

Jerry Filipiak

Mark Wilmer – Bouse Pumping Plant
Maintenance Specialist



CAP
CENTRAL ARIZONA PROJECT

YOUR WATER. YOUR FUTURE.

Mark Wilmer Pumping Plant



Mark Wilmer Pumping Plant and Buckskin Mountain Tunnel Overview

- CAP broke ground at the Mark Wilmer Pumping Plant in 1973
- Construction lasted until 1985
- CAP broke ground on the Buckskin Mountain Tunnel in 1975. It was completed in 1980



Buckskin Mountain Tunnel:

The Buckskin Mountain Tunnel is seven miles long.

It is fully lined with 22 foot diameter concrete segments. Each segment is 5 feet wide and weighs approximately 2 tons. There are a total of 28,500 of these segments.

The tunnel starts approximately 860 feet above the pumps at Mark Wilmer Pumping Plant.



Outlet Structure/Buckskin Mountain Tunnel Entrance

A View from the Top



Mark Wilmer Pumps

- There are six pumps at the Mark Wilmer Pumping Plant.
- The pump discharge pressure is 390 psi. This pressure is required to lift the water 824 feet up Buckskin Mountain to the entrance of the Buckskin tunnel
- The pump Impeller, weighing in at over 13 tons, pushes water through a 54 inch diameter discharge pipe.
- The combined weight of each pump and motor assembly is approximately 225 tons.
- Each unit can pump 278,256 Gallons per minute, 16.7 million gallons per hour and 400 million gallons per day.
- All 6 pumps combined are capable of pumping 2.4 billion gallons of water per day

Motor

- Hitachi Synchronous Motor
- Horsepower: 60,000
- Speed: 514 rpm
- Voltage: 13,900V
- Number of Poles: 14 poles
- Full Load Current: 2160 amps
- Power: 50 Mega-Watts

Power



- Primary power comes from the Parker-Havasut Substation.
- 230KV supply stepped down to 13.9KV and then to 480V
- Backup power comes from the Parker-Bagdad substation
- 69KV supply stepped down to 480V
- 500KW diesel generator for emergency backup power

Mark Wilmer Pumping Plant is the single largest energy user in the State of Arizona making CAP, as an organization, the single largest energy user in the State.

Staffing

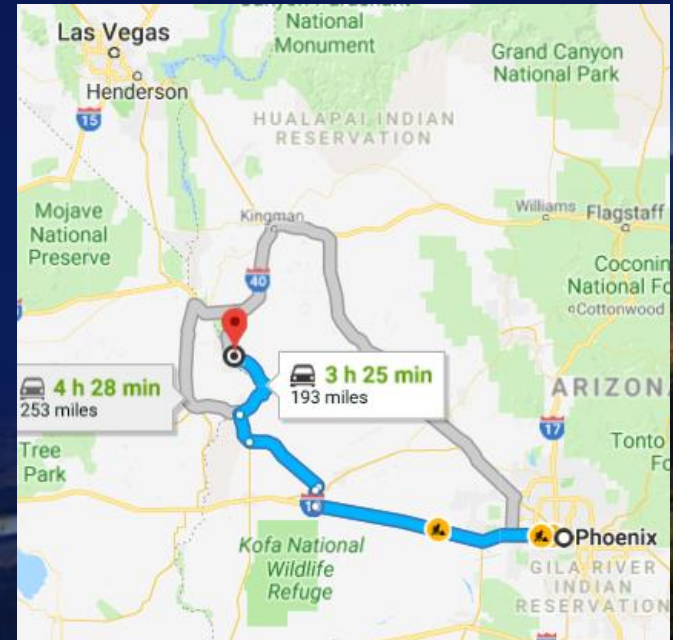
- 4 Journeyman level Electricians
- 4 Journeyman level Mechanics
- Maintenance Specialist
- Maintenance Worker
- Maintenance Planner
- Supervisor



Staff provides Maintenance and Operational support to the Mark Wilmer Pumping Plant, The Bouse Pumping Plant and 4 check structures along the first 50 plus miles of the canal. Essentially from the Colorado River to I-10 near the Vicksburg Road exit.

Challenges

- Remote Location
- Noise
- Age of Infrastructure
- Spare Parts
- Weeds



Recent and Ongoing Projects

- Sound Reduction Project
- Right and Left Plant Discharge Line Coating
- Air Blast Breaker Air Compressors
- Air Blast Breaker Replacement
- Elevator Modernization
- Weed removal



Sound Reduction Project

The noise levels at Mark Wilmer are extremely high and create a very difficult working environment.

We recently installed sound blankets on the 1st floor near the impeller man-ways of all units.

The sound reduction in these areas have reduced the decibel levels to half of what it was before they were installed.



Reline Projects

RP Project Started
June 1st 2016 and was
completed on
September 6th 2016
LP Project Started
June 5th 2017 and was
completed on
September 7th 2017



Entrance to
Buckskin
Mountain
Tunnel

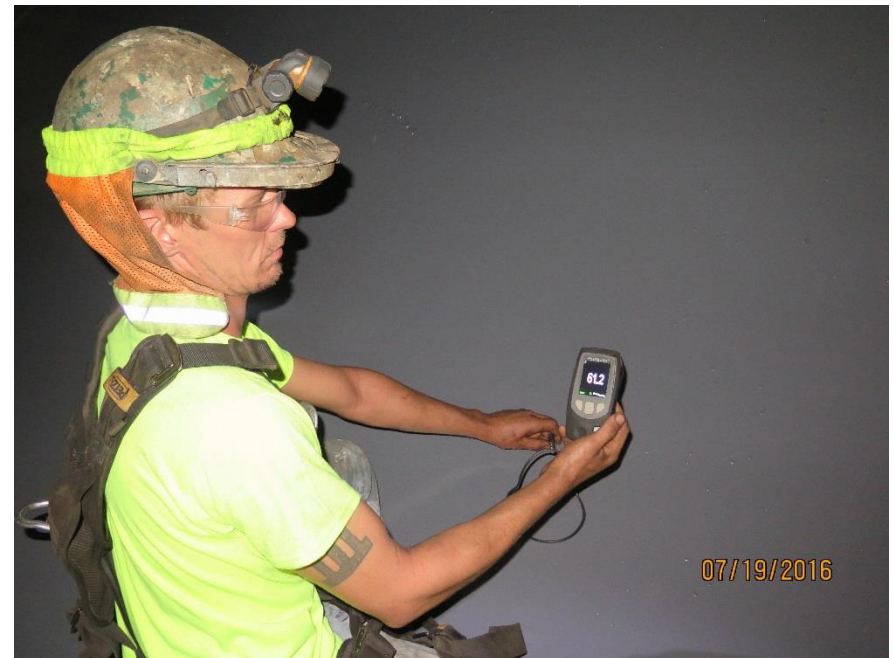
Right and Left Plant Discharge Pipe Recoating



The original coal tar enamel coating in the discharge manifolds and pipes at Mark Wilmer Pumping Plant were failing. Large sheets of the enamel had completely disbonded from the primer coat. Although much of the primer coat was still intact, there were cracks throughout forming corrosion lines in the substrate.



Inspection

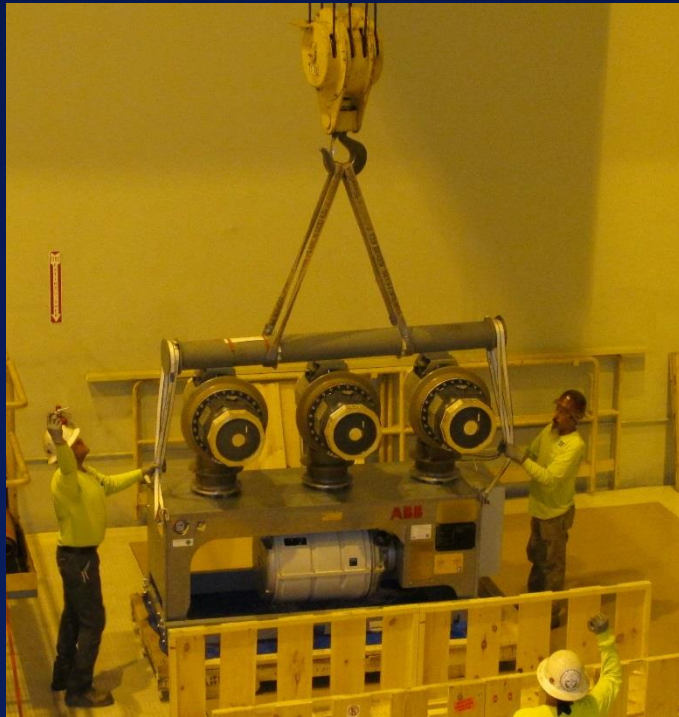




Air Blast Breaker Air Compressors

Air Blast Breakers

Replacement Began in the Summer of 2017 Unit 1 was Completed this Summer. Project Completion in 2020



Elevator Modernization Project



Elevator Machine Room
Mark Wilmer

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Weeds!



Weed Season poses some unique challenges for us. Weed removal is a very manual operation, often requiring 24/7 support

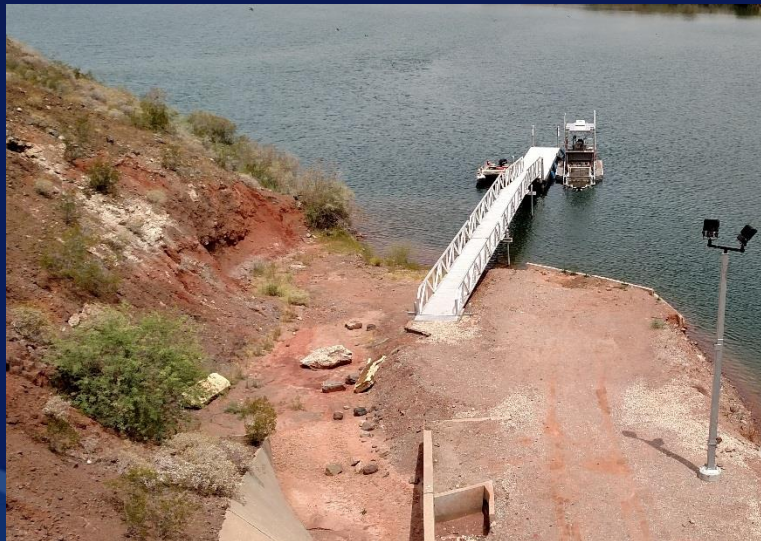


Resolutions?

A Work In Progress

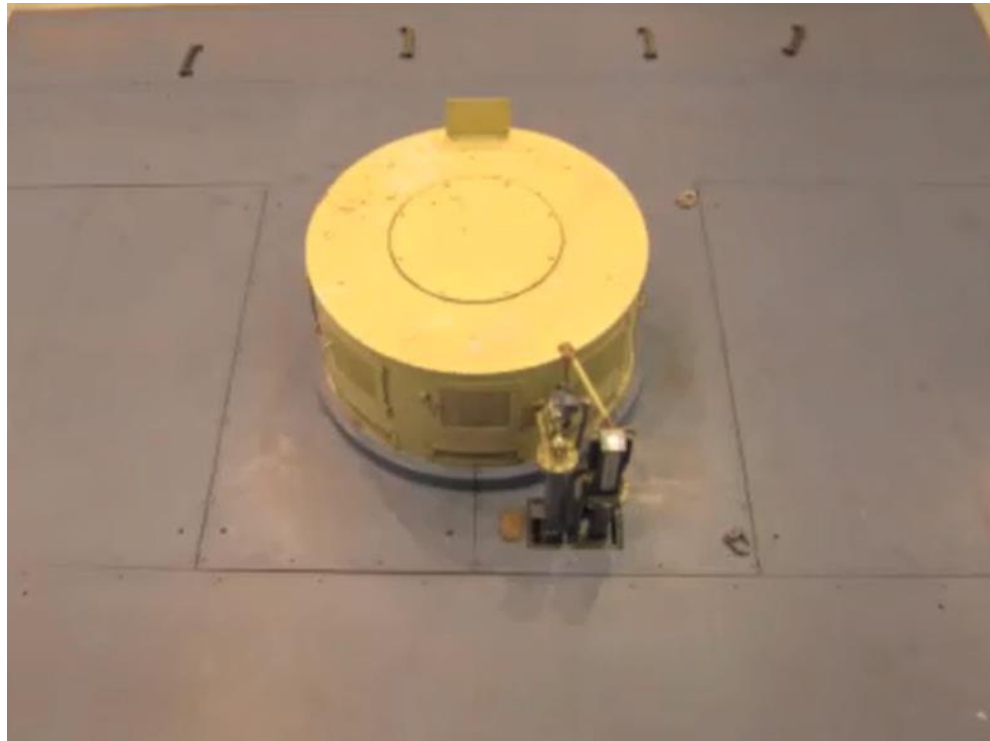


New Weed Boat, Dock Relocation and Shore Conveyor



Video

- Time Lapse Video of Pump Removal in 2014
- https://www.youtube.com/watch?v=u5mibr_t_e48



Questions?



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