

November 1, 2022

Mr. Steve Hawk  
Keystone Consulting Engineers  
863 Interchange Road, Suite 101  
Kresgeville, PA 18333

**RE: Wetland Anti-Degradation Analysis  
180-115 C-I Site, LLC  
Tunkhannock Township, Monroe County, PA**

Dear Steve:

Cherry Ridge Consulting LLC (Cherry Ridge LLC) understands that Keystone Consulting Engineers received comments from the Monroe County Conservation District regarding the stormwater management design for the proposed major subdivision. Comment #2 requested an EV Wetlands Anti-Degradation analysis to be completed in accordance with §102.8. This letter report serves to address Comment #2 and provide the information requested by the Monroe County Conservation District.

On March 18, 2022, Cherry Ridge LLC's Professional Wetland Scientist identified one (1) wetland area, identified as Wetland A-North (Wetland A-N), within the Study Area on the property (Figure 1, Attachment A). The Study Area was limited to an area within the northern section of Tax Parcel 20.7.1.14-24. Wetland A-N extends beyond the parcel boundary to the east and beyond the Study Area boundary to the south. The limit of Wetland A-N along its northern boundary was delineated to its interception with the approximate eastern property boundary.

Wetland A-N is the northeastern extent of a larger wetland complex (Figure 2, Attachment A). The northern boundary of Wetland A-N extends from the western portion of the Study Area to the approximate eastern parcel boundary (Figure 3, Attachment A). The western portion of Wetland A-N, located southeast of Potato Road, opens into an emergent and scrub-shrub wetland area. The eastern portion of Wetland A-N is primarily forested. The majority of the wetland complex is forested, with additional pockets of similar scrub-shrub vegetation. An open water feature that corresponds to Mud Pond Run was observed flowing from west to east within Wetland A-N. Natural seeps within the Study Area also contribute to the hydrology of Wetland A-N. These natural seeps, indicative of a high groundwater table, and precipitation runoff through the wetland complex serve to form the headwaters of Mud Pond Run, which is tributary to Tunkhannock Creek, east of the wetland complex.

Observed dominant vegetation within the scrub-shrub wetland area of Wetland A-N included black willow (*Salix nigra*), cattail (*Typha latifolia*), high-bush blueberry (*Vaccinium corymbosum*), silky dogwood (*Cornus amomum*), sedge species (*Carex sp.*), and common reed (*Phragmites australis*). Observed dominant vegetation within the forested portion of Wetland A-N included American hornbeam (*Carpinus caroliniana*), white oak (*Quercus alba*), grey alder (*Alnus incana*), giant rhododendron (*Rhododendron maximum*), high-bush blueberry (*Vaccinium corymbosum*), serviceberry



(*Amelanchier canadensis*), silky dogwood (*Cornus amomum*), cinnamon fern (*Osmundastrum cinnamomeum*), and sheep laurel (*Kalmia angustifolia*).

During the initial wetland identification and delineation on March 18, 2022, regional hydrologic conditions were determined to be “wetter than normal” (U.S. Army Corps of Engineers Antecedent Precipitation Tool, Attachment B). Cherry Ridge LLC observed a surface water depth of 2 to 3 inches within the headwater section of Mud Pond Run at that time. The pond observed within the eastern portion of the Study Area was observed to range in depth from 4 inches to approximately 12 inches at its deepest point. Areas of standing/ponded water within the wetland were no more than a few inches deep.

Cherry Ridge LLC personnel returned to the Study Area and wetland complex on October 7, 2022 for the purpose of obtaining additional hydrologic data for the wetland. At that time, the regional hydrologic conditions were determined to be “normal” with incipient drought having been observed the prior month (September), according to the U.S. Army Corps of Engineers Antecedent Precipitation Tool (Attachment B). On October 7<sup>th</sup>, Cherry Ridge LLC observed a surface water depth of 1 to 1.5 inches within the headwater section of Mud Pond Run. Scouring along the banks of Mud Pond Run at its northern extent was observed, likely due to high-flow precipitation events. Water depth within the eastern Study Area pond was observed to be approximately 3 to 9 inches deep. Areas of standing/ponded water within the wetland were a few inches deep, though less numerous than observed during the site reconnaissance on March 18<sup>th</sup>. Photographs of the observed “normal” conditions are included in Attachment C.

The typical hydroperiod for the observed scrub-shrub vegetation within the wetland complex is 3-6 inches of standing water. The typical hydroperiod for the observed tree and shrub species in the wetland complex is typically 0-12 inches of standing water. Cherry Ridge LLC observed microtopographic depressions and natural “mounding” around the vegetation within the complex, which is indicative of the vegetation’s ability to sustain seasonal flooding under “wet” conditions. Cherry Ridge LLC understands that the Post Construction Stormwater Management (PCSM) plan has been designed to be consistent with the §102.18 regulations and antidegradation guidance. The PCSM plan is designed to not significantly increase ponding depths in the wetland complex. As noted above, the existing wetland condition functions through seasonal flooding conditions and the proposed controlled release of stormwater to the wetland complex, as discussed below, will not have an adverse impact on the ponded depths and wetland function in this regard.

Cherry Ridge LLC understands that under the PCSM plan, stormwater flows will be mitigated from the project site through the installation of eight (8) subsurface seepage beds, six (6) bio-retention basins and multiple vegetated channels. Cherry Ridge LLC further understands that the PCSM plan proposes infiltration of the net increase in stormwater volume for the proposed site conditions, as compared to the existing site conditions, for all storm events up to the 2-year event. The purpose of this design consideration is to replicate the site’s existing conditions for groundwater recharge contribution. This will allow the existing recharge conditions upstream of the wetland complex to be maintained and therefore, not cause an adverse impact to the existing wetland hydrology.

The installation of the subsurface seepage beds, bio-retention basins and vegetated swales will mitigate concentrated discharge flows. The PCSM plan proposed peak rate mitigations for all design storms up to and including the 100-year storm. It is Cherry Ridge LLC’s understanding that the rate of discharge for design storms during the proposed condition are less than or equal to the existing site condition. This



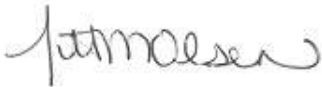
design plan consideration will not cause an adverse impact to wetland hydrology from precipitation contributions (concentrated discharge) upstream and downstream of the concentrated discharge points. In fact, mitigation of the upstream storm discharges through engineered design may contribute to less scour noted along the banks of Mud Pond Run within the wetland complex under existing conditions.

In order to mitigate thermal impacts to downstream waters, including the wetland complex, the PCSM plan is designed to capture and infiltrate the majority of the most thermally impacted (“first flush”) stormwater generated from impervious surfaces during small storm events. This design consideration is protective of thermal impacts to the EV wetlands.

Based on observation and comparison of the wetland complex function and hydrologic regime under wet and normal conditions, it is the opinion of the Professional Wetland Scientist completing this letter report that the wetland is predominantly groundwater fed and is self-regulating its hydrologic regime (flow volume and depths). It is further my professional opinion that the proposed PCSM plan will not have an adverse impact on the vegetation, type or function of the wetland complex.

If you have any questions or require additional information, please contact me at (570) 350-0809.

Sincerely,  
**Cherry Ridge Consulting LLC**

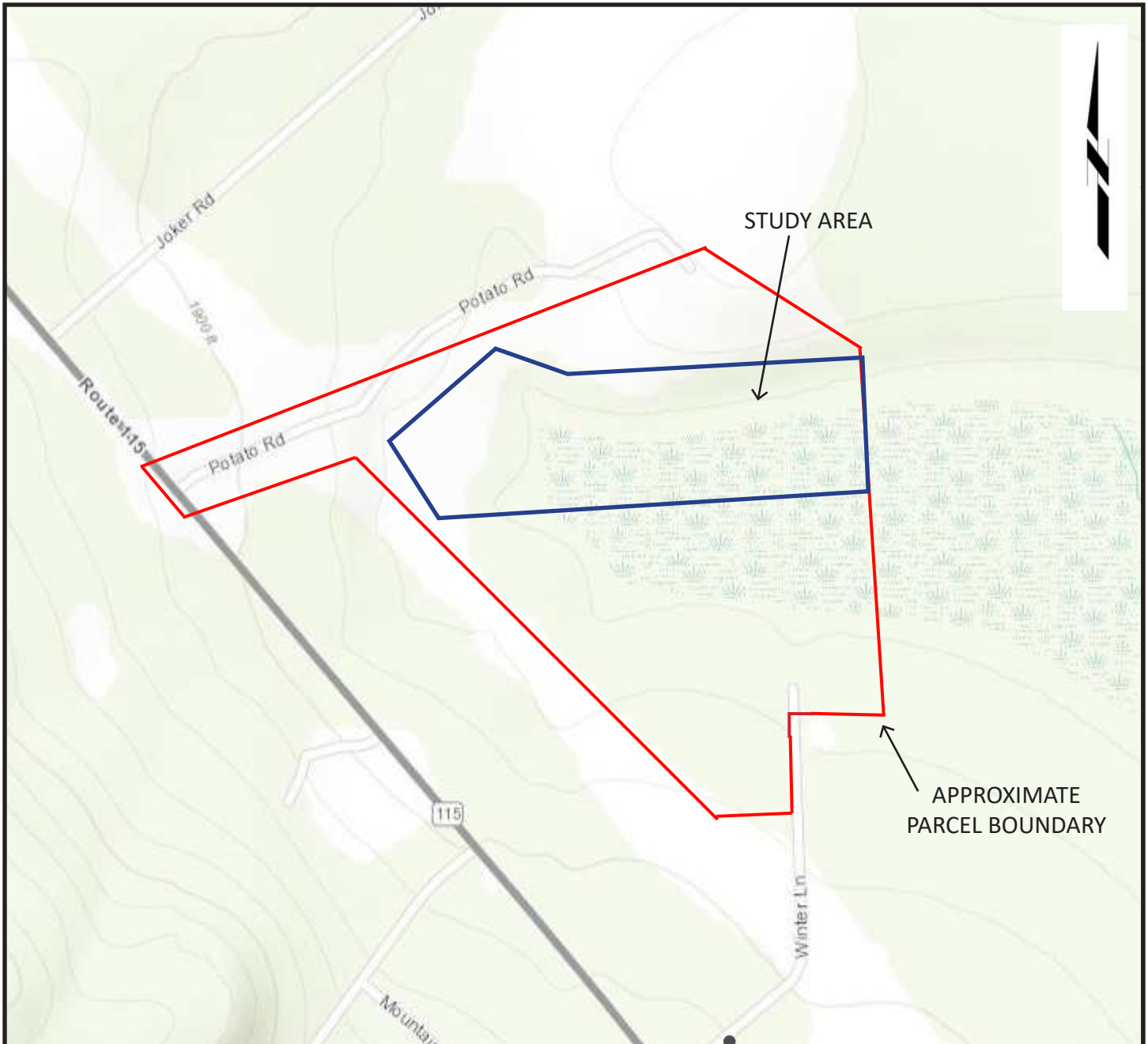


Jillian M. Olsen, QEP, PWS  
President

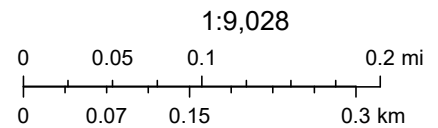


**ATTACHMENT A**  
**FIGURES**





SOURCE: THE NATIONAL MAP  
 (<https://www.usgs.gov/core-science-systems/national-geospatial-program/national-map>)  
 USGS 7.5-Minute Topographic Quadrangle, Blakeslee and Pocono Pines, PA.

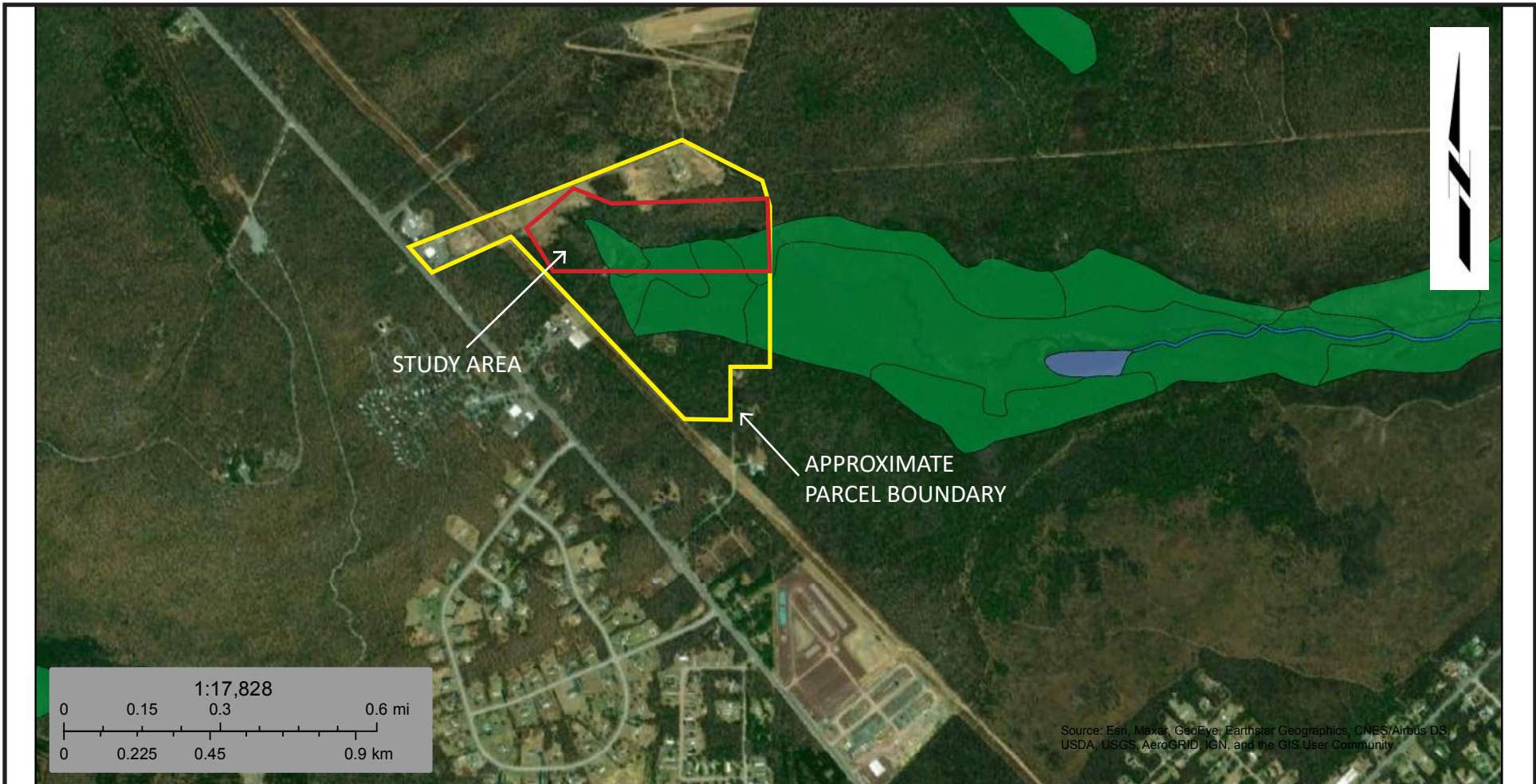


- APPROXIMATE PARCEL BOUNDARY
- APPROXIMATE STUDY AREA BOUNDARY













P.O. BOX 267  
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FIGURE 1  
 SITE LOCATION MAP  
 PARCEL 20.7.1.14-24  
 TUNKHANNOCK TOWNSHIP, MONROE COUNTY, PA



**Wetlands**

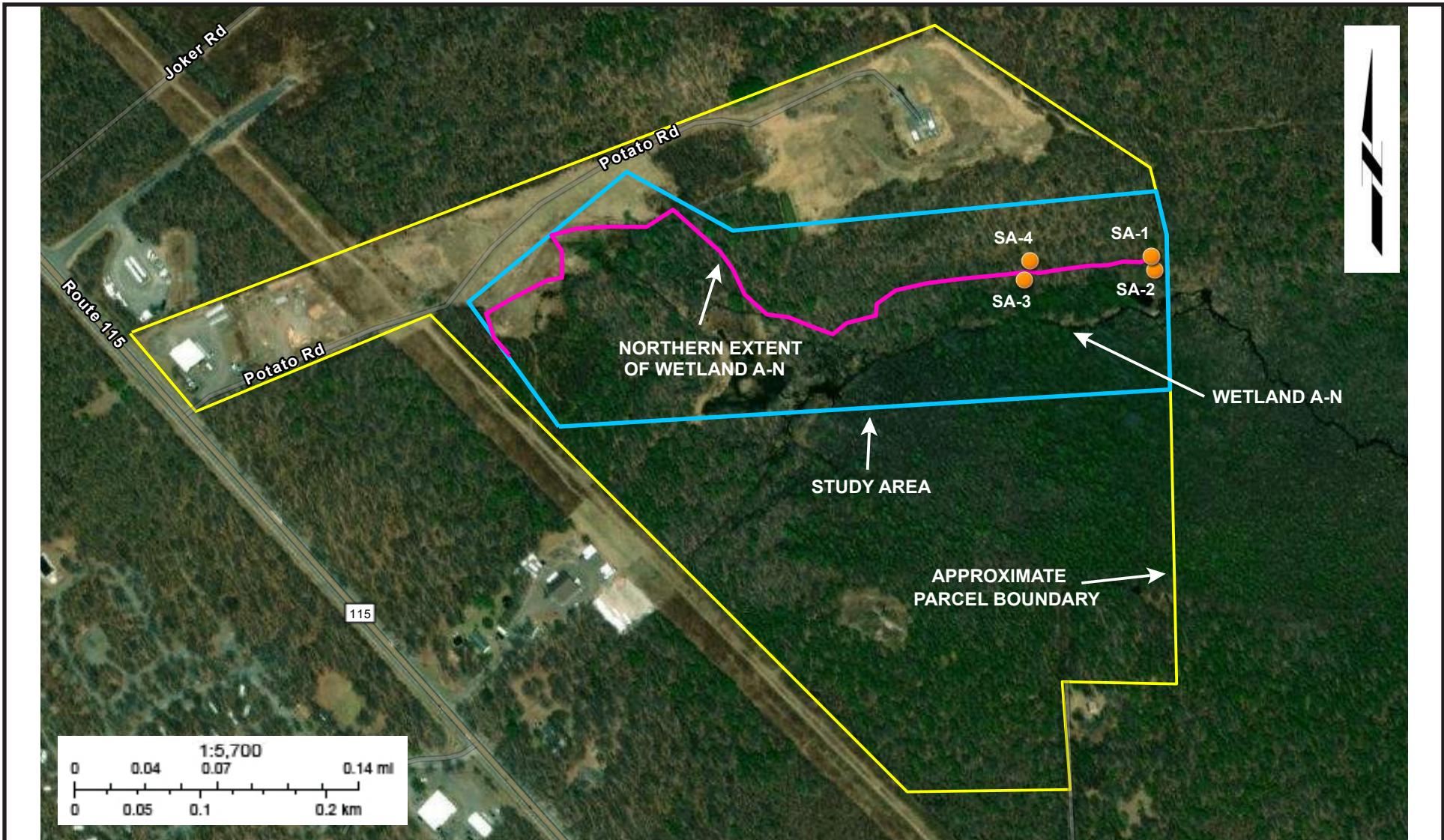
- |  |   |  |   |
|--|---|--|---|
|  Estuarine and Marine Deepwater |  Freshwater Emergent Wetland       |  Lake     |  APPROX. STUDY AREA BOUNDARY |
|  Estuarine and Marine Wetland   |  Freshwater Forested/Shrub Wetland |  Other    |  APPROX. PARCEL BOUNDARY     |
|  |  Freshwater Pond                   |  Riverine |   |



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SOURCE:  
 U.S FISH AND WILDLIFE SERVICE,  
 NATIONAL WETLANDS AND  
 INVENTORY MAPPER.

FIGURE 2  
 NATIONAL WETLANDS INVENTORY MAP  
 PARCEL 20.7.1.14-24  
 TUNKHANNOCK TOWNSHIP, MONROE COUNTY, PA



— APPROX. PARCEL BOUNDARY   
 — APPROX. WETLAND BOUNDARY   
 — APPROX. STUDY AREA BOUNDARY   
 ● APPROX. SOIL SAMPLE LOCATIONS

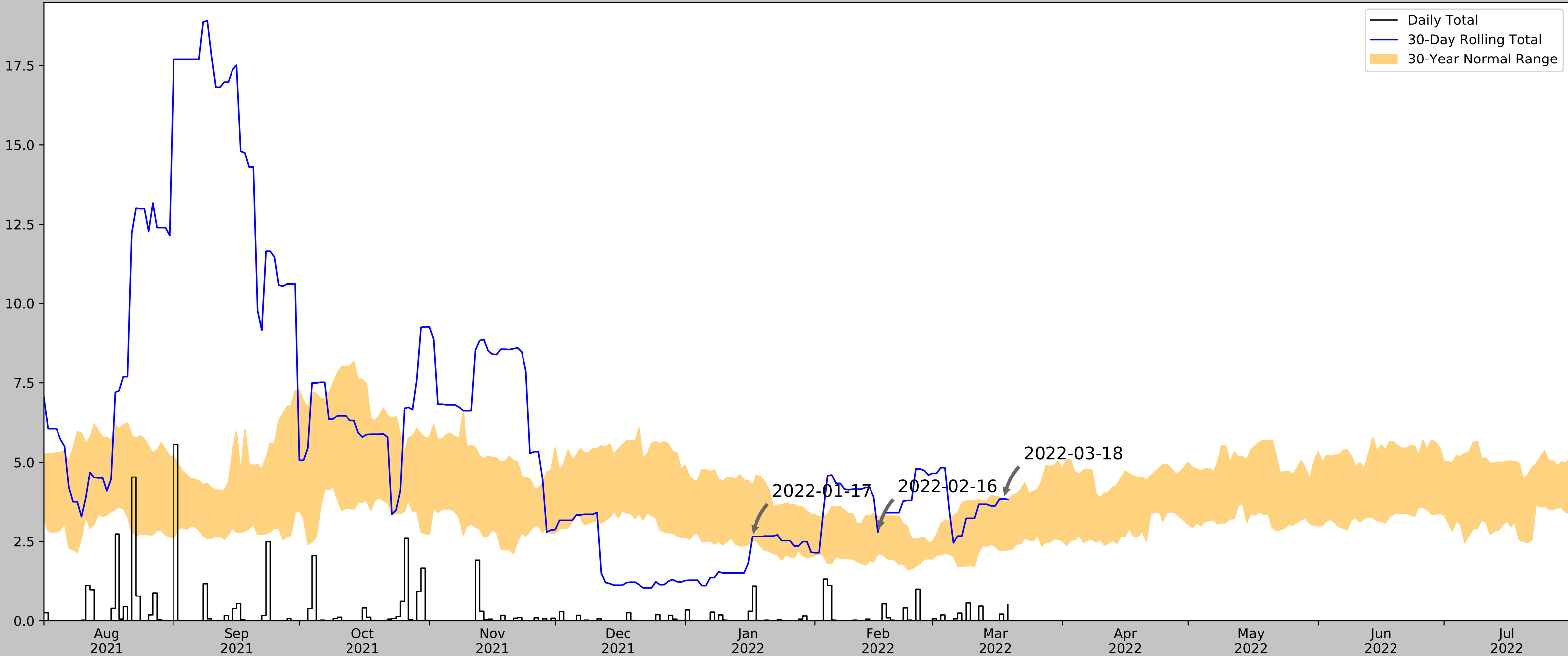
**ATTACHMENT B**  
**ANTECEDENT PRECIPITATION**  
**TOOL GRAPHS**





# Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network

Rainfall (Inches)



Coordinates	41.031120, -75.492799
Observation Date	2022-03-18
Elevation (ft)	1848.31
Drought Index (PDSI)	Moderate wetness (2022-02)
WebWIMP H <sub>2</sub> O Balance	Wet Season

30 Days Ending	30 <sup>th</sup> %ile (in)	70 <sup>th</sup> %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2022-03-18	2.214173	3.726772	3.84252	Wet	3	3	9
2022-02-16	2.101969	3.270866	2.799213	Normal	2	2	4
2022-01-17	2.514173	4.267323	2.653543	Normal	2	1	2
Result							<b>Wetter than Normal - 15</b>

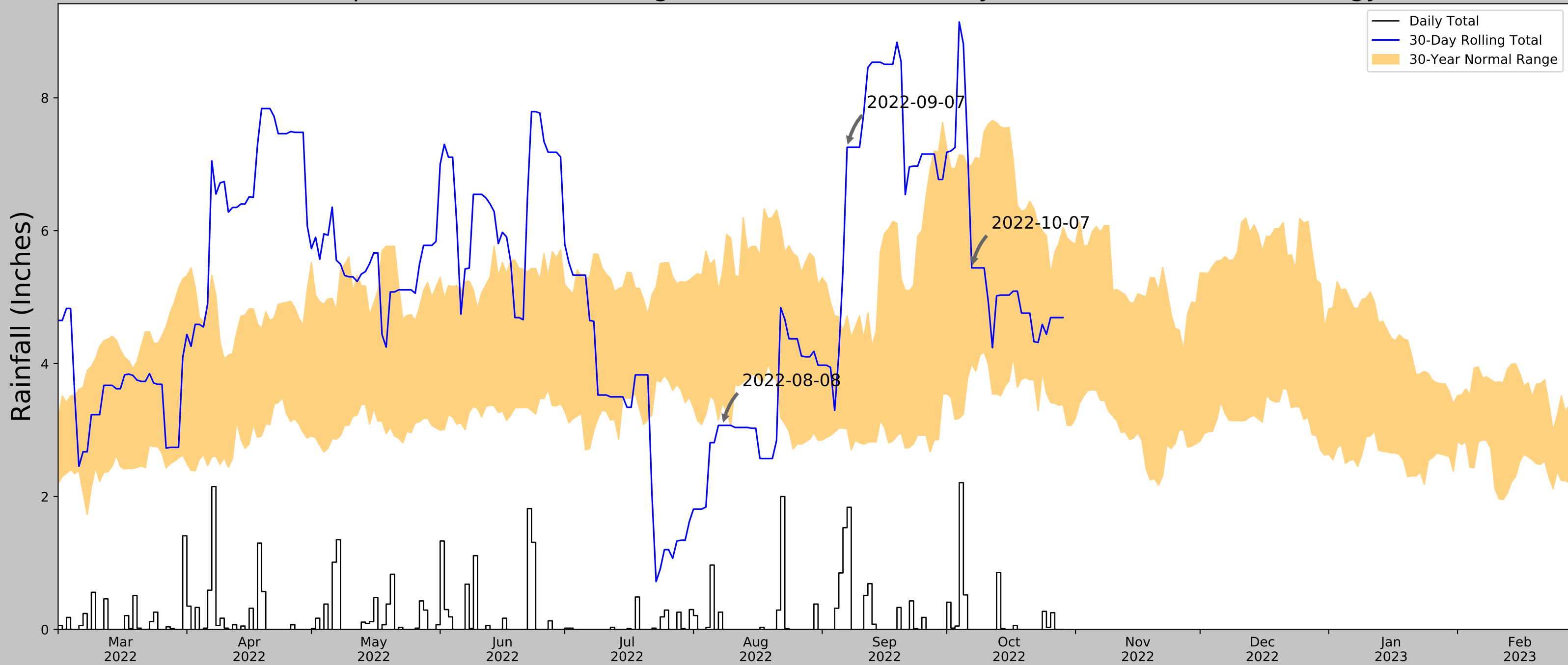


Figure and tables made by the  
**Antecedent Precipitation Tool**  
Version 1.0

Written by Jason Deters  
U.S. Army Corps of Engineers

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
MT POCONO MOUNTAINS AP	41.1389, -75.3794	1916.011	9.504	67.701	4.92	7991	90
MOUNT POCONO 0.7 N	41.1319, -75.358	1890.092	1.214	25.919	0.578	1	0
TOBYHANNA POCONO MTN AP	41.1386, -75.2225	1916.011	8.164	0.0	3.674	2264	0
TOBYHANNA 11.1 NE	41.2217, -75.3708	2116.142	5.738	200.131	3.73	1	0
LONG POND POCONO LAKE	41.1192, -75.5481	1799.869	8.885	116.142	5.03	953	0
POCONO PEAK LAKE	41.2808, -75.3958	2100.066	9.841	184.055	6.24	3	0
CANADENSIS E	41.1897, -75.2383	1110.892	8.135	805.119	10.21	31	0
MOSCOW 2.2 WSW	41.33, -75.57	1706.037	16.505	209.974	10.893	1	0
FRANCIS E WALTER DAM	41.1183, -75.7278	1508.858	18.188	407.153	15.59	79	0
HOLLISTERVILLE	41.3833, -75.4333	1370.079	17.117	545.932	17.047	26	0
E STROUDSBURG	41.0147, -75.2072	471.129	12.413	1444.882	23.521	3	0

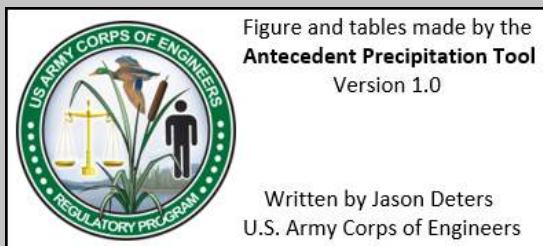
# Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	41.031120, -75.492799
Observation Date	2022-10-07
Elevation (ft)	1848.31
Drought Index (PDSI)	Incipient drought (2022-09)
WebWIMP H <sub>2</sub> O Balance	Wet Season

30 Days Ending	30 <sup>th</sup> %ile (in)	70 <sup>th</sup> %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2022-10-07	3.995669	6.983071	5.440945	Normal	2	3	6
2022-09-07	3.020079	4.719291	7.255906	Wet	3	2	6
2022-08-08	3.403937	5.374016	3.070866	Dry	1	1	1
Result							Normal Conditions - 13

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days (Normal)	Days (Antecedent)
MT POCONO MOUNTAINS AP	41.1389, -75.3794	1916.011	9.504	67.701	4.92	8367	90
LONG POND POCONO LAKE	41.1192, -75.5481	1799.869	6.733	48.441	3.356	2496	0
LAKE HARMONY 2.4 WNW	41.0733, -75.6332	1828.084	7.875	20.226	3.703	1	0
REEDERS 1.8 W	41.013, -75.371	1102.034	6.471	746.276	7.742	1	0
TOBYHANNA POCONO MTN AP	41.1386, -75.2225	1916.011	15.915	67.701	8.239	351	0
TOBYHANNA 11.1 NE	41.2217, -75.3708	2116.142	14.619	267.832	10.494	1	0
FRANCIS E WALTER DAM	41.1183, -75.7278	1508.858	13.642	339.452	10.77	110	0
BELTZVILLE DAM	40.8619, -75.6428	737.861	14.071	1110.449	21.957	5	0
HOLLISTERVILLE	41.3833, -75.4333	1370.079	24.529	478.231	22.769	21	0



**ATTACHMENT C**  
**PHOTO PAGES**



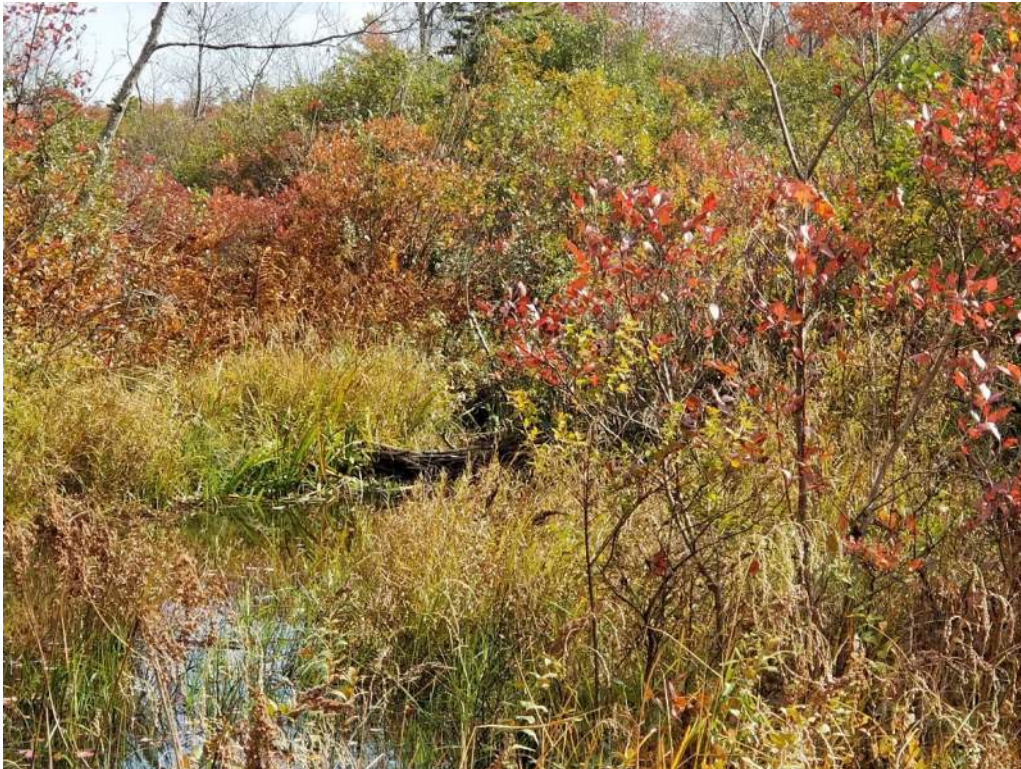
**Photograph #1 – Pond Area Near Eastern Property Boundary, Looking Southeast**



**Photograph #2 – Bank of Pond Area, No Relative Water Elevation Fluctuation**



**Photograph #3 – Typical View of Scrub-Shrub Portion of Wetland Complex**



**Photograph #4 – Typical View of Forested Area of Wetland Complex; Microtopographic Depressions at Tree Roots**



**Photograph #5 – Upper Reach of Mud Pond Run; Water Depth Approximately 0.5 – 1”**



**Photograph #6 – Headwater Area of Mud Pond Run; Scouring of Bank from Precipitation Events Noted**



**Photograph #7 – Mud Pond Run within Wetland Complex, Typical**



**Photograph #8 – Wetland Complex Interior, Typical**

