The Gladden Acid Mine Drainage Treatment Facility and Fishing Run Stream Sealing Project

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April 23, 2024

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The Gladden AMD Treatment Facility

- South Fayette Conservation Group (SFCG) received a $13,048,446 AML Economic Revitalization (AML Pilot) Grant from the PA DEP Bureau of Abandoned Mine Reclamation in 2019.
- The Gladden Discharge flows from the abandoned Montour No. 2 underground coal mine operated by the former Pittsburgh Coal Company and abandoned circa 1920
- The discharge dumped on average more than 900 gallons (750 – 1,500 gpm) of iron-laden (90 – 130 mg/liter) water into Millers Run every minute (1.3 million gallons per day)

Outline

- Overview of Gladden Treatment Plant
- Identification of Stream Loss
- Methods of Stream Sealing
- Results
- Conclusion

Gladden Discharge into Millers Run and Millers Run into Chartiers Creek

- Raw Discharge: pH=6, Fe 100 ppm
- Flows: Avg=750 gpm, 1,470 gpm max
- Draining 5,500 acres of Mine Workings
- 1,500 acres of Mine Pool

Treatment Plant Design

- A 2.2 million gallons per day (MGD) treatment plant was designed to treat the existing Gladden discharge.
- The Gladden AMD Treatment Facility is the first facility in PA that was designed from inception to be a Hydrogen Peroxide treatment plant.
- The plant includes two pumping stations to extract the AMD water from the mine pool and bring it to the surface for treatment.
- The treatment includes oxidation using industrial grade (50%) hydrogen peroxide addition, polymer addition to form solid precipitates, solids recirculation for enhanced flocculation, and a clarifier and settling/polishing pond to remove the precipitated metals and solids from the water.
- The treated water is discharged to Millers Run, and the sludge is pumped to a portion of the mine that is not hydrologically connected for disposal.


Completed and Operating Gladden AMD Treatment Facility – March 19, 2021
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Final Product – Millers Run Near Cuddy Post Office

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Gladden AMD Project - Miller's Run

Before

After

Governor's Award for ENVIRONMENTAL Excellence 2022

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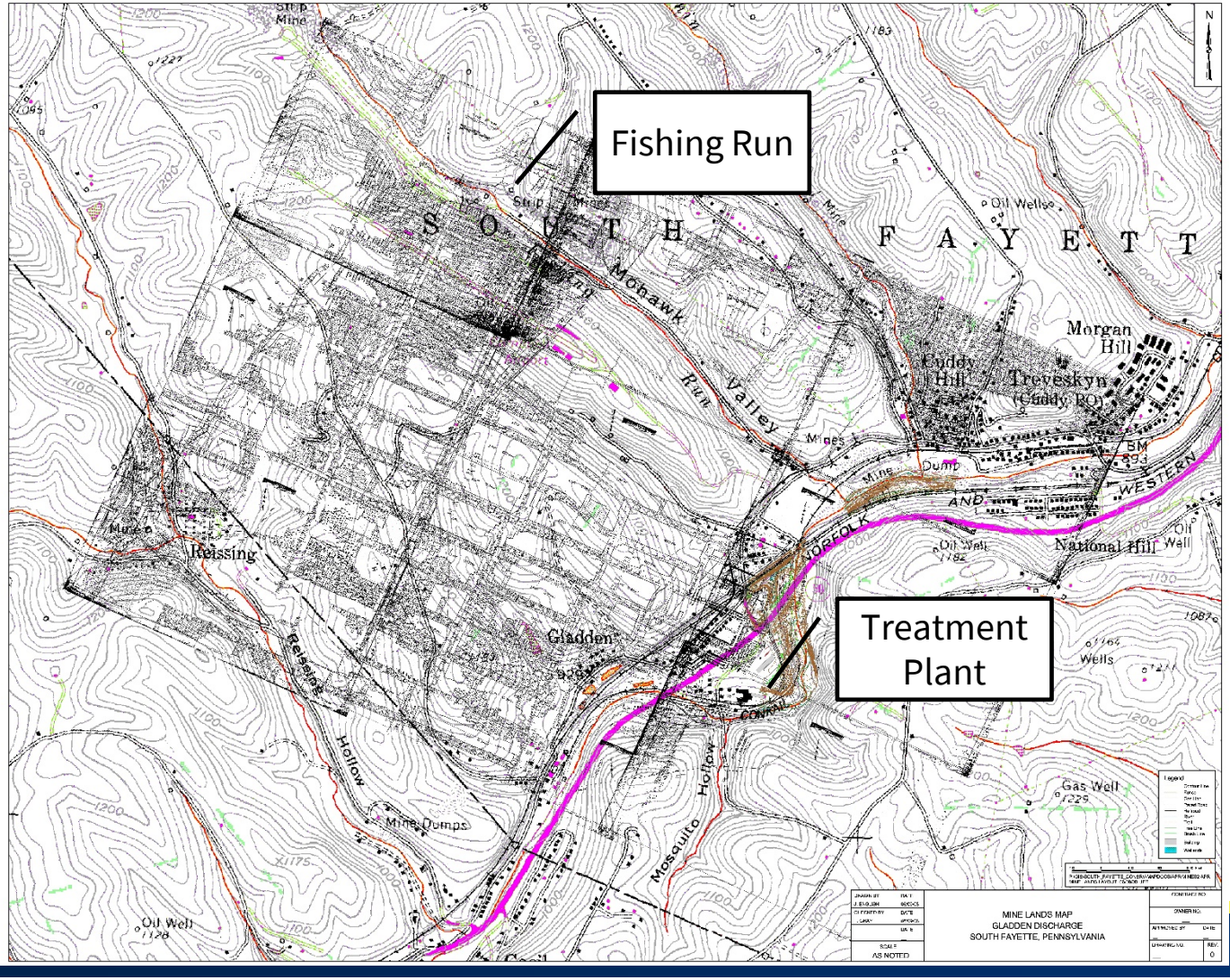
Staff from Tetra Tech and South Fayette Conservation Group at the April 26, 2022 Awards Ceremony

The Gladden AMD Treatment Facility Project was the Recipient of a 2022 Pennsylvania Governor's Award for Environmental Excellence

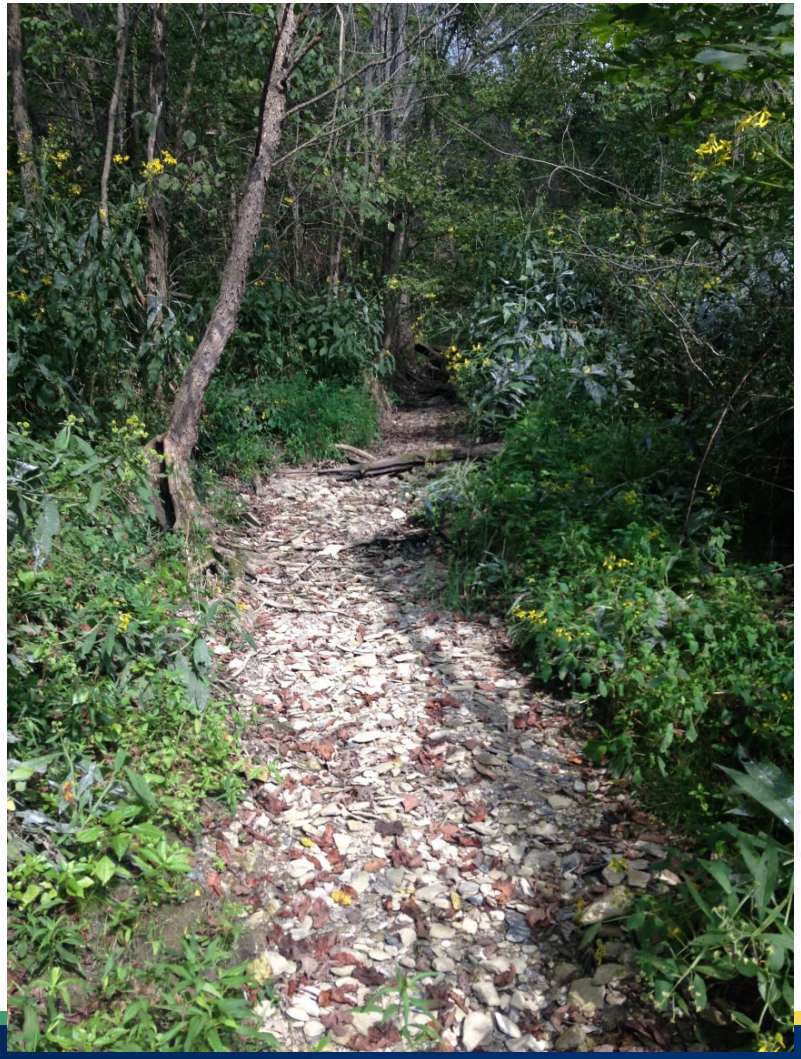
Fishing Run – The Problem

- Identified areas in Fishing Run and an adjacent unnamed tributary where stream loss was occurring, resulting in the water entering into the mine pool of the Gladden Discharge.
- Additionally identified an area adjacent to Fishing Run where water was cut off from entering into the stream and was percolating into the mine pool.

Fishing Run Contribution to Mine Pool



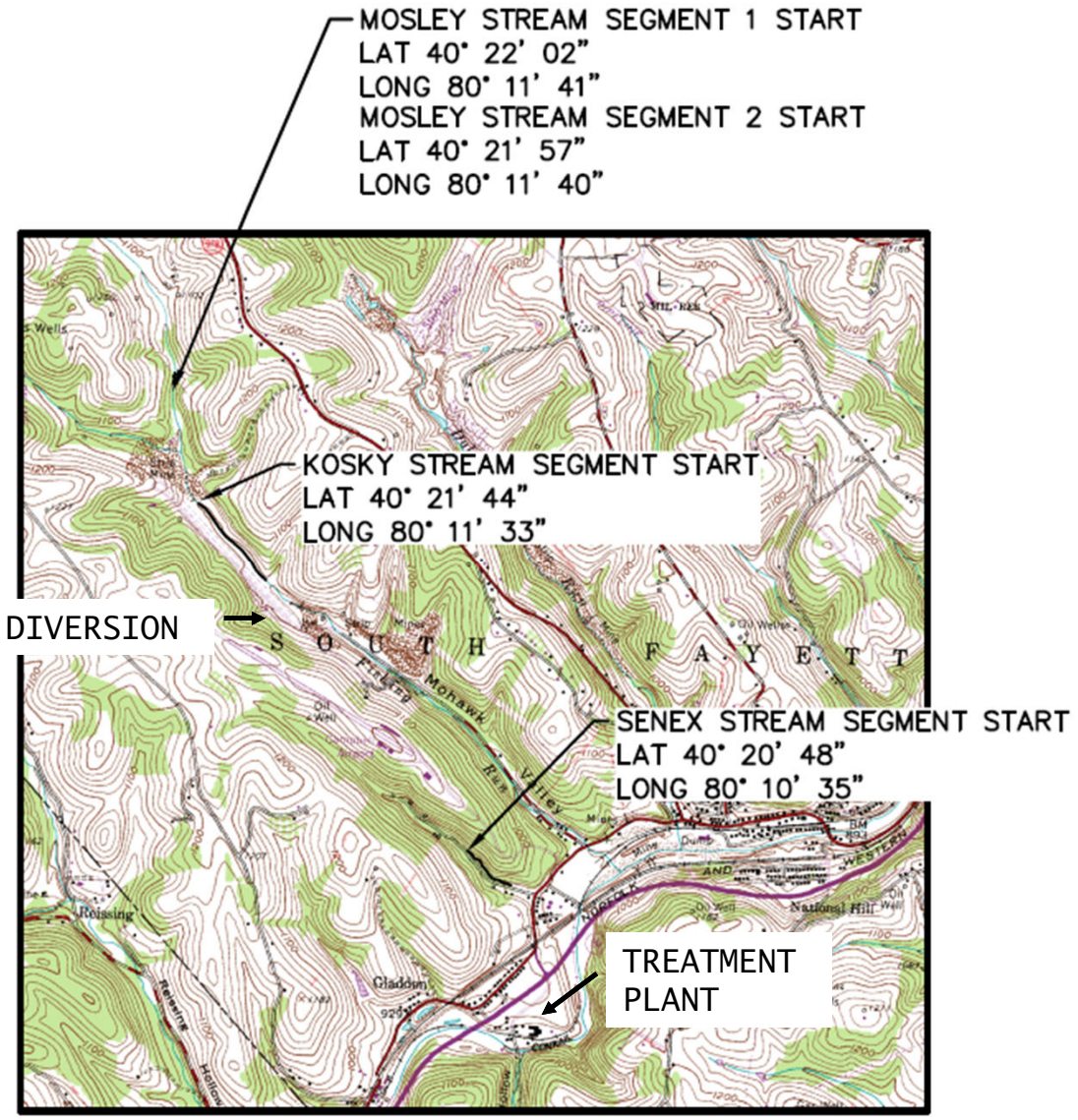
Stream Flow Loss



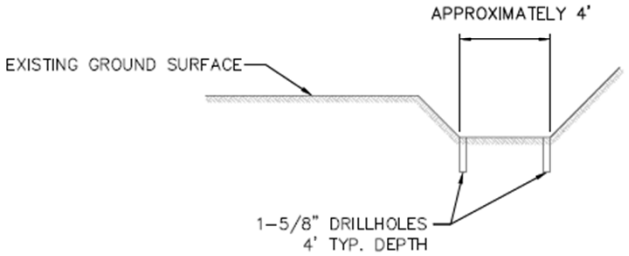
Fishing Run – The Solution

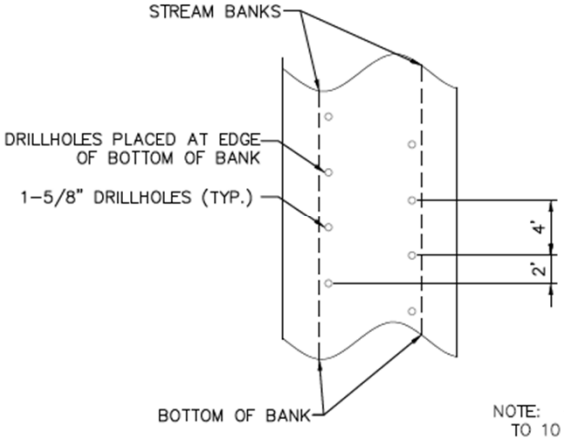
- Seal 965 linear feet of an unnamed tributary to Millers Run with polyurethane grout.
- Seal 5,035 linear feet of Fishing Run using Geosynthetic Clay Liner.
- Create a 2,800 linear foot diversion ditch to direct flow into Fishing Run.
- Construction started July 2022 and concluded December 2022.

Sealing Location



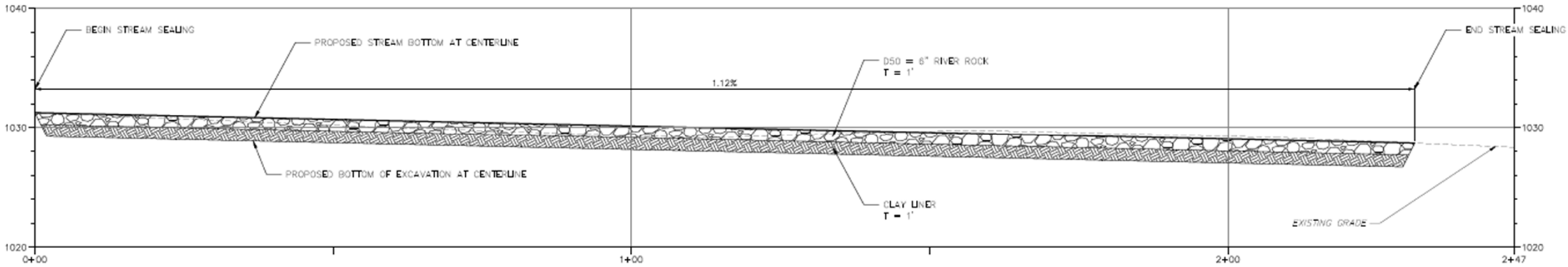
Stream Sealing Methods –Polyurethane Grout

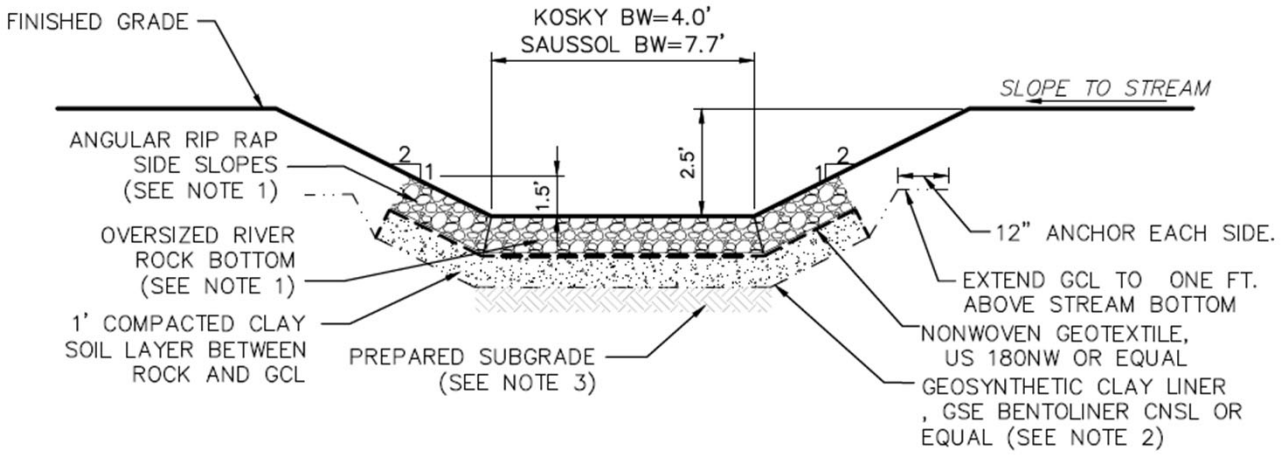




NOTE: CHANNEL WIDTH FROM TOP OF BANK RANGES FROM 5 TO 10 FEET, CHANNEL DEPTH RANGES FROM 2 TO 4 FEET

Stream Sealing Method – Geosynthetic Clay Liner





Stream Sealing Method – Geosynthetic Clay Liner

Preparing Subgrade

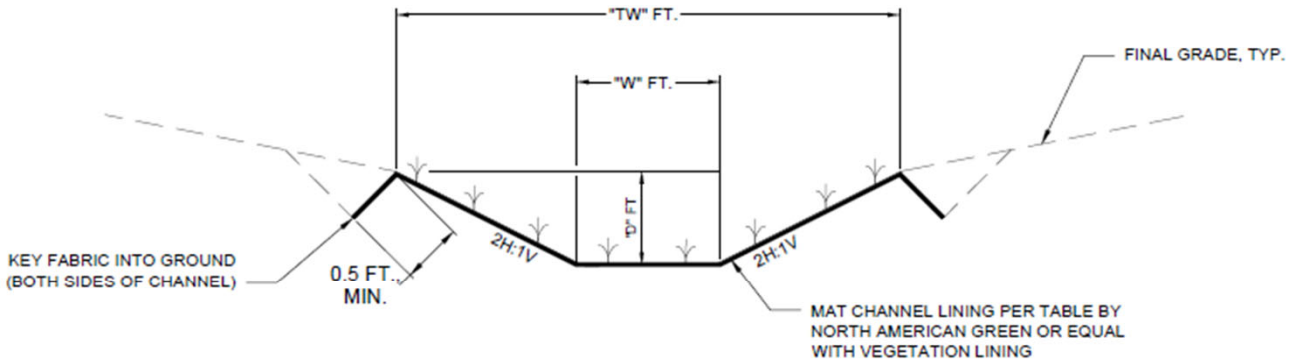
Geosynthetic Clay Liner

Stream Sealing Method – Geosynthetic Clay Liner

Oversized River Rock Bottom

Final Product

Diversion Ditch Method

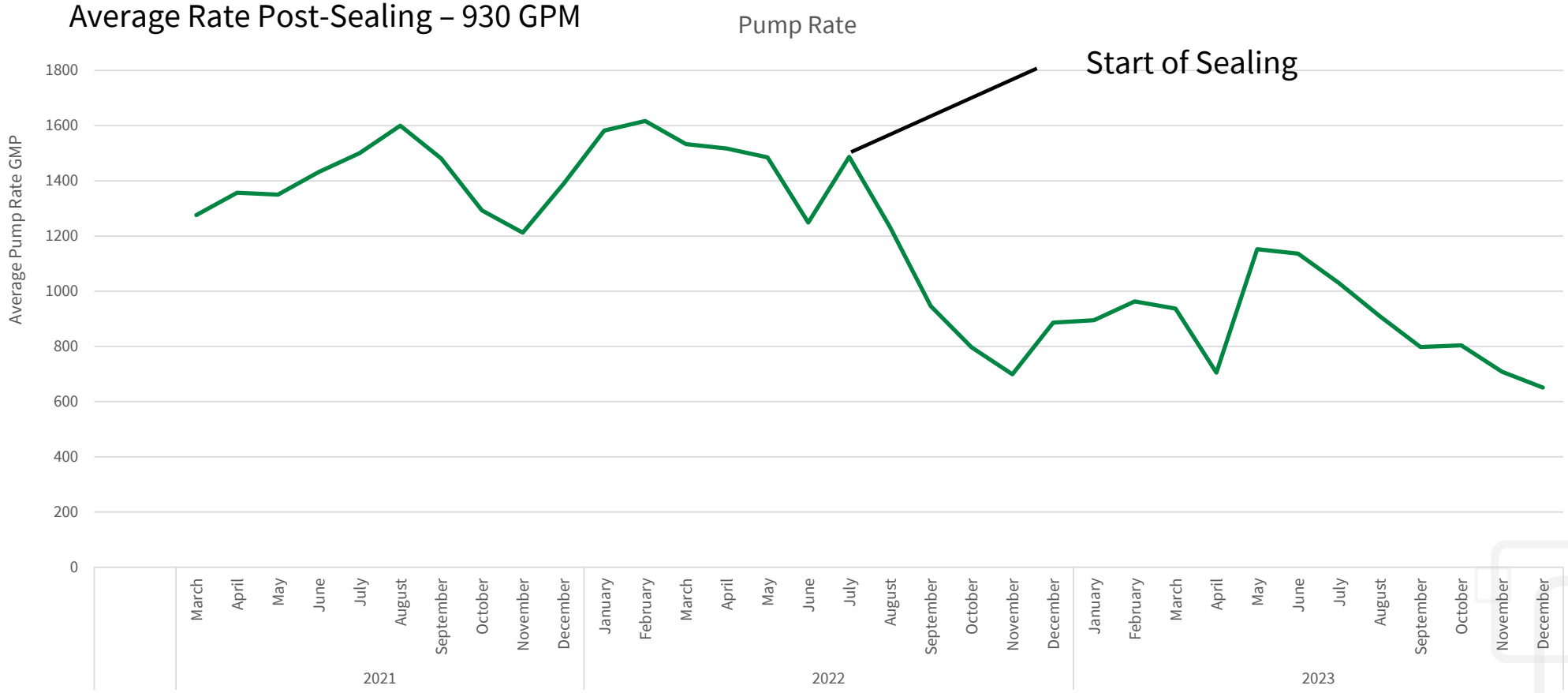


MAT LINED VEGETATED DIVERSION				
STATION	D (FT)	W (FT)	TW (FT)	MAT TYPE (OR EQUAL)
0+00 TO 8+50	2.0	2.0	8.0	NA Green BioNet SC125BN
8+50 TO 13+00	2.0	5.0	13.0	NA Green BioNet SC125BN
13+00 TO 15+00	2.0	5.0	13.0	NA Green Turf Reinforced Mat SC200
15+00 TO 15+50	2.0	5.0	13.0	NA Green BioNet SC125BN
15+50 TO 26+75	3.0	5.0	17.0	NA Green BioNet SC125BN

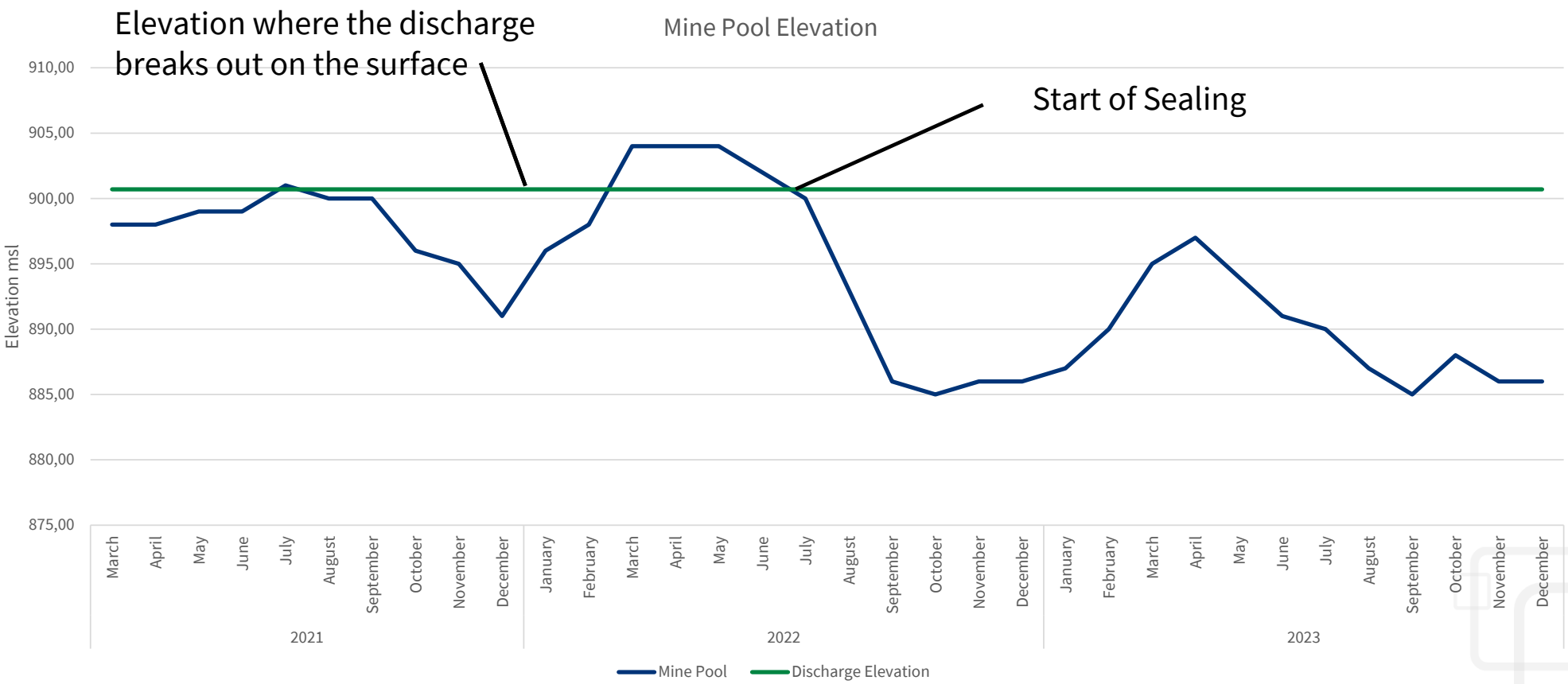
Results – Water in The Stream

Results – The Numbers at the Gladden AMD Treatment Plant

Average Rate Pre-Sealing – 1,430GPM
Average Rate Post-Sealing – 930 GPM

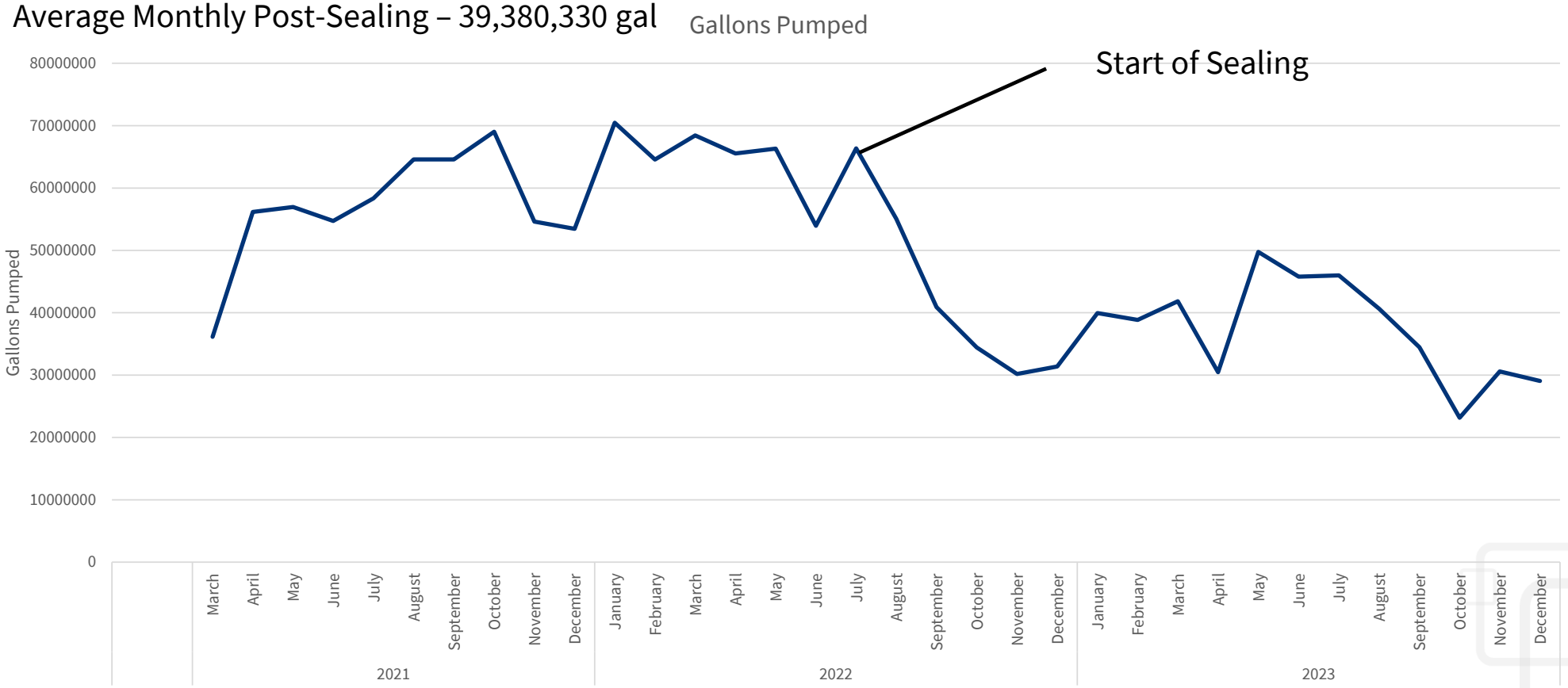


Results – The Numbers



Results – The Numbers

Average Monthly Pre-Sealing – 59,870,523 gal
Average Monthly Post-Sealing – 39,380,330 gal



Conclusion

- Stream Sealing and the Diversion has reduced the amount of water entering into the mine pool and has reduced the amount of water needing treatment at the Gladden AMD Treatment Plant.
- The results to date have demonstrated a reduction of an average over 20,000,000 gallons of mine water pumped per month.
- This reduction in the volume of AMD treated has lowered treatment costs and will also reduce wear on the plant.

Partners

TETRA TECH

- South Fayette Conservation Group
- John Kosky Contracting
- Sub-Technical
- AMD Industries

South Fayette CONSERVATION GROUP

John Kosky Contracting INC.

AMD INDUSTRIES INC.

Sub-Technical inc

Thank You

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