

July 13, 2015

Attn: Mr. Daniel J. Merhalski, MPA  
Town Manager  
Town of Denmark  
62 East Main Street  
Denmark, Maine 04022



**Subject: June 2015 Monthly Monitoring Report  
Poland Spring Bottling Company  
Cold Spring (Site): Denmark, Maine**

Dear Mr. Merhalski:

In accordance with the Town of Denmark Permit for Water Extraction from Cold Spring in Denmark, Maine (the Permit), Amec Foster Wheeler Environment and Infrastructure, Inc. (Amec Foster Wheeler) has prepared the attached June 2015 Monthly Monitoring Report on behalf of the Poland Spring Bottling Company. Water withdrawal for bottling purposes began on June 1, 2010 at the Cold Spring site. This monthly report includes the following information required by the noted conditions of the Permit:

- Borehole #1 and # 2 monitoring data (Schedule A1);
- Groundwater levels from onsite monitoring wells, and PZ-01 (Schedule A2);
- Domestic water levels and water quality (Schedule A3);
- Surface water levels from onsite staff gauges (Schedule A4);
- Stream flow from two locations along Beaver Brook (Schedule A5);
- Water levels and flow from onsite spring points (Schedule A6);
- Precipitation information (Schedule A7);
- Biological monitoring information (Schedule A8); and
- Action Levels and Responses (Schedule B).

Unless otherwise noted, these field data were collected on June 25, 2015.

## **BOREHOLE MONITORING**

In total, the volume of water withdrawn by Boreholes # 1 and # 2 between June 1<sup>st</sup> and 30<sup>th</sup> was 10,234,825 gallons. Weekly borehole production volumes for the June time period of May 31 through June 4, 2015 are presented in **Appendix A**. The aggregate pumping rate from Boreholes # 1 and # 2 for this period was less than the short term maximum rate of 300 gallons per minute (gpm). The aggregate pumping rate for Boreholes # 1 and # 2 was above the average weekly rate of 200 gpm during weeks 1, 2, 3, 4, and 5 of this period (Appendix A). In response, and pursuant to Schedule B, Condition B1 of the Permit, weekly monitoring was conducted. These data were included in the Weekly Monitoring Reports dated June 11, June 22, June 26, July 1, and July 12, 2015. The weekly extraction rates are shown in Appendix A.

Each tanker of water is tested for turbidity by Poland Spring personnel at the receiving bottling plants. Turbidity readings were below 0.5 Nephelometric Turbidity Units (NTU) for the month of June.

**Correspondence:**  
Amec Foster Wheeler  
511 Congress Street, Suite 200  
Portland, Maine 04101  
Tel 207-775-5401  
Fax 207-772-4762

Water samples were collected for odor analysis on August 5, 2009, February 16, 2010, February 15, 2011, January 12, 2012, January 31, 2013, January 8, 2014, and February 18, 2015. Odor was detected in the February 2011, January 2014, and February 2015 water samples collected from Borehole # 2, and the January 2012, January 2014, and February 2015 water samples collected from Borehole # 1. Odor was detected in these samples at a level of 1.0 threshold odor number (TON) which is below the Environmental Protection Agency Secondary Drinking Water Standard of 3.0 TON.

### MONITORING WELLS (WATER LEVELS)

| Monitoring Point | 06/25/2015 Water Elevation<br>feet above mean sea level (ft amsl) |
|------------------|-------------------------------------------------------------------|
| MW-1             | 383.54                                                            |
| MW-3             | 387.94                                                            |
| MW-5             | 387.39                                                            |
| MW-6             | 382.62                                                            |
| MW-8             | 397.28                                                            |
| MW-9             | 381.93                                                            |
| MW-10            | 383.26                                                            |
| MW-11            | 383.94                                                            |
| MW-12            | 382.73                                                            |
| MW-14            | 384.34                                                            |
| MW-16            | 380.60                                                            |
| MW-17            | 382.17                                                            |
| MW-18            | 385.24                                                            |
| MW-19            | 390.53                                                            |
| MW-21            | 393.04                                                            |
| MW-22            | 391.71                                                            |
| MW-23            | 385.35                                                            |
| PZ-01            | 401.67                                                            |

### DOMESTIC WELLS (WATER LEVELS AND WATER QUALITY)

The transducers deployed within the domestic monitoring locations are downloaded on a quarterly basis and data were retrieved on July 9, 2015. The domestic groundwater monitoring data (presented in graphical format) are included as **Appendix B**.

Water quality monitoring was conducted in December 2009, March 2010, November 2010, June 2012, and June 2013; approximately four months prior to beginning water withdrawal, one month prior to beginning water withdrawal, 6 months after startup, two years after startup, and three years after startup respectively, as required by Schedule A, Section 3 of the Permit. Letters and analytical reports were sent to the property owners who have taken part in Poland Spring's domestic monitoring program. A copy of these materials was also sent to the Town Manager and the Town consultant.

Based on monitoring to date, there have not been adverse impacts to domestic wells as a result of water withdrawal by Poland Spring.

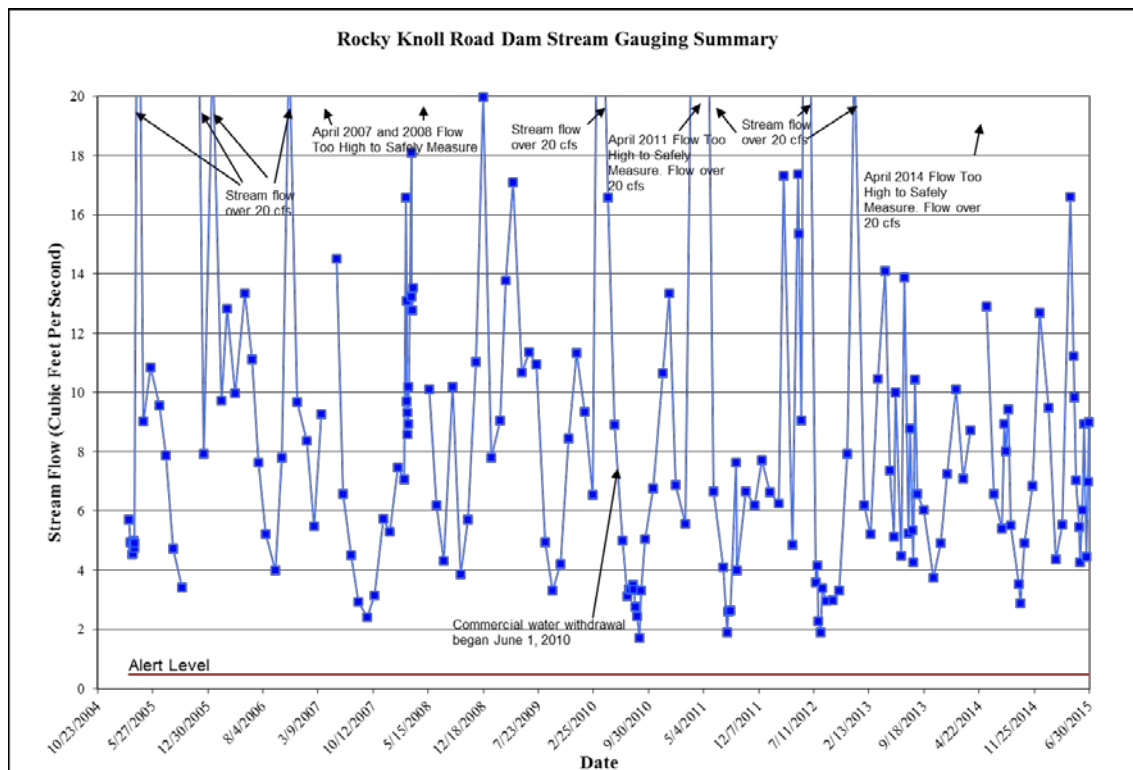
## STAFF GAUGES (WATER LEVELS)

| Monitoring Point | 06/25/2015 Surface Water Elevation (ft amsl) |
|------------------|----------------------------------------------|
| SG02             | 379.41                                       |
| SG03             | 377.91                                       |
| SG05             | 401.88                                       |
| SG07             | 378.18                                       |
| SG08             | 377.48                                       |

## STREAM FLOW (FLOW)

| Monitoring Point                   | 06/25/2015 Flow cubic feet per second (cfs) |
|------------------------------------|---------------------------------------------|
| Upstream at Denmark Road           | 3.55                                        |
| Downstream at Rocky Knoll Road Dam | 6.99                                        |

The field data utilized to calculate the stream flows are included as **Appendix C**. The following graph summarizes the downstream gauging results at the Rocky Knoll Road Dam since February 2005. The naturally occurring fluctuations shown in the graph below are expected to continue during site operation.



## SPRING POINTS (WATER LEVEL AND FLOW)

| Monitoring Point | 06/25/2015 Water Elevation (ft amsl) | Alert Level (one foot above ground surface)* | Action Level (below ground surface)* |
|------------------|--------------------------------------|----------------------------------------------|--------------------------------------|
| SP-01S           | 382.62                               | 380.62                                       | 379.62                               |
| SP-01D           | 382.99                               | 380.70                                       | 379.70                               |
| SP-02S           | 382.78                               | 380.93                                       | 379.93                               |
| SP-02D           | 382.79                               | 380.95                                       | 379.95                               |
| SP-03S           | 379.96                               | 378.84                                       | 377.84                               |
| SP-03D           | 380.71                               | 378.88                                       | 377.88                               |

\* Spring Point Alert and Action Level elevations are based on ground surface elevations surveyed in April 2010.

| Monitoring Point | Spring Flow (yes or no) |
|------------------|-------------------------|
| SP-01S           | Yes                     |
| SP-01D           | Yes                     |
| SP-02S           | Yes                     |
| SP-02D           | Yes                     |
| SP-03S           | Yes                     |
| SP-03D           | Yes                     |

## PRECIPITATION (RATE)

Precipitation data from the Fryeburg E. Slopes NOAA Station ID: KIZG and the on-site weather station are presented below:

| Precipitation Station                       | June 2015 Total Precipitation |
|---------------------------------------------|-------------------------------|
| Fryeburg E. Slopes AP NOAA Station ID: KIZG | 7.46 inches                   |
| On-site rain gauge                          | 6.54 inches                   |

## WETLAND MONITORING (PLANT SPECIES)

Stantec Consulting conducted biological monitoring during August 2014. This represents the fifth year of long-term wetland biomonitoring at the Cold Spring site. The results of the 2014 monitoring were summarized in the 2014 Long-Term Biological Monitoring Report included as **Appendix C** of the February 2015 Monthly Monitoring Report dated March 12, 2015. Biomonitoring is conducted in the summer months and the results are submitted early in the following year once the biomonitoring results have been tabulated and the report has been completed.

Stantec concludes that the data collected to date continue to demonstrate that Poland Spring's operations have not had an adverse impact on wetland vegetation or hydrology.

## ACTION LEVELS AND RESPONSES

### Pumping Rates

As summarized above, the aggregate pumping rate for Boreholes # 1 and # 2 was above the average weekly rate of 200 gpm during weeks 1, 2, 3, 4, and 5 of this period (Appendix A). In

response, weekly monitoring and reporting was completed pursuant to Schedule B, Condition B1 of the Permit.

### **Monitoring Wells**

The water level measured at MW-16 was 380.60 ft amsl. This elevation is greater than the alert level of 379.0 ft amsl and action level of 378.0 ft amsl. No response actions were required.

### **Spring Points**

Water levels were above the ground surface during this monitoring period. Spring point water elevations were greater than the alert level of one foot above the ground surface. Therefore, no response actions were required.

### **Stream Flow**

The stream flow measured at the Rocky Knoll Road Dam was 6.99 cfs. This flow is greater than the alert level of 0.48 cfs and action level of 0.40 cfs. Therefore, no response actions were required.

### **Domestic Wells**

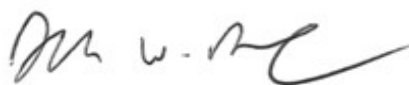
No response actions were required.

## **CONCLUSIONS**

Based on the monitoring results summarized in this report, water withdrawals by Poland Spring at the Cold Spring site in Denmark have not resulted in adverse impacts to groundwater, surface water, or other natural resources.

If you have any questions regarding the information contained in this monitoring report, please call me at 207-828-3289.

Sincerely,



Joshua W. Bowe, C.G., P.G.  
Senior Geologist  
Project Manager

### **Attachments**

Appendix A – Water Withdrawal Summary  
Appendix B – Domestic Groundwater Monitoring  
Appendix C – Stream Gauging Calculations

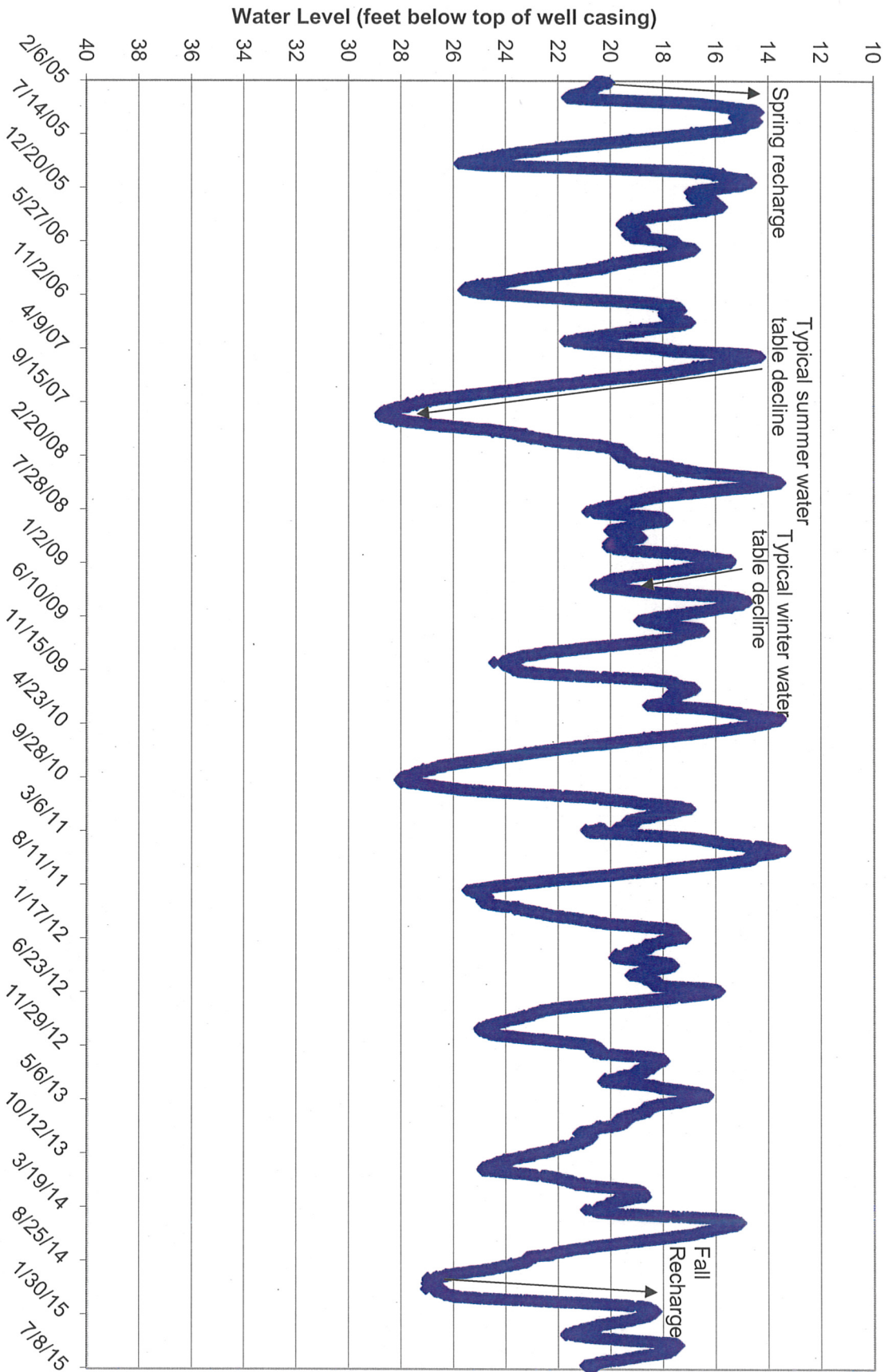
cc: Mr. Keith Taylor, St. Germain Collins  
Mr. Mark Dubois, Poland Spring Bottling Company  
Mr. Brian Rayback, Pierce Atwood  
Project File (3617157358)

## APPENDIX A – WATER WITHDRAWAL SUMMARY

|                                                                       |             | Borehole #1    |               | Borehole #2    |               |
|-----------------------------------------------------------------------|-------------|----------------|---------------|----------------|---------------|
| Week                                                                  | Dates       | Total Gallons  | Average gpm   | Total Gallons  | Average gpm   |
| 1                                                                     | 05/31-06/06 | 1140760        | 113.17        | 1137070        | 112.80        |
| 2                                                                     | 06/07-06/13 | 1198025        | 118.85        | 1194020        | 118.45        |
| 3                                                                     | 06/14-06/20 | 1243580        | 123.37        | 1241055        | 123.12        |
| 4                                                                     | 06/21-06/27 | 1176505        | 116.72        | 1172570        | 116.33        |
| 5                                                                     | 06/28-07/04 | 1169670        | 116.04        | 1165735        | 115.65        |
| <b>Total (05/31/15-07/04/15)</b>                                      |             | <b>5928540</b> | <b>117.63</b> | <b>5910450</b> | <b>117.27</b> |
| <b>Monthly Water<br/>Withdrawal Summary<br/>(06/01/15 – 06/30/15)</b> |             | <b>5124965</b> | <b>118.63</b> | <b>5109860</b> | <b>118.28</b> |

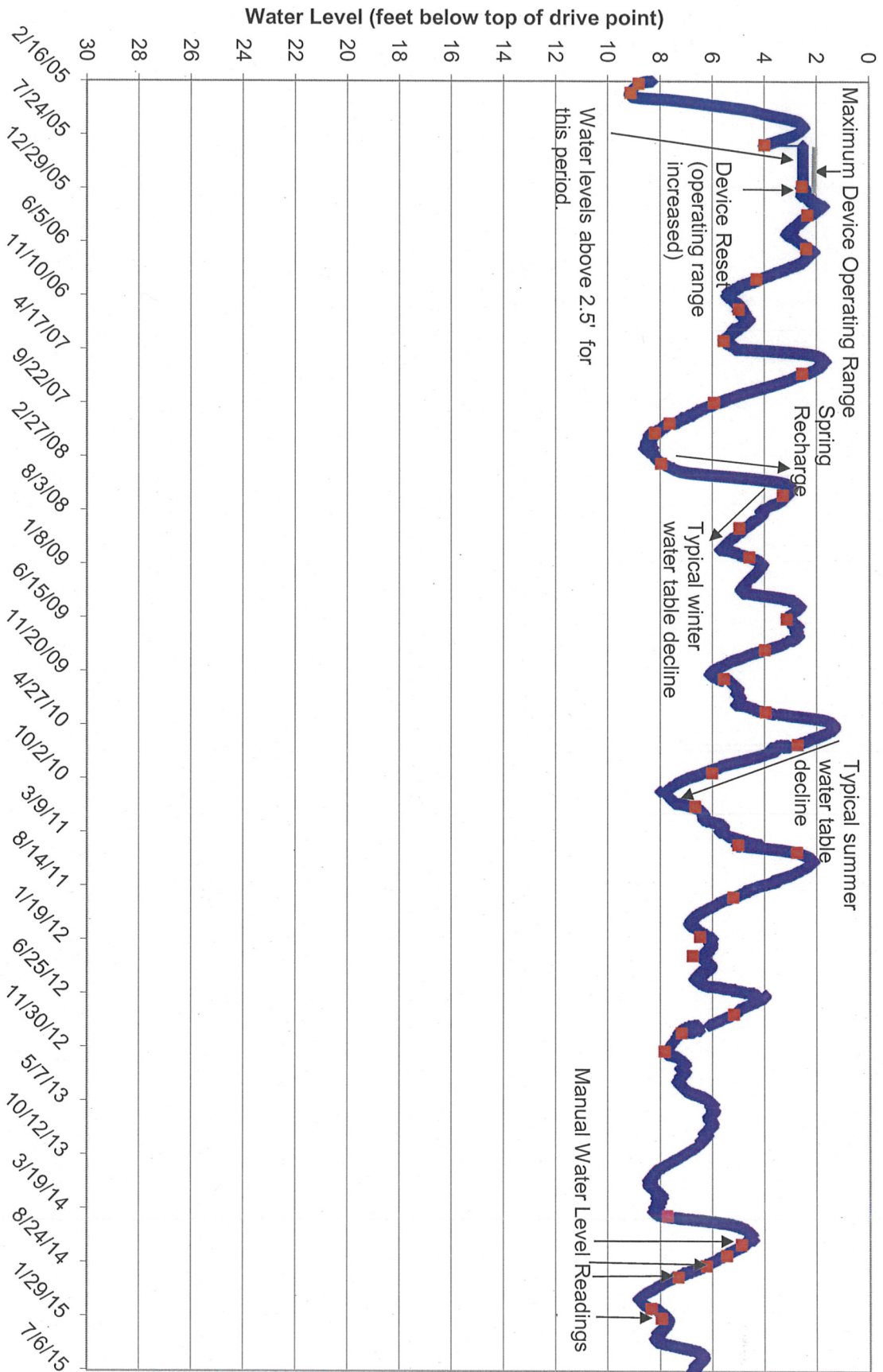
## **APPENDIX B – DOMESTIC GROUNDWATER MONITORING**

# DW01 (Bedrock Well)



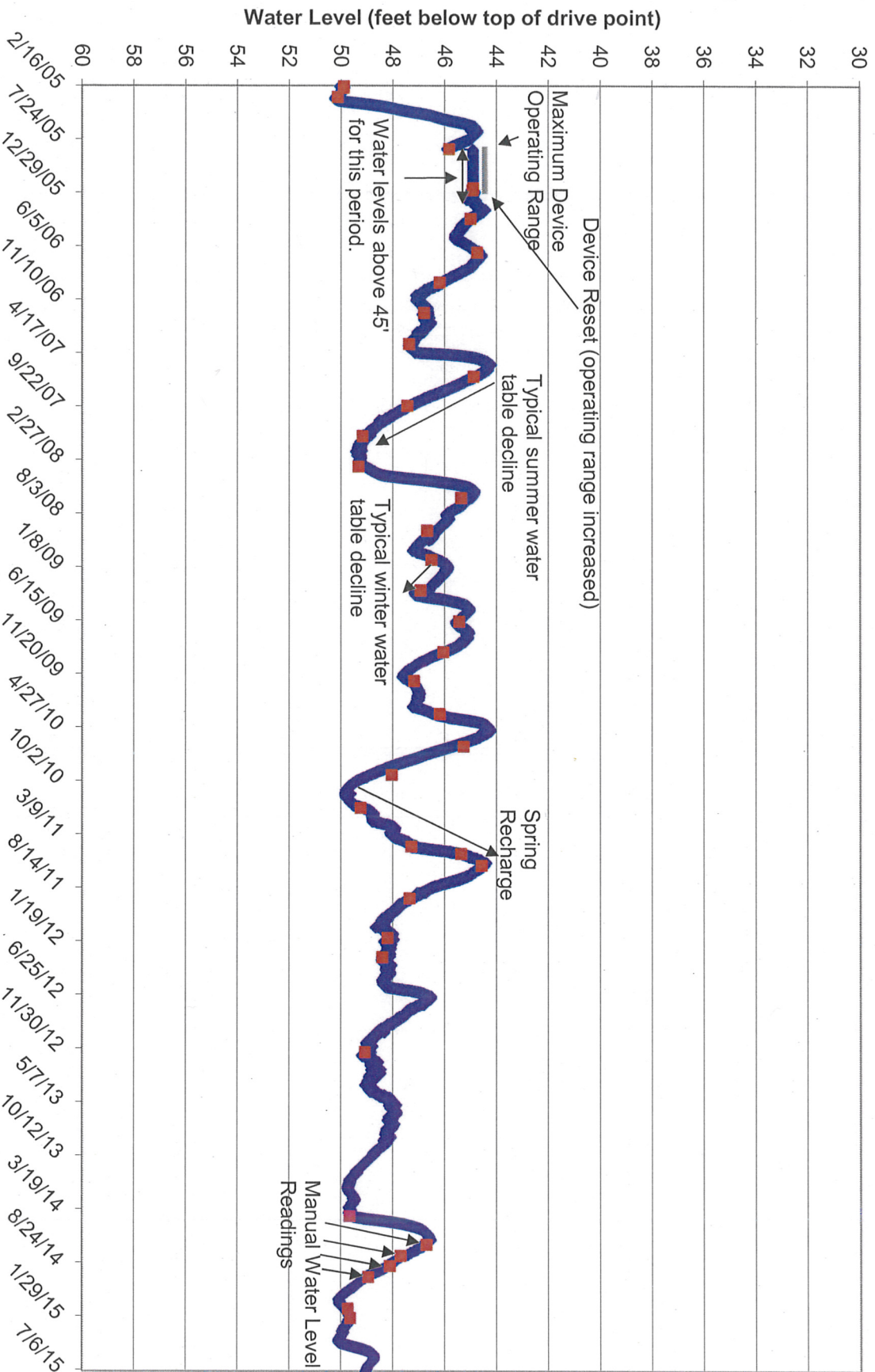
Commercial water withdrawal by Poland Spring began on June 1, 2010 at the Cold Spring site.

## DW02 (Drive Point Adjacent to Water Supply)



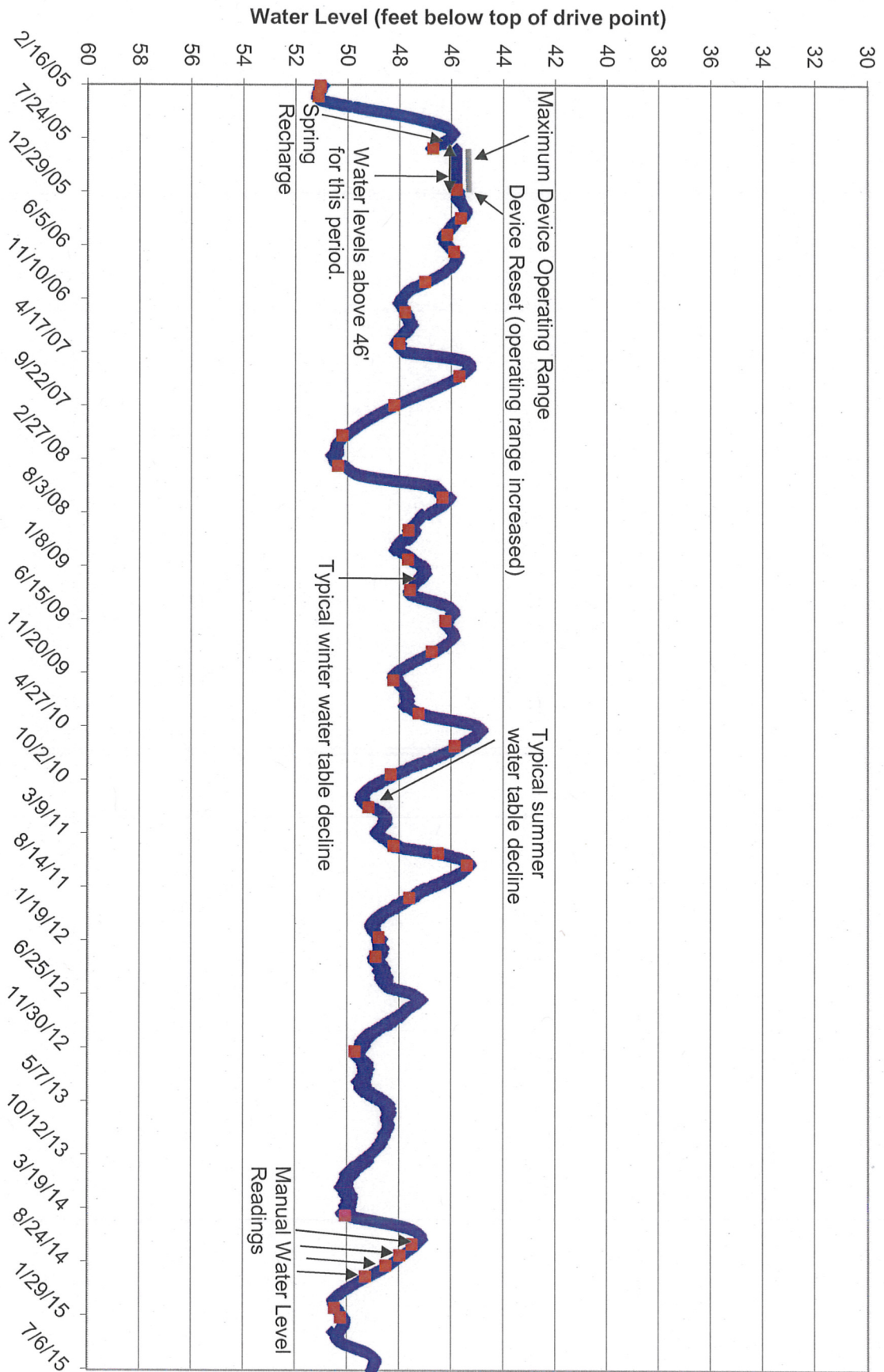
Commercial water withdrawal by Poland Spring began on June 1, 2010 at the Cold Spring site.

### DW03 (Drive Point Adjacent To Water Supply)



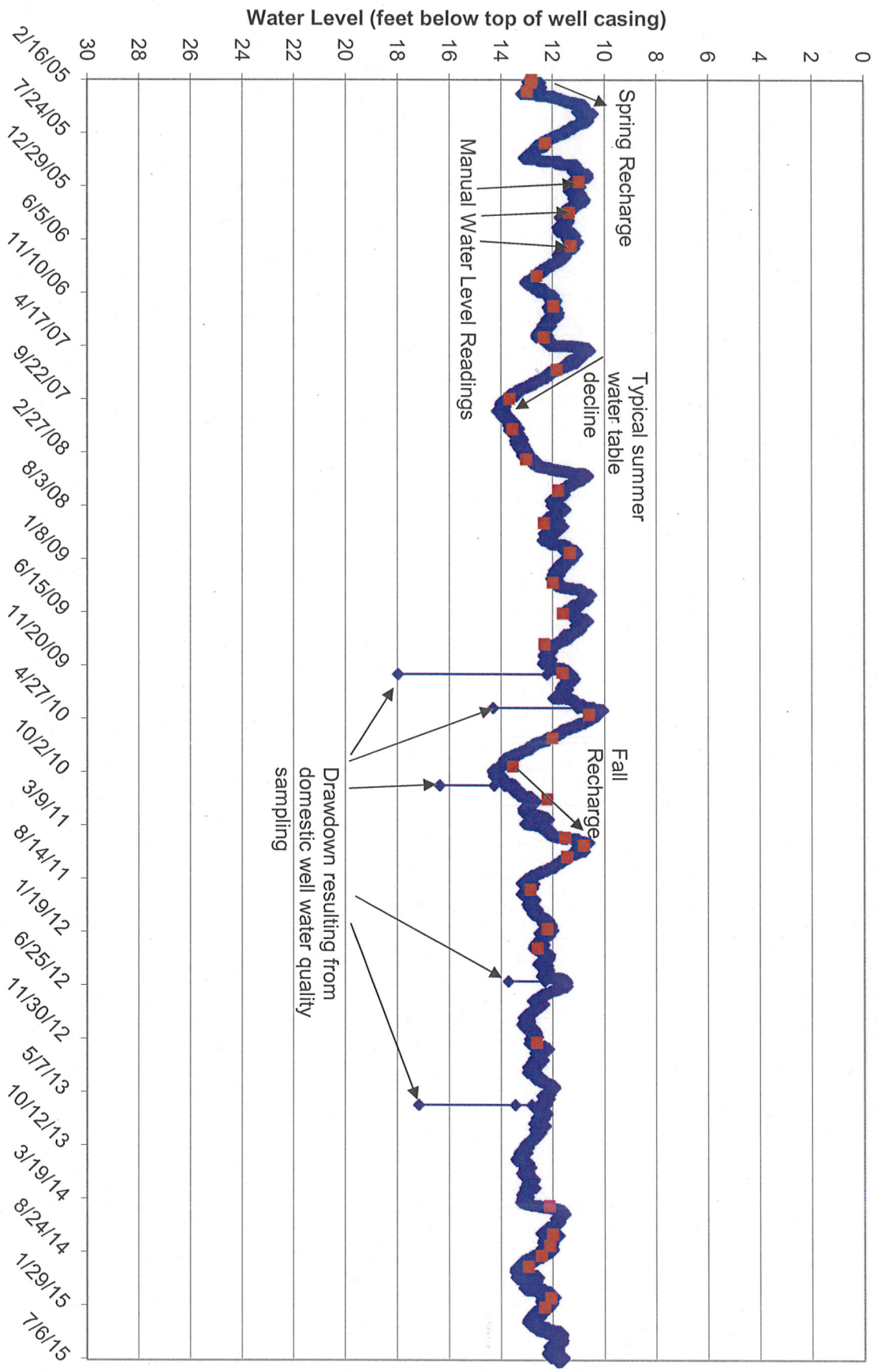
Commercial water withdrawal by Poland Spring began on June 1, 2010 at the Cold Spring site.

# DW04 (Drive Point Adjacent To Water Supply)



Commercial water withdrawal by Poland Spring began on June 1, 2010 at the Cold Spring site.

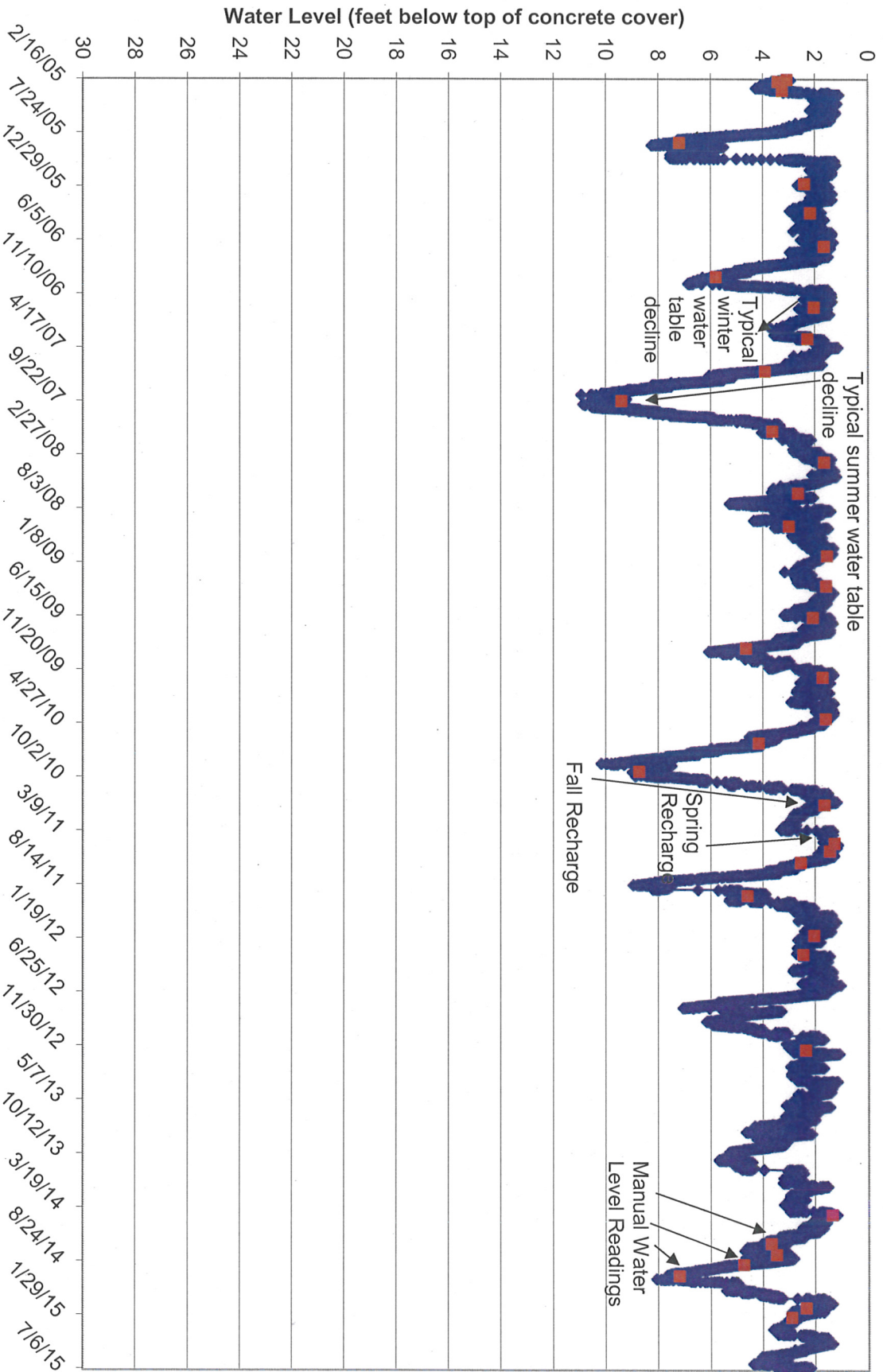
# DW05 (Bedrock Well)



Commercial water withdrawal by Poland Spring began on June 1, 2010 at the Cold Spring site.

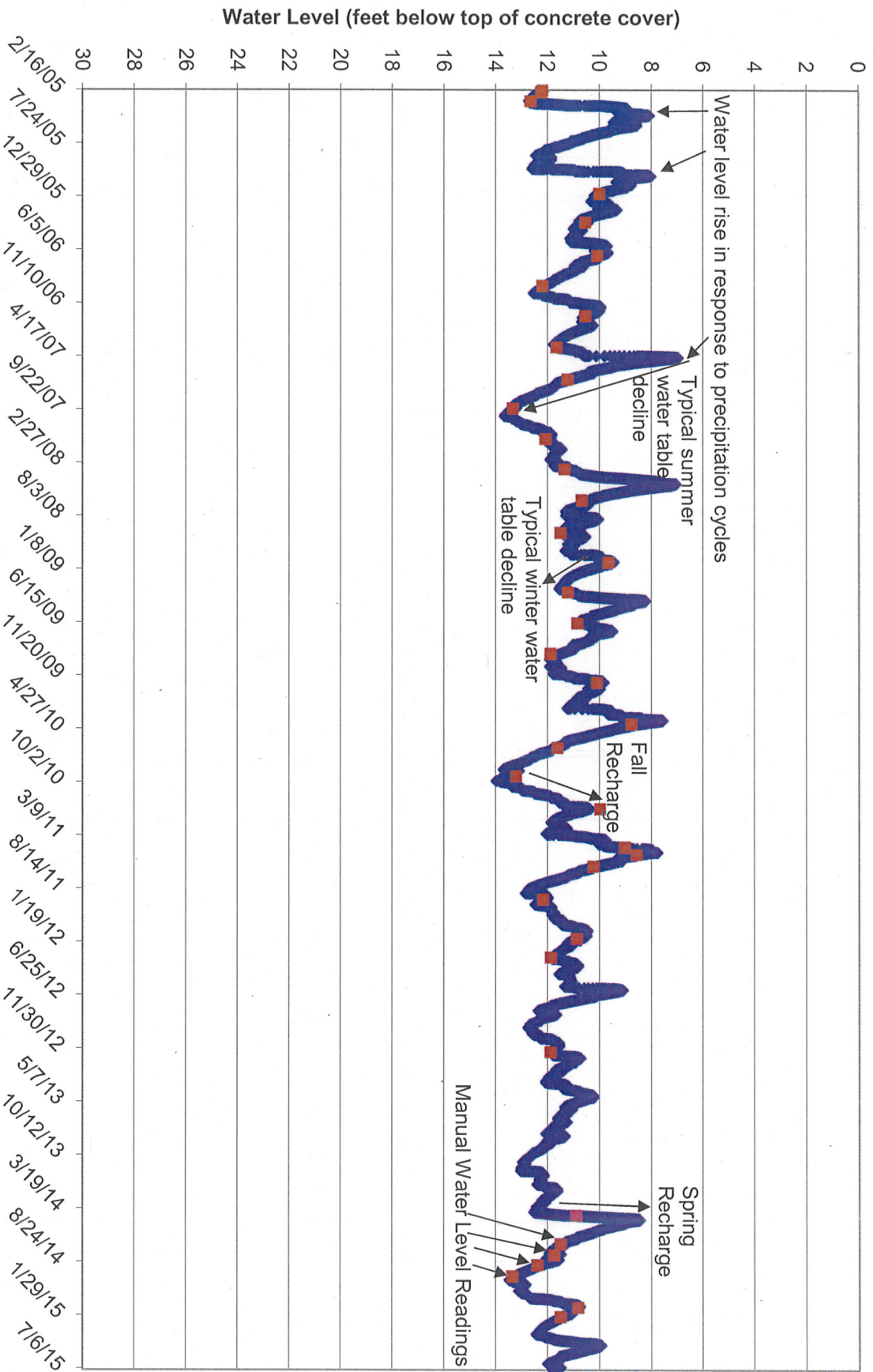
The lower diamond shapes reflect drawdown observed during domestic well water quality sampling.

# DW06 (Dug Well)



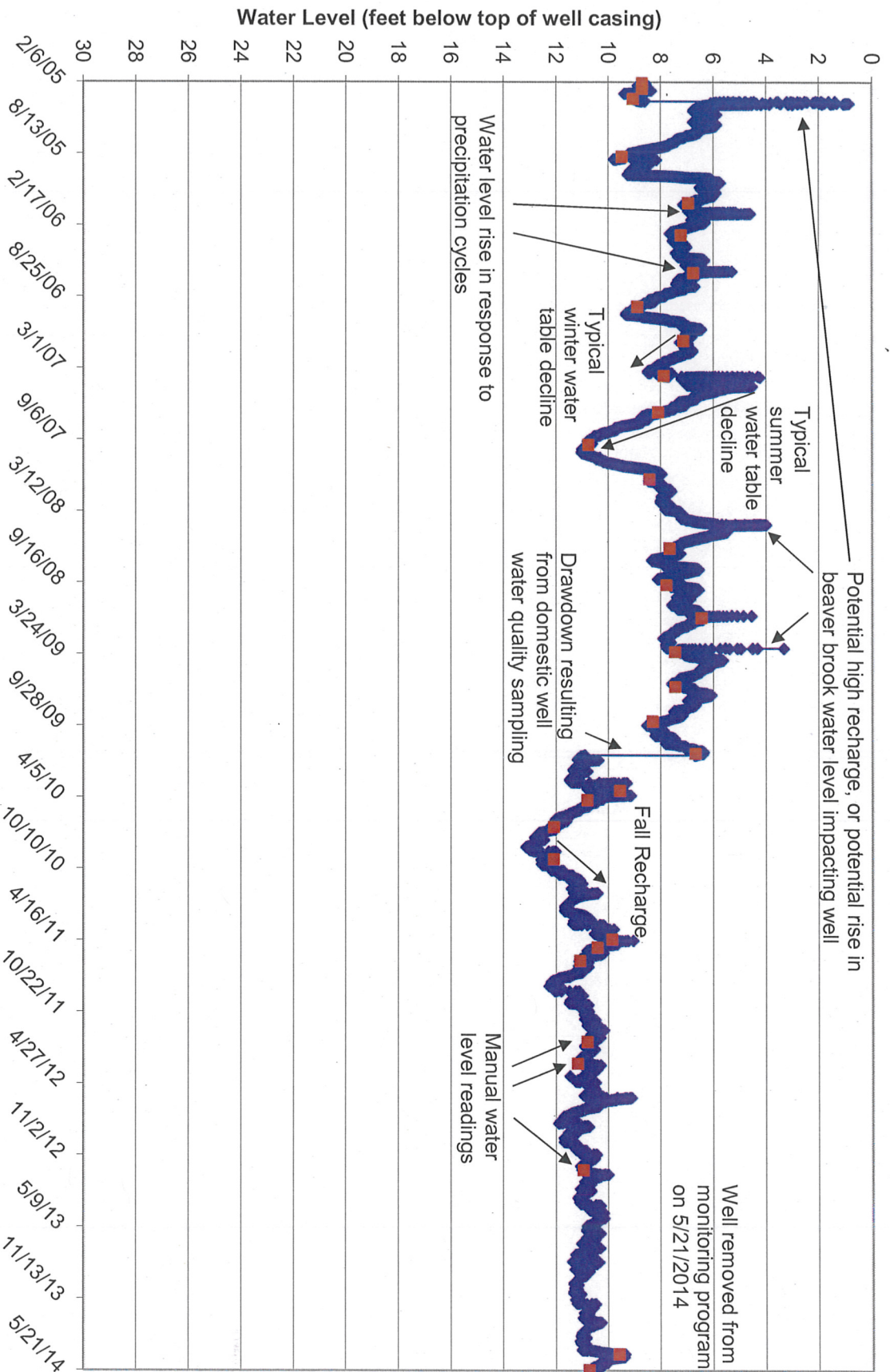
Commercial water withdrawal by Poland Spring began on June 1, 2010 at the Cold Spring site.

# DW07 (Dug Well)



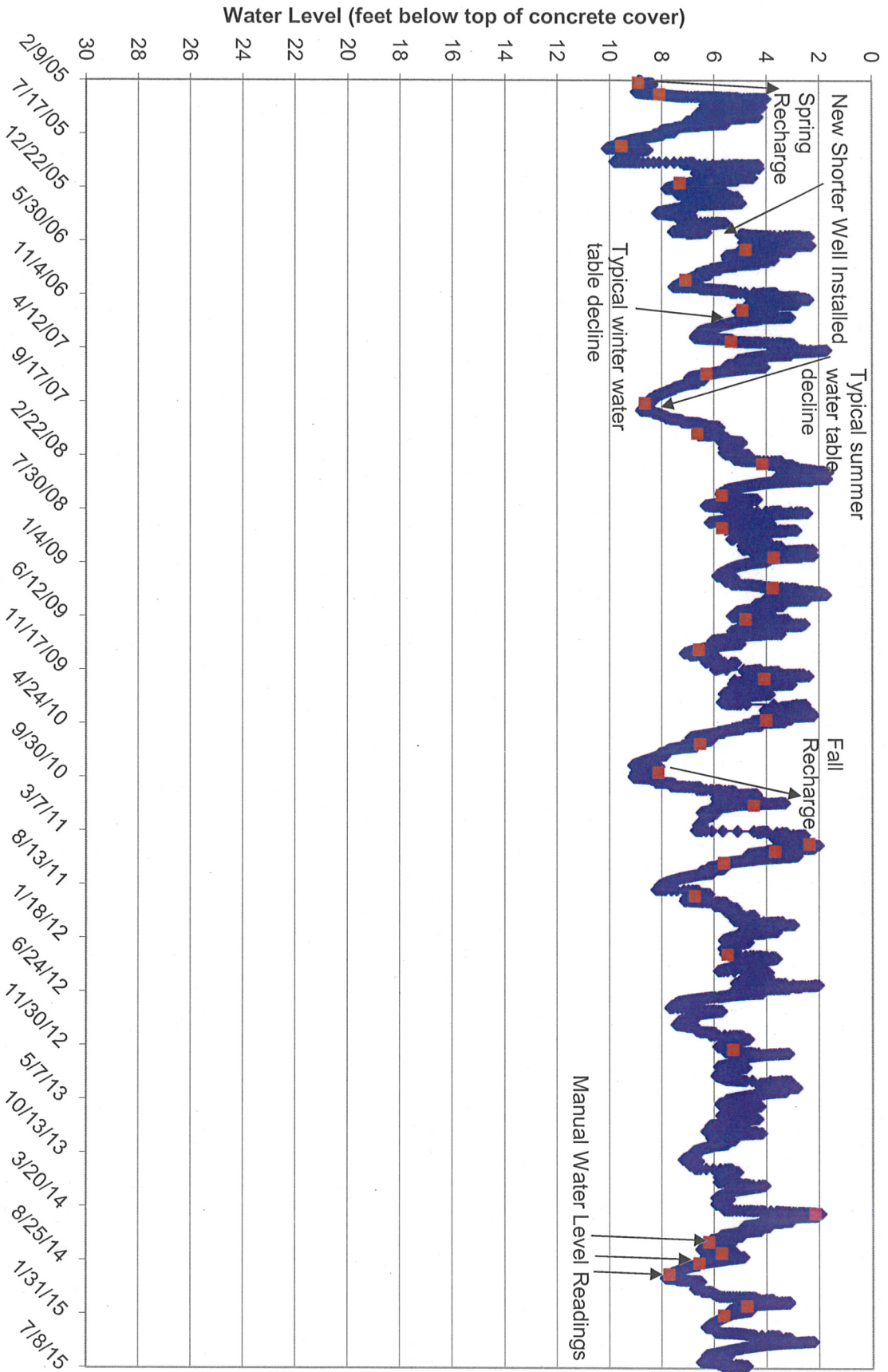
Commercial water withdrawal by Poland Spring began on June 1, 2010 at the Cold Spring site.

# DW08 (Bedrock Well - removed from monitoring program)



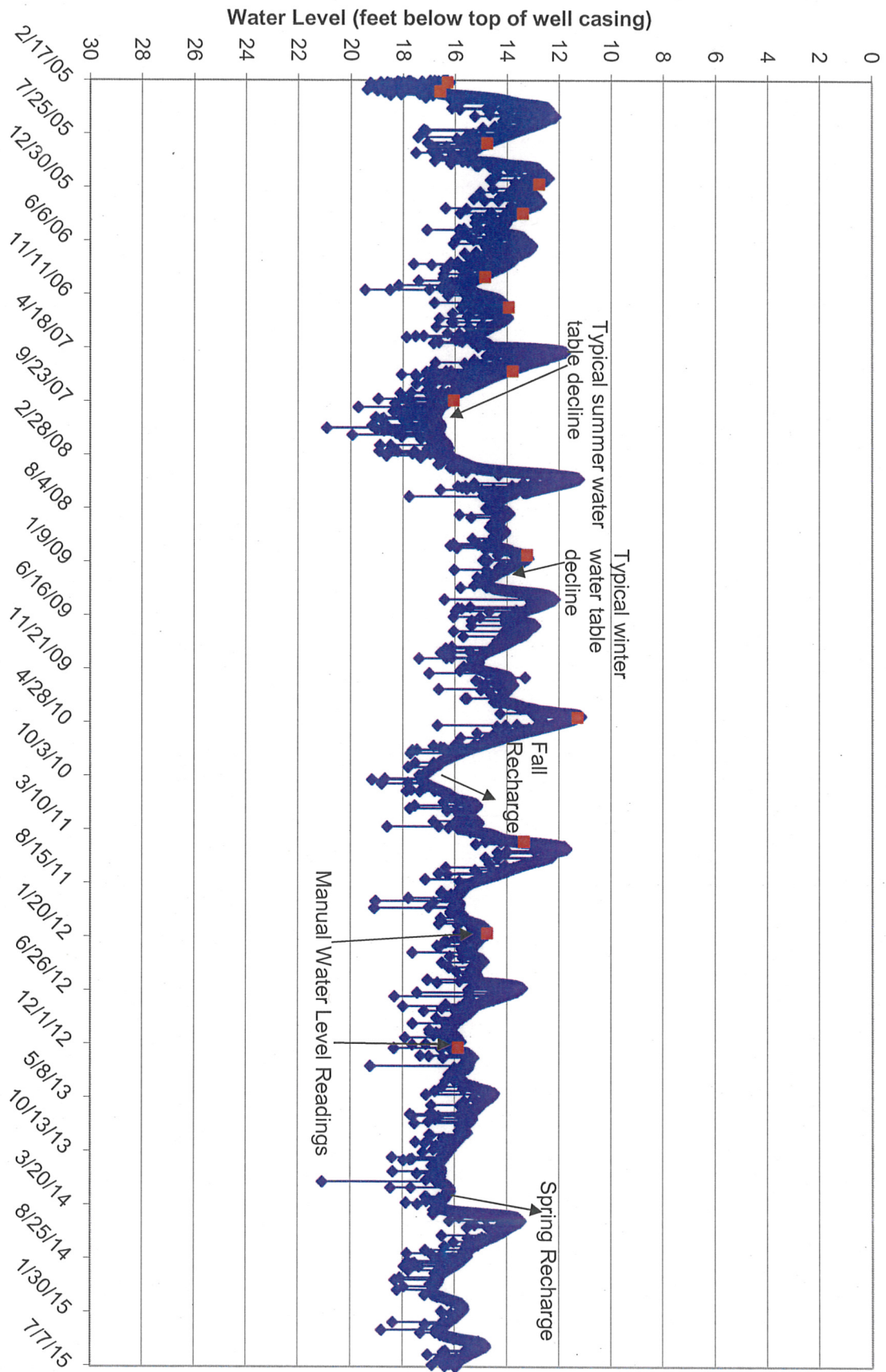
Commercial water withdrawal by Poland Spring began on June 1, 2010 at the Cold Spring site.

DW09 (Dug Well)



Commercial water withdrawal by Poland Spring began on June 1, 2010 at the Cold Spring site.

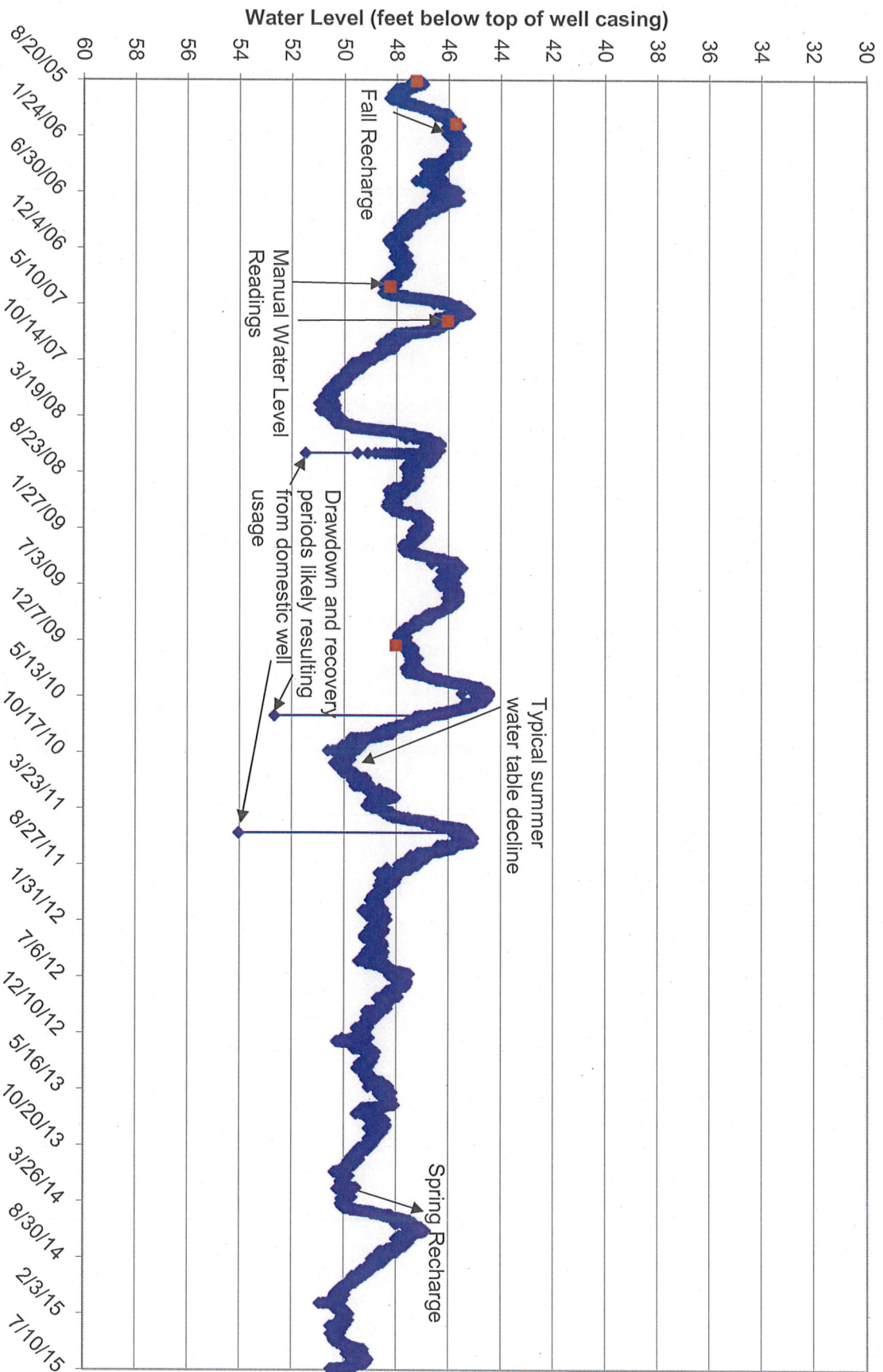
# DW10 (Bedrock Well)



Commercial water withdrawal by Poland Spring began on June 1, 2010 at the Cold Spring site.

The lower diamond shapes reflect drawdown observed during domestic well usage.

## DW11 (Bedrock Well)



Commercial water withdrawal by Poland Spring began on June 1, 2010 at the Cold Spring site.

The lower diamond shapes reflect drawdown observed during domestic well usage.

## APPENDIX C – STREAM GAUGING CALCULATIONS

### Beaver Brook Stream Gauging Denmark, Maine

#### Upstream Station at Denmark Road

6/25/2015 13:25

| Tape (ft) | Int Width (ft) | Depth (ft) | Area (ft <sup>2</sup> ) | Velocity (ft/s) | Volume (cfs) |
|-----------|----------------|------------|-------------------------|-----------------|--------------|
| 0.4       |                |            |                         |                 |              |
| 0.67      | 0.30           | 0.85       | 0.26                    | 0.04            | 0.01         |
| 1         | 0.33           | 0.83       | 0.27                    | 0.41            | 0.11         |
| 1.33      | 0.34           | 0.81       | 0.27                    | 0.43            | 0.12         |
| 1.67      | 0.34           | 0.81       | 0.27                    | 0.48            | 0.13         |
| 2         | 0.33           | 0.78       | 0.26                    | 0.60            | 0.15         |
| 2.33      | 0.34           | 0.72       | 0.24                    | 0.58            | 0.14         |
| 2.67      | 0.34           | 0.67       | 0.22                    | 0.71            | 0.16         |
| 3         | 0.33           | 0.54       | 0.18                    | 0.73            | 0.13         |
| 3.33      | 0.34           | 0.58       | 0.19                    | 0.74            | 0.14         |
| 3.67      | 0.34           | 0.70       | 0.23                    | 0.74            | 0.17         |
| 4         | 0.33           | 0.72       | 0.24                    | 0.74            | 0.18         |
| 4.33      | 0.34           | 0.79       | 0.26                    | 0.66            | 0.17         |
| 4.67      | 0.34           | 0.81       | 0.27                    | 0.55            | 0.15         |
| 5         | 0.33           | 0.86       | 0.28                    | 0.65            | 0.18         |
| 5.33      | 0.34           | 0.91       | 0.30                    | 0.71            | 0.22         |
| 5.67      | 0.34           | 0.84       | 0.28                    | 0.75            | 0.21         |
| 6         | 0.33           | 1.00       | 0.33                    | 0.56            | 0.18         |
| 6.33      | 0.34           | 1.02       | 0.34                    | 0.75            | 0.26         |
| 6.67      | 0.34           | 1.10       | 0.37                    | 0.72            | 0.27         |
| 7         | 0.33           | 1.10       | 0.36                    | 0.60            | 0.22         |
| 7.33      | 0.34           | 0.99       | 0.33                    | 0.45            | 0.15         |
| 7.67      | 0.34           | 0.98       | 0.33                    | 0.29            | 0.10         |
| 8         |                |            |                         |                 |              |

\*Air T = 80°F, Water T = 74°F

**Total 3.55**

#### Notes:

cfs - cubic feet per second  
ft - feet  
ft<sup>2</sup> - square feet  
ft/s - feet per second  
Int - Interval

#### Downstream Location At Rocky Knoll Road Dam

6/25/2015 14:00

| Tape (ft) | Int Width (ft) | Depth (ft) | Area (ft <sup>2</sup> ) | Velocity (ft/s) | Volume (cfs) |
|-----------|----------------|------------|-------------------------|-----------------|--------------|
| 11        |                |            |                         |                 |              |
| 12        | 1.00           | 0.41       | 0.41                    | 0.13            | 0.05         |
| 13        | 1.00           | 0.48       | 0.48                    | 0.12            | 0.06         |
| 14        | 1.00           | 0.60       | 0.60                    | 0.43            | 0.26         |
| 15        | 0.75           | 0.75       | 0.56                    | 0.36            | 0.20         |
| 15.5      | 0.50           | 0.80       | 0.40                    | 0.62            | 0.25         |
| 16        | 0.50           | 0.80       | 0.40                    | 1.02            | 0.41         |
| 16.5      | 0.50           | 0.80       | 0.40                    | 0.93            | 0.37         |
| 17        | 0.50           | 0.91       | 0.46                    | 1.04            | 0.47         |
| 17.5      | 0.50           | 0.91       | 0.46                    | 1.00            | 0.46         |
| 18        | 0.50           | 0.92       | 0.46                    | 0.94            | 0.43         |
| 18.5      | 0.50           | 0.98       | 0.49                    | 1.18            | 0.58         |
| 19        | 0.50           | 1.13       | 0.57                    | 1.24            | 0.70         |
| 19.5      | 0.50           | 1.18       | 0.59                    | 1.55            | 0.91         |
| 20        | 0.50           | 1.03       | 0.52                    | 1.52            | 0.78         |
| 20.5      | 0.50           | 1.00       | 0.50                    | 1.21            | 0.61         |
| 21        | 0.50           | 1.00       | 0.50                    | 0.98            | 0.49         |
| 21.5      | 0.50           | 0.84       | 0.42                    | 0.32            | 0.13         |
| 22        | 0.50           | 0.69       | 0.35                    | 0.08            | 0.03         |
| 22.5      | 0.50           | 0.53       | 0.27                    | -0.11           | -0.03        |
| 23        | 0.75           | 0.48       | 0.36                    | -0.18           | -0.06        |
| 24        | 1.00           | 0.65       | 0.65                    | -0.17           | -0.11        |
| 25        |                |            |                         |                 |              |

\*Air T = 80°F, Water T = 71°F

**Total 6.99**