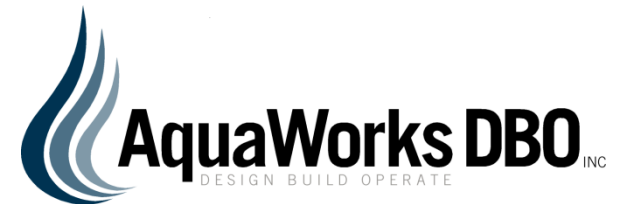


# Mountain Water & Sanitation District Radionuclide Mitigation Project



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# About the Project Team:

- ◉ Mountain Water & Sanitation District provides water and sewer service to approximately 900 people residing 45 minutes southwest of Denver, Colorado.
- ◉ AquaWorks DBO is a design build firm specializing in water and wastewater treatment infrastructure for small and rural utilities with populations of 10,000 or less – which make up 92% of our nation's community water/sanitation providers.

# Problem Statement:

- Uranium is a naturally occurring radioactive material present in rocks, soil, surface water, and groundwater.
- Colorado Department of Public Health and Environment's established Maximum Contaminant Limit (MCL) for uranium in drinking water is 30 µg/L.
- The Mountain Water & Sanitation District's 5-year historic uranium average was 160 µg/L.
- District was required to maintain compliance with the MCL.

# Project Complexities:

- What is the best way to remove the uranium from the raw water?
  - There are a number of options available: reverse osmosis, media absorption, ion exchange, and chemical removal.
- What to do with the residual hazardous waste?
  - Options available.
- How do we afford this?
  - Has to be affordable on a per capita basis for 900 people.

# Best Available Technology:

- For this application an ion exchange system was selected as the best approach.
- Raw water passes through media specifically selected to capture uranium.
- Uranium is bound to the media and retained in the canisters.



- Loaded media and canisters can be removed offsite and disposed of safely.

# Treatment Building:

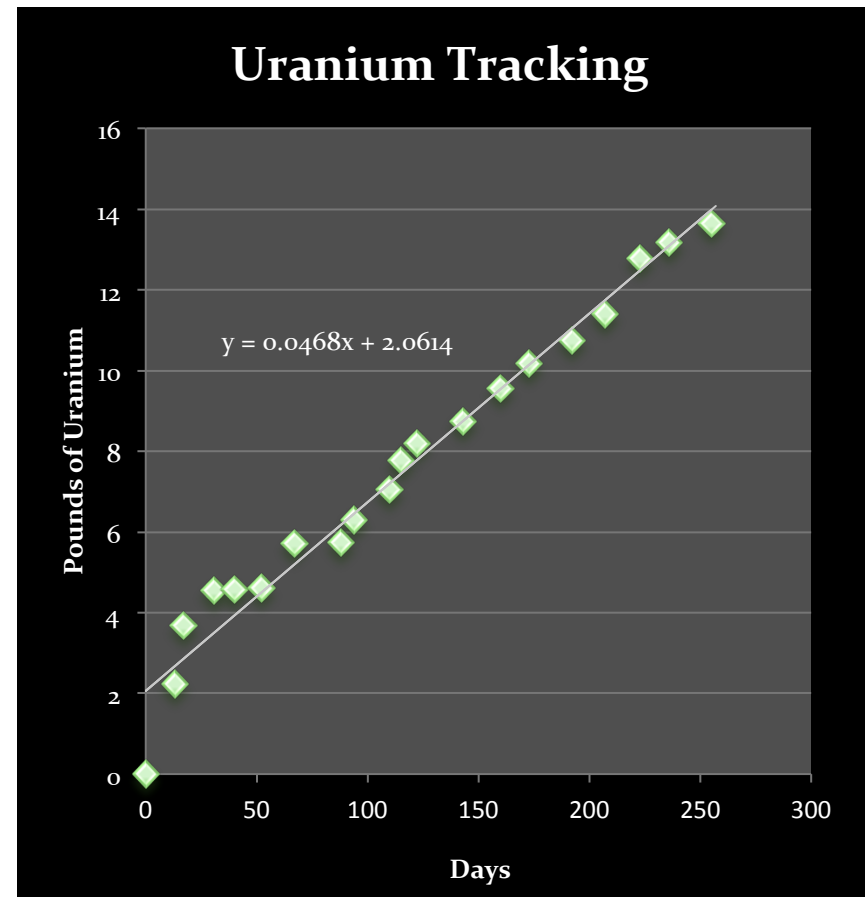
- Fits the residential mountain community it is surrounded by.
- Security provisions.



# System Performance:

- Raw water concentration over the first 10 months was 415  $\mu\text{g}/\text{L}$ .
- Treated water consistently tested below the detection limit for uranium over that period.
- Possible to qualify the amount of uranium retained:

$$V_{\text{Water}} \text{ (Gallons)} \times \text{Concentration}_{\text{U}} \text{ (}\mu\text{g}/\text{L}\text{)} = \text{Pounds Uranium Retained}$$



# Uranium Disposal:

- About 15-20 pounds of uranium residual will be generated per year.
- Two options available:
  - Option #1: Canisters can be hauled to a licensed hazardous waste facility and disposed of in a safe manner.
  - Option #2: Uranium can be recovered and reprocessed.
- The uranium from this project is being reprocessed, which has its advantages.



# State Revolving Fund Loan Program:

- The State Revolving Fund program is for the purpose of providing low-interest loans for investments in water and wastewater infrastructure.
- The program can support:
  - New Treatment Facilities
  - Improvements & Expansions
  - Consolidation
  - Distribution/Collection Systems
  - Water Storage Facilities

# State Revolving Fund Loan Program:

- Rates can range between 0% and 2%.
- It is a competitive program where projects are ranked on a point system.
- The District obtained a \$1,000,000 loan 20-year term at a 0% interest rate.
- The District was able to qualify for the 0% rate because of the Green Project Reserve Program.
- To be deemed “green”, 20% of the project’s costs had to meet EPA criteria (green infrastructure, energy efficiency, water efficiency, or environmentally innovative).

# Financial Success:

- Initial project budget estimates were over \$2,000,000.
- Final project cost for the uranium mitigation project was \$600,000.

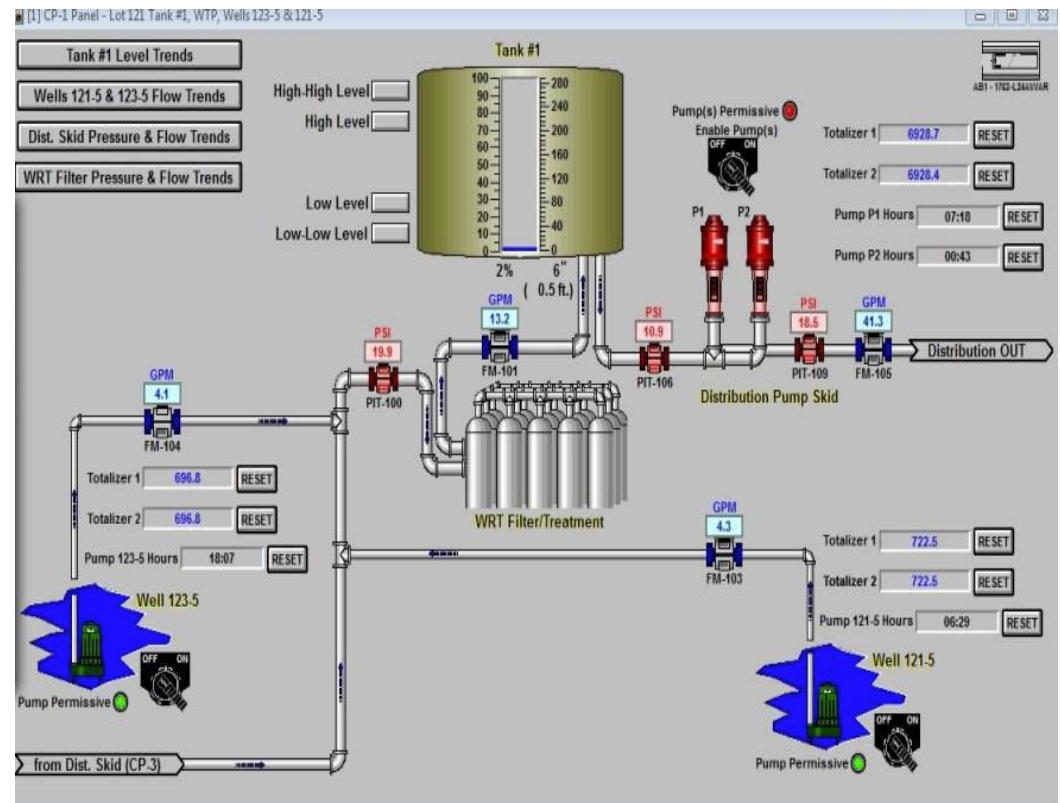
# Additional Accomplishments:

- The District was able to use the remaining \$400,000 of the 0% loan to make other improvements to its drinking water treatment and distribution system (pump replacement, leaking water line replacement).



# Additional environmental benefits:

- SCADA system to automate many of the District's treatment and distribution systems.
- The District was operating all of its infrastructure in hand mode.
- Reduced operator involvement and vehicle trips.



# Conclusions & Questions:

- Open for questions and comments.

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