Division of Lands and Minerals
Waters Program

Erika Herr| Mine Permitting and Coordination Supervisor

DEPARTMENT OF NATURAL RESOURCES

DNR Mining Hydrology Program History

- Mining Hydrology was previously part of the Division of Waters
- Consisted of one Mining Hydrologist
- Additional temporary and permanent staff were added as needed
- Mining Hydrology (Waters) was moved to the Division of Lands and Minerals in 2015

Division of Lands and Minerals

Mine Permitting and Coordination Section

(staff in St Paul and Hibbing)

- Mining Hydrology/Waters – Regulatory and Technical work
- Reclamation – Permit to Mine
- Research – Mine Waste Characterization
  - Research site and lab at Hibbing Lands and Minerals office
- Planners
- Wetland Specialists – RGU for WCA when a Permit to Mine is required

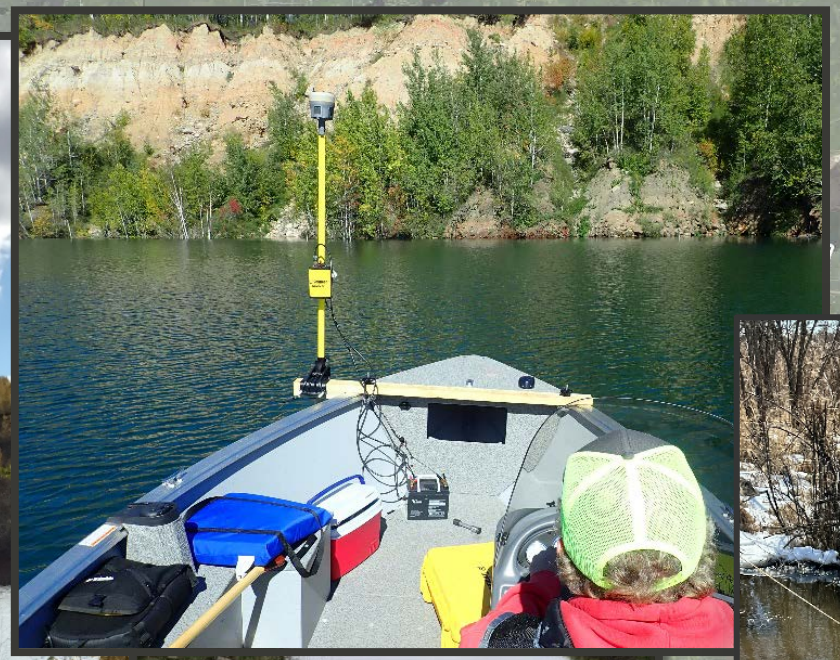
Division of Lands and Minerals Waters Unit

- Statewide program
- Projects that are worked on include ferrous, non-ferrous and peat mining, municipal water use
- Administer the Water Permitting Programs for mining-related projects (generally, those that require a Permit to Mine):
  - Public Waters Work Permits
  - Water Appropriation Permits
- Monitor surface and groundwater across the Mesabi Iron Range
- Data review and analysis
- Participate in special studies (Legacy Mine Pits) and are technical experts for other programs (Permit to Mine, Environmental Review)

Division of Lands and Minerals Waters Unit

- Mine Permitting and Coordination Supervisor: Erika Herr
- Mining Hydrologist: Martin Van Oort
- Assistant Mining Hydrologist: Jake Mickelson
- Mining Staff Hydrologist: vacant
- Mining Technical Specialist: new position/vacant

Division of Lands and Minerals Monitoring Program



Legacy Mine Pits

- Canisteo Pit
- Hill Annex Pit
- St. James Pit

Legacy Mine Pits

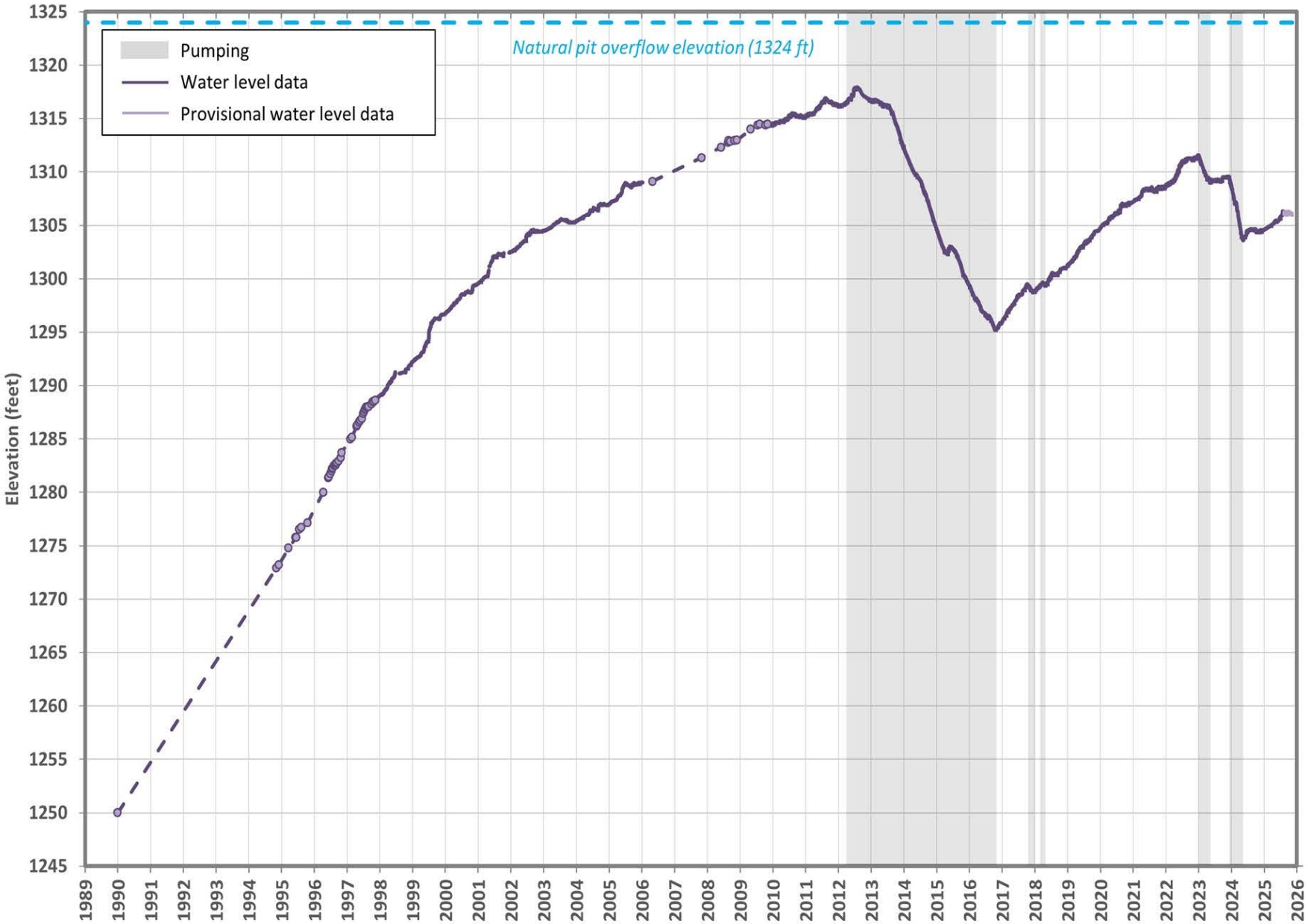
- Pits that were abandoned prior to the adoption of the Mineland Reclamation Rules in 1980
- No company or entity is responsible for reclamation or managing pit water levels
- The DNR does not have a program, statutory authority, or funding to manage legacy mine pits
  - DNR has received funding from different sources for specific projects
- DNR provides technical expertise to help address water management concerns
  - Coordinate with local and state partners

Legacy Mine Pits

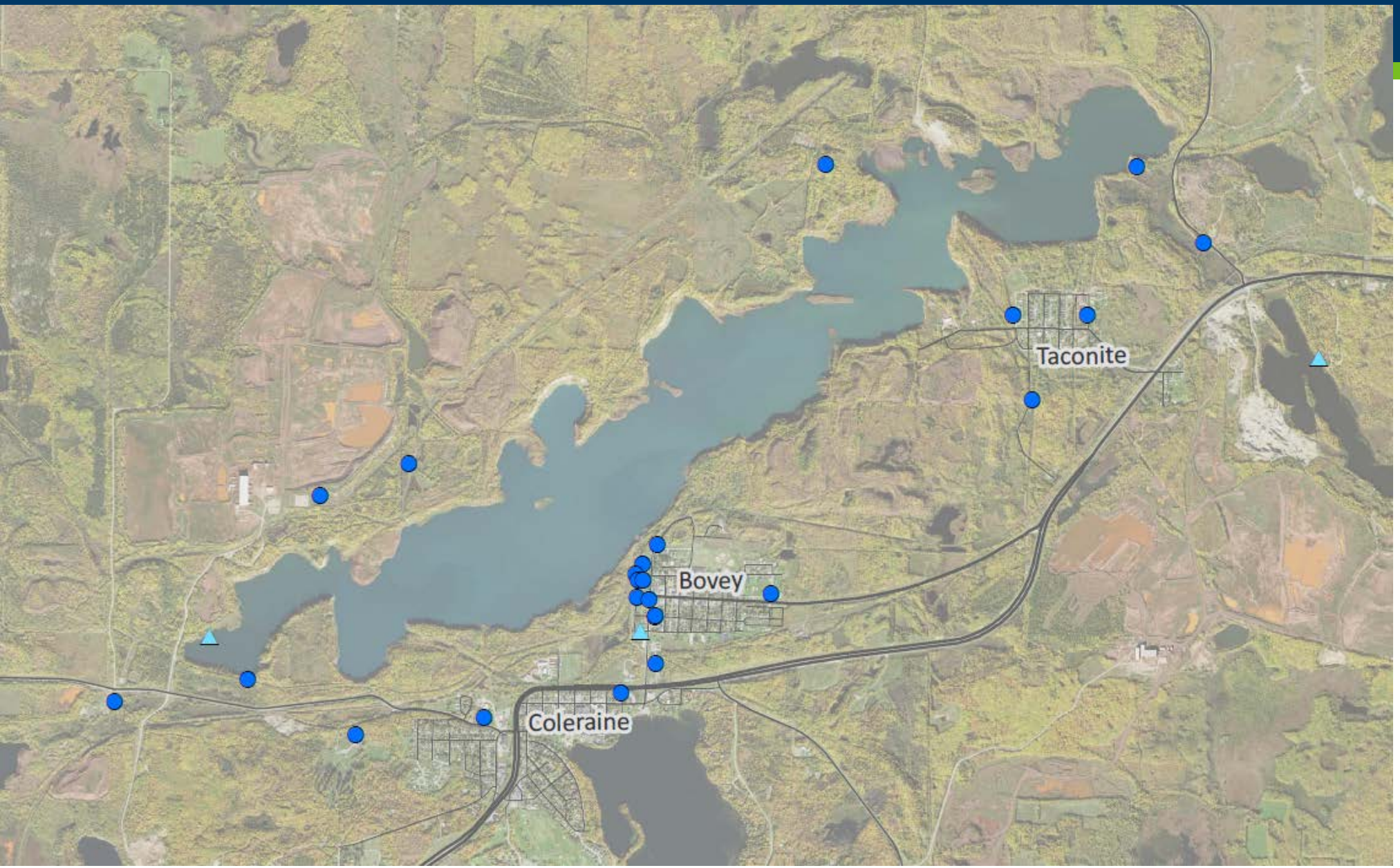
- The water level status for all existing legacy mine pits is unknown
- If it is determined that a pit needs an engineered outlet constructed:
  - Need to establish who would be the permittee, assist with technical permitting processes, and manage future maintenance
  - Water from the pits would need to be transferred or discharged under one or more regulatory program, which may require permitting, variances, and site-specific standards

Canisteo Legacy Mine Pit

Canisteo Mine Pit Water Levels



Canisteo Legacy Mine Pit

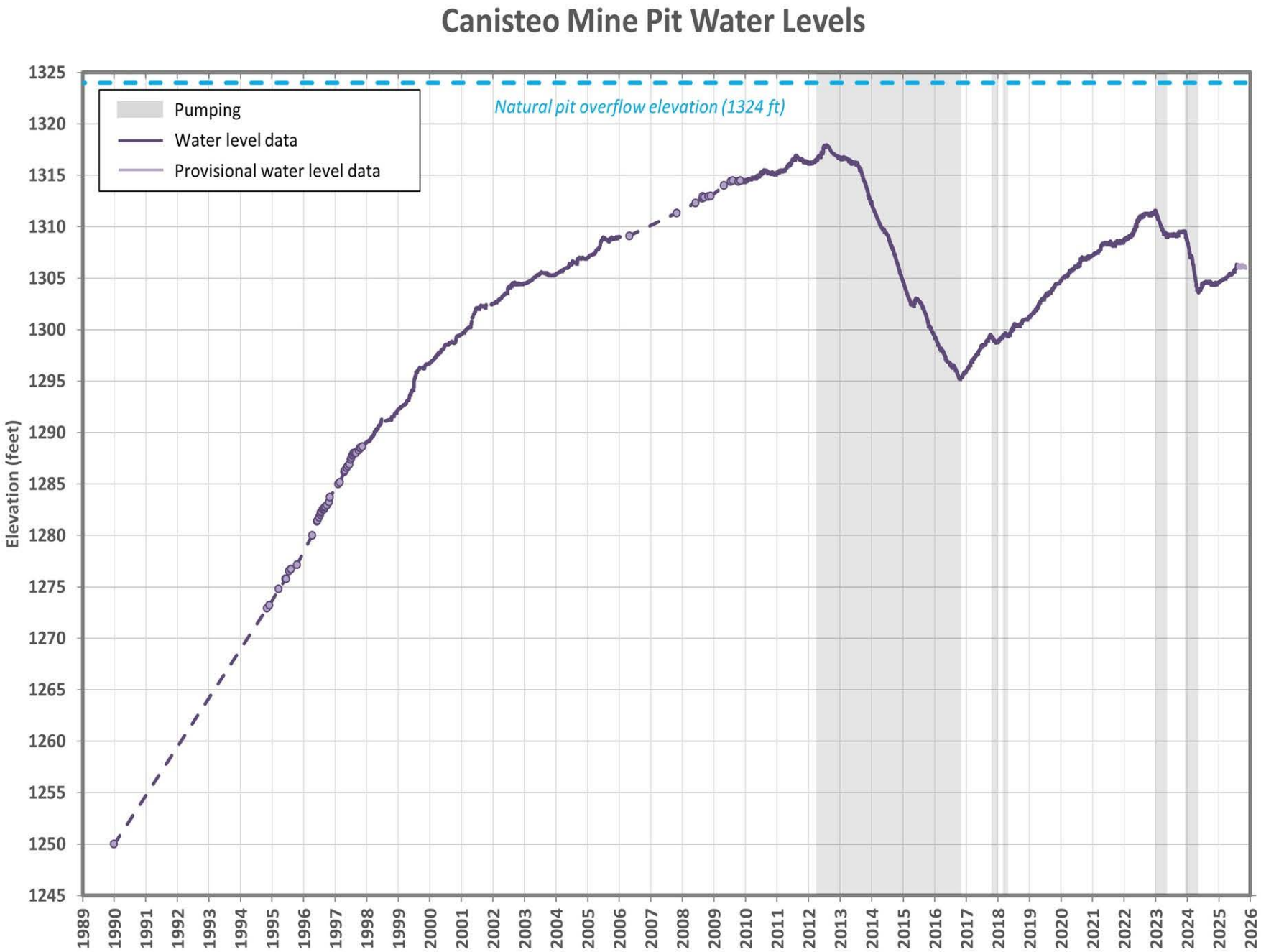


Groundwater Monitoring Well Locations

City of Bovey Drain Tile System

- System installed in 2011
- Diverts groundwater away from structures in low-lying areas
- Funds came from Flood Damage Reduction program line-itemed for the Canisteo

al Pumping
age Water



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Canisteo Legacy Mine Pit

- DNR received $8.875 million for construction of the Canisteo Legacy Pit outlet and long-term leases during the 2023 Legislative session
  - Funding can also be used for Hill Annex Legacy Pit
- Operation and Maintenance was not funded
  - Final O&M costs to be determined based on design; additional funds will be needed
- Outlet construction started in December 2024
  - Paused in May 2025 when soft soils were found in filter area
- DNR is working with Barr Engineering on finalizing a revised outlet construction design
  - Construction proposed to resume this winter when ground freezes

Canisteo Legacy Mine Pit Outlet Route

OUTLET SUMMARY

BID PART	LOCATION	DESCRIPTION
A	0+00 TO 1+17	30' WIDE ROCK CHANNEL
A	1+17 TO 2+53	136LF OF 2-36" RCP CULVERT (PIPE #1 & #2)
N/A	2+53 TO 16+80	LIND PIT
B	16+80 TO 19+33	WEIR
N/A	19+33 TO 53+59	WEST HILL PIT
C	53+59 TO 57+99	440LF OF 28" HDPE CULVERT (PIPE #3)
C	57+99 TO 65+71	EXCAVATED SWALE 4' BOTTOM WIDTH, 4H:1V SIDESLOPES THROUGH WETLAND 4
C	65+71 TO 70+83	512LF OF 24" RCP CULVERT (PIPE #4)
C	70+83 TO 75+80	EXCAVATED SWALE 4' BOTTOM WIDTH, 4H:1V SIDESLOPES THROUGH WETLAND 3
C	75+80 TO 80+00	420LF OF 24" RCP CULVERT (PIPE #5)
C	80+00 TO 91+20	EXCAVATED SWALE 4' BOTTOM WIDTH, 4H:1V SIDESLOPES THROUGH WETLAND 2
C	87+85 TO 93+61	568LF OF 24" RCP CULVERT (PIPE #6)
D	93+61 TO 93+68	MANHOLE
D	93+68 TO 93+78	12LF OF 24" HDPE PIPE (PIPE #7)
D	93+78 TO 93+84	CONTROL STRUCTURE
D	93+84 TO 98+53	470LF OF 24" HDPE PIPE (PIPE #8 - BYPASS PIPE)
C	93+97 TO 98+53	A.I.S. FILTER
C	98+53 TO 98+63	SPLITTER STRUCTURE
C	98+63 TO 98+78	18LF OF 28" HDPE PIPE (PIPE #9)
C	98+78 TO 98+89	METER MANHOLE
C	98+89 TO 99+17	30LF OF 28" HDPE PIPE (PIPE #10)
C	99+17 TO 99+28	VALVE VAULT
D	99+28 TO 99+82	56LF OF 28" HDPE PIPE (PIPE #11)
D	99+82 TO 99+92	OUTLET STRUCTURE
D	99+92 TO 100+75	CANISTEO OUTLET BAY

LEGEND

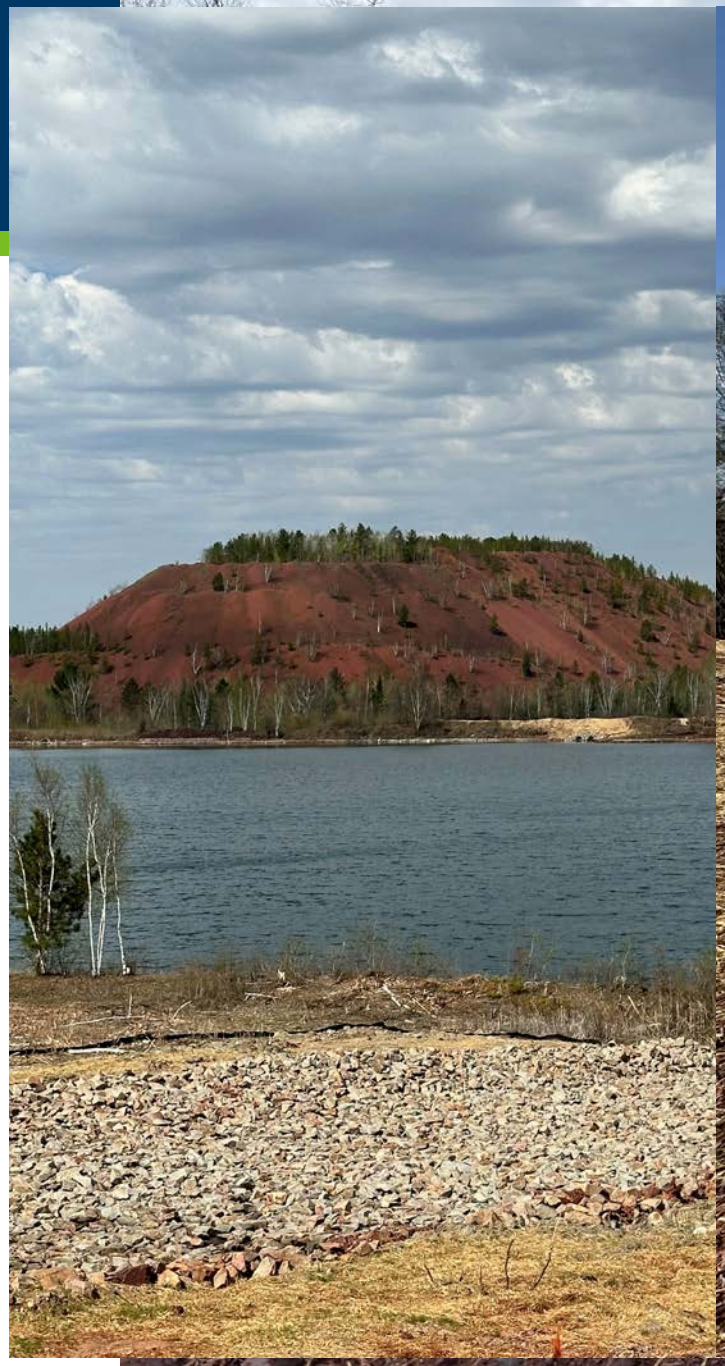
- OUTLET ALIGNMENT CENTERLINE
- APPROXIMATE CLEARING LIMITS
- WETLANDS
- APPROXIMATE CONSTRUCTION LIMITS
- OVERHEAD ELECTRIC LINE

NOTES:

1. WETLANDS SHOWN FIELD DELINEATED BY BARR IN 2021
2. LAYOUT BASED ON LIDAR OBTAINED FROM THE U.S. GEOLOGICAL SURVEY. SURVEY COMPLETED IN 2023. MAPPING BASED ON THE FOLLOWING DATUM:
   - VERTICAL DATUM: TWO FOOT CONTOUR INTERVAL BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988
   - HORIZONTAL DATUM: MINNESOTA STATE PLANE COORDINATE SYSTEM, NORTH ZONE, NAD 83/96
3. CONTRACTOR SHALL VERIFY PIT WATER ELEVATIONS PRIOR TO CONSTRUCTION ACTIVITY

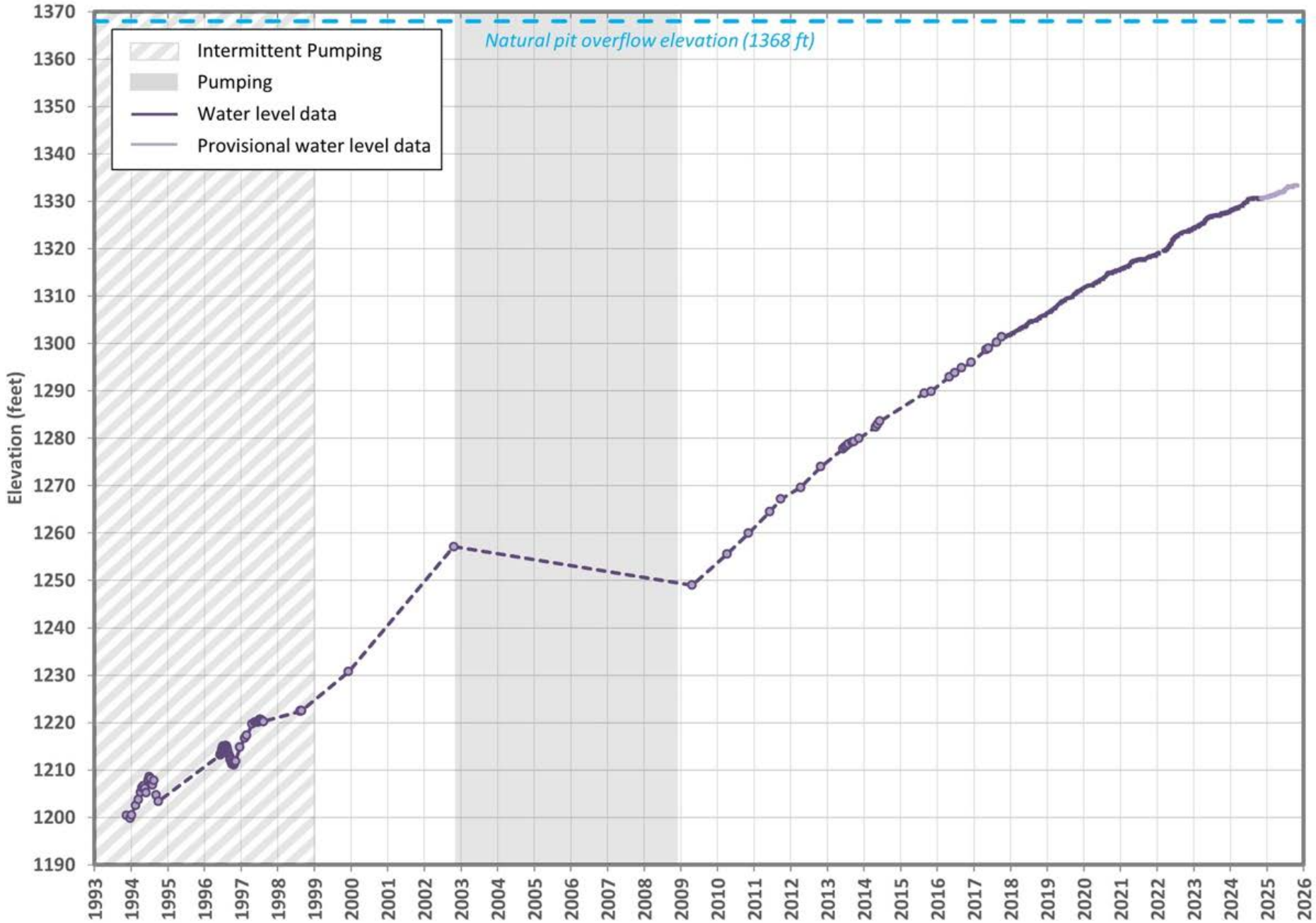
0 400 800
SCALE IN FEET

ISSUED FOR APPROVAL NOT FOR CONSTRUCTION



Hill Annex Legacy Mine Pit

Hill Annex Pit Water Levels



Hill Annex Legacy Mine Pit

- The DNR worked with the MPCA and IRRR to collect water quality data to help determine a potential outlet route ($50,000 from IRRR to conduct this sampling) (2018)
- Funding received so far:
  - $430,000 from IRRR was received in FY21; $50,000 was received in FY22
  - $2,000,000 received in the 2020 Legislative session for both Canisteo and Hill Annex Pits
- Funds have been used to install wells and conduct study
- Additional funding will be needed to complete design and construction of an engineered outflow if one is required

Hill Annex Legacy Mine Pit

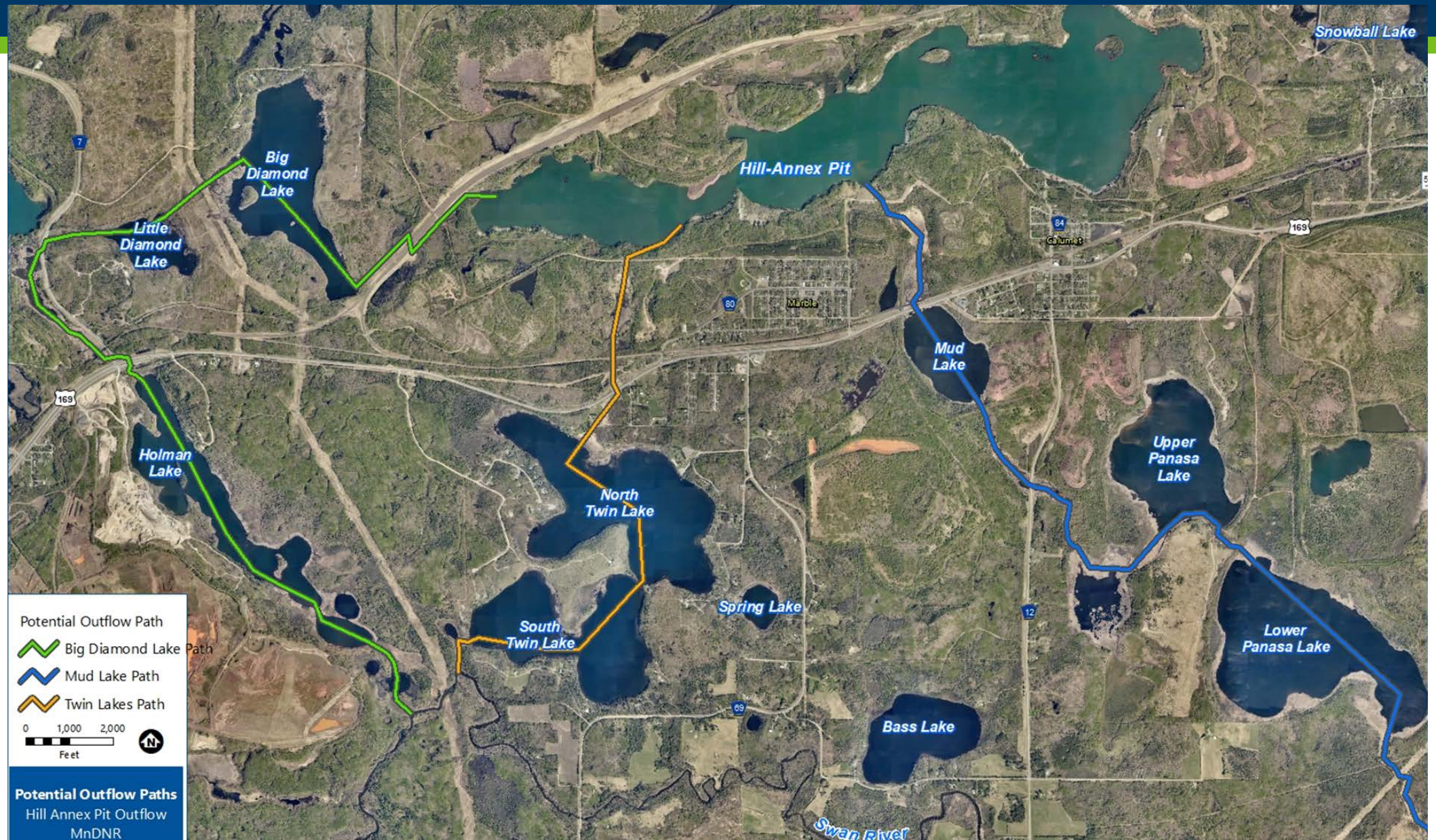
DNR hired Barr Engineering to perform:

- Water Balance Model
  - Used existing data (data collection will continue)
- Outlet Route Analysis
  - Three potential outlet routes identified
- Final report received by DNR in November 2025
  - Next steps being discussed
  - Additional modeling likely needed

Hill Annex Legacy Mine Pit

Groundwater Monitoring Well Locations

Hill Annex Legacy Mine Pit



St. James Legacy Mine Pit

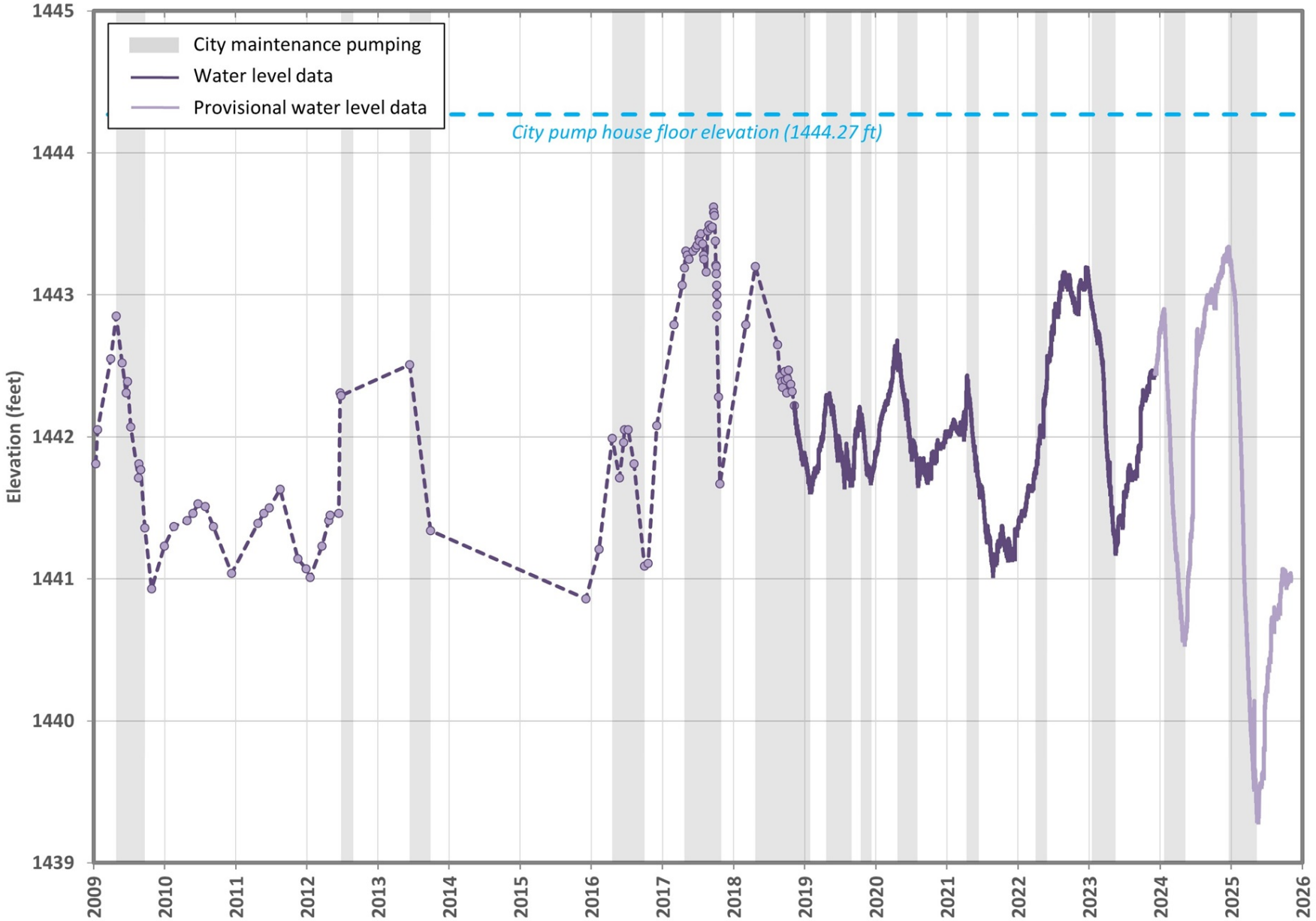
St. James Legacy Mine Pit

- City of Aurora has used the St. James Pit for their municipal water supply
  - Switching to the Embarrass Pit
- City of Aurora pumps additional water to manage water levels
  - Prevents flooding of their pumphouse
- Zebra mussels discovered in 2021
  - Water level maintenance pumping occurs in the winter
- City of Aurora monitors pit water levels; DNR installed continuous monitoring equipment in 2018

St. James Legacy Mine Pit

- 2021 City of Aurora was approved for a LCCMR study
  - Work involved installation of groundwater monitoring wells, wet basement study, and groundwater modeling
- DNR to continue to study the pit: installing additional monitoring wells, collecting data, additional modeling
  - $2.5 million Legislative funding received in 2023
- Need to know if pit will continue to fill once pumping stops
- Additional funding will be needed to complete the design and construction of an engineered outflow if one is required

St James Pit Water Levels



St. James Legacy Mine Pit

Groundwater Monitoring Well Locations

DEPARTMENT OF NATURAL RESOURCES

Thank You!

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