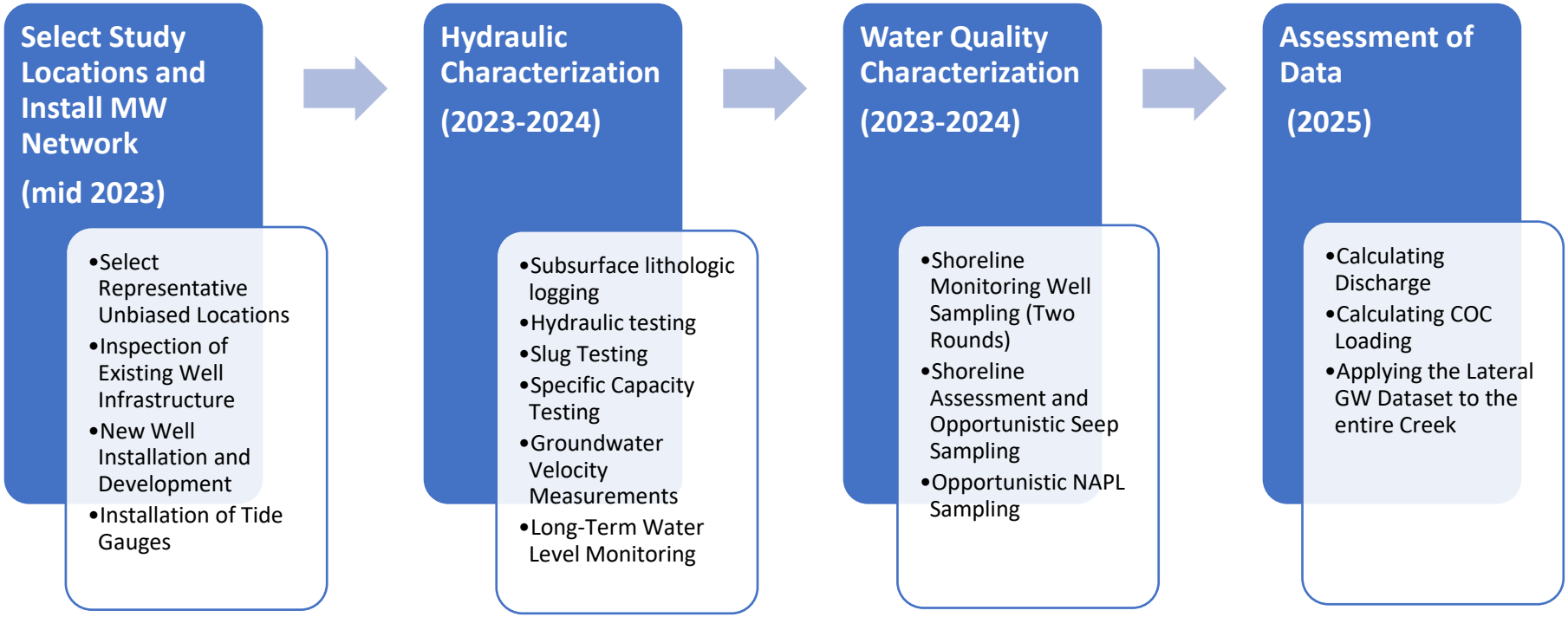
Newtown Creek OU1 Lateral Groundwater Investigation – Update

Newtown Creek Superfund Site
Queens and Brooklyn, New York City
June 25, 2025

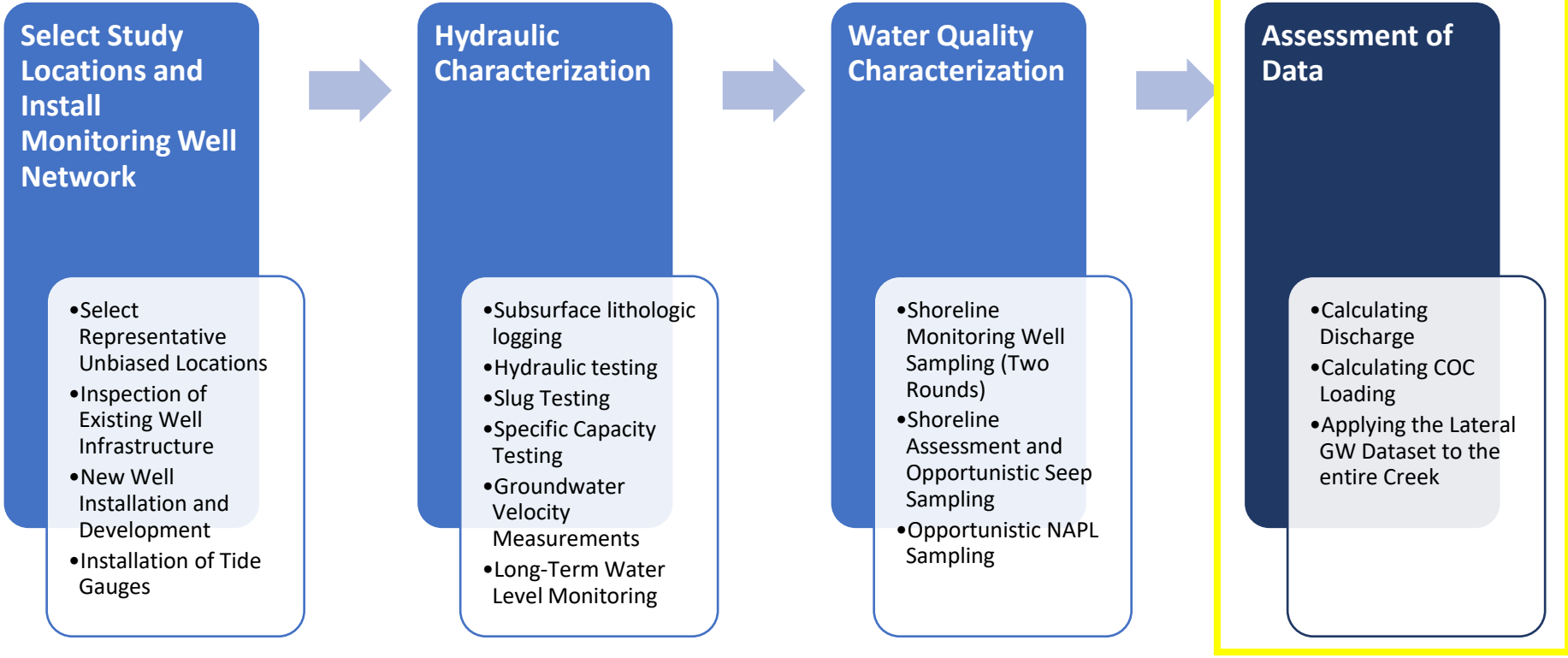
Investigation Objectives

- Improve characterization of shallow lateral groundwater contaminant loading to the study area, including discharge of contaminants of concern (COCs).
- Improve the CSM for shallow lateral groundwater flow and contaminant discharge to the study area.
- Provide critical information regarding the shallow lateral groundwater flow characterization to support decisions for the FS.

Investigation Approach

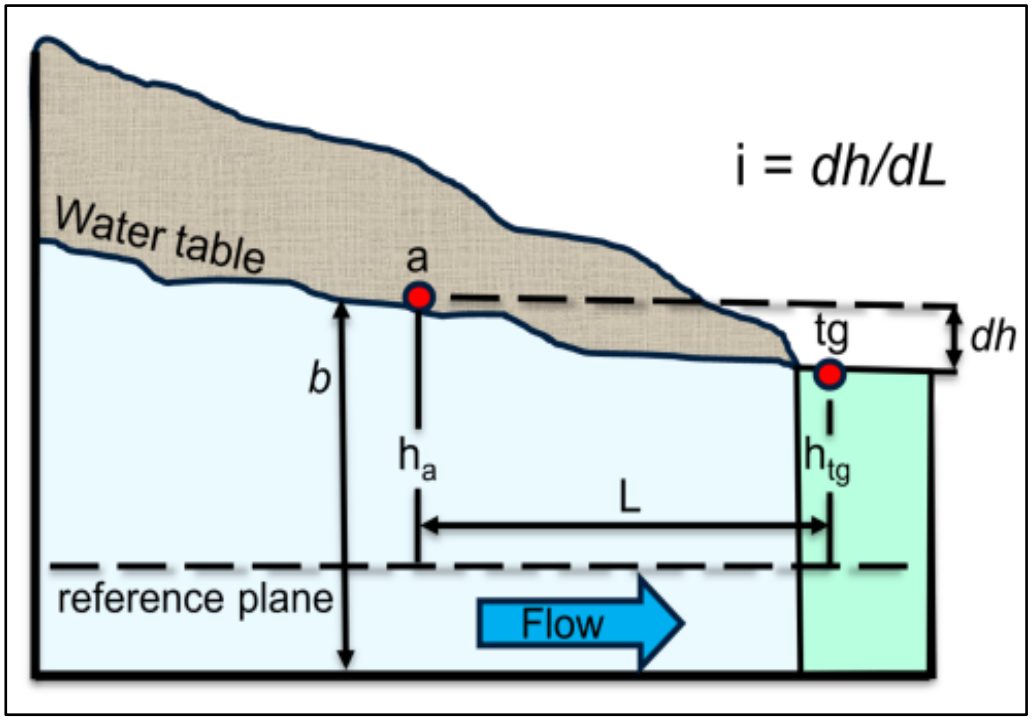


Investigation Approach



Calculating Groundwater Discharge

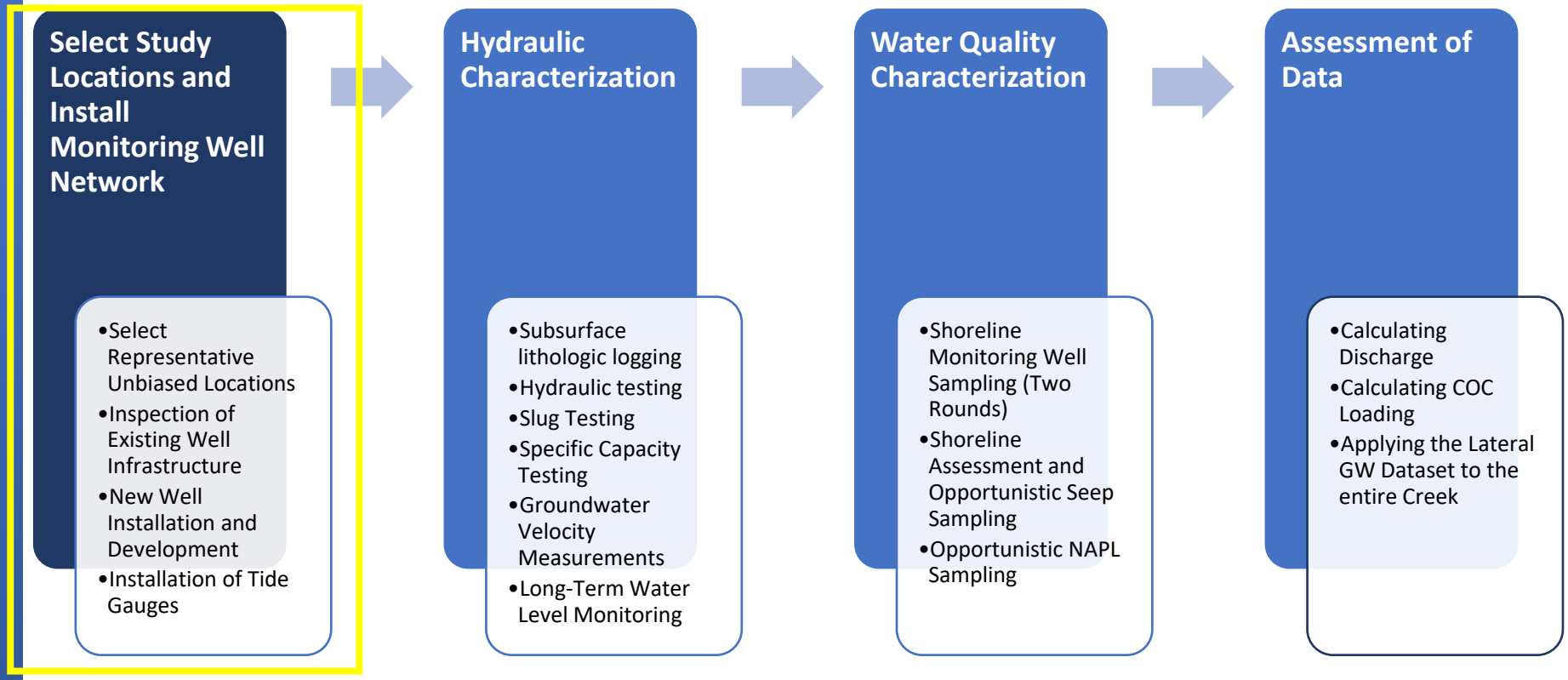
- Darcy's Law: Q = KiA
- Q = discharge to the creek
- K = hydraulic conductivity
- i = hydraulic gradient
- A = cross-sectional area of discharge



Calculating Contaminant Loading

- Contaminant Load = COC concentration x Groundwater Discharge
  - Contaminant load – unit mass over time (kg per day)
  - COC concentration – unit mass per volume (kg per liter)
  - Groundwater Discharge (Q) – unit of volume per time (liters per day)

Investigation Approach

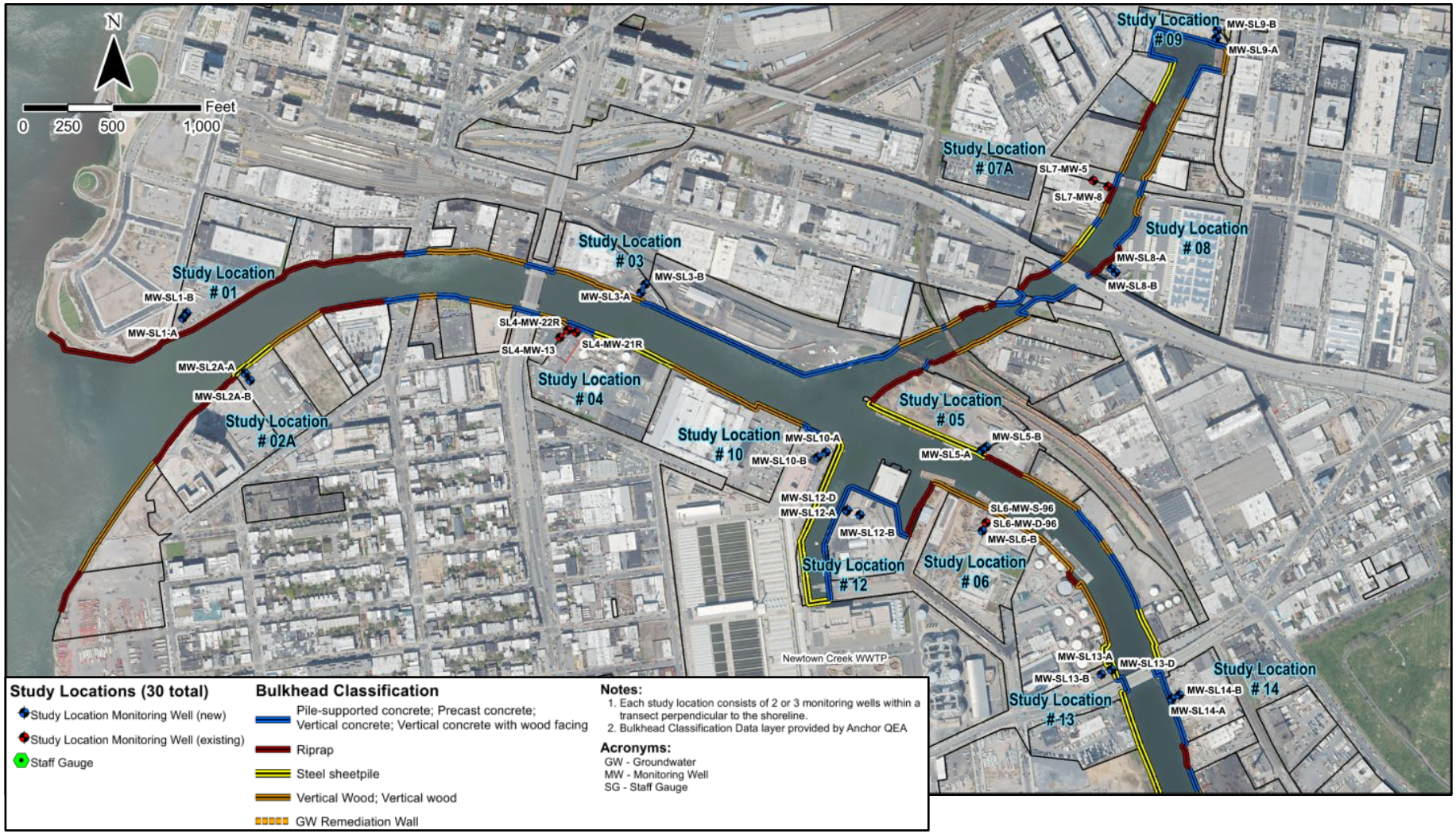


Study Location Determination

- 30 Study Locations were selected to define representative lateral groundwater flow conditions throughout the Newtown Creek basin.

- Final monitoring well network designed to:
  - Be equally spaced throughout the creek and its tributaries
  - Provide a representative distribution of the various shoreline types/structures that can influence groundwater flow

Investigation Locations



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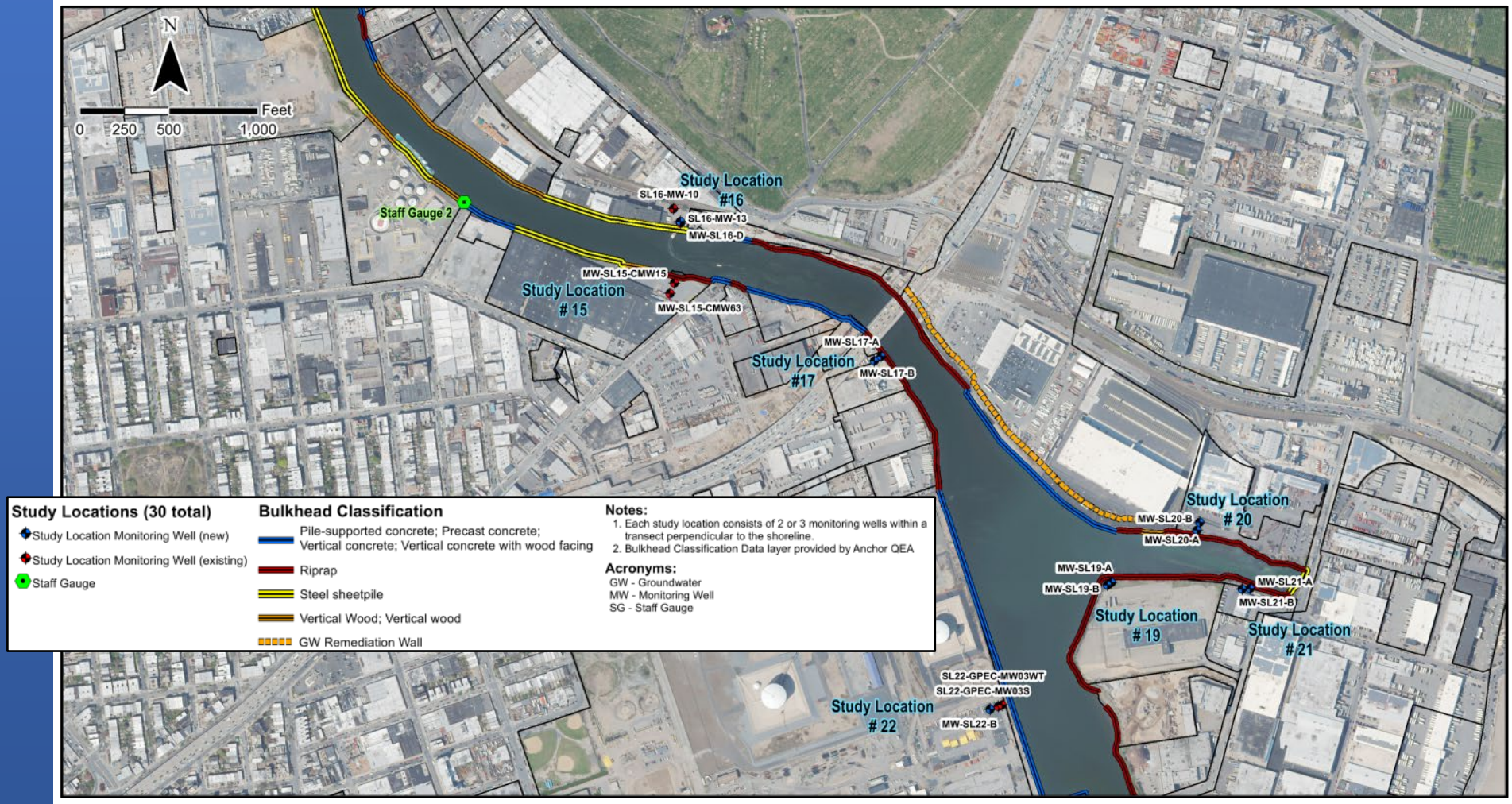

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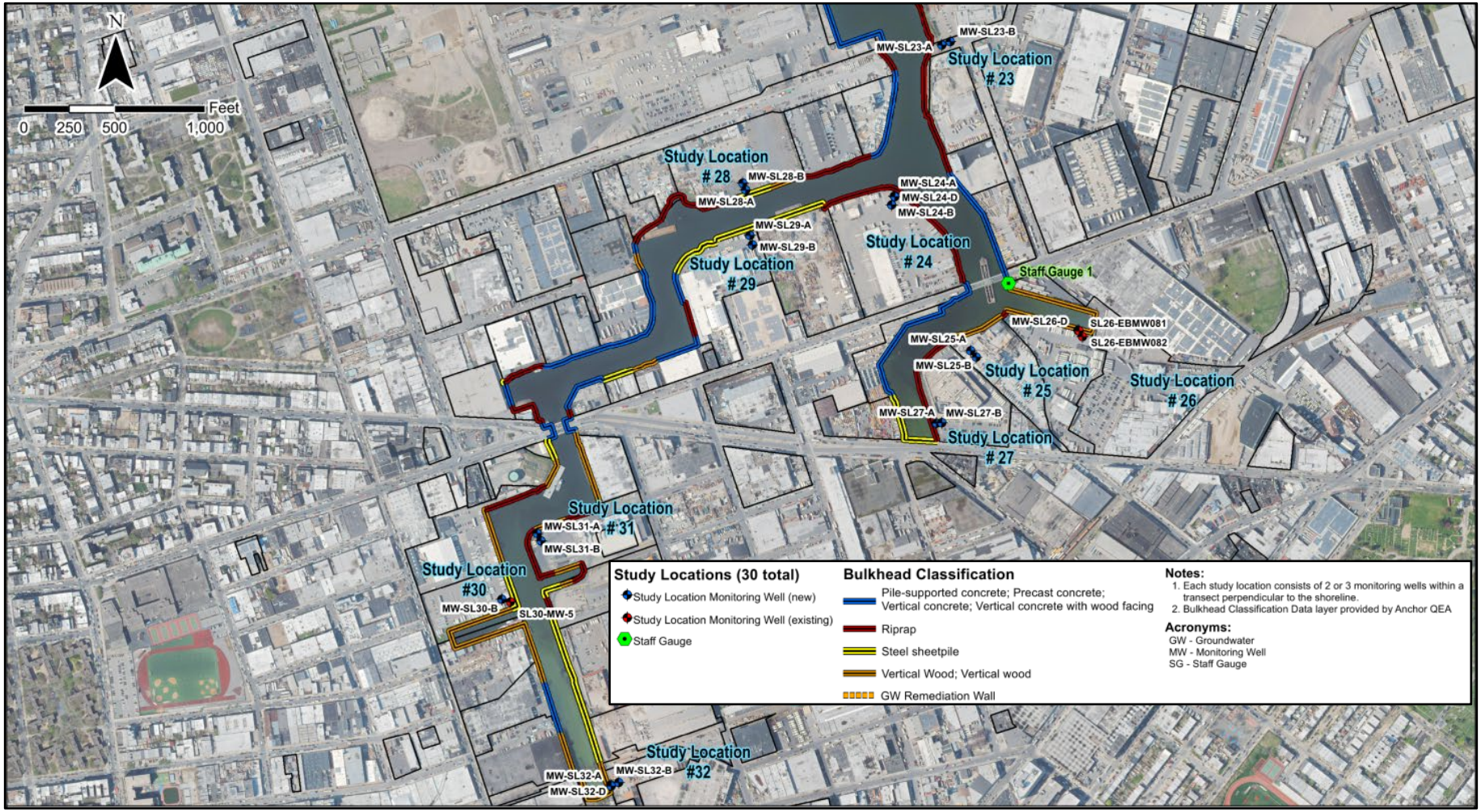


Installation of Monitoring Well Network

- Each Study Location
  - Lithologic Soil Boring
  - 2 paired shallow wells in a transect perpendicular to the shoreline
    - Shoreline well
    - Inland well – 50 to 100 feet inland
  - Deeper well paired with the shoreline well at 8 Study Locations

- Final Monitoring Network (June 2023)
  - 62 shallow wells
  - 8 deeper wells
  - 2 staff (Tide) gauges

Subsurface Lithology

- Lithologic Soil Borings
  - Collect continuous soil cores from the ground surface to the top of the upper glacial aquifer (sand and gravels)
  - Log the core for lithology and observations of contamination
  - Geotechnical Samples:
    - grain-size of various hydrogeologic units
    - Collection of Shelby tube samples

CDM Smith

Sheet 1 of 2

Boring Number: MW-SL12-A

Client: USEPA **Project Name:** Newtown Creek

Project Location: Brooklyn and Queens, New York **Project Number:** 264775

Drilling Contractor/Driller: ADT/J. McGill **Surface Elevation (ft):** 8.25

Drilling Method/Bore Hole Diameter: HSA/9 in. **Total Depth (ft):** 27.0

Hammer Style/Weight/Drop Height/Spoon Size: Automatic/140 lb/30 in./2 in. **Depth to Initial Water Level (ft):**

Bore Hole Location: Study Location #12 Depth 5.0 Date 1/3/2023 Time 0:00

N: 207358.50 **E:** 999137.00 **Abandonment Method:** Completed as well. Refer to diagram.

Drilling Date: **Start:** 1/3/2023 **End:** 1/3/2023 **Logged By:** M. Renko

Elev. (ft)	Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Blows per 6 inches	Sample Recovery (in)	N-Value	PID (ppm)	Graphic Log	Strata	Material Description	Remarks
	0	AS	1	60	N/A	60	N/A	0		Fill Material	Well graded SAND with gravel (SP) — fine to medium, rounded, fine to coarse gravel, trace silt, Moist, 10YR 4/4 (dark yellowish brown), loose	
-4.0	5	SS	2	24	4 2 2 2	12	4	0			Well graded SAND (SW) — medium to coarse, non-cohesive,, Wet, 10YR 6/6 (brownish yellow), very loose	
		SS	3	24	3 2 2 3	24	4	0			Well graded SAND (SW) — medium to coarse, non-cohesive, Wet, brownish yellow (10YR 6/6), very loose	
-1.0	10	SS	4	24	miss miss miss miss	24	0	0				
		SS	5	24	15 19 22 24	17	41	0			Poorly graded SAND (SP) — fine to medium, Wet, black (10YR 2/1), loose to dense	

Consistency vs Blowcount/Foot

(Sand): Dense: 30-50 V. Dense: >50

Fine Grained (Clay): V. Soft: <2 Soft: 2-4 M. Stiff: 4-8 Stiff: 8-15 V. Stiff: 15-30 Hard: >30

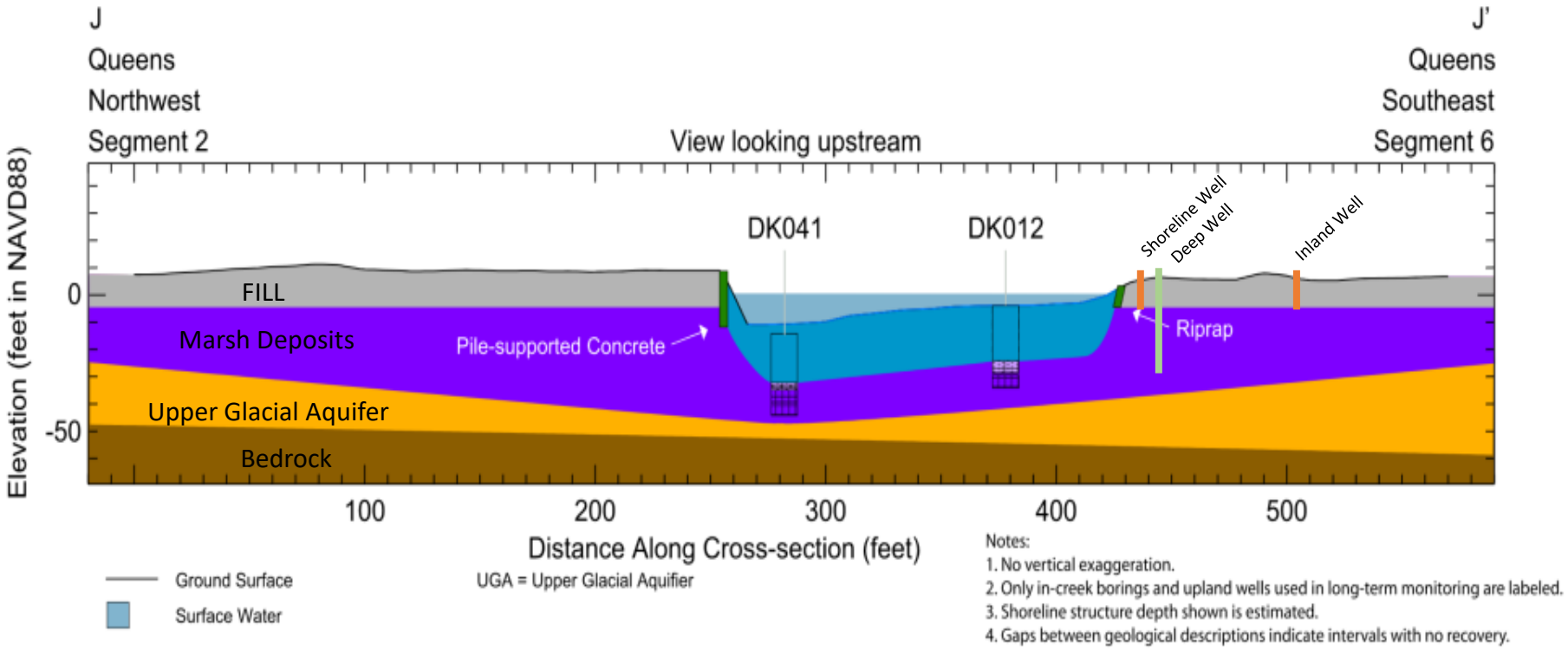
USCS Classification

some 31 - 49%
little 16 - 30%
few 6 - 15%
trace < 5%
moisture, color, density

Date: 5/31/2023 **Boring Number:** MW-SL12-A

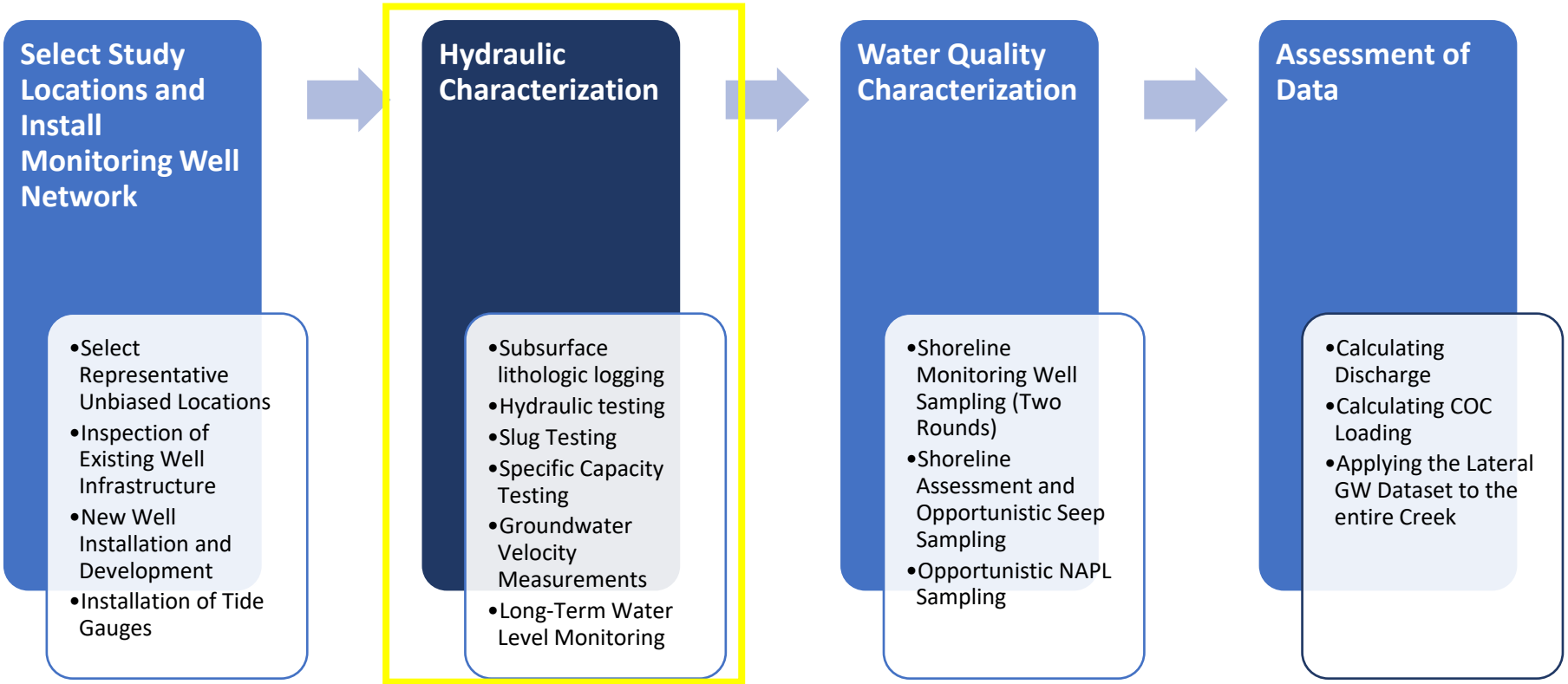
Monitoring Well Placement

- Geologic Framework – fill, post glacial marsh deposits, upper glacial aquifer
- Shallow Wells - installed in the fill unit to screen upper portion of the aquifer
- Deep Wells – installed based on lithology targeting a zone > 5-feet below corresponding paired shallow well



Source: Remedial Investigation Report, Anchor QEA, March 2023

Investigation Approach

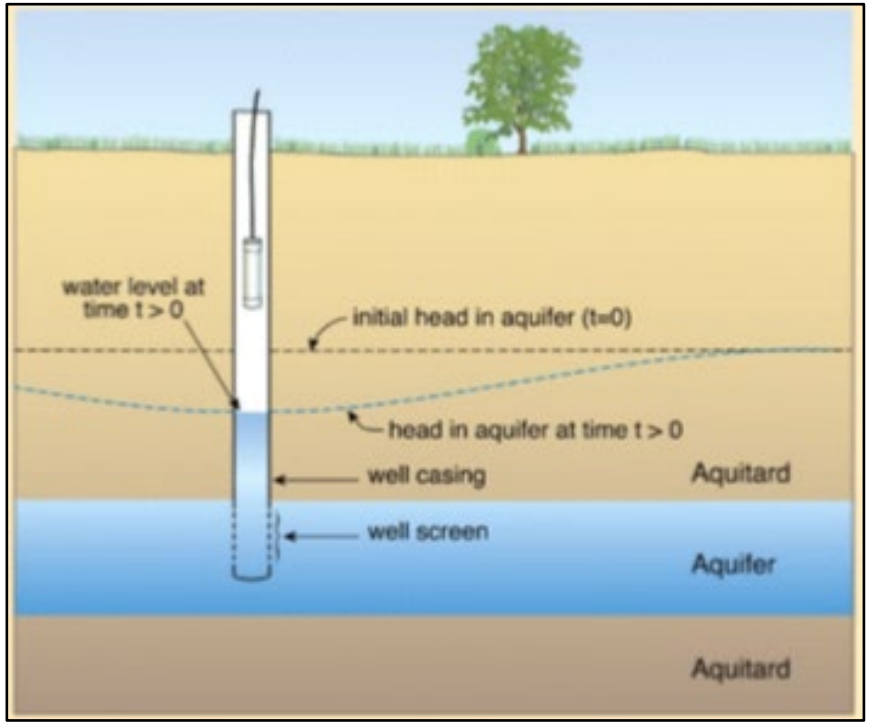


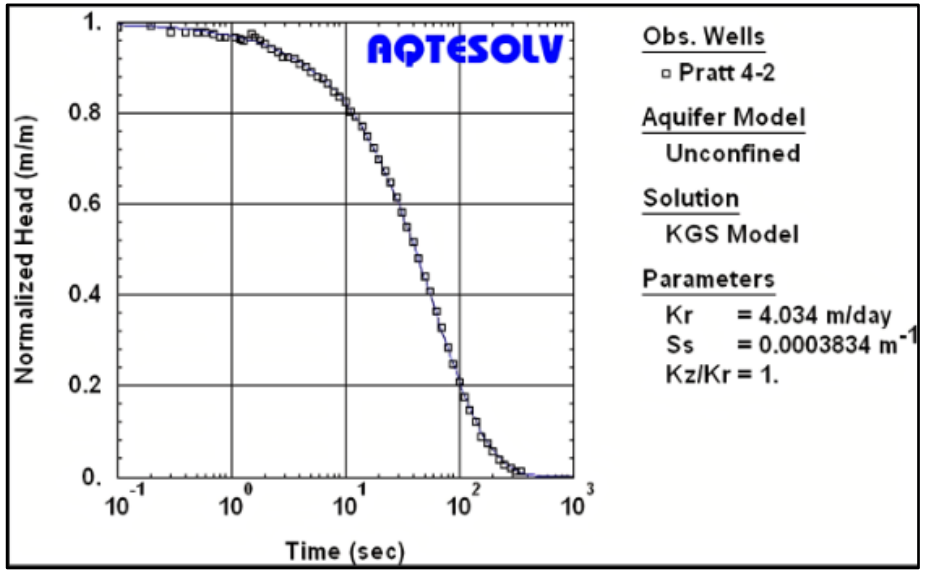
Hydraulic Characterization

- Hydraulic Testing – slug testing and specific capacity tests
- Groundwater velocity measurements (heat pulse flow meters)
- 1 year of continuous water level measurements via transducers

Hydraulic Testing

- Slug and Specific Capacity Testing
- Performed at all monitoring wells
- Allows estimate of hydraulic conductivity (K)

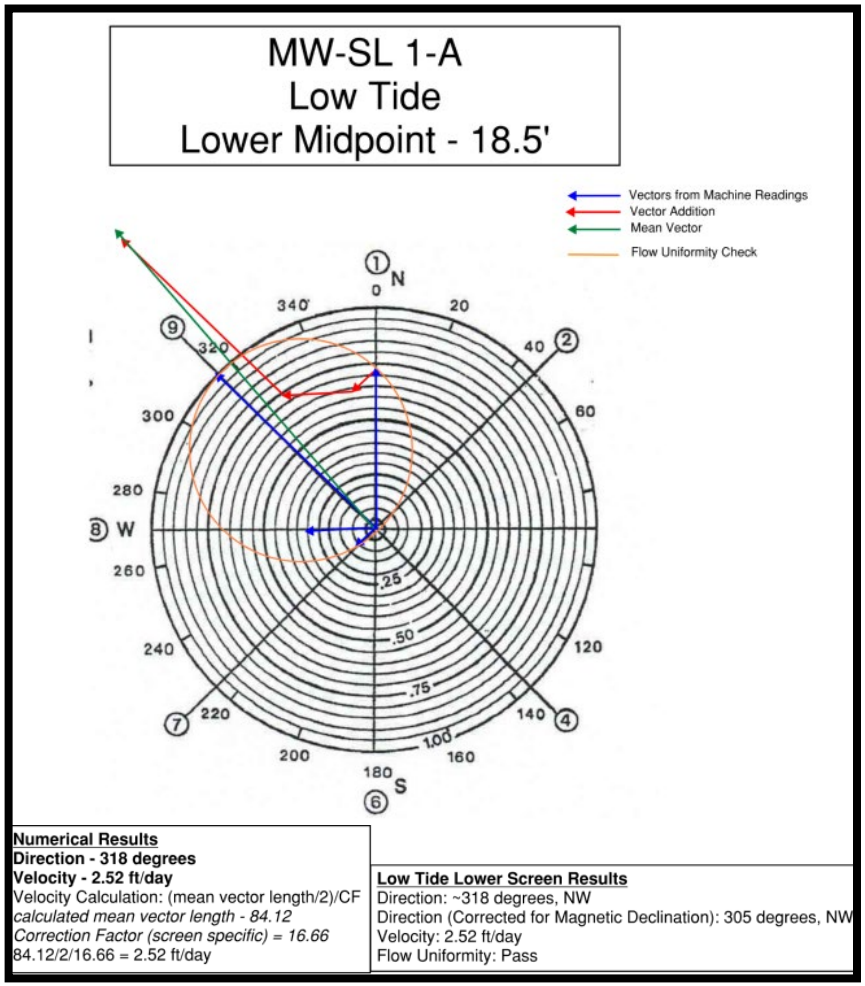




Groundwater Velocity Measurements

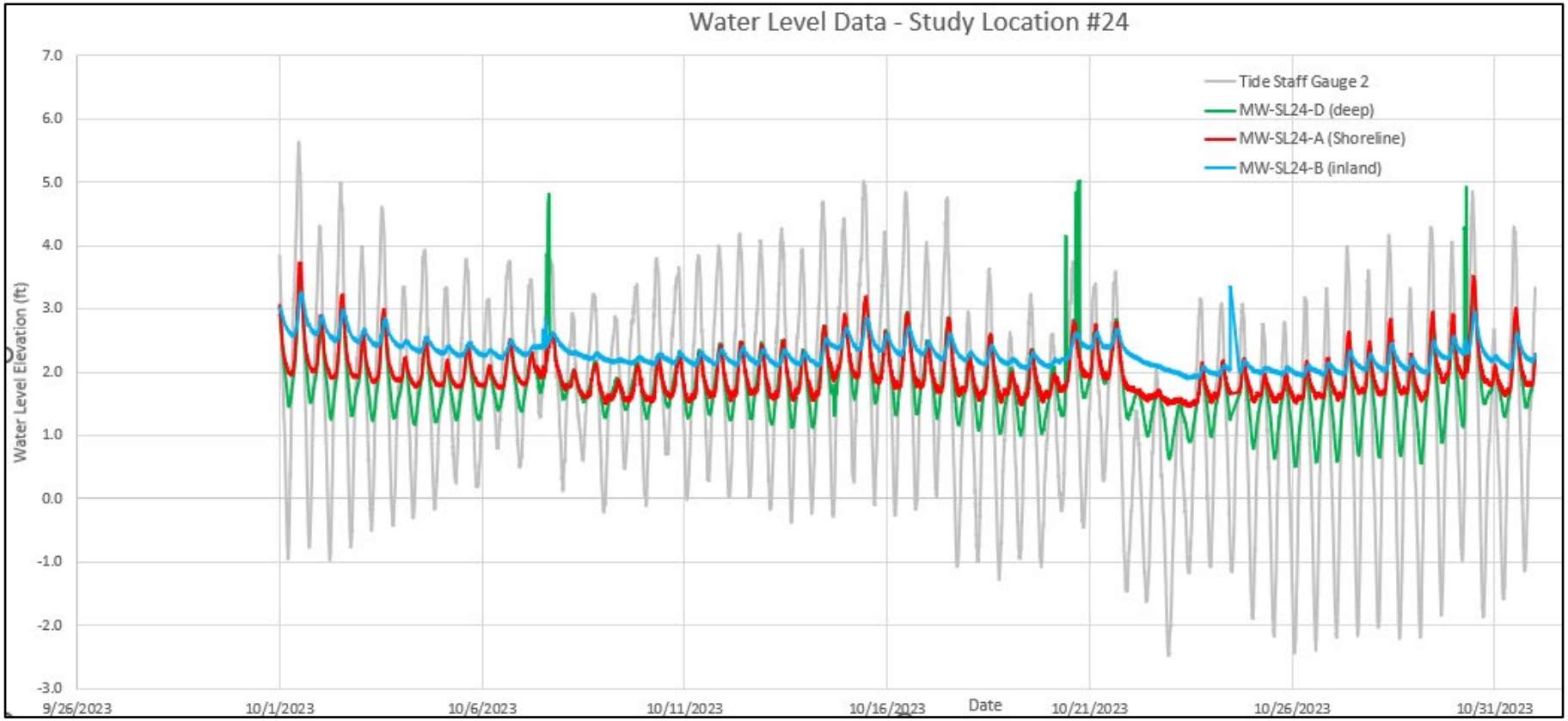
Heat pulse flow meters

- Provide a direct measurement of the movement of groundwater at a well
- Complicated by shoreline structures and tidal change
- Data collected to be complimentary to the other hydraulic testing performed



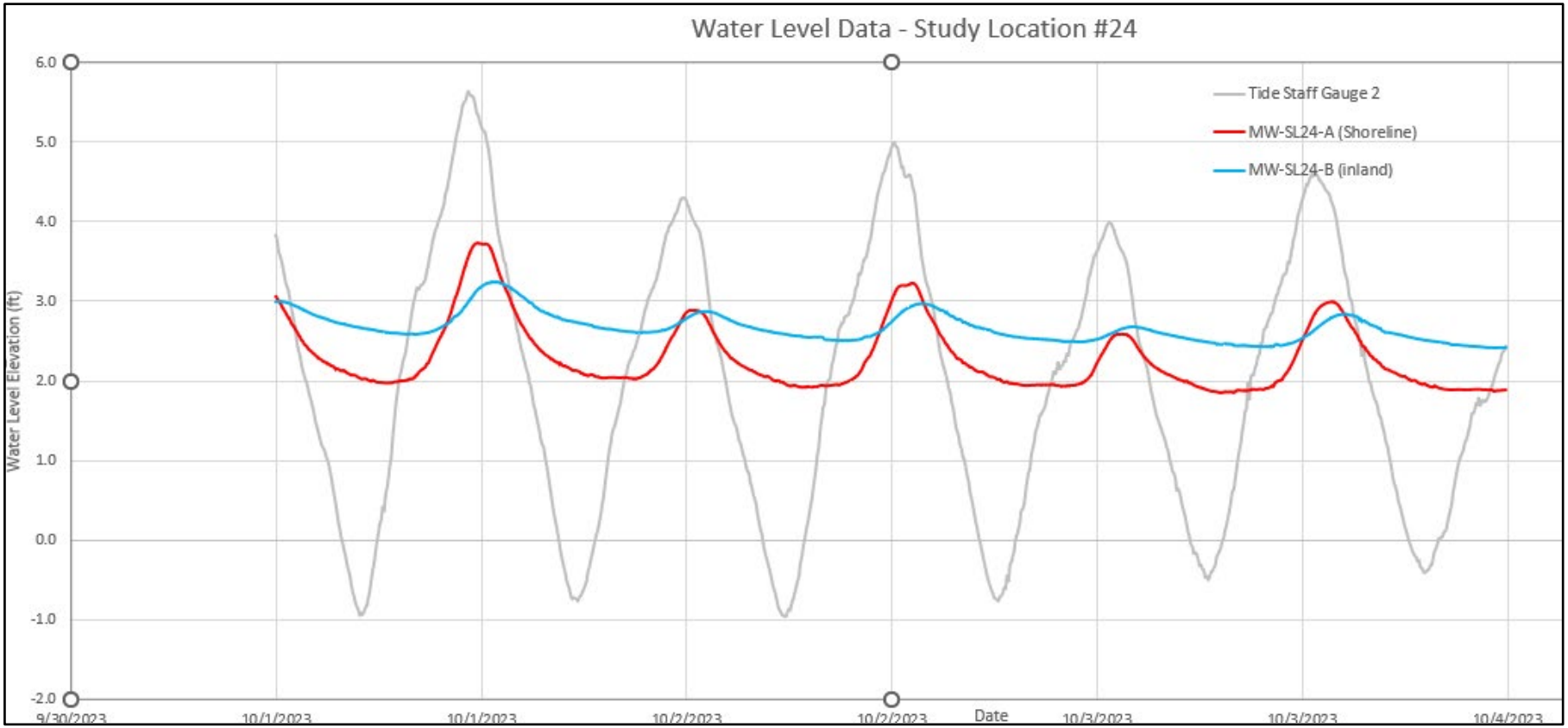
Long-term Water Level Monitoring

- 1 year of continuous water level measurements in all wells and creek staff gauges via transducers
- Water levels corrected for changes in water density (due to tides)



Long-term Water Level Monitoring

- Allows for calculation of the hydraulic gradient
- Complicated by the tidal changes (reversal of flow direction)



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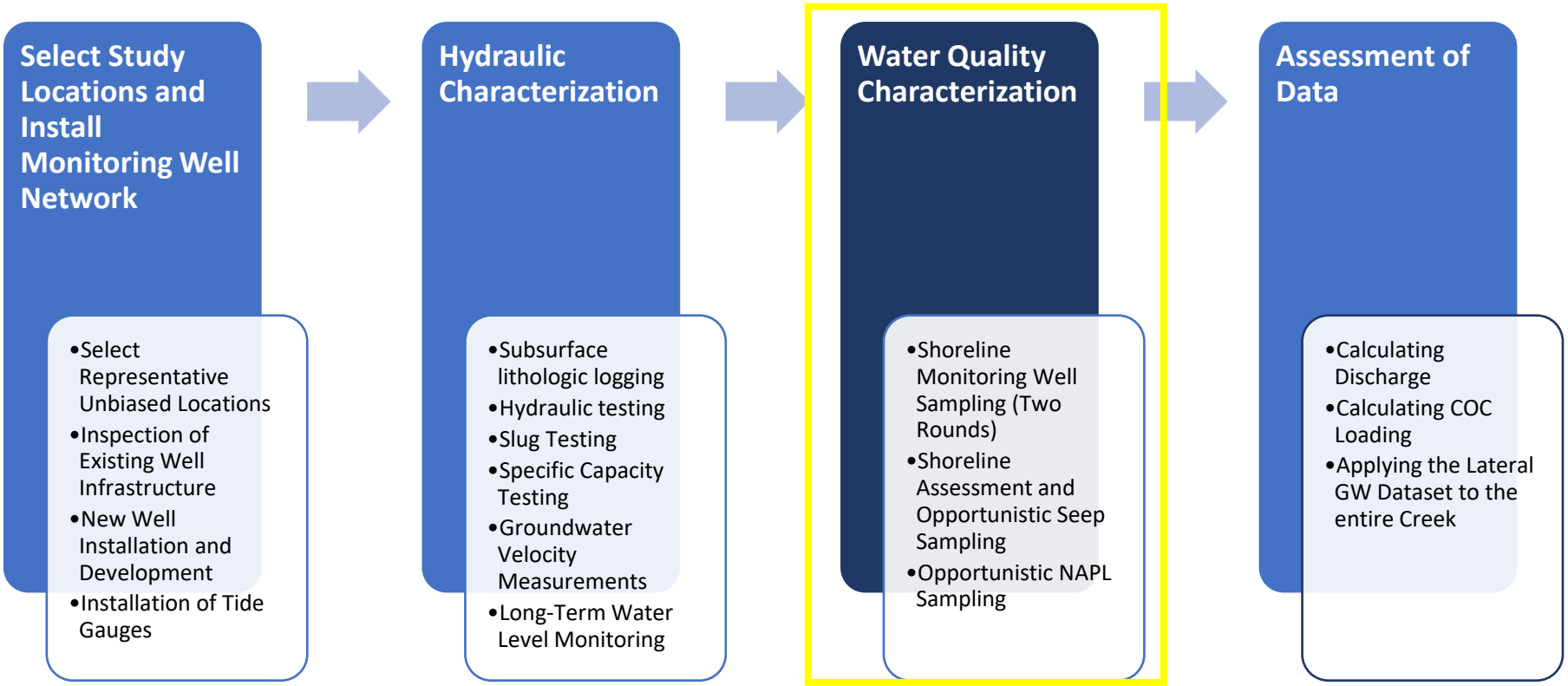


Groundwater Characterization

- 2 rounds of groundwater sampling – April 2023/ September 2023
- Samples collected from shoreline monitoring wells
- Sampling for COCs in RI (PAHs, EPH, PCBs, D/Fs, Metals, etc.)

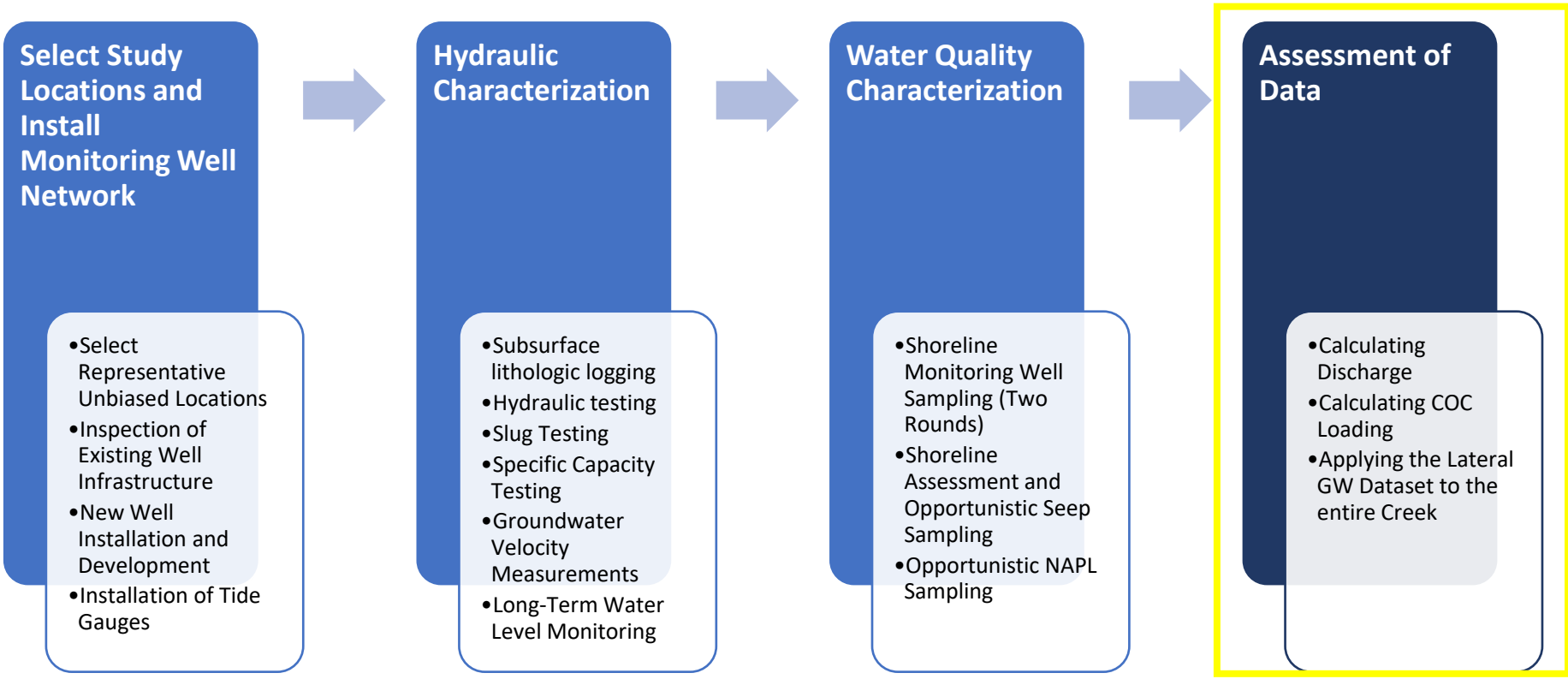
Opportunistic Seep Sampling

- Opportunistic shoreline seep sampling – April 2023
- Collected 9 samples from points throughout the Creek
- Sampling for COCs in RI (PAHs, EPH, PCBs, D/Fs, Metals, etc.)

Shoreline structure of SP-2 location. Located across the channel from SL #31. Facing South.

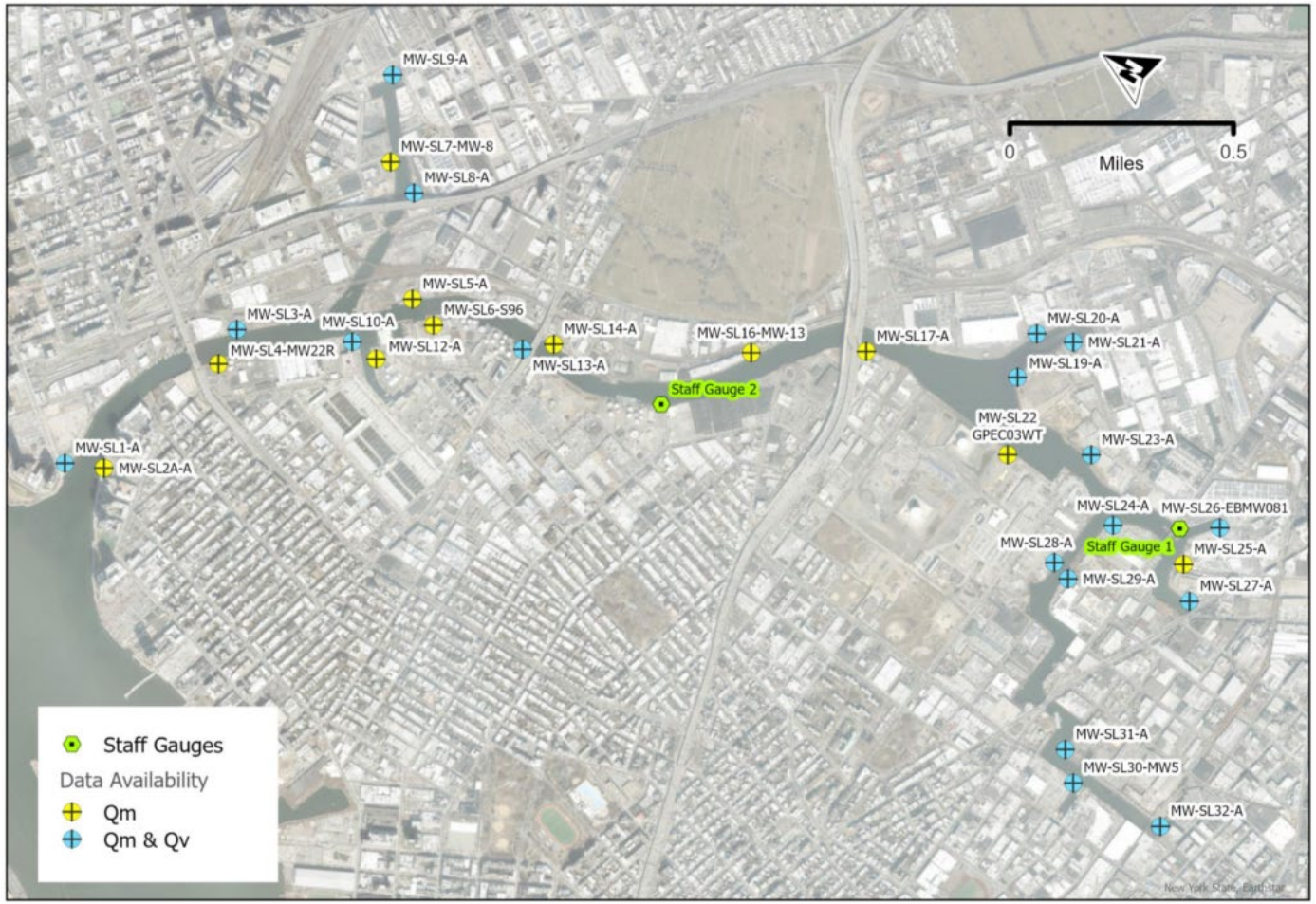

Seepage at SP-2 sampling point.

Investigation Approach



Applying the Dataset to the Entire Creek

- Determine how to apply representative dataset to the entire Creek
- Update current Long-Term Equilibrium Model to include the new inputs



Next Steps:

- Complete a revision to the Data Summary Report
- Hold technical workshops with NYSDEC, NYCDEP, and the NCG
- Update models and incorporate new data and understanding of the shallow groundwater flow system into the Feasibility Study

Questions?