1013B, MW-1013C, MW-1014A, MW-1014B, and MW-1014C), and in April 2001 for wells MW-1015A and MW-1015B. Trend analyses for wells MW-1013, MW-1013A, and MW-1014 began in October 2005, and for MW-1000R and MW-1004 in October 2010, when groundwater levels recovered sufficiently to collect samples.

The statistical results of the non-parametric Mann-Kendall test are used in conjunction with the time series graphs in Attachments 1, 2, and 3 to evaluate trend conditions within the context of the broader site hydrology. It should be noted that a statistically increasing or decreasing trend as determined through the Mann-Kendall test does not necessarily indicate a substantial increase or decrease in actual parameter concentrations. For example, there are situations where variation in the data is small, allowing slight but consecutive increasing or decreasing concentration changes to be detected as a statistically significant trend. Although these minor trends may occur, they should not be construed as an indication of a broader impact on water quality.

In some cases, the Mann-Kendall trend test results of Attachments 1, 2, and 3 may indicate a statistical trend in the "long-term" data (i.e., results since October 1997), while "short-term" data do not illustrate a trend. In these situations, higher or lower concentration data may have been observed in the past, but more recent concentration data has stabilized. The trend result discussion given below focuses on cases that exhibit trends only in the more recent "short-term" data of 2017 through 2021.

The procedure for the Mann-Kendall test is given in Gilbert (1987)[2] and U.S. Environmental Protection Agency (USEPA) (2009)[3]. The Type I error for each test was set to 0.01 (two-tailed), with the exception of the five-year trend tests for the annual parameters. To counteract the decrease in statistical power due to small sample sizes in those cases, the type I error (two-

[2]Gilbert, R.O., 1987. *Statistical Methods for Environmental Pollution Monitoring*, Van Nostrand Reinhold, New York.

[3]USEPA, 2009. Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities – Unified Guidance. EPA 530-R-09-007. Office of Resource Conservation and Recovery, Program Implementation and Information Division, Washington, D.C.

tailed) was set to 0.05 to increase the statistical power (power of detecting existing trends). All non-detected values were replaced with a common value below the lowest detected value.

In the trend test results of Attachments 1, 2, and 3, a "+" indicates a statistically increasing trend and a "-" indicates a statistically decreasing trend. If neither a "+" or "-" is given, no statistically significant trend is present as measured by the Mann-Kendall test.

3. Trend Results

The majority of trends, increasing and/or decreasing, were exhibited in the groundwater results for the semi-annual parameters. Statistical trend results at each well are summarized below. Historical trend graphs from Attachment 1 (semi-annual parameters), Attachment 2 (annual parameters), Attachment 3 (surface water), and Attachment 4 (hydrographs) aid in interpretation. The results are organized by well nest and location.

As previously noted, the Mann-Kendall test may at times indicate that a statistical trend exists due to slight but consecutive concentration changes (either increasing or decreasing). In certain instances, trend tests (Attachments 1, 2, and 3) indicate either an increasing ("+") or decreasing ("-") result which does not reflect a substantial overall concentration change as illustrated in the time series graphs. The discussion below is therefore limited to trends existing in the recent five-year dataset that show at least a modest change in relative concentration level.

3.1 Semi-Annual Parameters (Attachment 1)

Semi-annual parameters include alkalinity, arsenic, copper, hardness, iron, manganese, sulfate, total dissolved solids (TDS), pH, conductivity, oxidation reduction potential (ORP), and water elevation.

3.1.1 Intervention Boundary Wells

- **MW-1000R/MW-1000PR/MW-1010P (Figures B-1a through B-1d):** These three wells are located near the immediate southwest boundary and hydraulically downgradient of the reclaimed mine pit.

  Changes in Reported Trends from Previous Annual Report:

  - The decreasing trends of copper, manganese, and conductivity noted in the recent five-year dataset of MW-1000R, and conductivity in MW-1000PR, have ceased. These trends are no longer statistically significant.

  Continuing Trends from Previous Annual Report:

  - None to report.

- **MW-1002/MW-1002G (Figures B-2a through B-2d):** This well nest is located approximately 1,800 feet to the northwest and hydraulically side-gradient to the former mine pit.

Changes in Reported Trends from Previous Annual Report:

- None to report.

Continuing Trends from Previous Annual Report:

- Alkalinity and hardness in MW-1002G continue to have statistically increasing trends indicated in the five-year data. Increasing trends in these parameters began in 2014 for alkalinity and 2011 for hardness.

- **MW-1004/MW-1004S/MW-1004P (Figures B-3a through B-3d):** This well nest is located near the immediate northwest boundary and is hydraulically downgradient of the former mine pit.

  Changes in Reported Trends from Previous Annual Report:

  - The statistically increasing trend of sulfate in the five-year dataset for MW-1004S has ceased. No statistically significant trends in the five-year datasets are present for any of the semi-annual constituents for MW-1004, MW-1004S or MW-1004P.

  Continuing Trends from Previous Annual Report:

  - None to report.

- **MW-1005/MW-1005S/MW-1005P (Figures B-4a through B-4d):** This well nest is located approximately 1,000 feet to the southeast and hydraulically upgradient of the former mine pit.

  Changes in Reported Trends from Previous Annual Report:

  - The statistically decreasing trends for the five-year datasets in MW-1005S for hardness, iron, TDS, and conductivity have ceased. These were slower trends, reflecting only smaller changes in actual concentration, but are no longer statistically significant.

  - Statistically increasing trends in the five-year datasets for sulfate in MW-1005S and for iron in MW-1005 are observed, but similarly are slower trends reflecting only smaller changes in actual concentration.

  Continuing Trends from Previous Annual Report:

  - Statistically decreasing trends are observed in MW-1005S for alkalinity and manganese. However, again, these are slower trends and reflect smaller changes in actual concentration.

- **MW-1015A/MW-1015B (Figures B-5a through B-5d):** This well nest is located approximately 1,000 feet to the west and hydraulically downgradient of the former mine pit.

Changes in Reported Trends from Previous Annual Report:

- Statistically increasing trends in the five-year datasets are observed in MW-1015A for alkalinity and hardness. However, these are slower trends, reflecting only smaller changes in actual concentration.

Continuing Trends from Previous Annual Report:

- None to report.

3.1.2 In-Pit Wells

- **MW-1013/MW-1013A/MW-1013B/MW-1013C (Figures B-6a through B-6d):** This well nest is located within the former mine pit on the southwest side.

  Changes in Reported Trends from Previous Annual Report:

  - The statistically increasing trends previously reported in the five-year data for arsenic in MW-1013C and sulfate in MW-1013B have ceased. An increasing trend of alkalinity is now reported for MW-1013C but reflects only a relatively smaller change in actual concentration.
  - The statistically decreasing trends previously reported in the five-year data for conductivity in MW-1013B and TDS in MW-1013C have ceased.
  - A statistically decreasing trend is reported in the five-year data for sulfate for the already low concentrations in MW-1013.

  Continuing Trends from Previous Annual Report:

  - Iron in MW-1013 has historically exhibited a large degree of variation. Between 2006 and 2009 seasonal effects were apparent, with iron being highest during the first and fourth quarter sampling events. While the seasonal effect seemed to diminish following 2009, iron concentrations in this well were elevated in 2013, and again in 2018, and to a lesser degree in 2019. While no statistical trend is currently reported, the seasonal effect was once again stronger during 2020 and 2021, with the fourth quarter concentrations elevated from the second quarter concentrations.
  - A statistically decreasing trend in the five-year data for conductivity in MW-1013C continues.

- **MW-1014/MW-1014A/MW-1014B/MW-1014C (Figures B-7a through B-7d):** This well nest is located within the former mine pit on the northeast side.

  Changes in Reported Trends from Previous Annual Report:

  - A statistically increasing trend in the five-year dataset for sulfate in MW-1014 is observed, but is a slower trend reflecting only smaller changes in actual concentration.

Continuing Trends from Previous Annual Report:

- Arsenic at MW-1014C shows a smaller increasing trend since 2003, however, concentrations remain below the maximum observed in this well during July 2000.
- Decreasing trends of copper and manganese are observed in MW-1014B, with concentrations being particularly lower during 2019. Copper, hardness, manganese, sulfate, TDS, and conductivity in MW-1014B all illustrated significantly reduced concentrations during May and June of 2019, with concentrations of hardness, manganese, sulfate, TDS, and conductivity, for the most part, subsequently rebounding to previously observed levels.

3.2 Annual Parameters (Attachment 2)

As previously noted, per the 2020 Updated Monitoring Plan, analytes collected on an annual basis are now limited to calcium, chloride, lead, magnesium, potassium, and zinc. Similar to previous trend analyses, the annual groundwater parameters illustrate few statistically significant trends. Of those trends that are noted, most reflect relatively small consecutive concentration changes. The following summary is limited to those trends which show at least a modest change in recent concentrations.

Historical trend charts for the annual parameters are illustrated on Figures B-8a through B-14b of Attachment 2.

Changes in Reported Trends from Previous Annual Report:

- The only statistical trend reported in the five-year dataset is for a decrease in chloride at MW-1015B. Chloride concentrations of been sequentially decreasing in this well since the high observed during 2017.

Continuing Trends from Previous Annual Report:

- Calcium, chloride and magnesium had small concentration increases during 2011 in MW-1005, which remained consistent through 2015. Concentrations of these parameters rose again from 2016 through 2018, potentially attributed to application of road salt on State Highway 27 along with rising water levels and evaporative concentration effects. However, concentrations have since remained consistent, with no statistical trend currently reported in the five-year datasets.

3.3 Surface Water (Attachment 3)

Flambeau voluntarily continued surface water sampling of the Flambeau River in 2021. Sampling parameters currently include copper, hardness, iron, manganese, zinc, total suspended solids (TSS), pH, conductivity, dissolved oxygen (DO) and ORP. Concentrations were generally stable with no statistical trends in the five-year data.

The ORP readings collected at both SW-1 (upstream of the mine footprint) and SW-2 (center of the mine footprint) which observed an increase in 2020 have returned during 2021 to the lower historically observed concentrations.

3.4 Hydrographs (Attachment 4)

As observed in the hydrographs (Figures B-16a through B-16j), water levels have stabilized in all wells that showed significant drawdown during the production period from 1993 to 1997.

Groundwater elevations increased steadily from 1999 through 2002 for the in-pit wells MW-1013A, MW-1013B, MW-1013C, MW-1014, MW-1014A, MW-1014B, and MW-1014C, and stabilized after 2003. At MW-1013, groundwater elevation rose through 2004 and stabilized during 2005.

Generally, higher groundwater elevations are noted for all wells during 2010 and 2011, reflecting the increased precipitation observed in those years. Elevations dropped in 2012 and rebounded during summer 2013. An increase in water levels was observed from 2014 through 2017 for both the intervention boundary and the in-pit wells. Decreased elevations were observed in 2018, followed by a rebound in 2019 but tapering elevations during 2020 through 2021.

4. Conclusions

A detailed analysis of statistical trends occurring in the groundwater and surface water data was performed. Statistical tests evaluated the long-term trends occurring during the post-mining period (October 1997 to the present) and the short-term trends for the most recent five years. Historical trend graphs of the data are also presented.

A detailed discussion of the trend results for each well nest is provided in Section 3 above. In general, the number of more notable concentration trends as observed in previous Annual Reports has reduced for both the intervention boundary and in-pit wells, indicating a broader stabilization in the groundwater concentrations. A number of the trends noted through the Mann-Kendall nonparametric test are due to slight but consecutive concentration changes (either increasing or decreasing), and not reflective of a substantial overall concentration change. The majority of the observed trends continue to occur in the semi-annual groundwater indicator monitoring parameters.

For the intervention boundary wells, the decreasing trends for MW-1000R (near the immediate southwest boundary and hydraulically downgradient of the reclaimed mine pit) which began approximately in 2013 have stabilized. These decreases were observed for alkalinity, copper, hardness, TDS, conductivity and ORP. No statistical trends are present in the MW-1000R recent five-year datasets.

Increasing trends continue for alkalinity (beginning in 2014) and hardness (beginning in 2011) in MW-1002G (northwest and hydraulically side-gradient to the former mine pit).

In MW-1005 (hydraulically upgradient of the former mine pit), calcium, chloride, and magnesium had increased concentrations from 2016 through 2018, potentially due to application of road salt on State Highway 27 along with rising water levels and evaporative concentration effects. However, concentrations have since remained consistent, without any further substantial increase.

For the MW-1013 in-pit well nest, iron at MW-1013, which previously had an increasing trend and historically exhibited a large degree of variation, again exhibited stronger seasonal variation during 2020 and 2021 with increased concentrations observed during the fall event.

For the in-pit well nest at MW-1014, copper in in MW-1014B remains at lowered concentrations after a substantial decrease in 2019. Copper and manganese continue decreasing trends in this well.

No statistical trends were noted in the five-year datasets for surface water.

Attachments

- Attachment 1: Groundwater – Semi-Annual Parameters
- Attachment 2: Groundwater - Annual Parameters
- Attachment 3: Surface Water
- Attachment 4: Hydrographs and Groundwater Elevation Data

Attachment 1
Groundwater – Semi-Annual Parameters

Trend Analysis

Trend Graphs

2021 Data

Trend Analysis Results - Groundwater (Semi-Annual Parameters)
Year Ending 2021

	Alkalinity	Arsenic	Copper	Hardness	Iron	Manganese	Sulfate	TDS	Field pH (su)	Cond (umhos /cm)	Redox (mV)	Grd Water El (Feet)
MW-1000PR												
Trend Results for Most Recent 5 Years												
Sample Size	16	16	16	16	16	16	16	16	16	16	16	16
Mann-Kendall S	-10	30	20	-41	18	-28	-24	-32	11	-42	-54	-20
p-Level	0.690	0.194	0.398	0.071	0.450	0.228	0.306	0.166	0.658	0.064	0.016	0.398
Trend												
Trend Results for All Data Since Oct. 1997												
Sample Size	93	74	93	93	93	93	93	93	93	93	77	93
Mann-Kendall S	1747	1312	-1088	-3062	-257	-2686	-3220	-2981	1402	-3160	-1170	1394
p-Level	0.000	0.000	0.000	0.000	0.395	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Trend	+	+	-	-		-	-	-	+	-	-	+
MW-1000R												
Trend Results for Most Recent 5 Years												
Sample Size	16	16	16	16	16	16	16	16	16	16	16	16
Mann-Kendall S	-22	9	-54	-12	0	-52	-18	18	26	-8	-62	-19
p-Level	0.35	0.723	0.016	0.626	1	0.02	0.45	0.45	0.266	0.756	0.004	0.424
Trend											-	
Trend Results for All Data Since Oct. 1997												
Sample Size	41	41	41	41	41	41	41	41	41	41	40	92
Mann-Kendall S	-433	10	-390	-384	-187	-353	-146	-353	62	-402	-308	1509
p-Level	1.2104E-06	0.892814	1.25E-05	1.67875E-05	0.00717	7.65167E-05	0.103246	7.64E-05	0.493	6.67E-06	0	0.000
Trend	-		-	-	-	-		-		-	-	+
MW-1010P												
Trend Results for Most Recent 5 Years												
Sample Size	16	16	16	16	16	16	16	16	16	16	16	16
Mann-Kendall S	-16	-18	-35	53	0	0	48	24	-10	2	-48	-18
p-Level	0.506	0.450	0.128	0.018	1.000	1.000	0.032	0.306	0.690	0.964	0.032	0.450
Trend												
Trend Results for All Data Since Oct. 1997												
Sample Size	93	74	93	93	93	93	93	93	93	93	78	93
Mann-Kendall S	1161	910	-947	3111	-1523	-832	3327	1401	737	2620	550	1072
p-Level	0.000	0.000	0.000	0.000	0.000	0.006	0.000	0.000	0.015	0.000	0.018	0.000
Trend	+	+	-	+	-	-	+	+		+		+
MW-1002												
Trend Results for Most Recent 5 Years												
Sample Size	16	16	16	16	16	16	16	16	16	16	16	16
Mann-Kendall S	-18	0	-6	4	3	-3	-19	11	28	17	-15	-21
p-Level	0.450	1.000	0.824	0.894	0.929	0.929	0.424	0.658	0.228	0.478	0.535	0.374
Trend												
Trend Results for All Data Since Oct. 1997												
Sample Size	93	71	93	93	93	93	93	93	93	93	28	93
Mann-Kendall S	1450	-42	54	1503	-563	-255	-1766	190	-116	1217	-111	1008
p-Level	0.000	0.609	0.813	0.000	0.018	0.199	0.000	0.530	0.702	0.000	0.029	0.001
Trend	+			+			-			+		+
MW-1002G												
Trend Results for Most Recent 5 Years												
Sample Size	16	16	16	16	16	16	16	16	16	16	16	16
Mann-Kendall S	84	0	2	66	-13	-15	-10	-4	39	10	-29	-22
p-Level	0.000	1.000	0.964	0.002	0.595	0.535	0.690	0.894	0.087	0.690	0.211	0.350
Trend	+			+								
Trend Results for All Data Since Oct. 1997												
Sample Size	93	71	93	93	93	93	93	93	93	93	28	93
Mann-Kendall S	1846	-109	337	2813	-364	96	-580	1445	-372	2341	-105	961
p-Level	0.000	0.061	0.046	0.000	0.099	0.622	0.054	0.000	0.218	0.000	0.040	0.001
Trend	+			+				+		+		+

Trend Analysis Results - Groundwater (Semi-Annual Parameters)
Year Ending 2021

	Alkalinity	Arsenic	Copper	Hardness	Iron	Manganese	Sulfate	TDS	Field pH (su)	Cond (umhos /cm)	Redox (mV)	Grd Water El (Feet)
MW-1004												
Trend Results for Most Recent 5 Years												
Sample Size	16	16	16	16	16	16	16	16	16	16	16	16
Mann-Kendall S	4	-1	0	0	-4	-12	-22	13	46	2	-22	-16
p-Level	0.894	0.982	1	1	0.894	0.626	0.35	0.595	0.042	0.964	0.35	0.506
Trend												
Trend Results for All Data Since Oct. 1997												
Sample Size	40	40	40	40	40	40	40	40	40	40	39	80
Mann-Kendall S	-183	2	240	-123	-22	8	-102	127	112	-117	-308	798
p-Level	0.033	0.99	0.004	0.156	0.808	0.936	0.242	0.143	0.198	0.178	0	0.001
Trend			+								-	+
MW-1004S												
Trend Results for Most Recent 5 Years												
Sample Size	16	16	16	16	16	16	16	16	16	16	16	16
Mann-Kendall S	26	0	-35	42	0	-20	34	-6	31	21	-36	-16
p-Level	0.266	1.000	0.128	0.064	1.000	0.398	0.140	0.824	0.180	0.374	0.116	0.506
Trend												
Trend Results for All Data Since Oct. 1997												
Sample Size	93	73	93	93	93	93	93	93	93	93	78	93
Mann-Kendall S	209	-39	984	635	-744	-125	1915	-554	387	73	-1024	1529
p-Level	0.490	0.598	0.001	0.035	0.000	0.611	0.000	0.065	0.200	0.811	0.000	0.000
Trend			+		-		+				-	+
MW-1004P												
Trend Results for Most Recent 5 Years												
Sample Size	16	16	16	16	16	16	16	16	16	16	16	16
Mann-Kendall S	-2	22	-5	12	16	-7	-41	-22	-20	-30	-8	-9
p-Level	0.964	0.350	0.859	0.626	0.506	0.790	0.071	0.350	0.398	0.194	0.756	0.723
Trend												
Trend Results for All Data Since Oct. 1997												
Sample Size	94	74	94	94	94	94	94	94	94	94	74	94
Mann-Kendall S	1056	776	-859	1546	2378	2151	366	-80	445	1003	-850	1757
p-Level	0.000	0.000	0.000	0.000	0.000	0.000	0.190	0.796	0.147	0.001	0.000	0.000
Trend	+	+	-	+	+	+				+	-	+
MW-1005												
Trend Results for Most Recent 5 Years												
Sample Size	16	16	16	16	16	16	16	16	16	16	16	16
Mann-Kendall S	20	-9	3	-2	-57	-38	35	-12	-2	-4	-16	-34
p-Level	0.398	0.723	0.929	0.964	0.010	0.096	0.128	0.626	0.964	0.894	0.506	0.140
Trend					-							
Trend Results for All Data Since Oct. 1997												
Sample Size	93	71	93	93	93	93	93	93	93	93	28	92
Mann-Kendall S	-832	-391	804	1945	-176	906	1483	1916	-686	2005	-47	1510
p-Level	0.006	0.051	0.001	0.000	0.560	0.003	0.000	0.000	0.023	0.000	0.367	0.000
Trend	-		+	+		+	+	+		+		+
MW-1005S												
Trend Results for Most Recent 5 Years												
Sample Size	16	16	16	16	16	16	16	16	16	16	16	16
Mann-Kendall S	-75	3	0	-50	-55	-69	74	-32	-12	-46	17	-26
p-Level	0.000	0.929	1.000	0.026	0.014	0.002	0.000	0.166	0.626	0.042	0.478	0.266
Trend	-					-	+					
Trend Results for All Data Since Oct. 1997												
Sample Size	93	71	93	93	93	93	93	93	93	93	28	93
Mann-Kendall S	-211	-80	-25	103	-619	-215	-150	-872	297	13	37	1539
p-Level	0.471	0.693	0.794	0.728	0.039	0.470	0.586	0.004	0.325	0.968	0.480	0.000
Trend								-				+

Trend Analysis Results - Groundwater (Semi-Annual Parameters)
Year Ending 2021

	Alkalinity	Arsenic	Copper	Hardness	Iron	Manganese	Sulfate	TDS	Field pH (su)	Cond (umhos /cm)	Redox (mV)	Grd Water El (Feet)
MW-1005P												
Trend Results for Most Recent 5 Years												
Sample Size	16	16	16	16	16	16	16	16	16	16	16	16
Mann-Kendall S	-33	44	-15	-20	20	7	-1	8	31	-29	-16	-22
p-Level	0.153	0.052	0.535	0.398	0.398	0.790	0.982	0.756	0.180	0.211	0.506	0.350
Trend												
Trend Results for All Data Since Oct. 1997												
Sample Size	93	71	93	93	93	93	93	93	93	93	80	93
Mann-Kendall S	335	408	-87	963	2258	1176	-442	-107	206	834	152	1264
p-Level	0.253	0.007	0.623	0.001	0.000	0.000	0.018	0.724	0.496	0.006	0.530	0.000
Trend		+		+	+	+				+		+
MW-1015A												
Trend Results for Most Recent 5 Years												
Sample Size	16	16	16	16	16	16	16	16	16	16	16	16
Mann-Kendall S	62	0	-15	83	0	45	41	24	18	-15	-54	-26
p-Level	0.004	1.000	0.535	0.000	1.000	0.047	0.071	0.306	0.450	0.535	0.016	0.266
Trend	+			+								
Trend Results for All Data Since Oct. 1997												
Sample Size	87	80	87	87	88	88	87	87	88	88	64	88
Mann-Kendall S	1385	-155	177	1434	-73	-1045	-257	159	393	1653	-506	712
p-Level	0.000	0.051	0.263	0.000	0.651	0.000	0.347	0.561	0.157	0.000	0.003	0.010
Trend	+			+		-				+	-	
MW-1015B												
Trend Results for Most Recent 5 Years												
Sample Size	16	16	16	16	16	16	16	16	16	16	16	16
Mann-Kendall S	-17	0	-5	23	-29	-6	-8	12	-6	-24	-17	-26
p-Level	0.478	1.000	0.859	0.328	0.211	0.824	0.756	0.626	0.824	0.306	0.478	0.266
Trend												
Trend Results for All Data Since Oct. 1997												
Sample Size	87	80	87	87	88	88	87	87	88	88	65	88
Mann-Kendall S	-335	64	97	1574	-216	-1335	398	174	467	1455	1034	753
p-Level	0.166	0.614	0.264	0.000	0.438	0.000	0.019	0.525	0.093	0.000	0.000	0.007
Trend				+		-				+	+	+
MW-1013												
Trend Results for Most Recent 5 Years												
Sample Size	16	16	16	16	16	16	16	16	16	16	16	16
Mann-Kendall S	9	10	-31	-19	28	-23	-68	-19	14	-30	-9	-2
p-Level	0.723	0.690	0.180	0.424	0.228	0.328	0.002	0.424	0.564	0.194	0.723	0.964
Trend							-					
Trend Results for All Data Since Oct. 1997												
Sample Size	61	61	61	61	61	61	61	61	61	61	61	88
Mann-Kendall S	327	-18	216	-486	193	802	-1482	-209	-26	-684	-543	2644
p-Level	0.042	0.912	0.174	0.002	0.232	0.000	0.000	0.195	0.876	0.000	0.001	0.000
Trend				-		+	-			-	-	+
MW-1013A												
Trend Results for Most Recent 5 Years												
Sample Size	16	16	16	16	16	16	16	16	16	16	16	16
Mann-Kendall S	34	6	-19	34	-5	39	30	25	19	-10	-14	-8
p-Level	0.140	0.824	0.424	0.140	0.859	0.087	0.194	0.286	0.424	0.690	0.564	0.756
Trend												
Trend Results for All Data Since Oct. 1997												
Sample Size	61	61	61	61	61	61	61	61	61	61	60	88
Mann-Kendall S	591	-12	-58	43	161	808	-52	395	-1	-155	-513	2126
p-Level	0.000	0.929	0.670	0.793	0.302	0.000	0.750	0.014	1.000	0.338	0.001	0.000
Trend	+					+					-	+

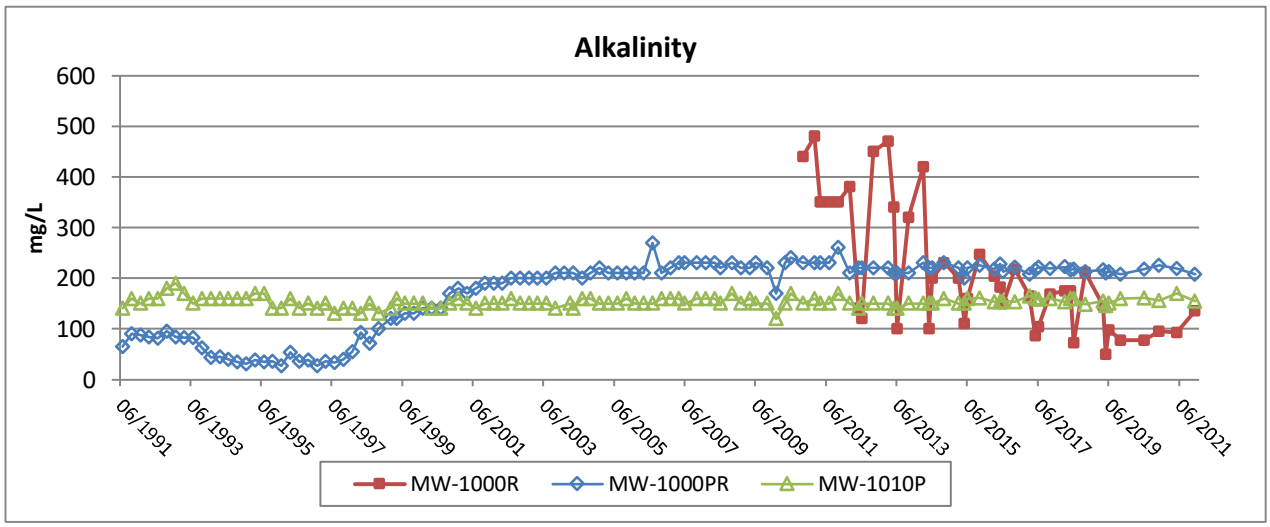
Trend Analysis Results - Groundwater (Semi-Annual Parameters)
Year Ending 2021

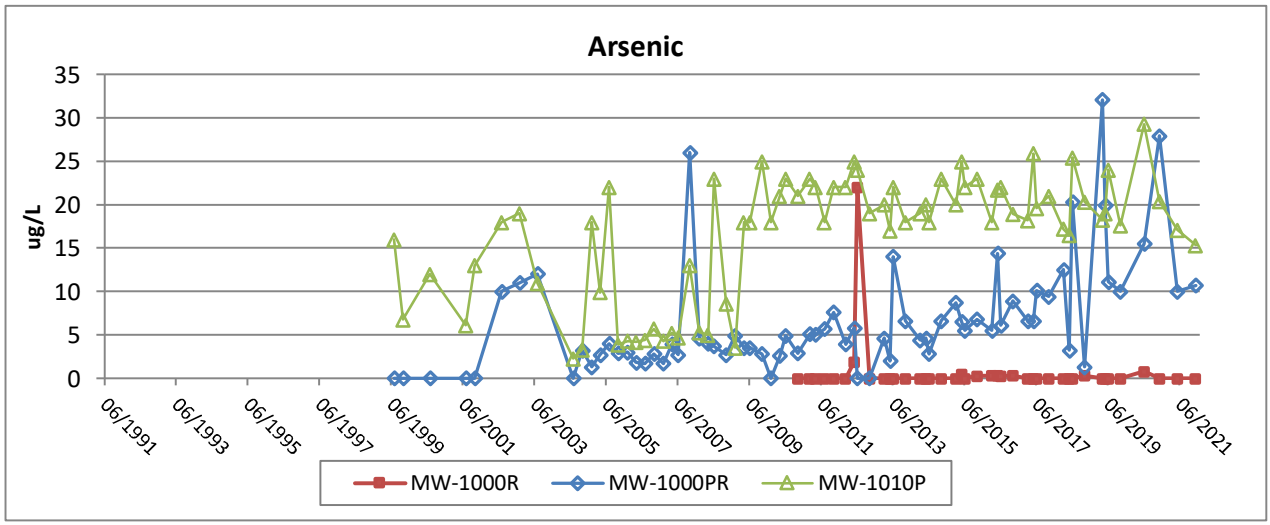
	Alkalinity	Arsenic	Copper	Hardness	Iron	Manganese	Sulfate	TDS	Field pH (su)	Cond (umhos /cm)	Redox (mV)	Grd Water El (Feet)
MW-1013B												
Trend Results for Most Recent 5 Years												
Sample Size	16	16	16	16	16	16	16	16	16	16	16	16
Mann-Kendall S	11	6	-28	16	6	-28	16	-36	-13	-28	8	-6
p-Level	0.658	0.824	0.228	0.506	0.824	0.228	0.506	0.116	0.595	0.228	0.756	0.824
Trend												
Trend Results for All Data Since Oct. 1997												
Sample Size	88	76	88	88	88	88	88	88	88	88	80	88
Mann-Kendall S	-508	-45	1832	-611	-603	-796	1265	-1196	-342	-1272	-540	2156
p-Level	0.067	0.834	0.000	0.023	0.018	0.004	0.000	0.000	0.218	0.000	0.025	0.000
Trend			+			-	+	-		-		+
MW-1013C												
Trend Results for Most Recent 5 Years												
Sample Size	16	16	16	16	16	16	16	16	16	16	16	16
Mann-Kendall S	57	52	3	19	51	-34	-11	-52	10	-72	-54	-14
p-Level	0.010	0.020	0.929	0.424	0.023	0.140	0.658	0.020	0.690	0.000	0.016	0.564
Trend	+									-		
Trend Results for All Data Since Oct. 1997												
Sample Size	88	76	88	88	88	88	88	88	88	87	80	88
Mann-Kendall S	250	1538	139	-1592	3264	313	-643	-2112	325	-1836	-124	2146
p-Level	0.368	0.000	0.519	0.000	0.000	0.258	0.017	0.000	0.242	0.000	0.609	0.000
Trend		+		-	+			-		-		+
MW-1014												
Trend Results for Most Recent 5 Years												
Sample Size	16	16	16	16	16	16	16	16	16	16	16	16
Mann-Kendall S	26	22	-42	49	15	14	59	20	8	9	-40	-6
p-Level	0.266	0.350	0.064	0.029	0.535	0.564	0.007	0.398	0.756	0.723	0.078	0.824
Trend							+					
Trend Results for All Data Since Oct. 1997												
Sample Size	61	61	61	61	61	61	61	61	61	61	61	85
Mann-Kendall S	209	34	-305	232	34	631	-462	162	-130	-251	-805	2104
p-Level	0.189	0.759	0.058	0.149	0.738	0.000	0.004	0.315	0.421	0.120	0.000	0.000
Trend						+	-				-	+
MW-1014A												
Trend Results for Most Recent 5 Years												
Sample Size	16	16	16	16	16	16	16	16	16	16	16	16
Mann-Kendall S	26	25	30	53	-27	24	-2	15	-16	-31	-30	-12
p-Level	0.266	0.286	0.194	0.018	0.247	0.306	0.964	0.535	0.506	0.180	0.194	0.626
Trend												
Trend Results for All Data Since Oct. 1997												
Sample Size	83	73	83	83	83	83	83	83	83	83	80	88
Mann-Kendall S	933	300	1246	76	-1157	-1802	150	-492	-453	-1206	-632	2334
p-Level	0.000	0.128	0.000	0.756	0.000	0.000	0.556	0.047	0.075	0.000	0.009	0.000
Trend	+		+		-	-				-	-	+
MW-1014B												
Trend Results for Most Recent 5 Years												
Sample Size	16	16	16	16	16	16	16	16	16	16	16	16
Mann-Kendall S	-24	-17	-80	-21	1	-64	-30	-33	8	-29	-30	-2
p-Level	0.306	0.478	0.000	0.374	0.982	0.004	0.194	0.153	0.756	0.211	0.194	0.964
Trend			-			-						
Trend Results for All Data Since Oct. 1997												
Sample Size	88	76	88	88	88	88	88	88	89	89	80	89
Mann-Kendall S	-912	-128	-1516	-1862	-28	-3071	-989	-2000	509	-2086	-1743	2202
p-Level	0.001	0.559	0.000	0.000	0.870	0.000	0.000	0.000	0.071	0.000	0.000	0.000
Trend	-		-	-		-	-	-		-	-	+

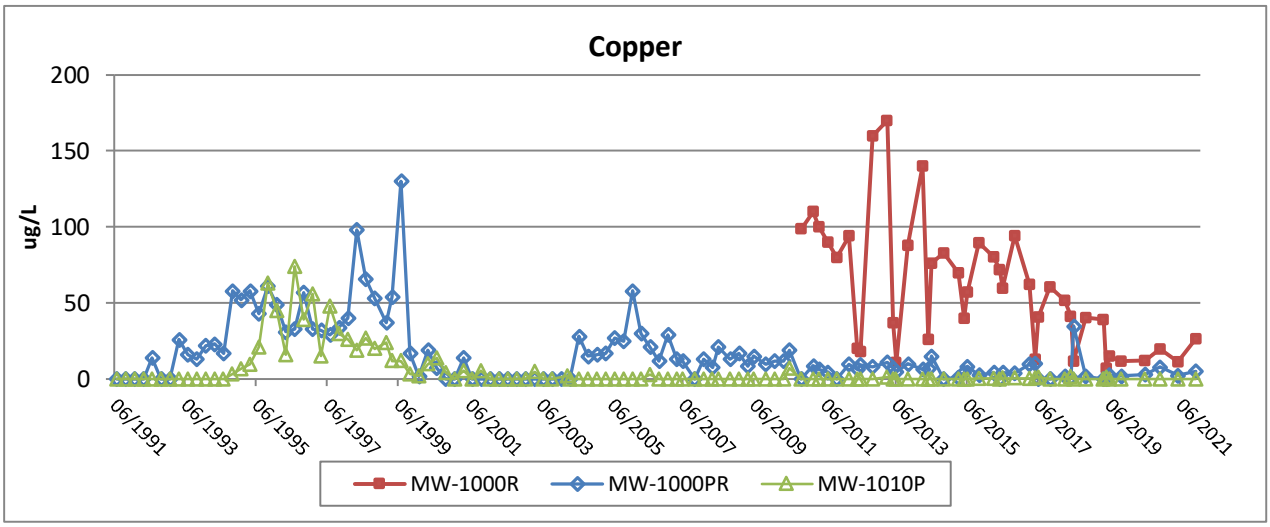
Trend Analysis Results - Groundwater (Semi-Annual Parameters)
Year Ending 2021

	Alkalinity	Arsenic	Copper	Hardness	Iron	Manganese	Sulfate	TDS	Field pH (su)	Cond (umhos /cm)	Redox (mV)	Grd Water El (Feet)
MW-1014C												
Trend Results for Most Recent 5 Years												
Sample Size	16	16	16	16	16	16	16	16	16	16	16	16
Mann-Kendall S	-31	73	0	48	35	-19	33	22	-3	-14	-34	-8
p-Level	0.180	0.000	1.000	0.032	0.128	0.424	0.153	0.350	0.929	0.564	0.140	0.756
Trend		+										
Trend Results for All Data Since Oct. 1997												
Sample Size	88	76	88	88	88	88	88	88	88	88	80	88
Mann-Kendall S	-2518	1829	116	-2146	-2843	-2631	-2174	-2138	888	-2817	18	2057
p-Level	0.000	0.000	0.537	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.944	0.000
Trend	-	+		-	-	-	-	-	+	-		+

Notes: Overall increasing trend denoted by "+".
Overall decreasing trend denoted by "-"
All trend tests performed at a Type I (two-tailed) error rate of 0.01.







Note: Fourth quarter 2010 was the first time MW-1000R had sufficient water recovery for sampling.

Foth

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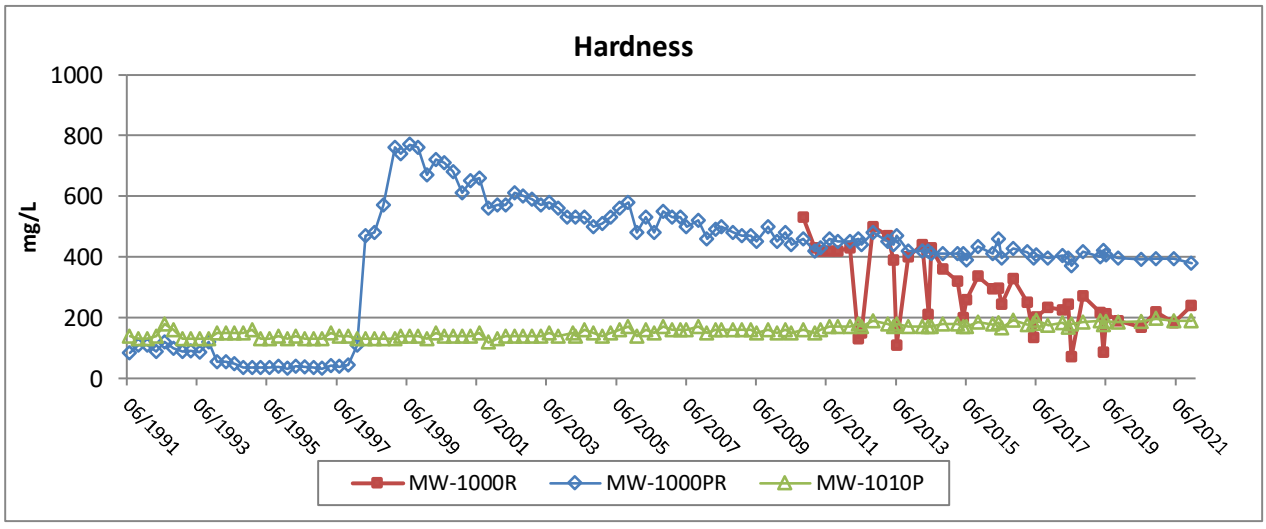
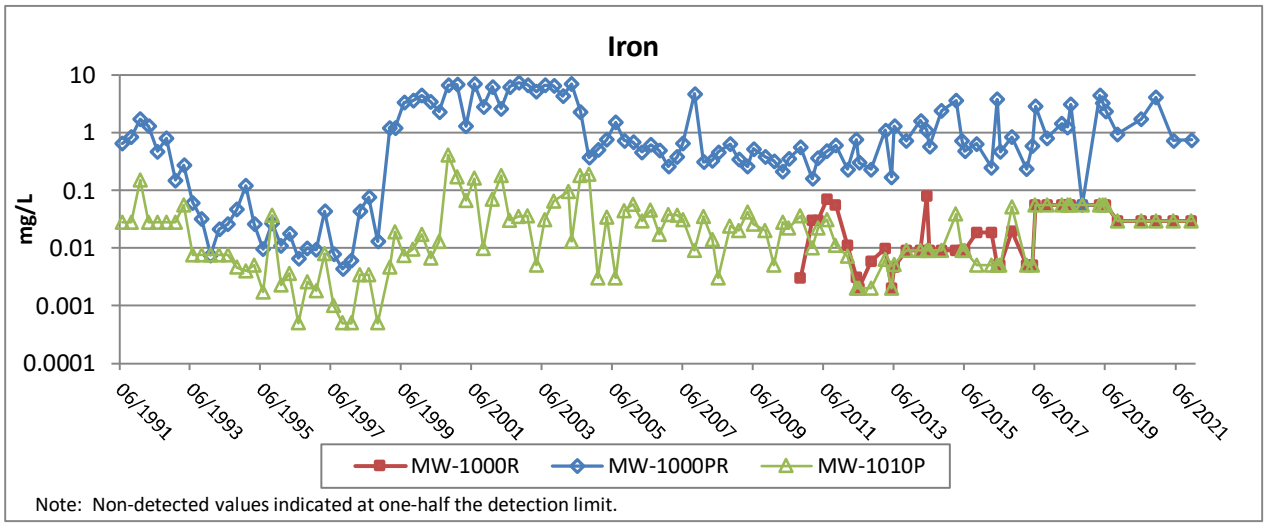
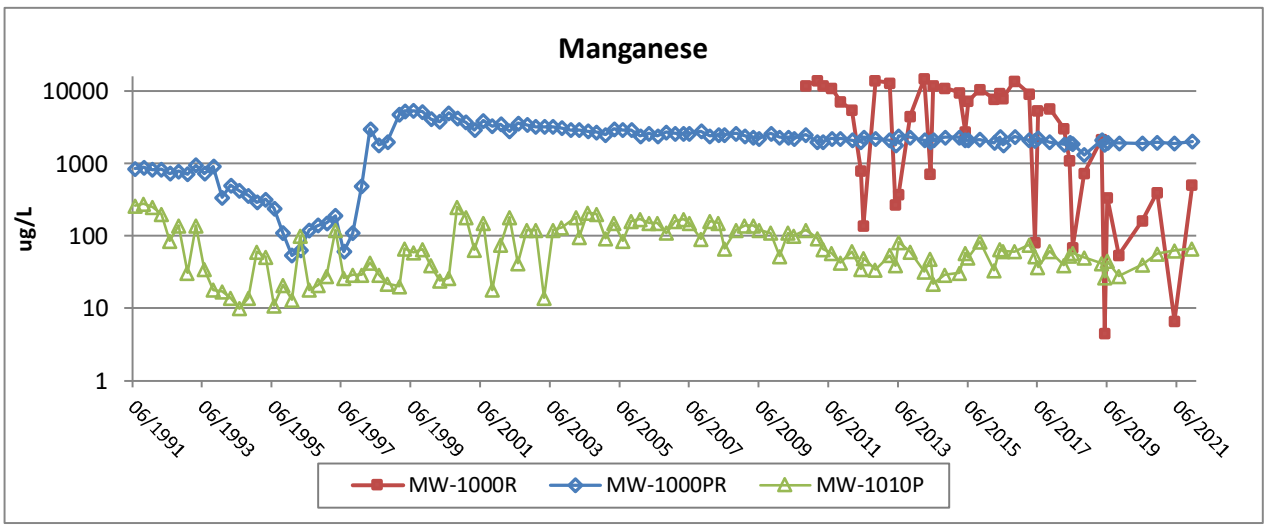
Figure B-1a
Groundwater Trend Graphs - Semi-Annual Results
MW-1000R/MW-1000PR/MW-1010P

Scale: NA	Date: January 2022
Prepared By: SGL	Checked By: SVF	Project: 17F777.22





Note: Non-detected values indicated at one-half the detection limit.



Note: Iron trend graphs are displayed on a logarithmic scale so the trend patterns of MW-1000R, MW-1000PR and MW-1010P are visible at different concentration scales.

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Figure B-1b
Groundwater Trend Graphs - Semi-Annual Results
MW-1000R/MW-1000PR/MW-1010P

Scale: NA	Date: January 2022	
Prepared By: SGL	Checked By: SVF	Project: 17F777.22

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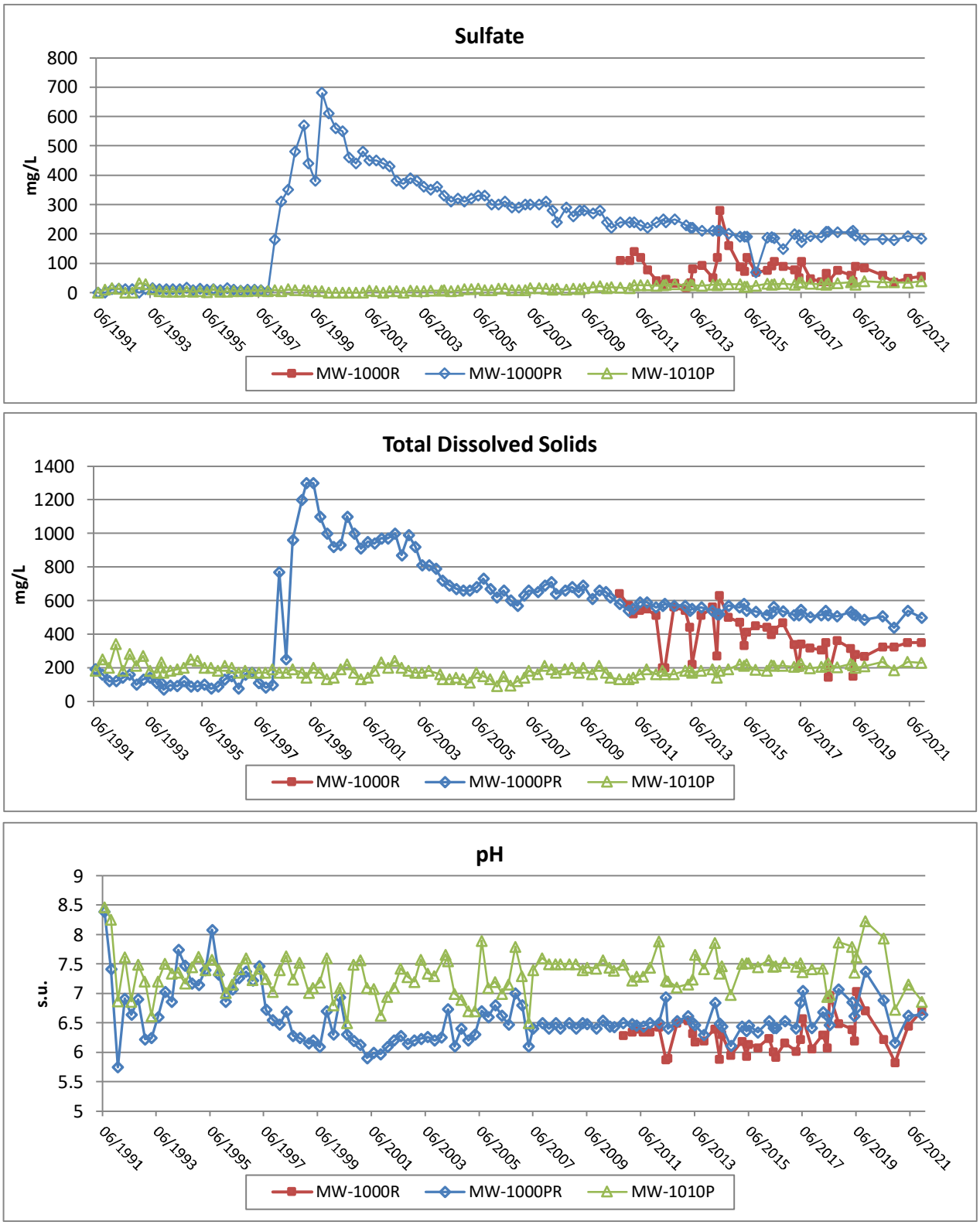

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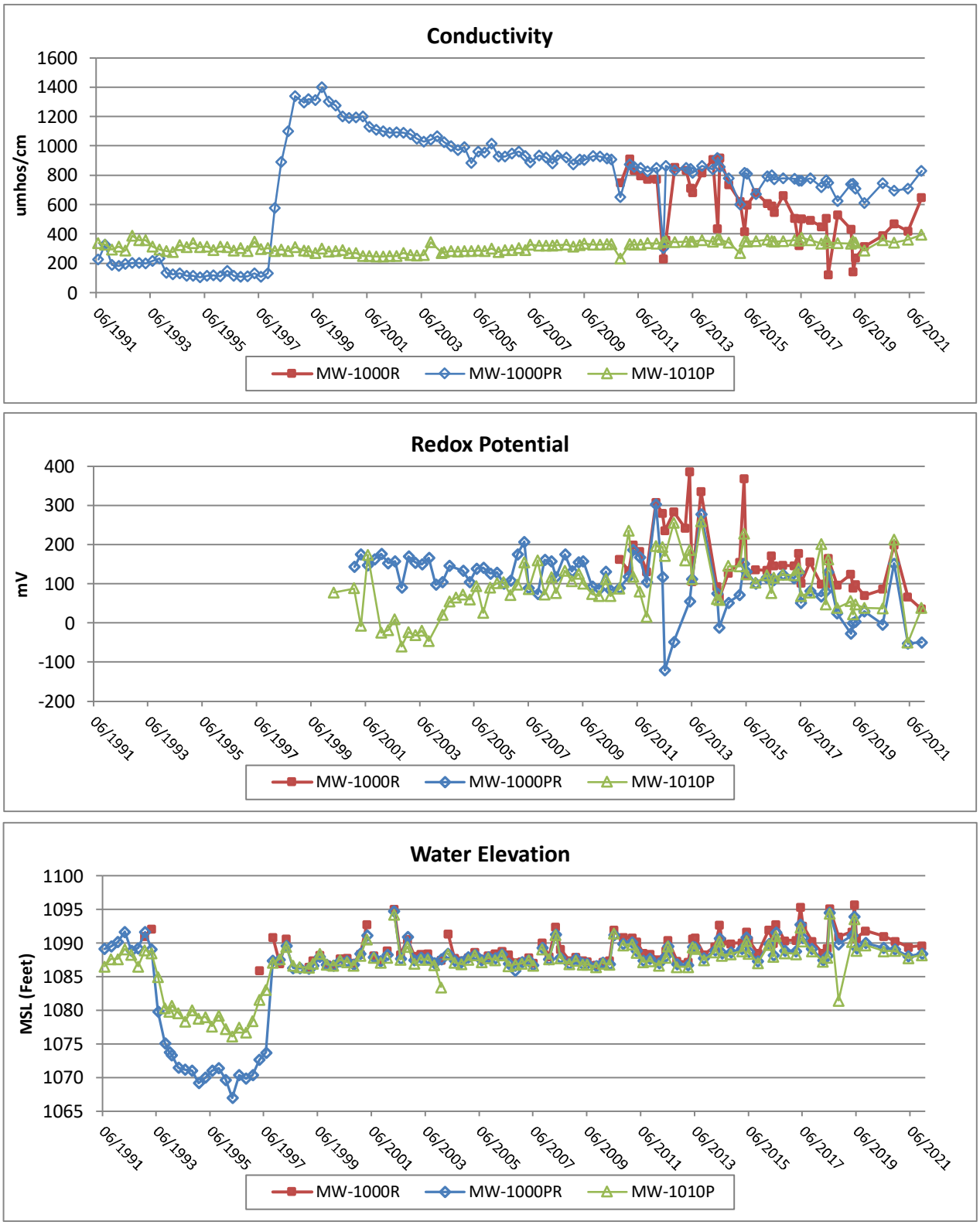
FLAMBEAU MINING COMPANY

Figure B-1c
Groundwater Trend Graphs - Semi-Annual Results
MW-1000R/MW-1000PR/MW-1010P

Scale: NA	Date: January 2022
Prepared By: SGL	Checked By: SVF	Project: 17F777.22



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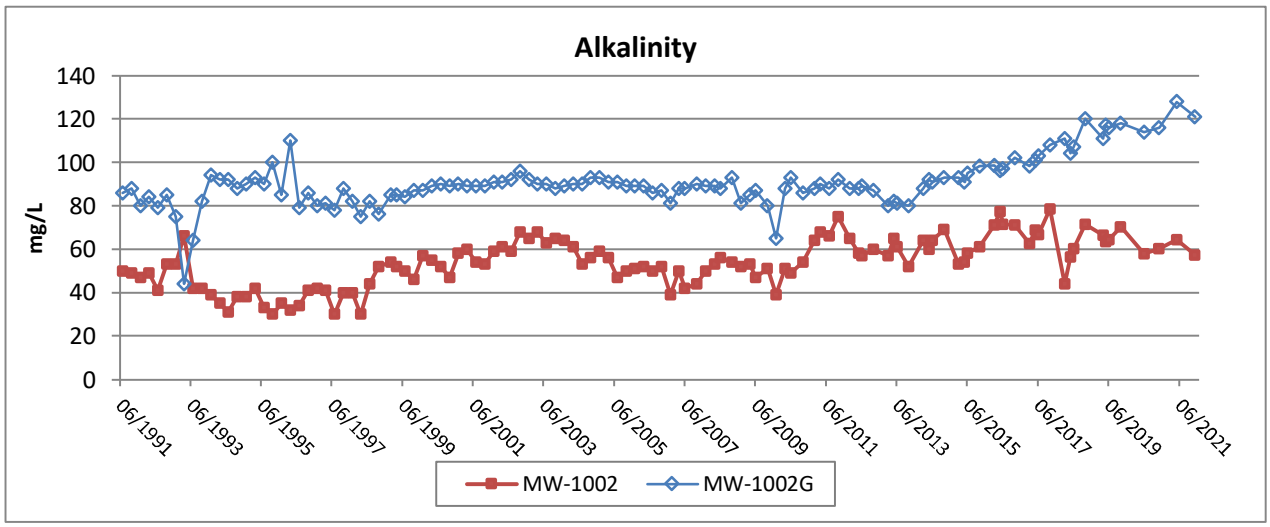
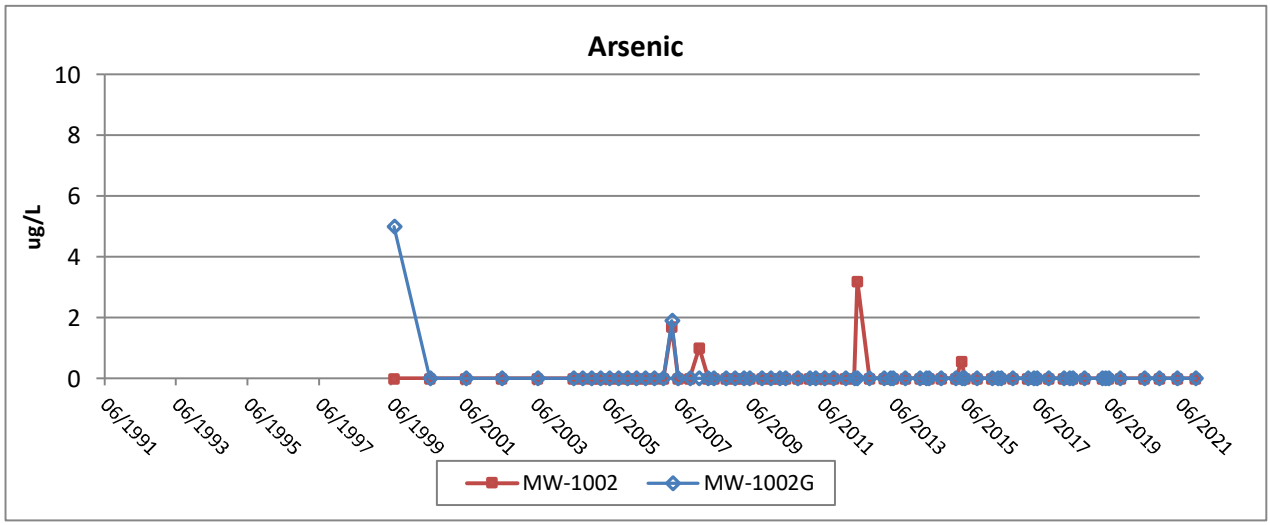
FLAMBEAU MINING COMPANY

Figure B-1d
Groundwater Trend Graphs - Semi-Annual Results
MW-1000R/MW-1000PR/MW-1010P

Scale: NA	Date: January 2022	
Prepared By: SGL	Checked By: SVF	Project: 17F777.22





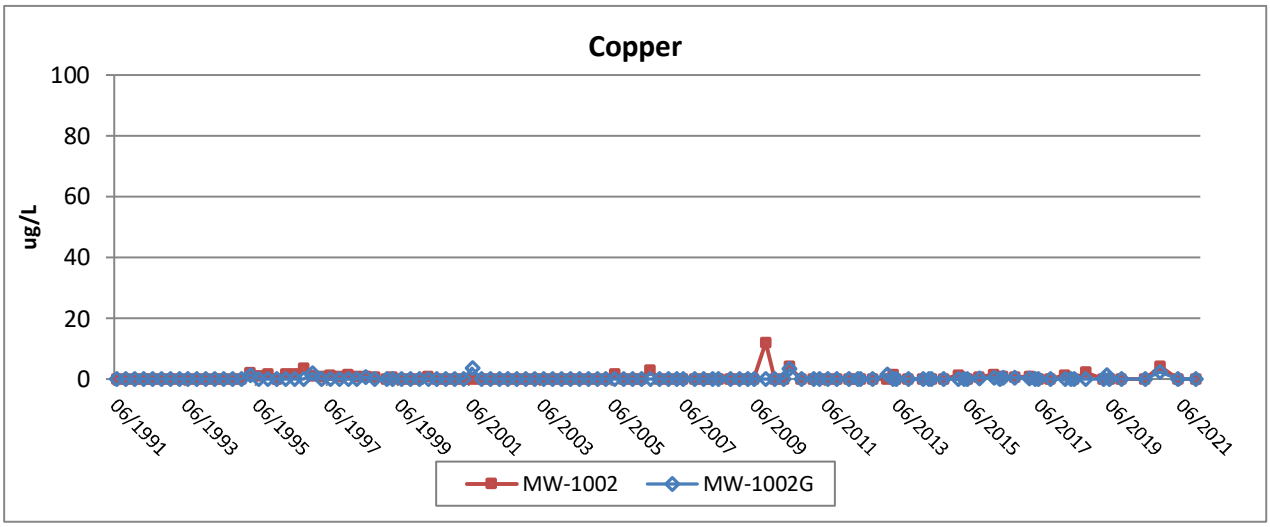


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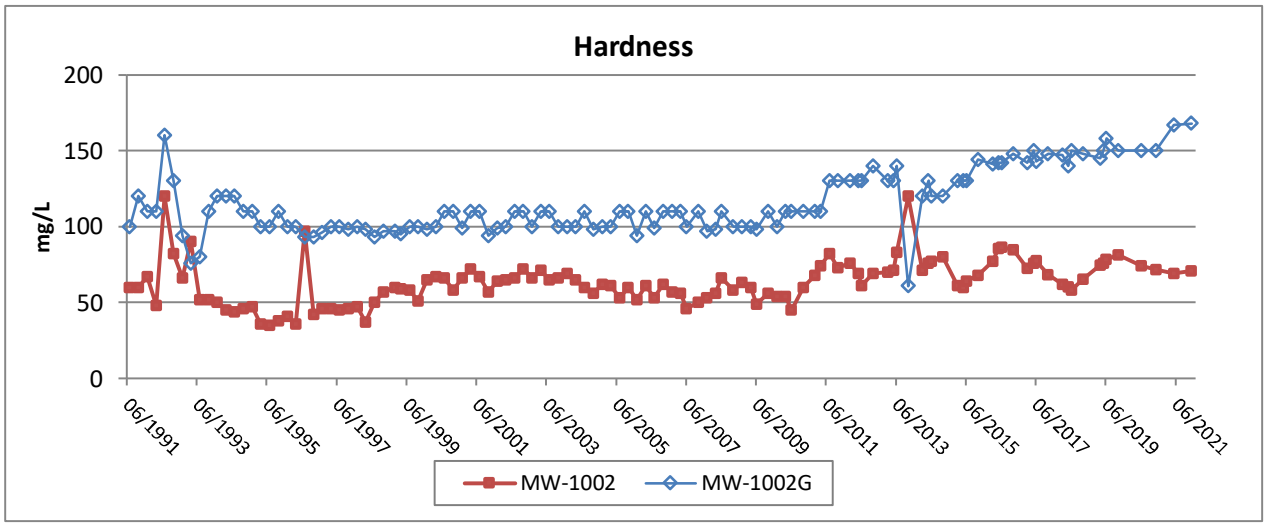
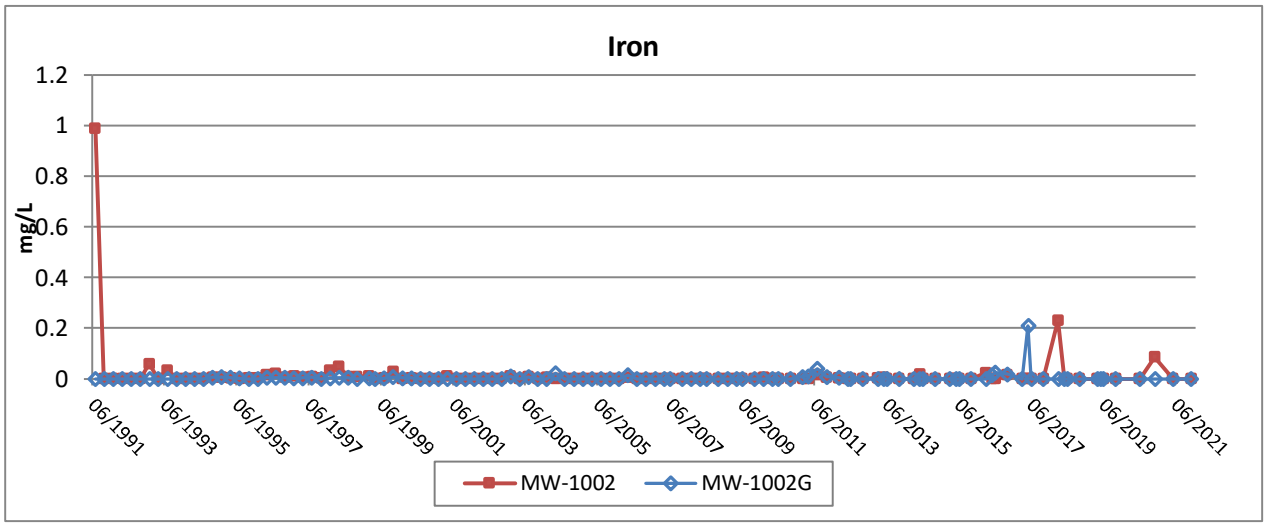
Figure B-2a
Groundwater Trend Graphs - Semi-Annual Results
MW-1002/MW-1002G

Scale: NA	Date: January 2022
Prepared By: SGL	Checked By: SVF	Project: 17F777.22





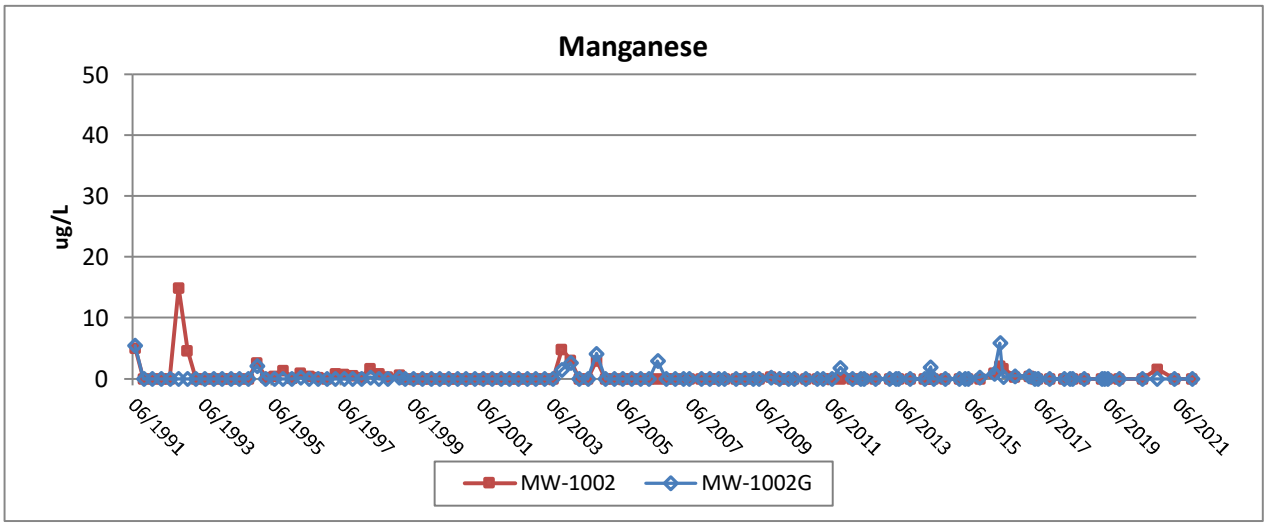


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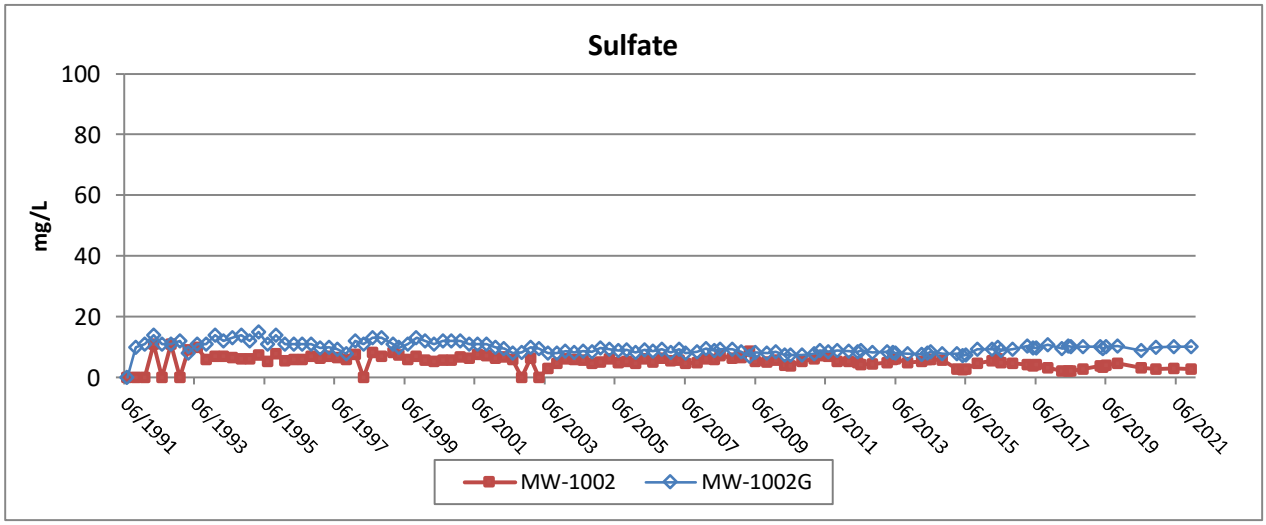
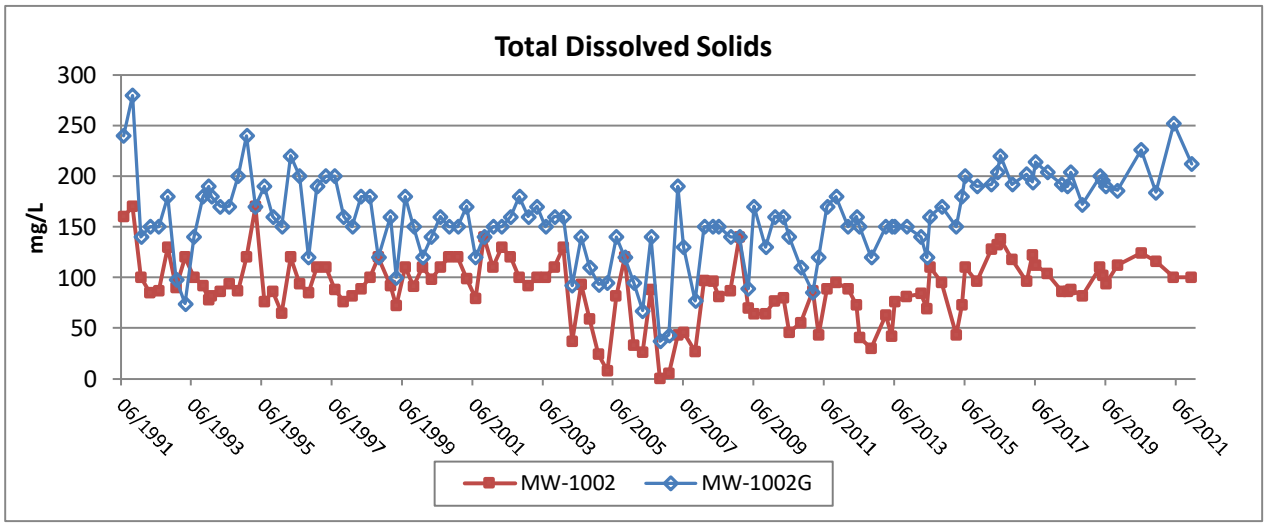
Figure B-2b
Groundwater Trend Graphs - Semi-Annual Results
MW-1002/MW-1002G

Scale: NA	Date: January 2022
Prepared By: SGL	Checked By: SVF	Project: 17F777.22





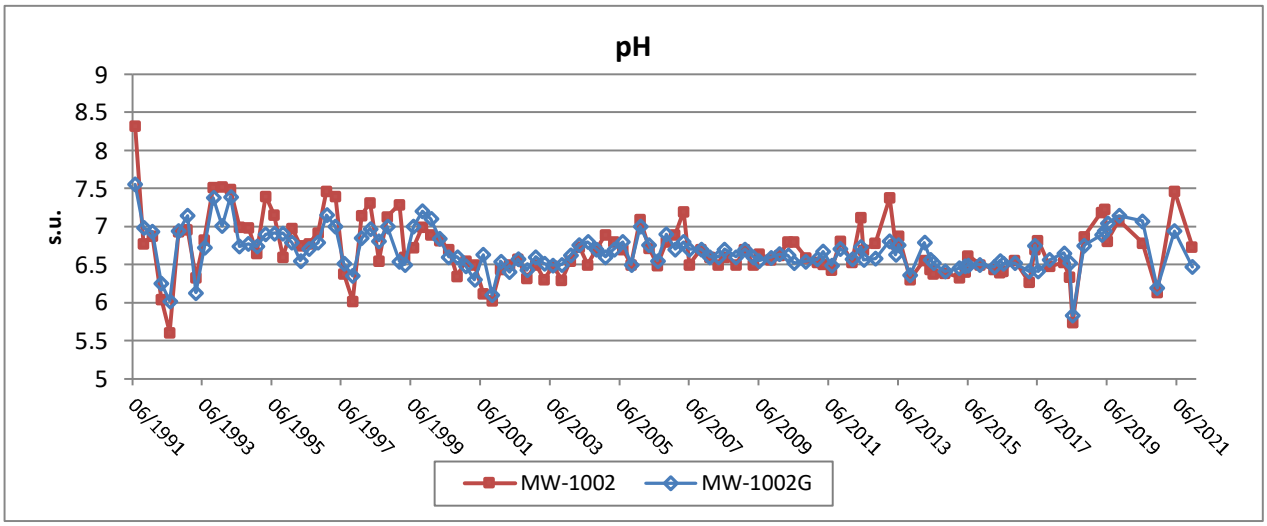


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Figure B-2c
Groundwater Trend Graphs - Semi-Annual Results
MW-1002/MW-1002G

Scale: NA	Date: January 2022
Prepared By: SGL	Checked By: SVF	Project: 17F777.22

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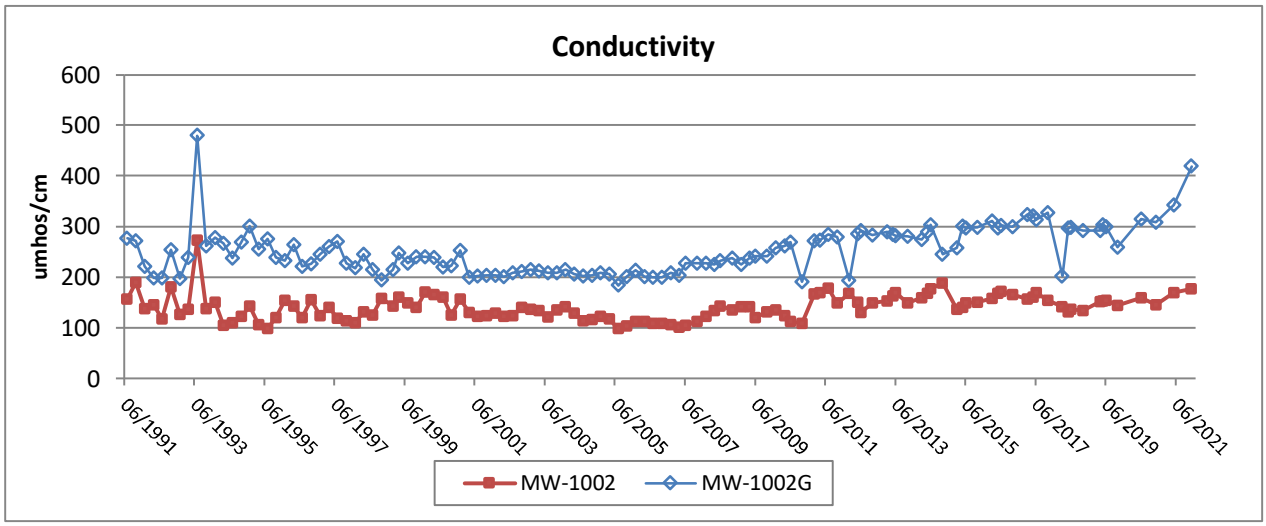

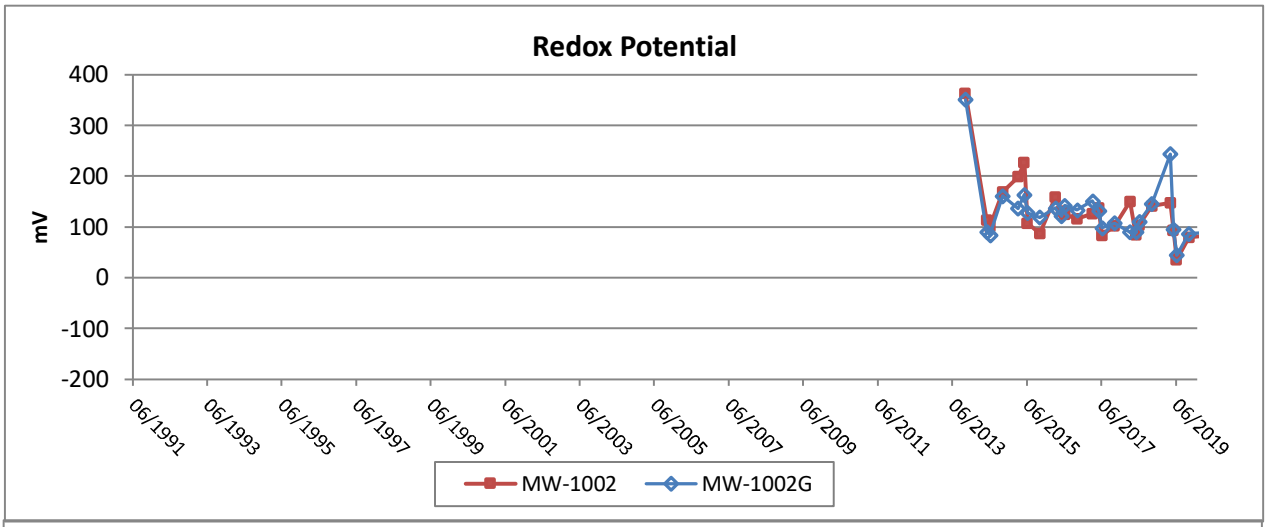

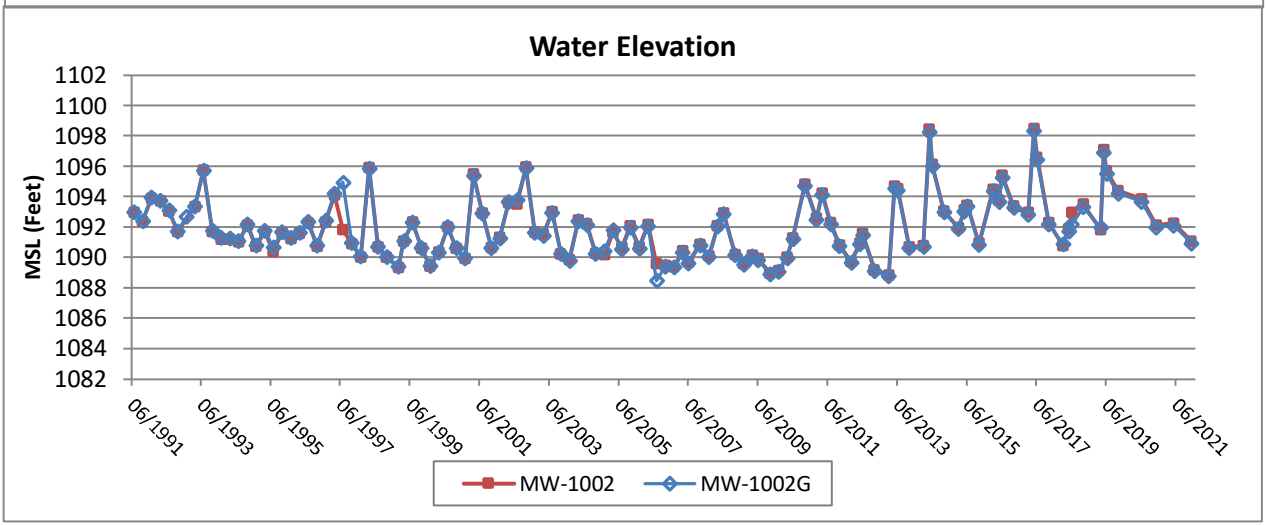

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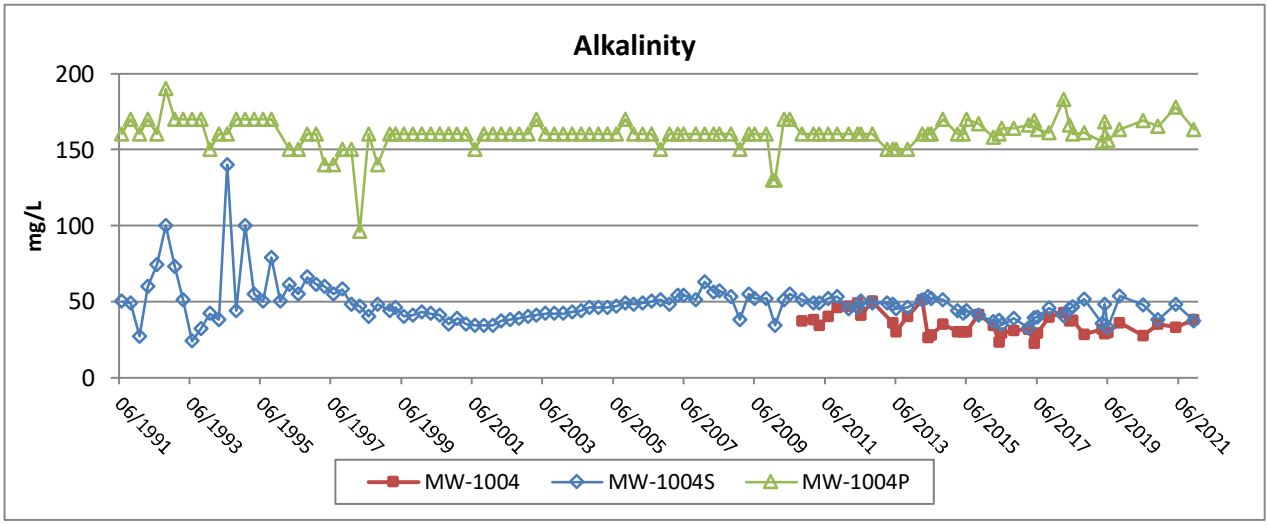
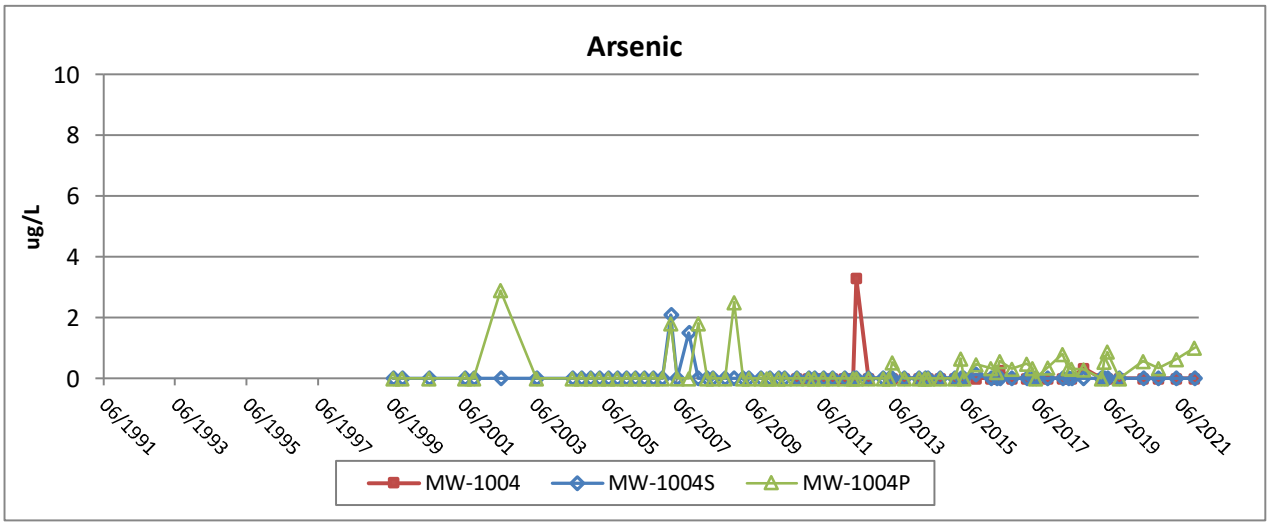
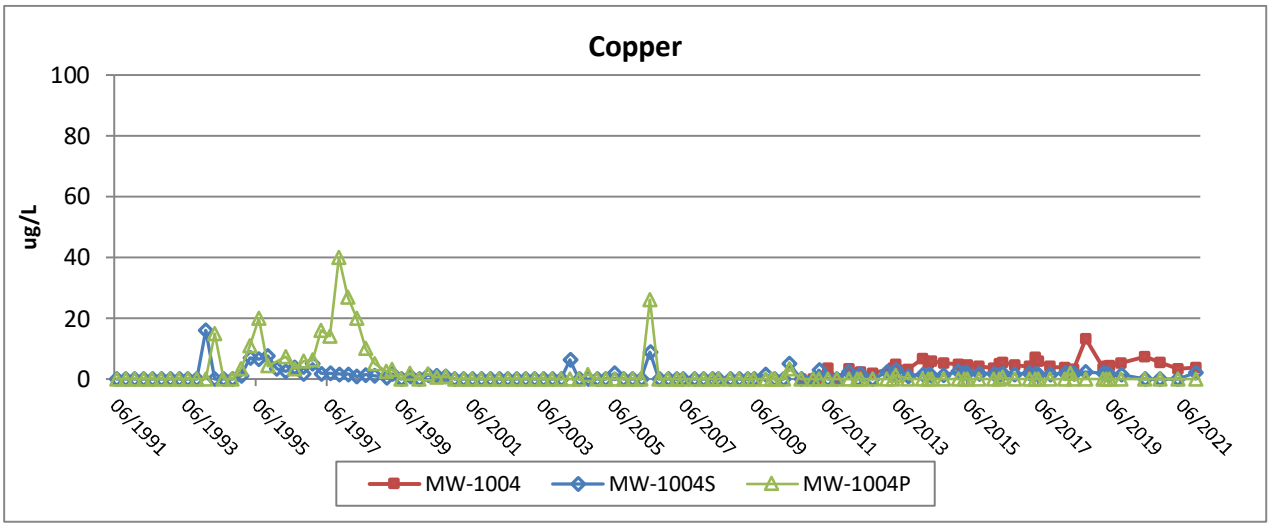
Figure B-2d
Groundwater Trend Graphs - Semi-Annual Results
MW-1002/MW-1002G

Scale: NA	Date: January 2022	
Prepared By: SGL	Checked By: SVF	Project: 17F777.22







Note: Fourth quarter 2010 was the first time MW-1004 had sufficient water recovery for sampling.

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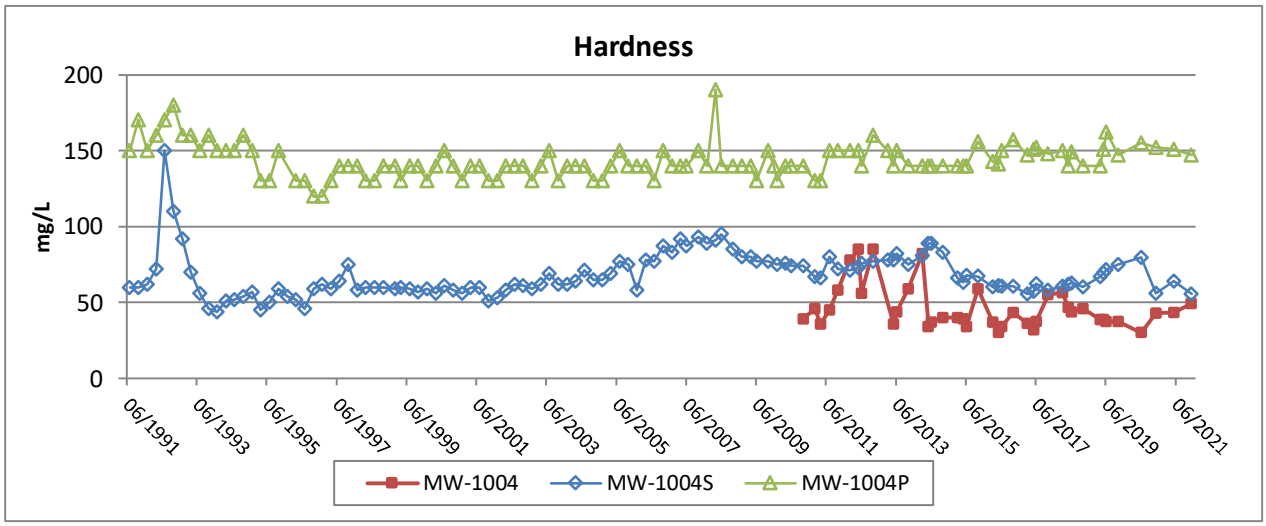
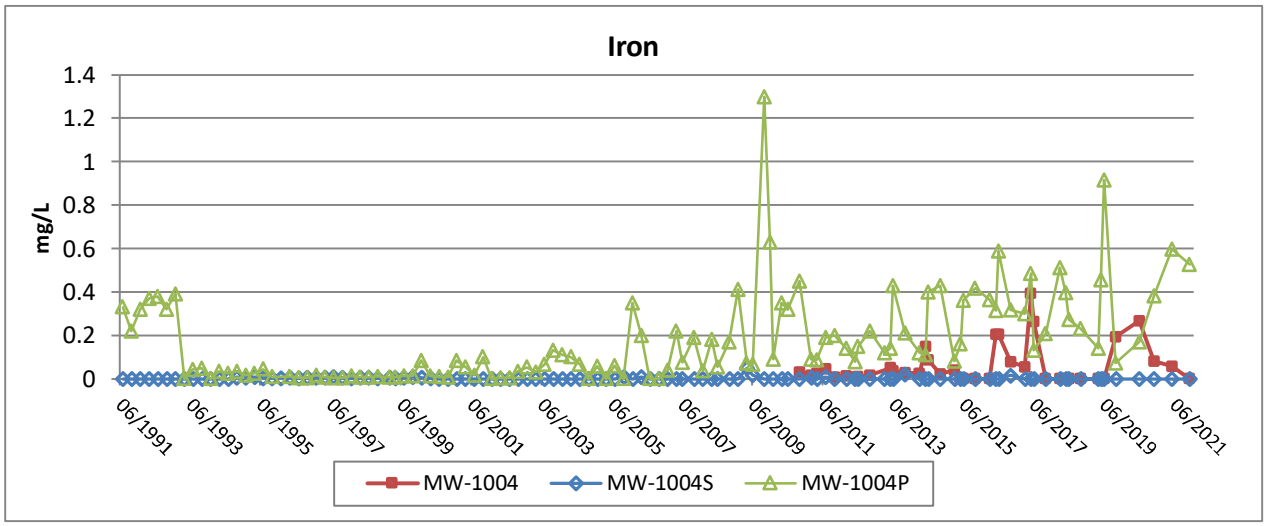
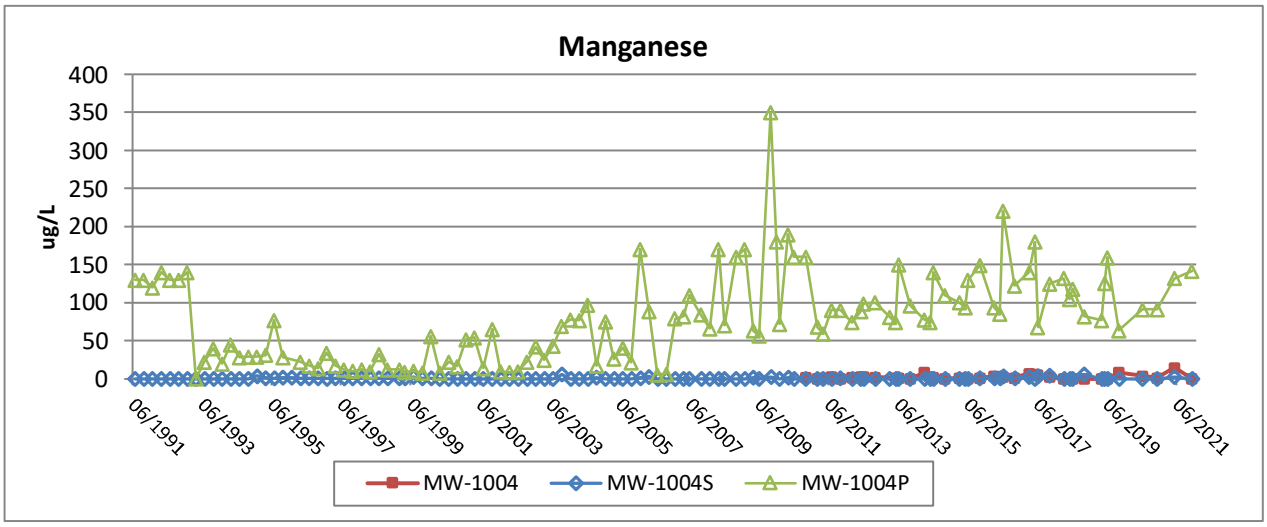
Figure B-3a
Groundwater Trend Graphs - Semi-Annual Results
MW-1004/MW-1004S/MW-1004P

Scale: NA	Date: January 2022	
Prepared By: SGL	Checked By: SVF	Project: 17F777.22





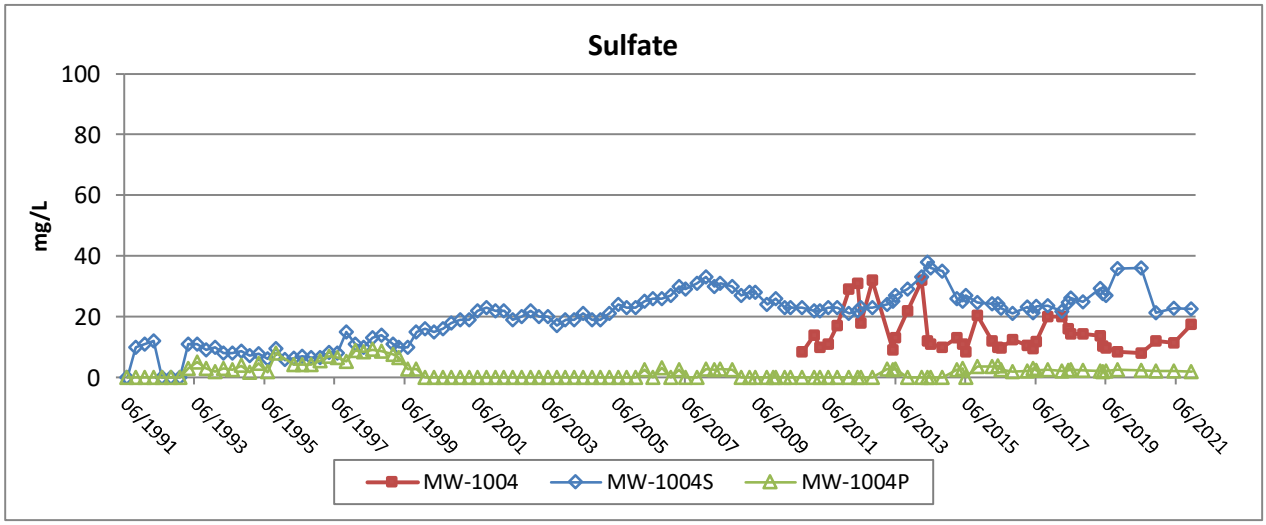


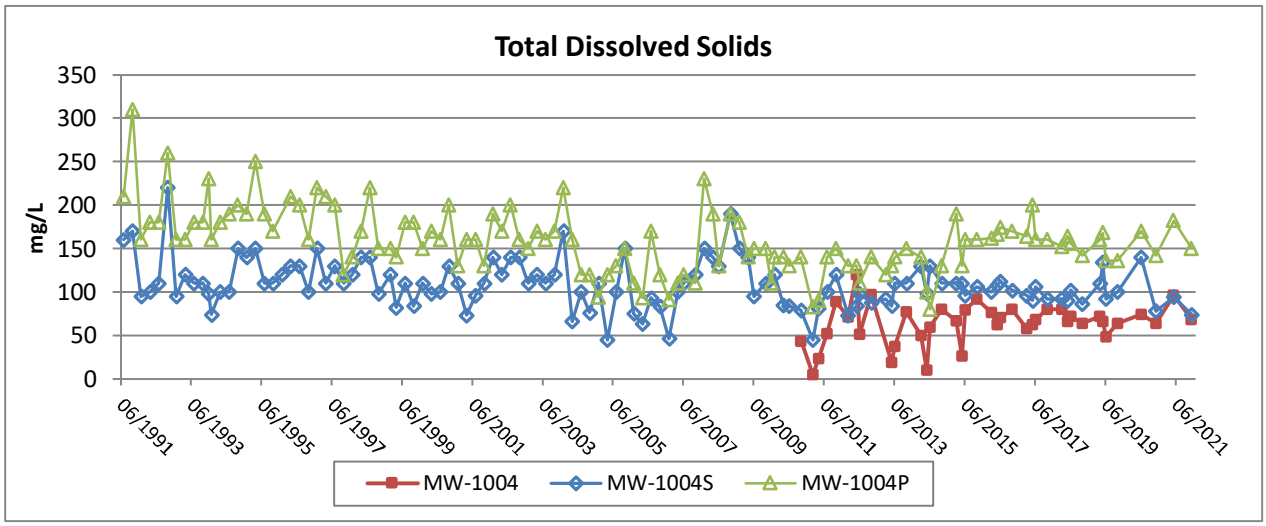
Foth

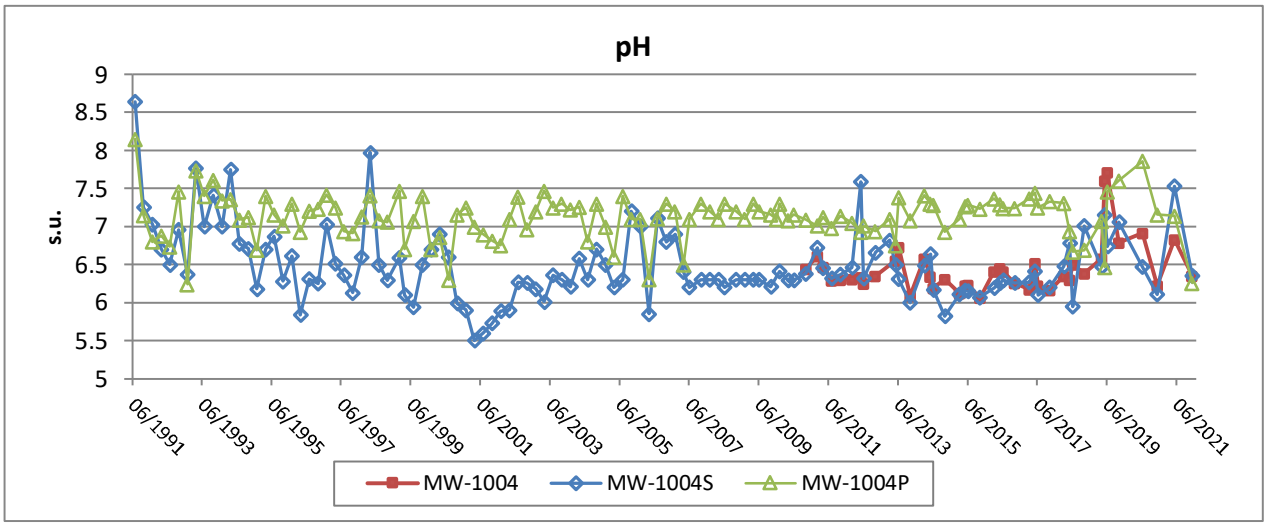
FLAMBEAU MINING COMPANY

Figure B-3b
Groundwater Trend Graphs - Semi-Annual Results
MW-1004/MW-1004S/MW-1004P

Scale: NA	Date: January 2022	
Prepared By: SGL	Checked By: SVF	Project: 17F777.22







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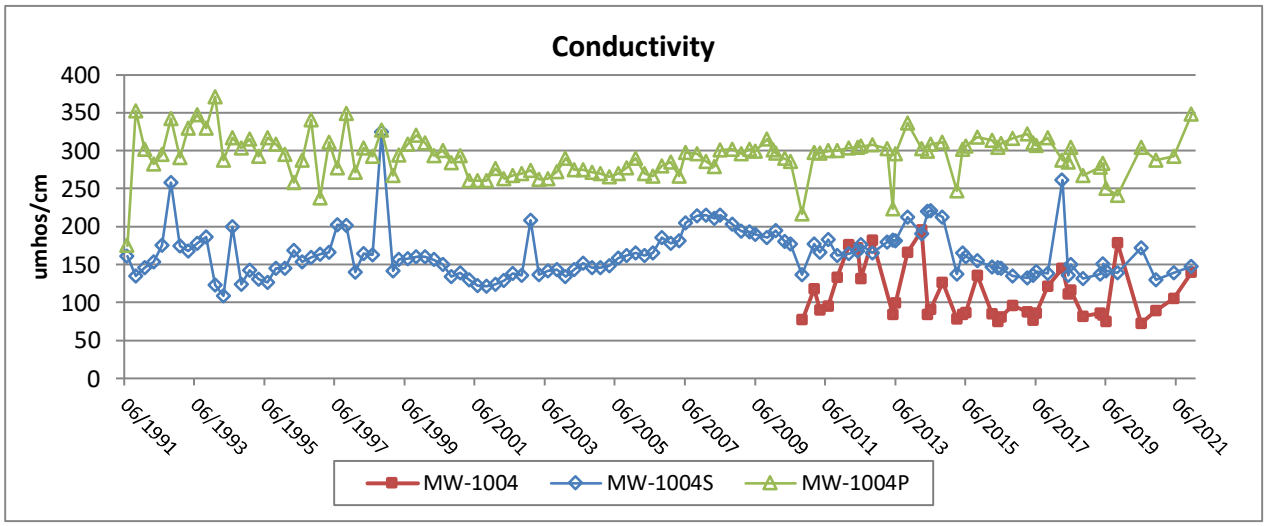
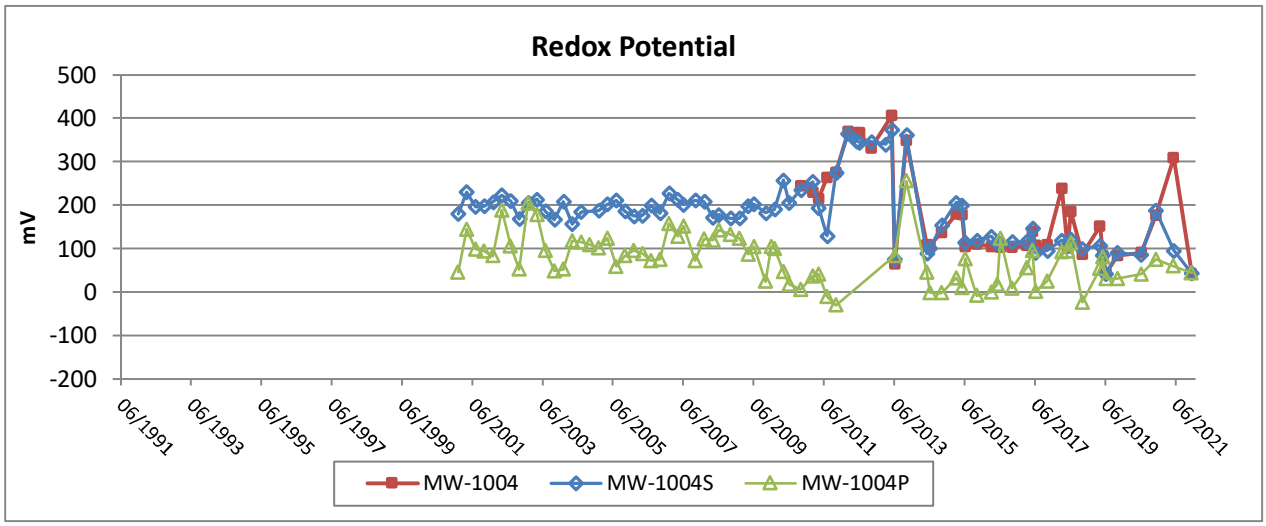
FLAMBEAU MINING COMPANY

Figure B-3c
Groundwater Trend Graphs - Semi-Annual Results
MW-1004/MW-1004S/MW-1004P

Scale: NA	Date: January 2022	
Prepared By: SGL	Checked By: SVF	Project: 17F777.22





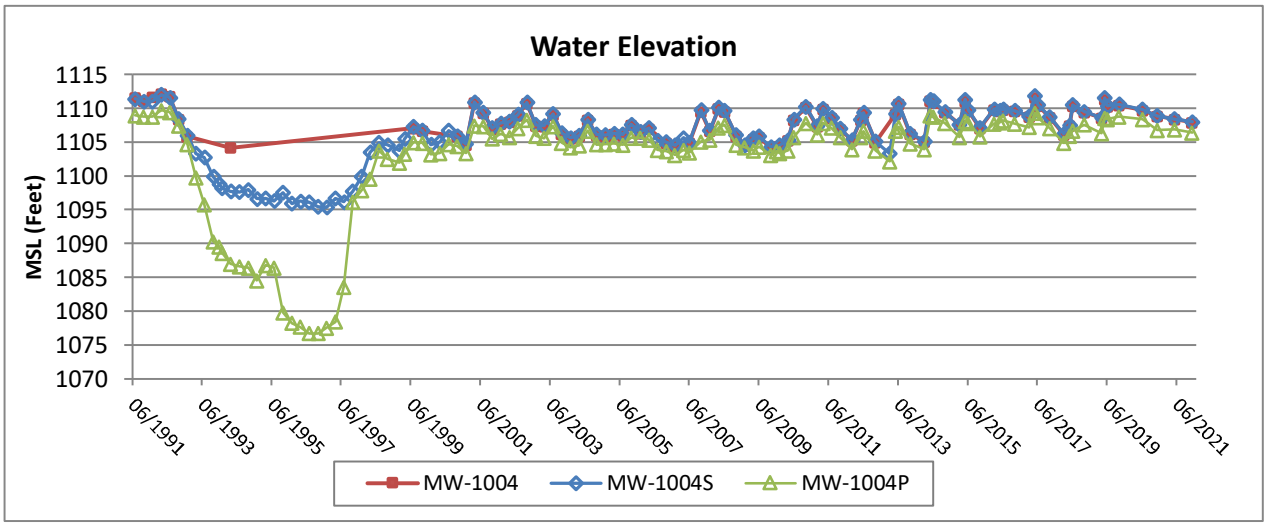


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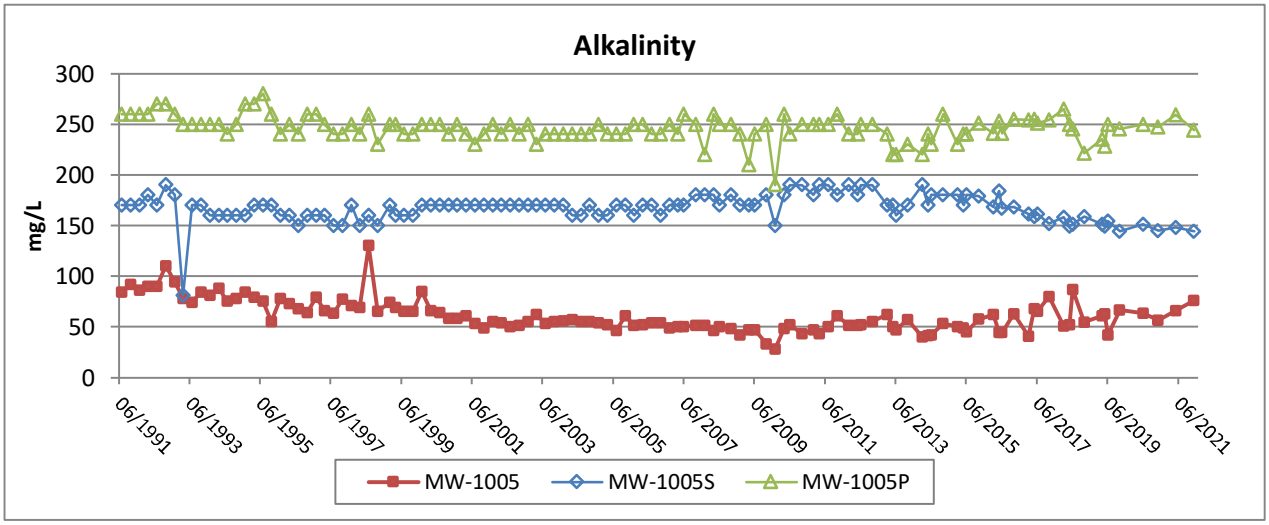
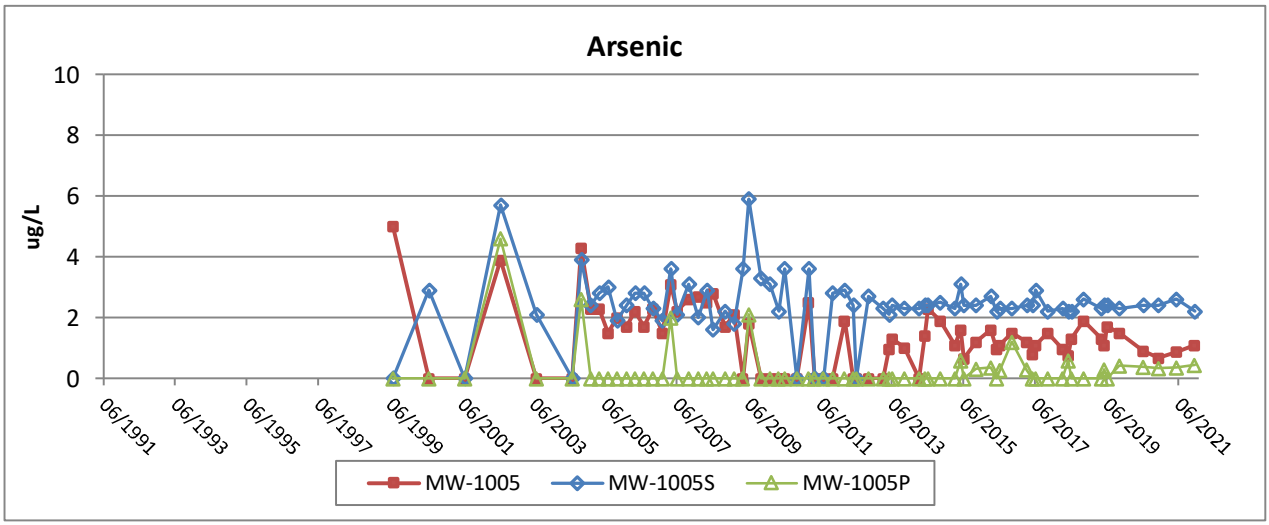
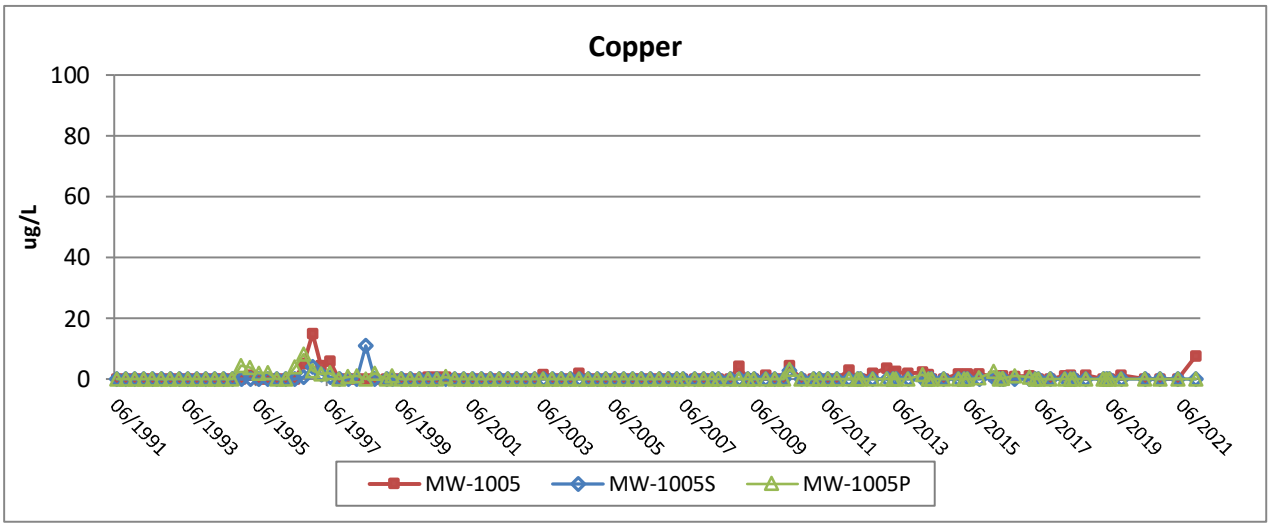
Figure B-3d
Groundwater Trend Graphs - Semi-Annual Results
MW-1004/MW-1004S/MW-1004P

Scale: NA	Date: January 2022
Prepared By: SGL	Checked By: SVF	Project: 17F777.22







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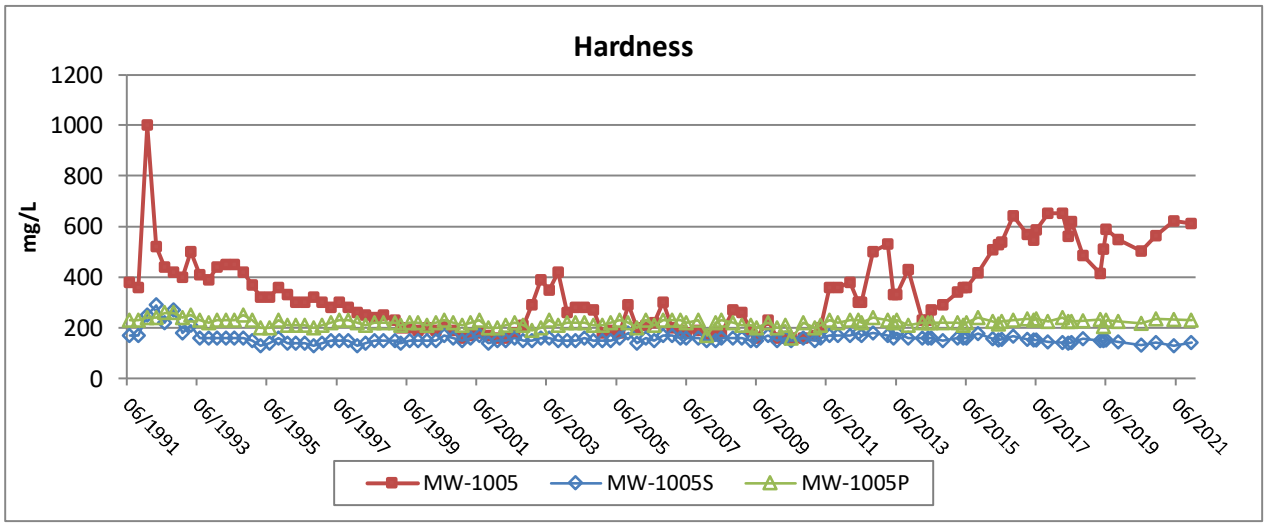
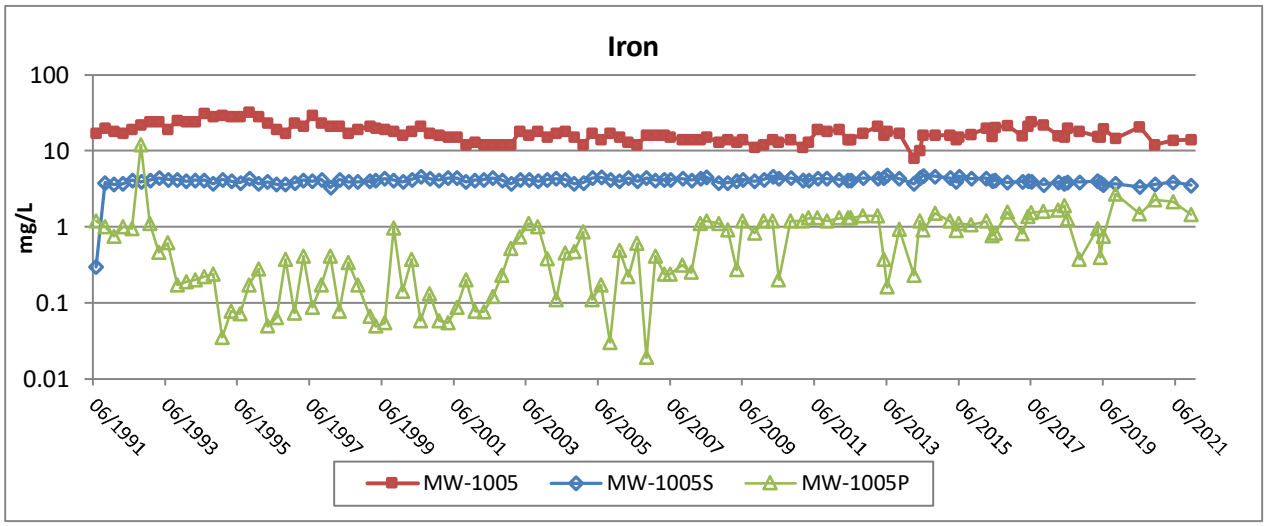
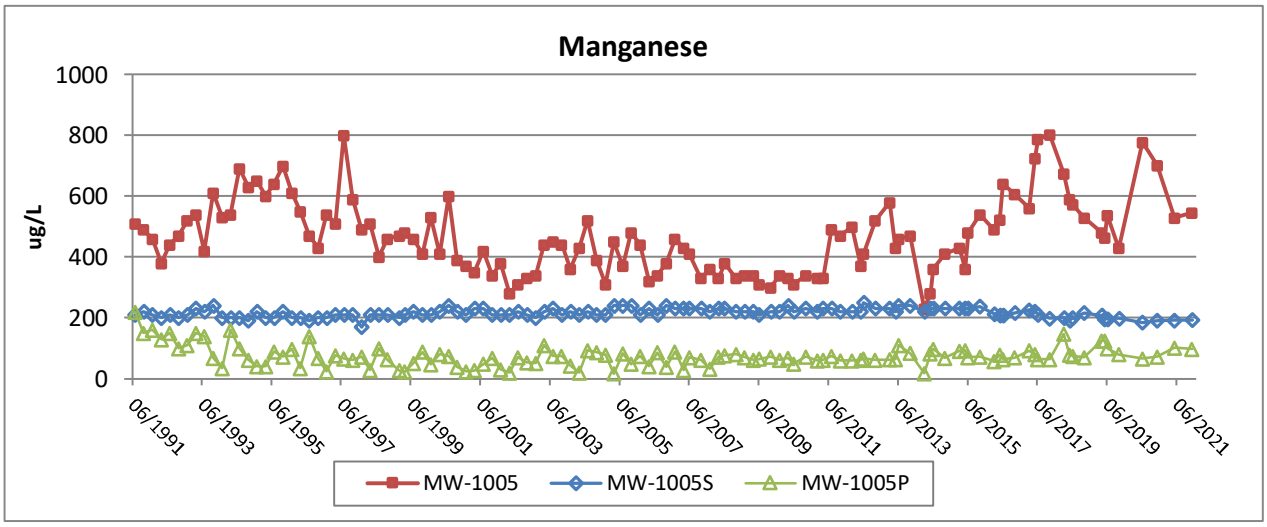
FLAMBEAU MINING COMPANY

Figure B-4a
Groundwater Trend Graphs - Semi-Annual Results
MW-1005/MW-1005S/MW-1005P

Scale: NA	Date: January 2022
Prepared By: SGL	Checked By: SVF	Project: 17F777.22







Note: Iron trend graphs are displayed on a logarithmic scale so the trend patterns of MW-1005, MW-1005S and MW-1005P are visible at different concentration scales.

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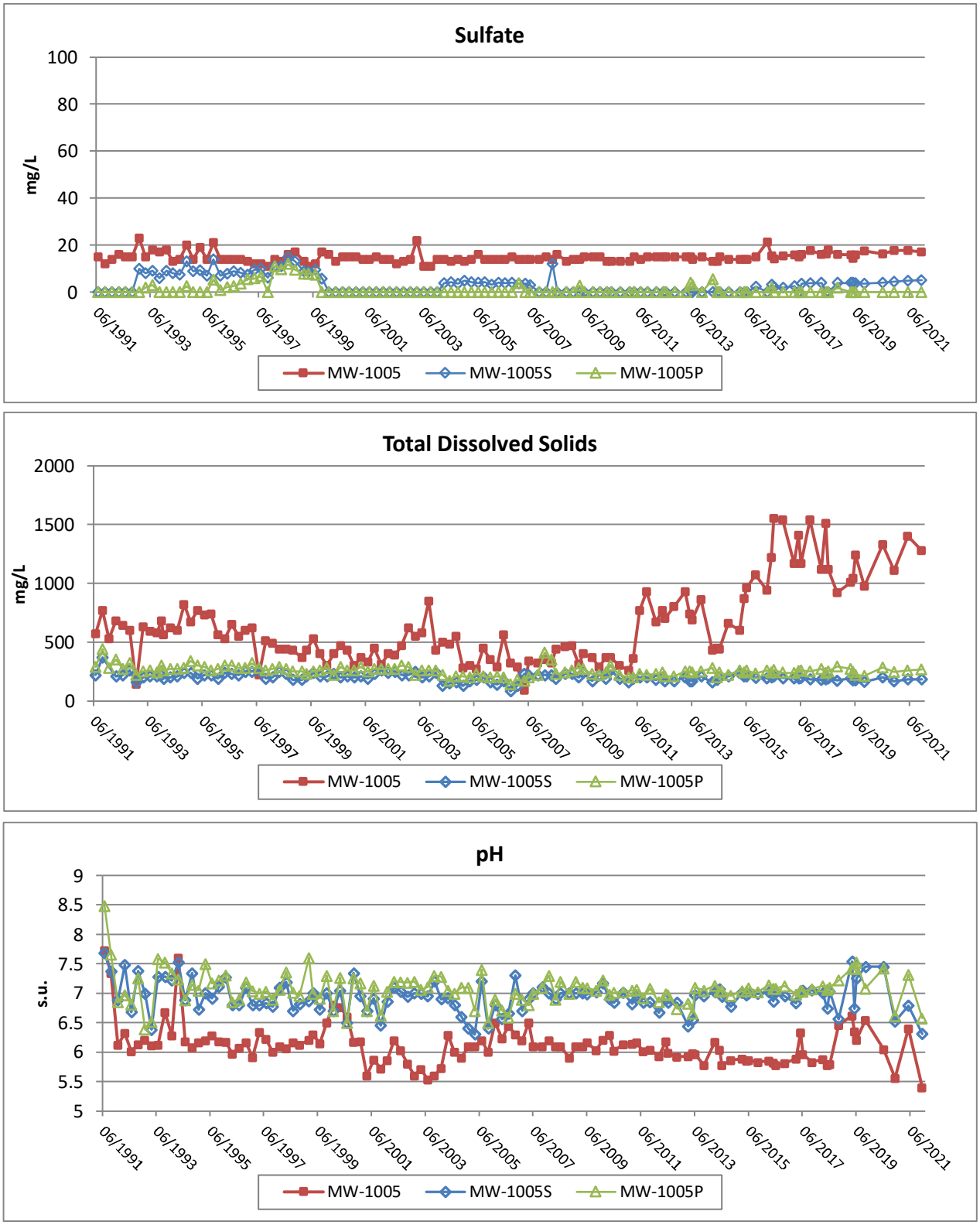
Figure B-4b
Groundwater Trend Graphs - Semi-Annual Results
MW-1005/MW-1005S/MW-1005P

Scale: NA	Date: January 2022	
Prepared By: SGL	Checked By: SVF	Project: 17F777.22



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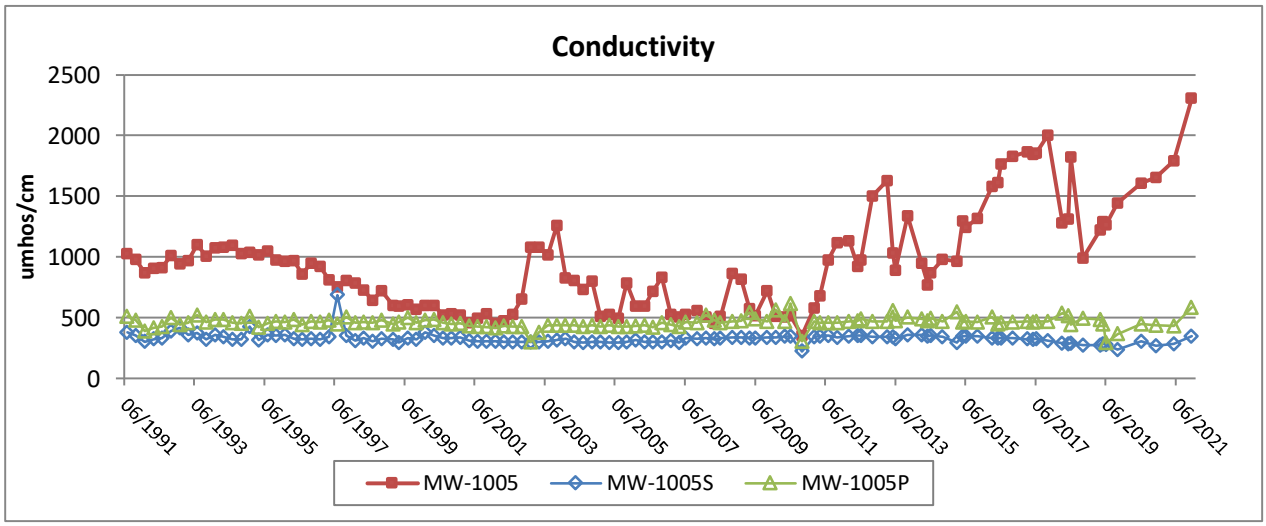
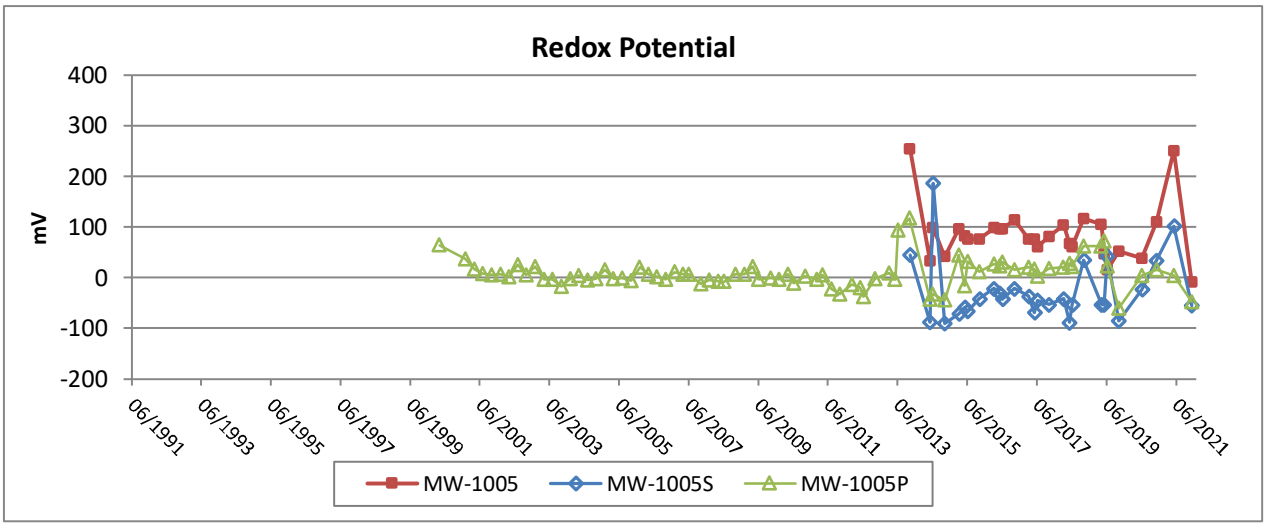
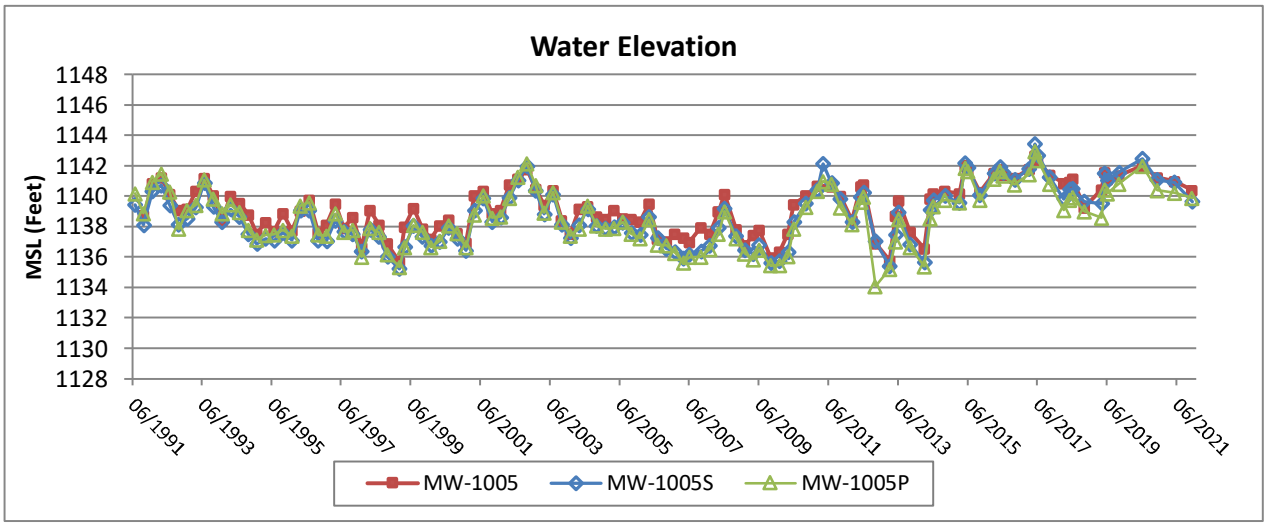
FLAMBEAU MINING COMPANY

Figure B-4c
Groundwater Trend Graphs - Semi-Annual Results
MW-1005/MW-1005S/MW-1005P

Scale: NA	Date: January 2022
Prepared By: SGL	Checked By: SVF	Project: 17F777.22







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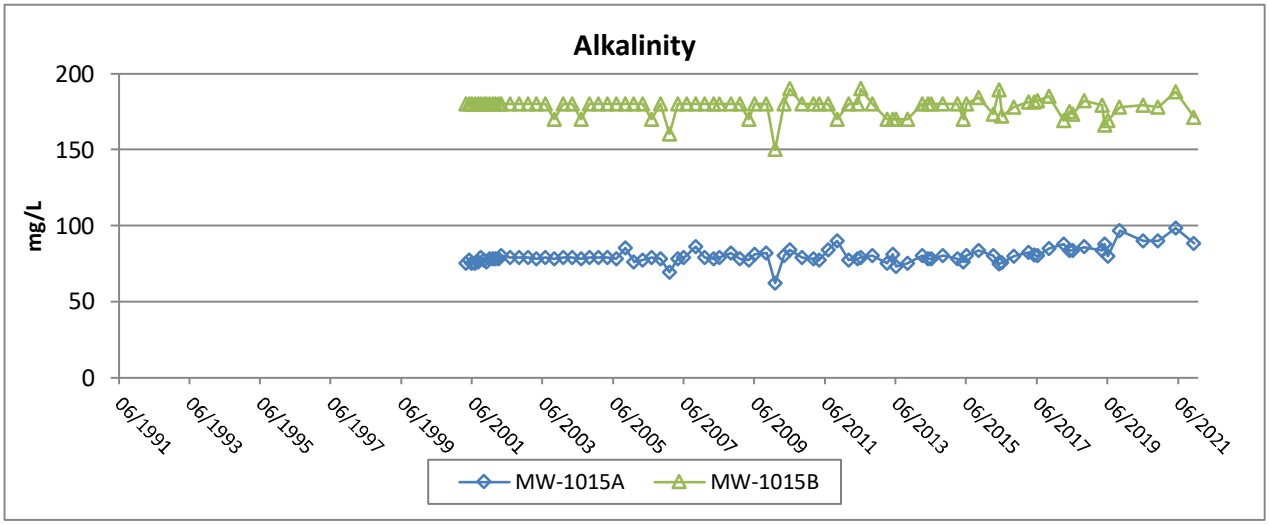
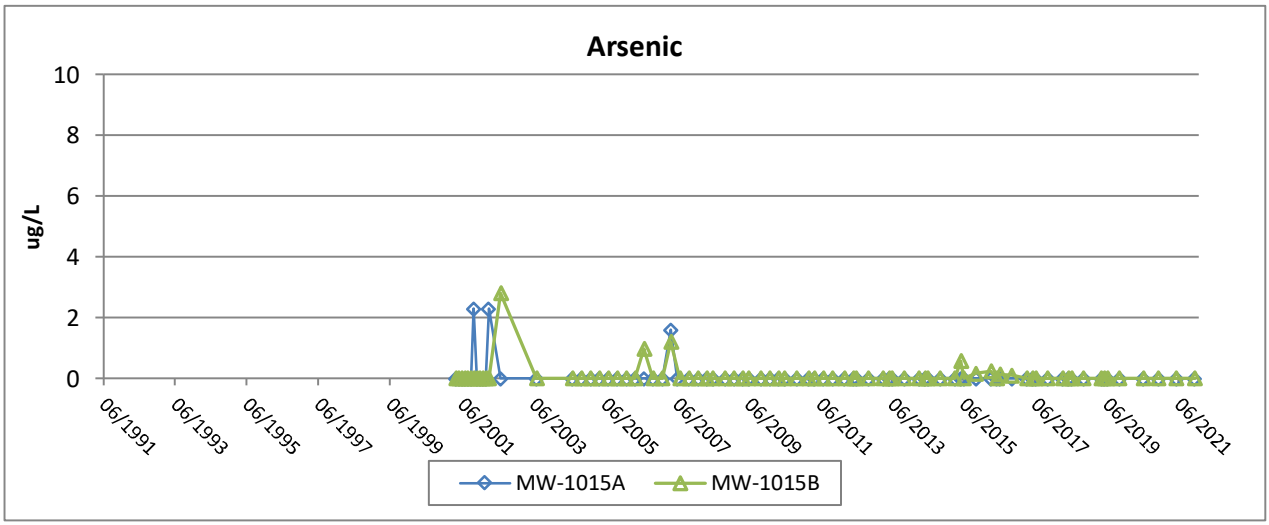
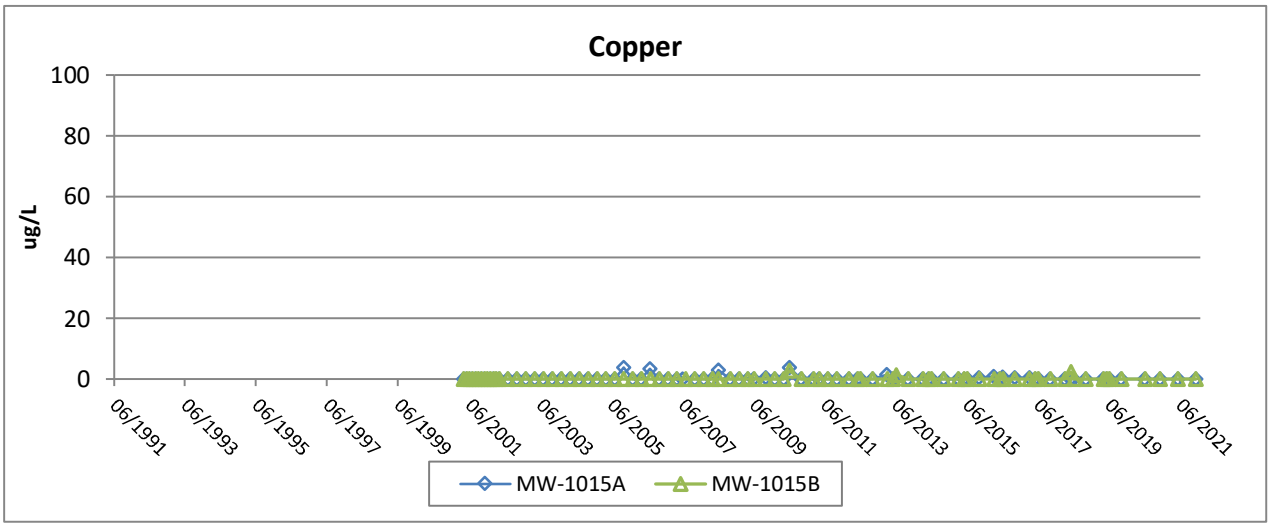
FLAMBEAU MINING COMPANY

Figure B-4d
Groundwater Trend Graphs - Semi-Annual Results
MW-1005/MW-1005S/MW-1005P

Scale: NA	Date: January 2022
Prepared By: SGL	Checked By: SVF	Project: 17F777.22





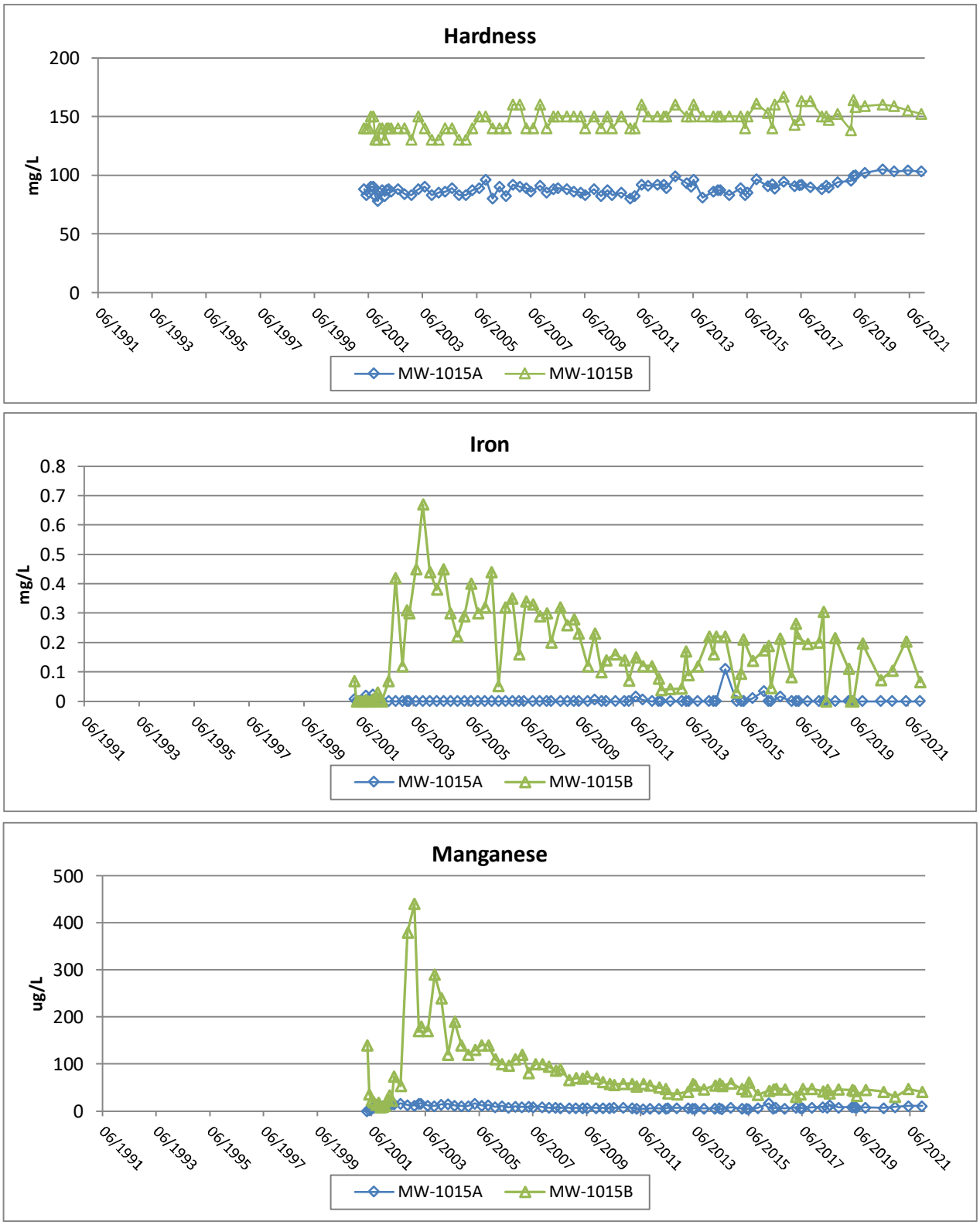


Foth

FLAMBEAU MINING COMPANY

Figure B-5a
Groundwater Trend Graphs - Semi-Annual Results
MW-1015A/MW-1015B

Scale: NA	Date: January 2022
Prepared By: SGL	Checked By: SVF	Project: 17F777.22

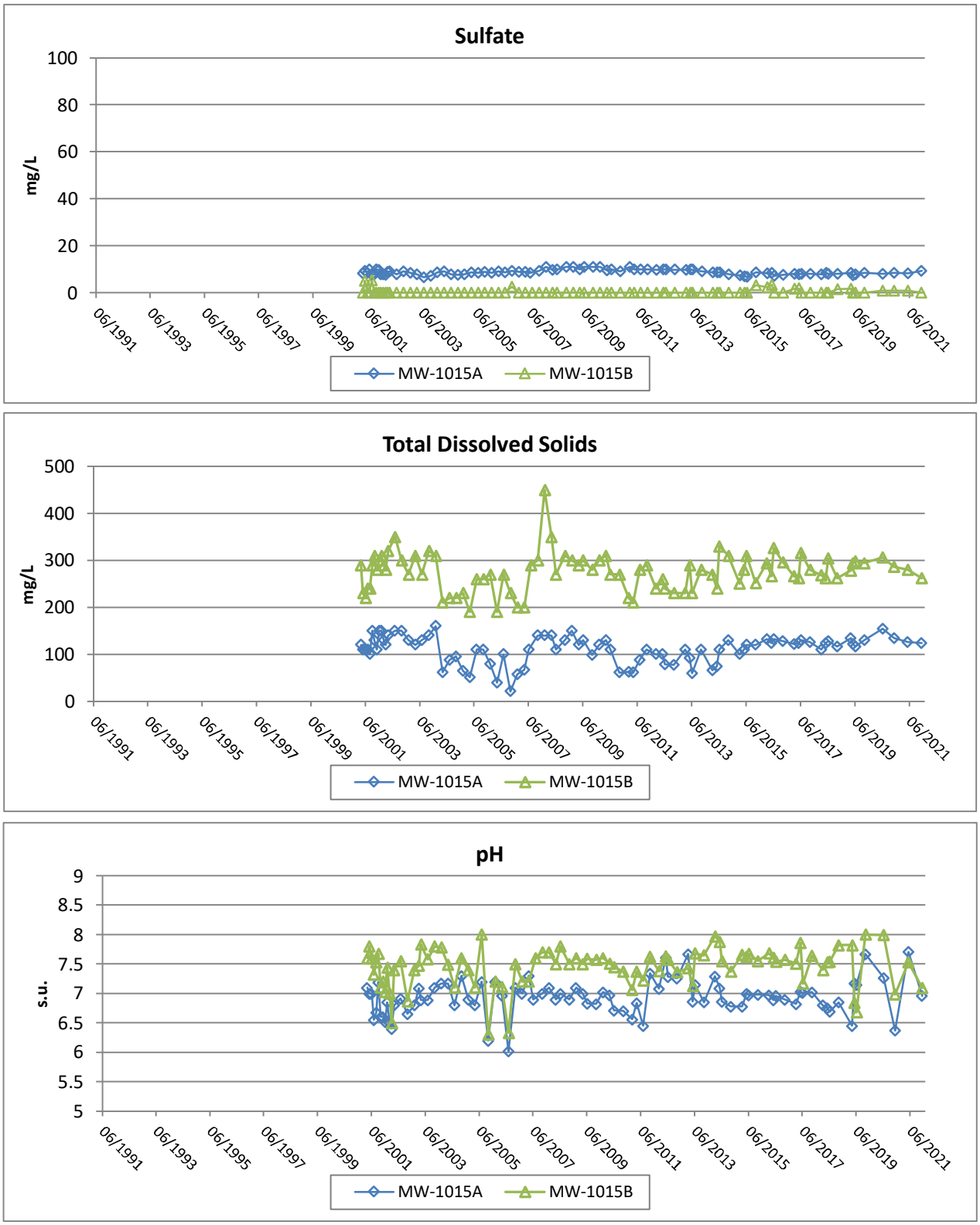


Foth

FLAMBEAU MINING COMPANY

Figure B-5b
Groundwater Trend Graphs - Semi-Annual Results
MW-1015A/MW-1015B

Scale: NA	Date: January 2022
Prepared By: SGL	Checked By: SVF	Project: 17F777.22



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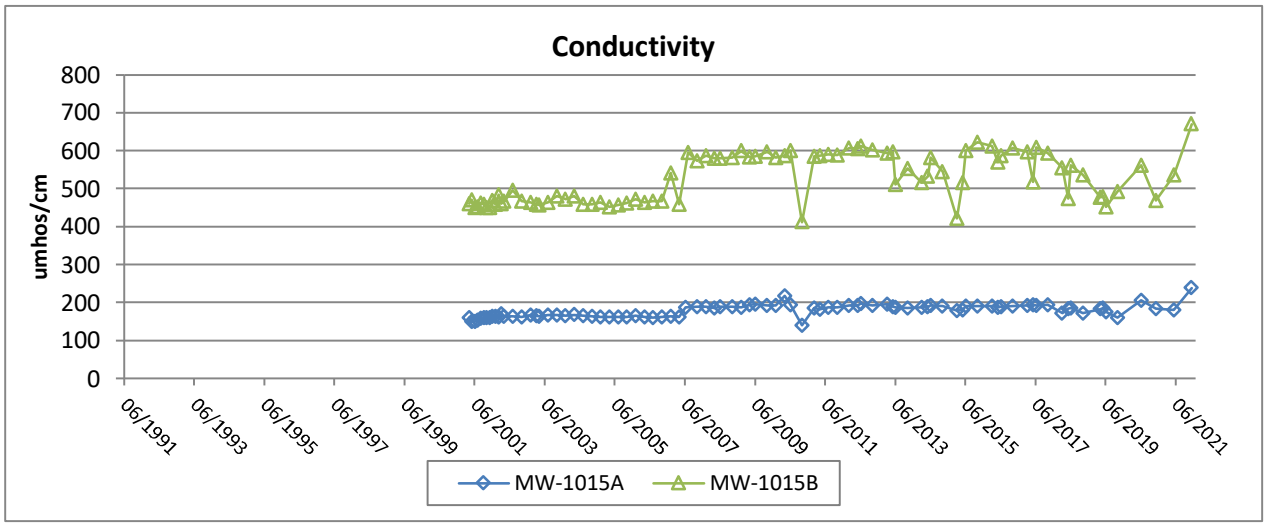
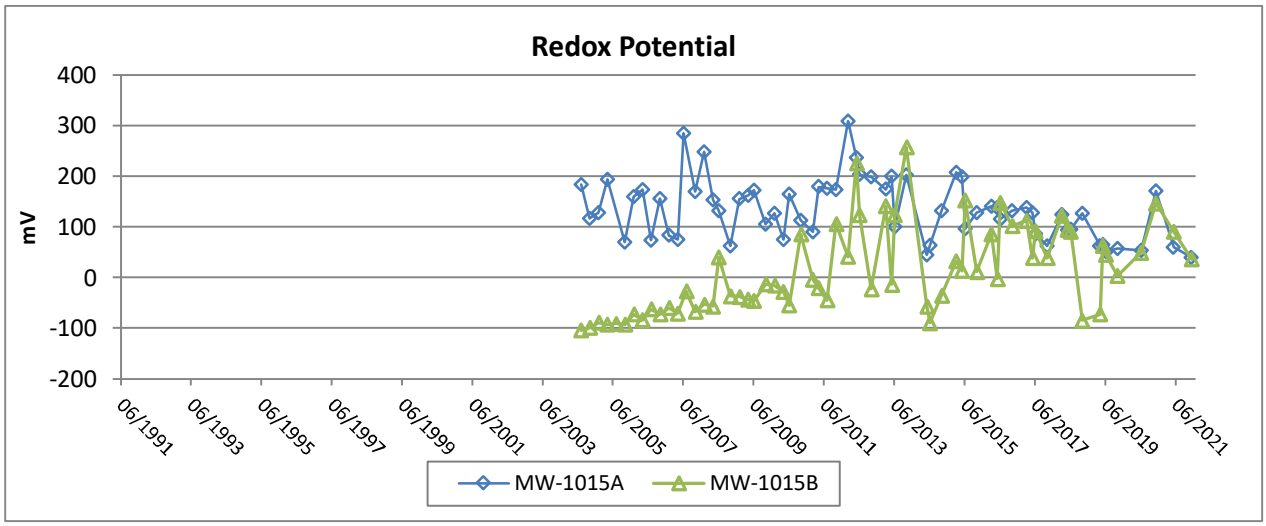
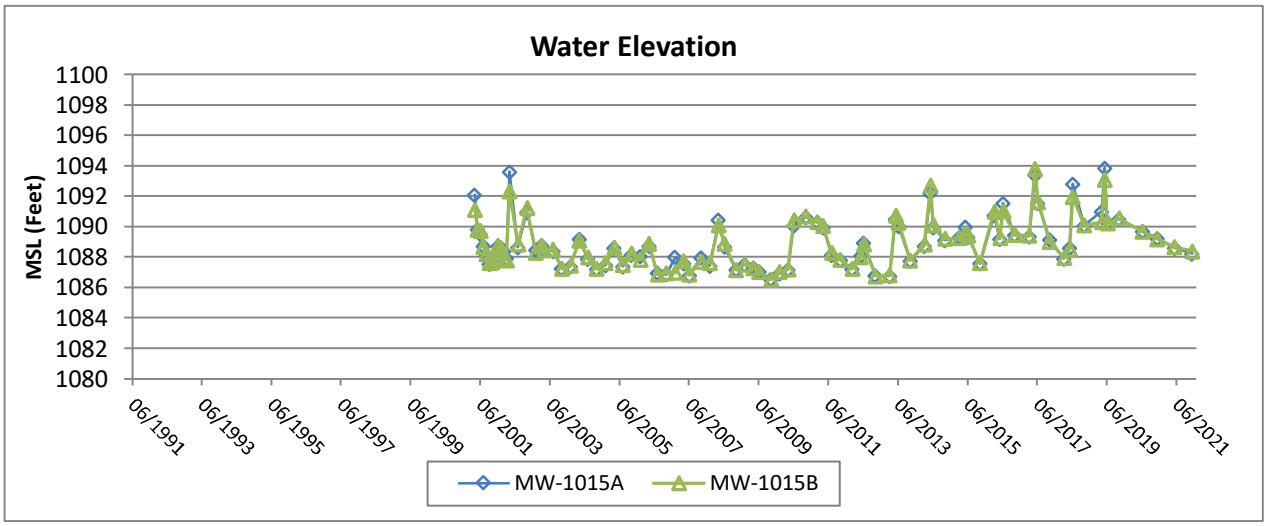
FLAMBEAU MINING COMPANY

Figure B-5c
Groundwater Trend Graphs - Semi-Annual Results
MW-1015A/MW-1015B

Scale: NA	Date: January 2022
Prepared By: SGL	Checked By: SVF	Project: 17F777.22







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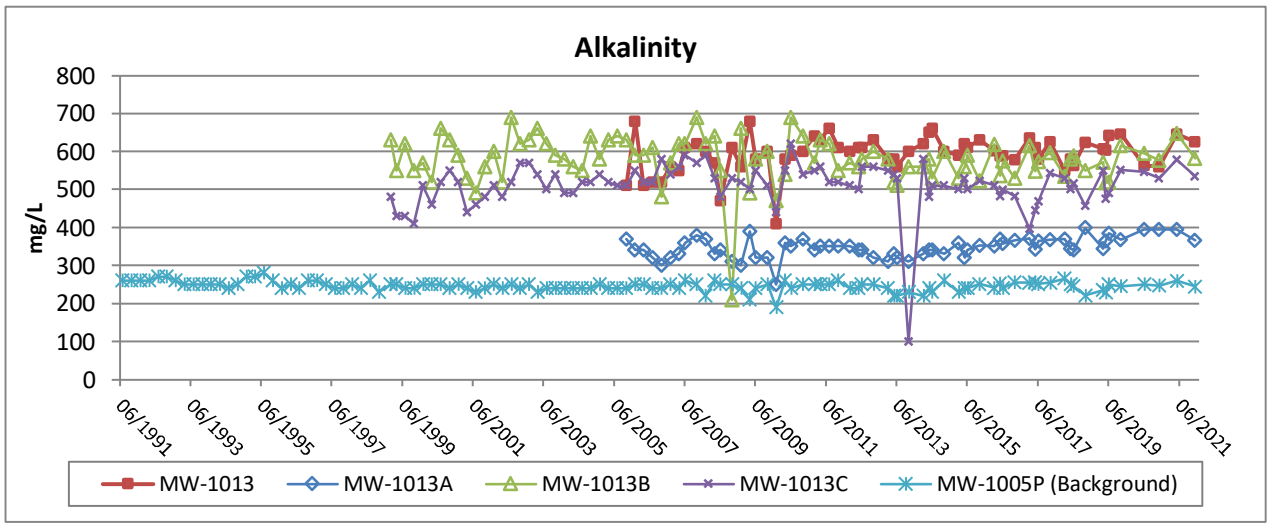
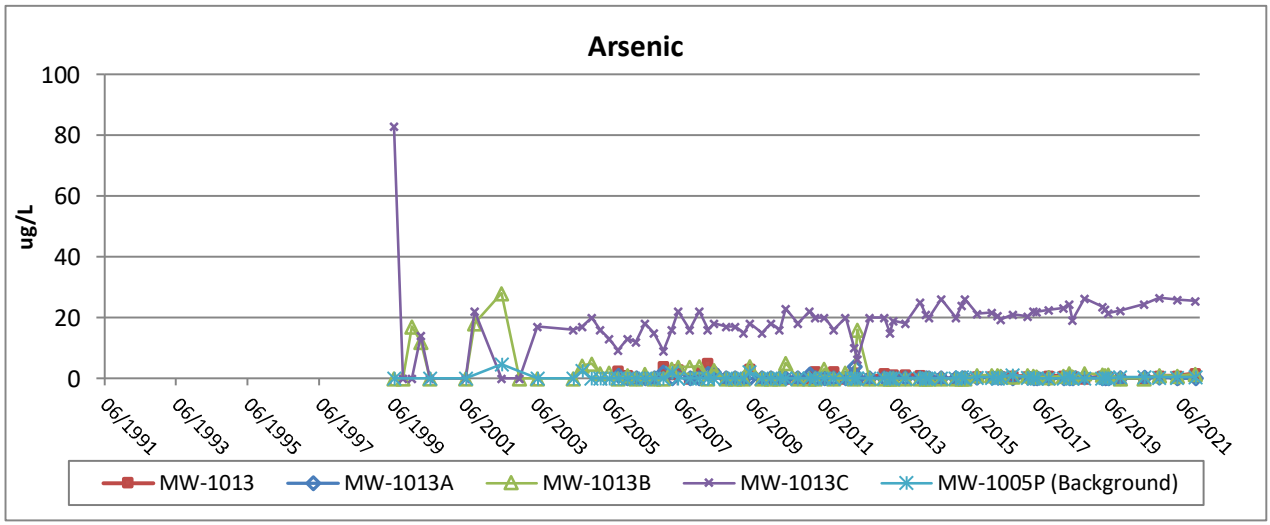
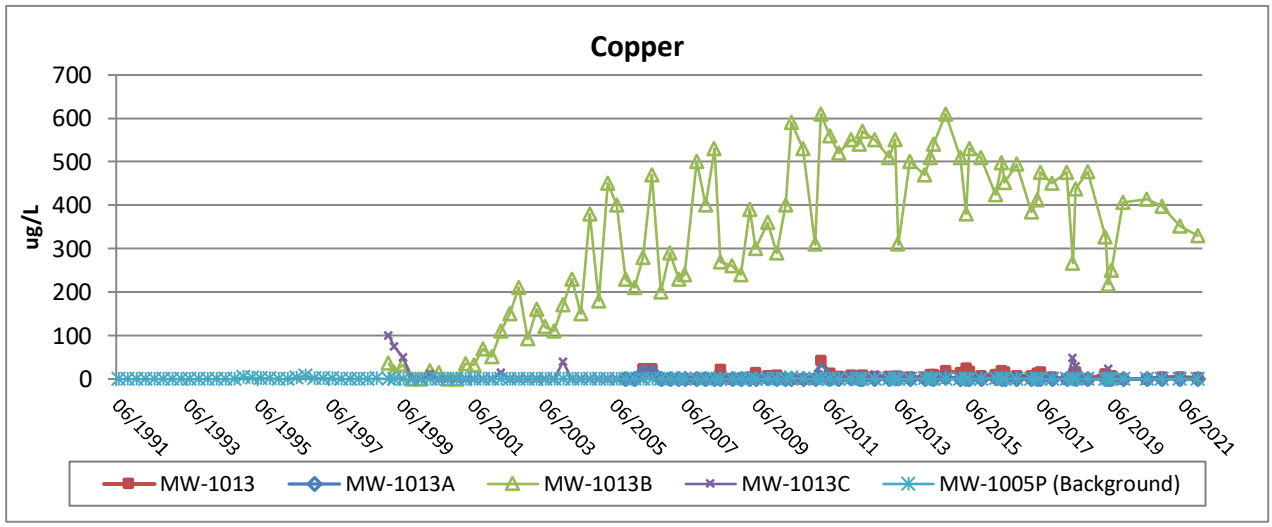
FLAMBEAU MINING COMPANY

Figure B-5d
Groundwater Trend Graphs - Semi-Annual Results
MW-1015A/MW-1015B

Scale: NA	Date: January 2022
Prepared By: SGL	Checked By: SVF	Project: 17F777.22







Note: Fourth quarter 2005 was the first time MW-1013 had sufficient water recovery for sampling.

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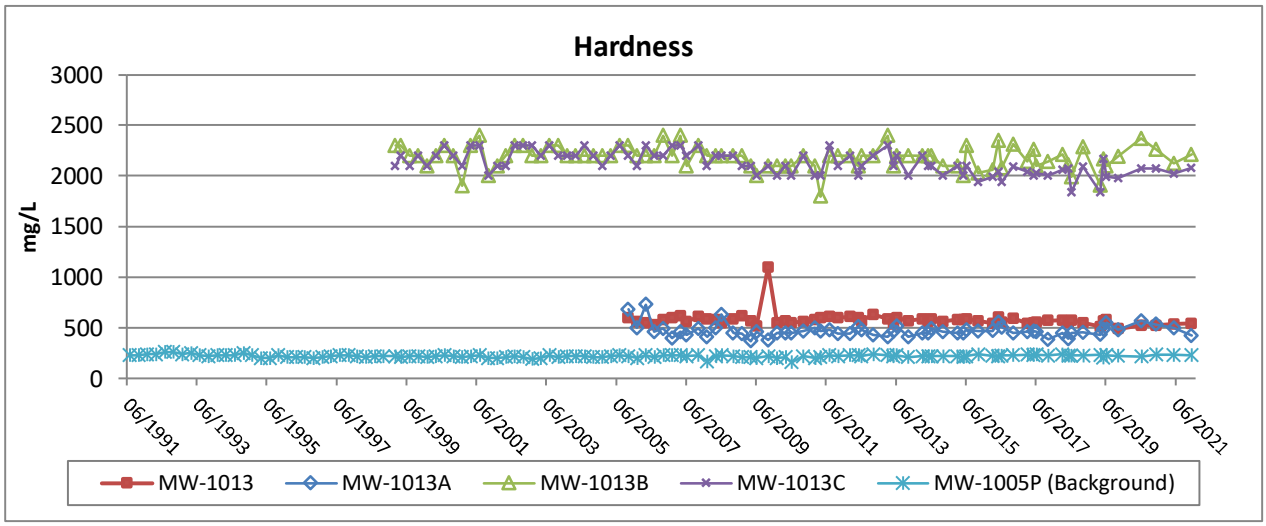
FLAMBEAU MINING COMPANY

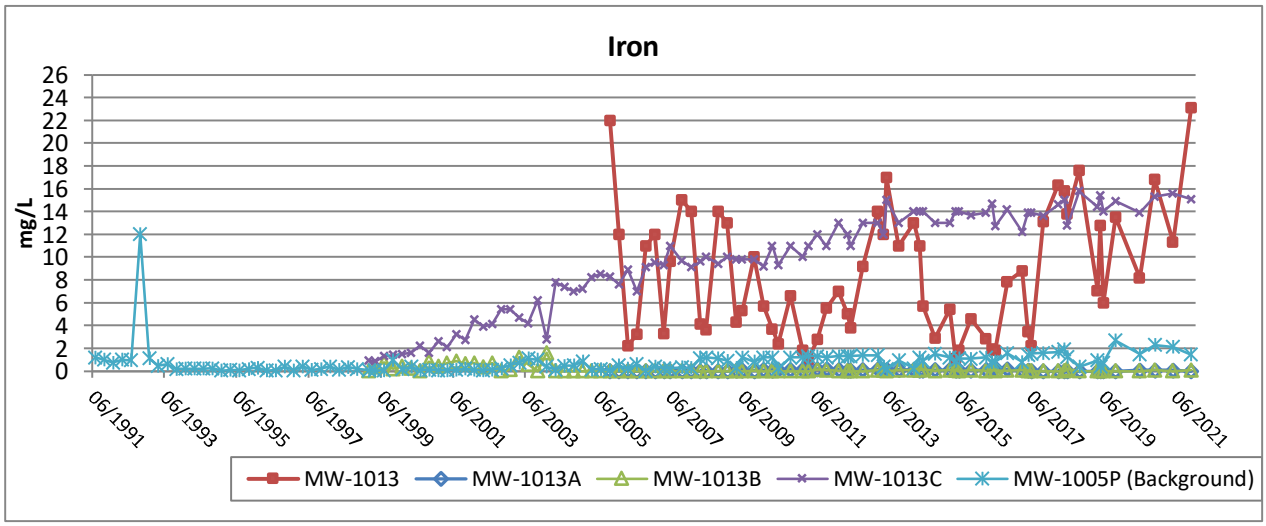
Figure B-6a

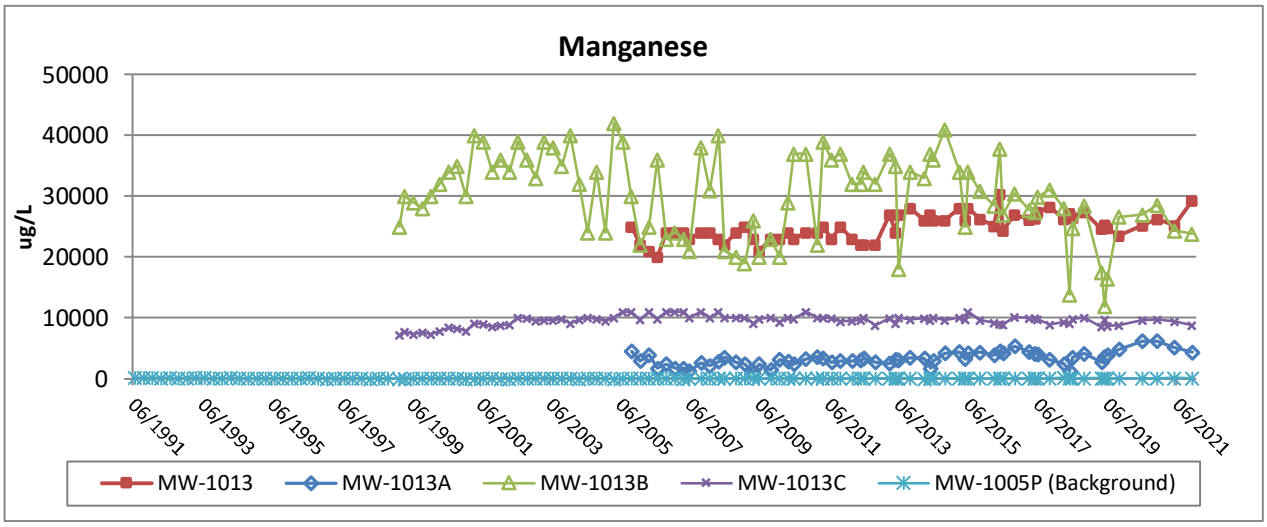
Groundwater Trend Graphs - Semi-Annual Results (In-Pit Wells)
MW-1013/MW-1013A/MW-1013B/MW-1013C

Scale: NA	Date: January 2022
Prepared By: SGL	Checked By: SVF	Project: 17F777.22

pw:\Flambeau Mining\0017F777\10500 Reference Information\Stats\2021 Annual Report\GWGraphs_Qtrly.xlsm







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FLAMBEAU MINING COMPANY

Figure B-6b

Groundwater Trend Graphs - Semi-Annual Results (In-Pit Wells)
MW-1013/MW-1013A/MW-1013B/MW-1013C

Scale: NA	Date: January 2022	
Prepared By: SGL	Checked By: SVF	Project: 17F777.22

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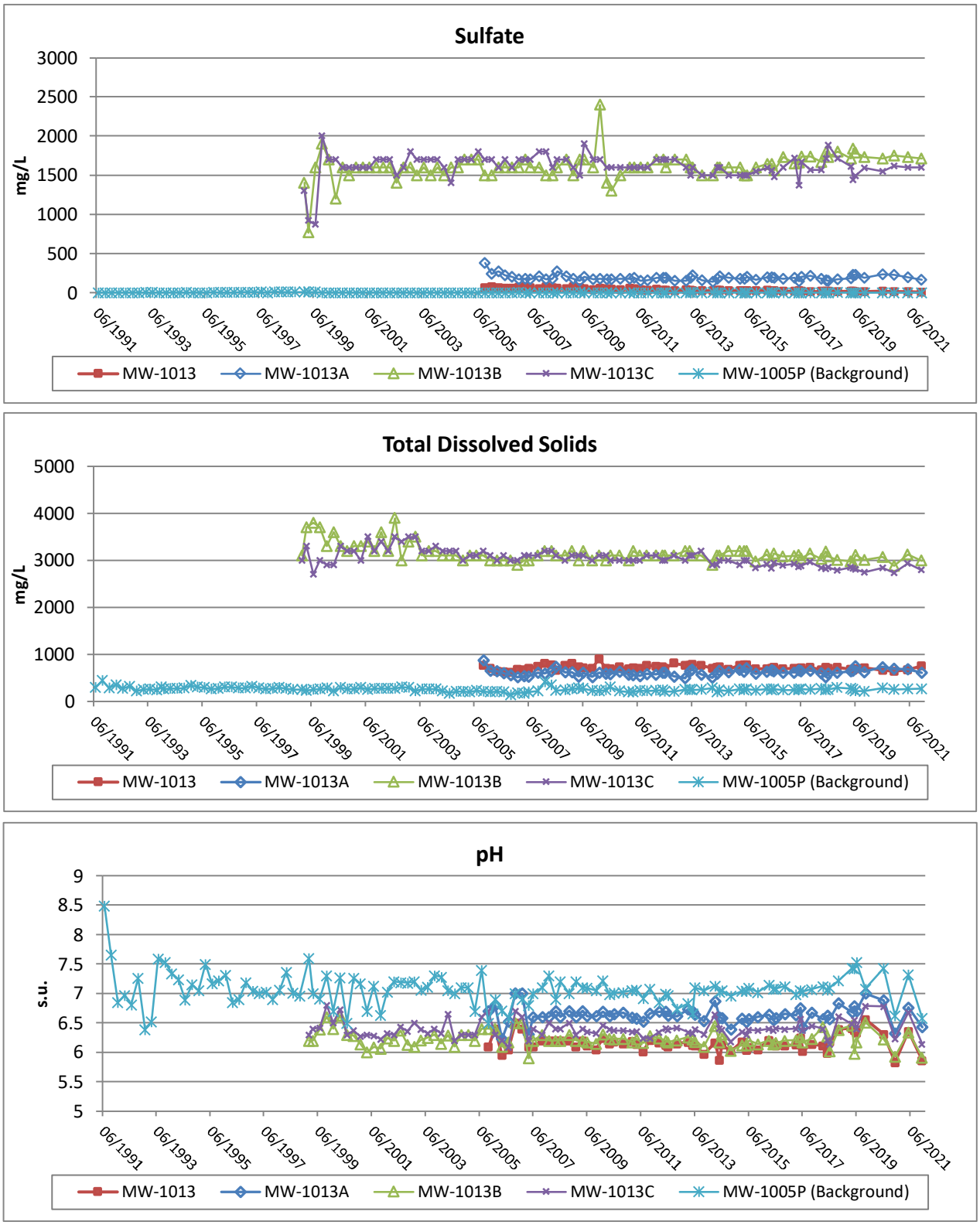

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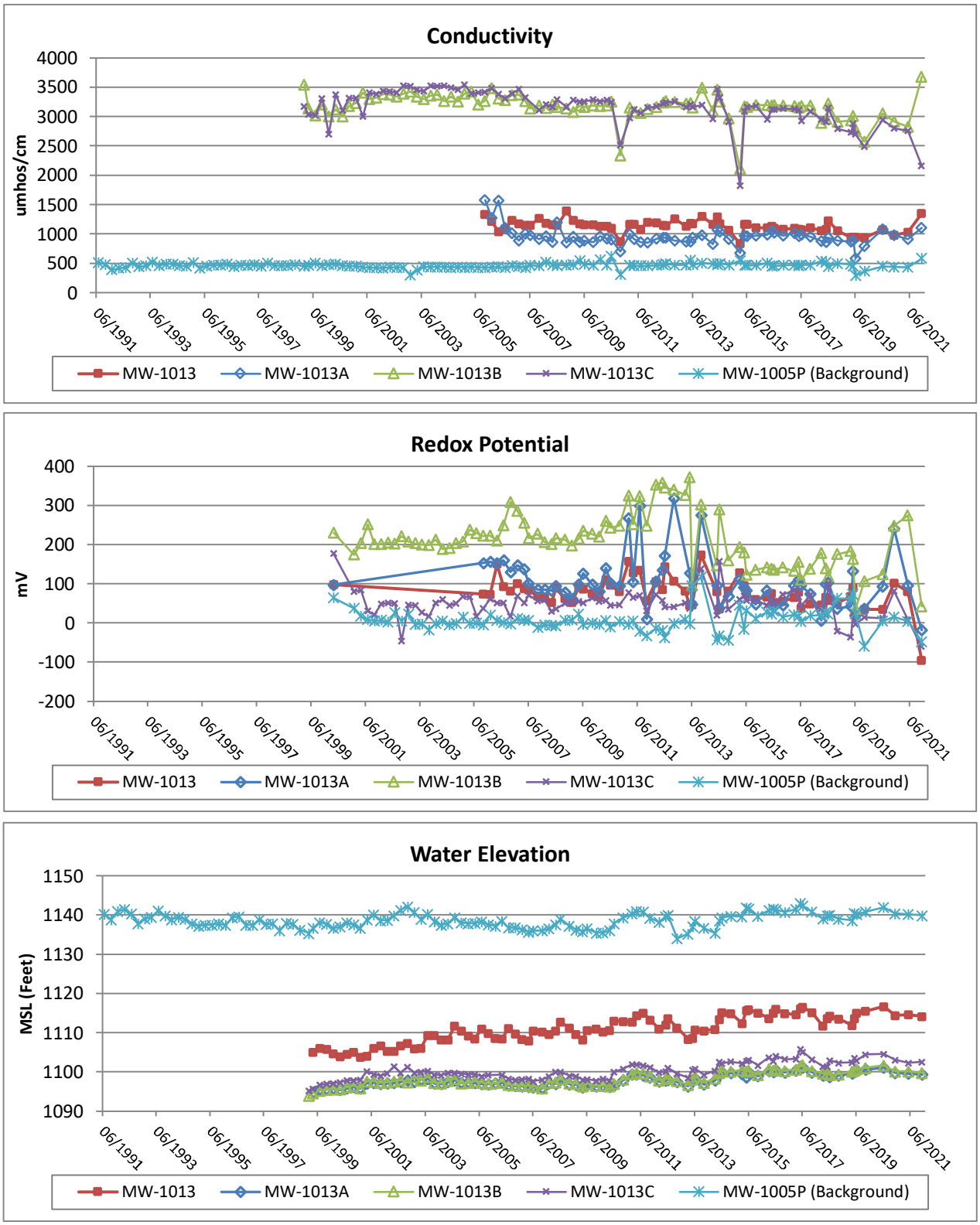
FLAMBEAU MINING COMPANY

Figure B-6c

Groundwater Trend Graphs - Semi-Annual Results (In-Pit Wells)
MW-1013/MW-1013A/MW-1013B/MW-1013C

Scale: NA	Date: January 2022
Prepared By: SGL	Checked By: SVF	Project: 17F777.22



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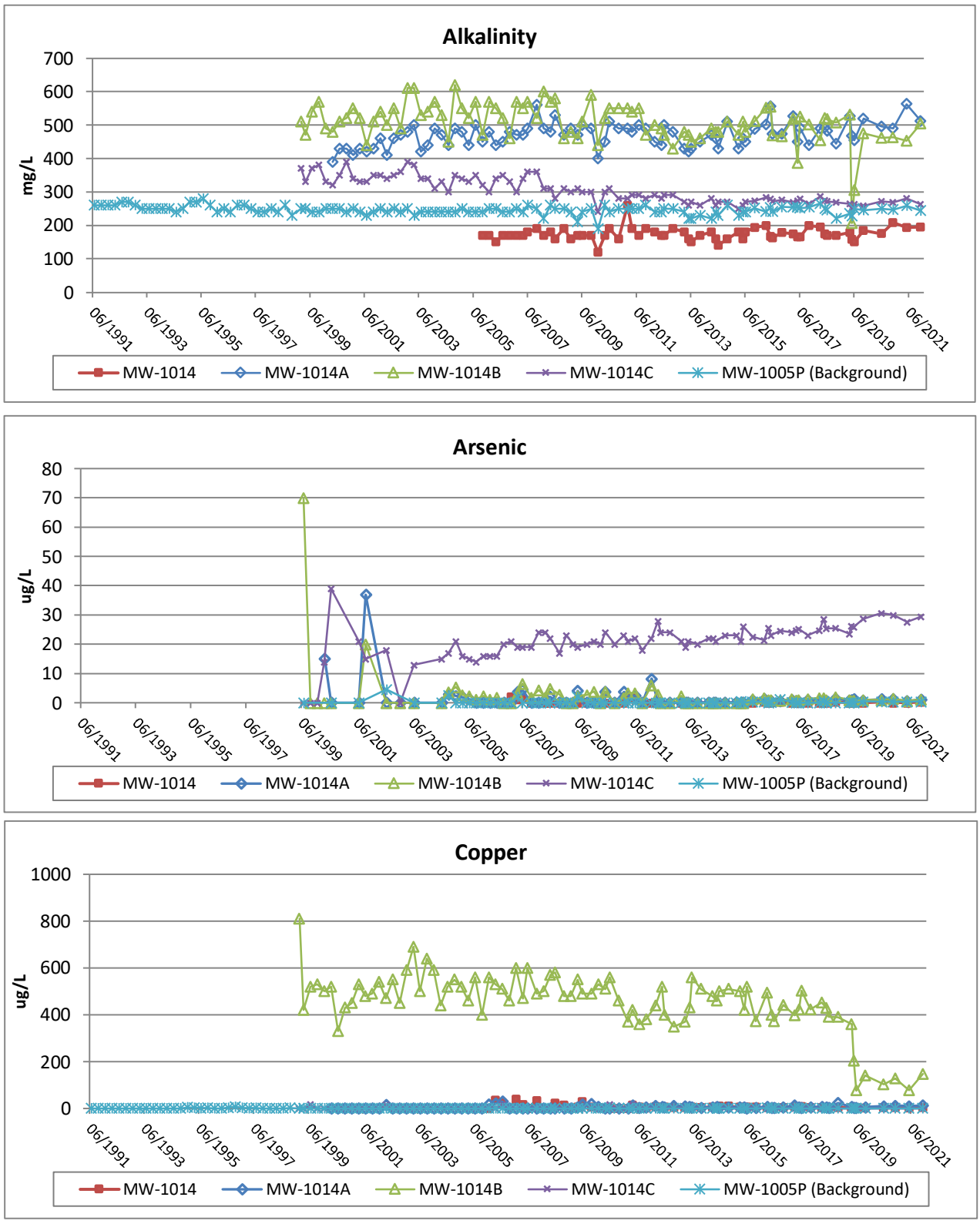
FLAMBEAU MINING COMPANY

Figure B-6d

Groundwater Trend Graphs - Semi-Annual Results (In-Pit Wells)
MW-1013/MW-1013A/MW-1013B/MW-1013C

Scale: NA	Date: January 2022
Prepared By: SGL	Checked By: SVF	Project: 17F777.22



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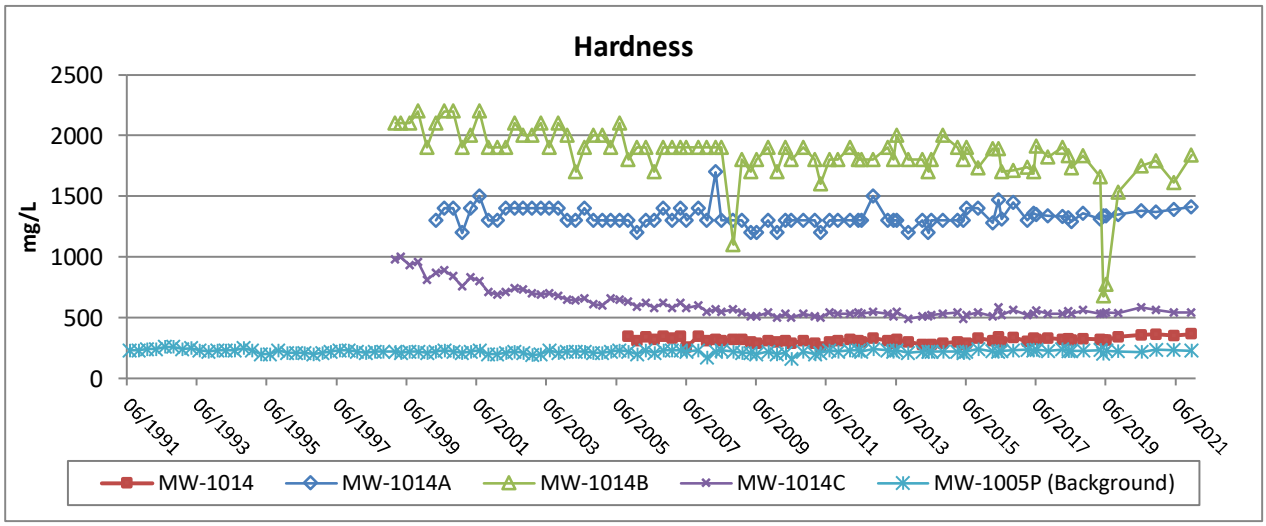
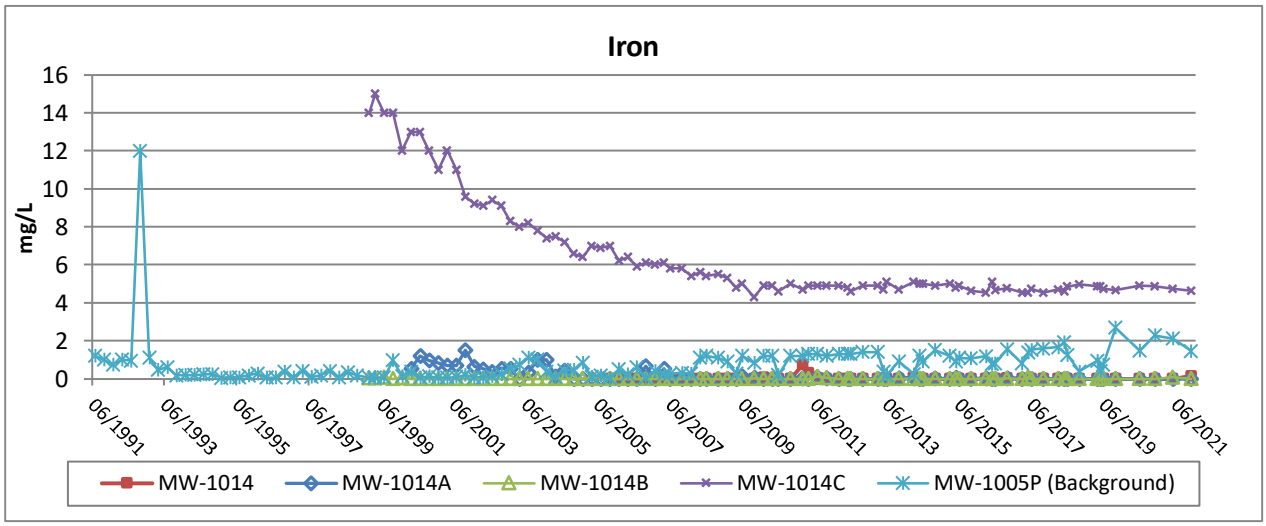
FLAMBEAU MINING COMPANY

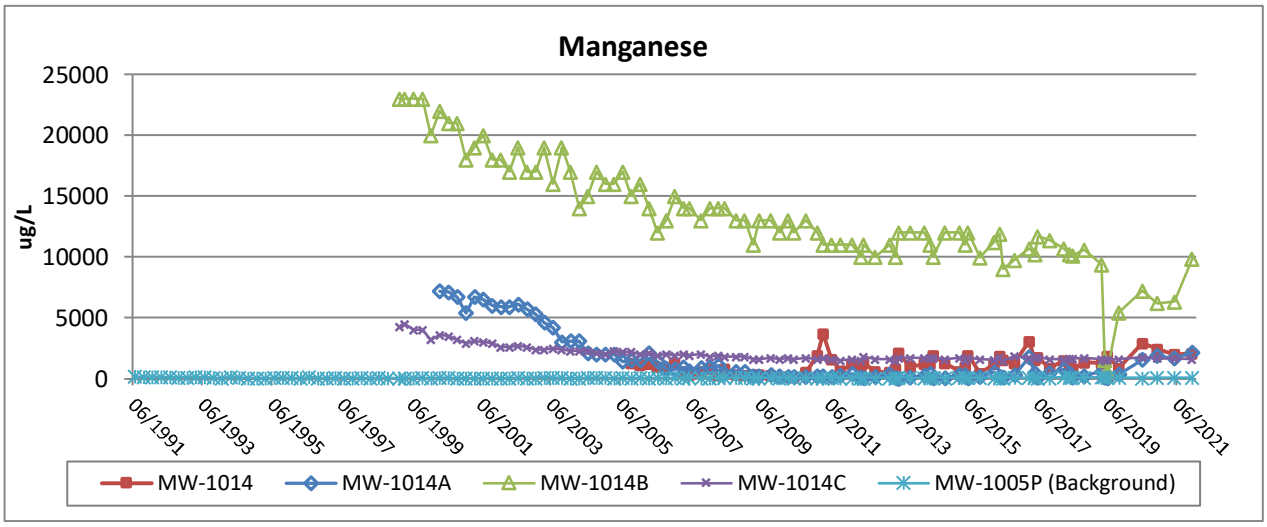
Figure B-7a

Groundwater Trend Graphs - Semi-Annual Results (In-Pit Wells)
MW-1014/MW-1014A/MW-1014B/MW-1014C

Scale: NA	Date: January 2022
Prepared By: SGL	Checked By: SVF	Project: 17F777.22







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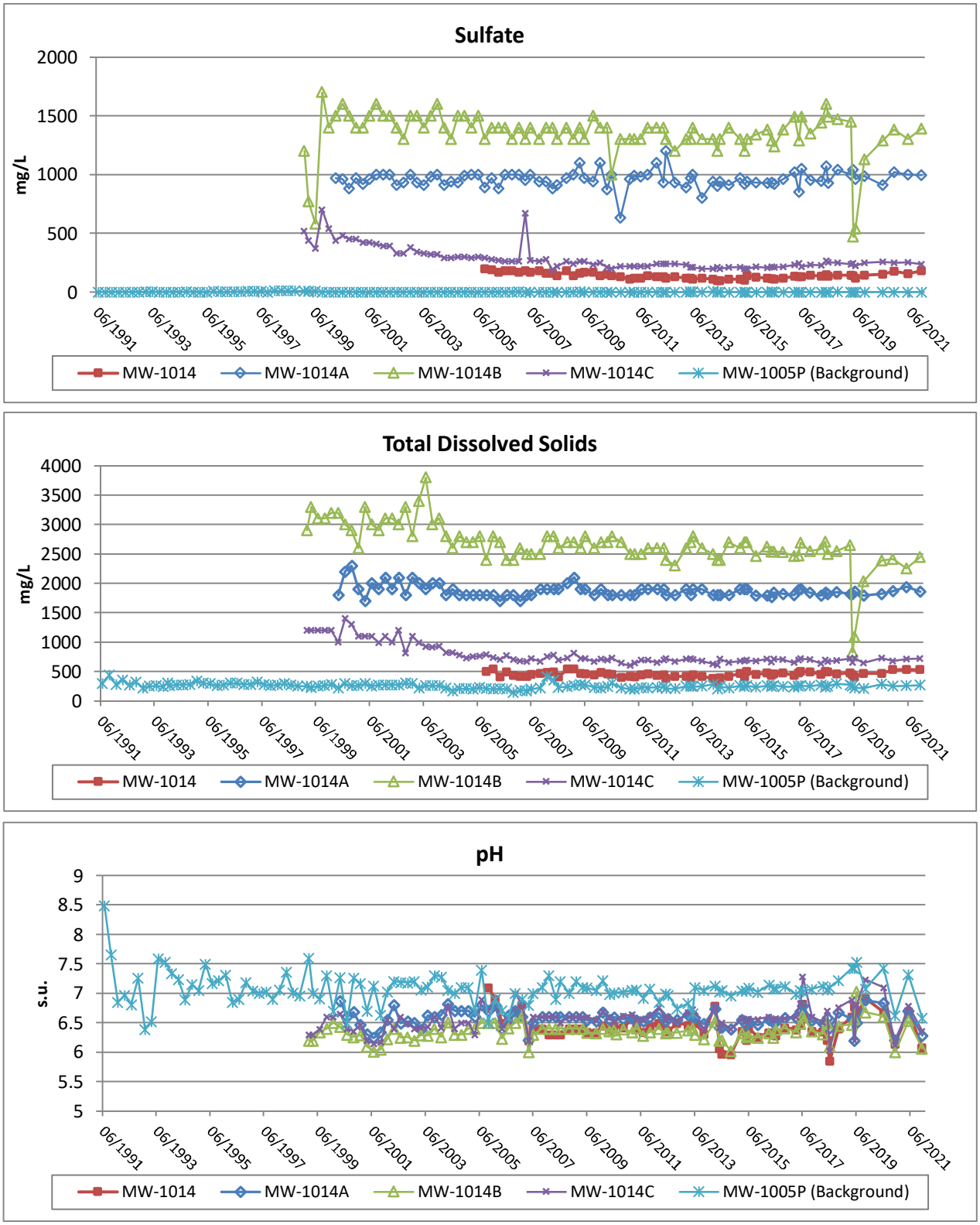
FLAMBEAU MINING COMPANY

Figure B-7b

Groundwater Trend Graphs - Semi-Annual Results (In-Pit Wells)
MW-1014/MW-1014A/MW-1014B/MW-1014C

Scale: NA	Date: January 2022
Prepared By: SGL	Checked By: SVF	Project: 17F777.22



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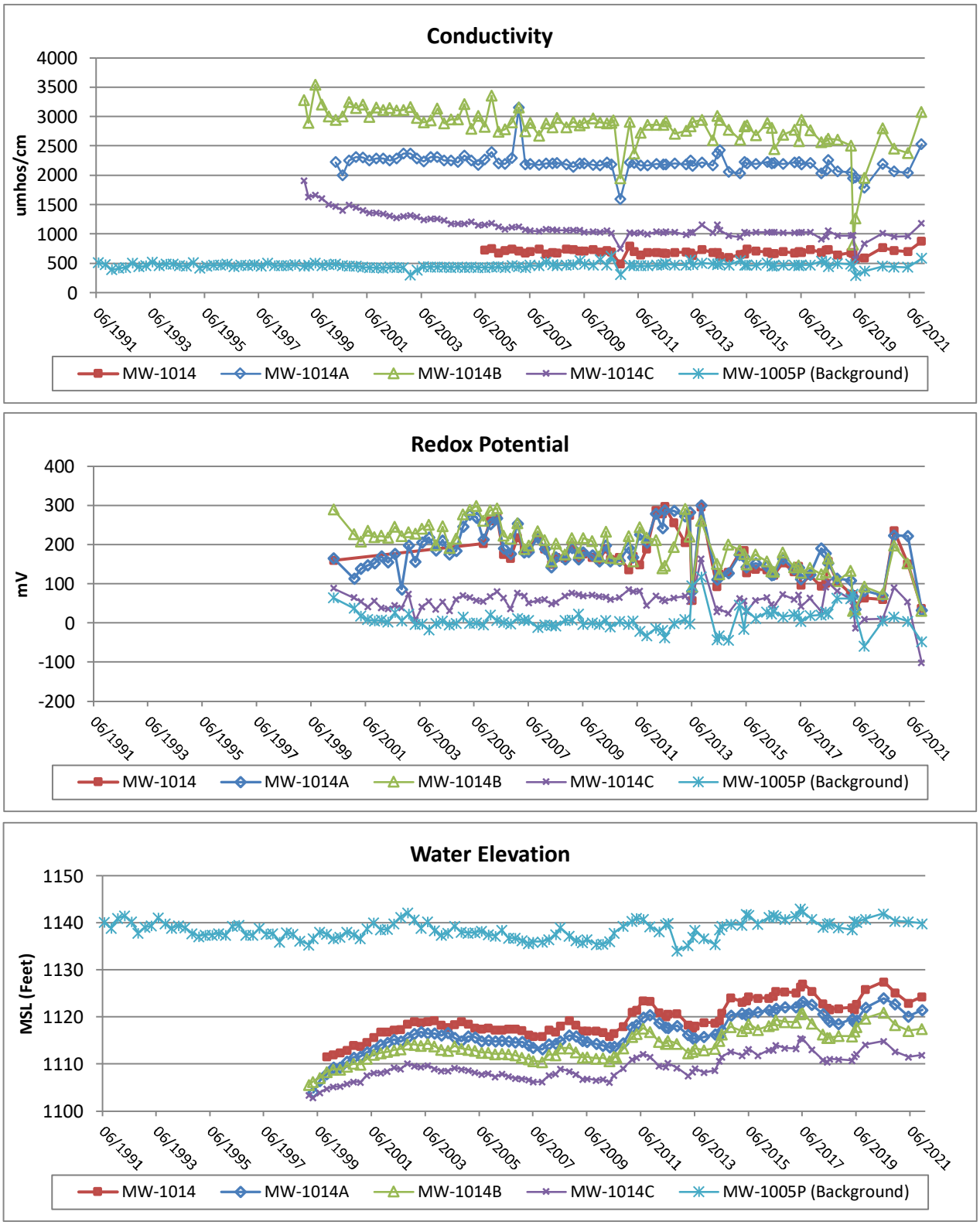
FLAMBEAU MINING COMPANY

Figure B-7c

Groundwater Trend Graphs - Semi-Annual Results (In-Pit Wells)
MW-1014/MW-1014A/MW-1014B/MW-1014C

Scale: NA	Date: January 2022	
Prepared By: SGL	Checked By: SVF	Project: 17F777.22



FLAMBEAU MINING COMPANY		
Figure B-7d Groundwater Trend Graphs - Semi-Annual Results (In-Pit Wells) MW-1014/MW-1014A/MW-1014B/MW-1014C		
Scale: NA	Date: January 2022	
Prepared By: SGL	Checked By: SVF	Project: 17F777.22

2021 Groundwater Results - Semi-Annual Parameters

Sample Date (yyyy-mm)	Location		Water Elevation ft	Alkalinity as CaCO3 mg/l	Arsenic ug/l	Copper ug/l	Hardness mg/l	Iron mg/l	Manganese ug/l	Sulfate mg/l	Total Dissolved Solids mg/l	pH s.u.	Conductivity umhos/cm	Redox Potential mV
2021-05	MW-1000PR		1088.04	219	10.0	2.4	393	0.728	1890	192	538	6.62	708.00	-52.5
2021-05	MW-1000R		1089.43	92.3	< 0.28	11.2	184	< 0.0580	6.7	48.8	348	6.45	418.00	65.5
2021-05	MW-1002		1092.26	64.2	< 0.28	< 1.9	69.0	< 0.0580	< 1.2	3.0	100	7.47	169.00	132.9
2021-05	MW-1002G		1092.11	128	< 0.28	< 1.9	167	< 0.0580	< 1.2	10.1	252	6.94	342.00	99.9
2021-05	MW-1002G	Dup.		130	< 0.28	5.6	162	< 0.0580	< 1.2	10.2	246			
2021-05	MW-1004		1108.37	33.1	< 0.28	3.3	43.6	0.0581	14.9	11.3	96.0	6.83	105.00	309.0
2021-05	MW-1004P		1106.82	178	0.62	< 1.9	151	0.598	132	2.1	182	7.14	292.00	59.4
2021-05	MW-1004S		1108.41	47.9	< 0.28	< 1.9	63.9	< 0.0580	2.2	22.7	94.0	7.53	139.00	95.4
2021-05	MW-1005		1140.99	66.0	0.87	< 1.9	622	13.8	529	17.7	1400	6.40	1791.00	250.4
2021-05	MW-1005P		1140.22	259	0.35	< 1.9	233	2.12	101	< 0.44	260	7.32	432.00	3.5
2021-05	MW-1005S		1140.89	148	2.6	< 1.9	130	3.86	192	4.9	184	6.79	284.00	101.4
2021-05	MW-1010P		1087.77	170	17.1	< 1.9	190	< 0.0580	63.2	33.4	234	7.16	361.00	-50.9
2021-05	MW-1013		1114.59	646	0.76	4.3	538	11.3	25200	13.1	672	6.36	1025.00	79.8
2021-05	MW-1013A		1099.54	394	< 0.28	< 1.9	498	0.0659	5140	196	682	6.76	912.00	95.7
2021-05	MW-1013B		1100.12	647	0.78	352	2120	< 0.0580	24300	1730	3120	6.34	2825.00	274.0
2021-05	MW-1013C		1102.27	579	25.9	< 1.9	2020	15.6	9420	1600	2930	6.68	2753.00	7.6
2021-05	MW-1014		1122.97	194	< 0.28	2.6	355	< 0.0580	1990	157	536	6.69	698.00	151.0
2021-05	MW-1014A		1120.1	563	0.55	10.1	1390	< 0.0580	1680	1000	1940	6.70	2043.00	222.0
2021-05	MW-1014B		1117.04	453	0.62	78.0	1610	0.0769	6350	1300	2250	6.53	2372.00	151.4
2021-05	MW-1014C		1111.49	281	27.6	< 1.9	544	4.72	1670	254	712	6.79	962.00	53.4
2021-05	MW-1014C	Dup.		277	27.1	< 1.9	510	4.71	1620	231	676			
2021-05	MW-1015A		1088.61	98.4	< 0.28	< 1.9	104	< 0.0580	10.8	8.3	126	7.71	180.00	59.4
2021-05	MW-1015B		1088.65	188	< 0.28	< 1.9	155	0.204	47.2	0.86	280	7.53	535.00	90.4
2021-11	MW-1000PR		1088.43	208	10.7	5.2	380	0.749	2010	184	498	6.64	829.72	-49.2
2021-11	MW-1000R		1089.61	136	< 0.28	26.4	241	< 0.0580	508	54.9	350	6.71	645.49	35.2
2021-11	MW-1002		1091.08	57.4	< 0.28	< 1.9	70.6	< 0.0580	< 1.2	2.7	100	6.74	177.02	50
2021-11	MW-1002G		1090.93	121	< 0.28	< 1.9	168	< 0.0580	< 1.2	10.2	212	6.47	418.93	60.2
2021-11	MW-1002G	Dup.		122	< 0.28	< 1.9	169	< 0.0580	< 1.2	10.2	212			
2021-11	MW-1004		1107.91	37.8	< 0.28	3.8	49.4	< 0.0580	< 1.2	17.5	68.0	6.35	139.87	42.6
2021-11	MW-1004P		1106.36	163	1.0	< 1.9	147	0.527	142	2.0	150	6.26	347.96	44
2021-11	MW-1004S		1107.98	37.1	< 0.28	2.1	55.7	< 0.0580	< 1.2	22.6	74.0	6.35	147.82	42.9
2021-11	MW-1005		1140.37	75.8	1.1	7.5	611	14.1	545	17.0	1280	5.4	2304.5	-9
2021-11	MW-1005P		1139.89	244	0.44	< 1.9	229	1.45	97.6	< 0.44	266	6.58	584.99	-48.1
2021-11	MW-1005S		1139.65	144	2.2	< 1.9	141	3.52	193	5.1	184	6.31	346.5	-54.7
2021-11	MW-1010P		1088.21	155	15.3	< 1.9	190	< 0.0580	66.5	38.1	228	6.86	394.32	38.4
2021-11	MW-1013		1114.2	625	1.6	3.0	544	23.1	29300	9.5	754	5.86	1350	-95.9
2021-11	MW-1013A		1099.33	366	< 0.28	< 1.9	421	< 0.0580	4320	163	608	6.43	1105	-17.8
2021-11	MW-1013B		1099.82	581	1.4	330	2210	0.0760	23800	1710	2990	5.91	3675.5	42
2021-11	MW-1013C		1102.58	535	25.4	< 1.9	2080	15.1	8800	1600	2790	6.14	2158.9	-61.1
2021-11	MW-1014		1124.3	195	0.30	4.4	368	0.147	2070	180	530	6.08	877.35	36.8
2021-11	MW-1014A		1121.48	512	1.1	12.7	1410	< 0.0580	2150	994	1860	6.28	2526.7	32.8
2021-11	MW-1014B		1117.52	505	1.2	148	1840	< 0.0580	9860	1390	2450	6.06	3072.2	30.6
2021-11	MW-1014C		1111.9	262	29.5	< 1.9	540	4.62	1610	236	718	6.36	1181	-102.2
2021-11	MW-1014C	Dup.		260	29.4	< 1.9	540	4.59	1610	237	742			
2021-11	MW-1015A		1088.22	88.3	< 0.28	< 1.9	103	< 0.0580	11.3	9.3	124	6.96	238.54	39.7
2021-11	MW-1015B		1088.38	171	< 0.28	< 1.9	152	0.0649	40.4	< 0.44	262	7.09	670.21	35.8

Attachment 2
Groundwater - Annual Parameters

Trend Analysis

Trend Graphs

2021 Data

Trend Analysis Results - Groundwater (Annual Parameters)
Year Ending 2021

	Calcium	Chloride	Lead	Magnesium	Potassium	Zinc
MW-1000PR						
Trend Results for Most Recent 5 Years						
Sample Size	5	5	5	5	5	5
Mann-Kendall S	-3	-7	1	-6	-4	-6
p-Level	0.650	0.159	1.000	0.234	0.484	0.234
Trend						
Trend Results for All Data Since Oct. 1997						
Sample Size	27	21	27	27	19	35
Mann-Kendall S	-287	-19	59	-296	-36	-402
p-Level	0.000	0.591	0.230	0.000	0.224	0.000
Trend	-			-		-
MW-1000R						
Trend Results for Most Recent 5 Years						
Sample Size	5	5	5	5	5	5
Mann-Kendall S	0	8	2	0	-2	0
p-Level	1	0.084	0.816	1	0.816	1
Trend						
Trend Results for All Data Since Oct. 1997						
Sample Size	11	11	11	11	11	11
Mann-Kendall S	-15	33	-1	-17	-20	-4
p-Level	0.282	0.01	1	0.218	0.142	0.821
Trend		+				
MW-1010P						
Trend Results for Most Recent 5 Years						
Sample Size	5	5	5	5	5	5
Mann-Kendall S	4	-1	4	-5	-7	0
p-Level	0.484	1.000	0.484	0.359	0.159	1.000
Trend						
Trend Results for All Data Since Oct. 1997						
Sample Size	27	21	27	27	19	35
Mann-Kendall S	249	102	33	239	-4	63
p-Level	0.000	0.002	0.508	0.000	0.918	0.382
Trend	+	+		+		
MW-1002						
Trend Results for Most Recent 5 Years						
Sample Size	5	5	5	5	5	5
Mann-Kendall S	-2	2	0	-2	2	0
p-Level	0.816	0.816	1.000	0.816	0.816	1.000
Trend						
Trend Results for All Data Since Oct. 1997						
Sample Size	22	18	23	22	18	33
Mann-Kendall S	58	91	4	69	25	0
p-Level	0.109	0.000	0.937	0.054	0.368	1.000
Trend		+				
MW-1002G						
Trend Results for Most Recent 5 Years						
Sample Size	5	5	5	5	5	5
Mann-Kendall S	7	-2	0	8	2	0
p-Level	0.159	0.816	1.000	0.084	0.816	1.000
Trend						
Trend Results for All Data Since Oct. 1997						
Sample Size	22	18	23	22	18	33
Mann-Kendall S	152	111	0	154	20	-22
p-Level	0.000	0.000	1.000	0.000	0.477	0.746
Trend	+	+		+		

Trend Analysis Results - Groundwater (Annual Parameters)
Year Ending 2021

	Calcium	Chloride	Lead	Magnesium	Potassium	Zinc
MW-1004						
Trend Results for Most Recent 5 Years						
Sample Size	5	5	5	5	5	5
Mann-Kendall S	2	3	0	-2	2	0
p-Level	0.816	0.65	1	0.816	0.816	1
Trend						
Trend Results for All Data Since Oct. 1997						
Sample Size	11	11	11	11	11	11
Mann-Kendall S	-16	28	0	-21	6	0
p-Level	0.25	0.033	1	0.12	0.705	1
Trend						
MW-1004S						
Trend Results for Most Recent 5 Years						
Sample Size	5	5	5	5	5	5
Mann-Kendall S	6	-3	0	2	-2	0
p-Level	0.234	0.650	1.000	0.816	0.816	1.000
Trend						
Trend Results for All Data Since Oct. 1997						
Sample Size	25	19	25	25	19	34
Mann-Kendall S	77	-101	13	56	-43	0
p-Level	0.076	0.000	0.782	0.202	0.144	1.000
Trend		-				
MW-1004P						
Trend Results for Most Recent 5 Years						
Sample Size	5	5	5	5	5	5
Mann-Kendall S	2	-1	0	0	4	0
p-Level	0.816	1.000	1.000	1.000	0.484	1.000
Trend						
Trend Results for All Data Since Oct. 1997						
Sample Size	25	19	25	25	19	34
Mann-Kendall S	133	56	0	89	32	3
p-Level	0.002	0.054	1.000	0.039	0.282	0.976
Trend	+					
MW-1005						
Trend Results for Most Recent 5 Years						
Sample Size	5	5	5	5	5	5
Mann-Kendall S	0	-1	0	0	2	0
p-Level	1.000	1.000	1.000	1.000	0.816	1.000
Trend						
Trend Results for All Data Since Oct. 1997						
Sample Size	22	18	23	22	18	33
Mann-Kendall S	107	92	3	112	97	22
p-Level	0.002	0.000	0.958	0.002	0.000	0.746
Trend	+	+		+	+	
MW-1005S						
Trend Results for Most Recent 5 Years						
Sample Size	5	5	5	5	5	5
Mann-Kendall S	-8	-1	-4	-4	-5	0
p-Level	0.084	1.000	0.484	0.484	0.359	1.000
Trend						
Trend Results for All Data Since Oct. 1997						
Sample Size	22	18	23	22	18	33
Mann-Kendall S	-58	40	17	-44	-50	0
p-Level	0.109	0.142	0.676	0.229	0.063	1.000
Trend						

Trend Analysis Results - Groundwater (Annual Parameters)
Year Ending 2021

	Calcium	Chloride	Lead	Magnesium	Potassium	Zinc
MW-1005P						
Trend Results for Most Recent 5 Years						
Sample Size	5	5	5	5	5	5
Mann-Kendall S	0	2	0	-6	0	0
p-Level	1.000	0.816	1.000	0.234	1.000	1.000
Trend						
Trend Results for All Data Since Oct. 1997						
Sample Size	23	18	23	23	18	33
Mann-Kendall S	38	39	16	41	24	29
p-Level	0.333	0.152	0.695	0.294	0.389	0.667
Trend						
MW-1015A						
Trend Results for Most Recent 5 Years						
Sample Size	5	5	5	5	5	5
Mann-Kendall S	6	4	0	7	8	0
p-Level	0.234	0.484	1.000	0.159	0.084	1.000
Trend						
Trend Results for All Data Since Oct. 1997						
Sample Size	22	17	32	22	17	37
Mann-Kendall S	80	51	24	108	-43	0
p-Level	0.024	0.038	0.712	0.002	0.084	1.000
Trend				+		
MW-1015B						
Trend Results for Most Recent 5 Years						
Sample Size	5	5	5	5	5	5
Mann-Kendall S	2	-10	0	-4	2	0
p-Level	0.816	0.016	1.000	0.484	0.816	1.000
Trend		-				
Trend Results for All Data Since Oct. 1997						
Sample Size	22	17	32	22	17	37
Mann-Kendall S	121	47	17	129	6	0
p-Level	0.000	0.058	0.797	0.000	0.840	1.000
Trend	+			+		
MW-1013						
Trend Results for Most Recent 5 Years						
Sample Size	5	5	5	5	5	5
Mann-Kendall S	-2	-2	-2	-4	-2	0
p-Level	0.816	0.816	0.816	0.484	0.816	1.000
Trend						
Trend Results for All Data Since Oct. 1997						
Sample Size	17	17	17	17	16	17
Mann-Kendall S	-7	-106	-45	12	-28	4
p-Level	0.808	0.000	0.070	0.656	0.228	0.904
Trend		-				
MW-1013A						
Trend Results for Most Recent 5 Years						
Sample Size	5	5	5	5	5	5
Mann-Kendall S	4	-2	0	4	0	0
p-Level	0.484	0.816	1.000	0.484	1.000	1.000
Trend						
Trend Results for All Data Since Oct. 1997						
Sample Size	17	17	17	17	16	17
Mann-Kendall S	10	-11	-19	14	0	-5
p-Level	0.716	0.686	0.465	0.598	1.000	0.872
Trend						

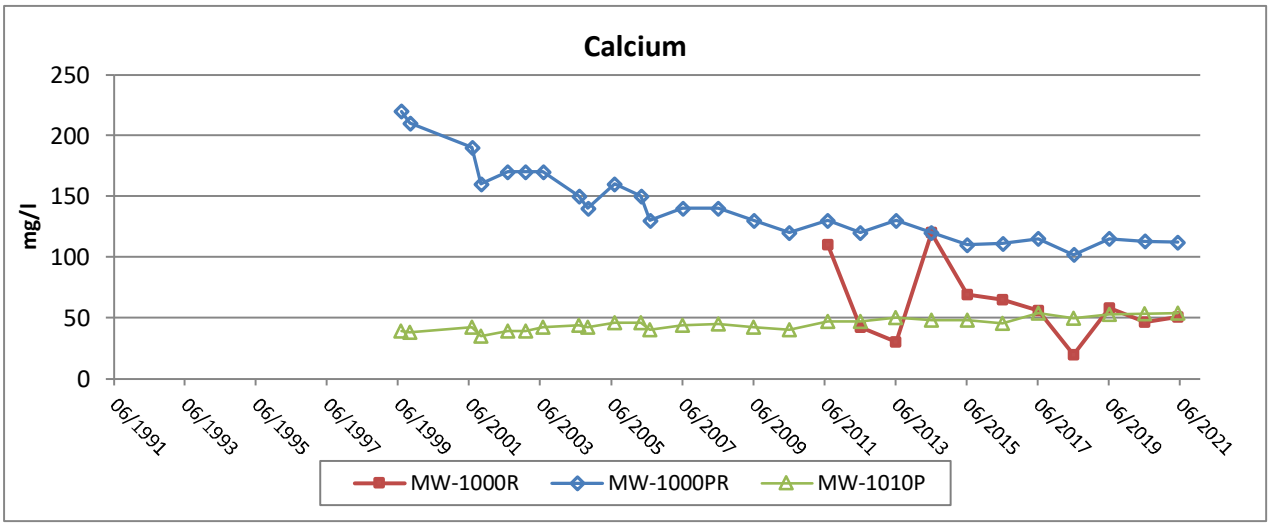
Trend Analysis Results - Groundwater (Annual Parameters)
Year Ending 2021

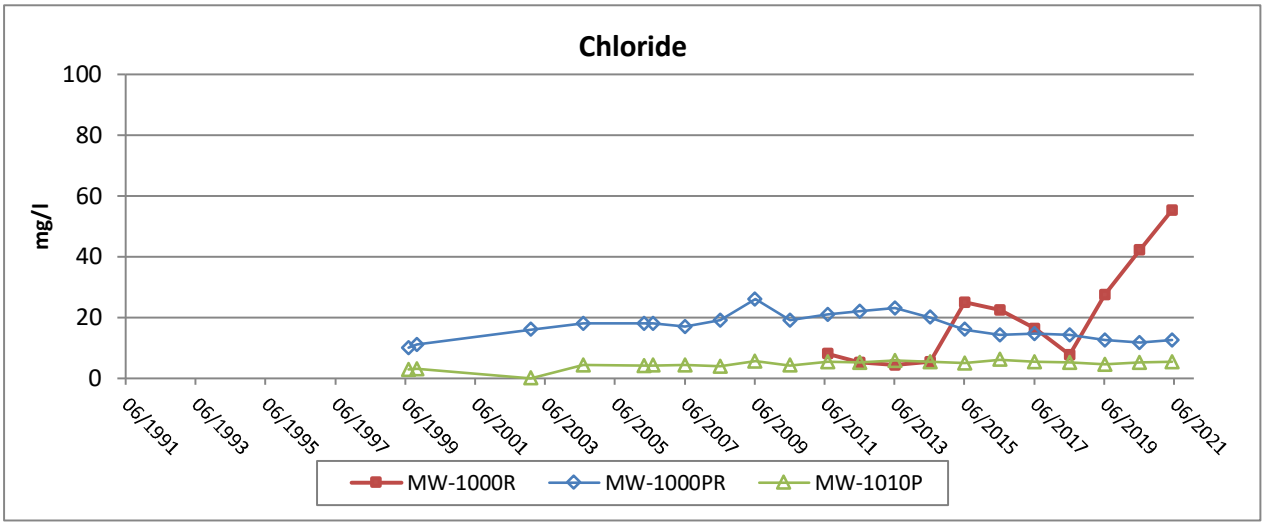
	Calcium	Chloride	Lead	Magnesium	Potassium	Zinc
MW-1013B						
Trend Results for Most Recent 5 Years						
Sample Size	5	5	5	5	5	5
Mann-Kendall S	5	-1	0	2	2	0
p-Level	0.359	1.000	1.000	0.816	0.816	1.000
Trend						
Trend Results for All Data Since Oct. 1997						
Sample Size	30	24	29	30	22	37
Mann-Kendall S	-80	25	24	-115	-81	235
p-Level	0.160	0.556	0.668	0.042	0.022	0.002
Trend						+
MW-1013C						
Trend Results for Most Recent 5 Years						
Sample Size	5	5	5	5	5	5
Mann-Kendall S	5	-8	-2	-2	0	-4
p-Level	0.359	0.084	0.816	0.816	1.000	0.484
Trend						
Trend Results for All Data Since Oct. 1997						
Sample Size	30	24	29	30	22	37
Mann-Kendall S	-42	4	63	-221	-36	-327
p-Level	0.467	0.942	0.248	0.000	0.328	0.000
Trend				-		-
MW-1014						
Trend Results for Most Recent 5 Years						
Sample Size	5	5	5	5	5	5
Mann-Kendall S	4	-4	0	4	4	-7
p-Level	0.484	0.484	1.000	0.484	0.484	0.159
Trend						
Trend Results for All Data Since Oct. 1997						
Sample Size	17	17	17	17	16	17
Mann-Kendall S	28	90	-2	35	-15	-27
p-Level	0.270	0.000	0.968	0.164	0.535	0.289
Trend		+				
MW-1014A						
Trend Results for Most Recent 5 Years						
Sample Size	5	5	5	5	5	5
Mann-Kendall S	6	2	4	4	-2	8
p-Level	0.234	0.816	0.484	0.484	0.816	0.084
Trend						
Trend Results for All Data Since Oct. 1997						
Sample Size	27	21	26	27	19	34
Mann-Kendall S	-32	17	27	-29	-39	214
p-Level	0.522	0.633	0.570	0.562	0.186	0.002
Trend						+
MW-1014B						
Trend Results for Most Recent 5 Years						
Sample Size	5	5	5	5	5	5
Mann-Kendall S	-4	-4	0	-4	-6	-4
p-Level	0.484	0.484	1.000	0.484	0.234	0.484
Trend						
Trend Results for All Data Since Oct. 1997						
Sample Size	30	23	29	30	22	37
Mann-Kendall S	-224	41	50	-286	-97	-472
p-Level	0.000	0.294	0.362	0.000	0.006	0.000
Trend	-			-	-	-

Trend Analysis Results - Groundwater (Annual Parameters)
Year Ending 2021

	Calcium	Chloride	Lead	Magnesium	Potassium	Zinc
MW-1014C						
Trend Results for Most Recent 5 Years						
Sample Size	5	5	5	5	5	5
Mann-Kendall S	3	0	0	-2	0	-6
p-Level	0.650	1.000	1.000	0.816	1.000	0.234
Trend						
Trend Results for All Data Since Oct. 1997						
Sample Size	30	24	29	30	22	37
Mann-Kendall S	-278	183	-1	-330	-89	-632
p-Level	0.000	0.000	0.993	0.000	0.012	0.000
Trend	-	+		-		-

Notes: Overall increasing trend denoted by "+".
Overall decreasing trend denoted by "-"
Long term trend tests performed at a Type I (two-tailed) error rate of 0.01.
5-Year Trend tests performed at a Type I (two-tailed) error rate of 0.05.
N/A - No trend test performed due to insufficient data.





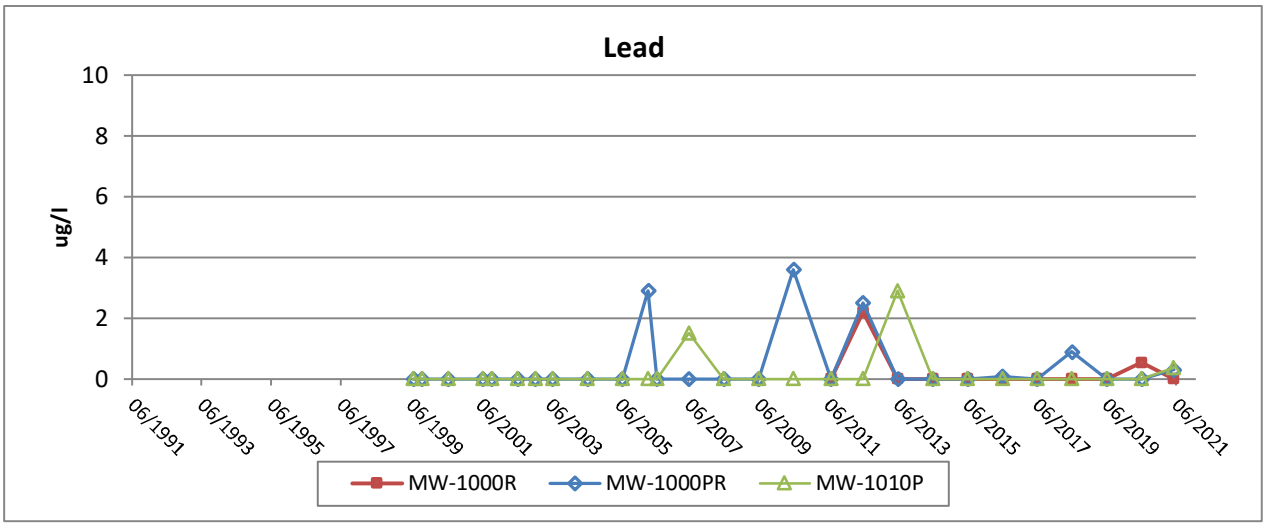


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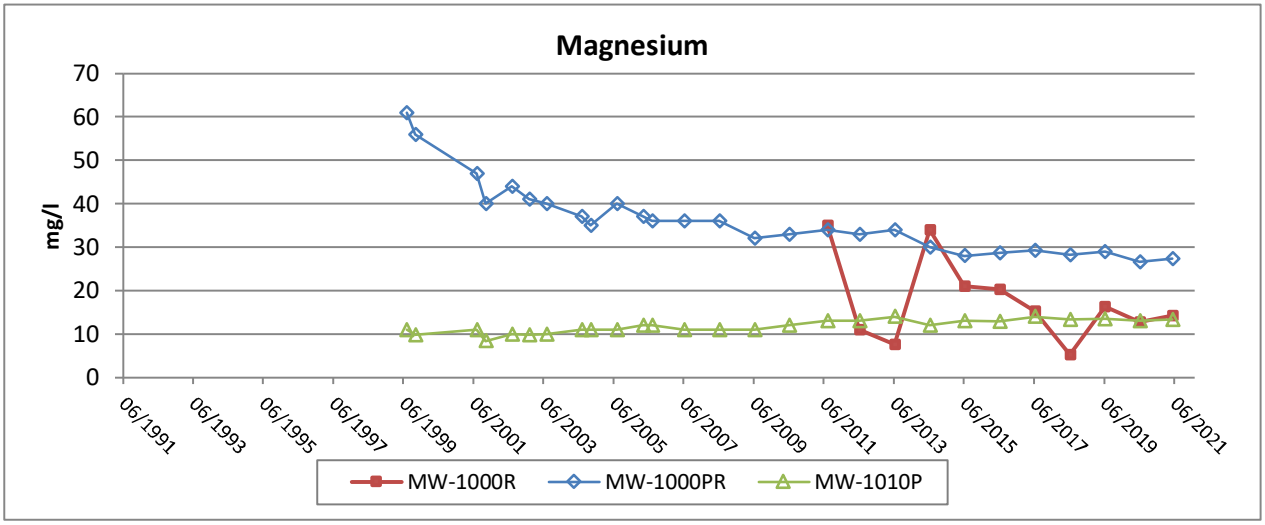
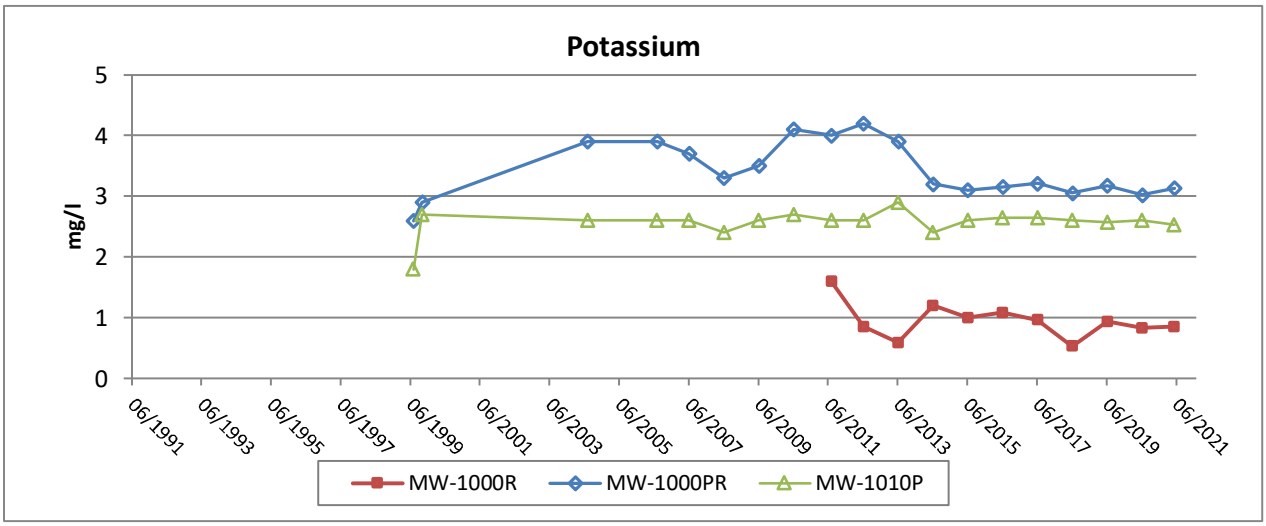
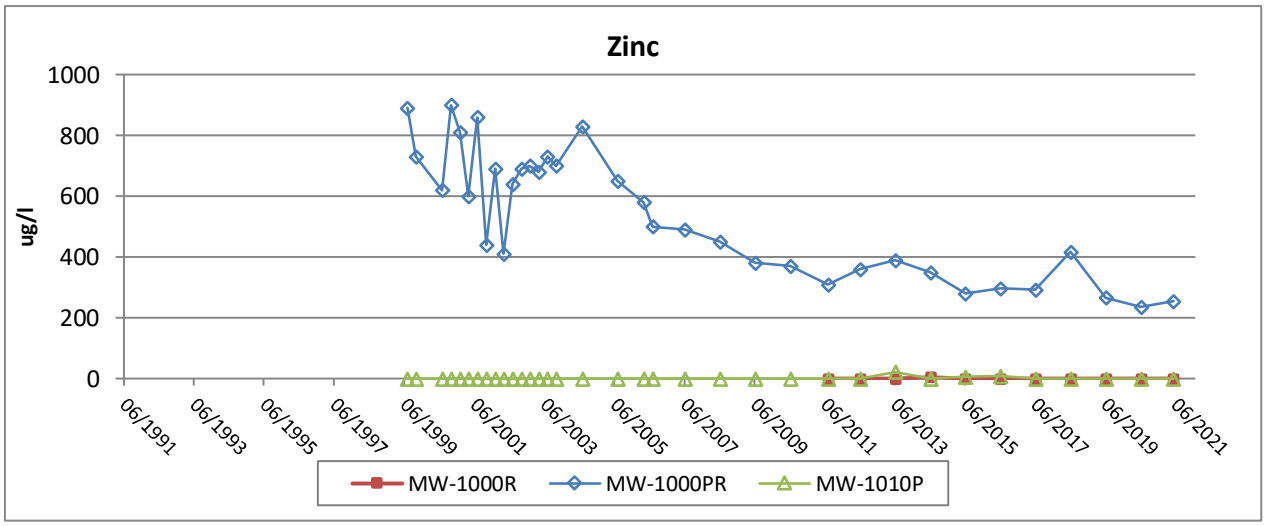
Figure B-8a
Groundwater Trend Graphs - Annual Results
MW-1000R/MW-1000PR/MW-1010P

Scale: NA	Date: January 2022	
Prepared By: SGL	Checked By: SVF	Project: 17F777.22







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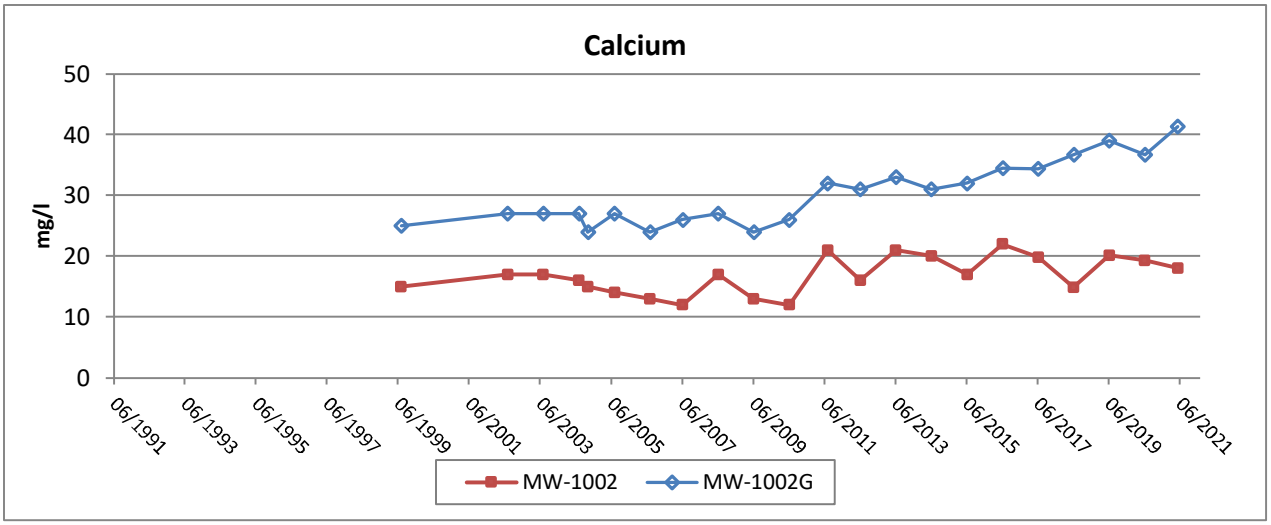
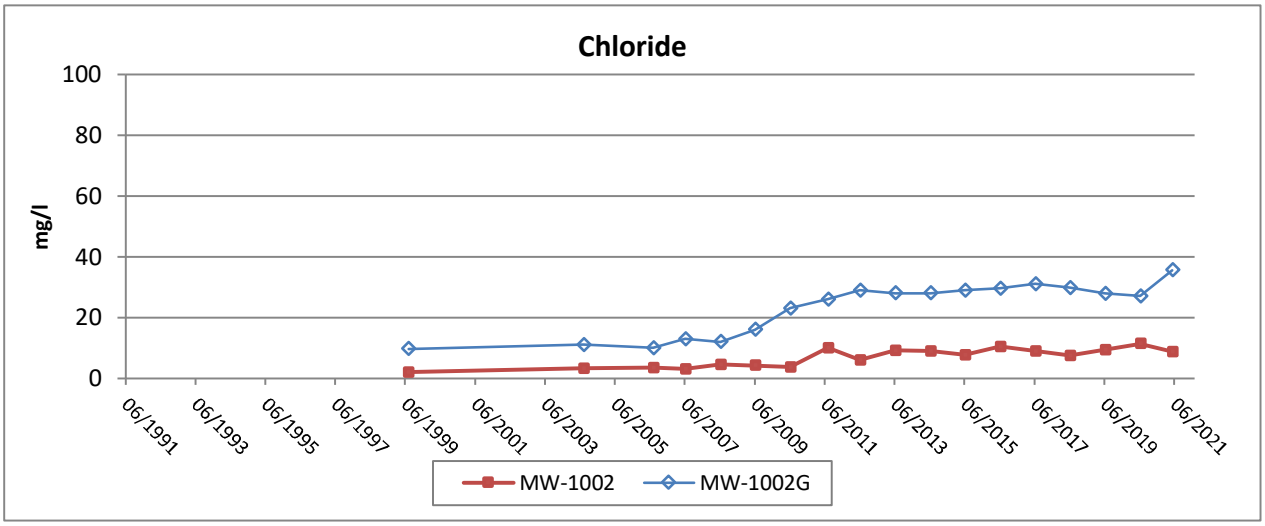
FLAMBEAU MINING COMPANY

Figure B-8b
Groundwater Trend Graphs - Annual Results
MW-1000R/MW-1000PR/MW-1010P

Scale: NA	Date: January 2022	
Prepared By: SGL	Checked By: SVF	Project: 17F777.22





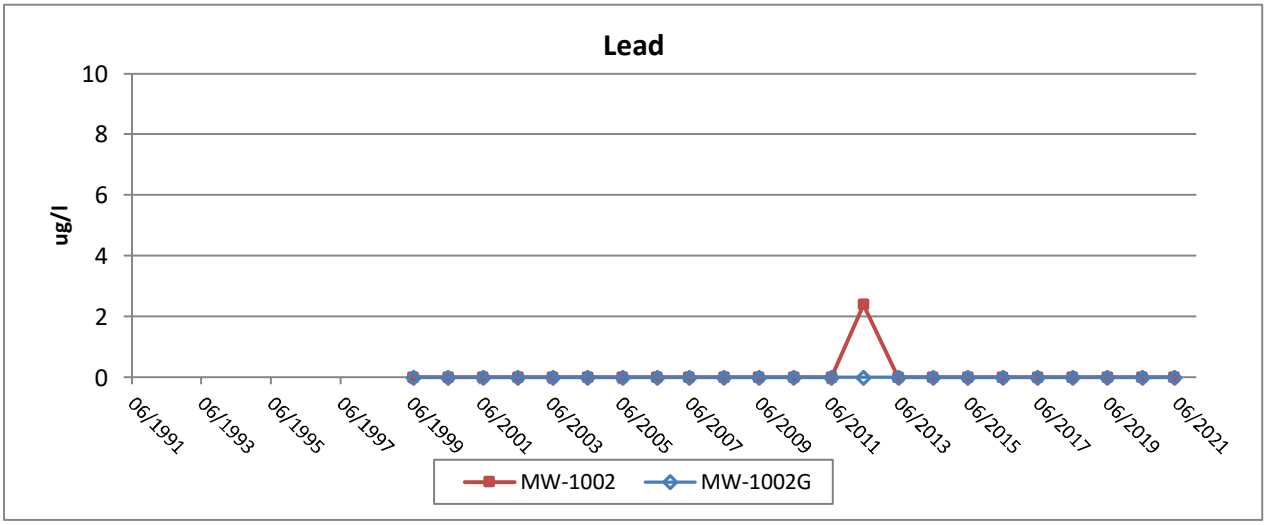


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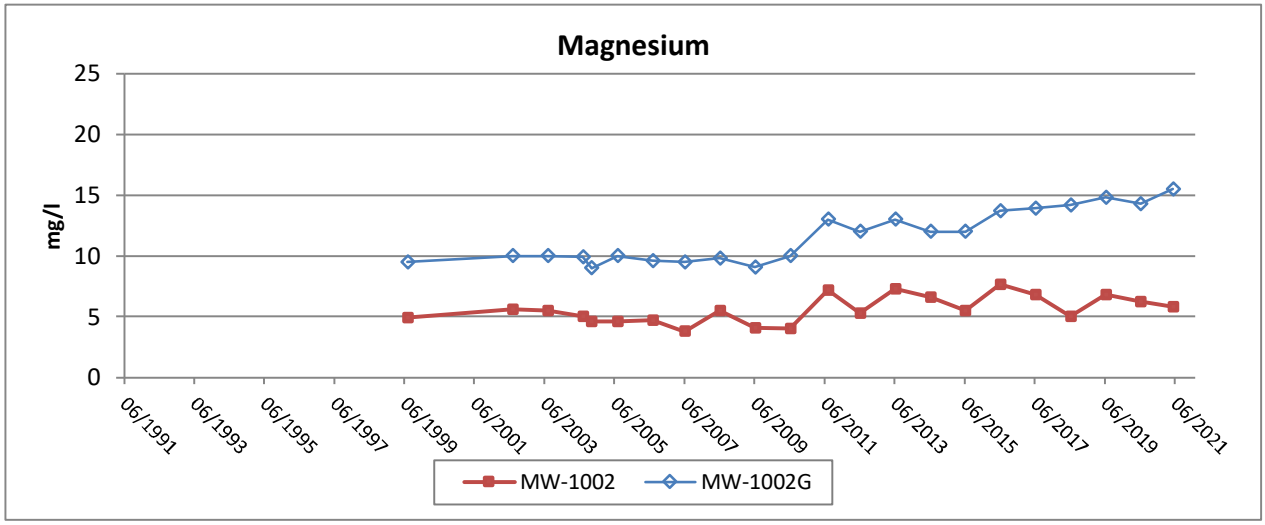
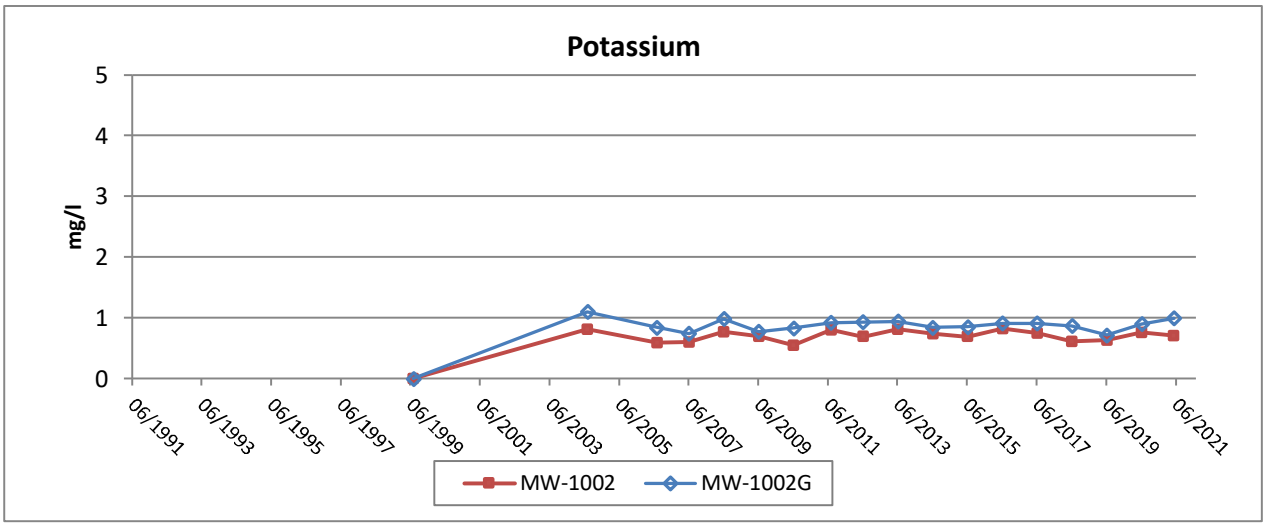
Figure B-9a
Groundwater Trend Graphs - Annual Results
MW-1002/MW-1002G

Scale: NA	Date: January 2022	
Prepared By: SGL	Checked By: SVF	Project: 17F777.22





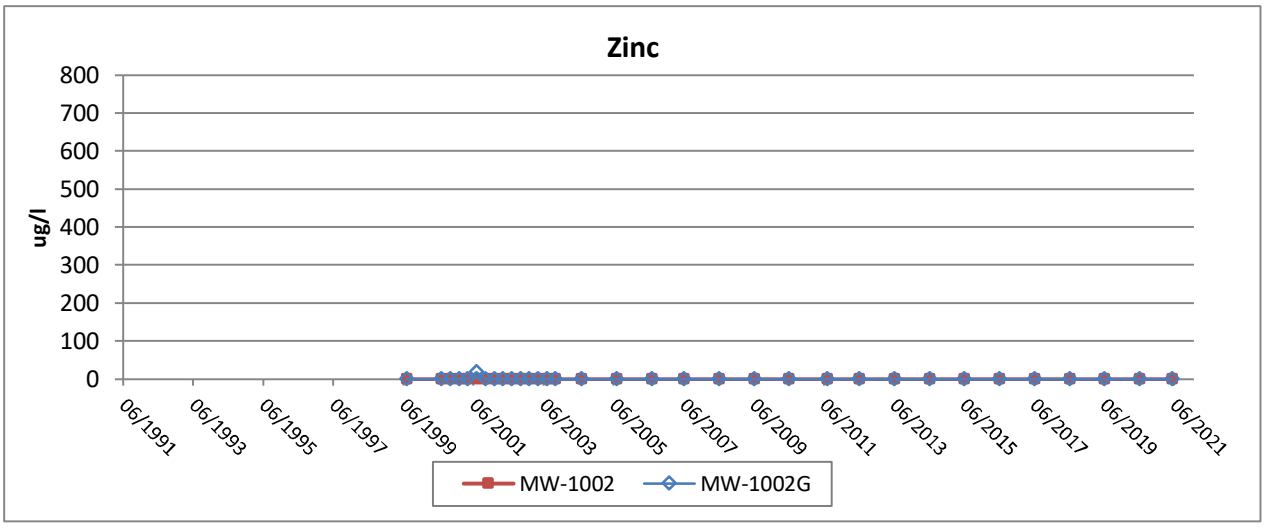


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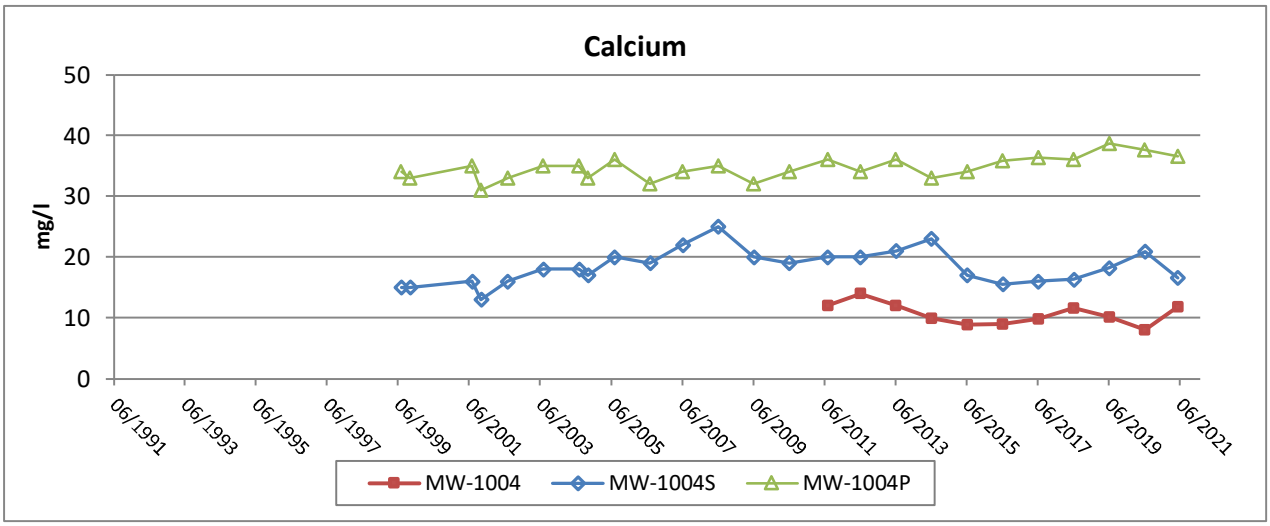
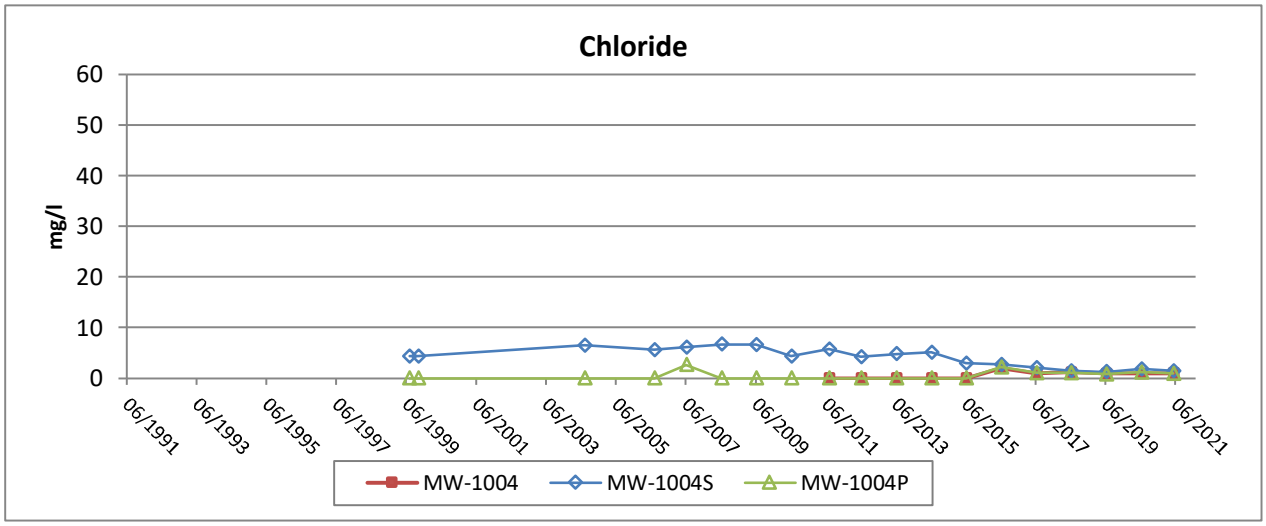
Figure B-9b
Groundwater Trend Graphs - Annual Results
MW-1002/MW-1002G

Scale: NA	Date: January 2022	
Prepared By: SGL	Checked By: SVF	Project: 17F777.22





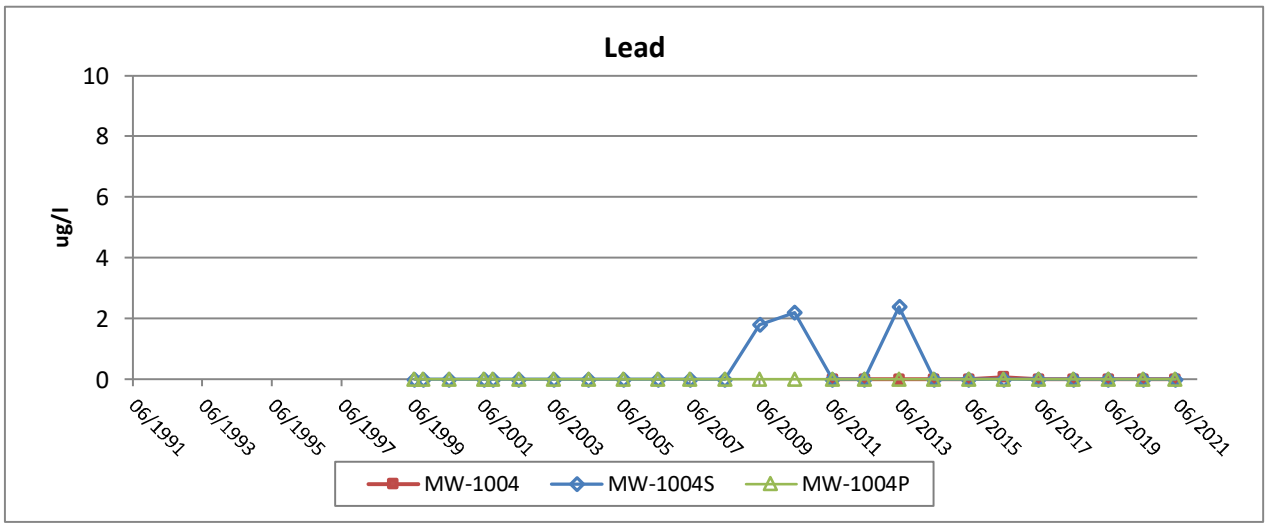


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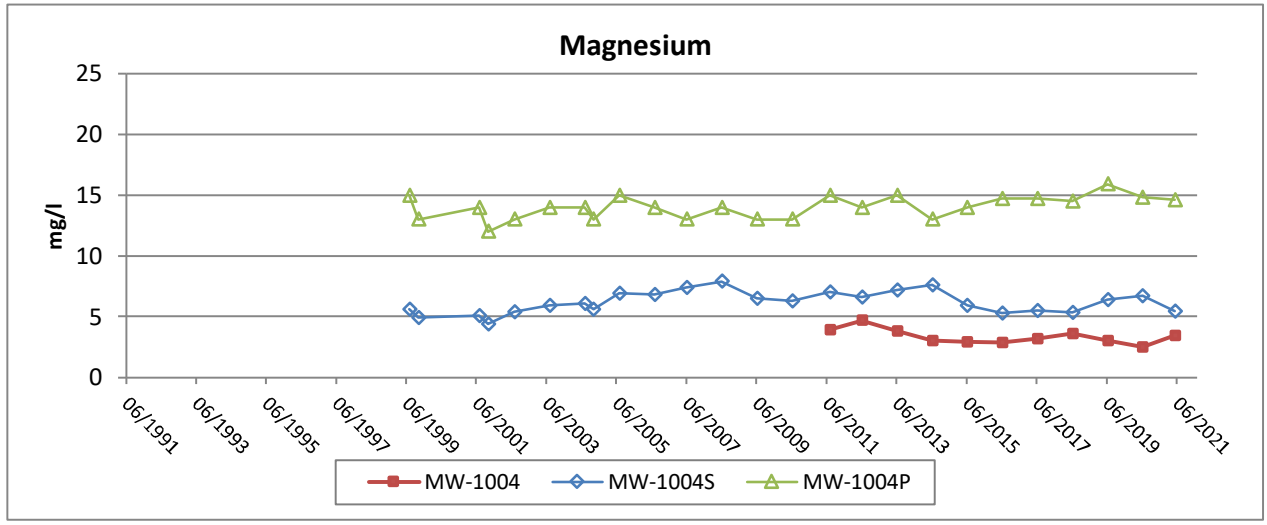
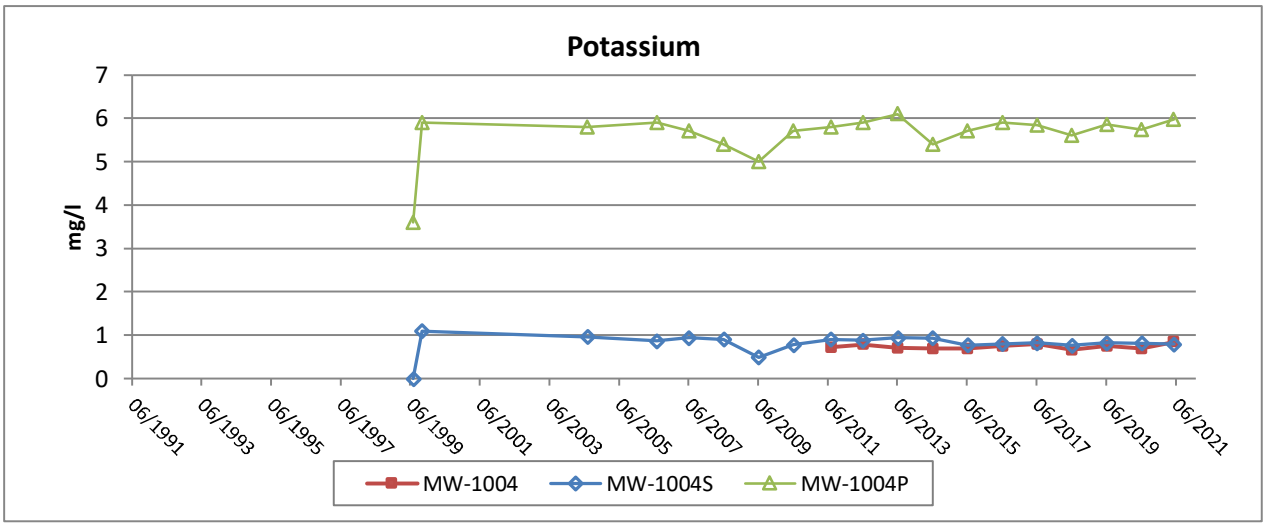
Figure B-10a
Groundwater Trend Graphs - Annual Results
MW-1004/MW-1004S/MW-1004P

Scale: NA	Date: January 2022	
Prepared By: SGL	Checked By: SVF	Project: 17F777.22





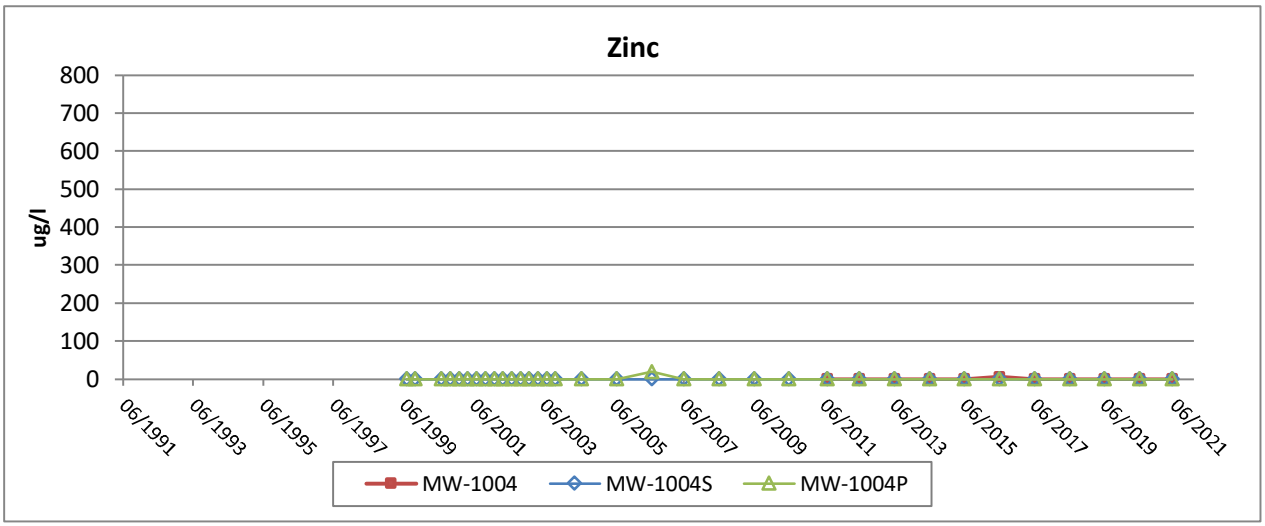


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Figure B-10b
Groundwater Trend Graphs - Annual Results
MW-1004/MW-1004S/MW-1004P

Scale: NA	Date: January 2022	
Prepared By: SGL	Checked By: SVF	Project: 17F777.22

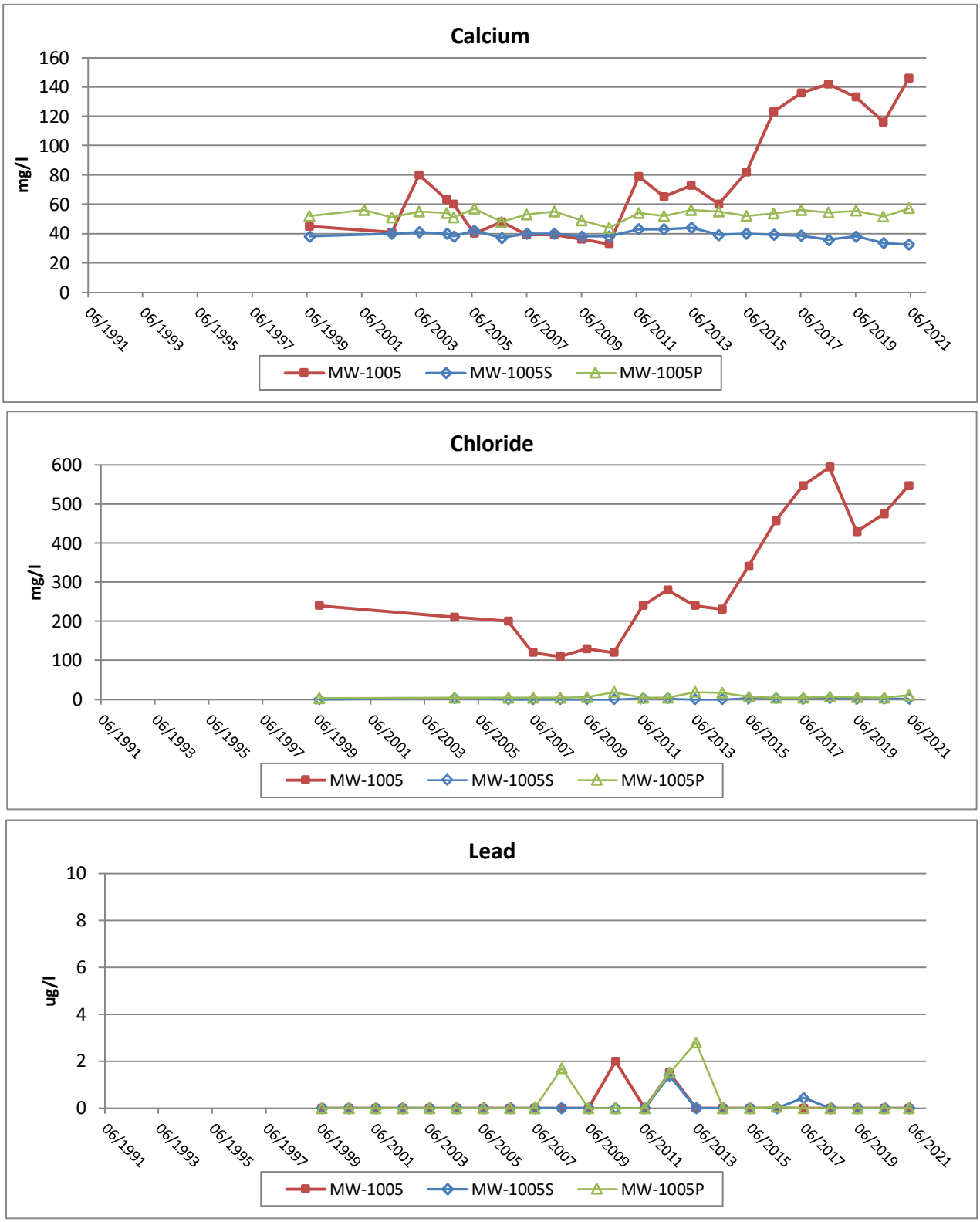

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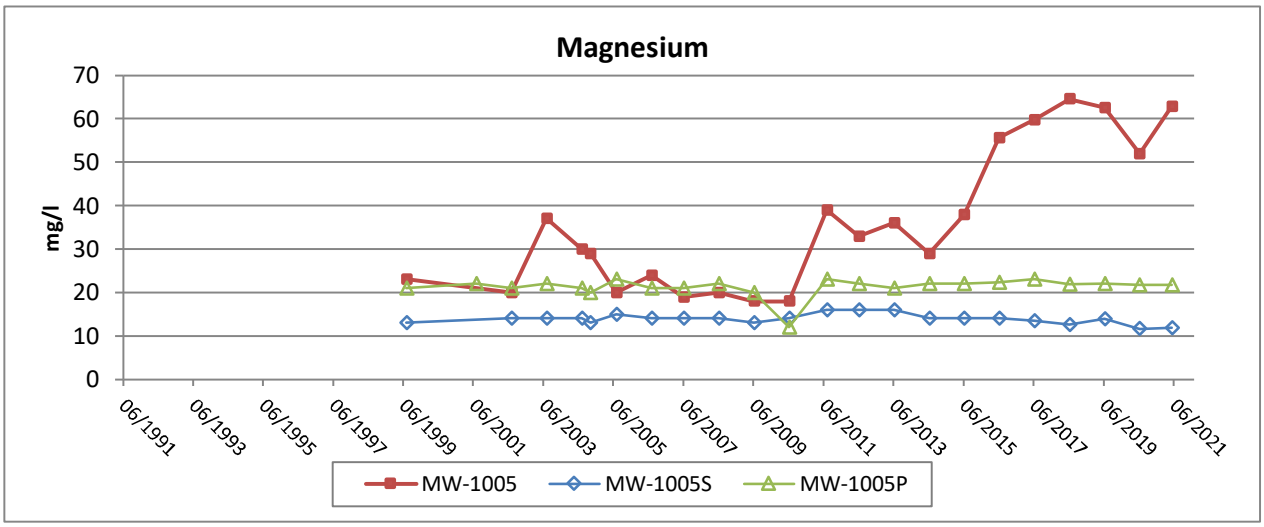
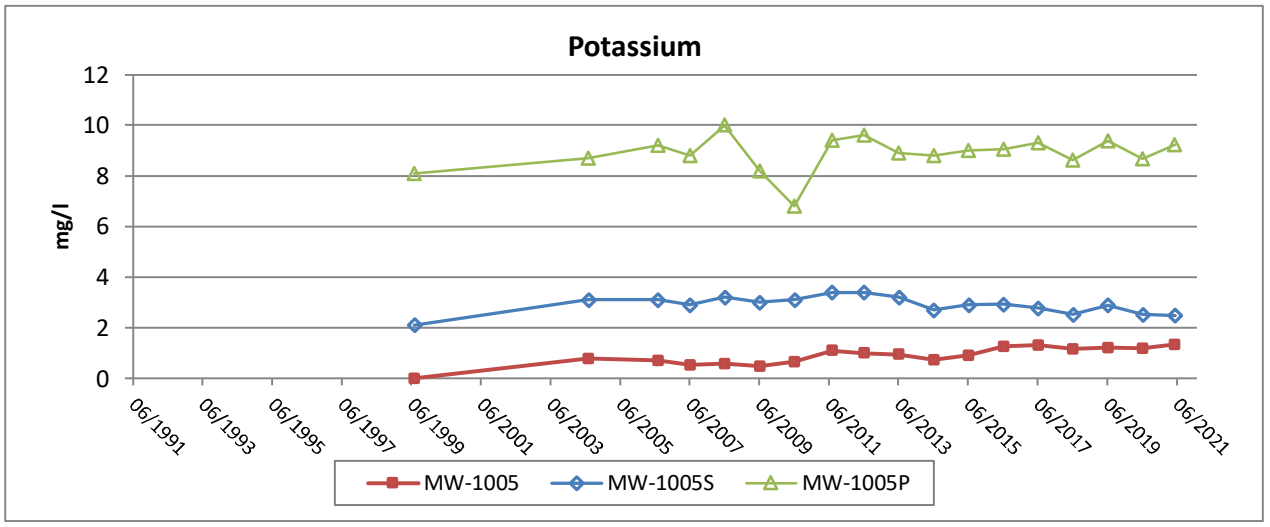
Figure B-11a
Groundwater Trend Graphs - Annual Results
MW-1005/MW-1005S/MW-1005P

Scale: NA	Date: January 2022	
Prepared By: SGL	Checked By: SVF	Project: 17F777.22





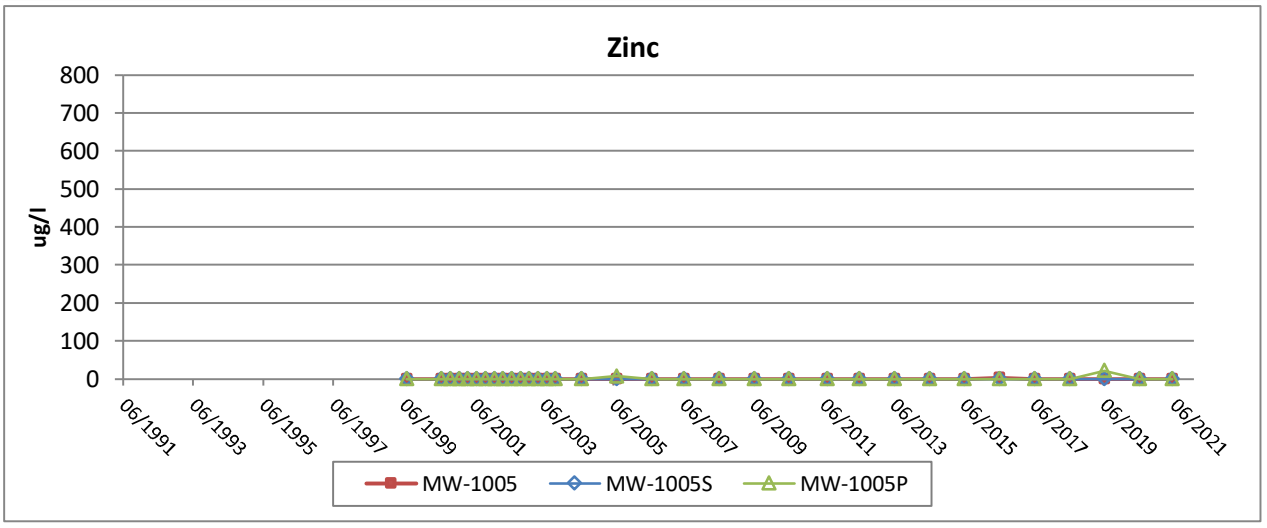


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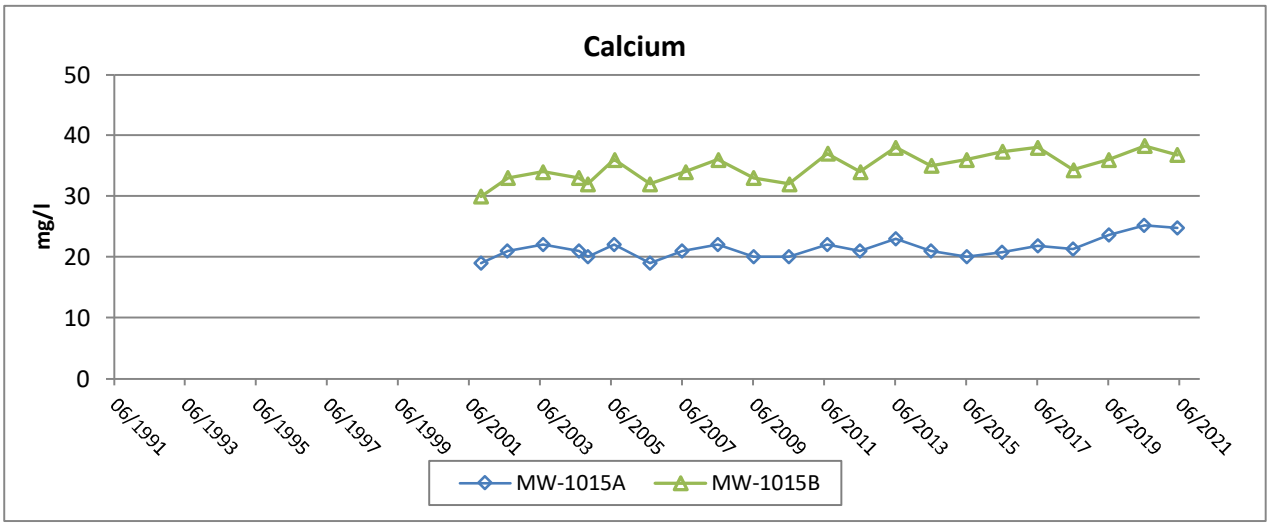
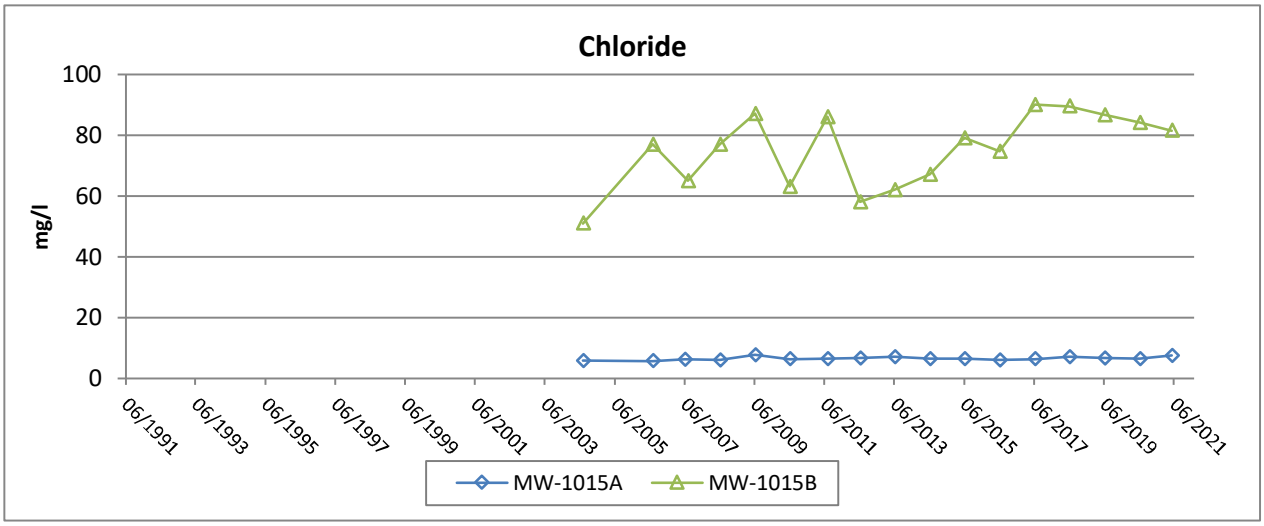
Figure B-11b
Groundwater Trend Graphs - Annual Results
MW-1005/MW-1005S/MW-1005P

Scale: NA	Date: January 2022	
Prepared By: SGL	Checked By: SVF	Project: 17F777.22





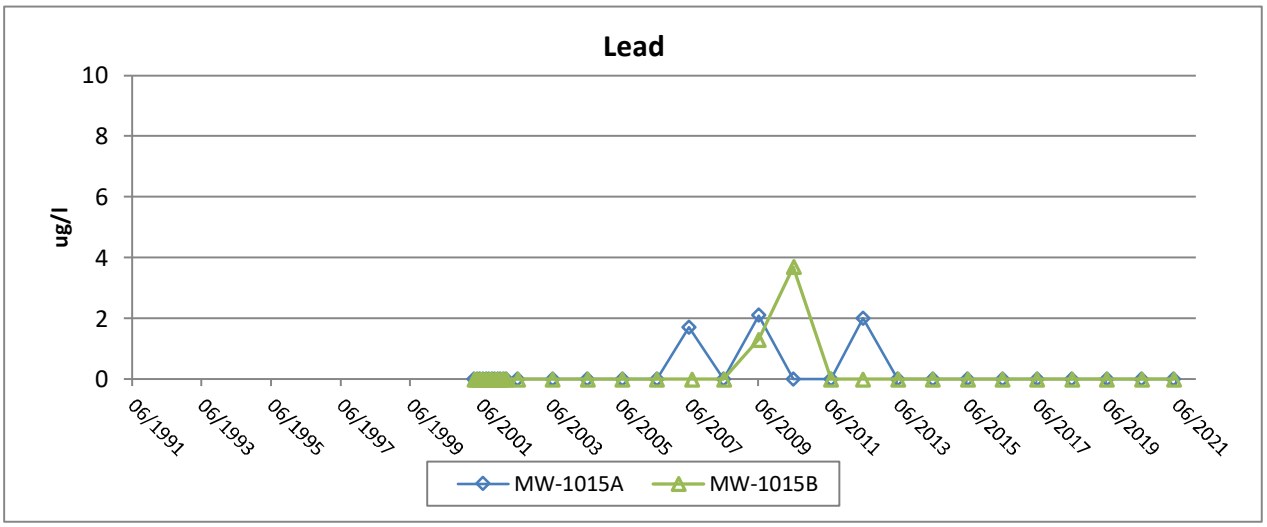


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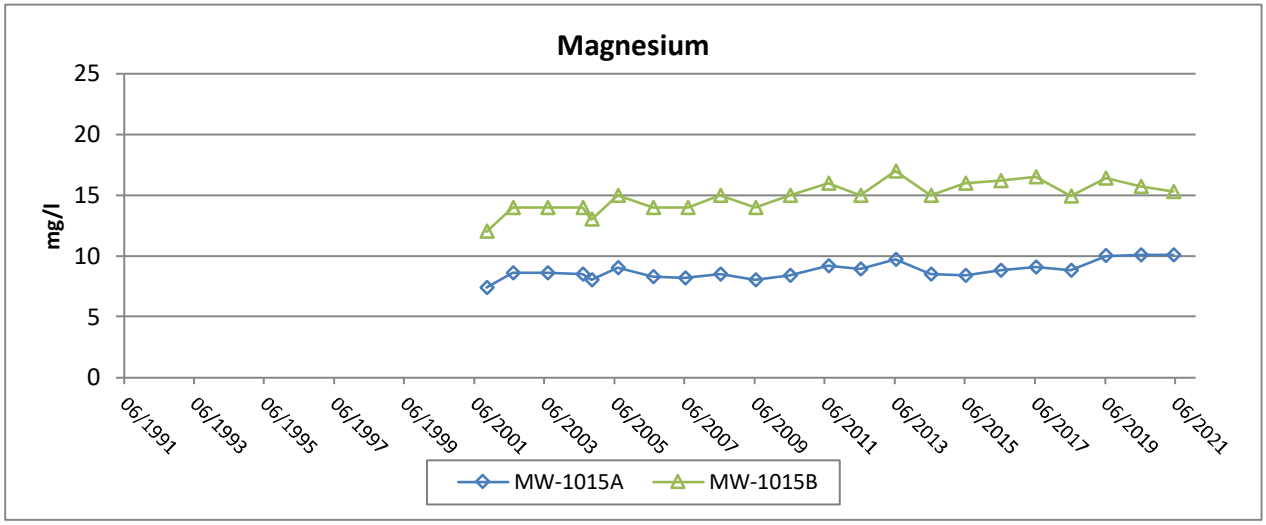
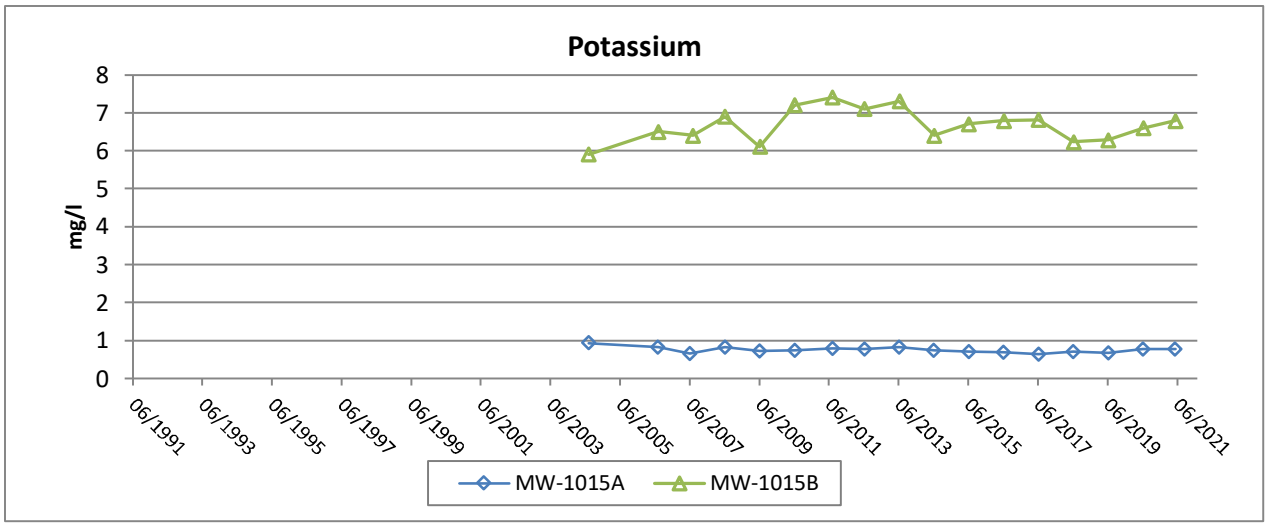
Figure B-12a
Groundwater Trend Graphs - Annual Results
MW-1015A/MW-1015B

Scale: NA	Date: January 2022	
Prepared By: SGL	Checked By: SVF	Project: 17F777.22





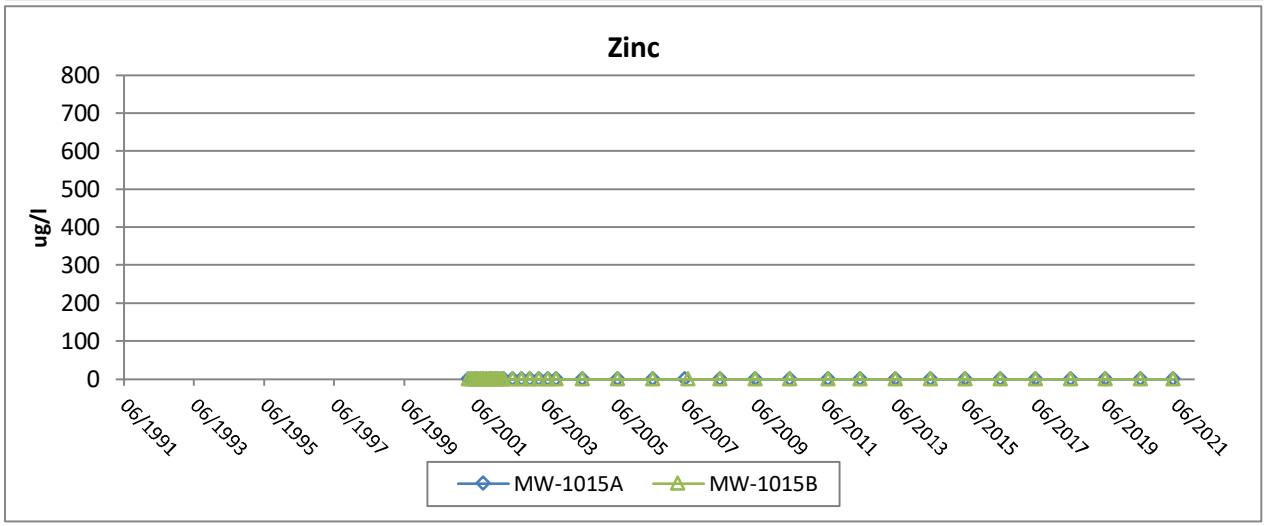


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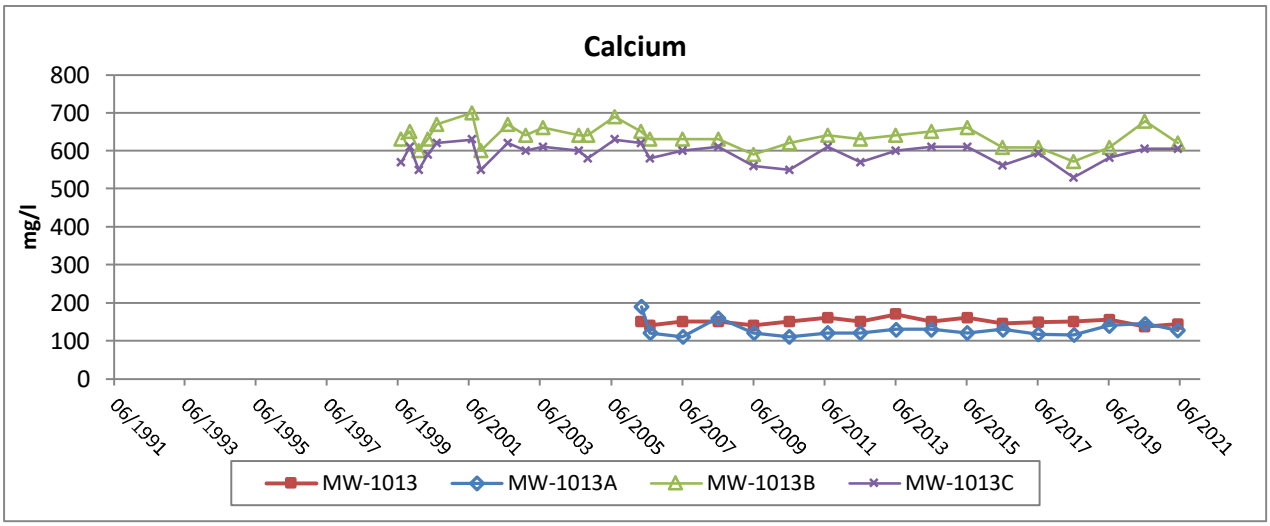
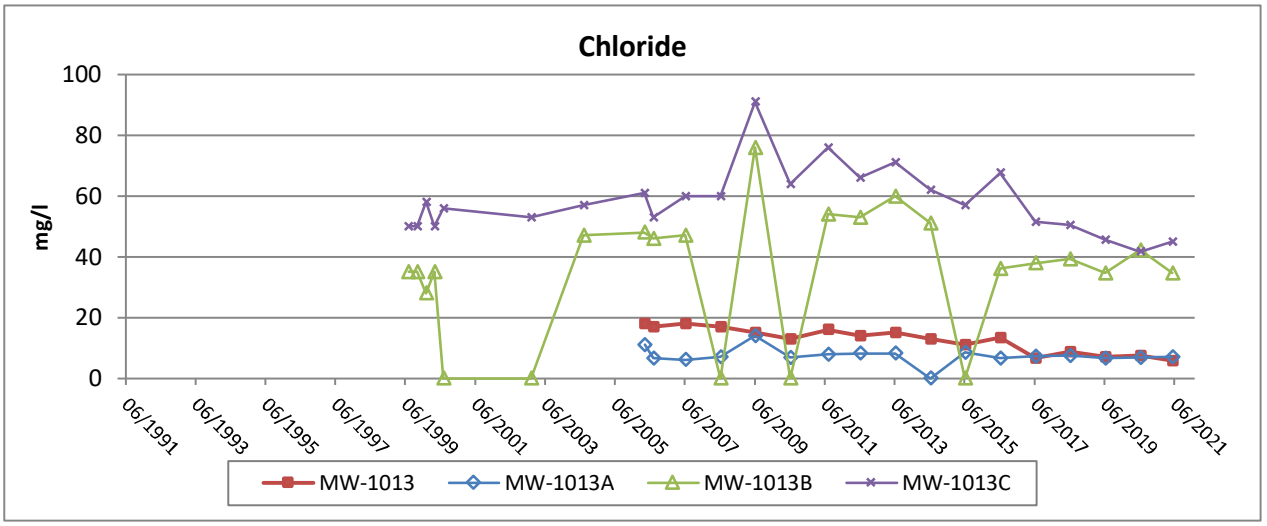
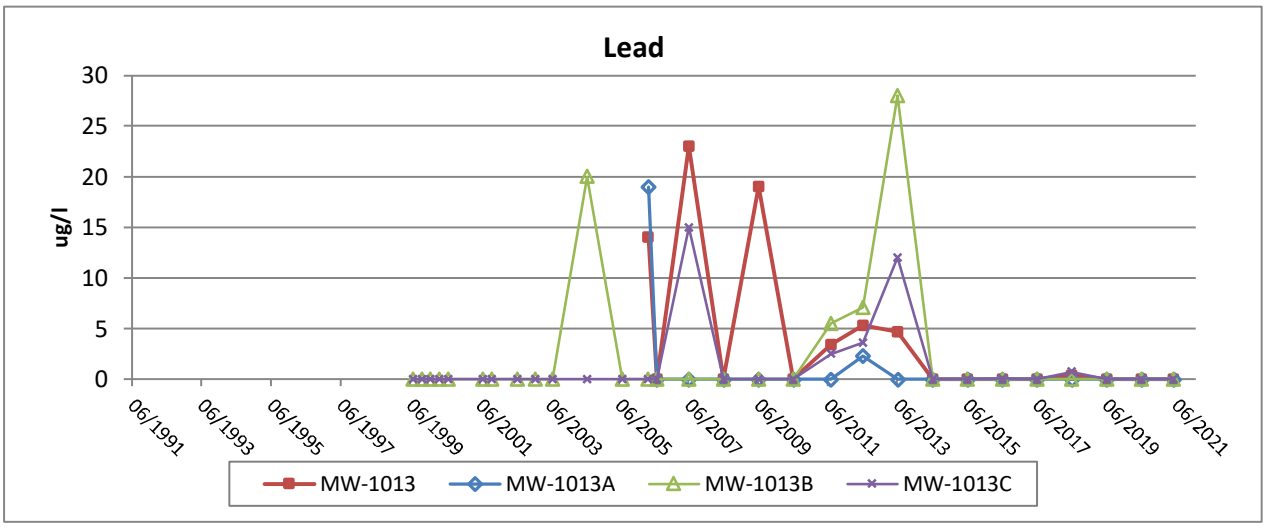
Figure B-12b
Groundwater Trend Graphs - Annual Results
MW-1015A/MW-1015B

Scale: NA	Date: January 2022
Prepared By: SGL	Checked By: SVF	Project: 17F777.22







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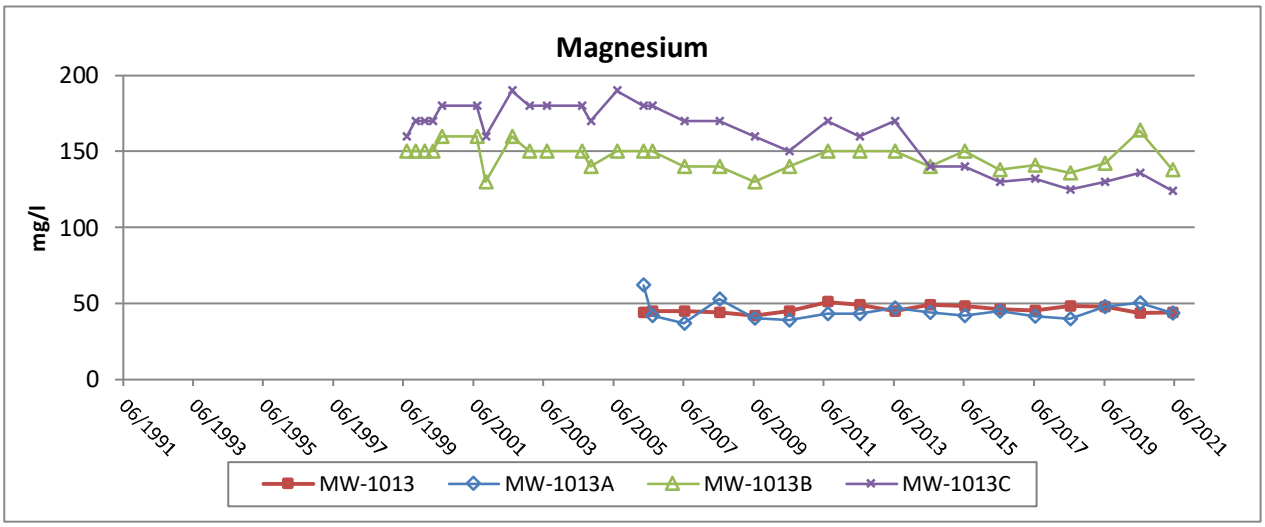
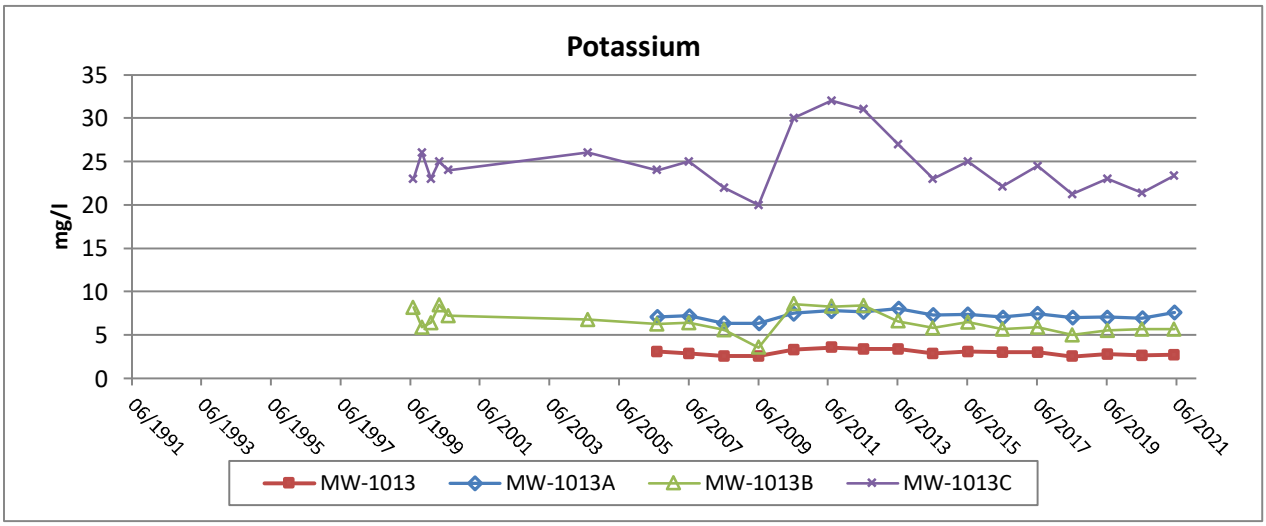
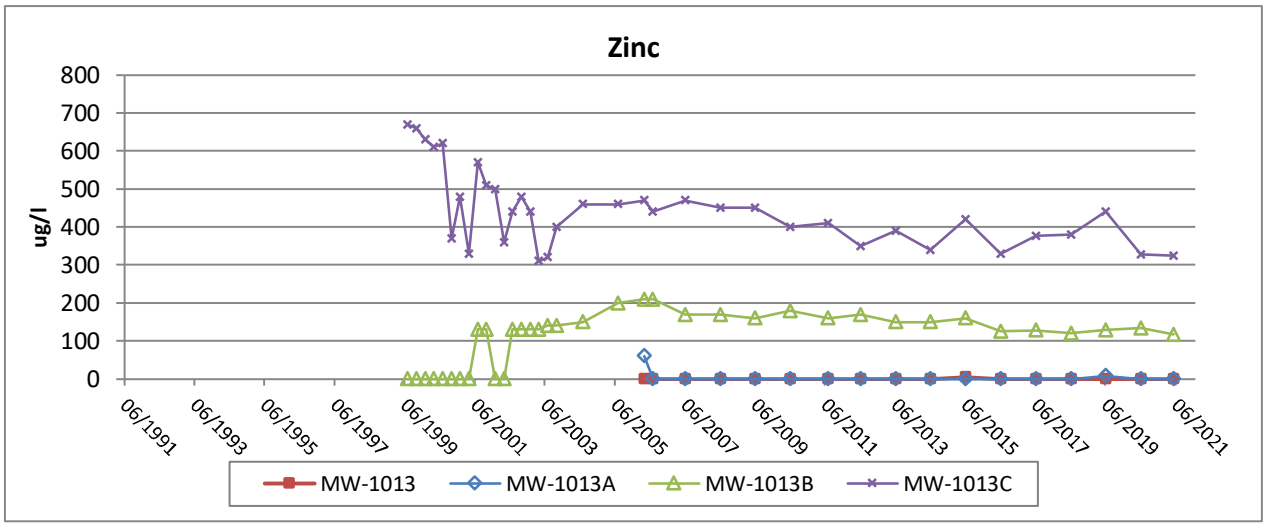
FLAMBEAU MINING COMPANY

Figure B-13a
Groundwater Trend Graphs - Annual Results (In-Pit Wells)
MW-1013/MW-1013A/MW-1013B/MW-1013C

Scale: NA	Date: January 2022	
Prepared By: SGL	Checked By: SVF	Project: 17F777.22







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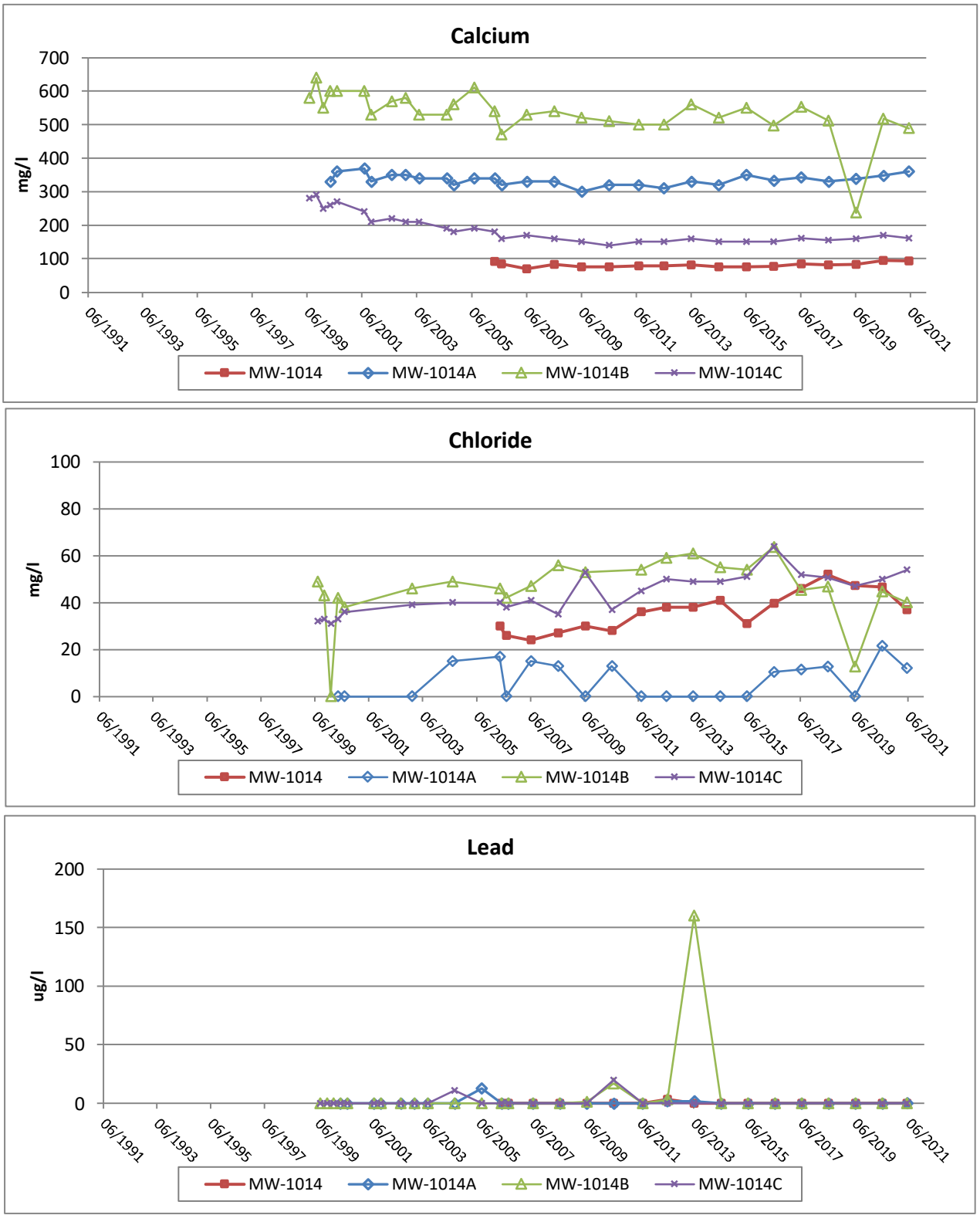
FLAMBEAU MINING COMPANY

Figure B-13b
Groundwater Trend Graphs - Annual Results (In-Pit Wells)
MW-1013/MW-1013A/MW-1013B/MW-1013C

Scale: NA	Date: January 2022	
Prepared By: SGL	Checked By: SVF	Project: 17F777.22

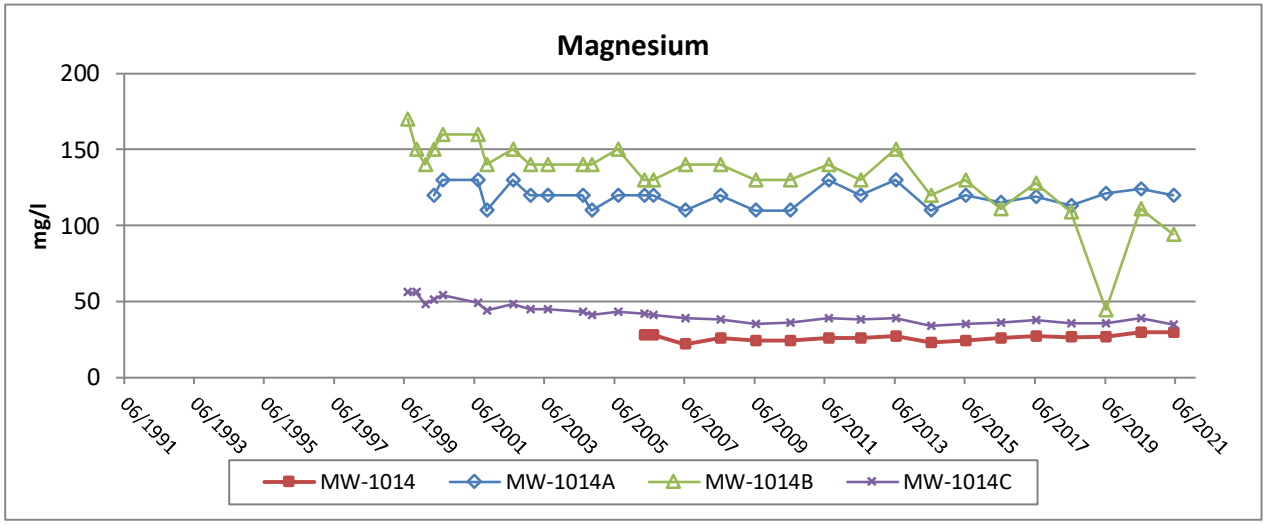


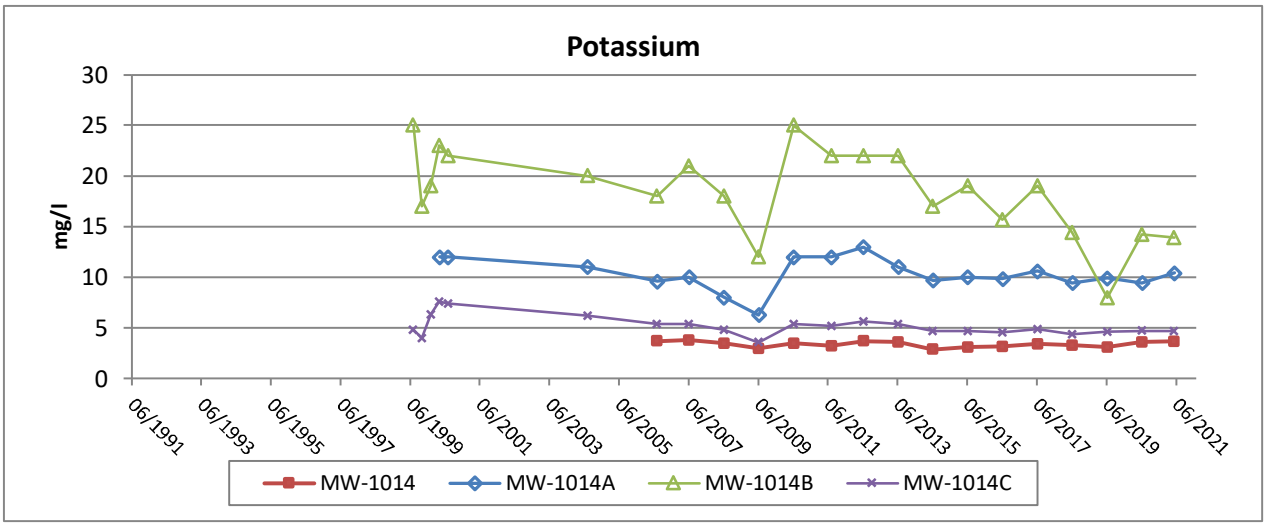
Foth

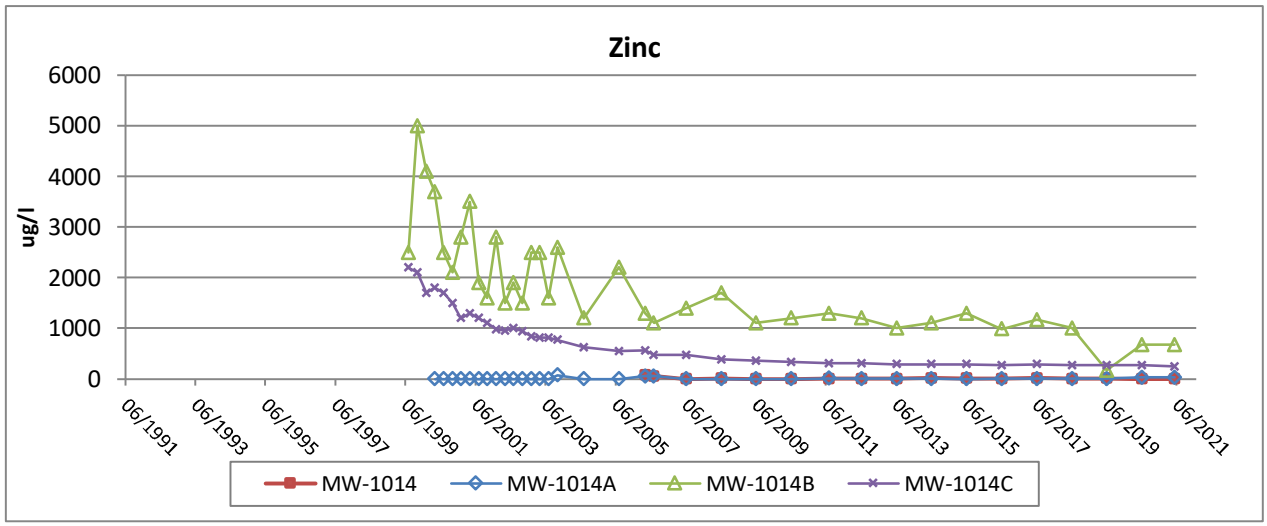
FLAMBEAU MINING COMPANY

Figure B-14a
Groundwater Trend Graphs - Annual Results (In-Pit Wells)
MW-1014/MW-1014A/MW-1014B/MW-1014C

Scale: NA	Date: January 2022	
Prepared By: SGL	Checked By: SVF	Project: 17F777.22







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FLAMBEAU MINING COMPANY

Figure B-14b
Groundwater Trend Graphs - Annual Results (In-Pit Wells)
MW-1014/MW-1014A/MW-1014B/MW-1014C

Scale: NA	Date: January 2022
Prepared By: SGL	Checked By: SVF	Project: 17F777.22

2021 Groundwater Results - Annual Parameters

Sample Date (yyyy-mm)	Location		Calcium mg/l	Chloride mg/l	Lead ug/l	Magnesium mg/l	Potassium mg/l	Zinc ug/l
2021-05	MW-1000PR		112	12.5	0.30	27.4	3.13	255
2021-05	MW-1000R		50.4	55.3	< 0.24	14.2	0.85	< 10.3
2021-05	MW-1002		18	8.8	< 0.24	5.81	0.706	< 10.3
2021-05	MW-1002G		41.4	35.6	< 0.24	15.5	0.995	< 10.3
2021-05	MW-1002G	Dup.	39.4	35.6	< 0.24	15.4	0.99	< 10.3
2021-05	MW-1004		11.8	1.0	< 0.24	3.42	0.853	< 10.3
2021-05	MW-1004P		36.6	0.92	< 0.24	14.6	5.97	< 10.3
2021-05	MW-1004S		16.6	1.5	< 0.24	5.43	0.792	< 10.3
2021-05	MW-1005		146	547	< 0.24	62.8	1.35	< 10.3
2021-05	MW-1005P		57.3	11.1	< 0.24	21.8	9.22	< 10.3
2021-05	MW-1005S		32.5	1.5	< 0.24	11.8	2.48	< 10.3
2021-05	MW-1010P		54	5.3	0.36	13.4	2.53	< 10.3
2021-05	MW-1013		143	5.8	< 0.24	43.9	2.72	< 10.3
2021-05	MW-1013A		127	7.1	< 0.24	43.7	7.6	< 10.3
2021-05	MW-1013B		620	34.7	< 0.24	138	5.69	117
2021-05	MW-1013C		605	44.9	< 0.24	124	23.4	325
2021-05	MW-1014		93.4	36.9	< 0.24	29.5	3.65	< 10.3
2021-05	MW-1014A		360	12.0	0.25	120	10.4	32.0
2021-05	MW-1014B		489	40.1	< 0.24	94	13.9	677
2021-05	MW-1014C		161	53.9	< 0.24	34.6	4.66	250
2021-05	MW-1014C	Dup.	149	51.4	< 0.24	33.4	4.42	244
2021-05	MW-1015A		24.8	7.5	< 0.24	10.1	0.782	< 10.3
2021-05	MW-1015B		36.8	81.5	< 0.24	15.3	6.79	< 10.3

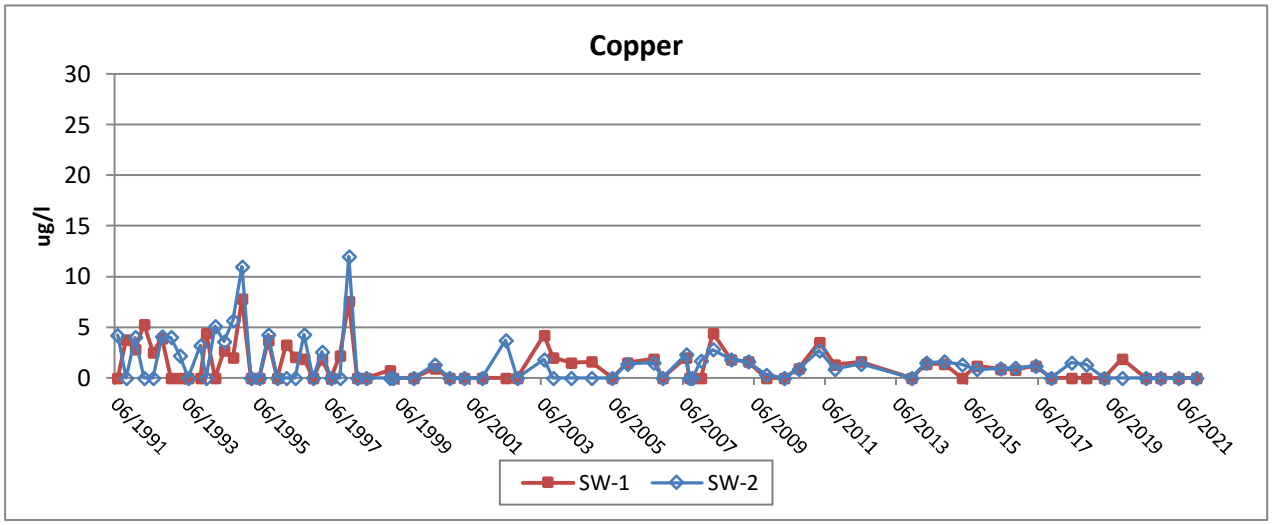
Attachment 3
Surface Water

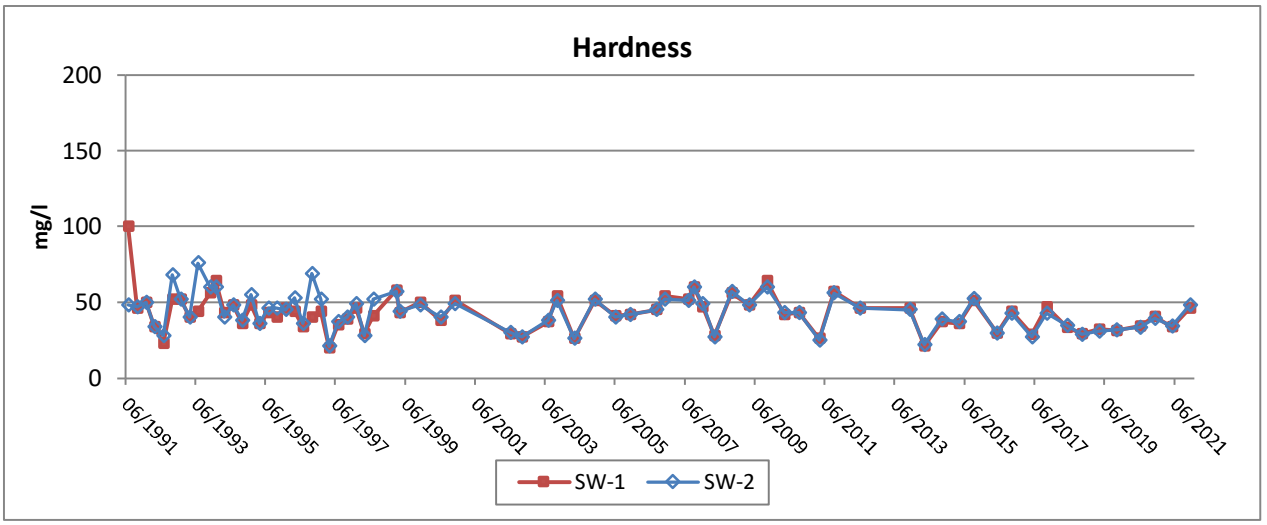
Trend Analysis
Trend Graphs
2021 Data

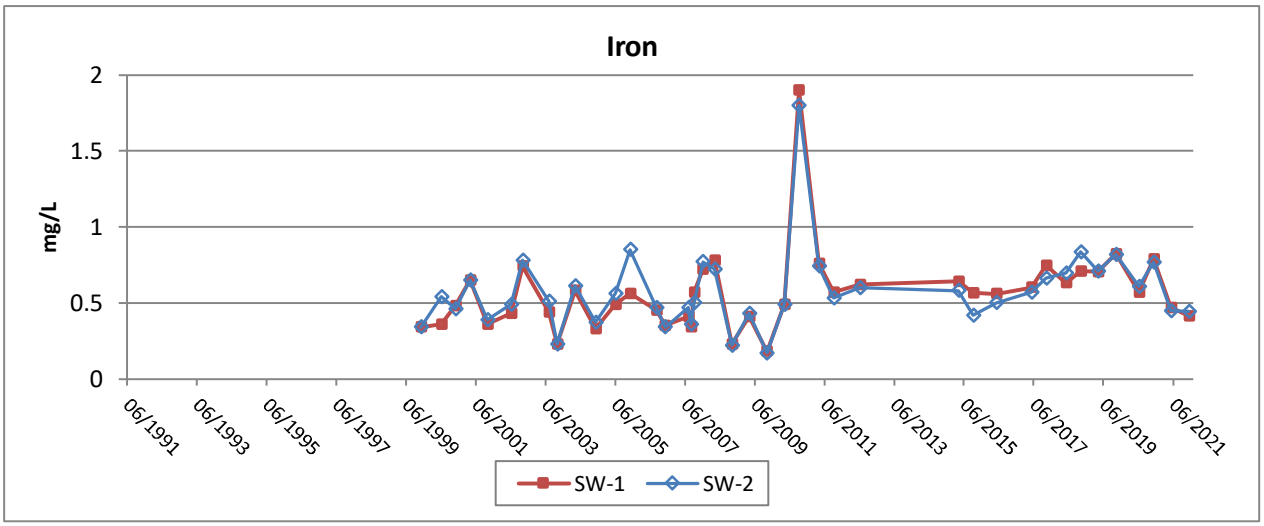
Trend Analysis Results - Surface Water
Year Ending 2021

	Conductivity (Field) (umhos/cm)	pH(Field) (su)	Copper	Hardness	Iron	Manganese	Zinc	Dissolved Oxygen	Redox Potential	Total Suspended Solids
SW-1										
Trend Results for Most Recent 5 Years										
Sample Size	8	7	10	10	10	10	8	6	7	10
Mann-Kendall S	0	11	-7	17	-11	-17	0	7	-5	-15
p-Level	1.000	0.136	0.600	0.156	0.380	0.156	1.000	0.272	0.562	0.216
Trend										
Trend Results for All Data Since Oct. 1997										
Sample Size	49	48	51	48	41	38	49	22	14	25
Mann-Kendall S	-271	-35	-127	-137	242	-43	-96	61	-11	-57
p-Level	0.020	0.762	0.271	0.226	0.007	0.600	0.324	0.090	0.590	0.194
Trend					+					
SW-2										
Trend Results for Most Recent 5 Years										
Sample Size	8	7	10	10	10	10	8	6	7	10
Mann-Kendall S	2	9	-16	19	-7	-17	-7	7	-7	-7
p-Level	0.904	0.238	0.186	0.108	0.600	0.156	0.473	0.272	0.382	0.600
Trend										
Trend Results for All Data Since Oct. 1997										
Sample Size	49	48	51	48	41	38	49	22	14	25
Mann-Kendall S	-289	77	41	-190	162	-84	-16	60	-21	-66
p-Level	0.013	0.499	0.727	0.093	0.070	0.299	0.879	0.096	0.280	0.130
Trend										

Notes: Overall increasing trend denoted by "+".
Overall decreasing trend denoted by "-"
All trend tests performed at a Type I (two-tailed) error rate of 0.01.





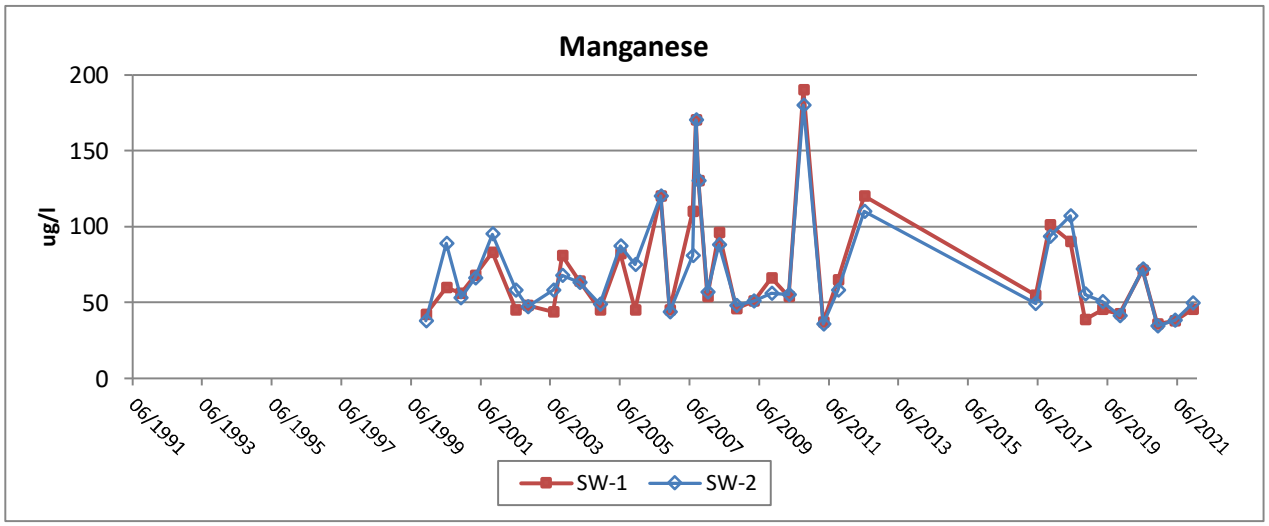


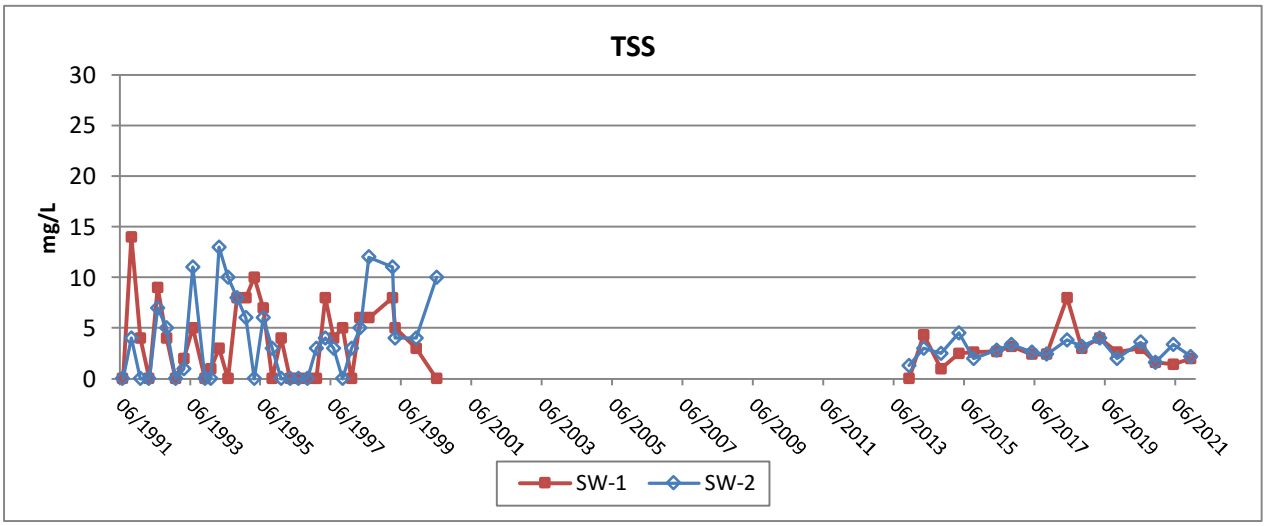
Foth

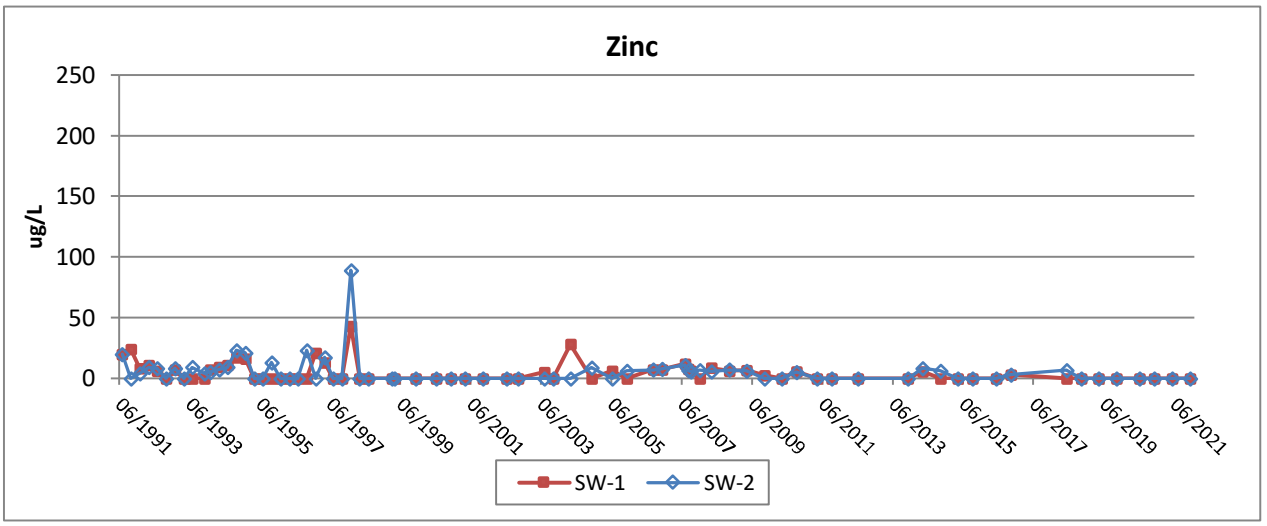
FLAMBEAU MINING COMPANY

Figure B-15a
Surface Water Trend Graphs
SW-1/SW-2

Scale: NA	Date: January 2022	
Prepared By: SGL	Checked By: SVF	Project: 17F777.22







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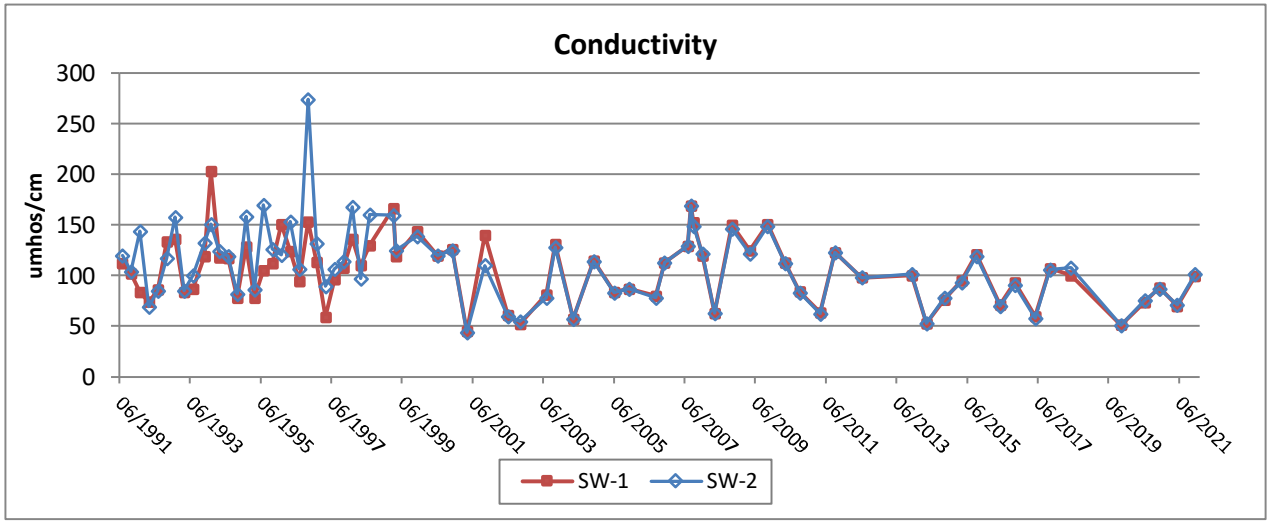
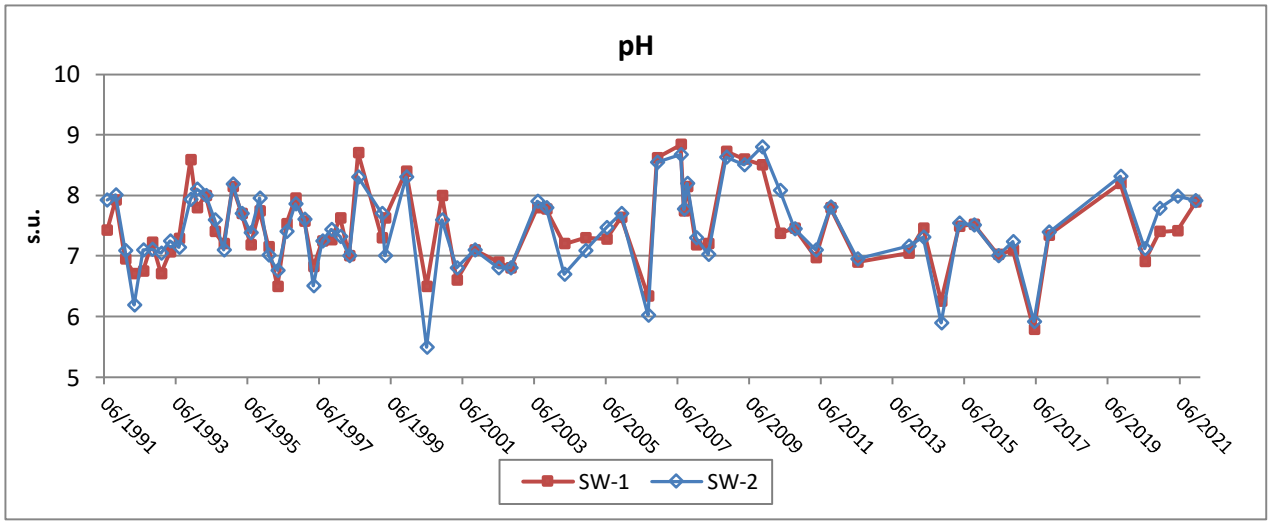
FLAMBEAU MINING COMPANY

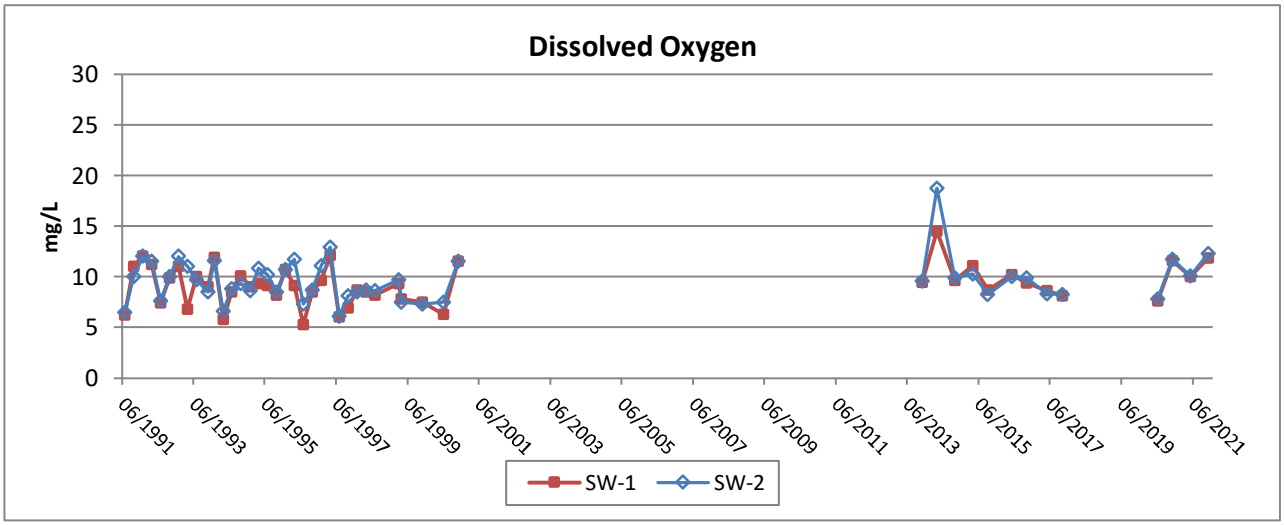
Figure B-15b
Surface Water Trend Graphs
SW-1/SW-2

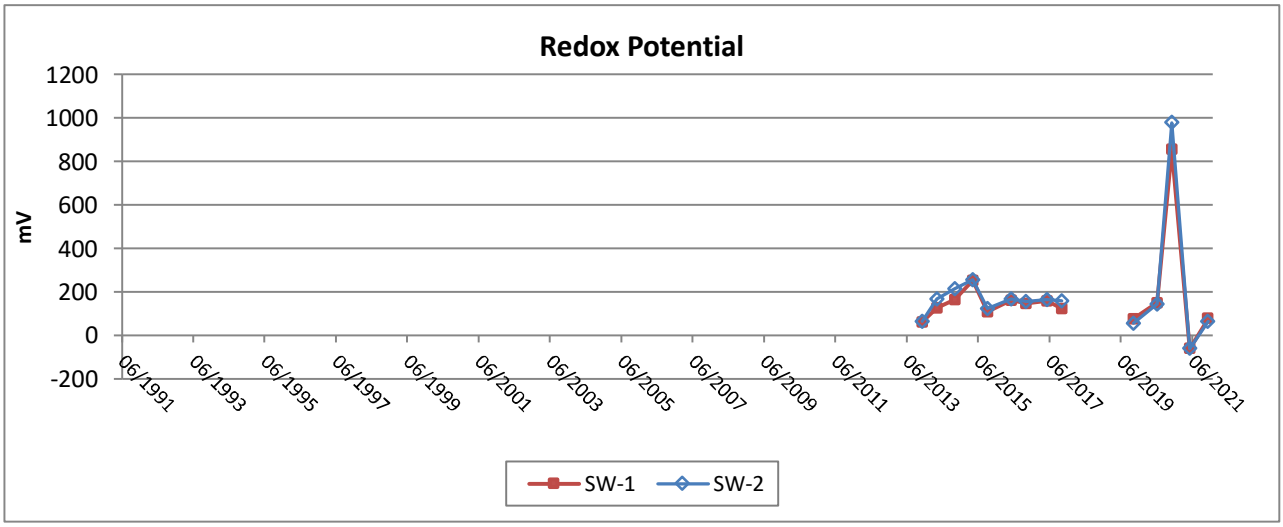
Scale: NA	Date: January 2022	
Prepared By: SGL	Checked By: SVF	Project: 17F777.22





Foth		
FLAMBEAU MINING COMPANY		
Figure B-15c Surface Water Trend Graphs SW-1/SW-2		
Scale: NA	Date: January 2022	
Prepared By: SGL	Checked By: SVF	Project: 17F777.22





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FLAMBEAU MINING COMPANY

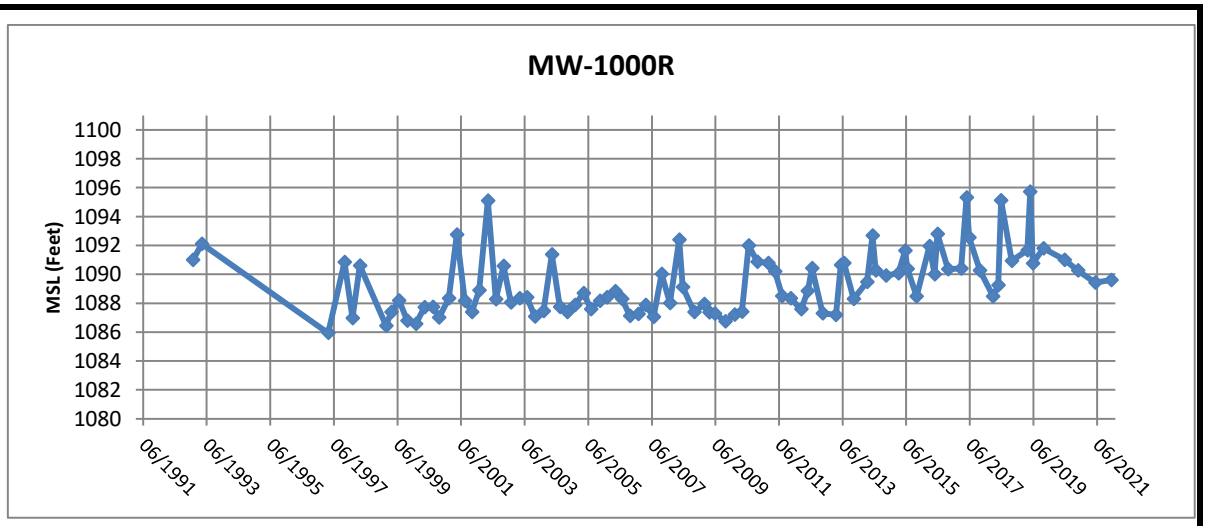
Figure B-15d
Surface Water Trend Graphs
SW-1/SW-2

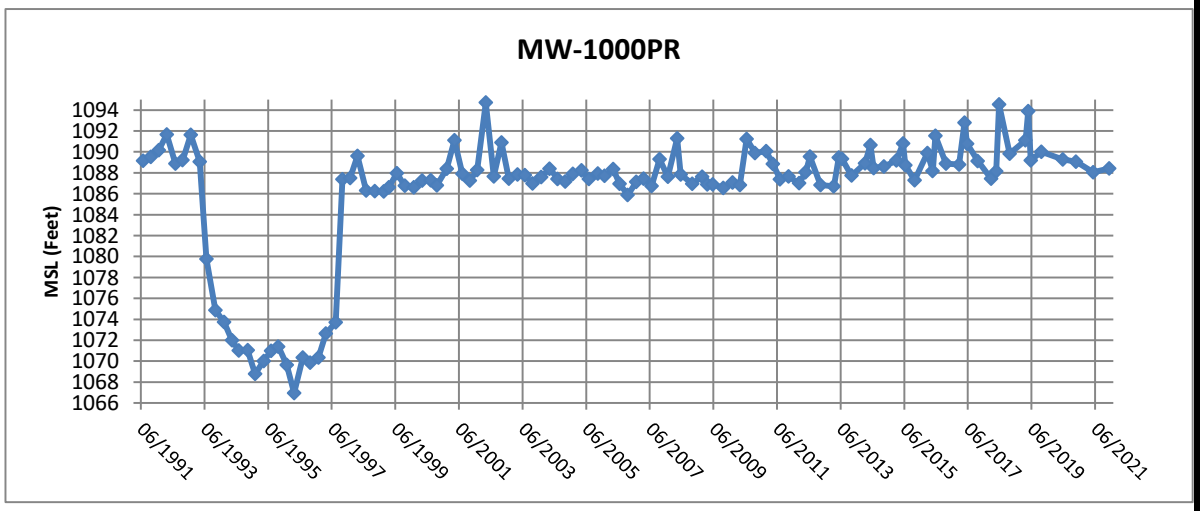
Scale: NA	Date: January 2022	
Prepared By: SGL	Checked By: SVF	Project: 17F777.22

2021 Surface Water Results

Sample Date (yyyy-mm)	Location		Conductivity (Field) umhos/cm	pH (Field) s.u.	Copper ug/l	Hardness mg/l	Iron mg/l	Manganese ug/l	Zinc ug/l	Dissolved Oxygen mg/l	Redox Potential mV	Total Suspended Solids mg/l
2021-05	SW-1		70	7.42	< 1.9	33.6	0.468	37.8	< 10.3	10.03	-60.5	1.4
2021-05	SW-1	Dup.			< 1.9	34.7	0.476	38.6	< 10.3			1.6
2021-05	SW-2		71	7.99	< 1.9	34.4	0.446	38.3	< 10.3	10.1	-60.3	3.4
2021-11	SW-1		99.48	7.89	< 1.9	45.9	0.414	45.6	< 10.3	11.85	77.3	2.0
2021-11	SW-1	Dup.			< 1.9	47.1	0.427	47.2	< 10.3			1.8
2021-11	SW-2		101.21	7.91	< 1.9	48.3	0.442	49.5	< 10.3	12.26	64.8	2.2

Attachment 4
Hydrographs and Groundwater Elevation Data





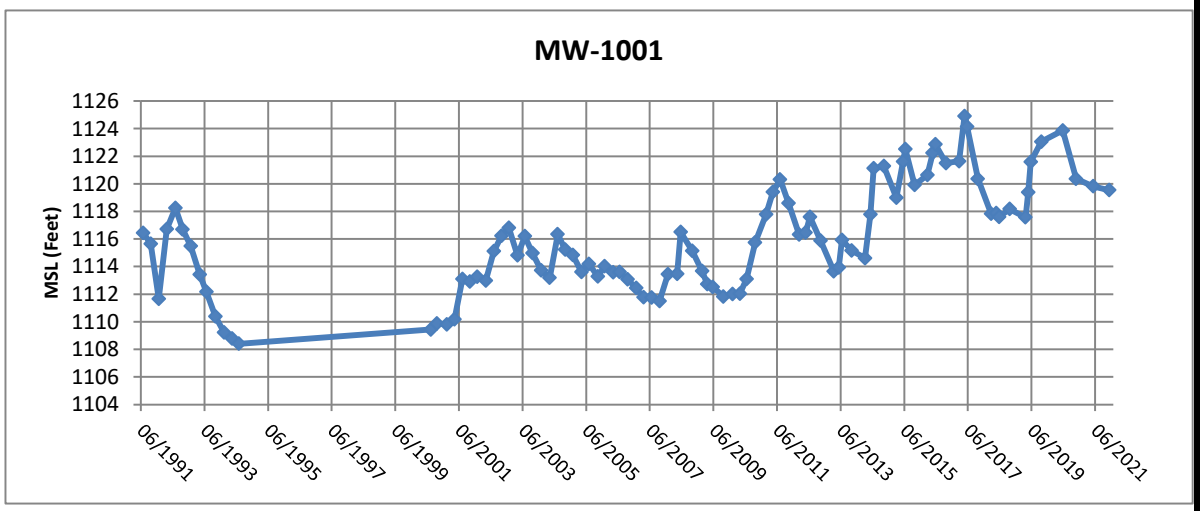


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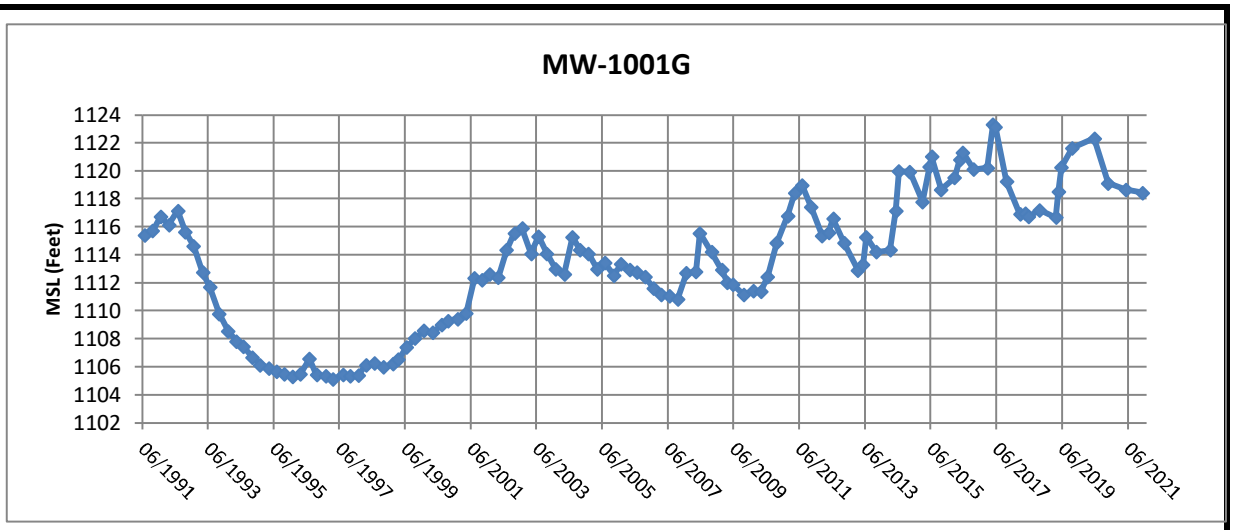
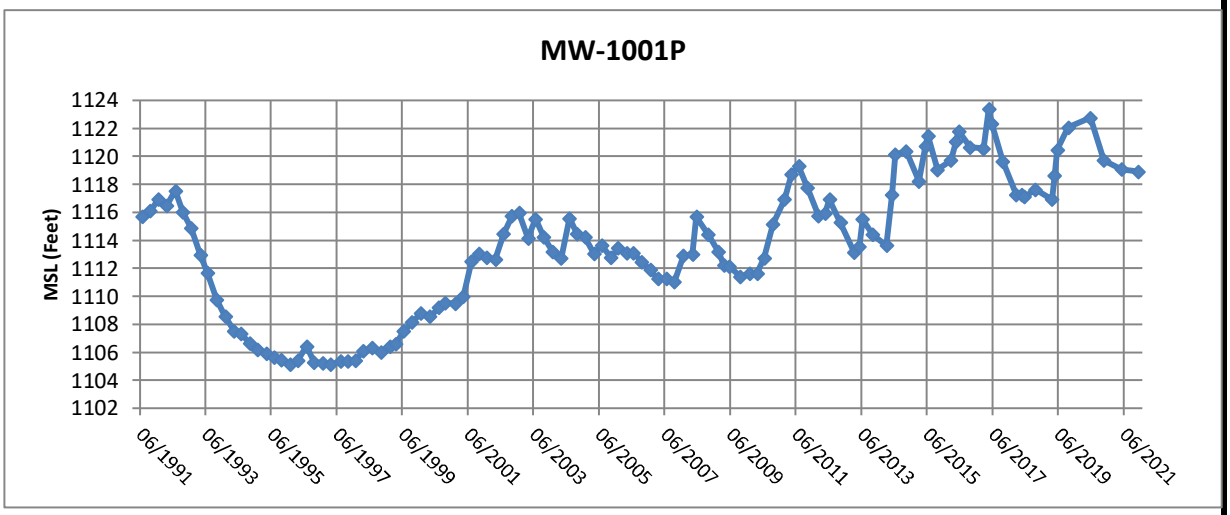
Figure B-16a
Hydrographs

Scale: NA	Date: January 2022	
Prepared By: SGL	Checked By: SVF	Project: 17F777.22





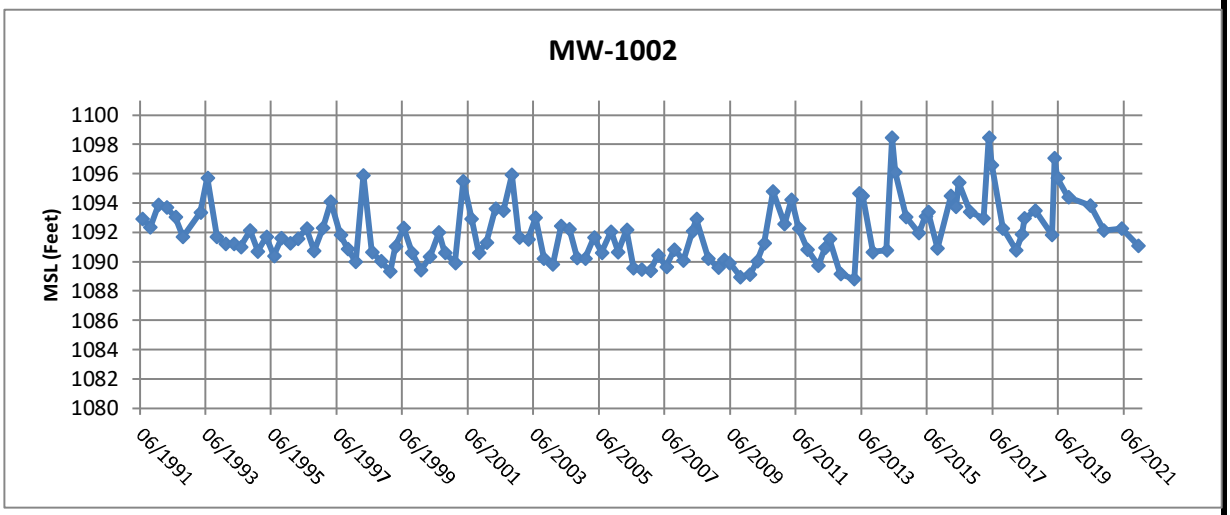


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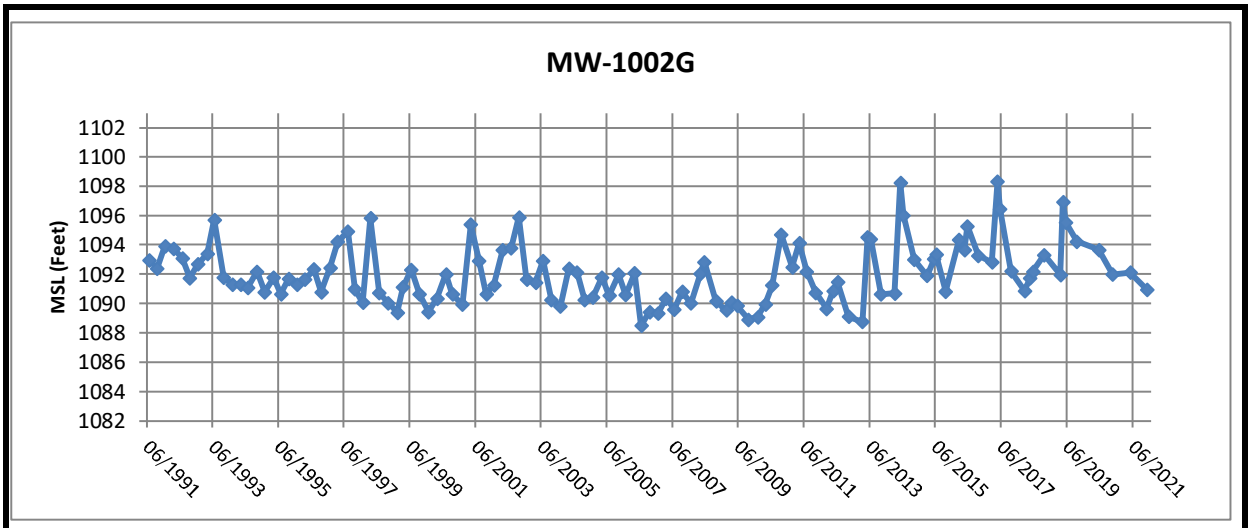
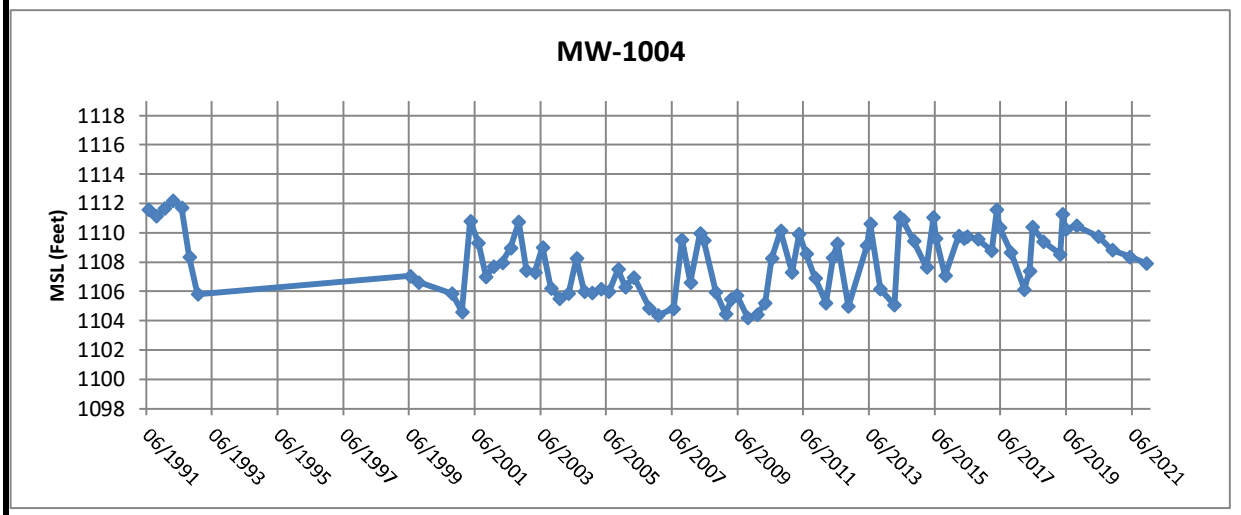
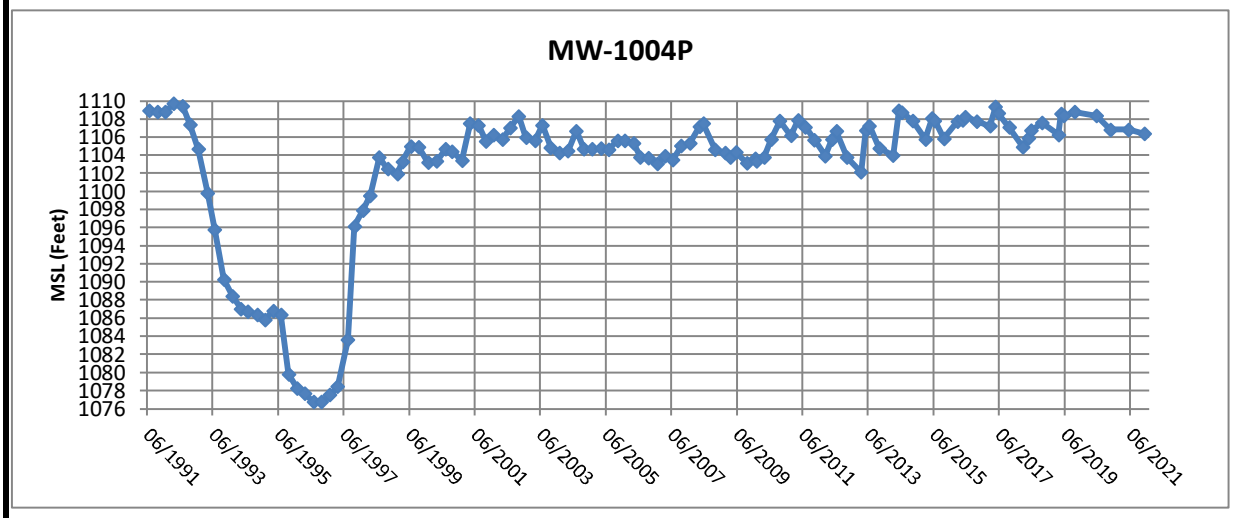
Figure B-16b
Hydrographs

Scale: NA	Date: January 2022	
Prepared By: SGL	Checked By: SVF	Project: 17F777.22





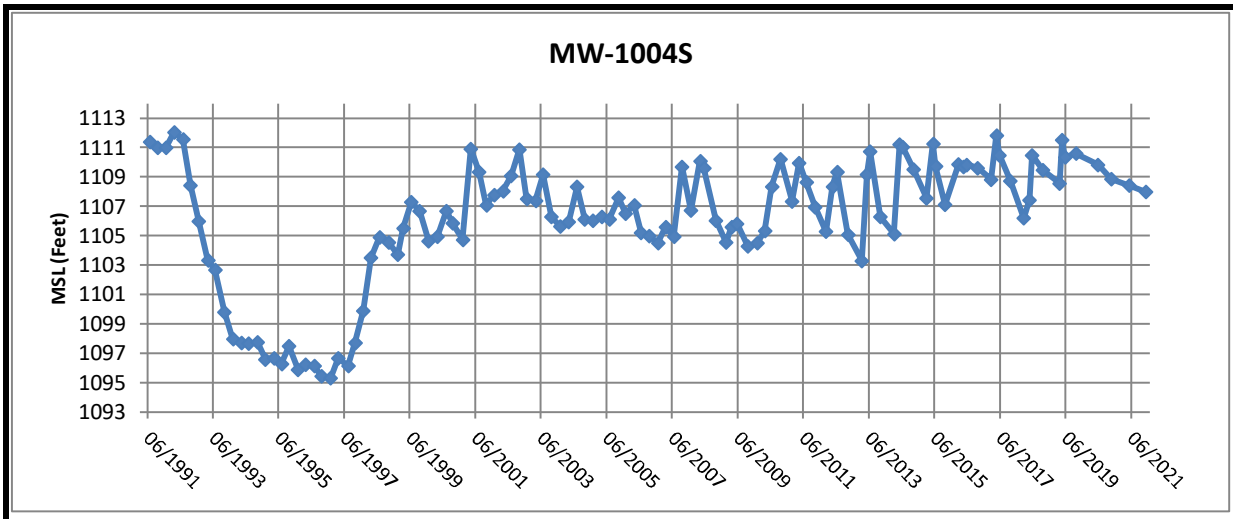


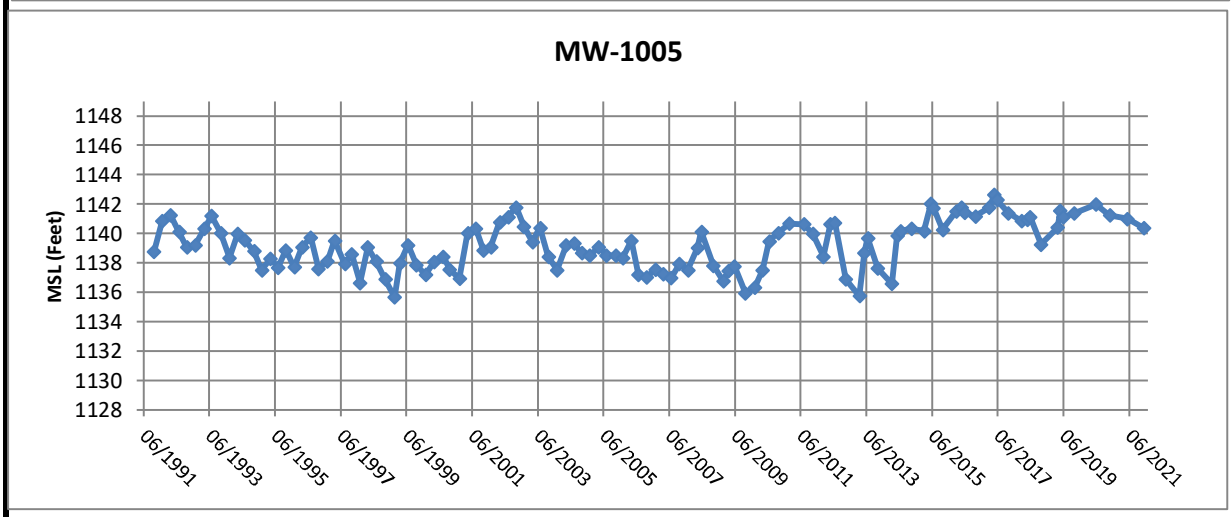
Foth

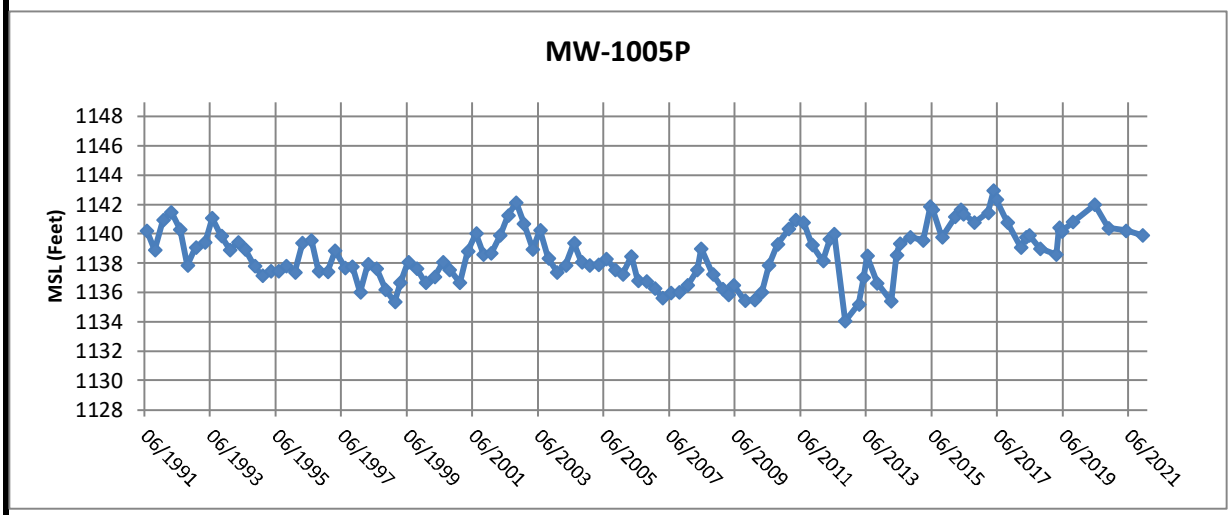
FLAMBEAU MINING COMPANY

Figure B-16c
Hydrographs

Scale: NA	Date: January 2022	
Prepared By: SGL	Checked By: SVF	Project: 17F777.22





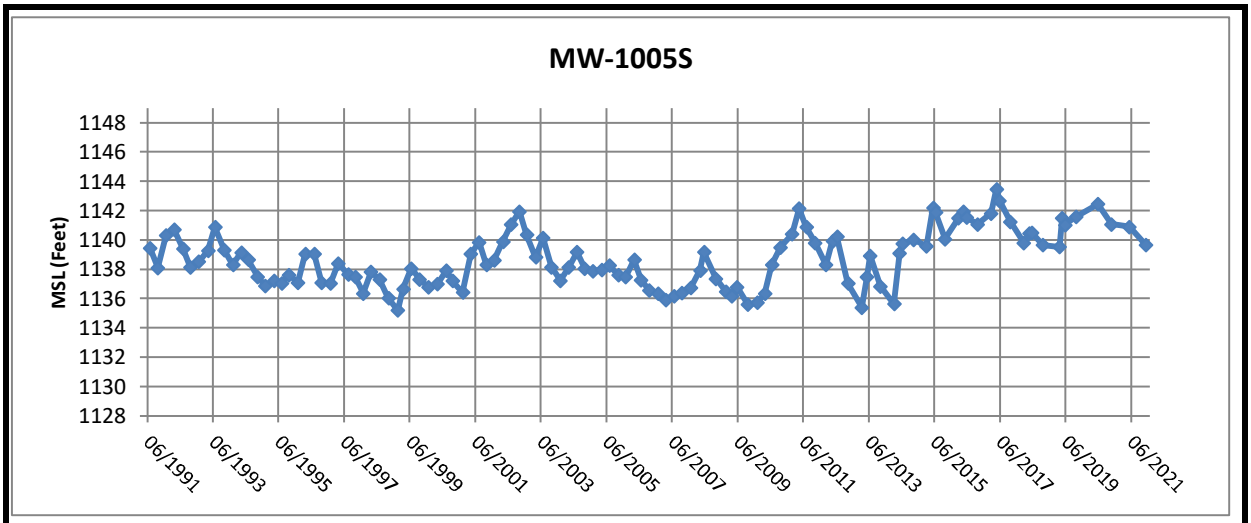


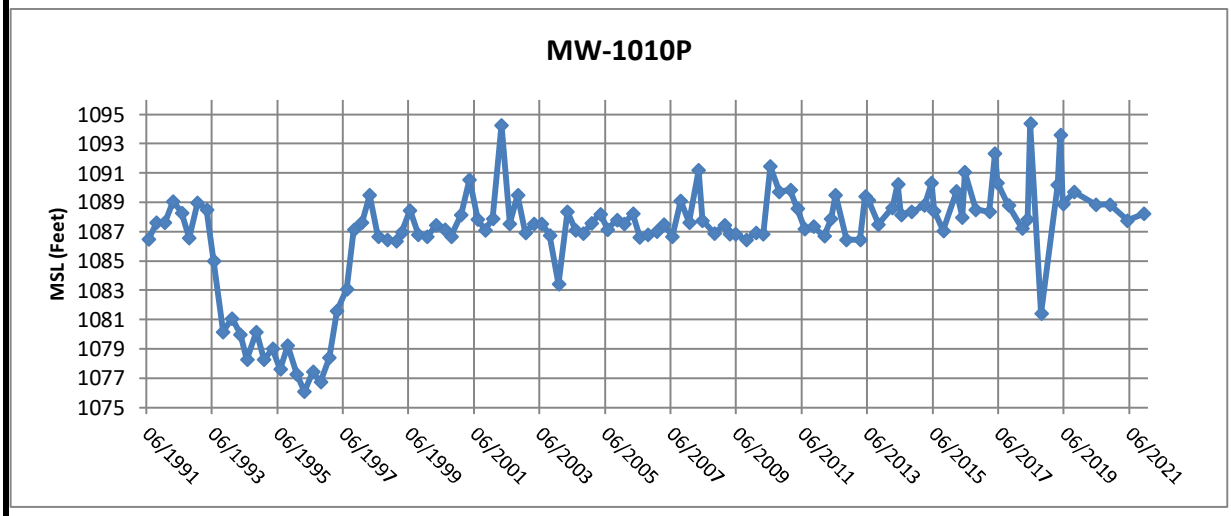
Foth

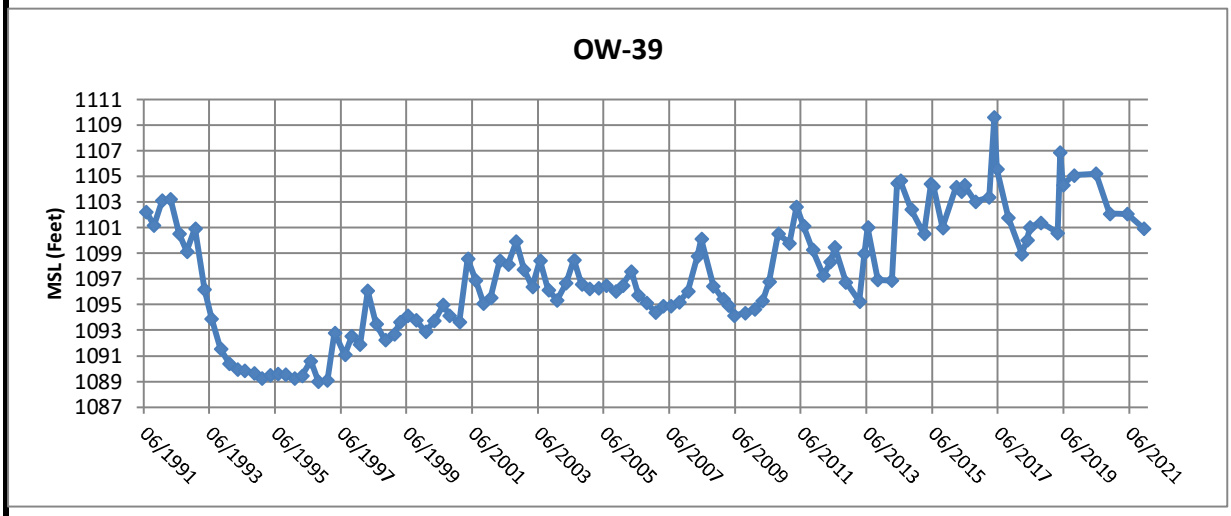
FLAMBEAU MINING COMPANY

Figure B-16d
Hydrographs

Scale: NA	Date: January 2022	
Prepared By: SGL	Checked By: SVF	Project: 17F777.22





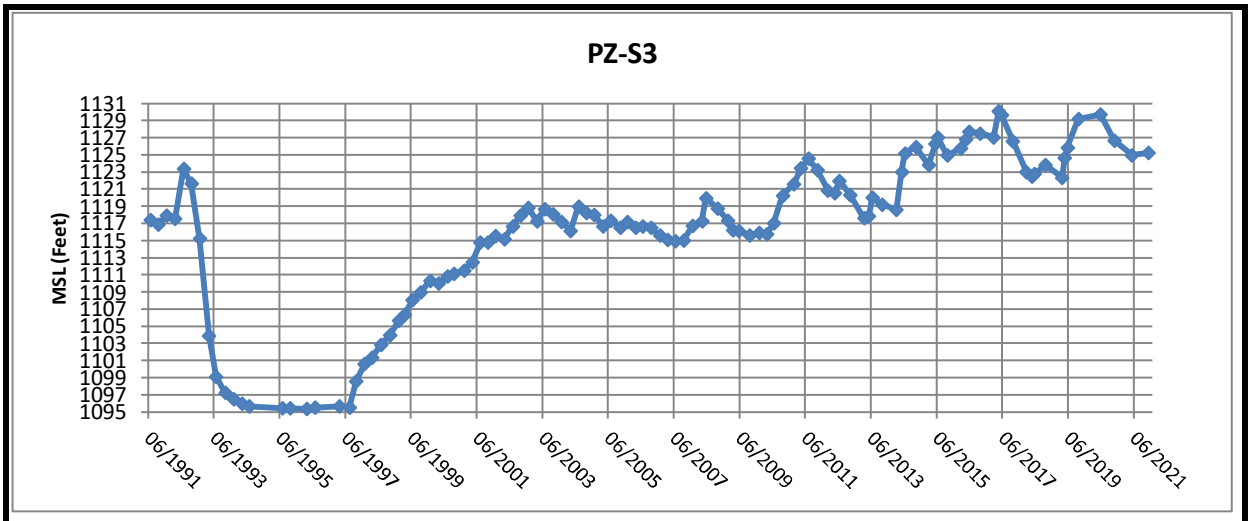


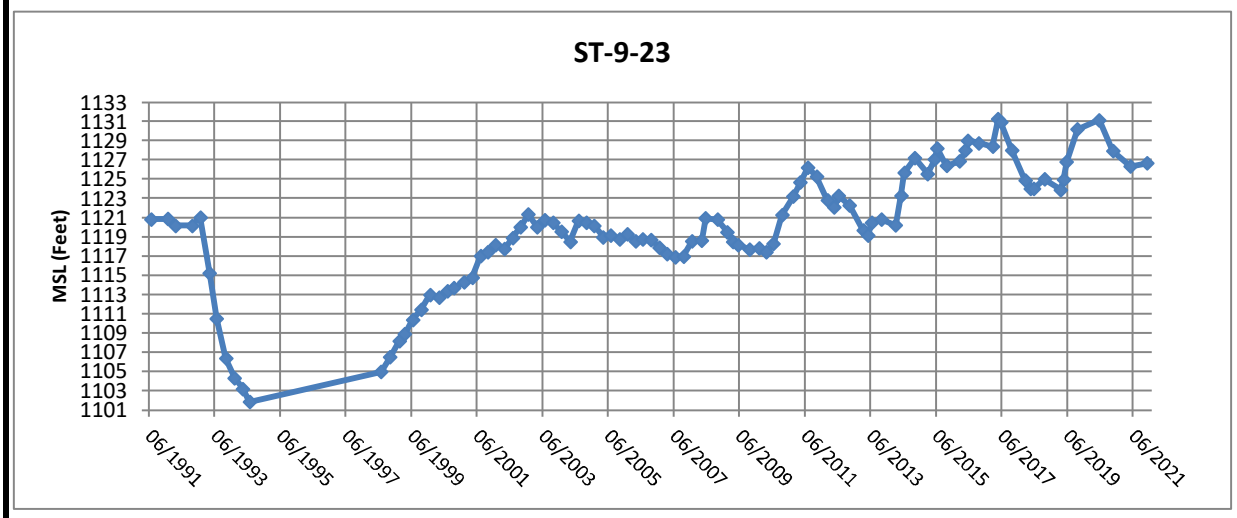
Foth

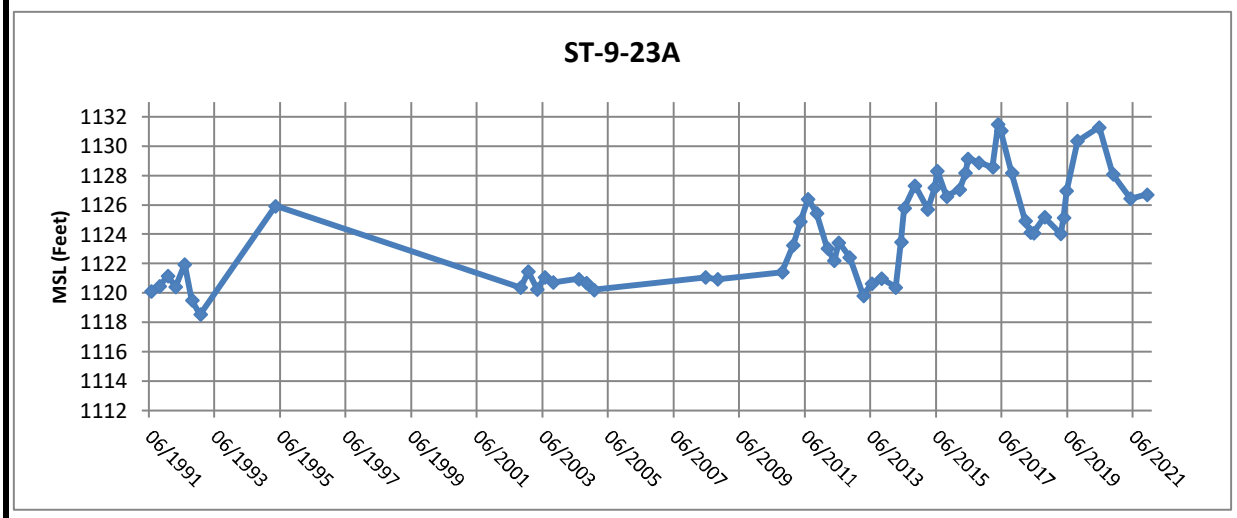
FLAMBEAU MINING COMPANY

Figure B-16e
Hydrographs

Scale: NA	Date: January 2022	
Prepared By: SGL	Checked By: SVF	Project: 17F777.22





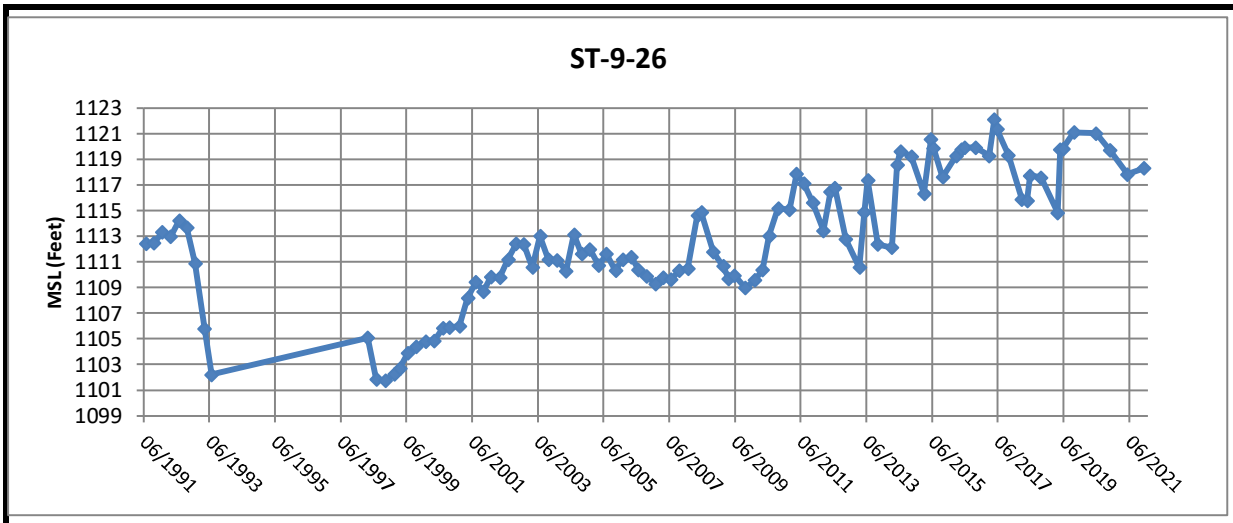


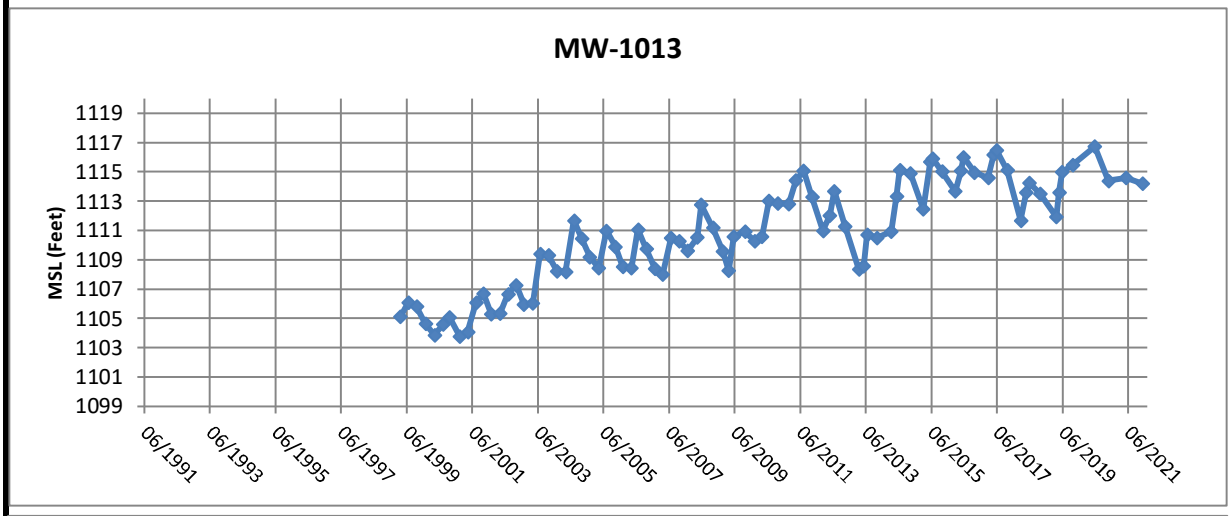
Foth

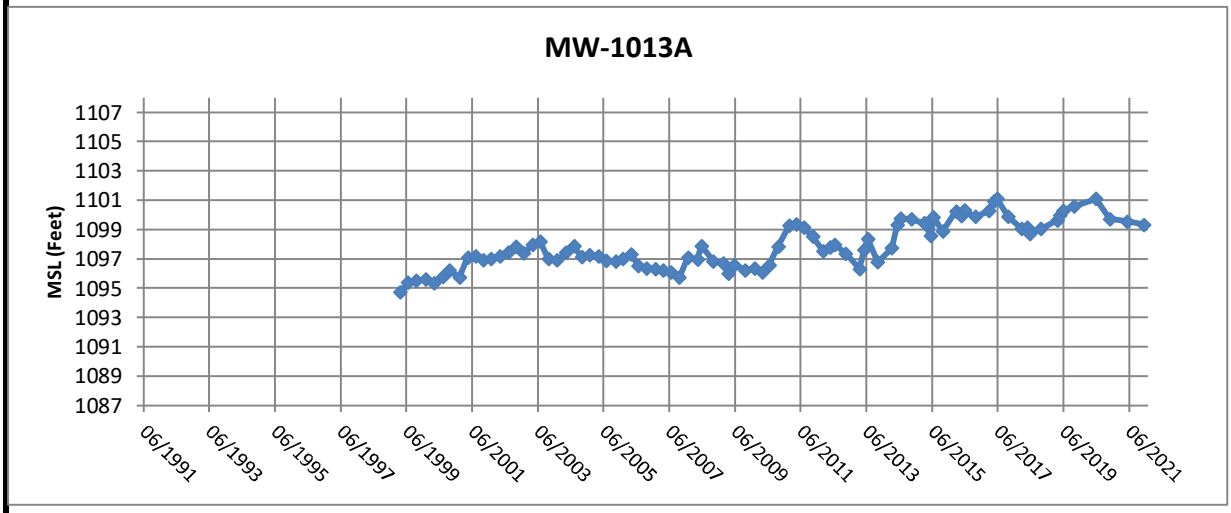
FLAMBEAU MINING COMPANY

Figure B-16f
Hydrographs

Scale: NA	Date: January 2022	
Prepared By: SGL	Checked By: SVF	Project: 17F777.22







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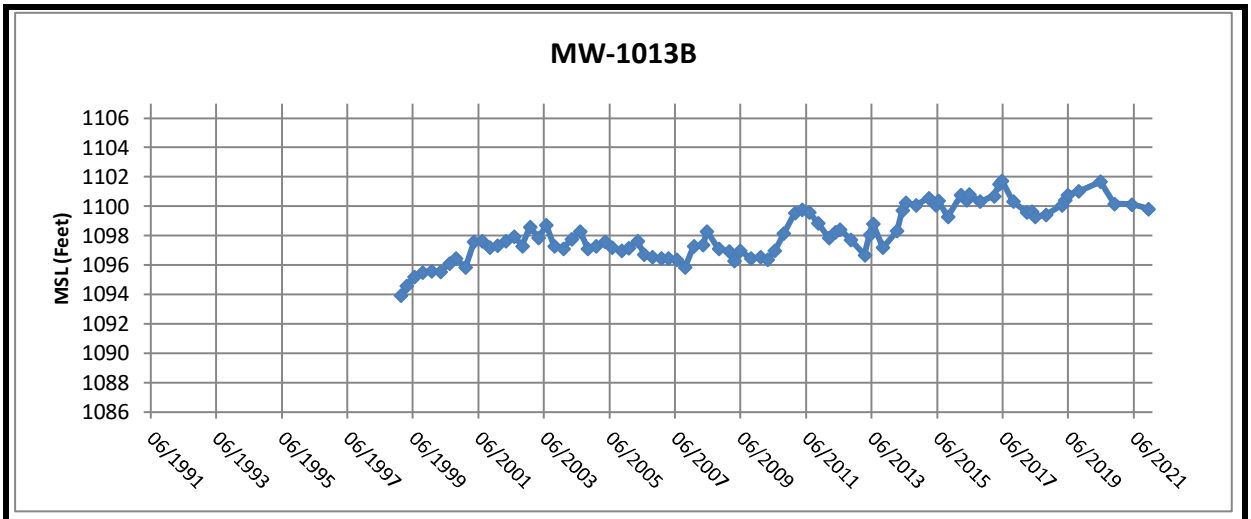
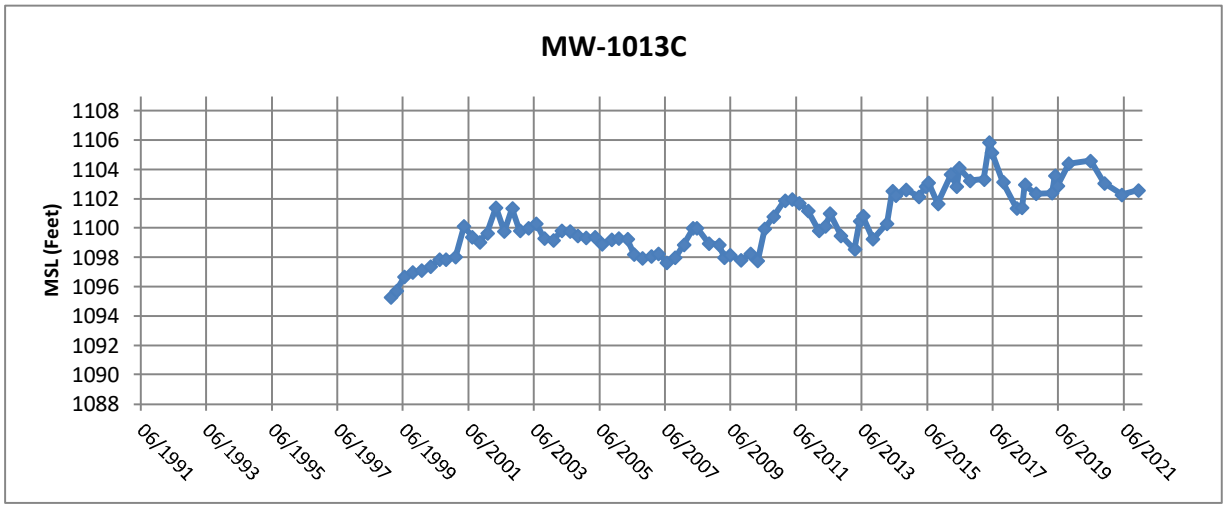
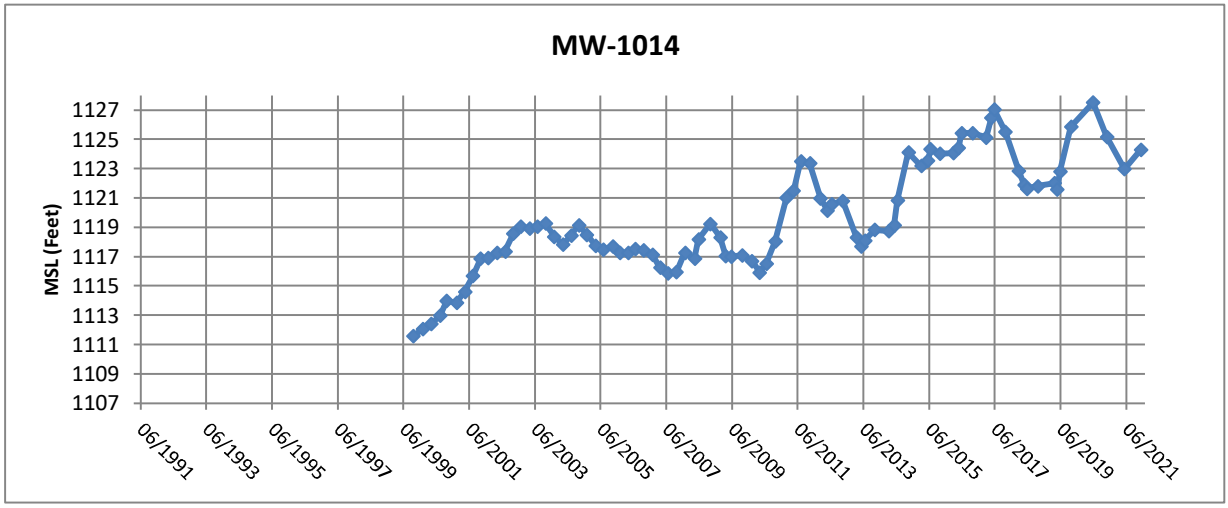
FLAMBEAU MINING COMPANY

Figure B-16g
Hydrographs

Scale: NA	Date: January 2022	
Prepared By: SGL	Checked By: SVF	Project: 17F777.22





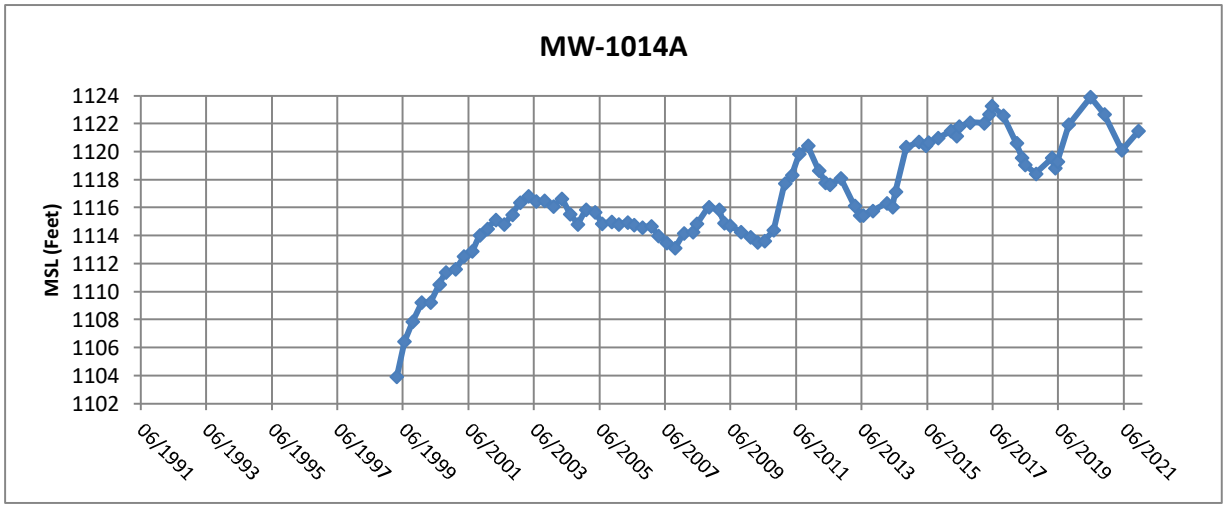


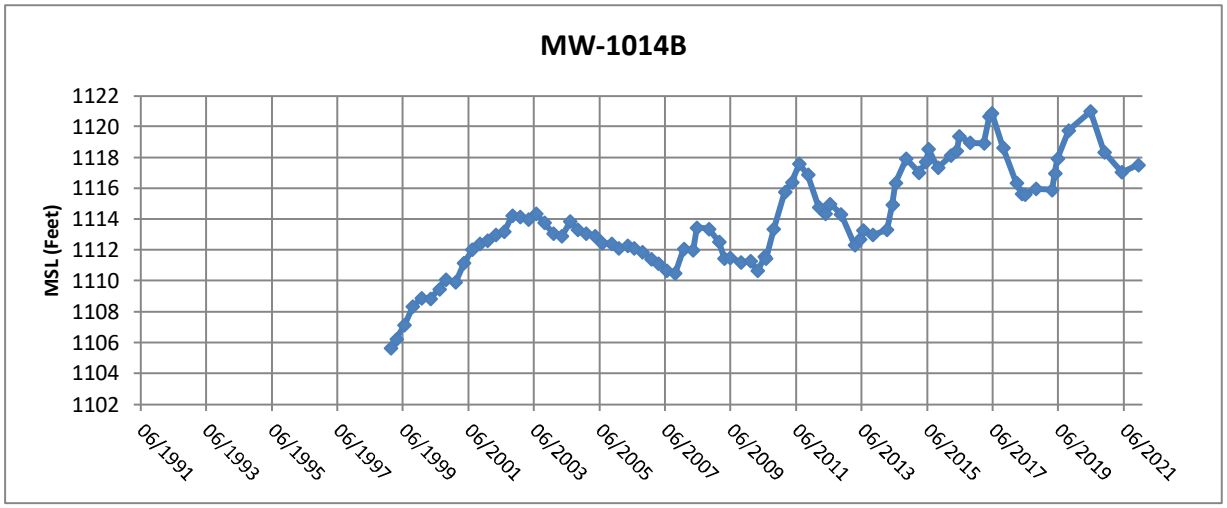
Foth

FLAMBEAU MINING COMPANY

Figure B-16h
Hydrographs

Scale: NA		Date: January 2022
Prepared By: SGL	Checked By: SVF	Project: 17F777.22





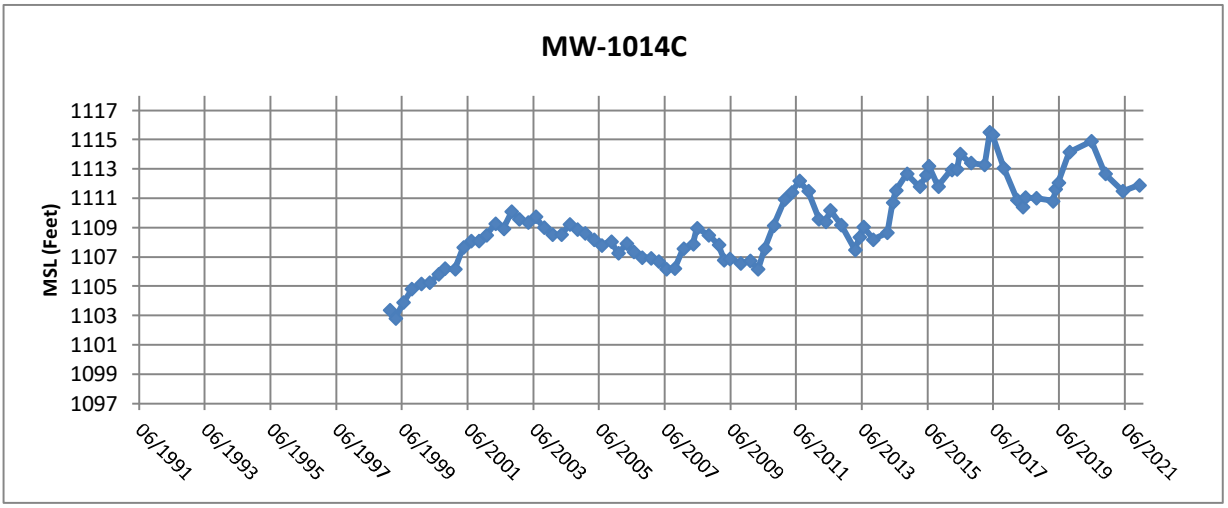


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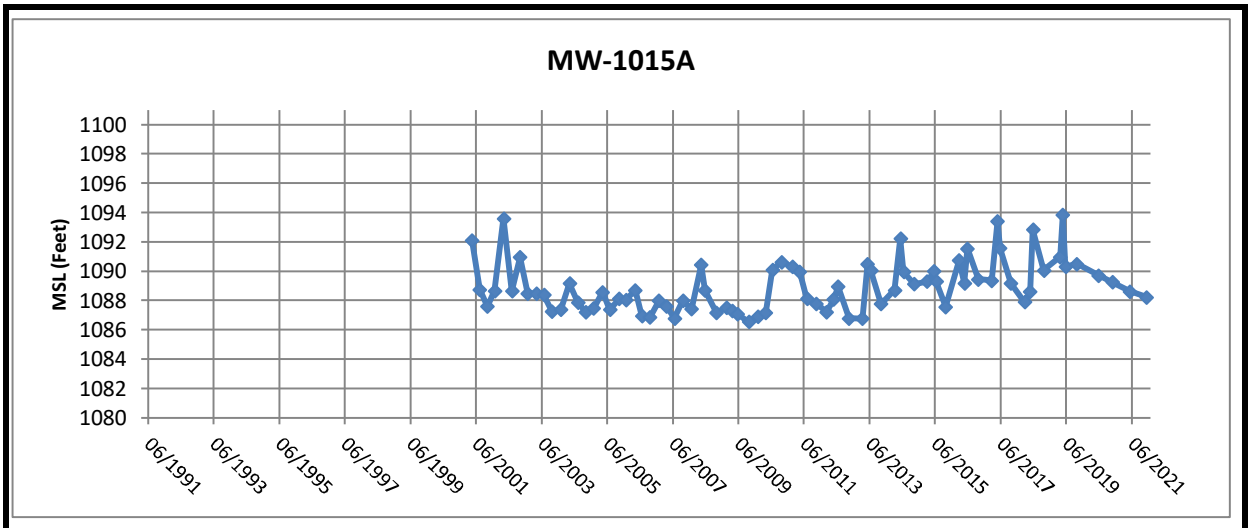
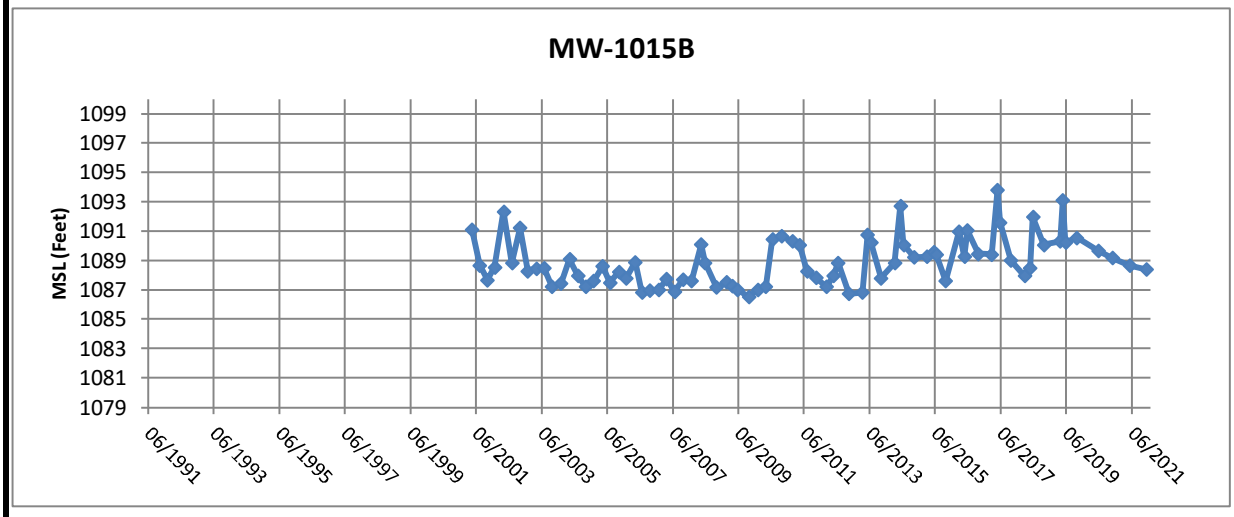
Figure B-16i
Hydrographs

Scale: NA	Date: January 2022	
Prepared By: SGL	Checked By: SVF	Project: 17F777.22





Foth

FLAMBEAU MINING COMPANY

Figure B-16j
Hydrographs

Scale: NA		Date: January 2022
Prepared By: SGL	Checked By: SVF	Project: 17F777.22

2021 Groundwater Elevation Results

Location	Sample Date	Elevation Ft. (MSL)		Sample Date	Elevation Ft. (MSL)
MW-1000PR	5/17/2021	1088.04		11/17/2021	1088.43
MW-1000R	5/17/2021	1089.43		11/17/2021	1089.61
MW-1001	5/17/2021	1119.82		11/17/2021	1119.54
MW-1001G	5/17/2021	1118.65		11/17/2021	1118.42
MW-1001P	5/17/2021	1119.08		11/17/2021	1118.91
MW-1002	5/18/2021	1092.26		11/18/2021	1091.08
MW-1002G	5/18/2021	1092.11		11/18/2021	1090.93
MW-1004	5/17/2021	1108.37		11/17/2021	1107.91
MW-1004P	5/17/2021	1106.82		11/17/2021	1106.36
MW-1004S	5/17/2021	1108.41		11/17/2021	1107.98
MW-1005	5/18/2021	1140.99		11/18/2021	1140.37
MW-1005P	5/18/2021	1140.22		11/18/2021	1139.89
MW-1005S	5/18/2021	1140.89		11/18/2021	1139.65
MW-1010P	5/17/2021	1087.77		11/17/2021	1088.21
MW-1013	5/17/2021	1114.59		11/17/2021	1114.20
MW-1013A	5/17/2021	1099.54		11/17/2021	1099.33
MW-1013B	5/17/2021	1100.12		11/17/2021	1099.82
MW-1013C	5/17/2021	1102.27		11/17/2021	1102.58
MW-1014	5/17/2021	1122.97		11/17/2021	1124.30
MW-1014A	5/17/2021	1120.10		11/17/2021	1121.48
MW-1014B	5/17/2021	1117.04		11/17/2021	1117.52
MW-1014C	5/17/2021	1111.49		11/17/2021	1111.90
MW-1015A	5/17/2021	1088.61		11/17/2021	1088.22
MW-1015B	5/17/2021	1088.65		11/17/2021	1088.38
OW-39	5/17/2021	1102.06		11/17/2021	1100.90
PZ-S3	5/17/2021	1124.97		11/17/2021	1125.22
ST-9-23	5/17/2021	1126.29		11/17/2021	1126.65
ST-9-23A	5/17/2021	1126.42		11/17/2021	1126.70
ST-9-26	5/17/2021	1117.82		11/17/2021	1118.29