

2021 Annual Aquifer Monitoring Report

Evergreen Spring

Fryeburg, Maine

Prepared for:

Blue Triton Brands, Inc.
(d/b/a Poland Spring)
123 Preservation Way
Poland Spring, Maine 04274

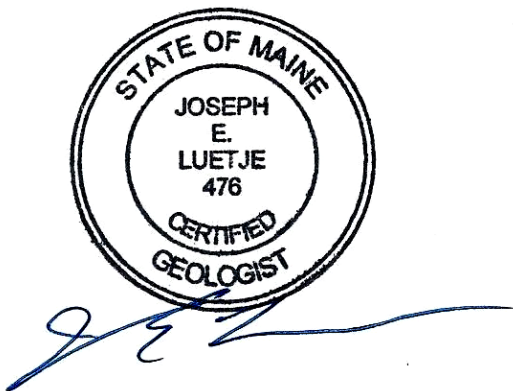


Prepared by:

Luetje Geological Services, LLC
153 Flying Point Road
Freeport, Maine 04032



McDonald Morrissey Associates, LLC
280 Pleasant Street
Concord, New Hampshire 03301



March 2022

**2021 ANNUAL AQUIFER MONITORING REPORT
EVERGREEN SPRING
FRYEBURG, MAINE**

Table of Contents

1.0	INTRODUCTION	1
2.0	AQUIFER MONITORING PROGRAM.....	1
3.0	PRECIPITATION	2
4.0	GROUNDWATER LEVELS	3
5.0	SURFACE WATER LEVELS	4
6.0	WARDS BROOK STREAM FLOW.....	5
7.0	WITHDRAWALS	5
8.0	BIOLOGICAL MONITORING	5
9.0	FINDINGS.....	6
10.0	CONCLUSIONS.....	7

List of Tables

Table 1	Fryeburg Monitoring Program Plan
Table 2	2021 Precipitation Summary
Table 3	PBH-1 2021 Withdrawal Summary

List of Figures

Figure 1	Fryeburg Site Map
Figure 2A	Hydrograph for 2021 Groundwater Elevations (Elevation 410 – 430 Feet NAVD)
Figure 2B	Hydrograph for 2021 Groundwater Elevations (Elevation 390 – 415 Feet NAVD)
Figure 2C	Hydrograph for 2021 Groundwater Elevations (Elevation 375 - 395 Feet NAVD)
Figure 3	Hydrograph for MW-108 and OW 1214
Figure 4	Hydrograph for 2021 Surface Water
Figure 5	Wards Brook Rating Curves

Appendices

Appendix A	Photographs
Appendix B	Groundwater and Surface Water Elevation Data, and Wards Brook Stream Flow Data

1.0 INTRODUCTION

Blue Triton Brands, Inc. (d/b/a/ Poland Spring) has contracted with Luetje Geological Services (LGS) of Freeport, Maine, and McDonald Morrissey Associates, LLC. (MMA) of Concord, New Hampshire, independent hydrogeologic consulting firms, to collect and compile data from the Wards Brook Aquifer. Poland Spring is not required to submit these data to the Town of Fryeburg, but started to do so voluntarily with the December 2008 monthly report. Annual reports are compiled after the end of each calendar year summarizing final data and drawing conclusions about hydrologic conditions in the Wards Brook Aquifer. Poland Spring purchases spring water in Fryeburg from the Fryeburg Water Company (FWC). The FWC also services other residential, commercial, industrial and public water users from Evergreen Spring in Fryeburg.

Hydrogeologic data collection from locations in and around the Wards Brook Aquifer began in 2003 by Woodard & Curran (W&C) for Pure Mountain Springs Company (PMS). LGS assumed responsibility for the monthly monitoring program in July 2008, and continues to conduct monitoring of the Wards Brook Aquifer on behalf of Poland Spring. The primary role for LGS is monthly data collection and preparation of monthly and annual reports. MMA was contracted to perform data analysis, program review, and general oversight of site monitoring and reporting.

In August 2005, Emery & Garrett Groundwater, Inc. submitted a report (*Groundwater Flow Model, Wards Brook Aquifer, Fryeburg, Maine, 2005*) to the Town of Fryeburg Planning Board. This report was funded by the Fryeburg Aquifer Resource Committee (FARC). To date, this appears to be the most comprehensive investigation and report pertaining to the Wards Brook Aquifer.

In 2018, Emery & Garrett updated and re-calibrated the numerical model of the Wards Brook Aquifer, incorporating the latest groundwater and surface water information. They concluded that “the original permissible [commercial withdrawal] limit of 603,000 gallons per day [i.e. 220 million gallons per year] is sustainable and ensures that groundwater discharge to Wards Brook will exceed 400 gallons per minute under any non-extreme climatic scenario¹”. In 2021, Poland Spring purchased approximately 129 million gallons, or approximately 59% of the sustainable yield for commercial withdrawal.

2.0 AQUIFER MONITORING PROGRAM

This annual report is a compilation of data for the period from January 2021 through December 2021. Also included is the entire record of water elevations (2003 – present) measured at MW-108 (**Figure 3**), showing typical seasonal groundwater fluctuations in the Wards Brook Aquifer as discussed further in Section 4.0. Data are presented for:

- Ten monitoring wells;
- Six surface water stations;
- Two rain gauges (an on-site rain gauge located at the load-out facility and data obtained from the Fryeburg Eastern Slopes Airport (ICAO Station KIZG, Northeast Regional Climate Center);

1. EGGI (2018), Recalibration and Application of the Numerical Model of the Wards Brook Aquifer, Fryeburg, Maine, submitted to the Town of Fryeburg.

- Withdrawal data from PBH-1; and,
- Two stream flow locations along Wards Brook.

Locations of all data collection stations are shown in **Figure 1**. **Table 1** summarizes data collection stations and monitoring frequency.

3.0 PRECIPITATION

Precipitation is recorded on-site adjacent to PBH-1 using an Onset Data Logging Rain Gauge (RG). The location of the on-site rain gauge is shown in **Figure 1**. A photograph showing the on-site rain gauge (Photograph C) appears in Appendix A. The on-site rain gauge has a self-tipping bucket that is activated with every 0.01 inches of precipitation. The gauge is also wrapped with a heat tape that melts snowfall and allows measurement of liquid precipitation through the winter months.

Precipitation data are also recorded at the Fryeburg Eastern Slopes Airport (ICAO Station KIZG, Northeast Regional Climate Center) and compared to precipitation measurements taken by the on-site rain gauge. The Fryeburg Eastern Slopes Airport is approximately two miles to the south of the on-site rain gauge. **Table 2** summarizes 2021 precipitation data available and used in the monthly reports.

Examination of **Table 2** shows that there is a correlation between precipitation data collected at both locations from month to month. For the 2021 calendar year, the on-site rain gauge recorded a total of 29.45 inches of precipitation. No data was obtained for the months of June and July due to on-site gauge malfunctions. During those months, KIZG recorded a total of 6.69 inches. Adding that to the on-site gauge annual total would bring the new on-site annual total to 36.14 inches. This value is 3.19 inches less than was recorded in 2020, and approximately twelve inches below the 30-year mean.

From 1992 to 2021 (30 years), the Fryeburg area has received an average of approximately 47 inches of precipitation per year. This average was calculated from data primarily recorded at the Fryeburg Eastern Slopes Airport weather station (ICAO Station KIZG, Northeast Regional Climate Center). Data from the on-site rain gauge was used where gaps in the KIZG record occurred.

The Fryeburg Eastern Slopes Airport gauging station recorded 35.19 inches of precipitation, 5.75 inches less than was recorded in 2020, and approximately twelve inches below the 30-year mean. During 2021, monthly precipitation recorded at KIZG was below the 30-year monthly mean for ten out of twelve months (July and October being the exceptions). According to the Palmer Hydrological Drought Index², the Fryeburg area entered ‘moderate’ drought conditions in March 2021 that persisted through the remainder of 2021. In June, prior to above average precipitation received in July, conditions were classified as ‘moderate’ to ‘severe’.

2. NOAA National Centers for Environmental Information, <https://www.ncdc.noaa.gov/temp-and-precip/drought/weekly-palmer/>.

4.0 GROUNDWATER LEVELS

Groundwater levels were measured in ten monitoring wells during the 2021 calendar year. All monitoring well locations are shown in **Figure 1**. These wells provide groundwater level data across and adjacent to the Wards Brook watershed. Photographs A and AA show a typical monitoring well in Fryeburg and the device used to measure the depth to water (water level indicator). Photographs appear in Appendix A.

Figures 2A through **2C** show groundwater elevations measured from the monitoring well network for the 2021 calendar year. All elevations are referenced to the 1988 North American Vertical Datum (NAVD88). **Figure 2A** shows groundwater elevations on a plot ranging from 410-430 feet NAVD88, **Figure 2B** shows groundwater elevations on a plot ranging from 390-415 feet NAVD88, and **Figure 2C** shows groundwater elevations on a plot ranging from 375-395 feet NAVD88. Each hydrograph is accompanied by a bar graph showing 2021 monthly precipitation and monthly mean precipitation.

Groundwater level fluctuations are primarily driven by the timing and amount of precipitation in a given region. In general, the highest groundwater levels occur in the spring in response to recharge from spring rain and snow melt. Groundwater levels tend to decline through the summer months, when evapotranspiration is greatest, and lowest groundwater levels occur near the end of the summer or early fall. After the trees drop their leaves and evapotranspiration decreases, groundwater levels generally rise until extreme cold conditions persist. Groundwater levels typically drop through the winter months, caused by the majority of precipitation being stored as snow and ice, coupled with irregular frozen ground conditions limiting subsurface recharge capabilities. Data tables showing all groundwater and surface water elevation data appear in Appendix B.

Groundwater levels as seen in **Figures 2A** thru **2C** show groundwater level trends typically observed across the aquifer. 2021 groundwater levels began with the seasonal winter decline in progress. This decline ended at most monitoring locations in February, after which a rise in groundwater elevations was observed in the spring caused by snowpack melt and precipitation recharging the aquifer. Groundwater levels reached their seasonal maximum during the months of April and May 2021. Groundwater levels declined through the summer, reaching seasonal low levels in October and November 2021. At all monitoring well locations, groundwater levels began to rise again in response to late fall/early winter recharge prior to the end of 2021.

Frozen conditions were observed at TW-9 during January through March, and December 2021 monitoring rounds as seen in **Figure 2B**. Frozen conditions were also observed at TW-2 during the January and February monitoring rounds. The water levels in TW-2 and 9 have consistently been above ground surface and water occasionally will freeze in the well casing during the winter months if water is not overflowing the well casing.

Figure 3 shows the entire record of groundwater elevations for MW-108 (November 2003 – present) and demonstrates the typical seasonal groundwater fluctuations observed across the aquifer. **Figure 3** also shows the hydrograph of OW-1214, a well located in Oxford, Maine and monitored by the United States Geological Survey. OW-1214 is a six inch diameter well screened from 35-38 feet below ground surface in stratified sand and gravel, and shows groundwater level fluctuations outside of the Fryeburg area but in the same general region and in

a similar geologic environment. Inclusion of OW-1214 demonstrates the close correlation between water level fluctuations at both locations.

In addition on **Figure 3**, precipitation data are displayed in two plots below the hydrographs. Precipitation data is presented as monthly, annual totals, annual cumulative departure from the 30-year mean (reset annually), and total cumulative precipitation departure from the 30-year mean since 2000.

5.0 SURFACE WATER LEVELS

Surface water elevation is measured at six locations in and around the Wards Brook Aquifer watershed as seen in **Figure 1**. The surface water measuring locations are as follows:

- Saco River Monitoring Point (SRMP-1): surface water elevation is measured at the Route 113 bridge;
- Wards Pond Monitoring Point (WPMP-1): surface water elevation is measured at the Route 113 crossing;
- Lovewell Pond Staff Gauge (LPSG-1): surface water elevation is measured at the inlet from Wards Brook;
- Wards Pond Staff Gauge (WPSG-2A): surface water elevation is measured near the center of the watershed in a bog located to the south of Wards Pond; and,
- SG-2 and SG-3: These staff gauges are in Wards Brook at the upstream and downstream gauging locations, and are discussed further in Section 6.0.

Appendix A includes a photograph (Photograph B) showing a typical staff gauge used to measure surface water stage and a view of Lovewell Pond (Photograph BB) facing north from the boat ramp located off Route 113. The Lovewell Pond photograph is taken every June monitoring event to document conditions during the same time of year. 2021 surface water elevations from surface water stations appear in **Figure 4**. A data table summarizing surface water elevation data appears in Appendix B.

Examination of **Figure 4** shows normal seasonal surface water fluctuations near the site. In general, there is typically a rise in surface water levels during spring melt, a decline through the summer months, another rise in the fall and early winter followed by frozen conditions during winter months. In 2021, surface water levels rose from the June to July monitoring rounds. This was caused by the timing and amount of precipitation that occurred over the first three weeks in July 2021. During July 2021, station KIZG recorded 6.09 inches of precipitation, nearly two inches above the 30-year mean. Surface water levels declined from July to September or October, representing the typical seasonal summer decline. Frozen conditions were observed at WPSG-2A during the January through March, and December 2021 monitoring rounds. Frozen conditions were observed at WPMP-1 during the February 2021 monitoring round, and at SRMP-1 during the February and December monitoring rounds. Conditions at LPSG-1 remained unfrozen throughout 2021.

6.0 WARDS BROOK STREAM FLOW

Beginning with the June 2020 monitoring round, stream flow and surface water elevation have been measured at two locations along Wards Brook. As seen on **Figure 1**, SG-2 (~200' downstream from Rt 113) is the upstream location, and SG-3 (at the former grist mill site) is the downstream location. Surface water elevation is measured at these locations to potentially create a 'rating curve' that may establish a relationship between surface water stage and stream flow. Between SG-2 and SG-3, Wards Brook gains flow from spring discharge, including those associated with the Evergreen Spring site.

Flow was measured using a Marsh McBirney Flo-Mate Model 2000 electromagnetic velocity flow meter from January through October 2021. Starting with the November 2021 monitoring round, the use of a HACH FH950 current meter was implemented (hardware upgrade). Velocity measurement protocols are based upon United States Geological Survey (USGS) stream gaging methods. Flow rates are measured in 'cells' along a cross-section of the stream. Calculation of cell area and measurement of flow rate through each cell allows for the computation of total flow through the cross-section. Units are generally in cfs (cubic feet per second; 1 cfs = 448.8 gallons per minute).

During 2021, the average gain in stream flow between SG-2 and SG-3 was 2.15 cfs. Highest flows were measured during the April 2021 monitoring round; 4.55 cfs was measured at SG-2 and 7.24 cfs was measured at SG-3. Lowest flows were measured during the June and August monitoring rounds. The 2021 lowest flow was recorded at SG-2 in June (0.30 cfs) and was recorded at SG-3 in August (2.18 cfs). Below average precipitation for the months of May and June resulted in low surface water flows measured during the June 2021 monitoring round. Seasonal low flow and stage typically occur during the August/September timeframe.

Figure 5 shows two plots presenting the stage/discharge relationship (rating curves) at the upstream (SG-2) and downstream (SG-3) locations from the June 2020 monitoring round through the writing of this report. As can be seen in **Figure 5**, a good relationship may be drawn between stage and discharge at both stream gauging locations, whereby discharge might be inferred using stage (surface water elevation). Future measurements added to this dataset should help to refine this relationship further. All stream flow and stage data appears in Appendix B.

7.0 WITHDRAWALS

In accordance with the contract with the Fryeburg Water Company, spring water volume withdrawn from PBH-1 is presented as total gallons recorded as offloaded at bottling facilities. **Table 3** summarizes the 2021 monthly withdrawal volumes. Spring water withdrawals from PBH-1 totaled 128,780,850 gallons for the 2021 calendar year.

8.0 BIOLOGICAL MONITORING

To complement the biological investigations conducted by Normandeau Associates in the 2006 and 2008 field seasons, Poland Spring initiated a long-term biological monitoring program of Wards Brook beginning in 2009. Bio-monitoring was last completed by Stantec in 2019, and has

been conducted every other year between 2009 and 2019. Results from these investigations have remained consistent, whereby Wards Brook has maintained Class A water quality standards, which is above the statutory Class C designation. Stantec concluded in 2019 that water withdrawal operations at the Evergreen Spring site have not had an adverse effect on the water quality of Wards Brook. Based on the consistency in results, Stantec recommended continuing stream biomonitoring on an every-three-year schedule³. Therefore, bio-monitoring is next scheduled to be conducted in 2022 and will appear in the 2022 annual report.

9.0 FINDINGS

This annual report prepared on behalf of Poland Spring is a summary of hydrologic data collected from the Wards Brook Aquifer through the 2021 calendar year. Poland Spring also provides these data voluntarily to the Town of Fryeburg, Fryeburg Water District and the Fryeburg Water Company on a monthly basis in the form of a monthly report that began with the December 2008 report. These data provide an on-going comprehensive summary of hydrologic conditions in the Wards Brook Aquifer. Findings for 2021 include the following:

- In 2021, Poland Spring purchased 128,780,850 gallons of spring water from the FWC;
- 128,780,850 gallons represents approximately 59% of the sustainable amount of water available for commercial withdrawal as determined by Emery & Garrett Groundwater, Inc.;
- Normal seasonal variations of groundwater levels were observed through 2021 at all monitoring well locations;
- Highest groundwater elevations for 2021 were observed in April and May, while the lowest groundwater elevations were recorded in October and November;
- Surface water levels showed normal seasonal variation in 2021;
- Total precipitation for the 2021 calendar year was 35.19 inches, as recorded at station KIZG, 5.75 inches less than in 2020, and approximately twelve inches below the 30-year mean.

3. Stantec (2019), Evergreen Spring: Biological Monitoring Report, Fryeburg, Maine; February 20, 2019.

10.0 CONCLUSIONS

Based on our analysis of groundwater and surface water data collected in Fryeburg, Luetje Geological Services and McDonald Morrissey Associates have not observed any adverse impact to waters of the State, water-related natural resources and existing uses as a result of the sale of water by the Fryeburg Water Company to Poland Spring.

If you have any questions regarding the data, explanations, or interpretations included in this report, please do not hesitate to contact Ed Luetje (207) 415-9898.

Sincerely,

Luetje Geological Services, LLC



Ed Luetje L.G.

McDonald Morrissey Associates, LLC



Michael Mobile, Ph.D. CGWP

cc: Fryeburg Water Company (Mr. George Weston)
Emery & Garrett Groundwater, Inc. (Mr. Dan Tinkham)
Poland Spring (Mr. Mark Dubois)
Poland Spring (Mr. Iain Kurry)
Town of Fryeburg (Ms. Katie Haley)
Maine Water Company (Mr. Rick Knowlton)

List of Tables

Table 1	Fryeburg Monitoring Program Plan
Table 2	2021 Precipitation Summary
Table 3	PBH-1 2021 Withdrawal Summary

TABLE 1
FRYEBURG MONITORING PROGRAM PLAN

Monitoring Station	Frequency
<i>Monitoring Wells</i>	
TW-2 ¹	Monthly
TW-9	Monthly
MW-101 ²	Monthly
MW-105	Monthly
MW-107	Monthly
MW-108	Monthly
MW-109	Monthly
MW-110	Monthly
MW-113	Monthly
MW-114	Monthly
<i>Surface Water Stations</i>	
WPMP-1 ³	Monthly
WPSG-2A ⁴	Monthly
SRMP-1 ⁵	Monthly
LPSG-1 ⁶	Monthly
SG-2 (Upstream gauging location)	Monthly
SG-3 (Downstream gauging location)	Monthly
<i>Precipitation</i>	
RG – On-site Rain Gauge	Continuous
ICAO Station KIZG (Fryeburg Airport)	Continuous
<i>Withdrawal Data</i>	
PBH-1	Continuous
<i>Stream Flow Measurement (Wards Brook)</i>	
SG-2 (upstream)	Monthly
SG-3 (downstream)	Monthly

Notes: 1. TW refers to ‘test well’.
2. MW refers to ‘monitoring well’.
3. WPMP refers to ‘Wards Pond Monitoring Point’.
4. WPSG refers to ‘Wards Pond Staff Gauge’.
5. SRMP refers to ‘Saco River Monitoring Point’.
6. LPSG refers to ‘Lovewell Pond Staff Gauge’.

TABLE 2
2021 PRECIPITATION SUMMARY

<i>MONTH</i>	<i>ON-SITE RAIN GAUGE DATA (inches)</i>	<i>FRYEBURG EASTERN SLOPES AIRPORT (ICAO STATION KIZG)¹ (inches)</i>
Jan 2021	1.68	1.86
Feb 2021	2.80	2.78
Mar 2021	2.01	2.20
Apr 2021	4.23	4.09
May 2021	1.38	1.47
Jun 2021	na ²	0.60
Jul 2021	na	6.09
Aug 2021	2.99	3.15
Sep 2021	3.92	2.07
Oct 2021	5.29	5.40
Nov 2021	2.16	2.15
Dec 2021	2.99	3.33
2021 Total	29.45	35.19

Notes: 1. KIZG station updated data. KIZG data presented in the monthly reports is preliminary, and is rechecked for this annual report.
2. Not Available – on-site gauge malfunction.

TABLE 3
PBH-1 2021 WITHDRAWAL SUMMARY

Month	Monthly Total (gal)
Jan 2021	7,784,730
Feb 2021	5,467,810
Mar 2021	5,752,780
Apr 2021	11,932,745
May 2021	14,039,210
Jun 2021	11,692,915
Jul 2021	14,327,110
Aug 2021	13,472,505
Sep 2021	14,310,520
Oct 2021	13,671,500
Nov 2021	11,756,270
Dec 2021	4,572,755
2021 Total	128,780,850

List of Figures

Figure 1	Fryeburg Site Map
Figure 2A	Hydrograph for 2021 Groundwater Elevations (Elevation 410 – 430 Feet NAVD88)
Figure 2B	Hydrograph for 2021 Groundwater Elevations (Elevation 390 – 415 Feet NAVD88)
Figure 2C	Hydrograph for 2021 Groundwater Elevations (Elevation 375 – 395 Feet NAVD88)
Figure 3	Hydrograph for MW-108 and OW-1214
Figure 4	Hydrograph for 2021 Surface Water
Figure 5	Wards Brook Rating Curves

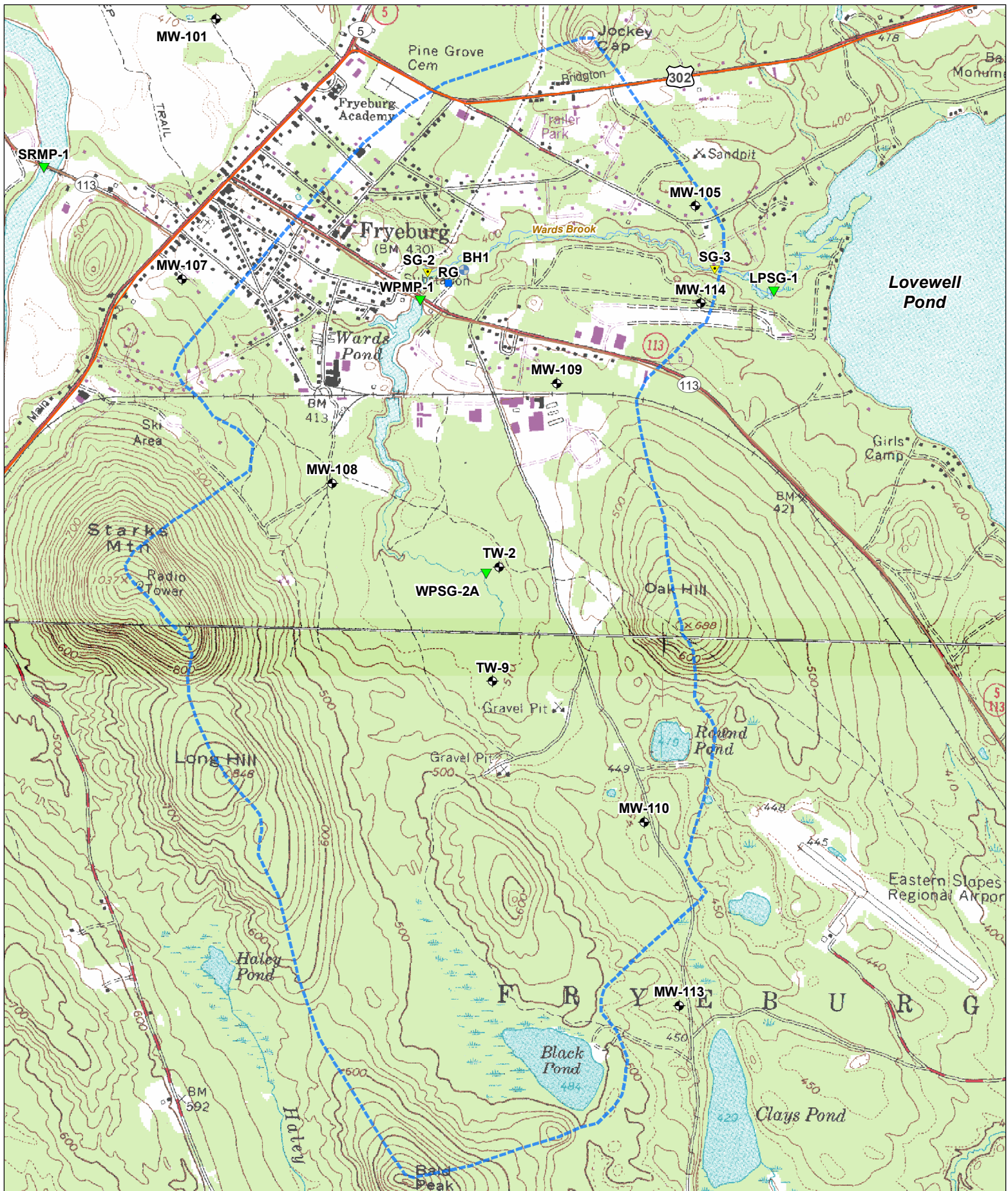


FIGURE 1
2021 ANNUAL AQUIFER MONITORING REPORT
EVERGREEN SPRING
FRYEBURG, MAINE

0 400 800 1,600 2,400 Feet

NOTES:
1. ALL GENERAL DATA LAYERS ACQUIRED FROM THE
MAINE OFFICE OF GIS AND/OR ESRI ONLINE.

N
DATE:
2/16/2022



LUETJE GEOLOGICAL SERVICES, LLC
153 FLYING POINT ROAD
FREEPORT, ME 04032
207-415-9898
ed@luetjegeological.com

- BOREHOLE
- MONITORING WELL
- RAIN GAUGE
- SURFACE WATER STATION
- STREAM FLOW AND STAGE
- WARDS BROOK WATERSHED (APPROXIMATE)

FIGURE 2A
HYDROGRAPH FOR 2021 GROUNDWATER ELEVATIONS (ELEVATION 410 - 430 FEET NAVD88)

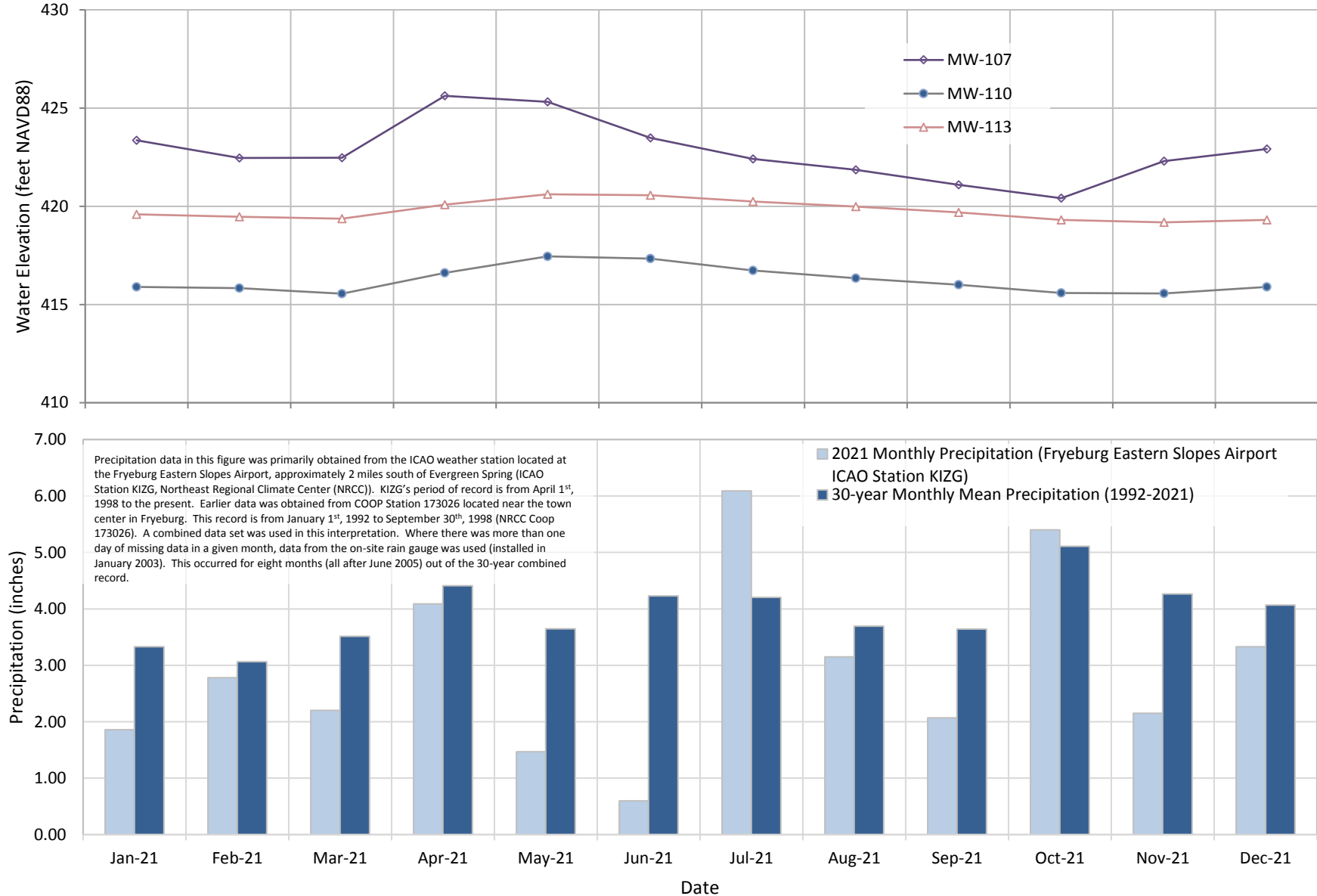


FIGURE 2B
HYDROGRAPH FOR 2021 GROUNDWATER ELEVATIONS (ELEVATION 390 - 415 FEET NAVD88)

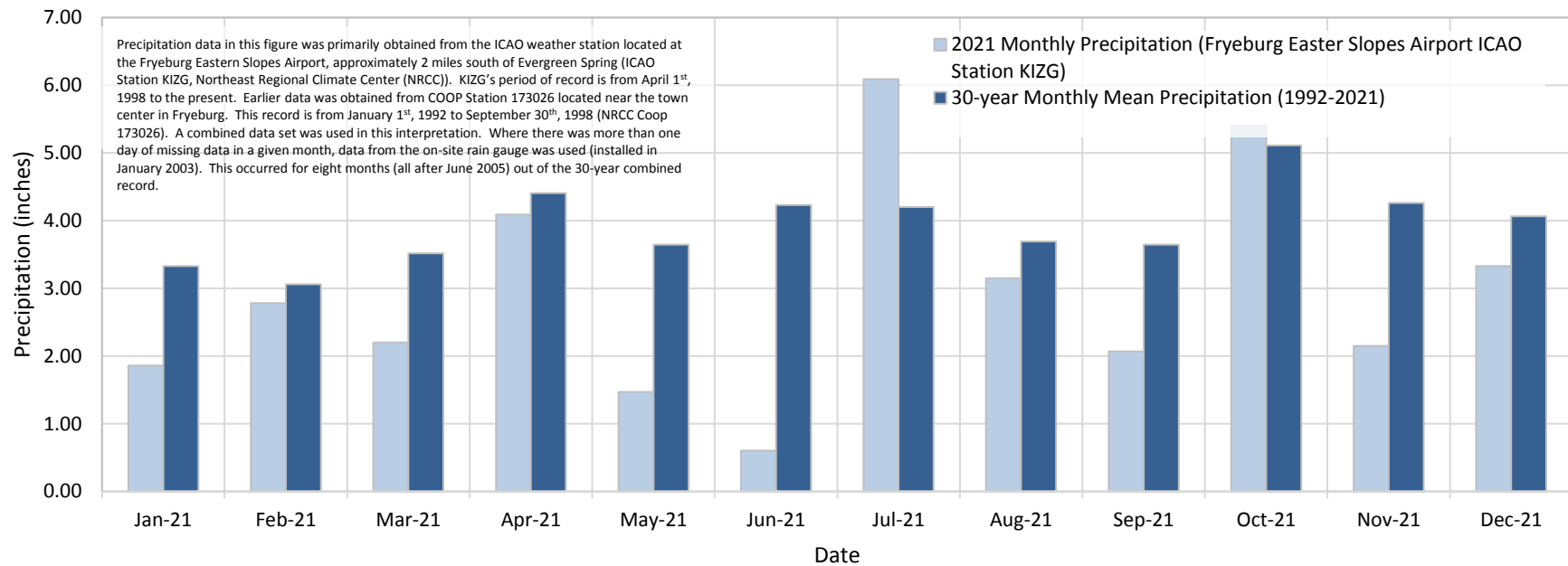
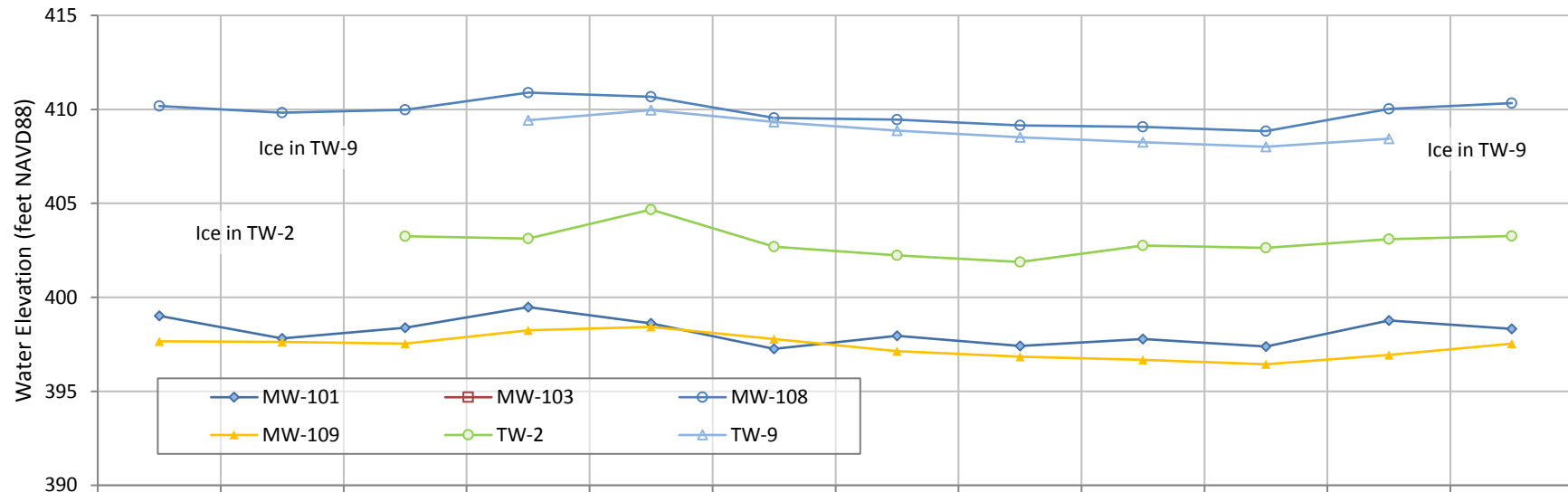


FIGURE 2C
HYDROGRAPH FOR 2021 GROUNDWATER ELEVATIONS (ELEVATION 375 - 395 FEET NAVD88)

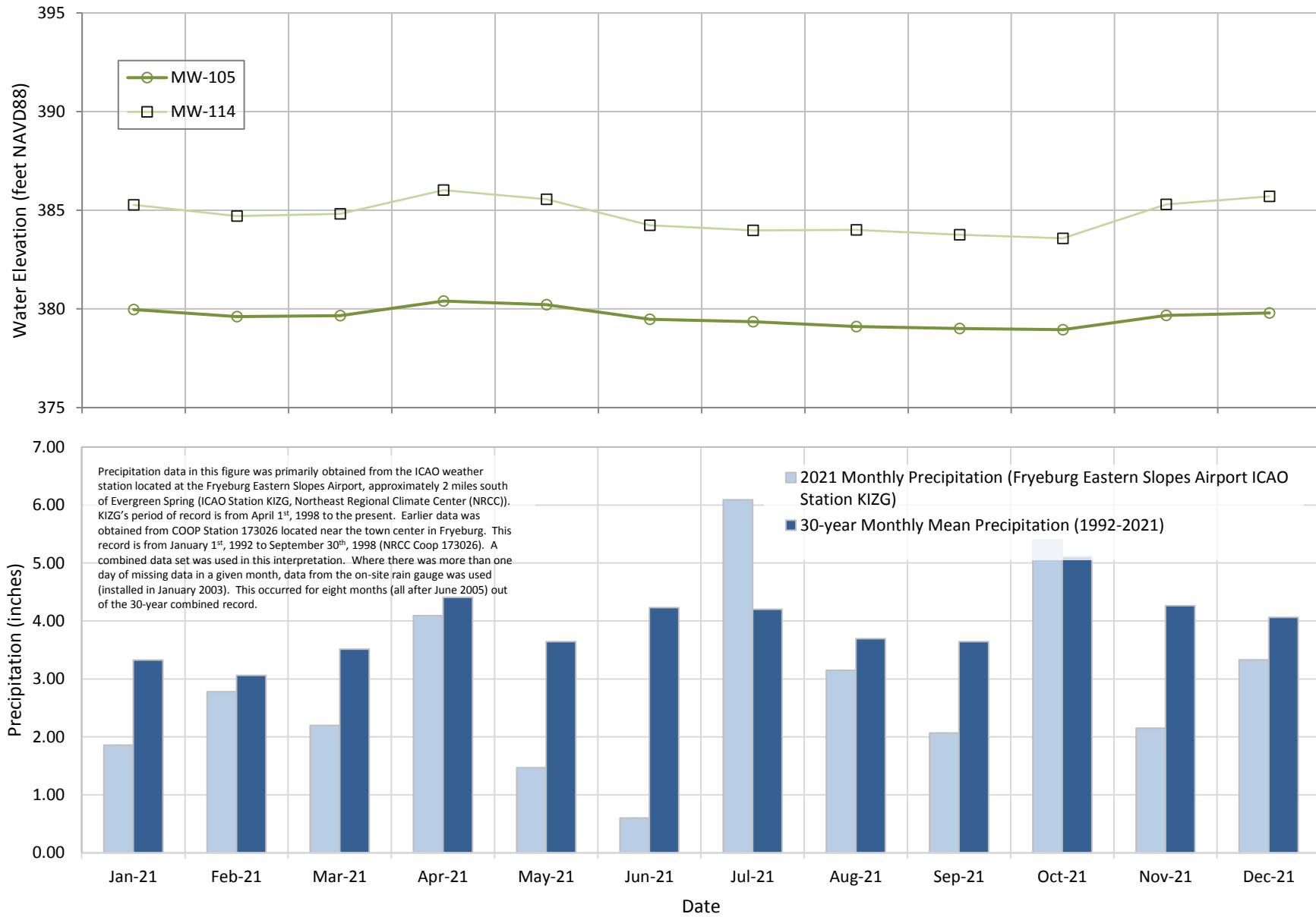


FIGURE 3
HYDROGRAPH FOR MW-108 AND OW-1214

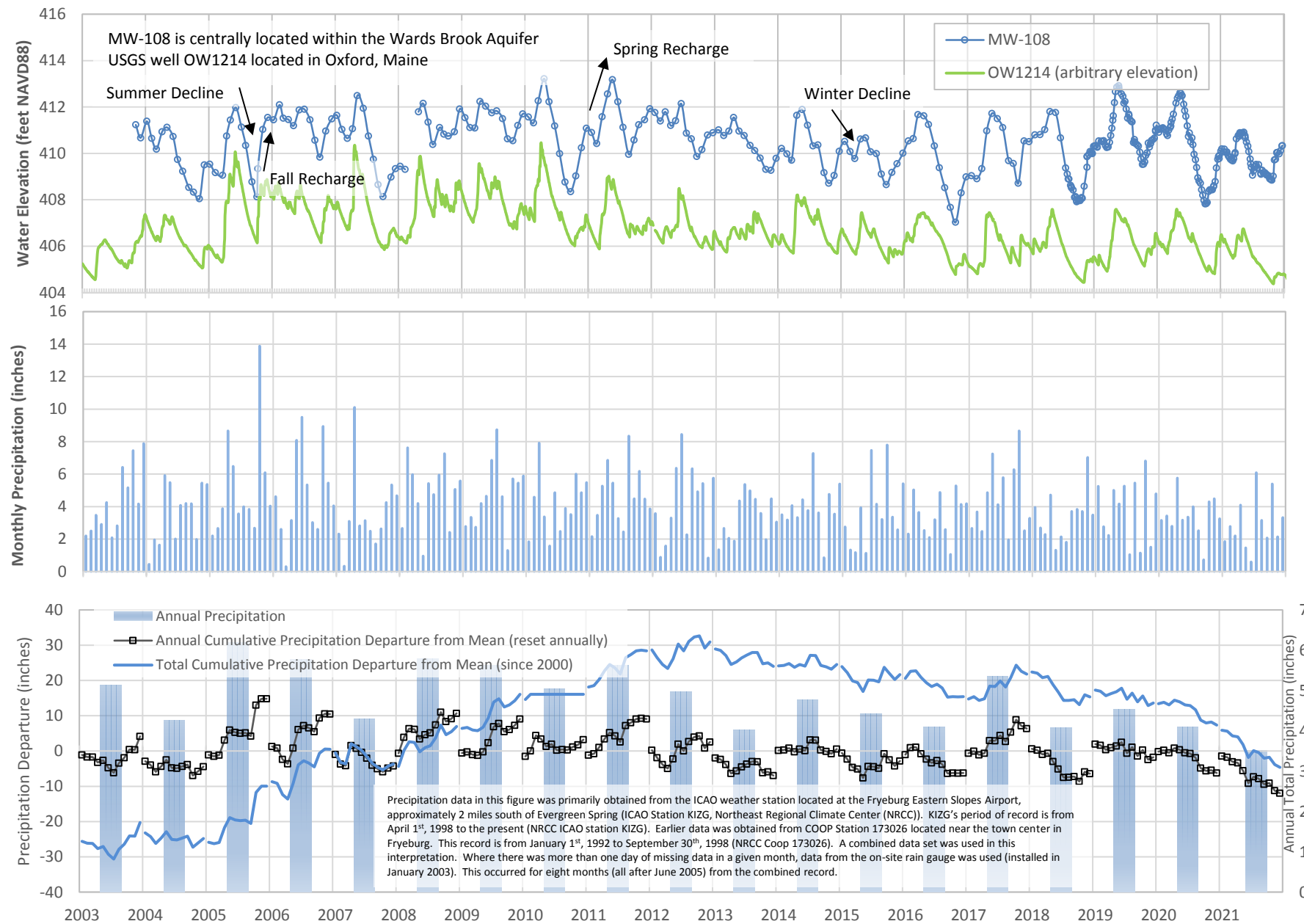


FIGURE 4
HYDROGRAPH FOR 2021 SURFACE WATER

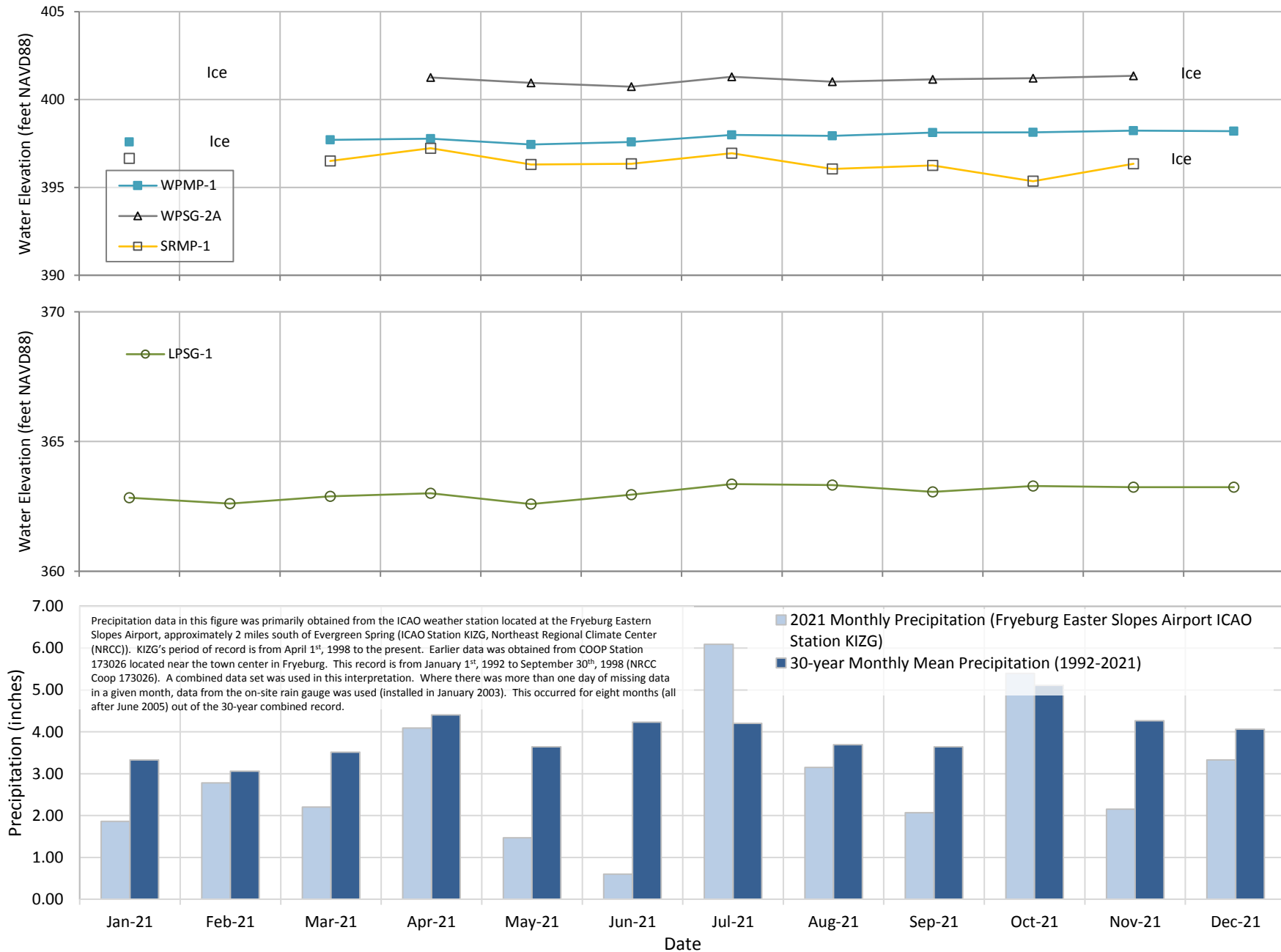
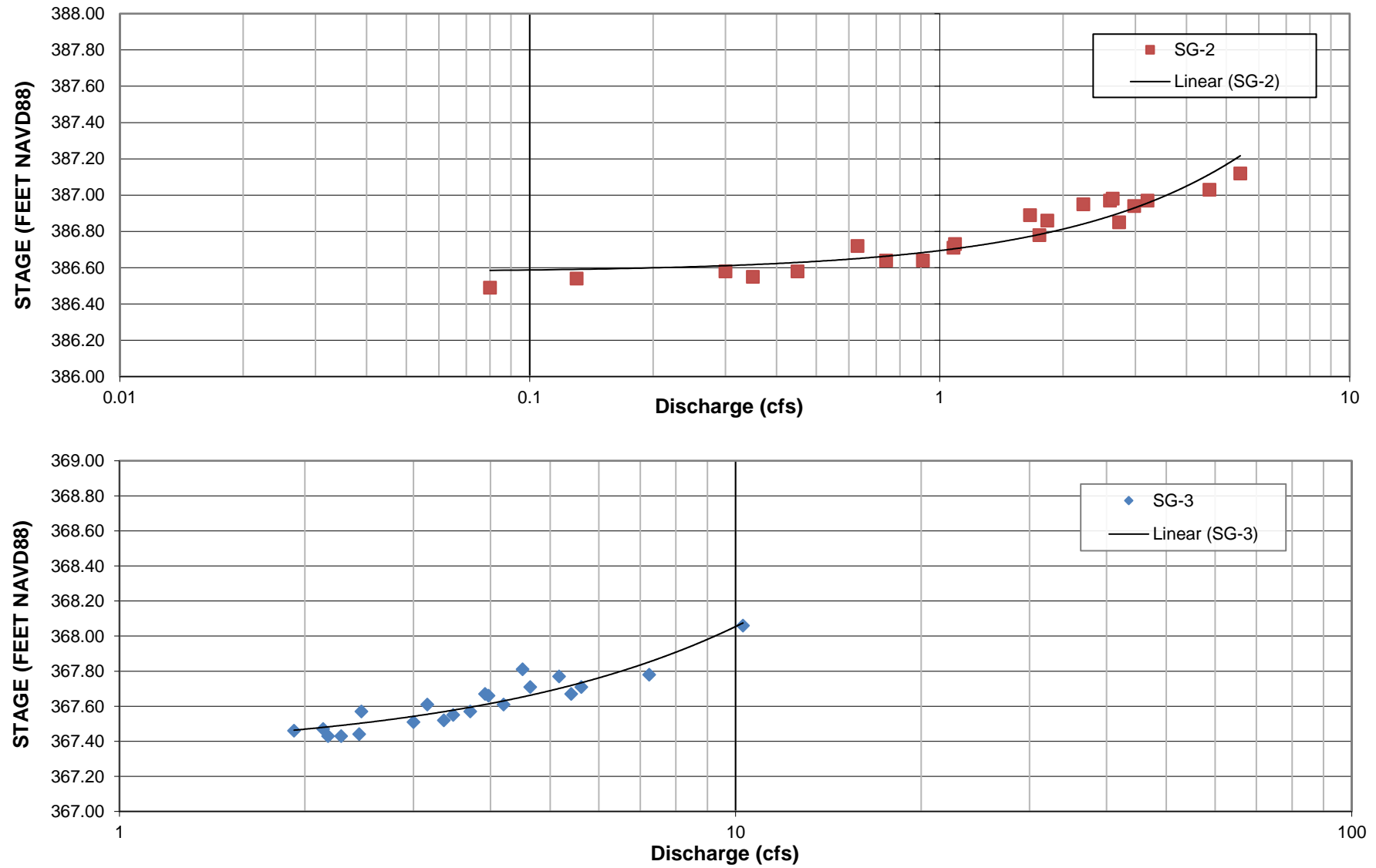


Figure 5
Wards Brook Rating Curves



Appendices

Appendix A	Photographs
Appendix B	Groundwater and Surface Water Elevation Data, and Wards Brook Stream Flow Data

APPENDIX A

Photographs

Photographs A and AA: Measuring depth to water using a water level indicator at MW-114.



Photograph A



Photograph AA

Photograph B: WBSG-2 – Typical staff gage used for measuring surface water elevation.

Photograph BB: Lovewell Pond from boat ramp off Rt. 113 facing north (6/21/2021).



Photograph B



Photograph BB



Photograph C: On-site Rain Gage

APPENDIX B

Groundwater and Surface Water Elevation Data, And Wards Brook Stream Flow Data Fryeburg, Maine

APPENDIX B
GROUNDWATER AND SURFACE WATER ELEVATION DATA, AND WARDS BROOK STREAM FLOW DATA
FRYEBURG, MAINE

<i>Monitoring Wells</i>	MW-101 ²	MW-105	MW-107	MW-108	MW-109	MW-110	MW-113	MW-114	TW-2	TW-9
<i>Reference Elevation (feet NAVD88)</i> ¹	408.32	404.98	432.05	419.88	420.08	461.84	441.11	405.25	404.19	409.17
1/20/2021	399.01	379.97	423.36	410.18	397.66	415.89	419.59	385.28	ice	ice
2/18/2021	397.82	379.61	422.46	409.82	397.63	415.83	419.47	384.71	ice	ice
3/22/2021	398.38	379.66	422.47	409.98	397.54	415.55	419.37	384.82	403.25	ice
4/19/2021	399.48	380.40	425.62	410.89	398.25	416.61	420.08	386.02	403.12	409.42
5/20/2021	398.61	380.22	425.32	410.67	398.43	417.45	420.61	385.56	404.67	409.96
6/21/2021	397.26	379.47	423.48	409.55	397.78	417.33	420.56	384.24	402.70	409.33
7/19/2021	397.95	379.35	422.41	409.45	397.13	416.73	420.24	383.98	402.23	408.87
8/18/2021	397.42	379.11	421.86	409.14	396.85	416.34	419.98	384.01	401.88	408.51
9/20/2021	397.78	379.01	421.09	409.07	396.68	416.01	419.69	383.76	402.75	408.26
10/20/2021	397.38	378.95	420.41	408.84	396.44	415.59	419.31	383.58	402.64	408.01
11/19/2021	398.77	379.67	422.30	410.03	396.93	415.56	419.18	385.30	403.10	408.44
12/21/2021	398.32	379.80	422.91	410.33	397.53	415.89	419.31	385.70	403.26	ice

<i>Surface Water Stations</i>	LPSG-1 ³	WPMP-1 ⁴	SRMP-1 ⁵	WPSG-2A ⁶	SG-2		SG-3	
<i>Reference Elevation (feet NAVD88)</i>	365.54 365.54	401.22	418.85	402.37 402.25	389.41 389.42		370.70 370.70	
					elevation	flow (cfs) ⁷	elevation	flow (cfs)
1/20/2021	362.83	397.59	396.65	ice	386.97	3.21	367.71	5.62
2/18/2021	362.61	ice	ice	ice	386.71	1.08	367.55	3.48
3/22/2021	362.89	397.71	396.50	ice	386.94	2.98	367.67	5.41
4/19/2021	363.01	397.77	397.23	401.25	387.03	4.55	367.78	7.24
5/20/2021	362.59	397.44	396.30	400.95	386.73	1.09	367.52	3.36
6/21/2021	362.95	397.58	396.34	400.73	386.58	0.30	367.43	2.29
7/19/2021	363.36	397.99	396.95	401.29	386.85	2.74	367.61	4.20
8/18/2021	363.32	397.93	396.05	401.01	386.55	0.35	367.43	2.18
9/20/2021	363.06	398.12	396.25	401.15	386.58	0.45	367.44	2.45
10/20/2021	363.29	398.13	395.35	401.21	386.72	0.63	367.57	2.47
11/19/2021	363.24	398.23	396.35	401.35	386.97	2.60	367.81	4.51
12/21/2021	363.24	398.20	ice	ice	386.98	2.64	367.77	5.17

NOTES:

1. NAVD88 is the North American Vertical Datum 1988. Elevations are in feet NAVD. Measuring points were re-surveyed in November 2015 by Bliss Associates.

2. 'MW' refers to 'monitoring well'.

3. 'LPSG' refers to 'Lovewell Pond Staff Gauge'.
365.54 = old reference elevation (May, 2020)
365.54 = new reference elevation (May, 2021)

4. 'WPMP' refers to 'Wards Pond Monitoring Point'.
401.22 = reference elevation (November 2015, Bliss)

5. 'SRMP' refers to 'Saco River Monitoring Point'.
418.85 = reference elevation (November 2015, Bliss)

6. 'WPSG' refers to 'Wards Pond Staff Gauge'.
402.37 = old reference elevation (May, 2020)
402.25 = new reference elevation (May, 2021)

7. cfs = cubic feet per second

APPENDIX B
GROUNDWATER AND SURFACE WATER ELEVATION DATA, AND WARDS BROOK STREAM FLOW DATA
FRYEBURG, MAINE

MW-108 DATA

Date	Groundwater Elevation (NAVD88)	Date	Groundwater Elevation (NAVD88)	Date	Groundwater Elevation (NAVD88)	Date	Groundwater Elevation (NAVD88)	Date	Groundwater Elevation (NAVD88)	Date	Groundwater Elevation (NAVD88)
11/6/2003	411.23	2/8/2007	411.03	6/21/2010	411.18	10/21/2013	409.31	2/21/2017	408.91	12/13/2018	410.05
12/4/2003	410.67	3/12/2007	410.65	7/19/2010	409.99	11/20/2013	409.27	3/21/2017	409.34	12/19/2018	410.02
1/9/2004	411.38	4/10/2007	411.06	8/19/2010	408.76	12/20/2013	409.79	4/19/2017	410.97	12/20/2018	409.99
2/6/2004	410.65	5/8/2007	412.49	9/20/2010	408.35	1/20/2014	410.21	5/18/2017	411.72	12/27/2018	410.30
3/4/2004	410.18	6/12/2007	411.94	10/20/2010	409.03	2/20/2014	409.98	6/19/2017	411.50	1/2/2019	410.32
4/6/2004	410.93	7/11/2007	410.75	11/22/2010	410.24	3/19/2014	409.70	7/20/2017	411.11	1/8/2019	410.33
5/4/2004	411.12	8/9/2007	409.75	12/20/2010	411.08	4/18/2014	411.64	8/23/2017	409.68	1/16/2019	410.28
6/8/2004	410.73	9/5/2007	408.65	1/19/2011	410.90	5/19/2014	411.89	9/19/2017	409.56	1/17/2019	410.26
7/5/2004	409.73	10/4/2007	408.14	2/18/2011	410.42	6/19/2014	411.21	10/18/2017	408.71	1/25/2019	410.53
8/3/2004	409.23	11/18/2007	408.98	3/21/2011	411.58	7/21/2014	410.32	11/20/2017	410.53	2/9/2019	410.52
9/7/2004	408.53	12/14/2007	409.34	4/22/2011	412.56	8/18/2014	410.36	12/19/2017	410.50	2/15/2019	410.50
10/4/2004	408.33	1/11/2008	409.44	5/20/2011	413.18	9/22/2014	409.17	1/22/2018	410.80	2/18/2019	410.50
11/8/2004	408.05	2/8/2008	409.31	6/20/2011	412.22	10/20/2014	408.71	2/21/2018	410.81	2/23/2019	410.54
12/6/2004	409.50	3/20/2008	nr	7/20/2011	411.12	11/20/2014	409.05	3/19/2018	411.02	3/5/2019	410.33
1/6/2005	409.53	4/25/2008	411.79	8/22/2011	409.96	12/19/2014	410.09	4/18/2018	411.80	3/12/2019	410.25
2/7/2005	409.17	5/22/2008	412.15	9/21/2011	410.57	1/19/2015	410.51	5/21/2018	411.76	3/19/2019	410.29
3/21/2005	409.06	6/20/2008	411.34	10/19/2011	411.23	2/20/2015	410.08	6/19/2018	410.67	3/20/2019	410.27
4/14/2005	410.75	7/17/2008	410.38	11/21/2011	411.45	3/19/2015	409.78	7/18/2018	409.37	3/28/2019	410.47
5/5/2005	411.43	8/25/2008	411.11	12/21/2011	411.92	4/20/2015	410.62	7/27/2018	409.11	4/4/2019	410.77
6/6/2005	411.97	9/19/2008	410.83	1/20/2012	411.76	5/20/2015	410.67	8/2/2018	408.90	4/11/2019	411.08
7/8/2005	411.13	10/15/2008	410.75	2/20/2012	411.39	6/18/2015	410.07	8/6/2018	408.90	4/16/2019	411.42
8/2/2005	410.34	11/19/2008	410.93	3/20/2012	411.79	7/21/2015	409.99	8/16/2018	408.62	4/19/2019	411.62
9/7/2005	408.77	12/19/2008	411.91	4/20/2012	411.20	8/19/2015	409.11	8/20/2018	408.56	4/26/2019	412.18
10/5/2005	408.13	1/19/2009	411.54	5/18/2012	411.40	9/17/2015	408.65	8/21/2018	408.51	5/2/2019	412.66
10/11/2005	409.34	2/16/2009	411.11	6/20/2012	412.14	10/19/2015	409.18	8/30/2018	408.42	5/10/2019	412.85
11/8/2005	411.03	3/17/2009	411.09	7/20/2012	410.87	11/18/2015	409.55	9/7/2018	408.11	5/20/2019	412.91
12/7/2005	411.55	4/16/2009	412.23	8/17/2012	410.63	12/22/2015	410.01	9/13/2018	408.14	5/22/2019	412.82
1/10/2006	411.44	5/18/2009	412.03	9/18/2012	409.87	1/22/2016	410.53	9/19/2018	407.97	6/6/2019	412.56
2/13/2006	412.09	6/22/2009	411.75	10/17/2012	410.16	2/19/2016	410.64	9/20/2018	407.91	6/14/2019	412.46
3/7/2006	411.52	7/20/2009	411.83	11/19/2012	410.79	3/18/2016	411.67	9/29/2018	407.95	6/19/2019	412.16
4/5/2006	411.46	8/24/2009	411.50	12/20/2012	410.89	4/20/2016	411.62	10/7/2018	407.97	6/26/2019	412.23
5/5/2006	411.19	9/21/2009	410.63	1/21/2013	411.01	5/18/2016	411.24	10/10/2018	407.96	7/3/2019	411.91
6/6/2006	411.87	10/22/2009	410.54	2/20/2013	410.77	6/20/2016	410.32	10/19/2018	408.10	7/11/2019	411.52
7/6/2006	411.90	11/20/2009	411.20	3/22/2013	410.96	7/19/2016	409.38	10/23/2018	408.07	7/18/2019	411.69
8/8/2006	411.44	12/18/2009	411.70	4/19/2013	411.55	8/19/2016	408.52	11/2/2018	408.58	7/19/2019	411.64
9/5/2006	410.56	1/19/2010	411.57	5/20/2013	410.96	9/20/2016	407.67	11/18/2018	409.40	7/24/2019	411.46
10/4/2006	409.84	2/18/2010	411.31	6/19/2013	410.77	10/21/2016	407.03	11/19/2018	409.86	7/31/2019	411.38
11/7/2006	410.96	3/18/2010	412.26	7/22/2013	410.34	11/22/2016	408.30	11/20/2018	409.88	8/6/2019	411.35
12/12/2006	411.49	4/20/2010	413.22	8/19/2013	410.12	12/21/2016	408.99	11/30/2018	409.95	8/14/2019	410.46
1/10/2007	411.64	5/19/2010	412.22	9/19/2013	409.80	1/20/2017	409.04	12/6/2018	410.08	8/19/2019	410.60

APPENDIX B
GROUNDWATER AND SURFACE WATER ELEVATION DATA, AND WARDS BROOK STREAM FLOW DATA
FRYEBURG, MAINE

MW-108 DATA, cont.

Date	Groundwater Elevation (NAVD88)	Date	Groundwater Elevation (NAVD88)	Date	Groundwater Elevation (NAVD88)	Date	Groundwater Elevation (NAVD88)	Date	Groundwater Elevation (NAVD88)	Date	Groundwater Elevation (NAVD88)
8/21/2019	410.49	4/30/2020	412.48	12/30/2020	410.10	8/18/2021	409.14				
8/28/2019	410.41	5/8/2020	412.61	1/5/2021	410.19	8/19/2021	409.10				
9/4/2019	410.36	5/14/2020	412.58	1/13/2021	410.08	8/26/2021	409.27				
9/11/2019	410.31	5/19/2020	412.50	1/20/2021	410.18	9/2/2021	409.16				
9/19/2019	410.05	5/21/2020	412.48	1/28/2021	410.04	9/10/2021	409.17				
9/26/2019	409.77	5/30/2020	412.11	2/4/2021	410.06	9/17/2021	409.12				
10/4/2019	409.52	6/5/2020	411.84	2/12/2021	409.89	9/20/2021	409.07				
10/11/2019	409.53	6/11/2020	411.60	2/18/2021	409.82	9/23/2021	409.06				
10/18/2019	409.63	6/19/2020	411.18	2/24/2021	409.74	10/1/2021	409.04				
10/24/2019	409.91	6/26/2020	410.73	3/3/2021	409.70	10/8/2021	408.91				
10/31/2019	410.02	7/1/2020	410.88	3/10/2021	409.67	10/14/2021	408.87				
11/8/2019	410.44	7/10/2020	410.49	3/15/2021	409.77	10/20/2021	408.84				
11/14/2019	410.27	7/17/2020	410.67	3/22/2021	409.98	10/21/2021	408.85				
11/19/2019	410.41	7/22/2020	410.37	3/23/2021	410.03	10/29/2021	409.02				
11/21/2019	410.43	7/29/2020	409.96	3/30/2021	410.63	11/4/2021	409.71				
11/26/2019	410.55	8/6/2020	409.72	4/9/2021	410.77	11/11/2021	409.75				
12/5/2019	410.60	8/12/2020	409.39	4/14/2021	410.73	11/18/2021	410.03				
12/12/2019	410.66	8/20/2020	408.95	4/19/2021	410.89	11/19/2021	410.03				
12/19/2019	410.95	8/26/2020	408.80	4/21/2021	410.85	11/22/2021	410.04				
12/20/2019	411.00	9/3/2020	408.71	4/28/2021	410.87	12/2/2021	409.98				
12/24/2019	411.21	9/10/2020	408.43	5/4/2021	410.89	12/10/2021	410.11				
1/2/2020	411.03	9/17/2020	408.20	5/12/2021	410.91	12/17/2021	410.32				
1/8/2020	410.91	9/24/2020	407.97	5/19/2021	410.76	12/21/2021	410.33				
1/17/2020	411.04	10/1/2020	407.82	5/20/2021	410.67						
1/22/2020	411.07	10/7/2020	407.83	5/27/2021	410.48						
1/30/2020	411.10	10/13/2020	407.88	6/4/2021	410.31						
2/3/2020	411.05	10/21/2020	408.36	6/9/2021	410.08						
2/12/2020	411.02	10/28/2020	408.43	6/17/2021	409.76						
2/21/2020	410.84	11/4/2020	408.43	6/21/2021	409.55						
2/26/2020	410.77	11/11/2020	408.43	6/24/2021	409.40						
3/4/2020	411.00	11/18/2020	408.56	7/1/2021	409.06						
3/12/2020	411.11	11/19/2020	408.60	7/7/2021	409.24						
3/17/2020	411.17	11/27/2020	408.78	7/16/2021	409.41						
3/18/2020	411.33	12/4/2020	409.37	7/19/2021	409.45						
3/24/2020	411.48	12/13/2020	409.75	7/22/2021	409.52						
3/31/2020	411.69	12/16/2020	409.87	7/29/2021	409.37						
4/15/2020	412.16	12/21/2020	409.78	8/5/2021	409.51						
4/23/2020	412.38	12/22/2020	409.92	8/13/2021	409.31						