



Piseco Lake Association – 2017 Annual Meeting

**Engineering Services –
Pisecto Lake Outlet Dam**

Kevin Ruswick, PE, CFM

August 19, 2017



Schnabel
ENGINEERING

Presentation Outline

- Introductions / Firm Qualifications
- Dam Information
- Review the Town's Concerns
- Preliminary Study
- Refined Analysis
- Study Status
- Q&A



INTRODUCTIONS / QUALIFICATIONS



Piseco Lake Outlet Dam viewed from the Route 10 Bridge.

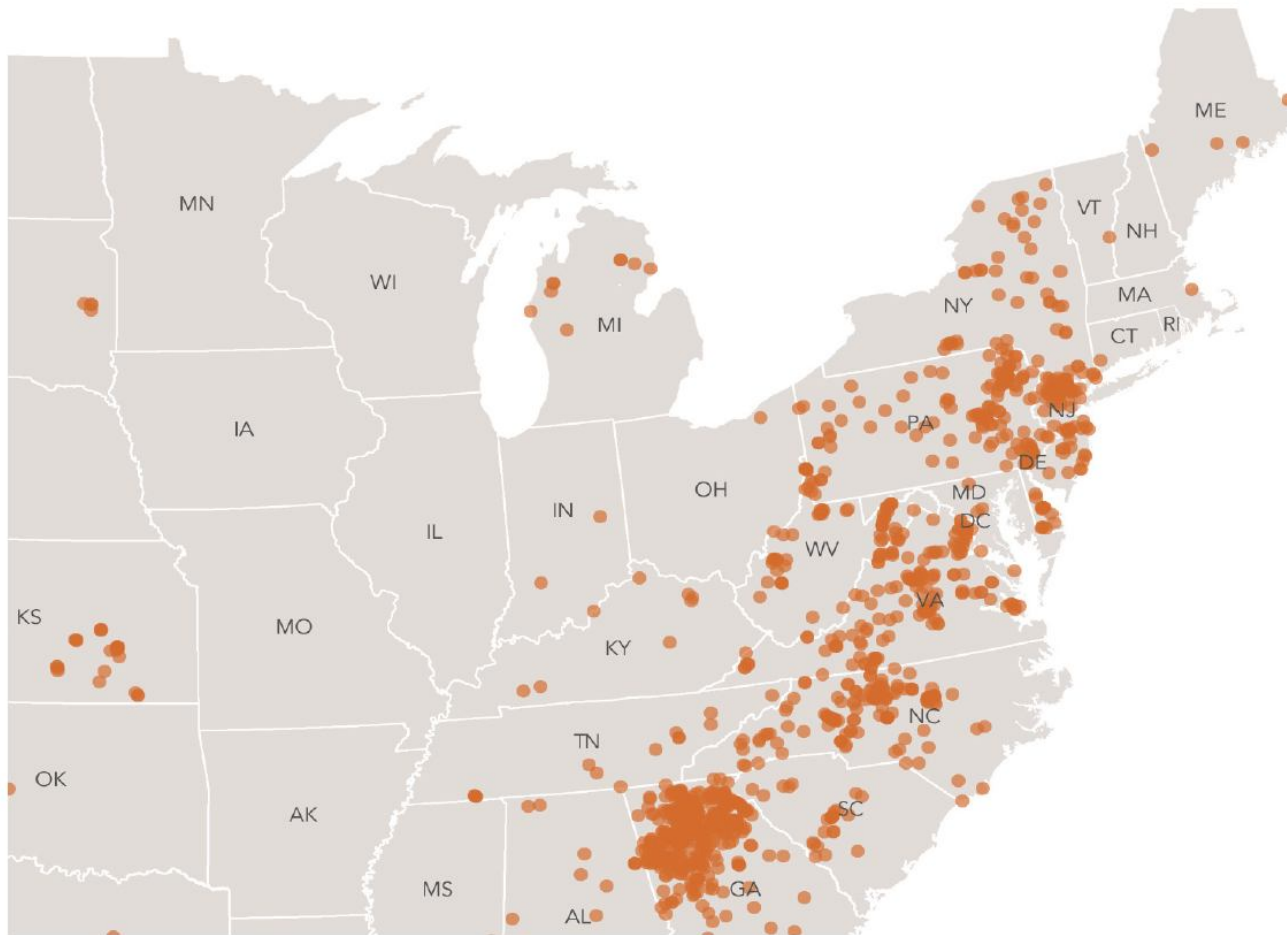
Schnabel and Dam Engineering

- Schnabel has over 300 employees, of which more than 100 are dedicated to dam safety projects and work exclusively in this field. These include all disciplines to support dam safety projects.
- In the last 20 years our firm has completed more than 2,000 dam and water resource projects.
- We believe that hiring a firm that specializes in dam engineering will result in a superior project outcome.

Schnabel and Dam Engineering

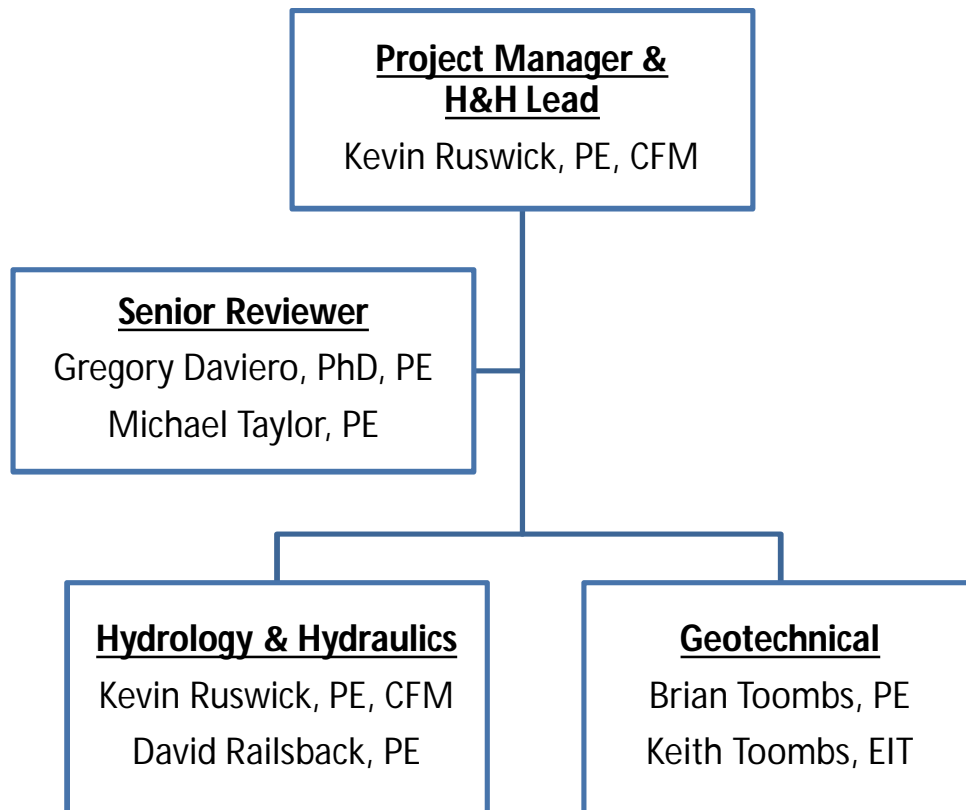


Schnabel and Dam Engineering



Regional Schnabel Dam Projects

Project Team



KEVIN RUSWICK
H&H, Dam Engineering



MICHAEL TAYLOR
Geotechnical /
Dam Engineering



DAVID RAILSBACK
H&H, Dam Engineering

All members of the Project Team are located in our Clifton Park, NY office.

Recent New York State Dams Experience

Schnabel has worked on over 40 dams in New York State, including:

- **NYS DEC** – Hazard Screenings & Hazard Classifications for 23 DEC-Owned Dams including Lake Durant Dam, Lake Clear Outlet Dam, Kunjumuk Creek Dam, Hillabrandt Vly Dam
- **Hudson River Black River Regulating District** – Conklingville Dam (Great Sacandaga Lake)
- **City of Plattsburgh** – Mead Reservoir Dam, Westbrook Reservoirs No. 1 & 2
- **Town of Wilmington** – Wilmington Dam
- **City of Saratoga Springs** – Loughberry Lake Dam
- **NYC DEP**– Cannonsville Reservoir Dam
- **Albany Water Board** – Alcove Reservoir Dam, Basic Reservoir Dam, Loudonville Reservoir Dam, Rensselaer Lake Dam



Kunjumuk Creek Dam (NYS DEC)

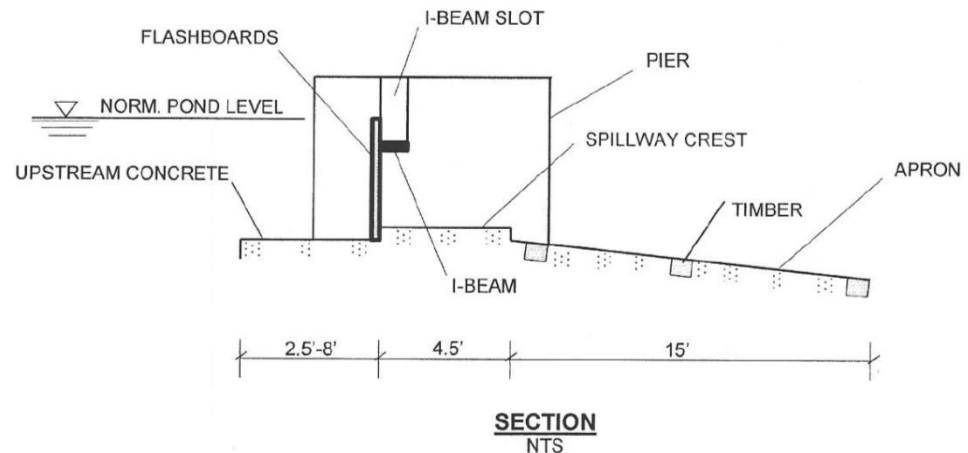
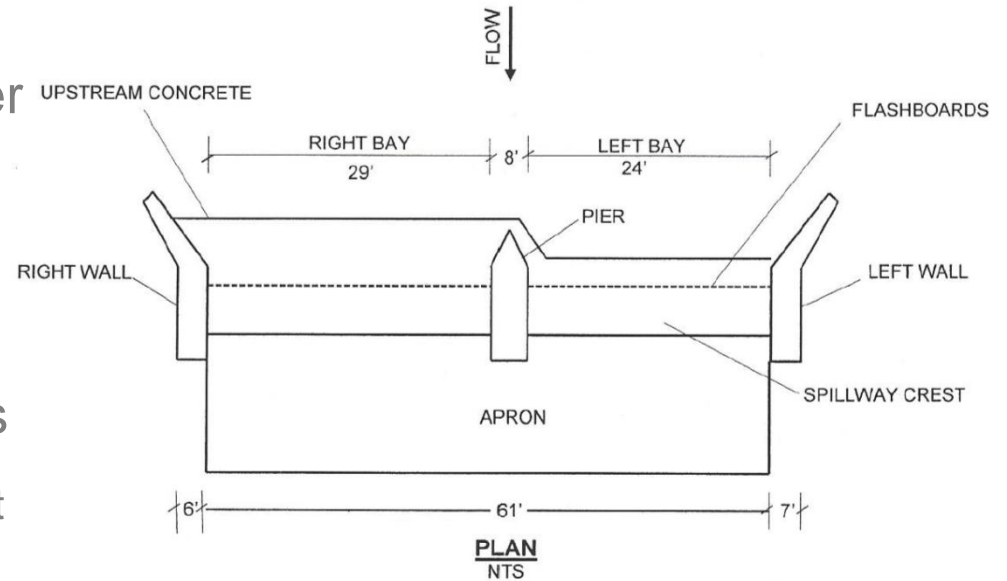
DAM INFORMATION



Piseco Lake Outlet Dam viewed from Left Abutment.

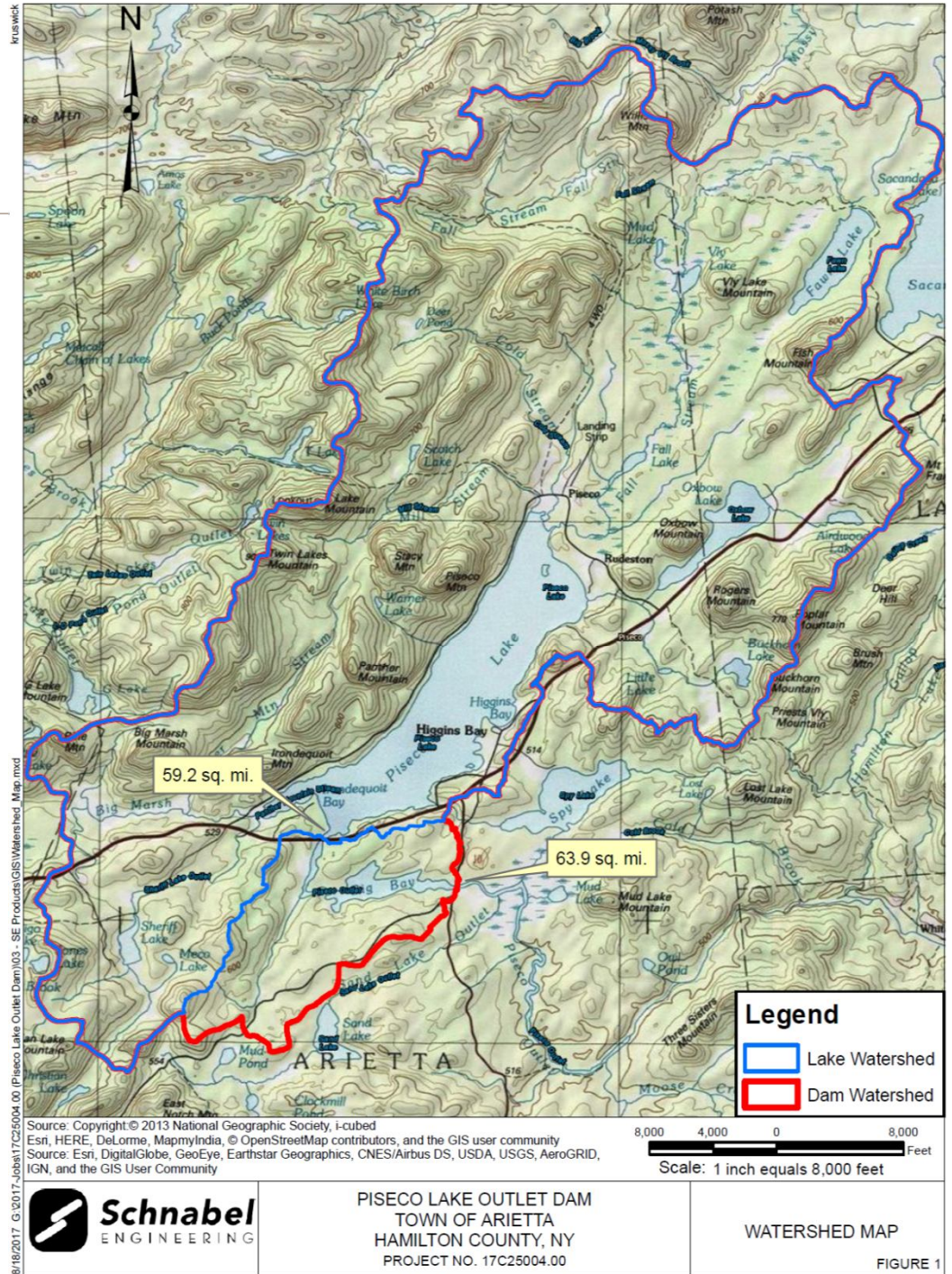
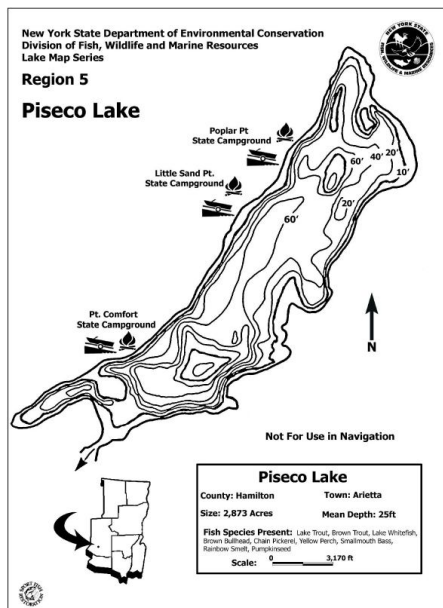
Dam Details (NYSDEC)

- West Branch of Sacandaga River (59.4 sq. mi.)
- Original Construction in 1888 (Timber Crib)
- Dam Modified in 1950's – 1960's
 - Concrete and Earthen Embankment
- 65-ft long, 6-ft max height
- Storage – 164,386 ac-ft
 - Mostly inactive storage
- NYS DEC Class A Structure
- Stop Logs to Manage Lake Levels (May - Oct)



Watershed Information

- 59.2 sq. mi. at Route 8 Bridge
- 63.9 sq. mi. at Dam
- 80% Forest Land
- 19% Lakes/Wetlands
 - Piseco Lake – 4 sq. mi.
- 1% Developed/Urban Land



REVIEW OF THE TOWN'S CONCERNS



Piseco Lake Outlet Dam viewed from Right Abutment.

2015 MBP Condition Inspection

Short-Term Recommendations:

- Remove Trees and Brush
- Repair Undermined Concrete at Left Abutment Wall
- Remove Apron Timbers and Install Engineered Riprap Blanket at Toe
- Armor Left Embankment Abutment
- Repair Leakage Through Left Abutment
- Alternate Flashboard (3-ft, 4-ft) Placement
- Replace Flashboards and Install Walkway
- Install Warning Signs and Fence



2015 MBP Condition Inspection

Long-Term Recommendations:

- Topographic and Bathymetric Survey
- Hydrologic and Hydraulic Analysis
- Collect Soil Borings
- Structural Stability Analysis
- Develop Conceptual Design and Cost Estimate
 - Address Dam Safety Deficiencies
 - Consider Automated Flashboards and/or Spillway Gates
 - Spillway Apron Repair
 - Increase Spillway Capacity, Raise/Protect Abutments
- Final Design & Construction



Town/PLA Concerns / Desired Improvements

- Condition of Dam

- Seepage at Left Abutment
- Concrete Deterioration

- Improve Lake Level

Management

- Stoplogs vs. automated/gates or rubber dam

- Regulatory Compliance

- Environmental Stewardship and NYSDEC Requirements

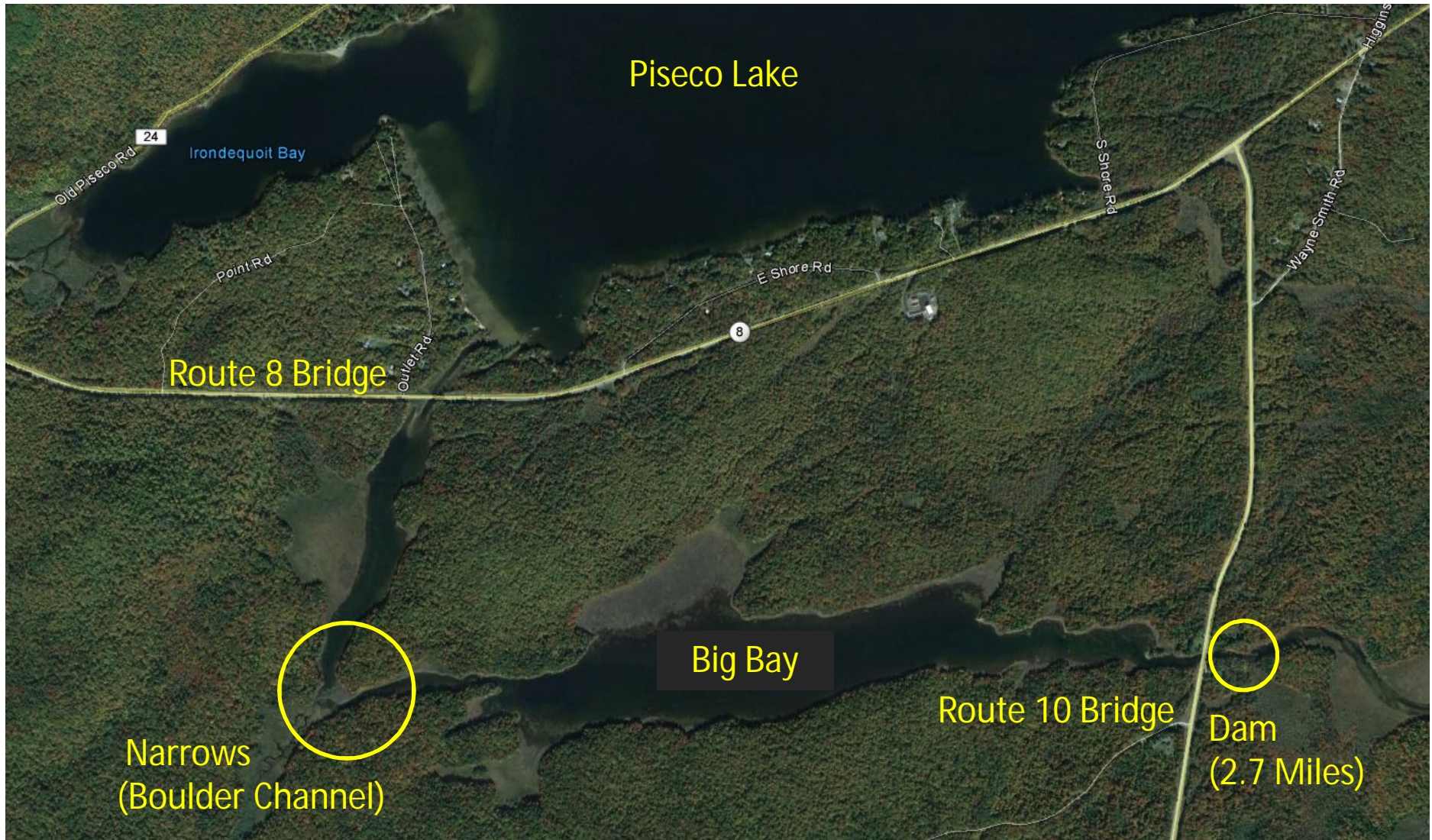


PRELIMINARY STUDY



Piseco Lake viewed from Route 8 Bridge.

Dam Operations and Lake Level Control



Anecdotal Lake Level Data

Water Level at Piseco Lake
506.1 meters (1660.4 ft)

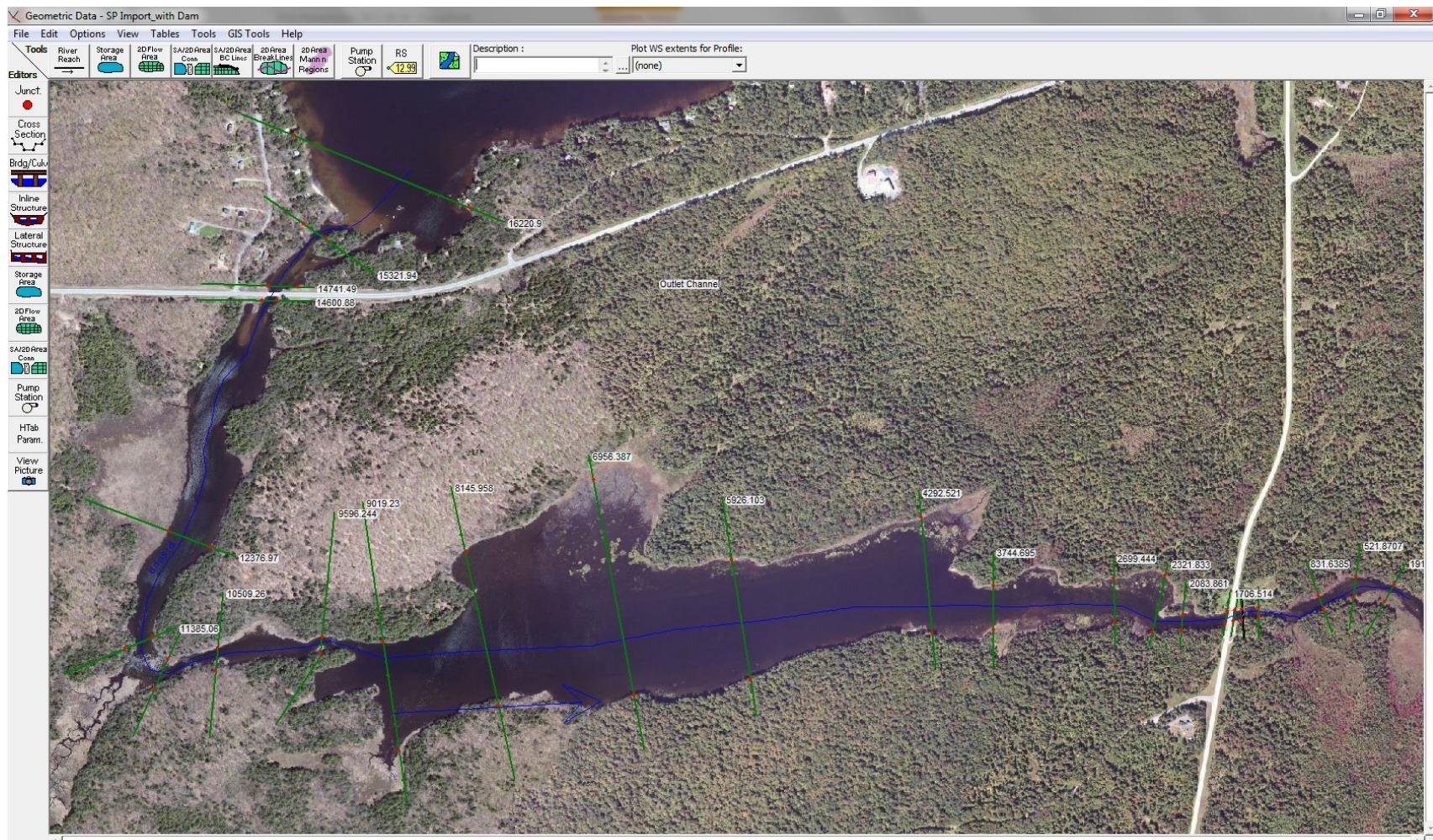
“The structure only acts as a dam when the ... flashboards are in place,” Fontana wrote in a 1999 letter to Spy Lake Corporation, which owns the property.

The boards raise the water level about three feet above the streambed and the lake level by a foot to 18 inches, he wrote, because the streambed is below lake level.

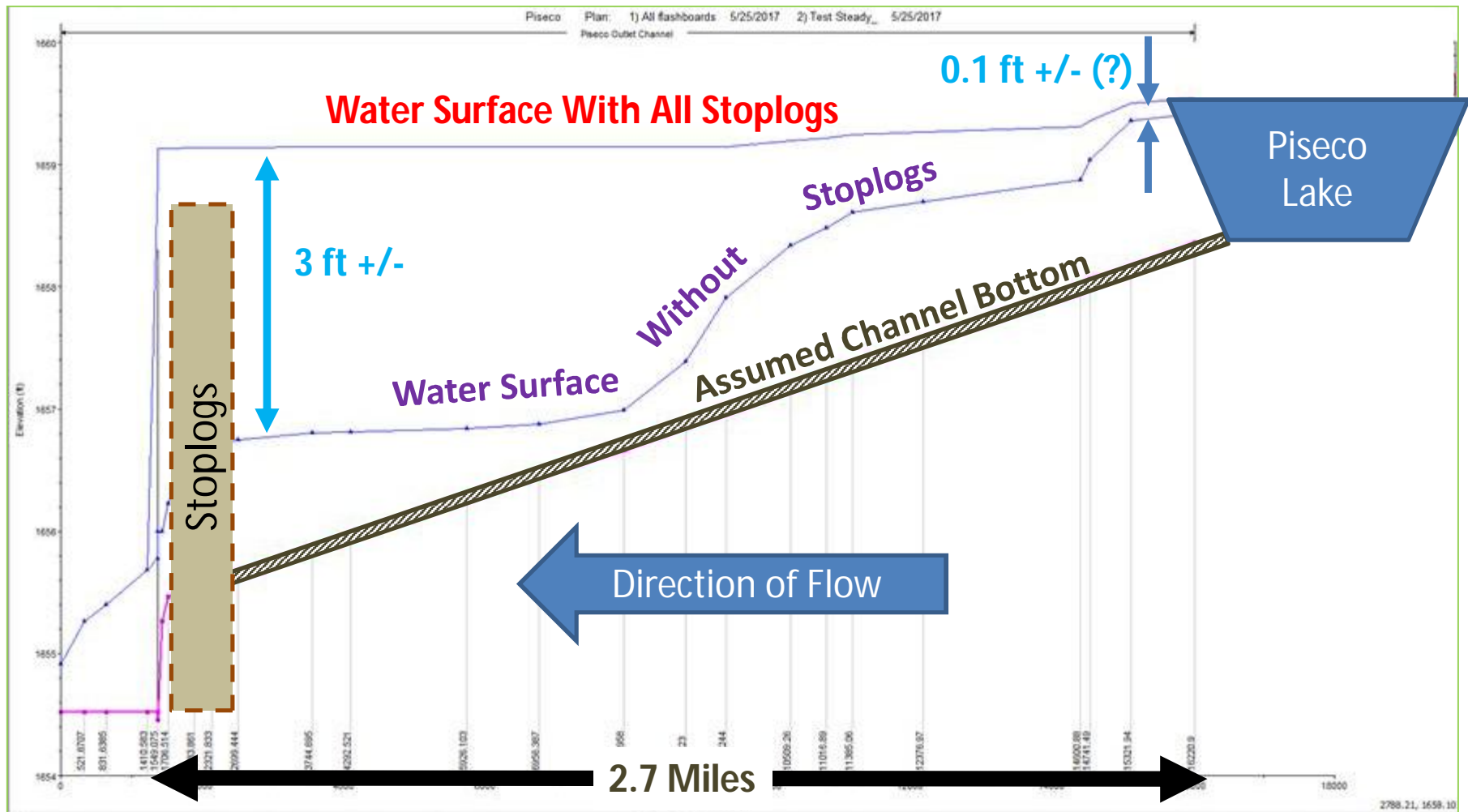
Water Level at Rt 10 Bridge
504.3 meters (1654.5 ft)

Preliminary Hydraulic Model Development

- USGS 10-meter DEM
- NYSDOT Data for Route 8 and Route 10 Bridges



Preliminary Hydraulic Model Results



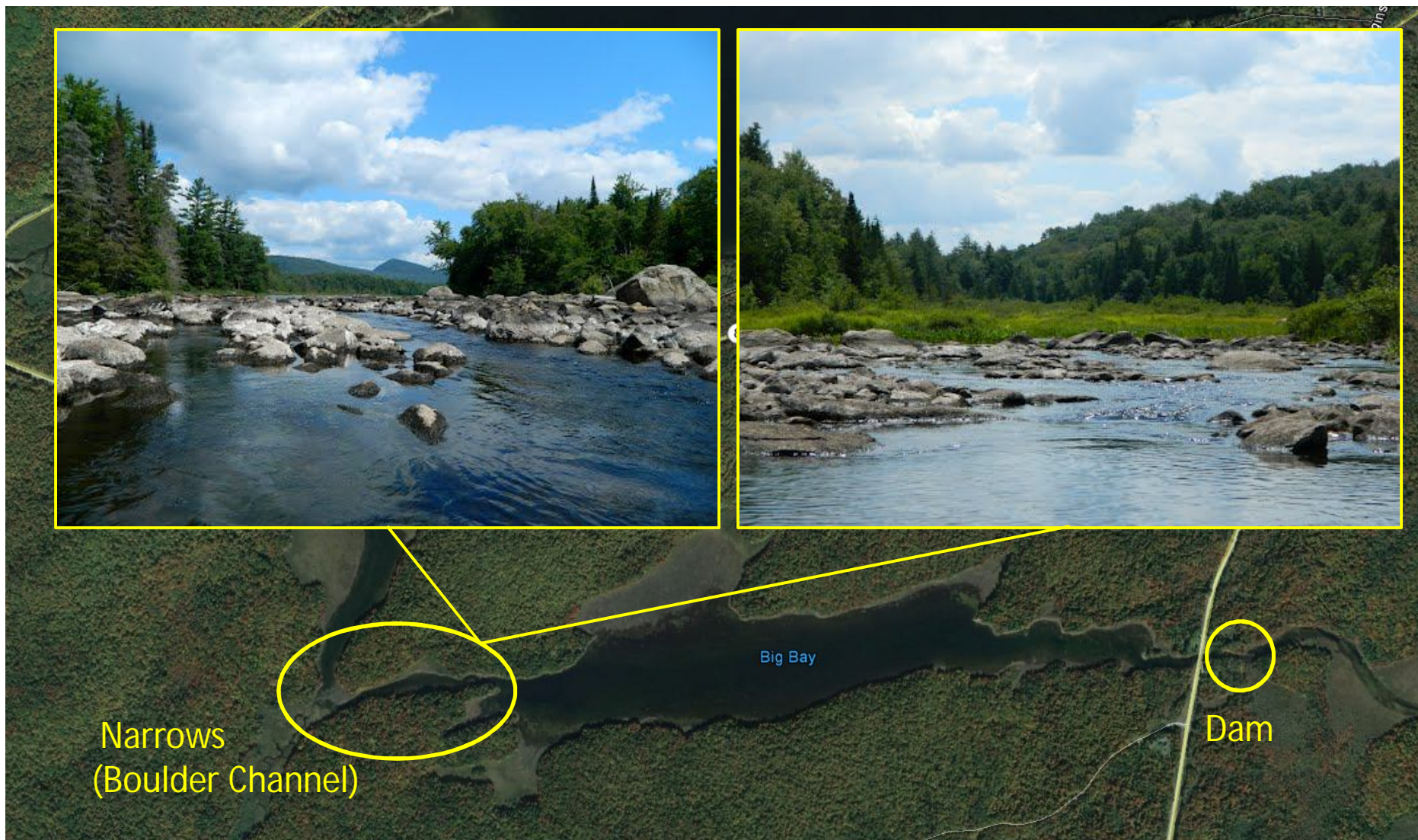
Dam / Route 10

Big Bay

Narrows (Boulder Channel)

Route 8

Need for Survey to Refine the Hydraulic Model



ESTABLISH THE ROADMAP



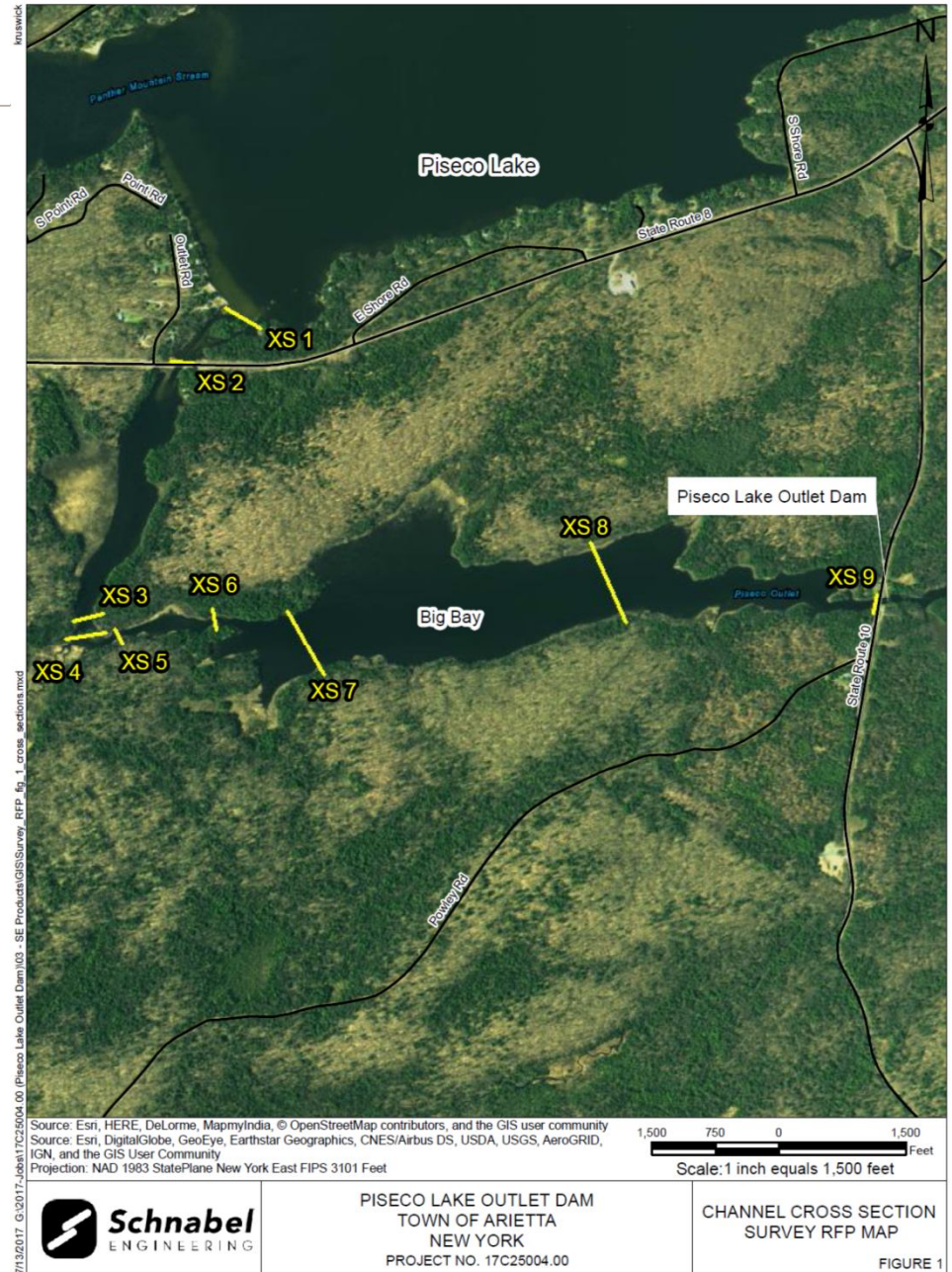
Big Bay viewed from Route 10 Bridge.

Suggested Road Map

- **Data Collection / File Review / Site Visit**
- **Survey – Topographic & Bathymetric**
 - Establish Datum for current lake level gage & add staff gage at the dam.
- **H&H Study – Inflow and Outflow from the Lake/Dam**
- **Geotechnical Investigation**
 - Excavations and Maintenance – Test Pits and Backfill with Select Material
 - Laboratory Testing of Embankment/Foundation Materials
- **Establish Goals and Priorities for Short-Term and Long-Term Repairs and Improvements**
- **Develop Scope and Budget to Achieve Objectives**
- **Design and Implement Repairs**

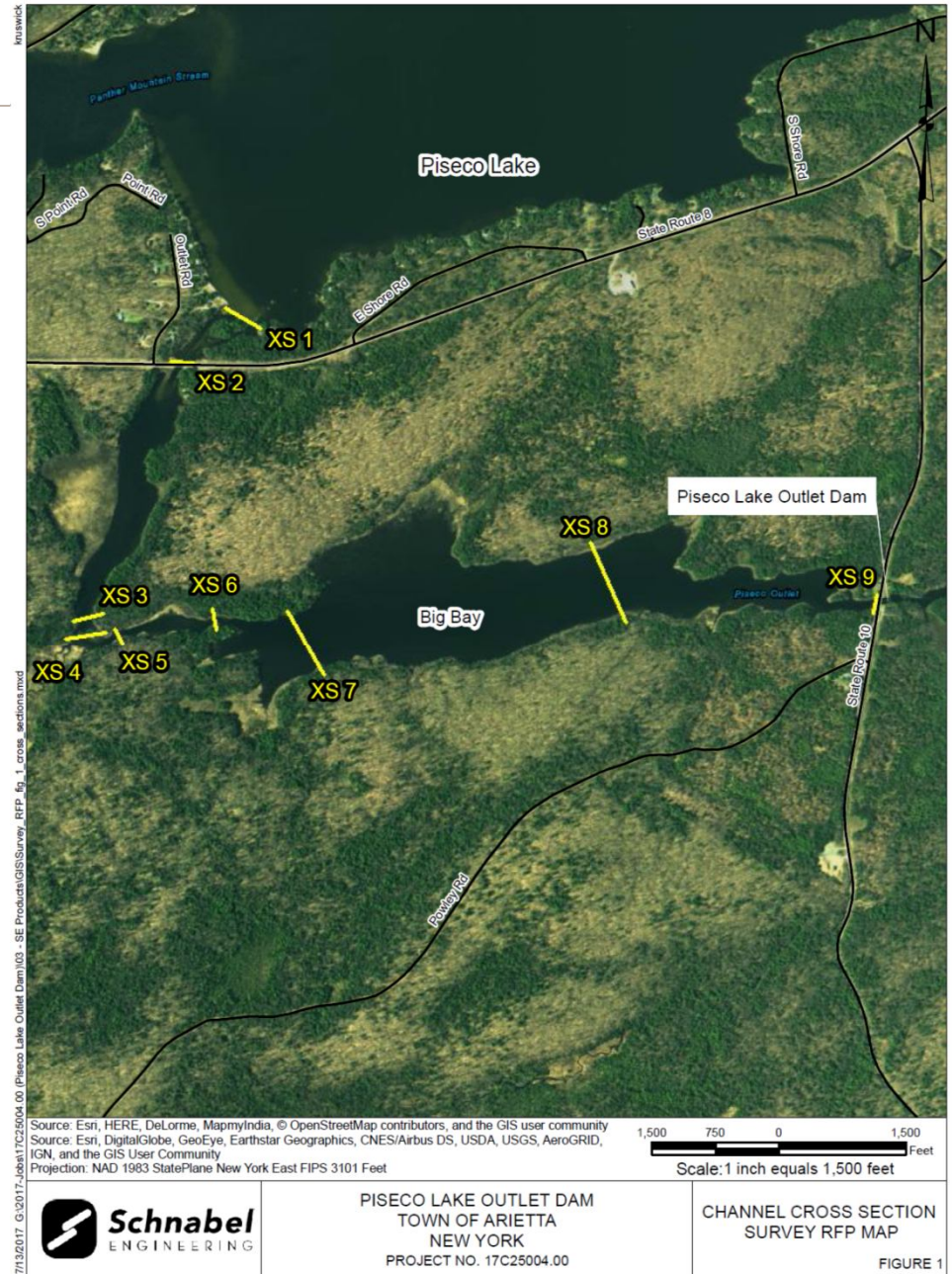
Survey Status

- Scope of Work
 - 9 Stream Cross Sections
 - 2 Bridges
 - Piseco Outlet Dam & Site
 - Establish Staff gages at dam & lake
- Solicited Bids from 6 Local Surveyors
- 3 Bids Received –
 - Shumaker Engineering - \$19,350
 - Susan Anacker - \$11,160
 - Blanchard Land Surveying - \$5,500



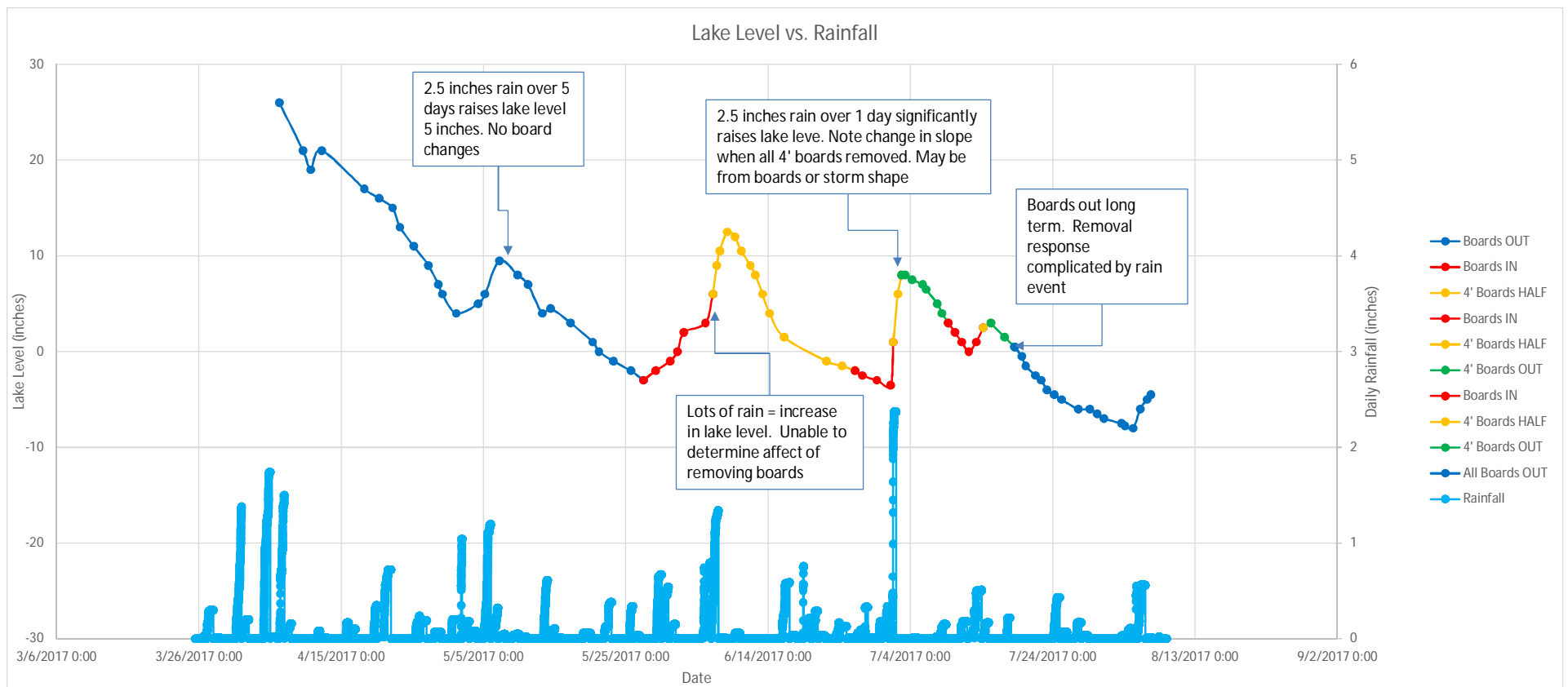
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H&H Study Status

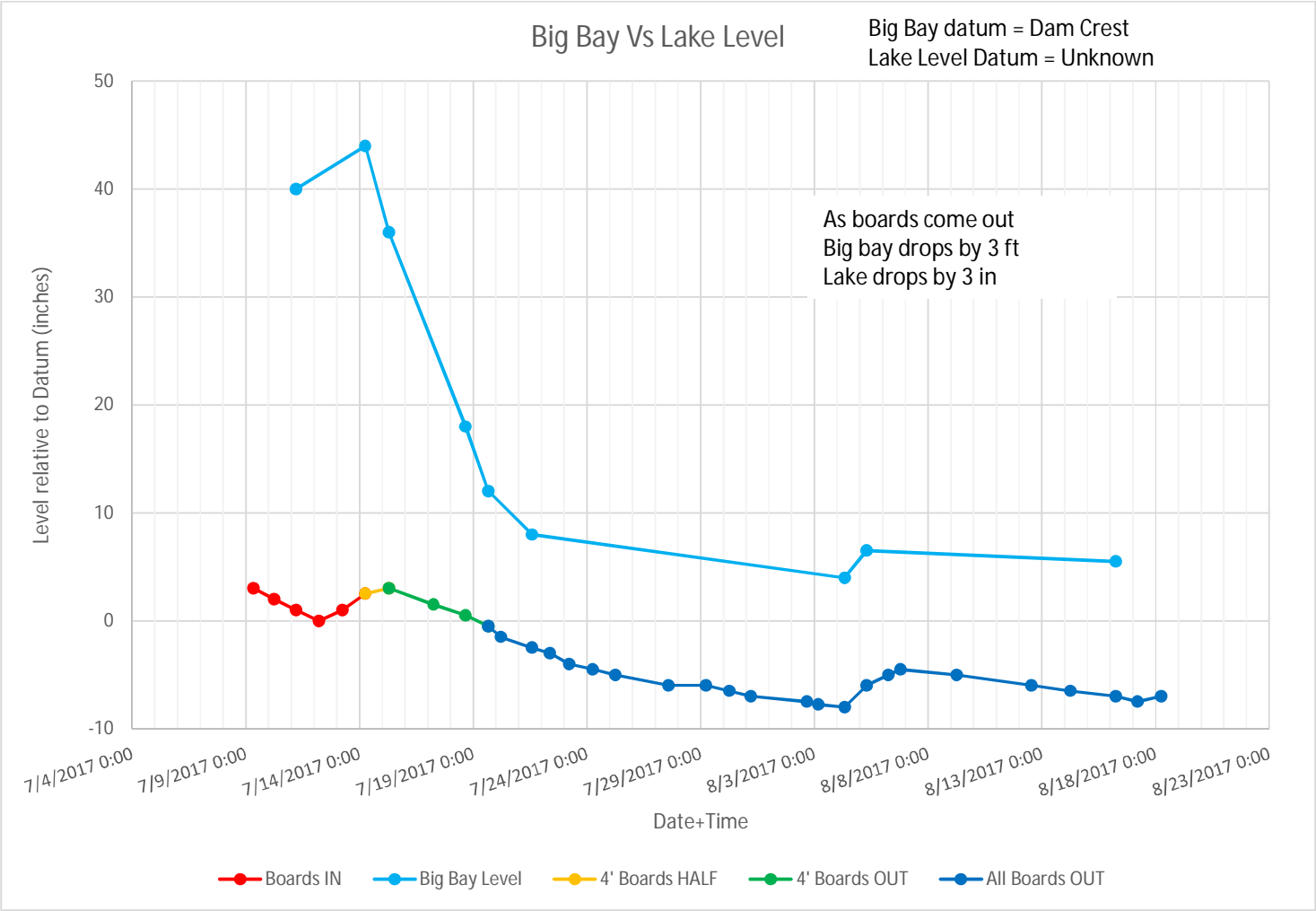
- HEC-HMS Hydrologic model developed
 - Waiting for Survey Data to Finalize outflow rating curve & storage rating curve
- Hydraulic Model – Waiting for Survey Data
- 2017 Lake Level Monitoring - Ongoing



Recent Lake Level Monitoring

■ Lake Level & Big Bay Level

■ Correlate water levels with stop-log operation



Geotechnical Investigation

- Explore Left Abutment
 - Seepage Assessment and Material Loss
- Town is working on arrangements for excavator
 - Evaluate “unseen” below-grade conditions
- Schnabel is coordinating with local stone suppliers for material availability and specs
- Schnabel will coordinate with NYSDEC – Dam Safety to assess maintenance permitting requirements



Questions

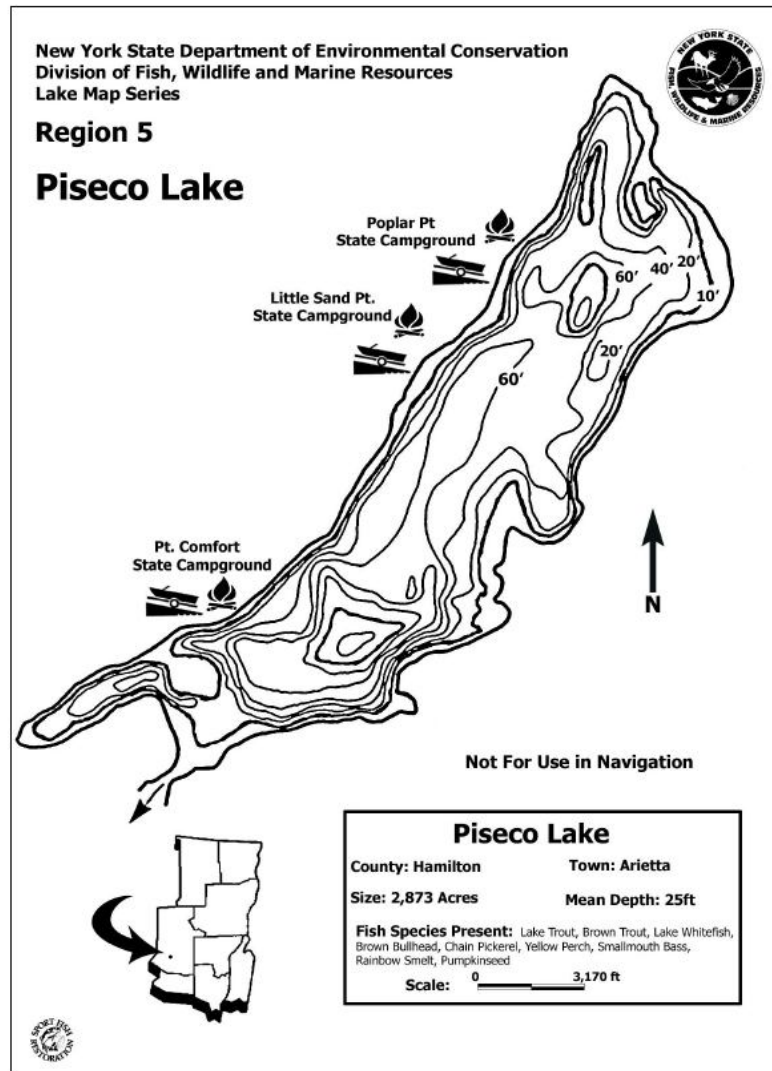


SUPPLEMENTAL
INFORMATION



Piseco Lake viewed from Route 8 Bridge.

Bathymetric Map



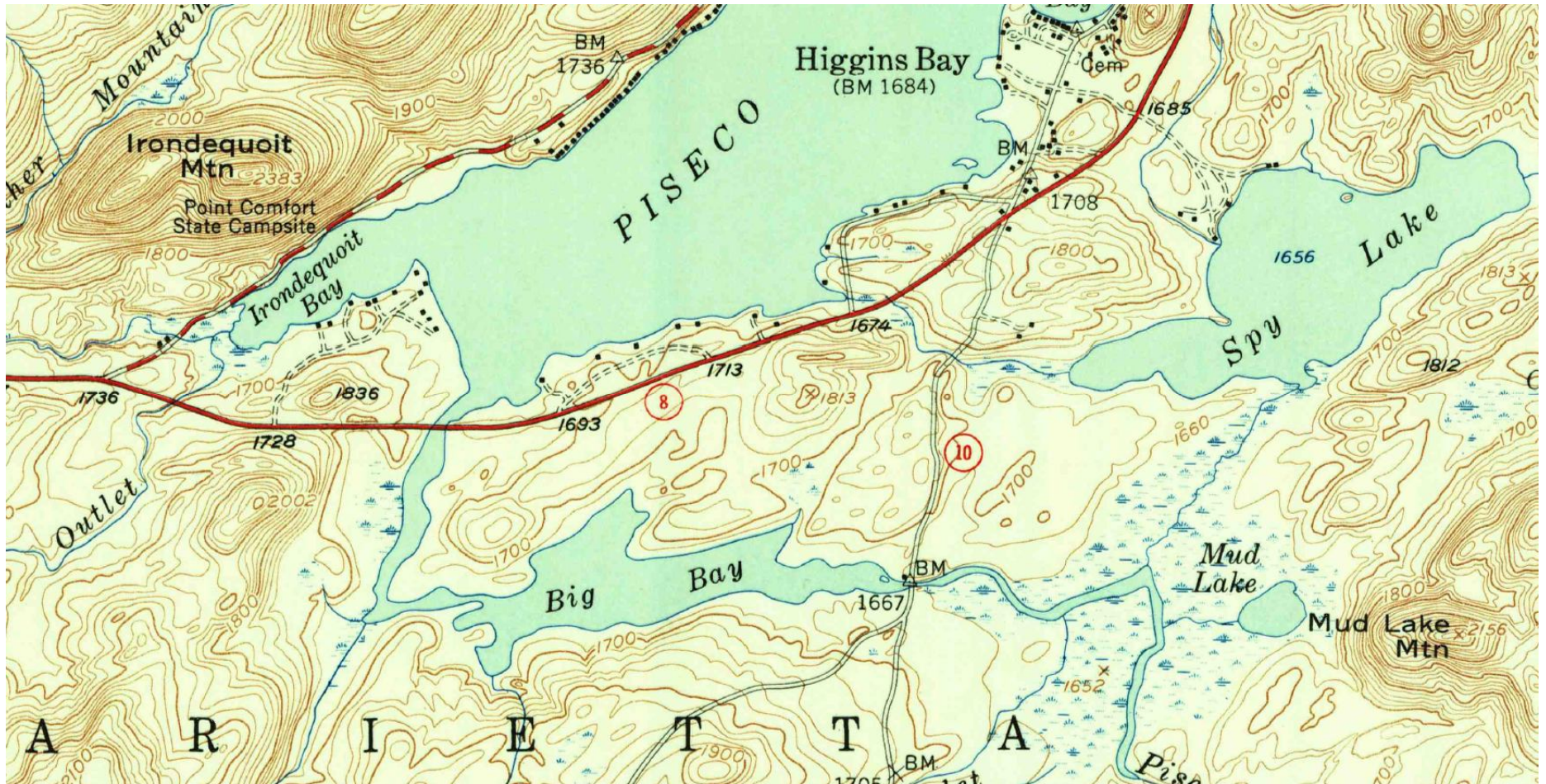
Piseco Saw Mill



USGS Topographic Map - 1906



USGS Topographic Map - 1954



SIMILAR PROJECTS



Route 10 Bridge.

Case Study: Otsego Lake Dam – Cooperstown, NY

- Dam is located approximately 1-mile from Otsego Lake.
- Schnabel performed Hydrology & Hydraulics analyses to evaluate flood reduction alternatives.
- Channel and constrictions between lake and dam limited outflows from lake.
- Schnabel performed hazard class assessment and lowered from Class B to Class A.



Case Study: Wilmington Dam Operational Improvements

- At Wilmington Dam, the existing outlet gate does not allow much flexibility with respect to installing and removing stop logs.
- We are helping the Town improve operations by designing and installing a new low-level gate.
- We made use of hydrologic and hydraulic models to design a practical and cost-effective solution, which is pending construction.



Case Study: Mead Reservoir Dam – Plattsburgh, NY

- At Mead Reservoir Dam we utilized refined hydrologic modeling to reduce (by a factor of two) the spillway design flood which had been developed by another consultant.
- Schnabel's approach was approved by NYS DEC and represents an estimated \$3M in construction cost savings for the City.
- We are currently developing rehabilitation designs for the new spillway.



Case Study: Sugar Hollow Dam – Crozet, VA

