RECLAMATION
Managing Water in the West

Humboldt River Water Conservation Project
Environmental Assessment

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1.0 INTRODUCTION

1.1 Background

The Humboldt River Water Conservation Project (proposed project) includes elements that are either part of the Bureau of Reclamation (Reclamation) Humboldt Project (Rye Patch Dam) or are affected by water passing though the Humboldt Project (Pitt and Rogers Dams and Rogers Canal). The Humboldt Project is located in northwestern Nevada on the Humboldt River. Rye Patch Dam and Reservoir is on the Humboldt River about 22 miles upstream from Lovelock, the county seat of Pershing County.

The Humboldt Project provides for storage at Rye Patch Dam, acquisition of lands and water rights upstream in the Battle Mountain area for supplementing the water supply for project lands, and utilization of the Pitt-Taylor Reservoirs. The purpose of the project is to provide seasonal and long-term regulation of the Humboldt River and to increase the amount of water available for irrigation of agricultural lands in the Lovelock area. Currently there are 37,506 irrigable acres within the Water District, approximately 32,000 acres of which are irrigated on an annual basis.

The operation and maintenance of the project were transferred from Reclamation to the Pershing County Water Conservation District (PCWCD) on January 15, 1941. Since that time, the PCWCD has assumed all costs resulting from the day-to-day operations and maintenance of the entire Humboldt Project.

Although the distribution system downstream of Rye Patch is affected by releases from Rye Patch, it is not part of the Humboldt Project. It consists of six canals (Young, Union, Rogers, Big Five, Irish American, and Pitt-Taylor Diversion) and five ditches (Old Channel, B&B, Lakeshore, Tule, and Seven). The drainage system consists of four principal drains in the upper valley (Graveyard, Johnson, Lovelock, and Irish-American) and two principal drains in the lower valley (Toulon and Army). A 1.3 mile section of Rogers Canal is included in the proposed improvements.

The distribution system also includes 5 diversion dams (Young, Pitt, Rogers, Sommers, and Big Five) located downstream of Rye Patch Dam. The proposed project includes improvements to two of these dams, the Pitt and the Rogers.

1.2 Purpose and Need for the Project

1.2.1 Hydropower at Rye Patch Dam

PCWCD is proposing to install a hydropower turbine on Rye Patch Dam. The purpose for the project would be to generate electricity that could be sold back to the existing grid. Revenue generated by the sale of power would provide PCWCD with a steady source of funding for water system improvements and to offset irrigation pumping costs throughout the PCWCD system. The improvements funded by the power generation would potentially increase the conservation efficiency of existing facilities in the district, including the Rye Patch Dam and Reservoir.

1.2.2 Installation of Overshot gates and Water Level Sensor at Pitt Dam

Two automated power actuated overshot gates would be installed in the existing stoplog keyways in the Pitt Dam buttress bays. A water level sensor with appurtenant wireless remote monitoring would also be installed and would be hooked into existing power.

The purpose for the installation of the two gates and water level sensor at Pitt Dam is to allow for more accurate water control at the dam and thus better water conservation. More importantly, the improvements would make it possible to coordinate the release and impoundment of water at Pitt Dam with releases from Rye Patch reservoir. Coordination of releases at the Pitt and Rogers Dams downstream of Rye Patch reservoir will help conserve water while maintaining sufficient flows for irrigation. In summary, these facility upgrades are needed to improve overall water use management and decrease water loss.

1.2.3 Rogers Dam and Canal Improvements

There are three improvements proposed for the Rogers Dam facilities. The facilities include the Dam itself, the Rogers Canal diversion structure, and the Rogers Canal. The proposed improvements include the following:

1. Installation of a water level sensor with appurtenant wireless remote monitoring on Rogers Dam (see Figure 3).
2. Installation of an automated hoist (see Figure 5) on the existing radial gate and a solar powered water level sensor with appurtenant wireless remote monitoring on the Rogers Canal diversion structure.
3. Reconstruction of a 1.3 mile section of Rogers Canal.

The purpose for the improvements at Rogers Dam is to coordinate the release and impoundment of water with those of the Rye Patch and Pitt Dams. The improvements, along with those at the other dams, are part of a master planned approach to water management on the Humboldt River and specifically within the PCWCD system. The improvements at the Rye Patch, Pitt, and Rogers Dams are needed to help conserve available water.

The purpose for the rebuilding of the Rogers Canal is to improve measurement and flow through the canal. The improvement will allow for better water measurement and conservation.

2.0 PROPOSED ACTION AND NO ACTION ALTERNATIVE

2.1 Proposed Action

Under the proposed action, Reclamation would allow and provide $750,000 to fund the installation of following improvements:

1. Installation of a hydropower turbine and appurtenances on Rye Patch reservoir dam.
2. Installation of two 7-foot wide, powered overshot water release gates and an automated water level sensor with appurtenant wireless remote monitoring on the Pitt dam. The gates will be installed in the existing stoplog keyways in the concrete buttresses on the dam.
3. Installation of a water level sensor with appurtenant wireless remote monitoring on Rogers dam. The sensor will be wired into the existing control box on the dam.
4. Installation of a powered gate actuator and automated water level sensor with appurtenant wireless remote monitoring at Rogers Dam diversion entrance.
5. Reconstruction of Rogers Canal including the reshaping of approximately 1.3 miles of the Canal cross-section from the canal entrance to the entrance of a 7-foot diameter pipe over the Humboldt river.

The locations of these project elements are shown on maps in Appendix A.

2.1.1 Rye Patch Dam Hydropower

At Rye Patch Dam, a hydro-turbine would be installed on the downstream end of one of the two existing 48-inch penstocks. A penstock is an enclosed pipe that is used to regulate flow through the dam (see Figure 1). The power plant would be similar to those currently operating on similar sized dams in nearby reservoirs in California and Nevada.

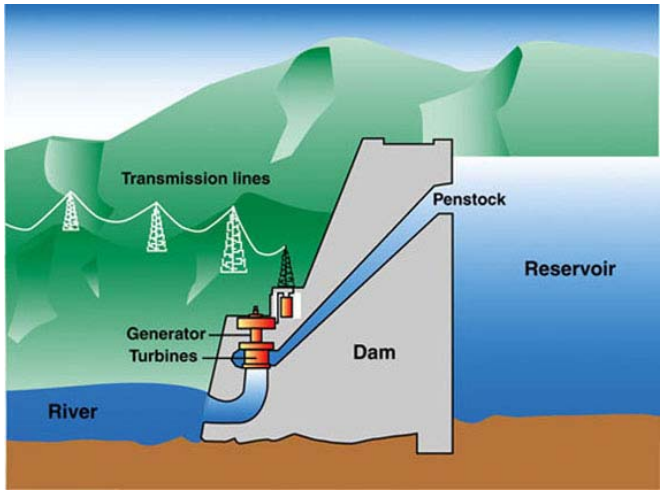

Figure 1 – Conceptual dam/hydro-turbine configuration

Additional appurtenances that would be installed as part of the hydro-turbine project include:

1. Construction of a power house near the existing gate house adjacent to the spillway. The footprint of the new building will be 18-feet square and the elevations will be designed to match that of the existing gate house. The building will house the power generation equipment.
2. Installation of a ventilation fan and ducting running from the dam valve chamber through the penstock maintenance tunnel. The proposed ducting is required by OSHA.
3. Installation of an external flow meter on the penstock pipe connected to the hydro turbine (see Figure 2)
4. Installation of gate position sensors on the two penstock control gates.
5. Installation of automated valves in the existing gate house.

The power generated by the hydropower turbine will be transmitted to the grid via existing power transmission lines located near Rye Patch Dam.

Figure 2 – Example of external flow sensor on penstock pipe

2.1.2 Pitt Dam Gates and Water Level Sensor

The proposed action includes the installation of two power actuated overshot gates and a water level sensor on Pitt Dam. The water level sensor includes a small antenna. Examples of an installed water level sensor and automated power actuated gates are shown in Figures 3 and 5, respectively.

Figure 3 – Water level sensor example showing solar panel and antenna

Figure 4 –Example of automated power radial gate hoist proposed for Rogers Canal

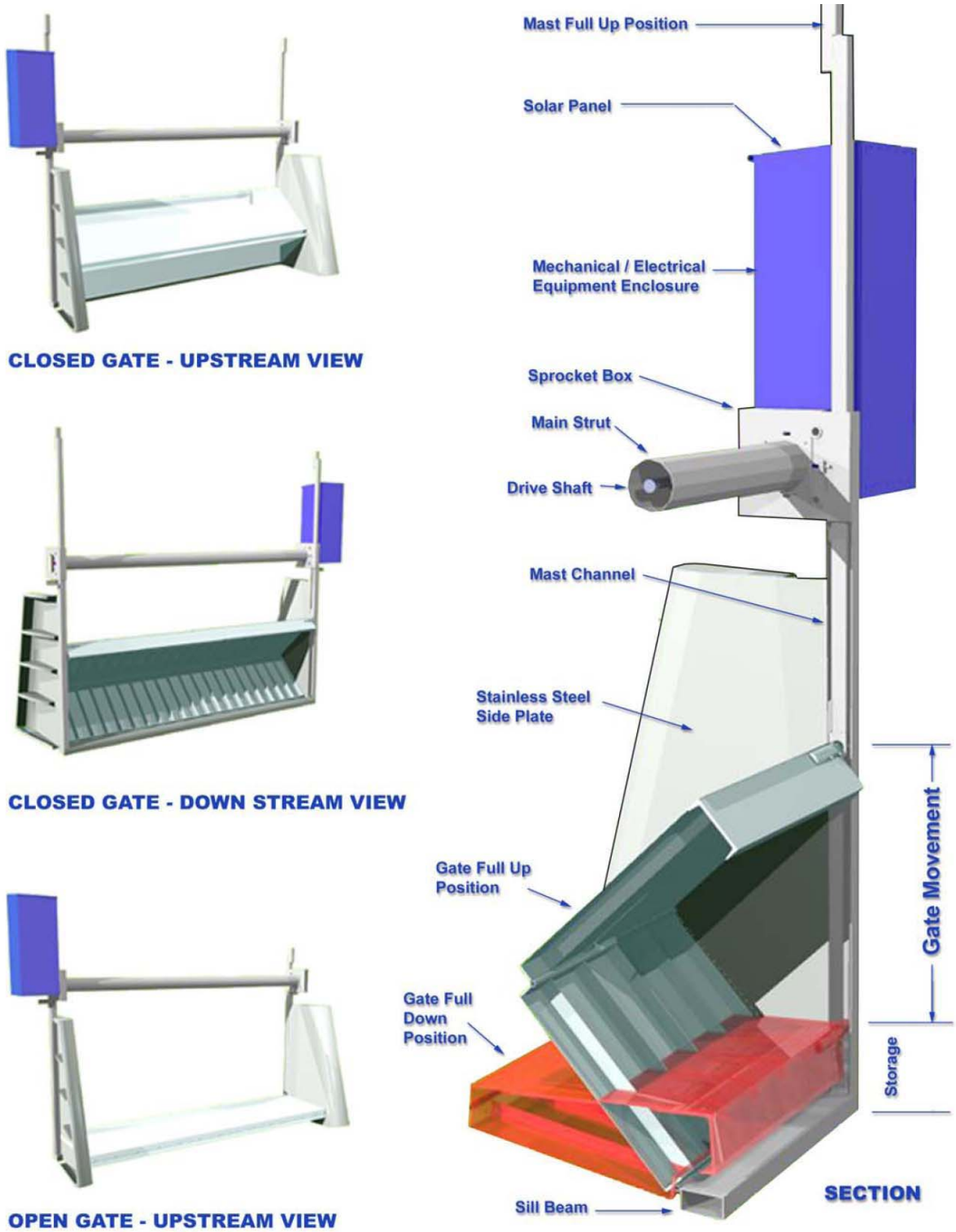

Figure 5 –Overshot gates proposed for Pitt Dam. Solar power won't be required on Pitt Dam

2.1.3 Rogers Dam Water Level Sensor

The control for the water level sensor on Rogers Dam will be installed in the existing panel on the dam. The sensor will not require a solar panel.

2.1.4 Rogers Canal Diversion Structure and Water Level Sensor

The water level sensor with solar panel and appurtenant wireless remote monitoring and gate actuator on the diversion structure will be similar to those shown in Figures 3 and 4, respectively. The gate actuator will replace the existing one shown in Figure 9.

2.1.5 Rogers Canal Reconstruction

The Rogers Canal reconstruction will include the reshaping of approximately 1.3 miles of cross section of the existing Rogers Canal starting at the canal entrance.

2.2 No Action

Under the "No Action" alternative, the following proposed actions would **not** be implemented:

1. The proposed hydropower plant and appurtenances would not be installed at Rye Patch Dam,
2. The proposed gates and water level sensor would not be installed at Pitt Dam,
3. The proposed water level sensor would not be installed at Rogers Dam,
4. The power gate actuator and water level sensor would not be installed at the Rogers diversion structure and,
5. The Rogers Canal would not be reconstructed.

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 Site Descriptions

3.1.1 Rye Patch

The Reclamation website for the existing Rye Patch Dam states the following:

"Rye Patch Dam lies within a valley cut by the Humboldt River. The materials forming the valley slopes at the dam site are variably consolidated Lahontan and pre-Lahontan lacustrine and fluviatile deposits consisting of very thinly-bedded to thickly-bedded gravel, sand, silt, and clay. Nearly continuous outcrops of the deposits occur in the valley slopes.

The deposits are nearly horizontal except for occasional local dips of 20 to 30 degrees south, southwest, and northwest along undulating erosional surfaces. Locally, Holocene age slopewash (Qs) forms 1- to 10-foot-thick clay and silt deposit on the lower half of the Humboldt River valley slopes.

The Lahontan deposits lie above elevation 4160 feet on the left abutment of the dam and above elevation 4200 feet on the right abutment of the dam and are not part of the abutments. The pre-Lahontan deposits (Qpl), which form the right and left abutments, include the Paiute, Rye Patch, and Lovelock Formations.

A volcanic ash bed and a calcium-carbonated-cemented gravel bed (5 feet thick) crop out in the upper Rye Patch Formation.

Since Lake Lahontan receded from the Rye Patch Dam area about 10,000 years ago, the Humboldt River has eroded the present valley and deposited up to 40 feet of unconsolidated alluvial silt and sand (Qa). This alluvium has been divided into six subunits based on physical characteristics. The central portion of the dam is founded on this alluvium.

A small shear zone was revealed during dam construction. This feature was attributed to minor slumping of pre-Lahontan deposits in the valley slopes. No faults are recognized in the foundation or abutments. No landslides or other major surficial slips are known to exist in the reservoir area. No fault displacement of Lahontan or pre-Lahontan deposits is known to exist in the immediate area of the dam."

Rye Patch Dam (Figure 6) is an earth fill structure. A total of 322,900 cubic yards of compacted earth fill covered by 9,800 cubic yards of gravel and 36,200 cubic yards of rock fill and riprap forms the Rye Patch Dam. The foundation is a mixture of clay, sand, and fine gravel.

The Dam was completed and began storing water in 1936. A rehabilitation and betterment program in 1975 enlarged Rye Patch Dam to 78 feet high and a crest 1,074 feet long. Improvements increased the reservoir`s storage capacity by an additional 23,000 acre-feet bringing its active capacity to 213,000 acre-feet.

The dam`s design has three major structural features: an embankment, outlet, and spillway. The spillway is 110 feet wide, 353 feet long, and its full capacity is 20,000 cubic feet per second. Five steel radial gates, 17 feet high by 20 feet wide, discharge the spillway's flow.

The outlet works of the dam include a trash rack that covers the outlet entrance into a 12-foot diameter concrete lined circular tunnel running 472 feet where two sets of high pressure slide gates control flow into two 48-inch diameter steel discharge pipes. Control gates are in a gate chamber and a control

house, connected by a section of the tunnel. The outlet works can release 1,000 cubic feet per second and discharge is into the spillway stilling basin.

The Rye Patch Reservoir provides the usual types of water-based recreation. Facilities have been developed and operated under the administration of the Nevada Division of Parks. Fishing for trout and warm water species is under the management of the State Fish and Game Commission.

Figure 6 - Rye Patch Dam spillway and gate house

3.1.2 Pitt Dam

The Pitt Dam is located on the Humboldt River in the east half of Section 6, Township 27 North, Range 32 East. The Dam can be found on the Lovelock, Nevada 7.5 minute topographic map. The Dam is at elevation 4005 feet (approximate), latitude 40 degrees, 14 minutes, 5 seconds, and longitude 118 degrees, 25 minutes, and 14 seconds. The dam is located approximately 5 miles from the town of Lovelock.

The Pitt Dam is a seven-buttress dam constructed of steel reinforced concrete. The banks on both sides downstream of the dam are armored with rip-rap and the dam has a steel reinforced concrete toe and erosion control slab. The height of the dam from toe to crest is 15 feet and the length of the crest is approximately 85 feet. The dam has two railcar chassis placed end to end that provide the structure for a vehicular bridge that runs the length of the crest. Steel reinforced wooden flash boards in seven of the eight bays control the height of the water behind the dam and a manually operated rack and pinion operated wooden slide gate in the eighth bay controls the release of water from the dam. The dam is used to back up water for diversion to the Old Channel and Union Canals. The Pitt Dam was constructed in 1915.

The Pitt Dam (Figure 7) is considered a small dam by State of Nevada since the potential reservoir capacity (approximately 150 acre feet) is less than 1,000 acre feet. The Pitt Dam is used for irrigation purposes and is considered a low hazard dam because if breached the increased flows would be insignificant. The National Identification Number for the Pitt Dam is NV00203.

Figure 7 – Pitt Dam

3.1.3 Rogers Dam and Diversion Structure

The Rogers Dam is situated just northeast of Lovelock on the Humboldt River. It is located in the northeast quarter of Section 24, Township 27 North, Range 31 East. The latitude of the dam is 40 degrees, 11 minutes, 57 seconds and the longitude is 118 degrees, 26 minutes, 27 seconds. The dam is at elevation 3995 feet and can be found on the Lovelock, Nevada 7.5 minute series topographic map. The dam and diversion structure are approximately 2 miles northeast of the town of Lovelock.

The original Rogers Dam failed on Tuesday, July 18th, 2006 as a result of very high flows in the Humboldt River. The dam could not be repaired for temporary or permanent use and consequently was removed and a new dam was constructed in its place.

Construction of the new Rogers Dam (Figure 8) included a temporary coffer dam and north by-pass spillway (bypass) around the coffer dam. Although the coffer dam was removed once the Rogers Dam was complete, the bypass remained in place as a permanent part of the project.

The design for the new Rogers Dam was completed by October 2007 and construction of the structure was completed in June 2008. The dam measures 100'x75'x40' and includes three buttresses and four 15' motor actuated radial gates and one 5-foot wide motor actuated slide gate.

The Rogers diversion structure was replaced at the same time as Rogers Dam and its purpose is to control water flowing into the Rogers Canal. The structure is constructed of concrete and steel sheet piles and includes a 7'x 12' manually operated radial gate.

The dam and diversion structure are approximately 2 miles northeast of the town of Lovelock.

Figure 8 – Rogers Dam

Figure 9 – Rogers Diversion Structure and existing gate actuator

3.1.4 Rogers Canal

The Rogers Canal originates at the Rogers Dam diversion structure (approximately 50 feet southeast of Rogers Dam) and flows southwest for approximately 1.5 miles at which point it joins the Union Canal to form the Union Rogers. The canal averages 23 feet in width at the bottom and has no diversions. The canal is approximately 1 mile east of the town of Lovelock.

The 1.3 mile (approximate) section of the Rogers Canal that is to be renovated as part of the proposed project originates at the Rogers Dam diversion structure. It terminates at a 7-foot diameter elevated steel pipe that crosses the Humboldt River. Figure 10 shows the section of the canal to be renovated.

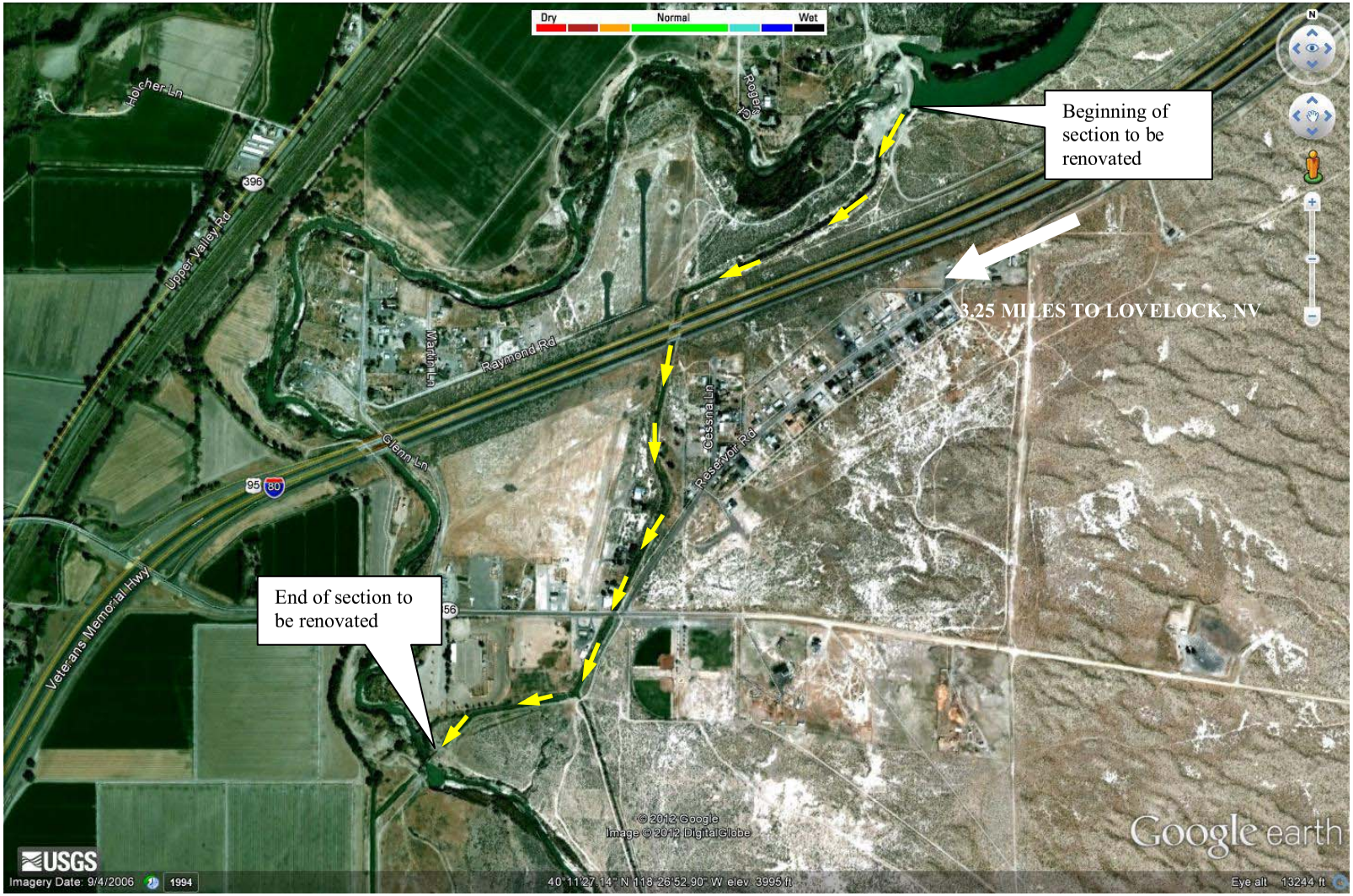

Figure 10 – Rogers Canal. Length to be renovated is approximately 1.3 miles

3.2 Affected Environment/Environmental Consequences

After initial analysis it was determined that the proposed action would not affect: climate, wetlands, geology, mineral resources, land use, and coastal zones. Therefore, these environments are not considered in detail in this EA.

The "No Action" alternative could have no environmental effects. The facilities discussed in the proposed project would remain in their current condition and would continue to operate as they currently do.

3.2.1 Wildlife

Rye Patch Dam Affected Environment

The Nevada department of Wildlife (NDOW) was contacted regarding the proposed project elements at Rye Patch Dam. NDOW delineated an area of interest that included a three-mile buffer around the proposed project area. Based on that area of interest, NDOW provided information regarding wildlife known to reside in the vicinity. Sensitive wildlife in the vicinity includes various species of raptors. Of those, burrowing owl, ferruginous hawk, northern goshawk, peregrine falcon, short-eared owl, and Swainson's hawk are NDOW species of special concern and are target species for conservation as outlined by the Nevada Wildlife Action Plan.

The following species have also been observed in the vicinity of the project area:

American beaver	Coyote	Sacramento blackfish
Bluegill	Great blue heron	Tahoe sucker
Common carp	North American river otter	Walleye
Rainbow trout	Channel catfish	Spotted bass
Largemouth bass	Smallmouth bass	Crappie
Bullhead catfish	White catfish	Wiper

Table 1

Rye Patch Dam Environmental Consequences

Proposed Action
Consequences to wildlife resources generally result from impacts to individuals, populations, or from disturbance to habitat. Most potential impacts to wildlife are associated with habitat disturbance and vegetation removal.

Because the proposed action area of effect includes only the interior of the dam, the existing parking area, and the dam spillway, the only anticipated impact would be the potential killing of fish passing through the hydroelectric turbine. NDOW has suggested that a fish screen might be installed on the intake of the penstock pipe that would supply water to the turbine. This option would not be practical for the following reasons:

1. There is one existing common inlet for two existing outlet pipes (penstocks). If a screen were installed on the inlet, it would prevent fish from passing through both outlets. With no screen on the inlet, the fish can pass completely unmolested through one of the pipes even when the turbine is operating. Also, the pipe connected to the turbine has a bypass immediately before the turbine

which will be regularly flushed and open in high flow and low flow events. If there is no screen, fish can also pass unmolested through both pipes during these events.

2. PCWCD (dam operator and turbine owner) and the BOR (dam owner) prefer not to use fish screens in the presence of Quaga Mussels. Once mussel populations become more established, they become a maintenance problem as they encrust the fish screen and choke off flow to the dam outlet.
3. When the dam water level is lower than 15 feet (max water level is 60-63 feet) power cannot be generated and water will be directed through the turbine bypass. This eliminates the possibility of fish looking for deeper water in low water events from passing through the turbine. Likewise, even with water levels higher than 15 feet, any time the dam is scheduled to release water volumes less than 75 cfs, the turbine cannot make power. In both these scenarios, fish will pass unmolested. It should also be noted that less than 75 cfs is released from October 15th to March 15th as this is the off irrigation season.
4. Fisherman downstream do not want a screen because it will eliminate all large fish. Without a screen some large fish can still pass in the scenarios described above. Some small fish will pass with or without a screen and can survive particularly in the upper reaches of the river.
5. The river does end at the Humboldt sink and all fish perish at that point. In other words the downstream fishery is already limited/finite.
6. Installing a screen on such a small scale, low head, low velocity power project is cost prohibitive.

Other than the potential effect on fish, there are no other anticipated environmental consequences associated with wildlife in the vicinity of Rye Patch Dam under the proposed action. It should also be noted that all proposed project elements at Rye Patch Dam are reversible.

No Action

The "No Action" alternative would not affect wildlife at the Rye Patch Dam. All facilities discussed in the proposed action would remain in their present condition and would continue to operate as they currently do.

Pitt and Rogers Dams and Rogers Canal Affected Environment

Wildlife species residing in the areas near both the Pitt and Rogers Dams are similar to those found in the vicinity of Rye Patch Dam. However, the Pitt and Rogers Dams are located near residential and agricultural areas so there is less wildlife than that found at Rye Patch.

Pitt and Rogers Dams and Rogers Canal Environmental Consequences

Proposed Action

Under the proposed action, work on the Pitt and Rogers Dams and Rogers Canal would include minor mechanical modifications to existing facilities. No habitat will be disturbed on land or in the river. All work activities associated with the installation of project elements will be performed in previously disturbed areas intended for maintenance activities (parking areas).

No Action

The "No Action" alternative would not affect wildlife at the Pitt and Rogers Dams and Rogers Canal. All facilities discussed in the proposed action would remain in their present condition and would continue to operate as they currently do.

3.2.2 Threatened and Endangered Species

Rye Patch, Pitt, and Rogers Dams Affected Environment

According to the U.S. Fish and Wildlife Service there are no listed species under the Endangered Species Act of 1973 (Act), as amended, in Pershing County, Nevada (U.S. Fish and Wildlife Service, 2011).

Rye Patch, Pitt, and Rogers Dams Environmental Consequences, both Alternatives

There are no environmental consequences for either alternative since there are no threatened and endangered species occupying these areas.

3.2.3 Water Resources

Rye Patch Dam Affected Environment

The exterior area affected by the proposed action includes the parking area on the west side of the dam spillway and the west side of the spillway. The parking area has a compacted gravel surface and is frequented by vehicles. The dam spillway is concrete and the area where the turbine will be installed will be covered with water from time to time. The depth is dependent upon the amount released down the spillway.

The interior area affected by the proposed project includes the north wall above the existing dam controls, the penstock tunnel and the gate room inside the dam.

Rye Patch Dam Environmental Consequences

Proposed Action
Construction of the power house would affect the parking area. However, the drainage in the parking area will not change and the power house will have no effect on water resources.

The hydro turbine will be installed on the discharge end of one of two existing penstock pipes on the west side of the spillway. The turbine assembly will allow for discharge through the turbine or through an integrated bypass. This proposed design will ensure that the amount of water discharged from the penstock pipes will be the same as it is currently.

Installation of the turbine will require the attachment of anchor bolts to the dam. During this process best management practices will be employed to insure that any debris generated during the installation process will not be allowed to enter the river. Therefore the installation of the hydro turbine will not affect water resources.

Once the turbine is installed, it will be in contact with the water release from the dam. Any lubrication that might come in contact with the water will be vegetable based.

Other proposed appurtenant equipment to be installed at the dam include ducting inside the gate room and penstock tunnel, flow sensors on the penstock pipes, gate position sensors on the penstock control gates, and automated valves in the gatehouse. These proposed project elements will improve water release control at the dam. Construction activities related to the installation of these appurtenances will have no effect on water resources.

Consequently, the anticipated effect on water resources of these project elements would be to allow for better water conservation.

There would be no direct environmental consequences associated with the "No Action" alternative as it relates to water resources. However, even though the dam would remain as it is and would continue to operate as it does currently, the potential for the anticipated water conservation associated with the proposed action would not be realized.

Pitt Dam Affected Environment

The buttresses and floor where the power automated gates would be installed on the Pitt Dam are constructed of concrete that is approximately 100 years old. The buttresses have exiting stop log keyways. The new gates would be installed in two buttress bays approximately in the center of the river where, when the river is flowing, it passes over the floor and through the buttresses.

Pitt Dam Environmental Consequences

Proposed Action

The powered gates are installed by sliding them down into the existing stop log keyways. Non toxic neoprene gaskets are then installed at the bottom and sides to provide a seal. The installation of the power automated gates on the Pitt Dam would require no diversion of the water flowing through the dam.

Since the gates will be used to control the release and impoundment of water at the dam, the only affect on water resources would be to improve operational control thus increasing the potential for water conservation. No excavation will be performed on the river bed itself so there will be no environmental consequences.

Rogers Dam and Rogers Canal Affected Environment

The Rogers Dam was completed in 2007 and the area around it and the diversion structure to the Rogers Canal are the same condition as they were when the dam was completed.
The 1.3 mile section of Rogers Canal to be reconstructed is used throughout the irrigation season and only rarely in the off season. The canal is unlined and the area adjacent to the canal is relatively free of weeds. The terrain is relatively flat and there are also very few trees in the immediate vicinity. The canal is regularly maintained by the PCWCD.

Rogers Dam and Rogers Canal Environmental Consequences

Proposed Action

The proposed actions at the Rogers Dam, Rogers diversion structure, and Rogers Canal would include the implementation of Best Management Practices (BMPs) to reduce sediment erosion, in compliance with the storm water pollution prevention requirements of the Clean Water Act. Also, petroleum products or other chemical spills that may occur during construction would be isolated and any contaminated material would be treated appropriately or removed and disposed of, in compliance with state and local requirements. Water used for dust abatement would be trucked into the project area and would not affect surface waters in the project area.

No environmental consequences are anticipated. Positive consequences would be the improvement of operational control at the facilities and a corresponding increase in water conservation.

No Action
In general, under a "No Action" alternative, there would be no environmental consequences regarding water resources for any of the facilities. All facilities would continue to function as they do currently.

3.2.4 Air Quality

Rye Patch, Pitt, and Rogers Dams and Rogers Canal Affected Environment

The National Ambient Air Quality Standards (NAAQS) published by USEPA in 40 CFR Part 50 define the levels of air quality that USEPA has determined protect human health and welfare. An area is considered to be in nonattainment for a pollutant if it violates a particular NAAQS. Conversely, attainment areas are those where monitoring shows that no violations of the NAAQS have occurred. An area is considered unclassifiable if no monitoring has been conducted to determine its classification and NAAQS violations would not otherwise be expected. Pershing County is classified as an attainment area and all of the proposed action is located within Pershing County.

Rye Patch, Pitt, and Rogers Dams and Rogers Canal Environmental Consequences

Proposed Action
The construction of the power house at Rye Patch Dam and the reconstruction of the Rogers Canal will require some excavation and consequently fugitive dust will be generated. According to the Nevada Division of Environment Protection (NDEP) Bureau of Air Quality Planning, if an area in excess of five (5) acres is disturbed, a surface area disturbance permit is required. Also, regardless of the size of the disturbed area, fugitive dust emissions must be controlled at all times through the use of BMPs. The total area to be disturbed over the course of the project is 17 acres.

Most of the soil disturbance associated with the project will occur during the reconstruction of the Rogers Canal (approximately 16 acres); with the construction at Rye Patch Dam disturbing only about .25 acres. In summary the air quality environmental consequences associated with the proposed action will be the fugitive dust generated during construction. Fugitive dust generated during construction will be controlled by best management practices including watering. No air quality issues are anticipated post construction.

No Action
There will be no air quality environmental consequences associated with the "No Action" alternative since no work will be performed.

3.2.5 Noise

Rye Patch, Pitt, and Rogers Dams and Rogers Canal Affected Environment

There is traffic noise on all of the dams since they all have vehicular roads across their crest. On Rye Patch there is a two-lane vehicular road and the Pitt and Rogers each have one lane. Auto traffic across the dams would be considered light and the relative loudness of light auto traffic at 100 feet is approximately 50 decibels (dBA) ((Beranek (1988) and EPA (1971)).

All of the project locations are relatively close to U.S. Interstate 80 (I-80) and the Southern Pacific Railroad corridors. The Pitt Dam is also within 0.5 miles of U.S. Highway 95. I-80 and railroad distances are shown in Table 2.

Site	I-80 (miles)	Railroad (miles)
Rye Patch Dam	1.2	1.0
Pitt Dam	1.0	0.5
Rogers Dam	0.2	0.7
Rogers Canal	0 to 0.5 (passes under I-80)	0.7

Table 2 – Distance from the project sites of existing road and rail noise sources.

All of the project sites experience noise related to the release of water from the control gates. The noise from the water varies according to the amount being released but can reach levels where it is difficult to hear other sounds.

Rye Patch, Pitt, and Rogers Dams and Rogers Canal Environmental Consequences

Proposed Action
All of the proposed project site would experience a temporary increase in noise due to construction activities. However, the amount of construction equipment for these projects will be minimal and brief. Construction at Rye Patch may include a small excavator and a loader or backhoe. Installation of gates at Pitt Dam and the Rogers diversion structure will require a crane. Construction on the Rogers Canal will include an excavator and a loader.

At the Rye Patch Dam, the noise level inside the power house will be 75 to 85 dB at 100% power. 100 ft away from the power house the noise level should be less than 65 dB at 100% power. Most of the hydro turbine noise will be radiated downward and will be masked by the water exiting the tailrace and hitting the river. The turbine will radiate 80 to 90 dB at full power however it will be no louder than the water rushing out of the control pipes now.

At the Pitt Dam and Rogers Diversion Structure, the sound of the powered gates during operation is the only noise the proposed action would produce. The noise produced by the gates would be less than that of a vehicle passing over the dams.

No Action
No additional noise would be produced under the "No Action" alternative and so there would be no environmental consequences.

3.2.6 Vegetation

Rye Patch, Pitt, and Rogers Dams and Canal Affected Environment

The dominant habitat type at Rye Patch above the reservoir is Great Basin saltbush scrub. Dominant species around the shoreline include black greasewood, four-wing saltbush, tamarisk, cheat grass, halogeton, Russian thistle, and native Great Basin wildrye. Great Basin saltbush scrub blends into desert sagebrush scrub habitat on the upland mesa surrounding the reservoir. This area is dominated by sagebrush, shadscale saltbush, rabbitbrush, and black greasewood.
Native riparian and aquatic plants along the river upstream and (to a lesser extent) downstream from the reservoir include Fremont cottonwood, narrow-leaved willow, buffalo berry, common monkeyflower, common spikerush, beautiful spikerush, and Baltic rush. This riparian scrub-forest habitat is patchy and disturbed, and has been heavily invaded or replaced by tamarisk and, to a lesser extent, Russian olive.

For the Rye Patch, Pitt, and Rogers Dams there is no vegetation in the locations where proposed improvements would be installed.

Vegetation adjacent to the Rogers Canal consists of some of the vegetation found at Rye Patch in addition to weeds and crabgrass. The area that will be affected, including the canal, will be approximately 60 feet wide for the 1.3 mile section of the canal that will be reconstructed.

Rye Patch, Pitt, and Rogers Dams and Canal Environmental Consequences

Proposed Action
There is some potential for weeds to infest areas where the soil and existing vegetation have been disturbed. Areas of the project where the soil will be disturbed include an approximately 0.25 acre section in the parking area at Rye Patch and the 60 foot wide, 1.3 mile long section of the Rogers Canal. Implementation of BMPs including a noxious weed plan will prevent the spread of invasive plant species in these areas.

No Action
No vegetation or soil would be disturbed under the "No Action" alternative and so there would be no environmental consequences.

3.2.7 Hazardous Materials

Rye Patch, Pitt, and Rogers Dams and Canal Affected Environment

None of the proposed project sites have facilities that store or use hazardous materials.

Rye Patch, Pitt, and Rogers Dams and Rogers Canal Environmental Consequences

Proposed Action
Construction of the various project elements would involve the use of common hazardous materials, including, but not limited to, fuel, such as diesel and gasoline, oil, and lubricants. To reduce the risk of the release of any pollutants, the following BMPs would be implemented:

- Gasoline, oil, and lubricants would be transported in approved containers in accordance with National Fire Protection Association Code,
- Sorbent material would be maintained on site to absorb petroleum products spills occurring during construction.
- There are two water wells near the dam. Equipment will not be allowed near the water wells

The risk of using routine hazardous materials during project construction would be minimal.

No Action
No hazardous materials would be transported or used under the "No Action" alternative and so there would be no environmental consequences.

3.2.8 Visual Resources

Rye Patch Dam Affected Environment

The project vicinity is characteristic of the Great Basin environment; desolate, sunny, and brush-strewn valley floors are bordered by often barren, but frequently colorful, elongated, and steep mountain ranges. Vegetation on the valley floor grows low and evenly and primarily consists of monochromatic desert brush (US Navy 2000).

Rye Patch Dam is camouflaged by its surroundings. The dam`s design has three major structural features: an embankment, outlet, and spillway. On the west side of the spillway there is a small gate house. Below Rye Patch dam the Humboldt River is a low gradient meandering river.

Pitt Dam Affected Environment

The visual environment found in the Pitt Dam vicinity is similar to that found at Rye Patch Dam. Near Pitt Dam to the west there are agricultural fields, hay barns, and baled hay stack yards. To the east the terrain is similar to that seen at Rye Patch. There is dirt road on both sides of the dam and the dam has a wooden vehicular bridge across the crest.

Rogers Dam and Canal Affected Environment

The Rogers Dam vicinity is also comparable to Rye Patch. Near Rogers Dam to the north there is a heavily disturbed, well compacted area that has very little vegetation and relatively frequent vehicular traffic. There are also a few homes that can be seen in the distance.

South of the dam there is a disturbed well compacted area that also experiences vehicular traffic. The beginning of the Rogers canal can also be seen in this area with I-80 in the near distance.

The canal's visual environment is similar to that of the dam, however the canal is closer to I-80 than the dam. There are some homes nearby as well as local surface streets. There are also some agricultural fields adjacent to the canal and the area is generally flat.

Rye Patch, Pitt, and Rogers Dams and Rogers Canal Environmental Consequences

Proposed Action

The most significant visual change would occur at the Rye Patch Dam. The project there includes the construction of a power house near the existing gate house on the west side of the spillway. The new power house would be constructed to match the architecture of the existing gate house. Additionally, the hydropower turbine would be installed at the end of one of the existing penstock pipes. Both additions would have minor effects on the existing visual environment.

The improvements at Pitt Dam would only change the appearance of the top of two existing stoplog bays. The gates that would be installed on the dam would include two masts each. The masts would be approximately 6-feet high and would extend straight up above the top of the dam on either side of each gate (see Figure 5). Although this would change the appearance of the dam, the installation of the gates is non-invasive and the gates could be removed at any time.

Improvements at Rogers Dam will be nearly imperceptible and will actually improve the appearance of the Rogers Canal inlet. The water level sensor that would be installed at the Rogers Dam would not

require a solar panel and would be barely noticeable. The power gate hoist (see figure 4) that would be installed on the Rogers Canal structure would replace an existing manually operated hoist and would be similar to those installed on the Rogers Dam with the exception of the additional solar panel. The water level sensor that would be installed on the Rogers Canal would be similar to that shown in Figure 3. The improvements in the Rogers dam area would be in keeping with the existing visual environment.

The reconstruction of the Rogers Canal would not change how the canal appears currently. The reconstruction would mainly affect the appearance of the inside of the canal itself. There would be some increase in the height of the canal banks at end of the reconstructed section near the river but it would be minor and would not affect the general appearance of the area.

No Action
Modifications to the existing structures would not occur under the "No Action" alternative. The structures would continue to appear as they currently do and so there would be no environmental consequences.

3.2.9 Transportation

Rye Patch Dam Affected Environment

The project area is approximately 1.2 miles west of I-80 and 1.0 mile west of the Southern Pacific Railroad. Rye Patch Reservoir Road passes over the dam.

Pitt Dam Affected Environment

The Pitt Dam is 1.0 miles west of I-80 and 0.5 miles west of the Southern Pacific Railroad. Old Pitt Dam Road crosses over the crest of the dam.

Rogers Dam and Canal Affected Environment

The Rogers Dam is 0.2 miles north of I-80 and 0.7 miles east of the Southern Pacific Railroad. Rogers Dam Road approaches the dam but does not cross it. There is an unnamed dirt road leading up to the dam that crosses the crest and continues along the Rogers Canal. At one point, the Rogers Canal passes under I-80. Regarding surface streets in Lovelock, the canal runs parallel to Reservoir Road for approximately 0.2 miles and then passes under Airport Road. The closest the canal comes to the Southern Pacific Railroad is approximately 0.6 miles.

Rye Patch, Pitt, and Rogers Dams and Rogers Canal Environmental Consequences

Proposed Action
Transportation at Rye Patch and Rogers Dam would not be affected by the project elements that would be implemented at those facilities. Traffic across Pitt Dam would be interrupted for approximately one day but only 4 or 5 vehicles pass over the dam on an average day. Additionally, Upper Valley Road provides an alternate route around the dam.

Work on Rogers Canal could interrupt traffic for ½ day but it is unlikely that that will occur. If it did occur, traffic control standards would be maintained until project completion. Otherwise the proposed action will not affect transportation.

No Action
Transportation will not be affected under the "No Action" alternative since no work will be performed on the facilities.

3.2.10 Indian Trust Assets

Rye Patch, Pitt, and Rogers Dams and Rogers Canal Affected Environment

Indian Trust Assets (ITAs) are legal interests in property held in trust by the United States for Indian Tribes or individuals. The Secretary of the Interior, acting as the trustee, holds many assets in trust. Examples of objects that may be trust assets are lands, minerals, hunting and fishing rights, and water rights. While most ITAs are on reservations, they may also be found off-reservations.

The Lovelock Paiutes are located in the town of Lovelock, Nevada and the Fallon Paiute-Shoshone are located near the town of Fallon, Nevada. However, there are no ITAs at any of the proposed project sites.

Environmental Consequences- Both Alternatives
The proposed action and the no action alternatives would not affect Indian Trust Assets, since there are no trust resources within the project areas.

3.2.11 Environmental Justice

Rye Patch, Pitt, and Rogers Dams and Rogers Canal Affected Environment

Executive Order No. 12898, Environmental Justice, requires each federal agency to achieve environmental justice as part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects, including social and economic effects, of its programs, policies, and activities on minority and low-income populations. EPA guidelines for evaluating potential adverse environmental effects of projects require identification of minority populations when a minority population either exceeds 50 percent of the population of the affected area or represents a meaningfully greater increment of the affected population than of the population of some other appropriate geographic unit.

Analysis reveals that the ethnic composition of the populations of Pershing County is less than 50 percent and is not meaningfully different than the State of Nevada. Analysis of the percentage of persons below the poverty level for Pershing County reveals that the incidence of poverty in the County is not meaningfully different than the State of Nevada. Statistics for ethnicity and income for Pershing County and the state of Nevada are shown in Table 3.

Additionally, none of the proposed project elements are located in populated areas.

Description	Pershing County	Nevada
White	81.9 %	66.2 %
Black	3.7%	8.1 %
Native Americans	3.2 %	1.2 %
Asian	1.3 %	7.2 %
Pacific Islanders	0.1 %	0.6 %
Hispanic or Latino	22.3 %	26.5 %
Per-Capita Income (2010)	$17,519	$27,589
Median Household Income (2010)	$56,491	$55,726
Persons Below Poverty (percent, 2010)	13.7%	11.9%

Table 3 – Ethnicity and Income statistics for Pershing County (2010 U.S. Census)

Environmental Consequences - Both Alternatives

Neither the proposed action nor the no action alternative would disproportionately affect minority or low-income populations.

3.2.12 Soils

The project will require soil disturbances at Rye Patch Dam and the Rogers Canal only. Work on the Pitt Dam, Rogers Dam, and Rogers Diversion structure will be on the concrete structures only and will not require any soil disturbance.

Rye Patch Dam Affected Environment

The soils in the parking area at the Dam are heavily compacted due to years of vehicle traffic. The surface is paved with approximately 6 inches of gravel.

Rogers Canal Affected Environment

The 1.3 mile section of Rogers Canal that will be reconstructed is unlined and the cross section consists of native soils.

Rye Patch Dam Environmental Consequences

The construction of the new power house will require excavation for the foundation. The excavation will be approximately 3 feet deep and will disturb an area including approximately 400 square feet.

During construction, all fugitive dust will be controlled using best management practices. Since the disturbance will be relatively small, watering will be the method used for dust control. Once the power house is complete, the area to the west of it will continue to serve as a parking area.

Rogers Canal Environmental Consequence

Work on the Rogers Canal will require excavation and reshaping of the canal cross-section. Best management practices will be used to control all fugitive dust. The primary method for controlling the dust on the project will be watering.

The project will not change the appearance of the surrounding area. The only noticeable change will be the shape of the canal cross-section.

No Action
In the absence of the proposed project, the soils would remain as they are currently.

3.2.13 Floodplains

Rye Patch Dam Affected Environment

FEMA flood insurance rate map 320032-1550B shows that the area where construction will take place at Rye Patch Dam is located just outside of flood zone A.

Pitt Dam Affected Environment

Pitt Dam is located in FEMA flood zone A and is subject to the 100 year flood.

Rogers Dam Affected Environment

Rogers Dam is located in FEMA flood zone A and is subject to the 100 year flood.

Rogers Canal Affected Environment

Rogers Canal is located outside of the 100 year flood zone.

Rye Patch Dam Environmental Consequences

The last 100 year flood occurred in 1984 and the existing gate house was not affected. The project also would have no effect on the floodplain.

Pitt Dam Environmental Consequences

The Pitt Dam would be inundated in a 100 year flood event however the project would not change the floodplain. In the event of a flood, the gates that are proposed for the dam would allow for more rapid opening of the buttress bays to relieve floodwater pressure on the dam.

Rogers Dam Environmental Consequences

The Rogers Dam could be inundated in a 100 year flood event. However the proposed project would not change the floodplain nor would it be adversely affected by flood waters.

Rogers Canal Environmental Consequences

The Rogers canal is used during high flow events to divert water away from the river to prevent flooding. The reconstruction of the canal will make this function more efficient by allowing for the diversion of larger flows.

No Action
In absence of the proposed project all of the facilities would remain as they are currently.

3.2.14 Historic and Cultural Resources

Rye Patch, Pitt, and Rogers Dams and Rogers Canal Affected Environment

"Cultural Resources" is a broad term that includes prehistoric, historic, architectural, and traditional cultural properties. Those cultural resources that are included in or eligible for inclusion in, the National Register of Historic Places (NRHP) are referred to as historic properties. The criteria for NRHP eligibility are outlined at 36 CFR Part 60.4. Section 106 of the National Historic Preservation Act (NHPA) requires federal agencies to take into account the effects of their undertakings on historic properties. Compliance with Section 106 of the NHPA follows a series of steps outlined at 36 CFR Part 800. These steps are used to identify and consult with interested parties, determine the area of potential effects (APE) for an undertaking, determine if historic properties are present within the APE, assess the effects the undertaking would have on historic properties, and resolve any adverse effects to historic

properties before the undertaking is implemented. The Section 106 process also requires consultation with the State Historic Preservation Office (SHPO), Indian tribes, and other interested parties. Basin Research Associates of San Leandro, California, and their subcontractors conducted class III cultural resources inventory consisting of a pre-field records search and pedestrian survey of Rye Patch Dam, Pitt Dam, Rogers Dam, and Rogers Canal. The surveys were conducted March – April 2012. The purpose of this inventory was to identify cultural resources in the 17 acre discontinuous APE and to evaluate the eligibility of those resources for inclusion in the NRHP.

Through the surveys described above, three historic properties were identified in the APE: Rye Patch Dam, Pitt Dam, and Rogers Canal. Reclamation applied the criteria of adverse effect and Secretary of Interior Standards to all three historic properties. None of the proposed actions will adversely affect any of the characteristics that make these properties eligible for listing. There is very little to no potential to effect archaeological deposits. In summary, based on all of the available information, Reclamation finds the overall project will result in a finding of no adverse effect to historic properties pursuant to 36 CFR § 800.5(b).

Rye Patch, Pitt, and Rogers Dams and Rogers Canal Environmental Consequences

Proposed Action

Before finalizing this EA and signing a Finding of No Significant Impact, Reclamation will complete Section 106 compliance, including SHPO consultation, related to the Proposed Action for the Humboldt River Water Conservation Project. The Proposed Action will not be implemented until Reclamation has completed Section 106 compliance. Reclamation will make a determination of the effects of the undertaking based on all the available compliance documents prepared by Basin Research and Associates and Reclamation. Reclamation is in the process of consulting with the SHPO on the eligibility of the resources and the finding of effect and, with SHPO concurrence, the proposed water conservation project may proceed as planned. No work will occur until Reclamation's obligations under Section 106 of the NHPA have been fulfilled.

No Action

Under the No Action alternative, Reclamation would not allow grant funds to be used for the proposed project. Conditions related to cultural resources would remain the same as existing conditions. There would be no impacts to cultural resources under the No Action alternative.

4.0 CONSULTATION AND COORDINATION

4.1 Agencies and Individuals Contacted

Agency	Individual
Nevada Department of Wildlife	Tim Herrick
U.S. Fish and Wildlife Service	Robert Williams, Field Supervisor
U.S. Senate	Senator Dean Heller
U.S. Senate	Senator Harry Reid
Nevada Department of Transportation	Daryl James, Chief
Nevada Bureau of Water Pollution Control	Joseph Maez
Nevada Bureau of Safe Drinking Water	Jennifer Carr, Chief
Nevada Bureau of Air Quality Planning	Adele Malone, Planning Supervisor
Nevada State Historic Preservation Office	Rebecca Palmer, Historic Preservation Specialist
Nevada Division of Water Resources	Kelvin Hickenbottom, Deputy State Engineer
FEMA	Sara Owen
Federal Energy Regulatory Commission	To Whom it May Concern
U.S. Army Corps of Engineers	Kristine Hansen, Senior Project Manager
Natural Resources Conservation Service	Craig McKnight
Nevada Division of State Parks	To Whom it May Concern
Nevada Natural Heritage Program	Eric Miskow, Biologist/Data Manager
Lovelock Tribal Council	Chairman
Pershing County Commissioners	Karen Wesner, Chairman
Pershing County Floodplain Manager	Michael Johnson
Union Pacific Railroad	John Devish, Real Estate Contracts Manager
Humboldt River Ranch Association	To Whom it May Concern

4.2 List of Preparers

Bureau of Reclamation
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San Leandro, California 94577
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5.0 REFERENCES

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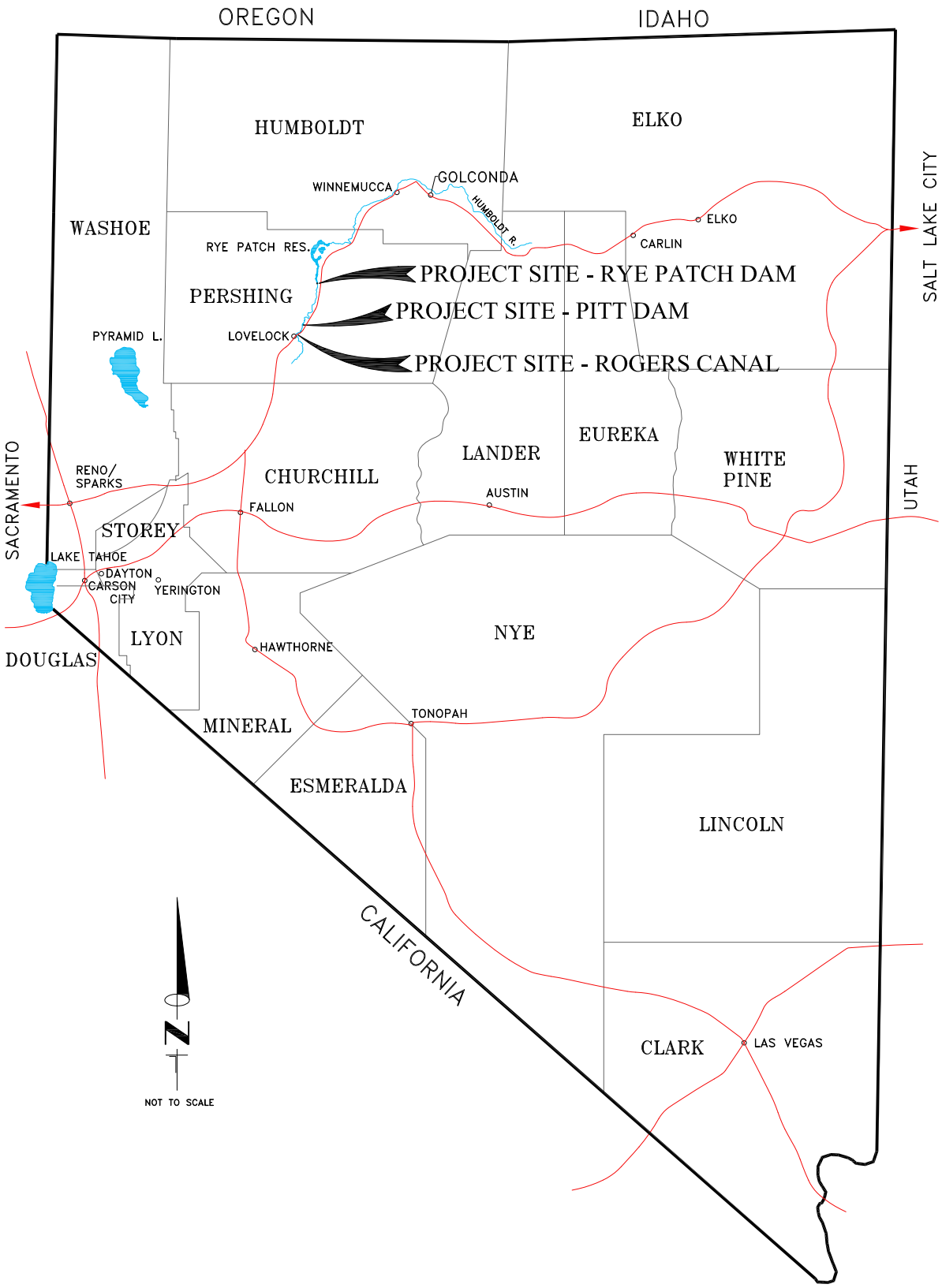
APPENDIX

Appendix - Project Element location maps



SHEET NUMBER			
E1	HUMBOLDT RIVER WATER CONSERVATION PROJECT PROJECT VICINITY	FARR WEST ENGINEERING 5442 LONGLEY LANE, SUITE B RENO, NEVADA 89511 PHONE: (775) 851-4788 FAX: (775) 851-0766	JOB NO.: 0374 PCWCD HYDRO DATE: APRIL, 2012 SCALE: AS SHOWN DESIGNED: DRAWN: CHECKED:
1 OF 1	PERSHING COUNTY NEVADA		

REVISION	DESCRIPTION	BY	APP	DATE

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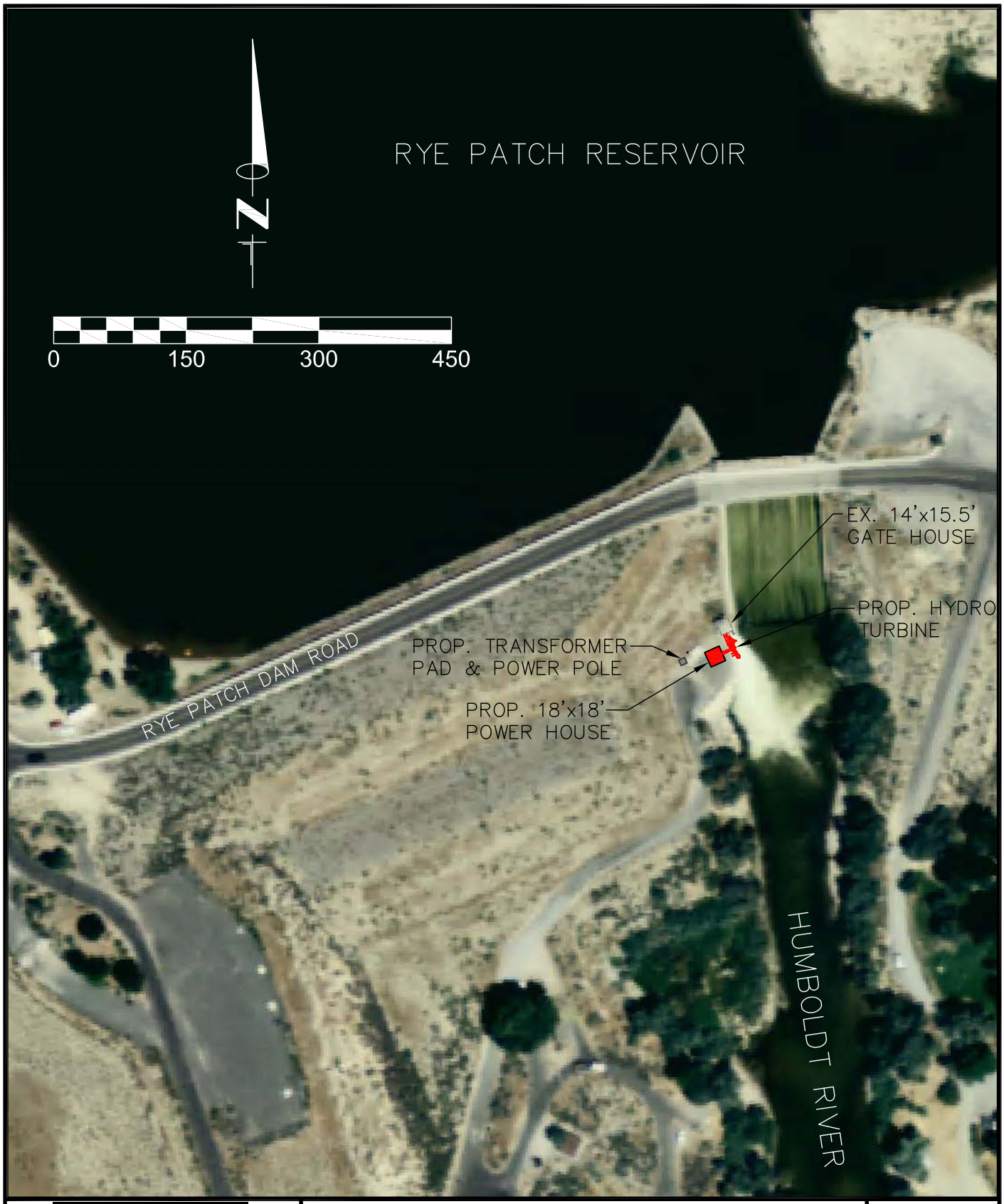

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HUMBOLDT RIVER WATER CONSERVATION PROJECT

RYE PATCH DAM SITE

PERSHING COUNTY NEVADA

PLATE 1

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