

Annual Report for Active IDOT Wetland Mitigation and Hydrologic Monitoring Sites: September 1, 2018 through August 31, 2019

Geoffrey E. Pociask, Steven E. Benton, Jessica L. B. Monson, Audra M. Noyes,
Eric T. Plankell, Mackenzie K. Marti, Lindsey A. Schafer, and Keith W. Carr



La Grange Wetland Mitigation Bank, Brown County. Photo by Mackenzie Marti.

Wetlands Geology Section
Illinois State Geological Survey
Prairie Research Institute
University of Illinois at Urbana-Champaign

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Illinois State Geological Survey
PRAIRIE RESEARCH INSTITUTE

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Illinois State Geological Survey
Prairie Research Institute
University of Illinois at Urbana-Champaign

615 East Peabody Drive
Champaign, Illinois 61820-6964
<http://www.isgs.illinois.edu/>



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INTRODUCTION

This report was prepared by the Illinois State Geological Survey (ISGS) to provide the Illinois Department of Transportation (IDOT) with hydrogeologic data collected from sites monitored for IDOT under grants for FY18 and FY19 (grant code D6099), including current and potential wetland mitigation sites and banks. Where appropriate, this report also includes a determination of areas meeting wetland hydrology criteria listed in the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual and its online updates (Environmental Laboratory 1987), hereafter collectively referred to as the 1987 Manual, as well as areas meeting wetland hydrology criteria as outlined in the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (U.S. Army Corps of Engineers [USACE] 2010), hereafter referred to as the 2010 Midwest Region Supplement. Additional activities performed under this contract, such as water-quality monitoring, are not included in this report. Other site observations are included where appropriate.

Summaries of 16 wetland mitigation sites are included in this report. Each summary contains a location map, a site map showing field instruments and the extent of area satisfying wetland hydrology criteria as appropriate, a table indicating whether well locations met wetland hydrology criteria, a table providing gauged surface-water levels that met wetland hydrology criteria, hydrographs from active wells and surface-water gauges, and graphs of local precipitation data for the period. Locations of wetland mitigation sites are shown on Figure 1, and a list of site names is presented in Table 1. Also, a summary of areas meeting wetland hydrology criteria for each site is provided in Table 2. Except where noted, all data included in this report are from September 1, 2018, through August 31, 2019, at IDOT's request.

METHODS

The primary purpose of this report is to present the area within each wetland mitigation site that satisfied the wetland hydrology criteria listed in the 1987 Manual and in the 2010 Midwest Region Supplement. Areas satisfying wetland hydrology criteria were delineated using both methods because both are in use at present, and to compare methodologies. However, to be a wetland, an area must also satisfy soil and vegetation criteria. The Illinois Natural History Survey (INHS) will combine the hydrologic data presented in this report with vegetation and soils data that they collect, determine the total wetland area of each mitigation site, and report it under separate cover. The total wetland area determined by INHS may differ from the area that satisfied the wetland hydrology criteria shown in this report.

An area must be inundated or saturated for no less than 5% of the growing season to satisfy wetland hydrology criteria using the 1987 Manual, or a minimum of 14 consecutive days during the growing season when using the 2010 Midwest Region Supplement. These areas will be identified as jurisdictional wetlands if vegetation and soils criteria mentioned above are also met. Areas that are inundated or saturated for greater than 12.5% of the growing season satisfy wetland hydrology criteria in a conclusive manner, and strongly indicate wetland conditions, especially where soil and/or vegetation are slow to respond or data from these components are inconclusive after site construction activities. To assist in proper characterization of wetland mitigation sites, this report shows areas that were inundated or saturated for at least 5% and 12.5% of the growing season, using the 1987 Manual. Areas satisfying wetland hydrology criteria in the 2010 Midwest Region Supplement (14 consecutive days during the growing season) are also shown. Inundation occurs when surface water is present at depths no greater than 2 meters (m) (6.6 feet [ft]). Saturation occurs when the water table is no deeper than 30 centimeters (cm) (1 ft) below land surface.

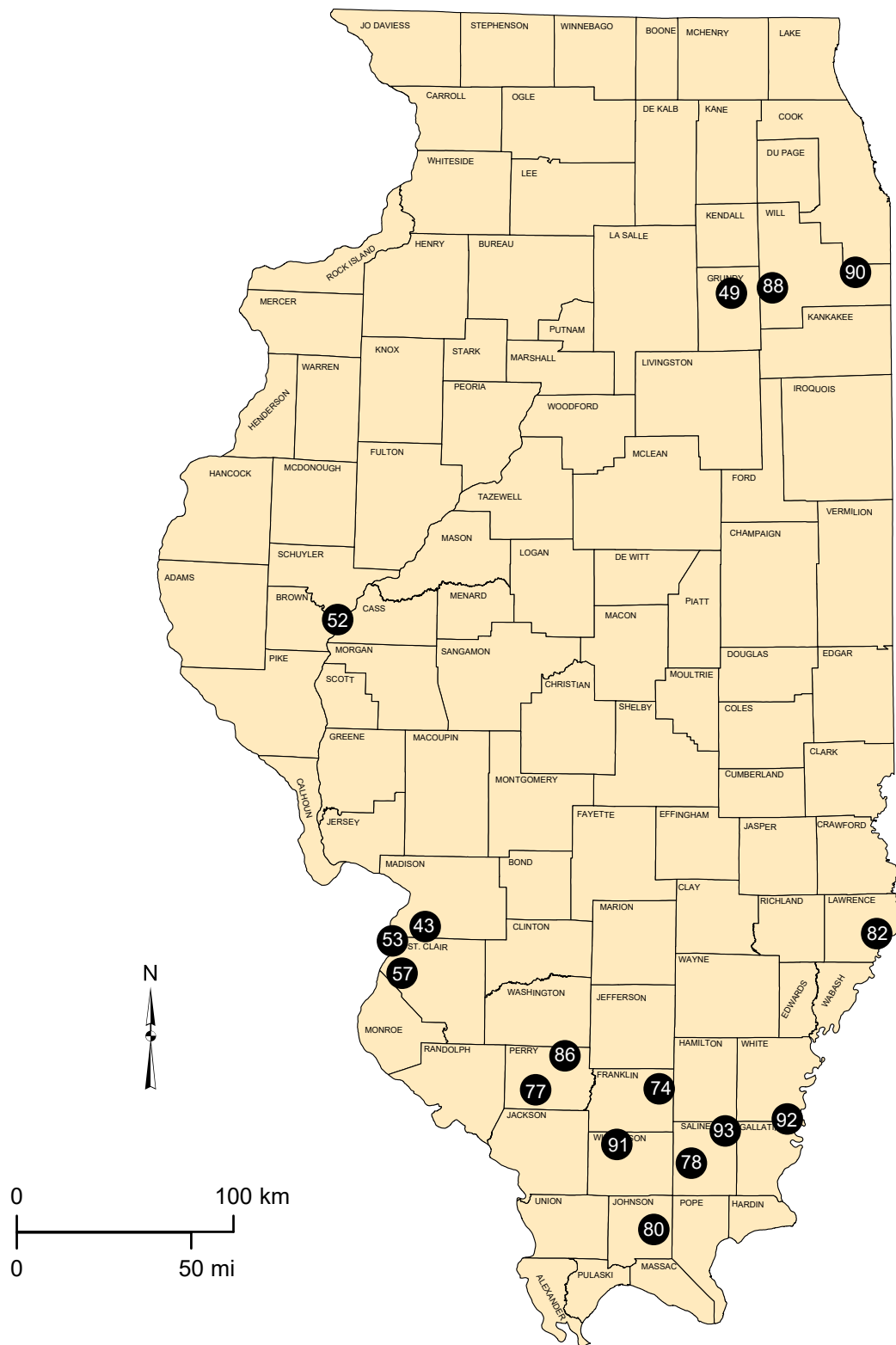


Figure 1. General locations of sites monitored by the ISGS for IDOT from September 1, 2018, through August 31, 2019. Numbers are the ISGS project numbers listed in Table 1.

Table 1. ISGS project numbers and active IDOT wetland mitigation sites monitored by ISGS from September 1, 2018, through August 31, 2019.

ISGS Number	Site Name	Site Type	Project	FA #	Sequence #	County
43	Eckmann/Bischoff	Wetland Mitigation Site	N/A	FAP 14	27	Madison
49	Morris	Wetland Mitigation Bank	N/A	N/A	1306	Grundy
52	La Grange	Wetland Mitigation Bank	N/A	N/A	9579	Brown
53	Fairmont City	Potential Wetland Mitigation Site	N/A	FAP 14	27	St. Clair
57	Former Tieman Property	Potential Wetland Mitigation Site	N/A	FAP 14	27	St. Clair
74	Sugar Camp Creek	Wetland and Stream Mitigation Bank	N/A	N/A	9282	Franklin
77	Pyramid Site EC25	Wetland Mitigation Site	Pyatts Blacktop	FAS 864	9778	Perry
78	Harrisburg, Site 2	Wetland Mitigation Site	IL 14	FAP 857	547	Saline
80	Max Creek	Wetland Mitigation Site	IL 147	FAS 932	8717A	Johnson
82	Lawrence County	Wetland Mitigation Bank	N/A	N/A	14912	Lawrence
86	Swan Road	Wetland Mitigation Site	TR 222	N/A	12315	Perry
88	Grant Creek North	Wetland Mitigation Site	I-55	FAI 55	N/A	Will
90	Thorn Creek Headwaters Preserve	Wetland Mitigation Site	I-57/Stuenkel Road	FAI 57	12558	Will
91	Herrin Road	Wetland Mitigation Site	Herrin to Johnson City Rd	FAS 903/FAU 9588	9891B	Williamson
92	New Haven	Wetland Mitigation Site	IL 141	FAP 877	18257	White
93	Former Garner Property	Wetland Mitigation Site	US 45	FAP 332	14105	Saline

Table 2. Summary of wetland hydrology area estimates for the 2019 growing season for active IDOT wetland mitigation sites monitored by the IGS from September 1, 2018, through August 31, 2019.

IGS Number	Site Name	Target Compensation Area		>5% of growing season (1987 Manual)		>12.5% of growing season (1987 Manual)		14 days or more (2010 Midwest Region Supplement)	
		ha	ac	ha	ac	ha	ac	ha	ac
43	Eckmann/Bischoff	17.20	42.50	24.28	60.00	24.28	60.00	24.28	60.00
49	Morris	44.11	109.00	13.61	33.63	11.00	27.17	12.57	31.07
52	La Grange	414.40	1,024.00	578.48	1,429.46	572.71	1,415.20	577.20	1,426.29
53	Fairmont City	10.93	27.00	18.40	45.46	18.40	45.46	18.40	45.46
57	Former Tiernan Property	17.04	42.10	18.98	46.89	18.68	46.16	18.70	46.22
74	Sugar Camp Creek	28.00	69.20	29.62	73.19	28.15	69.56	29.62	73.19
77	Pyramid Site EC25	4.57	11.30	NR	NR	NR	NR	NR	NR
78	Harrisburg, Site 2	4.13	10.20	NR	NR	NR	NR	NR	NR
80	Max Creek	0.49	1.20	NR	NR	NR	NR	NR	NR
82	Lawrence County	13.62	33.65	15.74	38.90	13.44	33.20	14.99	37.05
86	Swan Road	0.30	0.73	NR	NR	NR	NR	NR	NR
88	Grant Creek North	5.99	14.80	NR	NR	NR	NR	NR	NR
90	Thorn Creek Headwaters Preserve	12.02	29.70	24.60	60.80	16.22	40.09	21.20	52.39
91	Herrin Road	3.20	7.90	1.92	4.75	1.86	4.60	1.92	4.74
92	New Haven	2.57	6.36	3.06	7.57	2.89	7.13	3.05	7.53
93	Former Garner Property	11.69	28.89	NR	NR	NR	NR	NR	NR

NR: Wetland hydrology area not reported, see individual site summary for details.

The Midwestern Regional Climate Center (MRCC) at the Illinois State Water Survey (ISWS) provides data on the length and beginning and end dates of the growing season (MRCC 2019). In the 1987 Manual, the growing season is defined as the time period between the last occurrence of 28°F (-2.2°C) air temperatures in the spring and the first occurrence of 28°F (-2.2°C) air temperatures in the fall. The median beginning date and length of the growing season are calculated by the MRCC for individual climate observation stations throughout the state. Data from the nearest observation station with an adequate period of record are used for each site. This method is used when determining the areas that satisfy wetland hydrology criteria under the 1987 Manual. The 2010 Midwest Region Supplement provides different methods for determining the growing season. While the above method is allowable, one of the two following site-specific methods is preferred. The first method relies on observations of vegetation growth and development, and defines the start of the growing season as when at least two different species of non-evergreen vascular plants begin to grow, as indicated by various features such as emergence of herbaceous plants from the ground, bud burst, emergence or opening of flowers, and others. The second method relies on soil temperatures, with the growing season being the period when soil temperatures at a depth of 30 cm (1 ft) are continuously above 41°F (5°C). Site-specific observations of soil temperatures and vegetation were collected by field staff. The earliest date when either methodology was satisfied was determined to be the beginning of the growing season, and was used when determining areas that satisfy wetland hydrology criteria under the 2010 Midwest Region Supplement. Soil temperatures were collected during site visits using analog bimetal thermometers at a depth of 30 cm (12 inches [in.]), and some sites were equipped with soil-temperature data loggers for continuous readings. A soil-temperature data logger installed at the IDOT Harrisburg Site 3 wetland mitigation site, which is no longer monitored for wetland hydrology, provided representative soil-temperature data for the following sites: Sugar Camp Creek #74, Max Creek #80, Herrin Road #91, New Haven #92, and Former Garner Property #93. Also, the Illinois State Water Survey operates Illinois Climate Network (ICN) stations throughout the state that measure soil temperatures at 20 cm (8 in.). Those data were obtained from the Water and Atmospheric Resources Monitoring Program (WARM) website and used to supplement on-site readings as needed (WARM 2019).

Wells and surface-water gauges where water levels satisfied wetland hydrology criteria are indicated in tables within the summary for each site. Interpolation between measuring points and extrapolation were used to locate the boundary of the area that satisfied wetland hydrology criteria. Best professional judgment was used to refine the location of this boundary, using observations of saturation, small-scale topographic features, vegetation, soils, and other site features. The areas that satisfied wetland hydrology criteria were mapped using ArcGIS 10 geographic information system software. Areas were calculated in acres [ac] in the GIS and converted to hectares [ha] (see Table 2).

The error of each area measurement varies depending on the quality, precision, and scale of the topographic map, and the precision in measuring the location of monitoring devices. The base maps used for these determinations are orthorectified aerial imagery from the U.S. Department of Agriculture-Farm Service Agency (USDA-FSA) National Agricultural Imagery Program (NAIP), base map imagery provided by Esri (2019), or satellite imagery (Landsat/Copernicus) provided by Google Earth (2017, 2019). For most sites, detailed site topography was collected by IDOT (e.g., GPS or photogrammetry) or by ISGS (e.g., total station or GPS measurements) and was used for mapping wetland hydrology areas. In some cases, digital elevation models produced from LiDAR measurements (ISGS 2019) were also used to guide delineation of wetland hydrology polygons. The locations of monitoring instruments were measured using GPS devices or a total station. Given the many potential sources of error, estimates of the amount of error are difficult to calculate and are not included.

In general, water-level data were collected biweekly during March through May, when the highest water levels generally occur in Illinois. As needed, biweekly manual readings were begun as early as February and/or extended into June. Water-level data were also collected during periods of the growing season when floods or heavy precipitation occurred, otherwise water levels readings were made at least once during late summer, fall and winter.

For sites presented in this report, 5% of the growing season is 10 to 12 days, and 12.5% of the growing season ranges from about 25 to 30 days using the methods of the 1987 Manual. Therefore, two consecutive biweekly manual water-level measurements were required to satisfy wetland hydrology criteria at 5% of the growing season, and three readings were required at 12.5% of the growing season. If fewer readings suggested wetland hydrology, then linear interpolation of the water levels was used to determine total number of days of inundation or saturation. Interpolation between two dates was not used if a water level was not recorded for both dates. Flooding that prevented measurement of any specific instrument was considered sufficient evidence of inundation for that site visit. Manual water-level measurements were often supplemented with various automated data loggers that measured daily or more frequently. These data loggers were used to determine the timing of hydrologic events, such as precipitation or flooding, that occurred between manual measurements. One manual measurement alone was generally considered insufficient to indicate inundation or saturation for a sufficient duration without the identification of a precipitation or flooding event that would have initiated the inundation or saturation. If conflicts occurred between automatic and manually recorded data, best professional judgment was used to solve any conflicts in data, and a specific note was added to the site summary in question. The same methods were used to determine duration of inundation or saturation to satisfy the 14-day requirement of the 2010 Midwest Region Supplement.

Monitoring wells were given an alphanumeric designation based in part on their relative depths. Monitoring wells designated with an 'S' or 'VS' are shallow and were specifically constructed for measuring wetland hydrology in the soil zone. Monitoring wells designated with a 'U' (i.e., upper) have varying depths but are deeper than 'S' wells, and may be used to determine wetland hydrology depending on well construction and hydrogeologic setting, as determined by the project manager. Other types of wells, including those designated with 'M', 'L', or 'D' (i.e., middle, lower, and deep), are deeper wells used to collect other hydrogeologic data and cannot be used to determine wetland hydrology. They are included only to document ISGS activities at the site and are not listed or discussed in the text of this report.

Graphs for each site show water-level elevations at wells and surface-water gauges, and the depth to water below land surface at each well. The graphs follow the summary text for each site, and there may be multiple graphs for each site. Depths are shown as negative values when water levels are above land surface. Elevations are shown relative to the North American Vertical Datum of 1988 (NAVD 1988) unless otherwise labeled. If no data are shown on the graphs for any specific well or gauge, then the well or gauge was either dry, not read, or the data were removed for quality-control purposes (see below).

At most sites, data loggers were used to monitor water levels at regular intervals ranging from daily to hourly. Various types of loggers were used and each type of instrument has different operations and default values. We have removed readings that result when the instrument sensor was dry (i.e., zero or other default values). Other spurious readings that occurred due to data-logger malfunction or natural conditions that caused inaccuracies (e.g., freezing, vegetation growth, or debris accumulation beneath the logger) were removed after interpretation by ISGS scientists. For some sites, stage data from gauges operated by the U.S. Geological Survey (USGS), USACE, or the U.S. Forest Service (USFS) were obtained from online or other sources (USGS 2019, USACE 2019, USFS 2019) and used to supplement ISGS data in evaluations of hydrologic conditions. In a

few cases, we applied Partial Least Squares (PLS) regression to predict water levels in wells without data loggers where manual readings did not provide enough resolution to make unambiguous interpretation of depth and duration of water levels. The PLS regression method was used to model a continuous hydrograph by estimating depth to water readings in wells without data loggers based on the depth to water of all other wells with data loggers.

On-site precipitation data were collected by the ISGS using tipping-bucket rain gauges. Due to inherent difficulties in maintaining rain gauges (e.g., clogging, equipment malfunction, and timing of deployments), actual precipitation for each month may be greater than the recorded value. None of the ISGS rain gauges are heated and therefore are not appropriate for recording winter precipitation. However, monthly precipitation data obtained from MRCC climate observation stations are provided to show monthly precipitation throughout the year. The closest weather station with an adequate period of record was used for each site; however, additional stations or data collected by the ISGS at the site may be used to supplement the record if data from the closest station are missing. Normal (i.e., average) precipitation values and above- and below-normal range threshold values were calculated by the National Water and Climate Center (NWCC 2019). Normal and range threshold values were based on a 30-year period, 1971-2000 or 1981-2010. Above- and below-normal thresholds were calculated using a 2-parameter gamma distribution over the 30-year period (NWCC 1995). Precipitation is classified as “above 30% threshold”, or above the normal range, when there is a 30% chance precipitation will be greater than or equal to the value shown. Precipitation is “below 30% threshold”, or below the normal range, when there is a 30% chance that precipitation will be less than or equal to the value shown. Monthly total precipitation is considered to be within the normal range when it is neither above nor below the 30% thresholds. Precipitation also may be described simply as above or below normal, where the above- and below-normal range threshold values are not shown.

This document is intended to be a summary of all hydrologic data collected during the reporting period. Therefore, some details have been omitted that may be necessary to interpret the data for other uses. The primary project manager listed for each site should be contacted for additional information.

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**ECKMANN/BISCHOFF
WETLAND MITIGATION SITE**

ISGS #43

FAP 14

Sequence #27

Madison County, near Collinsville, Illinois

Primary Project Manager: Steven E. Benton

Secondary Project Manager: Lindsey A. Schafer

SITE HISTORY

- A Level II hydrogeologic investigation was conducted from 2000 to 2004.
- March 2009: IDOT tasked ISGS to resume monitoring of the site.
- April 2009: ISGS installed a monitoring network at the site and resumed data collection.

WETLAND HYDROLOGY CALCULATION FOR 2019

The target compensation area for the Eckmann/Bischoff wetland mitigation site is 17.20 ha (42.50 ac). Using the 1987 Manual (Environmental Laboratory 1987), 24.28 ha (60.00 ac) of the total site area of 24.28 ha (60.00 ac) satisfied wetland hydrology criteria for greater than 5% of the growing season and 24.28 ha (60.00 ac) satisfied wetland hydrology criteria for greater than 12.5% of the growing season. Using the 2010 Midwest Region Supplement (USACE 2010), 24.28 ha (60.00 ac) satisfied wetland hydrology criteria for 14 or more consecutive days during the growing season. These estimates are based on the following factors:

- The median date that the growing season begins in nearby Belleville, Illinois, is April 4 and the season lasts 204 days (MRCC 2019); 5% of the growing season is 10 days and 12.5% of the growing season is 26 days, using the 1987 Manual. Using the 2010 Midwest Region Supplement, March 9 was the starting date of the 2019 growing season based on soil temperatures measured on site and at the nearby Fairmont City wetland mitigation site (ISGS #53).
- Total precipitation for the monitoring period, recorded at Belleville, Illinois (MRCC station #110510), was 132% of normal, precipitation in spring 2019 (March through May) was 137% of normal. Precipitation in eight months during the period was at or above normal, and the wettest months were September 2018 (222% of normal precipitation) and August 2019 (194% of normal precipitation).
- A beaver dam in Schneider Ditch causes long-term inundation and saturation of the site. In past years, inundation was confined to the entire former Eckmann property and the eastern portion of the former Bischoff property. However, this year, both properties were almost entirely inundated.
- In 2019, water levels measured in 10 of 10 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 5% of the growing season, and water levels measured in 10 of 10 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 12.5% of the growing season, using the 1987 Manual. Using the 2010 Midwest Region Supplement, water levels in 10 of 10 soil-zone monitoring wells satisfied wetland

hydrology criteria for 14 or more consecutive days of the growing season. See the tables at the end of this summary for details.

PLANNED FUTURE ACTIVITIES

- Monitoring of the site will continue until no longer required by IDOT.

WETLAND HYDROLOGY TABLES FOR 2019

Well locations meeting wetland hydrology criteria			
<i>ID</i>	<i>5% of growing season</i>	<i>12.5% of growing season</i>	<i>14 days during growing season</i>
1S	Y	Y	Y
2S	Y	Y	Y
3S	Y	Y	Y
4S	Y	Y	Y
5S	Y	Y	Y
6S	Y	Y	Y
7S	Y	Y	Y
8S	Y	Y	Y
9S	Y	Y	Y
10S	Y	Y	Y

Y – met wetland hydrology criteria

N – did not meet wetland hydrology criteria

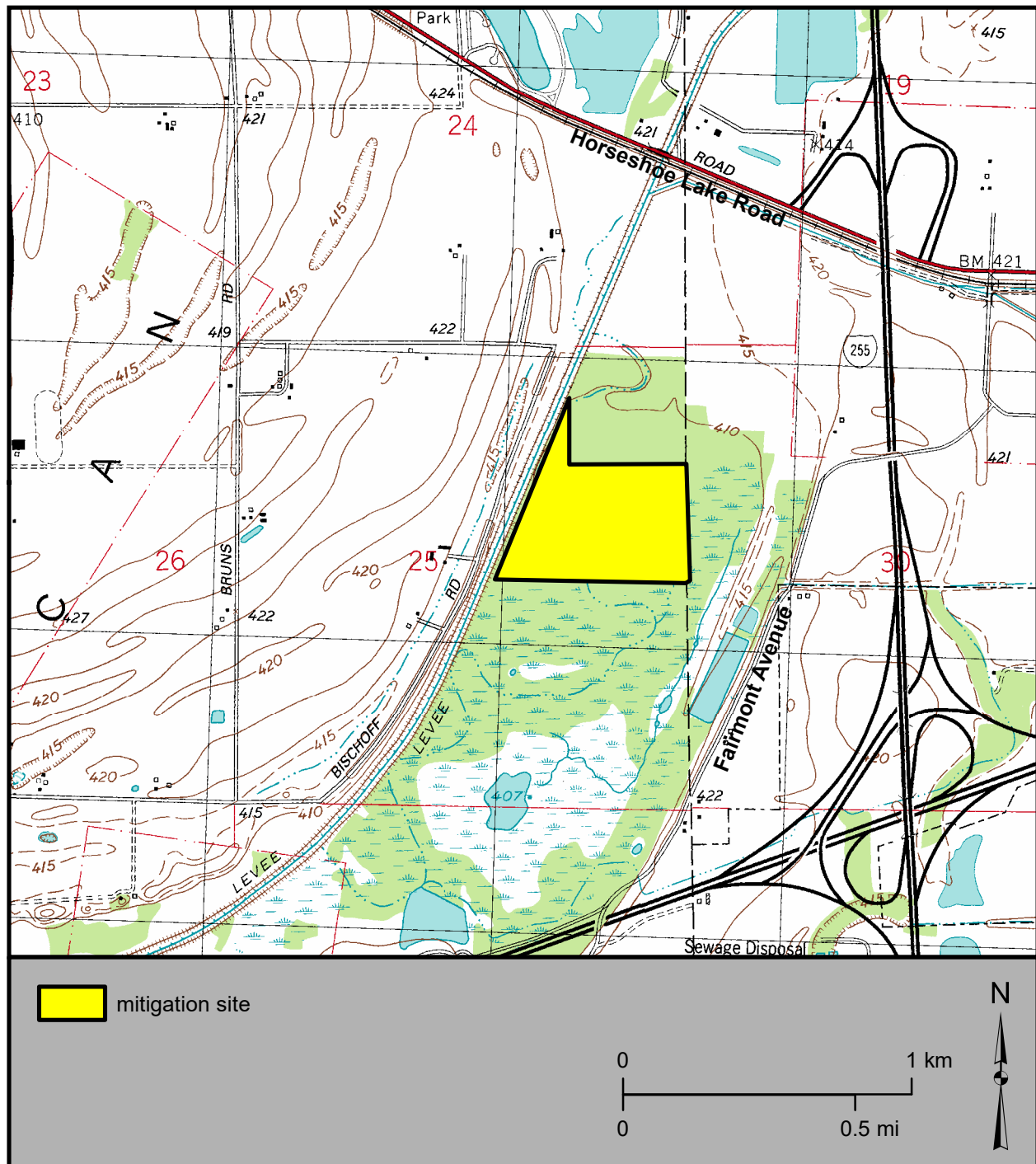
Surface-water gauge elevations meeting wetland hydrology criteria			
<i>ID</i>	<i>5% of growing season</i>	<i>12.5% of growing season</i>	<i>14 days during growing season</i>
B	124.64 m (408.92 ft)	124.64 m (408.92 ft)	124.64 m (408.92 ft)
C	124.70 m (409.12 ft)	124.65 m (408.95 ft)	124.70 m (409.12 ft)
D	124.64 m (408.92 ft)	124.64 m (408.92 ft)	124.64 m (408.92 ft)
F	124.55 m (408.63 ft)	124.50 m (408.46 ft)	124.53 m (408.56 ft)
SW2	124.55 m (408.63 ft)	124.50 m (408.46 ft)	124.53 m (408.56 ft)

n/a – insufficient data to determine an elevation

Eckmann/Bischoff Wetland Mitigation Site (FAP 14)

General Study Area and Vicinity

from the USGS Topographic Series, Monks Mound, IL, 7.5-minute quadrangle (USGS 1954b)

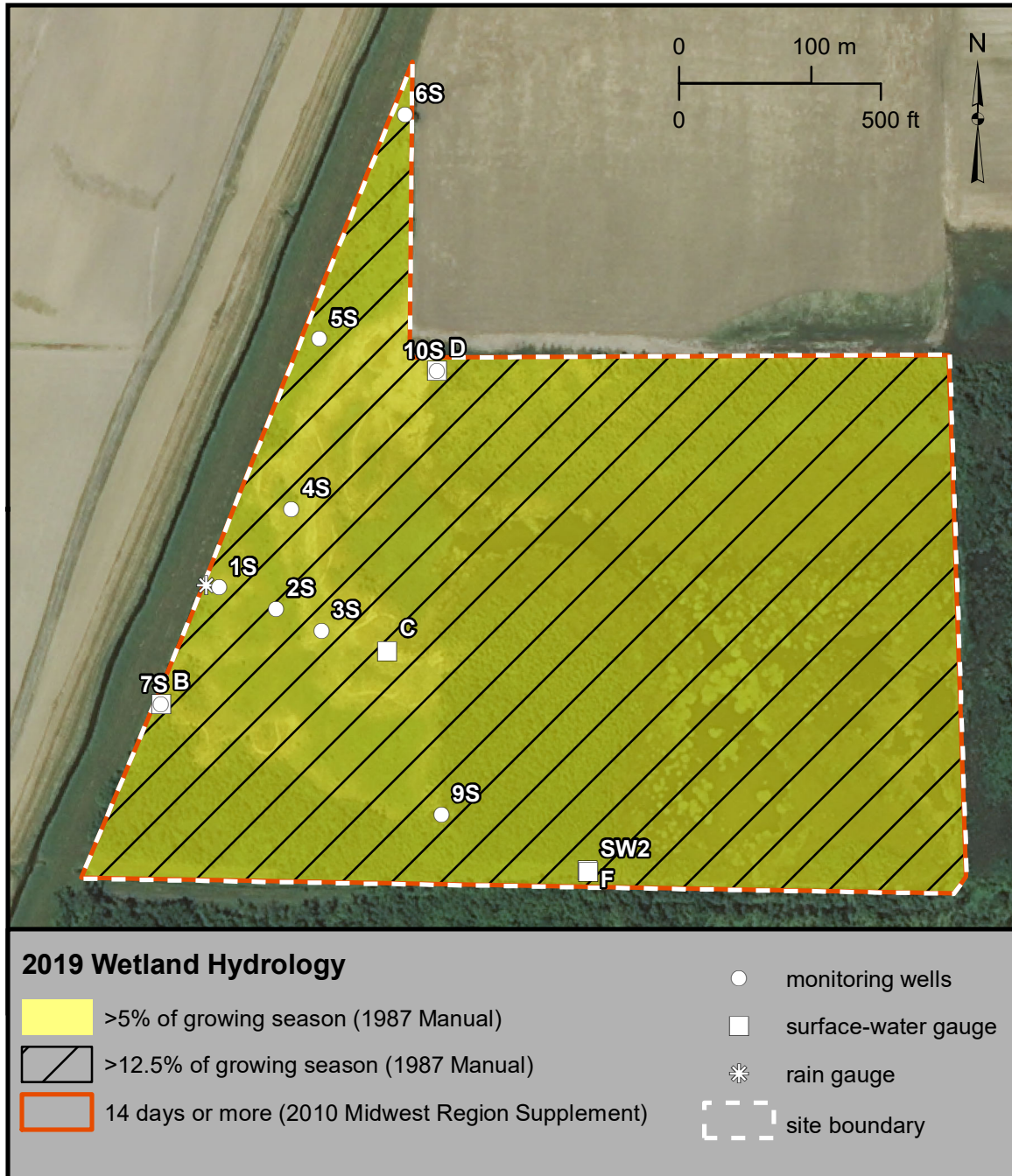


Eckmann/Bischoff Wetland Mitigation Site (FAP 14)

Estimated Areal Extent of 2019 Wetland Hydrology

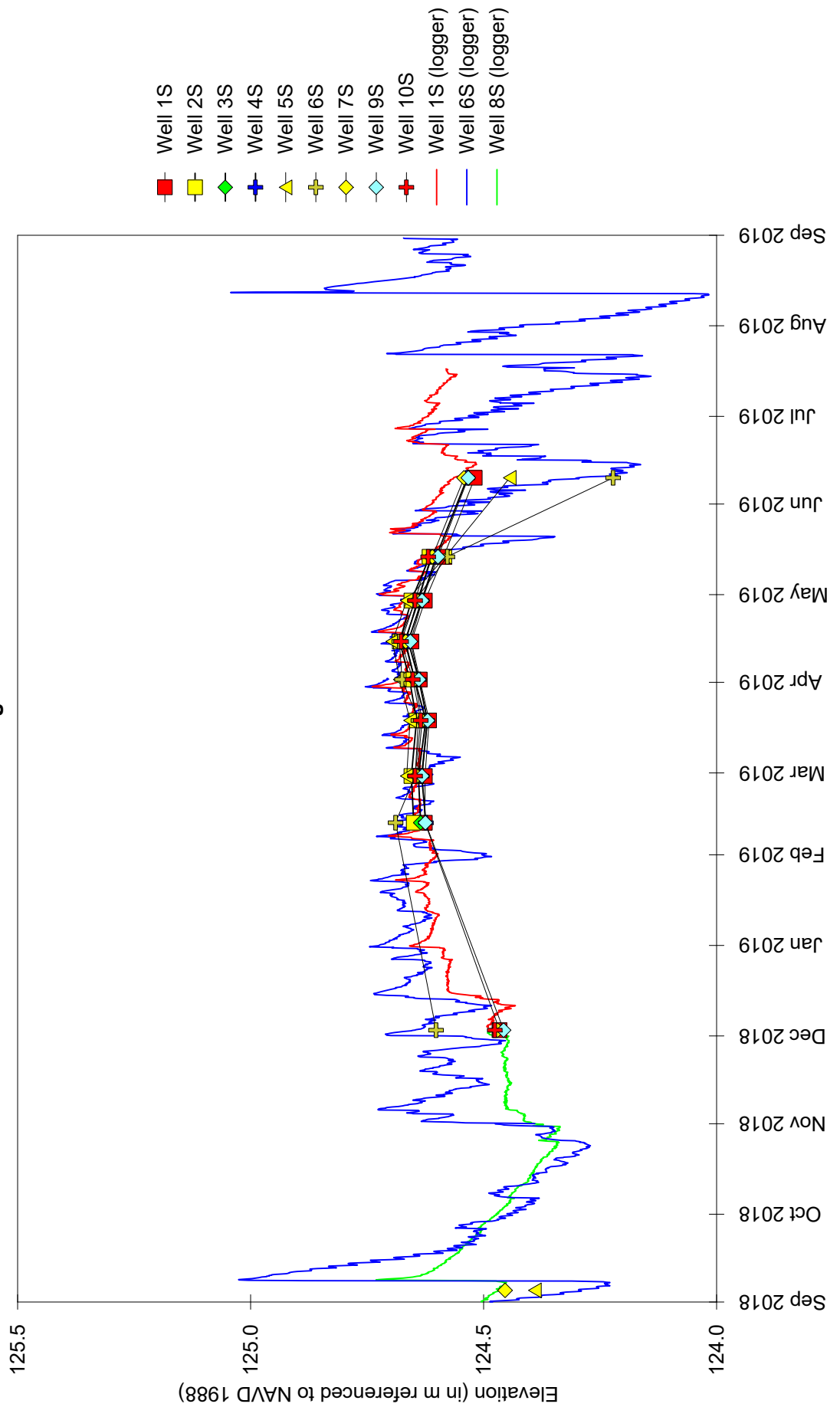
September 1, 2018 through August 31, 2019

Map based on 2012 Farm Service Agency
digital orthophotography, Madison County, Illinois (USDA-FSA 2012)

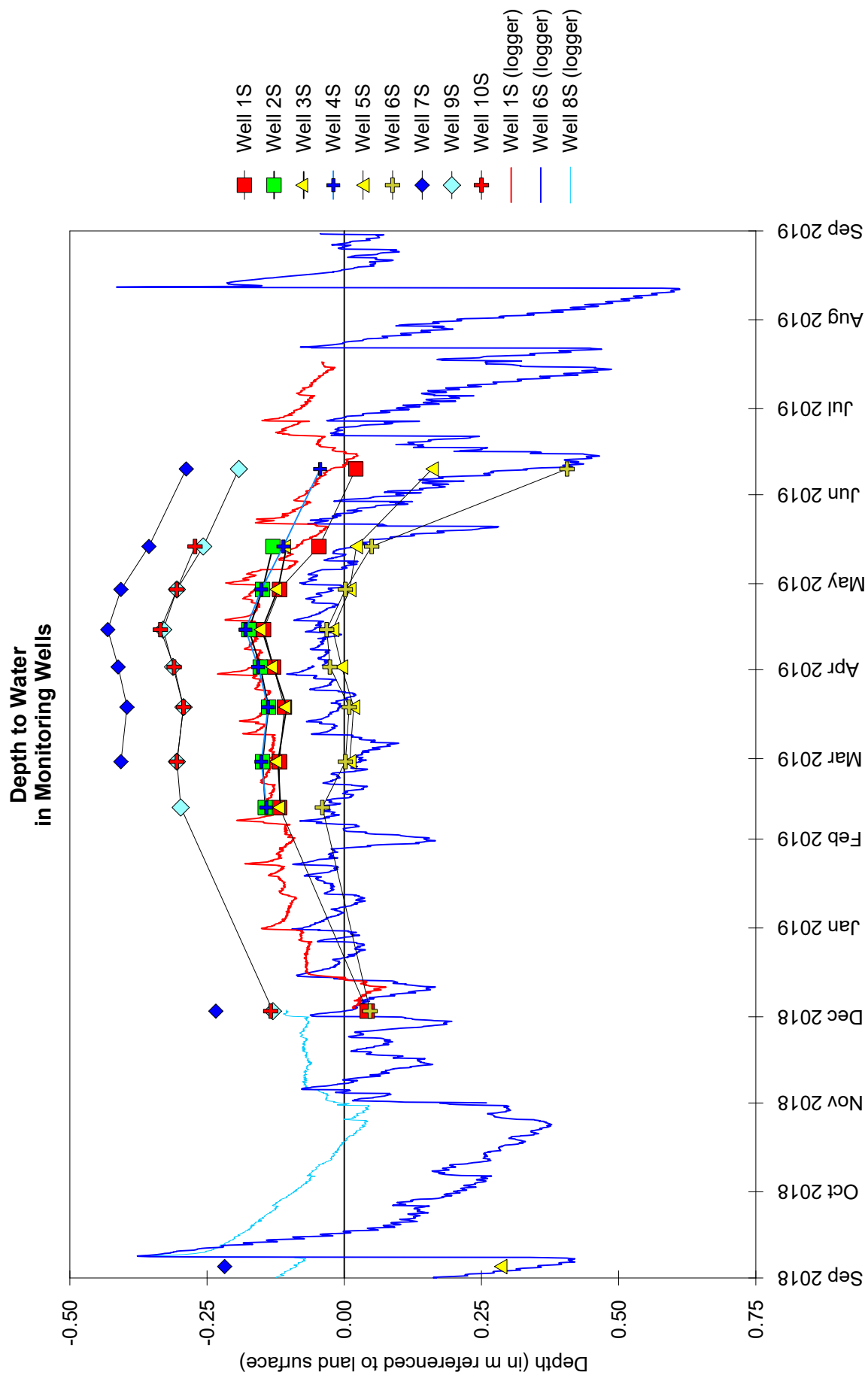


Eckmann/Bischoff Wetland Mitigation Site **September 1, 2018 through August 31, 2019**

Water-Level Elevation in Monitoring Wells

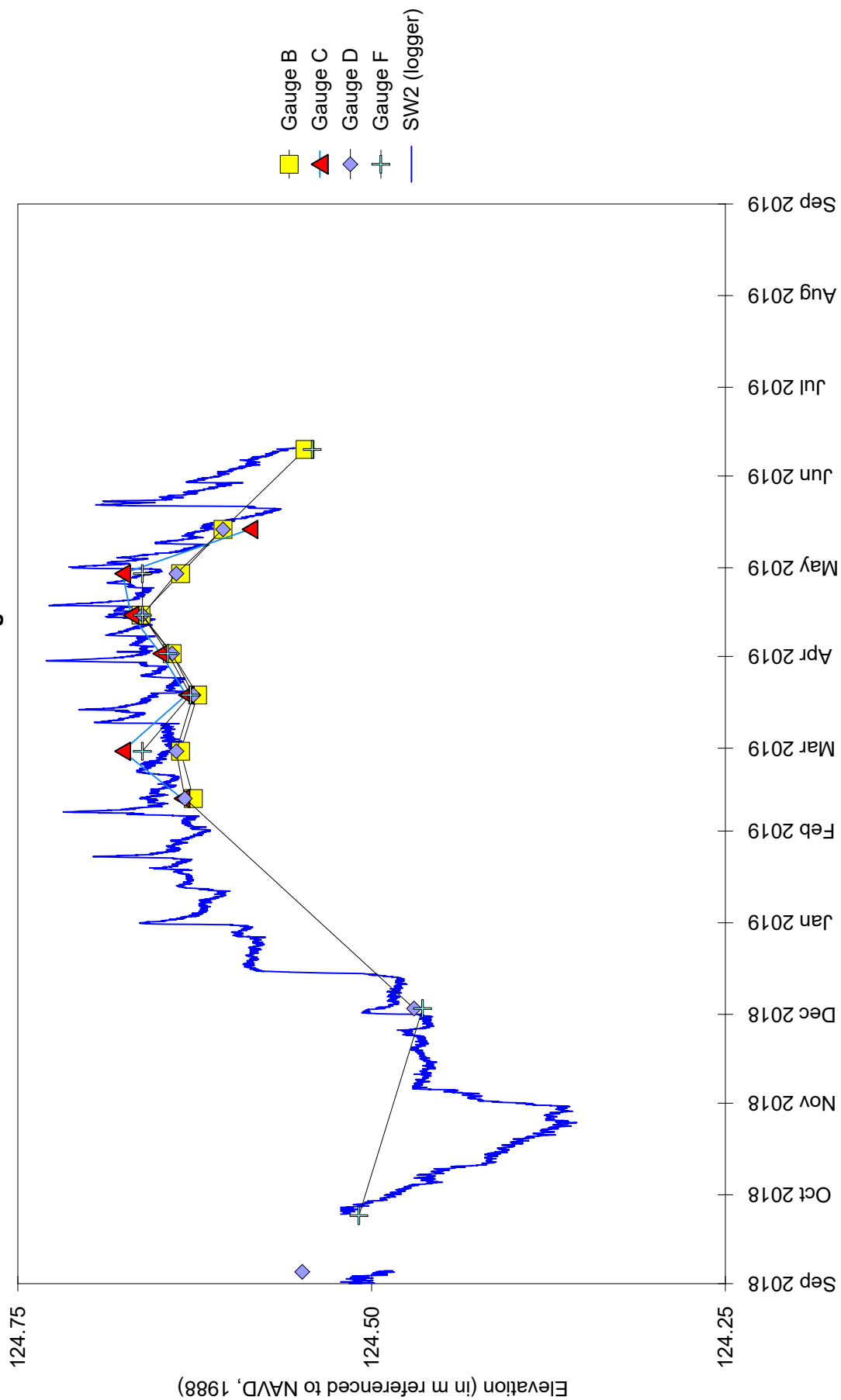


Eckmann/Bischoff Wetland Mitigation Site September 1, 2018 through August 31, 2019



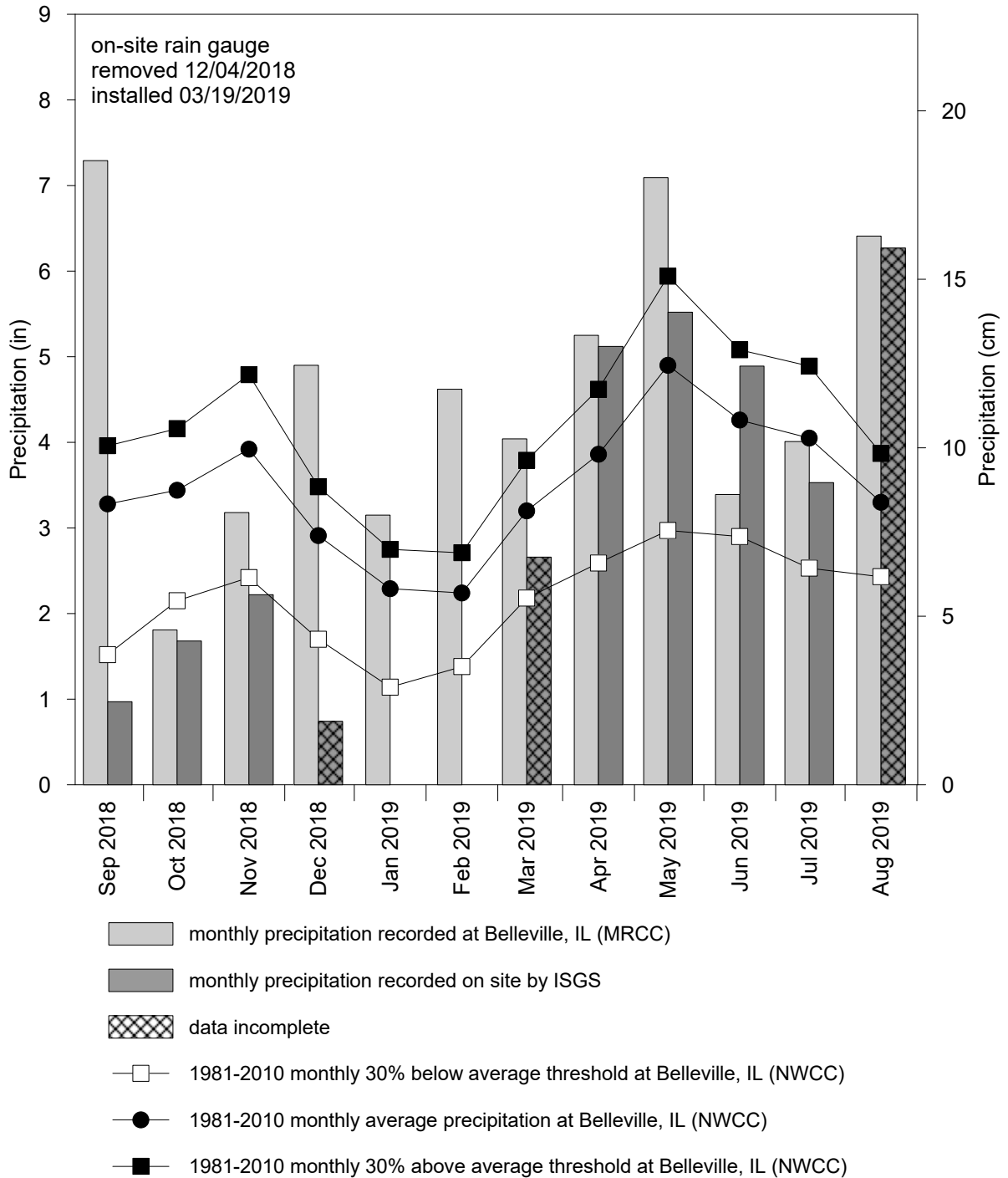
Eckmann/Bischoff Wetland Mitigation Site **September 1, 2018 through August 31, 2019**

Water-Level Elevation at Surface-Water Gauges



Eckmann/Bischoff Wetland Mitigation Site September 2018 through August 2019

Total Monthly Precipitation Recorded on Site and at Belleville, IL (MRCC station #110510)



**MORRIS
WETLAND MITIGATION BANK**

ISGS #49

Sequence #1306

Grundy County, near Morris, Illinois

Primary Project Manager: Eric T. Plankell

Secondary Project Manager: Mackenzie K. Marti

SITE HISTORY

- March 1999: ISGS was tasked by IDOT to begin monitoring for a potential wetland banking site.
- March 2007: A Level II hydrogeologic characterization report was submitted to IDOT (ISGS Open-File Series 2007-03).
- February 2009: IDOT specified that monitoring of surface-water inundation and floodwater storage functions would be limited to an off-site USACE river gauge and on-site data loggers.

WETLAND HYDROLOGY CALCULATION FOR 2019

The target compensation area for the Morris wetland mitigation bank is 44.11 ha (109.00 ac). Using the 1987 Manual (Environmental Laboratory 1987), 13.61 ha (33.63 ac) of the total site area of 341.56 ha (844.00 ac) satisfied wetland hydrology criteria for greater than 5% of the growing season, and 11.00 ha (27.17 ac) satisfied wetland hydrology criteria for greater than 12.5% of the growing season. Using the 2010 Midwest Region Supplement (USACE 2010), 12.57 ha (31.07 ac) satisfied wetland hydrology criteria for 14 or more consecutive days during the growing season. These estimates are based on the following factors:

- The median date that the growing season begins in Morris, Illinois, is April 12, and the season lasts 200 days (MRCC 2019). Using the 1987 Manual, 5% of the growing season is 10 days, and 12.5% of the growing season is 25 days. Using the 2010 Midwest Region Supplement, April 2 was the starting date of the 2019 growing season based on soil temperatures measured on site.
- Total precipitation for the monitoring period at Morris, Illinois (MRCC station #115825), was 120% of normal. During spring 2019 (March through May), precipitation was 174% of normal.
- The Illinois River flooded portions of the site three times during the 2018-2019 monitoring period.
- The period of maximum inundation and saturation during the growing season occurred from late April to early May, following 5.56 in. of rainfall, recorded at the Morris weather station between April 28 and May 3.
- The table at the end of this summary lists surface-water gauge elevations that met wetland hydrology criteria.

PLANNED FUTURE ACTIVITIES

- Monitoring of surface water via on-site ISGS data loggers and the off-site USACE river gauge at Morris will continue until no longer required by IDOT. The continued aim will be to watch for significant changes in the on-site wetland hydrology acreage or wetland site functions.

WETLAND HYDROLOGY TABLE FOR 2019

Well locations meeting wetland hydrology criteria			
ID	5% of growing season	12.5% of growing season	14 days during growing season
42S	Y	Y	Y
44S	Y	Y	Y
64S	Y	Y	Y

Y – met wetland hydrology criteria

N – did not meet wetland hydrology criteria

Surface-water gauge elevations meeting wetland hydrology criteria			
ID	5% of growing season	12.5% of growing season	14 days during growing season
SW2A*	n/a	n/a	n/a
SW8	150.66 m (494.29 ft)	150.59 m (494.06 ft)	150.63 m (494.19 ft)
SW43	150.70 m (494.42 ft)	150.64 m (494.23 ft)	150.67 m (494.32 ft)
IL River**	149.26 m (489.70 ft)	148.42 m (486.94 ft)	149.04 m (488.98 ft)

n/a – insufficient data to determine an elevation

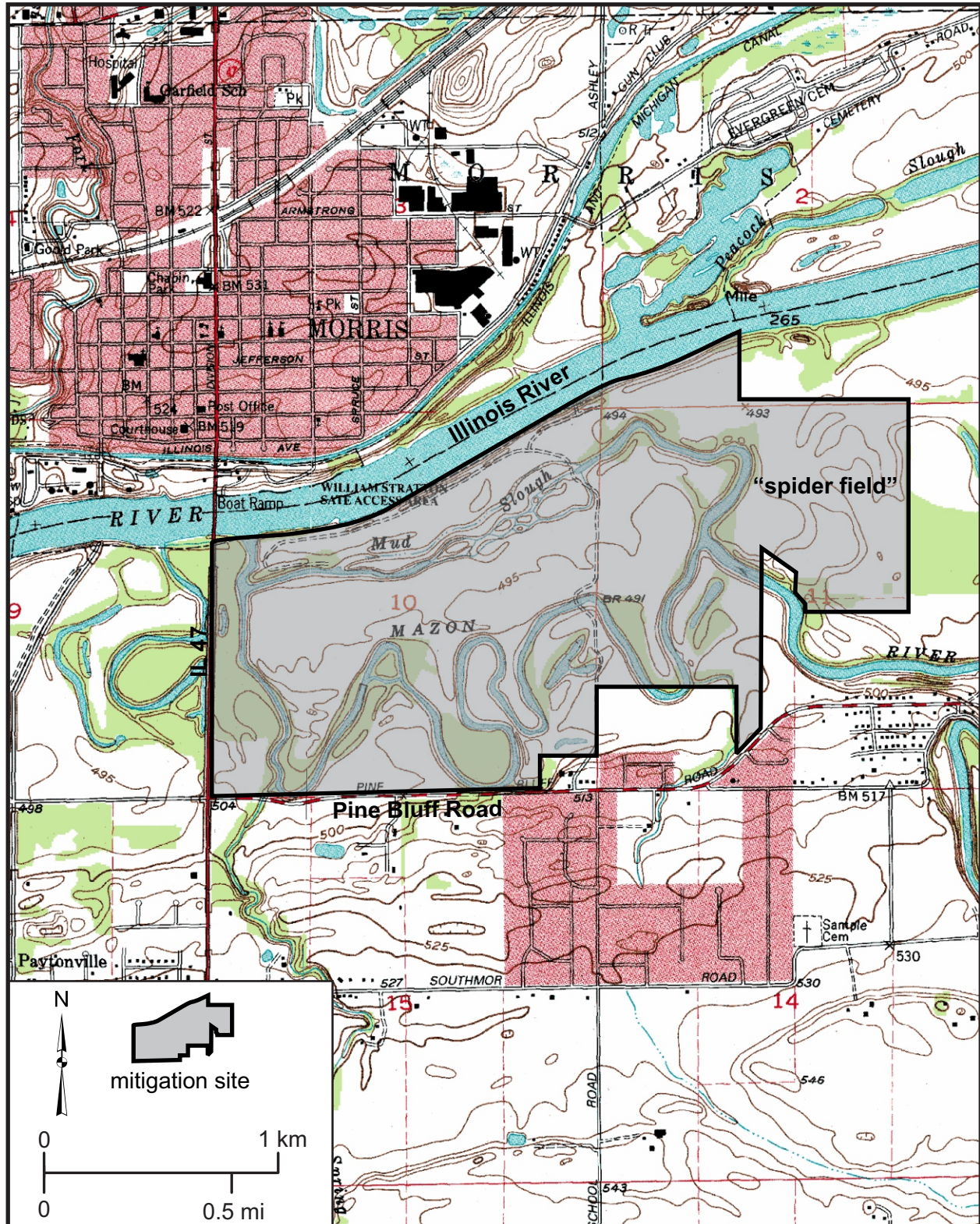
*-Mazon River at ISGS Gauge SW2A.

** - Illinois River at Morris (USACE 2019). Elevations listed for the Illinois River reflect minimum river stages recorded at the 5%, 12.5%, and 14-day thresholds, all of which were insufficient to cause flooding of the site.

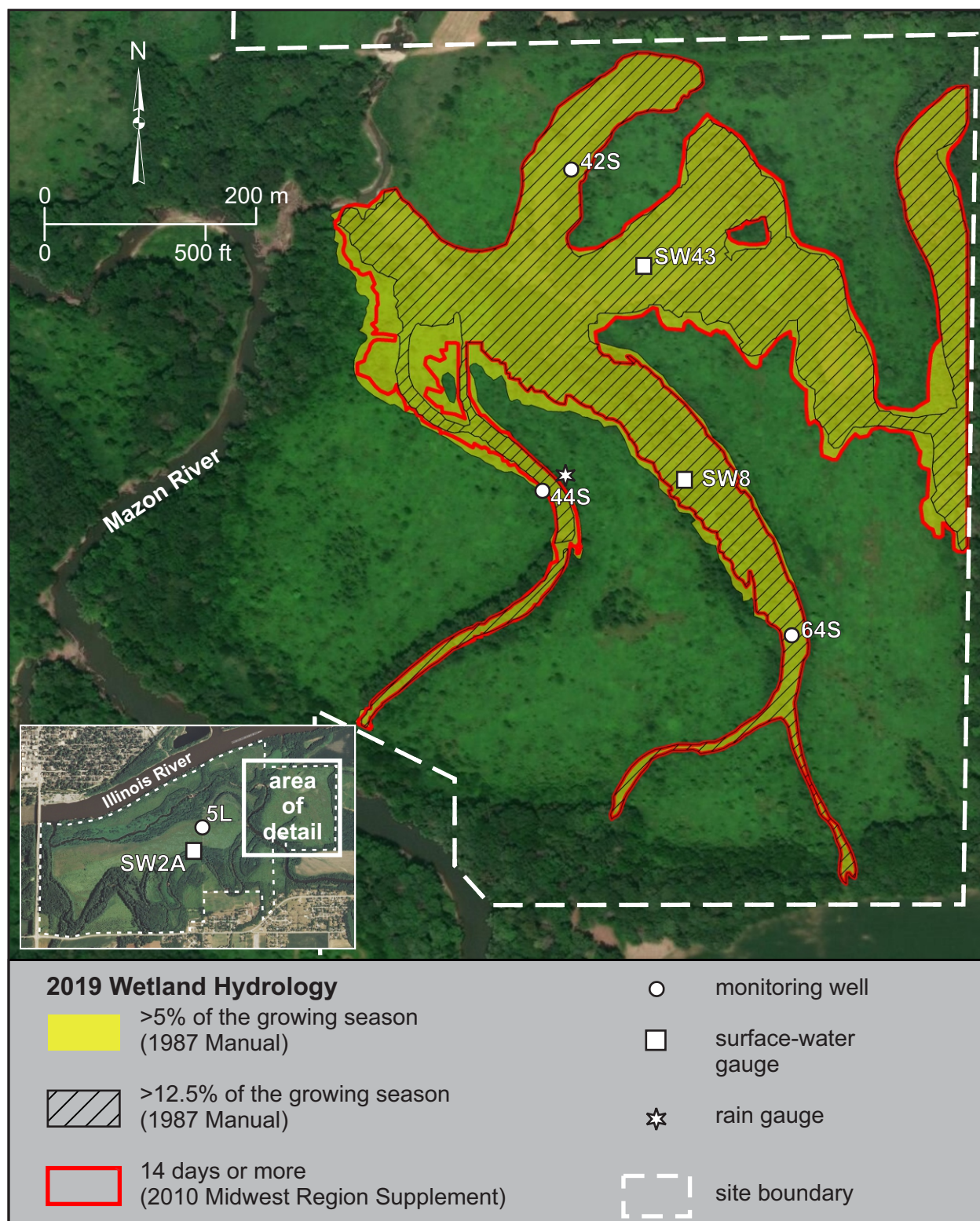
Morris Wetland Mitigation Bank

General Study Area and Vicinity

from the USGS Topographic Series, Morris, IL, 7.5-minute Quadrangle (USGS 1993d)
contour interval is 5 feet

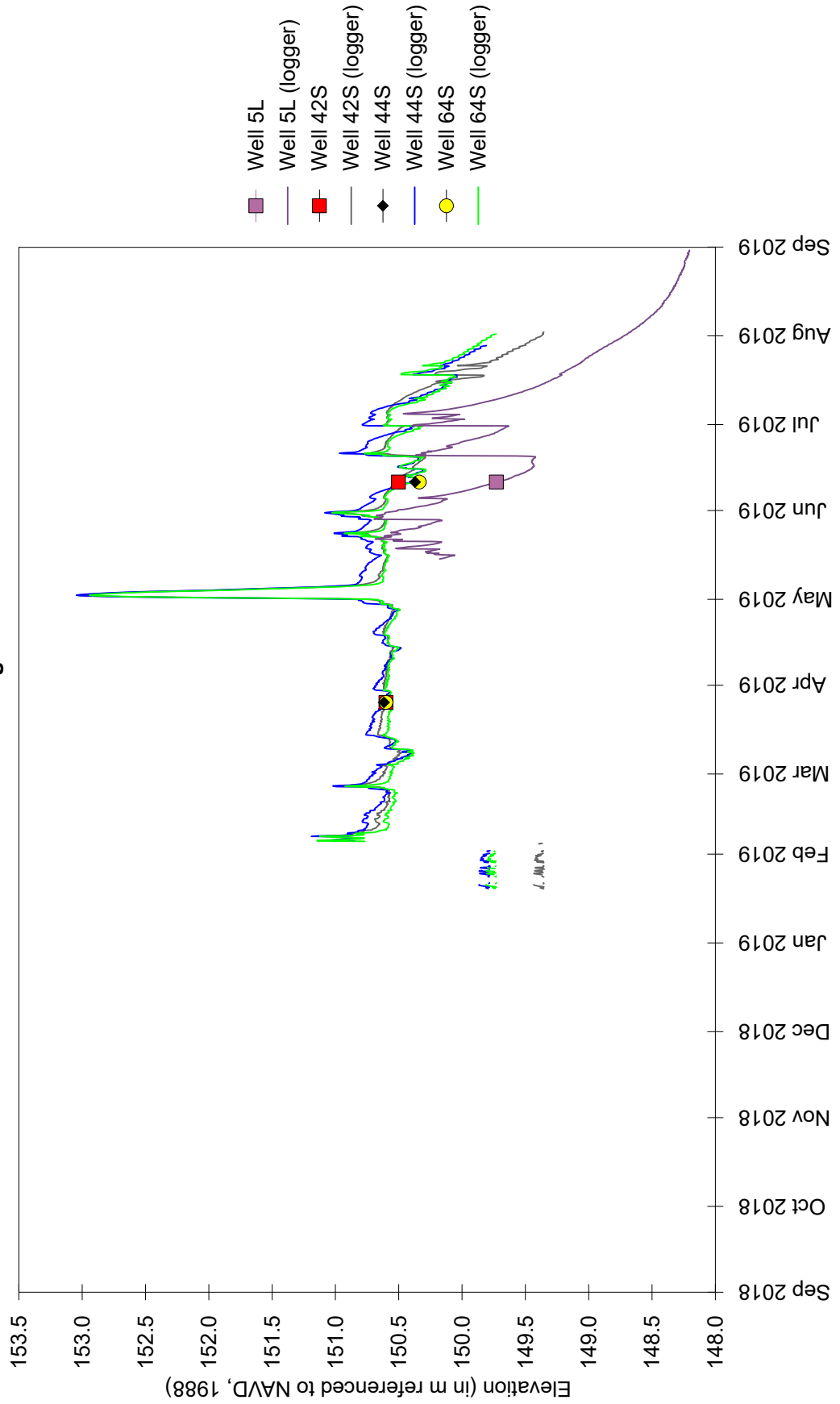


Morris Wetland Mitigation Bank
Estimated Areal Extent of 2019 Wetland Hydrology
September 1, 2018 through August 31, 2019
 Map based on imagery available from Esri (Esri 2019)

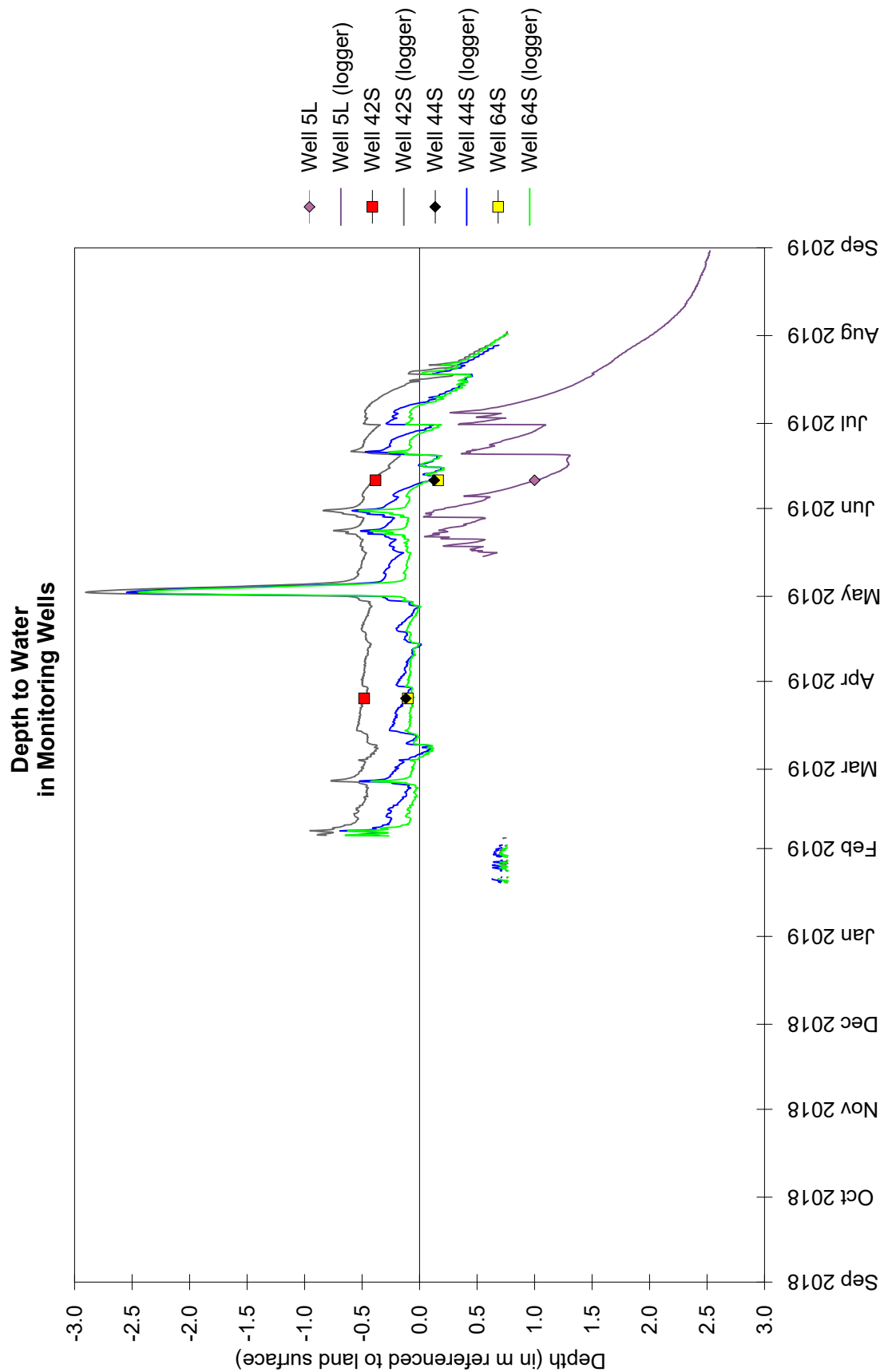


Morris Wetland Mitigation Bank September 1, 2018 through August 31, 2019

**Water-Level Elevation
in Monitoring Wells**

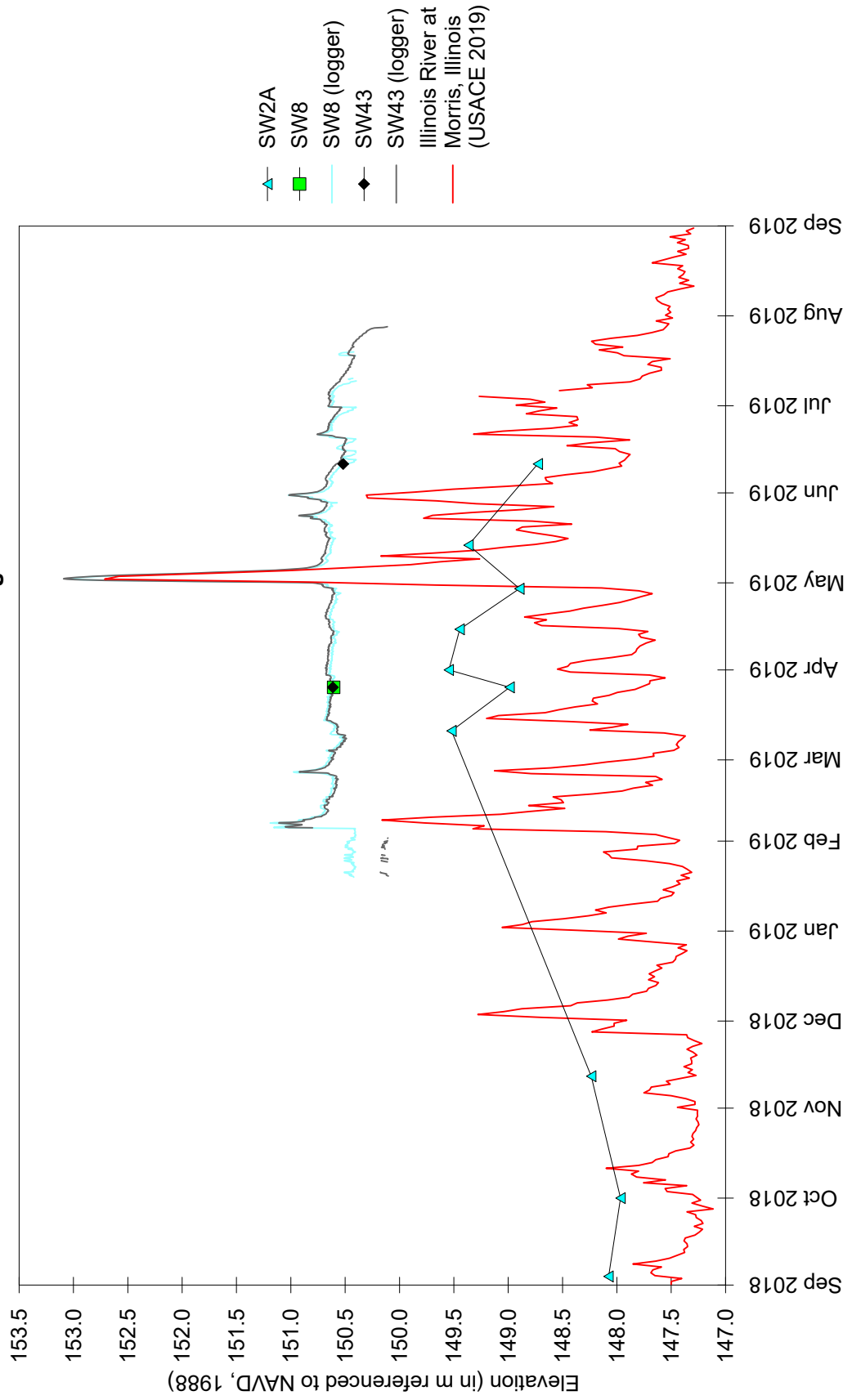


Morris Wetland Mitigation Bank September 1, 2018 through August 31, 2019



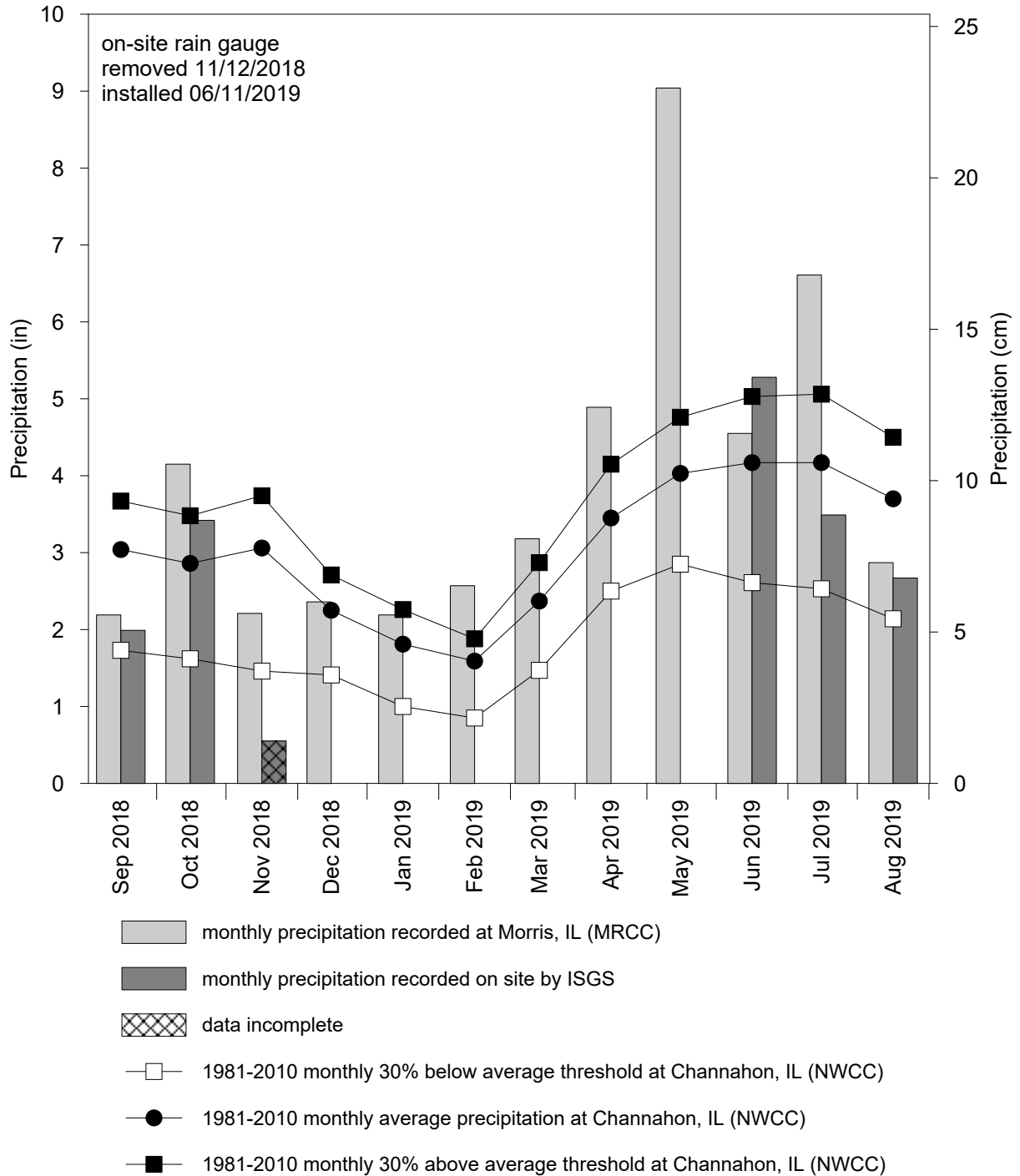
Morris Wetland Mitigation Bank September 1, 2018 through August 31, 2019

**Water-Level Elevation
at Surface-Water Gauges**



Morris Wetland Mitigation Bank September 2018 through August 2019

Total Monthly Precipitation Recorded on Site and at
Morris, IL (MRCC station #115825)



**LA GRANGE
WETLAND MITIGATION BANK**

ISGS #52

Sequence #9579

Brown County, near La Grange, Illinois

Primary Project Manager: Geoffrey E. Pociask

Secondary Project Manager: Keith W. Carr

SITE HISTORY

- January 2003: ISGS submitted a wetland banking instrument to IDOT.
- January 2005: A Level II hydrogeologic characterization report was submitted to IDOT (ISGS Open-File Series 2005–02).
- Fall 2005: Construction began at the site.
- Summer/fall 2011: Additional construction was completed at the site. Trees were planted in portions of Fields 12, 13, 14, and 15 and in areas surrounding Amelia Barker Lake.
- Fall 2015: Portions of Fields 12 and 13 were re-planted with trees.

WETLAND HYDROLOGY CALCULATION FOR 2019

The target compensation area for the La Grange wetland mitigation bank is 414.40 ha (1,024.00 ac). Using the 1987 Manual (Environmental Laboratory 1987), 578.48 ha (1,429.46 ac) of the total site area of 665.72 ha (1,645.00 ac) satisfied wetland hydrology criteria for greater than 5% of the growing season and 572.71 ha (1,415.20 ac) satisfied wetland hydrology criteria for greater than 12.5% of the growing season. Using the 2010 Midwest Region Supplement (USACE 2010), 577.20 ha (1,426.29 ac) satisfied wetland hydrology criteria for 14 or more consecutive days during the growing season. These estimates are based on the following factors:

- The median date that the growing season begins in nearby Rushville, Illinois, is April 5, and the season lasts 212 days (MRCC 2019); 5% of the growing season is 11 days, and 12.5% of the growing season is 27 days, using the 1987 Manual. Using the 2010 Midwest Region Supplement, March 21 was the starting date of the 2019 growing season based on soil temperatures measured on site.
- Total precipitation for the monitoring period at Rushville, Illinois (MRCC station #117551), was 92% of normal. During spring 2019 (March through May), precipitation was 64% of normal. Rainfall during June 2019 was particularly excessive with 150% of monthly normal precipitation.
- The period of maximum inundation and saturation during the 2019 growing season at the site occurred from early February through late July during a period of prolonged flooding. The duration of this flood event was the longest recorded since ISGS began monitoring the La Grange mitigation bank.

- In 2019, water levels measured in 11 of 11 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 5% of the growing season, and water levels measured in 10 of 11 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 12.5% of the growing season, using the 1987 Manual. In addition, using the 2010 Midwest Region Supplement, water levels in 11 of 11 soil-zone monitoring wells satisfied wetland hydrology criteria for 14 or more consecutive days of the growing season. See the tables at the end of this summary for details.

PLANNED FUTURE ACTIVITIES

- ISGS will monitor hydrology at this site until no longer required by IDOT.
- Sediment accumulation measurements are planned for late Fall 2019 or Winter 2020.

WETLAND HYDROLOGY TABLES FOR 2019

Well locations meeting wetland hydrology criteria			
ID	5% of growing season	12.5% of growing season	14 days during growing season
2S	Y	N	Y
14S	Y	Y	Y
41S	Y	Y	Y
45S	Y	Y	Y
46S	Y	Y	Y
47S	Y	Y	Y
48S	Y	Y	Y
49S	Y	Y	Y
50S	Y	Y	Y
51S	Y	Y	Y
52S	Y	Y	Y

Y – met wetland hydrology criteria

N – did not meet wetland hydrology criteria

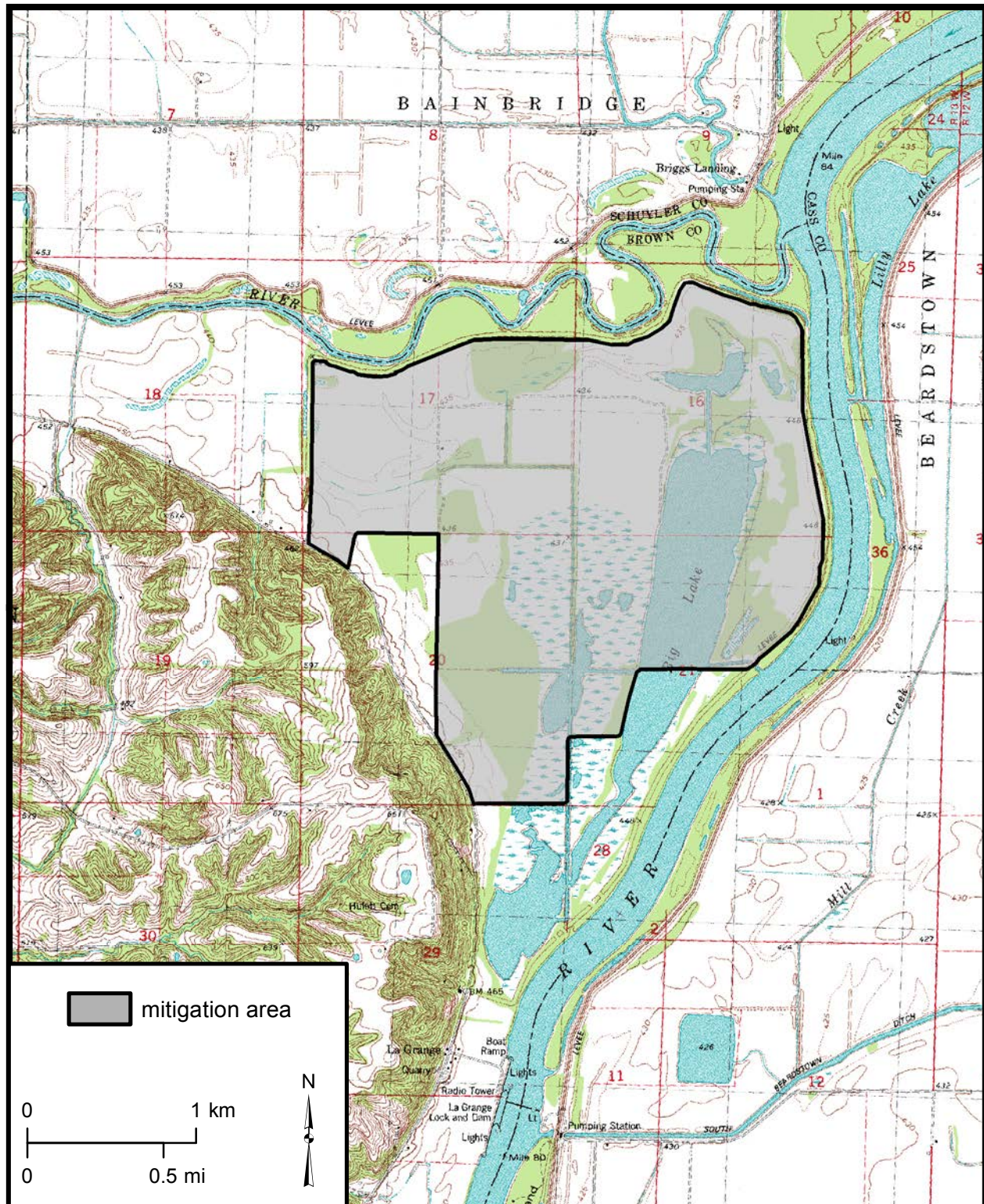
Surface-water gauge elevations meeting wetland hydrology criteria			
ID	5% of growing season	12.5% of growing season	14 days during growing season
SW19	135.84 m (445.66 ft)	135.09 m (443.20 ft)	135.69 m (445.16 ft)
IL River*	135.84 m (445.66 ft)	135.09 m (443.20 ft)	135.69 m (445.16 ft)

* - off-site gauge, Illinois River at New La Grange Lock and Dam (USACE 2019)

n/a – insufficient data to determine an elevation

La Grange Wetland Mitigation Bank General Study Area and Vicinity

from the USGS Topographic Series, Cooperstown, IL, 7.5-minute Quadrangle (USGS 1980)
contour interval is 10 feet



La Grange Wetland Mitigation Bank

Management Areas

Map based on 2012 Farm Service Agency digital orthophotography, Brown County, Illinois (USDA-FSA 2012)

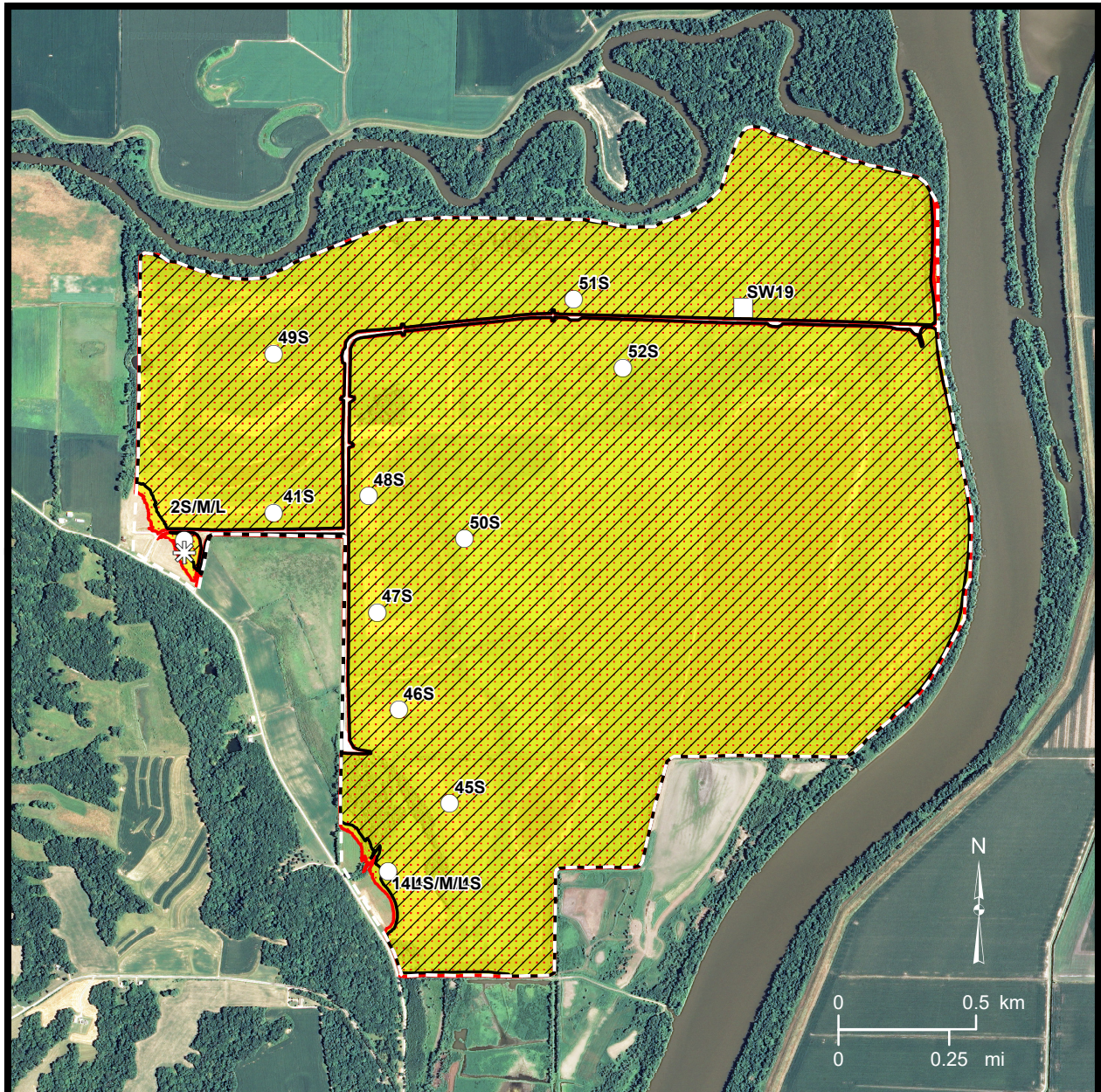


La Grange Wetland Mitigation Bank








Estimated Areal Extent of 2019 Wetland Hydrology

September 1, 2018 through August 31, 2019

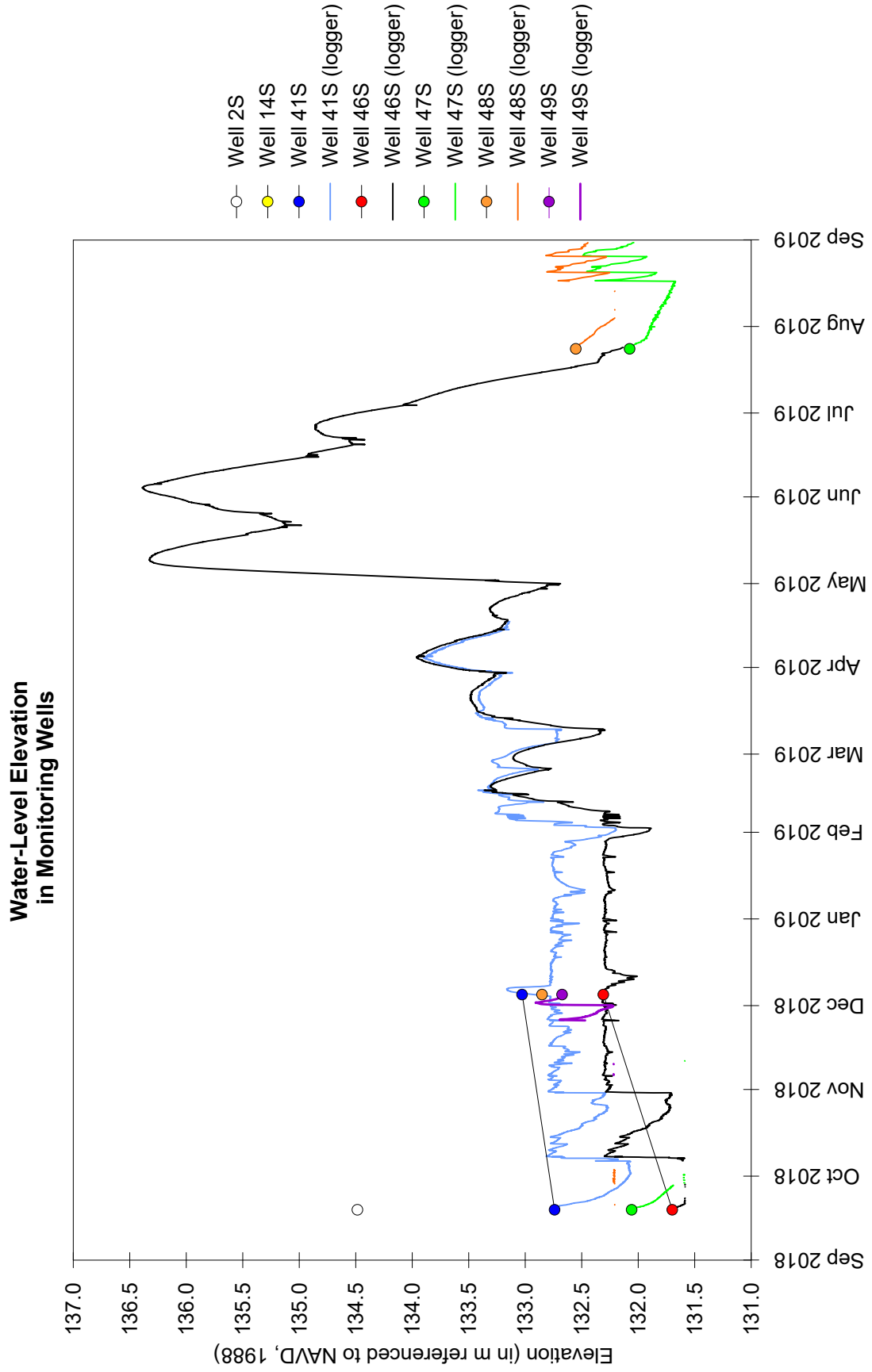
Map based on 2012 Farm Service Agency digital orthophotography, Brown County, Illinois (USDA-FSA 2012)



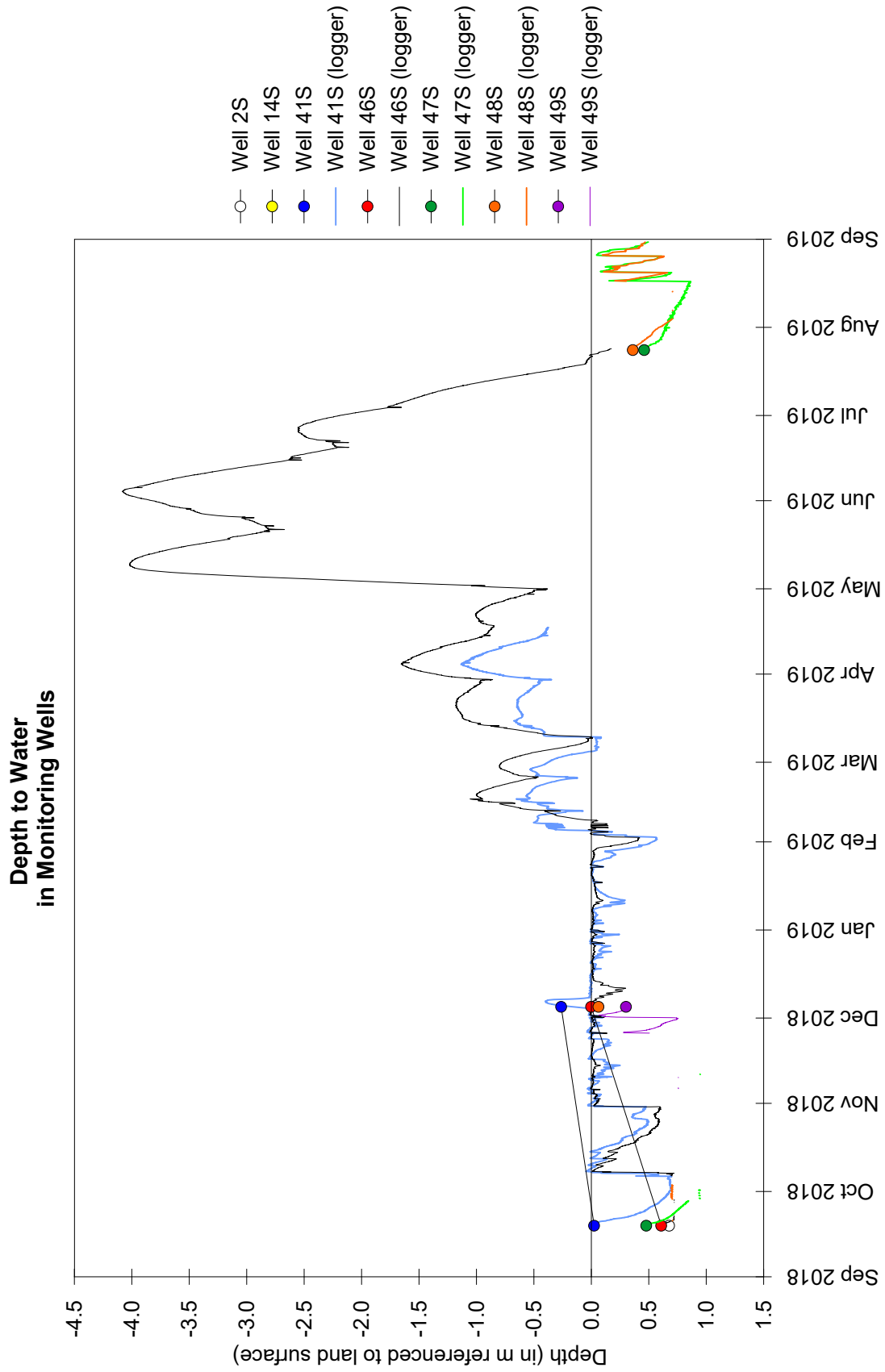
2019 Wetland Hydrology

- | | | | |
|---|--|---|---------------------|
|  | >5% of growing season (1987 Manual) |  | monitoring well |
|  | >12.5% of growing season (1987 Manual) |  | surface-water gauge |
|  | 14 days or more (2010 Midwest Region Supplement) |  | rain gauge |
| | |  | mitigation area |

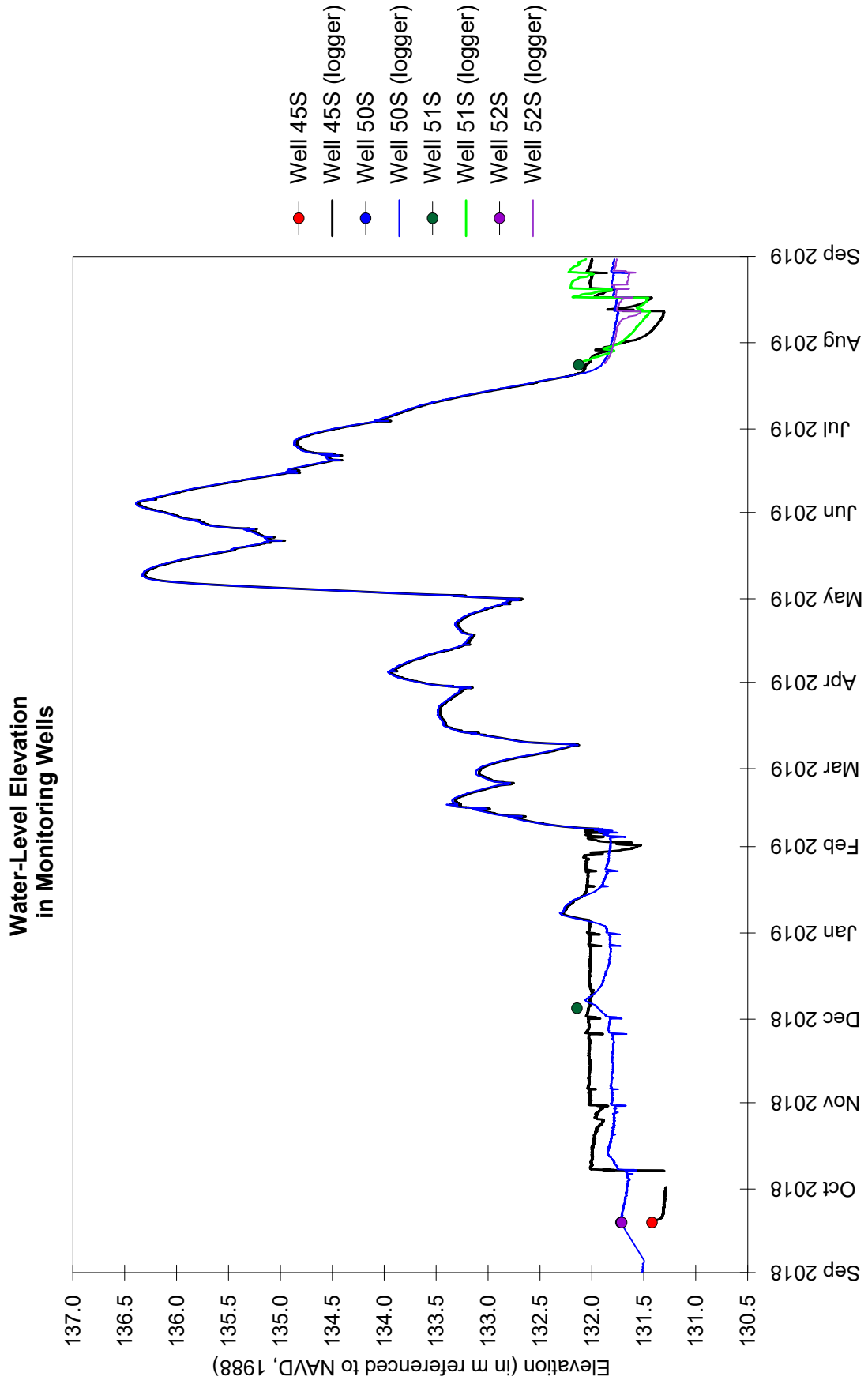
La Grange Wetland Mitigation Bank **September 1, 2018 through August 31, 2019**



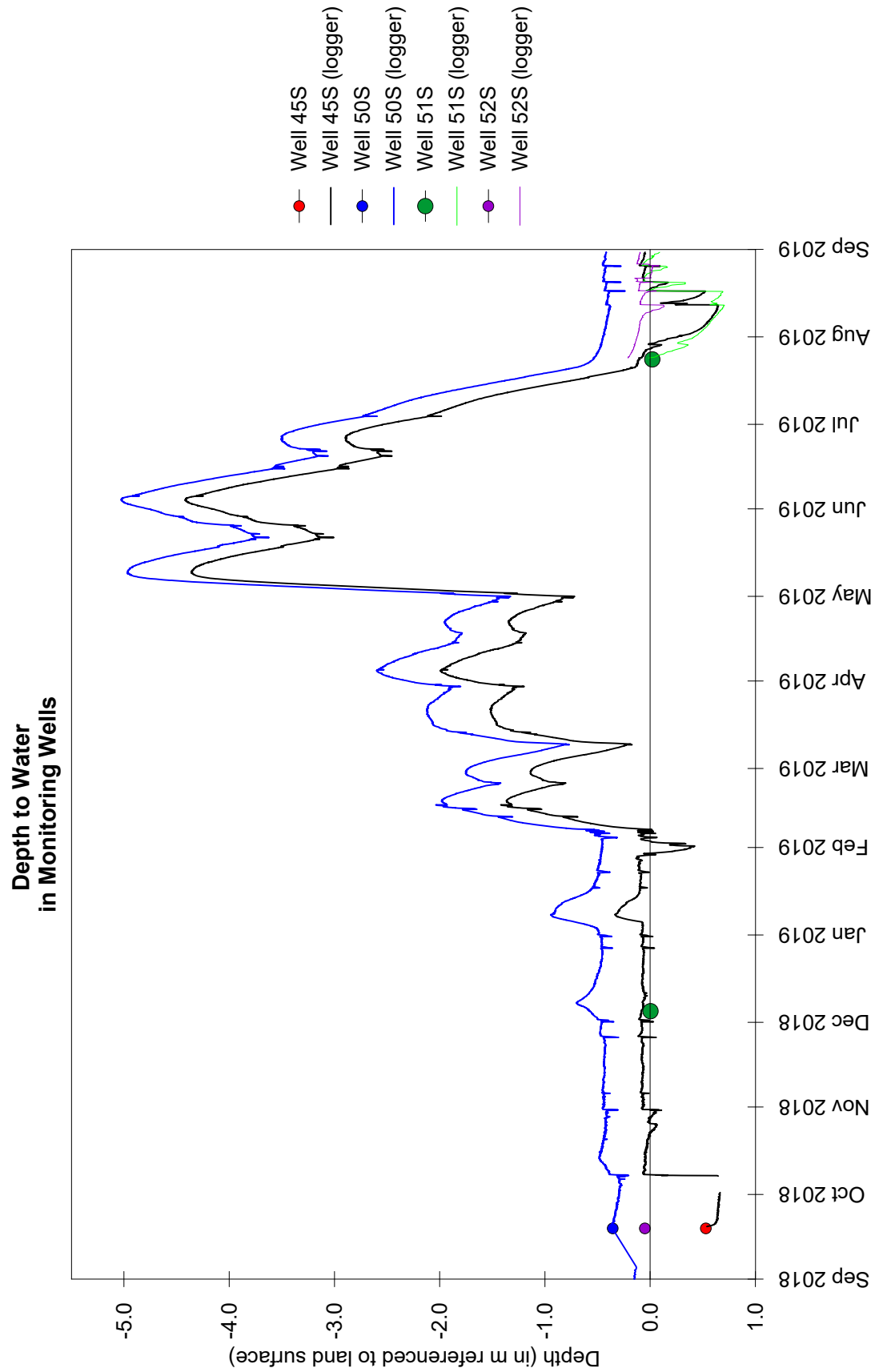
La Grange Wetland Mitigation Bank **September 1, 2018 through August 31, 2019**



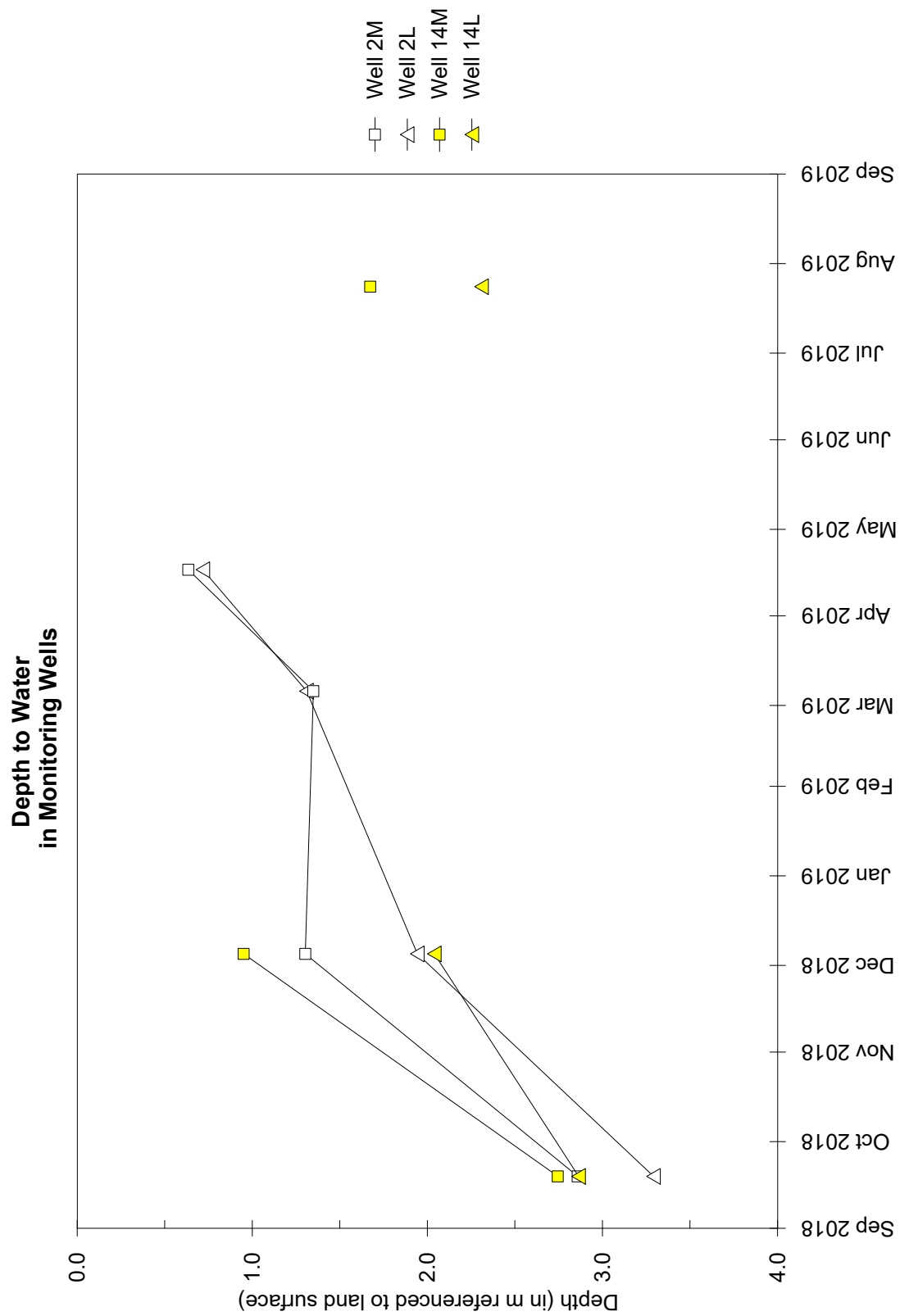
La Grange Wetland Mitigation Bank **September 1, 2018 through August 31, 2019**



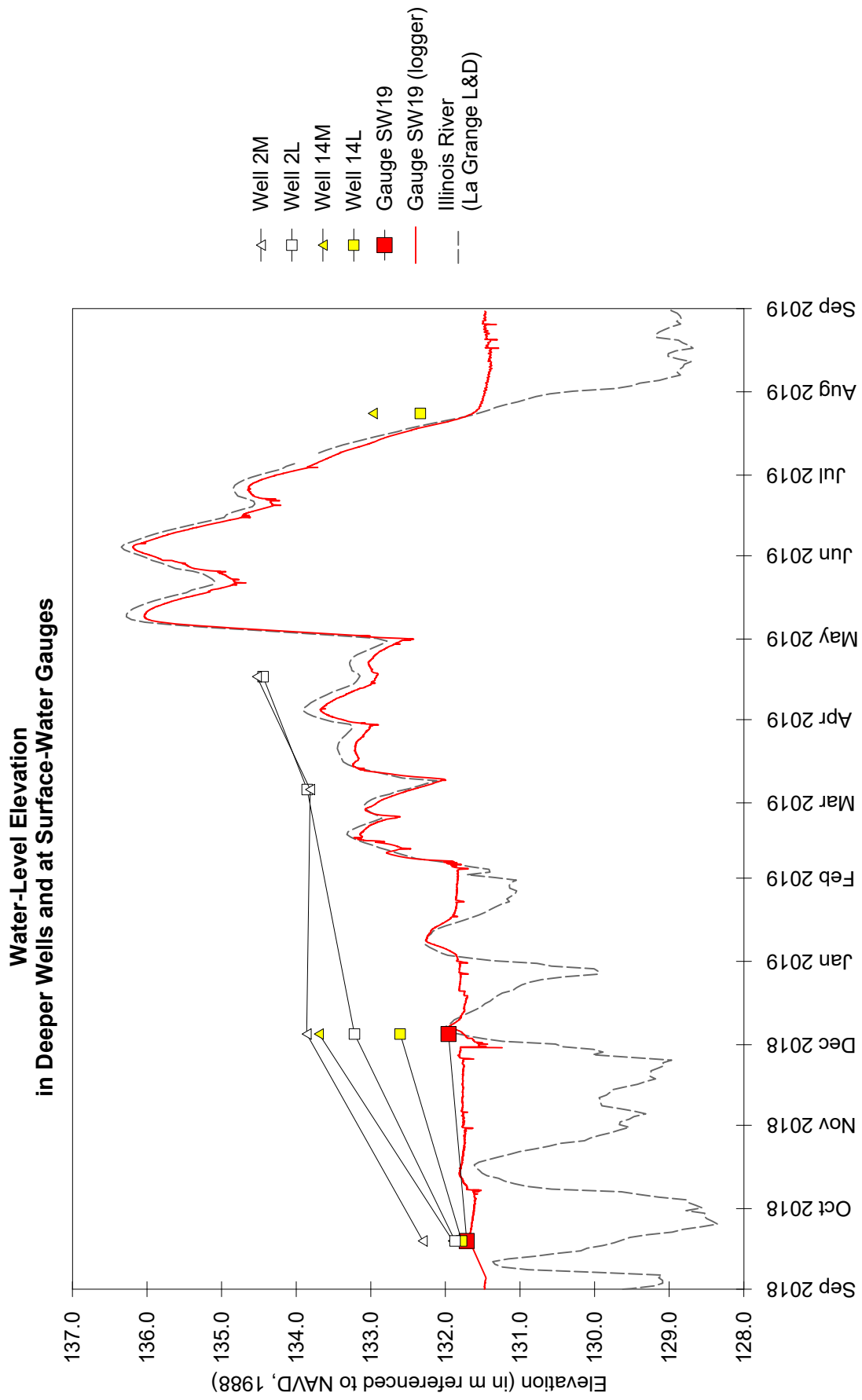
La Grange Wetland Mitigation Bank September 1, 2018 through August 31, 2019



La Grange Wetland Mitigation Bank **September 1, 2018 through August 31, 2019**

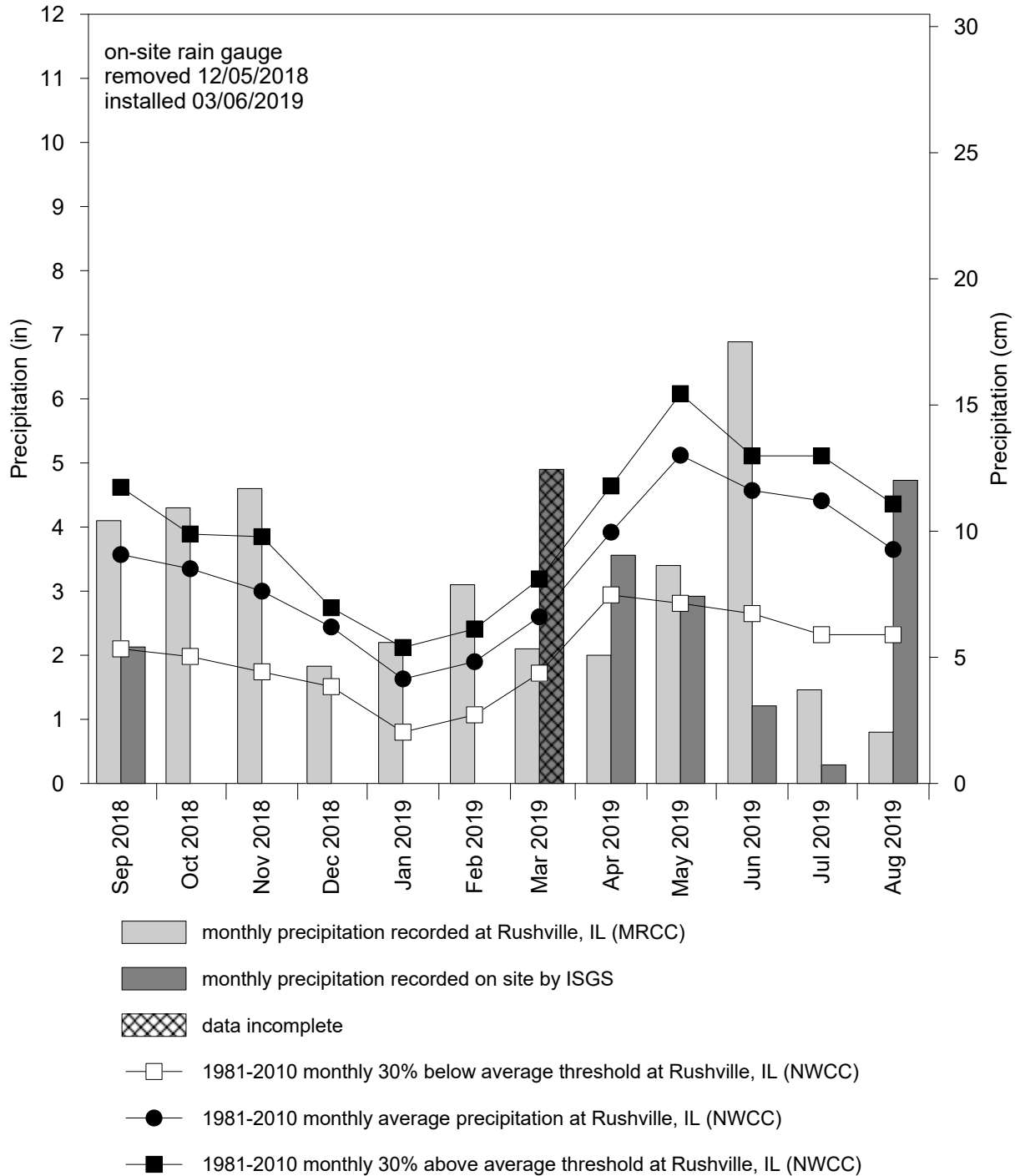


La Grange Wetland Mitigation Bank **September 1, 2018 through August 31, 2019**



La Grange Wetland Mitigation Site September 2018 through August 2019

Total Monthly Precipitation Recorded on Site and at
Rushville, IL (MRCC station #117551)



**FAIRMONT CITY
POTENTIAL WETLAND MITIGATION SITE**

ISGS #53

FAP 14

Sequence #27

St. Clair County, near Fairmont City, Illinois

Primary Project Manager: Steven E. Benton

Secondary Project Manager: Lindsey A. Schafer

SITE HISTORY

- August 1999: ISGS conducted an initial site evaluation.
- September 2000: ISGS began monitoring groundwater and surface-water levels.
- March 2003: A Level II hydrogeologic characterization report was submitted to IDOT (ISGS Open-File Series 2003–04).
- August 2014: Ownership of the site was transferred from IDOT to Fairmont City, Illinois.

WETLAND HYDROLOGY CALCULATION FOR 2019

The target compensation area for the Fairmont City wetland mitigation site is 10.93 ha (27.00 ac). Using the 1987 Manual (Environmental Laboratory 1987), 18.40 ha (45.46 ac) of the total site area of 27.11 ha (67.00 ac) satisfied wetland hydrology criteria for greater than 5% of the growing season and 18.40 ha (45.46 ac) satisfied wetland hydrology criteria for greater than 12.5% of the growing season. Using the 2010 Midwest Region Supplement (USACE 2010), 18.40 ha (45.46 ac) satisfied wetland hydrology criteria for 14 or more consecutive days during the growing season. These estimates are based on the following factors:

- The median date that the growing season begins in nearby Belleville, Illinois, is April 4 and the season lasts 204 days (MRCC 2019); 5% of the growing season is 10 days and 12.5% of the growing season is 26 days, using the 1987 Manual. Using the 2010 Midwest Region Supplement, March 9 was the starting date of the 2019 growing season based on soil temperatures measured at the site and at the Belleville SIU Research Station.
- Total precipitation for the monitoring period, recorded at Belleville, Illinois (MRCC station #110510), was 132% of normal, precipitation in spring 2019 (March through May) was 137% of normal. Precipitation in eight months during the period was at or above normal, and the wettest months were September 2018 (222% of normal precipitation) and August 2019 (194% of normal precipitation).
- The period of maximum inundation and saturation during the 2019 growing season occurred from mid-March to mid-May, though inundation and saturation continued to occur intermittently until the end of the monitoring period.
- In 2019, water levels measured in 19 of 20 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 5% of the growing season, and water levels measured in 19 of 20 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 12.5% of the growing season, using the 1987 Manual. Using the 2010 Midwest Region

Supplement, water levels in 19 of 20 soil-zone monitoring wells satisfied wetland hydrology criteria for 14 or more consecutive days of the growing season. See the tables at the end of this summary for details.

PLANNED FUTURE ACTIVITIES

- Monitoring will continue until no longer required by IDOT.

WETLAND HYDROLOGY TABLES FOR 2019

Well locations meeting wetland hydrology criteria			
ID	5% of growing season	12.5% of growing season	14 days during growing season
4S	Y	Y	Y
5S	Y	Y	Y
6S	Y	Y	Y
6VS	Y	Y	Y
7S	Y	Y	Y
9SR	Y	Y	Y
14S	Y	Y	Y
16S	Y	Y	Y
17SR	Y	Y	Y
23S	Y	Y	Y
24S	Y	Y	Y
25S	Y	Y	Y
25VS	Y	Y	Y
26S	Y	Y	Y
27S	Y	Y	Y
28S	N	N	N
29S	Y	Y	Y
30S	Y	Y	Y
31S	Y	Y	Y
32S	Y	Y	Y

Y – met wetland hydrology criteria

N – did not meet wetland hydrology criteria

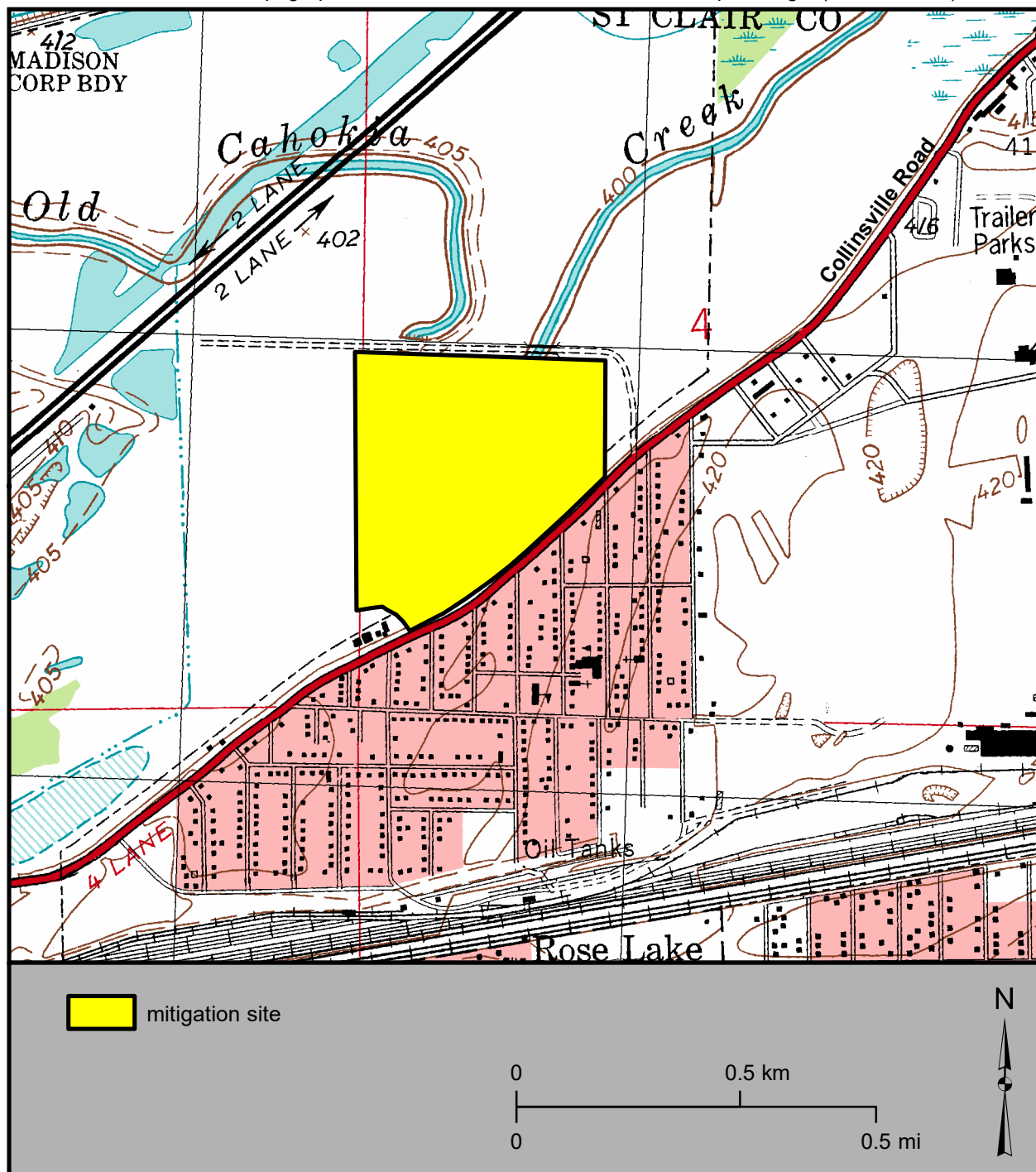
Surface-water gauge elevations meeting wetland hydrology criteria			
ID	5% of growing season	12.5% of growing season	14 days during growing season
AR2	122.16 m (400.78 ft)	122.24 m (401.04 ft)	122.25 m (401.08 ft)
BR	122.22 m (400.98 ft)	n/a	n/a
E	122.13 m (400.68 ft)	122.25 m (401.08 ft)	122.31 m (401.28 ft)
G	122.47 m (401.80 ft)	122.42 m (401.64 ft)	122.42 m (401.64 ft)
SW Pond	122.16 m (400.78 ft)	122.24 m (401.04 ft)	122.25 m (401.08 ft)

n/a – insufficient data to determine an elevation

Fairmont City Potential Wetland Mitigation Site (FAP 14)

General Study Area and Vicinity

from the USGS Topographic Series, Monks Mound, IL, 7.5-minute quadrangle (USGS 1954b)

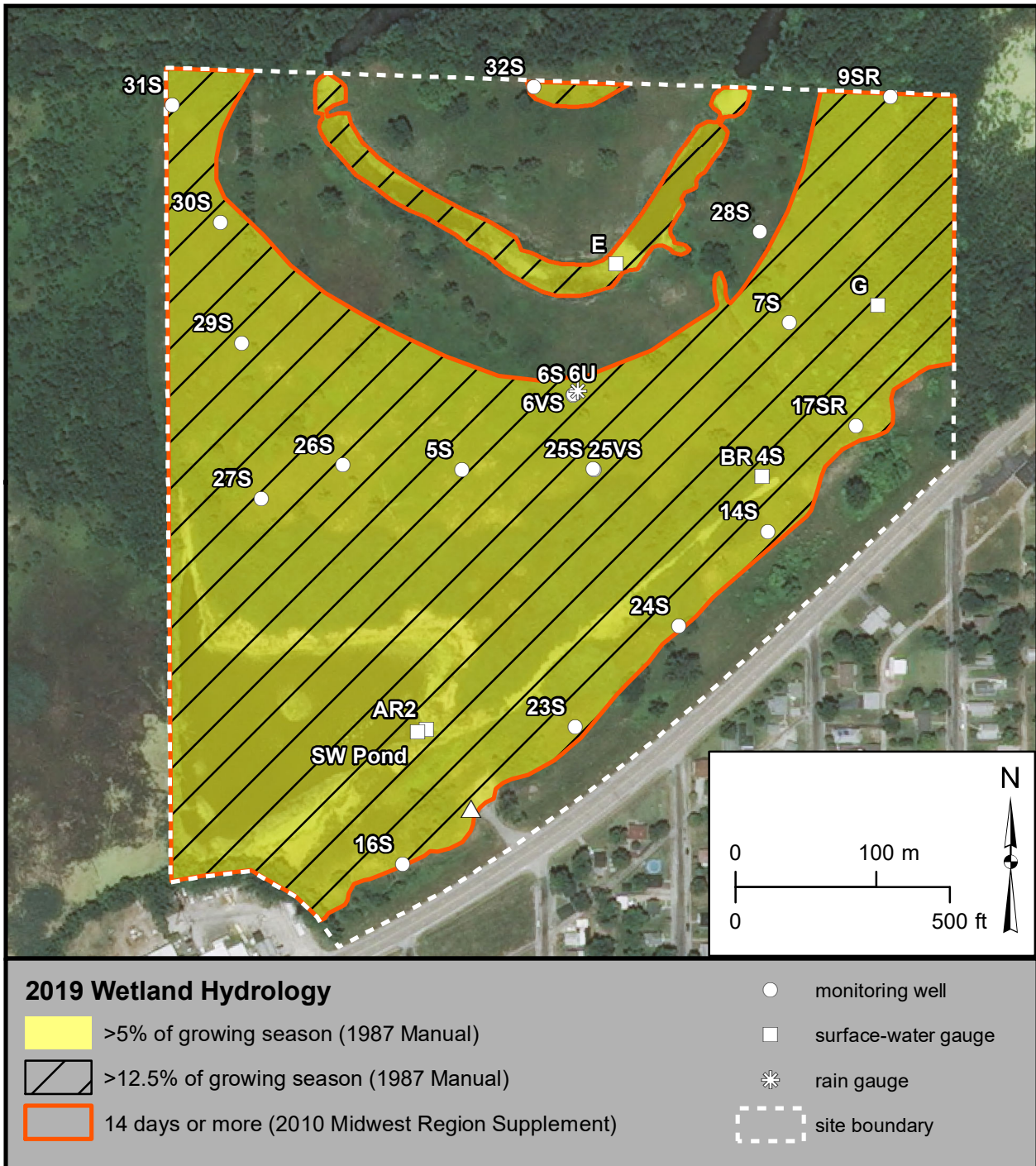


Fairmont City Potential Wetland Mitigation Site (FAP 14)

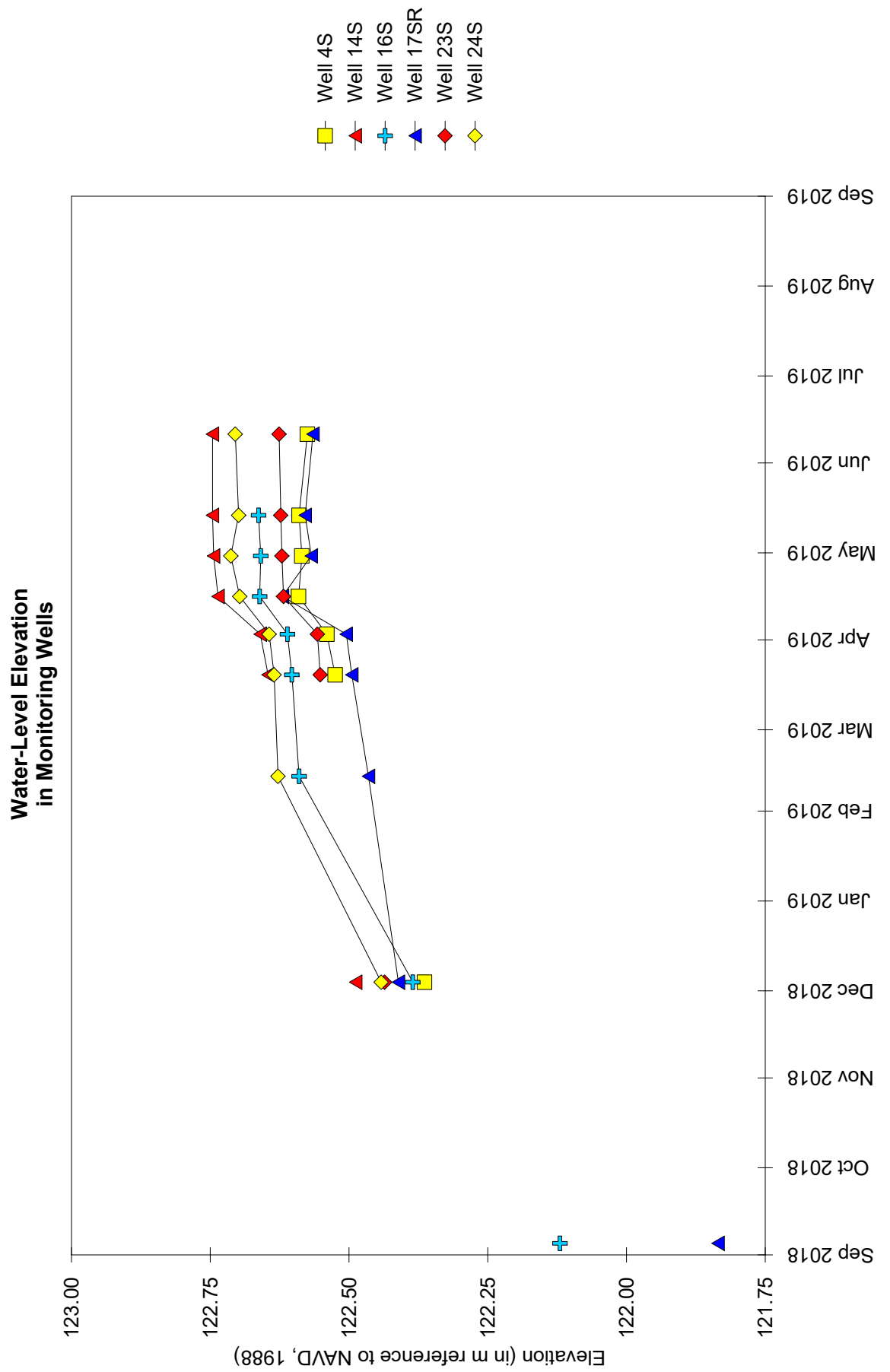
Estimated Areal Extent of 2019 Wetland Hydrology

September 1, 2018 through August 31, 2019

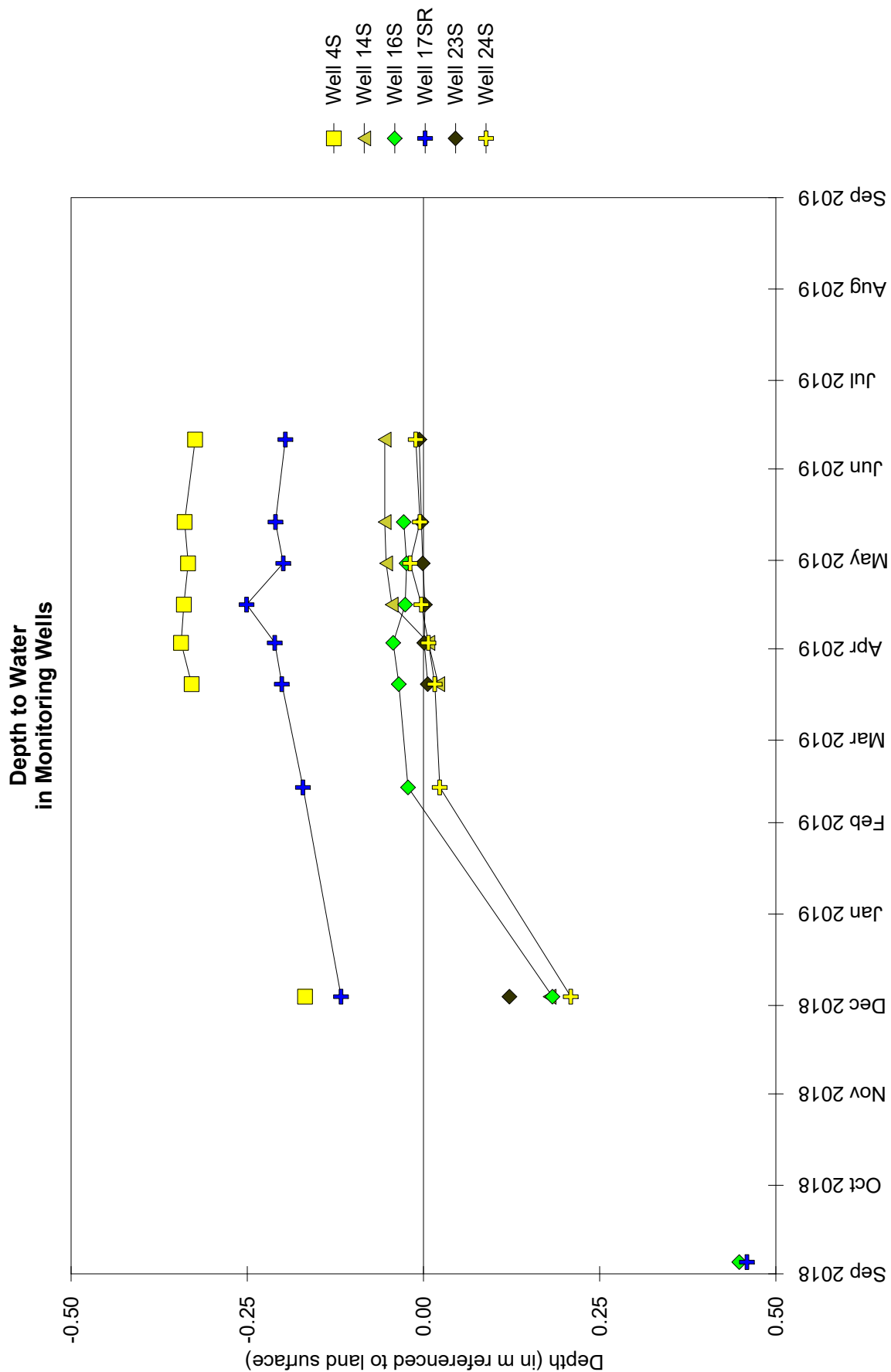
Map based on 2012 Farm Service Agency digital orthophotography, St. Clair County, Illinois (USDA-FSA 2012)



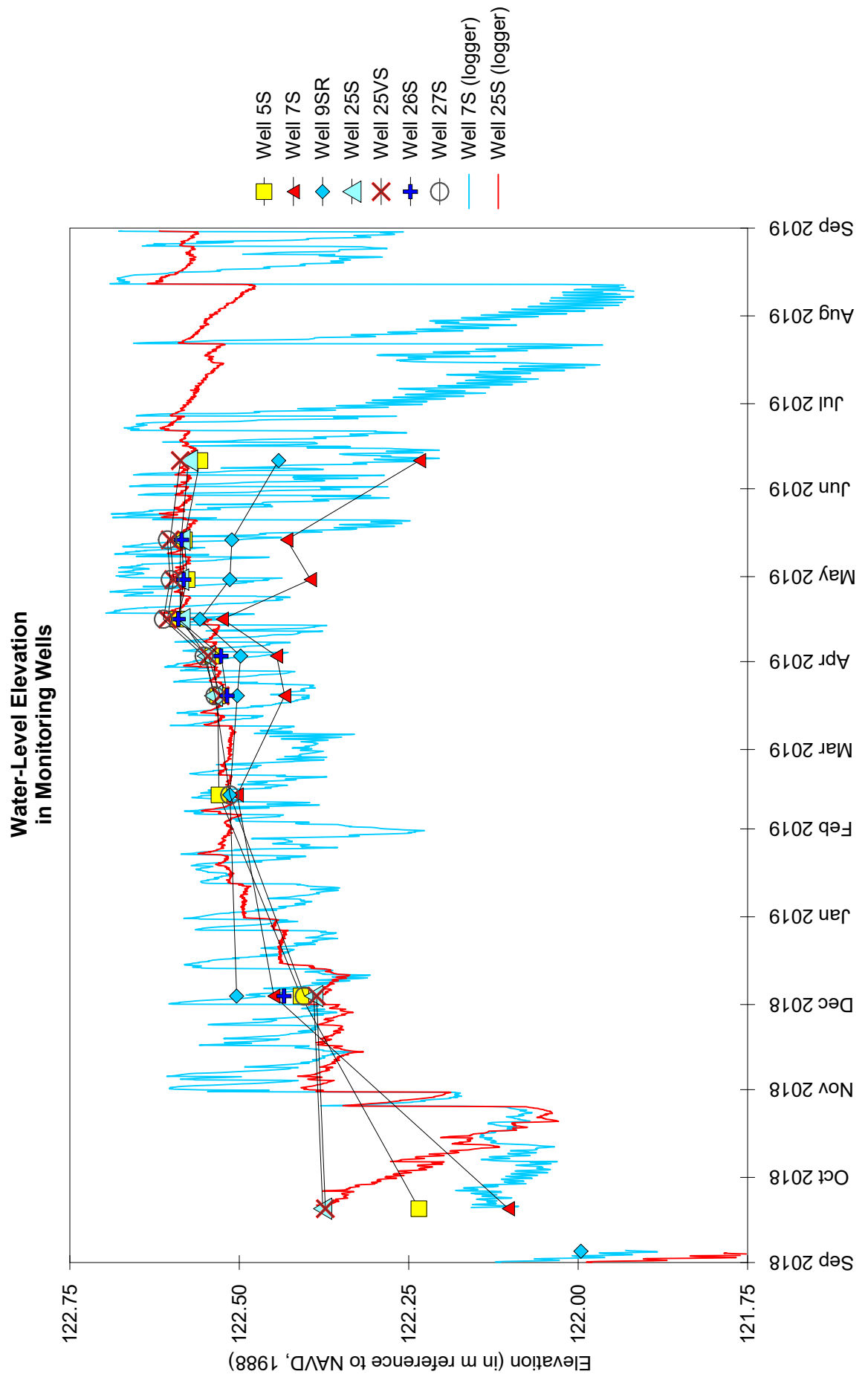
Fairmont City Potential Wetland Mitigation Site **September 1, 2018 through August 31, 2019**



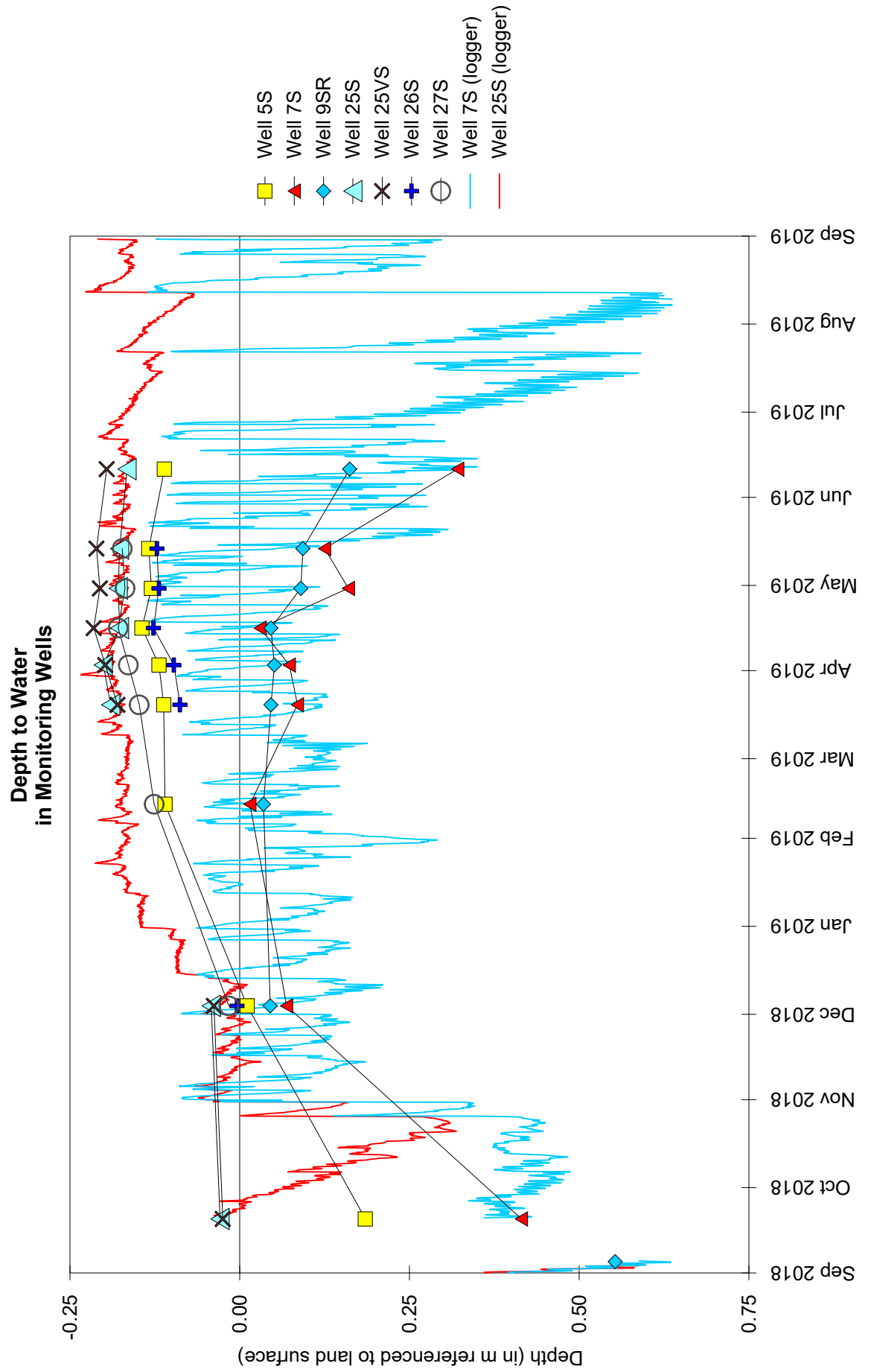
Fairmont City Potential Wetland Mitigation Site **September 1, 2018 through August 31, 2019**



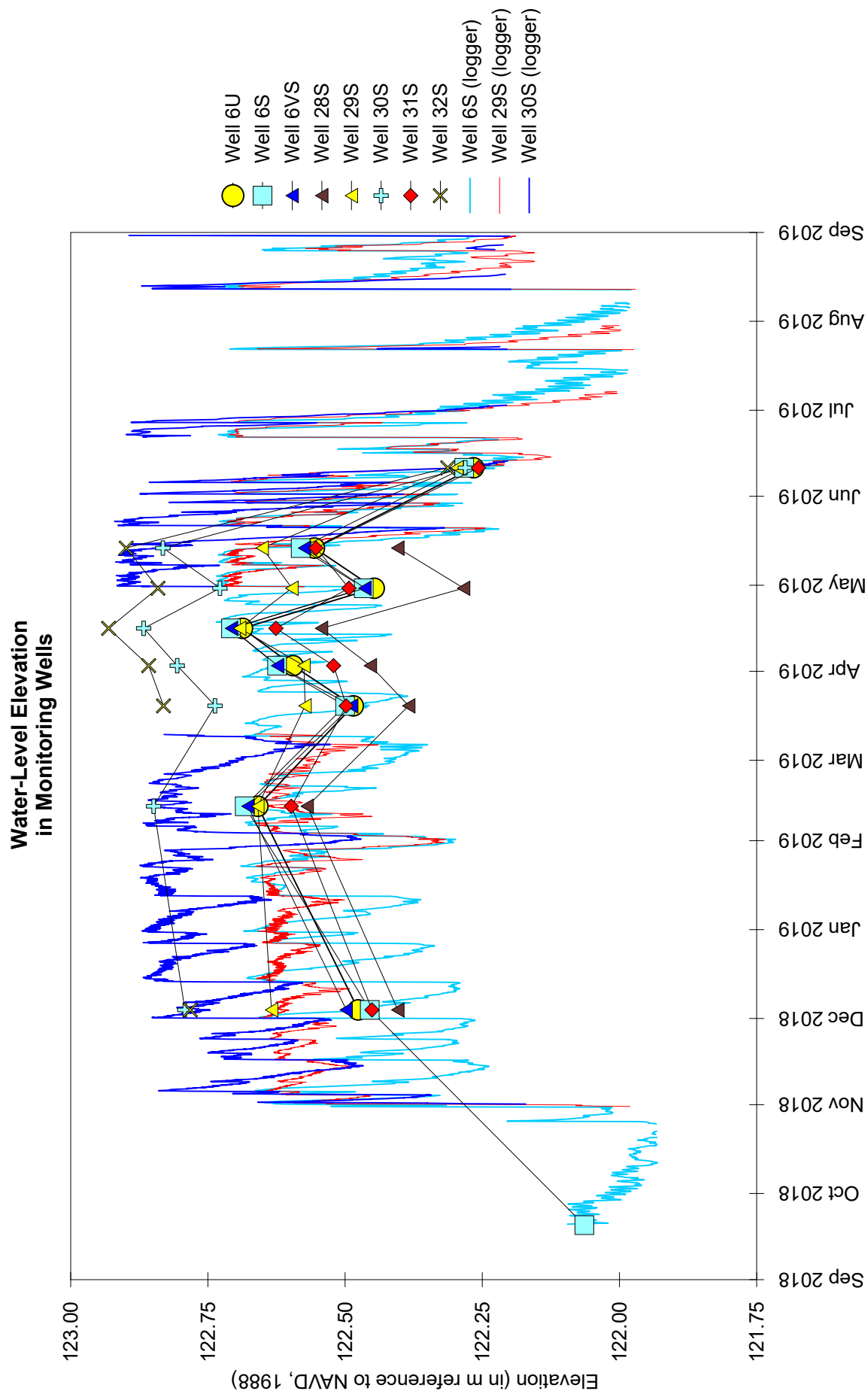
Fairmont City Potential Wetland Mitigation Site **September 1, 2018 through August 31, 2019**



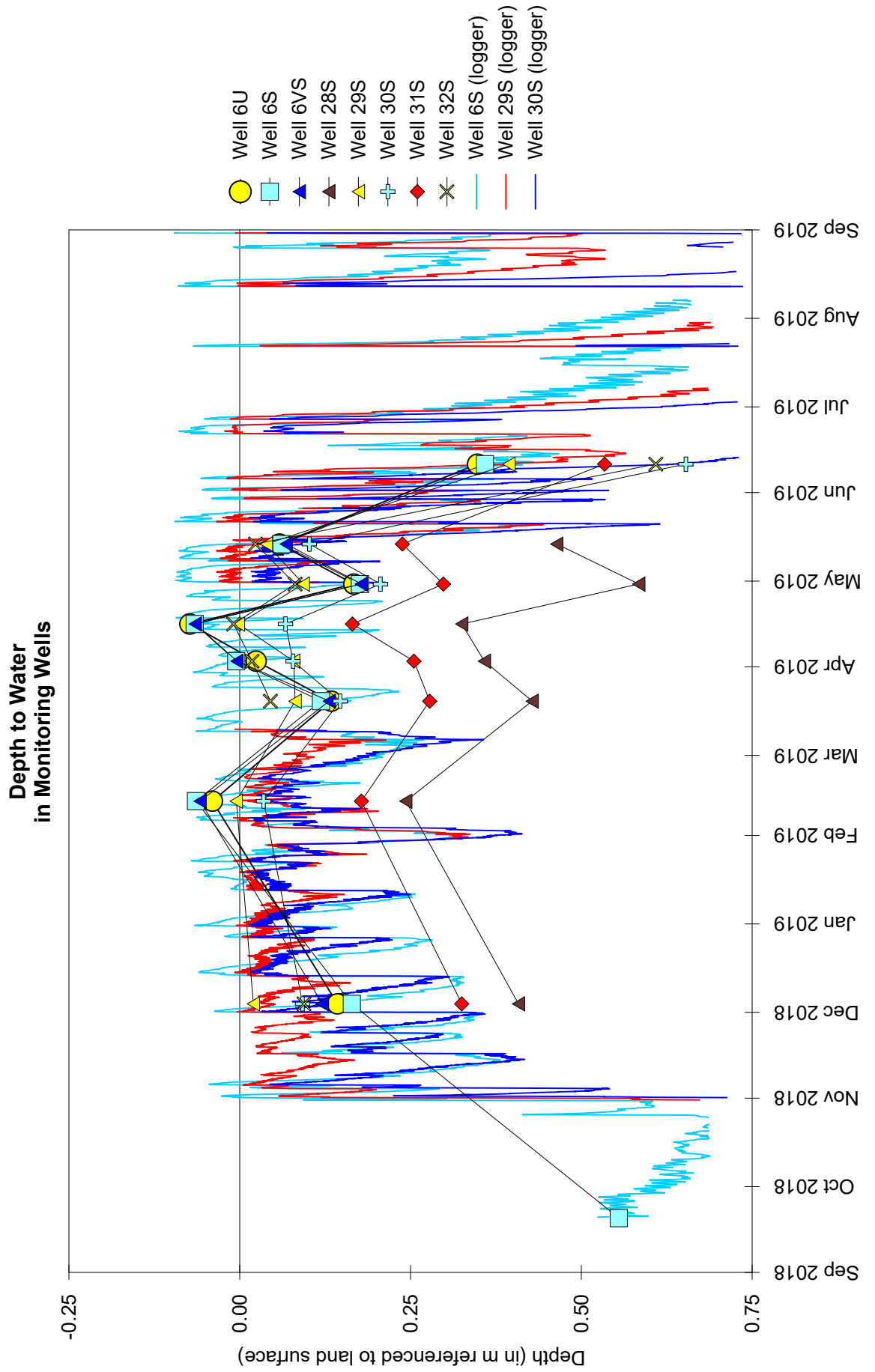
Fairmont City Potential Wetland Mitigation Site **September 1, 2018 through August 31, 2019**



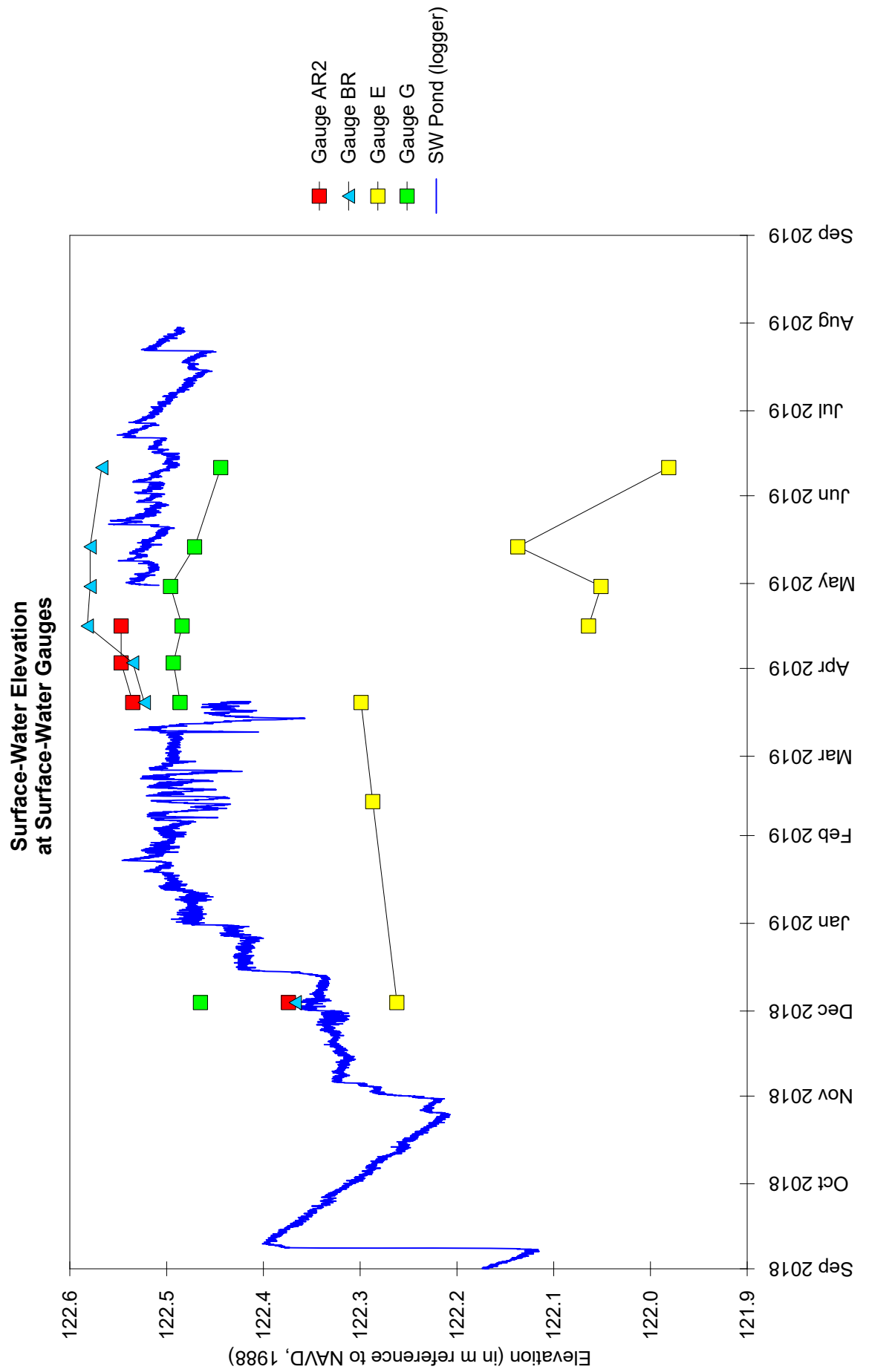
Fairmont City Potential Wetland Mitigation Site **September 1, 2018 through August 31, 2019**



Fairmont City Potential Wetland Mitigation Site **September 1, 2018 through August 31, 2019**

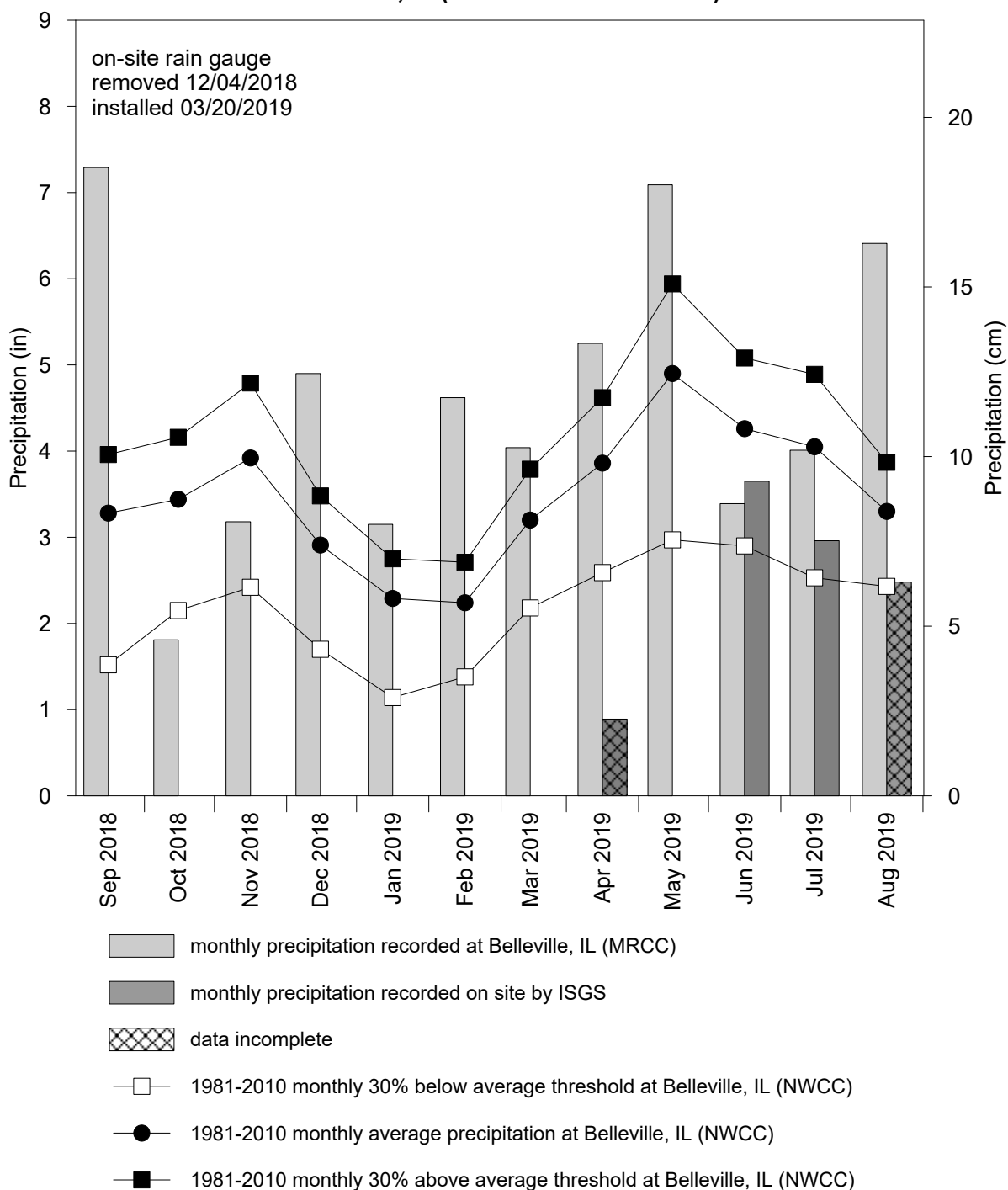


Fairmont City Potential Wetland Mitigation Site September 1, 2018 through August 31, 2019



Fairmont City Potential Wetland Mitigation Site September 2018 through August 2019

Total Monthly Precipitation Recorded on Site and at
Belleville, IL (MRCC station #110510)



**FORMER TIERNAN PROPERTY
POTENTIAL WETLAND MITIGATION SITE**

ISGS #57

FAP 14

Sequence #27

St. Clair County, near Cahokia, Illinois

Primary Project Manager: Steven E. Benton

Secondary Project Manager: Lindsey A. Schafer

SITE HISTORY

- July 2000: ISGS was tasked to perform a Level II hydrogeologic assessment of the site.
- July 2005: A Level II hydrogeologic characterization report was submitted to IDOT (ISGS Open-File Series 2005–11).

WETLAND HYDROLOGY CALCULATION FOR 2019

The target compensation area for the Former Tiernan Property wetland mitigation site is 17.04 ha (42.10 ac). Using the 1987 Manual (Environmental Laboratory 1987), 18.98 ha (46.89 ac), out of a total site area of 26.43 ha (65.30 ac), satisfied wetland hydrology criteria for greater than 5% of the 2019 growing season and 18.68 ha (46.16 ac) satisfied wetland hydrology criteria for greater than 12.5% of the growing season. Using the 2010 Midwest Region Supplement (USACE 2010), 18.70 ha (46.22 ac) satisfied wetland hydrology criteria for 14 or more consecutive days during the growing season. These estimates are based on the following factors:

- The median date that the growing season begins in nearby Belleville, Illinois, is April 4 and the season lasts 204 days (MRCC 2019); 5% of the growing season is 10 days and 12.5% of the growing season is 26 days, using the 1987 Manual. Using the 2010 Midwest Region Supplement, March 9 was the starting date of the 2019 growing season based on soil temperatures measured on site and at the Belleville SIU Research Station.
- Total precipitation for the monitoring period, recorded at Belleville, Illinois (MRCC station #110510), was 132% of normal, precipitation in spring 2019 (March through May) was 137% of normal. Precipitation in eight months during the period was at or above normal, and the wettest months were September 2018 (222% of normal precipitation) and August 2019 (194% of normal precipitation).
- The northern and southern portions of the site have different water sources, which usually results in different periods of maximum inundation and saturation during the growing season. In the portion of the site north of well cluster 23, the maximum occurred from the first week of April to the second week of June due to precipitation and perched groundwater. In the portion of the site south of well cluster 23, the maximum occurred in June and July. In this portion of the site inundation typically occurs when the Mississippi River at St. Louis reaches a stage of about 6.1 m (20.0 ft), and the river was at or above that stage from March 11, 2019 to August 9, 2019, the highest river stages occurred from May 24, 2019 to June 20, 2019, when the river was at least 10 ft above flood stage (30 ft).

- In 2019, water levels measured in 32 of 36 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 5% of the growing season, and water levels measured in 30 of 36 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 12.5% of the growing season, using the 1987 Manual. In addition, using the 2010 Midwest Region Supplement, water levels in 32 of 36 soil-zone monitoring wells satisfied wetland hydrology criteria for 14 or more consecutive days of the growing season. See the tables at the end of this summary for details.

PLANNED FUTURE ACTIVITIES

- Monitoring will continue until no longer required by IDOT.

WETLAND HYDROLOGY TABLES FOR 2019

Well locations meeting wetland hydrology criteria			
<i>ID</i>	<i>5% of growing season</i>	<i>12.5% of growing season</i>	<i>14 days during growing season</i>
1S	Y	N	Y
2S	Y	Y	Y
4S	Y	Y	Y
5S	Y	Y	Y
6S	N	N	N
7S	N	N	N
10S	Y	Y	Y
11SR	Y	Y	Y
12SR	Y	N	Y
13S	Y	Y	Y
16S	Y	Y	Y
17S	Y	Y	Y
18S	Y	Y	Y
19SR	Y	Y	Y
22S	Y	Y	Y
23S	N	N	N
23VS	N	N	N
24S	Y	Y	Y
24VS	Y	Y	Y
25S	Y	Y	Y
25VS	Y	Y	Y
26SR	Y	Y	Y
26VS	Y	Y	Y
27SR2	Y	Y	Y
27VS	Y	Y	Y
28S	Y	Y	Y
28VS	Y	Y	Y
29S	Y	Y	Y
29VS	Y	Y	Y
30S	Y	Y	Y
30VS	Y	Y	Y
31S	Y	Y	Y
31VS	Y	Y	Y
32SR	Y	Y	Y
33S	Y	Y	Y
34S	Y	Y	Y

Y – met wetland hydrology criteria

N – did not meet wetland hydrology criteria

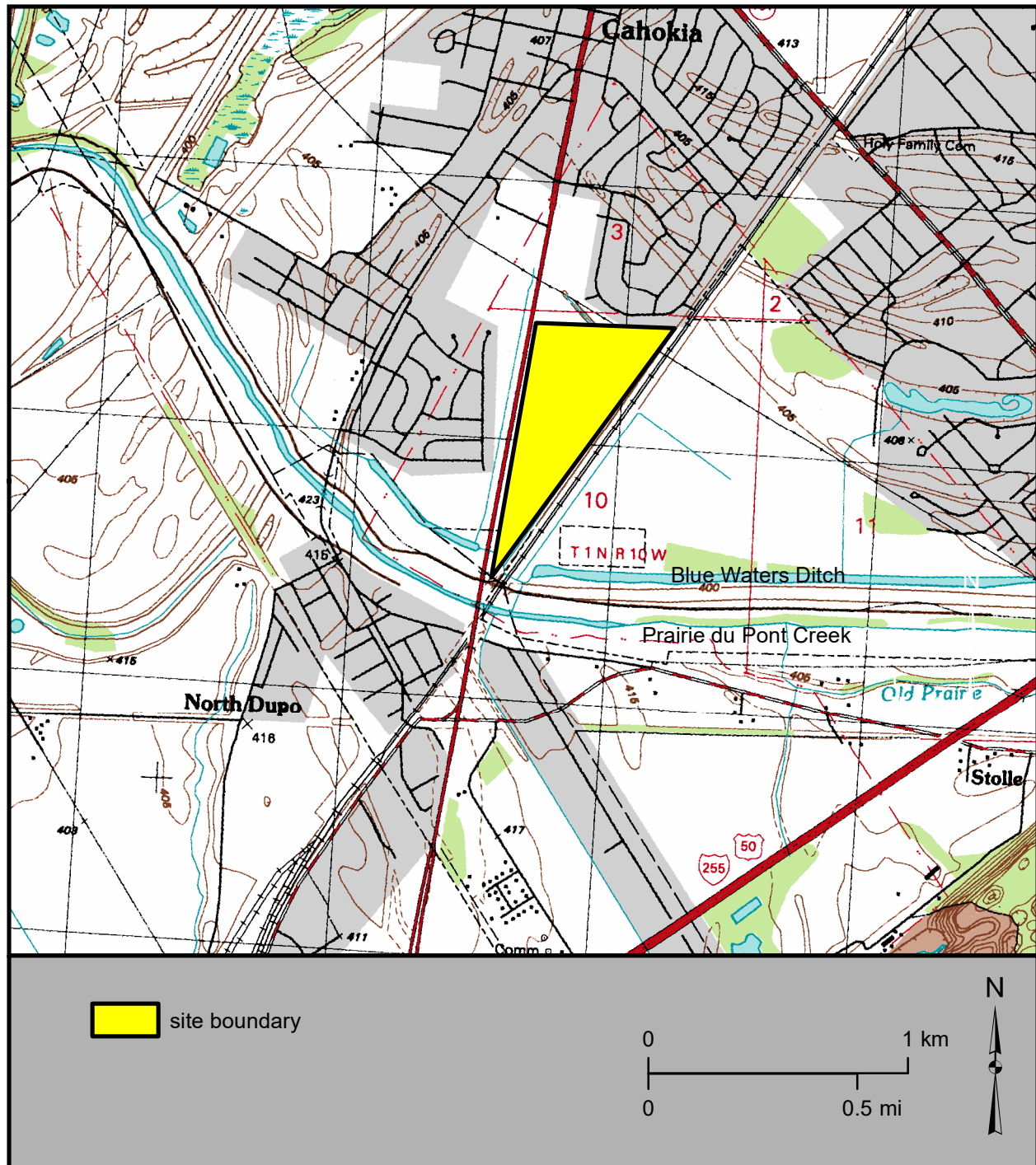
Surface-water gauge elevations meeting wetland hydrology criteria			
<i>ID</i>	<i>5% of growing season</i>	<i>12.5% of growing season</i>	<i>14 days during growing season</i>
E	121.35 m (398.13 ft)	121.35 m (398.13 ft)	121.35 m (398.13 ft)
F	121.36 m (398.16 ft)	121.36 m (398.16 ft)	121.36 m (398.16 ft)
G	121.29 m (397.93 ft)	121.29 m (397.93 ft)	121.29 m (397.93 ft)
H	121.71 m (399.31 ft)	121.70 m (399.27 ft)	121.71 m (399.31 ft)

n/a – insufficient data to determine an elevation

Former Tiernan Property, Potential Wetland Mitigation Site (FAP 14)

General Study Area and Vicinity

from the USGS Topographic Series, Cahokia, IL, 7.5-minute quadrangle (USGS 1954a)

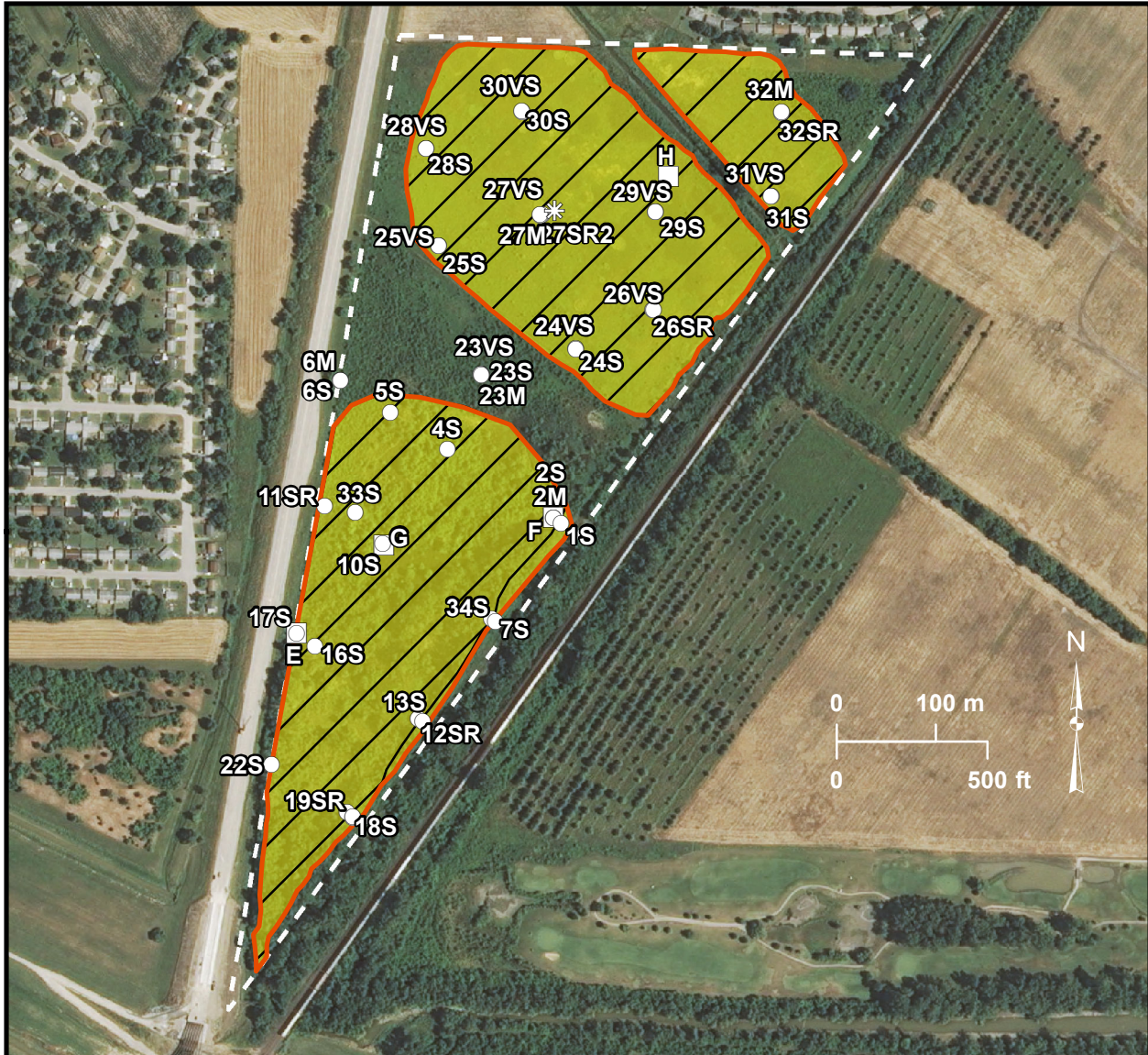


Former Tiernan Property, Potential Wetland Mitigation Site (FAP 14)

Estimated Areal Extent of 2019 Wetland Hydrology

September 1, 2018 through August 31, 2019

Map based on 2012 Farm Service Agency digital orthophotography, St. Clair County, Illinois (USDA-FSA 2012)



2019 Wetland Hydrology

>5% of growing season (2010 Midwest Region Supplement)

>12.5% of growing season (1987 Manual)

14 days or more (2010 Midwest Region Supplement)

rain gauge

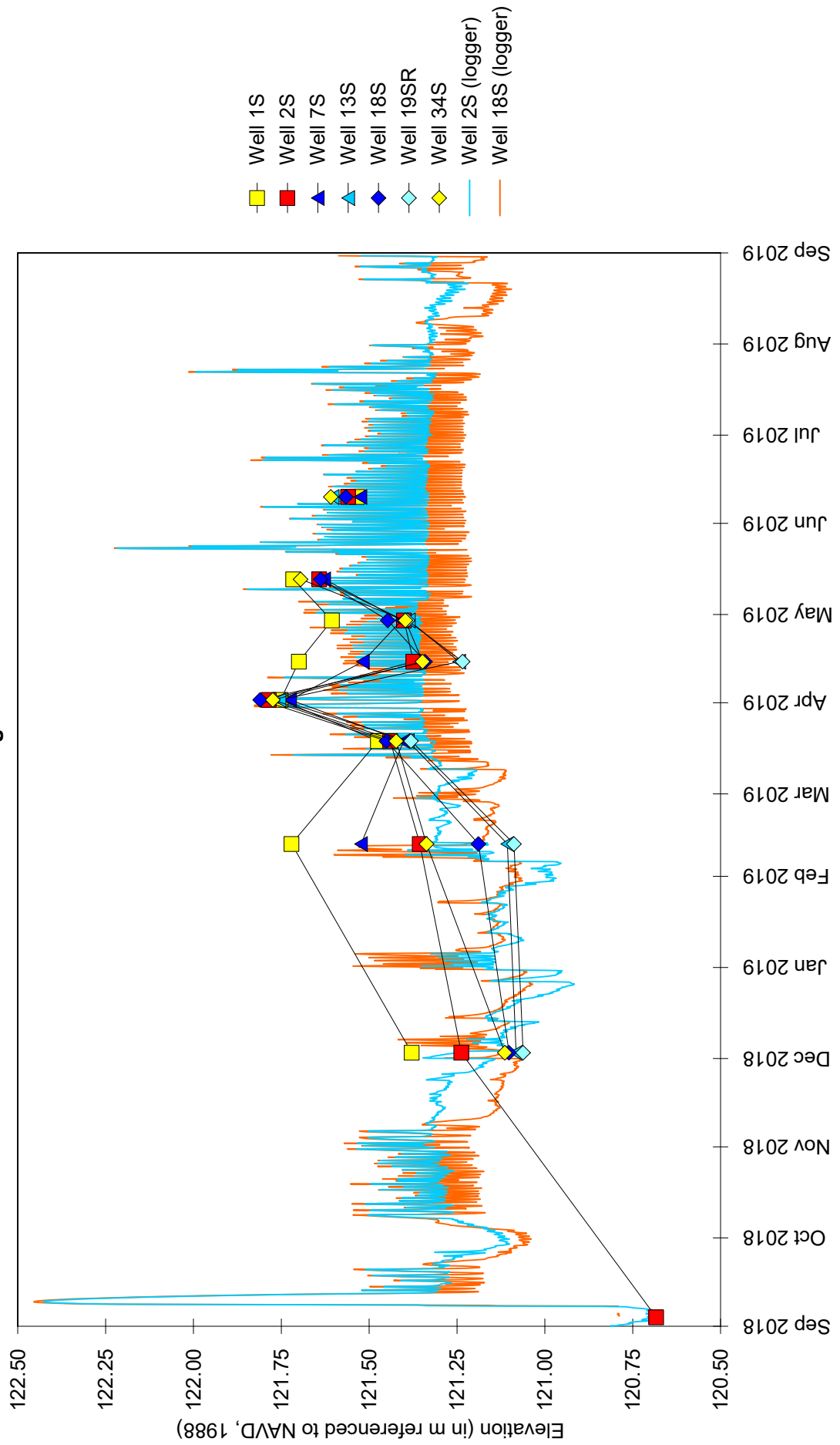
monitoring wells

surface-water gauge

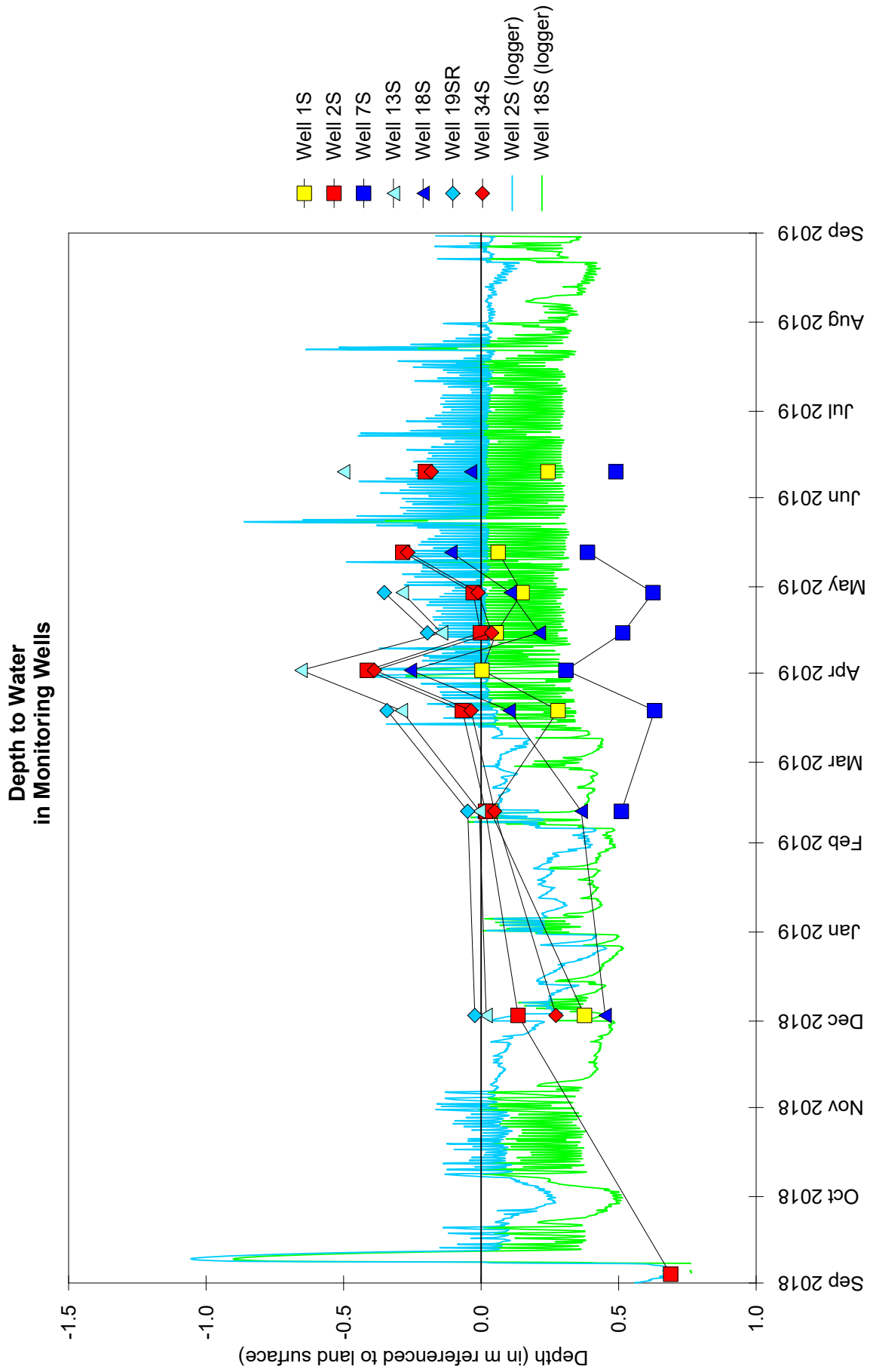
site boundary

Former Tiernan Property, Potential Wetland Mitigation Site September 1, 2018 through August 31, 2019

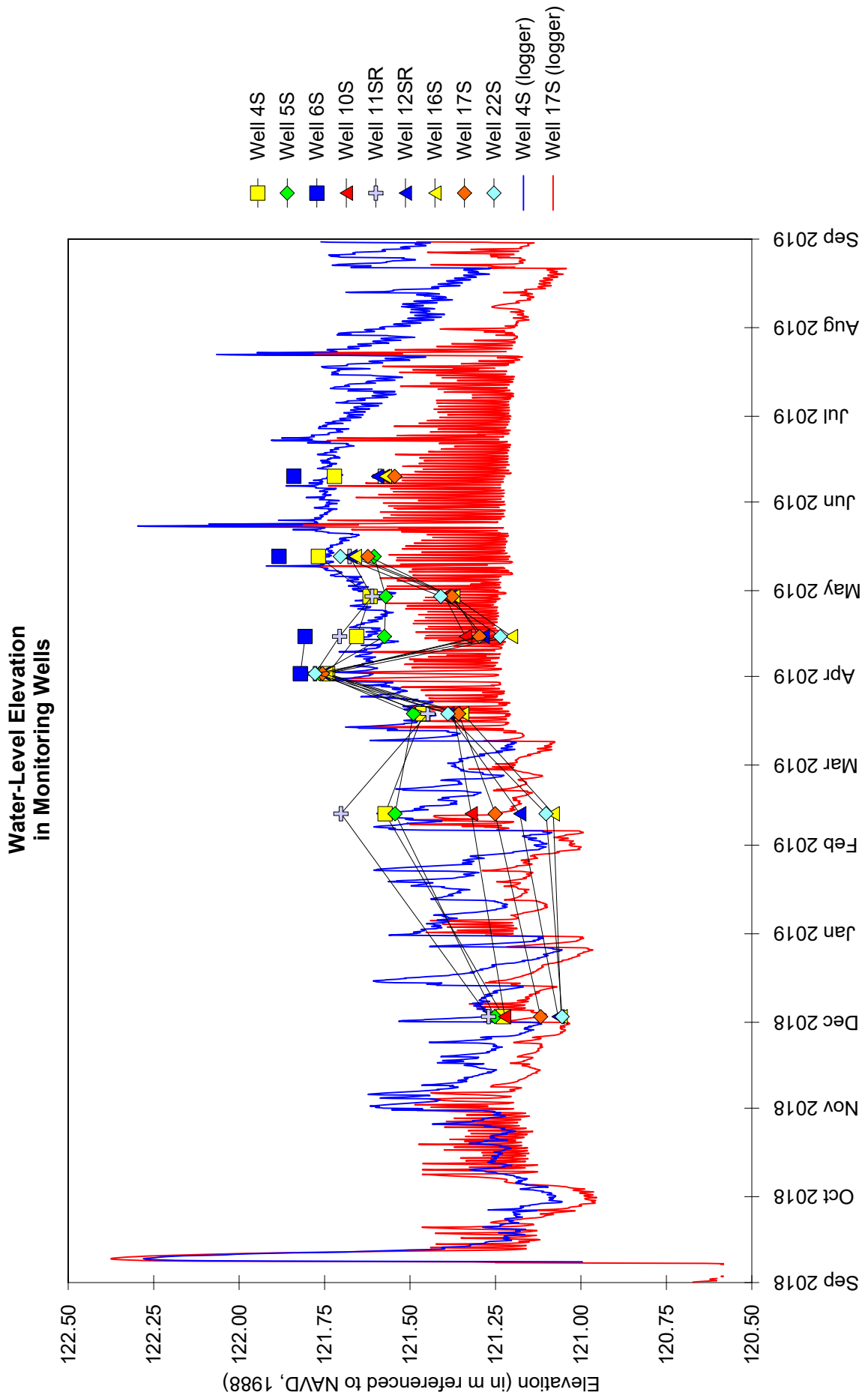
Water-Level Elevation
in Monitoring Wells



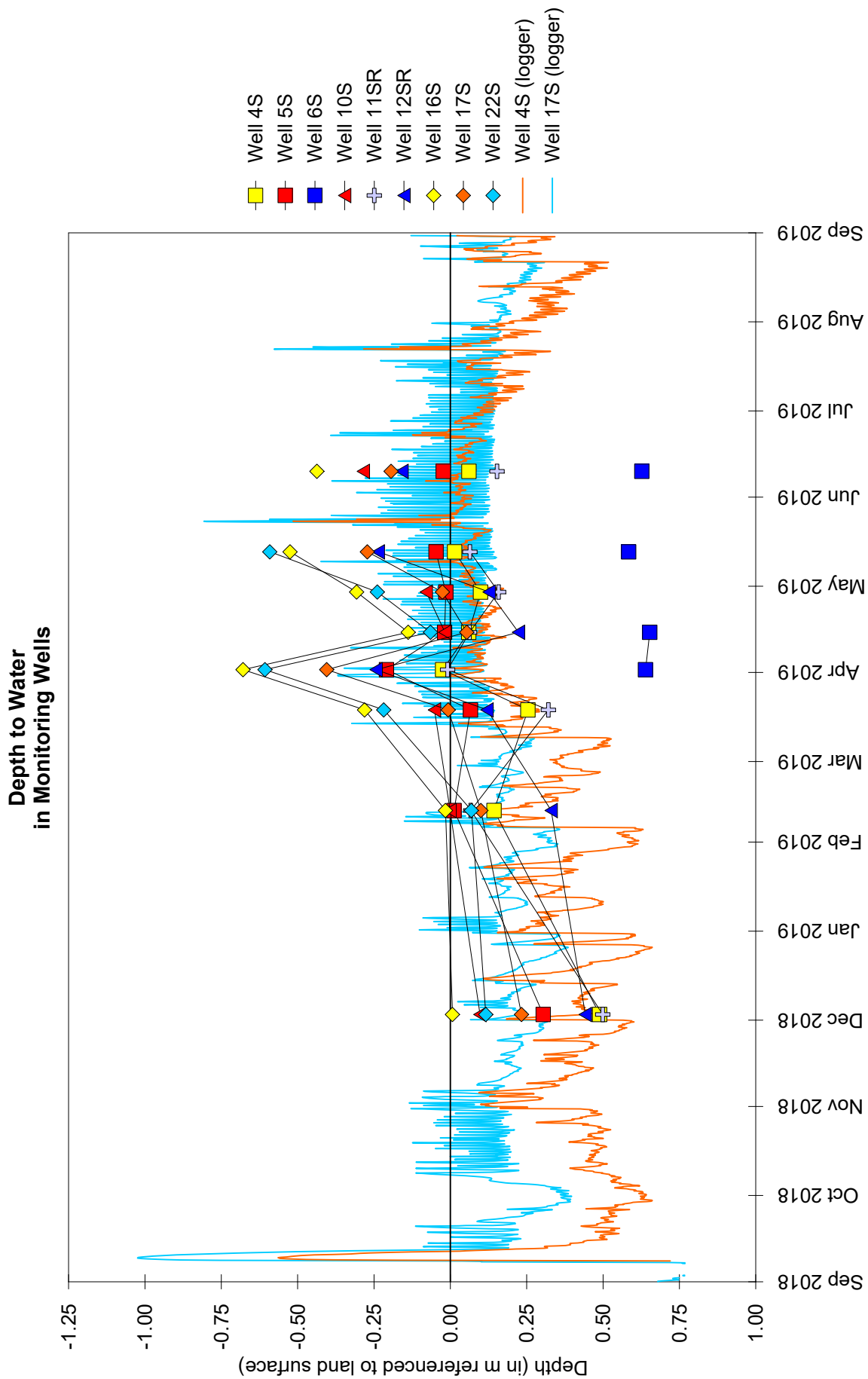
Former Tiernan Property, Potential Wetland Mitigation Site September 1, 2018 through August 31, 2019



Former Tiernan Property, Potential Wetland Mitigation Site September 1, 2018 through August 31, 2019

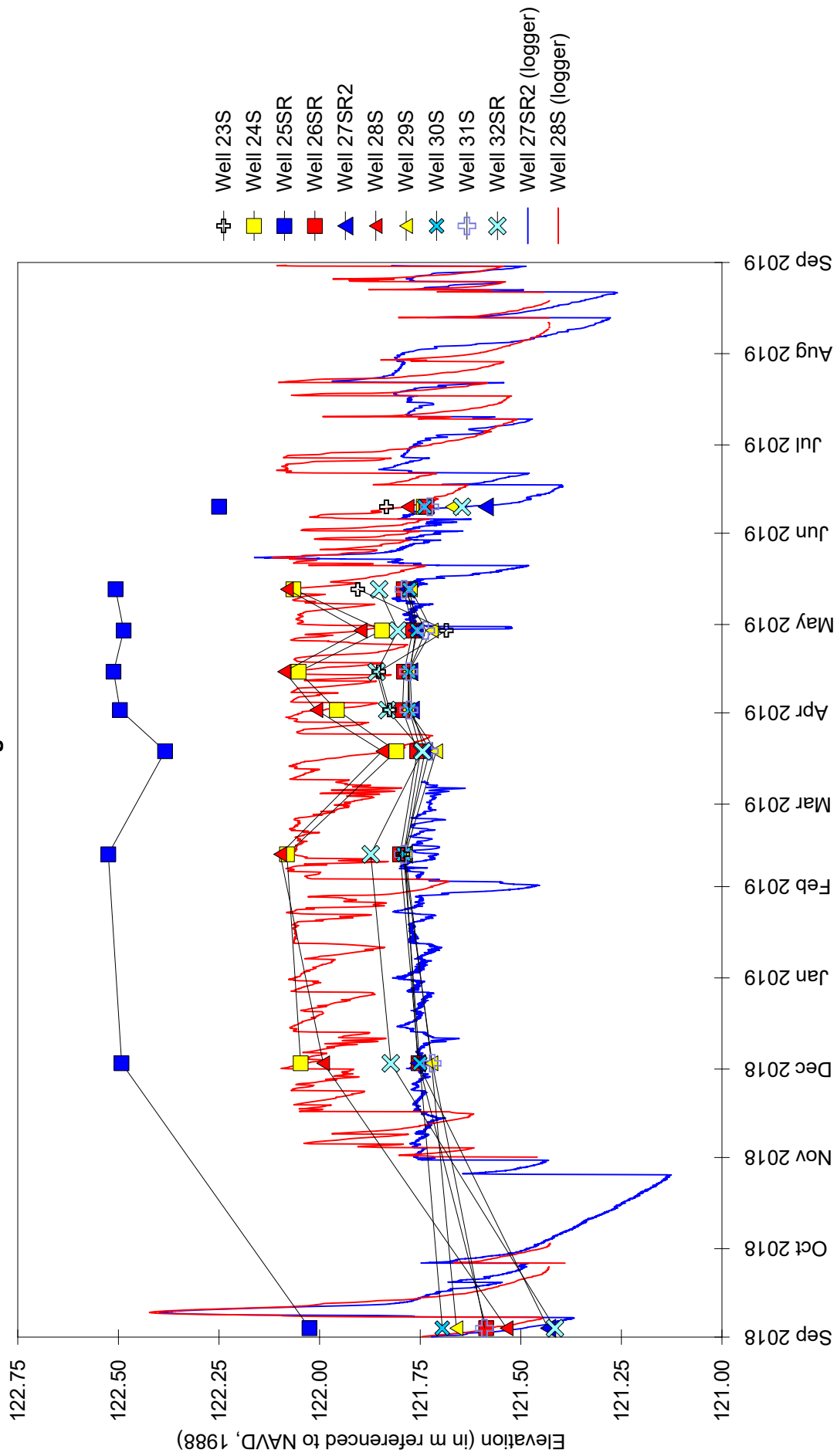


Former Tiernan Property, Potential Wetland Mitigation Site **September 1, 2018 through August 31, 2019**



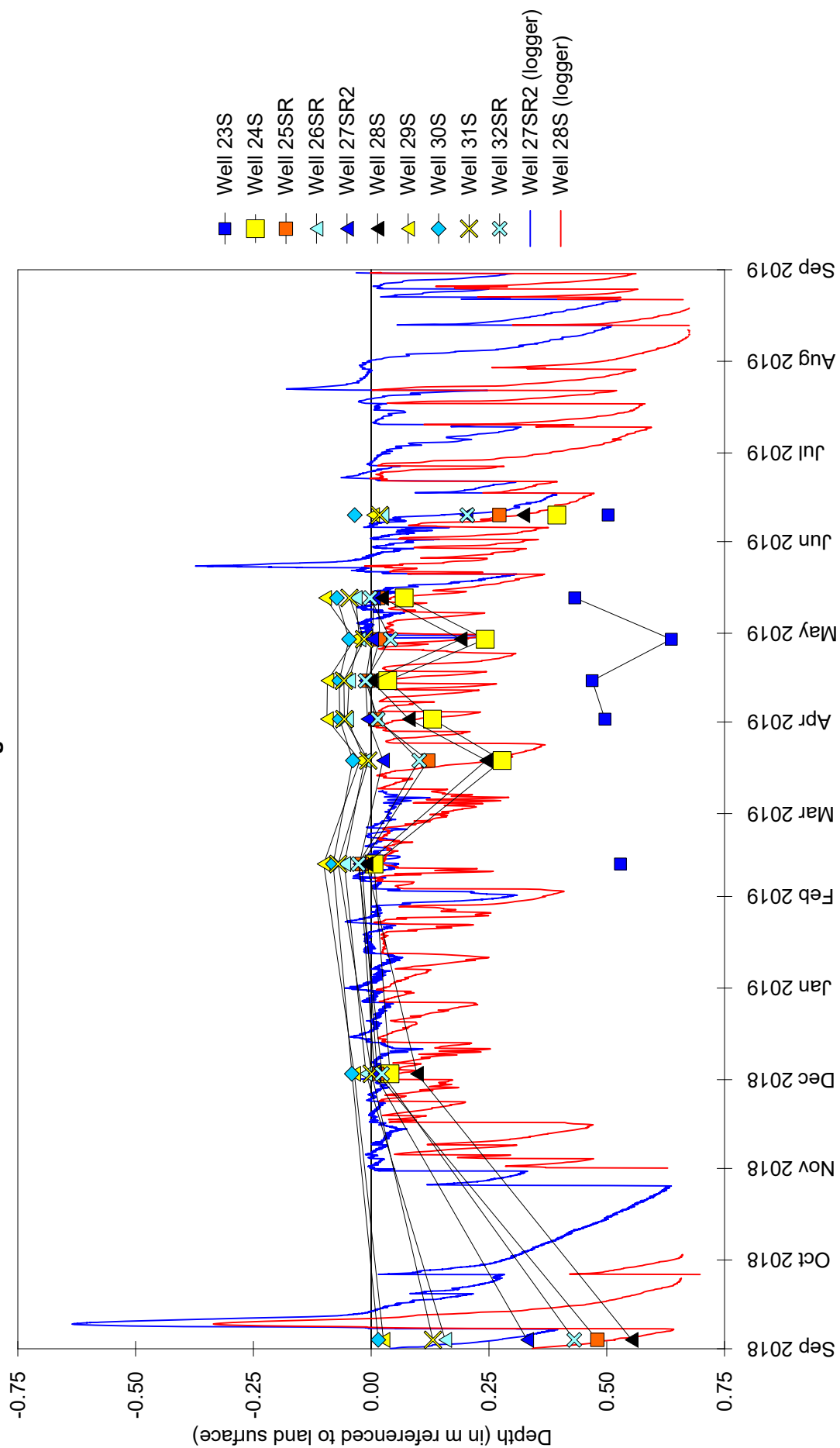
Former Tiernan Property, Potential Wetland Mitigation Site September 1, 2018 through August 31, 2019

Water-Level Elevation
in Monitoring Wells

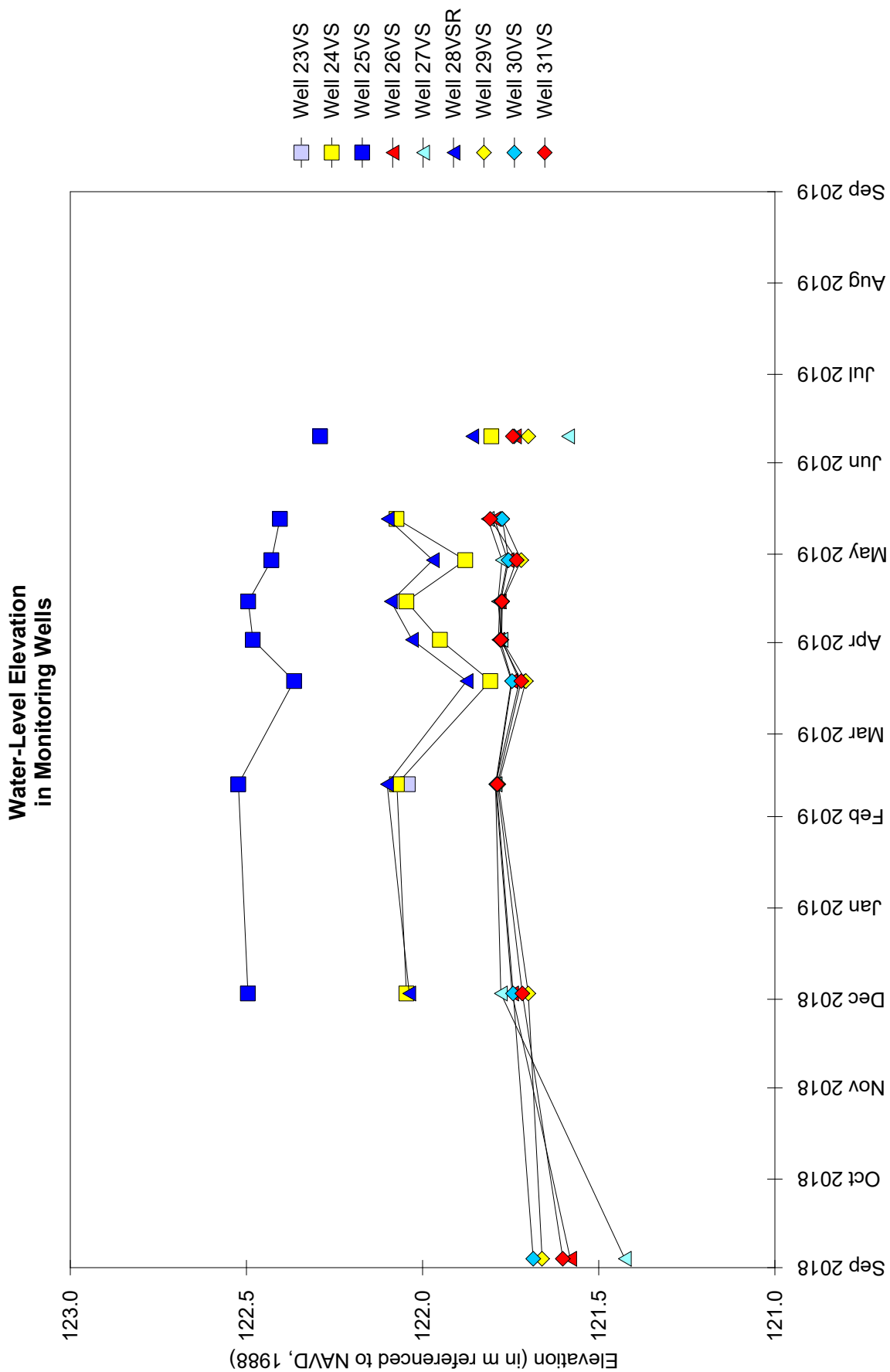


Former Tiernan Property, Potential Wetland Mitigation Site September 1, 2018 through August 31, 2019

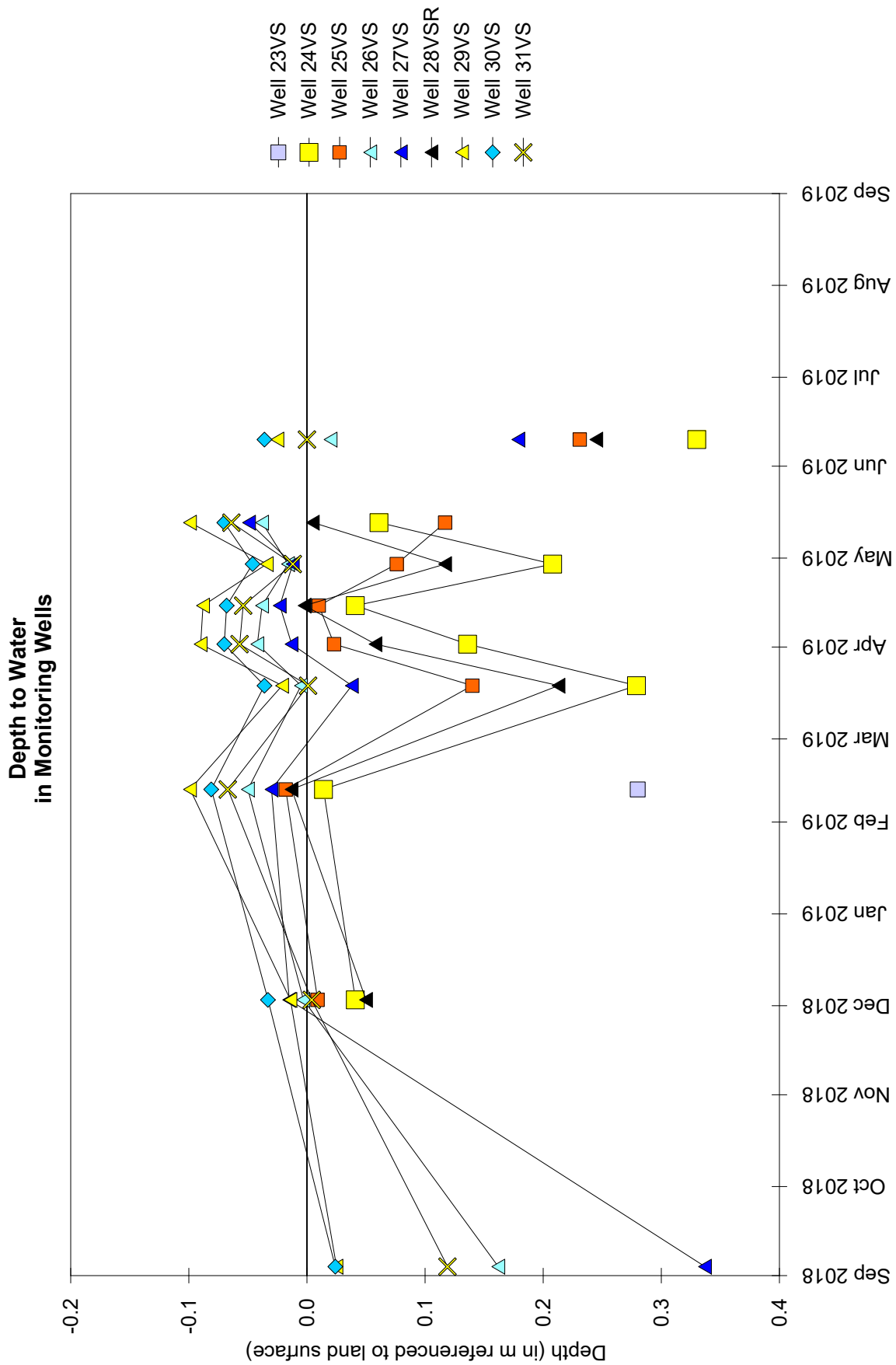
Depth to Water
in Monitoring Wells



Former Tiernan Property, Potential Wetland Mitigation Site **September 1, 2018 through August 31, 2019**

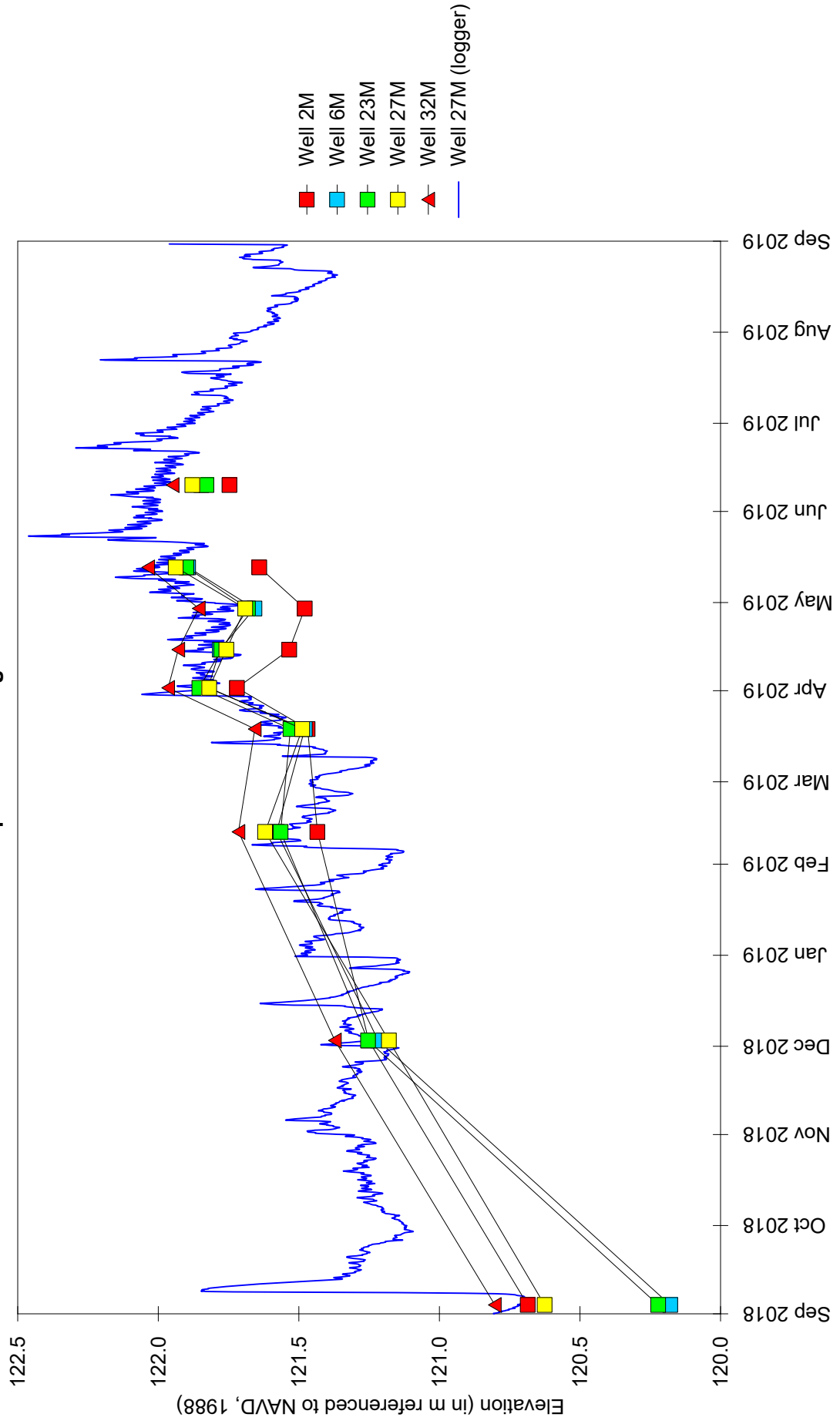


Former Tiernan Property, Potential Wetland Mitigation Site September 1, 2018 through August 31, 2019



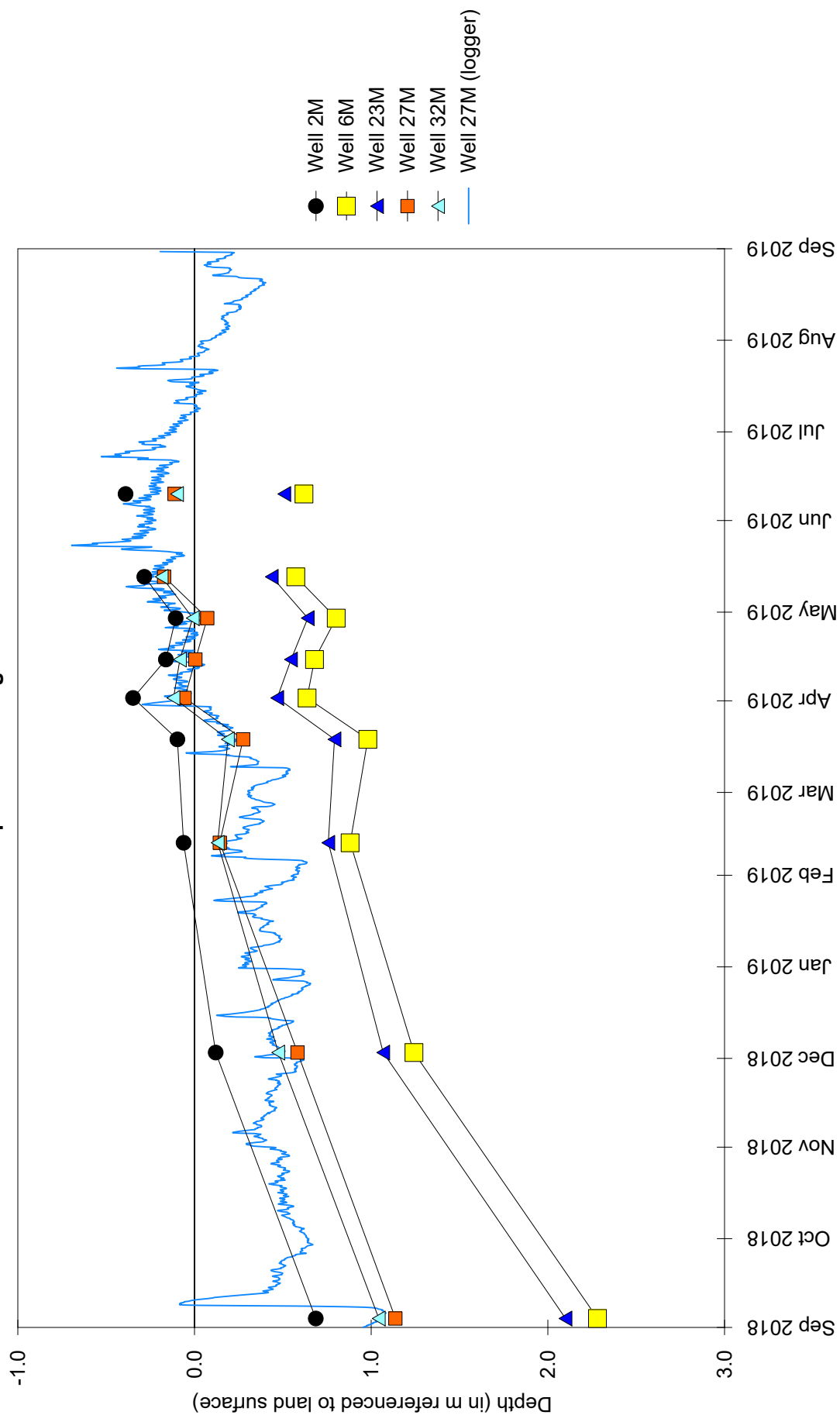
Former Tiernan Property, Potential Wetland Mitigation Site September 1, 2018 through August 31, 2019

Water-Level Elevation
in Deeper Monitoring Wells



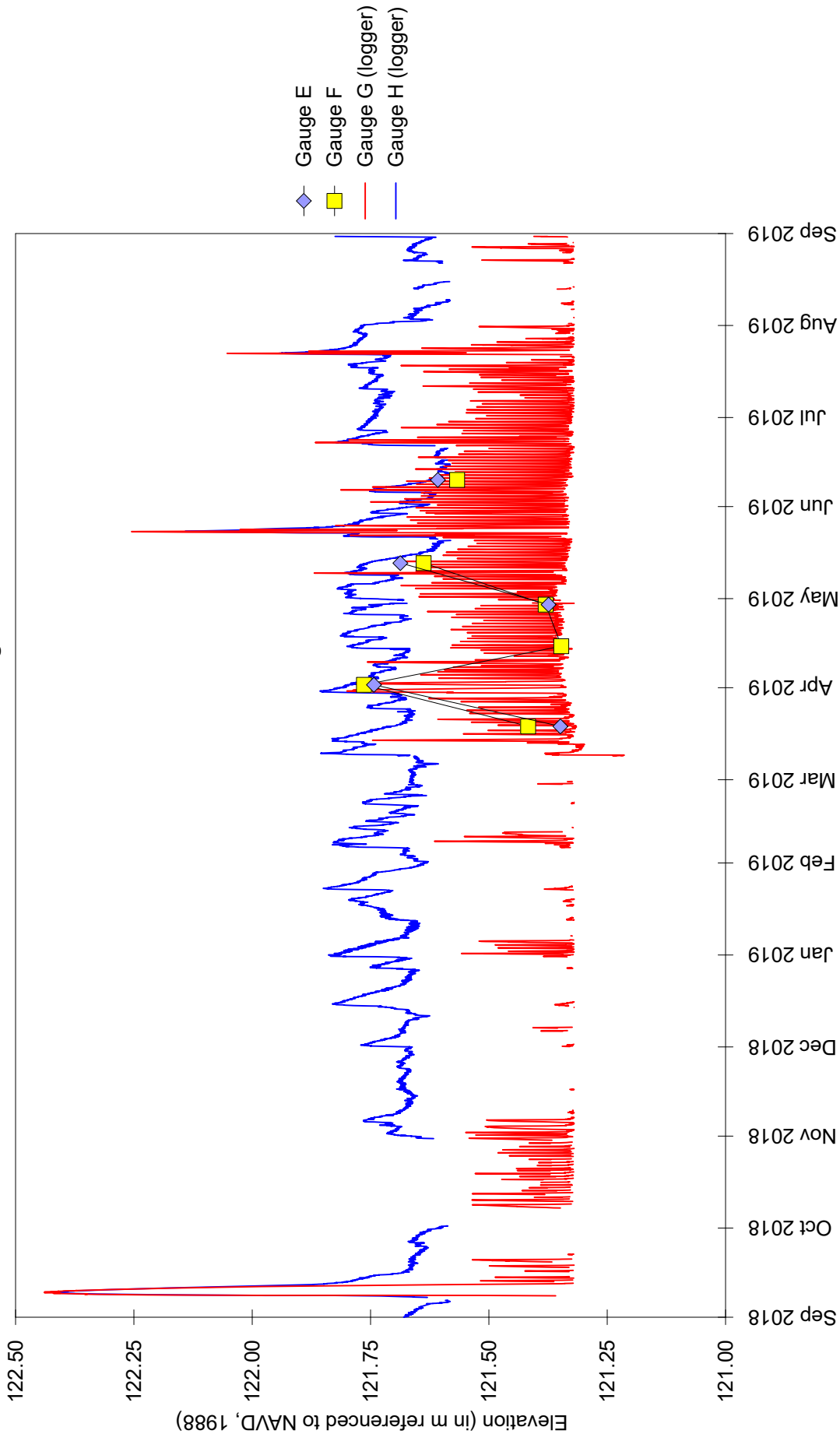
Former Tiernan Property, Potential Wetland Mitigation Site September 1, 2018 through August 31, 2019

Depth to Water
in Deeper Monitoring Wells



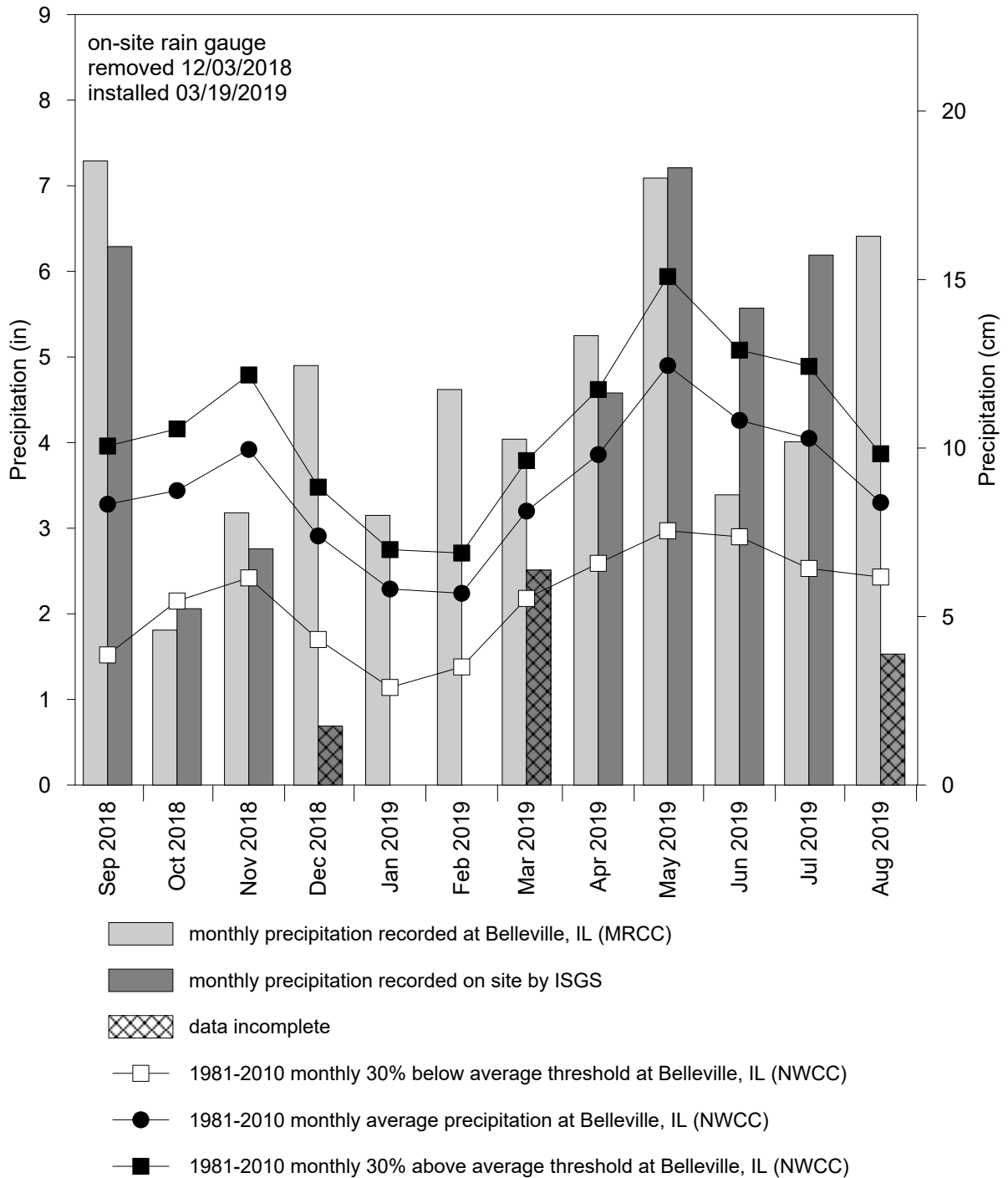
Former Tiernan Property, Potential Wetland Mitigation Site
September 1, 2018 through August 31, 2019

Water-Level Elevation
at Surface Water Gauges



Former Tiernan Property Potential Wetland Mitigation Site September 2018 through August 2019

Total Monthly Precipitation Recorded on Site and at Belleville, IL (MRCC station #110510)



SUGAR CAMP CREEK

ISGS #74

WETLAND AND STREAM MITIGATION BANK

Sequence #9282

Franklin County, Northern Township, Illinois

Primary Project Manager: Geoffrey E. Pociask

Secondary Project Manager: Audra M. Noyes

SITE HISTORY

- December 2004: ISGS submitted an initial site evaluation report to IDOT.
- March 2007: ISGS submitted a Level II hydrogeologic characterization report to IDOT (ISGS Open-File Series 2007–02).
- June 2009: A wetland and stream mitigation banking instrument was approved by the Interagency Review Team.
- August 2011: IDOT tasked ISGS to monitor Phase 1 of the Sugar Camp Creek Wetland and Stream Mitigation Bank for performance standards.
- Summer 2013: Trees were planted in Phase 2.

WETLAND HYDROLOGY CALCULATION FOR 2019

The total target compensation area, including Phase 1 and Phase 2 of the Sugar Camp Creek wetland mitigation bank, is 28.00 ha (69.20 ac). Using the 1987 Manual (Environmental Laboratory 1987), 29.62 ha (73.19 ac) of the total bank area of 42.57 ha (105.20 ac) satisfied wetland hydrology criteria for greater than 5% of the 2019 growing season, and 28.15 ha (69.56 ac) satisfied wetland hydrology criteria for greater than 12.5% of the growing season. Using the 2010 Midwest Region Supplement (USACE 2010), 29.62 ha (73.19 ac) of the wetland bank satisfied wetland hydrology criteria for 14 or more consecutive days during the growing season. The areas that satisfied wetland hydrology criteria within each phase of the mitigation bank can be found in the 'Additional Information' section below. These estimates are based on the following factors:

- The median date that the growing season begins in nearby Du Quoin, Illinois, is March 30, and the season lasts 217 days (MRCC 2019). Using the 1987 Manual, 5% of the growing season is 11 days and 12.5% of the growing season is 27 days. Using the 2010 Midwest Region Supplement, March 13 was the starting date of the 2019 growing season based on soil temperatures measured on site and at the nearby Harrisburg, Site 3, wetland mitigation site (ISGS #87).
- Total precipitation for the monitoring period at nearby West Frankfort, Illinois (MRCC #119148), was 124% of normal, and spring 2019 (March through May) precipitation was 135% of normal.
- Sugar Camp Creek flooded portions of the site 21 times during the monitoring period. None of these floods lasted long enough to satisfy wetland hydrology criteria.

- The period of maximum inundation and saturation during the 2019 growing season occurred from mid-April to late May in response to frequent flooding from Sugar Camp Creek. During this time, six brief flood events covered portions of the site.
- In 2019, water levels measured in 29 of 29 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 5% of the growing season, and water levels measured in 27 of 29 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 12.5% of the growing season, using the 1987 Manual. Using the 2010 Midwest Region Supplement, water levels in 29 of 29 soil-zone monitoring wells satisfied wetland hydrology criteria for 14 or more consecutive days of the growing season. See the tables at the end of this summary for details.

ADDITIONAL INFORMATION

- Phase 1 of the wetland mitigation bank is in year 9 and Phase 2 is in year 6 of post-construction monitoring. Therefore, we present wetland hydrology acreage separately for each phase in this section. Using the 1987 Manual (Environmental Laboratory 1987), 14.74 ha (36.42 ac) of Phase 1 and 14.88 ha (36.77 ac) of Phase 2 satisfied wetland hydrology criteria for greater than 5% of the growing season, and 14.20 ha (35.08 ac) of Phase 1 and 13.95 ha (34.48 ac) of Phase 2 satisfied wetland hydrology criteria for greater than 12.5% of the growing season. Using the 2010 Midwest Region Supplement, 14.74 ha (36.42 ac) of Phase 1 and 14.88 ha (36.77 ac) of Phase 2 satisfied wetland hydrology criteria for 14 or more consecutive days during the growing season.

PLANNED FUTURE ACTIVITIES

- Data logger replacements are planned for fall 2019.
- Monitoring will continue until no longer required by IDOT.

WETLAND HYDROLOGY TABLES FOR 2019

Well locations meeting wetland hydrology criteria			
<i>ID</i>	<i>5% of growing season</i>	<i>12.5% of growing season</i>	<i>14 days during growing season</i>
11S	Y	Y	Y
19S	Y	Y	Y
33S	Y	Y	Y
36VS	Y	Y	Y
37S	Y	Y	Y
38S	Y	Y	Y
39S	Y	Y	Y
40S	Y	Y	Y
41S	Y	Y	Y
42S	Y	Y	Y
43S	Y	Y	Y
44S	Y	Y	Y
45S	Y	Y	Y
47S	Y	Y	Y
48S	Y	Y	Y
49S	Y	Y	Y
50S	Y	Y	Y
51S	Y	Y	Y
52S	Y	Y	Y
53S	Y	Y	Y
54S	Y	Y	Y
55S	Y	Y	Y
56S	Y	Y	Y
57S	Y	Y	Y
58S	Y	Y	Y
59S	Y	Y	Y
61S	Y	Y	Y
62S	Y	N	Y
63S	Y	N	Y

Y – met wetland hydrology criteria

N – did not meet wetland hydrology criteria

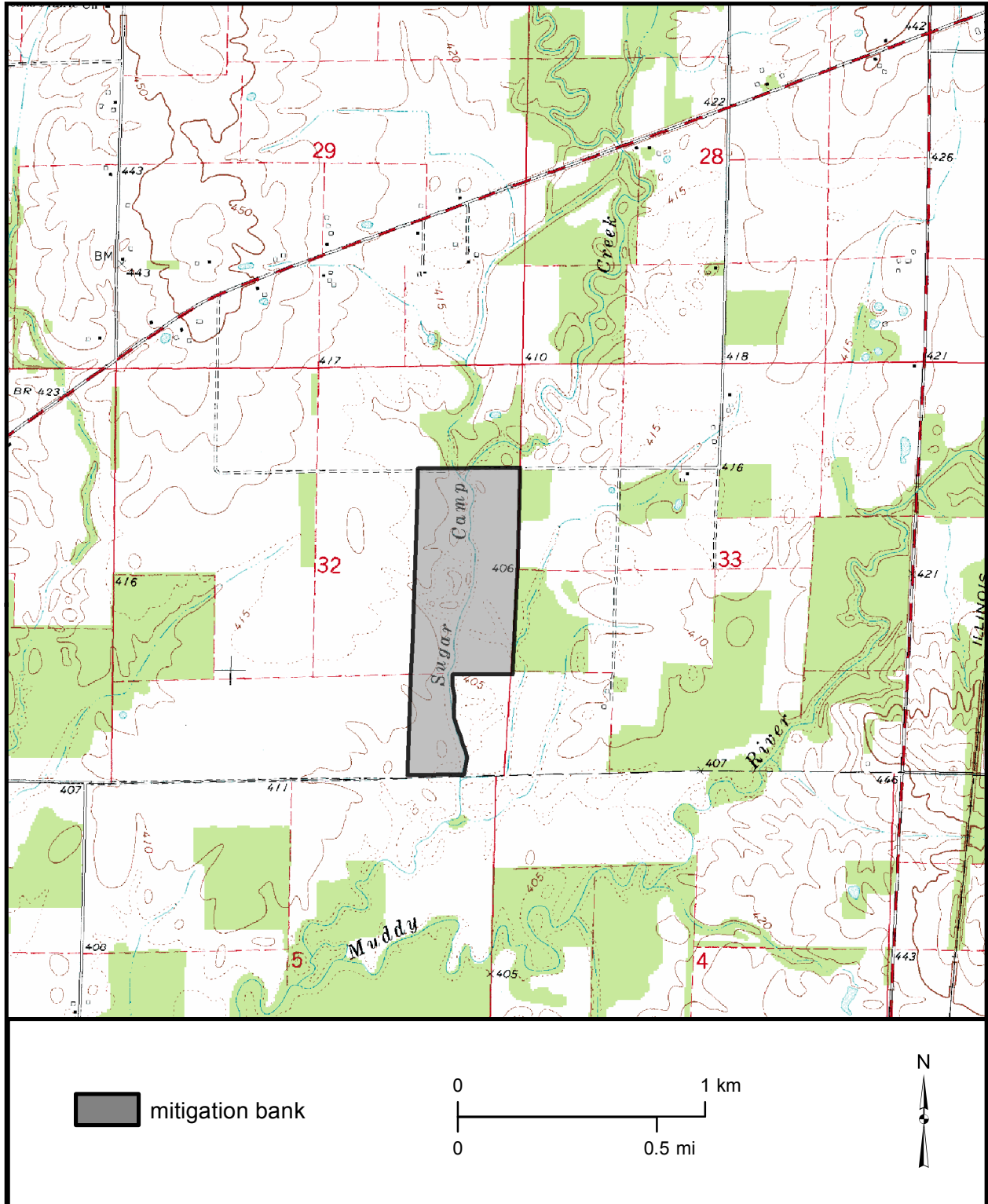
Surface-water gauge elevations meeting wetland hydrology criteria			
<i>ID</i>	<i>5% of growing season</i>	<i>12.5% of growing season</i>	<i>14 days during growing season</i>
A	122.67 m (402.47 ft)	122.50 m (401.89 ft)	122.81 m (402.93 ft)
L	123.97 m (406.72 ft)	123.96 m (406.68 ft)	123.98 m (406.75 ft)
M	123.53 m (405.27 ft)	123.51 m (405.20 ft)	123.55 m (405.34 ft)
N	123.99 m (406.78 ft)	123.97 m (406.74 ft)	123.99 m (406.78 ft)
O	124.04 m (406.95 ft)	124.04 m (406.95 ft)	124.04 m (406.95 ft)
P	123.88 m (406.43 ft)	123.88 m (406.43 ft)	123.88 m (406.43 ft)

n/a – insufficient data to determine an elevation

Sugar Camp Creek Wetland and Stream Mitigation Bank

General Study Area and Vicinity

from the USGS Topographic Series, Ewing, IL, 7.5-minute Quadrangle (USGS 1974a)
contour interval is 10 feet

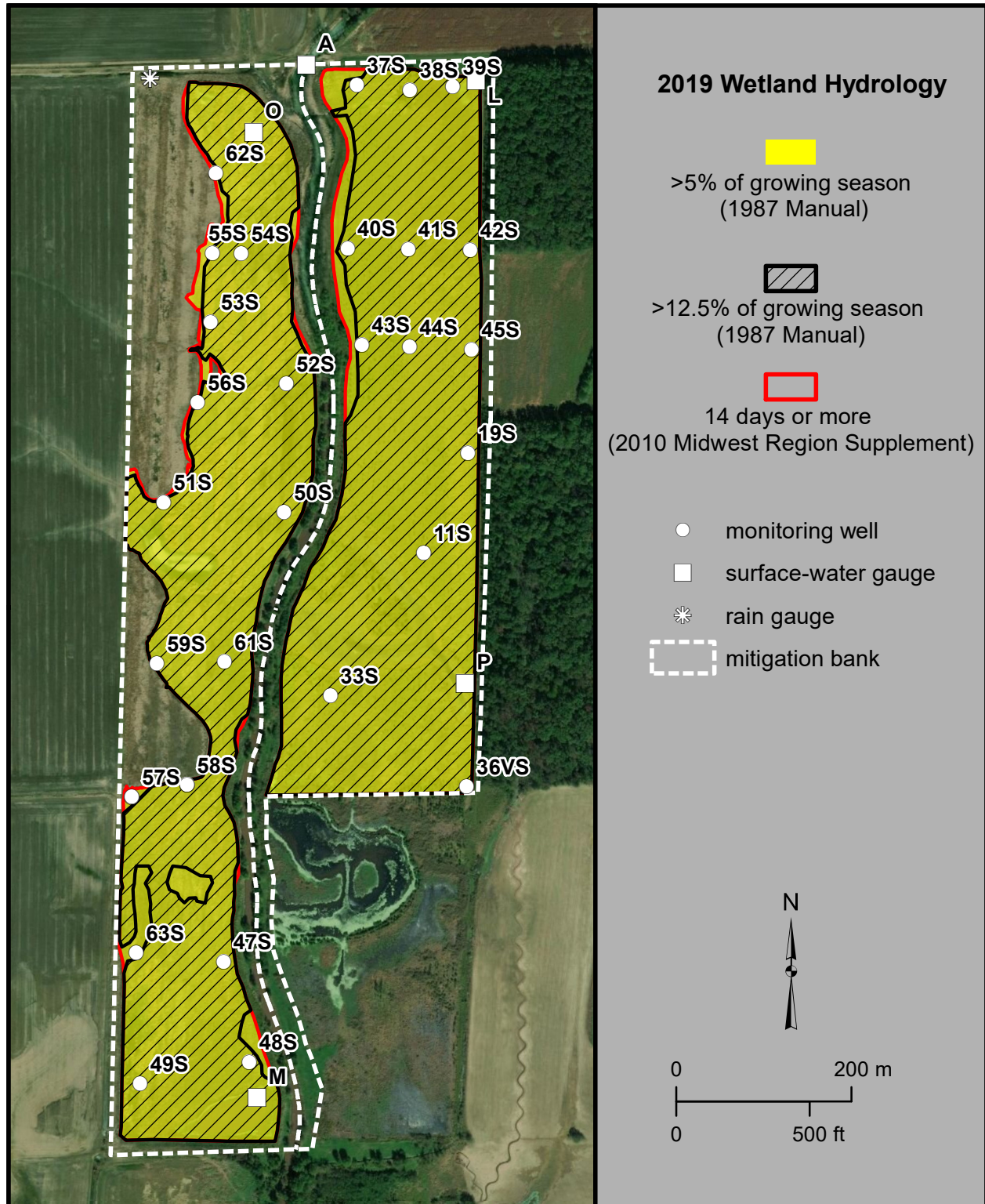


Sugar Camp Creek Wetland and Stream Mitigation Bank

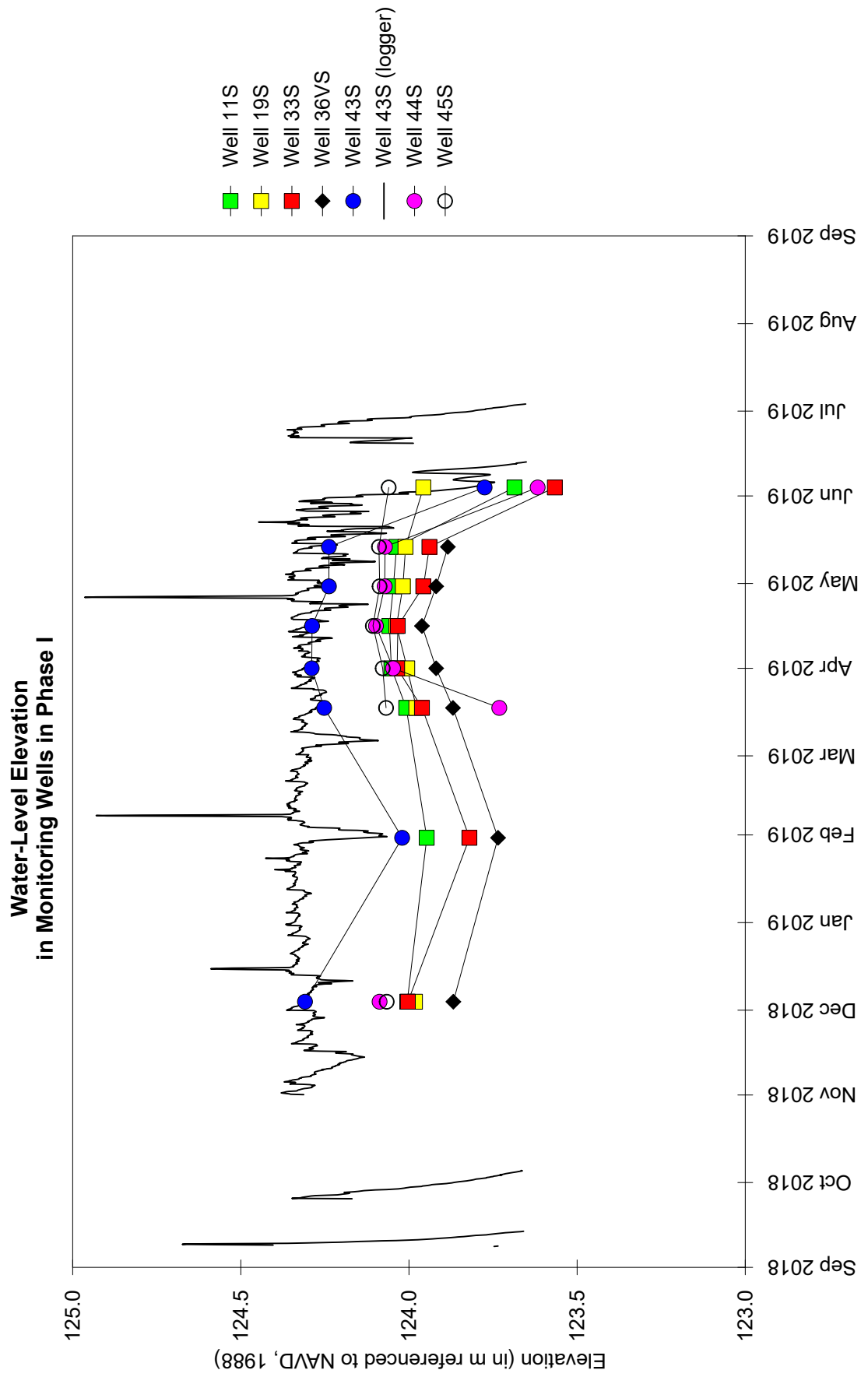
Estimated Areal Extent of 2019 Wetland Hydrology

September 1, 2018 through August 31, 2019

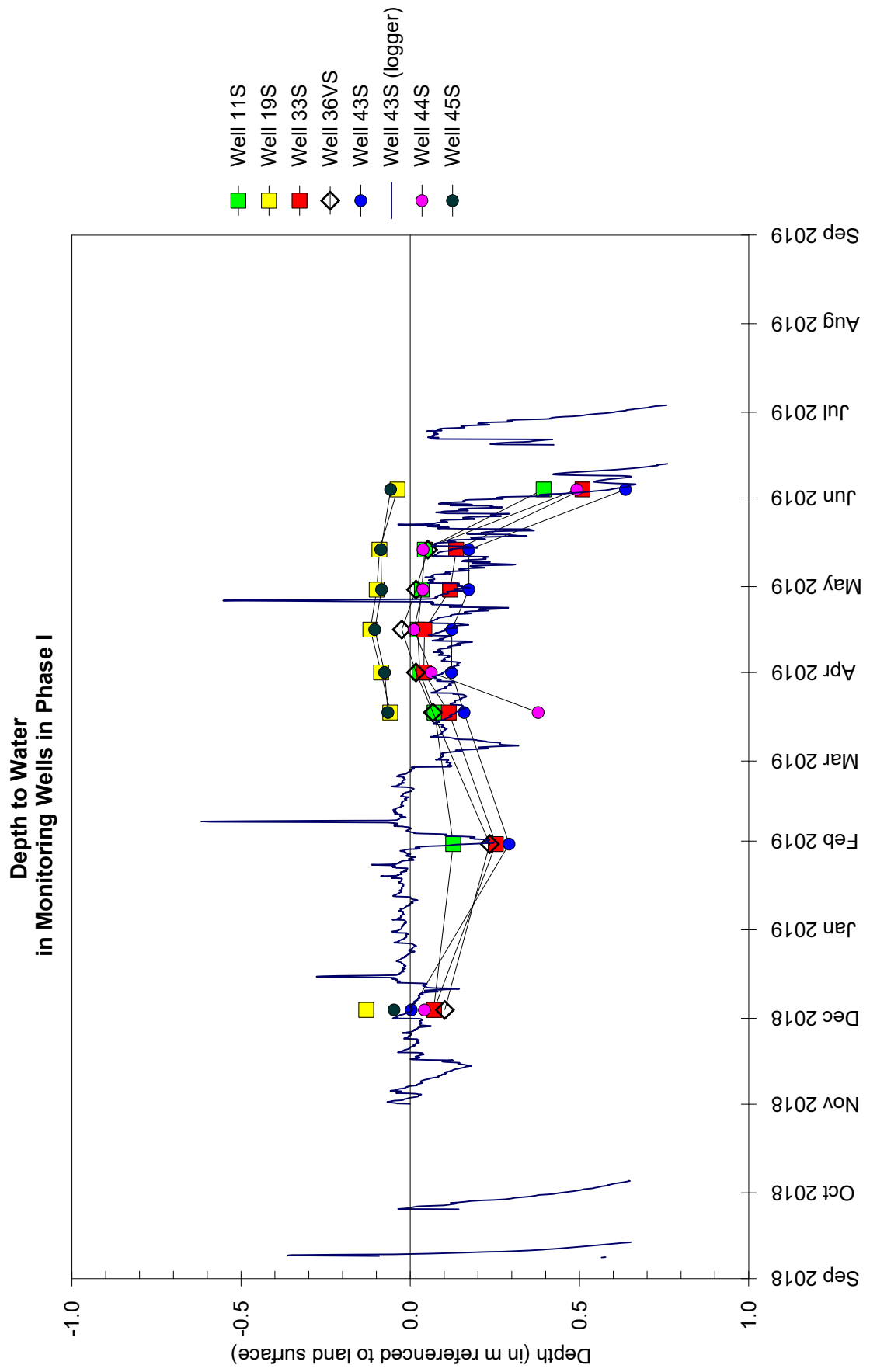
Map based on imagery available from Esri (Esri 2019)



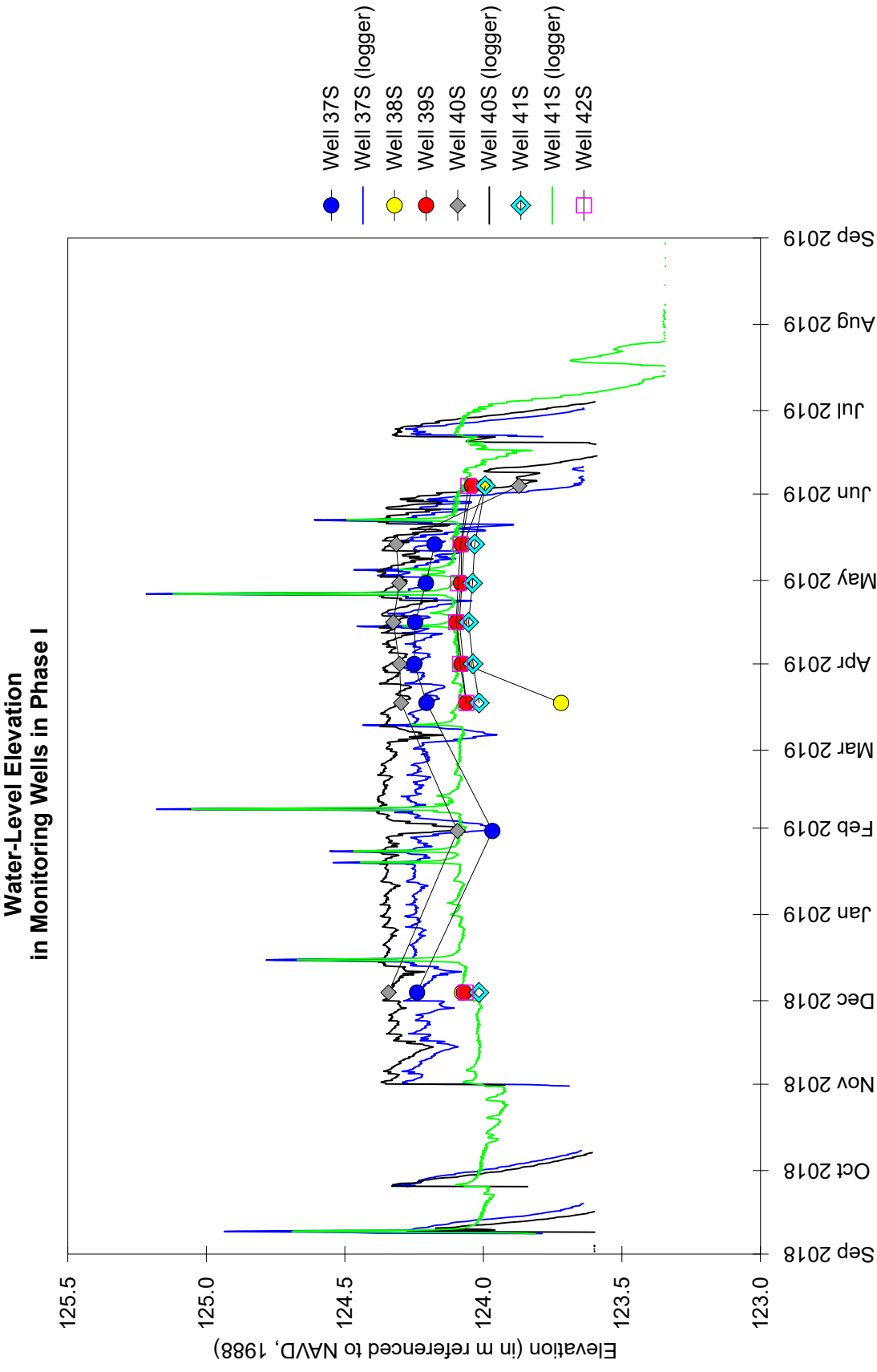
Sugar Camp Creek Wetland and Stream Mitigation Bank **September 1, 2018 through August 31, 2019**



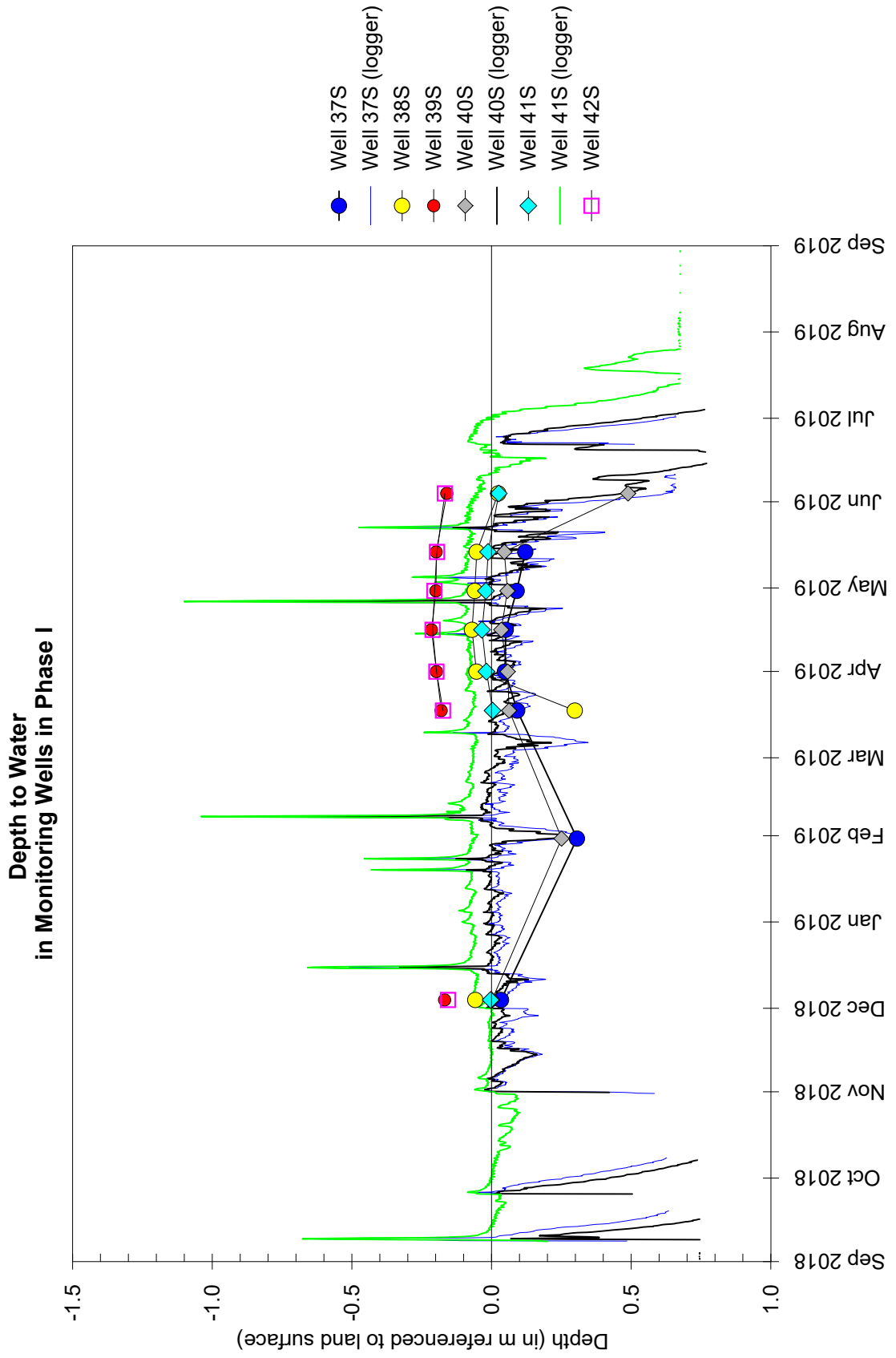
Sugar Camp Creek Wetland and Stream Mitigation Bank **September 1, 2018 through August 31, 2019**



Sugar Camp Creek Wetland and Stream Mitigation Bank **September 1, 2018 through August 31, 2019**

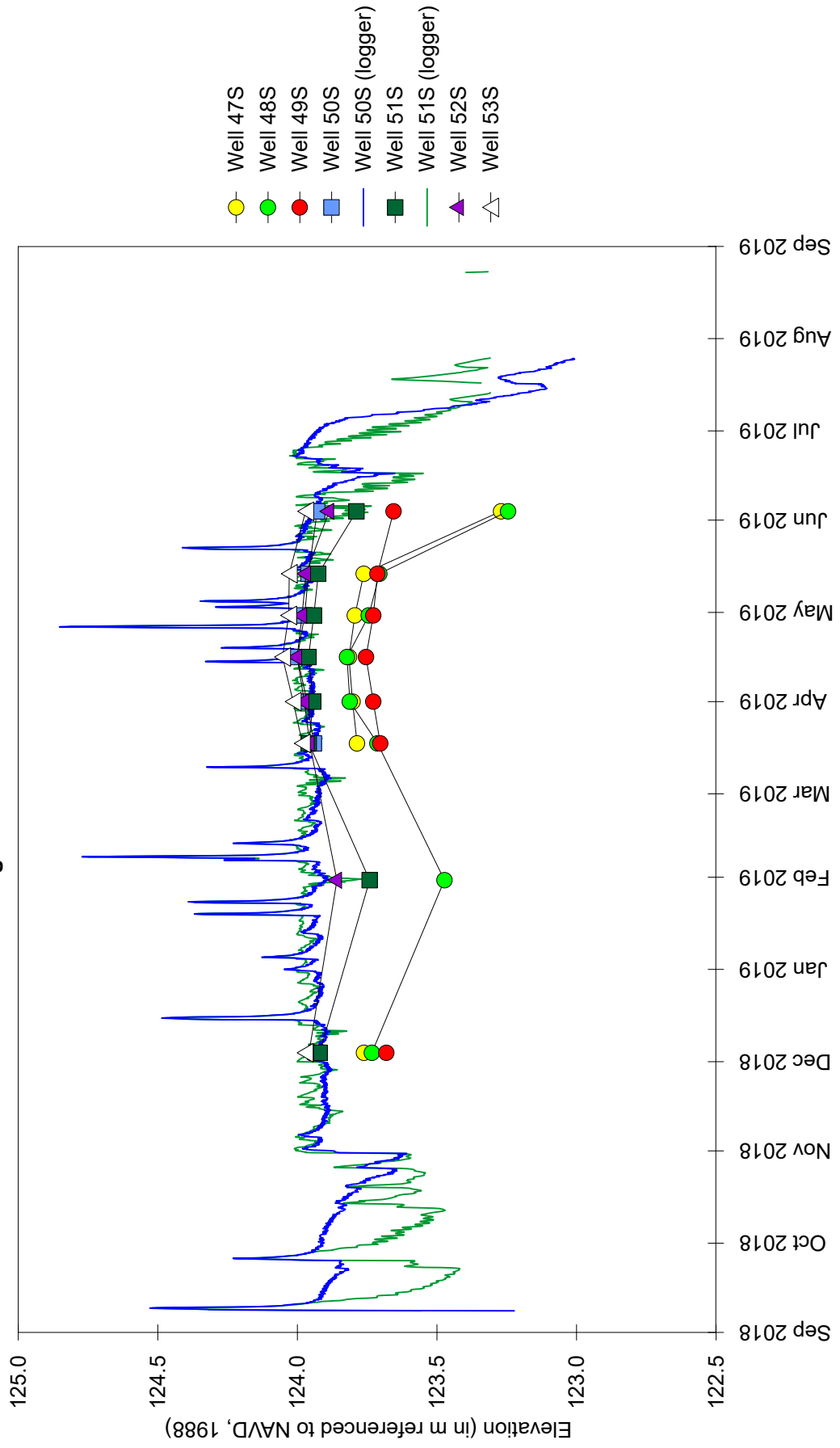


Sugar Camp Creek Wetland and Stream Mitigation Bank September 1, 2018 through August 31, 2019

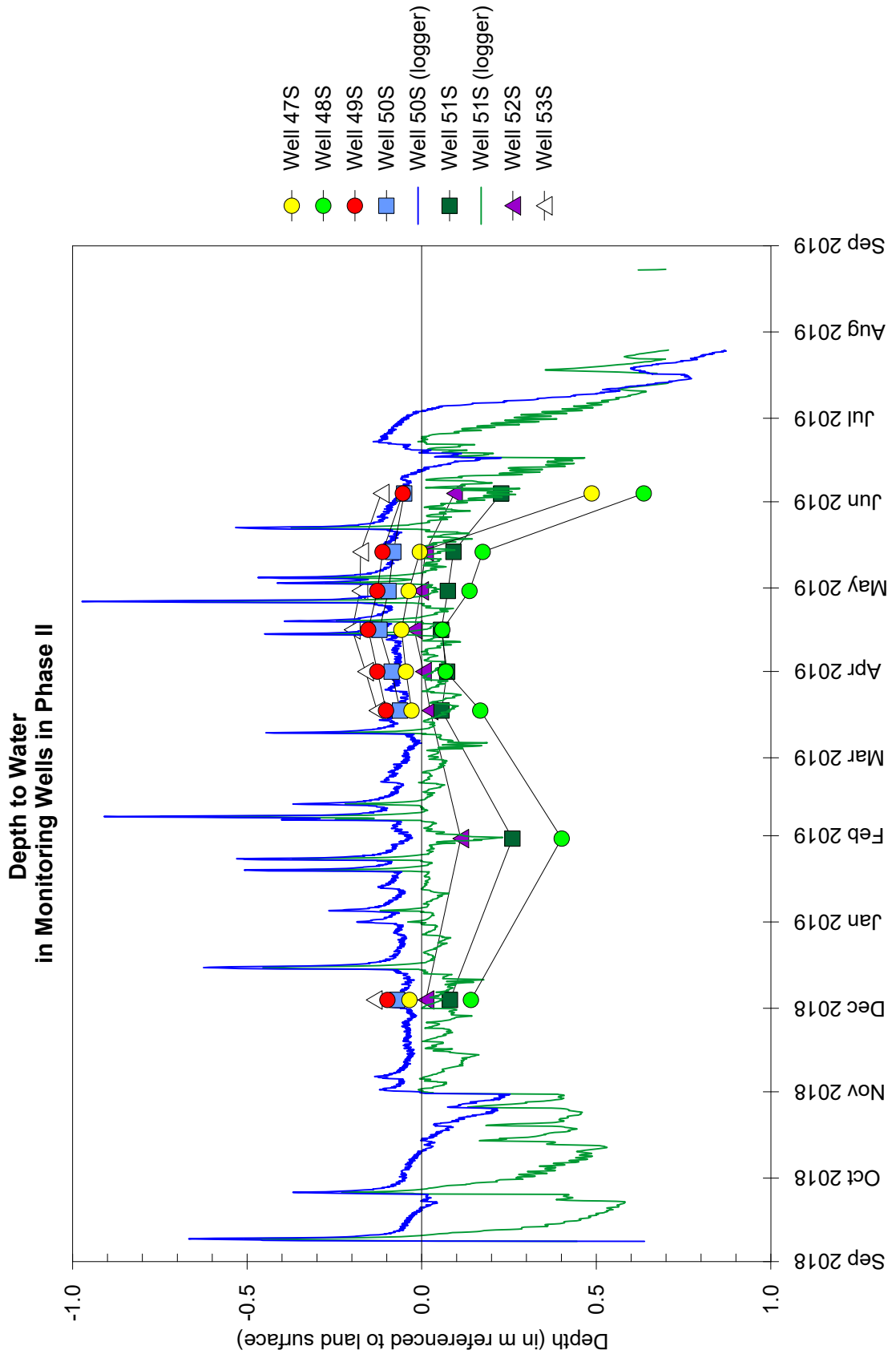


Sugar Camp Creek Wetland and Stream Mitigation Bank **September 1, 2018 through August 31, 2019**

Water-Level Elevation in Monitoring Wells in Phase II

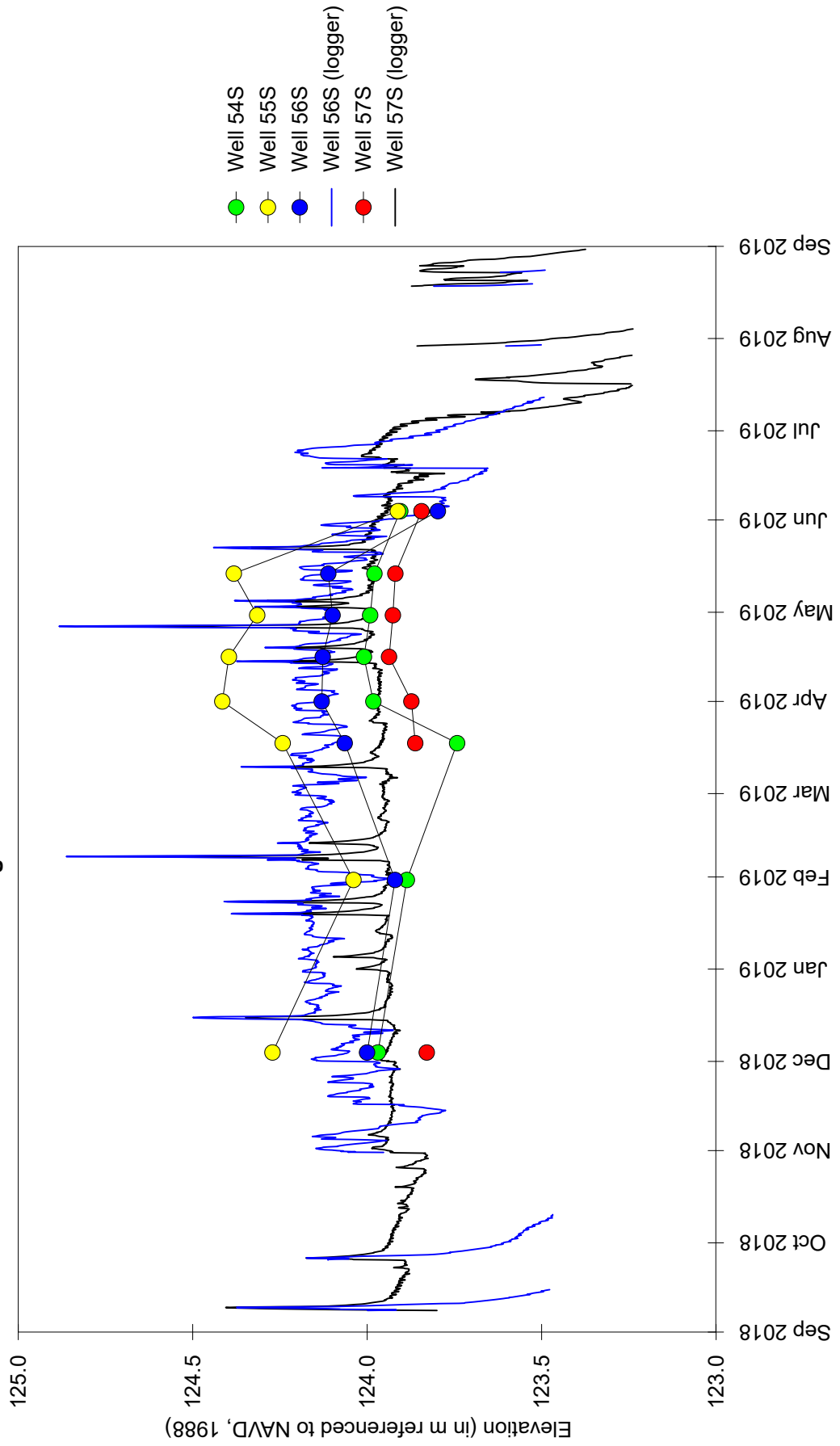


Sugar Camp Creek Wetland and Stream Mitigation Bank **September 1, 2018 through August 31, 2019**

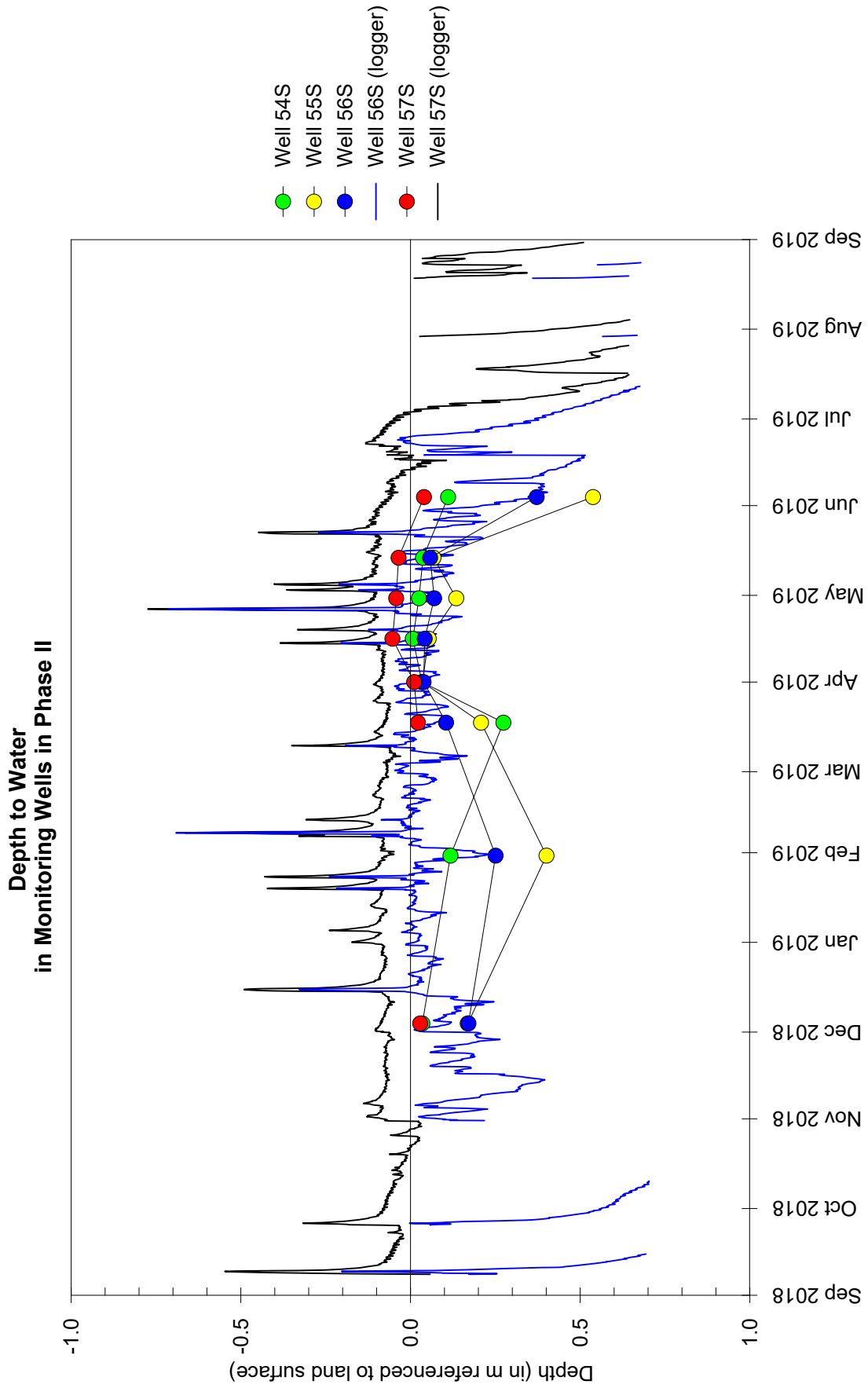


Sugar Camp Creek Wetland and Stream Mitigation Bank **September 1, 2018 through August 31, 2019**

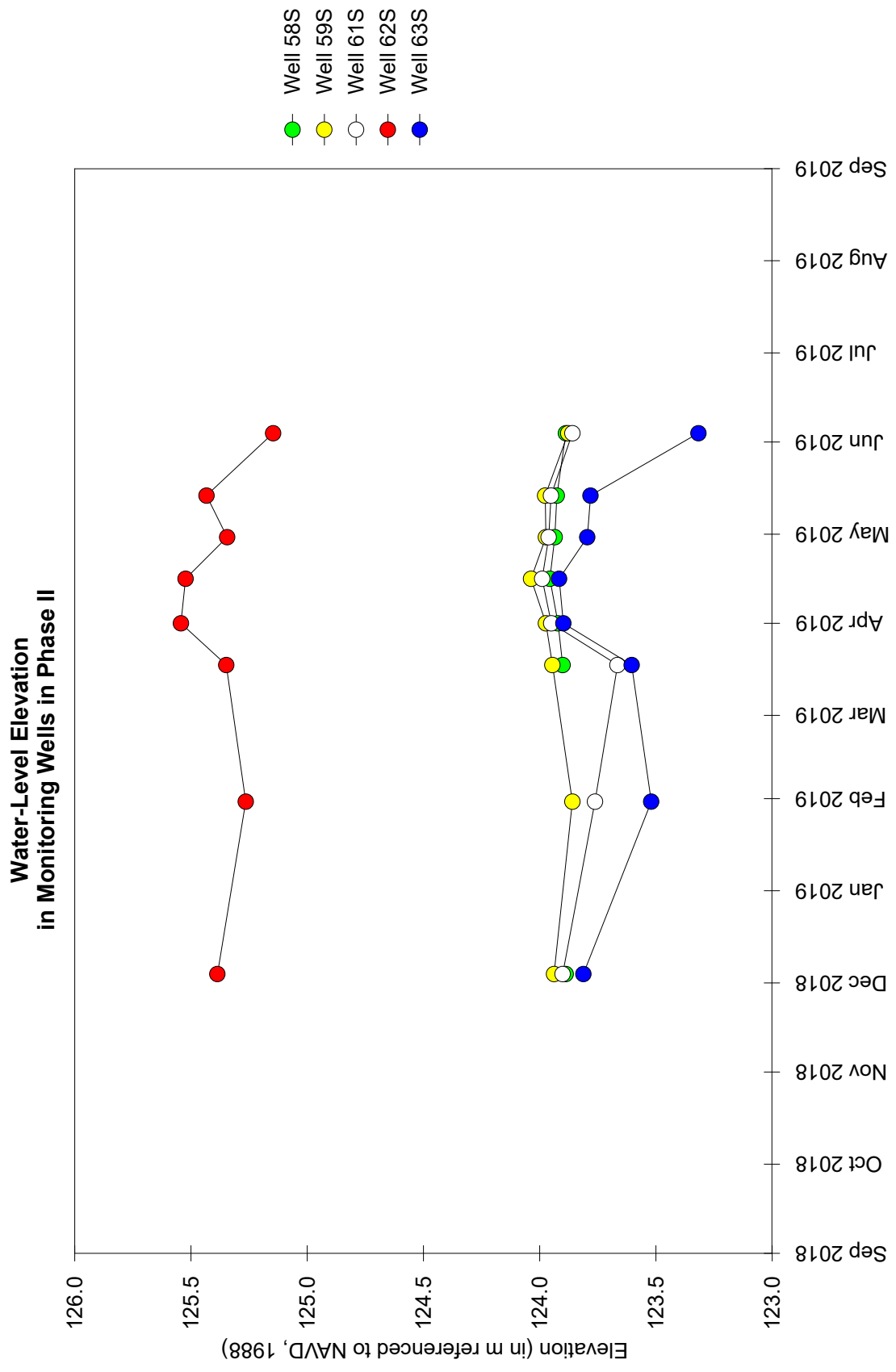
Water-Level Elevation in Monitoring Wells in Phase II



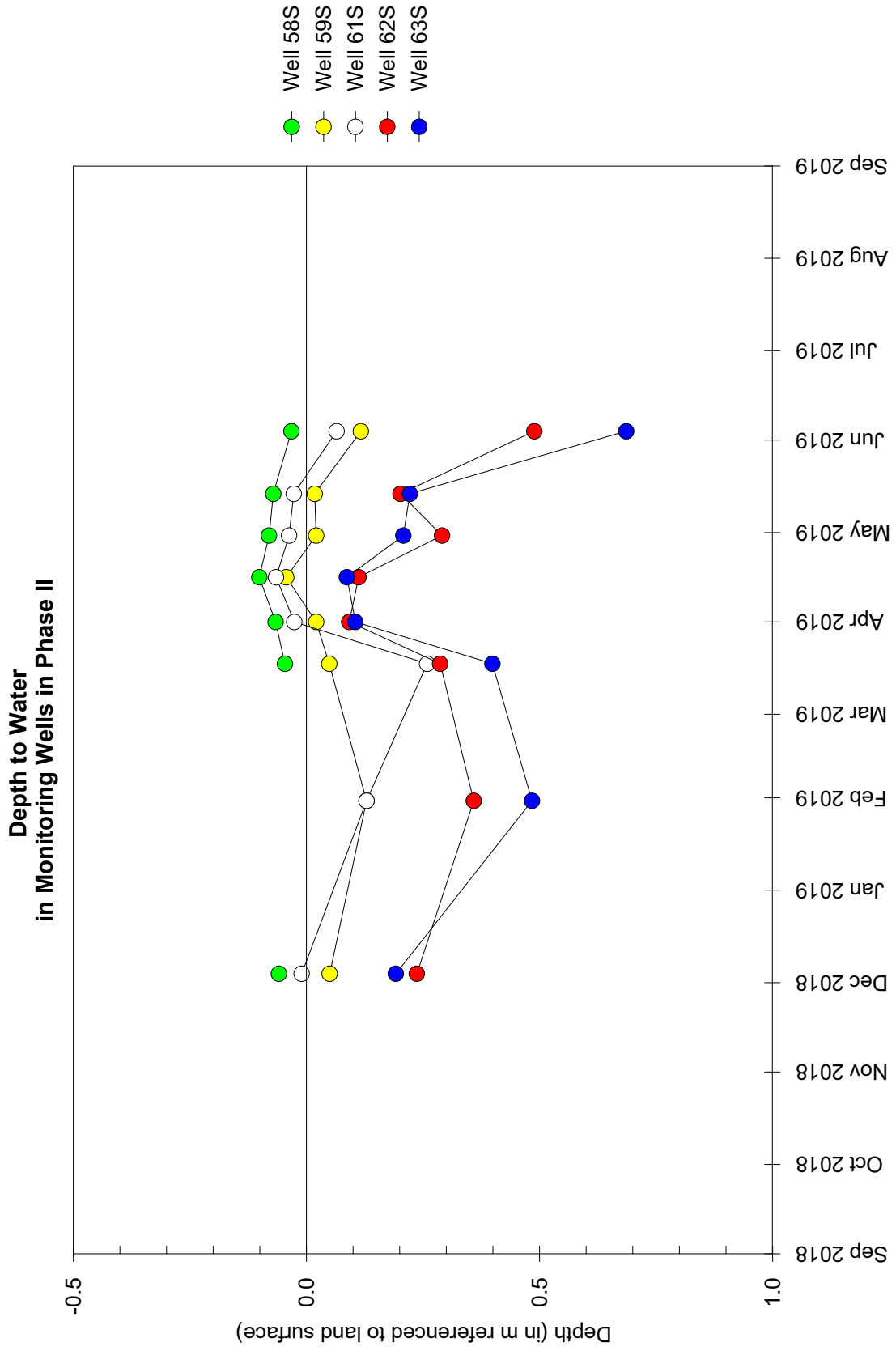
Sugar Camp Creek Wetland and Stream Mitigation Bank **September 1, 2018 through August 31, 2019**



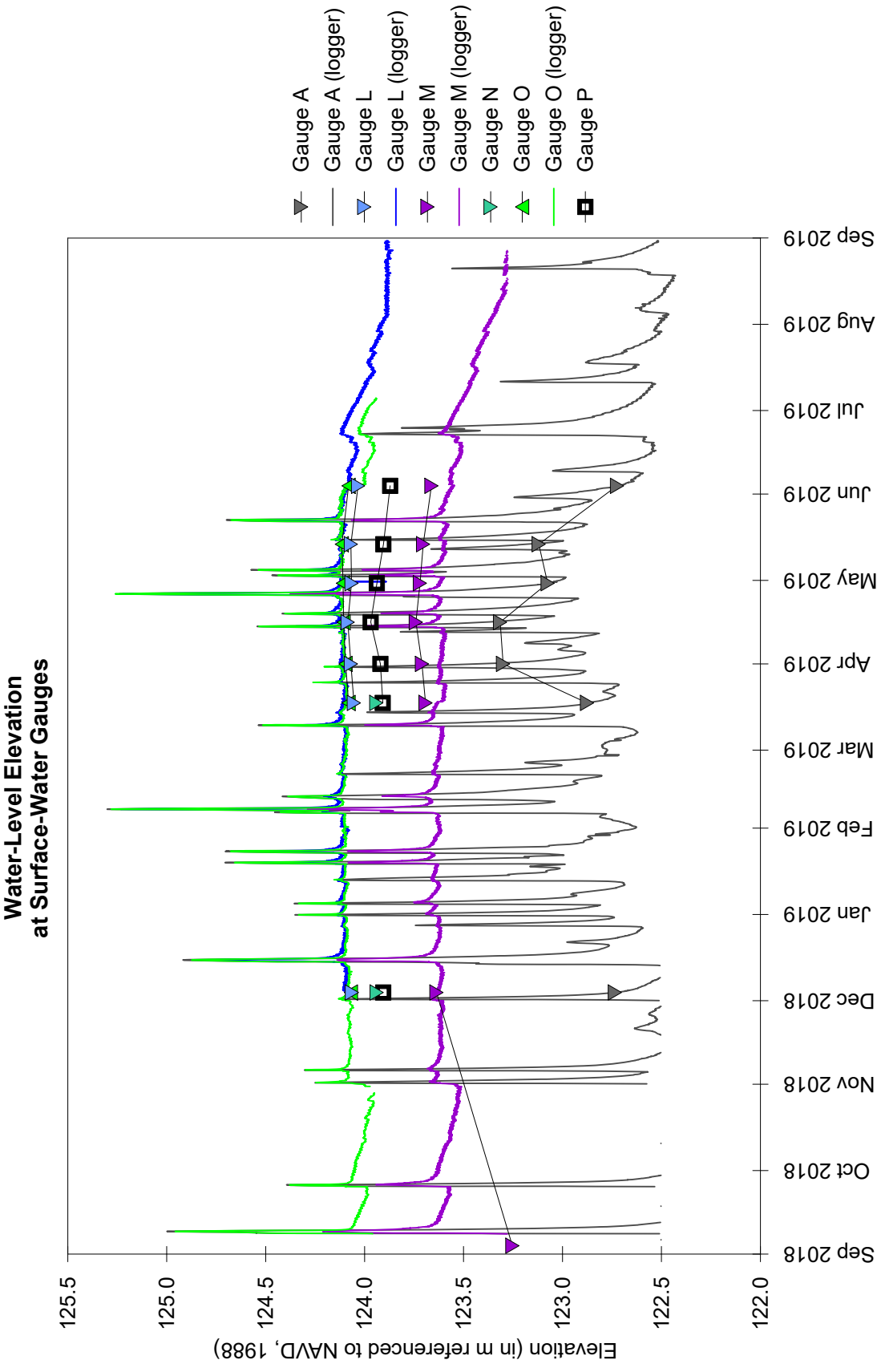
Sugar Camp Creek Wetland and Stream Mitigation Bank September 1, 2018 through August 31, 2019



Sugar Camp Creek Wetland and Stream Mitigation Bank September 1, 2018 through August 31, 2019

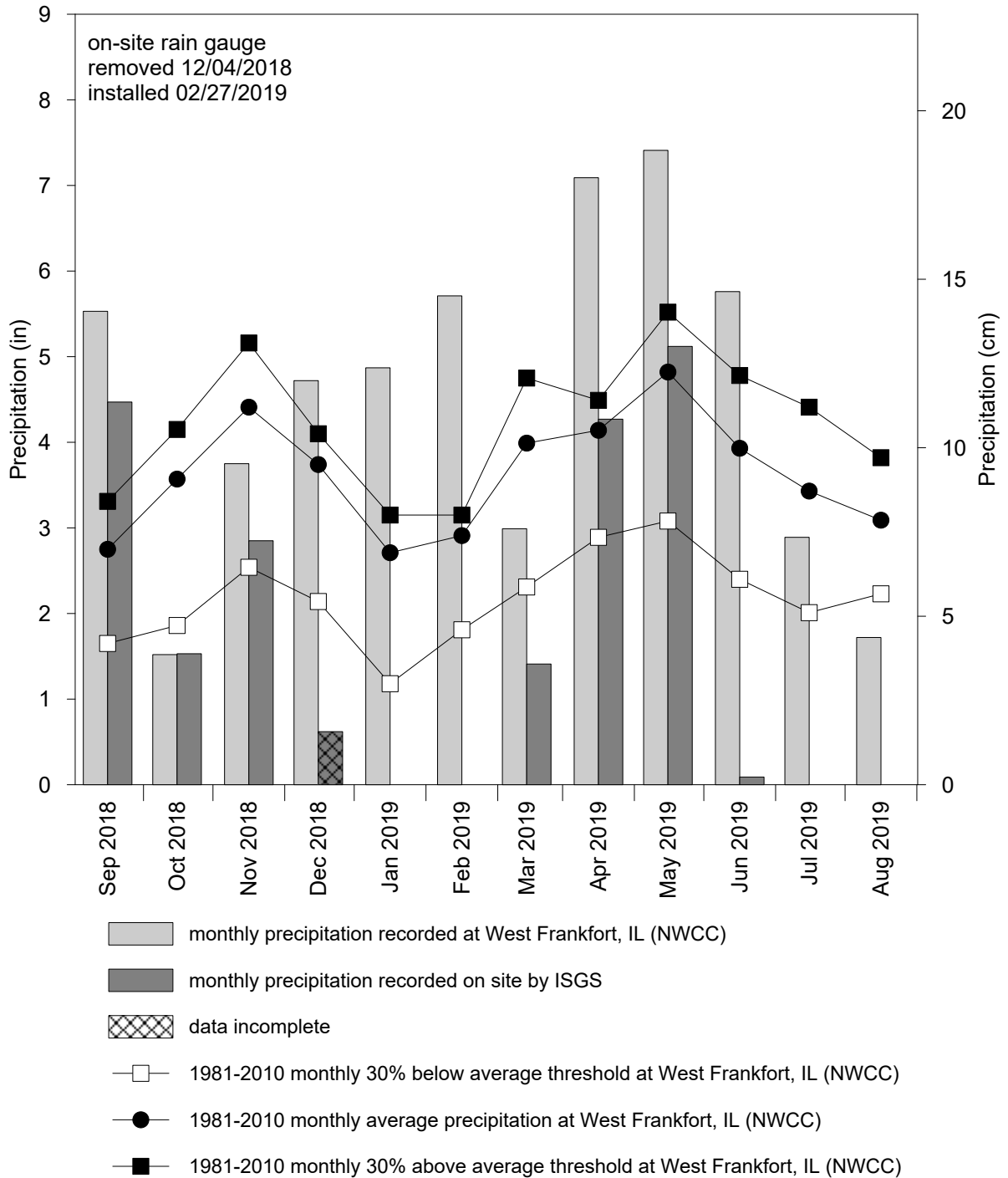


Sugar Camp Creek Wetland and Stream Mitigation Bank September 1, 2018 through August 31, 2019



Sugar Camp Creek Wetland and Stream Mitigation Bank September 2018 through August 2019

Total Monthly Precipitation Recorded on Site and at West Frankfort, IL (MRCC station #119148)



**PYRAMID SITE EC25
WETLAND MITIGATION SITE**

ISGS # 77

Pyatts Blacktop

FAS 864

Sequence #9778

Perry County, near Pinckneyville, Illinois

Primary Project Manager: Jessica L. B. Monson

Secondary Project Managers: Audra M. Noyes and Lindsey A. Schafer

SITE HISTORY

- June 2007: ISGS was tasked by IDOT to monitor wetland hydrology.
- April 2008: ISGS began on-site monitoring.
- April 2019: The ISGS was notified by IDOT that post-construction monitoring was complete.

WETLAND HYDROLOGY CALCULATION FOR 2019

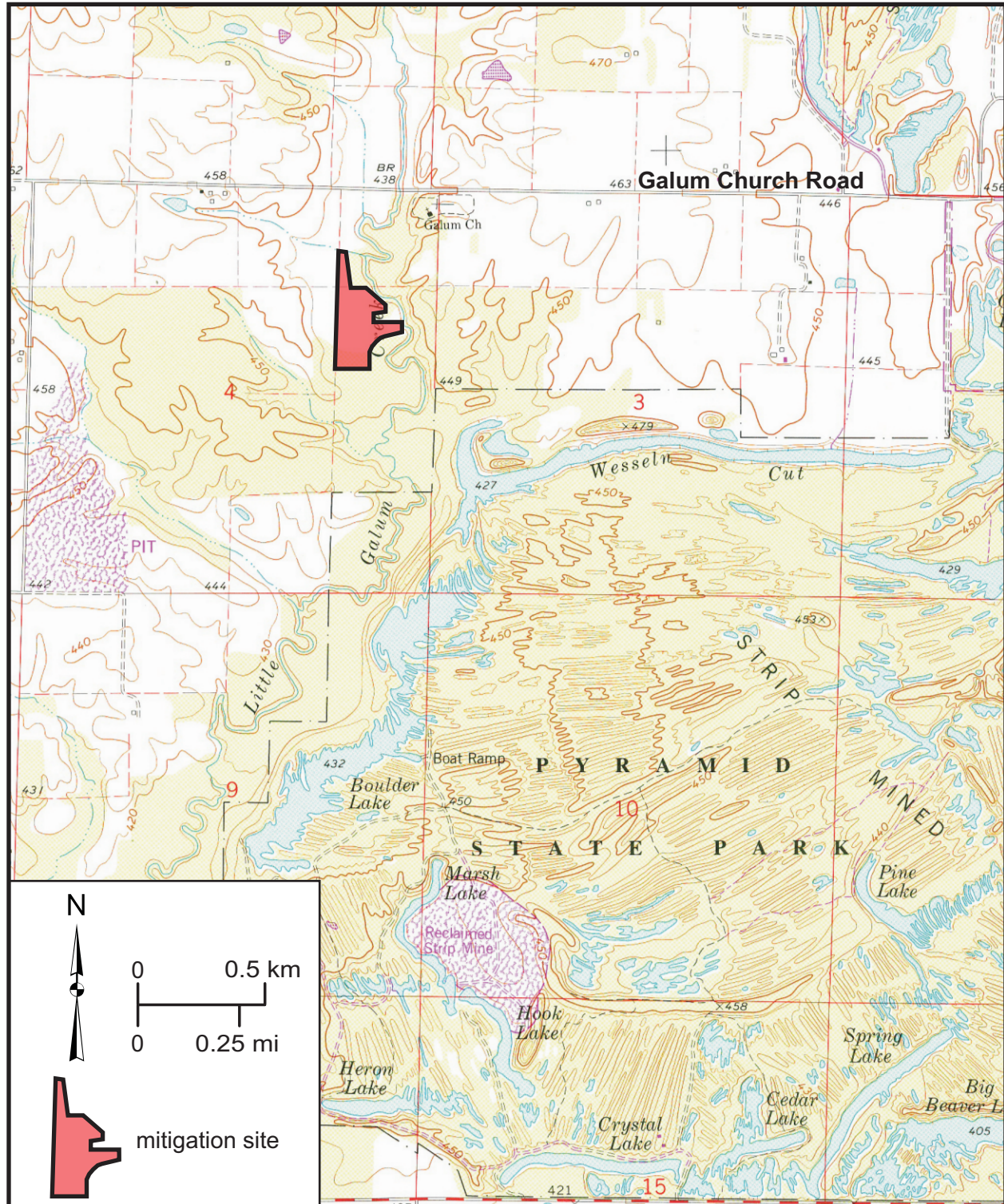
Jurisdictional wetland hydrology area was not estimated for the 2019 growing season. IDOT discontinued monitoring of this site on 4/30/2019. As only a portion of the growing season was evaluated for hydrology, the data record is not adequate for providing a complete analysis. The hydrologic data that were collected during the 2018-2019 monitoring period are provided in following pages of this site summary.

PLANNED FUTURE ACTIVITIES

- The monitoring network will be removed as time allows.

**Pyramid Site EC25 Wetland Mitigation Site
(Pyatts Blacktop, FAS 864)
General Study Area and Vicinity**

from the USGS Topographic Series, Pinckneyville, IL, 7.5-minute Quadrangle (USGS 1974b)
contour interval is 10 feet

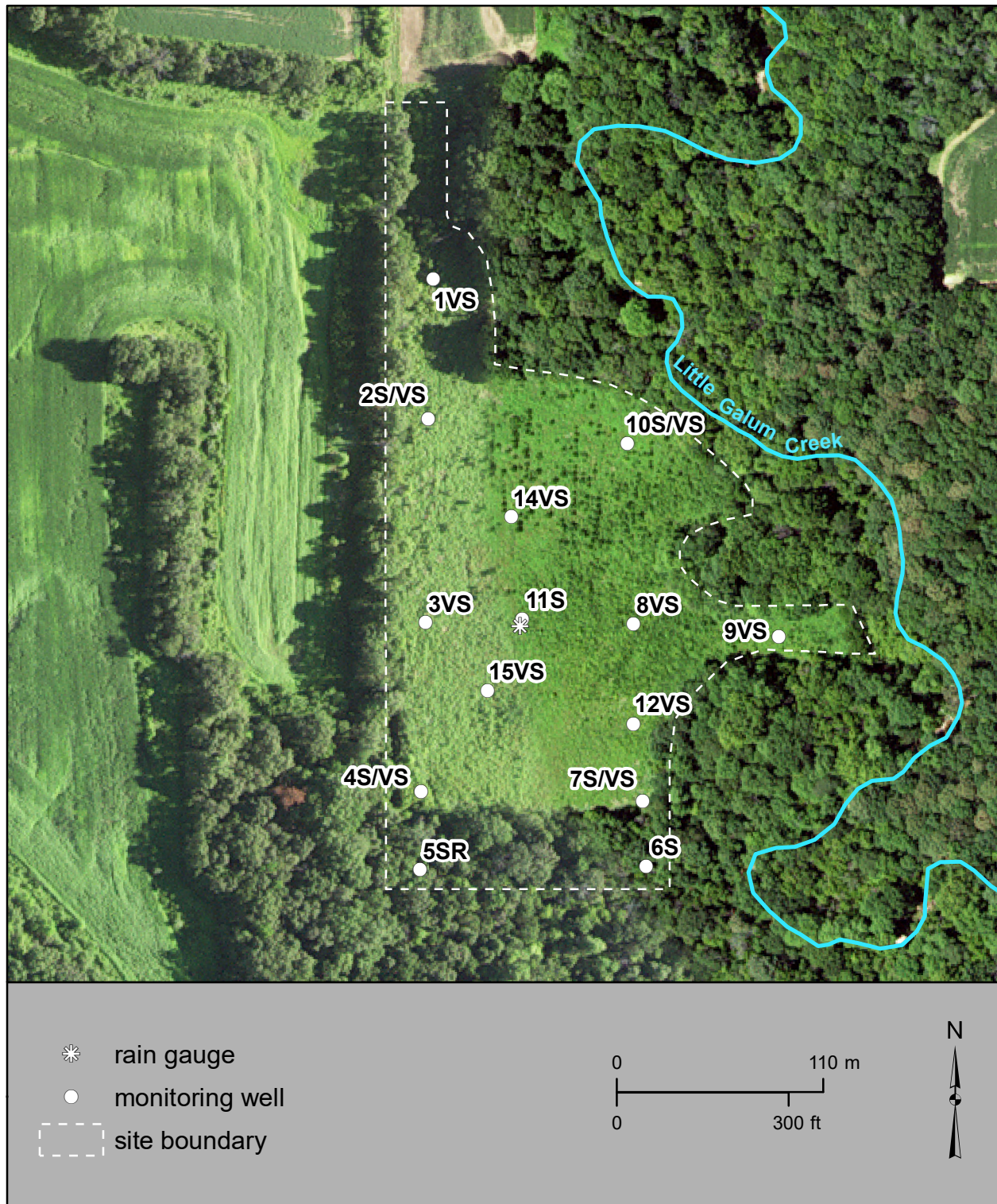


Pyramid Site EC25 Wetland Mitigation Site (Pyatts Blacktop, FAS 864)

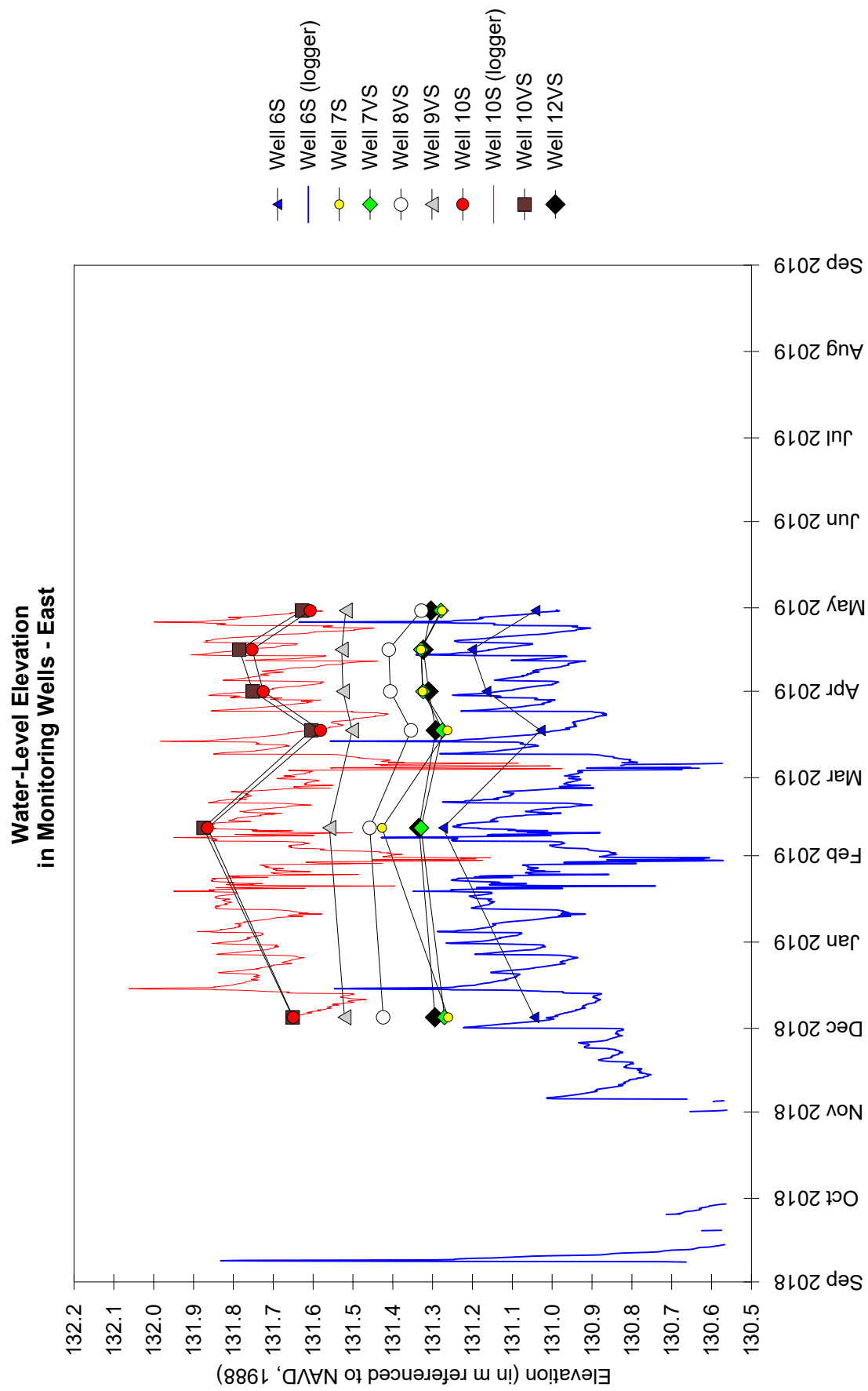
2019 Monitoring Network

September 1, 2018 through May 1, 2019

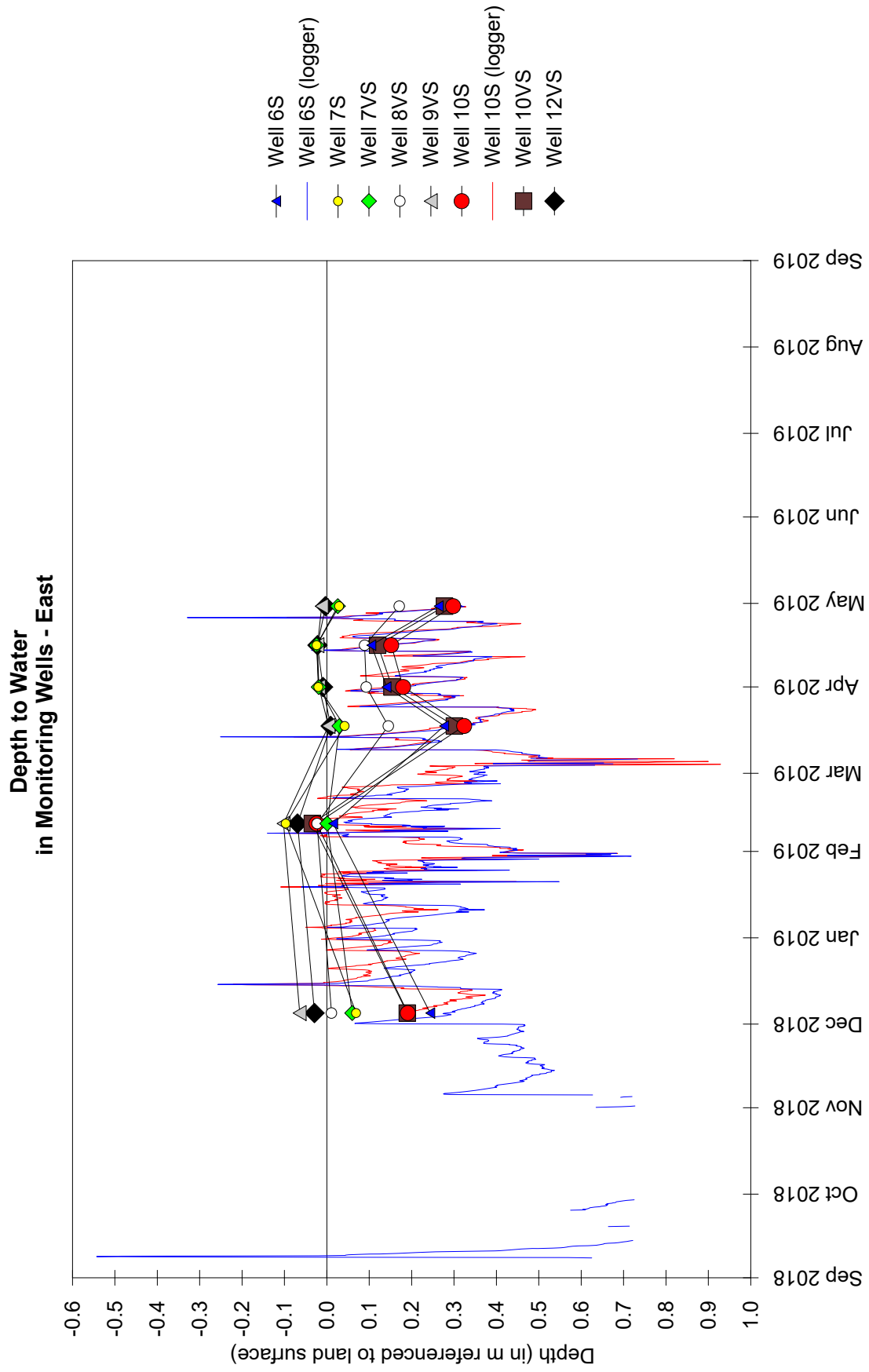
Map based on 2015 Farm Service Agency digital orthophotography, Perry County, Illinois (USDA-FSA 2015)



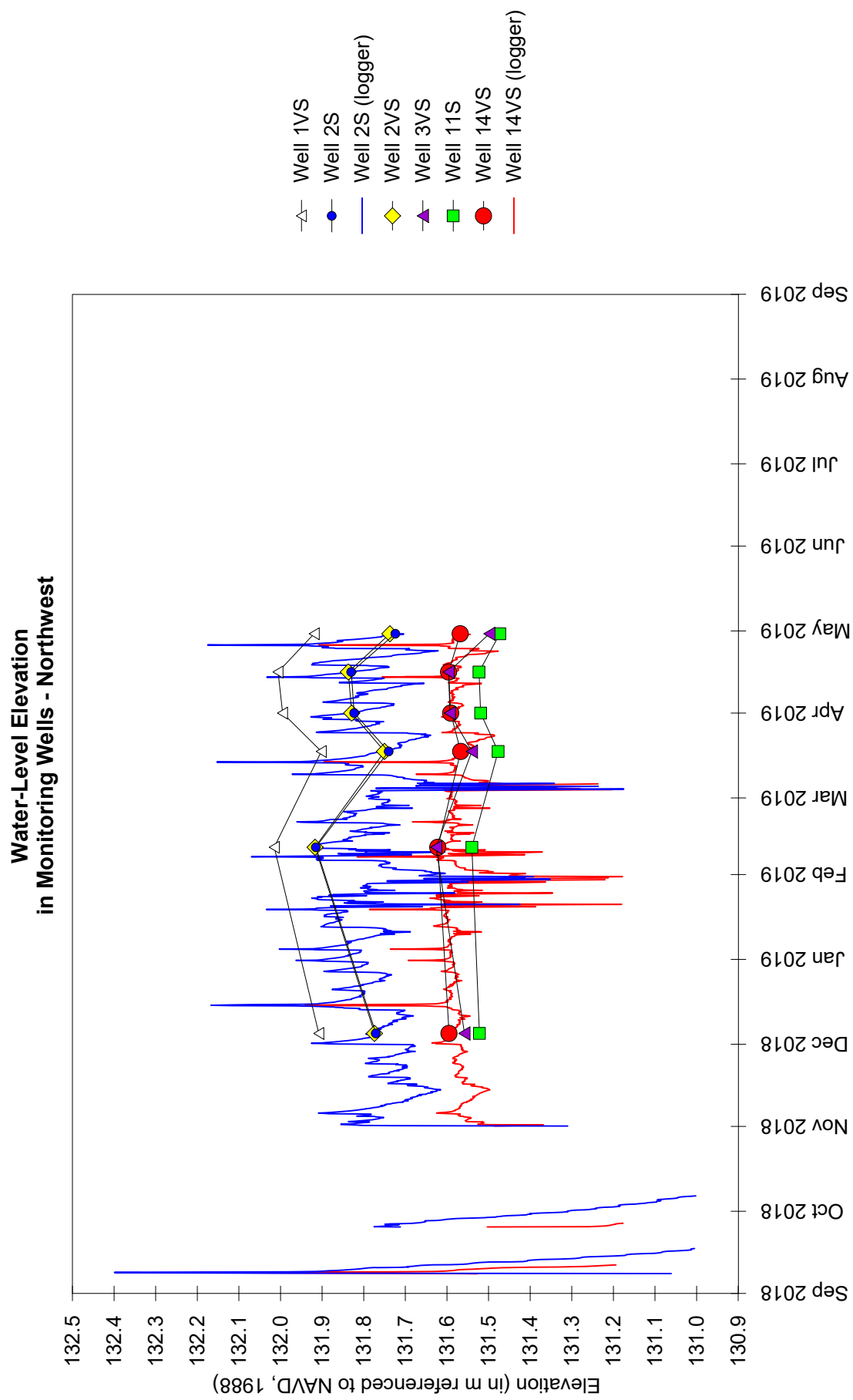
Pyramid Site EC25 Wetland Mitigation Site **September 1, 2018 through August 31, 2019**



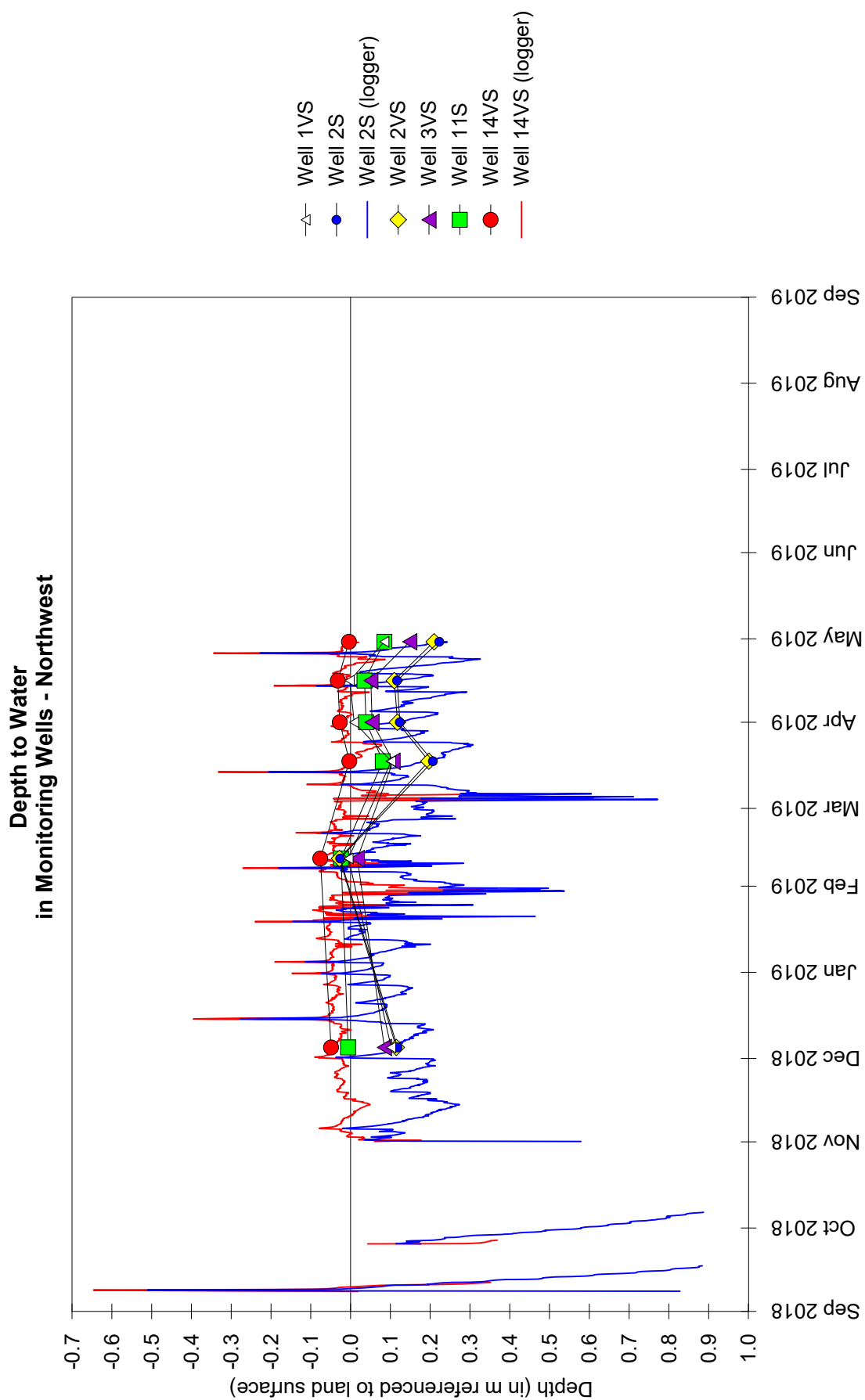
Pyramid Site EC25 Wetland Mitigation Site **September 1, 2018 through August 31, 2019**



Pyramid Site EC25 Wetland Mitigation Site **September 1, 2018 through August 31, 2019**

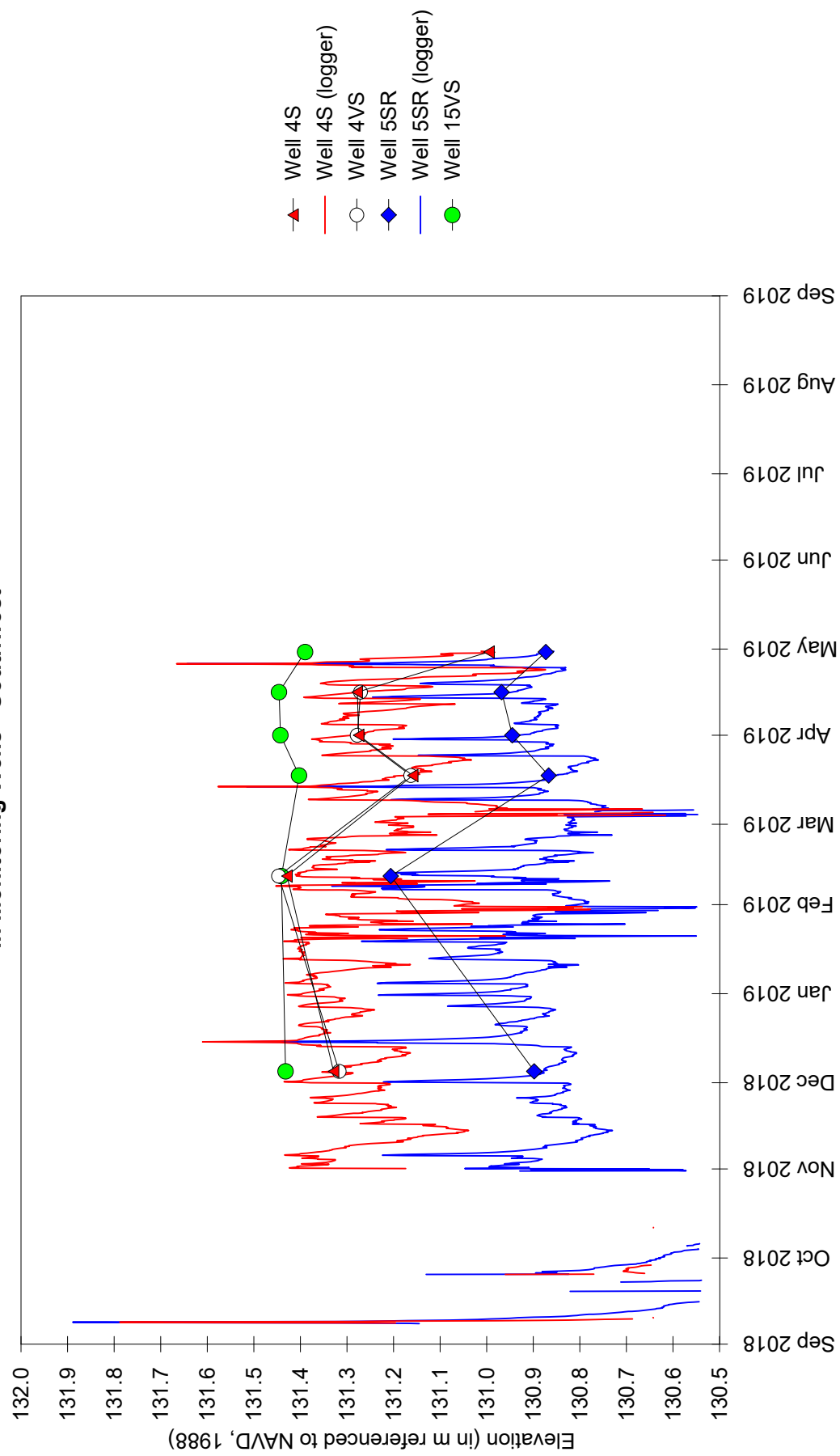


Pyramid Site EC25 Wetland Mitigation Site September 1, 2018 through August 31, 2019



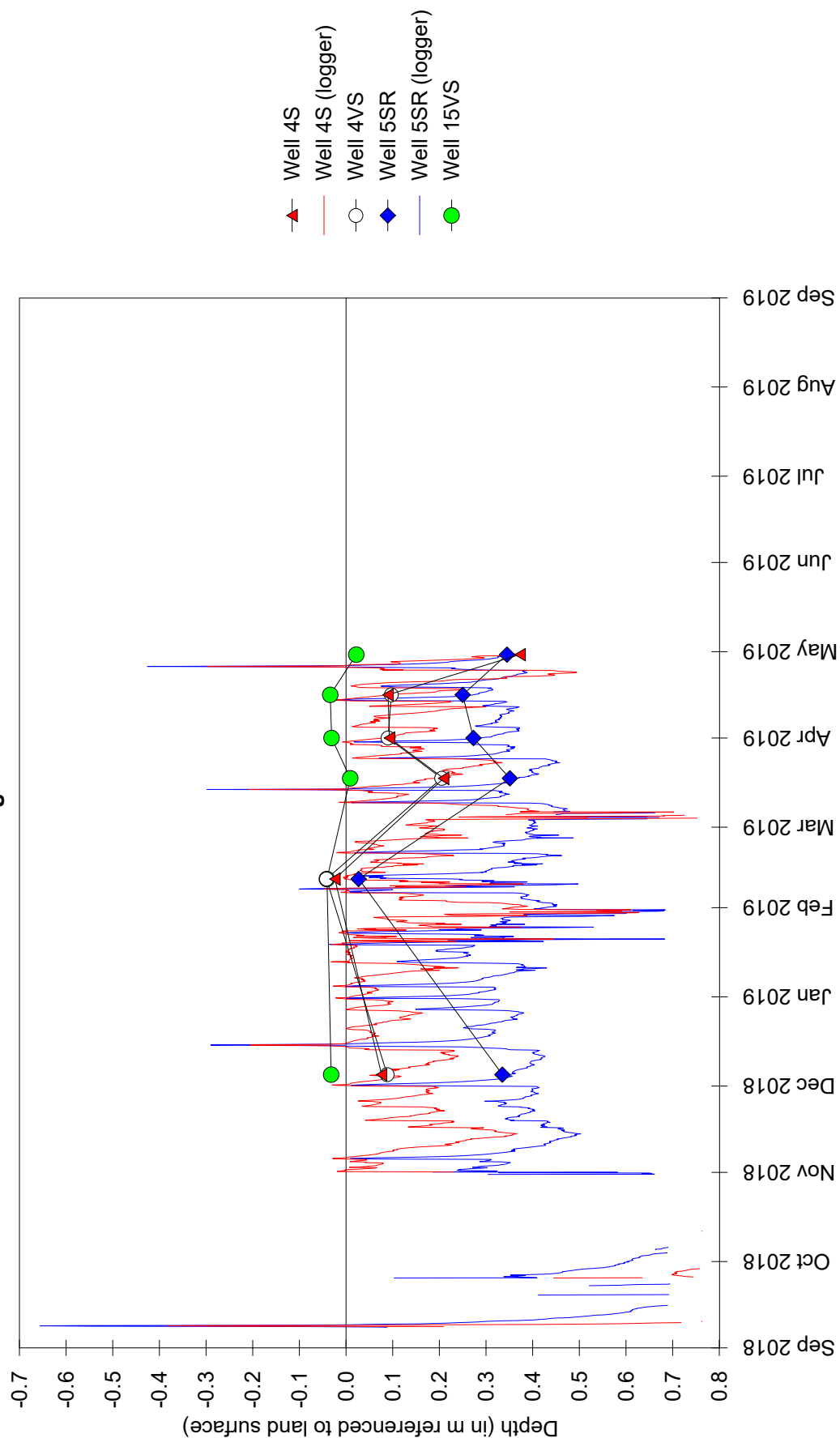
Pyramid Site EC25 Wetland Mitigation Site **September 1, 2018 through August 31, 2019**

Water-Level Elevation in Monitoring Wells - Southwest



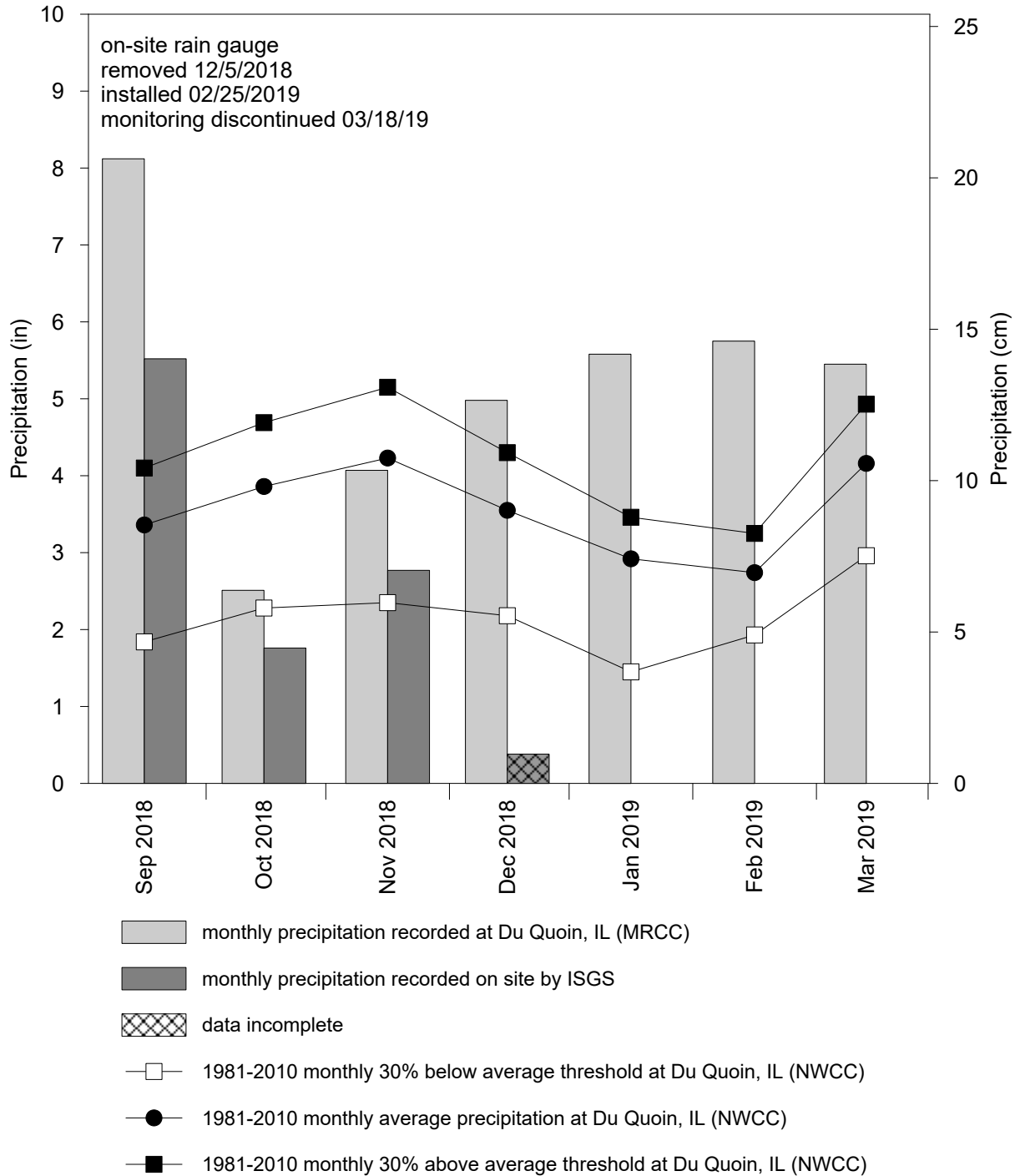
Pyramid Site EC25 Wetland Mitigation Site September 1, 2018 through August 31, 2019

Depth to Water
in Monitoring Wells - Southwest



Pyramid Site EC25 Wetland Mitigation Site September 2018 through March 2019

Total Monthly Precipitation Recorded on Site and at
Du Quoin, IL (MRCC station #112483)



HARRISBURG, SITE 2
WETLAND MITIGATION SITE

ISGS #78

IL 14

FAP 857

Sequence #547

Saline County, near Harrisburg, Illinois

Primary Project Manager: Geoffrey E. Pociask

Secondary Project Manager: Audra M. Noyes

SITE HISTORY

- October 2007: Construction began at the wetland mitigation site.
- March 2008: ISGS was tasked by IDOT to monitor the site for performance standards as outlined in the wetland mitigation plan, and post-construction water-level monitoring was initiated.
- May 2008: Construction at the wetland mitigation site was completed.
- March 2019: The ISGS was notified by IDOT that post-construction monitoring was complete.

WETLAND HYDROLOGY CALCULATION FOR 2019

Jurisdictional wetland hydrology area was not estimated for the 2019 growing season. IDOT discontinued monitoring of this site on 3/28/2019. As only a portion of the growing season was evaluated for hydrology, the data record is not adequate for providing a complete analysis. The hydrologic data that were collected during the 2018-2019 monitoring period are provided in following pages of this site summary.

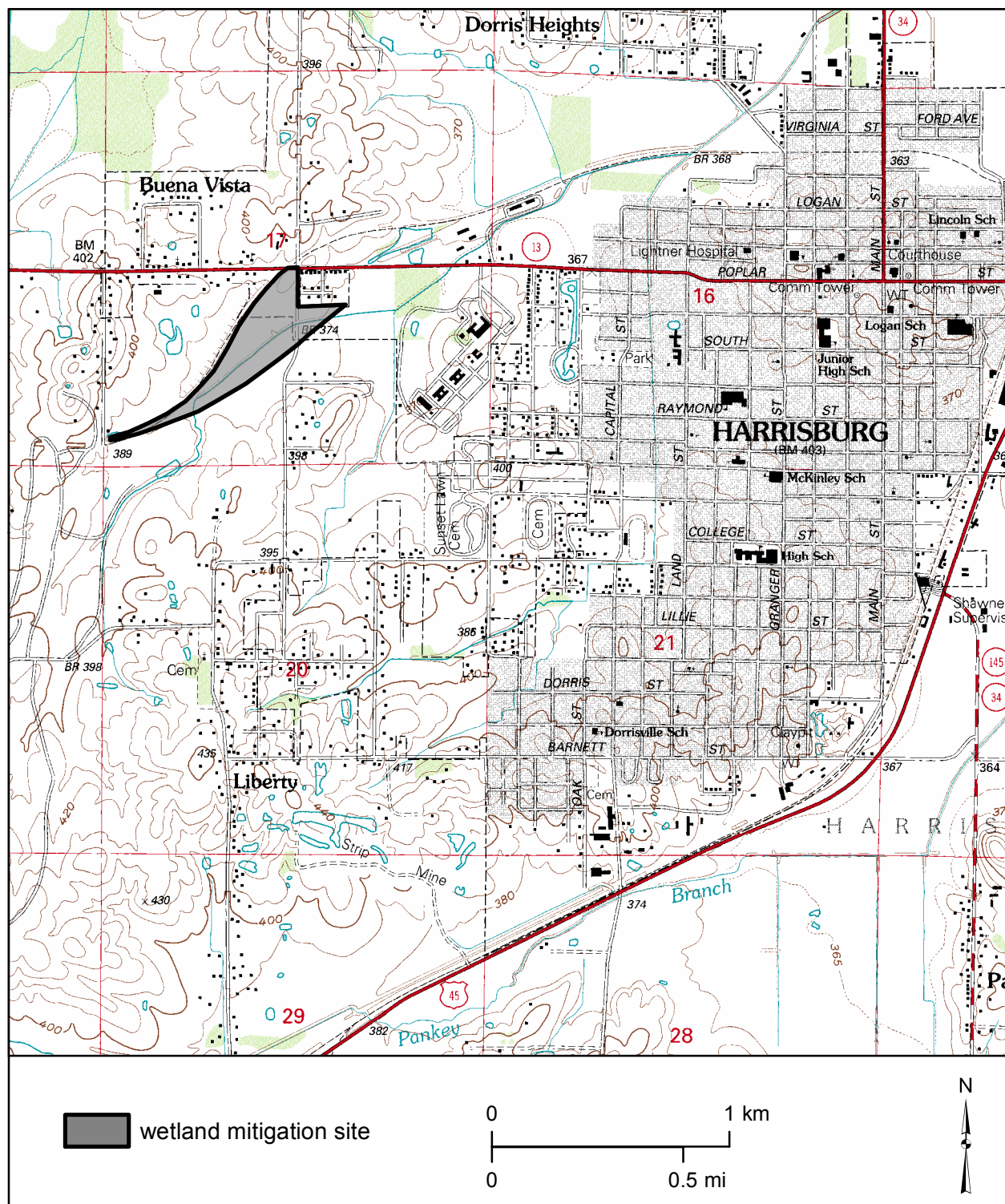
PLANNED FUTURE ACTIVITIES

- The monitoring network will be removed as time allows.

Harrisburg, Site 2 Wetland Mitigation Site (IL 14, FAP 857)

General Study Area and Vicinity

from the USGS Topographic Series, Harrisburg, IL, 7.5-minute Quadrangle (USGS 1961)
contour interval is 5 feet

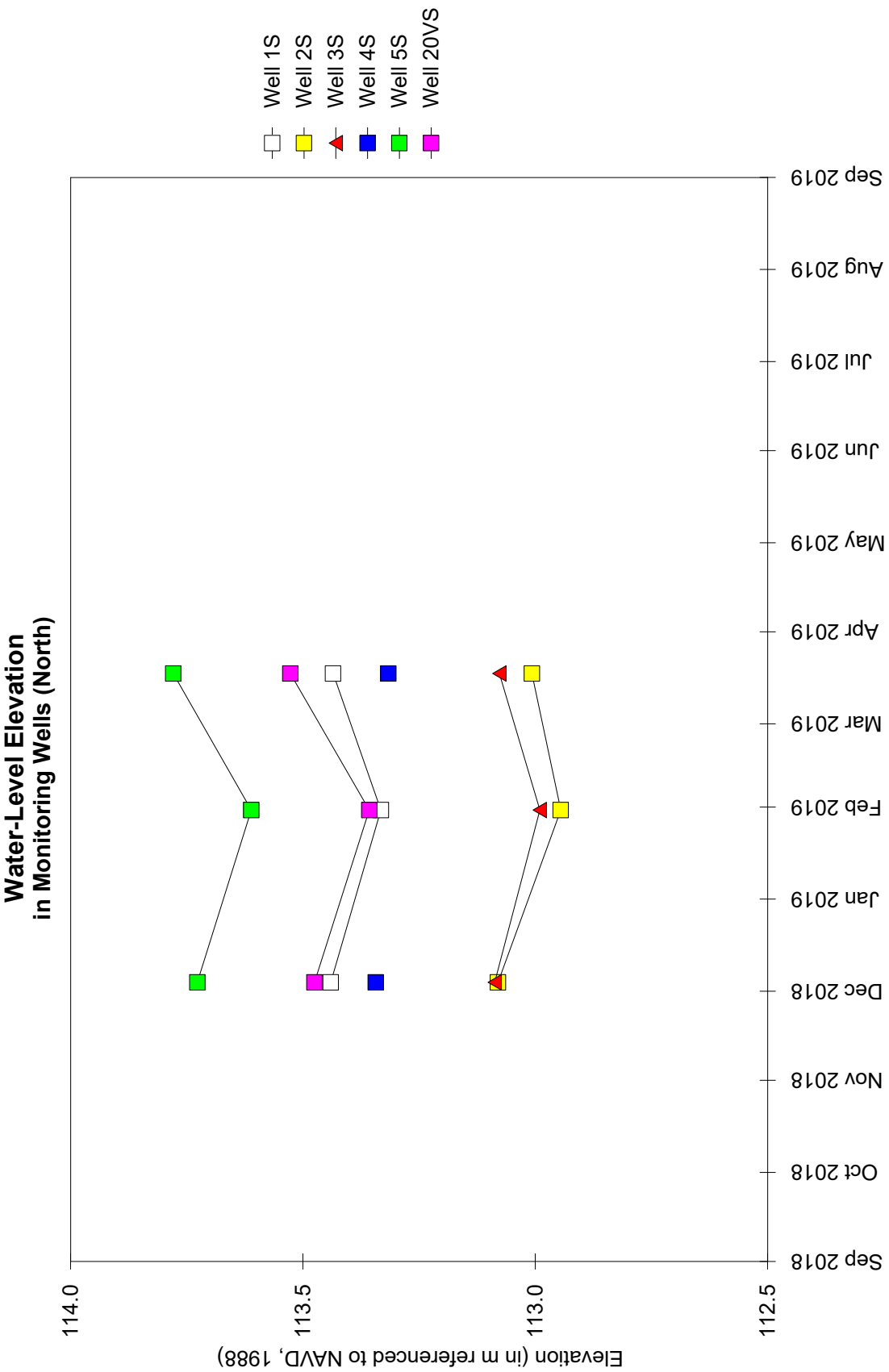


Harrisburg, Site 2 Wetland Mitigation Site (IL 14, FAP 857) Monitoring Network 2019

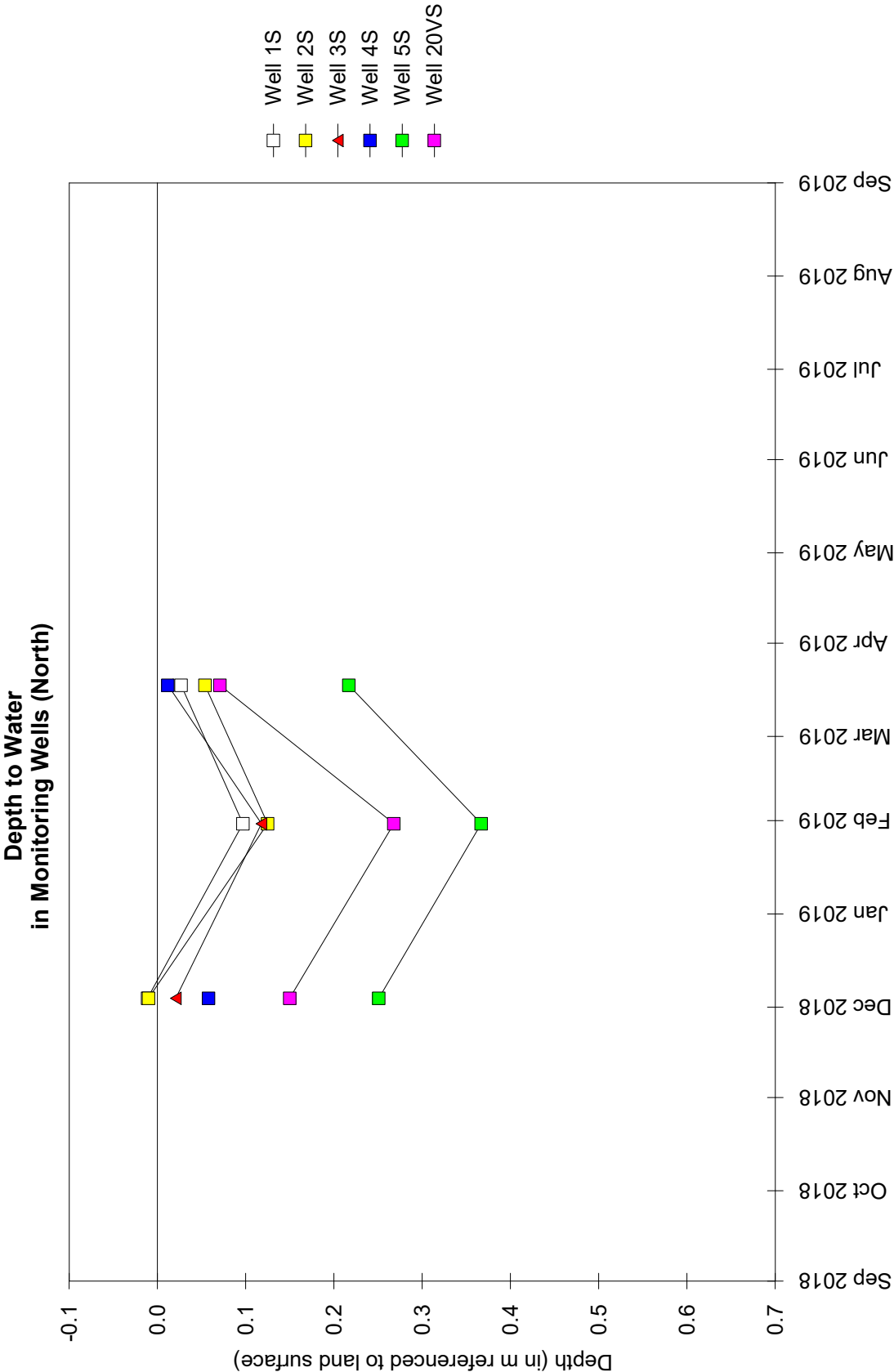
Map based on imagery available from Esri (Esri 2019)



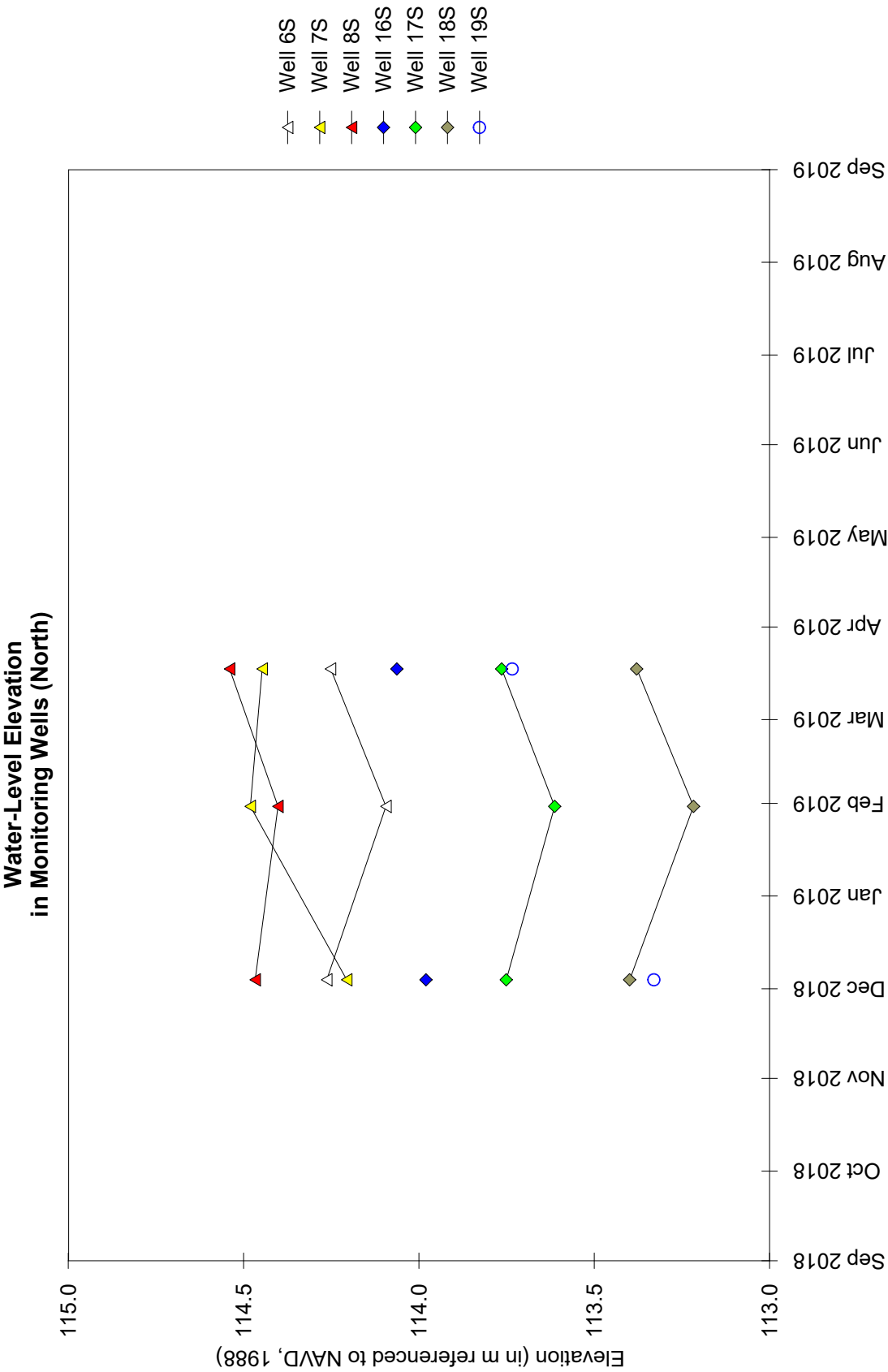
Harrisburg, Site 2 Wetland Mitigation Site September 1, 2018 through August 31, 2019



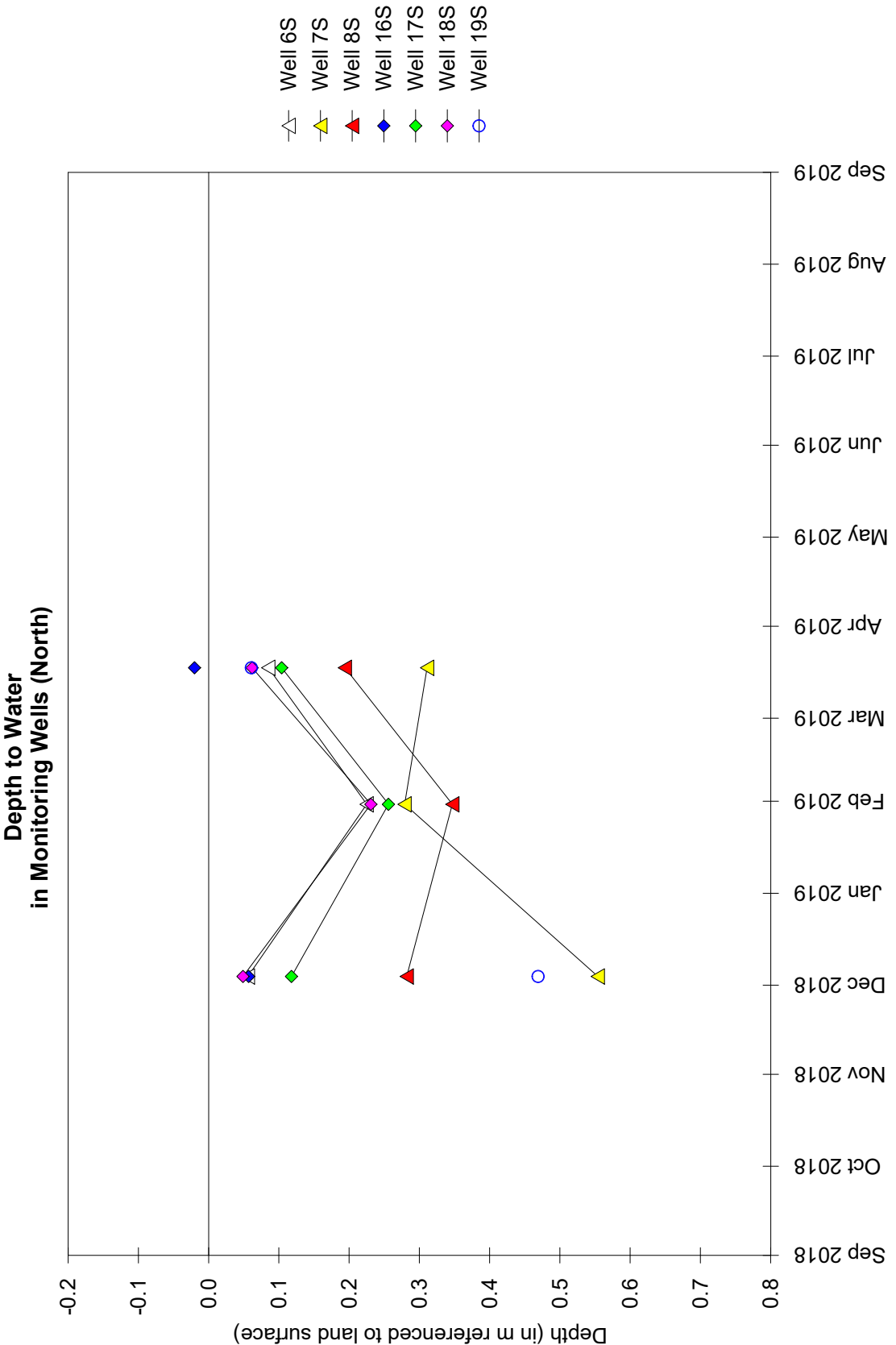
Harrisburg, Site 2 Wetland Mitigation Site September 1, 2018 through August 31, 2019



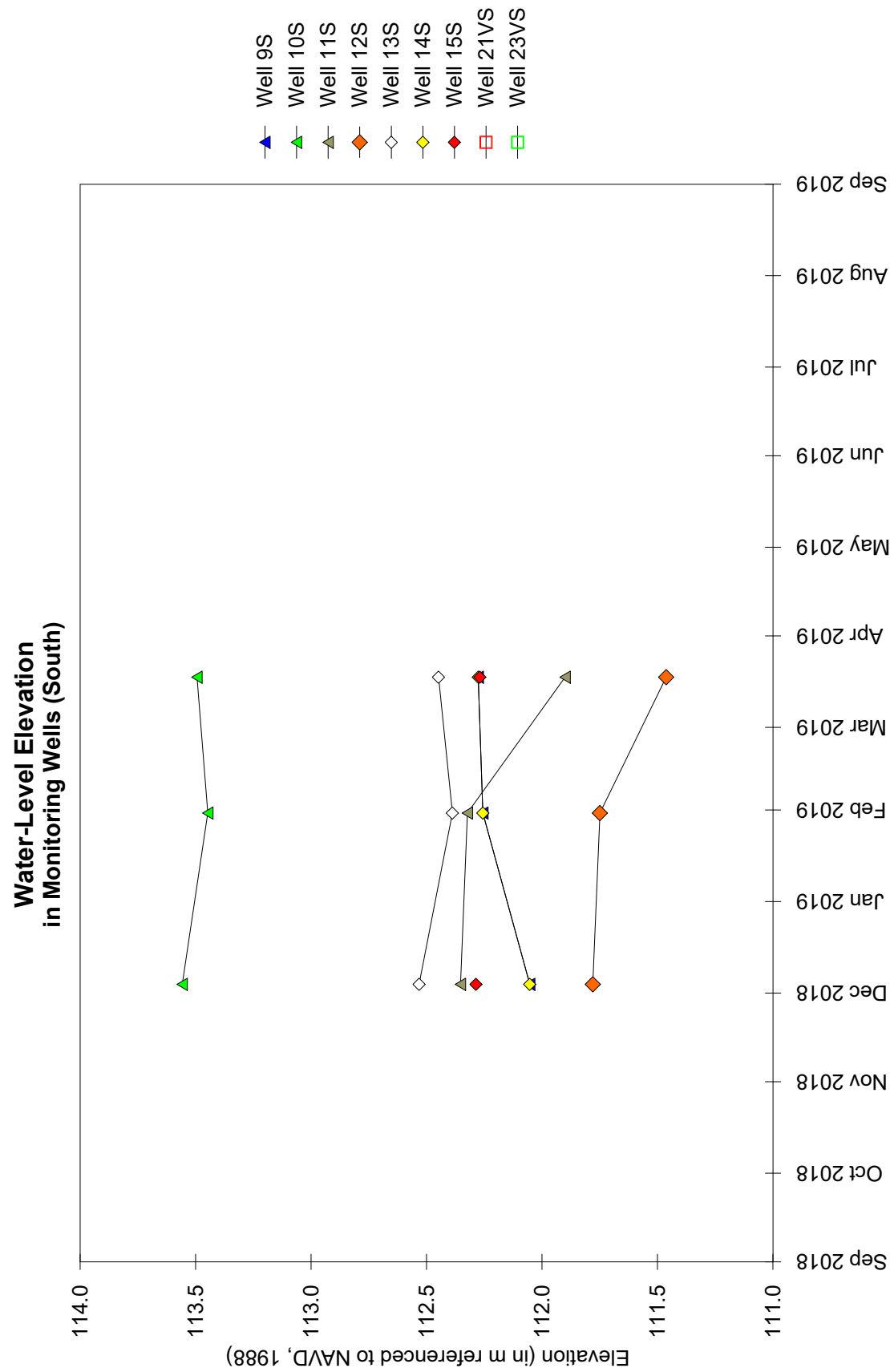
Harrisburg, Site 2 Wetland Mitigation Site September 1, 2018 through August 31, 2019



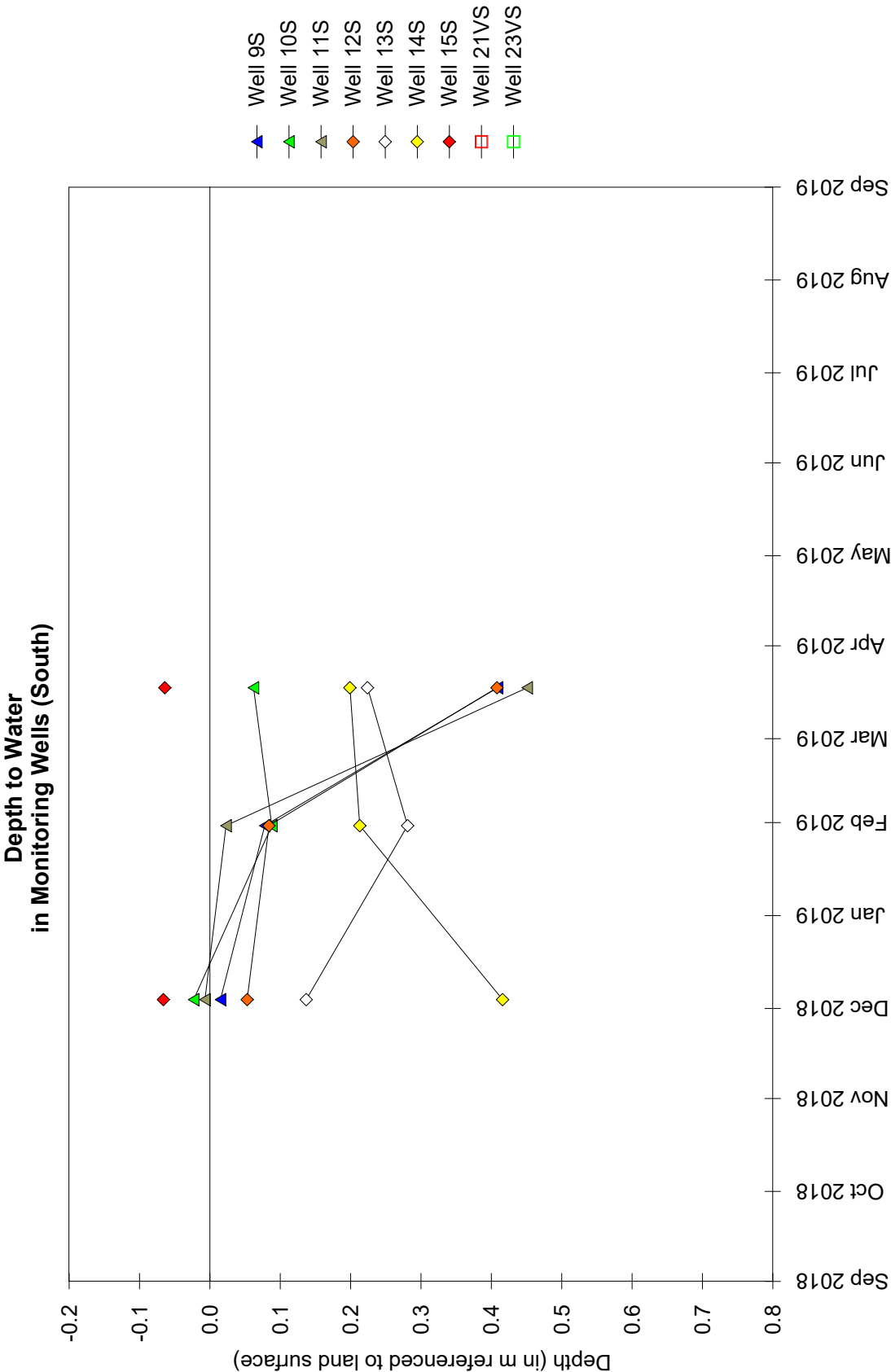
Harrisburg, Site 2 Wetland Mitigation Site
September 1, 2018 through August 31, 2019



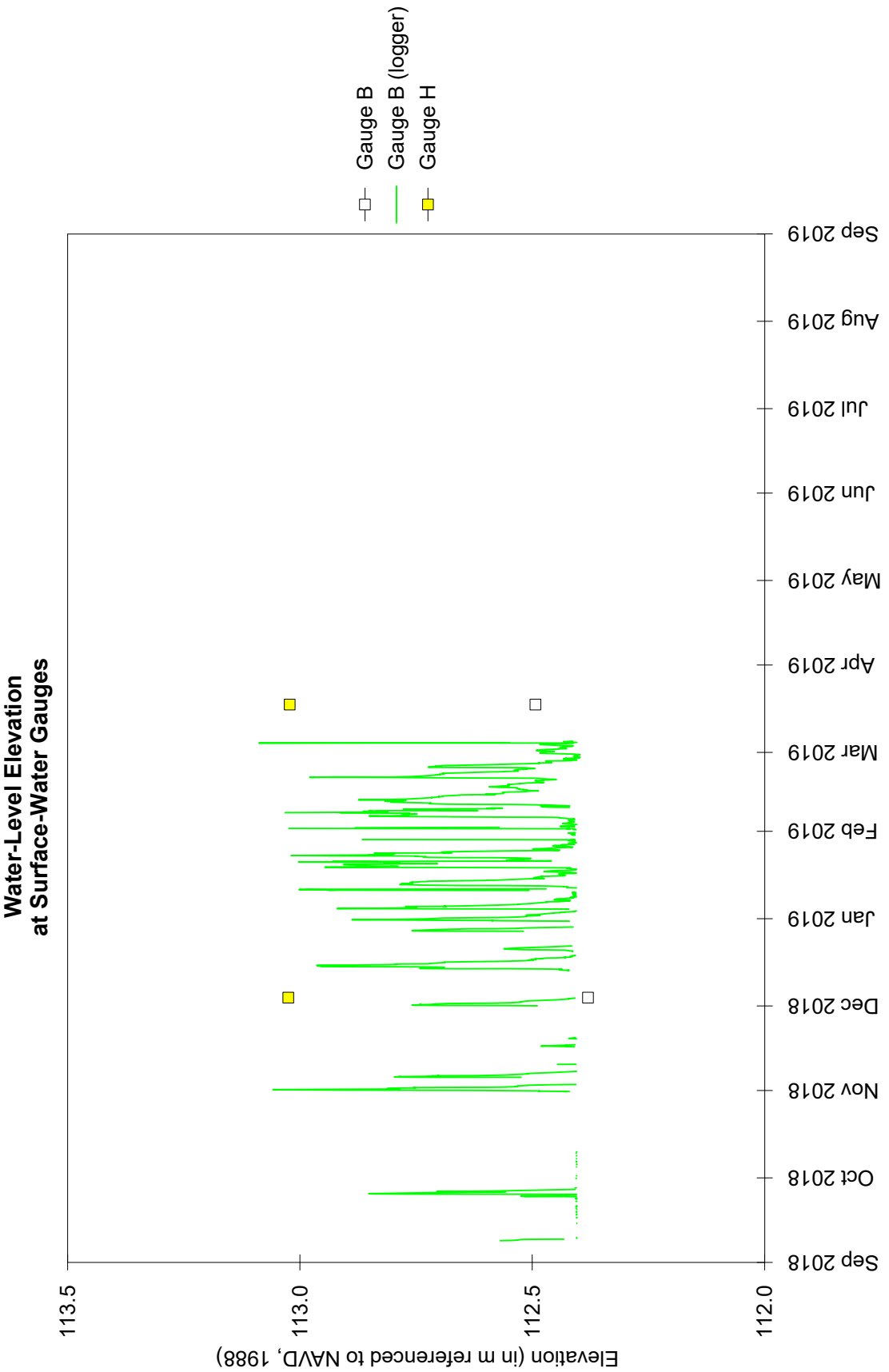
Harrisburg, Site 2 Wetland Mitigation Site September 1, 2018 through August 31, 2019



Harrisburg, Site 2 Wetland Mitigation Site September 1, 2018 through August 31, 2019

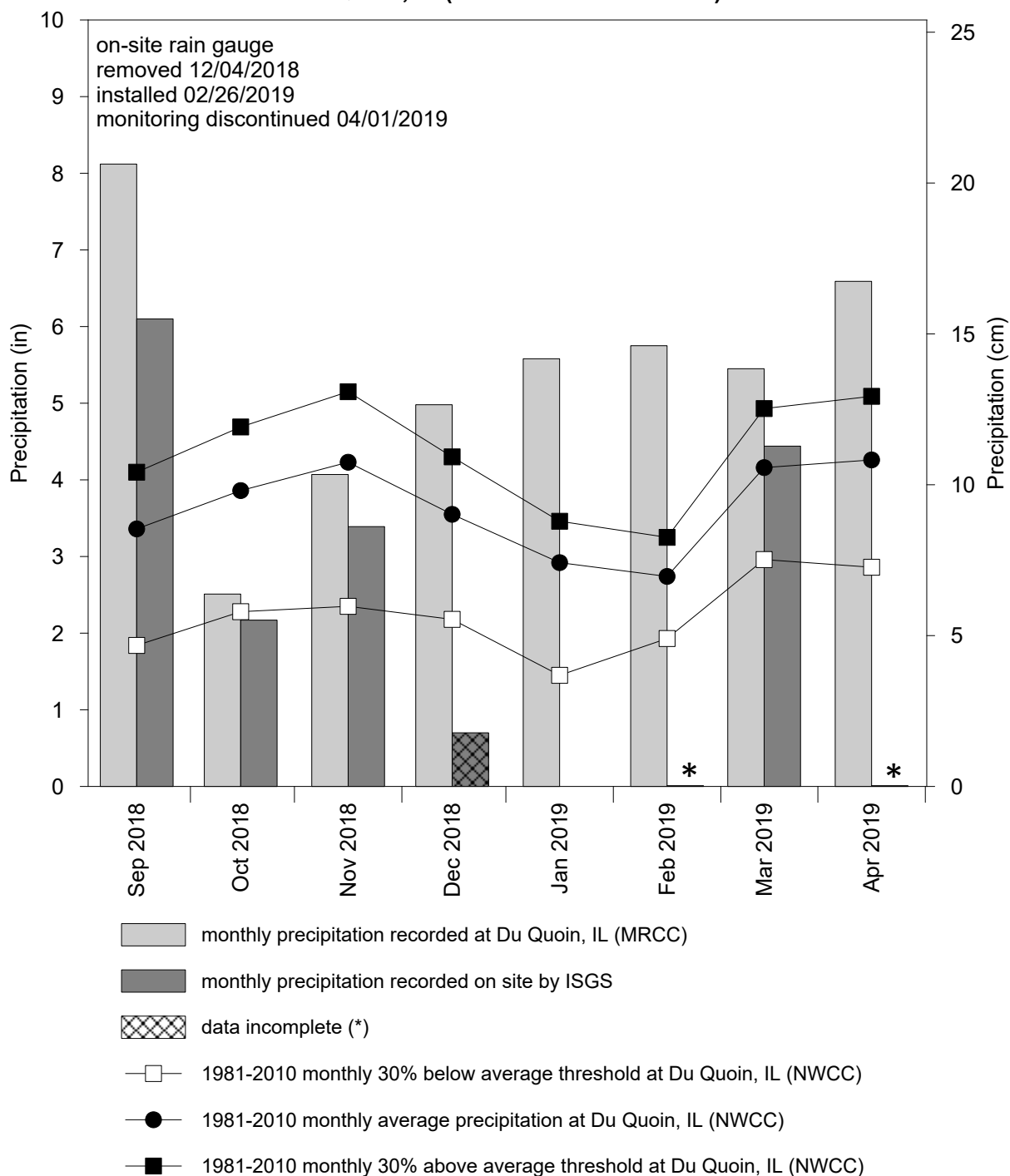


Harrisburg, Site 2 Wetland Mitigation Site
September 1, 2018 through August 31, 2019



Harrisburg Site 2 Wetland Mitigation Site September 2018 through April 2019

Total Monthly Precipitation Recorded on Site and at Du Quoin, IL (MRCC station #112483)



**MAX CREEK
WETLAND MITIGATION SITE**

ISGS #80

IL 147

FAS 932

Sequence #8717A

Johnson County, near Simpson, Illinois

Primary Project Manager: Geoffrey E. Pociask

Secondary Project Manager: Audra M. Noyes

SITE HISTORY

- December 2008: Water-level monitoring was initiated.
- August 2009: Construction at the wetland mitigation site began.
- Spring 2011: ISGS was notified by IDOT to begin post-construction monitoring.
- March 2019: The ISGS was notified by IDOT that post-construction monitoring was complete.

WETLAND HYDROLOGY CALCULATION FOR 2019

Jurisdictional wetland hydrology area was not estimated for the 2019 growing season. IDOT discontinued monitoring of this site on 3/28/2019. As only a portion of the growing season was evaluated for hydrology, the data record is not adequate for providing a complete analysis. The hydrologic data that were collected during the 2018-2019 monitoring period are provided in following pages of this site summary.

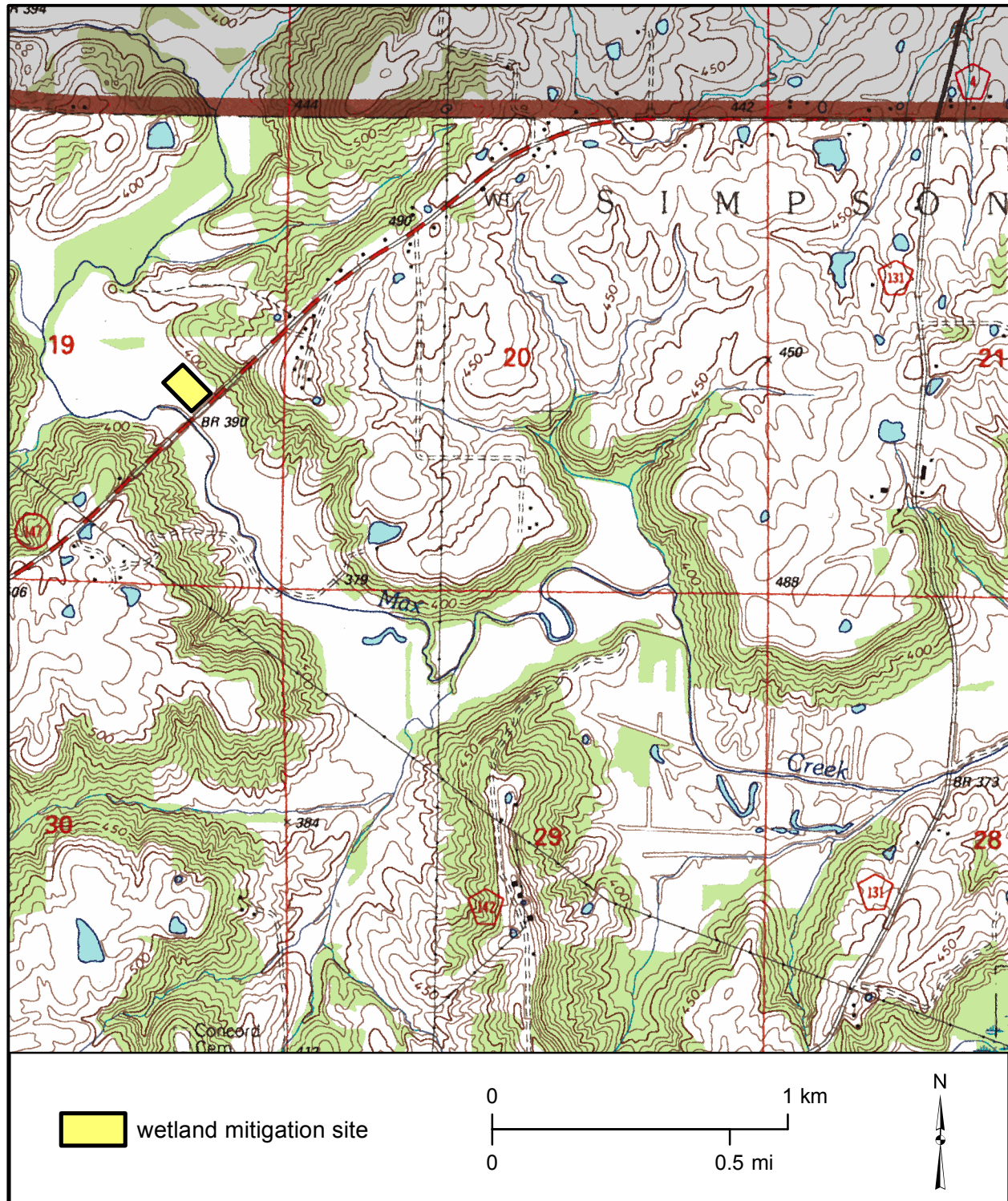
PLANNED FUTURE ACTIVITIES

- The monitoring network will be removed as time allows.

Max Creek Wetland Mitigation Site (IL 147, FAS 932)

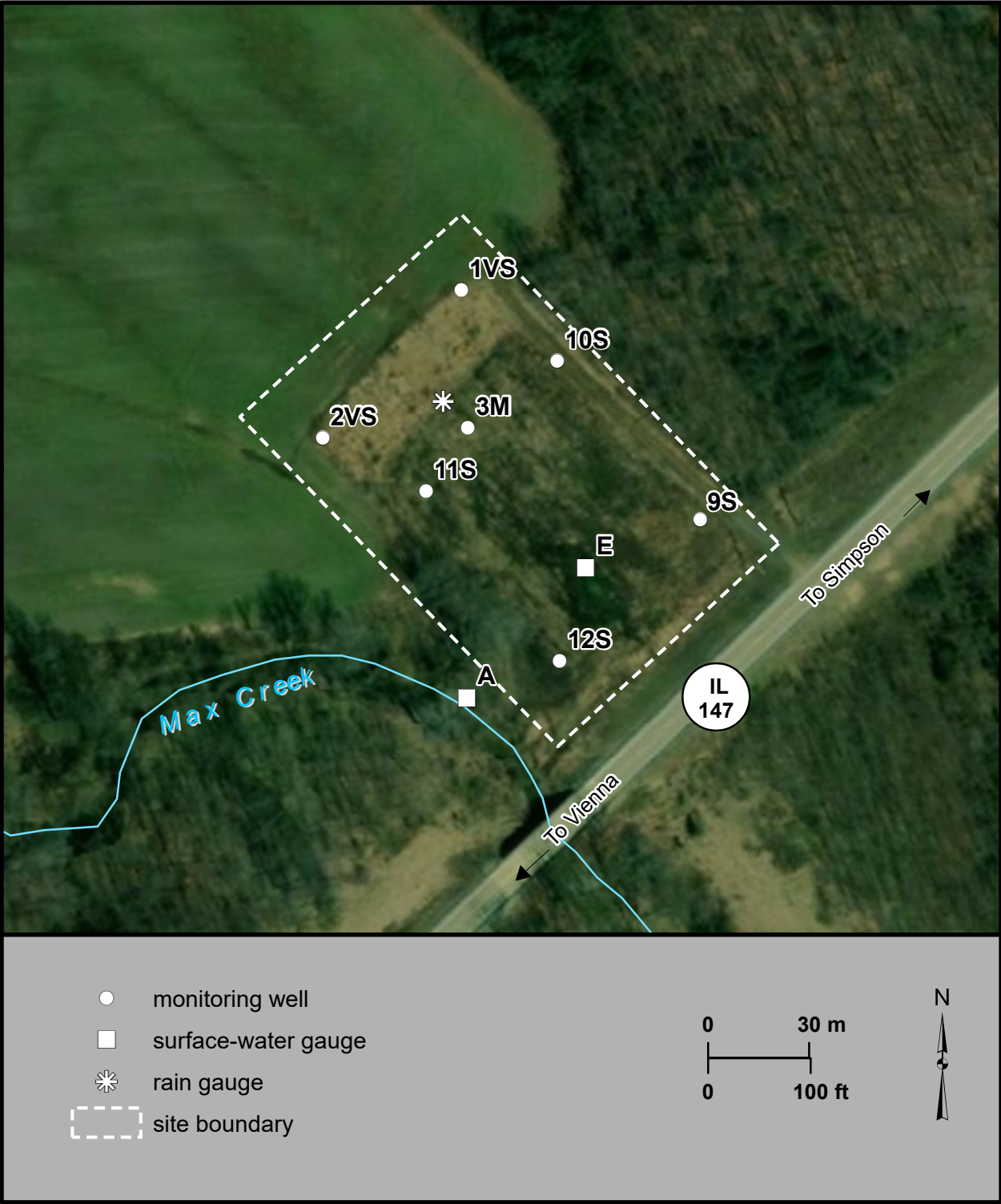
General Study Area and Vicinity

from the USGS Topographic Series, Bloomfield, IL 7.5-minute Quadrangle (USGS 1966)
contour interval is 10 feet

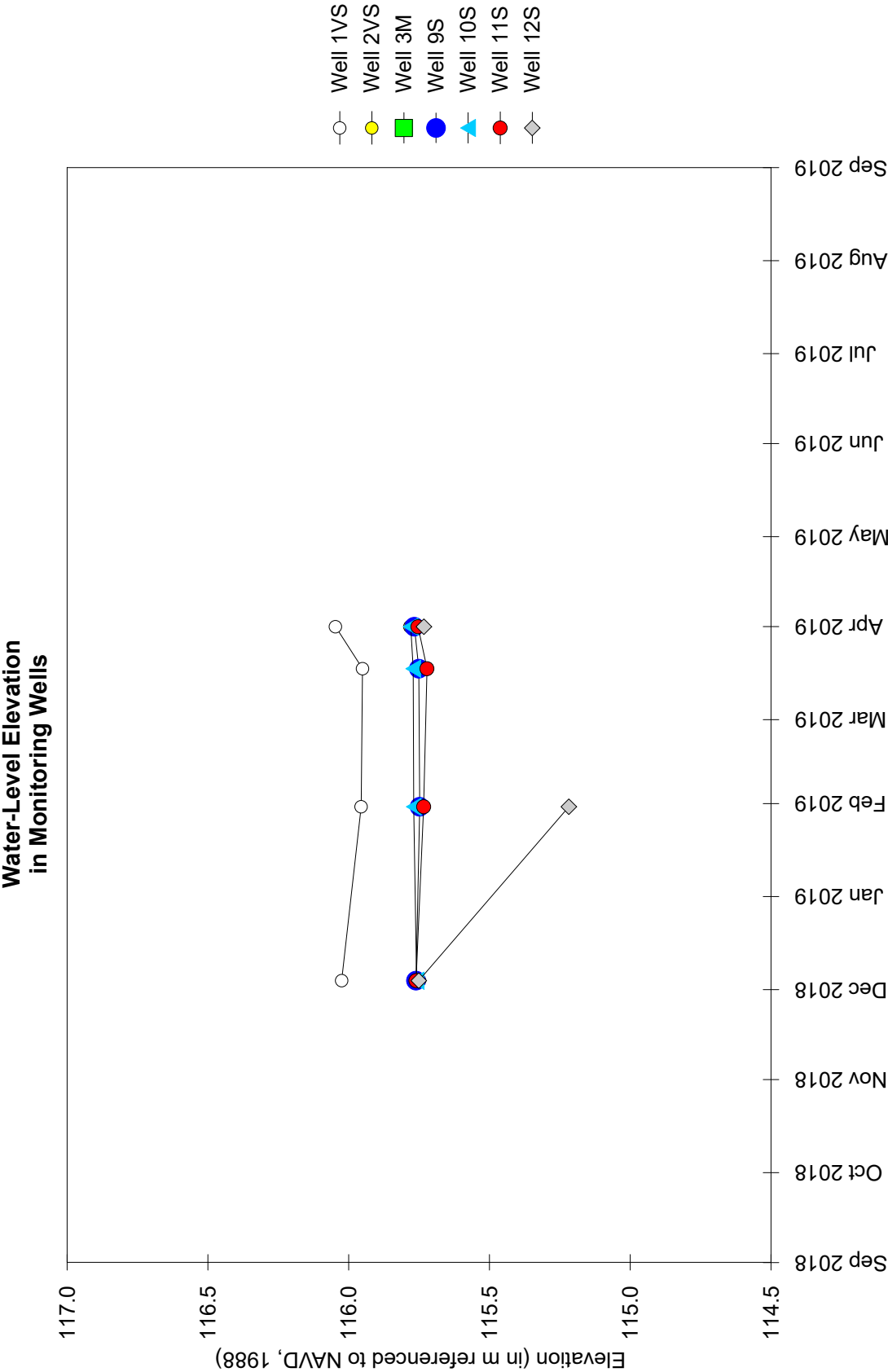


**Max Creek Wetland Mitigation Site
(IL 147, FAS 932)
Monitoring Network 2019**

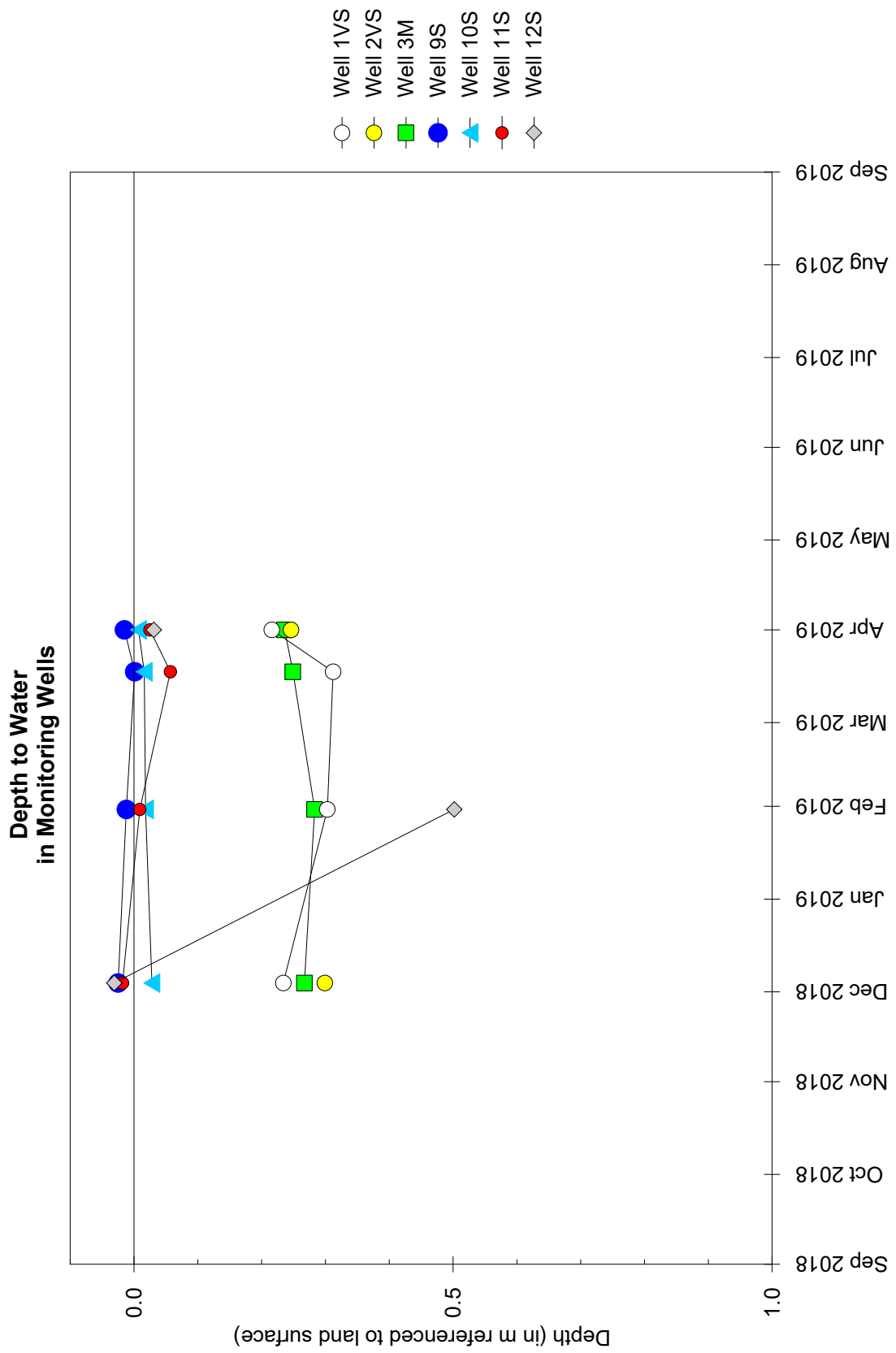
Map based on 2012 Farm Service Agency digital orthophotography, Johnson County, Illinois (USDA-FSA 2012)



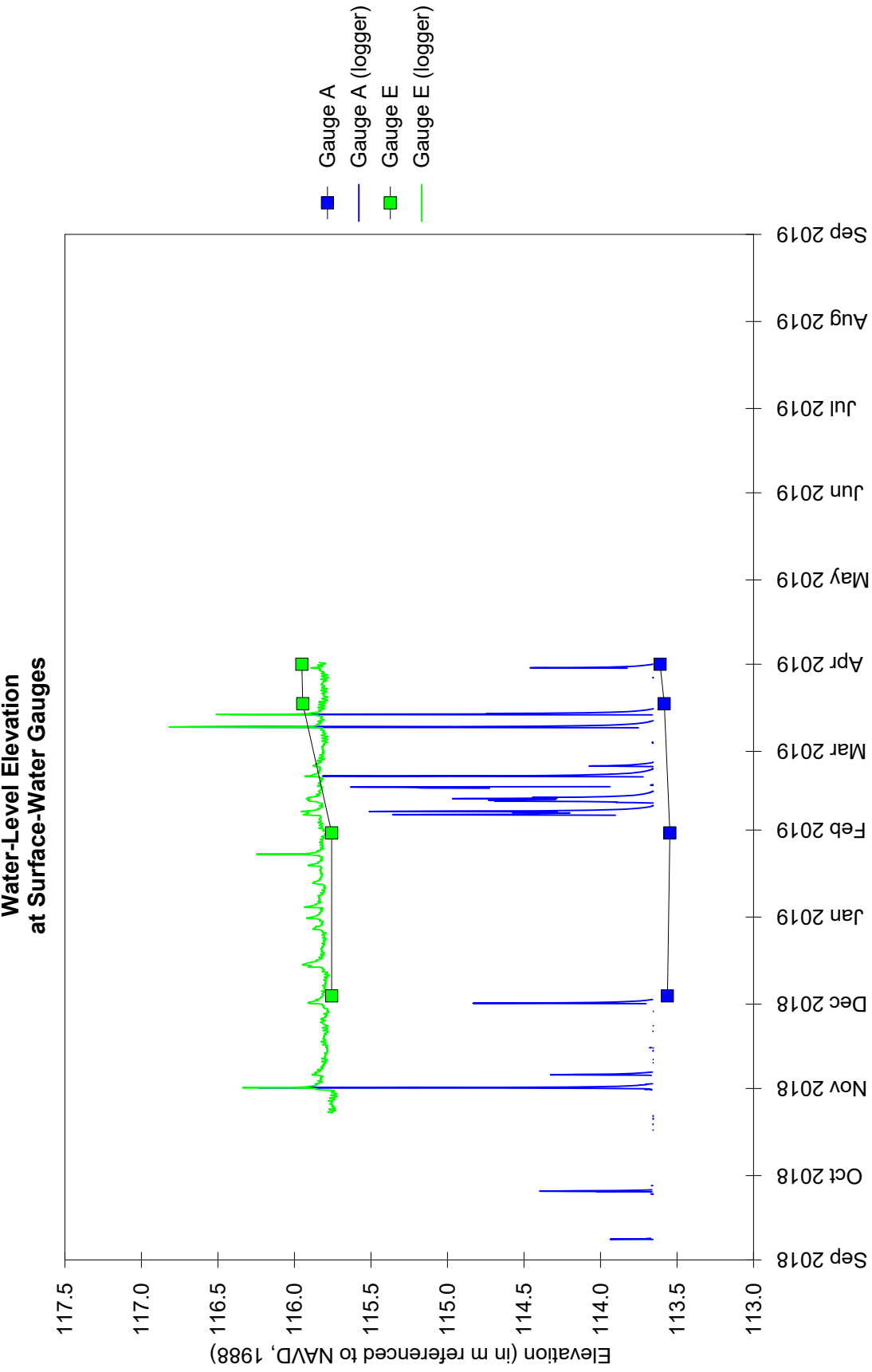
Max Creek Wetland Mitigation Site **September 1, 2018 through August 31, 2019**



Max Creek Wetland Mitigation Site **September 1, 2018 through August 31, 2019**

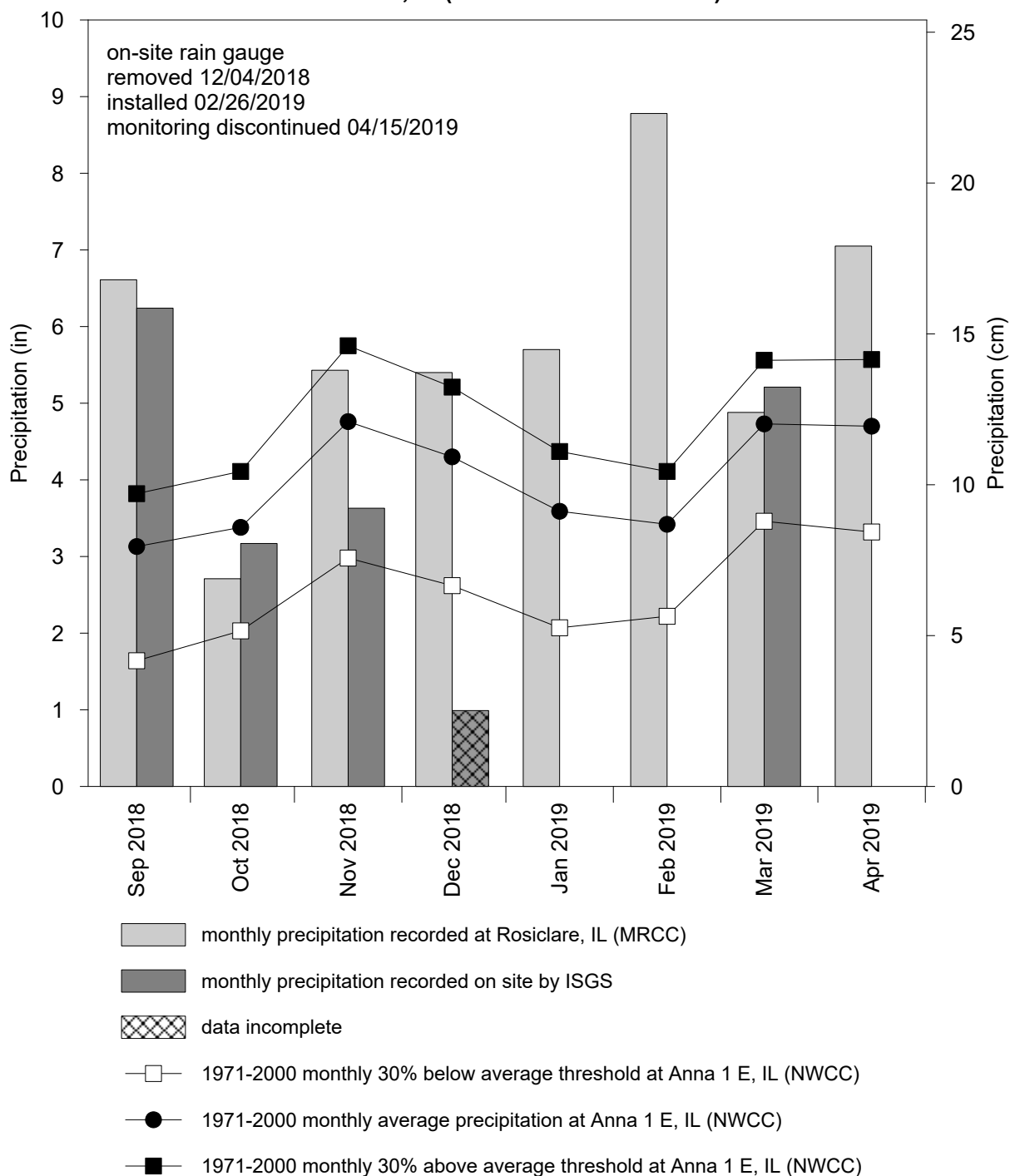


Max Creek Wetland Mitigation Site
September 1, 2018 through August 31, 2019



Max Creek Wetland Mitigation Site September 2018 through April 2019

Total Monthly Precipitation Recorded on Site and at Rosiclare, IL (MRCC station #117487)



**LAWRENCE COUNTY
WETLAND MITIGATION BANK**

ISGS #82

Sequence #14912

Lawrence County, near Lawrenceville, Illinois

Primary Project Manager: Steven E. Benton

Secondary Project Manager: Audra M. Noyes

SITE HISTORY

- June 2009: An Initial Site Evaluation report was submitted to IDOT on June 18, 2009.
- December 2011: A Level II hydrologic characterization report (ISGS Open-File Series 2011-4) was submitted to IDOT.
- April 2013: The wetland banking instrument for the Lawrence County Wetland Mitigation Bank was approved.
- November 2013: Construction of the wetland bank was completed.

WETLAND HYDROLOGY CALCULATION FOR 2019

The target compensation area for the Lawrence County Wetland Mitigation Bank is 13.62 ha (33.65 ac). Using the 1987 Manual (Environmental Laboratory 1987), 15.74 ha (38.90 ac) of a total site area of 25.71 ha (63.52 ac), satisfied wetland hydrology criteria for greater than 5% of the 2019 growing season, and 13.44 ha (33.20 ac) satisfied wetland hydrology criteria for greater than 12.5% of the growing season. Using the 2010 Midwest Region Supplement (USACE 2010), 14.99 ha (37.05 ac) satisfied wetland hydrology criteria for 14 or more consecutive days during the growing season. These estimates are based on the following factors:

- The median date that the growing season begins at Lawrenceville, Illinois is March 30, and the season lasts 221 days (MRCC 2019); 5% of the growing season is 11 days, and 12.5% of the growing season is 28 days, using the 1987 Manual. Using the 2010 Midwest Region Supplement, March 9 was the starting date of the 2019 growing season based on soil temperatures measured at the site.
- Total precipitation for the monitoring period, recorded at Lawrenceville International Airport (MRCC station #13809), was 127% of normal. Precipitation in spring 2019 (March through May) was 122% of normal. The wettest period was February to April with 165% of normal precipitation.
- The period of maximum inundation and saturation during the 2019 growing season occurred in April because of flood events on the Embarras River that lasted a total of about three weeks (3/31/19-4/7/19 and 4/14/19-4/29/19). These floods caused Beaver Pond Ditch to back-flood the site.
- In 2019, water levels measured in 18 of 23 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 5% of the growing season, and water levels measured in 13 of 23 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 12.5% of the growing season, using the 1987 Manual. In addition, using the 2010

Midwest Region Supplement, water levels in 17 of 23 soil-zone monitoring wells satisfied wetland hydrology criteria for 14 or more consecutive days of the growing season. See the tables at the end of this summary for details.

PLANNED FUTURE ACTIVITIES

- Monitoring will continue at the site until no longer required by IDOT.

WETLAND HYDROLOGY TABLES FOR 2019

Well locations meeting wetland hydrology criteria			
<i>ID</i>	<i>5% of growing season</i>	<i>12.5% of growing season</i>	<i>14 days during growing season</i>
1S	Y	Y	Y
3S	Y	Y	Y
4SR	Y	Y	Y
6S	Y	Y	Y
7S	Y	Y	Y
9S	Y	Y	Y
13S	Y	Y	Y
15S	Y	Y	Y
17S	Y	N	N
19S	N	N	N
20SR	Y	Y	Y
21S	N	N	N
22S	N	N	N
23S	N	N	N
24S	Y	Y	Y
25S	Y	N	Y
26S	Y	Y	Y
27SR	Y	N	Y
29S	Y	N	Y
30S	N	N	N
31S	Y	N	Y
32S	Y	Y	Y
33S	Y	Y	Y

Y – met wetland hydrology criteria

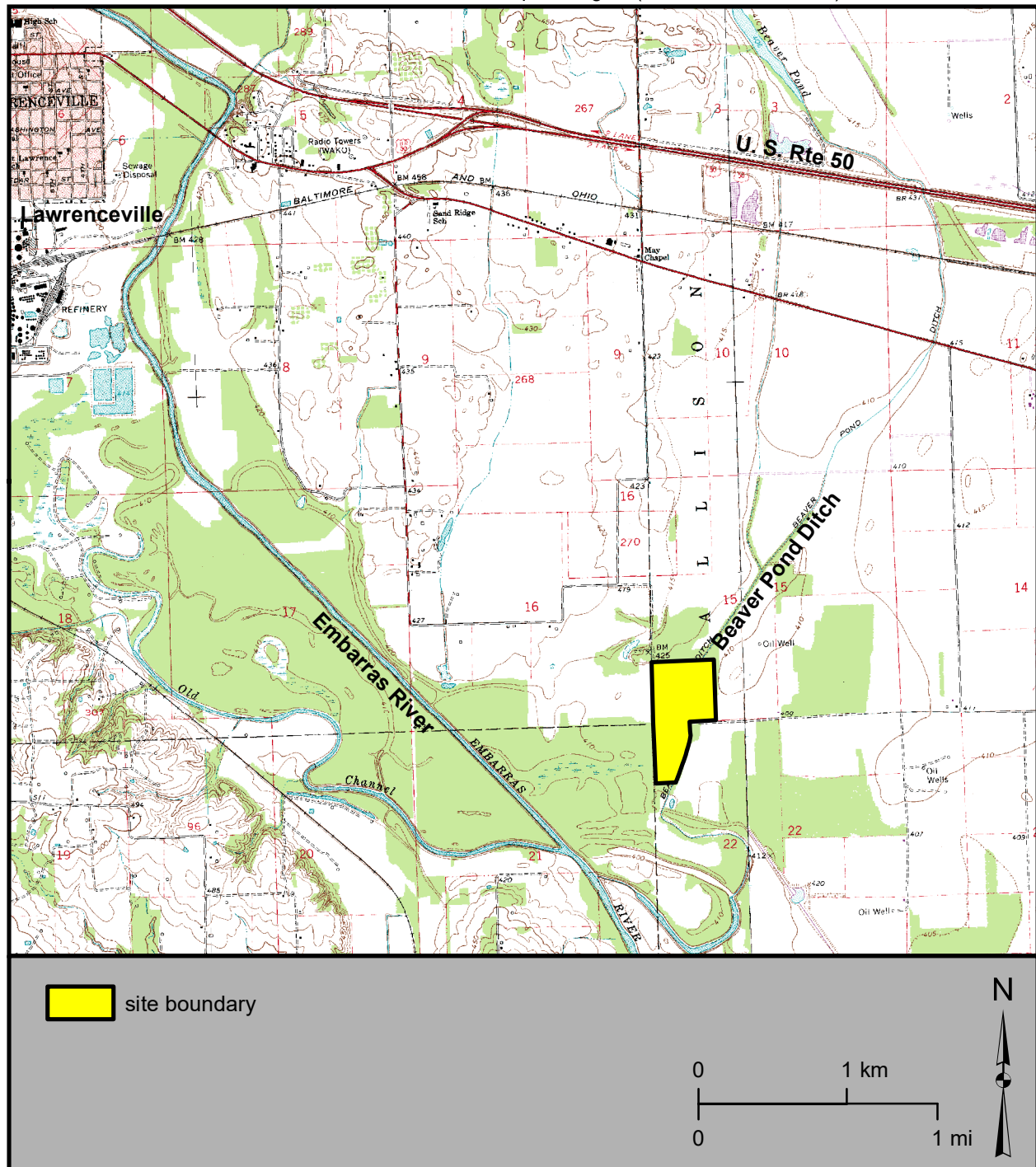
N – did not meet wetland hydrology criteria

Surface-water gauge elevations meeting wetland hydrology criteria			
<i>ID</i>	<i>5% of growing season</i>	<i>12.5% of growing season</i>	<i>14 days during growing season</i>
B	n/a	n/a	n/a
D	124.62 m (408.86 ft)	n/a	124.62 m (408.86 ft)
E	124.34 m (407.93 ft)	n/a	124.34 m (407.93 ft)
F	124.66 m (408.98 ft)	124.65 m (408.95 ft)	124.66 m (408.98 ft)
G	124.65 m (408.95 ft)	124.64 m (408.92 ft)	124.64 m (408.92 ft)
H	124.56 m (408.66 ft)	124.54 m (408.59 ft)	124.56 m (408.66 ft)

n/a – insufficient data to determine an elevation

Lawrence County Wetland Mitigation Bank General Study Area and Vicinity

from the USGS Topographic Series, Lawrenceville, IL,
and Vincennes, IN-IL, 7.5-minute quadrangles (USGS 1965a, 1965b)



Lawrence County Wetland Mitigation Bank

Estimated Areal Extent of 2019 Wetland Hydrology

September 1, 2018 through August 31, 2019

Map based on 2014 Farm Service Agency digital orthophotography, Lawrence County, Illinois (USDA-FSA 2014)



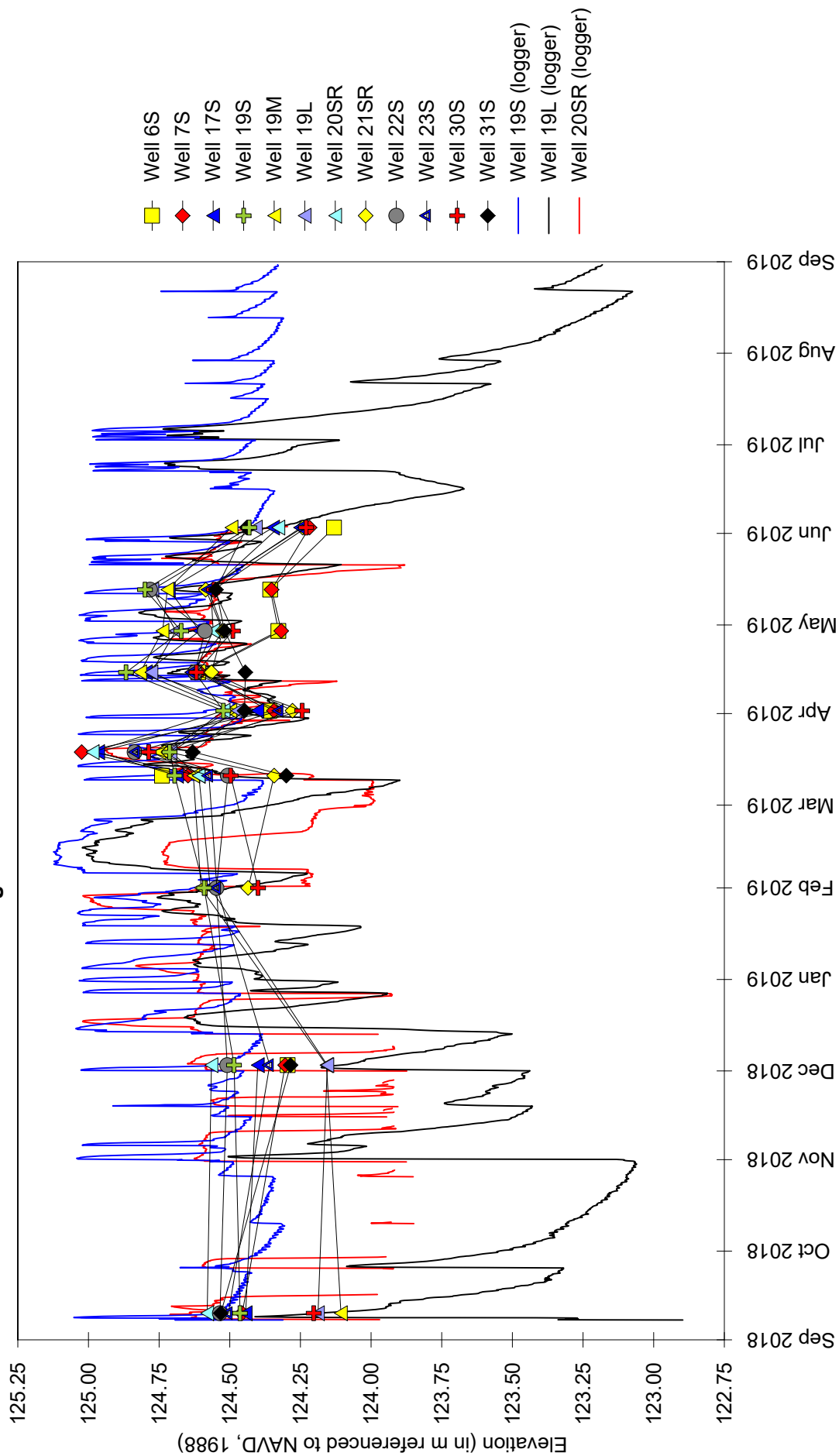
2019 Wetland Hydrology

- >5% of growing season (1987 Manual)
- >12,5% of growing season (1987 Manual)
- 14 days or more (2010 Midwest Region Supplement)

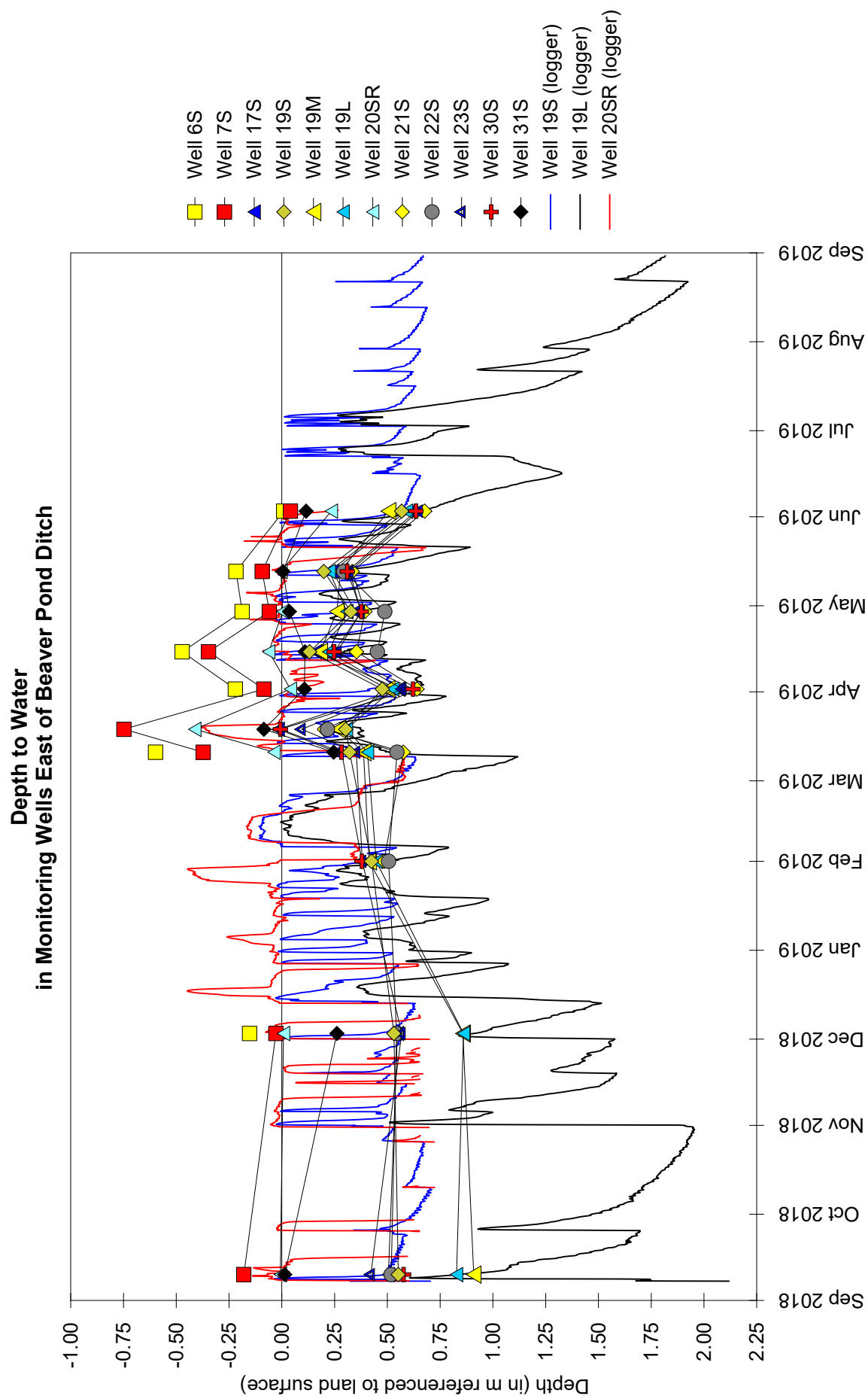
- monitoring well
- surface-water gauge
- water-control structures
- site boundary

Lawrence County Wetland Bank September 1, 2018 through August 31, 2019

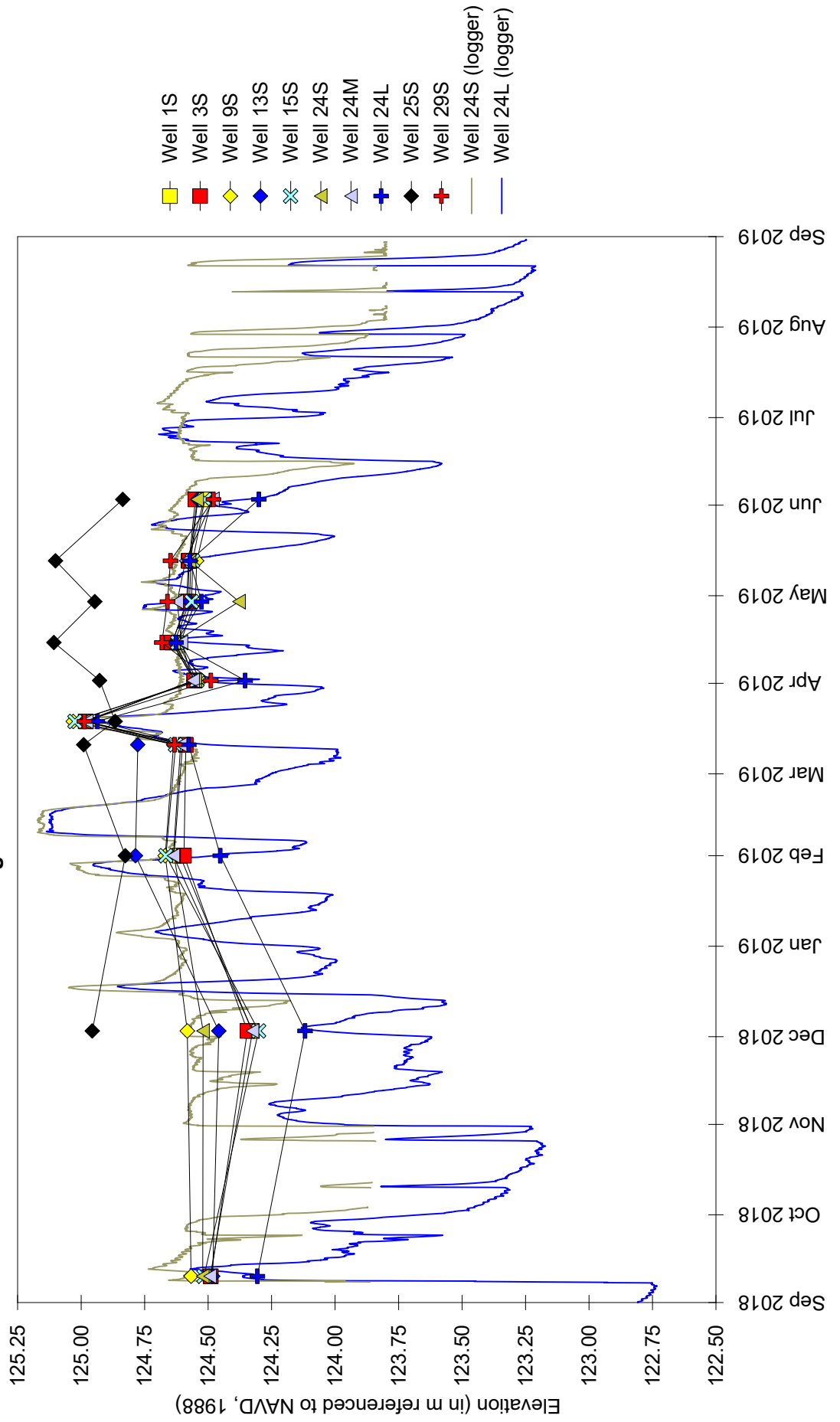
Water-Level Elevation in Monitoring Wells East of Beaver Pond Ditch



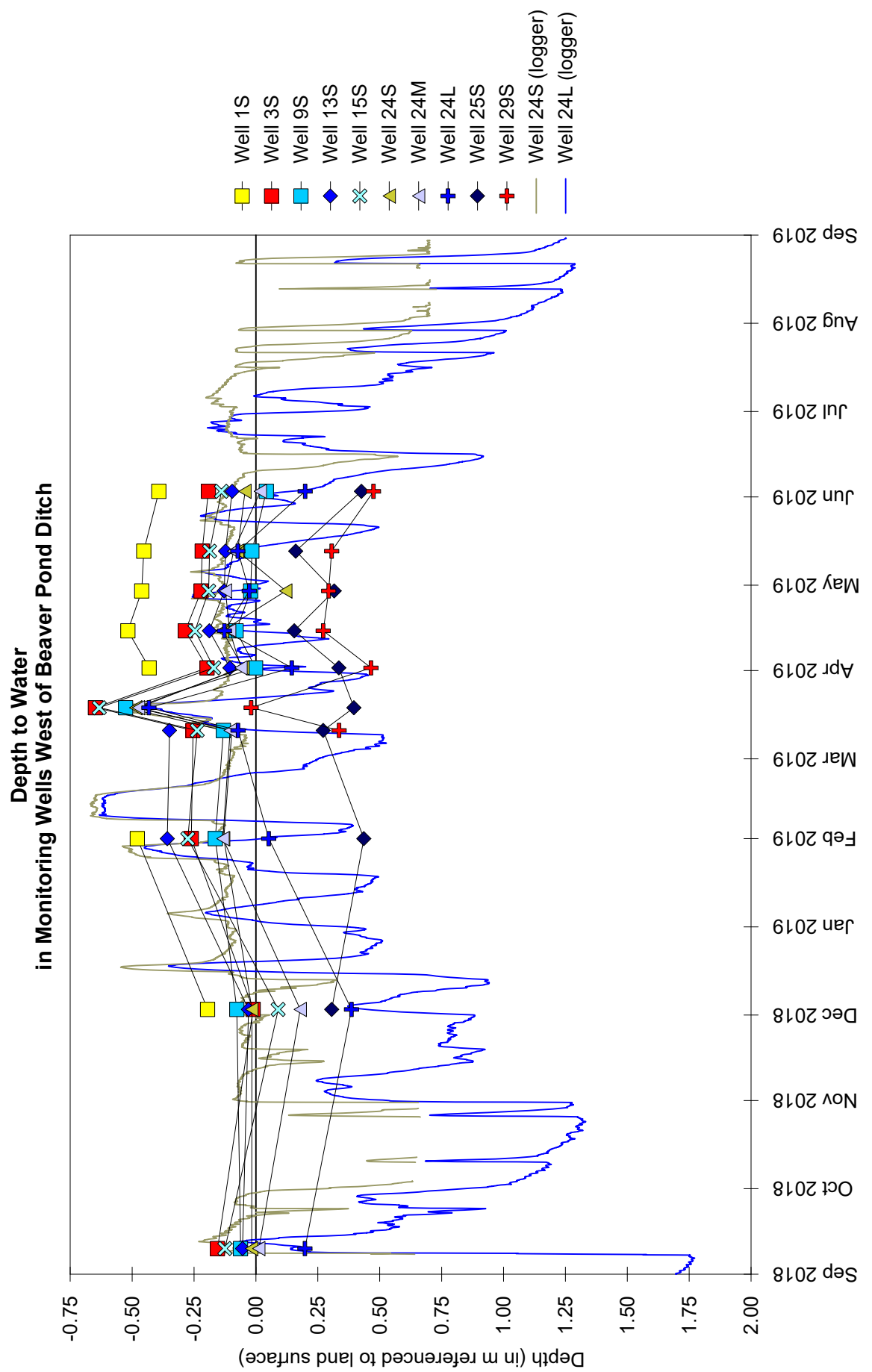
Lawrence County Wetland Mitigation Bank September 1, 2018 through August 31, 2019



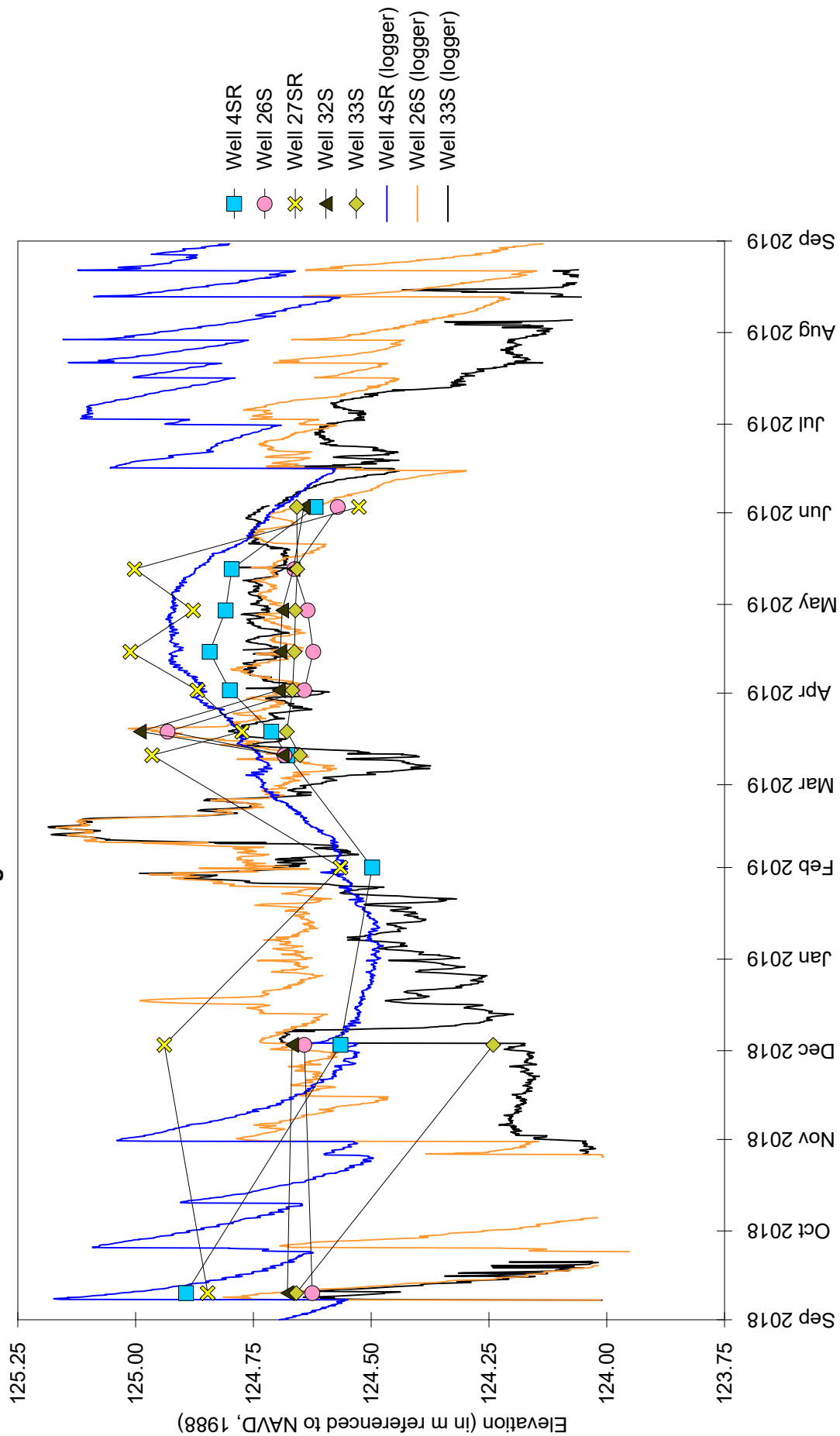
Lawrence County Wetland Bank September 1, 2018 through August 31, 2019 Water-Level Elevation in Monitoring Wells West of Beaver Pond Ditch



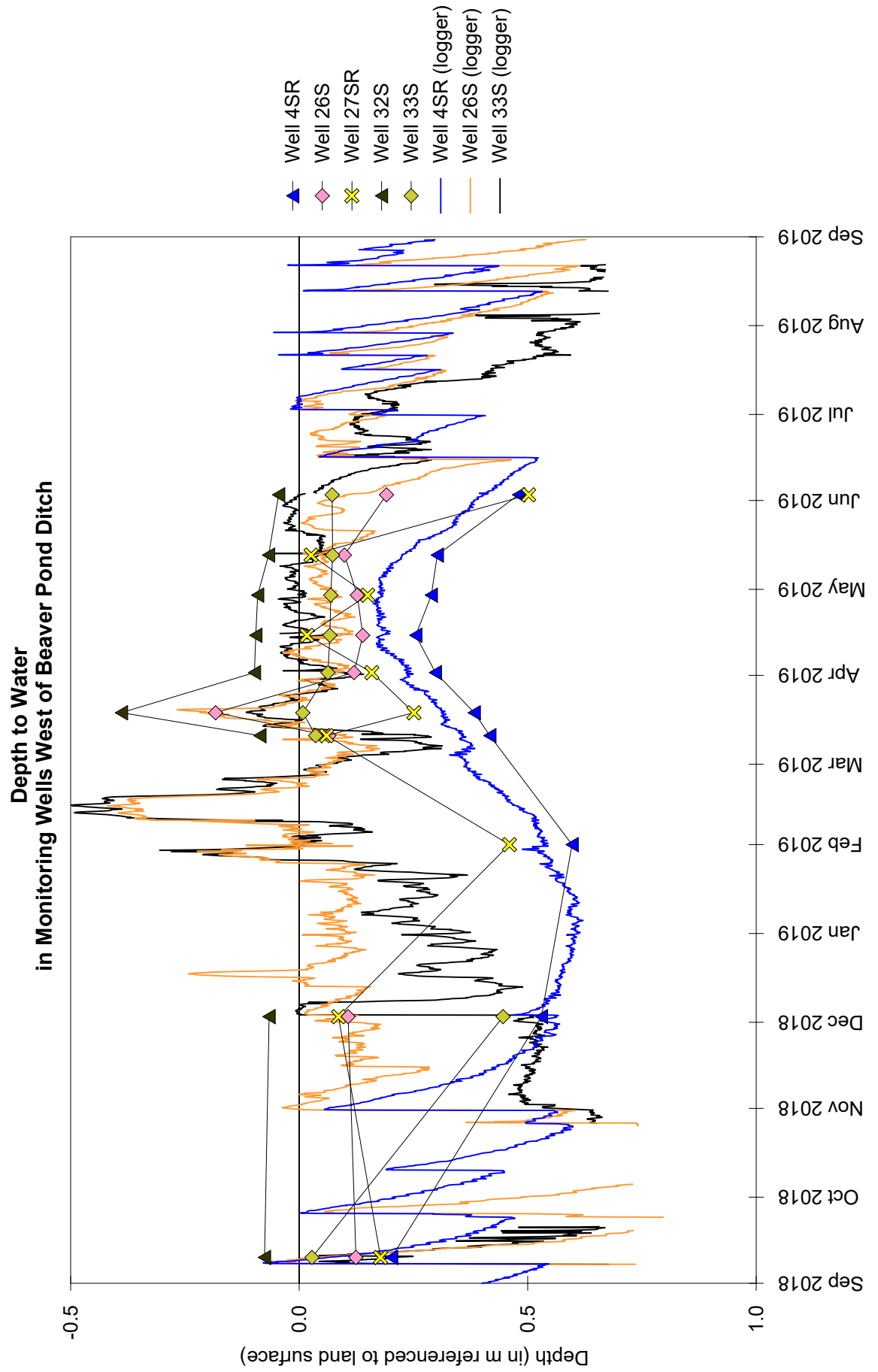
Lawrence County Wetland Bank September 1, 2018 through August 31, 2019



Lawrence County Wetland Bank September 1, 2018 through August 31, 2019 Water-Level Elevation in Monitoring Wells West of Beaver Pond Ditch

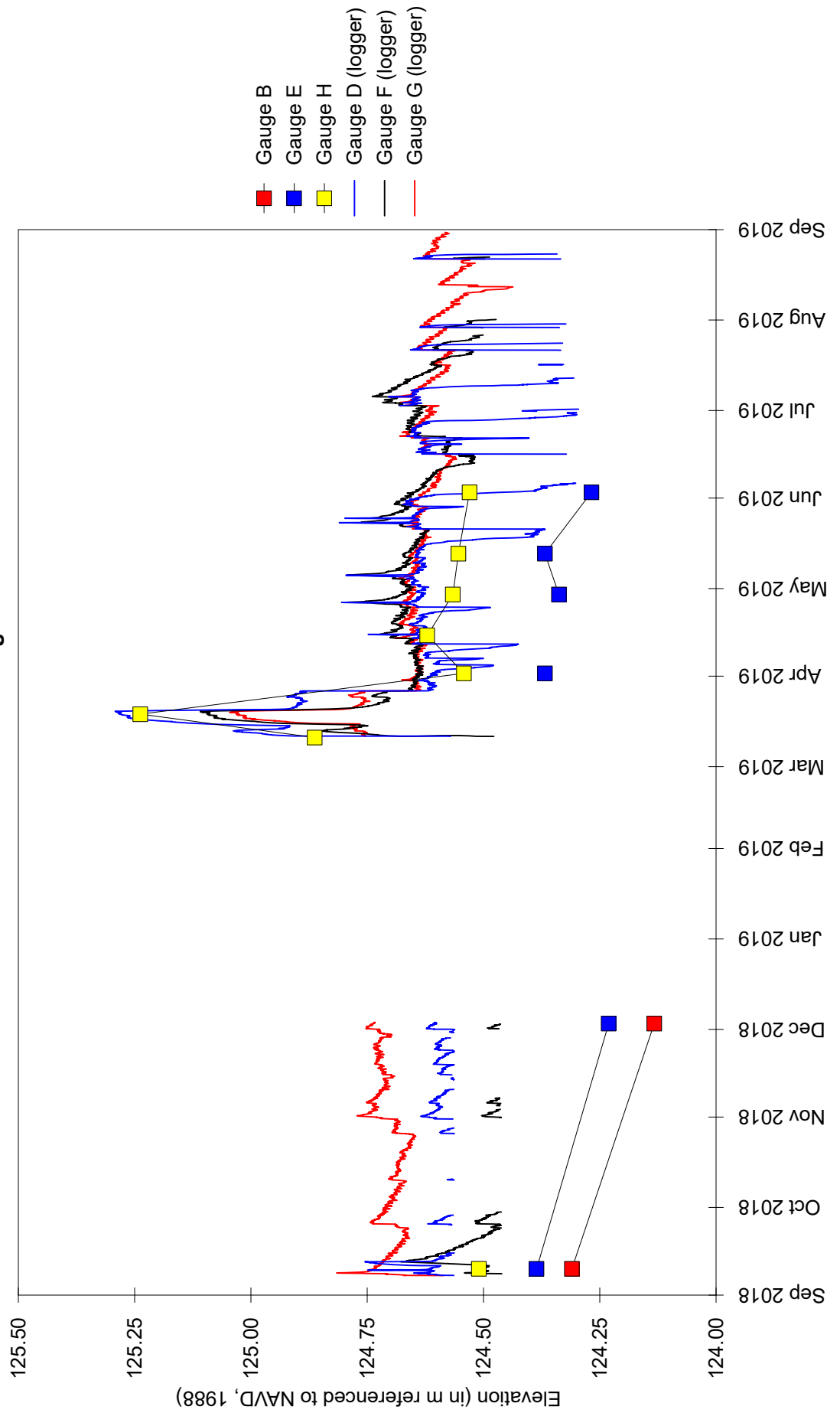


Lawrence County Wetland Bank September 1, 2018 through August 31, 2019



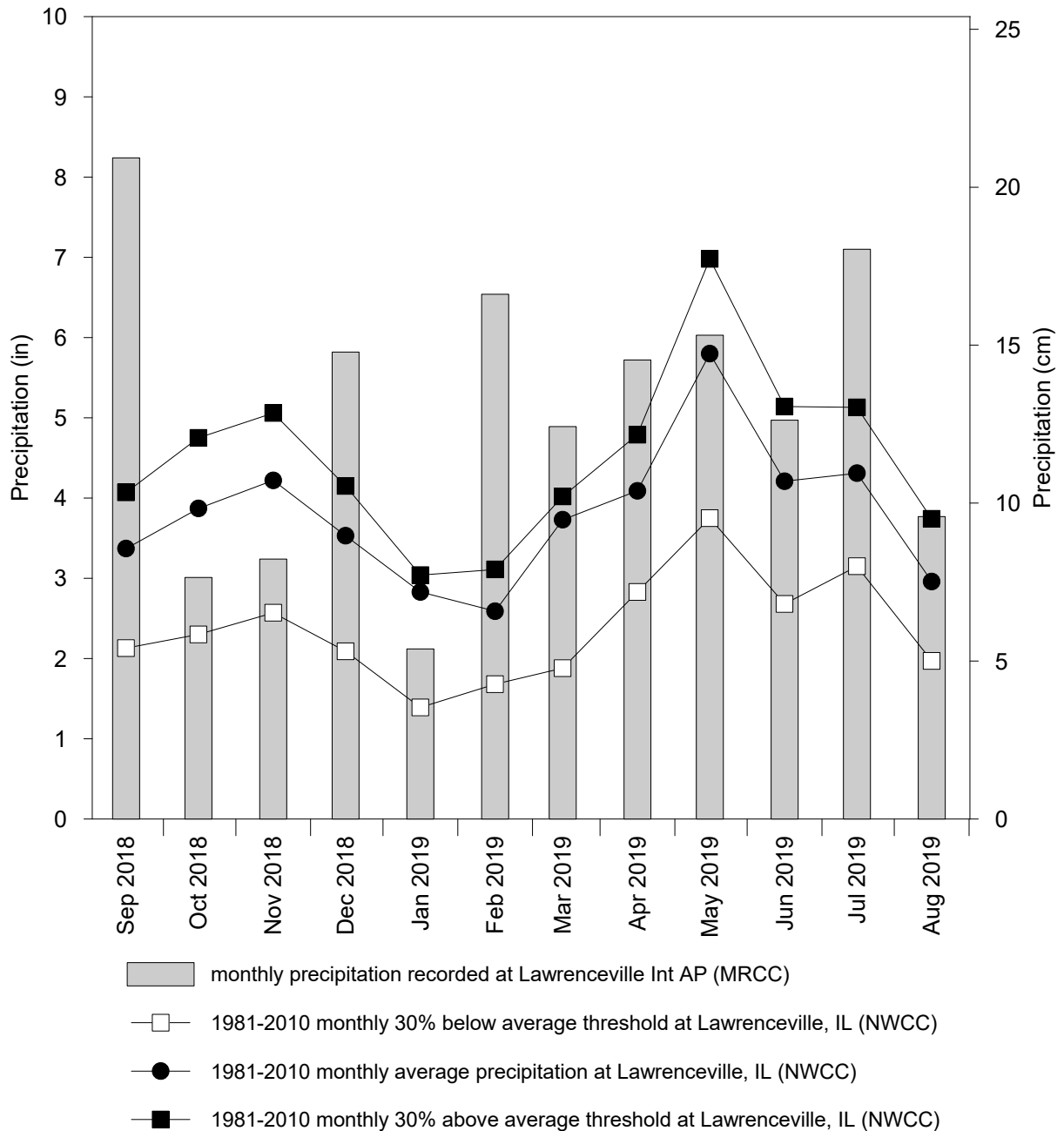
Lawrence County Wetland Bank September 1, 2018 through August 31, 2019

Water-Level Elevation at Surface-Water Gauges



Lawrence County Wetland Mitigation Bank September 2018 through August 2019

Total Monthly Precipitation Recorded at
Lawrenceville International Airport (MRCC station #13809)



**SWAN ROAD
WETLAND MITIGATION SITE**

ISGS #86

TR 222

Sequence #12315

Perry County, near Tamaroa, Illinois

Primary Project Manager: Jessica L. B. Monson

Secondary Project Manager: Audra M. Noyes

SITE HISTORY

- April 2011: ISGS was tasked to monitor wetland hydrology at the site.
- May 2011: Water-level monitoring was initiated.
- Winter 2017: Excavation took place around the site's northeast parcel just prior to the beginning of the 2017 growing season. This activity lowered surrounding land elevations, which will increase surface drainage offsite, which could also locally reduce wetland hydrology in the northeast parcel.
- March 2019: The ISGS was notified by IDOT that post-construction monitoring was complete.

WETLAND HYDROLOGY CALCULATION FOR 2019

Jurisdictional wetland hydrology area was not estimated for the 2019 growing season. IDOT discontinued monitoring of this site on 3/13/2019. As only a portion of the growing season was evaluated for hydrology, the data record is not adequate for providing a complete analysis. The hydrologic data that were collected during the 2018-2019 monitoring period are provided in following pages of this site summary.

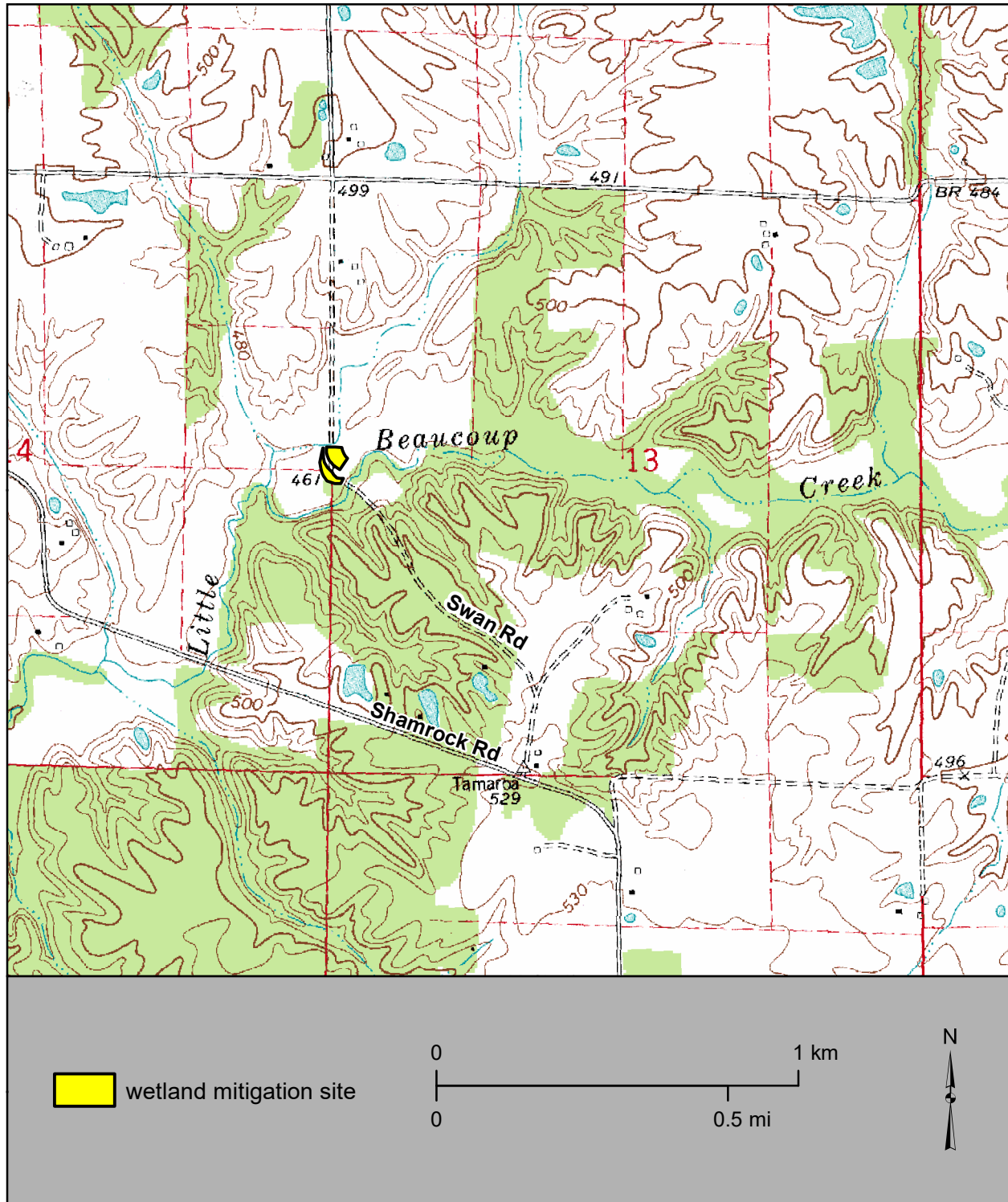
PLANNED FUTURE ACTIVITIES

- The monitoring network will be removed as time allows.

Swan Road Wetland Mitigation Site (TR222, Swan Road)

General Study Area and Vicinity

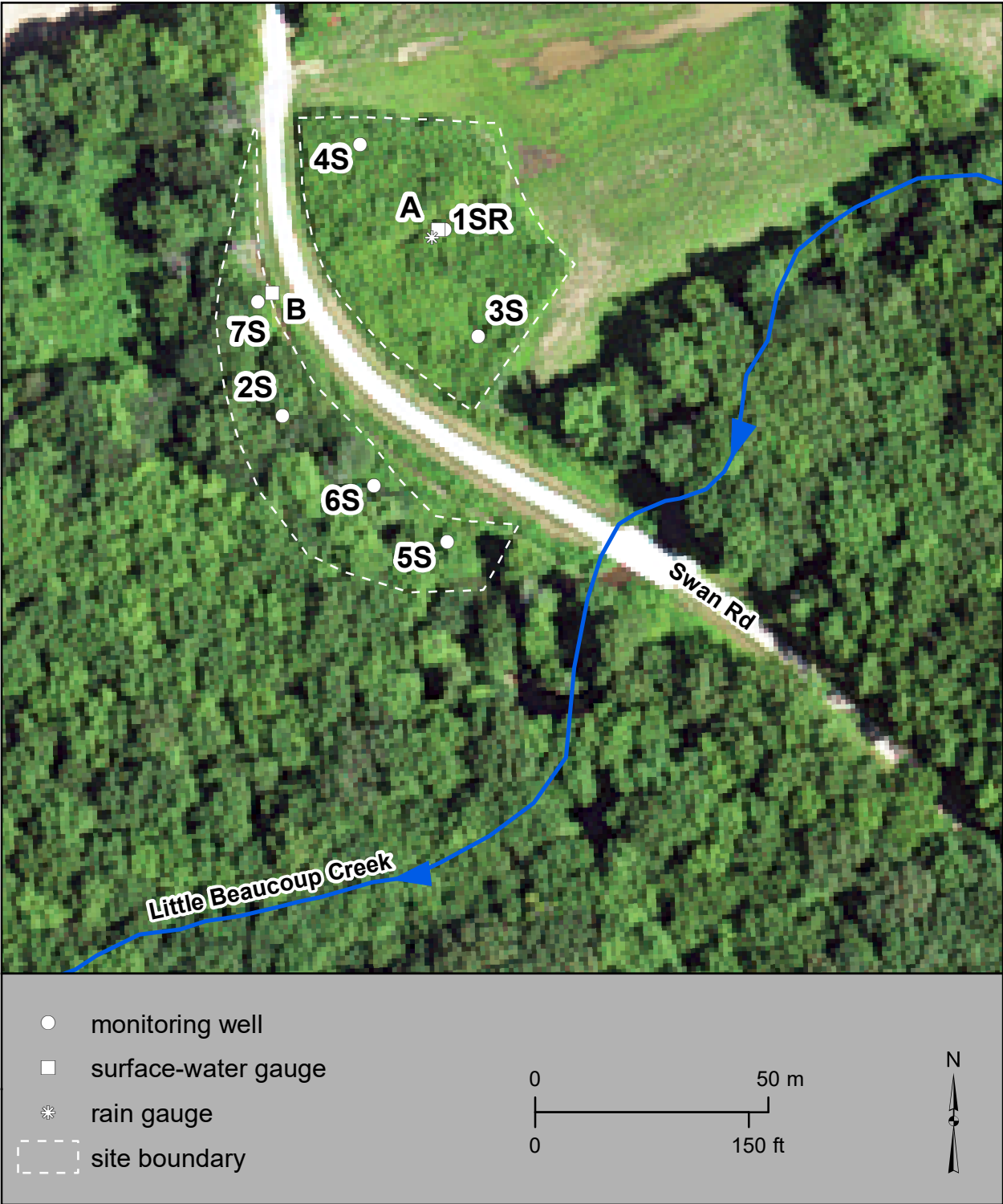
from the USGS Topographic Series, Tamaroa, IL, 7.5-minute Quadrangle (USGS 1975)
contour interval is 10 feet



**Swan Road Wetland Mitigation Site
(TR222, Swan Road)
2019 Monitoring Network**

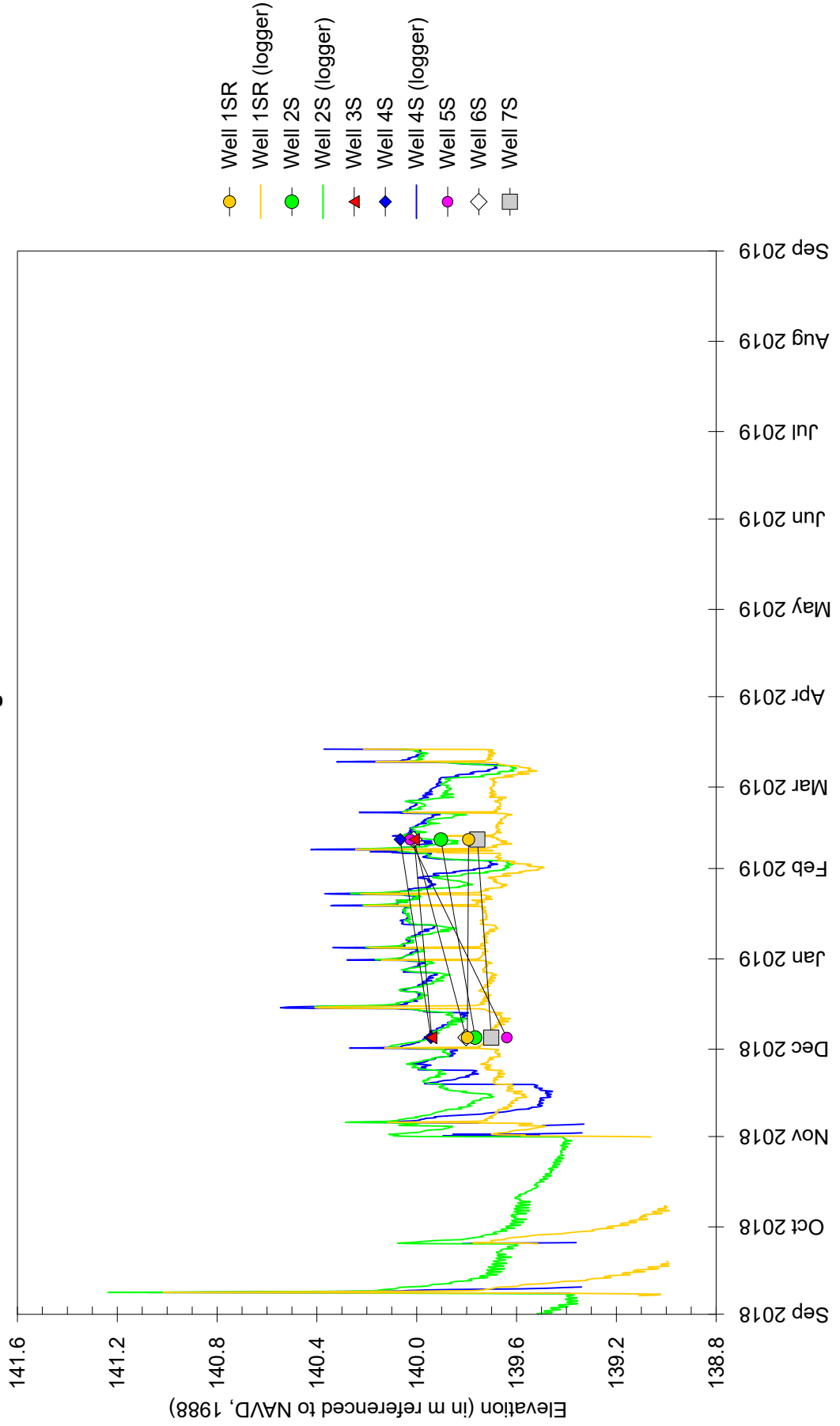
September 1, 2018 through March 13, 2019

Map based on 2015 Farm Service Agency digital orthophotography, Perry County, Illinois
(USDA-FSA 2015)



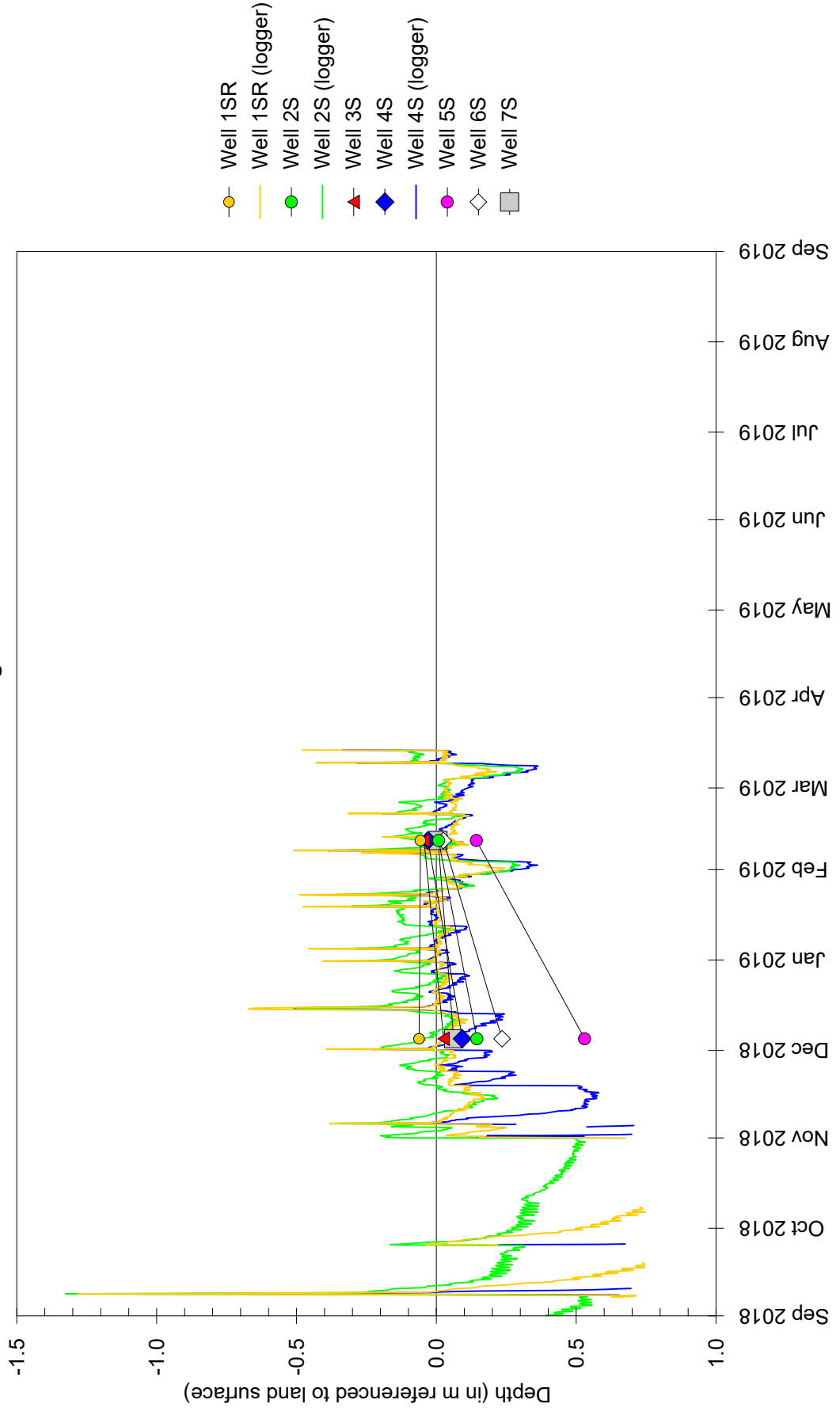
Swan Road Wetland Mitigation Site **September 1, 2018 through August 31, 2019**

Water-Level Elevation in Monitoring Wells



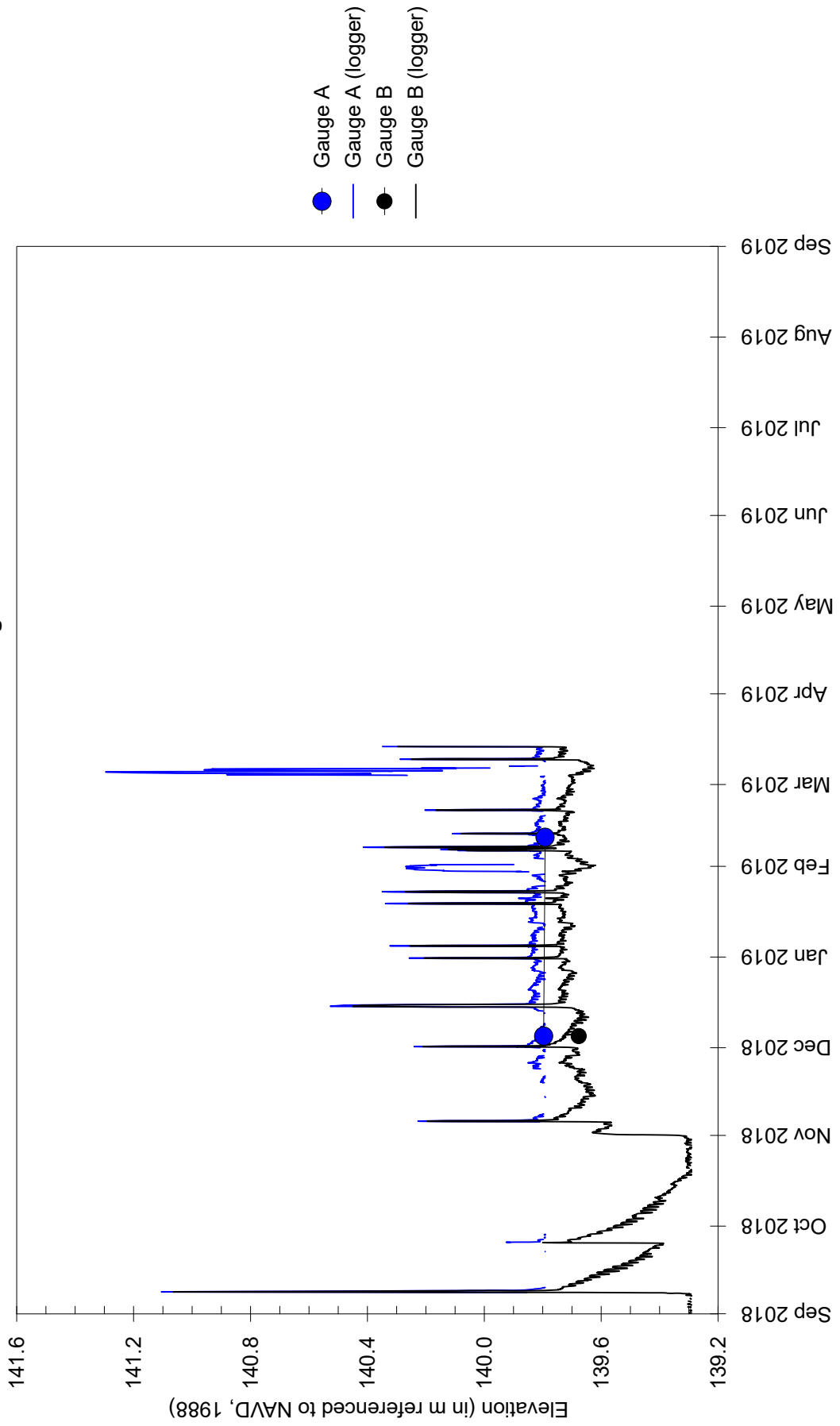
Swan Road Wetland Mitigation Site **September 1, 2018 through August 31, 2019**

Depth to Water
in Monitoring Wells



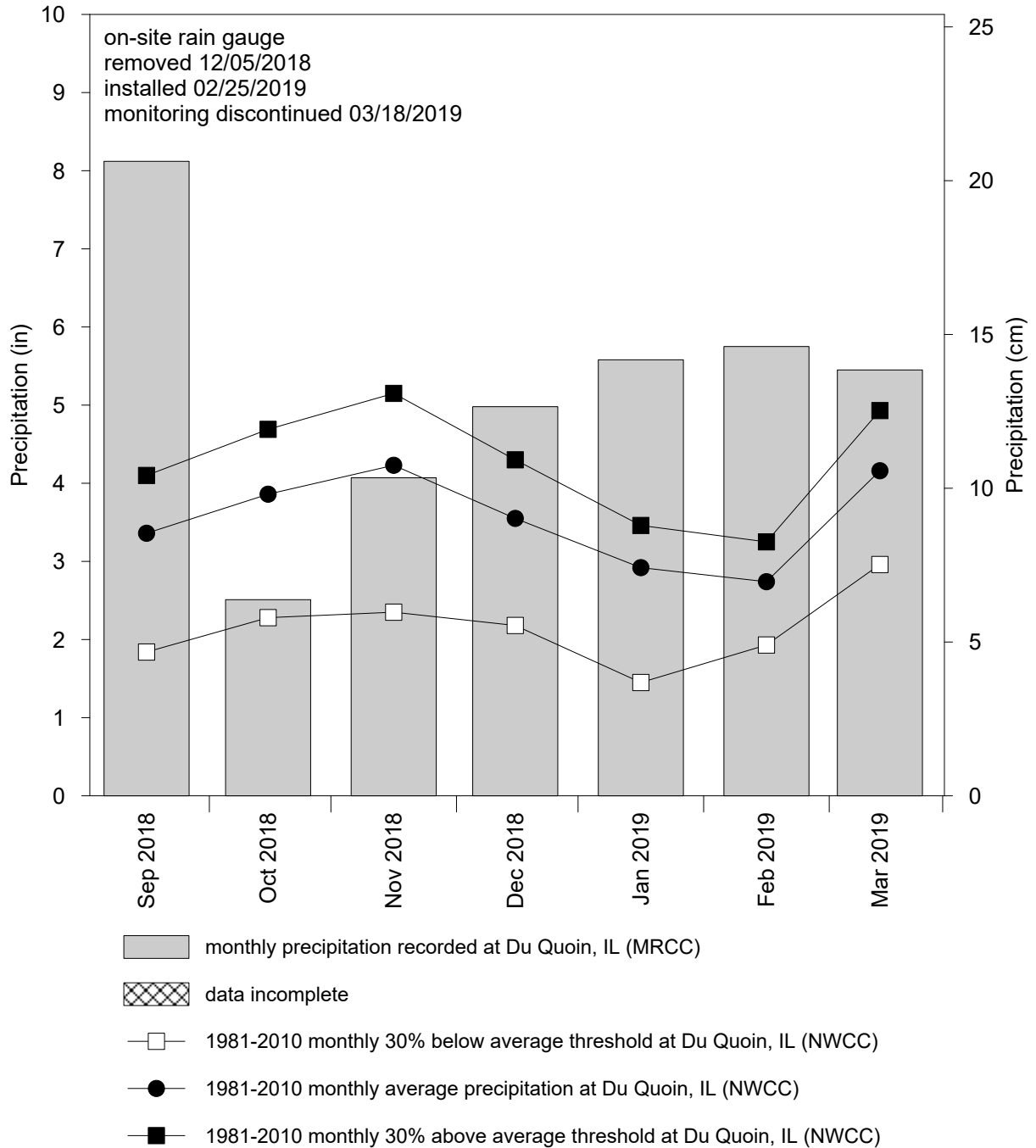
Swan Road Wetland Mitigation Site
September 1, 2018 through August 31, 2019

**Water-Level Elevation
at Surface-Water Gauges**



Swan Road Wetland Mitigation Site September 2018 through March 2019

Total Monthly Precipitation Recorded on Site and at Du Quoin, IL (MRCC station #112483)



**GRANT CREEK NORTH
WETLAND MITIGATION SITE**

ISGS #88

I-55

FAI 55

Will County, near Wilmington, Illinois

Primary Project Manager: Eric T. Plankell

Secondary Project Manager: Mackenzie K. Marti

SITE HISTORY

- February 2012: ISGS was tasked by IDOT to monitor wetland hydrology.
- April 2012: ISGS installed a monitoring network.
- September 2012: Huddleston-McBride Land Drainage Company installed gate valves at strategic positions along active drainage tiles underlying the site.
- July 2017: Huddleston-McBride Land Drainage Company permanently sealed all drainage tile gate valves at the site with cement and bentonite.
- April 2019: The ISGS was notified by IDOT that post-construction monitoring was complete.

WETLAND HYDROLOGY CALCULATION FOR 2019

Jurisdictional wetland hydrology area was not estimated for the 2019 growing season. IDOT discontinued monitoring of this site on 3/28/2019. As only a portion of the growing season was evaluated for hydrology, the data record is not adequate for providing a complete analysis. The hydrologic data that were collected during the 2018-2019 monitoring period are provided in following pages of this site summary.

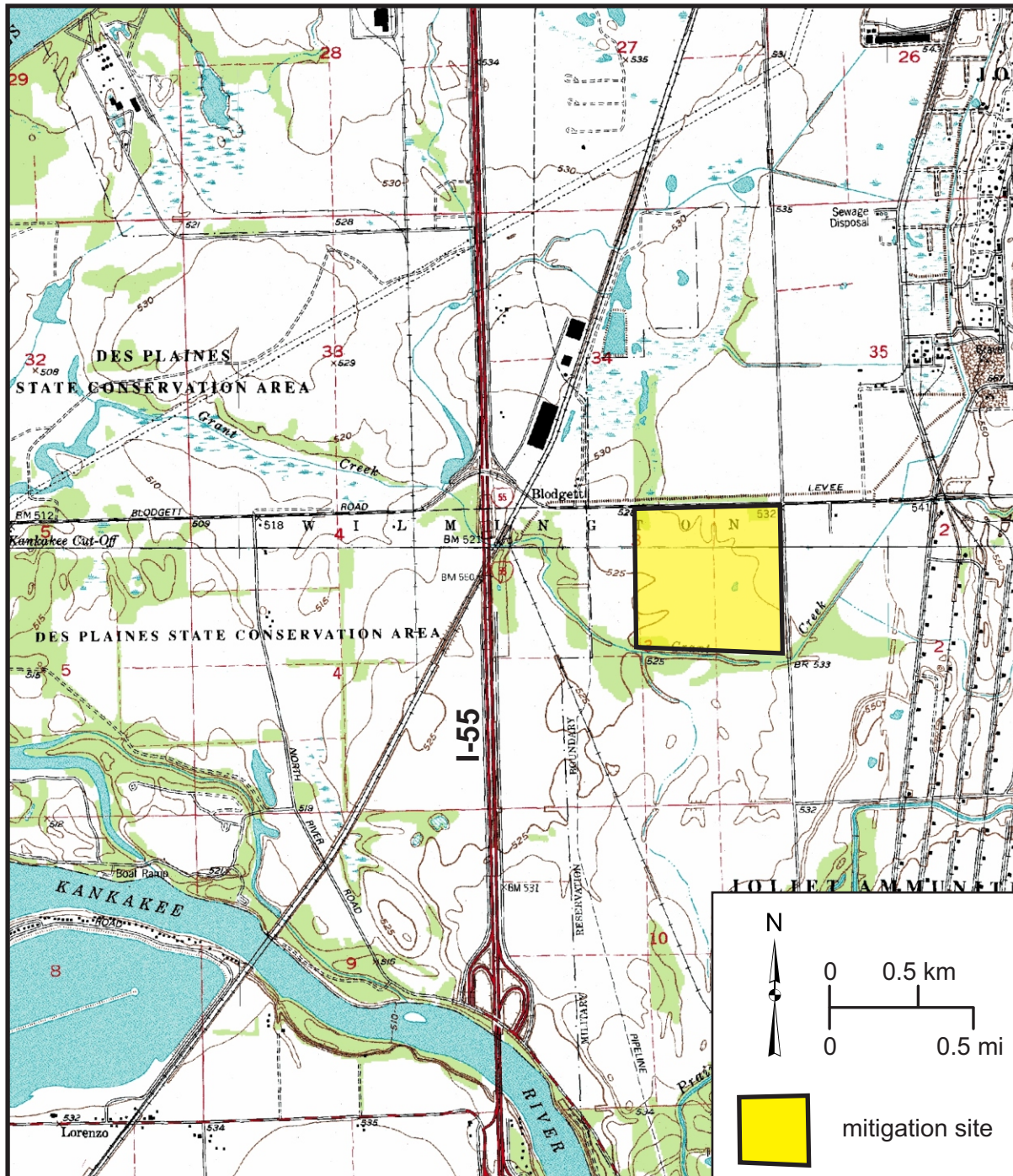
PLANNED FUTURE ACTIVITIES

- The monitoring network will be removed as time allows.

Grant Creek North Wetland Mitigation Site (I-55, FAI 55)

General Study Area and Vicinity

from the USGS Topographic Series, Channahon, IL, and Wilmington, IL, 7.5-minute Quadrangles
(USGS 1993a, 1993e). Contour intervals are 10 feet and 5 feet, respectively.

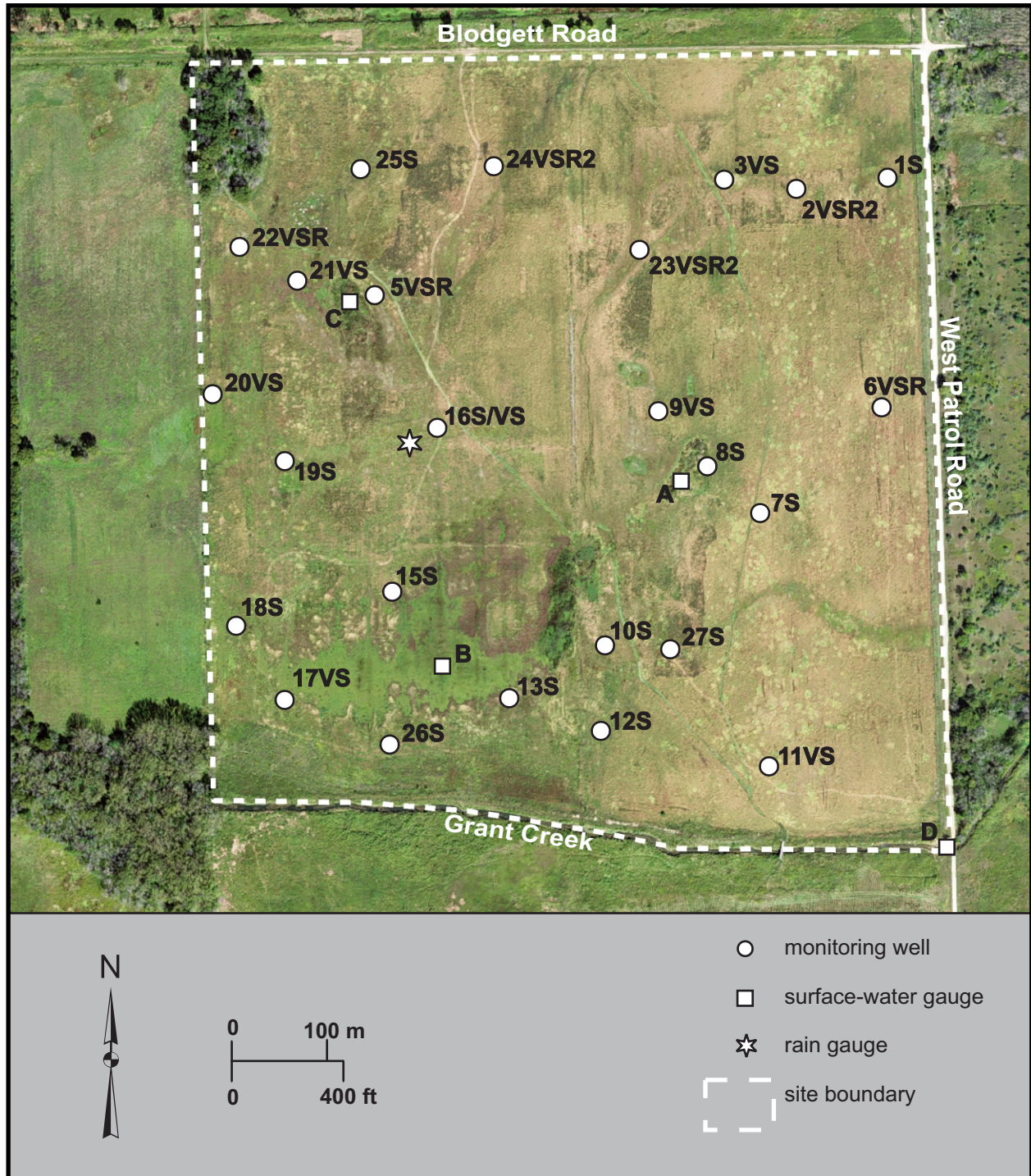


Grant Creek North Wetland Mitigation Site (I-55, FAI 55)

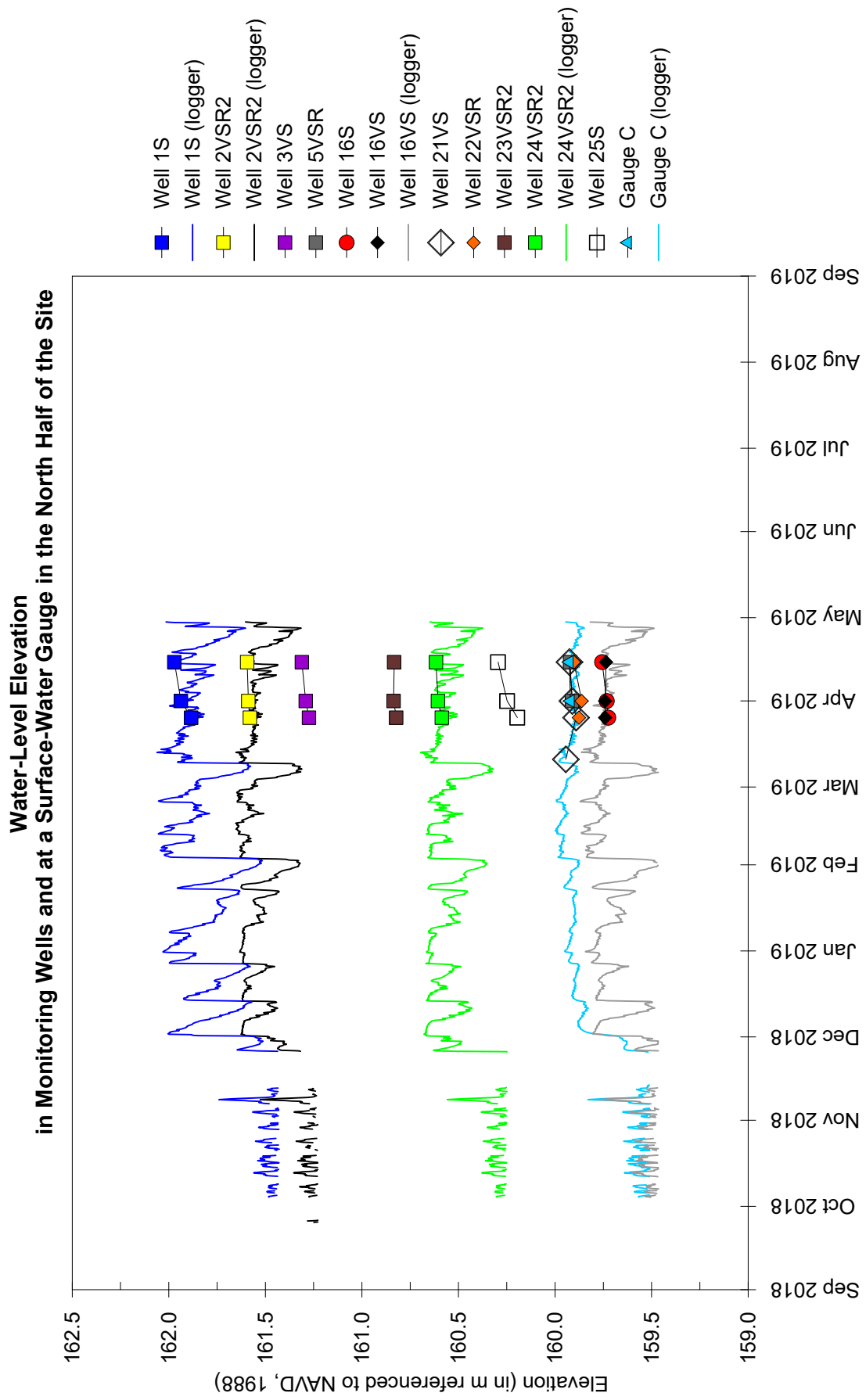
Monitoring Network

September 1, 2018 through August 31, 2019

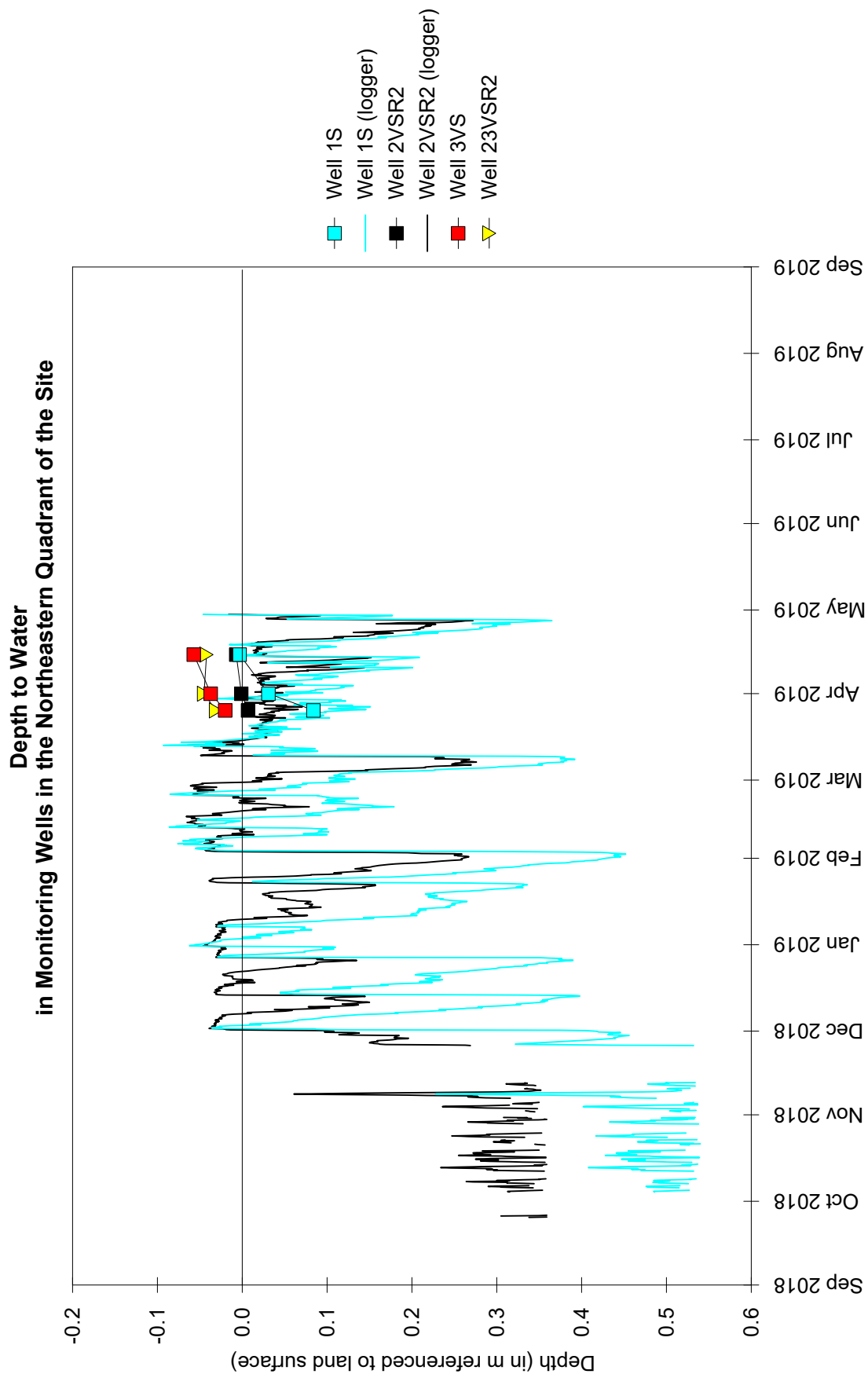
Map based on 2015 Farm Service Agency digital orthophotography, Will County, Illinois (USDA-FSA 2015)



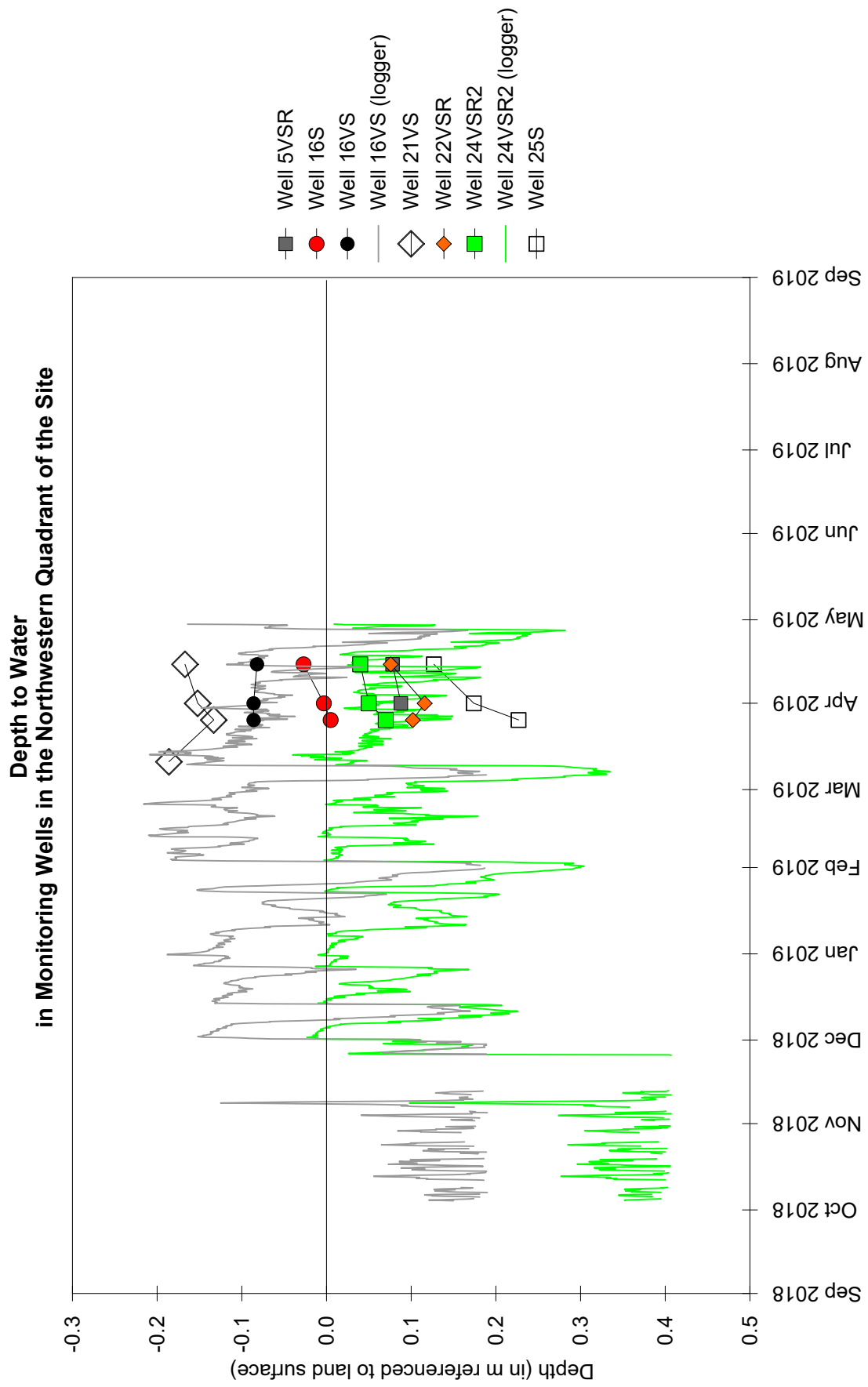
Grant Creek North Wetland Mitigation Site September 1, 2018 through August 31, 2019



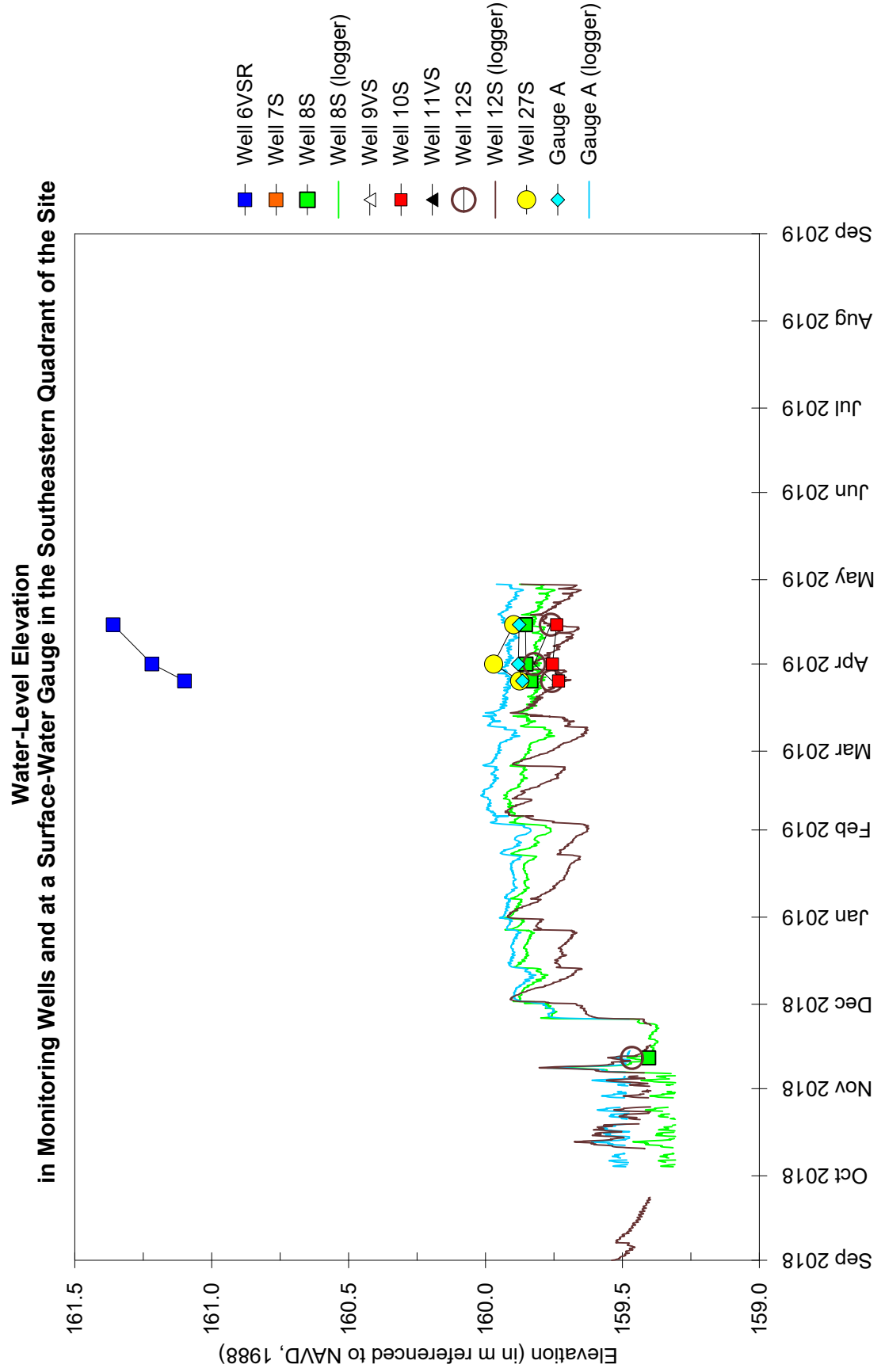
Grant Creek North Wetland Mitigation Site **September 1, 2018 through August 31, 2019**



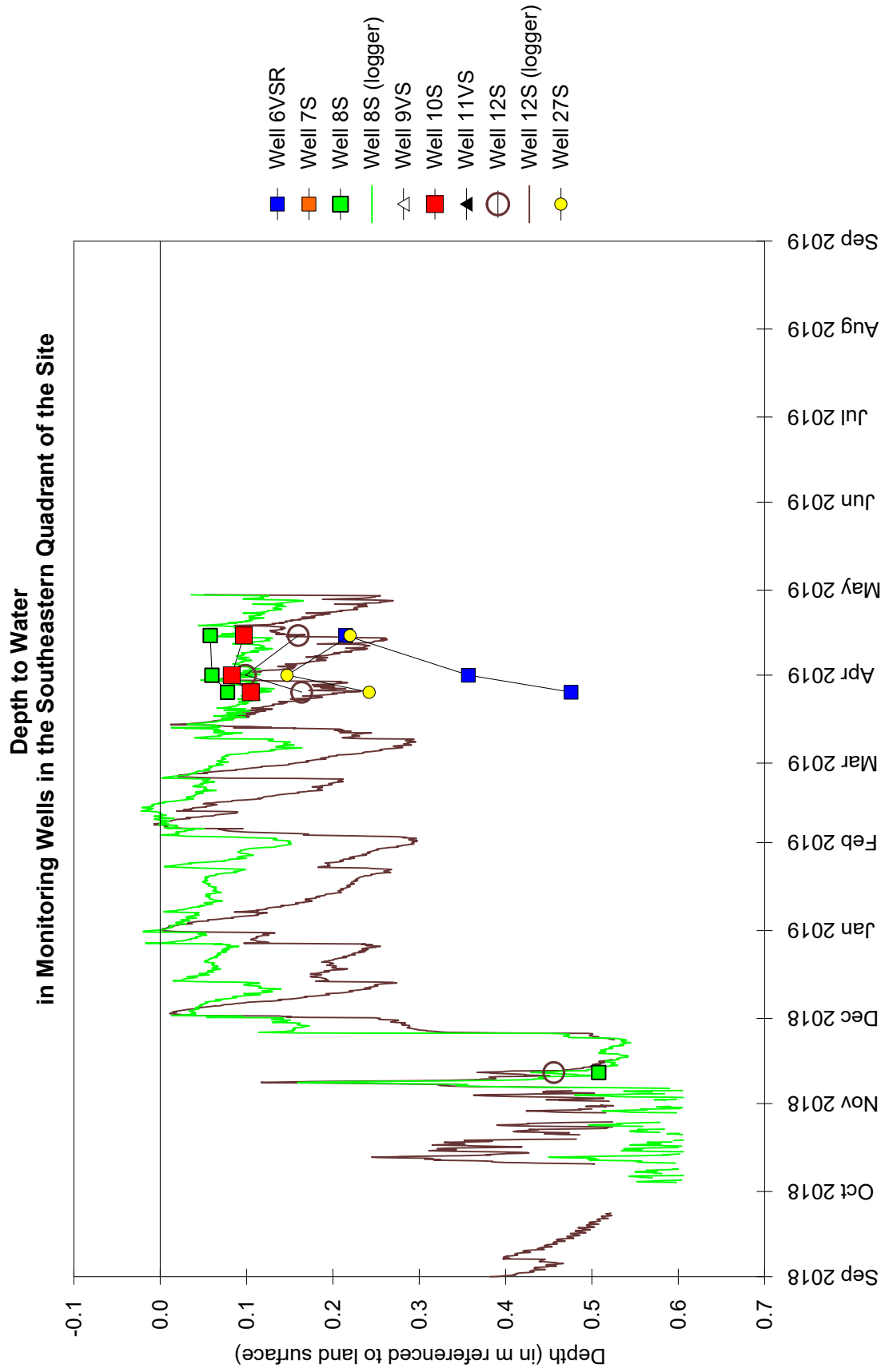
Grant Creek North Wetland Mitigation Site September 1, 2018 through August 31, 2019



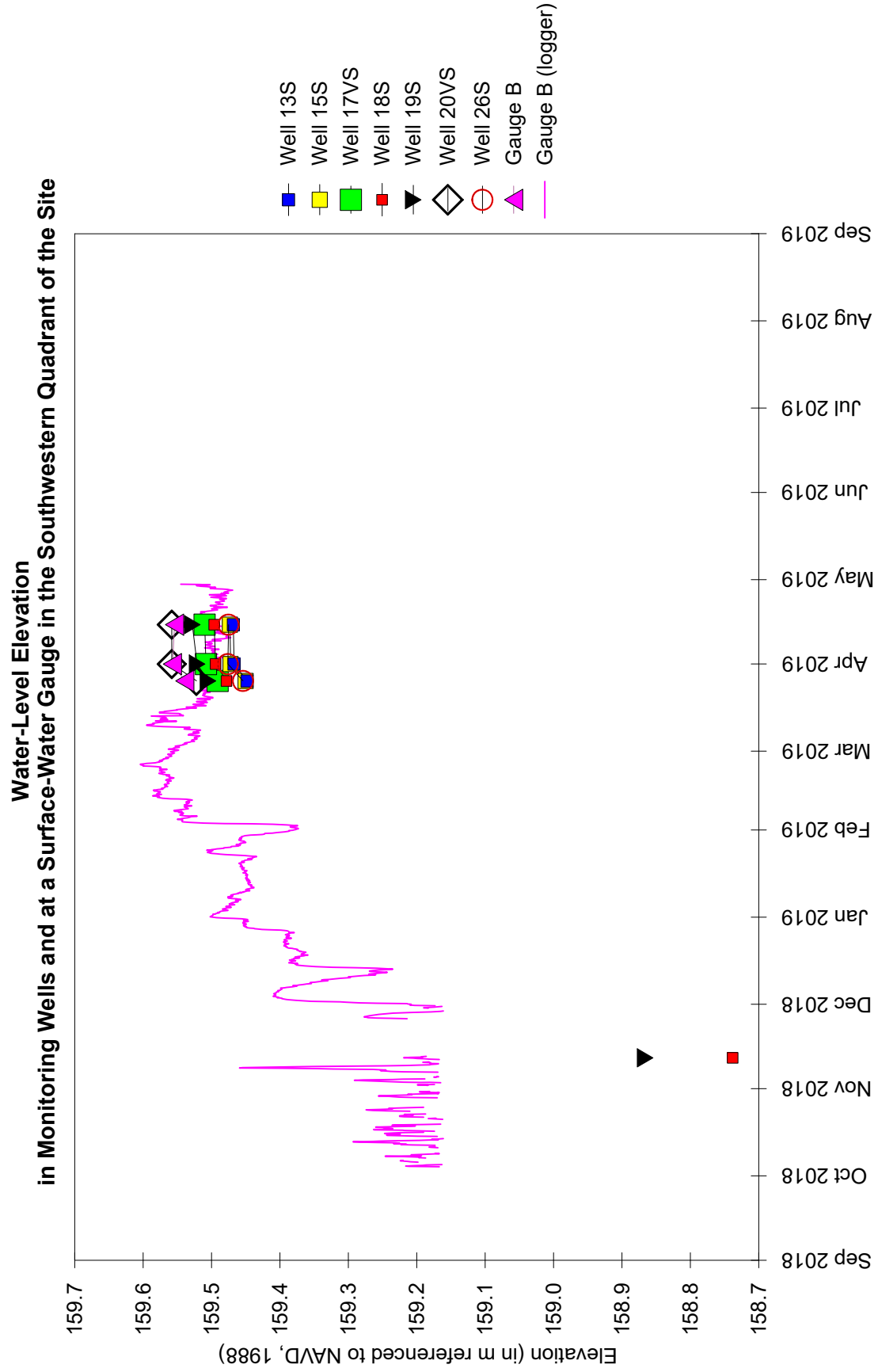
Grant Creek North Wetland Mitigation Site September 1, 2018 through August 31, 2019



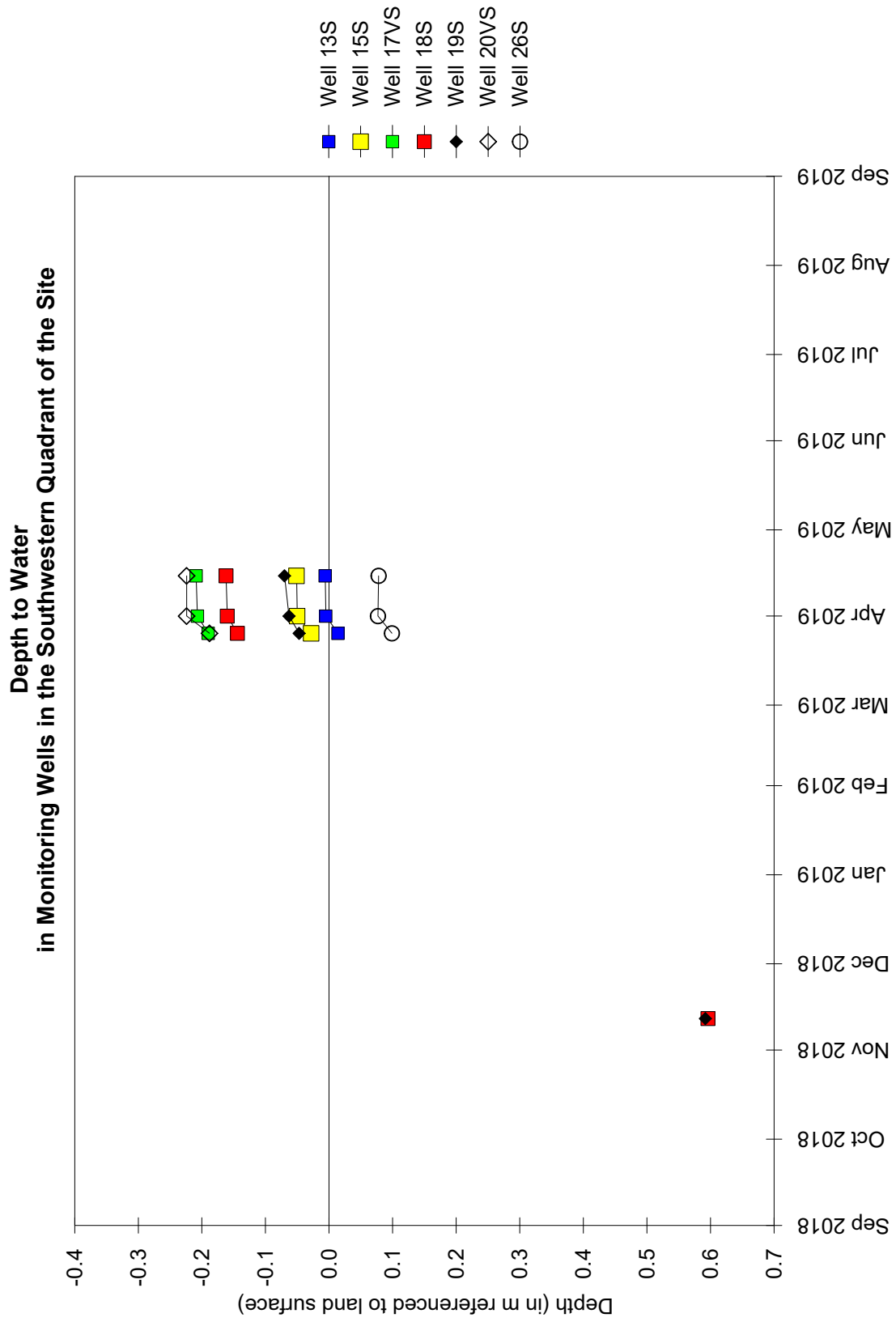
Grant Creek North Wetland Mitigation Site September 1, 2018 through August 31, 2019



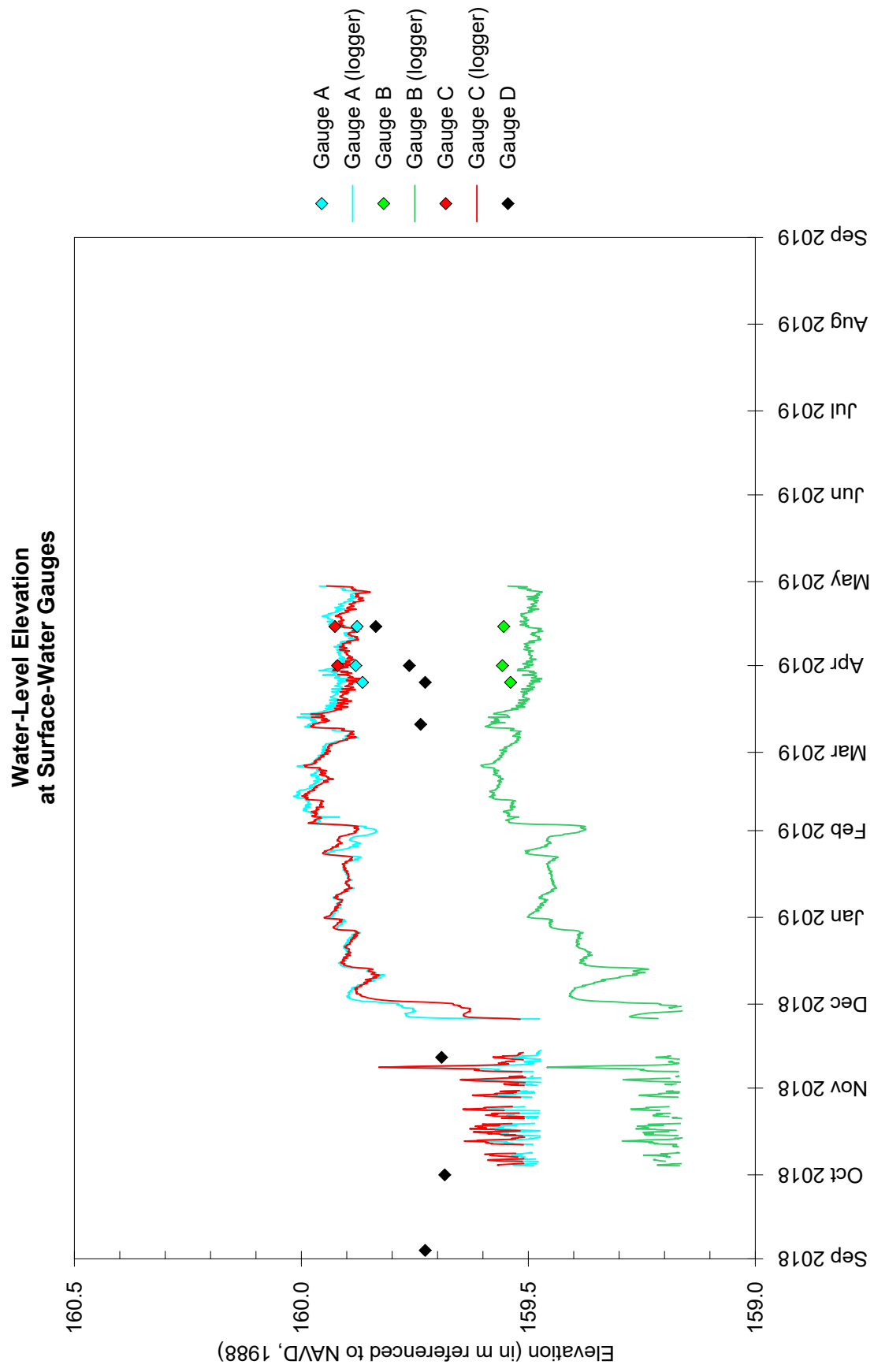
Grant Creek North Wetland Mitigation Site September 1, 2018 through August 31, 2019



Grant Creek North Wetland Mitigation Site September 1, 2018 through August 31, 2019

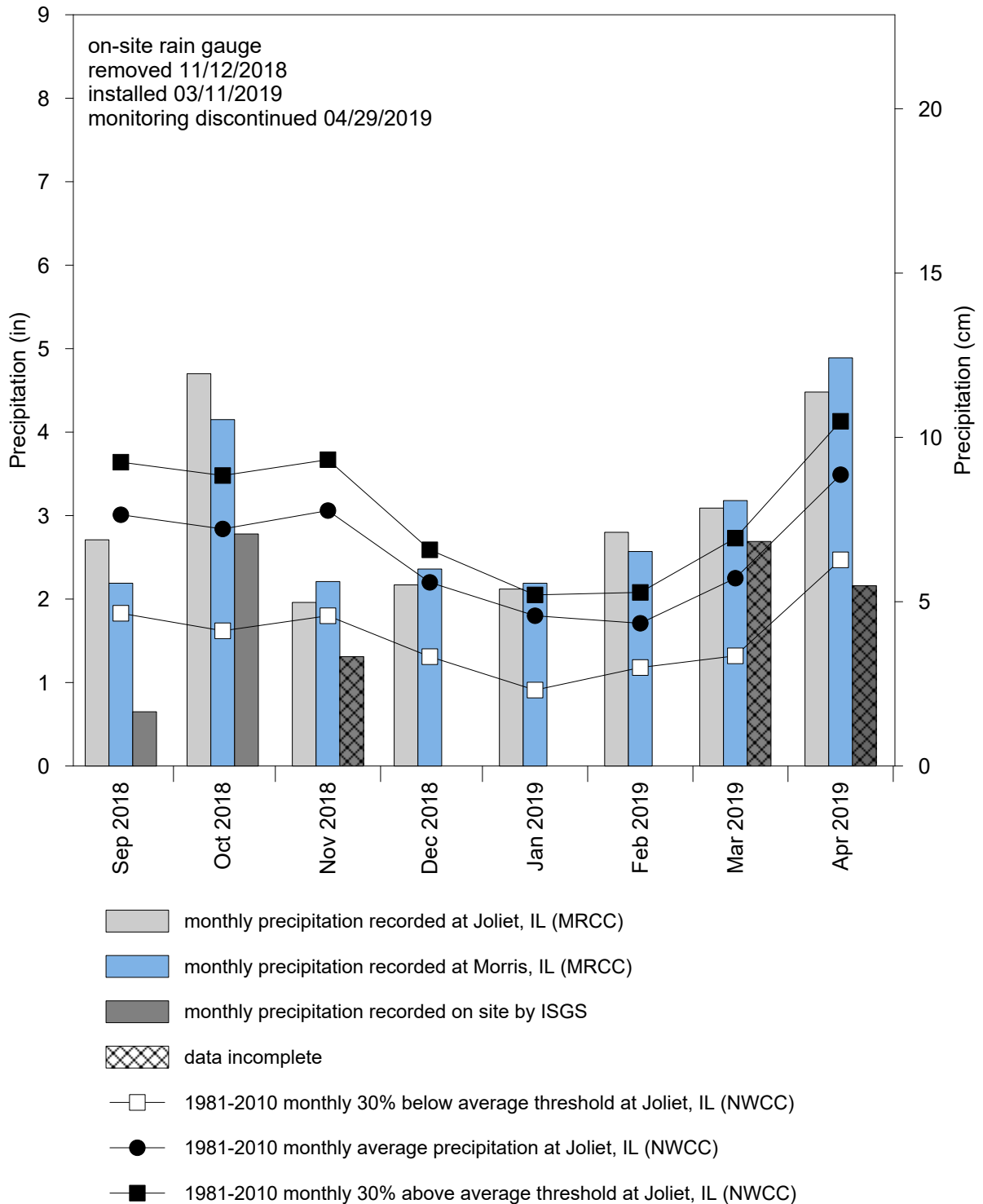


Grant Creek North Wetland Mitigation Site September 1, 2018 through August 31, 2019



Grant Creek North Wetland Mitigation Site September 2018 through April 2019

**Total Monthly Precipitation Recorded on Site and at Joliet, IL
(MRCC station #114530) and at Morris, IL (MRCC station #115825)**



**THORN CREEK HEADWATERS PRESERVE
WETLAND MITIGATION SITE**

ISGS #90

I-57/Stuenkel Road

FAI 57

Sequence #12558

Will County, near University Park, Illinois

Primary Project Manager: Geoffrey E. Pociask

Secondary Project Manager: Mackenzie K. Marti

SITE HISTORY

- September 2012: ISGS was tasked by IDOT to monitor wetland hydrology.
- March 2013: ISGS installed a monitoring network at the site.
- Winter 2013-14: Drainage tiles were broken and the site was broadcast seeded.
- Winter 2016-17: A drainage tile blowout was filled in the eastern portion of the site.

WETLAND HYDROLOGY CALCULATION FOR 2019

The target compensation area for the Thorn Creek Headwaters Preserve wetland mitigation site is 12.02 ha (29.70 ac). Using the 1987 Manual (Environmental Laboratory 1987), 24.60 ha (60.80 ac) of the total site area of 37.54 ha (92.77 ac) satisfied wetland hydrology criteria for greater than 5% of the 2019 growing season, and 16.22 ha (40.09 ac) of the site satisfied wetland hydrology criteria for greater than 12.5% of the growing season. Using the 2010 Midwest Region Supplement (USACE 2010), 21.20 ha (52.39 ac) satisfied wetland hydrology criteria for 14 or more consecutive days during the growing season. These estimates are based on the following factors:

- The median date that the growing season begins in Park Forest, Illinois, is April 8, and the season lasts 209 days (MRCC 2019). Using the 1987 Manual, 5% of the growing season is 10 days, and 12.5% of the growing season is 26 days. Using the 2010 Midwest Region Supplement, April 3 was the starting date of the 2019 growing season based on soil temperatures measured at the site.
- Total precipitation for the monitoring period at Park Forest, Illinois (MRCC station #116616), was 124% of normal, and spring 2019 (March through May) precipitation was 166% of normal. Precipitation for May 2019 was particularly excessive totaling 226% of normal.
- The period of maximum inundation and saturation during the 2019 growing season at the site occurred during late April and into May. This period began with 3.56 inches of rainfall at the site during April 26 through May 3 followed by frequent rainfall during the remainder of the month of May.
- In 2019, water levels measured in 29 of 31 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 5% of the growing season, and water levels measured in 25 of 31 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 12.5% of the growing season, using the 1987 Manual. In addition, using the 2010

Midwest Region Supplement, water levels in 25 of 31 soil-zone monitoring wells satisfied wetland hydrology criteria for 14 or more consecutive days of the growing season. See the tables at the end of this summary for details.

ADDITIONAL INFORMATION

- Surface water currently drains from the western portion of the site through a storm sewer located along the west margin of the site (between wells 1S and 30S) and a small swale that has been partially blocked (between wells 30S and 3S). Blocking these outlets would prolong and expand ponding in the western portion of the site. However, appropriate threshold elevations should be determined before outlets are blocked.

PLANNED FUTURE ACTIVITIES

- Monitoring will continue until no longer required by IDOT.

WETLAND HYDROLOGY TABLES FOR 2019

Well locations meeting wetland hydrology criteria			
<i>ID</i>	<i>5% of growing season</i>	<i>12.5% of growing season</i>	<i>14 days during growing season</i>
1S	Y	Y	Y
3S	Y	Y	Y
4S	Y	N	N
5S	Y	Y	Y
6S	Y	Y	Y
7S*	Y	Y	Y
10S	Y	Y	Y
11S	Y	Y	Y
12S	Y	N	Y
13S	Y	Y	Y
15S	Y	Y	Y
16S	Y	Y	Y
17S	N	N	N
18S	Y	Y	Y
19S	Y	Y	Y
20S	Y	Y	Y
21S	Y	N	Y
22S	Y	Y	Y
23S	Y	Y	Y
24S	Y	Y	Y
25S	Y	Y	Y
26S	Y	Y	Y
27S	Y	Y	Y
28S*	Y	N	Y
29S*	N	N	N
30S*	Y	Y	Y
31S	Y	Y	Y
32S	Y	Y	Y
33S	Y	Y	Y
34S	Y	Y	Y
35S	Y	Y	Y

Y – met wetland hydrology criteria

N – did not meet wetland hydrology criteria

* – wetland hydrology determination based on PLS model estimate

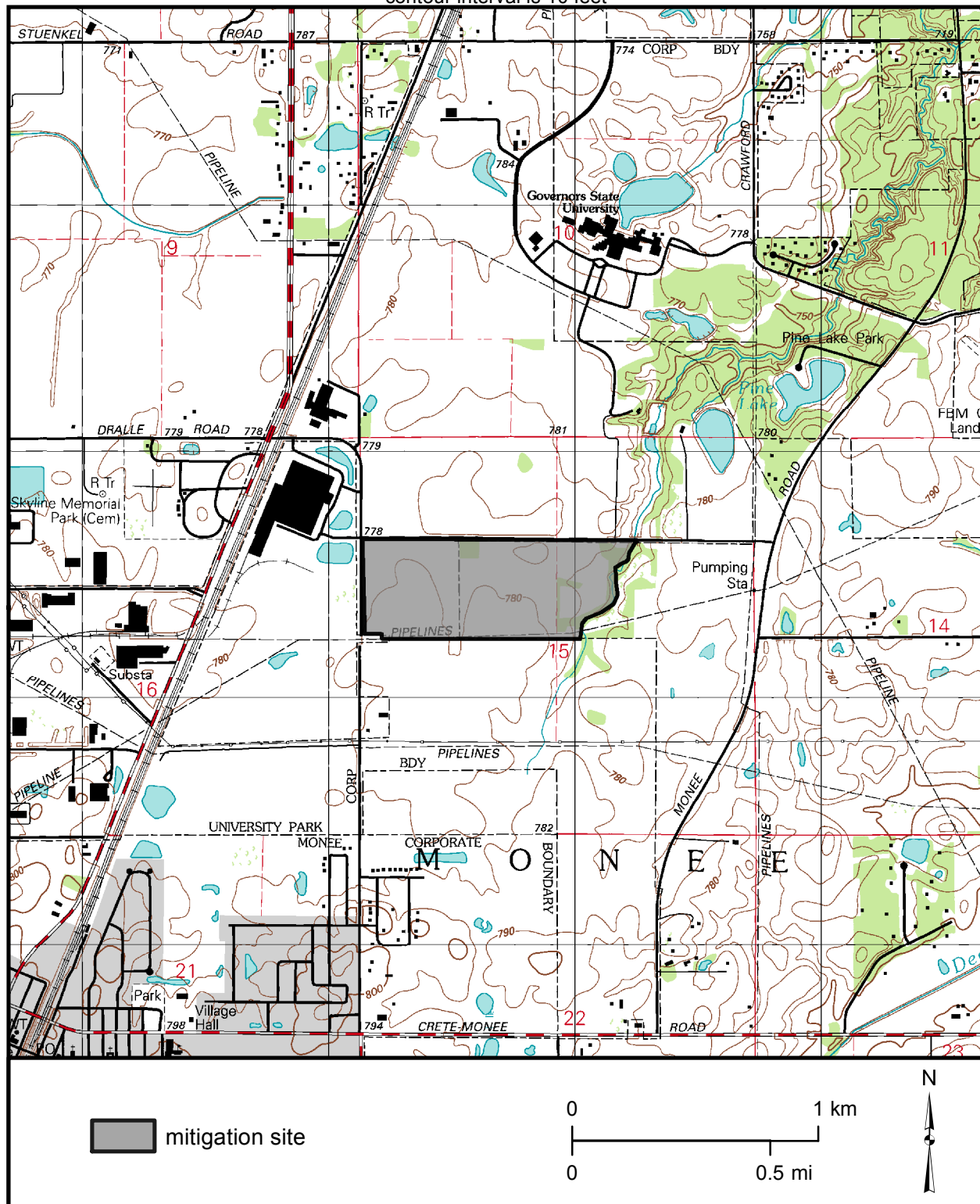
Surface-water gauge elevations meeting wetland hydrology criteria			
<i>ID</i>	<i>5% of growing season</i>	<i>12.5% of growing season</i>	<i>14 days during growing season</i>
B	236.69 m (776.55 ft)	n/a	236.63 m (776.35 ft)
C	233.37 m (765.65 ft)	n/a	233.37 m (765.65 ft)

n/a – insufficient data to determine an elevation

Thorn Creek Headwaters Preserve Wetland Mitigation Site (I-57 at Stuenkel Road, FAI 57)

General Study Area and Vicinity

from the USGS Topographic Series, Steger, IL, 7.5-minute Quadrangle (USGS 1990)
contour interval is 10 feet

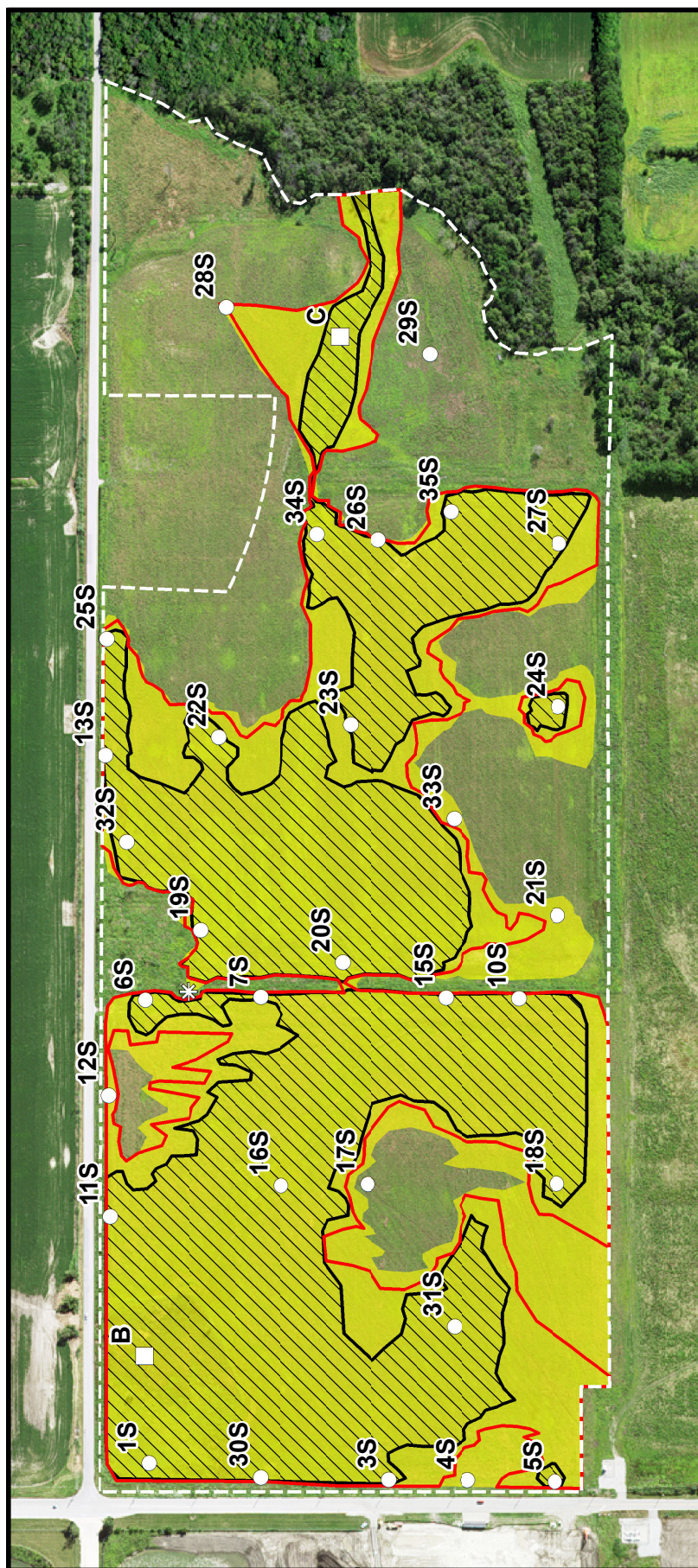


Thorn Creek Headwaters Preserve Wetland Mitigation Site (I-57 at Stuenkel Road, FAI 57)

Estimated Areal Extent of 2019 Wetland Hydrology

September 1, 2018 through August 31, 2019

Map based on 2015 Farm Service Agency digital orthophotography, Will County, Illinois (USDA-FSA 2015)



2019 Wetland Hydrology

>5% of growing season (1987 Manual)

>12.5% of growing season (1987 Manual)

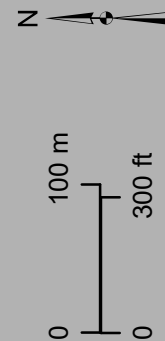
14 days or more (Midwest Region Supplement 2010)

monitoring well

surface-water gauge

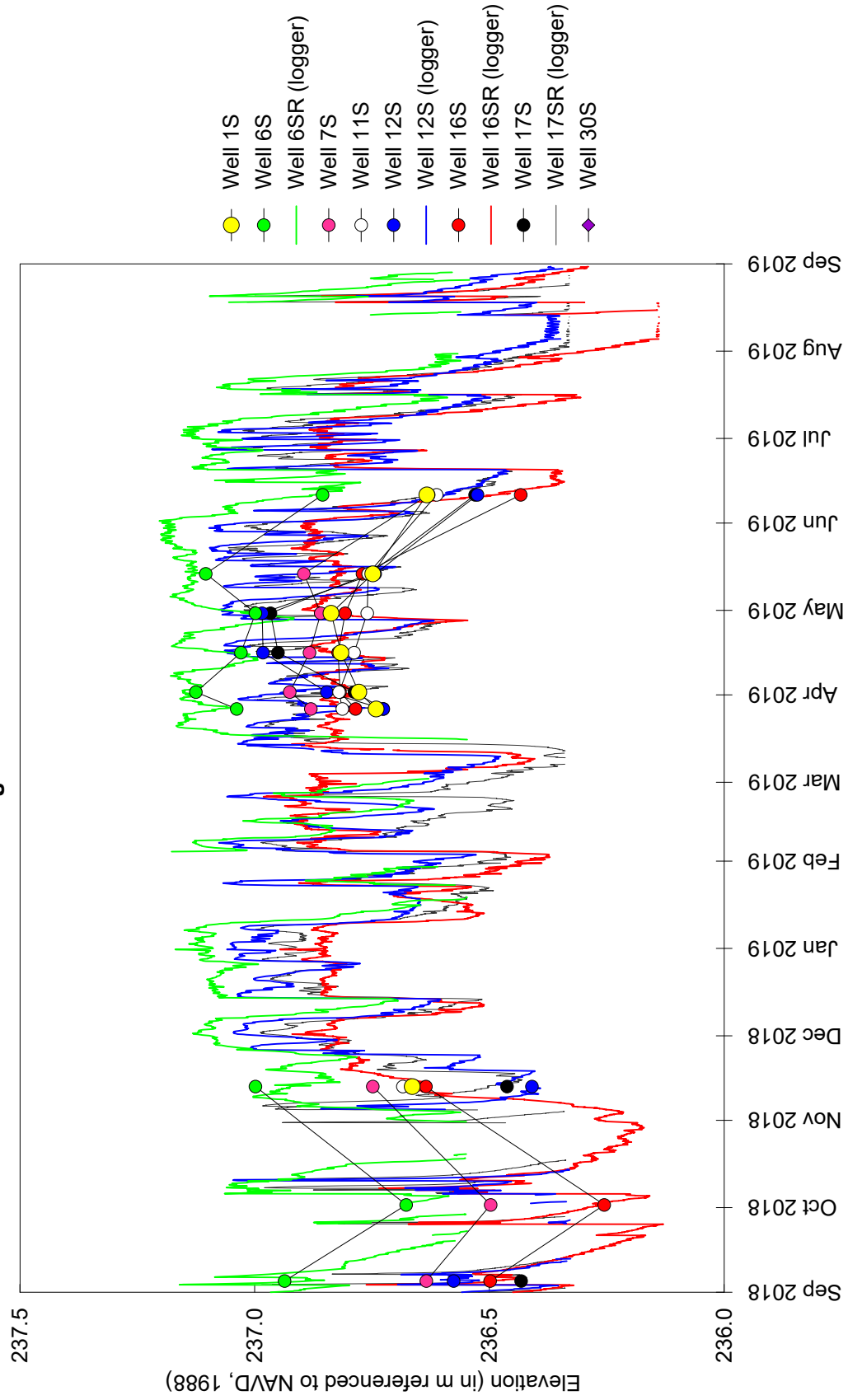
rain gauge

mitigation site

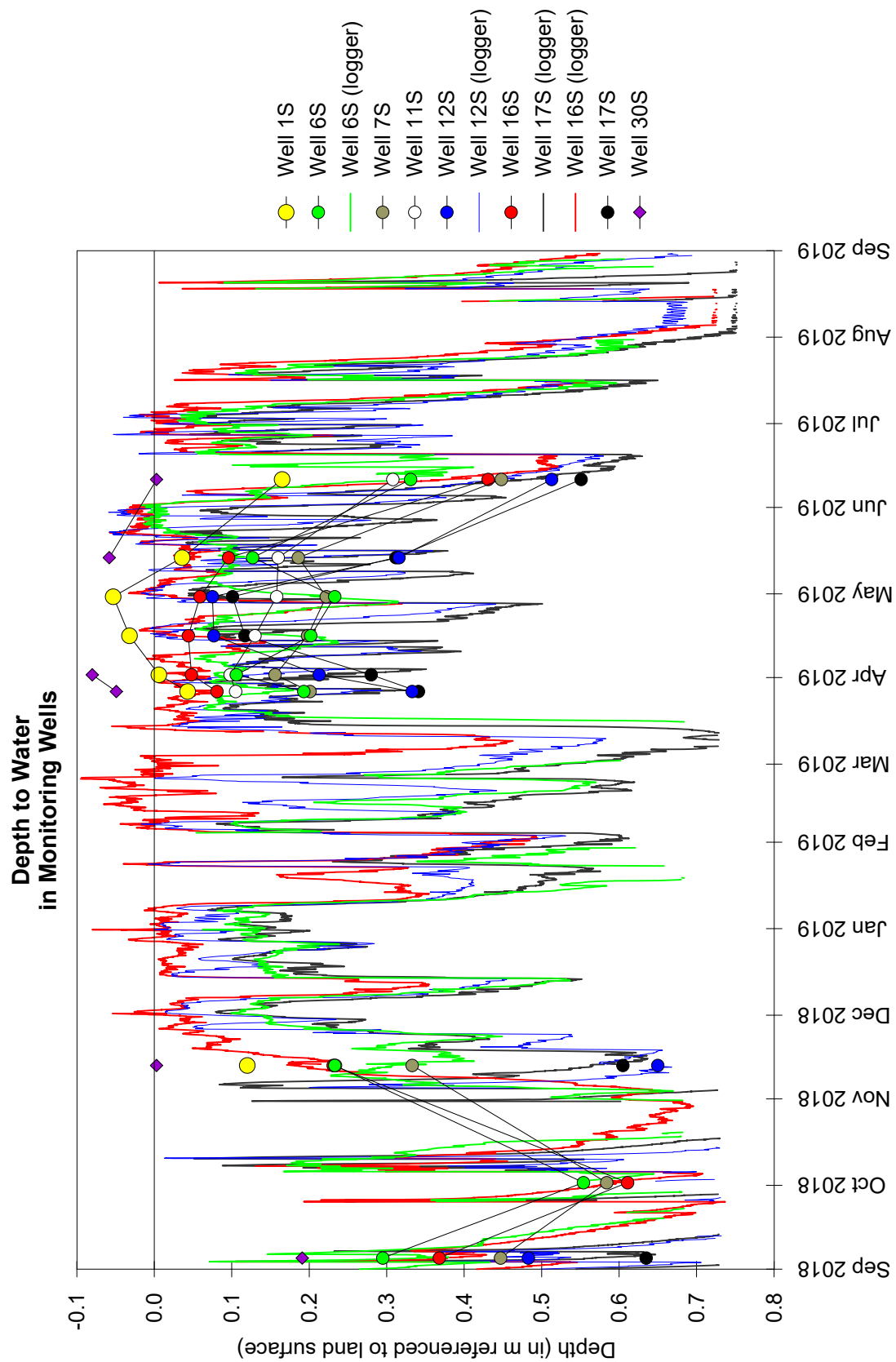


Thorn Creek Headwaters Preserve Wetland Mitigation Site September 1, 2018 through August 31, 2019

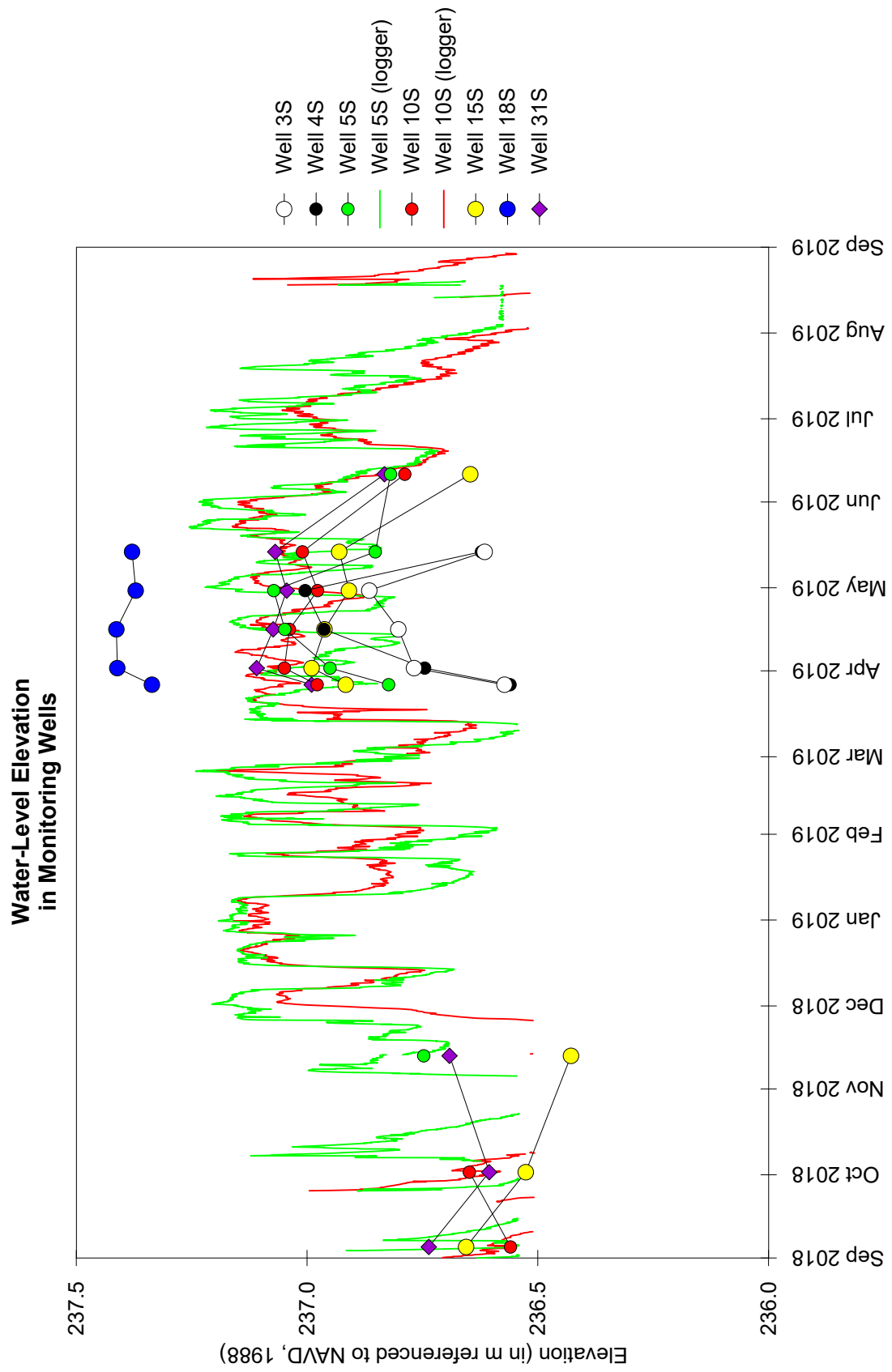
Water-Level Elevation in Monitoring Wells



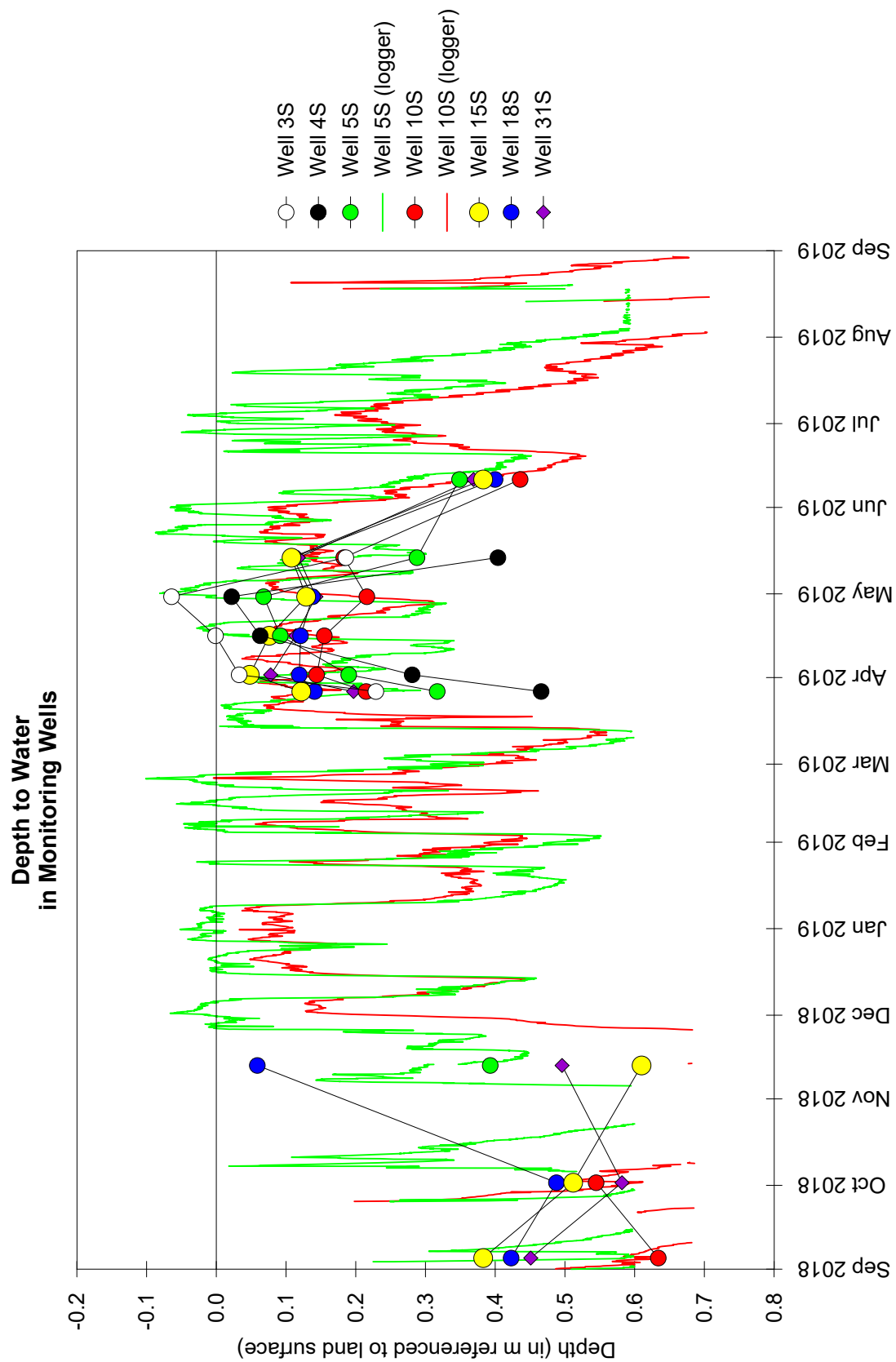
Thorn Creek Headwaters Preserve Wetland Mitigation Site September 1, 2018 through August 31, 2019



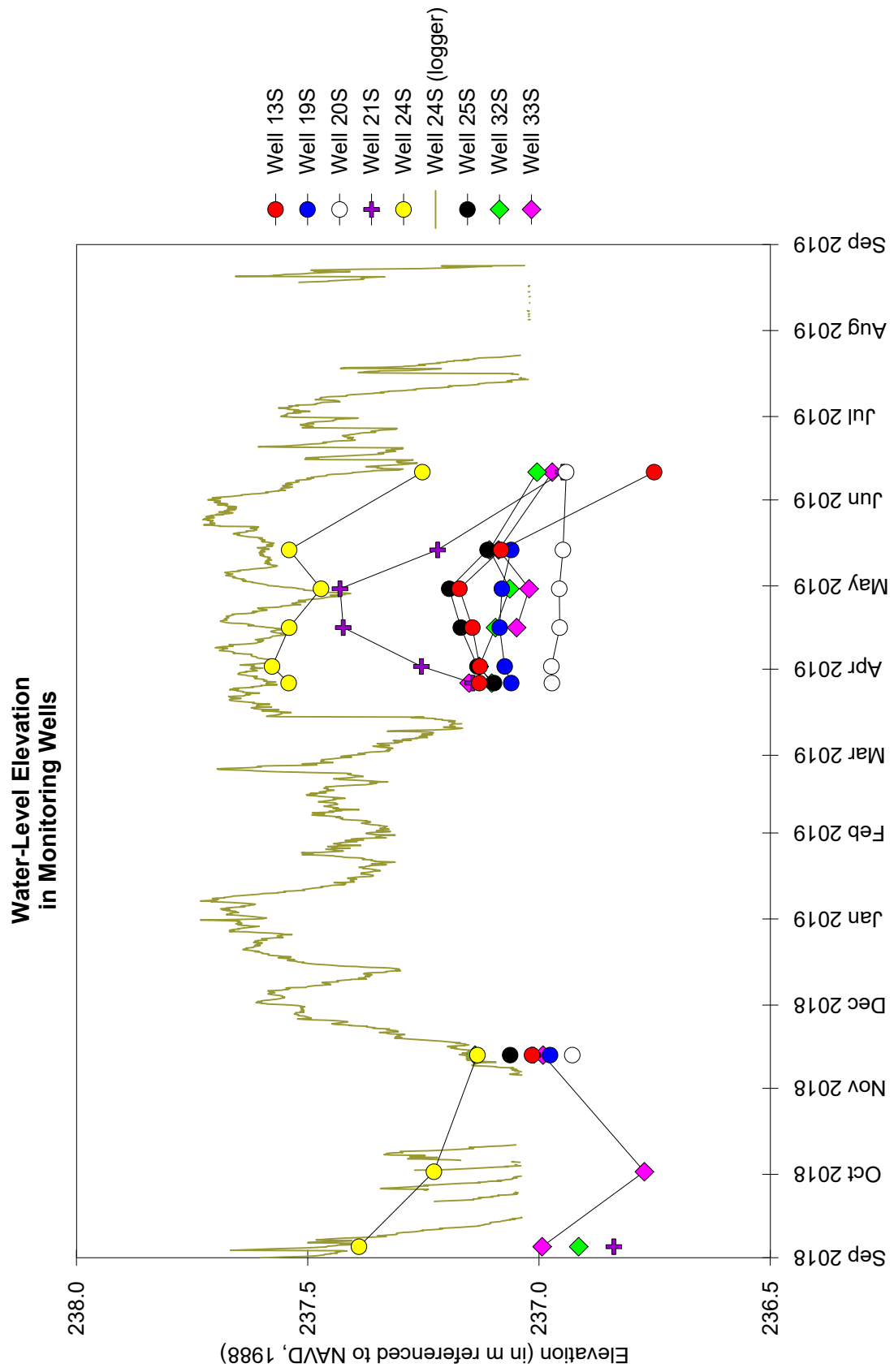
Thorn Creek Headwaters Preserve Wetland Mitigation Site September 1, 2018 through August 31, 2019



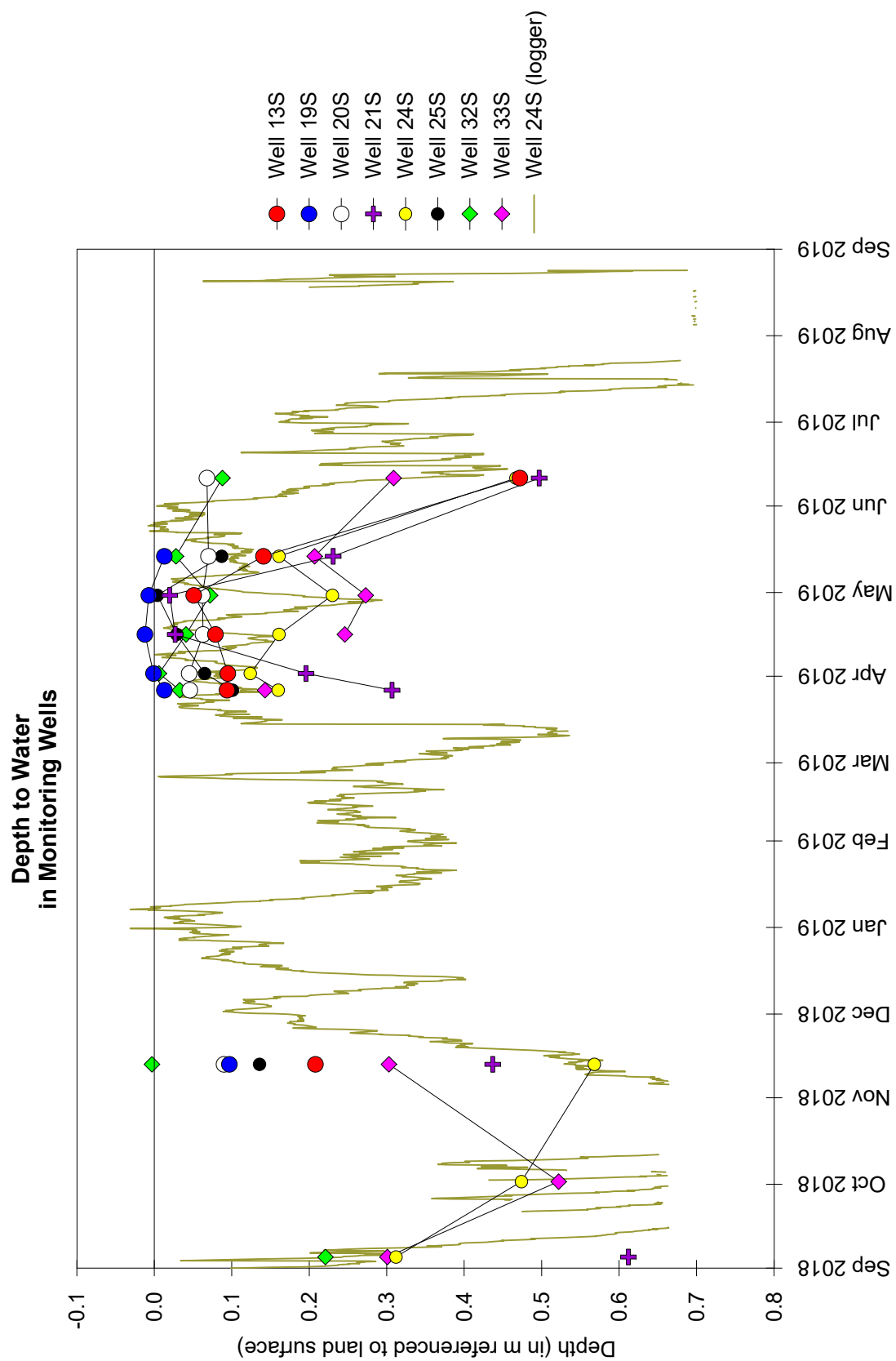
Thorn Creek Headwaters Preserve Wetland Mitigation Site September 1, 2018 through August 31, 2019



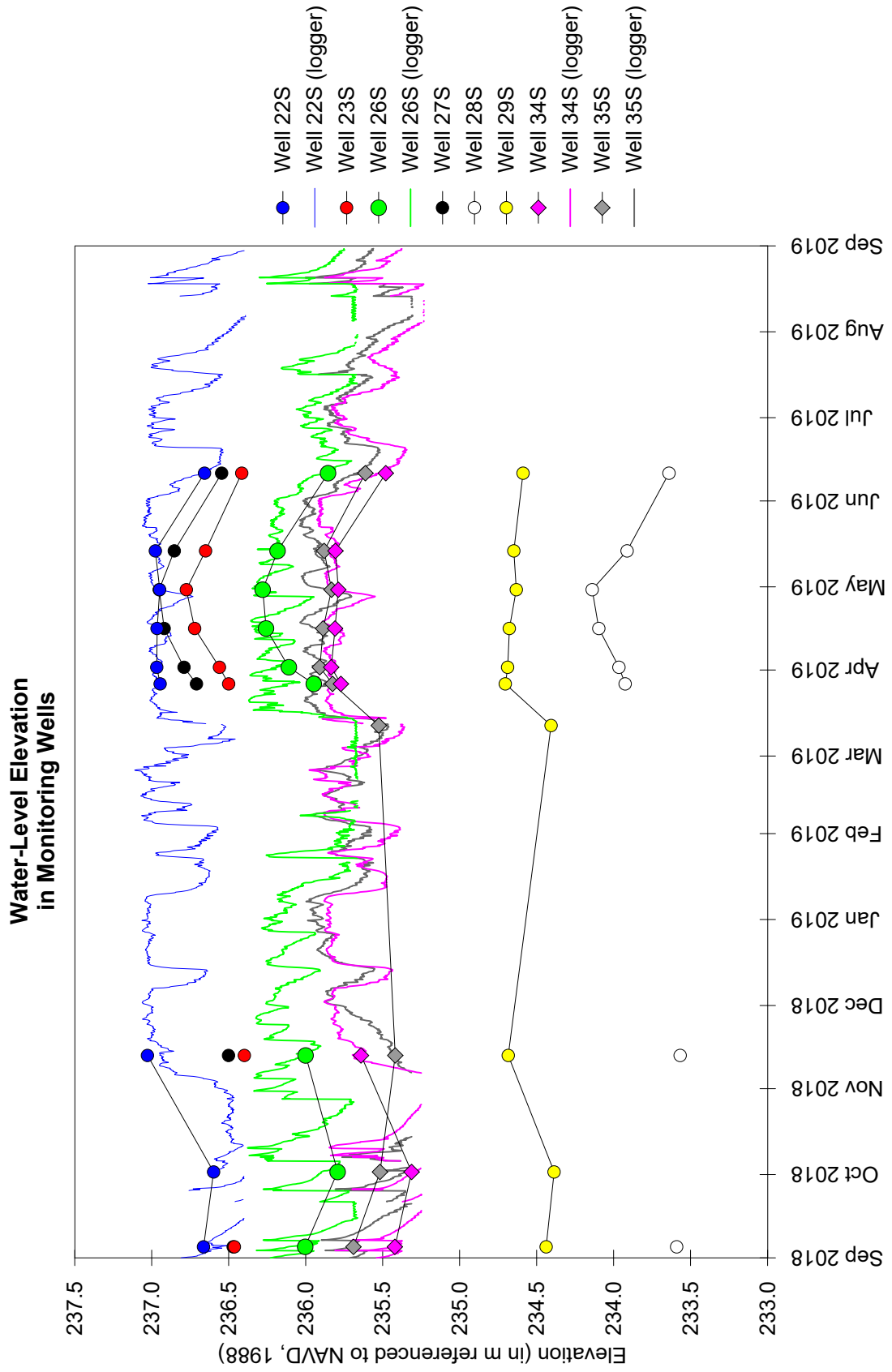
Thorn Creek Headwaters Preserve Wetland Mitigation Site September 1, 2018 through August 31, 2019



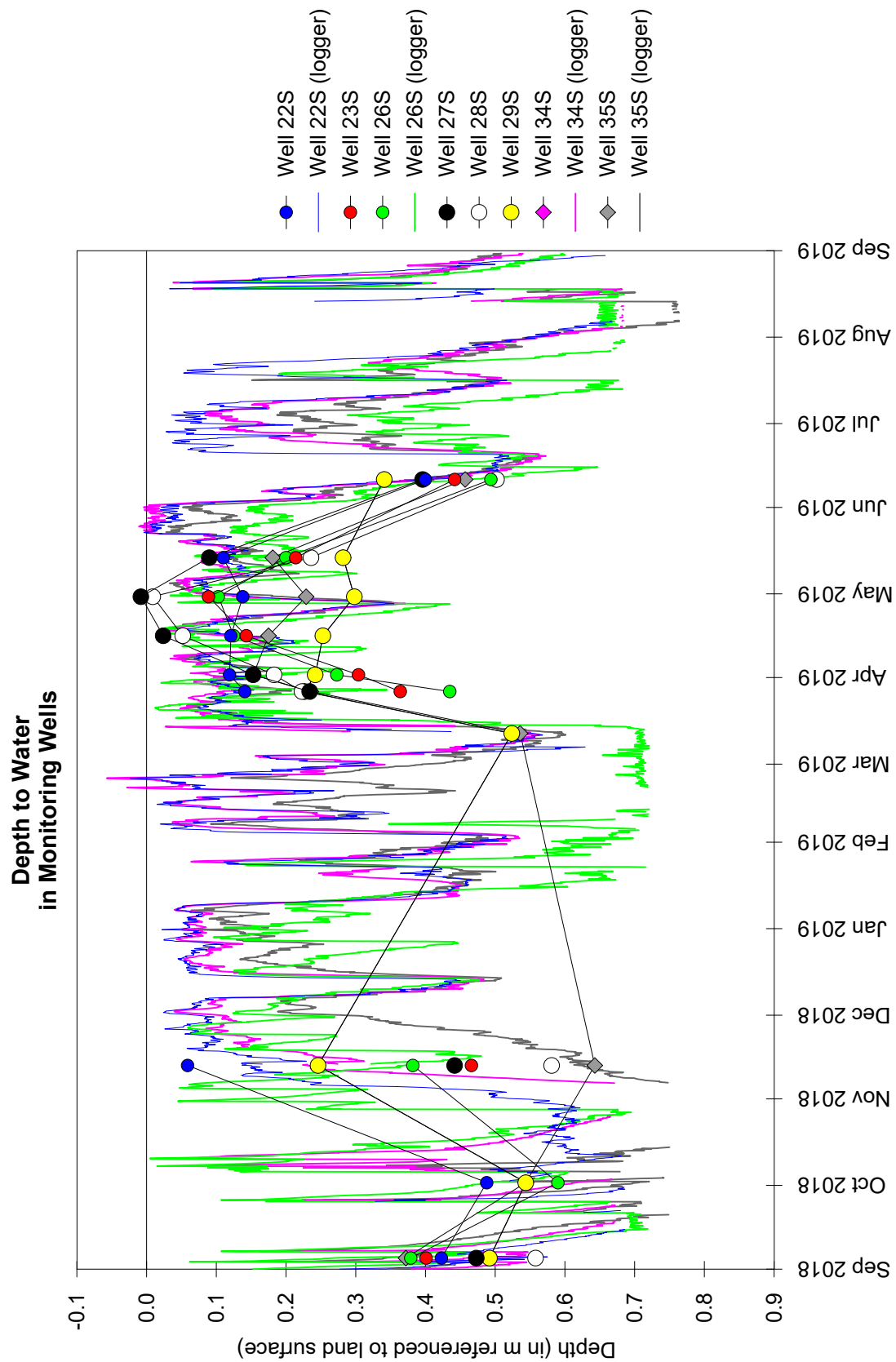
Thorn Creek Headwaters Preserve Wetland Mitigation Site September 1, 2018 through August 31, 2019



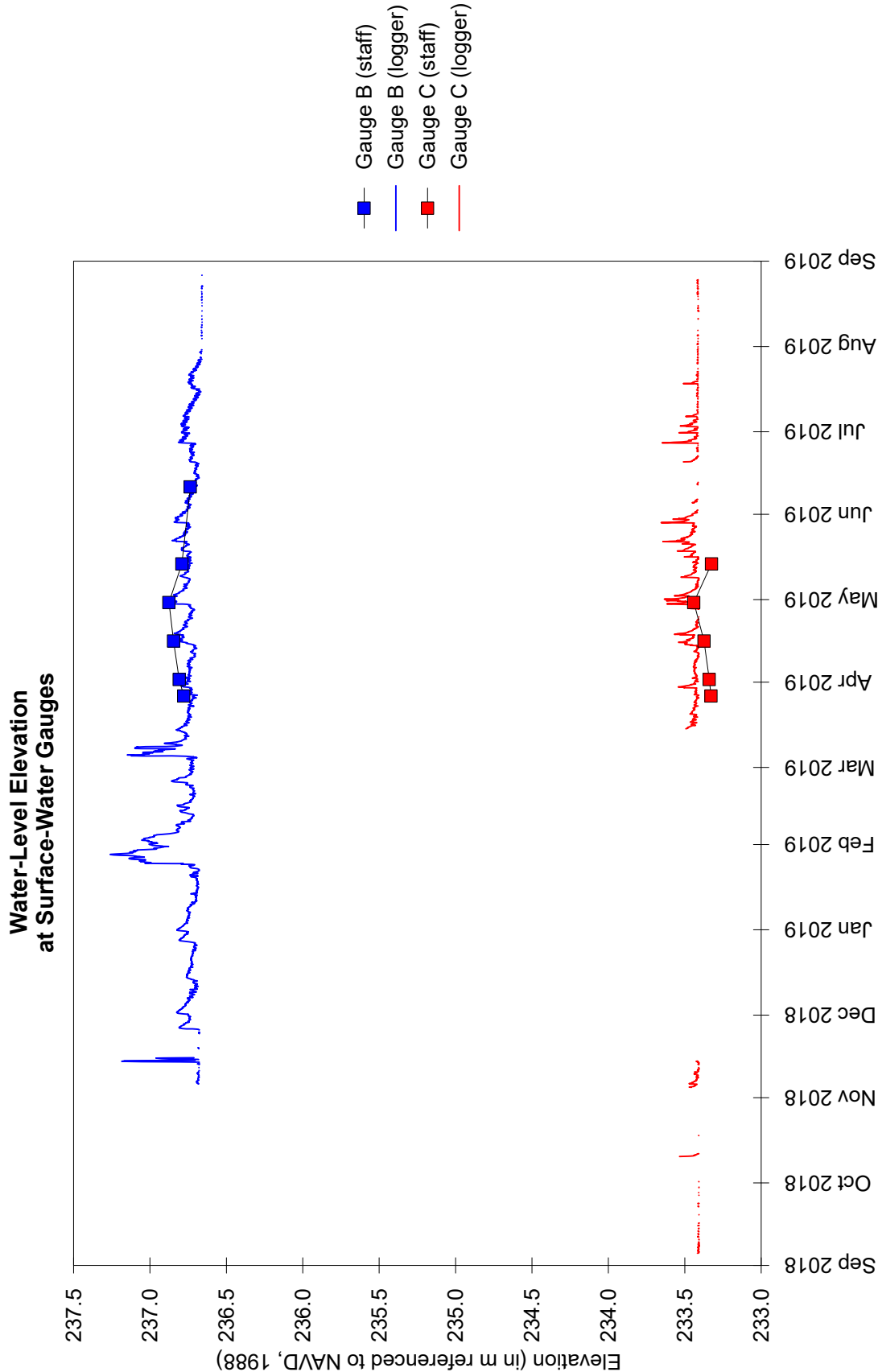
Thorn Creek Headwaters Preserve Wetland Mitigation Site September 1, 2018 through August 31, 2019



Thorn Creek Headwaters Preserve Wetland Mitigation Site September 1, 2018 through August 31, 2019

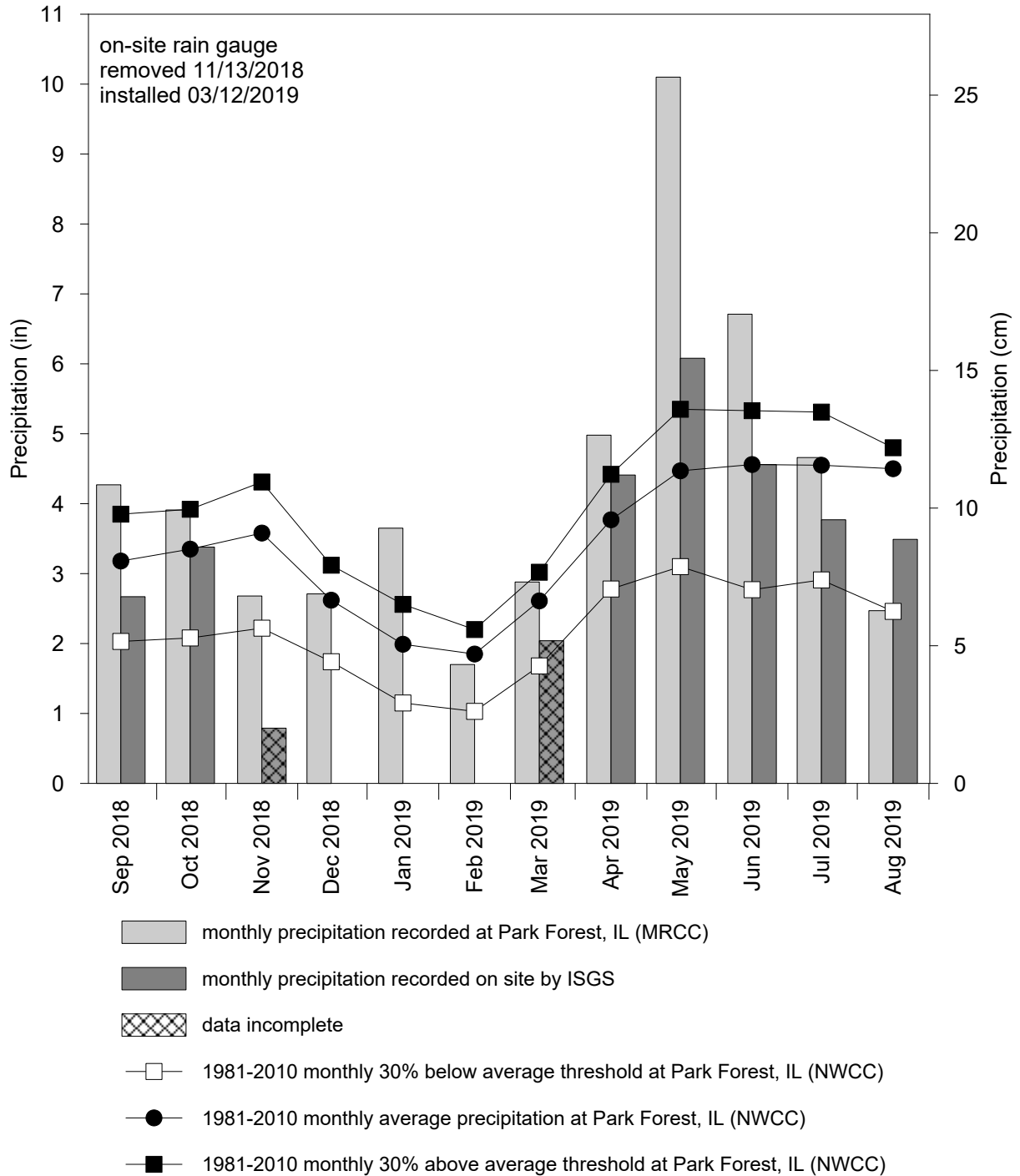


Thorn Creek Headwaters Preserve Wetland Mitigation Site
September 1, 2018 through August 31, 2019



Thorn Creek Wetland Mitigation Site September 2018 through August 2019

Total Monthly Precipitation Recorded on Site and at Park Forest, IL (MRCC station #116616)



**HERRIN ROAD
WETLAND MITIGATION SITE**

ISGS #91

FAS 903/FAU 9588, Herrin to Johnston City Road

Sequence #9891B

Williamson County, near Herrin, Illinois

Primary Project Manager: Audra M. Noyes

Secondary Project Manager: Lindsey A. Schafer

SITE HISTORY

- June 2017: ISGS was tasked by IDOT to monitor wetland hydrology.
- November 2017: The ISGS installed a monitoring network at the site.

WETLAND HYDROLOGY CALCULATION FOR 2019

The target compensation area for the Herrin Road wetland mitigation site is 3.20 ha (7.90 ac). Using the 1987 Manual (Environmental Laboratory 1987), 1.92 ha (4.75 ac) of the total site area of 2.52 ha (6.23 ac) satisfied wetland hydrology criteria for greater than 5% of the 2019 growing season, and 1.86 ha (4.60 ac) of the site satisfied wetland hydrology criteria for greater than 12.5% of the growing season. Using the 2010 Midwest Region Supplement (USACE 2010), 1.92 ha (4.74 ac) satisfied wetland hydrology criteria for 14 or more consecutive days during the growing season. These estimates are based on the following factors:

- The median date that the growing season begins in Du Quoin, Illinois, is March 30, and the season lasts 217 days (MRCC 2019). Using the 1987 Manual, 5% of the growing season is 11 days, and 12.5% of the growing season is 27 days. Using the 2010 Midwest Region Supplement, March 13 was the starting date of the 2019 growing season based on soil temperatures measured at the nearby Harrisburg, Site 3 wetland mitigation site (ISGS #87).
- Total precipitation for the monitoring period at West Frankfort, Illinois (MRCC station #119148), was 124% of normal, and spring 2019 (March through May) precipitation was 135% of normal.
- The period of maximum inundation and saturation during the 2019 growing season occurred during late April into May due to several precipitation events. February, April, and May all recorded above-average precipitation at the West Frankfort MRCC station. Some wells were still meeting wetland hydrology criteria in July.
- In 2019, water levels measured in 15 of 16 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 5% of the growing season, and water levels measured in 15 of 16 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 12.5% of the growing season, using the 1987 Manual. In addition, using the 2010 Midwest Region Supplement, water levels in 15 of 16 soil-zone monitoring wells satisfied wetland hydrology criteria for 14 or more consecutive days of the growing season. See the tables at the end of this summary for details.

ADDITIONAL INFORMATION

- There are a series of beaver dams upstream and downstream of Gauge BR in the unnamed creek. If more beaver dams arise, the IDOT may need to take action to avoid impacting adjacent parcels.

PLANNED FUTURE ACTIVITIES

- Monitoring will continue until no longer required by IDOT.

WETLAND HYDROLOGY TABLES FOR 2019

Well locations meeting wetland hydrology criteria			
<i>ID</i>	<i>5% of growing season</i>	<i>12.5% of growing season</i>	<i>14 days during growing season</i>
1S	Y	Y	Y
2S	Y	Y	Y
3S	Y	Y	Y
4S	Y	Y	Y
5S	Y	Y	Y
6S	Y	Y	Y
7S	Y	Y	Y
8S	Y	Y	Y
9S	Y	Y	Y
10S	Y	Y	Y
11S	N	N	N
12S	Y	Y	Y
13S*	Y	Y	Y
14S	Y	Y	Y
15S	Y	Y	Y
16S	Y	Y	Y

Y – met wetland hydrology criteria

N – did not meet wetland hydrology criteria

* – wetland hydrology determination based on PLS model estimate

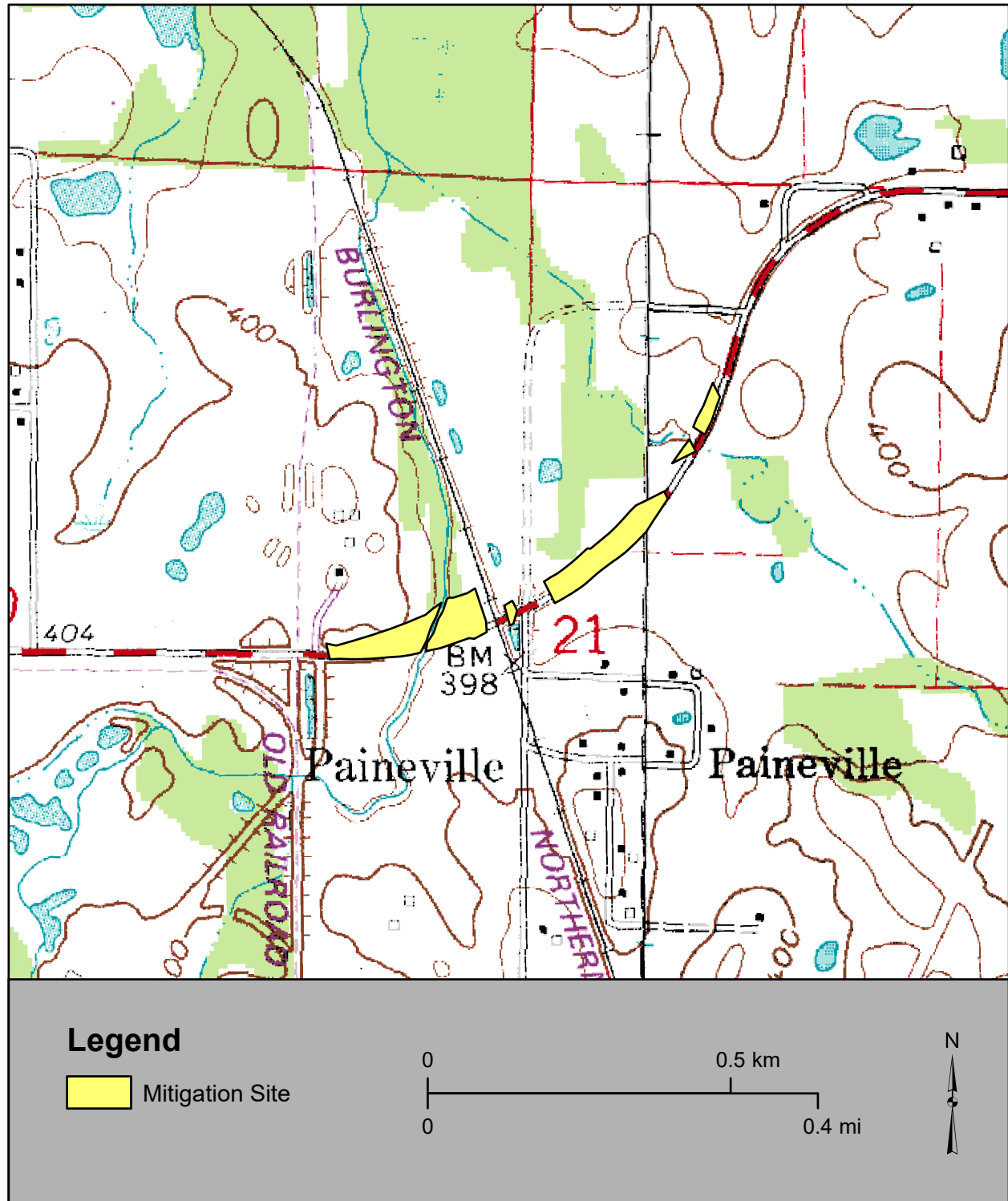
Surface-water gauge elevations meeting wetland hydrology criteria			
<i>ID</i>	<i>5% of growing season</i>	<i>12.5% of growing season</i>	<i>14 days during growing season</i>
A	116.87 m (383.44 ft)	116.82 m (383.28 ft)	116.87 m (383.44 ft)
BR	117.53 m (385.61 ft)	117.53 m (385.58 ft)	117.53 m (385.61 ft)

n/a – insufficient data to determine an elevation

Herrin Road Wetland Mitigation Site (FAS 903/FAU 9588)

General Study Area and Vicinity

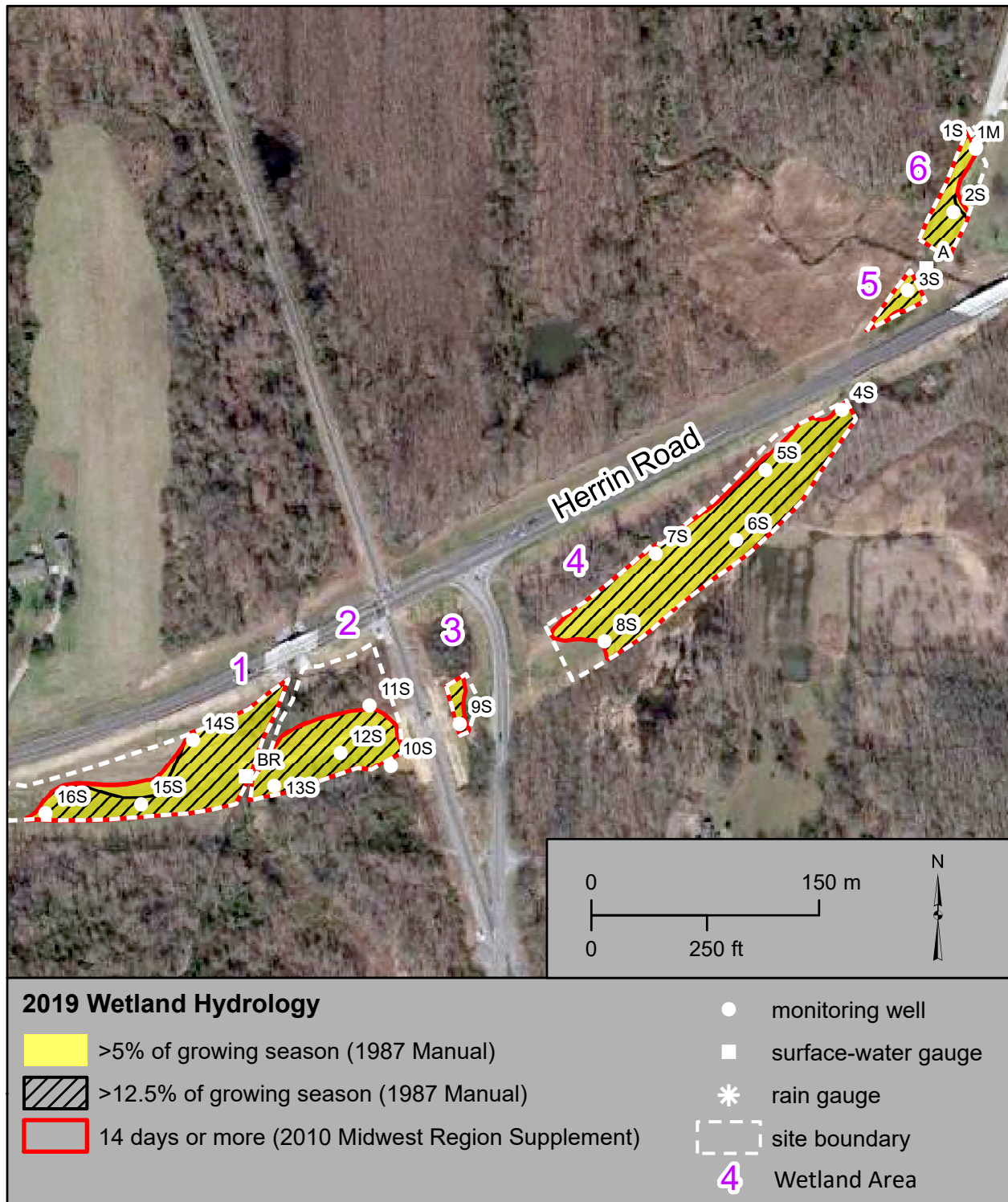
from the USGS Topographic Series, Herrin, IL 7.5-minute Quadrangle (USGS 1968)
and Johnston City, IL 7.5-minute Quadrangle (USGS 1963c)
contour interval is 10 feet



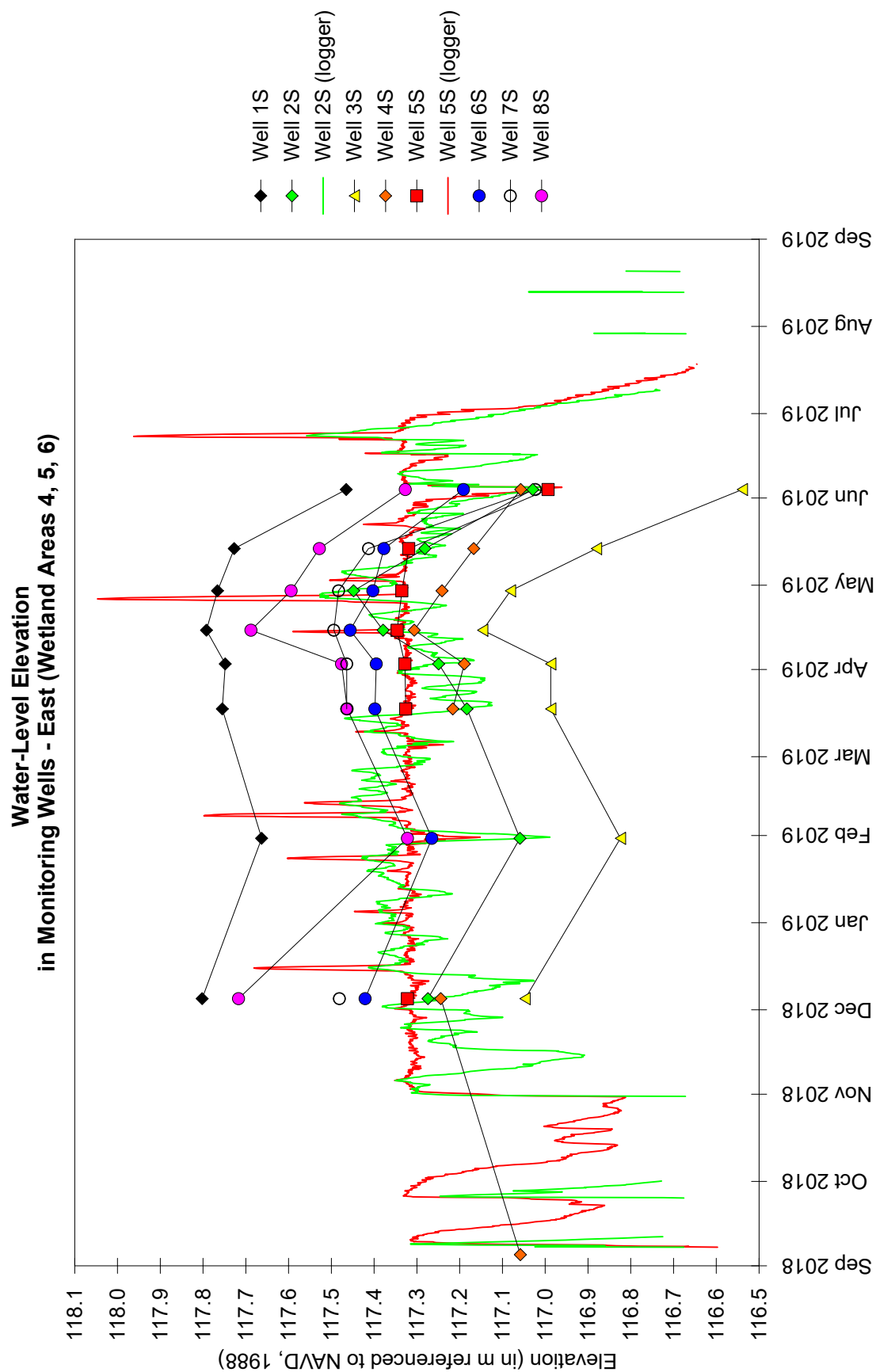
Herrin Road Wetland Mitigation Site (FAS 903/FAU 9588)

Estimated Areal Extent of 2019 Wetland Hydrology
September 1, 2018 through August 31, 2019

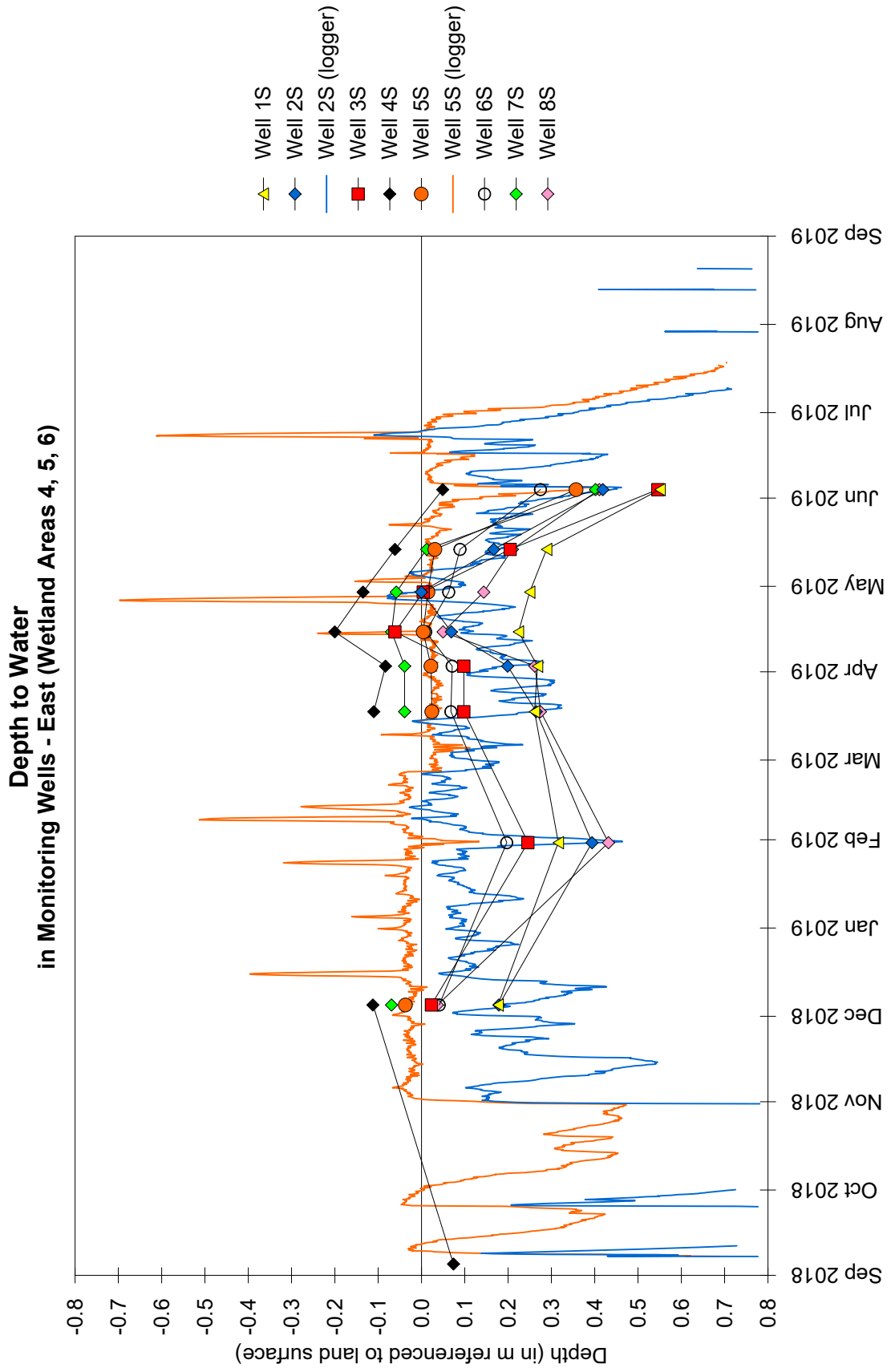
Map based on imagery available from Google Earth (Google 2017)



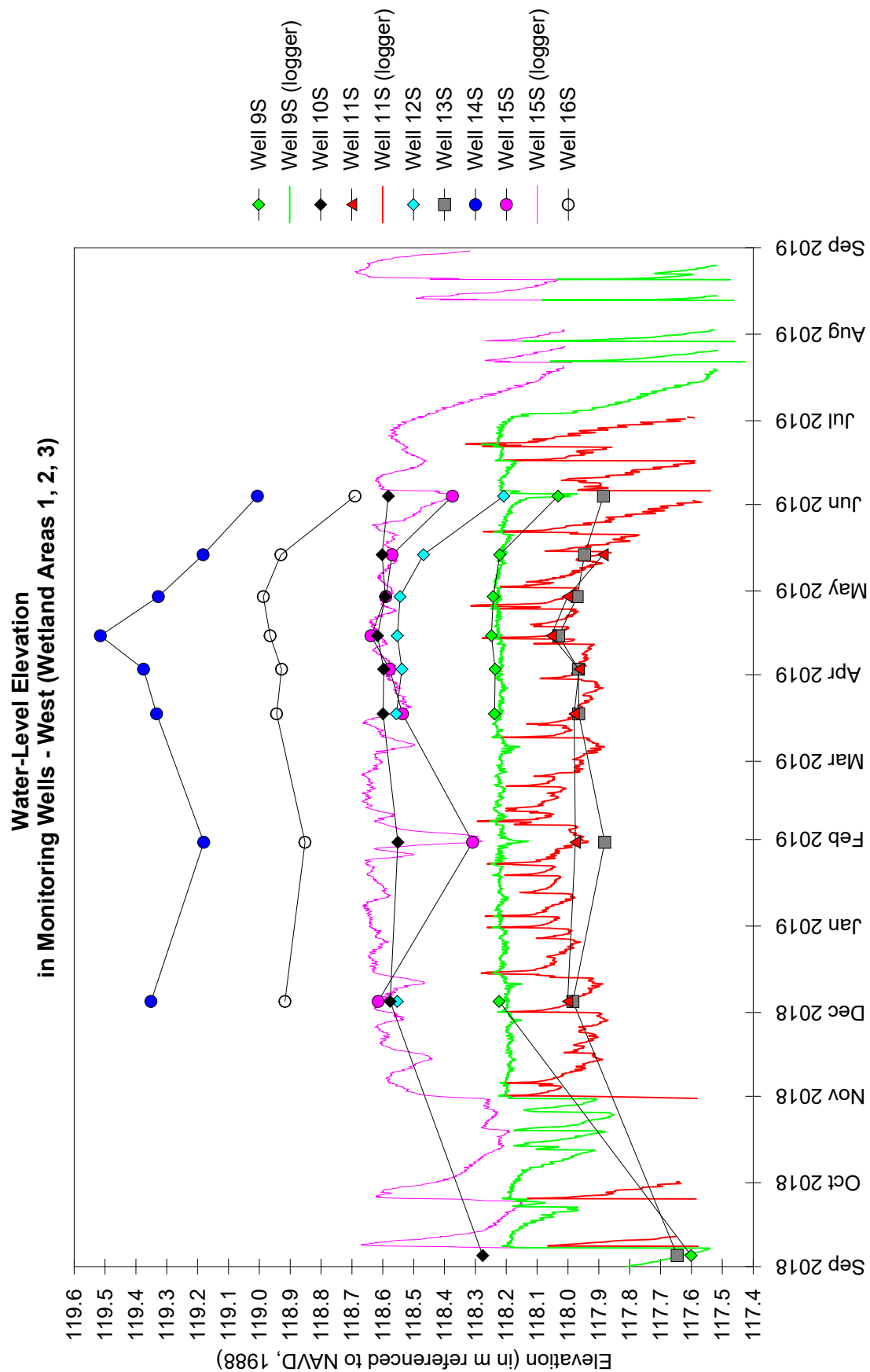
Herrin Road Wetland Mitigation Site September 1, 2018 through August 31, 2019



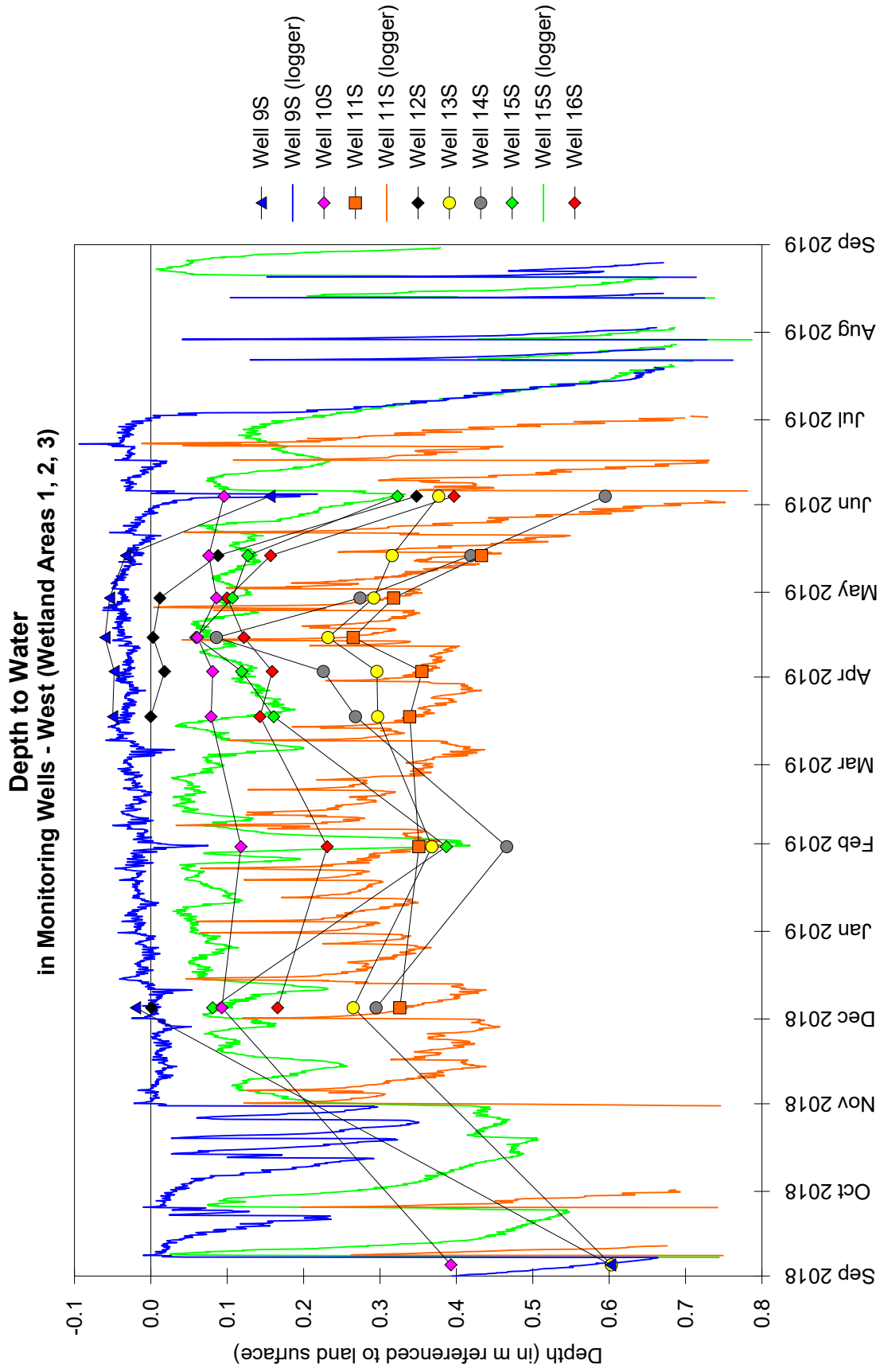
Herrin Road Wetland Mitigation Site **September 1, 2018 through August 31, 2019**



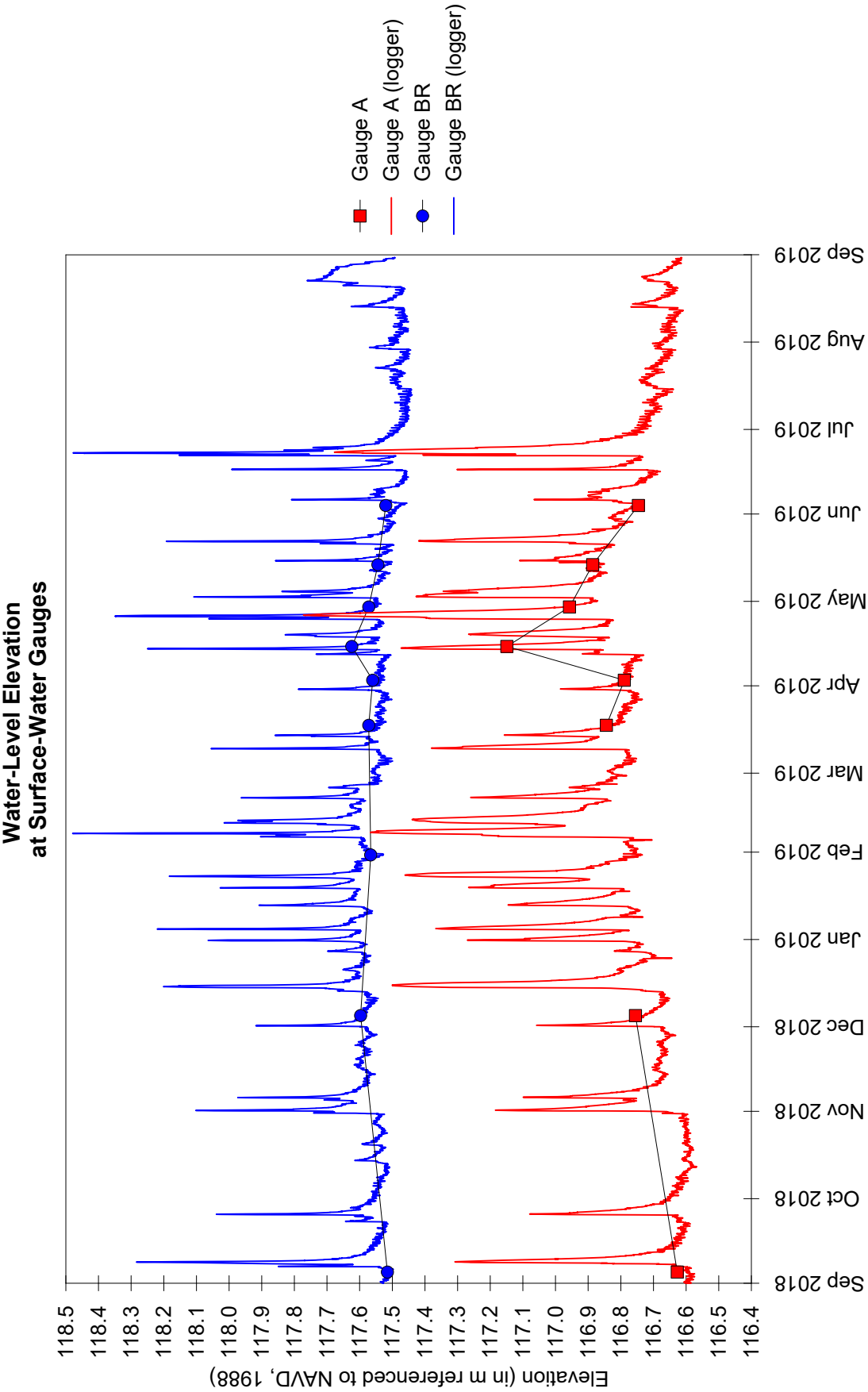
Herrin Road Wetland Mitigation Site September 1, 2018 through August 31, 2019



Herrin Road Wetland Mitigation Site **September 1, 2018 through August 31, 2019**

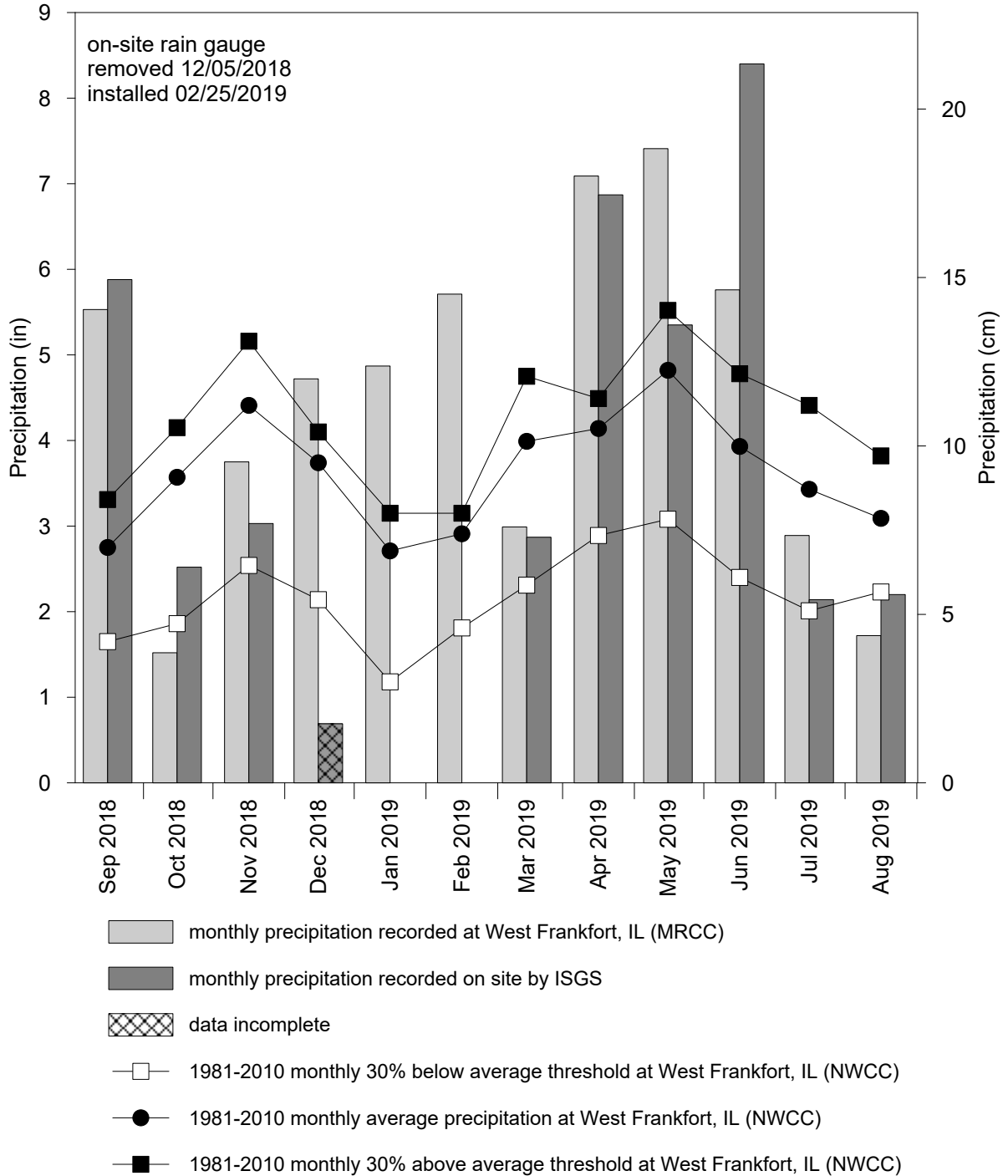


Herrin Road Wetland Mitigation Site
September 1, 2018 through August 31, 2019



Herrin Road Wetland Mitigation Site September 2018 through August 2019

Total Monthly Precipitation Recorded on Site and at West Frankfort, IL (MRCC station #119148)



**NEW HAVEN
WETLAND MITIGATION SITE**

ISGS #92

FAP 877, IL 141

Sequence #18257

White County, near New Haven, Illinois

Primary Project Manager: Audra M. Noyes

Secondary Project Manager: Jessica L.B. Monson

SITE HISTORY

- November 2018: The ISGS installed a monitoring network at the site.

WETLAND HYDROLOGY CALCULATION FOR 2019

The target compensation area for the New Haven wetland mitigation site is 2.57 ha (6.36 ac). Using the 1987 Manual (Environmental Laboratory 1987), 3.06 ha (7.57 ac) of the total site area of 3.18 ha (7.87 ac) satisfied wetland hydrology criteria for greater than 5% of the 2019 growing season, and 2.89 ha (7.13 ac) of the site satisfied wetland hydrology criteria for greater than 12.5% of the growing season. Using the 2010 Midwest Region Supplement (USACE 2010), 3.05 ha (7.53 ac) satisfied wetland hydrology criteria for 14 or more consecutive days during the growing season. These estimates are based on the following factors:

- The median date that the growing season begins in Mt. Vernon, Indiana, is March 23, and the season lasts 236 days (MRCC 2019). Using the 1987 Manual, 5% of the growing season is 12 days, and 12.5% of the growing season is 30 days. Using the 2010 Midwest Region Supplement, March 13 was the starting date of the 2019 growing season based on soil temperatures measured at the nearby Harrisburg, Site 3 wetland mitigation site (ISGS #87).
- Total precipitation for the monitoring period at Carmi 3, Illinois (MRCC station #111302), was 120% of normal, and spring 2019 (March through May) precipitation was 117% of normal.
- The period of maximum inundation and saturation during the 2019 growing season occurred between mid-April and mid-May. This was due to frequent rainfall in the region that resulted in flooding along the Ohio, Wabash, and Little Wabash rivers for most of the month of April. Backflooding occurred on site through the Wabash and Little Wabash Rivers. A larger flood event occurred mid-February to mid-March, but was largely before the start of the growing season.
- In 2019, water levels measured in 12 of 12 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 5% of the growing season, and water levels measured in 12 of 12 soil-zone monitoring wells satisfied wetland hydrology criteria for greater than 12.5% of the growing season, using the 1987 Manual. In addition, using the 2010 Midwest Region Supplement, water levels in 12 of 12 soil-zone monitoring wells satisfied wetland hydrology criteria for 14 or more consecutive days of the growing season. See the tables at the end of this summary for details.

PLANNED FUTURE ACTIVITIES

- Monitoring will continue until no longer required by IDOT.

WETLAND HYDROLOGY TABLES FOR 2019

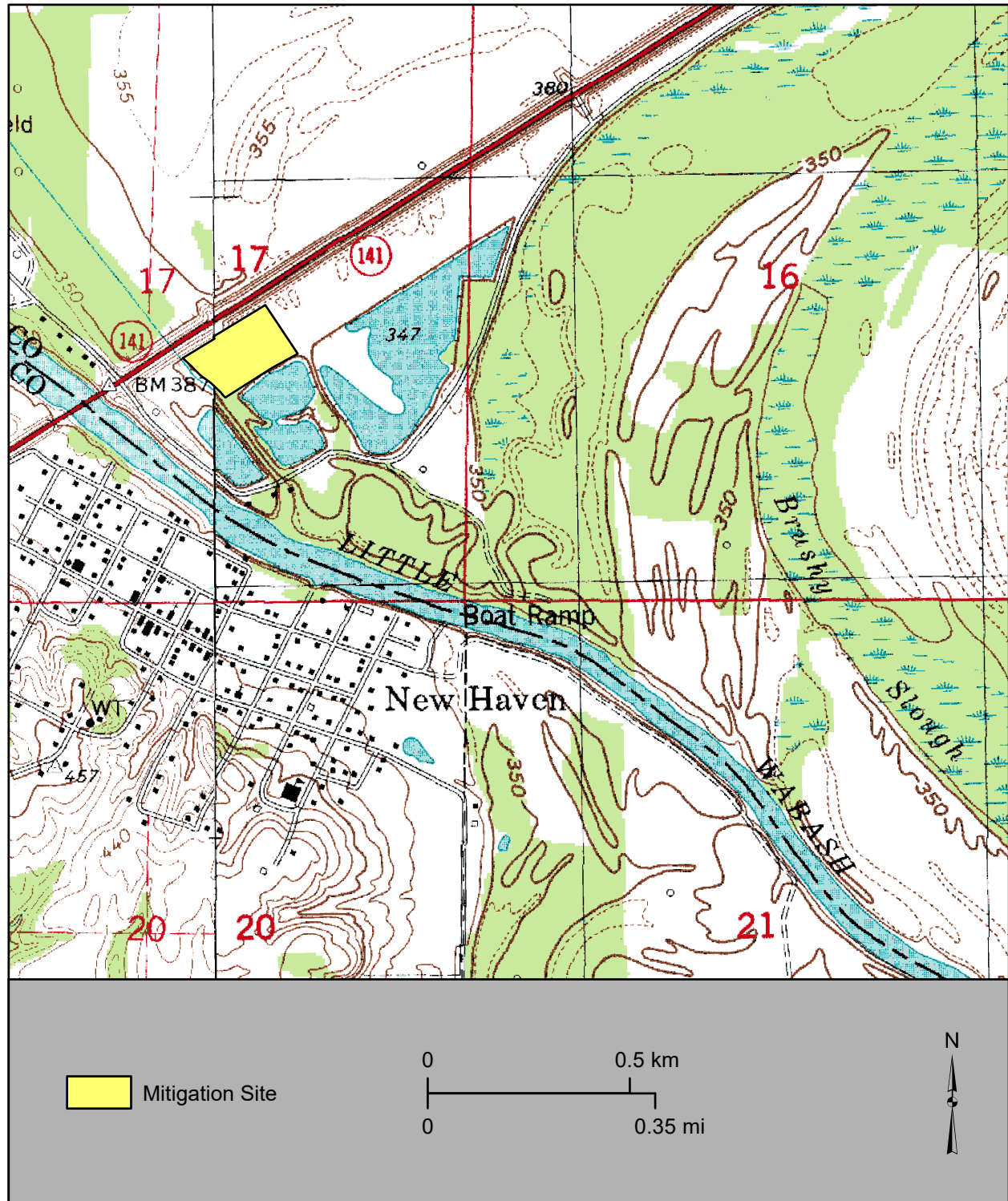
Well locations meeting wetland hydrology criteria			
<i>ID</i>	<i>5% of growing season</i>	<i>12.5% of growing season</i>	<i>14 days during growing season</i>
1S	Y	Y	Y
2S	Y	Y	Y
3S	Y	Y	Y
4S	Y	Y	Y
5S	Y	Y	Y
6S	Y	Y	Y
7S	Y	Y	Y
8S	Y	Y	Y
9S	Y	Y	Y
10S	Y	Y	Y
11S	Y	Y	Y
12S	Y	Y	Y

Y – met wetland hydrology criteria

N – did not meet wetland hydrology criteria

New Haven Wetland Mitigation Site (FAP 877) General Study Area and Vicinity

from the USGS Topographic Series, New Haven, IL 7.5-minute Quadrangle (USGS 1964)
and Emma, IL 7.5-minute Quadrangle (USGS 1978)
contour interval is 10 feet

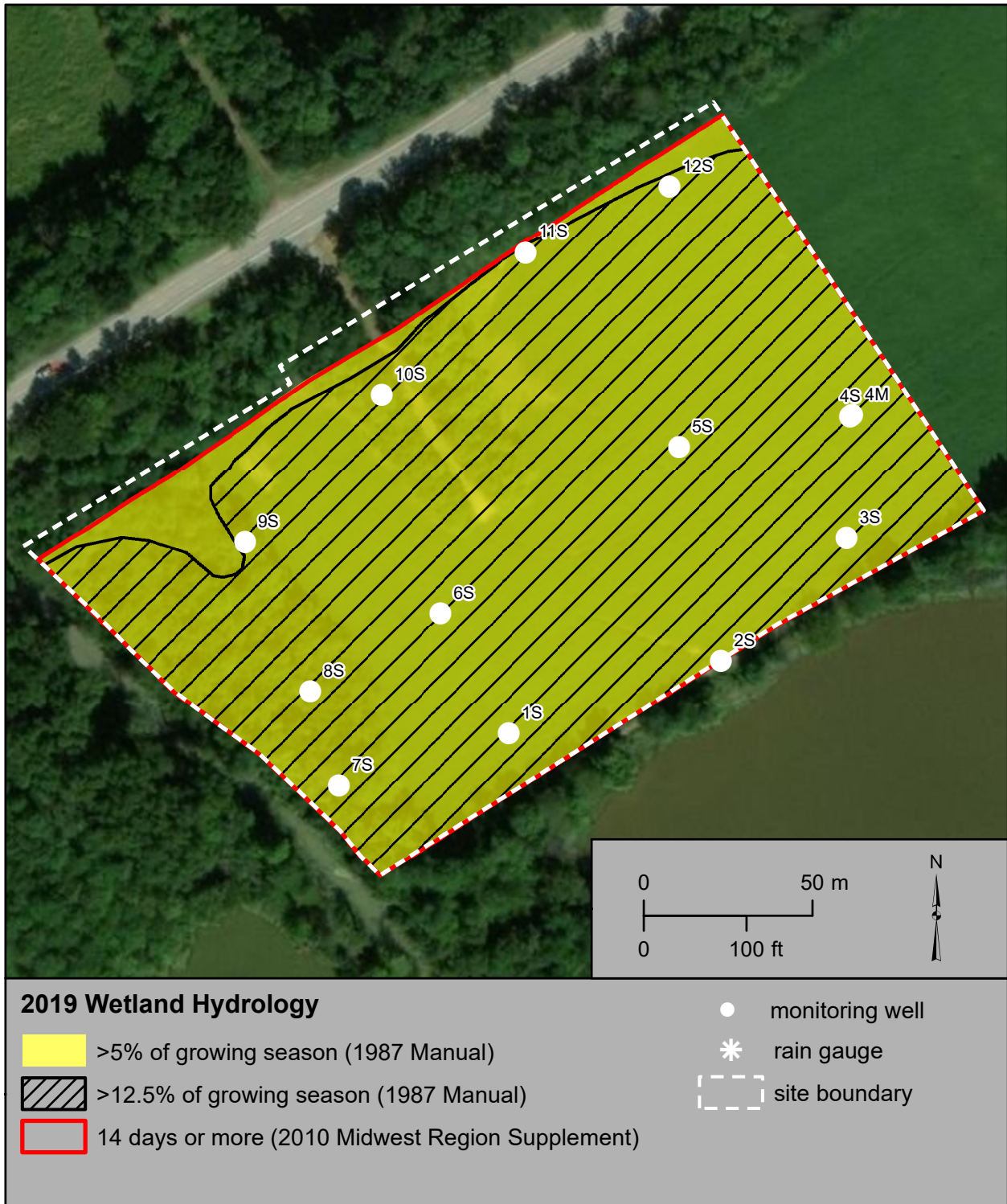


New Haven Wetland Mitigation Site (FAP 877)

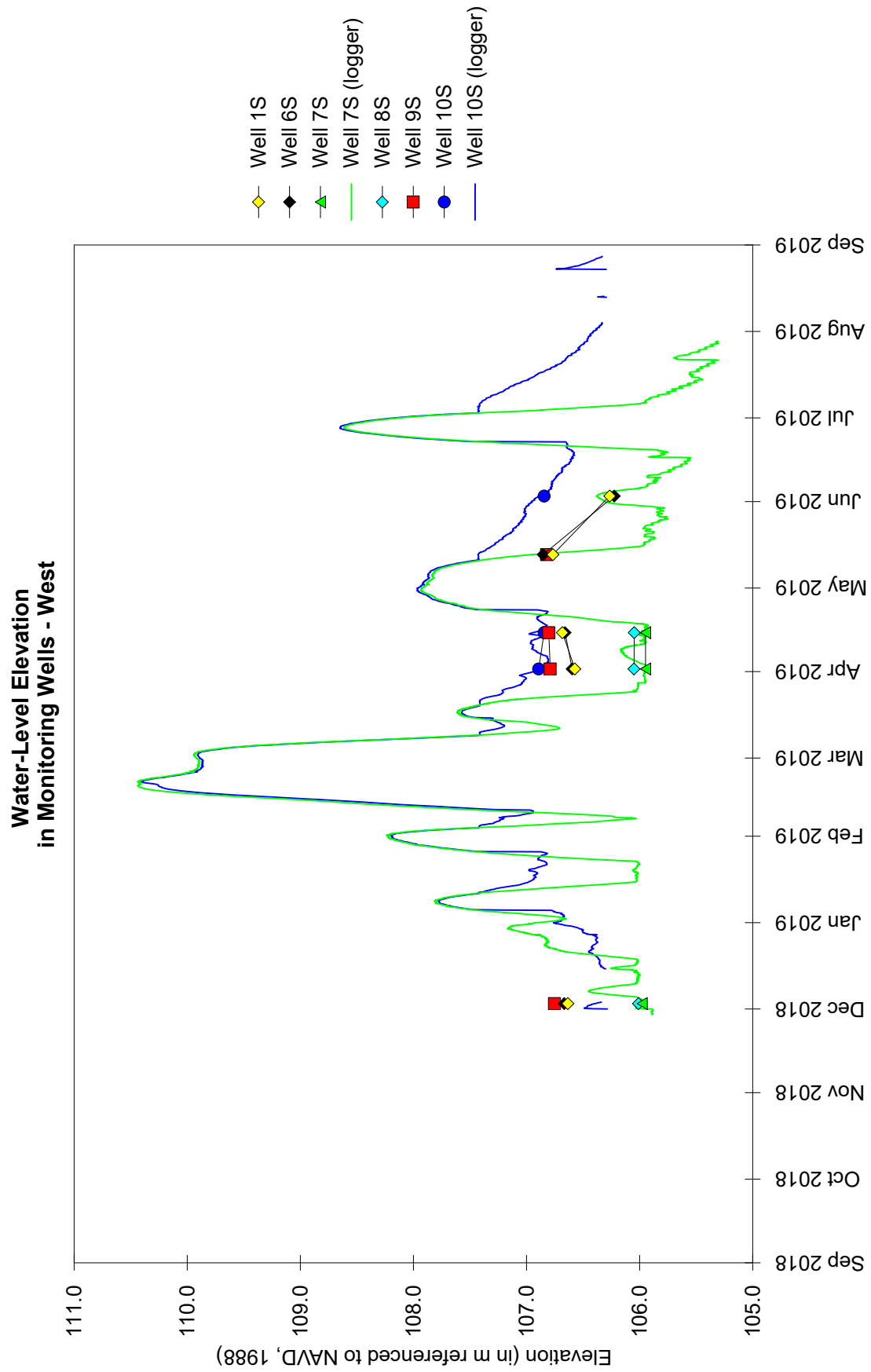
Estimated Areal Extent of 2019 Wetland Hydrology

September 1, 2018 through August 31, 2019

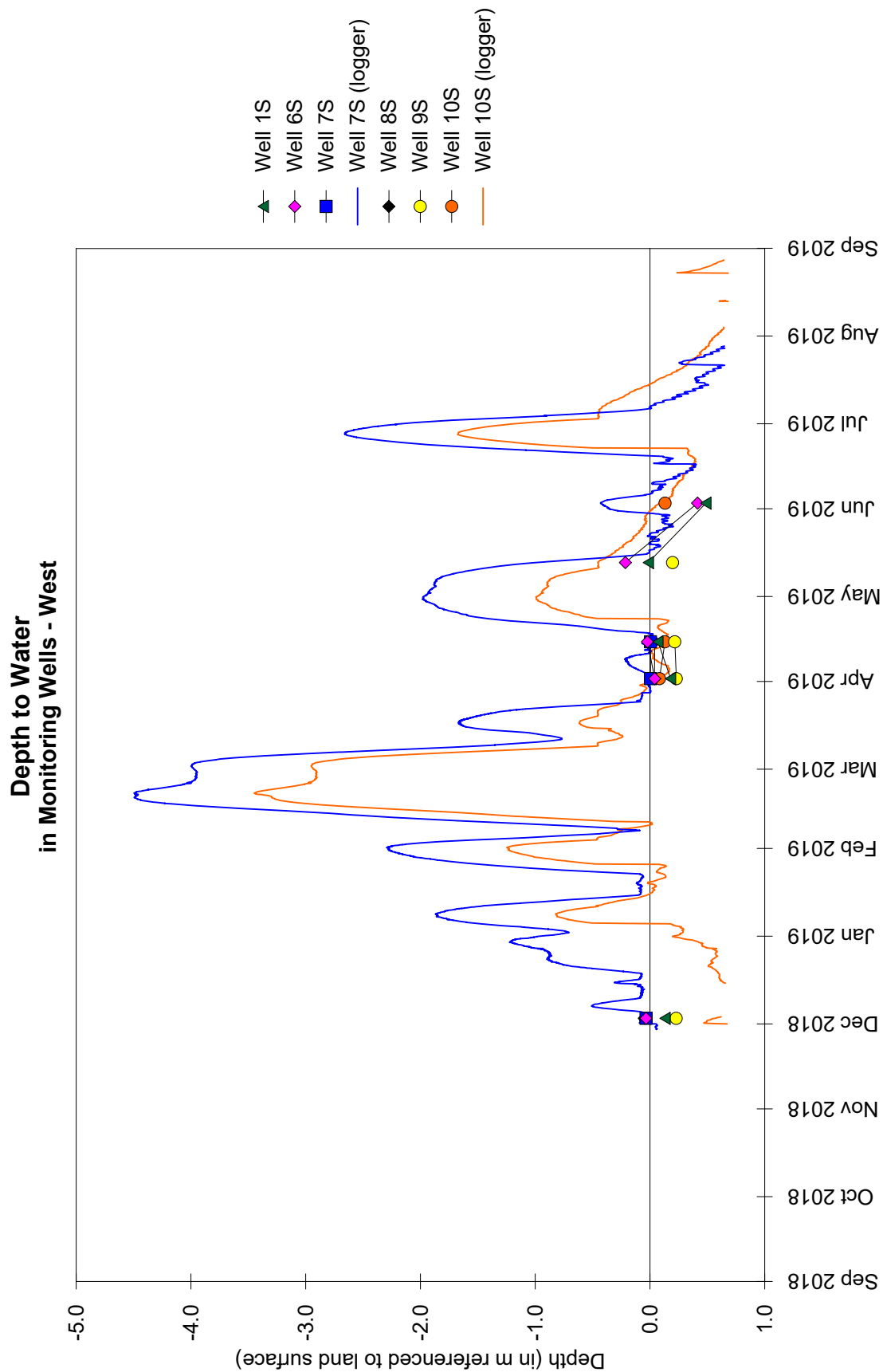
Map based on imagery available from Esri (Esri 2019)



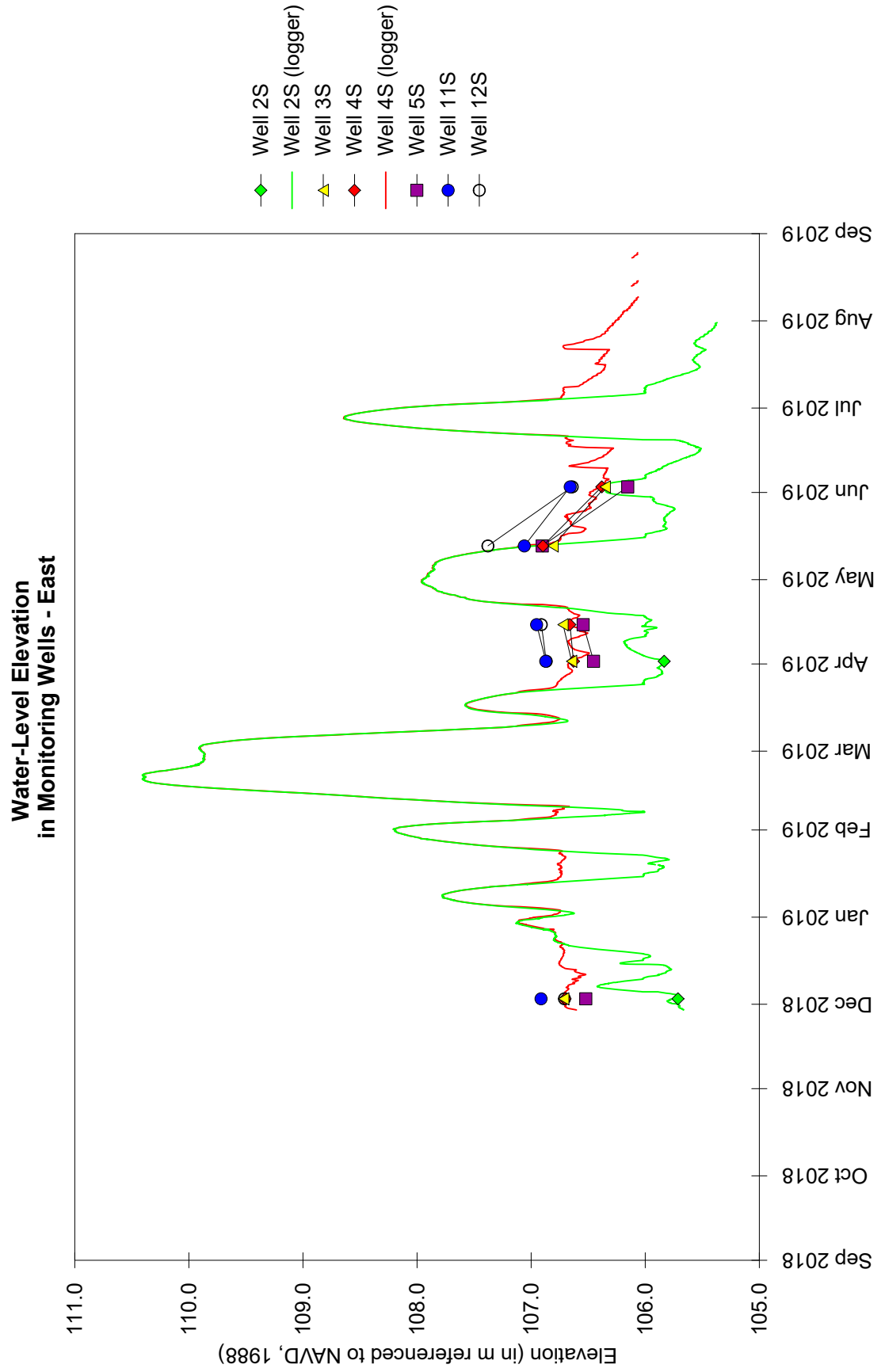
New Haven Wetland Mitigation Site **September 1, 2018 through August 31, 2019**



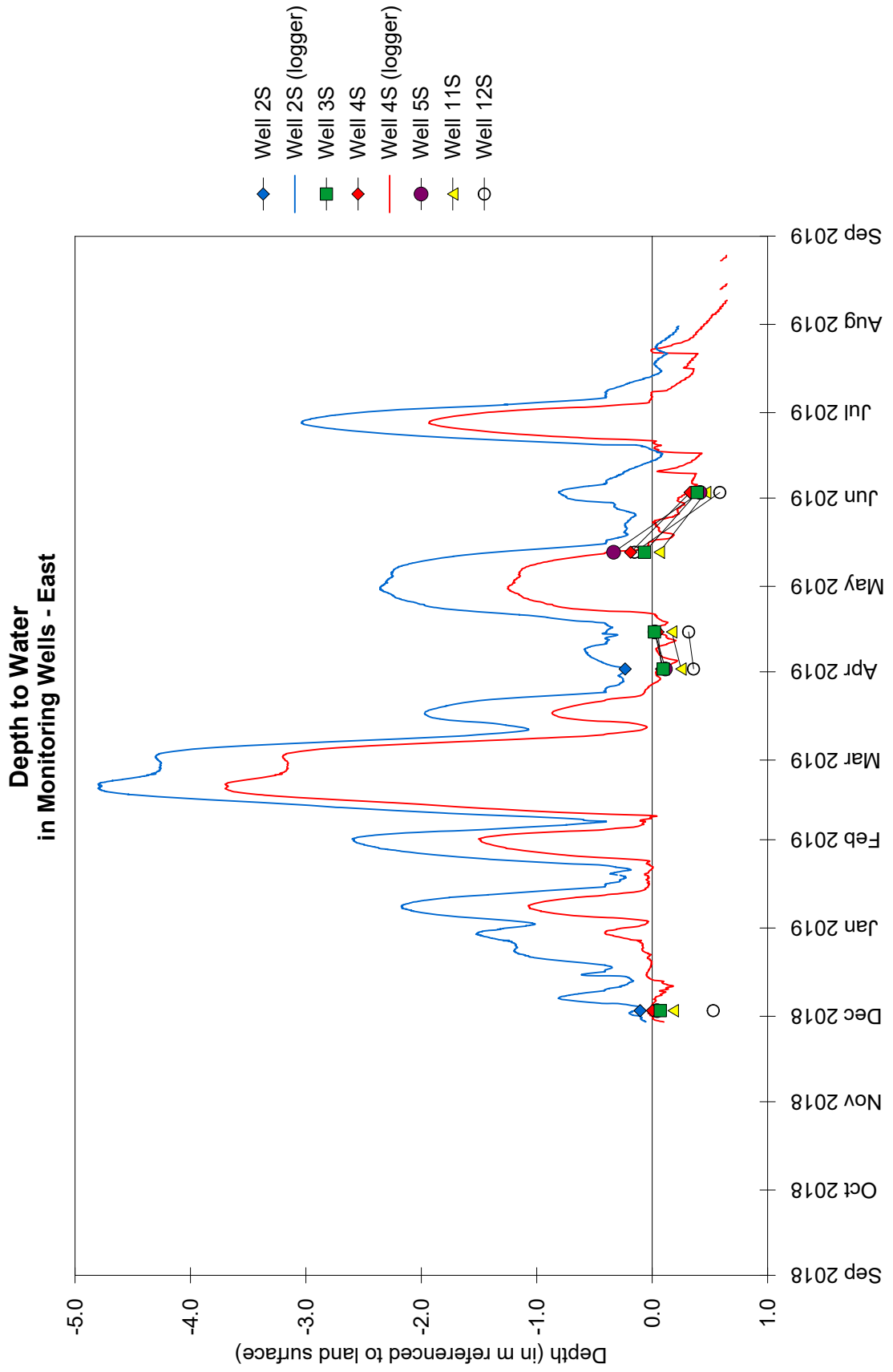
New Haven Wetland Mitigation Site **September 1, 2018 through August 31, 2019**



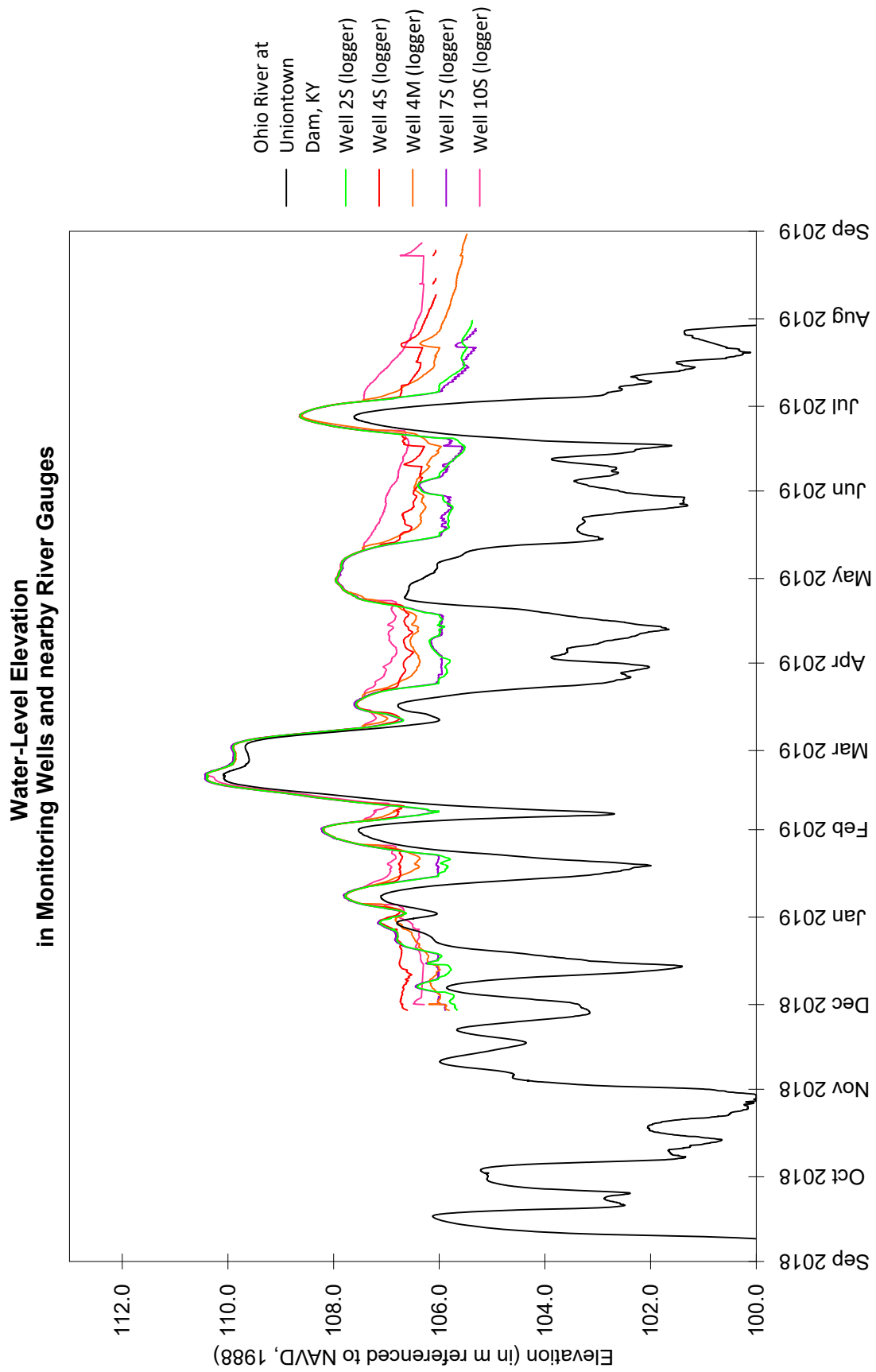
New Haven Wetland Mitigation Site **September 1, 2018 through August 31, 2019**



New Haven Wetland Mitigation Site **September 1, 2018 through August 31, 2019**

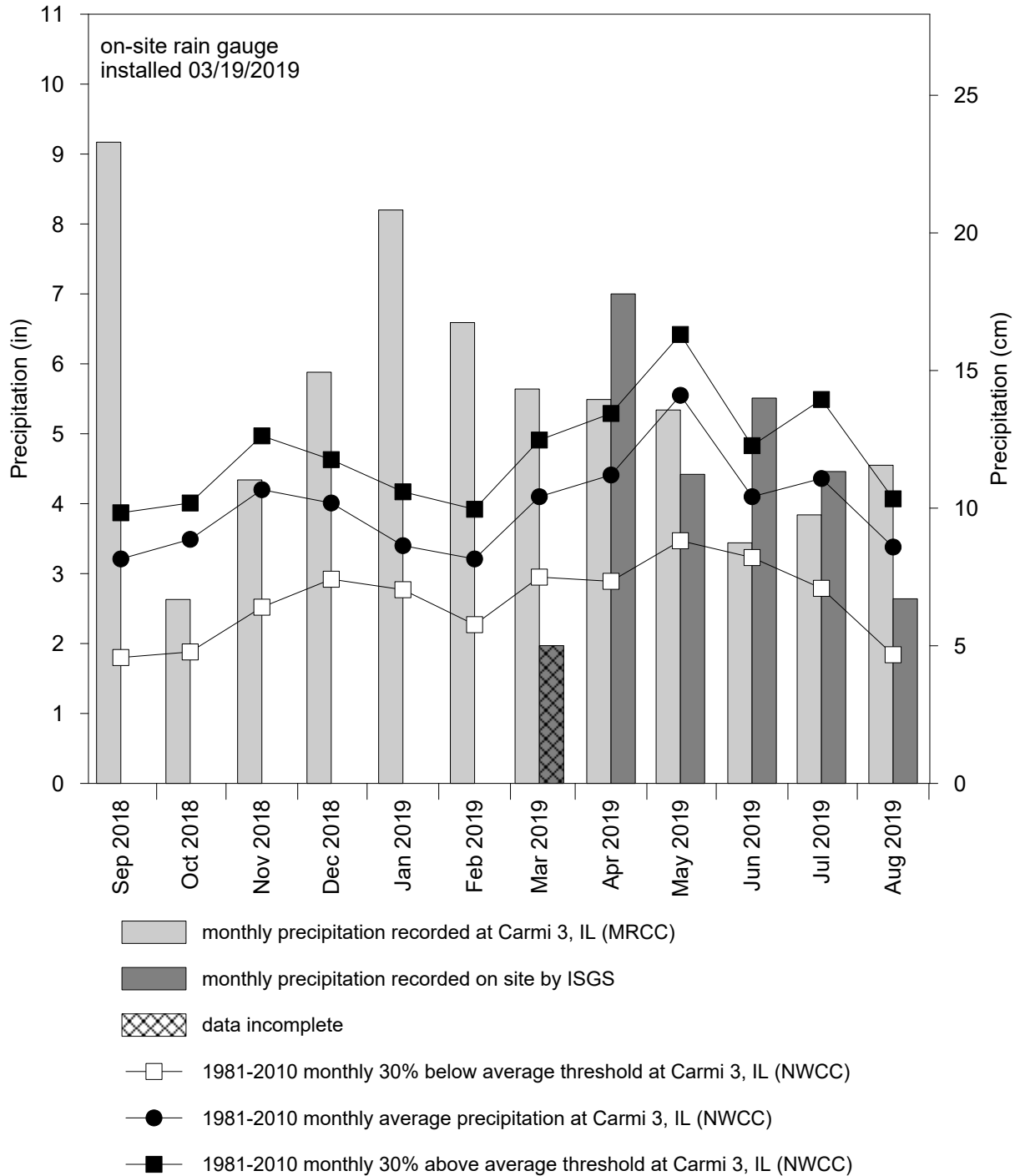


New Haven Wetland Mitigation Site **September 1, 2018 through August 31, 2019**



New Haven Wetland Mitigation Site September 2018 through August 2019

Total Monthly Precipitation Recorded on Site and at Carmi 3, IL (MRCC station #111302)



**FORMER GARNER PROPERTY
WETLAND MITIGATION SITE**

ISGS #93

FAP 332, US 45

Sequence #14105

Saline County, near Texas City, Illinois

Primary Project Manager: Jessica L.B. Monson

Secondary Project Manager: Audra M. Noyes

SITE HISTORY

- May 2019: ISGS was tasked by IDOT to monitor wetland hydrology.
- June 2019: The ISGS installed a monitoring network at the site.

WETLAND HYDROLOGY CALCULATION FOR 2019

The target compensation area for the Former Garner Property wetland mitigation site is 11.69 ha (28.89 ac). A wetland hydrology estimate was not applicable for this year as the monitoring network was installed after the spring; the record of data collected during this time interval is not adequate for assessing the site's wetland hydrology for the 2019 growing season. Details of the 2019 growing season are listed below:

- The median date that the growing season begins in Mt. Vernon, Indiana, is March 23, and the season lasts 236 days (MRCC 2019). Using the 1987 Manual, 5% of the growing season is 12 days, and 12.5% of the growing season is 30 days. Using the 2010 Midwest Region Supplement, March 13 was the starting date of the 2019 growing season based on soil temperatures measured at the nearby Harrisburg, Site 3 wetland mitigation site (ISGS #87).
- Total precipitation for the monitoring period at Carmi 3, Illinois (MRCC station #111302), was 120% of normal, and spring 2019 (March through May) precipitation was 117% of normal.

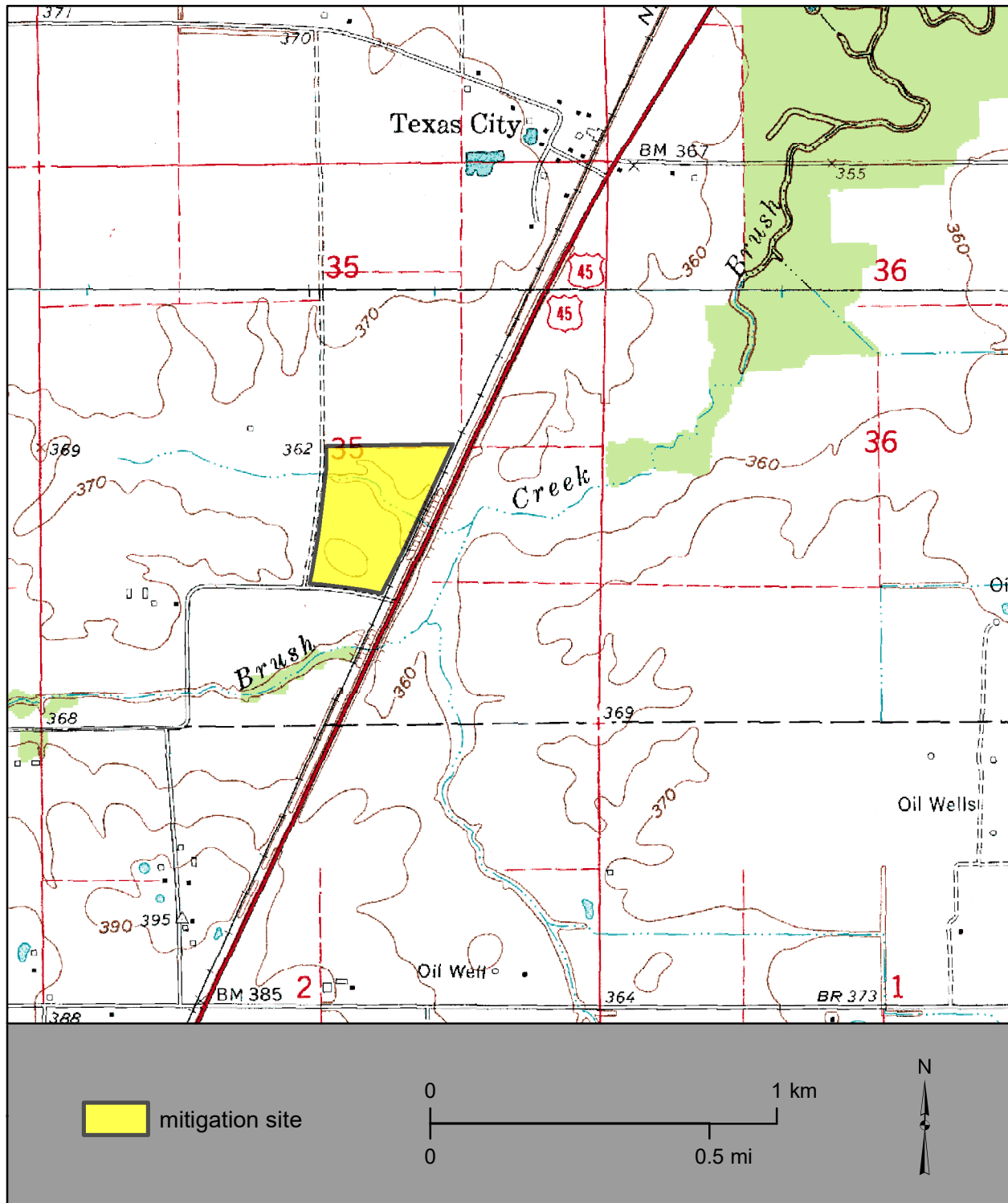
PLANNED FUTURE ACTIVITIES

- Monitoring will continue until no longer required by IDOT.

Wilma Garner Wetland Mitigation Site (US 45, FAP 332)

General Study Area and Vicinity

from the USGS Topographic Series, Broughton, IL 7.5-minute Quadrangle (USGS 1963a)
and Eldorado, IL 7.5-minute Quadrangle (USGS 1963b)
contour interval is 10 feet

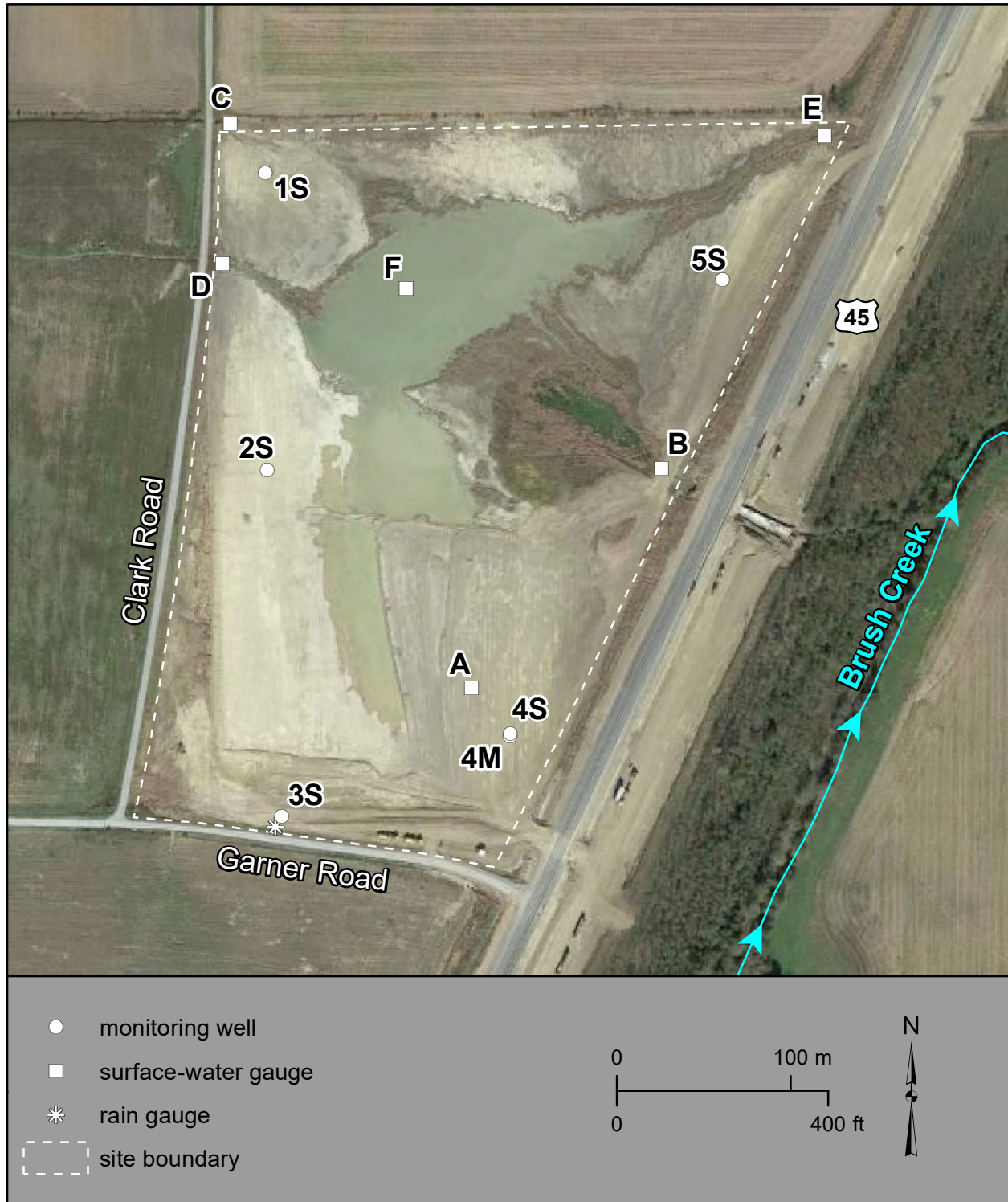


**Former Garner Property Wetland Mitigation Site
(US 45, FAP 332)**

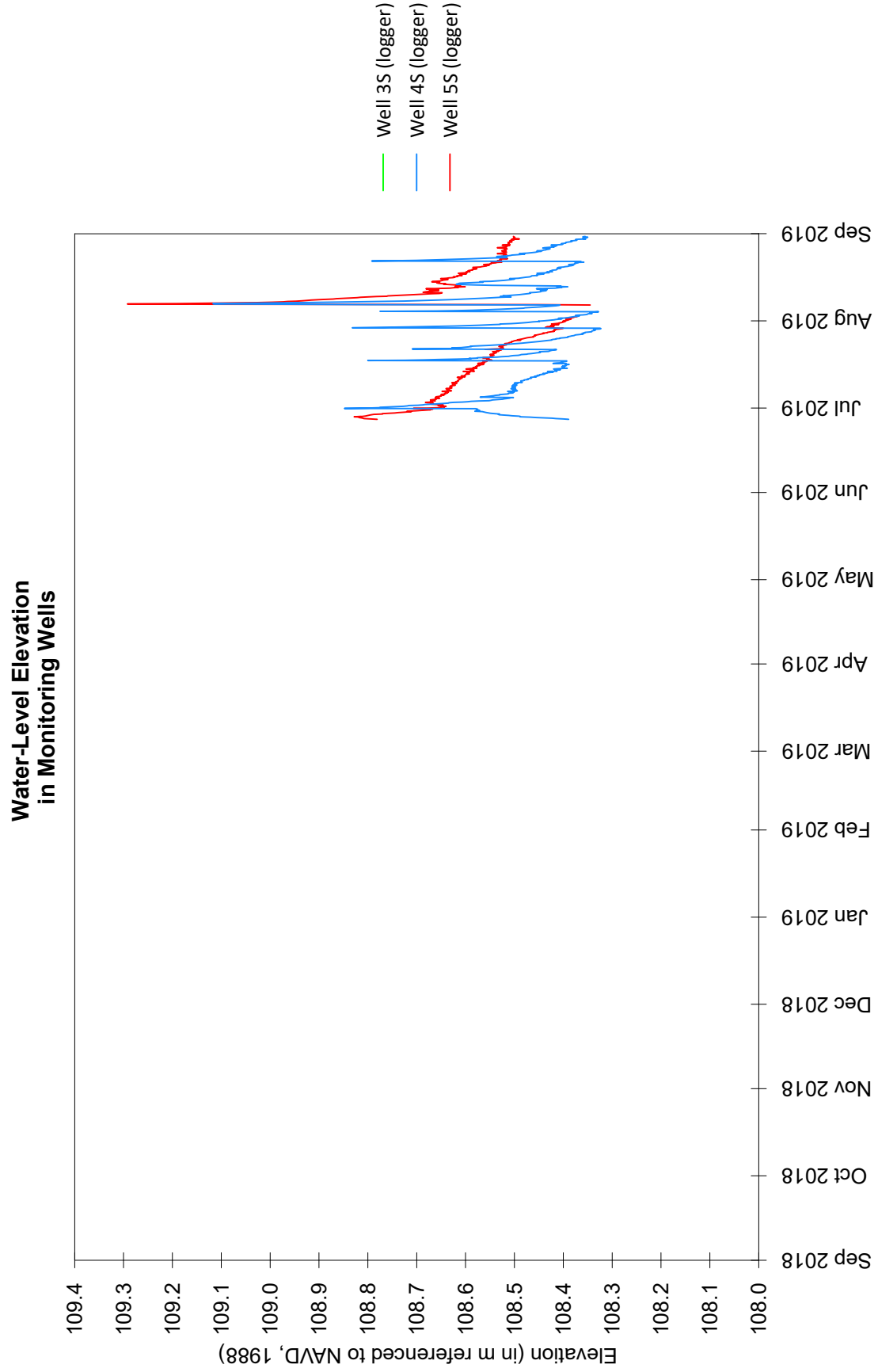
2019 Monitoring Network

June 25, 2019 through August 31, 2019

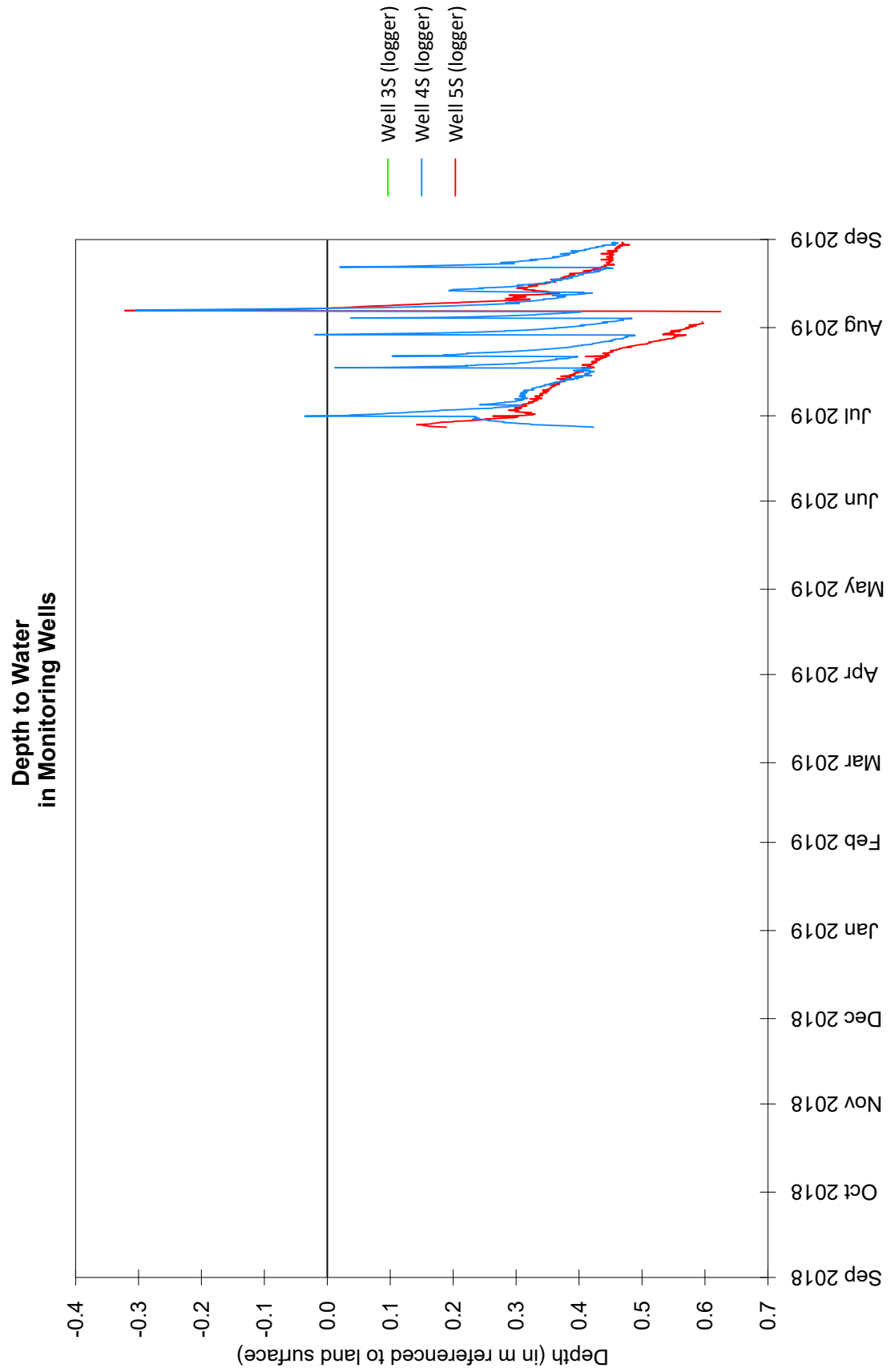
Map based on 2016 imagery available from Google Earth (Google 2019)



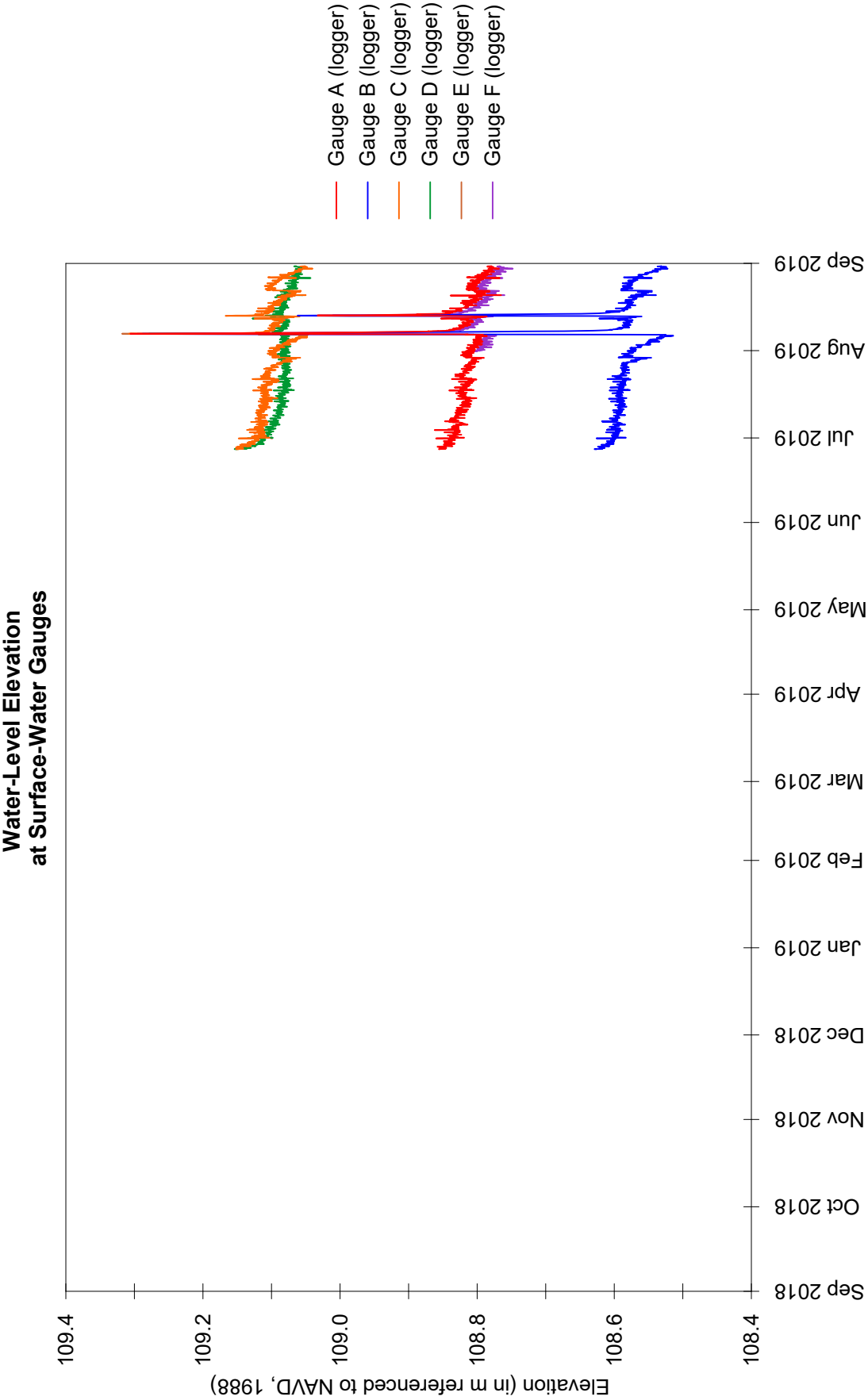
Former Garner Property Wetland Mitigation Site September 1, 2018 through August 31, 2019



Former Garner Property Wetland Mitigation Site **September 1, 2018 through August 31, 2019**



Former Garner Property Wetland Mitigation Site
September 1, 2018 through August 31, 2019



Former Garner Property Wetland Mitigation Site June 2019 through August 2019

Total Monthly Precipitation Recorded on Site and at Carmi 3, IL (MRCC station #111302)

