Pittsburgh Water Treatment Plant Projects

by
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Who Is American Water
We are the largest publicly traded water and wastewater utility in the United States

- Broad national footprint and strong local presence
- Services to an estimated 14 million people in more than 1,500 communities in more than 30 states and parts of Canada
- Approx. 6,700 dedicated and active employees
- Treats and delivers more than one billion gallons of water daily
Our Company

- Subsidiary of American Water Works Co. Inc.
- Roots date back to early 1800s, Incorporated in 1904
- Largest regulated water and wastewater service provider in PA
- Serving approximately 2.2 million people in 36 counties
- More than 1,000 employees
- Customer base:
  - 640,000 water customers
    - 92% residential
    - 7% commercial
    - 1% industrial/other
  - 17,000 wastewater customers
Pennsylvania American Water Service Area

Serving 17 percent of the Commonwealth’s population
Pittsburgh Water Treatment Plant History

- **Beck’s Run Raw Water Pump Station**
  - Located at mile point 4.5 on the Monongahela River
  - Constructed in 1893

- **Hays Mine Filtration Plant**
  - Constructed in 1906 to treat, filter and pump river water
  - Expanded in 1923, 1936, 1952 to total capacity of 40 filters and 60 MGD; upgraded with Superpulsators in 1989

- **Hays Mine Chemical Building**
  - Constructed in 1922

- **E. H. Aldrich Water Treatment Plant**
  - Located at mile point 24.5 on the Monongahela River
  - Constructed in 1958 with 8 Aldrich Filter units and total capacity of 50 MGD
Project Overview

• $108 Million Water Treatment Plant Upgrade

• Main Focus Areas
  ▪ Replace Aging Infrastructure
  ▪ Improve Safety and Reliability
  ▪ Ensure Compliance with latest DBP Regulations
Project Overview

• Replace Aging Infrastructure
  ▪ New Beck’s Run Intake and Raw Water Pump Station (BRPS)
  ▪ New Hays Mine Chemical Building
  ▪ New Hays Mine Water Treatment Plant (WTP) High Service Pumps

• Improve Safety and Reliability
  ▪ Eliminate chlorine gas – switch to sodium hypochlorite generation
  ▪ Improved chemical handling and containment, reliable chemical feed
  ▪ Install emergency generators at BRPS, Hays Mine and Aldrich WTPs

• Ensure Compliance with Latest DBP Regulations
  ▪ Switch to chloramination at Hays Mine and Aldrich WTPs
  ▪ Reduce reliance of pre-chlorine at Hays Mine WTP
  ▪ Construct 4.5 MG Clearwell Tanks with baffles at Hays Mine WTP for increased contact time (CT)
Beck’s Run Intake

• **Old Beck’s Run Intake**
  - Two travelling screens in poor condition
  - Maintenance Intensive
  - One common chamber to old Beck’s Run Pump Station (BRPS)

• **New Beck’s Run Intake**
  - Passive Screen technology
  - Air Burst system
  - Redundancy, including twin 42” diameter raw water suction lines to new BRPS
Beck’s Run Intake – Existing Conditions
Beck’s Run Intake – Cofferdam for New Construction
Beck’s Run Intake – Raw Waterline & Screens
Beck’s Run Intake - Complete
Beck’s Run Raw Water Pump Station

• Old Beck’s Run Pump Station
  ▪ 100+ year old building with significant structural issues
  ▪ Pumps electrified in 1970, coal fired and steam powered previously
  ▪ Double stage pumping, very inefficient with high maintenance costs
  ▪ Whole facility prone to flooding
  ▪ No back-up emergency power
  ▪ 31” riveted steel raw water discharge piping

• New Beck’s Run Pump Station
  ▪ Four vertical turbine, 1,750 hp pumps, rated at 20 MGD each; plus one spare bowl assembly. Three of four pumps have Variable Frequency Drives.
  ▪ Small building footprint with pump motors and electrical gear out of flood plain
  ▪ Dual electric feeds with 2 diesel, 2,922 hp, 2.0 megawatt back-up emergency power generators capable of producing 40 MGD
  ▪ New 42” ductile iron raw water discharge piping
Beck’s Run Pump Station – New Construction
Beck’s Run Pump Station – New Header and Pumps
Beck’s Run Pump Station – Finished Station
Hays Mine Chemical Building

• Old Hays Mine Chemical Building
  - 90+ year old building with significant structural issues
  - Four stories high - poor layout for storing, feeding chemicals and chemical containment
  - Across busy street from Hays Mine WTP
  - Difficult to unload chemicals, poor chemical injection and mixing

• New Hays Mine Chemical Building
  - Addition to existing Hays Mine WTP, all new facilities in one location
  - Complete SCADA monitoring and control
  - Standardized and redundant construction with bulk tanks, day tanks, feed pumps, chemical spill containment, etc.
  - Standardized chemical fill area with automated spill overflow containment
  - All new chemical injection points with enhanced mixing
Hays Mine Chemical Building - Existing
Hays Mine Chemical Building – New Location
Hays Mine Chemical Building - Completed
Hays Mine Chemical Building – Sodium Hypochlorite
Hays Mine Chemical Building – Chemical Feed
Hays Mine High Service Pump Station (HSPS)

- **Old Hays Mine HSPS**
  - Located in existing Hays Mine WTP, seven pumps ranging from 5 to 15 MGD; only one with a VFD
  - Most of the pumps installed in 1950
  - Each pump has its own discharge meter
  - Dual electric feeds but no back-up emergency power

- **New Hays Mine HSPS**
  - Four horizontal, split case, 2000 hp pumps, rated at 20 MGD each; plus one spare impeller assembly. Three of four pumps have VFD’s
  - Common venturi metering point
  - Two surge tanks to reduce system water hammer
  - Dual electric feeds with two diesel, 3705 hp, 2.5 megawatt back-up emergency power generators capable of producing 40 MGD
Hays Mine High Service Pump Station - Overview
Hays Mine – New Clearwell Tanks with Baffles
Hays Mine High Service Pump Station - Completed
Project Summary

• Replace Aging Infrastructure
  ▪ New Beck’s Run Intake and Raw Water Pump Station
  ▪ New Hays Mine Chemical Building
  ▪ New Hays Mine WTP High Service Pumps

• Improve Safety and Reliability
  ▪ Eliminate chlorine gas
  ▪ New chemical feed facilities
  ▪ Emergency power

• Ensure Compliance with Latest DBP Regulations
  ▪ MCL for TTHM's is 80 ug/l
  ▪ Before Chloramination, TTHM ranged from 65 to 112 ug/l
  ▪ After Chloramination, TTHM ranged from 35 to 55 ug/l
Questions?

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