

RECLAMATION

Managing Water in the West

Environmental Assessment Farson/Eden Salinity Control Project Eden Canal, E-5 & E-6 Laterals Sweetwater County, Wyoming

PRO-EA-11-007

**Provo Area Office
Provo, Utah
Upper Colorado Region**



**U.S. Department of the Interior
Bureau of Reclamation
Provo Area Office
Provo, Utah**

December 2011

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The mission of the Department of the Interior is to protect and provide access to our Nation's natural and cultural heritage and honor our trust responsibilities to Indian Tribes and our commitments to island communities.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

Environmental Assessment Farson/Eden Salinity Control Project Eden Canal, E-5 & E-6 Laterals

**Eden Project, Sweetwater County, Wyoming
Upper Colorado Region
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Chapter 1: Purpose and Need for the Proposed Action

1.1. Introduction and Background

This Environmental Assessment (EA) analyzes the potential effects of the proposed Farson/Eden Canal Salinity Control Project, located in Sweetwater County, Wyoming. The Federal action evaluated in this document is whether the Bureau of Reclamation should authorize the use of Federal funds to line the existing Eden Canal from the Farson Lateral to the Little Sandy Creek Siphon with a shotcrete covered ethylene propylene diene Monomer (EPDM) liner; and to replace the existing Eden Canal E-5 and E-6 earthen laterals with a pipeline.

This EA evaluates the potential impacts of the proposed action and has been prepared as required by the National Environmental Policy Act (NEPA), the Council on Environmental Quality and the U.S. Department of the Interior regulations implementing NEPA. As required by the NEPA implementing regulations, if potentially significant impacts to the environment are identified, an Environmental Impact Statement (EIS) will be prepared. If no significant impacts are identified, a Finding of No Significant Impact (FONSI) will be issued by Reclamation.

1.2. Purpose and Need for the Proposed Action

The purpose of the proposed action is to line the existing unlined earthen portion of the Eden Canal from the Farson Lateral to the Little Sandy Creek Siphon with a shotcrete covered EPDM liner; and to replace the existing Eden Canal E-5 and E-6 unlined earthen laterals with a pipeline. The need for the proposed action, consistent with the purpose of the Colorado River Basin Salinity Control Program, is to reduce the salinity contributions to the Upper Colorado River Basin that result from the Eden Canal and the associated laterals. The proposed piping and lining would reduce seepage from the unlined canal and canal laterals, which dissolves salts in the soils and eventually carries the salts to the Upper Colorado River Basin.

1.3. Background

1.3.1 Colorado River Basin Salinity Control Program

In 1974, Congress enacted the Colorado River Basin Salinity Program to enhance and protect the quality of water in the Colorado River. The Colorado River

provides water for more than 32 million people and irrigation for more than 4 million acres of land in the United States, as well as water for about 3 million people and 500,000 irrigated acres in Mexico (Bureau of Reclamation, 2011). Controlling the salinity of the Colorado River remains a high priority for Reclamation. Salinity impacts agricultural, municipal, and industrial water users. High salinity levels make it difficult to grow produce. In water systems, it plugs and destroys municipal and household pipes and fixtures.

Recent salinity levels in the lower portion of the Colorado River are typically about 700 mg/L, but in the future may range between 800 and 1,200 mg/L, depending upon the amount of water in the river system. Salinity damages in the United States portion of the Colorado River Basin range between \$500 million to \$750 million per year and could exceed \$1.5 billion per year if future increases in salinity are not controlled (Bureau of Reclamation, 2000). Irrigation practices within the Colorado River Basin are thought to account for as much as 37 percent of salt contributions, with most of the salt load contributions coming from federally developed irrigation projects (Colorado River Basin Salinity Control Forum, 2011).

1.3.2 Eden Canal, E-5 and E-6 Laterals Salinity Control Project

The proposed project is located 40 miles north of Rock Springs near the towns of Farson and Eden, in Sweetwater County, Wyoming (Figure 1.1: Project Location). The project area extends from approximately 2 miles east of Farson to roughly 5 miles northeast of Farson (Figure 1.2: Project Area and Figure 1.3: Proposed Alignment). The existing Eden Canal off-farm laterals comprise approximately 25 miles of unlined earthen laterals that provide irrigation water to approximately 5,649 acres of irrigated land. The irrigated land includes 509 acres of flood irrigation and 5,140 acres of center pivot sprinkler irrigation. The major irrigated crops in this area include alfalfa, grass hay, barley, oats, and field peas.

As a component of Reclamation's Eden Project (completed in 1959), the Eden Canal laterals are operated by the Eden Valley Irrigation and Drainage District (EVIDD) under a contract with Reclamation. The Eden Project also includes the Big Sandy Dam and Reservoir, the Eden Dam and Reservoir, Little Sandy Canal, the Means Canal, and a lateral and drainage system. The Eden Canal from the Farson Lateral to Little Sandy Creek Siphon is approximately 1.38 miles long. The E-5 and E-6 laterals are approximately 2.8 miles and 1.88 miles long, respectively. The proposed pipeline to replace the open E-5 and E-6 laterals would be approximately 3.18 miles in length.

This project is part of a larger salinity control project being undertaken by EVIDD. In January 2010, Reclamation prepared an EA and FONSI for the piping of the Eden Canal E-13 lateral. Independently, the piping of E-13 is anticipated to reduce the annual salinity loading of the Colorado River Basin by a total of 832 tons. A subsequent FONSI and EA were prepared in December 2010 for the piping of the Eden Canal E-7, E-8, and the Westside laterals, with an anticipated annual salinity load reduction of 5,762 tons. Collectively, including the proposed

action analyzed in this EA, the Farson-Eden Salinity Control Project would reduce the annual salinity contributions to the Colorado River Basin by 7,695 tons.

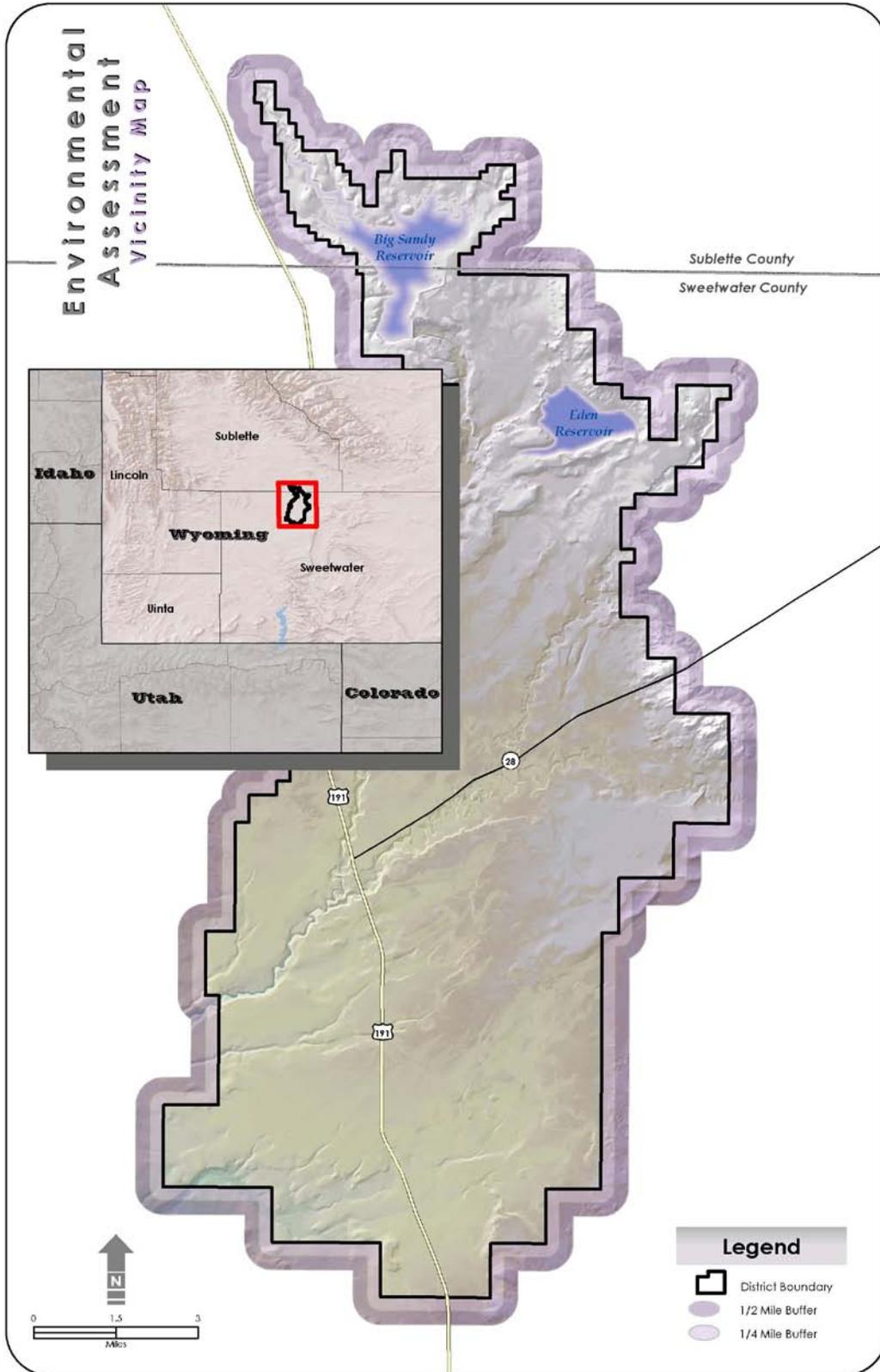


Figure 1.1: Project Location

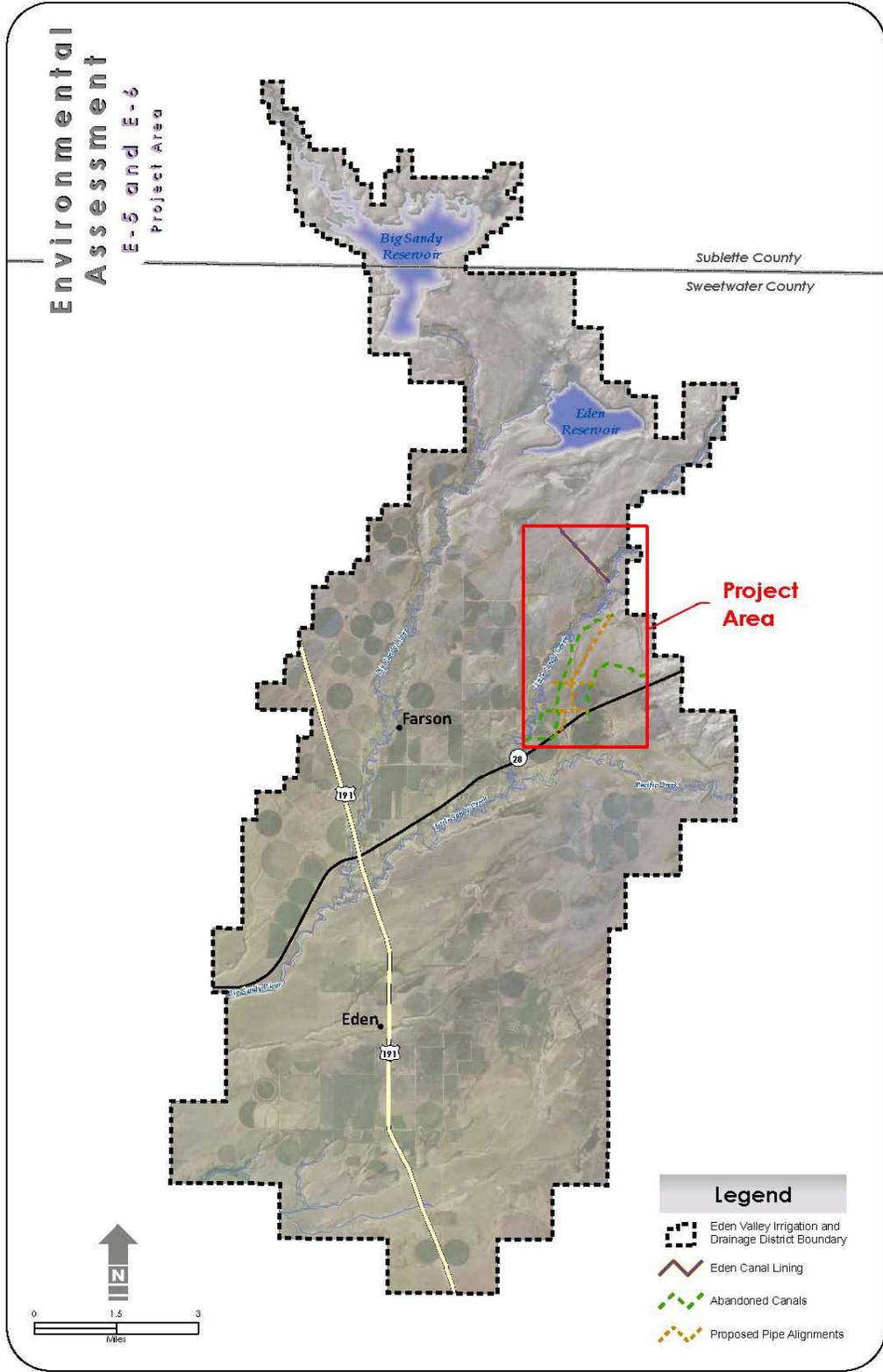


Figure 1.2: Project Area

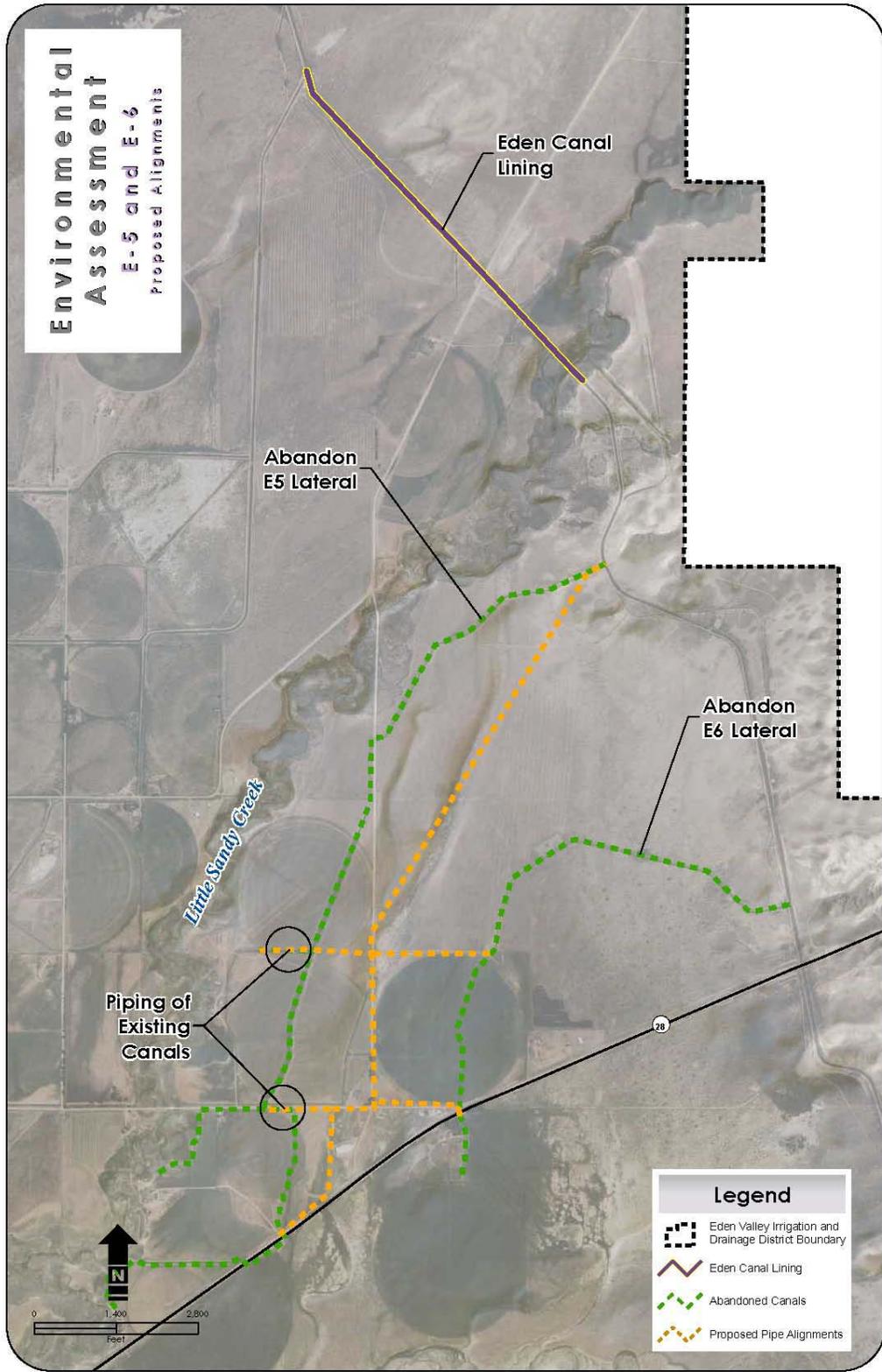


Figure 1.3: Proposed Alignment

1.4. Decision to be Made

Reclamation must decide whether to authorize the use of Federal Salinity Control Program funds by the Eden Valley Irrigation and Drainage District, for the lining of the Eden Canal from the Farson Lateral to Little Sandy Creek Siphon, and the replacement of the existing E-5 and E-6 unlined earthen laterals with a combined pipeline.

1.5. Permits and Authorizations

If the proposed action is approved, the following permits would be required prior to project implementation:

- 404 Permit - This permit would be issued to the applicant by the U.S. Army Corps of Engineers (USACE) and complies with Section 404 of the Clean Water Act (CWA) for actions on waters of the United States and jurisdictional wetlands (see USACE correspondence in Appendix A).
- Stream Alteration Permit – This permit (if required) would be issued to the applicant by the Wyoming Department of Environmental Quality and would comply with Section 404 of the Clean Water Act for small projects not affecting wetlands.
- Wyoming Pollution Discharge Elimination Permit – This permit (if required) would be issued to the applicant by the Wyoming Division of Water Quality and would comply with Section 402 of the Clean Water Act for actions disturbing more than 1 acre of ground or any discharge.
- Easements with landowners – Right-of-way would be obtained through Grants of Easement. These easements are required for the following project objectives:
 - Protect Reclamation’s facilities from encroachment
 - Ensure the ability to access and perform operations and maintenance on Reclamation’s facilities

Compliance with the following laws and Executive Orders (E.O.) are also required prior to and during project implementation:

Natural Resource Protection Laws

- Endangered Species Act of 1973 (ESA) as amended, (16 U.S.C. 1531-1544, 87 Stat. 884)
- Clean Water Act (CWA) of 1972 as amended (33 U.S.C. 1251 *et seq.*)
- Migratory Bird Treaty Act of 1918 (MBTA) (16 U.S.C. 703-712)

- Bald and Golden Eagle Protection Act of 1940 (BGEPA) (16 U.S.C. 668-668c)
- Comprehensive Environmental Response Compensation and Liability Act of 1980 (CERCLA) (42 U.S.C. 9601)
- Superfund Amendments and Reauthorization Act of 1986 (SARA) (6 U.S.C. Public Law 107-296)
- Resource Conservation and Recovery Act of 1979 (RCRA) (42 U.S.C. 9601)

Cultural Resource Laws

- National Historic Preservation Act (NHPA) of 1966 (16 U.S.C. 470 *et seq.*)
- Archaeological Resources Protection Act (ARPA) of 1979 (16 U.S.C. 470aa-470mm *et seq.*)
- Archaeology and Historic Preservation: Secretary of the Interior's Standards and Guidelines (48 FR 44716)

Native American Laws

- American Indian Religious Freedom Act (AIRFA) of 1978 (42 U.S.C. 1996 and 1996a)
- Enhancing the Intergovernmental Partnership (E.O. 12875, October 26, 1993 [58 Federal Register 58093])
- Native American Graves Protection and Repatriation Act (NAGPRA) of 1990 (25 U.S.C. 3001 *et seq.*)
- Consultation and Coordination with Indian Tribal Governments (E.O. 13084, May 14, 1998 [63 Federal Register 27655])
- Indian Sacred Sites (E.O. 13007, May 24, 1996 [61 Federal Register 26771])

Paleontological Resource Laws

- Paleontological Resources Preservation Act (PRPA) of 2009 (Section 6301-6312 of the Omnibus Land Management Act of 2009 [Public Law 111-11 123 Stat. 991-1456]).

1.6. Relationship to Other Projects

- **Farson/Eden Salinity Control Project**, E-7, E-8, and Westside Laterals. This project replaces approximately 25 miles of the unlined earthen Eden

Canal E-7, E-8, and Westside Laterals with a pipeline and was approved by Reclamation through an EA and FONSI in December 2010.

- **Farson/Eden Salinity Control Project, E-13 Lateral.** This project replaces 5 miles of the unlined earthen Eden Canal E-13 lateral with a pipeline and was approved by Reclamation through an EA and FONSI in January 2010.

Farson/Eden Salinity Control Project, Phase III M-1 and M-1B Laterals.

This project, funded under the American Recovery and Reinvestment Act of 2009, was approved by Reclamation through completion of a categorical exclusion checklist

Chapter 2: Alternatives

2.1. Introduction

The proposed action analyzed in this EA, is Reclamation's authorization for use of Federal funds for the enhancement deemed most suitable for the Eden Canal and associated laterals under the present conditions, including the execution of any easements for required land acquisition as described in Section 2.3. This EA will be used to determine the potential effects on the human and natural environment and will serve to guide Reclamation's decision, along with other pertinent information, about whether or not to implement the proposed action. The proposed action (Action Alternative) is analyzed in comparison to a No Action Alternative in order to determine potential effects.

If Reclamation decides to implement the proposed action, the Eden Valley Irrigation and Drainage District (EVIDD) would be authorized to proceed with the lining of the Eden Canal from the Farson Lateral to the Little Sandy Creek Siphon, and the replacement of the Eden Canal E-5 and E-6 laterals with a pipeline in order to reduce the annual salt loading of the Upper Colorado River Basin.

If authorized to proceed, EVIDD would construct, operate, and maintain the lined Eden Canal and the new pipeline in place of the open Eden Canal, E-5 and E-6 laterals. As a feature of the Eden Valley Project, the new pipelines, existing and newly acquired easements would be owned by the United States, administered by Reclamation, and operated by EVIDD under contract with Reclamation.

2.2. No Action Alternative

Under the No Action Alternative, Reclamation would not authorize use of Federal funds for the lining of the Eden Canal and the piping of the E-5 and E-6 laterals.

Under the No Action Alternative, the existing open unlined canal and laterals would continue to deliver irrigation water with no proposed improvements for reducing or eliminating seepage. Currently, approximately 50 percent of irrigation water traveling through the canal and laterals is lost to seepage. The seepage leads to the dissolving of salts in the sandy soils, which ultimately leads to an increase in salinity of the Colorado River. Under the No Action Alternative, 1,355 tons of salt would continue to reach the Colorado River every year. In addition, the loss of water due to seepage requires far greater than necessary water

appropriation for agricultural use, due to the inefficiency of the existing unlined canal system.

2.3. Action Alternative

Under the proposed Action Alternative, Reclamation would authorize the use of Federal funds to line the existing Eden Canal from the Farson Lateral to Little Sandy Creek Siphon and to replace the existing unlined earthen Eden Canal E-5 and E-6 laterals with a pipeline. This action would reduce the salinity loading of the Colorado River by a total of 1,335 tons annually (Table 2.1 Estimated Salt Reduction per Lateral). In the Funding Opportunity Announcement Letter dated November 18, 2010, Reclamation estimated the annual salt load reduction resulting from the successful implementation of the Phase IV lining and piping projects to be 1,101 tons. The 1,101 tons per year estimate was calculated based on lateral lengths of 1,045 and 6,531 linear feet for the E-5 and E-6 laterals, respectively. Site visits and survey have confirmed a linear length of 14,850 feet for E-5 and 9,520 feet for E-6. Based on the recent survey information and onsite verification, the annual salt load estimates increased to 1,335 tons per year. The subsequent description of the Action Alternative takes into account the most current annual salt load estimates of 1,335 tons.

**Table 2.1
Estimated Salt Reduction per Lateral**

Lateral	Tons/year
Eden Canal	807
E-5	357
E-6	171
Sum	1,335

Piping these laterals would also reduce the amount of water lost through seepage, making more water available for irrigation. Additionally, piping these laterals would reduce the amount of ongoing system maintenance. Ongoing maintenance includes: removing the debris from the channels; clearing overgrown vegetation; and replacing outdated valves and gates.

The Eden Canal is approximately 6,200 feet long from the Farson Lateral to the Little Sandy Creek Siphon. The proposed action includes the lining of the existing open canal with a 30 mil EPDM liner with a non-woven 10 oz. geotextile fabric, and would place 5 inches of shotcrete with fiber mesh across the canal. This would include the replacement of approximately 330 linear feet of the existing concrete transition liner at the entrance and exit of the Little Sandy Creek Siphon. The proposed action would also include the modification of the existing concrete overflow structure and the modification of three existing turnouts. Modifications to the turnout structures include the installation of valves and meters.

The Eden Canal E-5 lateral is approximately 14,850 feet long from the turnout on the Eden Canal to the end of service. The Eden Canal E-6 lateral is 9,520 feet long from the turnout on the Eden Canal to the end of service. The proposed action includes the replacement of the existing Eden Canal E-5 and E-6 laterals with one 16,790 foot long pipe. The pipe size would range from 34 inches to 12 inches at the end of the line. The new alignment stretches across agricultural land and land owned by Reclamation for approximately half its length. The remaining new alignment follows Sweetwater County roads or crosses private property (Figure 2.1: Proposed Alignment).

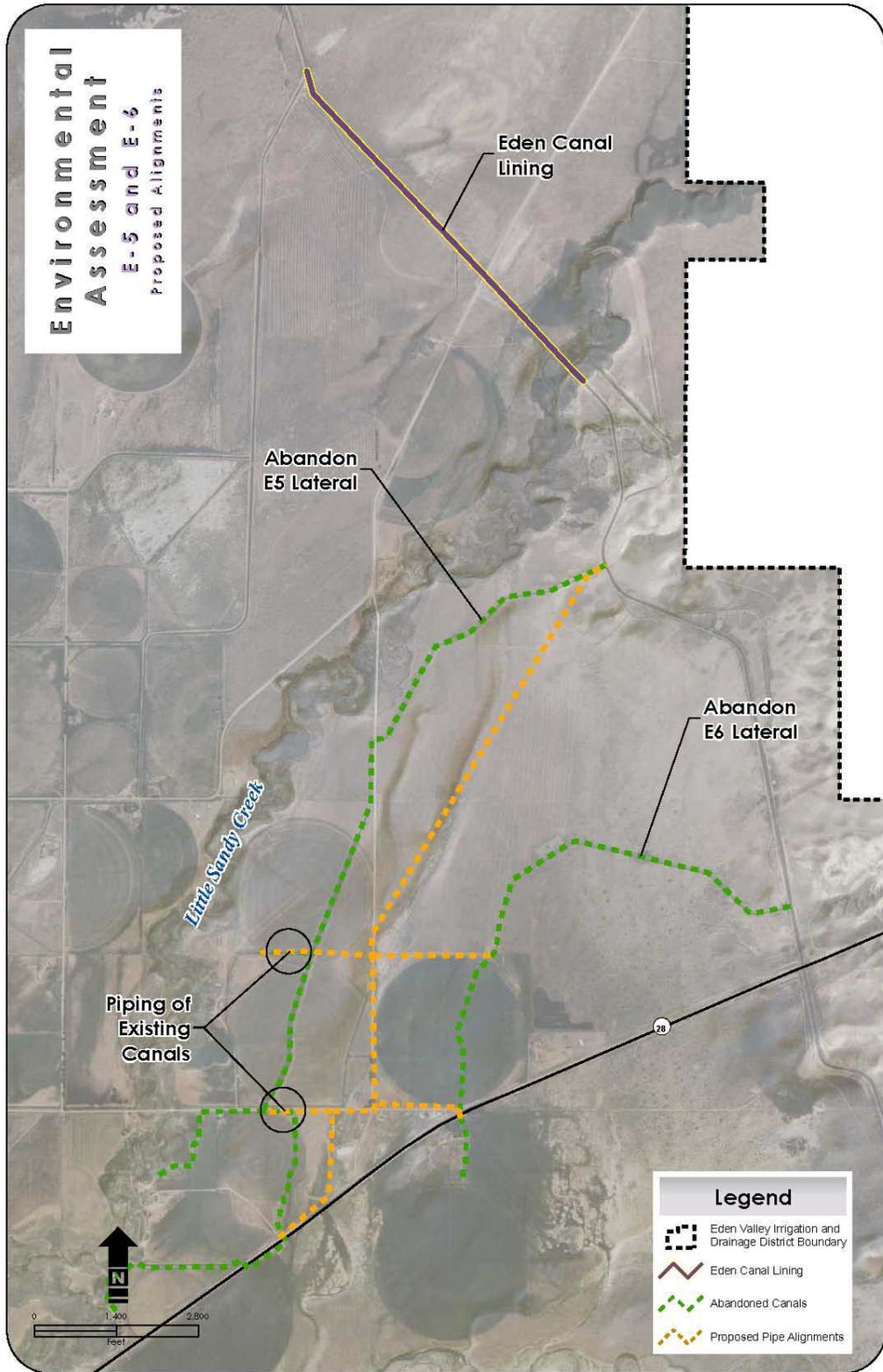


Figure 2.1: Proposed Alignment

Easements

New easements would be obtained from landowners (public or private) where the existing E-5 lateral alignment and the proposed pipeline alignment deviate. All acquired easements from adjacent property owners would be in the name of the United States. Where deviation from the existing alignment occurs, a 50-foot wide permanent easement would be needed for operation and maintenance of the pipeline. Additionally, a 100-foot wide temporary easement is required for construction in areas where the alignment deviates from the existing alignment.

The alignment of the Eden Canal would remain in place within existing Reclamation property and no right-of-way or easements would be needed.

New easements would be required along the new pipeline. The proposed pipeline alignment would require approximately 20,384 linear feet of new permanent easements. These easements would be within land currently owned by Reclamation (9,364 linear feet), Sweetwater County (6,360 linear feet), and private landowners (4,660 linear feet). Temporary construction easements would account for approximately 23 acres of land.

All new easements would be granted and associated facilities would be constructed in accordance with the Engineering and O&M Guidelines for Crossings (Reclamation, 2008).

Turnouts, Drains, Services and Meters

The project would install new turnout structures within the laterals that would include trash cleaning capability using an intake screen system. A flow measurement instrument would be installed at the beginning of the pipeline by means of an external ultrasonic flow meter. Flow measurement instruments would also be installed at each of the irrigation service locations. This would provide distribution and allocation of the delivered water for improvements of on-farm irrigation water management.

Drains would be installed at the end of the pipeline and at key locations to facilitate the draining of the lateral. Irrigation services would consist of pipes being stubbed across the property line with a valve. The aforementioned flow meter is included to control and monitor the flow. If the land owner exclusively uses flood irrigation then riprap and an additional control structure would be provided.

Supervisory Control and Data Acquisition (SCADA) System

A SCADA system would be installed along the Eden Canal at the diversion point for the new pipeline. The SCADA would be used to monitor flows and to deliver flows according to water users' needs; and, allow for control of that water from the diversion gates on the dam. This would eliminate both seepage losses and administrative losses.

2.3.1. Construction Procedures

2.3.1.1. Canal Lining Procedures

The lining of the Eden Canal would include the following sequence:

- Flagging of the construction zone
- Mobilization of the construction equipment
- Clearing vegetation, excavation and shaping the canal
- Placement of 10 oz. geotextile across canal section
- Placement of 30 mil EPDM liner over geotextile across canal section
- Placement of 10 oz. geotextile over EPDM liner across canal section
- Placement of 5 inch thick shotcrete over geotextile across canal section
- Clean up and restoration of areas disturbed by construction
- Planting and reseeding of disturbed areas for re-vegetation

2.3.1.2. Pipeline Construction Procedures

Construction of the pipeline would likely occur in the following sequence:

- Flagging of the construction zone
- Mobilization of the construction equipment
- Delivery of pipe to construction site
- Excavation of the trench
- Fusing of pipe
- Placement of pipe within the trench
- Backfill around pipe and compaction of backfill
- Clean up and restoration of areas disturbed by construction
- Planting and reseeding of disturbed areas for re-vegetation

2.3.1.3. Trench Excavation

Trenches approximately 5 feet wide and 8 feet deep would be excavated for the installation of the replacement pipe for the E-5 and E-6 laterals. Approximately 6 inches of excavation would be required for the lining of the existing Eden Canal. Excavation in all areas would be performed with the use of appropriately sized construction equipment to minimize disturbance to the surrounding area. All excavated material would be stockpiled to the side of the trenches, and be

used as backfill after pipe installation. In critical areas, such as established agricultural lands and wetlands, top soil would be separated from other material to preserve it and place it as the top soil layer.

2.3.1.4 Pipe and Appurtenance Installation

The pipes would be transported by a tractor trailer from the manufacturer to the staging areas. From the staging areas, they would either be transported by a loader to the work site or fused into longer sections and transported to the work site. Existing access roads would be used to transport pipe to the work site. Each section of pipe would be fused together with a pipe fuser and then placed in the prepared trench.

At various points determined during design, construction would be required to install drain valves, air-vacuum valves, and air-release valves. These valves would be installed to facilitate filling and operation of the system, and to allow any excess water at the end of the irrigation season to drain from the pipes. The air-vacuum valves are typically installed on top of the pipe to vent air during pipe filling and to allow air into the pipe while it drains. After installing the pipe, backfill would be placed around the pipe. In critical areas, including wetlands and established agricultural areas, the preserved top soil would be placed last to minimize impacts and facilitate a speedy recovery. Backfill would be mechanically compacted. Soil in work areas would be spread evenly, to blend with the natural topography and maintain local drainage patterns. Stockpiled topsoil would then be spread evenly over previously vegetated areas and reseeded with native or agricultural vegetation species, as appropriate. In areas with a new alignment, the abandoned section of the laterals would be allowed to dry up naturally. In locations where there is excess or a shortage of material, a slight swale or hump would be incorporated into the cross section.

2.3.1.5. Crossings

Existing drainage crossings would be maintained during construction. Additional crossings may be necessary under Farson 4th East and Farson 3rd North. The installation of new drainage crossings would not require the closure of the roadway, although there may be some minor traffic impacts as construction vehicles enter and exit the roads.

2.3.1.6. Quality Control Procedures

After backfilling and completion of construction activities, the contractor would provide quality control of construction through visual inspection.

2.3.2 Construction Staging Areas

Construction staging areas have been identified throughout the project area (Figure 2.2: Staging Areas). The staging area would be used to stockpile the pipe, equipment, and construction vehicles. Staging areas have been assessed to determine potential project impacts during the duration of construction, (discussed further in Section 3 of this document).

2.3.3. Land Disturbance

The proposed pipeline alignment described in Section 2.3 totals approximately 16,790 feet in length and would require a maximum construction width of 100 feet. Construction activities would be confined to this 100-foot width where there are existing easements. New easements for sections of the pipeline that deviate from the alignment of the existing canal would be 50 feet wide for both construction and operation. Construction activities associated with the lining of the Eden Canal would be confined to a 100-foot wide disturbance area.

2.3.4. Transportation Requirements

Transportation to the project would follow existing access roads parallel to the laterals to minimize disturbance to the existing vegetation. These roads currently used for service access to the lateral, are already disturbed and would be within the proposed construction easement. Temporary access roads would be necessary for construction outside the existing alignment. These temporary access roads would be contoured and re-vegetated with native plant material following completion of construction. Permanent access roads for ongoing maintenance parallel to the where the new pipeline alignment deviates from the existing E-5 lateral alignment would be required.

2.3.5. Standard Operating Procedures

Standard Operating Procedures (SOPs) would be followed (except for unforeseen conditions) during construction, operation, and maintenance of the proposed action to avoid or minimize adverse impacts on people and natural resources. The SOPs and features of the proposed action have been formulated to avoid or minimize adverse impacts. A preconstruction meeting with Reclamation, the contractor, and the EVIDD's representative, would be held prior to commencing construction. During construction, weekly meetings would be held to assess the progress of the work.

Specifics of restoration will be outlined in the SOPs and/or right-of-way easements. Specifics of restoration procedures include the determination of what native vegetation, reseeding rates, landscaping, re-vegetation, and noxious weed removal and control is appropriate for the different construction zones. Monitoring and treatment would continue until the success criteria are met for two successive years without human intervention. These actions will provide that disturbed areas are returned to a natural state as appropriate. Chapter 3 presents the impact analysis for resources after SOPs have been successfully implemented.

Chapter 3: Affected Environment and Environmental Consequences

3.1. Introduction

This chapter describes the existing environment of the project area and any potential impacts from the No Action and Action Alternatives to that environment. The following resources are examined in detail in this chapter: air quality, water resources, upland vegetation resources, wetlands and riparian resources, fish and wildlife, special status species, cultural resources, paleontological resources, soil erosion and sedimentation, Indian Trust Assets, transportation, and environmental justice. The present condition and characteristics of each resource are discussed, followed by an analysis of the predicted impacts under the No Action and Action Alternatives.

3.2. Resources Eliminated from Analysis

Resources that do not exist within the project area and/or would not be impacted by the No Action or Action Alternatives were eliminated from further analysis, and are described in Table 3.1 Resources Eliminated from Further Analysis.

Table 3.1 Resources Eliminated from Further Analysis

Resource	Rationale for Elimination from Further Analysis
Public Health	There would be no negative impacts on public health from the proposed action. Furthermore, this project would reduce a safety hazard by enclosing the open ditch water conveyance system for the existing E5 and E6 laterals, thereby eliminating the potential of injury from the open water.
Recreation Resources	There would be no direct effects on recreation resources found within the project area.
Wilderness and Wild and Scenic Rivers	There are no designated wilderness areas or Wild and Scenic Rivers within the project area; therefore there is no impact to these resources from the proposed action.
Noise	There would be no long-term impacts due to increases of noise levels. Noise levels are expected to be elevated during construction, but no new noise is generated from the proposed action after construction.

Prime and Unique Farmland	There is no Prime and Unique Farmland within the project area and therefore, there are no impacts to this resource from the proposed action.
Energy Requirements and Conservation Potential	There are no impacts to energy requirements and conservation potential within the project area from the proposed action.
Urban Quality and Design of the Built Environment	The proposed action is located in a rural setting on public and agricultural lands; therefore, there are no impacts to urban quality and design of the built environment from the proposed action.
Visual	There are no impacts to visual resources within the project area from the proposed action.

3.3. Affected Environment

3.3.1. Air Quality

Air Quality is regulated by the U.S. Environmental Protection Agency (EPA) and the Wyoming Division of Air Quality. The National Ambient Air Quality Standards (NAAQS) established by the EPA under the Clean Air Act (CAA) specify limits of air pollutants for carbon monoxide, particulate matter (PM 10 & PM 2.5), ozone, sulfur dioxide, lead, and nitrogen.

The project area is in attainment for all criteria pollutants. However, in March of 2009, Wyoming Governor Dave Freudenthal, formally requested that portions of Sweetwater County be designated by the EPA as a non-attainment area for ozone (Letter to EPA, March 2009). At the time of this analysis, EPA had not made a formal finding on non-attainment status for ozone. The attainment designation is not anticipated to change prior to the construction of the proposed action.

3.3.2. Water Resources

The project area is within the Big Sandy Sub-basin, a component of the Green River Basin. The Green River Basin is the largest tributary of the Colorado River. The headwaters of the Big Sandy Sub-basin originate in the Wind River mountain range in western Wyoming. Water resources within the Big Sandy Sub-basin include the Big Sandy River, the Little Sandy River, the Big Sandy Dam and Reservoir, the Eden Dam and Reservoir, the Little Sandy Canal, the Means Canal, the Eden Canal, the Westside, Farson and Eden laterals, and associated drain lines.

The Big Sandy Dam and Reservoir are located 10 miles north of Farson, Wyoming. Below the Big Sandy Reservoir, water is diverted along a lateral system to irrigate lands in the Eden Project area. Eden Reservoir is an off-channel reservoir fed from the Little Sandy River and from the Big Sandy Dam. Three major canals stem from the Eden Reservoir: the Little Sandy Canal which

is 4 miles in length; the Means Canal which is 6 miles in length; and the Eden Canal which is 10.8 miles in length. Their diversion capacities are 150, 635, and 475 cubic feet per second, respectively. In addition to these canals, the Westside, Farson, and Eden lateral systems have an aggregate length of 94 miles and are used to distribute irrigation water for agricultural uses. These laterals range in capacity from 6 to 160 cubic feet per second (Eden Project, 2011).

3.3.3. Water Quality

The Eden Canal laterals and drainage ditches in the project area are classified by the Wyoming Department of Environmental Quality as Class 4A waterways. Class 4A waterways are waters where aquatic life uses are not attainable, pursuant to the provisions of Section 33 of the Clean Water Act (CWA). Uses designated on Class 4 waters (of which Class 4A waters fall within) include recreation, wildlife, industry, agriculture and scenic value. Class 4A designations are based upon the knowledge that a water body is an artificial, man-made conveyance and has been determined not to support aquatic life uses (Wyoming Surface Water Standards, September 2008).

The Eden Canal laterals and drainage system provide flood irrigation to agricultural users. Flood irrigation causes excess soil moisture, infiltration of water vertically downward through the soil to a shale layer, and horizontal movement of water downstream. Irrigation seepage into shallow aquifers is the source of many saline seeps. As the water migrates through the soil, it dissolves and gathers salts. The seeps and springs within the Eden project area contribute an estimated 116,000 tons of salt annually to the Colorado River Basin. This salt loading degrades the water quality of the basin and its tributaries.

3.3.4. Upland Vegetation Resources

Much of the land in the project area is comprised of human-altered vegetation, primarily used for agriculture. Agricultural activities in the project area have replaced native upland vegetation with alfalfa and pasture grasses. Non-agricultural vegetation such as cheatgrass and thistle is more common in disturbed areas along roads.

In addition to the human-altered environment, the vegetation in the project area is dominated by upland vegetation species. Upland vegetation species in the project area include big sagebrush (*Artemisia tridentata*), a low growing shrub that is known to grow in deep, somewhat moist soils, as well as extremely dry rocky areas; rabbit-brush (*Chrysothamnus spp.*), a deciduous shrub with bright white or yellow flowers that is a member of the Asteraceae family; western wheatgrass (*Pascopyrum smithii*), a common, native grass that is the state grass of Wyoming; crested wheatgrass (*Agropyron cristatum*), a drought-tolerant grass species in the Poaceae family; and blue-bunch wheatgrass (*Pseudoroegneria spicata*), a tall forage grass that is found in areas with deep soils.

3.3.5. Wetlands and Riparian Resources

There are no naturally occurring wetlands within the project area. However, wetlands and riparian areas are common along the Big Sandy River. These areas are classified as Riverine systems. A Riverine system is bounded on the landward side by upland, by the channel bank (including natural and man-made levees), or by wetlands dominated by trees, shrubs, persistent emergents, mosses, or lichens. The Riverine system includes all wetlands and deep-water habitats contained in natural or artificial channels, periodically or continuously containing flowing water which forms a connecting link between the two bodies of standing water.

Palustrine wetlands may occur in the open canal laterals, but they are not part of the Riverine system. The species prevalent in the riparian areas include: Baltic rush (*Juncus balticus*), a common rush that occurs most abundantly at low to mid elevations; creeping meadow foxtail (*Alopecurus arundinaceus*), a relatively tall grass that is common along wetted ditches and channels that is moderately salt tolerant; and common spikerush (*Eleocharis paustris*), a native perennial species that is fairly common in moist habitats.

A wetlands survey completed in June 2011 by J-U-B Engineers, Inc., concluded that there are no fringe wetlands associated with the canal laterals within the project area.

3.3.6. Fish and Wildlife Resources

Wildlife habitat in the project area can be categorized into three general categories: upland sagebrush and sedges; riparian and wetland; and human-altered/agricultural environments. The upland sagebrush and sedges habitat is found mostly on public lands managed by Reclamation and adjacent to the Bureau of Land Management (BLM) areas. Species that may use the upland habitat areas include the sandhill crane (*Grus canadensis*), red-tailed hawk (*Buteo jamaicensis*), and antelope (*Antilocapra Americana*). Riparian and wetland areas provide habitat for waterfowl such as the mallard duck (*Anas platyrhynchos*). No aquatic animal or fish species were identified in the laterals or adjacent canals of the project area. The human-altered/agricultural lands are home to antelope (*Antilocapra Americana*), badger (*Taxidea taxus*), ground squirrel (*Spermophilus elegans*), and various small rodents.

3.3.7. Special Status Species

3.3.7.1. Federally Listed Species

The Endangered Species Act of 1973 (16 U.S.C. 1531-1543) protects federally listed endangered, threatened, proposed, and candidate plant and animal species and their critical habitats. Candidate species are those for which the United States Fish and Wildlife Service (USFWS) has sufficient data to list as threatened or endangered, but for which proposed rules have not yet been issued. Threatened species are those that are likely to become endangered in the foreseeable future throughout all or a significant portion of their range. The USFWS has identified nine federally listed species including six endangered, one threatened, and two

candidate species that may potentially exist within or downstream from the project area. (Appendix B, USFWS Letter).

Endangered Species

Black-footed Ferret (*Mustela nigripes*)

The black-footed ferret is 18 to 24 inches long, and weighs 1.5 to 2.5 pounds, with males slightly larger than females. It is a slender, wiry animal with a black face mask, black feet, and a black-tipped tail. It has short legs with large front paws and claws developed for digging (USFWS Species Profile, July 2011). The black-footed ferret is known to inhabit white-tailed prairie dog towns or complexes. The species was listed as Endangered on March 11, 1967.

Blowout Penstemon (*Penstemon haydenii*)

The blowout penstemon is a perennial herb with stems less than 12 inches tall. The inflorescence is 2-6 inches long and has 6-10 compact whorls of milky-blue to pale lavender flowers. Blowout penstemon flowers from May until early June. Known populations in Wyoming are found between 6,680-7,440 feet in elevation. However, recent surveys have indicated that systemic surveys may be warranted in some lower elevations where active sand blowout features occur. The blowout penstemon was listed as Endangered on October 1, 1987 (NatureServe Comprehensive Species Report, 2011).

Bonytail (*Gila elegans*)

The bonytail is a large freshwater minnow, up to 2 feet in length, with a long, slender caudal peduncle. This warm water species appears to favor main-stem rivers regardless of turbidity, usually in or near deep swift water, in flowing pools and eddies just outside the main current. Spawning likely occurs in spring over rocky substrates. Flooded bottomland habitats appear to be important growth and conditioning areas, particularly as nursery habitats for young. The bonytail was formerly widespread through much of the Colorado River Basin but is now widely extirpated and very rare, with no known self-sustaining populations. The species was listed as Endangered on April 23, 1980 (NatureServe Comprehensive Species Report, 2011).

Colorado Pikeminnow (*Ptychocheilus lucius*)

The Colorado pikeminnow is a large freshwater minnow that may reach a length of 6 feet. Adults are highly mobile and prefer medium to large rivers. Young prefer small, quiet backwaters. The species makes extensive spawning migration (up to 124 miles one way) and spawning occurs in late spring. Their habitat is restricted to large rivers within the Colorado River Basin. The Colorado pikeminnow was listed as Endangered on March 11, 1967 (NatureServe Comprehensive Species Report, 2011).

Humpback Chub (*Gila cypha*)

The humpback chub is a large freshwater minnow with a slender caudal peduncle and a hump behind the head in large mature individuals. Spawning occurs in

spring after peak water flow. Adults use various habitats, including deep turbulent currents and shaded ledges. Young prefer habitat over non-rocky substrate. The species population is restricted to the Colorado River system. The humpback chub was listed as Endangered on March 11, 1967, (NatureServe Comprehensive Species Report, 2011).

Razorback Sucker (*Xyrauchen texanus*)

The razorback sucker is a freshwater sucker fish with a large sharp keel on the nape. The species is usually found swimming in schools. Spawning occurs in late winter to early spring and in groups of hundreds of individuals. Habitat includes backwaters and eddies of medium to large rivers, and flood lowlands which serve as breeding areas. The species population is restricted to the Colorado River Basin. The razorback sucker was listed as Endangered on October 23, 1991 (NatureServe Comprehensive Species Report, 2011).

Threatened Species

Ute Ladies'-tresses (*Spiranthes diluvialis*)

Listed as a Threatened species in January 1993, the Ute ladies'-tresses is a member of the orchid family found mostly in wetlands and riparian areas. Numerous, vanilla-scented, small white or ivory colored flowers arranged in a gradual spiral are found along the length of the stem during flowering. The species requires open habitat, and populations decline if trees and shrubs invade the habitat. They are not tolerant of permanent standing water, and do not compete well with aggressive species such as reed canary grass.

Candidate Species

Yellow-billed Cuckoo (*Coccyzus americanus*)

The yellow-billed cuckoo, as the name suggests, has a yellow lower mandible. It has rufous wings, which contrast against gray-brown wing coverts and upper parts, and white under parts. Large white spots can be noted on its long black undertail. It is a neotropical migrant, which winters in South America. Breeding often coincides with the appearance of massive numbers of cicadas, caterpillars, or other large insects. Its incubation/nesting period is the shortest of any known bird, because it is one of the last neotropical migrants to arrive in North America and chicks have very little rearing time before embarking on their transcontinental migration (Alsop 2001). Yellow-billed cuckoos are considered a riparian obligate and are usually found in large tracts of cottonwood/willow habitats with dense sub-canopies. Yellow-billed cuckoos are a Candidate species.

Greater Sage-grouse (*Centrocercus urophasianus*)

Greater sage-grouse inhabit sagebrush plains, foothills, and mountain valleys. Sagebrush is the dominant plant species in quality sage-grouse habitat, but a good understory of grasses, forbs, and associated wet meadow areas are essential for optimum habitat. Male sage-grouse gather on traditional "strutting grounds" (also called leks) during March and April, and females visit the grounds during the first part of April, with nesting beginning in April. Their principal winter food item is

sagebrush leaves. During summer, the fruiting heads of sagebrush, leaves and flower heads of clovers, dandelions, grasses and other plants are taken; and insects are also a food source during the summer months. Sagebrush eradication and intensive use of lands by domestic livestock have reduced sage-grouse numbers. Sage-grouse range is declining in Wyoming in both quantity and quality. Some moderate to poor quality habitat is present near and within the project area, but no individuals were observed during the field reconnaissance. On March 5, 2010, USFWS added the greater sage-grouse to the Candidate species list.

The Wyoming Game and Fish Department (WGFD) maintains a database on known leks and identified core areas for the greater sage grouse in Wyoming. Recently, the State of Wyoming has published Executive Order 2011-5, which dictates management requirements for this species and their suitable habitat. Based on a review of WGFD’s database, the project action area falls within a designated core area; however, there are no active leks within a one mile radius of the proposed project action area (Snyder 2011).

The list of threatened, endangered or candidate species with potential habitat that may be affected by the proposed action is found in Table 3.2 Federally Listed Species with Potential Habitat in the Project Area. No occurrences of these species have been documented within the project area, and none were observed in the project area during site visits in June and August 2011.

Table 3.2 Federally Listed Species with Potential Habitat in the Project Area

Species/Critical Habitat	Status	Document Occurrences in Project Area
Black-footed Ferret (<i>Mustela nigripes</i>)	Endangered	No
Blowout Penstemon (<i>Penstemon haydenii</i>)	Endangered	No
<u>Colorado River Fish</u> Bonytail (<i>Gila elegans</i>), Colorado Pikeminnow (<i>Ptychocheilus lucius</i>), Humpback Chub (<i>Gila cypha</i>), Razorback Sucker (<i>Xyrauchen texanus</i>)	Endangered Endangered Endangered Endangered	No
Ute Ladies’-tresses (<i>Spiranthes diluvialis</i>)	Threatened	No
Yellow-billed Cuckoo (<i>Coccyzus americanus</i>)	Candidate	No
Greater Sage Grouse (<i>Centrocercus urophasianus</i>)	Candidate	No

3.3.7.2. State Sensitive Species

Section 06D of the ESA defines State Sensitive Species as those species that could become endangered or extinct within the state. Two species were identified as sensitive by the USFWS for the project area vicinity: the bald eagle and the mountain plover.

Bald Eagle (*Haliaeetus leucocephalus*)

The bald eagle is a large bird of prey. Adults possess a white head, a large bright yellow bill, and dark plumage. Immature bald eagles are dark with variable amounts of light splotching on the body, underwing covert, flight feathers, and tail base. The bald eagle roosts primarily in forested canyons or tall cottonwoods along streams and reservoirs. Migration of bald eagles from breeding areas generally takes place between September and December. The species clutch size is 1-3, and incubation lasts about five weeks. On June 28, 2007, the USFWS removed the bald eagle from the endangered species list. The bald eagle is still protected under the Bald Eagle Protection Act and the Migratory Bird Act (NatureServe Comprehensive Species Report, 2011).

Mountain Plover (*Charadrius montanus*)

The mountain plover is a medium-sized ground bird. It is misnamed, as it lives on level land. Unlike most plovers, this one is usually not found near bodies of water or even on wet soil; it prefers dry habitat with short grass (usually due to grazing) and bare ground. The mountain plover is 8 to 9.5 inches long and weighs about 3.7 ounces. In appearance, it is similar to other *Charadrius* plovers, except that unlike most, it has no band across the breast. The upper parts are sandy brown and the under parts and face are whitish. There are black feathers on the fore-crown and a black stripe from each eye to the bill (the stripe is brown and may be indistinct in winter); otherwise the plumage is plain (USFWS Species Profile, July 2011).

Table 3.3
State Sensitive Species with Potential Habitat in the Project Area

Species/Critical Habitat	Scientific Name	Status	Documented Occurrence in Project Area
Bald Eagle	<i>Haliaeetus leucocephalus</i>	State Sensitive	No
Mountain Plover	<i>Charadrius montanus</i>	State Sensitive	No

3.3.7.3. Special Concern Species

The BLM identifies nine species of special concern occurring in Sweetwater County. These species include the Utah mountain lilac (*Ceanothus martini*), dwarf mountain mahogany (*Cercocarpus ledifolius* var. *intricatus* [*Cercocarpus intricatus*]), fullstem (*Chamaechaenactis scaposa*), Greene's rabbitbrush (*Chrysothamus greenii*), Cedar Rim thistle (*Cirsium aridum*), Ownbey's thistle (*Cirsium ownbeyi*), slender cryptantha (*Cryptantha gracillis*), Rollins' catseye (*Cryptantha rollinsii*) and the western dodder (*Cuscuta occidentalis*).

Utah Mountain Lilac (*Ceanothus martinii*)

The Utah mountain lilac is a non-thorny multi-branched low shrub. The species possesses shiny leaves and white flowers which bloom in the late spring. This species occurs in mountain brush, sagebrush, thinly wooded rocky slopes, ridge, and canyon bottoms. The Wyoming population occurs on steep sagebrush slopes or mountain shrub communities (Wyoming Natural Diversity Database, 2011).

Dwarf Mountain Mahogany (*Cercocarpus intricatus*)

This intricately-branching shrub or small tree can reach heights of up to 7 feet. Leaves are very thin and needlelike; oblong to linear. This species' elevation range falls between 4,000 and 8,500 feet. Flowering and fruiting occurs in June and July. Dwarf mountain mahogany grows on rocky slopes, sandstone outcrops, and sandy desert hills (Wyoming Natural Diversity Database, 2011).

Fullstem (*Chamaechaenactis scaposa*)

Fullstem is a caespitose perennial forb which grows 0.75 -3.5 inches tall with a deep caudex crowned by remnant leaf bases. Disk flowers are cream colored to pink and have a pappus of membranous scales. Flowering generally occurs from May to mid-June, and fruiting occurs from early to mid-early June. Fullstem typically occurs in cushion plant communities on sparsely vegetated calcareous clay barrens, rims and benches with a lag surface of shale flakes or in dry washes on extremely fine clay shales at 6,350 to 7,400 feet in elevation (Wyoming Natural Diversity Database, 2011).

Greene Rabbitbrush (*Chrysothamnus Greenei*)

Greene rabbitbrush is a multi-branched, white-bark stemmed shrub with yellow disk flowers. Flowering occurs in late July to September. The species is found in dry, open, rocky places on desert flats at 7,000 feet in elevation (Wyoming Natural Diversity Database, 2011).

Cedar Rim Thistle (*Cirsium aridum*)

Cedar Rim thistle is a perennial, taprooted herb with a loosely to densely woolly-hairy stem. Flowering and fruiting occurs from June to July with lavender flowers and cream-colored fruit with fine brown streaks. The species is found on barren, chalky hills, gravelly slopes, and fine textured, sandy-shaley draws. Populations are found mostly in sparsely vegetated openings with big sagebrush grasslands at 5,800 to 7,500 feet in elevation (Wyoming Natural Diversity Database, 2011).

Ownbey's Thistle (*Cirsium ownbeyi*)

Ownbey's thistle is a perennial taprooted herb with white to pink flowers. Flowering occurs primarily from late June to early August, while fruiting occurs from July to September. The species is found primarily on semi-barren rims or steep slopes of broken gray slate at 6,440 to 8,200 feet in elevation. Most occurrences are on sandy clay soils. Populations may also occur on roadcuts (Wyoming Natural Diversity Database, 2011).

Slender Cryptantha (*Cryptantha gracilis*)

Slender cryptantha is a slender, erectly branched annual with dense spreading hairs. Flowering and fruiting typically occurs from April to July. The species is typically found on coarse slate in sagebrush communities or with junipers on slopes and in washes at 6,040 to 6,900 feet in elevation (Wyoming Natural Diversity Database, 2011).

Rollins' Catseye (*Cryptantha rollinsii*)

Rollins' catseye is a densely bristly forb with a white, funnel-shaped corolla. Flowers appear May to June and fruit is present through July. The species is found on shale ridges, in salt and mixed desert scrub, sagebrush, pinyon-juniper and mountain brush communities. Wyoming populations are found in cushion plant communities on ridge tops and slopes with sandy soils or sandstone slate flakes between 6,040 to 7,820 feet in elevation (Wyoming Natural Diversity Database, 2011).

Western Dodder (*Cuscuta occidentalis*)

Western dodder is a rootless, annual parasitic herb with slender, twining, yellowish stems and a lance-shaped corolla. The species flowers June to August. The western dodder is found in big sagebrush communities at 6,400 to 7,600 feet in elevation (Wyoming Natural Diversity Database, 2011).

Although the project area may provide habitat for species of concern, the field survey did not identify any special concern species within the vicinity of the project area.

Table 3.4 Special Concern Species with Potential Habitat in the Project Area

Species	Scientific Name	Heritage Rank	Documented Occurrence in Project Area
Utah mountain lilac	<i>Ceanothus martinii</i>	G4/S1	No
Dwarf mountain mahogany	<i>Cercocarpus ledifolius</i> var. <i>intricatus</i> [<i>Cercocarpus intricatus</i>]	G5T4/S1	No
Fullstem	<i>Chamaechaenactis scaposa</i>	G4/ S1S2	No
Greene rabbitbrush	<i>Chrysothamnus greenei</i>	G5/S1	No
Cedar Rim thistle	<i>Cirsium aridum</i>	G2Q/S2	No
Ownbey's thistle	<i>Cirsium ownbeyi</i>	G3/S2	No
Slender cryptantha	<i>Cryptantha gracilis</i>	G5/S1	No

Rollins' catseye	<i>Cryptantha rollinsii</i>	G3/S1	No
Western dodder	<i>Cuscuta occidentalis</i>	G5/S1	No

3.3.8. Cultural Resources

Cultural resources are defined as physical or other expressions of human activity or occupation. Such resources include culturally significant landscapes, prehistoric and historic archaeological sites as well as isolated artifacts or features, traditional cultural properties, Native American and other sacred places, and artifacts and documents of cultural and historic significance.

Section 106 of the National Historic Preservation Act of 1966 (NHPA), mandates that Reclamation take into account the potential effects of a proposed Federal undertaking on historic properties. Historic properties are defined as any prehistoric or historic district, site, building, structure, or object included in, or eligible for, inclusion in the National Register of Historic Places (NRHP). Potential effects of the described alternatives on historic properties are the primary focus of this analysis.

The affected environment for cultural resources is identified as the APE (area of potential effects), in compliance with the regulations to Section 106 of the NHPA (36 CFR 800.16). The APE is defined as the geographic area within which Federal actions may directly or indirectly cause alterations in the character or use of historic properties. The APE for the proposed action includes the portion of the Eden Canal from the Farson Lateral to the Little Sandy Creek Siphon, the replacement pipeline corridor for the E-5 and E-6 Laterals, access roads, and staging areas.

3.3.8.1 Cultural History

The archaeological record in the Eden Valley area spans thousands of years, from the Paleo-Indian Period through historic times. Pioneers in the early nineteenth century passed through this arid valley on their way to the milder climates of Oregon and California, stopping only to water their livestock at the Big Sandy Creek and rest for the night. Very few gave the area a second thought until the growth of the ranching industry in the late 1800's. Even then, the cold, prohibitive climate and desert-like water conditions deterred the less hardy settlers from making their homes permanent. By the late nineteenth century, it was clear that if settlements in the valley were to prosper, the construction of an irrigation project was necessary. The result was the Eden Project. The Eden Project, named for its proximity to the town of Eden, Wyoming, predominately serves farms in the northern section of Sweetwater County in the northeastern corner of the Green River Basin (Klajic 2000).

Features of the Eden Project include Big Sandy Dam and Reservoir, Eden Dam and Reservoir, Little Sandy Canal, Means Canal, Eden Canal, and a lateral and

drainage system. The Eden Canal was originally constructed, beginning in 1907, by the Eden Irrigation and Land Company. Work continued on the canal until 1914, when it was considered largely complete (Kail 1998). During the late 1930's, Reclamation and the Department of Agriculture investigated the canal and surrounding irrigation area, eventually determining that a plan of development and rehabilitation was necessary. A plan was approved in 1940 as a Great Plains project under the water conservation provision of the Interior Department Appropriation Act of 1940, and included work to the Eden Canal, as well as the construction of the Big Sandy Dam and Reservoir, the Means Canal, and a series of lateral canals. Due to a long delay in construction caused by World War II, completion of the project was reauthorized by an act of Congress on June 28, 1949 (Klajic 2000).

Construction was recommenced in 1950 and completed in 1970, resulting in a final project configuration of three dams (Eden Dam, Big Sandy Creek Dam, and Little Sandy Diversion Dam). One dike (Big Sandy Dike), two reservoirs (Eden Reservoir and Big Sandy Creek Reservoir), two main canals (Little Sandy Canal and Means Canal), and two laterals (Westside and Farson Laterals)(Klajic 2000).

3.3.8.2 Cultural Resources Status

A Class I literature review and a Class III cultural resource inventory were completed for the APE, defined in the Action Alternative and analyzed for the proposed action, by Kyak Marook Heritage Research, LLC (Kyak Marook) in August 2011. A total of approximately 249 acres were inventoried. Three previously recorded sites were identified as a result of the inventory (Tanner 2011).

Two of the sites identified during the Class III cultural resource inventory have been previously determined eligible for the NRHP under Criterion A (Bureau of Land Management 1986 and Waddell 1991). These sites are the Oregon Trail and the Eden Canal. The NRHP eligibility of the other site remains unevaluated (Kail and Kail 1998).

In accordance with 36 CFR 800.4(c), the sites were re-evaluated for significance in terms of NRHP eligibility. The significance criteria applied to evaluate cultural resources are defined in 36 CFR 60.4 as follows: The quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and:

- A. that are associated with events that have made a significant contribution to the broad patterns of our history; or
- B. that are associated with the lives of persons significant in our past; or
- C. that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess

high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction, or

- D. that have yielded, or may be likely to yield, information important in prehistory or history.

Kyak Marook evaluated the three sites and agreed with the previous NRHP eligibility determinations. The portion of the Oregon Trail within the APE lies under a well established county road. The proposed action will have no effect, as defined in 36 CFR 800.16(i), on the Oregon Trail. There will be an effect on the Eden Canal as a result of the proposed action. The proposed action would include lining a portion of the canal. The proposed action will have no effect on the third site, as it lies outside the APE.

Pursuant to 36 CFR 800.5, the criteria of adverse effect were applied to the Eden Canal. An adverse effect is defined as an effect that could diminish the integrity of a historic property's location, design, setting, materials, workmanship, feeling, or association. The proposed action would not diminish the integrity of the Eden Canal and would, therefore, have no adverse effect to the historic property.

In compliance with 36 CFR 800.4(d)(1) and 36 CFR 800.11(d), a copy of the cultural resource inventory report and a determination of no historic properties affected were submitted for consultation to the Wyoming State Historic Preservation Office (WYSHPO) and tribes, which may attach religious or cultural significance to historic properties possibly affected by the proposed action.

Reclamation received concurrence from the WYSHPO in a letter dated November 1, 2011. WYSHPO determined that the Eden Canal is a historic property eligible for listing on the NRHP. WYSHPO also determined that there would be no adverse effect to the Eden Canal as a result of the proposed action.

3.3.9. Paleontological Resources

Paleontological resources are defined as any fossilized remains, traces, or imprints of organisms, preserved in or on the earth's crust, that are of paleontological interest and that provide information about the history of life on earth. Any materials associated with an archaeological resource (as defined in section 3(1) of the Archaeological Resources Protection Act of 1979 (16 U.S.C. 470bb(1) and any cultural item (as defined in section 2 of the Native American Graves Protection and Repatriation Act (25 U.S.C. 3001) are not considered paleontological resources.

Section 6302 of the Paleontological Resources Preservation Act (PRPA) of 2009 (Sections 6301-6312 of the Omnibus Land Management Act of 2009 [Public Law 111-11 123 Stat. 991-1456]) requires the Secretary of the Interior to manage and protect paleontological resources on Federal land using scientific principles and expertise.

The affected environment for paleontological resources is represented by the same APE that corresponds to cultural resources as described in Section 3.3.8.

3.3.8.1 Paleontological Resources Status

Two recent paleontological literature searches and field surveys have been conducted within close proximity (less than ½ mile) to the APE (Trujillo and Robinson 2009 and Knauss and Murphey 2010). The following information regarding the geological units and possible presence of paleontological resources within the APE are based on these previous studies.

The APE is underlain by two geologic units, the Laney Shale Member of the Green River Formation and Pleistocene- and Holocene-age alluvium (Knauss and Murphey 2010:6). The Green River Formation is well known for both its economic importance (oil shale and trona) and for its fossil content, mainly fish, plants, and insects. Further, rock units that have yielded important vertebrate fossils lie nearby, indicating that the probability of construction impacting vertebrate fossils is relatively high within the APE (Trujillo and Robinson 2009:5).

The proposed action will include surface and subsurface excavation. Construction activities are anticipated to stay out of the bedrock formations in the project area. However, due to the occurrence of vertebrate fossils near the APE a paleontological monitor would be required during all excavation activities.

3.3.10. Soil Sedimentation and Erosion

The soils in the project area were mapped by the Natural Resource Conservation Service (NRCS) on June 30, 2008 (Eden Project Soil Report, 2008). The soils in the project area are primarily comprised of sandy loams and loamy sands with a 0 to 6 percent slope. The composition of the soil in the project area includes Vonason loamy sand (49.7 percent), Means-Farson sandy loams (10.3 percent), gunbarrel loamy sands (9.2 percent), Farson sandy loam (7.5 percent), and Shellcreek silty clay (5.8 percent). The project area also contains a few small areas of wind deposited sand dune soils and heavy clay soils. The upland vegetation areas contain soils with shallow shale bedrock. Soil erosion is common within the project area, in areas surrounding ditches and in areas that receive periods of heavy wind (NRCS Soil Survey, 2011).

3.3.11. Indian Trust Assets

Indian Trust Assets (ITA's) are legal interests in property held in trust by the United States for federally recognized Indian tribes or individuals. The Department of the Interior's policy is to recognize and fulfill its legal obligations to identify, protect and conserve the trust resources of federally recognized Indian tribes and tribal members and to consult with the tribes on a government-to-government basis whenever plans or actions affect tribal trust resources, trust assets, or tribal safety (please refer to the Departmental manual, 512 DM 2). Under this policy, as well as Reclamation's ITA policy, Reclamation is committed to carrying out its activities in a manner which avoids adverse impacts

to ITAs when possible, and to mitigate or compensate for such impacts when it cannot. All impacts to ITAs, even those considered insignificant, must be discussed in the trust analyses in NEPA compliance documents and appropriate compensation or mitigation must be implemented.

Trust assets may include lands, minerals, hunting and fishing rights, traditional gathering grounds, and water rights. Impacts to ITAs are evaluated by assessing how the action affects the use and quality of ITAs. Any action that adversely affects the use, value, quality or enjoyment of an ITA is considered to have an adverse impact on the resources. There are no known ITAs in the APE vicinity, and no ITA concerns were identified through tribal consultation.

3.3.12. Environmental Justice

Executive Order 12898 established environmental justice as a Federal agency priority to ensure that minority and low income populations are not disproportionately impacted by Federal actions. The information obtained from the U. S. Census indicates that a minority population does exist in the project area. According to 2010 U. S. Census data, the combined population of Eden and Farson is 594. Of these residents 574 (96.6 percent) are white, while the remaining 20 residents (3.4 percent) are identified as an ethnic minority. Sweetwater County, in comparison, has a total population of 43,806, with 42,786 (88.5 percent) identified as white only, with the remaining 1,020 (11.5 percent) identified as an ethnic minority. At the time of this analysis, 2010 Census data had not been released for economic indicator such as median household income. Therefore, the data on median income comes from the U.S. Census American Community Survey (2005-2009). The median income for U.S. Census Tract which includes Farson and Eden is \$71,875, while the median income for Sweetwater County is \$67,210.

3.3.13. Public Safety, Access, and Transportation

Transportation resources in the area include US Highway 191, State Highway 28, and local roads. US 191 provides access between Rock Springs and Pinedale and is the only major highway in this area. SH 28 provides east-west access between Lander and Kemmerer. Local roads in the area are developed on a grid system and provide local access and mobility for residents.

3.4. Environmental Consequences

The environmental consequences section discusses potential impacts to the project area resources from the No Action and Action Alternatives.

3.4.1. Air Quality

No Action Alternative

Under the No Action Alternative there would be no adverse effects to air quality.

Action Alternative

Under the Action Alternative there would be no long-term impacts to local air quality. Fugitive dust generation from construction activities would have a temporary, short-term effect on the air quality in the project area. The fugitive dust would be generated by excavation activities and the movement of construction equipment on unpaved roads. Best Management Practices (BMPs,) such as watering for dust control to minimize fugitive dust will be implemented. Impacts due to construction activities would be temporary and would cease once the project was completed.

3.4.2. Water Resources

No Action Alternative

Under the No Action Alternative, water from the laterals would continue to seep into the soil and ultimately contribute to the concentrated salt loads to the Colorado River Basin. This seepage would result in the loss of approximately 50 percent of the irrigation water that runs through the Eden Canal, and the E-5 and E-6 laterals.

Action Alternative

The Action Alternative would eliminate seepage from the Eden Canal, and the E-5 and E-6 laterals. This would result in an estimated 50 percent increase in water traveling to agricultural users along the laterals, thereby improving the efficiency of the irrigation system.

3.4.3. Water Quality

No Action Alternative

Under the No Action Alternative, there would be long-term minor to moderate adverse impacts to the water quality of the Colorado River Basin. Salt loads from the deep percolation of seepage from the Eden Canal, and the E-5 and E-6 laterals would continue to degrade water quality in the Basin.

Action Alternative

The Action Alternative would reduce seepage from the Eden Canal, and the E-5 and E-6 laterals. The reduced seepage will result in an estimated 1,355 fewer tons of salt from reaching the Colorado River Basin annually. This would result in minor long-term reduced salinity in the Colorado River Basin and improvement in the long-term water quality of the Colorado River.

3.4.4. Upland Vegetation Resources

No Action Alternative

Under the No Action Alternative, heavy equipment used during routine maintenance of the ditch would continue to have minor impacts on the upland vegetation in the project area. These plant communities would remain in their current condition, and are not anticipated to experience sizeable gains or losses from maintenance activities.

Action Alternative

Under the Action Alternative, much of the area disturbed by construction activities would be in upland and agricultural areas. Most of the areas where construction would take place are already altered from their natural state. Construction would occur outside the growing season, between October and May, and would occur within a 50 to 100-foot wide construction easement. Upland areas would experience short-term losses. Brush and grasses would be impacted during construction by the operation of construction equipment, excavation, and the staging of materials. All areas disturbed by construction activities would be contoured and reseeded with native species. After completion of the contouring and reseeded, relatively minor native habitat would be permanently lost when compared to the current condition. Upland vegetation communities would likely be reestablished, and some previously disturbed areas may see an increase in native species compositions after reseeded. Areas that are disturbed may be more vulnerable to non-native species and noxious weed infestation. These non-native species typically recover more quickly after a disturbance than native species. To minimize impact to native vegetation, previously disturbed areas would be used for construction activities, where possible. Cultivated lands that are disturbed by construction activities would be reseeded with an appropriate agricultural mix.

BMPs would be followed to reduce impacts, including placing staging and material sources outside of sensitive areas. Construction materials and equipment would be washed to remove dirt, seeds from weeds, and to reduce the possibility of infestation by non-native species. After any surface disturbance, proper rehabilitation procedures would be followed to prevent the infestation of invasive species. This would include seeding mixtures of desirable native species and agricultural grasses, where appropriate and post-construction treatment to control noxious and invasive species. Blue-bunch wheatgrass would be used to reseed barren areas (outside of agricultural fields), post construction at a dispersal rate of at least 40 lbs. per acre.

3.4.5. Wetlands and Riparian Resources

No Action Alternative

The local riparian habitat would remain in its current condition, experiencing minor fluctuations in quantity and quality, as naturally occurring precipitation patterns vary. Routine ditch maintenance would continue to disturb these areas, and the area is likely to see an increase in the composition and infestation of noxious and non-native species, due to their ability to thrive in disturbed areas. Though periodically removed within the ditch during maintenance, these noxious plant species would likely increase their dominance within the project area, resulting in degradation of habitat quality.

Action Alternative

The wetland and riparian habitats in the project area are ditch-induced and supported by seepage from the ditch. Under the Action Alternative, the long-term project impacts to riparian resources would occur in ditch-induced wetland and

riparian habitats. This project's impacts are covered under the CWA Section 404(f) exemption. Under this exemption, no permit is required for the project's irrigation system, that may impact wetlands and other waters associated with the irrigation ditches.

Riparian habitat would be impacted by the piping of the laterals. Piping of the lateral would result in a total loss of ditch-induced riparian habitat. These areas may see increases in non-native species including tamarisk and Russian olive; these two species may be able to out-compete native species for limited water supplies when irrigation flows cease.

The amount of riparian habitat within the ditch prisms that would be lost under the Action Alternative is approximately 10.19 acres. As required by the Colorado River Basin Salinity Control Act (43 U.S.C. 1571-1599), any wildlife values lost as a result of project implementation must be replaced by EVIDD through habitat replacement and management plans approved by Reclamation following coordination with Federal and state wildlife officials. Replacement habitat must be of an equal or greater value to the habitat lost by the proposed project, and must be managed to maintain its value for the life of the salinity control project (50 years). Riparian habitat will also be managed during construction under the guidelines set forth in the Colorado River Basin Salinity Control Act and E.O. 11990.

To minimize impact to native riparian vegetation, previously disturbed areas would be used for construction activities, where possible. Best Management Practices would be followed to reduce construction impacts. After any surface disturbance, proper rehabilitation procedures would be followed to prevent the infestation of invasive riparian species. This would include seeding mixtures of desirable native riparian species.

3.4.6. Fish and Wildlife Resources

No Action Alternative

Under the No Action Alternative, terrestrial wildlife habitat would remain in its current condition, and there would be no gains or losses to the wildlife habitat. Salinity loading of the Colorado River drainage would continue at current rates, which may affect water quality within the drainage, thereby continuing to impact the wildlife using the area.

Action Alternative

The upland wildlife habitat impacted by the proposed action would result in minor short-term impacts to all wildlife species present in the project area. There would be some upland habitat temporarily lost due to pipeline construction but similar habitat is available in the surrounding areas.

After construction, areas disturbed by construction would be contoured, replanted, and reseeded with native vegetation except in agricultural fields, where appropriate crop seeds would be used. Best Management Practices would be

followed to minimize impacts, including placing staging sites and access outside of sensitive or highly valuable habitats. After any surface disturbance, proper rehabilitation procedures would be followed to prevent the infestation of invasive weed species. This would include seeding disturbed areas with mixtures of desirable native species, including grasses, shrubs, and forbs.

During the construction period and during pipeline maintenance there could be a short-term displacement (approximately three to six months) of wildlife that normally occupies the immediate project area. Construction would occur from autumn through early spring to avoid disturbance during critical periods of time for nesting or fawning for many wildlife species. All construction activities would occur within a 50 to 100-foot wide area along the Proposed Pipeline Alignment. Generally, animals would move easily and find alternative areas for forage and cover, and may return after construction and maintenance operations have been completed. Some upland habitats would experience short-term disturbance until native vegetation components within these areas are restored (two to three growing seasons).

Impacts to small mammals, especially burrowing animals, could include direct mortality and displacement during construction activities. Most small mammal species would likely experience reduced populations in direct proportion to the amount of disturbed habitat. These species and habitats are relatively common throughout the area, so the loss would be minor.

Impacts to big game would include short-term disturbance and displacement of late summer and fall incidental use during the construction period. It is anticipated, due to the minor amount of habitat disturbance, that minor to no impact to wintering big game populations would occur.

Impacts to raptors and other avian species would include minor short-term disturbance and displacement during construction, with no long-term impacts after construction.

Those species, including avian and amphibian species, which are dependent on wetland and riparian habitats, would experience a long-term (greater than five years) loss of habitat as described above.

The proposed action would result in a decrease in salinity, which would improve water quality in the Colorado River and potentially indirectly benefit fish within the Colorado River System. The total habitat value that would be lost long-term would be replaced through acquired replacement habitat to be proposed by the applicant and approved by Reclamation.

3.4.7. Special Status Species

Federally Listed Species

No Action Alternative

There would continue to be minor direct or indirect impacts to threatened, endangered, or candidate species from continued salt loading in the Colorado River Basin. Salinity loading of the Colorado River Basin would continue at current rates due to seepage from the Eden Canal, and the E-5 and E-6 laterals, which will impact water quality within the drainage, thereby impacting wildlife using the area. Any impacts to federally listed species and their habitat from the salt loading would continue.

Action Alternative

According to the Wyoming Game and Fish Department the project action area falls within a designated core area for greater sage grouse; however, there are no active leks within a one mile radius of the proposed project action area (Snyder 2011). In accordance with Executive Order 2011-5, the construction of agricultural/irrigation water pipelines are considered “exempt (*de minimus*) activities” if the construction activities are more than 0.6 miles from known leks (WGFD 2011). The proposed construction activities are planned to be completed before the start of the critical breeding season window (i.e. March 15th). A large percentage of the proposed project action area is in a pre-disturbed or pre-developed setting, due to the on-going agricultural practices (i.e. cultivated lands and free range livestock). Therefore based on the scope, nature and location of this project and there should be no adverse effect to the greater sage grouse.

There have been no documented occurrences of any other federally listed threatened, endangered or candidate species within the project area. Biological site surveys completed in June and August 2011 determined that there would be no effect to any federally listed species from the proposed action (Appendix C, Biological Assessment).

Construction activities would not take place in the immediate proximity of any natural stream. The Eden Canal, and the E-5 and E-6 laterals do not connect directly to the Green or Colorado Rivers through surface channels or waterways. As a result, no impact to endangered fish species within the Colorado River Basin would result from sedimentation entering the laterals during construction activities. The proposed action may result in long-term, minor depletions of flows to the Colorado River Basin due to reduced seepage. The proposed action would result in a long-term decrease in salinity which would increase water quality in the Colorado River and may therefore contribute to cumulative benefits for endangered fish species from improved water quality.

State Sensitive Species

No Action Alternative

There would be no impact to State Sensitive Species under the No Action Alternative.

Action Alternative

There have been no documented occurrences of any Wyoming State Sensitive Species within the project area. Habitat for these species does exist within or adjacent to the project area, therefore there would be no effect to State Sensitive Species under the proposed action.

Special Concern Species

No Action Alternative

There would be no impact to Special Concern Species under the No Action Alternative.

Action Alternative

There have been no documented occurrences of any Special Concern Species within the project area. Habitat for these species does exist within or adjacent to the project area. Effects of the development of the proposed action on Special Concern Species would be similar to effects on general upland vegetation.

3.4.8. Cultural Resources

No Action Alternative

Under the No Action Alternative, there would be no adverse effects to cultural resources. There would be no need for ground disturbance for any pipe installation, staging areas, or access roads. The existing conditions would remain intact and would not be affected.

Action Alternative

Under the Action Alternative, there would be no foreseeable adverse effects to cultural resources. There would, however, be ground-disturbing activities which have the potential to disturb subsurface cultural material.

3.4.9. Paleontological Resources

No Action Alternative

Under the No Action Alternative there would be no effects to paleontological resources. There would be no need for ground disturbance for any pipe installation, staging areas, or access roads. The existing conditions would remain intact and would not be affected.

Action Alternative

Under the Action Alternative, there would be ground-disturbing activities which have the potential to disturb subsurface fossil material. Paleontological monitoring is required during all excavation activities associated with the Action Alternative.

3.4.10. Soil, Erosion and Sedimentation**No Action Alternative**

Under the No Action Alternative there would be no adverse effects to soil erosion and sedimentation. Soil erosion from water and wind would continue in the area at the current rate.

Action Alternative

Under the Action Alternative, soil would be excavated, compacted and graded during construction. In the short-term period, during and immediately following construction, erosion and sedimentation would increase. Best Management Practices would be employed to minimize the potential for impacts from erosion and sedimentation. The proposed pipeline alignment would be reseeded, and over the long-term the soil would return to a pre-project condition once vegetation is established.

3.4.11. Indian Trust Assets (ITAs)**No Action Alternative**

The No Action Alternative would have no impact on ITAs.

Action Alternative

Since there are no known ITAs in the APE vicinity, implementation of the proposed action would have no effect on ITAs.

3.4.12. Environmental Justice**No Action Alternative**

The No Action Alternative would have no impact on Environmental Justice populations.

Action Alternative

The project area lies on privately and publicly owned land in Sweetwater County, Wyoming. After a review of the United States 2010 census information and socioeconomic data available for Sweetwater County, populations that could potentially be affected by the proposed project were evaluated. There were no minorities or low-income population centers in the vicinity of the project area. Furthermore, implementation of the Action Alternative would not disproportionately (unequally) affect any low-income or minority communities near the project area. The proposed action would not involve population relocation, health hazards, hazardous waste, property takings, or substantial economic impacts. The proposed action would therefore have no adverse effects to human health or the environment and would not disproportionately affect minority and low-income populations.

3.4.14. Transportation

No Action Alternative

The No Action Alternative would have no effect on transportation facilities within the project area.

Action Alternative

The proposed action may cause limited delays along roadways adjacent to the project area due to construction vehicles entering and exiting the highway. Emergency dispatch service for Eden is operated from the Eden Valley Fire District in Farson. Service from the fire station would not be impacted by the Action Alternative. Although no temporary road closures are planned, any temporary road or access closure will be coordinated with local law enforcement and emergency services. The public will also be notified of any road closures that take place due to the proposed action.

3.4.15. Summary of Environmental Consequences

Resource Issue	Alternatives	
	No Action	Action
Air Quality	No Effect	Minor short-term effects due to fugitive dust and equipment exhaust from construction activity. Mitigate with Best Management Practices (BMPs).
Water Quality	Continued salt loading of the Colorado River Basin. Long-term minor to moderate impacts.	The Proposed Project would result in an estimated 1,355 fewer tons of salt from entering the Colorado River Basin annually; thereby reducing the salinity and improving water quality. There would be long-term benefits to water quality from the decreased salinity.
Upland Vegetation Resources	No Effect	Short-term upland vegetation loss with the potential for an increase in invasive plants. BMPs would be employed to decrease the likelihood of invasive species.
Wetland and Riparian Resources	No Effect	There would be permanent loss of riparian areas along the existing E5 and E6 laterals.
Fish and Wildlife Resources	Direct and indirect impacts may occur due to continued salt loading of nearby waterways.	Minor short-term disturbance and displacement during construction. Downstream habitat may be improved as a result of long-term increased water quality. There would be permanent loss of 10.19 acres of riparian areas once the laterals are piped. A Habitat

		Replacement Plan as required by the salinity legislation would be implemented to replace wildlife values foregone.
Special Status Species- Federally Listed Threatened, Endangered, and Candidate Species	Minor direct and indirect impacts may occur due to continued salt loading of nearby waterways.	No Effect
Special Status Species- State Sensitive Species	No Effect	No Effect
Special Concern Species	No Effect	No Effect. Individual plants were not identified within the project area, but there may be some short-term disturbance to potential habitat during construction (3 to 6 months) and during maintenance activities.
Special Status- Other Sensitive Plant Species	No Effect	No Effect. There may be some short-term disturbance to potential habitat during construction (3 to 6 months) and during maintenance activities.
Cultural Resources	No Adverse Effect	Potential effects to subsurface cultural material during construction
Paleontology	No Effect	Potential effects to subsurface fossils during construction. Monitoring is required for all excavation activities associated with the Action Alternative.
Soil Erosion and Sedimentation	No Effect	Minor short-term effects due to runoff during and shortly after construction activity. Mitigate with BMPs.
Indian Trust Assets	No Effect	No Effect
Environmental Justice	No Effect	No Effect
Transportation	No Effect	No Effect
Cumulative Effects	No Effect	Cumulative impacts from the proposed action and related actions were assessed during the resource evaluation (Chapters 3 & 4). This analysis determined that there were no adverse cumulative impacts.

Chapter 4: Environmental Commitments

The following environmental commitments would be implemented as an integral part of the proposed action for the Eden Canal, and the E-5 and E-6 laterals.

1. Standard Reclamation Best Management Practices – Standard Reclamation BMPs would be applied during construction activities to minimize environmental effects and would be implemented by construction personnel or included in contract specifications.

2. Additional Analysis – If the proposed action were to change significantly from the alternative described in this EA, additional environmental analyses would be undertaken as necessary.

3. Cultural Resources – In the case that any cultural resources either on the surface or subsurface is discovered during construction, Reclamation’s Provo Area Office archaeologist shall be notified, and construction in the area of the inadvertent discovery will cease until an assessment of the resource and recommendations for further work can be made by a professional archaeologist.

Any person who knows or has reason to know that he/she has inadvertently discovered possible human remains on Federal land, must provide immediate telephone notification of the discovery to Reclamation’s Provo Area Office archaeologist. Work would stop until the proper authorities are able to assess the situation onsite. This action would promptly be followed by written confirmation to the responsible Federal agency official, with respect to Federal lands. The WYSHPO and interested Native American tribal representatives would be promptly notified. Consultation would begin immediately. This requirement is prescribed under the Native American Graves Protection and Repatriation Act (43 CFR Part 10); and the Archaeological Resources Protection Act of 1979 (16 U.S.C. 470).

At the request of the Shoshone-Bannock Tribes of the Fort Hall Reservation of Idaho, a 100-foot buffer will be maintained between the APE and the previously recorded site with unevaluated NRHP eligibility discussed in Section 3.3.8.2.

4. Paleontological Resources – Monitoring is required for all excavation activities associated with the Action Alternative. If bedrock of the Laney Shale Member (lithified layers of *in-situ* and/or sandstone) is encountered anywhere within the APE during construction and a paleontological monitor is not present, construction activities should cease until a Reclamation-permitted paleontologist

arrives on site. In addition, if any subsurface bones or other potential fossils are unearthed during construction and a paleontological monitor is not present, Reclamation must be contacted immediately and work in the area of discovery should cease until a Reclamation-permitted paleontologist can assess the discovery, determine its significance, and make additional recommendations.

5. Construction Activities Confined to the Surveyed Corridor – All construction activities would be confined to the 100 foot wide corridor that has been surveyed for cultural, paleontological, and biological resources.

6. Roads – Existing roads would be used whenever possible for project activities. New access roads would be necessary along the new E-5 alignment. The contractor shall obtain all necessary permits through Sweetwater County for work within and adjacent to all county roads.

7. Disturbed Areas – During construction topsoil would be saved and then redistributed after completion of construction activities. Subsequently, disturbed areas resulting from the project would be smoothed, shaped, contoured and reseeded to as near their pre-project condition as practicable. Seeding and planting would occur at appropriate times with weed-free seed mixes of native plants and agricultural grasses, distributed where appropriate. Blue-bunch wheatgrass would be used to reseed barren areas (outside of agricultural fields), post construction at a dispersal rate of at least 40 lbs. per acre.

8. Air Quality – BMPs would be implemented to control fugitive dust during construction. The contractor would follow the EPA's recommended control methods for aggregate storage pile emissions to minimize dust generation, including periodic watering of equipment, staging areas, and dirt/gravel roads. All loads that have the potential of leaving the bed of the truck during transportation would be covered or watered to prevent the generation of fugitive dust. Construction machinery and operation/maintenance vehicles would be routinely maintained to ensure that engines remain tuned and emission-control equipment is properly functioning as required by law. Additionally, the contractor would comply with all Wyoming State air quality regulations.

9. Habitat Replacement – A plan to replace wildlife values foregone will be prepared by the applicant and approved by Reclamation following coordination with the USFWS and Wyoming Department of Game and Fish. Total acreage of wildlife habitat predicted to be lost is 10.19 acres of riparian habitat along the lateral prism.

10. Sage Grouse Monitoring- Prior to initiating construction activities, and as the project proceeds, the applicant will ensure that surveys and monitoring would be conducted to ensure that greater sage grouse leks do not exist within the construction area. If there are leks present in the area, the applicant and contractor shall notify the Wyoming Department of Game and Fish and

Reclamation's Provo Area Office biologist and construction activities will only be carried out from 8 a.m. to 6 p.m. during lekking season (from March 15-May 15 to reduce disruption to lekking activity.

11. Grazing – Prior to initiating work on grazing lands within the project area (Grazing Permits Eden Project Unit #3 and #4), grazing permittee(s) would be contacted. Grazing permittees and adjacent landowners would be notified prior to construction activities. Grazing permittee users who have a water right use for watering livestock will be provided with a tap for livestock watering.

Chapter 5: Consultation and Coordination

5.1 Introduction

Reclamation's public involvement process presents the public with opportunities to obtain information about a given project and allows all interested parties to participate in the project through written comments. The key objective is to create and maintain a well-informed, active public that assists decision makers throughout the process, culminating in the implementation of an alternative. This section of the EA discusses public involvement activities undertaken to date for the proposed action.

5.2 Native American Consultation

Reclamation conducted Native American consultation throughout the public involvement process. Consultation letters and copies of the Class III cultural resource inventory report were sent to the Ute Indian Tribe of the Uintah and Ouray Reservation, the Arapahoe Tribe of the Wind River Reservation, the Shoshone Tribe of the Wind River Reservation, and the Shoshone-Bannock Tribes of the Fort Hall Reservation of Idaho. This consultation was conducted in compliance with 36 CFR 800.2(c)(2) on a government-to-government basis. Through this effort each tribe is given a reasonable opportunity to identify any concerns about historic properties; to advise on the identification and evaluation of historic properties, including those of traditional religious and cultural importance; to express their views on the effects of the proposed action on such properties; and to participate in the resolution of adverse effects. Reclamation received a response from the Shoshone-Bannock Tribes of the Fort Hall Reservation of Idaho. In their response, the tribe requested that Reclamation avoid a previously recorded site which remains unevaluated for NRHP eligibility. No response from any of the other consulted tribes was received.

5.3 Wyoming State Historic Preservation Office

A copy of the Class III cultural resource inventory report and a determination of no historic properties affected for the proposed action were submitted to the WYSHPO. WYSHPO concurred with Reclamation's determination of no historic properties affected in a letter dated November 1, 2011 (Appendix D, WYSHPO Concurrence Letter).

Chapter 6: Preparers

The following table provides a list of the agency representatives and consultants who participated in the preparation of the Environmental Assessment.

Table 6.1 List of Preparers

Name	Title/Position	Contributions
Agency Representatives		
Jeff D'Agostino	Environmental Protection Specialist, Bureau of Reclamation, Provo Area Office	Project coordination
Scott Elliot, P.E.	Engineer, Bureau of Reclamation, Provo Area Office	Project Engineer
W. Russ Findlay	Biologist, Bureau of Reclamation, Provo Area Office	Biological Resource Oversight
Brian Joseph	Archaeologist, Bureau of Reclamation, Provo Area Office	Cultural Resources, Paleontological Resources, and Indian Trust Assets
Consultants		
Brian Deeter, P.E.	Engineer, J-U-B Engineers, Inc.	Project Manager
Jon Frazier, P.E.	Engineer, J-U-B Engineers, Inc.	Alternative Analysis
Ross Wilson, P.E.	Engineer, J-U-B Engineers, Inc.	Alternative Analysis
Marti Hoge	Environmental Planner, J-U-B Engineers, Inc.	Environmental Project Manager NEPA Oversight
Andy Ashton	Gateway Mapping, Inc.	GIS, Document Graphics
Vincent Barthels	Biologist, J-U-B Engineers, Inc.	Biological and Wetland Resources, Habitat Replacement Plan
Russell Tanner	Kyak Marook Heritage Research, LLC	Cultural Resources

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Appendix A
USACE Correspondence

Appendix B
USFWS Letter

Appendix C

Biological Assessment

Appendix D
WYSHPO Concurrence Letter