

Project Title: Operation and Maintenance of the Fish Screen and Maintenance of the Fish Passage Facility at the Redlands Water and Power Company Diversion Dam.

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Project Summary: The Redlands Water and Power Diversion, located on the Gunnison River near Grand Junction, Colorado, diverts water into the Redlands Power Canal. A fish passage structure was constructed around the diversion dam in 1996. A fish screen and fish return pipeline was constructed in the canal in 2004. The fish passage is operated by the U.S. Fish and Wildlife Service. Redlands operates and maintains the fish screen and performs maintenance on the fish passage.

Study Schedule: Redlands makes every effort to operate the fish screen whenever diverting water into the Power Canal. Maintenance on the fish passage is performed after the U.S. Fish and Wildlife Service complete annual operation.

Relationship to RIPRAP: Colorado River Action Plan: Mainstem II.B.3.

Accomplishment of FY 2018 Tasks and Deliverables, Discussion of Initial Findings and shortcomings:

The following major maintenance activities were completed on the fish passage:
Refer to US Fish and Wildlife Service – Dale Ryden

Redlands Water and Power Co. cooperated with FWS on maintenance

The following improvements were made to the fish passage:

Refer to US Fish and Wildlife Service – Dale Ryden

Redlands Water and Power Co. cooperated with FWS on maintenance

The fish screen was operated during the following periods:

Online	04/02/18	Put unit online
Bypassed	06/21/18	Bypassed due to trash rake repairs
Online	06/26/18	Trash rake repairs complete, put unit back online
Bypassed	11/05/18	Unit bypassed for the season

The following maintenance activities were completed at the Fish Screen and Fish Passage.

Pressure washing of walkways and railings to remove large volumes of Raccoon feces which had accumulated over the season. This is performed to eliminate the unsanitary conditions from the work area for the safety of the employees who service and repair the facility on a daily basis. In the future this may be scheduled on a more regular basis as the Fish Screen is popular with Raccoons. RWP rented a trailer mounted pressure washer unit and supplied an employee to operate the machine. In the future RWP now owns a machine to enable cleaning the facility more often.

Several pieces of the facility were cleaned and painted including the large air compressor and the trash rake backstop. Future work plans call for cleaning and repainting the entire trash rake unit as this helps prevent corrosion and extends the working life of the machine. Most components of the Fish Screen are

constructed of concrete and galvanized steel. However some items are painted steel and must be maintained to ensure continued operations for many years to come.

RWP replaced one brush drive cable with a stronger more durable piece that is more suitable to the strains and bends which are required on the drive pulleys. The old cable had hard wire strands and had become badly frayed.

The standby generator was serviced and the battery and a GFI breaker were replaced.

The air compressor was serviced and continues to perform well.

Both of the bypass radial gate operators failed this summer and were replaced. After dismantling and investigating the cause of the failures it was determined that the housings were not adequately sealed from the elements. It took several years for the moisture to find its way inside the housings and cause the bearings to rust and seize. New operators were installed as the seized bearings had actually broken apart which allowed pieces to bind in the gears and break teeth. After realizing what the issue was RWP checked the manual gate operators at the Fish Passage and found a similar situation. We were able to dismantle, clean and replace the bearings before they failed and destroyed the entire operator assembly. We were also able to replace the bearings inside the failed Fish Screen bypass gate operators. These operators have some missing teeth but will work as emergency backups in case needed. They are stored on the parts shelf inside the Conex container located at the Fish Screen.

The concrete apron was extended beyond the trash rake deck area which now allows easier clearing of debris from the deck area. Before the aprons were extended the area was dirt and gravel and was slowly being eroded by the clearing action when using a backhoe. RWP also installed precast concrete blocks at the end of the concrete apron to allow debris to be pushed against it and loaded into the trash truck. RWP owns a trash truck which we use to haul debris to the composting facility when possible and the landfill when composting is not

available. The concrete apron was reinforced with #4 rebar in a grid pattern and poured to a thickness suitable for supporting heavy equipment passing over it.

RWP also hauled and spread several truckloads of road base and ¾" rock in the area immediately surrounding the Fish Screen area. The road between the river diversion and the Fish Screen was also graveled as we travel between the two to adjust canal water levels. We also graveled a short distance of the entrance road leading to the Fish Screen. This road will require additional maintenance in the future. RWP used our Grader to spread the gravel and maintain the two mile long entrance road to the Fish Screen. We also used a water truck and water pump located inside the facility to perform dust control throughout the summer.

RWP also performed weed abatement to keep the facility clean and well kept. This facility works well for impromptu tours as it is just moments from Grand Junction and the BOR-FWS offices. There is a portable toilet onsite for both workers and visitors.

The security lighting was cleaned and repaired this summer as the insects tend to accumulate inside the light fixtures quite heavily.

The brush arms and trolleys were greased and cleaned several time this season. In the future it will be necessary to rebuild or replace the trolleys due to bearing wear.

The trash rake required extensive repairs this season as it removes a large volume of debris from the canal each day. The trash rake seems to be the weakest link in the facility which could be due to the volume of debris. The main boom or mast had a guide roller fail which broke in two and caused the mast to become bound resulting in the main hydraulic cylinder becoming bent and damaged.

Replacement of this cylinder from Atlas Polar required an upgrade to a new style cylinder as the old unit was no longer available. The parts were a considerable expense but are now the new style. RWP supplied all of the expertise and labor to repair the trash rake and all other components in the facility including pouring the concrete to hauling the gravel.

The Fish Passage requires far less attention from RWP as the USFWS operates the facility each year. However RWP did have to work with the Mesa County Sheriffs Department on several occasions to remove trespassers and vandals from the Fish Passage area. There are some area on the outer perimeter fence which will require repairs due to being cut by vandals. The outer fence also is damaged by vehicles occasionally by vandals which may require future installation of large boulders to limit access to the fence area.

RWP also replaced the No Trespassing signs on the diversion and Fish Passage to aid in lawfully removing trespassers.

RWP also continues to work towards replacing the canal head gates with new stainless steel units which will allow for consistent operation of the gates for water level control. This is important because the Fish Screen would then be able to communicate with the gate operators at the head gate and control water levels. All of the equipment was installed during construction of the Fish Screen but the old head gates have been the sticking point for operations. RWP anticipates fabricating and installing the first canal head gate in 2019 as we were able to purchase a large amount of stainless steel to fabricate new gates at reasonable prices. RWP has been providing the capital and labor for the gate projects but it is feasible that this could be a joint funding effort between Recovery and RWP as the automation of the gates would be a significant improvement.

RWP continues to be a contributing and supportive partner in the operation of the Fish Screen and Fish Passage. RWP does not request reimbursement for all of the equipment used in the maintenance and operation of the facilities but instead operates as a partner in the recovery efforts.

Recommendations:

Project Status: On schedule and on budget.

FY 2018 Budget Status:

Funds Provided: \$64,983.56

Funds Expended: \$64,983.56

Status of Data Submission (where applicable): Not applicable

A handwritten signature in blue ink that reads "Kevin E. Jones". The signature is written in a cursive style with a large initial 'K' and 'J'.

Kevin E. Jones, Superintendent
REDLANDS WATER AND POWER COMPANY