



TDI 2025 Award Entry

Dewatering Project of the Year

Georgia Stream Relocation
Culvert



Project Summary

Project Information

This project centered on the construction of a new pile-supported stream relocation culvert at a major power plant in Georgia, immediately adjacent to a CCR landfill. The location introduced both environmental sensitivity and technical complexity, requiring an excavation approach that balanced stability, groundwater control, and regulatory compliance.

The culvert was installed within a large-scale open-cut excavation with dimensions near 780ft X 225ft (~2,000LF perimeter). Existing site grades ranged from EL 750–770, while the excavation extended 20–40 feet below to target grades of EL 724–730. Achieving this depth safely required managing significant groundwater inflows, with anticipated static groundwater levels ranging from EL 740–750. In practical terms, the project demanded **16–26 feet of drawdown across highly variable geological conditions.**

Hydrogeology

Geological Conditions

Subsurface investigations revealed a challenging stratigraphy, consisting of three distinct units:

- **Residual Soils (Saprolite):** 3–49 feet thick; sandy silt, silty sand, sandy clay, and silty clay.
- **Partially Weathered Rock (PWR):** 0–13 feet thick; intensely fractured, cobble- to gravel-sized rock fragments bound within a clay/silt matrix.
- **Bedrock:** Competent schist and gneiss forming the underlying foundation.

This variability created a complex hydraulic environment, with fractured zones offering preferential flow paths while clay-rich saprolite restricted recharge.

Groundwater Characterization

Groundwater conditions were evaluated through geotechnical borings and site-installed piezometers. Several slug tests were performed within the saprolite and PWR units to estimate hydraulic conductivity. Results indicated a geometric mean range of **0.06–0.55 ft/day**, confirming that groundwater movement would be slow, uneven, and highly sensitive to geological transitions.

Project Challenges

The need for substantial drawdown in fractured, low-permeability soils adjacent to a CCR landfill elevated the complexity of this project well beyond typical dewatering efforts. The excavation required:

- Sustained control of groundwater inflows despite variable hydraulic conductivity.
- Protection of landfill integrity and prevention of migration pathways.
- Careful sequencing to maintain excavation stability during culvert installation.

The Griffin Difference

For this project, Griffin engineered and installed a perimeter eductor dewatering system from a pre-cut bench provided by the Contractor. Leveraging detailed geotechnical data, Griffin completed both analytical and numerical modeling to evaluate groundwater behavior and determine the most effective control strategy. This technical approach ensured a system that was both cost-effective and fully aligned with the project's stringent performance requirements. To maintain quality assurance, the project team required a PE-stamped comprehensive dewatering plan, which Griffin provided, including all design parameters and supporting calculations.

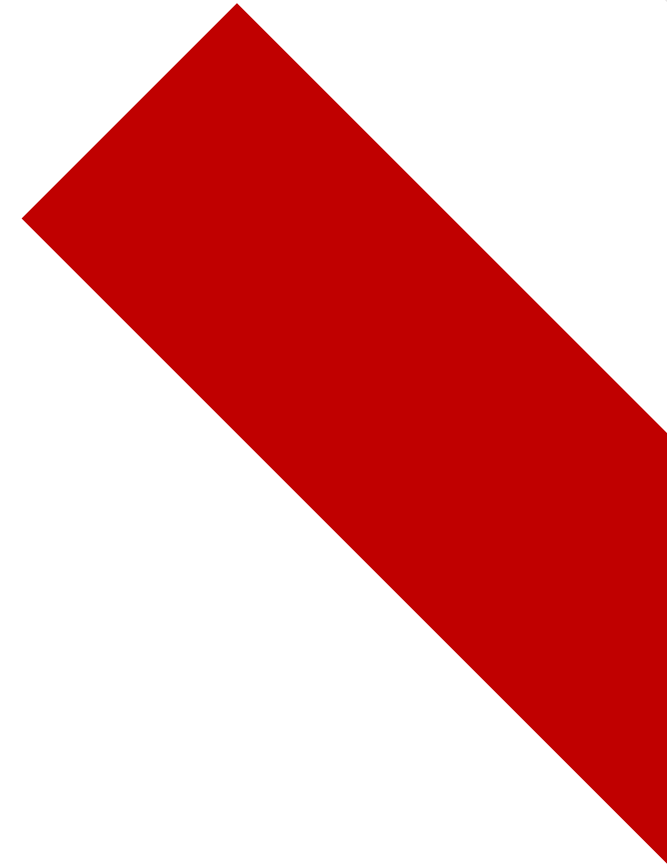
The eductor wells were installed using Griffin's proprietary in-house sonic drilling technology, which enabled successful advancement through the hard, fractured PWR material. Wells were positioned at 10–15 ft spacing and drilled to depths of approximately 50 ft. The completed system included two (2) eductor pumping stations connected to the well network. To provide continuous oversight, Griffin also installed three (3) piezometers with transducers capable of transmitting real-time groundwater data wirelessly to the design team and Contractor.

During system installation, Griffin conducted a comprehensive pumping test to verify soil hydraulic conductivity values and to confirm the system's performance against design expectations. The eductor system effectively achieved the target groundwater drawdown, creating stable conditions for culvert construction.

Project Outcomes

By implementing this solution, Griffin enabled excavation, culvert installation, and dewatering system removal several months ahead of schedule. The combination of advanced modeling, innovative drilling technology, and real-time monitoring delivered a reliable and efficient groundwater control system that exceeded project goals.

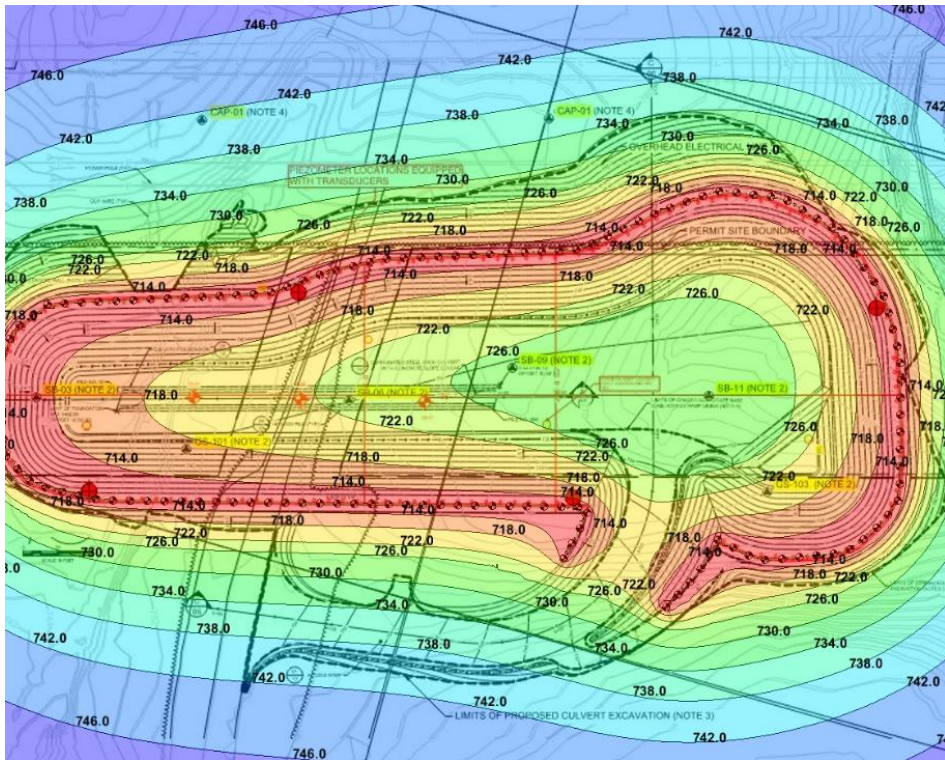
Project Photos







Groundwater Modeling



System Conceptual Layout

