Continuous Instream Monitoring:

Responding to Increasing Deep Well Activity

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Purpose and Scope

Purpose and scope is unique – results in different methodologies

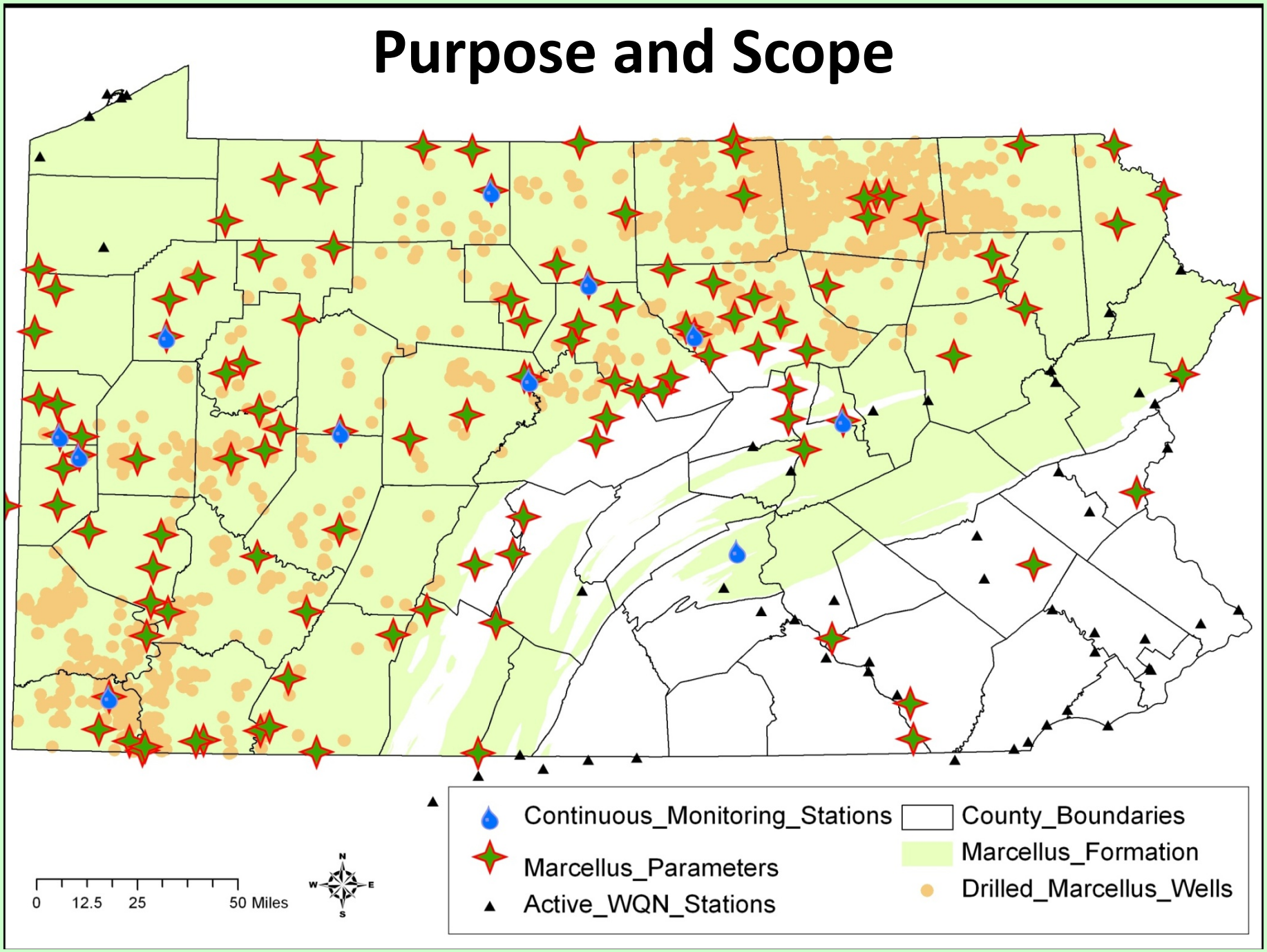
Objectives:

- Measure baseline stream parameters in areas with deep well activity.
- Discover potential violations to water quality criteria.
- Data collection for Antidegradation surveys

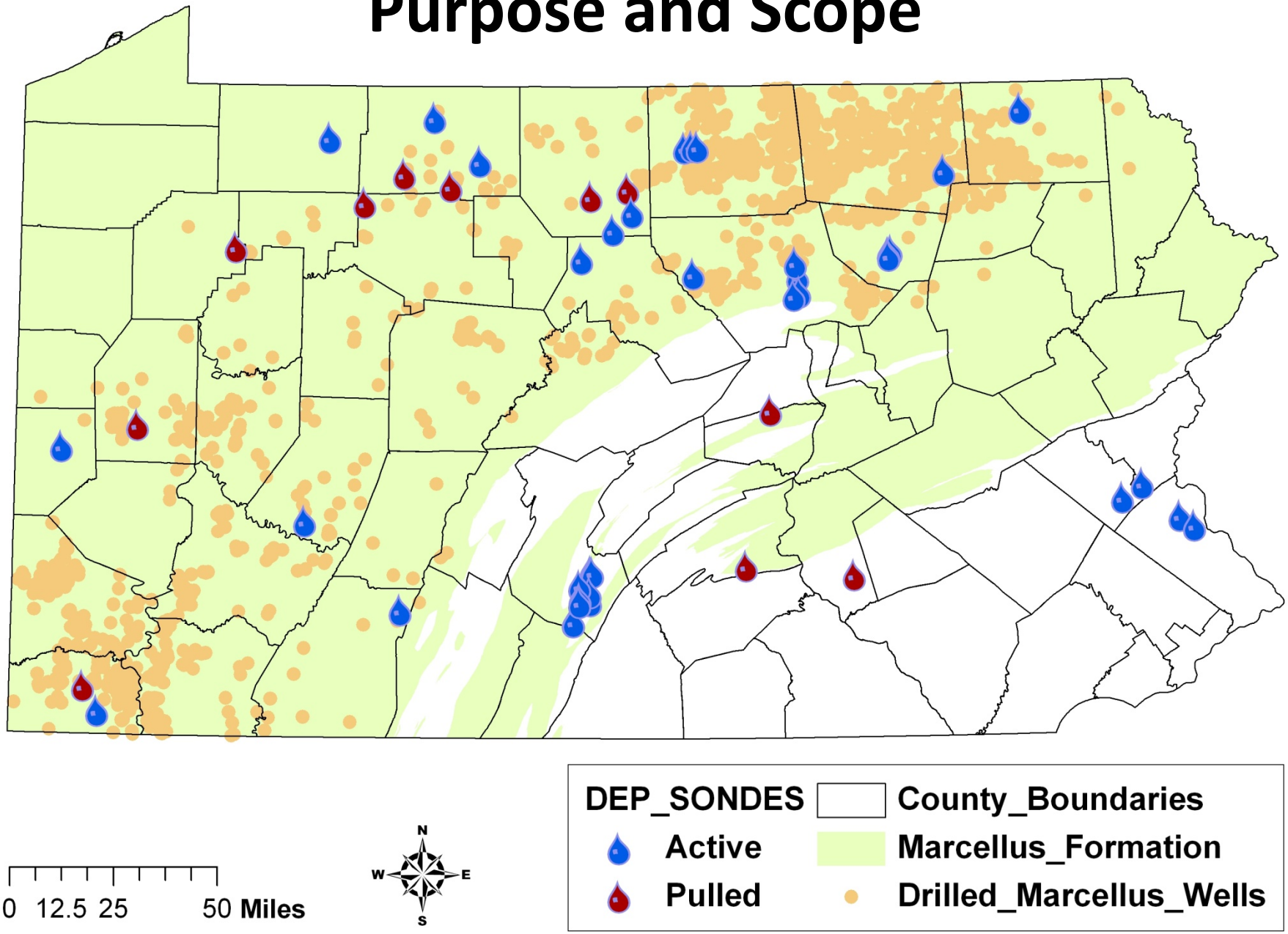
Current Effort:

- Continue annual monitoring cycles
- Development/implementation of a new reporting format and protocol.

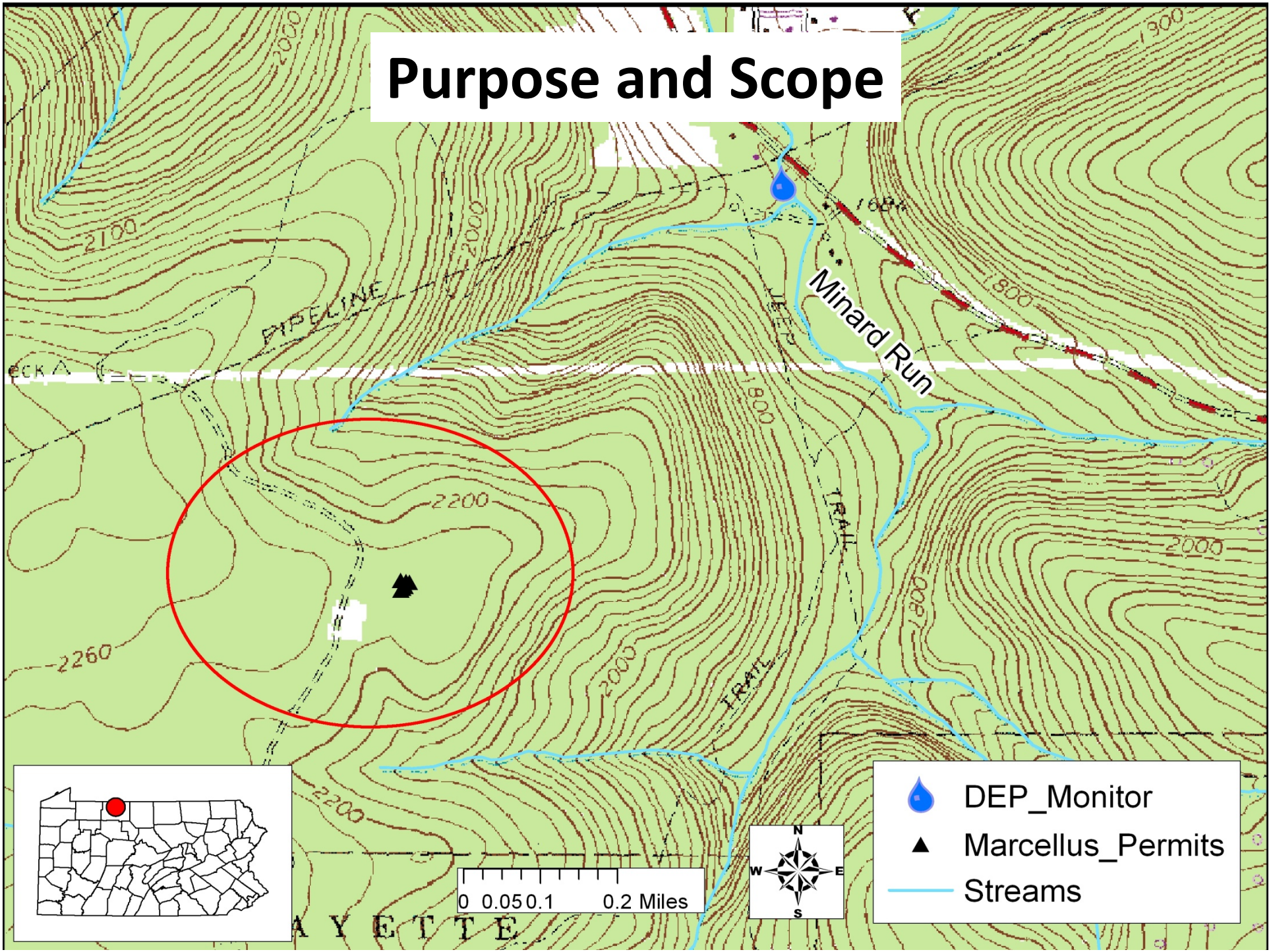
Purpose and Scope



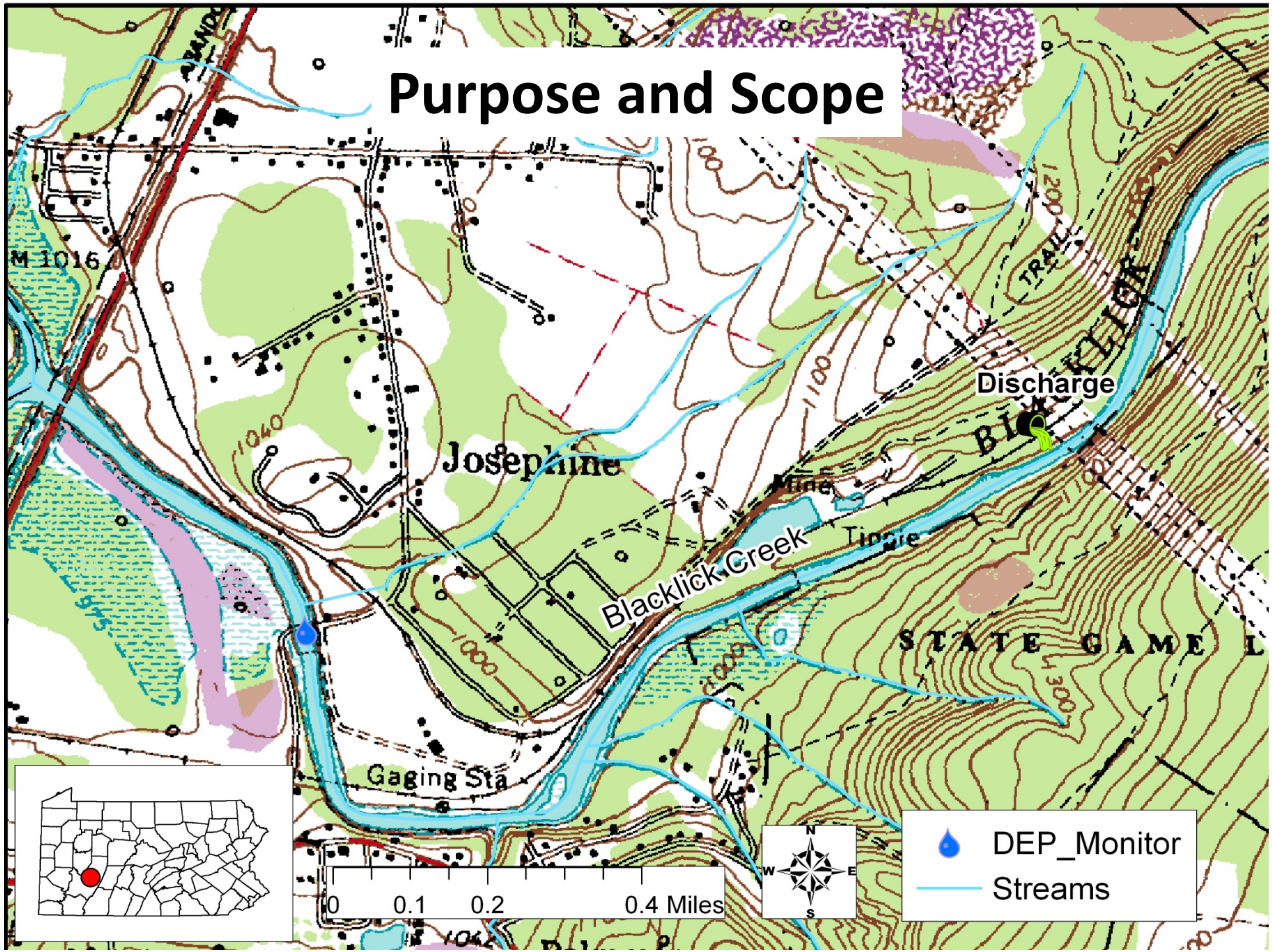
Purpose and Scope



Purpose and Scope



Purpose and Scope



Deployment

Deployment

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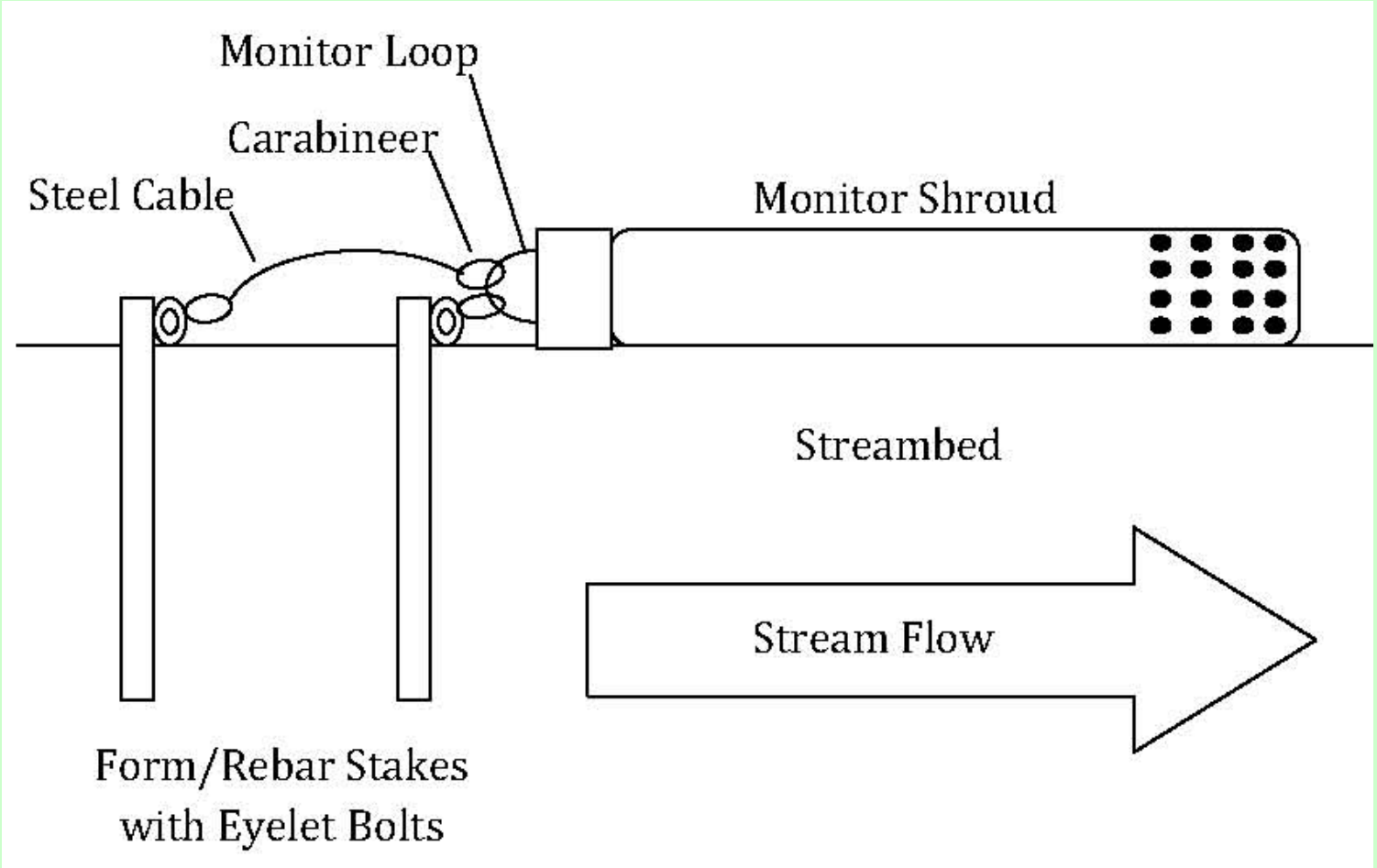
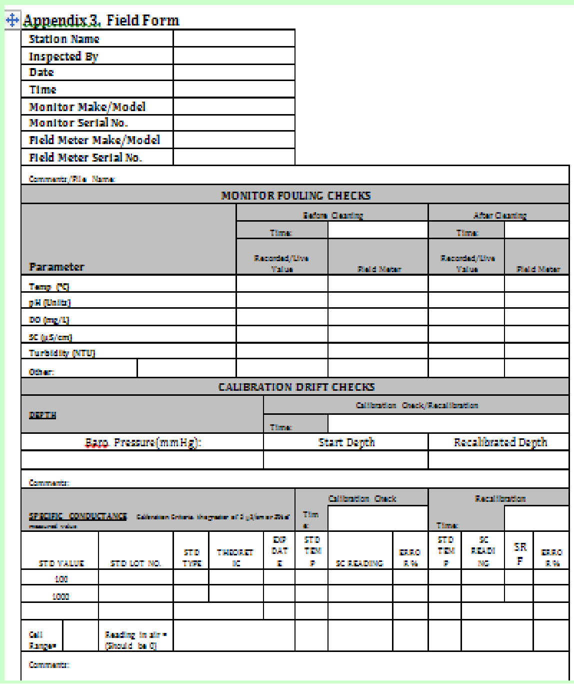

Monitor Loop
Carabineer
Steel Cable
Monitor Shroud
Streambed
Stream Flow
Form/Rebar Stakes
with Eyelet Bolts

Field Maintenance

- Download and review data
- Side-by-side before and after cleaning checks (Fouling Drift)
- Calibration checks (Calibration Drift)
- Final side-by-side



Appendix 3. Field Form

Station Name	
Inspected By	
Date	
Time	
Monitor Make/Model	
Monitor Serial No.	
Field Meter Make/Model	
Field Meter Serial No.	

Comments/File Name:

MONITOR FOULING CHECKS

Parameter	Before Cleaning Recorded/Live Value	Before Cleaning Field Meter	After Cleaning Recorded/Live Value	After Cleaning Field Meter
	Time:		Time:	
Temp (°C)				
pH (Units)				
DO (mg/L)				
SC (µS/cm)				
Turbidity (NTU)				
Other:				

CALIBRATION DRIFT CHECKS

DEPTH — Calibration Check/Recalibration — Time:

Baro. Pressure(mmHg):	Start Depth	Recalibrated Depth

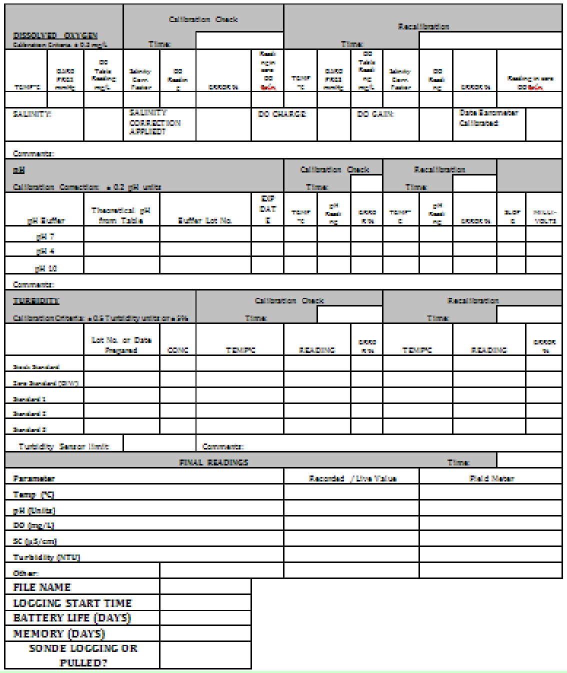
Comments:

SPECIFIC CONDUCTANCE — Calibration Check — Time: — Recalibration — Time:

STD VALUE	STD LOT NO.	STD TYPE	THEORET SC	EXP DATE	STD TEMP	SC READING	ERROR %	STD TEMP	SC READING	SRF	ERROR %
100											
1000											

Cell Range= Reading in air = (Should be 0)

Comments:



DISSOLVED OXYGEN — Calibration Check — Time: — Recalibration — Time:

SALINITY: SALINITY CORRECTION APPLIED? DO CHARGE: DO GAIN: Date Barometer Calibrated:

Comments:

pH — Calibration Correction: ± 0.2 pH units — Calibration Check — Time: — Recalibration — Time:

pH Buffer	Theoretical pH from Table	Buffer Lot No.	EXP DATE
pH 7			
pH 4			
pH 10			

Comments:

TURBIDITY — Calibration Check — Time: — Recalibration — Time:

	Lot No. or Date Prepared	CONC	TEMP°C	READING	ERROR %	TEMP°C	READING	ERROR %

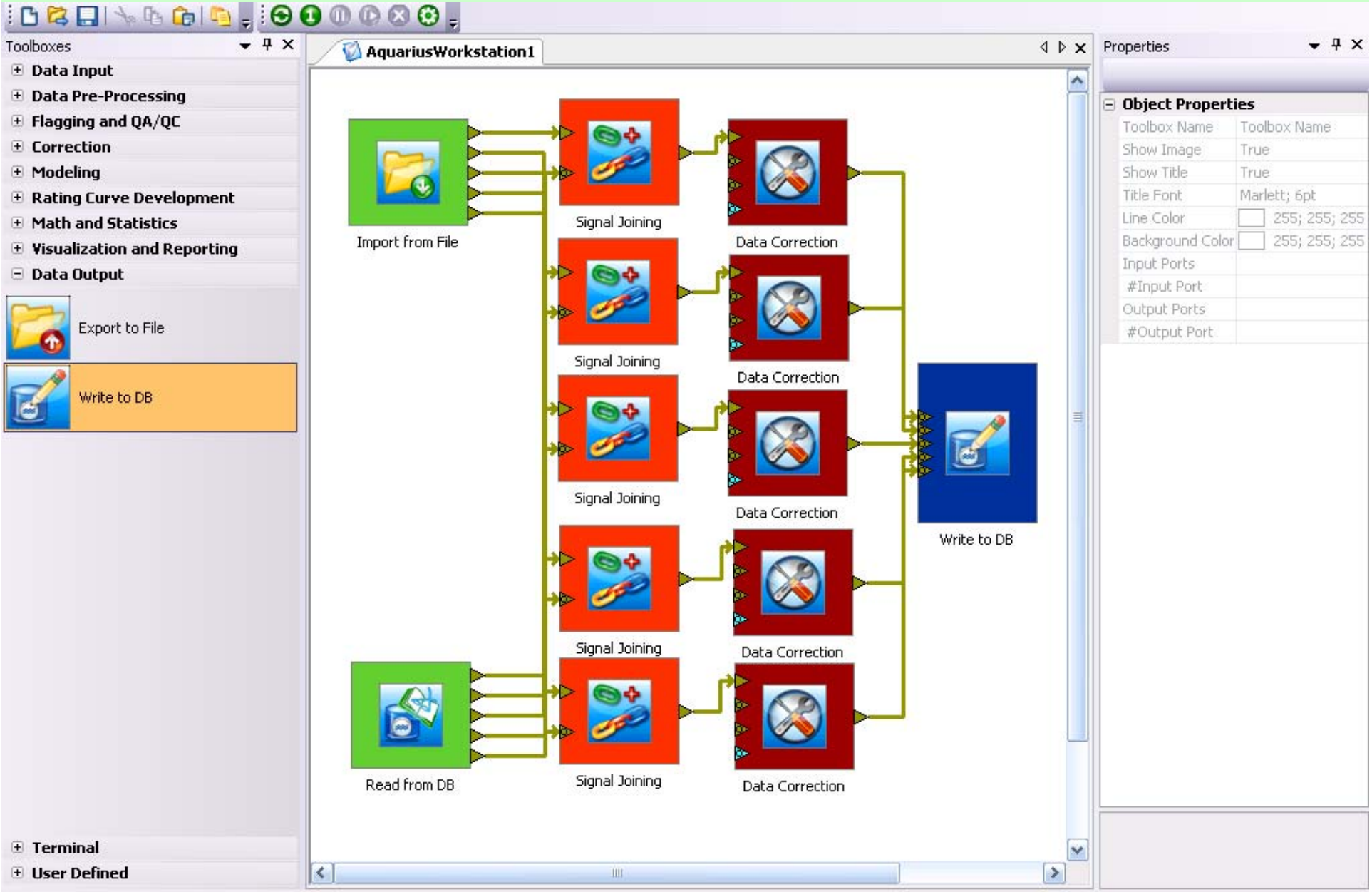
Turbidity Sensor limit: Comments:

FINAL READINGS — Time:

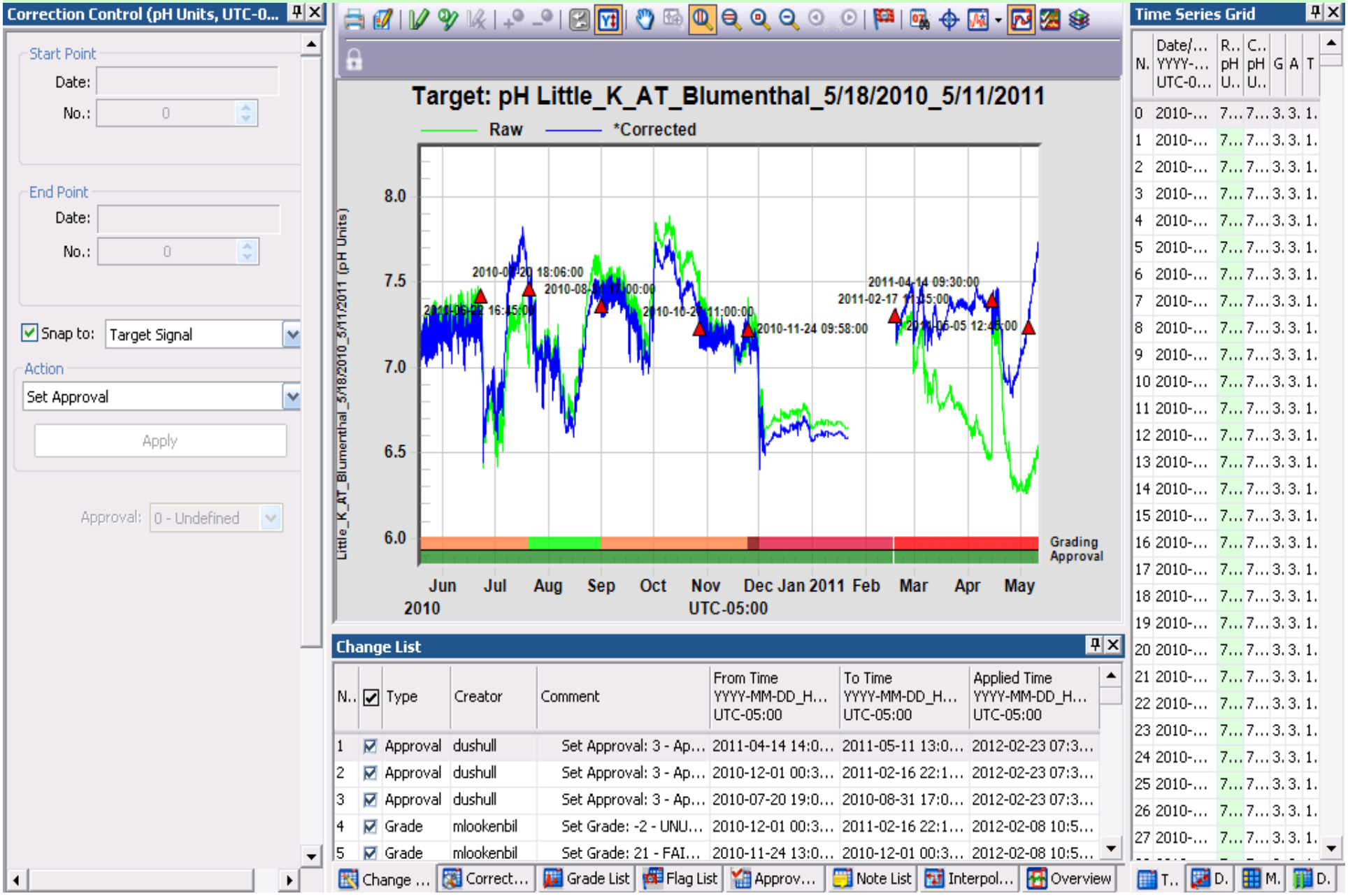
Parameter	Recorded / Live Value	Field Meter
Temp (°C)		
pH (Units)		
DO (mg/L)		
SC (µS/cm)		
Turbidity (NTU)		
Other:		

FILE NAME	
LOGGING START TIME	
BATTERY LIFE (DAYS)	
MEMORY (DAYS)	
SONDE LOGGING OR PULLED?	

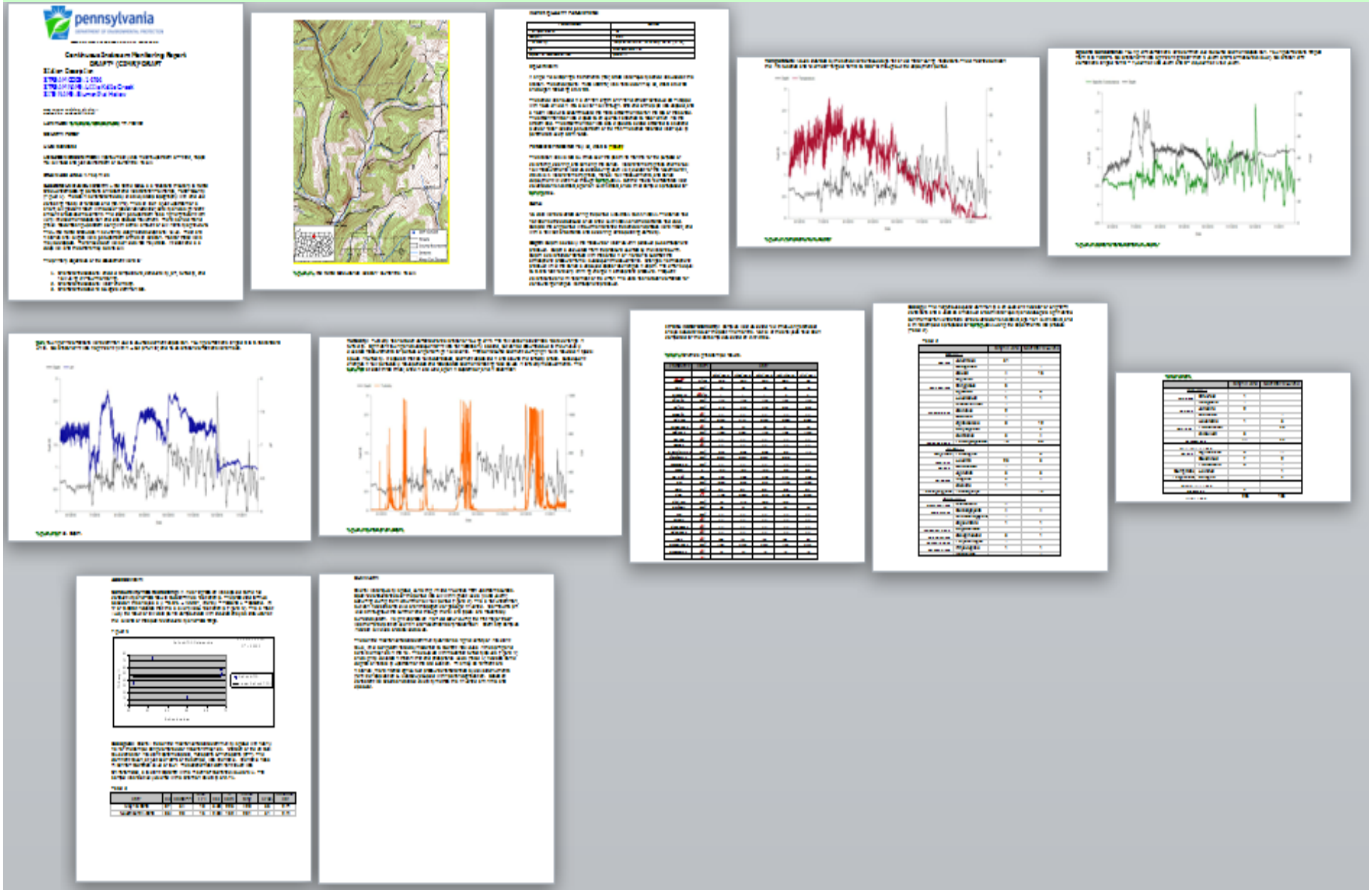
Data Management



Data Management



Reporting



Reporting

Continuous Instream Monitoring Report (CIMR)

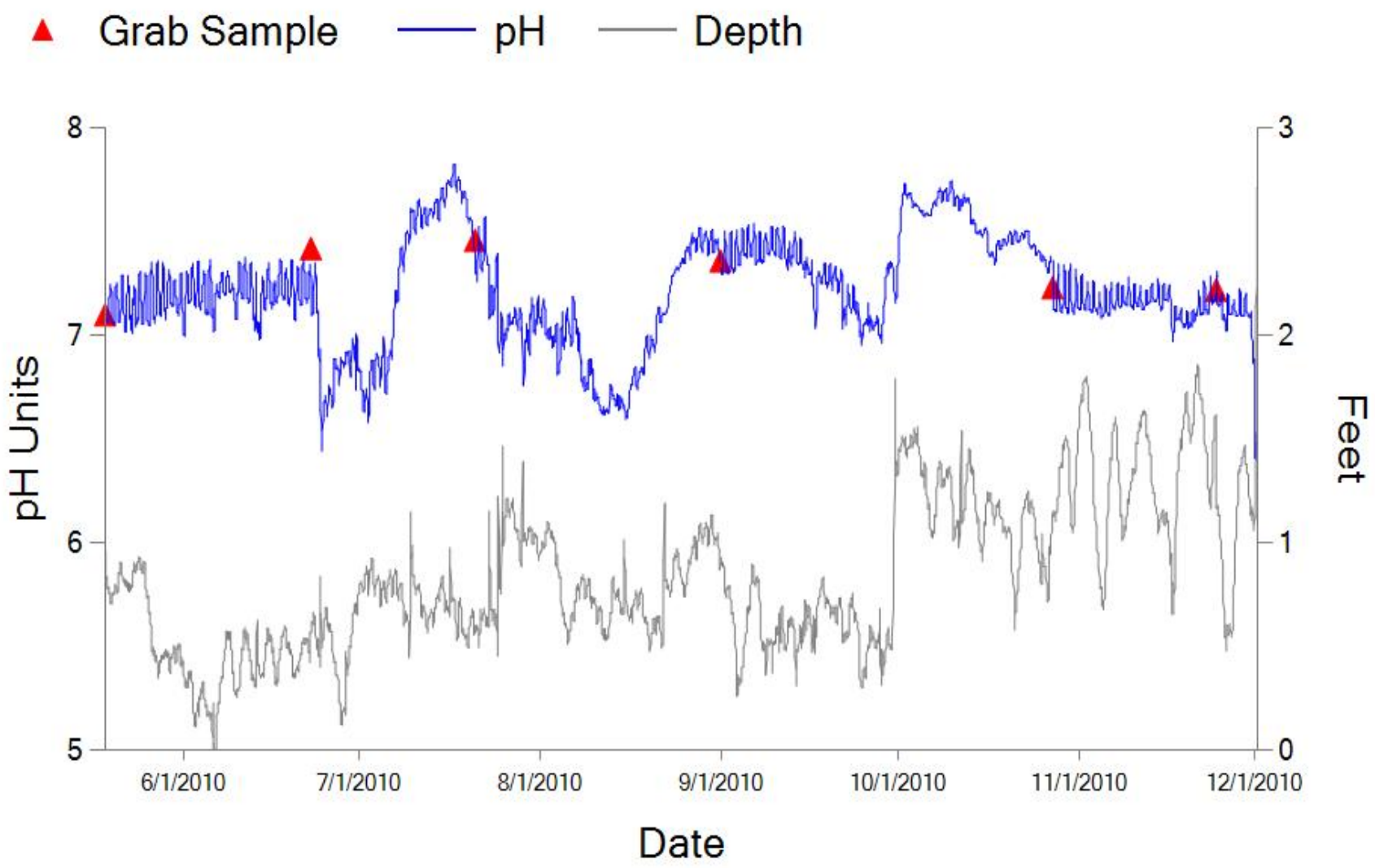
STATION DESCRIPTION
STREAM CODE:
STREAM NAME:
SITE NAME:
MOST RECENT REVISION:
REVISED BY:
LATITUDE: LONGITUDE:
COUNTY:
HUC:
LOCATION DESCRIPTION:
DRAINAGE AREA:
BACKGROUND AND HISTORY:
WATER QUALITY PARAMETERS (Table):
EQUIPMENT:
PERIOD OF RECORD:

DATA:
- **Depth:**
- **Temperature:**
- **Specific Conductance:**
- **pH:**
- **Turbidity:**
- **In-situ Water Chemistry:**
- **Biology:**

ASSESSMENT:
- **Conductivity/TDS relationship:**
- **Biological:**

SUMMARY:

Reporting

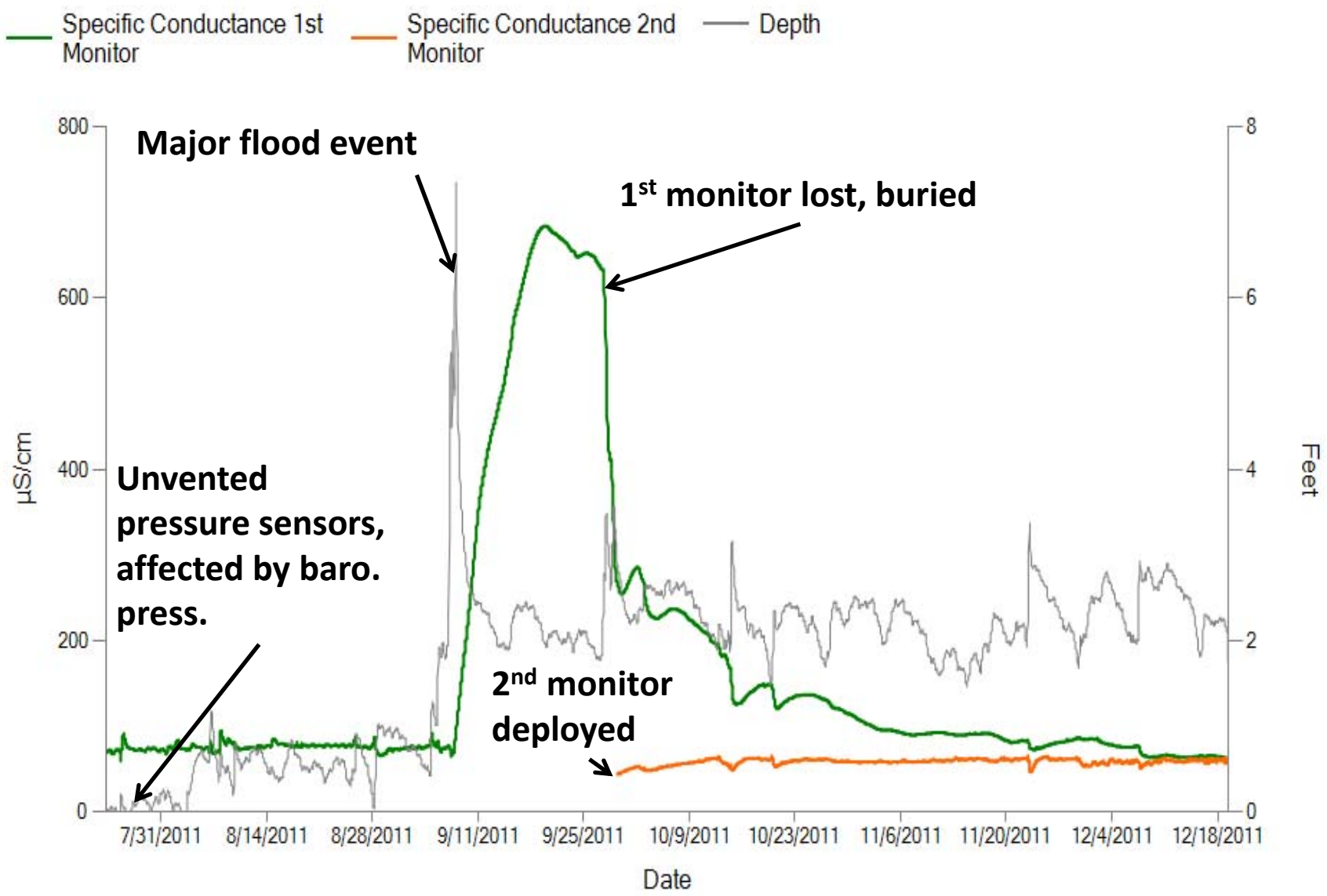

Grab Sample
pH
Depth
8
7
6
5
pH Units
3
2
1
0
Feet
6/1/2010
7/1/2010
8/1/2010
9/1/2010
10/1/2010
11/1/2010
12/1/2010
Date

Lessons Learned

- **Importance of field form documentation for corrections and data interpretation**
  - Sediment fouling – product of deployment methodology
  - Sensor integrity – operation and life span

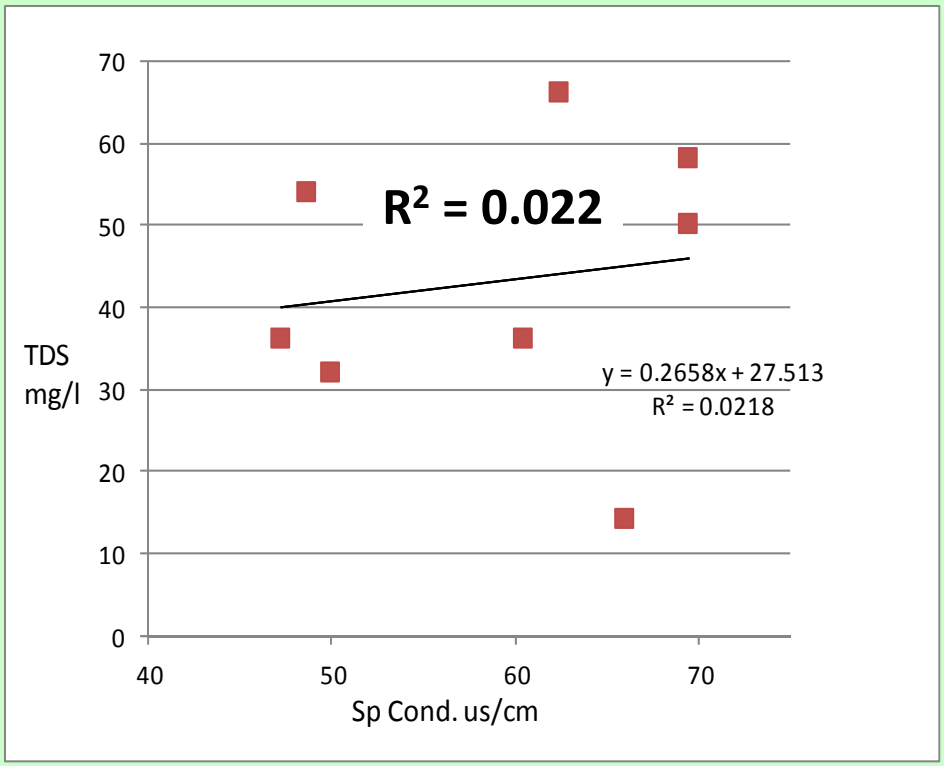
- **Identifying data needs vs. equipment and supplies used**
  - Turbidity Calibration Standard
  - Depth/Discharge

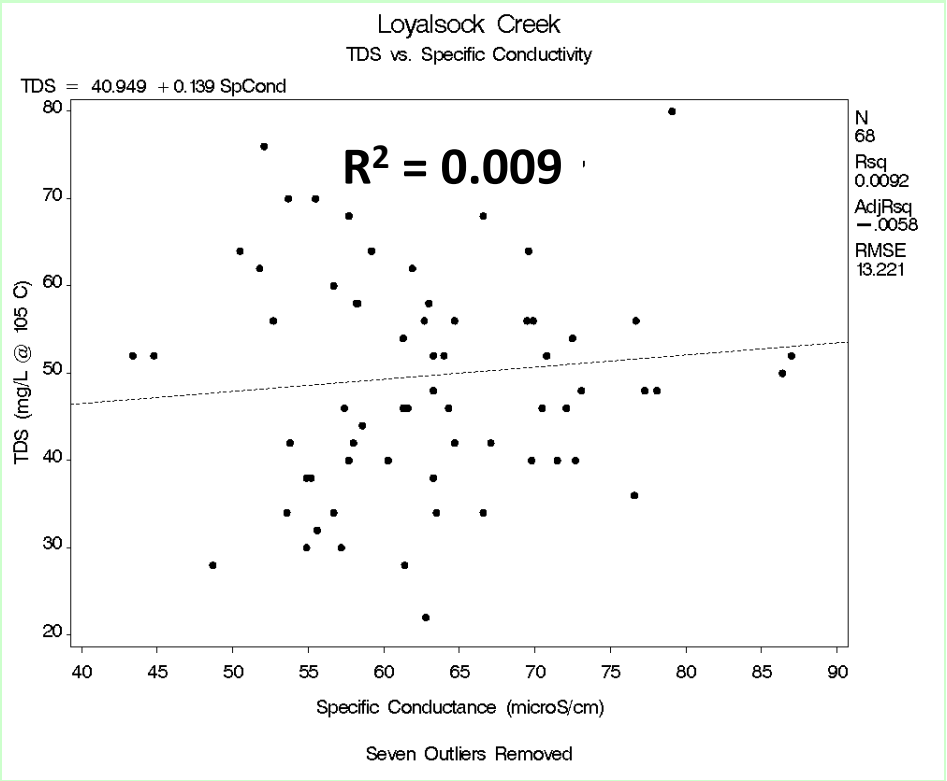
Lessons Learned



Lessons Learned

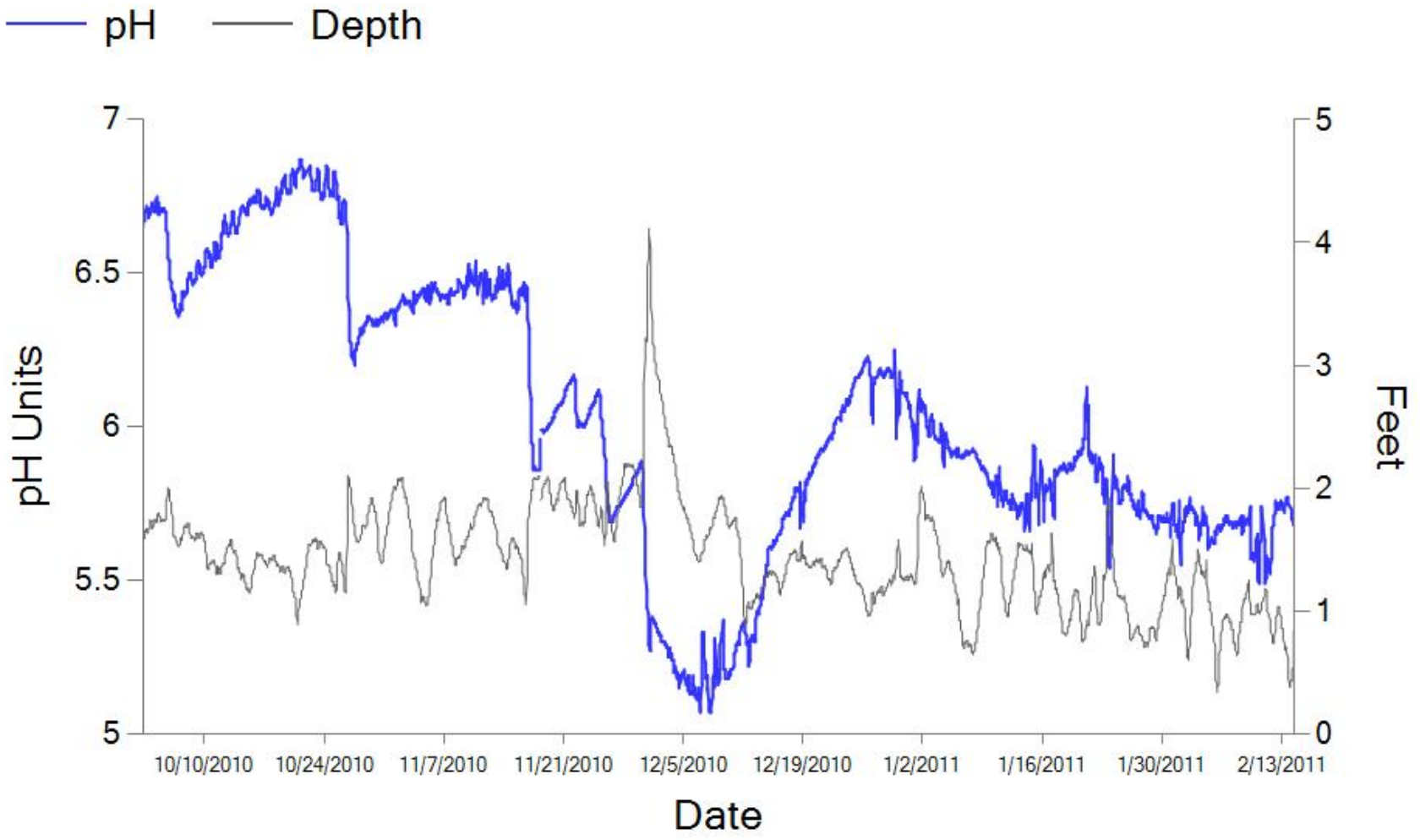
Relating TDS to Specific Conductance





Lessons Learned

Characterizing acid deposition issues



Lessons Learned

Wetsuit jackets and gloves are great for cold weather field checks!!!

Questions?

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pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION