

# Garrison Diversion Operations and Maintenance: Snake Creek Pumping Plant

By Kimberly Cook

The Garrison Diversion Conservancy District (Garrison Diversion) was created by the North Dakota Legislature to establish, construct, develop, maintain and operate the Garrison Diversion Unit (GDU) and all its parts. The McClusky Canal, New Rockford Canal and Snake Creek Pumping Plant (SCPP) are part of the GDU's principal supply works and owned by the Bureau of Reclamation (Reclamation). Garrison Diversion completes operations and maintenance (O&M) of these facilities under an Operations, Maintenance and Replacement contract with the agency.

Garrison Diversion's skilled O&M staff has high levels

of expertise in several areas, including earth moving, canal maintenance, vegetative management, road building, and paintings and coatings to name a few. These skills enable the completion of many diverse jobs.

One such facility benefiting from the expertise of Garrison Diversion's O&M team is the SCPP. Owned and operated by Reclamation, the SCPP is an important feature of the GDU Principal Supply Works. The SCPP is the primary facility for lifting Missouri River water from Lake Sakakawea to Lake Audubon to keep Lake Audubon at desired elevations for wildlife purposes.

One of the large, labor-intensive jobs completed by

*Snake Creek Pumping Plant.*



Garrison Diversion O&M staff as part of the annual work plan is painting and coating the structures at the SCPP, which is done to prevent corrosion and failure, ultimately extending the life of the structure. There are three steel discharge pipes moving water under Highway 83 from Lake Sakakawea into Lake Audubon. Each discharge pipe is opened every two years and examined to determine its condition.

In March and April, Garrison Diversion O&M staff performed maintenance to the Unit 3 discharge pipe, which included inspecting, sandblasting and spot coating the interior discharge tube, suction tube and pump bowl; recoating the exposed exterior portions of the suction tubes of all three units, inspecting and adjusting the upper and lower pump guide bearing clearances according to manufacturer recommendations, and measuring the propeller clearance. Additionally, all manways and entry openings were cleaned, recoated and resealed.

The discharge pipe is approximately 450 feet long and 12 feet in diameter. It can be accessed in two ways: through a hatch cover on the Lake Audubon side or through a small manhole about two feet in diameter in the SCPP. The limited access points increase the difficulty level of the project, as all equipment and necessary materials must enter and exit through the small access points.

Safety measures were taken before beginning the maintenance project. Because Unit 3 is a permit-required confined space, a specific SA, confined space permit, and entry procedure were drafted, reviewed and signed by all participants prior to initiating the work. Lockout/tagout procedures were performed on the plant equipment to eliminate engulfment hazard. On a daily basis, ventilation fans and MSA air monitoring equipment provided assurance the air quality was safe for occupancy.

The process and steps involved with sandblasting and coating the discharge pipe are extensive. Once the SA is approved and signed, dewatering the discharge tunnel begins. To begin dewatering, stop logs are put down on the Lake Audubon side to prevent water from coming into the tunnel. Sump pumps and sandbags are also utilized to achieve complete dewatering.

Once dewatered, pre-inspection of the existing coating begins, which involves walking the length of the tunnel and marking any areas needing further inspection. On the pipe's interior, several locations of the coating were peeling and chipping, requiring attention. Corrosion was present on the pipe's exterior where the suction tube steel contacts the concrete.

Garrison Diversion staff preps the areas for new coating by scrub cleaning the failed areas with water and brushes, then sandblasting those areas down to bare metal. Sediment that has collected inside the pipe is cleaned out.

Now the pipe interior is ready for two coats of Sherwin



*Pre-inspection of tunnel and marking suspect areas.*



*Example of area needing attention.*



*Example of recoated area.*

Williams Corothane I – Coal Tar, applied with 12 to 24 hours in between coats. Coating measurements are recorded and logged after each coat is applied, and measure roughly seven mils in thickness when completed.

On Unit 3’s exterior, the areas were sandblasted and recoated with Sherwin Williams Corothane I-MIO Aluminum. The manhole doors were sealed with Permatex The Right Stuff Gasket Maker and the exposed exterior portions of the suction tubes of all three units were recoated.

While the coating process isn’t very difficult for the experienced crew, it is a long process. The inspection and repair project usually takes eight to 10 weeks on average, with the preparations, sandblasting, coating and cleaning involved. This year, O&M staff worked on the project from early March through the first week of May, with the project delayed slightly due to inclement weather.

“We have an outstanding team of employees that make this annual repair and inspection a great success,” says Snake Creek Pumping Plant supervisor Dustin Offerdahl.

With construction of the SSCP completed in 1974, the facility is reaching 50 years old. Due to diligent maintenance and care given over time, the facility and its parts are in excellent condition and will continue to serve its purpose of lifting water from Lake Sakakawea to Lake Audubon for many years to come.



*Entering the tunnel via the fourth floor manway.*