RECLAMATION
Managing Water in the West

Draft Environmental Assessment Shavano Falls Hydropower Project

Western Colorado Area Office
Upper Colorado Region

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ATTACHMENT A- Contract No. 2014-0031-CF-0001(Preliminary Lease of Power Privilege)

ATTACHMENT B-Temporary Use Permit (No. 14-LM-4A-00110)

Figure 1. Project Area

CHAPTER 1 – INTRODUCTION

PROPOSED ACTION

The proposed action is for the Bureau of Reclamation (Reclamation) to execute a Lease of Power Privilege (LOPP) to the Uncompahgre Valley Water Users Association (UVWUA) for hydropower development at existing Bureau of Reclamation facilities on the Montrose and Delta (M&D) Canal of the federal Uncompahgre Project. The LOPP would authorize the use of federal facilities and Uncompahgre Project water to construct, operate and maintain 2.8 megawatt (MW) hydropower facilities at a location known as "Shavano Falls." The proposed hydropower project would be located in Montrose County, Colorado, approximately 6.8 miles west of the town of Montrose, Colorado as shown in Figure 1.

The hydropower project would be located in a section of the M&D Canal between the CP Lateral and CQ Lateral headgates downstream of Coal Creek. This section of the M&D Canal drops approximately 184 ft to Coal Creek and creates the Shavano Falls. Water that currently goes over Shavano Falls would be diverted into a penstock and through the hydropower plant before returning to the M&D Canal and CQ Lateral to meet irrigation delivery demands downstream. The project also includes a 0.9 mile overhead interconnection line across private lands to bring the hydropower produced at that site to the power grid.

This Environmental Assessment (EA) is prepared in accordance with the National Environmental Policy Act, the Council on Environmental Quality Regulations for Implementing the Procedural Provisions of NEPA (40 CFR 1500-1508), and the U.S. Department of the Interior's regulations (43 CFR Part 46). The EA evaluates the environmental effects of permitting the construction and operation of the hydropower project.

NEED FOR AND PURPOSE OF ACTION

The purpose of the proposed action is to develop clean hydropower facilities consistent with federal regulations. A LOPP is needed for private development of a 2.8 megawatt (MW) hydropower plant on the M&D Canal at Shavano Falls. Current Federal policy encourages non-Federal development of environmentally sustainable hydropower potential on Federal water resource related projects. The LOPP would ensure that the development of hydropower would be implemented consistent with established authorities, purposes, and water operations for the Uncompahgre Project. The electricity generated by the Project would provide the UVWUA with an additional source of revenue that can be used to defray annual operating expenses associated with the Uncompahgre Project while assisting local utilities in meeting regional requirements and demands for renewable energy.

BACKGROUND INFORMATION

Uncompahgre Project

The Uncompahgre Project is a Reclamation irrigation project located in west-central Colorado, which is operated by the UVWUA. Irrigated lands surround the town of Montrose, and extend 34 miles along both sides of the Uncompahgre River to Delta, Colorado. Project features include Taylor Park Dam and Reservoir in Gunnison County, the Gunnison Tunnel, 7 diversion dams, 128 miles of main canals, 438 miles of laterals, and 216 miles of drains. The systems divert water from the Uncompahgre and Gunnison rivers to serve over 76,000 acres.

The Uncompahgre Project was authorized in 1903, under the provisions of the Reclamation Act. The Gunnison Tunnel was completed in 1909 and the Gunnison Diversion Dam was completed in January 1912, allowing delivery of water from the Gunnison River to the Uncompahgre Valley. Taylor Park dam, built from funds allotted under the National Industrial Recovery Act, was completed in 1937. The project was transferred to the UVWUA for operation and maintenance in 1932.

Montrose & Delta Canal

The M&D Canal, originally known as the private Uncompahgre Canal, began delivering water to the area west of the Uncompahgre River in 1883. Negotiations to purchase the canal for use in the Uncompahgre Project began in 1906, and the purchase was finalized in May of 1908. After the South Canal empties into the Uncompahgre River, about 2.2 miles downstream the M&D Canal diverts water from the river and transports it northwestward. On Franklin Mesa, the M&D Canal spills water into a man-made watercourse that cascades over the sandstone cliffs into Shavano Valley, forming what is known as Shavano Falls. Water not spilled over the canyon side continues northward in the CP Lateral. Water spilled over the falls is siphoned across Coal Creek into the CQ Lateral. The remaining flows over the falls enter Coal Creek, where it is picked up a few miles downstream in a continuation of the M&D Canal (aka C Canal).

Lease of Power Privilege

A Lease of Power Privilege (LOPP) is a contract between a non-Federal entity and the United States to use federal project facilities for electric power generation consistent with Reclamation project purposes. A LOPP must not impair the efficiency of Reclamation generated power or water deliveries, jeopardize public safety, or negatively affect any other Reclamation project purposes. The Uncompahgre Project includes the development of hydropower as an authorized project purpose. A LOPP has terms of 40 years, and the general authority includes, among others, the Town Sites and Power Development Act of 1906 (43 U.S.C. 522), and the Reclamation Project Act of 1939 (43 U.S.C. 485h(c)).

On August 3, 2013, Congress passed the Bureau of Reclamation Small Conduit Hydropower Development and Rural Jobs Act. This act requires that Reclamation first offer a LOPP to the irrigation district or water users association operating the federal project, or to the irrigation district or water users association receiving water from the federal project. The UVWUA is the water users association which operates the Uncompahgre Project.

In January 2014, a Preliminary Lease of Power Privilege (Contract No. 2014-0031-CF-0001) was entered into by Reclamation and the UVWUA to permit cost-recovery for the construction and operation of a hydropower facility at Shavano Falls. A copy of this contract is included as Attachment A. The LOPP on Shavano Falls must accommodate existing contractual, water delivery, and environment commitments related to operation and maintenance of the M&D Canal and the Uncompahgre Project. All costs incurred by the United States related to development and operation and maintenance under the LOPP, including NEPA compliance, engineering reviews, and development of the LOPP, are the expense of UVWUA.

CHAPTER 2 – PROPOSED ACTION AND ALTERNATIVES

Alternatives evaluated in this EA include the No Action Alternative and the Proposed Action Alternative.

NO ACTION ALTERNATIVE

Under this alternative, execution of a LOPP between Reclamation and UVWUA for construction, operation, and maintenance of a hydropower facility at Shavano Falls along the M&D Canal would not occur.

PROPOSED ACTION

Under the Proposed Action, Reclamation would execute a LOPP to permit UVWUA to construct, operate, and maintain a 2.8 MW hydropower plant and associated facilities adjacent to the M&D Canal. The existing CP Lateral diversion will be moved, and a new structure would serve as a diversion for the CP Lateral and divert M&D Canal and CQ Lateral flows into a penstock for the hydroelectric facility (Figures 2 and 3).

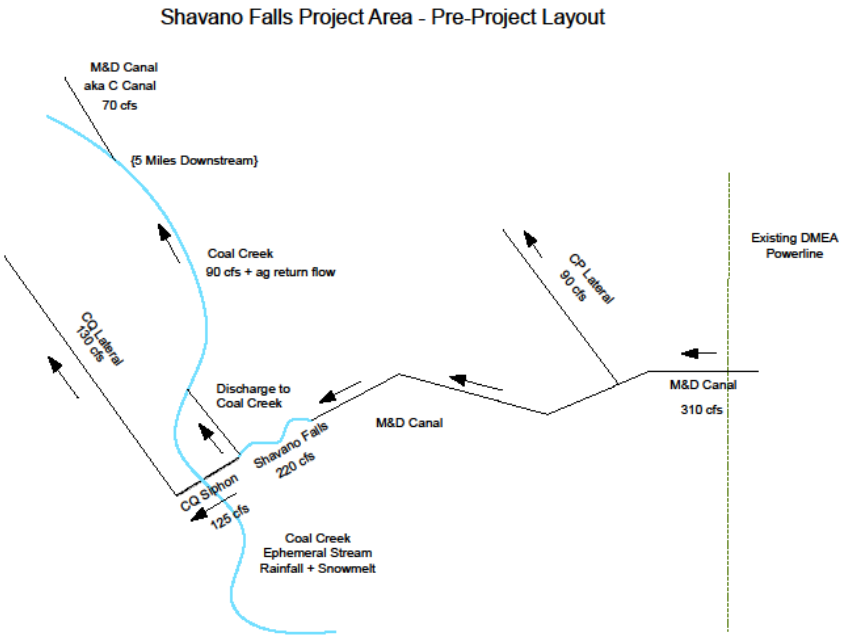

Figure 2. The existing layout of the Shavano project area. The arrows show the direction of flow.

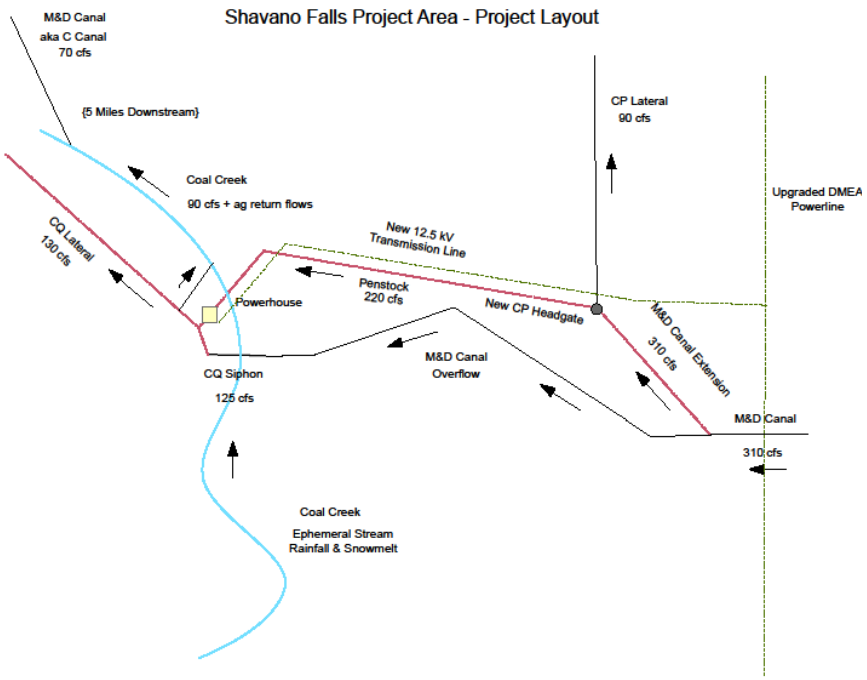

Figure 3. Proposed project layout. Modified laterals and the penstock are displayed in red. Arrows show the direction of flow.

Hydropower Project Design

Project designs would be reviewed and approved by Reclamation prior to authorizing construction. Existing diversion structures and the CQ Lateral siphon would remain in place and would be maintained to meet irrigation deliveries during construction and if the penstock or hydropower plant are down for repairs or maintenance during the irrigation season. Power produced would be wheeled by the Delta Montrose Electric Association (DMEA), to the Municipal Energy Association of Nebraska (MEAN). The project includes a new interconnect line and will require 0.9 miles of new overhead line to reach the substation. The interconnection line will be outside of the existing Uncompahgre Project facilities and rights-of-way.

Project designs include improving the existing canals and related structures to convey the entire M&D Canal flows in an expanded reach of the CP Lateral, then into a 69 inch diameter penstock 1,790 feet in length before producing power through the 2.8 MW powerplant, and then returning flows to the M&D Canal and CQ Lateral downstream. This will be a parallel bypass of water and will not alter irrigation deliveries. A summary of the hydropower project features are described in greater detail below. Additional details can be found in the project's supporting design report (Sorenson Engineering 2013):

A. **Diversion/Bypass**-The existing CP Lateral will be replaced. It will serve as a diversion and a bypass structure for the hydroelectric facility. A second diversion (intake) will be constructed downstream of the powerhouse in the CQ Lateral to divide water between the CQ Lateral and Coal Creek. The CP Diversion will consist of a 20' wide by 4' high roller gate which will serve as a bypass for the hydroelectric facility. A secondary fail-safe bypass will consist of a 20' long weir and two 5' wide automatic trip gates (ATG).

B. **Canal System**-The M&D Canal is an earth embankment structure which serves Uncompahgre Project lands and is operated and maintained by UVWUA. The M&D Canal will not be altered. Prior to the 2014 irrigation season, UVWUA enlarged a 1200' long section of the CP Lateral on private lands to increase capacity from 90 cfs to 310 cfs, in anticipation of delivering the Shavano Drop water to the intake for the hydroelectric facility. UVWUA also modified the CQ Lateral by digging the lateral to the level anticipated to be needed for water coming out of the powerhouse. Coal Creek will not be altered.

C. **Intake**-The intake structure will be located approximately 1200' downstream of the CP Diversion. It will be a new bulkhead structure consisting of two 48' wide sluice gates to continually feed the CP Lateral. Flows in the CP Lateral downstream of the intake will not be altered. A 20' wide concrete feeder canal will be utilized to divert flow from the CP Lateral to the steel penstock. A 20' wide roller gate will be placed in this new section to shut off flows to the hydroelectric facility. The 69" diameter penstock will deliver water to the generation unit in the powerhouse. A bar screen and mechanized trash removal system will be utilized.

D. **Bypass**-During turbine shutdown or startup, the automatic electric motor will drive on the bypass roller gates at the intake, and the CP Diversion will operate at rates to match the turbine wicket gates, i.e. maintain constant upstream water level and thus constant movement of flow, including upstream flow modifications. The bypass structure will include two 5' wide automatic trip gates which will function as a redundant safe guard in the event the plant shuts down for any reason and the bypass gate is not able to divert the required flows. In conjunction with the ATGs, a 20' long weir wall will be added at the CP Lateral to return excess flows to the canal.

E. **Powerhouse**-The powerhouse will be a steel building structure with a reinforced concrete foundation. The foundation will embed the turbine housing and steel draft tube. The building will be approximately 40' wide by 30' long and house the generator and mechanical/electrical auxiliaries. The building will be equipped with a roof access hatch to facilitate future maintenance. Powerhouses and substations will be non-reflective and painted to blend with the project area background.

F. **Turbine**-The turbine will be a horizontal Francis. The turbine will be of American/European design built in China, as will be the generator. The turbine manufacturer is represented by Far East Engineering of Boise, Idaho.

Construction of the hydropower facility is currently a private venture, however UVWUA has applied for grants from state and federal sources. Construction is expected to take between 6 and 9 months at a cost of approximately $8 million. Construction activities would be coordinated with canal operations and on-going irrigation delivery. Normal irrigation deliveries would be maintained throughout construction. The UVWUA has already increased the capacity of sections of the CP and CQ Laterals to handle the additional flows for the M&D associated with the hydropower project. This was completed on private lands by UVWUA during the spring of 2014, in anticipation of approval of the LOPP. Storage areas and staging areas during

construction would be adjacent to the CQ Lateral below the existing falls. Existing roads would be used for construction access, with the exception of the Shavano Falls CCC road. This road would not be used for construction access (see the Cultural Resource Section). The UVWUA also requested temporary construction access across Coal Creek on Reclamation lands. Reclamation issued the temporary use permit which authorizes the discharge of fill material for the temporary construction and use of the access road subject to approval by the Army Corps of Engineers (ACOE) under Section 404 of the Clean Water Act. A copy of the temporary use permit and ACOE's authorization are attached as Attachment B. UVWUA will be responsible for obtaining any other required Federal, state, or local permits to construct and operate the Project, including permits under the Clean Water Act (Section 402 and 404 permits) which may be needed for dewatering or other construction activities.

Disturbed land would be contoured to prevent erosion, and topsoil, where available, will be stockpiled during construction for later use in re-vegetation. A seeding mix specifically designed for the impact area would be used, and long-term weed control would be implemented. Additional information is found in Chapter 3 under Environmental Commitments.

Operation

UVWUA anticipates that the units would be operated by an automatic computer (unmanned) control located at the plant, fitted with a dial-in signal to allow remote monitoring of the plant, including critical variables (temperature, voltage, etc) from any telephone. In addition, the control panel will be fitted with an automatic telephone dialer to alert of alarm conditions. The facilities will be utility grade with battery system operation of essential features during power outages.

At the beginning of each irrigation season, water would be discharged through the irrigation system and powerplant to exercise the gates and make certain all systems associated with the project are in working order.

The facilities would be designed and equipped with structures to protect existing canal and irrigation flows. The Uncompahgre Project was authorized under provisions of the Reclamation Act of 1902. The Uncompahgre Project was also authorized to allow for the sale of hydroelectric power under the Act of June 28, 1938 (52 Stat. 941). The hydropower project would be operated as a run-of-canal plant, and diversions to the M&D Canal from the Uncompahgre River and irrigation deliveries would not change. During the irrigation season, the Project would divert flows from the M&D Canal through the penstock and through the powerplant, and then return the water to Coal Creek and the CQ Lateral immediately below the powerplant. There would be no increases in diversions from the Uncompahgre River authorized by the LOPP for the hydropower project. No hydropower production would occur outside the normal irrigation season (November through February). Water available for hydropower is discussed further in Chapter 3 under Water Resources.

The electricity generated by the Project would provide UVWUA with a source of revenue that can be used to defray annual operating the maintenance expenses.

SUMMARY

Table 1. Summary of potential impacts for alternatives

Resource	No Action Alternative	Hydropower Development at Shavano Falls
Energy production	None	12,973 megawatt-hours (MWh) of energy per year
Wetlands and riparian resources	No Effect	Temporary Impacts associated with construction at Coal Creek and the permanent loss of 0.04 acres association with pier foundation for penstock.
Recreation use	No Change	No Effect
Fisheries	No Change	No Effect
Water rights/streamflows	No Effect	No change in water rights. Decrease flows in a 1,000-foot section of Coal Creek during irrigation season
Endangered Species	Uncompahgre Project depletions are included in the Gunnison Basin PBO	No Change to endangered fish, no effect to other listed species.
Wildlife and vegetation	No Change	Temporary impacts associated with construction and maintenance of the hydropower facilities
Water supply for irrigation and municipal uses	No Change	No Change
Cultural Resources	No Effect	Adverse effects to some NRHP eligible historic resources, but impacts will be mitigated as stipulated in MOA developed between Reclamation and SHPO
Air Quality	No Change	Minor changes in Air Quality during construction associated with fugitive dust. Active dust abatement program implemented to keep changes in air quality to an insignificant level. Offset emissions of carbon dioxide (estimated at 27 to 28 million pounds per year) and other greenhouse gases
Noise	No Change	Temporary increase of noise levels during construction; distance from any nearby structures combined with enclosure of project equipment will result in no significant long-term effect
Socio-economics	No Effect	Assist in providing a source of renewable energy for MEAN to market to retail municipal utilities throughout Colorado; temporary benefit of increased construction jobs. Increased employment/tax revenues. Long-term benefit to UVWUA members resulting from sale of power.

CHAPTER 3 – AFFECTED ENVIRONMENT & ENVIRONMENTAL CONSEQUENCES

This chapter discusses resources that may be affected by actions taken to construct and operate a hydropower plant on the M&D Canal at Shavano Falls. For each resource, existing conditions and impacts are described. This chapter is concluded with a list of environmental commitments.

UNCOMPAHGRE PROJECT OPERATIONS AND WATER RESOURCES

Existing Conditions: The Uncompahgre Project is authorized and operated to provide water supplies for irrigation in the Uncompahgre Valley. Irrigation supplies are developed from four sources: direct flow diversions from the Uncompahgre River, storage water from Ridgway Reservoir, direct flow diversions from the Gunnison River, and storage water from Taylor Park Reservoir. Water associated with the Proposed Action is directly diverted from the Uncompahgre River.

Flows were measured several times during the 2012 irrigation season at a location between the CP Lateral headgate and the top of Shavano Falls. These measured flows were then combined with the records of the turn-on and shut-off dates for the irrigation seasons from 1997-2012. An estimated average daily flow of 220 cubic feet per second (cfs) in the M&D Canal downstream of the CP Diversion would be available for hydropower production. Irrigation deliveries generally begin at the end of March and the flows in the M&D Canal quickly reach 220 cfs, and remain constant until the end of the irrigation season in late October. Irrigated acres serviced by the lower section of the M&D Canal have remained constant over time, and is projected to remain unchanged in the foreseeable future.

No Action Alternative: Under the No Action Alternative, there would be no changes to current irrigation deliveries or operations. M&D Canal diversions from the Uncompahgre River vary from year to year due to water availability, weather patterns, crop and land use patterns, and other factors. This variability would continue with or without the hydropower project. Changes in climate or major changes in cropping or land use patterns may also affect irrigation diversions and water use patterns.

Proposed Action: Under the proposed action, the water diverted in the M&D Canal for irrigation would also be used for hydropower production. There would be no change in operations, the timing, or the amount of water diverted into the M&D Canal. The power plant would be operated as a run of the canal facility, and existing irrigation supplies and deliveries would not be

affected. Additional improvements to existing canals, laterals, and diversion structures would occur outside the irrigation season. Hydropower production would only occur during the irrigation season.

ENERGY AND SOCIOECONOMIC CONDITIONS

Existing Conditions: Hydropower has been developed previously at two sites along the South Canal, and additional hydropower developments are planned at other locations. The existing and proposed Uncompahgre Project hydropower projects are located in the Rocky Mountain Power Area of the Western Electric Coordination Council Region of the North American Electric Reliability Council.

In the short-term, the proposed project would be used to meet a portion of the electricity demand in Municipal Energy Agency of Nebraska's (MEAN) service territory. MEAN is part of the Nebraska Municipal Power Pool and was organized in 1980 to secure power supply for its members and provide related administrative and technical services. MEAN combines the capacities of a number of municipally-owned plants with Western Area Power Administration power and purchased power. MEAN supplies power and energy to approximately 40 municipalities in Nebraska, Colorado, and Kansas (Nebraska Power Review Board 2014). There is existing potential for future power produced from the Shavano Hydropower Project to be used to meet future local power demands. Demand for electricity in Delta-Montrose Energy Association's service territory has been on an ever increasing trend for decades. The peak demand and annual energy requirements for the Rocky Mountain Power Area are projected to increase at an average annual compound rate of 1.8 to 2.0 percent (WECC 2004). The proposed project would help meet this rising demand.

Amendment 37 to the Colorado Constitution established a Renewable Energy Standard which requires each provider of retail electric service in the State of Colorado that serves over 40,000 customers to secure a minimum percentage of electricity (10% by 2015) from renewable energy sources such as wind, solar, and hydroelectricity.

The Uncompahgre Project and water supplies from the Gunnison and Uncompahgre rivers are critical to the economies of Delta and Montrose Counties, and west-central Colorado. The Uncompahgre Project supports over 66,000 acres of irrigated agriculture through a series of over 500 miles of canals and laterals. The M&D Canal's main channel extends 31.4 miles from south of the City of Montrose to southwest of the City of Delta, and was designed to carry flows up to 650 cfs. In total, the M&D Canal serves 75 laterals and sub-laterals for a total of 72.75 miles in length, and irrigates 33,600 acres. Principle crops harvested on the irrigated lands include alfalfa, wheat, corn, dry beans, and small grains (Colorado Decision Support Systems).

No Action Alternative: Under the No Action Alternative, UVWUA would not build a hydropower facility at Shavano Falls and economic opportunities associated with the hydropower project would be forgone.

Proposed Action: The new hydropower project would produce an estimated average of 12,973 megawatt-hours (MWh) of energy per year based on run of the canal flows, and would help meet regional power demands in the future. Power from the proposed project would be distributed through MEAN facilities in Colorado, Nebraska and Wyoming.

The life of the project is expected to extend well beyond 50 years, and could thus provide UVWUA a long-term, reliable revenue stream. According to initial estimates, revenues could be relatively small at first, dependent on financial terms of interest and amortization schedule, but the project should produce positive cash flow once operations start. The projections are highly dependent on interest rates and actual operation and maintenance costs. However, after the project debt is paid, the long-term life for which the project will be designed results in revenues to the UVWUA to help pay for Uncompahgre Project operation and maintenance costs.

The proposed project will provide an additional source of renewable energy for MEAN to market to municipalities throughout Colorado, which could then help those agencies reach the Renewable Energy Standard.

There would be short-term employment and spending on goods, services, and materials during the construction period, with an overall increase in the level of income in the county during the construction phase. This would benefit local communities and businesses, as well as increase tax revenues from taxes collected on these purchases.

The transport and delivery of irrigation or municipal and industrial water in the M&D Canal would not be affected by hydropower development during construction, operation, or any future maintenance project.

FISHERIES

Existing Conditions: Prior to construction of Ridgway Dam, the Uncompahgre River was a very poor fishery. The Uncompahgre River downstream of Ridgway Dam has now become a popular tailwater fishery with brown, rainbow and cutthroat trout maintained by a stocking program of the Colorado Division of Parks and Wildlife. As the river enters the Uncompahgre Valley, water temperatures warm, changing the river from a cold water to a warm water fishery. Water is diverted from the Uncompahgre River to the M&D Canal approximately 11 miles downstream of Ridgway Dam.

Coal Creek is a small tributary to Dry Creek. Water flows through Shavano Falls and enters either the CQ Lateral or Coal Creek. Above the project area, Coal Creek is an ephemeral stream, meaning it only has water flowing in it naturally after precipitation events or snowmelt, and it also receives irrigation return flows from the West Canal. During the irrigation season, an additional 90 cfs is diverted into Coal Creek below Shavano Falls. Approximately five miles downstream, about 70 cfs is diverted into the lower portion of the M&D Canal (aka C Canal). Remaining flows continue downstream where Coal Creek merges with Dry Creek and eventually the Uncompahgre River. Both Coal Creek and Dry Creek receive irrigation return flows from the surrounding fields. Fisheries in Coal Creek are limited by the intermittent flows and warmer irrigation return flows (CPW 2014). A 1975 CPW electrofishing record at the confluence with

Dry Creek estimated 100 percent of the fisheries were rough fish consisting of white sucker, long nose sucker, and dace.

No Action Alternative: Under the No Action Alternative, hydropower would not be developed at Shavano Falls. There would be no changes to the fishery conditions in the Uncompahgre River.

Proposed Action: Diversions from the Uncompahgre River would not change due to operation of the hydropower project. Habitat conditions in the Uncompahgre River will not change. Project designs incorporate a trash rack and screen above the penstock intake. The trash rack and screen are adequate to prevent large fish that could have normally gone over the falls from entering the penstock. The 90 cfs normally diverted to Coal Creek below Shavano Falls would be moved about 1,000 ft downstream. This will result in reduced flows in that 1,000 ft segment of Coal Creek during hydropower operations. The reduced flows are not predicted to significantly impact the existing fisheries in Coal Creek.

WILDLIFE AND VEGETATION

Existing Conditions: Native vegetation in the study area include mixed salt desert scrub, pinyon-juniper woodland, cottonwood riparian forest, herbaceous wetland, greasewood flat, disturbed ruderal areas, agricultural fields, and residential landscaped areas. The M&D Canal introduced a water supply to the area approximately 130 years ago. Seepage from the canal supports patches of 4-wing saltbush, and in wetter areas, cattail, willows, and cottonwoods. Some previously disturbed areas near the canal support Russian knapweed, Russian olive, and kochia.

The project area provides limited winter range for mule deer and occasionally elk. There are no prairie dog towns or known raptor nests in the hydropower project area.

No Action Alternative: Under the No Action Alternative, no hydropower facility would be developed at Shavano Falls. There would be no changes to the existing wildlife and vegetation conditions.

Proposed Action: Much of the project area has been disturbed in the past during construction, operations, and maintenance of the M&D Canal, CP, and CQ Laterals.

Bio-Logic Inc. (2014) completed a wetlands inventory of the project area to delineate jurisdictional wetlands that occur along Coal Creek. The inventory identified Coal Creek, the CP Lateral, and 4 wetlands as potentially jurisdictional Waters of the United States (WoUS). WoUS are subject to the provisions of the Clean Water Act.

Approximately 415 feet of the ordinary high water mark (OHWM) of Coal Creek and the CP Lateral occur within the project area. Wetlands 1-3 are within the Coal Creek floodplain and Wetland 4 is located on the side of Spring Creek Mesa, below a sandstone outcrop. Delineated wetlands are described below:

Wetlands 1-A 0.346 acre-wetland confined to the floodplain terrace on the west-side of Coal Creek. Dominate vegetation is tall fescue, creeping wild rye, and salt grass. Small patches or reed canary grass are also present as well as Canada thistle, sweet meliot, western aster, showy milkweed, horsetail, and artic rush, tamarisk and greasewood.

Wetlands 2 and 3-These two wetlands are confined to a narrow strip of bank of the floodplain terrace on the east side of Coal Creek and consist of hydrophytic vegetation dominated by reed canary grass. Wetland 2 is 0.011 acre and Wetland 3 is 0.007 acre, in size.

Wetlands 4- A 0.077-acre wetland on the west-facing side of Spring Creek Mesa, below the sandstone outcrop that forms the mesa edge and is dominated by tall fescue and redtop bentgrass associated with reed canary grass, alkali muhly, and orchard grass. One broadleaf cottonwood and one juniper are also located within this wetland.

As mentioned previously, a temporary access road across Coal Creek has been permitted by Reclamation and the ACOE. This authorization allows for the temporary discharge of 72"culvert and associated fill material that will temporary affect about 0.04 acres of palustrine emergent wetlands (Wetland 1 and 0.02 acres of Coal Creek. A copy of the ACOE authorization and special conditions is included in Attachment B).

Construction of one of the piers to support the Penstock crossing over Coal Creek would require a small discharge of concrete to support the pier. The pier is estimated to result in the permanent loss of about 0.04 acres of Wetland 1. Approximately 166 yd^3 of soil would be removed to construct a ditch to discharge the 90 cfs back to Coal Creek and meet irrigation demands downstream in the lower M&D Canal. Both activities affect Waters of the US subject to Section 404 of the Clean Water Act. The UVWUA would request authorization from the ACOE for these activities associated with construction of the hydropower facilities under Nationwide Permit No. 17, Hydropower Projects. A copy of the Nationwide Permit Summary (NWP) is included as Attachment C. The NWP requires the permittee to submit a pre-construction notification to the ACOE district engineer prior to commencing the activity. Any permits restrictions included in the ACOE authorization would be incorporated as environmental commitments.

Temporary impacts to wildlife and other vegetation would also occur due to the construction of the hydropower facilities. Approximately 10 acres of land would be disturbed during construction of the hydropower facilities at Shavano Falls as shown in Figure 4. Erosion-control Best Management Practices for drainage and sediment control will be implemented to prevent or reduce nonpoint source pollution during and following construction. Fuel storage, equipment maintenance, and fueling procedures will be developed to minimize the risk of spills and the impacts from these incidents. A Spill Prevention Control and Countermeasure Plan (SPCC) will be prepared prior to construction. With these control measures in place, wildlife impacts are predicted to be minor, and due primarily to direct disturbance associated with construction. Wildlife may avoid using the area during construction.

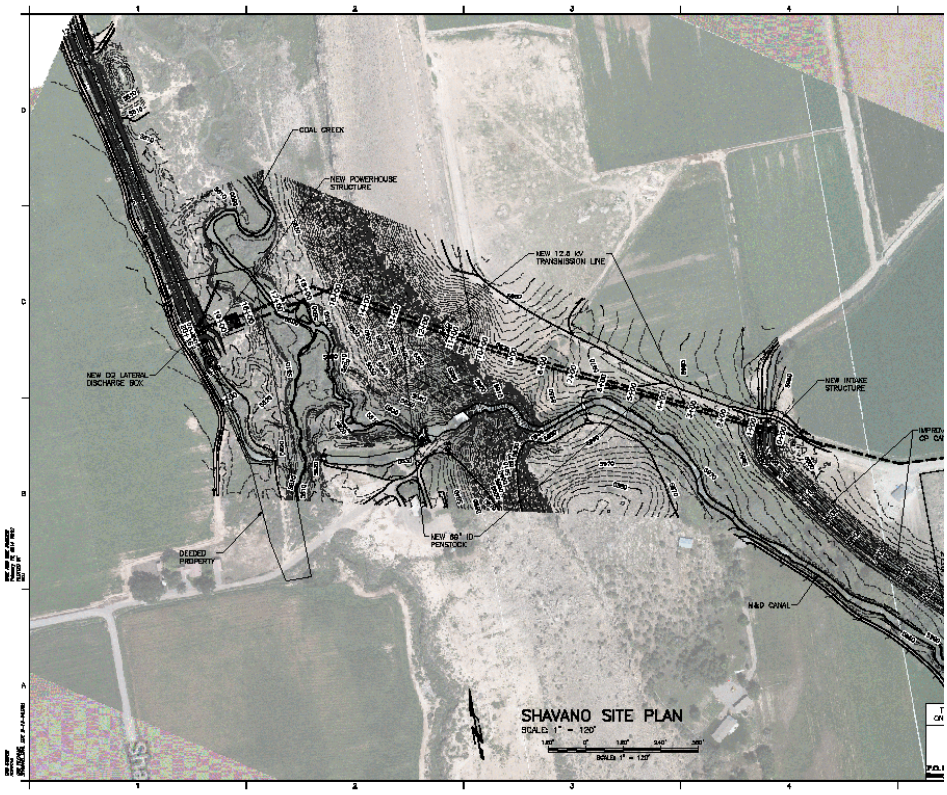

Figure 4-Shavano Falls Site Plan

Invasive and non-native plant species such as Russian knapweed, Russian olive, and kochia will be controlled within the project area for the life of the project by UVWUA as a condition of the LOPP, which will benefit native plant and animal species that utilize the area. UVWUA is responsible for consultation with Reclamation for acceptable weed control measures, including pesticides/herbicides approved for use on Reclamation land. Use of pesticides/herbicides will comply with the applicable Federal and state laws, and will be used only in accordance with their registered uses and within limitation imposed by the Secretary of the Interior. All construction equipment will be power-washed and free of soil and debris prior to entering the construction sites to reduce the spread of noxious and unwanted weeds. Topsoil, where available, will be stockpiled during construction for later use in re-vegetation. Disturbed areas will be contoured to reduce erosion and facilitate re-vegetation and will be re-seeded. The plan for re-vegetation and related erosion control/re-contouring and implementation will require approval by Reclamation. The UVWUA would work directly with Reclamation and adjacent landowners to re-vegetate disturbed areas and develop appropriate seed mixtures.

RECREATION

Existing Conditions: On Franklin Mesa, the M&D Canal spills water into the man-made watercourse that cascades over sandstone cliffs and enters the Shavano Valley, forming what is known as Shavano Falls. Recreation opportunities on the lands around Shavano Falls are limited because of the lack of public lands. Reclamation owns a 20 acre parcel that surrounds the falls and includes a UVWUA Ditchrider's residence and the CQ Lateral Siphon.

Areas adjacent to any canal and falls are dangerous. The maintenance road along the canal is steep and narrow in places and can be dangerous, especially when wet. For these reasons, public access is not allowed.

No Action Alternative: Under the No Action Alternative, hydropower facilities would not be constructed at Shavano Falls. There would be no change in recreation from existing conditions.

Proposed Action: Under the Proposed Action, hydropower facilities would be constructed at Shavano Falls. The watercourse created by the M&D Canal spillwater will be located within the pinstock, which will alter the ambience of the artificial falls. The project would have no effect on recreation.

THREATENED AND ENDANGERED SPECIES

Existing Conditions: Table 2 includes species which are listed under the Endangered Species Act as endangered, threatened, or are a candidate for listing which are potentially occurring in Montrose County or in downstream rivers.

Table 2. Special status species in Montrose County

Common Name	Scientific Name	Status	General Habitat
Bonytail	*Gila elegans*	Endangered	Colorado River and major tributaries
Colorado hookless cactus	*Sclerocactus glaucus*	Threatened	River benches, xeric slopes with cobbles and pebbles
Clay-loving wild buckwheat	*Eriogonum pelinophilum*	Endangered	Adobe hills
Colorado pikeminnow	*Ptychocheilus lucius*	Endangered	Colorado River and major tributaries
Greenback cutthroat trout	*Oncorhynchus clarki stomias*	Threatened	Small, high elevation streams
Humpback chub	*Gila cypha*	Endangered	Colorado River and major tributaries
Razorback sucker	*Xyrauchen texanus*	Endangered	Colorado River and major tributaries
Black-footed ferret	*Mustela nigripes*	Endangered	Prairie dog towns
Mexican Spotted owl	*Strix occidentalis lucida*	Threatened	Closed-canopy forests or rocky canyons

Yellow-billed cuckoo	*Coccyzus americanus*	Proposed Threatened	Riparian, cottonwood woodland
Skiff milkvetch	*Astragalus*	Candidate	Sagebrush parks
North American wolverine	*Gulo gulo luscus*	Candidate	Mountainous wilderness areas
Gunnison prairie dog	*Cynomys gunnisoni*	Candidate	Western Montrose County
Gunnison sage-grouse	*Centrocercus minimus*	Proposed Endangered	Colorado plateau, basin big sagebrush

Generated by the U.S. Fish & Wildlife Service's Environmental Conservation Online System on 03/07/2014.

The clay-loving wild buckwheat is found in specific microhabitats in the adobe hill areas along the eastern side of the Uncompahgre Valley, and it is endemic to Delta and Montrose Counties, Colorado. In the past, its habitat was fragmented and lost due to agricultural, road, and housing development. Currently, habitat is threatened by off-road vehicle use and expansion of housing areas. Vegetation surveys of the project's direct and indirect impact area did not record this species (Bio-Logic 2013 and Reclamation 2014b). There is no suitable habitat for clay-loving buckwheat within the project area.

The Colorado hookless cactus occurs primarily on alluvial benches (soils deposited by water) along the Colorado and Gunnison Rivers and their tributaries. The cactus generally occurs on gravelly or rocky surfaces on river terrace deposits and lower mesa slopes, and it is endemic to Delta, Montrose, Mesa, and Garfield Counties, Colorado. Ongoing and forseeable threats include mineral and energy development, illegal collection, recreational off-road vehicle use, and grazing. Vegetation surveys of the Project's direct and indirect impact area did not record this species (Bio-Logic 2013 and Recreation 2014b). The 2013 Bio-Logic inventory identified suitable habitat but no Colorado hookless cactus was found during the inventories.

The endangered bodytail, Colorado pikeminnow, humpback chub, and razorback sucker are found in the Gunnison and/or Colorado Rivers downstream from the project area, and are influenced by water use activities in the basin that affect both the quantity of flows and quality of water. In accordance with Section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 et seq.), and the Interagency Cooperation Regulations (50 CFR 402), the Fish and Wildlife Service (2009) issued a Programmatic Biological Opinion (PBO) for the Gunnison River and effects on the endangered Colorado pikeminnow, humpback chub, bonytail, and razorback sucker and their critical habitats. Consultation for the Gunnison River basin includes operation and depletions associated with existing Reclamation projects, including the Uncompahgre Project, other Federal projects, and existing non-federal water depletions.

Potential habitat for other listed species does not occur in areas affected by the hydropower project. Designated critical habitat occurs about 18 miles downstream below the confluence of the Gunnison River and Uncompahgre Rivers.

No Action Alternative: Under the no action alternative, there would be no change in effect to any threatened, endangered, or candidate species in Montrose County, Colorado.

Proposed Action: Under the proposed action, there would be no new effects on endangered, threatened, or candidate species or their habitat due to the development of any features of the hydropower project. There are no listed species present in areas that would be affected by construction, and there would be no changes in river flows or water quality that could affect the downstream endangered fish. Water depletions associated with the Uncompahgre Project were consulted on and addressed in the Gunnison Basin Programmatic Biological Opinion (FWS 2009) and, no additional consultation is needed for this project.

INDIAN TRUST ASSETS & ENVIRONMENTAL JUSTICE

Indian trust assets (ITAs) are legal interests in property held by the United States for Indian Tribes or individuals. Reclamation and other Federal agencies share the responsibility to protect these assets. There are no potentially affected ITA's in the project area, and therefore no impacts are projected.

Executive Order 12898 on Environmental Justice provides that Federal agencies analyze programs to assure that they do not disproportionately adversely affect minority or low income populations or Indian Tribes. There are no potentially affected minorities or low income populations or Indian Tribes affected by the project, and therefore, no impacts are predicted under the alternatives.

CULTURAL RESOURCES

Existing Conditions: The project impact area has been inventoried for cultural resources (Horn 2013). There were no prehistoric sites located; however, Reclamation determined that the M&D Canal, the CQ Lateral, the CP Lateral, and the CCC Shavano Falls Road are eligible for inclusion on the National Register of Historic Places (NRHP), or they contribute to officially eligible sites. The Colorado State Historic Preservation Officer (SHPO) has reviewed and concurred with Reclamation determinations. A brief description of these cultural resources is presented below.

The M&D Canal originated as the Montrose Canal and a pioneer canal in the Uncompahgre Valley, constructed between 1883 and 1888 by the Montrose & Delta Canal Company to convey water from the western side of the Uncompahgre River to farmland on the western side of the valley, namely Spring Creek and California Mesa. In 1907, the United States Government purchased the canal for use in the federal Uncompahgre Project.

The CQ Lateral was originally known as the East Coal Creek Lateral and it is unknown if it existed as part of the original M&D Canal system. Construction or improvements under the federal Uncompahgre Project were completed on the lateral between 1910 and 1912.

The CP Lateral was originally known as the Franklin Mesa Lateral and is believed to be part of the original M&D Canal system. The lateral was improved in 1911 and again in 1932 when the timber diversion at the head of the lateral was replaced with the current concrete structure.

The Civilian Conservation Corps (CCC) Shavano Falls Road is a historic dirt road constructed by the CCC through the rim of Shavano Valley from the top of Shavano Falls on the western side of Franklin Mesa to the bottom of the falls on the eastern side of Shavano Valley. The 800+ foot road is narrow, passes through sandstone rimrock, and descends steeply to the valley floor. It is supported by tabular sandstone rock retaining walls. Emergency Conservation Work Camp BR-23 began in 1936. Once completed, the road reportedly saved the ditch rider 6 miles of travel.

No Action Alternative: Under the No Action Alternative, hydropower facilities would not be constructed at Shavano Falls. There would be no impact to cultural resources.

Proposed Action: Under the proposed action, hydropower facilities would be constructed at Shavano Falls. Reclamation determined that the proposed project will adversely affect NHPA eligible cultural resources and has consulted with the SHPO. Consultation is ongoing and mitigation for adverse effects include avoiding sites where possible and completion of photo documentation according to SHPO's Level I standards. A Memorandum of Agreement (MOA) between Reclamation and the SHPO to mitigate the effects is being drafted and an executed MOA will be included in the Final EA. Cultural mitigation measures agreed to in the MOA will be completed by UVWUA before project construction commences.

To protect the CCC Shavano Falls Road, construction equipment (i.e dump trucks, excavators, and other heavy equipment) will not be allow to use this road. Construction access to the project site would be either from Shavano Valley Road, the M&D Canal Road on Franklin Mesa, or through private lands as shown in Figure 5 below.

Figure 5. Area of avoidance for the CCC Shavano Falls Road. This area is away from all proposed facilities and transmission lines.

In the event of discovery of evidence of possible cultural or paleontological resources, the UVWUA will immediately cease all ground-disturbing activities in the vicinity and notify Reclamation. Work will not be resumed until approved by Reclamation.

If any additional areas of impact (for example: access roads, borrow pits, or waste areas) are identified during the course of the undertaking, they will be inventoried for cultural resources

and consulted on with the SHPO. No construction work will occur at or near the additional impact area until this consultation is completed.

AIR QUALITY AND NOISE

Existing Conditions: Air quality is generally excellent in the project area, and there are no air quality non-attainment areas in the vicinity (EPA 2013). Agricultural operations and construction activities can be sources of dust pollution during wind events in the general region.

There are no significant noise sources or problems in the project area. The primary sources of noise in the project area are traffic along Shavano Valley Road and the noise of flowing water in the M&D Canal over Shavano Falls.

No Action Alternative: Under the No Action Alternative, no hydropower facilities would be constructed at Shavano Falls. There would not be a change in air quality and noise.

Proposed Action: Under the Proposed Action, a hydropower facility would be constructed at Shavano Falls.

There would be minor noise impacts during excavation for the powerplant and from construction traffic. During operation, the turbines and generators would produce machinery noise; however, such equipment would be fully enclosed, located a considerable distance from any dwellings, and should have no discernible impact. The turbine/generator represents a new potential noise source, however they will be fully enclosed and located at least 1,500 feet from the nearest existing structure. After construction of the project facilities, the distance from and enclosure of equipment to any residences will drop noise associated with operations of the hydropower facilities below detectable levels.

There would be short-term dust impacts during excavation work, although this is predicted to be insignificant because dust abatement Best Management Practices would be followed during construction and operation of the hydropower facilities. Reclamation will require watering to minimize/control dust from cleared areas and along roadways. There would be no long-term adverse impacts on air quality due to operation and maintenance of the hydropower facilities. As with other hydropower projects, there would be a beneficial offset of emissions of carbon dioxide (CO_2) and other greenhouse gases. According to the U.S. Energy Information Administration (EIA), in 2011 "the average annual electricity consumption for a U.S. residential customer was 11,280 kWh. With an average annual energy generation of 12,973,000 kWh, the Shavano Falls hydropower project would provide enough clean energy to power 1,150 homes each year. Table 3 has been modified to demonstrate the number of pounds of CO_2 that could be removed annually for the average U.S. household utilizing steam-electric generators in 2011 for the specific fuels identified (EIA 2013). Carbon dioxide emissions would be reduced by an estimated 27,000,000 to 28,000,000 pounds per year.

Table 3. Shavano Falls Hydroelectric Development Associated Carbon Reduction

Fuel Type: Coal	Lbs of CO_2 per Million Btu	Heat Rate (Btu per kWh)	Lbs CO_2 per kWh	Lbs of CO_2 removed when using clean energy
Bituminous	205.300	10,128	2.08	26,983,840
Sub-bituminous	212.700	10,128	2.15	27,891,950
Lignite	215.400	10,128	2.18	28,281,140

Last updated: June 13, 2013 (http://www.eia.gov/tools/faqs/faw.cfm?id=74&t=11)

CUMULATIVE IMPACTS

Cumulative impacts are impacts on the environment which result from the incremental impact of the action when added to other past, present, and reasonably foreseeable significant actions taking place over a period of time. Overall, the construction of the hydropower plant should not have significant cumulative impacts.

SUMMARY AND ENVIRONMENTAL COMMITMENTS

In summary, the primary effect of the proposed action would be to develop a renewable energy resource. There would be short-term economic benefits due to construction expenditures and employment. In the long-term, UVWUA and their members would benefit from income generated from the project.

Mitigation Measures and Environmental Commitments

The following measures will be implemented and followed by UVWUA and its contractors. The LOPP requires that these commitments be followed and met. An environmental commitment plan will be prepared to document how environmental commitments and mitigation measures will be implemented during design, construction, and operation of the Project.

- The construction and operation of the hydropower project is required to be operated in a manner that does not interfere with the irrigation supplies or maintenance of the Uncompahgre Project.
- Existing access roads will be used to access the construction areas. No new access roads will be constructed. The CCC Shavano Falls Road will not be used during construction for construction activities. Use of the road will be limited to pickup trucks and similar vehicles.
- Erosion-control Best Management Practices for drainage and sediment control will be implemented to prevent or reduce nonpoint source pollution during and following construction.
- All construction equipment shall be power-washed and free of soil and debris prior to entering the construction sites to reduce the spread of noxious and unwanted weeds.
- Topsoil, where available, will be stockpiled during construction for later use in re-vegetation. Disturbed areas will be contoured to reduce erosion and facilitate re-vegetation. Disturbed areas will be re-seeded. The plan for re-vegetation and related erosion control/re-contouring and implementation will require approval by Reclamation.
- Dust abatement Best Management Practices will be undertaken in all areas disturbed during construction.
- Fuel storage, equipment maintenance, and fueling procedures will be developed to minimize the risk of spills and the impacts from these incidents. A Spill Prevention Control and Countermeasure Plan (SPCC) will be prepared prior to construction.
- UVWUA will be responsible for obtaining any required Federal, state, or local permits to construct and operate the project, including permits under the Clean Water Act (Section 402 and 404 permits) which may be needed for dewatering or other activities.
- In the event of discovery of evidence of possible cultural or paleontological resources, the UVWUA will immediately cease all ground-disturbing activities in the vicinity and notify Reclamation. Work will not be resumed until approved by Reclamation.
- Cultural mitigation measures agreed to in a Memorandum of Agreement with the Colorado State Historic Preservation Officer will be completed by UVWUA before project construction commences.
- If any additional areas of impact (for example: access roads, borrow pits, or waste areas) are identified during the course of the undertaking, they will be inventoried for cultural resources and consulted on with the SHPO. No construction work will occur at or near the additional impact area until this consultation is completed.
- Powerhouses and substations will be non-reflective and painted to blend with the project area background.
- Under the hydropower project alternative, water in the M&D Canal diverted for irrigation will also be used for hydropower production. There will be no increase in diversions from the Uncompahgre River solely for hydropower use permitted under the LOPP.

- The UVWUA will be responsible for noxious weed control within the limits of the facility for the life of the project. UVWUA is responsible for consultation with Reclamation for acceptable weed control methods, including pesticides/herbicides approved for use on public land. Use of pesticides/herbicides will comply with the applicable Federal and state laws. Pesticides/herbicides will be used only in accordance with their registered uses and within limitations imposed by the Secretary of the Interior.

CHAPTER 4 – CONSULTATION & COORDINATION

GENERAL

The public was invited to attend a negotiation meeting between Reclamation and UVWUA was held on April 1, 2014 in Montrose to discuss the terms and conditions associated with the construction and operation of the Shavano Hydropower Project. Reclamation also used this public meeting to provide an opportunity for the public to identify issues and concerns with the proposed project. No interested parties attended the meeting. Reclamation and the UVWUA have had informal discussions with adjacent landowners, and local, county and state agencies. Reclamation also relied on issues that were previously identified for other hydropower projects recently constructed in the Lower Gunnison Basin on the Dallas Creek Project's at Ridgway Dam and South Canal of the Uncompahgre Project (Reclamation 2011 & 2012) in preparing this draft EA.

In addition, Reclamation has conducted consultations with the Colorado State Historic Preservation Officer under Section 106 of the National Historic Preservation Act, the U.S. Army Corps of Engineers under Section 404 of the Clean Water Act, and the U.S. Fish and Wildlife Service under the Endangered Species Act. Results of these consultations have been incorporated into the project analysis and discussions in Chapter 3.

Availability of this draft EA was announced through a press release and through a distribution letter sent to nearby landowners and interested agencies.

DISTRIBUTION LIST

News Releases announced the availability of the draft EA, and the EA was placed on Reclamation's website at: www.usbr.gov/uc/ under environment documents. The draft EA was also announced in a distribution letter to an updated mailing list as shown below:

- Colorado State Representatives
- Colorado State Senator
- Delta County Commission, Delta CO
- Montrose County Commission, Montrose CO
- Colorado Division of Water Resources, Montrose CO
- Colorado Parks and Wildlife, Montrose CO
- Colorado State Historic Preservation Office, Denver CO
- Tri-County Water Conservancy District, Montrose CO

- Delta-Montrose Electric Association, Montrose CO
- Uncompahgre Valley Water Users Association, Montrose CO
- Project 7 Water Authority, Montrose CO
- Montrose Daily Press, Montrose CO
- Telluride Watch, Telluride CO
- Ouray Plain Dealer, Ouray CO
- Western Slope Conservation Center, Paonia CO
- Daily Sentinel, Grand Junction CO
- Western Resource Advocates, Boulder CO
- High Country Citizens Alliance
- Southern Ute Indian Tribe, Ignacio CO
- Ute Mountain Ute Indian Tribe, Towaoc CO
- Fish and Wildlife Service, Grand Junction CO
- Corps of Engineers, Grand Junction CO
- U.S. Environmental Protection Agency, Denver CO
- U.S. Geological Survey, Grand Junction CO
- Individuals and Landowners

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