RECLAMATION
Managing Water in the West

Environmental Assessment
Farson/Eden Salinity Control Project
Lateral E-13
Sweetwater County, Wyoming

PRO-EA-010-005

Provo Area Office
Upper Colorado Region
Provo, Utah

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

January 2010

Mission Statements

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.

This updated and corrected Environmental Assessment supersedes the Farson/Eden Salinity Control Project Lateral E-13 EA, dated December 2009.

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Chapter 1: Purpose and Need for the Proposed Action

1.1 Introduction and Background

This document is an environmental assessment (EA) analyzing the potential effects of the Farson/Eden Canal salinity control project, located in Sweetwater County, Wyoming. The Federal action is whether the Bureau of Reclamation (Reclamation) should authorize the use of Federal funds to replace the Eden Canal's existing E-13 lateral with a pipeline.

Reclamation is also evaluating the piping of laterals E-7, E-8, and the Westside lateral from the Eden Canal. It was the original intent of Reclamation to include the evaluation of all laterals in one comprehensive environmental document. However, due to funding constraints and design issues for the laterals E-7, E-8 and the Westside lateral, the applicant requested that Reclamation consider lateral E-13 as a separate project. Analysis and evaluation of E-7, E-8, and the Westside laterals will be completed in a separate EA when project design details are available.

This EA has been prepared as required by the National Environmental Policy Act (NEPA), and the Council on Environmental Quality (CEQ) and U. S. Department of the Interior (Interior) regulations implementing NEPA. This EA will analyze the potential impacts of the proposed action. 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 replace the existing unlined earthen E-13 lateral with a pipeline. This pipeline would reduce seepage which dissolves salts in the soils and eventually carries the salts to the Upper Colorado River Basin. The need for the proposed action is to reduce the salinity contributions to the Upper Colorado River Basin that result from the existing Eden Canal laterals, consistent with the purposes of the Colorado River Basin Salinity Control Program.

1.3 Background

1.3.1 Colorado River Salinity Control Program

The purpose of the Colorado River Basin Salinity Control Program is to "protect the quality of water available in the Colorado River" (www.usbr.gov/uc/progact/salinity/). The Colorado River provides water for more than 23 million people and irrigation for more than 4 million acres of land in the United States, as well as water for about 2.3 million people and 500,000 irrigated acres in the Republic of Mexico. Controlling the salinity of the Colorado River remains one of the most important challenges facing Reclamation. High salinity levels make it difficult to grow winter vegetables and popular fruits. In water systems, it plugs and destroys municipal and household pipes and fixtures. Recent salinities in the lower portion of the Colorado River are typically about 700 mg/L, but in the future may range between 600 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

1.3.2 Eden Canal E-13 Lateral Salinity Control Project

The project is located in Sweetwater County, Wyoming, near the towns of Farson and Eden approximately 40 miles north of Rock Springs, Wyoming (Figure 1.1: Project Location). The project area extends from one mile north of Farson to two miles south of Eden (Figure 1.2: Project Area). 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.

The Eden Canal laterals are a component of Reclamation's Eden Project, completed in 1959. 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 E-13 lateral is approximately 5 miles long from its diversion point on the Eden Canal to the end of the lateral. The proposed pipeline to replace the open Lateral E-13 would also be about five miles long and have an approximate diameter of 48 inches at the beginning and would taper down toward the end of the pipe.

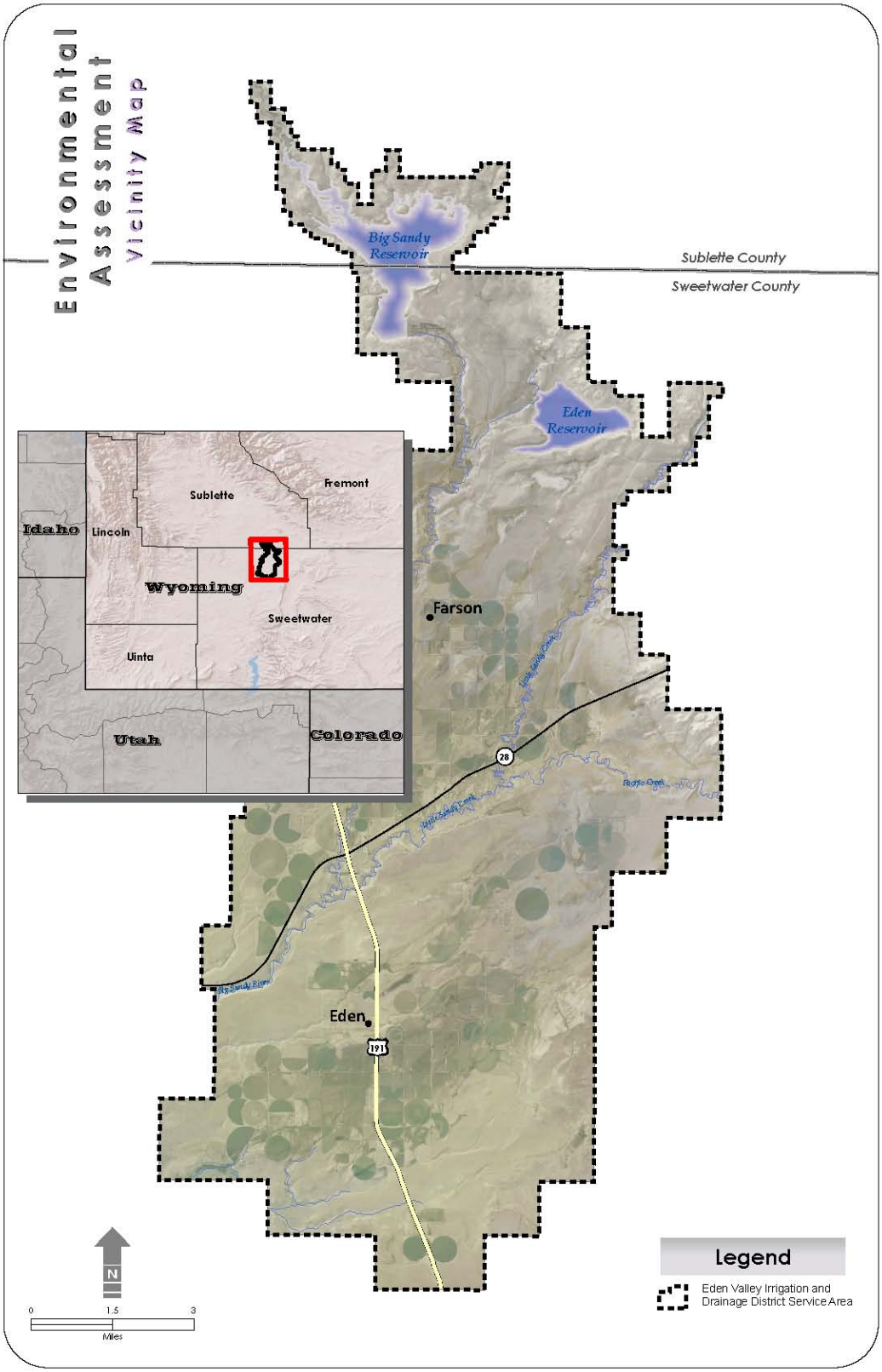

Figure 1:1 Project Location

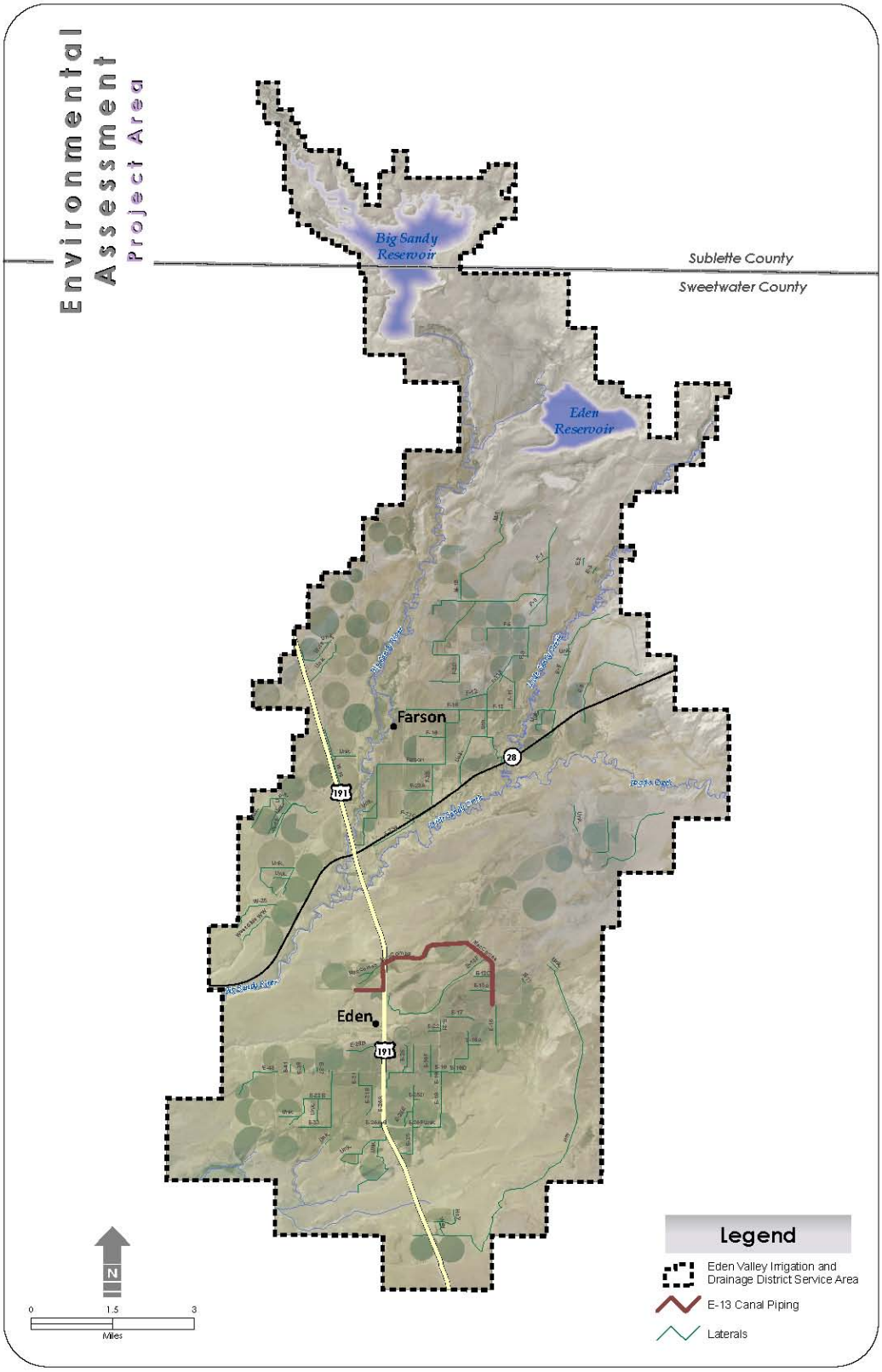

Figure 1.2: Project Area

1.4 Decisions to be Made

Reclamation must decide whether to authorize use of Federal Salinity Control Program funds for the piping of the E-13 lateral.

1.5 Permits and Authorizations

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

- Stream Alteration Permit – This permit (if required) would be issued through the Wyoming Department of Environmental Quality and complies 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 contractor by the Wyoming Division of Water Quality and complies with Section 402 of the Clean Water Act for actions disturbing more than one acre of ground or any discharge.
- Easements with landowners – Right of way will be obtained through Grants of Easement. These easements are required for the following project objectives:
    - Protection of Reclamation's facilities from encroachment
    - Ensure the ability to perform O&M of Reclamation's facilities, including access

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 of 1978 (AIRFA) (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])

1.6 Relationship to Other Projects

- **WYDOT US 191**. WYDOT is in the process of developing roadway improvement alternatives for US 191. Interaction of this project with the proposed action is discussed in this document in detail in Section 2.3.
- **Farson/Eden Salinity Control Project, Westside, E-7 and E-8 Laterals Environmental Assessment.** This document will evaluate the alternatives and potential impacts of replacing the Westside, E-7 and E-8 laterals of the Eden Project with pipelines.
- **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 lateral 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 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 would be authorized to proceed with piping lateral E-13 of the Eden Canal in order to reduce the salinity of the Upper Colorado River Basin.

If authorized to proceed, Eden Valley Irrigation and Drainage District (EVIDD) would construct, operate, and maintain this new pipeline in place of the open E-13 lateral. As a feature of the Eden Valley Project, the new pipeline and existing and newly acquired easements will be owned by the United States, administered by Reclamation, and continue to be 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 piping of the E-13 lateral.

Under the no action alternative, use of the existing lateral would continue, and seepage from this lateral would continue to occur. Currently, approximately 50% of irrigation water traveling through this lateral 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. 832 tons of salt would continue to reach the Colorado River every year (Jacobson, 2008). Loss of water due to seepage also requires far greater than necessary water appropriation for agricultural use, due to the inefficiency of the existing canal system.

2.3 Action Alternative

Under the proposed action alternative, Reclamation would authorize the use of Federal funds to replace the E-13 lateral with a pipeline. Independently, this action would reduce the salinity loading of the Colorado River by a total of 832 tons annually. Piping the other Eden Canal laterals E-7, E-8, and the Westside lateral would reduce the salinity load by an additional 5,762 tons annually (Table 2.1 Estimated Salt Reduction per Lateral). Piping the lateral will also reduce the amount of water lost through seepage, making more water available for irrigation. Additionally, the existing irrigation system has reached its useful life and requires frequent maintenance along the banks. Piping the lateral would reduce the amount of ongoing system maintenance.

Table 2.1
Estimated Salt Reduction per Lateral

Lateral	Tons/year
E-13	832
Other Eden Canal laterals	
Westside	4,737
E-7	899
E-8	126
Sum	6,594

Source: Jacobson, Kib. Bureau of Reclamation. *Mail Correspondence*. 28 March 2008.

The E-13 lateral is approximately 5 miles long from its diversion point on the Eden Canal to the end of the lateral. The proposed pipeline to replace the open E-13 lateral would also be about five miles long and would have an approximate diameter of 48 inches at the beginning and would taper down toward the end of the pipe. The pipeline would follow the existing E-13 alignment, except for two places (Figure 2.1: Proposed Pipeline Alignment). One area where the pipeline would deviate from the existing alignment would be a new connection from the Eden Canal which would connect E-13 opposite the old Haystack outlet and would head west for approximately 5,000 feet, crossing under Eden Second East and connecting into the existing E-13 lateral ditch. The piped lateral E-13 would parallel US 191 on the west side for approximately 2,600 feet between the existing crossing under US 191 and Eden West Second North. The other alignment deviation is situated near US 191. The Wyoming Department of Transportation (WYDOT) is currently developing plans for improvements to US 191 in this area. Because of this, two alignment alternatives (Proposed Action Option A and Option B) exist for the pipeline throughout this stretch. Depending on the specifics of the new roadway alignment, the pipeline easement may be contained within WYDOT right-of-way immediately west of the roadway (Proposed Action Option A), or it may be contained within private property immediately west of the WYDOT right-of-way (Proposed Action Option B).

Easements:
New easements will need to be obtained from landowners, whether public or private, where the existing canal alignment and the proposed pipeline alignment deviate. Where deviation from the existing alignment occurs, a fifty foot wide easement is needed for construction, reconstruction, operation and maintenance of the pipeline. Construction, operation and maintenance along the existing lateral would be within existing 100 foot wide easements.

The E-13 Lateral will require a new connection between the Eden Canal and the existing canal on the west side of Eden Second East Street. This Lateral will parallel approximately 2,500 feet of US Highway 191. In order to excavate the trench and install the pipeline at these locations, EVIDD must acquire easements from WYDOT and property owners in the name of the United States.

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

Table 2.2
Maximum Impact Acreage of Laterals

Lateral	Construction Easement	Permanent Easement
E-13	5.8 Acres	6.69 Acres

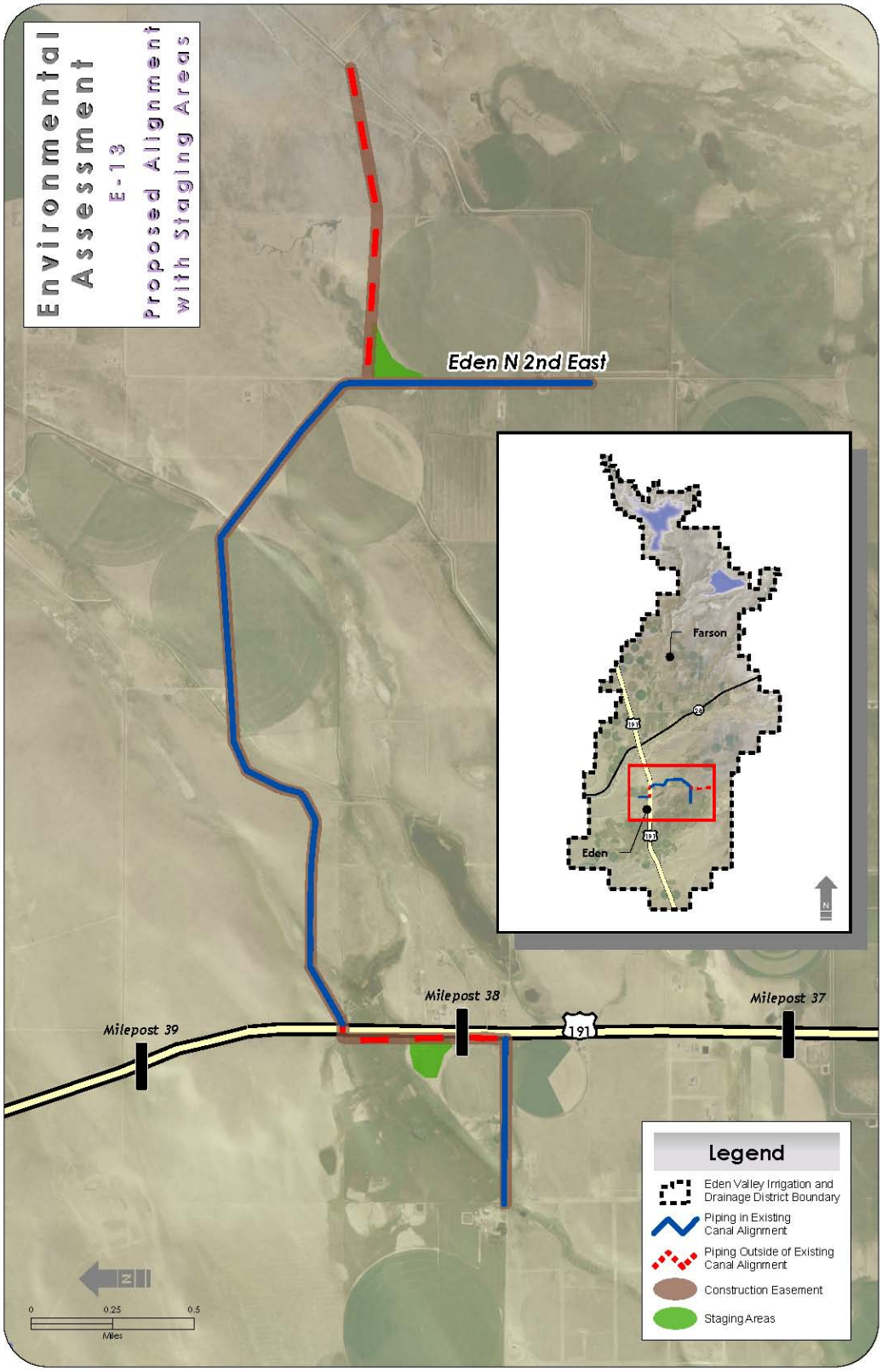

Figure 2.1: Proposed Pipeline Alignment

Turnouts, Drains, Services and Meters:
The project would install new turnout structures within the canal 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.

A drain 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 uses flood irrigation exclusively, rip rap 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 each diversion point and at the Big Sandy reservoir. 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 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

2.3.1.2 Trench Excavation
A trench approximately five feet wide would be excavated to provide for pipe installation. The trench would be approximately eight feet deep in the existing lateral, and approximately fifteen feet deep under the road. Excavation 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 trench, and be used as backfill after pipe installation. In critical

areas, such as established agricultural lands, top soil would be separated from other material in order to preserve it to be placed as the last layer.

2.3.1.3 Pipe and Appurtenance Installation

The pipe would be transported by a tractor trailer from the manufacturer to the staging areas. From the staging areas it would either be transported by a loader to the work site or fused into longer sections and drug to the work site. Existing access roads would be used to transport the 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 that is in the pipeline at the end of the irrigation season to drain from the pipe. 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 established agricultural areas, the preserved top soil would be placed last to minimize impacts and facilitate a speedy recovery. Backfill would be mechanically compacted. Spoil 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 lateral 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.

2.3.1.4 Crossings

Existing drainage crossings would be maintained during construction. One additional new crossing would be required under Eden Second East where a new pipe will connect the Eden Canal on the east-side with the existing lateral ditch on the west-side of the road.

2.3.1.5 Quality Control Procedures

After backfilling and completion of construction activities, the contractor would ensure quality control of construction through visual inspection and hydrostatic testing. Each segment or reach of pipe would be filled with water and pressurized for hydro testing through contractor-supplied pumps to ensure that the system operates to design specifications. If the pipe leaks or breaks, it would be repaired and re-tested until it meets specifications. After testing a segment, the water may be pumped into the next segment for testing.

2.3.2. Construction Staging Areas

Construction staging areas have been identified throughout the project (Figure 2.1: Proposed Alignment). The staging areas would be used to stockpile the pipe, equipment, and construction vehicles.

2.3.3. Land Disturbance

The proposed pipeline alignment described in Section 2.3, totals approximately 5 miles in length and would require a maximum construction width of 100 feet. Construction activities would be confined to this 100-foot width where provided by 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.

2.3.4. Transportation Requirements

Transportation to the project would mainly follow existing access roads parallel to the E-13 lateral to minimize disturbance to the existing vegetation. These roads are currently used for service access to the lateral, are already disturbed, and would be within the proposed construction easement. Temporary new access roads would be necessary for construction. These temporary access roads would be recontoured and revegetated with native plant material following construction. Additional access roads for ongoing maintenance parallel to the new segments between the Eden Canal and Eden Second East, and on the west-side of US 191 would also be necessary.

2.3.5. Standard Operating Procedures

Standard Operating Procedures (SOPs) would be followed (except for under 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 Irrigation Company'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 is appropriate for the different construction zones, reseeding rates, landscaping, re-vegetation, and noxious weed removal and control. These documents will include success criteria for restoration of disturbed areas. Monitoring and treatment will continue until the success criteria are met for two successive years without human intervention. These actions will ensure 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, thereby eliminating the potential of someone drowning.
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 will 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). While the project area is in the portion of Sweetwater County that might be designated as a non-attainment area, EPA has

not yet formally responded to the Governor's request. 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 Big Sandy Sub-basin's headwaters 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, 2009).

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. 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, manmade 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 of 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

The project area contains both naturally occurring riparian areas and those that have occurred due to the presence of the Eden Canal laterals and drainage system. Naturally occurring wetlands exist at two locations: west of the project corridor next to US 191, and on the north side of Eden Second North. The seepage from the irrigation water in E-13 has created riparian habitat along much of the existing channel. These riparian areas average 16.7 feet in width, ranging from 13 feet to 19 feet wide.

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.

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 human altered/agricultural lands are home to antelope *(Antilocapra Americana),* badger *(Taxidea taxus),* ground squirrel *(Spermopohilius elegans),* and various small rodents. 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.

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 eight federally listed species including six endangered, one threatened, and one candidate species that may potentially exist within or downstream from the project area (Appendix A, USFWS Letter).

Endangered Species

Black-footed Ferret *(Mustela nigripes)* The black-footed ferret is 18 to 24 inches long, and weighs only one-and-a-half to two-and-a-half 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 2009). 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. 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, 2009.

Bonytail (*Gila elegans*)

The bonytail is a large freshwater minnow, up to 62 cm, 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 added to the Endangered Species List on April 23, 1980 (NatureServe Comprehensive Species Report, 2009).

Colorado Pikeminnow (*Ptychocheilus lucius)*
The Colorado pikeminnow is a large freshwater minnow that may reach a length of 6 feet. Adults are high mobile and prefer medium to large rivers. Young prefer small, quiet backwaters. The species makes extensive spawning migration (up to 200 km. one way) and spawning occurs in late spring. Their habitat is restricted to large rivers within the Colorado River Basin. The Colorado pikeminnow was added to the Endangered Species List on March 11, 1967 (NatureServe Comprehensive Species Report, 2009).

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 list as Endangered on March 11, 1967 (NatureServe Comprehensive Species Report, 2009).

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 later 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, 2009).

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.

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 a June 2009 site survey and July 2009 site visit.

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 (*Mustela nigripes*)	Endangered	No
Blowout Penstemon (*Penstemon haydenii*)	Endangered	No
Colorado River Fish Bonytail (*Gila elegans*), Colorado Pikeminnow (*Ptychocheilus lucius*), Humpback Chub (*Gila cypha*), Razorback Sucker (*Xyrauchen texanus*)	 Endangered Endangered Endangered Endangered	No
Ute Ladies'-tresses (*Spiranthes diluvialis*)	Threatened	No
Yellow-billed Cuckoo (*Coccyzus americanus*)	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 in the state. Three species were identified as sensitive by the USFWS for the project area vicinity, including the bald eagle, greater sage-grouse and the mountain plover.

Bald Eagles *(Halieaeetues 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, 2009).

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. A study group is in the process of developing a maintenance plan for the greater sage-grouse (USFWS Species Profile, July 2009).

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 (20 to 24 cm) long and weighs about 3.7 ounces (105 grams). In appearance it is typical of *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 2009).

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	*Halieaeetues leucocephalus*	State Sensitive	No
Greater Sage-grouse	*Centrocercus urophasianus*	State Sensitive	No
Mountain Plover	*Charadrius montanus*	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 greenei),* Cedar Rim thistle *(Cirsium aridum),* Ownbey's thistle *(Cirsium ownbeyi),* slender cryptantha *(Cryptantha gracillis),* Rollins' cat's-eye *(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, 2009).

Dwarf Mountain Mahogany (*Cercocarpus intricatus*):

This intricately-branching shrub or small tree can reach heights of up to 2 meters. Leaves are 3-18 mm long and 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, 2009).

Fullstem (*Chamaechaenactis scaposa*):

Fullstem is a caespitose perennial forb which grows 2-9 cm. 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, 2009).

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 (Wyoming Natural Diversity Database, 2009).

Cedar Rim Thistle (*Cirsium aridum*):

Cedar Rim thistle is a perennial, taprooted herb with a loosely to densely woolly-hairy stem. The species possess lavender flowers and cream-colored fruit with fine brown streaks. Flowering and fruiting occurs from June to July. 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 5800 to 7500 feet (Wyoming Natural Diversity Database, 2009).

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 6440-8200 feet. Most occurrences are on sandy clay soils. Populations may also occur on roadcuts (Wyoming Natural Diversity Database, 2009).

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 6040-6900 feet (Wyoming Natural Diversity Database, 2009).

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 ridgetops and slopes with sandy soils or sandstone slate flakes between 6,040 to 7,820 feet (Wyoming Natural Diversity Database, 2009).

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 through August. The western dodder is found in big sagebrush communities at 6,400 to 7,600 feet (Wyoming Natural Diversity Database, 2009).

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	*Ceanothus martinii*	G4/S1	No
Dwarf mountain mahogany	*Cercocarpus ledifolius* var. *intricatus* [*Cercocarpus intricatus*]	G5T4/S1	No
Fullstem	*Chamaechaenactis scaposa*	G4/ S1S2	No
Greene rabbitbrush	*Chrysothamnus greenei*	G5/S1?	No
Cedar Rim thistle	*Cirsium aridum*	G2Q/S2	No
Ownbey's thistle	*Cirsium ownbeyi*	G3/S2	No
Slender cryptantha	*Cryptantha gracilis*	G5/S1	No
Rollins' cat's-eye	*Cryptantha rollinsii*	G3/S1	No
Western dodder	*Cuscuta occidentalis*	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 this proposed action is limited to the proposed pipeline corridor, 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 Paleoindian 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, the 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. Due to a long delay in construction caused by World War II, completion of the project was re-authorized by an act of the Congress on June 28, 1949. In 1950, construction and improvement work recommenced, resulting in a major overhaul to the Eden Canal (Klajic 2000).

Final construction of the project, including rehabilitation work on the existing Eden Dam and Reservoir, was substantially completed by December 1959. As a result of the work done by Reclamation in the 1950's, the upper 14.5 miles of the original Eden Canal (above Eden Reservoir) was abandoned, while the lower 15. 5 miles of the canal (below Eden Reservoir) was largely reconstructed. The reconstruction involved major earthwork and enlargement along most of the original Eden Canal alignment (Kail 1998). The Eden Canal today is approximately 10. 8 miles long and runs generally south from the Eden Reservoir.

3.3.8.2 Cultural Resources Status

The Area of Potential Effects (APE) defined in the action alternative analyzed for the proposed action, has been the subject of 100 percent pedestrian Class I and Class III cultural resource inventories by the Provo Area Office archaeologist in June and July, 2009. A total of 84 acres were inventoried. One historic property, the Eden Canal, was located during the inventory. The canal will not be impacted by the proposed action. In compliance with 36 CFR 800.4(d)(1) and 36 CFR 800.11(d), a cultural resource inventory report and determination of no historic properties affected for the undertaking were submitted to the Wyoming State Historic Preservation Office (SHPO) for consultation (Appendix B, SHPO consultation letter). In addition, copies of the report were also sent to tribes for consultation in compliance with 36 CFR 800.2. SHPO concurrence was received by Reclamation in November 2009.

3.3.9 Paleontological Resources

A paleontological literature search and a field inventory were conducted in September 2009 for the proposed project APE by Uinta Paleontological Associates, Inc. (Appendix C, Paleontological Report). The major lithologic unit in the proposed project APE is the Laney Member of the Green River Formation, a unit of Eocene age (approximately 54.8 to 33.7 million years ago). 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. In the proposed project APE, only the Laney Shale Member of the green River Formation is exposed.

The paleontological report indicates that no known fossil localities are located within the project area. Several important localities, however, are known from the immediate surrounding area. Further, even though there are no known vertebrate fossil localities within the proposed project APE, the presence of rock units that have yielded important vertebrate fossils nearby indicate that the probability of construction impacting vertebrate fossils is relatively high.

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%), Means-Farson sandy loams (10. 3%), gunbarrel loamy sands (9. 2%), Farson sandy loam (7. 5%), and Shellcreek silty clay (5. 8%). 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, 2009).

3.3.11 Indian Trusts Assets

Indian Trust Assets (ITA's) are legal interests in property held in trust by the United States for 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 tribes on a Government-to-Government basis whenever plans or actions affect tribal trust resources, trust assets, or tribal safety (please refer to 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 nonsignificant, 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 ITA's 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 to the resources. There are no known ITA's in the project area vicinity, and no ITA concerns were identified by potentially affected tribes during the tribal consultation process.

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 2000 U. S. Census data, Eden has a total population of 506 residents. Of these residents 497 (98. 2%) are white, while the remaining 9 residents are identified as an ethnic minority. Sweetwater County, in comparison, has a total population of 37,613, with 32,586 (86. 6%) identified as white only, with the remaining 5,027 (13. 4%) identified as an ethnic minority. Therefore, the census data suggests that although an ethnic minority population may be located within the project area, there is not a low-income minority population in the project area. The median income for Eden is $52,625, while the median income for Sweetwater County is $46,537.

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. The Wyoming Department of Transportation (WYDOT) is currently in the process of preparing a corridor rehabilitation and improvement plan for US 191. State Highway 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. The E-13 lateral crosses US 191 approximately a half mile north of Eden First

North, and also crosses Eden Second East approximately 1 mile north of Eden Second South.

3.4 Environmental Consequences

The environmental consequences section discusses potential impacts to the project area resources from the No Action and Action Alternatives. The Action Alternative includes analysis of both Build Alternative Option A and Build Alternative Option B, as described in Section 2.3 Action Alternative. In most of the resource areas the impacts of Build Alternative Option A and Build Alternative Option B were found to be the same. In the following discussions the impacts are the same for both options unless specifically noted otherwise.

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. Short term fugitive dust generation from construction activities could have a temporary adverse affect 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 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 lateral E-13 would continue to seep into the soil and ultimately contribute to the concentrated salt loads to Colorado River Basin. This seepage would result in the continued loss of approximately fifty percent of the irrigation water that runs through the E-13 lateral.

Action Alternative

The Action Alternative would reduce seepage from the E-13 lateral. This would result in an estimated fifty-percent increase in water traveling to agricultural users along the lateral, thereby improving the efficiency of the irrigation system.

3.4.3. Water Quality

No Action Alternative

Under the No Action Alternative, the Colorado River Basin would continue to receive concentrated salt loads from the deep percolation of seepage from lateral E-13. There would be long-term minor to moderate adverse impacts to the water quality of the Colorado River Basin under the No Action Alternative.

Action Alternative
The Action Alternative would reduce seepage from the E-13 lateral. The reduced seepage will result in an estimated 832 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, which would improve 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 to the upland vegetation in the project area. These 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 will be in upland and agricultural areas. Most of the areas where construction would take place are already altered from their natural states. Furthermore, construction would occur outside the growing season, between October and May, and would occur within a 50- to100-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 re-contoured and reseeded. After completion of the re-contouring and reseeding, 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 reseeding. 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 will be reseeded with an appropriate agricultural mix.

Best Management Practices 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.

3.4.5. Wetlands and Riparian Resources

No Action Alternative

Riparian habitat would remain in its current condition, experiencing minor fluctuations in quantity and quality, as naturally occurring precipitation patterns vary. Routine ditch maintenance will 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 plant species would likely increase their dominance within the project area, resulting in degradation of habitat quality.

Action Alternative

1. Many of the wetland and riparian habitats in the project area are ditch-induced and supported by seepage from the ditch. Under the Action Alternative, the majority of long-term project impacts to riparian resources would occur in ditch-induced wetland and riparian habitats. The proposed action would take place entirely within the existing lateral prism except in two locations: 1) between the Eden Canal and Eden Second East; and 2) between the crossing under U.S. 191 and the turn-off at Eden Second North (Figure 3.1: Wetlands in the Project Area). In the segment between U.S. 191 and Eden Second North, the proposed pipeline would cross through small seasonal wetlands. Under Build Alternative Option A and B, there would be temporary impacts to wetlands. Stockpiling and replacement of topsoil would minimize impacts to existing or recovering wetlands.

According to the USACE Wyoming Regulatory Office, the replacement of the open channel irrigation with a pipe is considered an irrigation exemption under RGL No. 07-02 Exemption for Construction or Maintenance of Irrigation Ditches and Maintenance of Drainage under Section 404 Part 323.4(a)(3) of the Clean Water Act (Appendix D, USACE Letter). Under this exemption, no Nationwide Permit is required for the impact to the naturally occurring wetlands within the project area.

Riparian habitat would be impacted by the piping of the lateral. Piping of the lateral will 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 prism that would be lost under the Action Alternative is approximately nine acres. These losses would be considered permanent and would be the same under both Alternative Options. 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 plan approved by

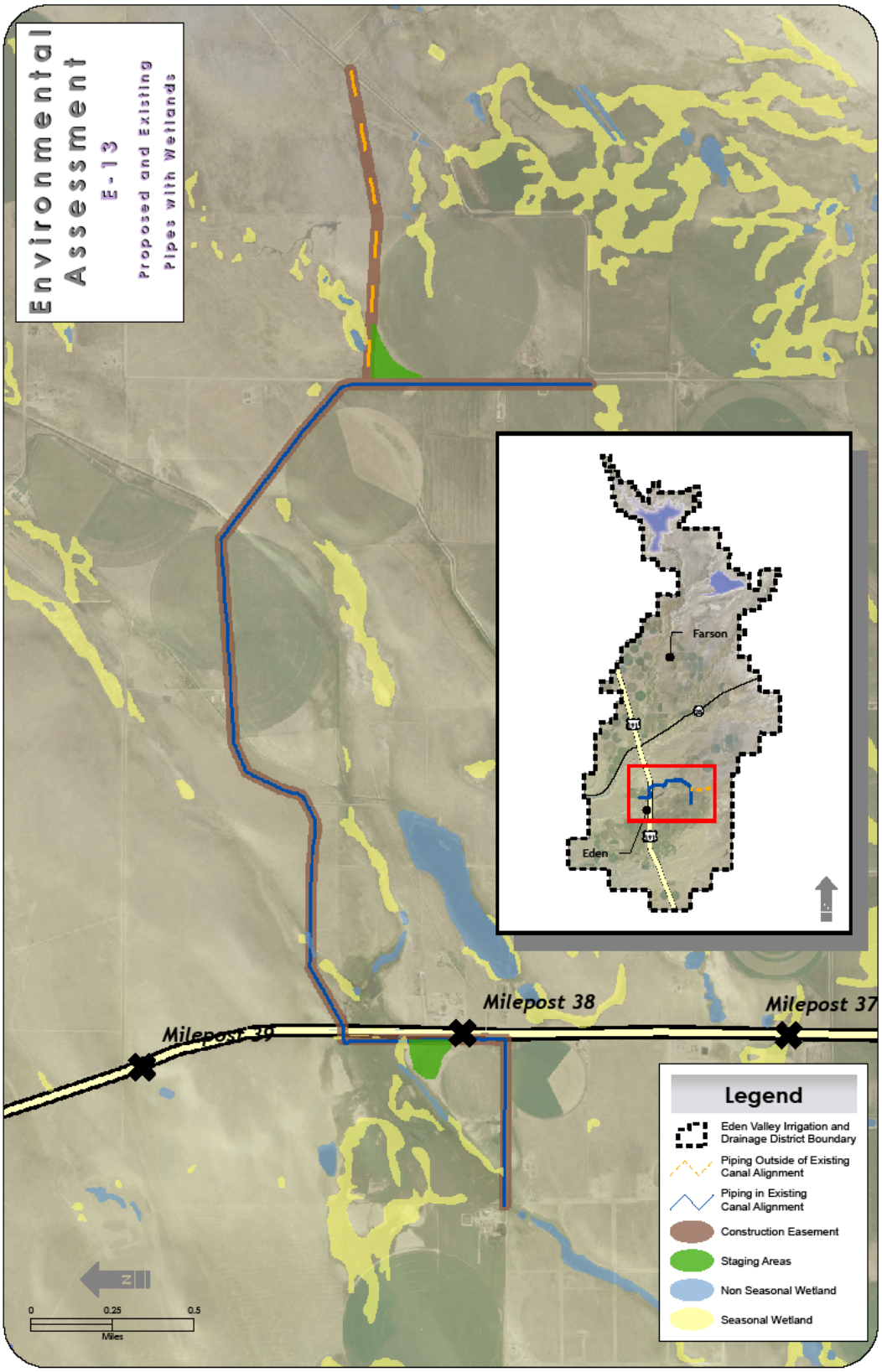

Figure 3.1: Wetlands in the Project Area

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).

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. 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 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 continue 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, approximately 3 acres, temporarily lost due to pipeline construction; but similar habitat is available in the surrounding areas.

After construction, areas disturbed by construction would be re-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 and agricultural species, including grasses, shrubs, and forbs as appropriate.

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 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) by re-contouring and reseeding.
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 E-13 lateral, which may affect 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 be the same as they have been historically.

Action Alternative

There have been no documented occurrences of any federally listed threatened, endangered or candidate species within the project area. A biological survey was completed in May and June 2009 determined that there would be no effect to any federally listed species from the proposed action (Appendix E, Biological Evaluation)

Construction activities would not take place in the immediate proximity of any natural stream. Lateral E-13 does not connect directly to the Green River through

surface channels or waterways. Seepage through soil connects subterraneously to the Colorado River Basin. As a result, no impact to endangered fish species within the Colorado River would result from sedimentation entering Lateral E-13 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 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. Effects of the development of the proposed action on State Sensitive Species would be similar to effects on general wildlife.

Special Concern 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. Effects of the development of the proposed action on State Sensitive 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 affects to cultural resources. There would be no need for ground disturbance for any pipe installation, staging areas, spoils deposit areas, or new roads. The existing conditions would remain intact and would not be affected.

Action Alternative
Class I and Class III cultural resource inventories for the APE resulted in the identification of one historic property, the Eden Canal. The site will not be impacted by the proposed action. Reclamation submitted a determination of no historic properties affected for the proposed project to the Wyoming SHPO and received concurrence in November 2009.

3.4.9. Paleontological Resources

No Action Alternative

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

Action Alternative

The paleontological report indicates that no known fossil localities are located within the project area. Several important localities, however, are known from the immediate surrounding area. Further, even though there are no known vertebrate fossil localities within the proposed project APE, the presence of rock units that have yielded important vertebrate fossils nearby indicate that the probability of construction impacting vertebrate fossils is relatively high.

Uinta Paleontological Associates, Inc. recommends monitoring during construction associated with the proposed project whenever bedrock will be impacted. When pipe is being placed in the existing canals, however, monitoring will not be necessary.

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 re-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 ITAs within the project 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 to Environmental Justice.

Action Alternative

The project area lies on privately and publicly owned land in Sweetwater County, Wyoming. After a review of the United States 2000 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. 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 that would disproportionately affect minority and low-income populations.

3.4.13. Transportation

No Action Alternative

The Wyoming Department of Transportation (WYDOT) is currently in the process of preparing a corridor rehabilitation and improvement plan for US 191. Under the No Action Alternative, WYDOT would be disturbing a strip of land west of US 191, including land between the E-13 lateral turn-off and Eden Second North.

Action Alternative

The proposed action would require the temporary closure of Eden Second East due to construction under the road. This temporary road closure will take place during typical construction hours (7 a.m. to 6 p.m.) and is anticipated to last no longer than one week. The proposed action would also cause limited delays along US 191 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 be minimally impacted along US 191 for emergency vehicles to access Eden and relay patients to Rock Springs to the south. The temporary closure of Eden Second East would require emergency crews to take an alternate route along Ryepatch Road for incidents north of the proposed crossing, and Eden First North for incidents south of the proposed crossing. All temporary road and access closure will be coordinated with local law enforcement and emergency services. The public will also be noticed of any road closures that take place due to the proposed action.

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 will result in an estimated 832 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. Best Management Practices would be employed to decrease likelihood of invasive species.
Wetland and Riparian Resources	No Effect	There would be permanent loss of riparian areas along lateral channel once E-13 is piped.
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 approximately 9 acres of riparian areas along the lateral channel once E-13 is piped. A Habitat Replacement Plan 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 Effect	Potential effect to subsurface cultural

		material during construction.
Paleontology	No Effect	There is a relatively high likelihood of disturbing vertebrate fossils with construction activities impacting bedrock. Mitigate with monitoring during construction activities that impact the bedrock layer.
Soil Erosion and Sedimentation	No Effect	Minor short-term effects due to runoff during and shortly after construction activity. Mitigate with Best Management Practices (BMPs).
Indian Trust Assets	No Effect	No Effect
Environmental Justice	No Effect	No Effect
Transportation	WYDOT rehabilitation/ improvements to US 191	Work along US 191 would cause minor temporary disruption, and traffic volume would increase temporarily during construction. Traffic on Eden Second East would be restricted during construction activity under the road.

Chapter 4: Environmental Commitments

The following environmental commitments would be implemented as an integral part of the proposed action for the piping of Eden Canal E-13 lateral.

1. **Standard Reclamation Management Practices –** Standard reclamation management practices will be applied during construction activities to minimize environmental effects and will 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 will be undertaken as necessary.

3. **State Stream Alteration Permit –** (If required) before implementing the selected alternative, the contractor will obtain a State Stream Alteration Permit from the Wyoming Department of Environmental Quality. The conditions and requirements of the Stream Alteration Permit will be strictly adhered to the contractor.

4. **Cultural Resources –** Any person who knows or has reason to know that he/she has inadvertently discovered possible human remains on Federal land, he/she must provide immediate telephone notification of the discovery to Reclamation's Provo Area Office archaeologist. Work will stop until the proper authorities are able to assess the situation onsite. This action will promptly be followed by written confirmation to the responsible Federal agency official, with respect to Federal lands. The Wyoming State Historic Preservation Office and interested Native American tribal representatives will be promptly notified. Consultation will 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).

   The above process is listed on a "yellow card," to be placed in the cabs of heavy equipment used during construction of the proposed project. This card will be distributed to the equipment operators and verbal direction and description of possible inadvertent discovery scenarios will be given at a preconstruction meeting by the Provo Area Office archaeologist prior to any ground-disturbing activity.

5. **Paleontological Resources –** Monitoring is required for all construction activities which impact the bedrock layer. Anyone who inadvertently discovers possible paleontological resources must stop work immediately and contact the Bureau of Reclamation, Provo Area Office archaeologist. Work will stop until the proper authorities are able to assess the discovery.

6. **Construction Activities Confined to the Surveyed Corridor –** All construction activities will be confined to the one hundred foot wide corridor that has been surveyed for cultural, paleontological, and biological resources.

7. **Roads –** Existing roads will be used whenever possible for project activities. New access roads will be necessary in two locations where there are no existing roads.

8. **Disturbed Areas –** During construction, topsoil will be saved and then redistributed after completion of construction activities. Subsequently, disturbed areas resulting from the project will be smoothed, shaped, contoured and reseeded to as near their pre-project condition as practicable. Stockpiling and replacement of topsoil will be used to minimize impacts to existing or recovering wetlands. Seeding and planting will occur at appropriate times with weed-free seed mixes of native plants and agricultural grasses, distributed where appropriate.

9. **Air Quality –** Best Management Practices (BMPs) will be implemented to control fugitive dust during construction. The contractor will 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 will be covered or watered to prevent the generation of fugitive dust. Construction machinery and operation/maintenance vehicles will be routinely maintained to ensure that engines remain tuned and emission-control equipment is properly functioning as required by law. Additionally, the contractor will comply with all Wyoming State air quality regulations.

10. **Habitat Replacement –** A plan to replace wildlife values foregone must be proposed by the applicant and approved by Reclamation following coordination with the U. S. Fish and Wildlife Service and the Wyoming Department of Game and Fish. Total acreage of wildlife habitat predicted to be lost is approximately 9 acres of riparian habitat along the lateral prism. A proposed replacement property must be acquired and improvements to that property must equal or exceed the values of the habitat lost due to project implementation. Once replacement values are achieved, they must be maintained for the life of the project (50 years). The Habitat Replacement Plan must be approved and initiated prior to project completion and final

payment of construction funds, in accordance with salinity control program procedures.

11. **Sage Grouse Monitoring-** Prior to initiating construction activities, and as the project proceeds, the applicant will ensure that surveys and monitoring will 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. Regardless of the presence of leks, any observation of sage grouse will lead to monitoring by a biologist to ensure that impacts to sage grouse are avoided.

Chapter 5: Consultation and Coordination

5.1 Public Involvement

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 chapter of the EA discusses public involvement as well as consultation and coordination activities undertaken to date for the Farson/Eden E-13 Lateral salinity control project.

In addition to the activities discussed below, this EA has been mailed to the public and made available on the Internet (www.usbr.gov/uc, click on 'Environmental Documents' and click on the specific link for this EA) for a 30-day review and comment period prior to consideration of whether or not to execute a Finding of No Significant Impact (FONSI) and authorize implementation of the proposed action. All comments received will be reviewed, together with the EA, before making a final decision on 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 reports 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. Tribal consultation for this proposed project has been completed.

5.3 Paleontological Resources

A paleontological literature search and a field inventory were conducted in September 2009 for the proposed project APE by Uinta Paleontological Associates, Inc. Uinta Paleontological Associates, Inc. recommends monitoring during construction associated with the proposed project whenever bedrock will be impacted. When pipe is being placed in the existing canals, however, monitoring will not be necessary.

5.4 Wyoming State Historic Preservation Office

A copy of the Class III cultural resource report and a determination of no historic properties affected for the proposed project were submitted to the Wyoming SHPO which concurred in November 2009 with Reclamation's determination of no historic properties affected.

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 *(Information is pending)*

Name	Title/Position	Contributions
Agency Representatives		
Beverley Heffernan, BA	Environmental Protection Specialist, Bureau of Reclamation, Provo Area Office	Project coordination, Environmental Justice, Indian Trust Assets
Rafael Lopez, BA	Biologist, Bureau of Reclamation, Provo Area Office	Coordination and Biological Resource Oversight
Brian Joseph, MA	Archaeologist, Bureau of Reclamation, Provo Area Office	Cultural Resources and Paleontological Resources
Consultants		
Brian Deeter, PE	Engineer, J-U-B, Engineers, Inc.	Project Manager
Jason Snedaker, PE	Engineer, J-U-B, Engineers, Inc.	Alternative Analysis
Ross Wilson, PE	Engineer, J-U-B, Engineers, Inc.	Alternative Analysis
Alex Beseris, BA	Environmental Manager, J-U-B, Engineers, Inc.	NEPA Oversight
Marti Hoge, MA	Environmental Planner, J-U-B Engineers, Inc.	Alternative Analysis Affected Environment Environmental Consequences Environmental Commitments
Andy Ashton	Gateway Mapping, Inc	GIS, Document Graphics
Vincent Barthels, BA	Biologist, J-U-B Engineers, Inc.	Biological and Wetland Resources
Kelli Trujillo, PhD	Paleontologist, Uinta Paleontological Associates, Inc.	Paleontological Resources
Peter Robinson, PhD	Paleontologist, Uinta Paleontological Associates, Inc	Paleontological Resources

Chapter 7: References

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Appendix A

USFWS Letter

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
5353 Yellowstone Road, Suite 308A
Cheyenne, Wyoming 82009

JUL 0 2 2009

In Reply Refer To:
ES-61411/W.22/WY09SL0283

Mr. Vincent Barthels
Biologist
JUB Engineers, Inc.
W. 422 Riverside, Suite 722
Spokane, WA 99201

RECEIVED
JUL 8 2009
J-U-B ENGINEERS INC.

Dear Mr. Barthels:

Thank you for your email of May 22, 2009 regarding the piping of approximately 24 linear miles of irrigation canals in Sweetwater County, located between T26N R106W and T25N, R105W near the town of Eden. The project will be constructed on both Federal (Bureau of Reclamation) and private lands and will consist of piping irrigation waters in a 66-inch HDPE pipes, replacing existing open irrigation ditches.

In response to your request, the Service is providing you with the following information pursuant to the Endangered Species Act (Act) of 1973 as amended, (16 U.S.C. 1531 *et seq.*), Migratory Bird Treaty Act (MBTA), 16 U.S.C. 703, and the Bald and Golden Eagle Protection Act (BGEPA), 16 U.S.C. 668. Other fish and wildlife resources are considered under the Fish and Wildlife Coordination Act and the Fish and Wildlife Act of 1956, as amended, 70 Stat. 1119, 16 U.S.C. 742a-742j. Wetlands are afforded protection under Executive Orders 11990 (wetland protection) and 11988 (floodplain management), as well as section 404 of the Clean Water Act.

In accordance with section 7 of the Act, the following species could be present within or near the project area:

SPECIES	STATUS	HABITAT
Black-footed ferret (*Mustela nigripes*)	Endangered	Prairie dog towns
Blowout penstemon (*Penstemon haydenii*)	Endangered	Sand blowouts or dunes

Ute ladies'-tresses (*Spiranthes diluvialis*)	Threatened	Seasonally moist soils and wet meadows of drainages below 7000 feet
Yellow-billed cuckoo (*Coccyzus americanus*)	Candidate	Riparian areas west of the Continental Divide

If the proposed action may lead to consumptive use of water in the Colorado River System, impacts to threatened and endangered species inhabiting the downstream reaches of this system should be included in the evaluation.

Colorado River fish	Endangered	Downstream riverine habitat of the Yampa, Green and Colorado River systems

Black-footed ferret: Black-footed ferrets may be affected if prairie dog towns are impacted. If white-tailed prairie dog towns or complexes greater than 200 acres will be disturbed, surveys for ferrets may be recommended in order to determine if the action will result in an adverse effect to the species. Surveys may be recommended even if only a portion of the white-tailed prairie dog town or complex. According to the Black-Footed Ferret Survey Guidelines, a prairie dog complex consists of two or more neighboring prairie dog towns less than 7 km (4.3 miles) from each other. If a field check indicates that white-tailed prairie dog towns or complexes may be affected, you should contact this office for guidance on ferret surveys We encourage you to protect all prairie dog towns for their value to the prairie ecosystem and the myriad of species that rely on them. We further encourage you to analyze potentially disturbed prairie dog towns for their value to future black-footed ferret reintroduction.

If white-tailed prairie dog towns or complexes greater than 200 acres will be disturbed, surveys for ferrets may be recommended in order to determine if the action will result in an adverse effect to the species. Surveys are recommended even if only a portion of the white-tailed prairie dog town or complex will be disturbed. According to the *Black-Footed Ferret Survey Guidelines* (USFWS 1989), a prairie dog complex consists of two or more neighboring prairie dog towns less than 7 km (4.3 miles) from each other. If a field check indicates that prairie dog towns may be affected, you should contact this office for guidance on ferret surveys.

Blowout penstemon: 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 was listed as endangered on October 1 1987. Blowout penstemon is known from multiple populations in western Nebraska (Fertig 2001). The plant's current known range in Wyoming consists of the Ferris dunes area in northwest Carbon County where the plant is restricted to two habitat types: steep, northwest facing slopes of active sand dunes with less than 5 percent vegetative cover; and on north facing sandy slopes, on the lee side of active blowouts with 25-40 percent vegetative cover. Known populations in Wyoming are found between 6680-7440 feet (Fertig 2001). However, recent surveys have indicated that

systematic surveys may be warranted in some lower elevations (below 6700 feet) in Wyoming where active sand blowout features occur (BLM 2005, Fertig 2001).

Blowouts are formed as strong winds deposit sands from the windward side of a dune to the leeward side and result in a sparsely vegetated crater-like depression. Associated vegetation includes blowout grass, thickspike wheatgrass, lemon scurfpea, Indian ricegrass and western wheatgrass. Threats to the plant occur when sand dunes are removed or overly disturbed by vehicular traffic. Surveys should be conducted from mid-June to early-July when flowering occurs by knowledgeable botanists trained in conducting rare plant surveys. The Service does not maintain a list of "qualified" surveyors but can refer those wishing to become familiar with the blowout penstemon to experts who can provide training/services.

Ute ladies'-tresses: Ute ladies'-tresses is a perennial, terrestrial orchid, 8 to 20 inches tall, with white or ivory flowers clustered into a spike arrangement at the top of the stem. *S. diluvialis* typically blooms from late July through August; however, depending on location and climatic conditions, it may bloom in early July or still be in flower as late as early October. *S. diluvialis* is endemic to moist soils near wetland meadows, springs, lakes, and perennial streams where it colonizes early successional point bars or sandy edges. The elevation range of known occurrences is 4,200 to 7,000 feet (although no known populations in Wyoming occur above 5,500 feet) in alluvial substrates along riparian edges, gravel bars, old oxbows, and moist to wet meadows. Soils where *S. diluvialis* have been found typically range from fine silt/sand, to gravels and cobbles, as well as to highly organic and peaty soil types. *S. diluvialis* is not found in heavy or tight clay soils or in extremely saline or alkaline soils. *S. diluvialis* seems intolerant of shade and small scattered groups are found primarily in areas where vegetation is relatively open. Surveys should be conducted by knowledgeable botanists trained in conducting rare plant surveys. *S. diluvialis* is difficult to survey for primarily due to its unpredictability of emergence of flowering parts and subsequent rapid desiccation of specimens. The Service does not maintain a list of "qualified" surveyors but can refer those wishing to become familiar with the orchid to experts who can provide training or services.

Yellow-billed cuckoo: The distinct population segment of the yellow-billed cuckoo (*Coccyzus americanus*), west of the Continental Divide, is a candidate for listing under the Endangered Species Act (66 FR 143, 25 July 2001). In Wyoming, the yellow-billed cuckoo is dependent on large areas of woody, riparian vegetation that combine a dense shrubby understory for nesting and a cottonwood overstory for foraging. Destruction, degradation and fragmentation of wooded, riparian habitats are continuing threats to yellow-billed cuckoos in Wyoming. Additionally, project actions to control outbreaks of caterpillars, cicadas or grasshoppers, and the general use of insecticides in or adjacent to riparian areas may negatively affect yellow-billed cuckoos. Surveys to determine the presence of yellow-billed cuckoos are difficult due to the secretive nature of the species and the variability in the timing of nesting. Therefore, we recommend as a conservation practice that projects avoid impacting large, woody riparian areas from late May to September, during the period when yellow-billed cuckoos seasonally occur in Wyoming. To help us better understand the distribution and status of the species in Wyoming, we request that all sightings of yellow-billed cuckoos west of the Continental Divide be reported to our office.

Colorado River water depletions: Formal consultation is required for projects that may lead to depletions of water to the Colorado River system. Federal agency actions resulting in water depletions to the Colorado River system may affect the endangered Bonytail (*Gila elegans*), Colorado pikeminnow (*Ptychocheilus lucius*), Humpback chub (*Gila cypha*), and Razorback sucker (*Xyrauchen texanus*) downstream in the Green and Colorado river systems. In addition, depletions may contribute to the destruction or adverse modification of designated critical habitat for these four species.

In general, depletions include evaporative losses and/or consumptive use of surface or groundwater within the affected basin, often characterized as diversions less return flows. Project elements that could be associated with depletions include, but are not limited to, ponds (detention/recreation/irrigation storage/stock watering), lakes (recreation/irrigation storage/municipal storage/power generation), reservoirs (recreation/irrigation storage/municipal storage/power generation), hydrostatic testing of pipelines, wells, dust abatement, diversion structures, and water treatment facilities. Any actions that may result in water depletion should be identified. The document should include: an estimate of the amount and timing of average annual water use (both historic and new uses) and methods of arriving at such estimates; location of where water use or diversion occurs as specifically as possible; if and when the water will be returned to the system; and what the water is being used for.

Migratory Birds: The MBTA, enacted in 1918, prohibits the taking of any migratory birds, their parts, nests, or eggs except as permitted by regulations, and does not require intent to be proven. Section 703 of the MBTA states, "Unless and except as permitted by regulations ... it shall be unlawful at any time, by any means or in any manner, to ... take, capture, kill, attempt to take, capture, or kill, or possess ... any migratory bird, any part, nest, or eggs of any such bird..." The BGEPA, prohibits knowingly taking, or taking with wanton disregard for the consequences of an activity, any bald or golden eagles or their body parts, nests, or eggs, which includes collection, molestation, disturbance, or killing.

Work that could lead to the take of a migratory bird or eagle, their young, eggs, or nests should be coordinated with our office before any actions are taken. Removal or destruction of such nests or causing abandonment of a nest could constitute violation of one or both of the above statutes. Removal of any active migratory bird nest or nest tree is prohibited. For golden eagles, inactive nest permits are limited to activities involving resource extraction or human health and safety. Mitigation, as determined by the local Service field office, may be required for loss of these nests. No permits will be issued for an active nest of any migratory bird species, unless removal of an active nest is necessary for reasons of human health and safety. Therefore, if nesting migratory birds are present on, or near the project area, timing is a significant consideration and needs to be addressed in project planning.

If nest manipulation is proposed for this project, the project proponent should contact the Service's Migratory Bird Office in Denver at 303-236-8171 to see if a permit can be issued for this project. No nest manipulation is allowed without a permit. If a permit cannot be issued,

the project may need to be modified to ensure take of a migratory bird or eagle, their young, eggs or nest will not occur.

Sensitive Species

Bald Eagle: The Service removed the bald eagle (*Haliaeetus leucocephalus*), except in portions of Arizona, from the list of threatened and endangered species protected under the Act (72 FR 37346; 73 FR 23966). However, the protections provided to the bald eagle under the BGEPA and the MBTA remain in place. The term "disturb" under the BGEPA has recently been defined as: "to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior" (72 FR 31332). Please see our bald eagle internet page for additional information at http://www.fws.gov/wyominges/Species_SpeciesConcern/BaldEagle.html.

Greater sage-grouse: The Service is currently conducting a status review of the greater sage-grouse (*Centrocercus urophasianus*) for possible listing under the Act (73 FR 10218). We continue to have concerns regarding sage-grouse population status, trends and threats, as well as concerns for other sagebrush obligate species. Greater sage-grouse are dependent on sagebrush habitats year-round. Habitat loss and degradation, as well as loss of population connectivity have been identified as important factors contributing to the decline of greater sage-grouse populations rangewide (Braun 1998, Wisdom et al. 2002). Therefore, any activities that result in loss or degradation of sagebrush habitats that are important to this species should be closely evaluated for their impacts to sage-grouse. If important breeding habitat (leks, nesting or brood rearing habitat) are found in the project area, the Service recommends no project-related disturbance March 1 through June 30, annually. Minimization of disturbance during lek activity, nesting, and brood rearing is critical to sage- grouse persistence within these areas. Likewise, if important winter habitats are present, we recommend no project-related disturbance November 15 through March 14.

Mountain Plover: The Service has identified the mountain plover (*Charadrius montanus*) as a Bird of Conservation Concern (74 FR 11128). The Service's Birds of Conservation Concern (2008) report identifies "species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become candidates for listing" under the Act. This report is intended to stimulate coordinated and proactive conservation actions among Federal, State, and private partners. We encourage project planners to develop and implement protective measures should mountain plovers occur within project areas. Suitable habitat for nesting mountain plovers includes grasslands, mixed grassland areas, short-grass prairie, shrub-steppe, plains, alkali flats, agricultural lands, cultivated lands, sod farms, and prairie dog towns. Measures to protect the mountain plover from further decline may include (1) avoidance of suitable habitat during the plover nesting season (April 10 through July 10 in Wyoming), (2) prohibition of ground disturbing activities in prairie dog towns, and (3) prohibition of any permanent above ground structures that may provide perches for avian predators or deter plovers from using preferred habitat.

Wetlands/Riparian Areas

Wetlands may be impacted by the proposed project. Wetlands perform significant ecological functions which include: (1) providing habitat for numerous aquatic and terrestrial wildlife species, (2) aiding in the dispersal of floods, (3) improving water quality through retention and assimilation of pollutants from storm water runoff, and (4) recharging the aquifer. Wetlands also possess aesthetic and recreational values. If wetlands may be destroyed or degraded by the proposed action, those wetlands in the project area should be inventoried and fully described in terms of their functions and values. Acreage of wetlands, by type, should be disclosed and specific actions should be outlined to avoid, minimize, and compensate for all unavoidable wetland impacts.

Riparian or streamside areas are a valuable natural resource and impacts to these areas should be avoided whenever possible. Riparian areas are the single most productive wildlife habitat type in North America. They support a greater variety of wildlife than any other habitat. Riparian vegetation plays an important role in protecting streams, reducing erosion and sedimentation as well as improving water quality, maintaining the water table, controlling flooding, and providing shade and cover. In view of their importance and relative scarcity, impacts to riparian areas should be avoided. Any potential, unavoidable encroachment into these areas should be further avoided and minimized. Unavoidable impacts to streams should be assessed in terms of their functions and values, linear feet and vegetation type lost, potential effects on wildlife, and potential effects on bank stability and water quality. Measures to compensate for unavoidable losses of riparian areas should be developed and implemented as part of the project.

Plans for mitigating unavoidable impacts to wetland and riparian areas should include mitigation goals and objectives, methodologies, time frames for implementation, success criteria, and monitoring to determine if the mitigation is successful. The mitigation plan should also include a contingency plan to be implemented should the mitigation not be successful. In addition, wetland restoration, creation, enhancement, and/or preservation does not compensate for loss of stream habitat; streams and wetlands have different functions and provide different habitat values for fish and wildlife resources.

Best Management Practices (BMPs) should be implemented within the project area wherever possible. BMPs include, but are not limited to, the following: installation of sediment and erosion control devices (e.g., silt fences, hay bales, temporary sediment control basins, erosion control matting); adequate and continued maintenance of sediment and erosion control devices to insure their effectiveness; minimization of the construction disturbance area to further avoid streams, wetlands, and riparian areas; location of equipment staging, fueling, and maintenance areas outside of wetlands, streams, riparian areas, and floodplains; and re-seeding and re-planting of riparian vegetation native to Wyoming in order to stabilize shorelines and streambanks.

We appreciate your efforts to ensure the conservation of Wyoming's fish and wildlife resources and look forward to working with you. If you have questions regarding this letter or your

Appendix B

Cultural Letter

United States Department of the Interior

BUREAU OF RECLAMATION
Upper Colorado Region
Provo Area Office
302 East 1860 South
Provo, Utah 84606-7317

IN REPLY REFER TO:

PRO-772
ENV-3.00

Received
OCT 28 2009

Ms. Mary Hopkins
State Historic Preservation Officer
2301 Central Avenue
Barrett Building, 3rd Floor
Cheyenne, WY 82002

Subject: Documentation for a Class III Cultural Resource Inventory for the Proposed Farson-Eden Salinity Control Project (SHPO Project #0909LKN014) and for a Class III Cultural Resource Inventory for the Proposed M-1 Salinity Control Project (SHPO Project #0909LKN015), both in Sweetwater County, Wyoming

Dear Ms. Hopkins:

In compliance with 36 CFR Part 800, Section 106 of the National Historic Preservation Act of 1966, and all other laws, regulations, and directives that are pertinent to these Federal undertakings, the Provo Area Office of the Bureau of Reclamation (Reclamation) is re-consulting with you regarding the subject reports, copies of which are enclosed.

Public Law 104-20, signed in 1995, authorizes Reclamation to pursue and fund salinity control efforts within the Colorado River Basin. A consultation letter regarding the original subject reports was sent to the Wyoming SHPO (SHPO) by Reclamation on September 2, 2009. In a letter dated September 21, 2009, SHPO requested reevaluations of the significance of the laterals involved in each project. This consultation concerns the most recent versions of the Class III cultural resources inventory reports for the two salinity control projects including the reevaluations.

With respect to the first project, the Eden Valley Irrigation and Drainage District (EVIDD) proposes to replace 5 miles of the existing E-13 Lateral, an earthen irrigation ditch originating on the Eden Canal (48SW9110), with 14 to 48-inch HDPE pipeline to reduce seepage and salt loads in the area. The area of potential effect (APE) for the proposed project covers approximately 84 acres of Reclamation and private lands. The impacts involve laying the pipeline into the existing E-13 Lateral prism and covering the pipe with fill dirt. In addition, three staging areas will also be used to store materials during the construction process.

The E-13 Lateral does not contribute to the significance of the Eden Canal. The lateral is a 5-mile-long earthen irrigation ditch branching off of the relocated and reconstructed portion of the

Eden Canal that supplies water to approximately 610 acres of the 20,000 acres of irrigated land supported by the Eden Project. Further, the E-13 Lateral, as previously mentioned, was constructed in 1955, long after most of the facilities of the Eden Project were originally completed, including the original Eden Canal No. 1 that was constructed in 1914. The E-13 Lateral is not a necessary feature in understanding the Eden Project as a whole and therefore, Reclamation recommends the lateral as a non-contributing portion of the overall eligibility of the Eden Canal.

With respect to the second project, the EVIDD proposes to use Federal funds provided pursuant to the American Recovery and Reinvestment Act of 2009 (ARRA) to replace 1.65 miles of the existing M-1 Lateral, an earthen irrigation ditch originating on the Means Canal (48SV6818), with 8 to 18-inch HDPE pipeline to reduce seepage and salt loads in the area. The area of potential effect (APE) for the proposed project covers approximately 22 acres of Reclamation and private lands. The impacts involve laying the pipeline into the existing M-1 Lateral prism and covering the pipe with fill dirt. In addition, one staging area will also be used to store materials during the construction process.

The M-1 Lateral has not played an important role in the development of the Eden Project, as a whole. The lateral is only 1.65 miles in length and supplies water to approximately 321 acres of the 20,000 acres of irrigated land supported by the project. Further, the M-1 Lateral was added as an aside to the Means Canal in 1959. When the Means Canal was originally completed in 1952, two major laterals, the West Side and Farson, diverted water from the canal to adjacent irrigated lands. The M-1 Lateral does not contribute to the significance of the Means Canal and is not a necessary feature in understanding the Eden Project irrigation system as a whole. Therefore, Reclamation recommends the lateral as a non-contributing portion of the overall eligibility of the Means Canal.

According to 36 CFR 800.4(d)(1), Reclamation is recommending a finding of No Historic Properties Affected for the proposed projects. However, in the case that any significant cultural material either on the surface or subsurface is discovered during construction (inadvertent discovery situations), Reclamation's Provo Area archaeologist, Mr. Brian Joseph, shall be notified at 801-379-1082, and construction in the area of the inadvertent discovery will cease until an assessment of the site and recommendations for further work can be made by a professional archaeologist.

In compliance with 36 CFR 800.2(c)(2)(ii), consultation with tribes is ongoing at this time. A consultation letter and a copy of the both Class III cultural resources inventory reports will be sent to each tribe.

Appendix C

Paleontological Report

Proposed Farson/Eden Canal Desalination Project Sweetwater County, WY

Paleontological literature survey, locality search, and preliminary field survey

Uinta Paleontological Associates, Inc.
Vernal, UT
Laramie, WY

Kelli C. Trujillo, Ph.D.
Peter Robinson, Ph.D.

September 25, 2009

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INTRODUCTION

Uinta Paleontological Associates, Inc. (Uinta Paleo) of Vernal, Utah was contacted by J-U-B Engineers of Salt Lake City, Utah in September of 2009 to conduct a literature survey and locality search and to perform preliminary field surveys for a proposed water canal project in Sweetwater County, WY. The project area for the Farson/Eden Canal Desalination Project is located in a geological unit that is well known for yielding fossil vertebrates, and several localities are recorded from the general area. This report summarizes this information and gives recommendations and procedures for protecting fossil resources. The proposed project would impact private, Bureau of Reclamation (BOR), and Bureau of Land Management (BLM) lands.

FEDERAL AND STATE REQUIREMENTS FOR PALEONTOLOGY

On Federal lands, fossil resources are protected under the mandates outlined in the following laws and rulings:

1) The **National Environmental Policy Act of 1969** (NEPA - 42 U.S.C. 4321-4327; P.L. 91-190; 31 Stat. 852, 42); this law involves federal land, federal funding or federal licensing and covers "objects of scientific interest".

2) The **Federal Land Policy and Management Act of 1976** (FLPMA - 43 U.S.C. 1701-1782; P.L. 94-579; 90 Stat. 2743). This law is specific to BLM land and covers "objects of scientific interest".

3) The **Paleontological Resources Preservation Act of 2009** (PRPA), a part of (sections 6301 to 6312) **The Omnibus Land Management Act of 2009**, PL 111-11 (123 Stat. 911 to 1456). A copy of sections 6301 to 6312 is attached as Appendix D. This law applies specifically to federal lands managed by the Departments of Agriculture and Interior (BOR and BLM).

4) BLM Paleontology Resources Management Manual and Handbook H-8270-1 (revised 1998 & 2008).

[**N.B.:** The **Antiquities Act of 1906** (16 U.S.C. 431 to 433; 34 Stat. 225 & ff) does not apply to fossils other than those associated with archaeological sites or specifically set aside for National Parks or Monuments. The section of that law establishing national parks and monuments is specific only to the lands of those monuments (sec. 431) and permits the establishments for the purpose of protecting fossils. Sections 432 and 433 are concerned with permitting legitimate archaeological (antiquities) exploration and excavation, and section 433 provides penalties for illegally disturbing or collecting ruins or objects of antiquity. It most definitely applies to Archaeology, and legal decisions and agency rulings have emphasized this fact.]

Similar guidelines also are outlined by Wyoming state laws and regulations regarding paleontological resource protection: **Wyoming Title 36-1-114 through 36-1-116** (as of 2003).

These federal and state guidelines authorize:

1) Environmental assessments or impact studies for vertebrate paleontological resources on their lands;
2) Permitting of paleontologists to perform pedestrian field surveys and collection of fossil specimens;
3) Evaluation of formal reports with resultant recommendations for and authorization of monitoring and mitigation (which can include avoidance) work in sensitive areas to be impacted during pipeline construction; and
4) Preparation, identification, and curation of recovered specimens and associated geologic data in an approved repository.

Federal and state laws also require final reports to be submitted to the appropriate federal or state agencies for review and approval.

RESOURCE ASSESSMENT GUIDELINES

The BLM released Instruction Memorandum No. 2009-011 on October 10, 2008 that updates the procedures to be followed when assessing potential impacts to paleontological resources. The BLM has also recently updated their Potential Fossil Yield Classification system (PFYC, 2008). Previously the BLM had utilized two different classification systems, including a previous version of the PFYC. The current classification system further divides categories of potentially fossil-bearing rock units to make the system more useful in the field. This updated set of criteria can be found as Appendix B of this report.

GEOGRAPHY AND GEOLOGY OF PROJECT AREA

GEOGRAPHY OF PROJECT AREA

The project area for the Farson/Eden Canal Desalination Project (FECDP) is located within the much larger Eden Valley Irrigation and Drainage District (EVIDD). The EVIDD is located within Townships 23 to 27 North and Ranges 104 to 107 West, mainly in Sweetwater County, Wyoming. The northernmost part of the area is in southern Sublette County. The project area being considered in this report is within Sweetwater County only, in townships 24 to 26 North and Ranges 105 and 106 West.

GEOLOGY OF PROJECT AREA

The major lithologic units in the Eden Valley Irrigation and Drainage District are the Laney Member of the Green River Formation and the Blacks Fork Member of the Bridger Formation, both of Eocene age (approximately 54.8 to 33.7 million years ago). These units are overlain by Quaternary alluvium and eolian (sand dune) deposits. Only the Laney Member of the Green River Formation occurs in the specific area of the proposed Farson/Eden Canal Desalination Project (Appendix A, Fig. 1).

Green River Formation

The Green River Formation is an important sequence of ancient lake deposits occurring in three former lake areas: The Fossil Basin of southwestern Wyoming (ancient Fossil Lake), the

Greater Green River Basin of southwestern Wyoming and northwestern Colorado (ancient Lake Gosiute) and the combined Uinta-Piceance Creek Basins of eastern Utah and northwestern Colorado (ancient Lake Uinta). The Green River Formation has a combined total thickness of 2,763 ft, measured in the Green River Basin reference section (Roehler, 1993). In all these areas it has an intertonguing relationship with the subjacent and superjacent formations. The Green River Formation is well known for both its economic importance (oil shale, trona) and for its fossil content, particularly fish, plants and insects. In the project area only the Laney Shale Member the Green River Formation is exposed.

EVALUATION PROCEDURES AND RESULTS

Literature survey procedures

Uinta Paleontological Associates, Inc. reviewed geologic maps, publications, and paleontological locality information for the proposed Farson/Eden Canal Desalination Project. The initial study involved an evaluation of existing data including a literature search reviewing the geological units (formations and/or their members) to be impacted and their paleontological sensitivity. We reviewed both published literature and unpublished sources to identify and describe the rock units and any significant fossil-bearing localities that may be impacted by construction of the proposed project or are in beds that may be correlative with rocks in the project area. Formations to be impacted are identified on maps and tables with sensitivity levels as defined by the BLM. Those formations known to contain vertebrate fossils generally are considered the most sensitive and at the highest risk from ground disturbance. Vertebrate fossils tend to be rare and fragmentary (portions of skeletons, isolated teeth) when found, so even disarticulated remains are considered significant. Invertebrate and plant fossils, by contrast, are relatively common but can be very important to paleoecological studies of the area. Of the invertebrate and plant fossil-producing localities, the "type" sites (i.e., locations that have produced fossils that paleontologists have used to define extinct species) are considered among the most significant scientific resources.

Databases queried

The databases of the University of Colorado Museum, the University of Wyoming Collection of Fossil Vertebrates, and the Bureau of Land Management (Wyoming office) have been examined for records. Much of the earlier work (up to 2000) is summarized in Robinson et al. (2002).

Literature survey results

GREEN RIVER FORMATION
Lower to Middle Eocene
PFYC Class 5
Underlies all of project area

.

Laney Shale Member

The Laney Shale Member crops out in all the subunits of the Greater Green River Basin (Roehler, 1991, 1993), but is more important (thicker) in the eastern part of the basin (the Washakie sub-basin). In the project area it is the major bedrock unit, but it generally has little

topographic expression. It is overlain by beds of the Bridger Formation to the east and north of the project area.

The Laney Shale Member consists of several formally named beds, each representing a different depositional environment in ancient Lake Gosiute (Roehler, 1992). In the project area, the unit present is the Sand Butte Bed of the Laney Shale Member. It is of fluvial origin in the project area and is composed of tuffaceous sandstone and siltstone and interbedded tuffs.

In the FECDP the Laney Shale Member has not yielded any fossils of significance, but some are known from just outside the FECDP (Farson Fish Beds; see Appendix A, Table 1). Known fossil vertebrates from the Laney Member are listed in Appendix A, Table 2. While other units of the Green River Formation produce large numbers of fossil leaves and insects, the Laney Shale Member has not been as productive of these materials

CONCLUSIONS AND RECOMMENDATIONS

No fossil localities are known from within the project area for the proposed Farson/Eden Canal Desalination Project. Several important localities are known from the immediate surrounding area, and they can be found on Table 1 and Figure 1 in Appendix A. Even though there are no known vertebrate fossil localities within the project area, the presence of rock units that have yielded important vertebrate fossils nearby indicate that the probability of construction impacting vertebrate fossils is relatively high. Construction projects in the Laney Shale often produce fossil fish, as in the Jonah Gas Field (pipeline construction) in southern Sublette County and during the construction of the Overland Pass Pipeline in western Sweetwater County near Little America (Bilbey et al., 2007 and OPP files for 2008).

Recommendations:

Based on our review of the pertinent literature and the field surveys, we recommend monitoring during construction of the Farson/Eden Canal Desalination Project, whenever bedrock will be impacted. When pipe is being placed within existing canals only, monitoring will not be necessary.

Acknowledgements:

We are indebted to the Personnel of the Bureau of Land Management, particularly Dale Hanson in the Wyoming State Office. Toni Culver at the UCM helped with information about localities in her institution.

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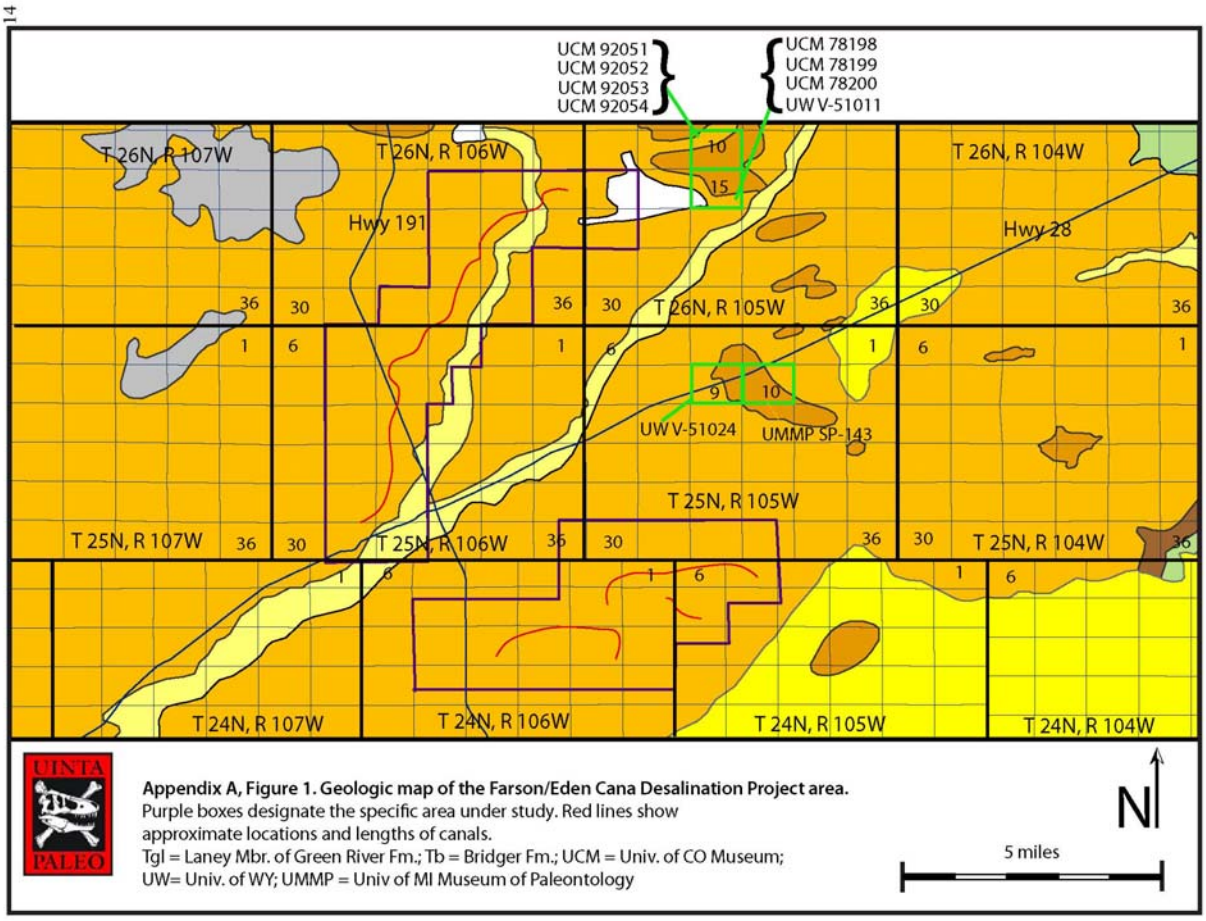
APPENDIX A

PROJECT MAPS AND TABLES



Appendix A, Figure 1. Geologic map of the Farson/Eden Cana Desalination Project area.
Purple boxes designate the specific area under study. Red lines show approximate locations and lengths of canals.
Tgl = Laney Mbr. of Green River Fm.; Tb = Bridger Fm.; UCM = Univ. of CO Museum; UW= Univ. of WY; UMMP = Univ of MI Museum of Paleontology

Appendix A, Table 1. Vertebrate fossil locaities nearby Farson/Eden Cana Desalination project area. All localities are in Sweetwater County, WY on the Eden Reservoir East USGS 7.5' quadrangle. UCM = Univ. of Colorado Museum; UW = University of Wyoming; UMMP = Univ. of Michigan Museum of Paleontology; BLM = Bureau of Land Management

Institut.	Locality #	Locality name	T	R	Sec	QQ Qtr	Q Qtr	Qtr	UTM zone	mE	mN	Lat	Long	Fm.	Mbr.	Period	Epoch
UCM	78198	Eden Reservoir #1	26N	105W	15	NE	NE	SW	12T	638124	4676123	42 13 37	109 19 35	Bridger		Tertiary	Eocene
UCM	78199	Eden Reservoir #2	26N	105W	15	NE	NE	SW	12T	638141	4676090	42 13 36	109 19 34	Bridger		Tertiary	Eocene
UCM	78200	Eden Reservoir JVC	26N	105W	15	NE	NE	SW	12T	638158	4676057	42 13 35	109 19 33	Bridger		Tertiary	Eocene
UCM	92051	Alt 91-21	25N	105W	10	NE	NE	NW	12T	638365	4668863	42 9 42	109 19 30	Bridger		Tertiary	Eocene
UCM	92052	Alt 91-22	25N	105W	10	NW	SW	NE	12T	638581	4668434	42 9 28	109 19 21	Bridger		Tertiary	Eocene
UCM	92053	Alt 91-23	25N	105W	10	SW	SW	NW	12T	637784	4668185	42 9 20	109 19 56	Bridger		Tertiary	Eocene
UCM	92054	Alt 91-24	25N	105W	10	NE	NW	SW	12T	638050	4668079	42 9 17	109 19 45	Bridger		Tertiary	Eocene
UW	V-51011	Morrow Creek Anthills	26N	105W	15		NE	SW	12T	638043	4676094	42 0 0	109 0 0	Green River	Laney	Tertiary	Eocene
UW	V-51024	East Eden Valley	25N	105W	9			NE	12T	637093	4668415	42 9 28	109 20 26	Bridger		Tertiary	Eocene
UMMP	SP-143		25N	105W	10				12T	638300	4668250			Bridger	Blacks Fork	Tertiary	Eocene
BLM		Farson Fish Beds	27N	105W	26			N 1/2						Green River	Laney	Tertiary	Eocene
		"	"	"	23			S 1/2									

Appendix A, Table 2

Vertebrate fossils from the Laney Shale Member, Eocene Green River Formation.
(From: Cope, 1870, 1871, 1877; Grande 1982a, 1982b, 2001; Grande and Bemis, 1998; Grande and Lundberg, 1988; Grande et al., 1982; Jordan, 1907; Leidy, 1873; Lundberg and Case, 1970; Zonneveld et al., 2000; and REX and OPP pipeline collections by UPAI. Classification of mammals from McKenna and Bell, 1997)

Kingdom Animalia
Phylum Chordata
Subphylum Vertebrata
Class Chondrichthyes (cartilaginous fishes)
Order Rajiformes (rays)
Dasyatidae
cf. *Heliobatis* sp.
Class Osteichthyes (bony fish)
Order Lepisosteiformes (gars)
Lepisosteidae
Lepisosteus sp.
Order Amiiformes (bowfins)
Amiidae
Amia sp.
Amia pattersoni
Order Osteoglossiformes
Osteoglossidae
Phareodus encaustus
Order Ellimmichthyiformes
Paraclupeidae
Diplomystus denatus
Order Clupeiformes
Clupeidae (herrings)
Knightia eocaena
Knightia alta
Gosiutichthys parvus
Order Cypriniformes
Catastomidae
Amyzon gosiutensis
Order Siluriformes
Hypsidoridae
Hypsidoris farsonensis
Ictaluridae
Astephus antiquus
Order Percopsifirmes

- Percopsidae
  - *Erismatopterus levatus*
- Uncertain position
  - Asineopidae
    - *Asineops squamifrons*

Class Reptilia

- Order Testudinata (turtles)
  - Baenidae
    - *Baena arenosa*
  - Bataguridae
    - *Echmatemys septaria*
    - *Echmatemys wyomingensis*
    - *Echmatemys* sp.
  - Testudinidae
    - *Hadrianus* sp.
  - Trionychidae
    - Trionychid indet
    - ? *Trionyx* sp.
    - cf. *Platypeltis* sp.
- Order Crocodylia
  - cf. *Borealosuchus* sp.
  - Crocodylidae
    - "*Crocodylus*" *affinis*
  - Alligatoridae
    - *Allognathosuchus* sp.
    - "*Diplocynodon*" sp.
    - Indet. Alligatorid
  - Pristichampsidae
    - *Pristichampsus vorax*
- Order Squamata
  - Suborder Lacertilia (lizards)
    - Infraorder Iguania
      - Iguanidae
        - *Parasauromalus olseni*
      - Agamidae
        - *Tinosaurus* sp.
    - Infraorder Autarchoglossa
    - Infraorder Anguimorpha
      - Anguidae
        - Glyptosaurinae
          - *Glyptosaurus sylvestris*
          - *Xestops* sp. cf. *X. vagans*
      - Indet. Lizards

Class Mammalia
- Supercohort Theria
  - Cohort Marsupialia
    - Magnorder Ameridelphia
      - Order Didelphimorpha
        - Didelphidae
          - *Peradectes* sp.
          - *Peratherium innominatum*
  - Cohort Placentalia
    - Magnorder Epitheria
    - Superorder Preptotheria
    - Grandorder Anagalida
      - **Order Rodentia**
        - Ischyromyidae
          - *Paramys* sp.
          - *Microparamys sp.*
          - *Thisbemys plicatus*
        - Sciuravidae
          - *Pauromys* sp.
          - *Sciuravus* sp.
          - *Sciuravus nitidus*
        - Cylindrodontidae
          - *Mysops* sp.
    - Grandorder Ferae
      - **Order Cimolesta**
        - Suborder Pholidota
          - Metacheiromyidae
            - *Metacheiromys* sp.
          - Epoicotheriidae
            - *Tetrapassalus* sp.
        - Suborder Apatotheria
          - Apatemyidae
            - *Apatemys* sp. cf. *A. bellus*
      - **Order Carnivora**
        - Miacidae
          - *Vulpavus* sp.
    - Grandorder Lypotyphla
      - **Order Soricomorpha**
        - Nyctitheriidae
          - *Nyctitherium* sp. cf. *N. serotinum*
        - Geolabididae
          - *Centetodon* sp.

Order Primates
- Microsyopidae
  - *Microsyops* sp. cf. *M. elegans*
- Omomyidae
  - *Omomys carteri*
  - *Hemiacodon gracilis*
- Notharctidae
  - *Smilodectes mcgrewi*
  - *Notharctus robinsoni*

Grandorder Ungulata

Order Dinocerata
- Uintatheriidae
  - *Uintatherium* sp.

Order Condylarthra (stem ungulates)
- Hyopsodontidae
  - *Hyopsodus* sp.

Order Perissodactyla (odd-toed ungulates)
- Brontotheriidae
  - Indet. Brontotheriid
- Equidae (horses)
  - *Orohippus* sp. cf. *O. pumilus*
- Hyrachyidae ("tapirs")
  - *Hyrachyus* sp.

APPENDIX B

Potential Fossil Yield Classification (PFYC) System

Occurrences of paleontological resources are closely tied to the geologic units (i.e., formations, members, or beds) that contain them. The probability for finding paleontological resources can be broadly predicted from the geologic units present at or near the surface. Therefore, geologic mapping can be used for assessing the potential for the occurrence of paleontological resources.

Using the Potential Fossil Yield Classification (PFYC) system, geologic units are classified based on the relative abundance of vertebrate fossils or scientifically significant invertebrate or plant fossils and their sensitivity to adverse impacts, with a higher class number indicating a higher potential. This classification is applied to the geologic formation, member, or other distinguishable unit, preferably at the most detailed mappable level. It is not intended to be applied to specific paleontological localities or small areas within units. Although significant localities may occasionally occur in a geologic unit, a few widely scattered important fossils or localities do not necessarily indicate a higher class; instead, the relative abundance of significant localities is intended to be the major determinant for the class assignment.

The PFYC system is meant to provide baseline guidance for predicting, assessing, and mitigating paleontological resources. The classification should be considered at an intermediate point in the analysis, and should be used to assist in determining the need for further mitigation assessment or actions.

The descriptions for the classes below are written to serve as guidelines rather than as strict definitions. Knowledge of the geology and the paleontological potential for individual units or preservational conditions should be considered when determining the appropriate class assignment. Assignments are best made by collaboration between land managers and knowledgeable researchers.

Class 1 – **Very Low**. Geologic units that are not likely to contain recognizable fossil remains.

- Units that are igneous or metamorphic, excluding reworked volcanic ash units.
- Units that are Precambrian in age or older.

(1) Management concern for paleontological resources in Class 1 units is usually negligible or not applicable.
(2) Assessment or mitigation is usually unnecessary except in very rare or isolated circumstances.

The probability for impacting any fossils is negligible. Assessment or mitigation of paleontological resources is usually unnecessary. The occurrence of significant fossils is non-existent or extremely rare.

Class 2 – **Low**. Sedimentary geologic units that are not likely to contain vertebrate fossils or scientifically significant nonvertebrate fossils.

- Vertebrate or significant invertebrate or plant fossils not present or very rare.

- Units that are generally younger than 10,000 years before present.
- Recent aeolian deposits.
- Sediments that exhibit significant physical and chemical changes (i.e., diagenetic alteration).

(1) Management concern for paleontological resources is generally low.
(2) Assessment or mitigation is usually unnecessary except in rare or isolated circumstances.

The probability for impacting vertebrate fossils or scientifically significant invertebrate or plant fossils is low. Assessment or mitigation of paleontological resources is not likely to be necessary. Localities containing important resources may exist, but would be rare and would not influence the classification. These important localities would be managed on a case-by-case basis.

Class 3 – **Moderate** or **Unknown**. Fossiliferous sedimentary geologic units where fossil content varies in significance, abundance, and predictable occurrence; or sedimentary units of unknown fossil potential.

- Often marine in origin with sporadic known occurrences of vertebrate fossils.
- Vertebrate fossils and scientifically significant invertebrate or plant fossils known to occur intermittently; predictability known to be low.

(or)

- Poorly studied and/or poorly documented. Potential yield cannot be assigned without ground reconnaissance.

Class 3a – **Moderate Potential.** Units are known to contain vertebrate fossils or scientifically significant nonvertebrate fossils, but these occurrences are widely scattered. Common invertebrate or plant fossils may be found in the area, and opportunities may exist for hobby collecting. The potential for a project to be sited on or impact a significant fossil locality is low, but is somewhat higher for common fossils.

Class 3b – **Unknown Potential.** Units exhibit geologic features and preservational conditions that suggest significant fossils could be present, but little information about the paleontological resources of the unit or the area is known. This may indicate the unit or area is poorly studied, and field surveys may uncover significant finds. The units in this Class may eventually be placed in another Class when sufficient survey and research is performed. The unknown potential of the units in this Class should be carefully considered when developing any mitigation or management actions.

(1) Management concern for paleontological resources is moderate; or cannot be determined from existing data.
(2) Surface-disturbing activities may require field assessment to determine appropriate course of action.

This classification includes a broad range of paleontological potential. It includes geologic units of unknown potential, as well as units of moderate or infrequent occurrence of significant fossils. Management considerations cover a broad range of options as well, and could

include pre-disturbance surveys, monitoring, or avoidance. Surface-disturbing activities will require sufficient assessment to determine whether significant paleontological resources occur in the area of a proposed action, and whether the action could affect the paleontological resources. These units may contain areas that would be appropriate to designate as hobby collection areas due to the higher occurrence of common fossils and a lower concern about affecting significant paleontological resources.

Class 4 – **High**. Geologic units containing a high occurrence of significant fossils. Vertebrate fossils or scientifically significant invertebrate or plant fossils are known to occur and have been documented, but may vary in occurrence and predictability. Surface disturbing activities may adversely affect paleontological resources in many cases.

> ***Class 4a*** – Unit is exposed with little or no soil or vegetative cover. Outcrop areas are extensive with exposed bedrock areas often larger than two acres. Paleontological resources may be susceptible to adverse impacts from surface disturbing actions. Illegal collecting activities may impact some areas.
>
> ***Class 4b*** – These are areas underlain by geologic units with high potential but have lowered risks of human-caused adverse impacts and/or lowered risk of natural degradation due to moderating circumstances. The bedrock unit has high potential, but a protective layer of soil, thin alluvial material, or other conditions may lessen or prevent potential impacts to the bedrock resulting from the activity.
>
> - Extensive soil or vegetative cover; bedrock exposures are limited or not expected to be impacted.
> - Areas of exposed outcrop are smaller than two contiguous acres.
> - Outcrops form cliffs of sufficient height and slope so that impacts are minimized by topographic conditions.
> - Other characteristics are present that lower the vulnerability of both known and unidentified paleontological resources.

(1) Management concern for paleontological resources in Class 4 is moderate to high, depending on the proposed action.
(2) A field survey by a qualified paleontologist is often needed to assess local conditions.
(3) Management prescriptions for resource preservation and conservation through controlled access or special management designation should be considered.
(4) Class 4 and Class 5 units may be combined as Class 5 for broad applications, such as planning efforts or preliminary assessments, when geologic mapping at an appropriate scale is not available. Resource assessment, mitigation, and other management considerations are similar at this level of analysis, and impacts and alternatives can be addressed at a level appropriate to the application.

The probability for impacting significant paleontological resources is moderate to high, and is dependent on the proposed action. Mitigation considerations must include assessment of the disturbance, such as removal or penetration of protective surface alluvium or soils, potential for future accelerated erosion, or increased ease of access resulting in greater looting potential. If

impacts to significant fossils can be anticipated, on-the-ground surveys prior to authorizing the surface disturbing action will usually be necessary. On-site monitoring or spot-checking may be necessary during construction activities.

Class 5 – **Very High**. Highly fossiliferous geologic units that consistently and predictably produce vertebrate fossils or scientifically significant invertebrate or plant fossils, and that are at risk of human-caused adverse impacts or natural degradation.

> ***Class 5a –*** Unit is exposed with little or no soil or vegetative cover. Outcrop areas are extensive with exposed bedrock areas often larger than two contiguous acres. Paleontological resources are highly susceptible to adverse impacts from surface disturbing actions. Unit is frequently the focus of illegal collecting activities.
>
> ***Class 5b*** – These are areas underlain by geologic units with very high potential but have lowered risks of human-caused adverse impacts and/or lowered risk of natural degradation due to moderating circumstances. The bedrock unit has very high potential, but a protective layer of soil, thin alluvial material, or other conditions may lessen or prevent potential impacts to the bedrock resulting from the activity.
>
> - Extensive soil or vegetative cover; bedrock exposures are limited or not expected to be impacted.
> - Areas of exposed outcrop are smaller than two contiguous acres.
> - Outcrops form cliffs of sufficient height and slope so that impacts are minimized by topographic conditions.
> - Other characteristics are present that lower the vulnerability of both known and unidentified paleontological resources.

(1) Management concern for paleontological resources in Class 5 areas is high to very high.
(2) A field survey by a qualified paleontologist is usually necessary prior to surface disturbing activities or land tenure adjustments. Mitigation will often be necessary before and/or during these actions.
(3) Official designation of areas of avoidance, special interest, and concern may be appropriate.

The probability for impacting significant fossils is high. Vertebrate fossils or scientifically significant invertebrate fossils are known or can reasonably be expected to occur in the impacted area. On-the-ground surveys prior to authorizing any surface disturbing activities will usually be necessary. On-site monitoring may be necessary during construction activities.

APPENDIX C
MONITORING AND MITIGATION PROCEDURES FOR PALEONTOLOGICAL RESOURCES

As discussed in Appendix B, the Bureau of Land Management has specific assessment and management guidelines in place for the protection of vertebrate fossil resources on public lands. When fossil material (vertebrate, invertebrate, plant, or trace) is likely to be encountered during ground disturbance associated with construction, the following mitigation protocols may be implemented:

Monitoring – If critical or significant fossil material in a PFYC Class 5 unit is likely to be encountered during the construction of the proposed project, paleontological monitoring is recommended. The probability of such material being encountered is determined from the evaluation of known data and from any field survey discoveries.

Sampling – During construction, fossil material will be sampled to facilitate further analyses to determine significance. Frequently fossil taxa are not sufficiently well known to allow determination of significance in the field.

Salvage – Salvage is requested when the fossil discovery is of scientific interest and if the construction will destroy the site. A written report with mitigation recommendations would be submitted to the lead agency, to the landowner if on private land, and to the Environmental Inspector (EI) in charge of the project as well as to J-A-B Engineers.

Rerouting – A request for a reroute may be made if critical or significant fossil materials encountered directly on the proposed corridor, access road, or ancillary site during the field survey. This option will take into consideration that salvage cost or delays may be unacceptably high.

MONITORING PROGRAM

The purpose of the monitoring program is to protect scientifically significant paleontological resources by documenting and collecting identifiable fossils that are found during construction. This includes monitoring of ground-disturbing activity such as ROW clearing and grading and excavation work. During construction there should be adequate paleontological monitoring of significant units as defined by the analysis of existing data and the field survey. In sedimentary units established as highly significant paleontologically (PFYC 4 or 5), a qualified paleontological monitor should be present during 100 percent of the ground-disturbing activity, unless it has been previously determined by the project paleontologist and the BLM that reduced monitoring is appropriate. In geologic units classified as moderately significant (PFYC 3), a paleontological monitor will perform spot-checks of debris during construction based on the lithology of the unit.

The monitoring program will include the following:

1. Qualified paleontological monitors will be present during 100 percent of ground disturbing activity along the PFYC Level 4 and 5 areas and will perform spot-checks in PFYC Level 3

areas. Geologic maps showing the specific areas to be monitored will be provided to the paleontological monitor, the operation chief of construction, field supervisors, developers, contractors and/or the EI prior to construction. Based on circumstances in the field, the Senior Paleontologist (PI) may downgrade some areas if it is determined that reduced monitoring is appropriate. Follow-up with the appropriate land managing agency office would include a written follow-up/confirmation, with attached rationale for the changed work plan.

2. The paleontological monitors are experienced in paleontological salvage and are equipped with tools and supplies to allow rapid removal of specimens. Paleontological team leaders are experienced in paleontological resource evaluation, fossil identification, fossil prospecting, and salvage. When numerous pieces of equipment are used simultaneously at diverse locations in sensitive areas, at least one paleontological monitor will be present at each work location. A paleontological monitor will follow the earth-moving equipment and examine excavated material and excavated areas for evidence of fossil resources. A follow-up survey may be conducted through sensitive areas to reaffirm the presence or lack of fossil material (wind and rain frequently expose fossil material that may have been missed during the initial evaluation).

If significant fossil material is found, the paleontological monitor will notify the senior project paleontologist immediately. The EI must also be contacted immediately to request that construction at that particular site be temporarily halted within the immediate vicinity to allow further evaluation of exposed fossil resources. If a small fossil is discovered, the paleontological monitor will immediately excavate and evaluate it, and construction will be allowed to proceed. If a complex fossil is discovered, the area will be marked for avoidance. The supervising paleontologist, in cooperation with the BOR and BLM personnel, EI, and paleontological monitor will arrange for sampling and/or immediate removal and verify when construction at that site may continue.

3. Backup monitors will be available to assist in the removal of relatively large, complete, or abundant fossils so that delays to continued construction are minimized. Theses monitors will report to the site as soon as possible, but no later than 48 hours after the find is reported.

4. Some significant vertebrate fossil resources are small to microscopic in size and may not be readily apparent during construction activity. When the potential for microfossil occurrences exists within geologic units in the construction area, matrix samples may be collected to test for their presence during monitoring while the rock is exposed on the debris pile. If fossils are found in this process, samples will be collected for further fossil recovery off-site. An adequate sample size is determined by the senior project paleontologist. The sampling and testing of rock debris will be done expeditiously during construction, to avoid delays, and in a safe manner that does not impede work or traffic.

5. Under no circumstances will fossils be removed from private lands for any reason, including curation, without the written consent of the landowners. The project's land agents will work with the paleontologists to obtain the required written consent of the landowners.

MITIGATION PROGRAM

The purpose of the mitigation program is to protect all scientifically significant paleontologic resources that are discovered during construction. This includes those fossils which are found during monitoring phases of the project, as well as unanticipated discoveries made anywhere in the construction area by any project personnel. All phases of the mitigation are to be supervised by a qualified paleontologist and will include the following procedures:

1. To prevent damage to known paleontologically sensitive resources and to prevent construction delays, avoidance, salvage, or rerouting recommendations will be made well before the beginning of construction.

2. Specific boundaries of sensitive formations (PFYC Class 4 or 5) or known fossil localities will be delineated on construction maps so the company personnel, developers, El, and/or contractors are aware of areas requiring continuous monitoring or spot checking.

3. Prior to the commencement of construction, all construction personnel will be made aware that scientifically significant fossils occur in the area, and personnel will be instructed not to remove or touch them if they are found. In addition, they will be made aware that they must immediately contact the El, the land manager, and the senior project paleontologist if any subsurface fossil bones or other potential fossils are exhumed during construction anywhere in the construction area. If no paleontological personnel are in the vicinity, they will be given adequate time to reach the site.

   Indirect impacts to fossil resources outside the construction area are possible. All workers will be advised that access to adjacent lands is restricted and that fossil resources may be found nearby. Unauthorized collection by workers or the general public may occur due to the increased access to the area. All workers will be advised that unauthorized collection of fossils is illegal. This is a law enforcement issue and will be handled accordingly.

4. **Inadvertent discovery of significant fossils:** Inadvertent discoveries are defined as fossils or fossil concentrations that were not anticipated in the monitoring and mitigation plan because their occurrence was considered to be unlikely. Monitors, contractors and construction workers will be made aware that the El and the paleontological supervisor must be contacted immediately if vertebrate or significant fossil material is unearthed during construction, even in areas where monitoring is not being required. Construction will temporarily halt in the immediate area of vertebrate fossil discovery until it can be evaluated. Work will be allowed to continue within 100 feet of the area of discovery without interruption unless further vertebrate fossil material is encountered.

5. The project paleontologists will be given adequate time to reach the site of an inadvertent discovery of significant fossils; the project paleontologists will respond to such finds as soon as possible, but no later than 48 hours after the find is reported. In addition, any vertebrate fossil discovery on federal or state lands will be reported immediately to the appropriate land managers as well as the El. They will be involved directly in the decisions regarding recovery of fossils and determining when construction may proceed at the fossil discovery site.

Salvaging and removal of fossil specimens will be conducted as efficiently as possible to avoid delays to construction, while taking appropriate measures to avoid damaging the fossils.

6. All significant fossils found in the construction area will be documented in field notebooks as well as on specimen tags. The UTM and Latitude/Longitude coordinates of each fossil locality will be recorded with a GPS. The types/taxa/numbers of fossils observed and or collected will be recorded in field notes as well as on individual specimen identification tags/field labels. The lithology and any other pertinent sedimentological information will be included in the locality description, as well as the geologic unit from which it was collected, the collector, and date. All fossils collected will be stabilized as necessary prior to their removal from the site.

POST-CONSTRUCTION

PREPARATION AND IDENTIFICATION OF FOSSILS

After removal from the construction area, all fossils collected during the monitoring and mitigation phases of the project will require preparation and identification. The primary investigators will prepare small to medium-sized vertebrate fossil material. Special arrangements will be made for preparation of large specimens, such as dinosaurian fossils. In addition, plant or invertebrate fossils also will be collected if scientifically important. Under no circumstances will fossils be removed from private lands for any reason, including curation, without the written consent of the landowners (see "Monitoring Program" section above).

Preparation of fossils involves cleaning (including rock removal) and stabilizing (treating with appropriate preservatives and assembly). Identification of fossils involves their assignment to a known (or possibly new) taxon. This may involve comparisons with specimens in museum collections and literature review. Numbering, boxing, and storage will be done as prescribed by the designated curation facilities. Fossil localities encountered in the field survey, as well as during construction, will be plotted on United States Geological Survey 7.5 minute quadrangle sheets. A set of field and laboratory records as well as photographs with an itemized specimen inventory will be compiled and filed at the curation facilities.

CURATION FACILITIES

Curation facilities are chosen by their proximity to the fossil site, by the professional curation staff, by the landowner, or by the federal or state agency that has authority over the site or that portion of the pipeline route. Curation agreements with potential repositories for fossils found during construction must be in place prior to construction in accordance with BLM paleontology permit regulations. The institution most appropriate for curation of fossil materials from this project is the University of Colorado Museum in Boulder.

FINAL REPORT

Upon completion of construction and evaluation of fossil samples collected, a final report will be compiled. A schedule to complete the final report will be negotiated after fieldwork is completed. Included in this report will be:

1) Description of fieldwork, including pre-construction, monitoring and mitigation planning;

2) Geologic history and stratigraphy of the formations along the route, with locality related ditch logs;

3) Survey results and evaluation of the formations impacted, with a description of fossil localities by formation;

4) Significance of recovered paleontological resources with regard to other known localities;

5) Selected bibliography of formations and paleontological resources;

6) Appendix of locality forms with maps and photographs. A confidential fossil locality appendix will be bound separately from the main report and will be distributed only to the BLM Field Office Paleontology Coordinators, the BLM Regional Paleontologists, The BOR Regional Archaeologist, and the curation facilities. This requirement is for the protection of sensitive paleontological resources in or near the project area;

7) Appendix of an itemized specimen inventory of collected samples with the curatorial facility accession numbers if applicable; and

8) Appendix of collection permits, curation agreements, and other appropriate communications.

Copies of the final report will be submitted for review and approval to the BOR and BLM as well as any other involved agencies. Additional copies will be provided to all agencies after the final report has been approved by appropriate federal and state officials.

APPENDIX D
PALEONTOLOGICAL RESOURCES PRESERVATION ACT
123 STAT. 1174 PUBLIC LAW 111–11—MAR. 30, 2009

Subtitle D—Paleontological Resources Preservation

SEC. 6301. DEFINITIONS.

(1) CASUAL COLLECTING.—The term ''casual collecting'' means the collecting of a reasonable amount of common invertebrate and plant paleontological resources for non-commercial personal use, either by surface collection or the use of nonpowered hand tools resulting in only negligible disturbance to the Earth's surface and other resources. As used in this paragraph, the terms ''reasonable amount'', ''common invertebrate and plant paleontological resources'' and ''negligible disturbance'' shall be determined by the Secretary.

(2) FEDERAL LAND.—The term ''Federal land'' means—

(A) land controlled or administered by the Secretary of the Interior, except Indian land; or

(B) National Forest System land controlled or administered by the Secretary of Agriculture.

(3) INDIAN LAND.—The term ''Indian Land'' means land of Indian tribes, or Indian individuals, which are either held in trust by the United States or subject to a restriction against alienation imposed by the United States.

(4) PALEONTOLOGICAL RESOURCE.—The term ''paleontological resource'' means 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, except that the term does not include—

(A) 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)); or

(B) any cultural item (as defined in section 2 of the Native American Graves Protection and Repatriation Act (25 U.S.C. 3001)).

(5) SECRETARY.—The term ''Secretary'' means the Secretary of the Interior with respect to land controlled or administered by the Secretary of the Interior or the Secretary of Agriculture with respect to National Forest System land controlled or administered by the Secretary of Agriculture.

(6) STATE.—The term ''State'' means the 50 States, the District of Columbia, the Commonwealth of Puerto Rico, and any other territory or possession of the United States.

SEC. 6302. MANAGEMENT.

(a) IN GENERAL.—The Secretary shall manage and protect paleontological resources on Federal land using scientific principles and expertise. The Secretary shall develop appropriate plans for inventory, monitoring, and the scientific and educational use of paleontological resources, in accordance with applicable agency laws, regulations, and policies. These plans shall

emphasize interagency coordination and collaborative efforts where possible with non-Federal partners, the scientific community, and the general public.
(b) COORDINATION.—To the extent possible, the Secretary of the Interior and the Secretary of Agriculture shall coordinate in the implementation of this subtitle.

SEC. 6303. PUBLIC AWARENESS AND EDUCATION PROGRAM.
The Secretary shall establish a program to increase public awareness about the significance of paleontological resources.

SEC. 6304. COLLECTION OF PALEONTOLOGICAL RESOURCES.
(a) PERMIT REQUIREMENT.—

(1) IN GENERAL.—Except as provided in this subtitle, a paleontological resource may not be collected from Federal land without a permit issued under this subtitle by the Secretary.

(2) CASUAL COLLECTING EXCEPTION.—The Secretary shall allow casual collecting without a permit on Federal land controlled or administered by the Bureau of Land Management, the Bureau of Reclamation, and the Forest Service, where such collection is consistent with the laws governing the management of those Federal land and this subtitle.

(3) PREVIOUS PERMIT EXCEPTION.—Nothing in this section shall affect a valid permit issued prior to the date of enactment of this Act.

(b) CRITERIA FOR ISSUANCE OF A PERMIT.—The Secretary may issue a permit for the collection of a paleontological resource pursuant to an application if the Secretary determines that—

(1) the applicant is qualified to carry out the permitted activity;
(2) the permitted activity is undertaken for the purpose of furthering paleontological knowledge or for public education;
(3) the permitted activity is consistent with any management plan applicable to the Federal land concerned; and
(4) the proposed methods of collecting will not threaten significant natural or cultural resources.

(c) PERMIT SPECIFICATIONS.—A permit for the collection of a paleontological resource issued under this section shall contain such terms and conditions as the Secretary deems necessary to carry out the purposes of this subtitle. Every permit shall include requirements that—

(1) the paleontological resource that is collected from Federal land under the permit will remain the property of the United States;
(2) the paleontological resource and copies of associated records will be preserved for the public in an approved repository, to be made available for scientific research and public education; and
(3) specific locality data will not be released by the permittee or repository without the written permission of the Secretary.

(d) MODIFICATION, SUSPENSION, AND REVOCATION OF PERMITS.—

(1) The Secretary may modify, suspend, or revoke a permit issued under this section—

(A) for resource, safety, or other management considerations;
or

(B) when there is a violation of term or condition of a permit issued pursuant to this section.

(2) The permit shall be revoked if any person working under the authority of the permit is convicted under section 6306 or is assessed a civil penalty under section 6307.

(e) AREA CLOSURES.—In order to protect paleontological or other resources or to provide for public safety, the Secretary may restrict access to or close areas under the Secretary's jurisdiction to the collection of paleontological resources.

SEC. 6305. CURATION OF RESOURCES.

Any paleontological resource, and any data and records associated with the resource, collected under a permit, shall be deposited in an approved repository. The Secretary may enter into agreements with non-Federal repositories regarding the curation of these resources, data, and records.

SEC. 6306. PROHIBITED ACTS; CRIMINAL PENALTIES.

(a) IN GENERAL.—A person may not—

(1) excavate, remove, damage, or otherwise alter or deface or attempt to excavate, remove, damage, or otherwise alter or deface any paleontological resources located on Federal land unless such activity is conducted in accordance with this subtitle;

(2) exchange, transport, export, receive, or offer to exchange, transport, export, or receive any paleontological resource if the person knew or should have known such resource to have been excavated or removed from Federal land in violation of any provisions, rule, regulation, law, ordinance, or permit in effect under Federal law, including this subtitle; or

(3) sell or purchase or offer to sell or purchase any paleontological resource if the person knew or should have known such resource to have been excavated, removed, sold, purchased, exchanged, transported, or received from Federal land.

(b) FALSE LABELING OFFENSES.—A person may not make or submit any false record, account, or label for, or any false identification of, any paleontological resource excavated or removed from Federal land.

(c) PENALTIES.—A person who knowingly violates or counsels, procures, solicits, or employs another person to violate subsection (a) or (b) shall, upon conviction, be fined in accordance with title 18, United States Code, or imprisoned not more than 5 years, or both; but if the sum of the commercial and paleontological value of the paleontological resources involved and the cost of restoration and repair of such resources does not exceed $500, such person shall be fined in accordance with title 18, United States Code, or imprisoned not more than 2 years, or both.

(d) MULTIPLE OFFENSES.—In the case of a second or subsequent violation by the same person, the amount of the penalty assessed under subsection (c) may be doubled.

(e) GENERAL EXCEPTION.—Nothing in subsection (a) shall apply to any person with respect to any paleontological resource which was in the lawful possession of such person prior to the date of enactment of this Act.

SEC. 6307. CIVIL PENALTIES.

(a) IN GENERAL.—

(1) HEARING.—A person who violates any prohibition contained in an applicable regulation or permit issued under this subtitle may be assessed a penalty by the Secretary after the person is given notice and opportunity for a hearing with respect to the violation. Each violation shall be considered a separate offense for purposes of this section.

(2) AMOUNT OF PENALTY.—The amount of such penalty assessed under paragraph (1) shall be determined under regulations promulgated pursuant to this subtitle, taking into account the following factors:

(A) The scientific or fair market value, whichever is greater, of the paleontological resource involved, as determined by the Secretary.

(B) The cost of response, restoration, and repair of the resource and the paleontological site involved.

(C) Any other factors considered relevant by the Secretary assessing the penalty.

(3) MULTIPLE OFFENSES.—In the case of a second or subsequent violation by the same person, the amount of a penalty assessed under paragraph (2) may be doubled.

(4) LIMITATION.—The amount of any penalty assessed under this subsection for any 1 violation shall not exceed an amount equal to double the cost of response, restoration, and repair of resources and paleontological site damage plus double the scientific or fair market value of resources destroyed or not recovered.

(b) PETITION FOR JUDICIAL REVIEW; COLLECTION OF UNPAID ASSESSMENTS.—

(1) JUDICIAL REVIEW.—Any person against whom an order is issued assessing a penalty under subsection (a) may file a petition for judicial review of the order in the United States District Court for the District of Columbia or in the district in which the violation is alleged to have occurred within the 30-day period beginning on the date the order making the assessment was issued. Upon notice of such filing, the Secretary shall promptly file such a certified copy of the record on which the order was issued. The court shall hear the action on the record made before the Secretary and shall sustain the action if it is supported by substantial evidence on the record considered as a whole.

(2) FAILURE TO PAY.—If any person fails to pay a penalty under this section within 30 days—

(A) after the order making assessment has become final and the person has not filed a petition for judicial review of the order in accordance with paragraph (1); or

(B) after a court in an action brought in paragraph (1) has entered a final judgment upholding the assessment of the penalty, the Secretary may request the Attorney General to institute a civil action in a district court of the United States for any district in which the person if found, resides, or transacts business, to collect the penalty (plus interest at currently prevailing rates from the date of the final order or the date of the final judgment, as the case may be). The district court shall have jurisdiction to hear and decide any such action. In such action, the validity, amount, and appropriateness of such penalty shall not be subject to review. Any person who fails to pay on a timely basis the amount of an assessment of a civil penalty as described in the first sentence of this paragraph shall be required to pay, in addition to such amount and interest, attorneys fees and costs for collection proceedings.

(c) HEARINGS.—Hearings held during proceedings instituted under subsection (a) shall be conducted in accordance with section 554 of title 5, United States Code.

(d) USE OF RECOVERED AMOUNTS.—Penalties collected under this section shall be available to the Secretary and without further appropriation may be used only as follows:

(1) To protect, restore, or repair the paleontological resources and sites which were the subject of the action, and to protect, monitor, and study the resources and sites.

(2) To provide educational materials to the public about paleontological resources and sites.

(3) To provide for the payment of rewards as provided in section 6308.

SEC. 6308. REWARDS AND FORFEITURE.

(a) REWARDS.—The Secretary may pay from penalties collected under section 6306 or 6307 or from appropriated funds—

(1) consistent with amounts established in regulations by the Secretary; or

(2) if no such regulation exists, an amount up to 1/2 of the penalties, to any person who furnishes information which leads to the finding of a civil violation, or the conviction of criminal violation, with respect to which the penalty was paid. If several persons provided the information, the amount shall be divided among the persons. No officer or employee of the United States or of any State or local government who furnishes information or renders service in the performance of his official duties shall be eligible for payment under this subsection.

(b) FORFEITURE.—All paleontological resources with respect to which a violation under section 6306 or 6307 occurred and which are in the possession of any person, shall be subject to civil forfeiture, or upon conviction, to criminal forfeiture.

(c) TRANSFER OF SEIZED RESOURCES.—The Secretary may transfer administration of seized paleontological resources to Federal or non-Federal educational institutions to be used for scientific or educational purposes.

SEC. 6309. CONFIDENTIALITY.

Information concerning the nature and specific location of a paleontological resource shall be exempt from disclosure under section 552 of title 5, United States Code, and any other law unless the Secretary determines that disclosure would—

(1) further the purposes of this subtitle;

(2) not create risk of harm to or theft or destruction of the resource or the site containing the resource; and

(3) be in accordance with other applicable laws.

SEC. 6310. REGULATIONS.

As soon as practical after the date of enactment of this Act, the Secretary shall issue such regulations as are appropriate to carry out this subtitle, providing opportunities for public notice and comment.

SEC. 6311. SAVINGS PROVISIONS.

Nothing in this subtitle shall be construed to—

(1) invalidate, modify, or impose any additional restrictions or permitting requirements on any activities permitted at any time under the general mining laws, the mineral or geothermal leasing laws, laws providing for minerals materials disposal, or laws providing for the management or regulation of the activities authorized by the aforementioned laws including but not limited to the Federal Land Policy Management Act (43 U.S.C. 1701–1784), Public Law 94–429 (commonly known as the ''Mining in the Parks Act'') (16 U.S.C. 1901 et seq.), the Surface Mining Control and Reclamation Act of 1977 (30 U.S.C. 1201–1358), and the Organic Administration Act (16 U.S.C. 478, 482, 551);

(2) invalidate, modify, or impose any additional restrictions or permitting requirements on any activities permitted at any time under existing laws and authorities relating to reclamation and multiple uses of Federal land;

(3) apply to, or require a permit for, casual collecting of a rock, mineral, or invertebrate or plant fossil that is not protected under this subtitle;

(4) affect any land other than Federal land or affect the lawful recovery, collection, or sale of paleontological resources from land other than Federal land;

(5) alter or diminish the authority of a Federal agency under any other law to provide protection for paleontological resources on Federal land in addition to the protection provided under this subtitle; or

(6) create any right, privilege, benefit, or entitlement for any person who is not an officer or employee of the United States acting in that capacity. No person who is not an officer or employee of the United States acting in that capacity shall have standing to file any civil action in a court of the United States to enforce any provision or amendment made by this subtitle.

SEC. 6312. AUTHORIZATION OF APPROPRIATIONS.

There are authorized to be appropriated such sums as may be necessary to carry out this subtitle.

APPENDIX E
Field survey of Canal E-13

Field survey of the E-13 part of the Eden/Farson Canal Desalination Project was accomplished on September 24, 2009. The route for this part of the project follows existing roads, cuts across hay fields, and crosses sagebrush-covered non-cultivated lands. In all of these areas no bedrock is exposed in the 100-ft. temporary right-of way surveyed. In all but the small areas of non-cultivated land, much of the right-of-way is composed of debris from the excavation of the canals and roads. In areas with undisturbed ground cover, there is a thick powdery layer of surface material present. Anthills were checked for small fossils, with none being found. No rock in-place was seen, and no fossils were found.

Submitted by Kelli C. Trujillo, Ph.D.
September 25, 2009

Figure 1. View of middle part of canal E-13, showing lack of any rock outcrops in area.

Figure 2. View to west at junction of Canal E-13 and Hwy 191. Proposed canal pipeline continues across road and follows highway south for some distance.

Appendix D

USACE Letter

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, OMAHA DISTRICT
WYOMING REGULATORY OFFICE
2232 DELL RANGE BOULEVARD, SUITE 210
CHEYENNE WY 82009-4942

REPLY TO
ATTENTION OF

August 28, 2009

Wyoming Regulatory Office

Mr. Ed Burton
District President
Eden Valley Irrigation Drainage District
P.O. Box 174
Farson, WY 82932

Dear Mr. Burton:

This letter is in response to a request we received from J-U-B Engineers, Inc. (JUB) on June 1, 2009, for a jurisdictional determination concerning maintenance and upgrade of irrigation conveyance associated with the Eden Valley Irrigation and Drainage District (EVIDD) near Eden and Farson, Wyoming. Project information was incomplete and additional information was received from JUB staff via phone discussions on June 16, 2009 and July 8, 2009, and via written correspondence on August 4, 2009 and August 28, 2009. EVIDD has requested authorization from the Bureau of Reclamation, the project lead federal agency, to replace four existing, unlined earthen irrigation laterals with enclosed pipelines to reduce water loss and improve water quality, pursuant to compliance with the Colorado River Basin Salinity Control Act (1974). The project is located between Township 25 North, Range 105 West and Township 24 North , Range 106 West, Sweetwater County, Wyoming.

The U.S. Army Corps of Engineers regulates the placement of dredged and fill material into waters of the United States under Section 404 of the Clean Water Act (33 U.S.C. 1344). The Corps' regulations are published in the *Code of Federal Regulations* as 33 CFR Parts 320 through 332. Detailed information on Section 404 requirements in Wyoming can be obtained from our website at: https://www.nwo.usace.army.mil/html/od-rwy/Wyoming.htm

Based on the information received from JUB, proposed activities include installation of fusible HDPE pipe of varying diameter (6 – 60 inches) in 127,571 linear feet (24.2 miles) of select irrigation distribution lateral canals and ditches. The distribution laterals identified for irrigation system maintenance and upgrade, shown in Figures 1 and 2 of the information submitted to our office on May 26, 2009, include E-7, E-8, and E-13, located east of Eden, and West Side, located north of Farson. Additional discharges include one irrigation pipeline crossing of Big Sandy River, installation of pipe inlet and outlet structures in designated canals, and fill of dry and abandoned distribution laterals after pipe has been installed. Temporary construction disturbance of seepage wetlands adjacent to laterals will be restored and re-vegetated. The majority of existing canal drains will be left in place. Portions of lateral E-8, E-13 and West Side that serve as drains will be abandoned and left open and unfilled to allow natural drying once irrigation sources have been removed.

Based on the information provided, it has been determined that the proposed activities associated with the irrigation laterals are maintenance that does not require Department of the Army authorization because Part 323.4(a)(3) of our regulations states that the following activities are exempt:

> Construction or maintenance of farm or stock ponds or irrigation ditches or the maintenance (but not construction) of drainage ditches. Discharges associated with siphons, pumps, headgates, wingwalls, weirs, diversion structures, and such other facilities as are appurtenant and functionally related to irrigation ditches are included in this exemption.

Discharge of fill in wetlands adjacent to the canals and ditches is not exempt. Discharge of fill in lateral drains that may also convey precipitation and ground water flows to other waters of the U.S. is not exempt. We recommend that monitoring wells be established in wetlands adjacent to the project laterals and in abandoned drains to demonstrate any changes in hydrology that may be associated with the removal of artificial irrigation.

Please be aware that because a Department of the Army permit is not required does not eliminate the requirement to obtain any other applicable federal, state, tribal or local permits. In addition, any deviations from the plans and specifications for the project, as provided by JUB as of August 28, 2009, could require additional authorization.

Thank you for your interest in cooperating with the requirements of the U.S. Army Corps of Engineers' regulatory program. Please contact Ms. Paige Wolken at (307) 772-2300 if you have any questions regarding this determination and reference file NWO-2009-01408.

Sincerely,

Matthew A. Bilodeau
Program Manager
Wyoming Regulatory Office

Copies Furnished:

Alex Beseris
J-U-B Engineers, Inc.
2875 South Decker Lake Drive
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Beverley C. Heffernan
Bureau of Reclamation
Provo Area Office, PRO-770
302 East 1860 South
Provo, Utah 84606-7317

Recei[illegible]

SEP – 2 [illegible]

Julia McCarthy
U.S. Environmental Protection Agency
Region 8, EPR-EP
1595 Wynkoop Street
Denver, Colorado 80202-1129

Jeremy Zumberge
Wyoming Department of Environmental Quality
Water Quality Division
1866 South Sheridan Avenue
Sheridan, Wyoming 82801

The Omaha District, Regulatory Branch. Wyoming Regulatory Office is committed to providing quality and timely service to our customers. In an effort to improve customer service, please take a moment to complete a Customer Service Survey found on our web site at https://www.nwo.usace.army.mil/html/od-rwy/survey.htm Paper copies of the survey are also available upon request for those without Internet access.

Appendix E

Biological Evaluation

J-U-B ENGINEERS, Inc.

Memo

To: Beverley Heffernan, Chief
Bureau of Reclamation Environmental Group

From: Vincent Barthels, Biologist (J-U-B)

Copy: Alex Beseris, J-U-B Environmental Group Manager

Date: October 5, 2009

Subject: Biological Assessment for the Eden Valley Irrigation District and Drainage (EVIDD) 2009 Proposed Piping Projects linked to the Farson/Eden Salinity Control Project; located in Sweetwater County, Wyoming

Introduction

This site evaluation and subsequent biological assessment (BA) was authorized by the project proponents, Eden Valley Irrigation District and Drainage (EVIDD). I have prepared the following No Effects Determination / BA, as required by Section 7(c) of the Endangered Species Act (ESA), for the proposed the EVIDD 2009 Proposed Salinity Control Projects located in the northern portion of Sweetwater County, Wyoming. The EVIDD projects involve piping four segments, and nearly 24.3 linear miles of irrigation laterals, in an effort to reduce the salinity in waters reaching the Colorado River. Irrigation waters are planned to be placed in 66-inch (diameter) or less HDPE pipes compared to the un-lined, trapezoidal, open ditches that currently exist. Piping the Eden Canal laterals, namely the Westside, Eden # 7, Eden # 8 and Eden # 13, would reduce the salinity loading into the Colorado River Basin by an estimated cumulative total of 6,594 tons annually.

The attached project summary exhibits outline the lateral segments that are linked to the proposed project actions. The four segments include: the West Side (WS); Eden # 7 (E-7); Eden # 8 (E-8); and Eden # 13 (E-13) laterals. Later portions of this memo will discuss in greater detail the physical locations of the four laterals and the general habitat conditions of the project area. This memo will serve as the analysis of potential impacts of the proposed projects on species listed as threatened or endangered under the ESA.

Methods

The anticipated action areas were systematically walked and/or driven on June 8th and 9th, 2009 by Vincent Barthels, Biologist, from J-U-B ENGINEERS, Inc., to assess the habitat conditions. During the site visit, the hydrologic characteristics were evident within the four lateral segments. Documented baseline biological information pertaining to aquatic or hydrologic features were gathered by referencing the pertinent National Wetland Inventory (NWI) Maps. Information in regard to any

potential ESA listed species located within the project vicinity was gathered from a consultation with the United States Fish and Wildlife Service (USFWS), see the attached letter dated July 2, 2009.

Discussion

Project Description and General Habitat Conditions

The elevation range of all four laterals falls between 6,500 and 6,700 feet above sea level. The total project action area encompasses approximately 59.8 acres. The following sections offer more specific details associated with each individual lateral that is planned to be piped.

West Side (WS) Lateral: The WS piping project starts at the intake that takes off from the Means Canal, which is located in the SE ¼ of Section 13, Township 26 N, Range 106 W. The WS lateral spans from the diversion on the Means Canal to the end of service, approximately 75,835 feet down-gradient and away from the Means Canal diversion point. A total of 14.3 linear miles of this lateral is proposed to be piped. The approximate maximum pipe diameter would be 66-inches and decreases along the length of the pipeline. This alignment would require approximately 3,400 square feet of new right-of-way.

This irrigation lateral is classified as a R4SBFx (riverine, intermittent, streambed, semi-permanently flooded, excavated) system on the Eden Reservoir West, WY NWI Map.

The typical channel width, measured from the Ordinary High Water Mark (OHWM) to OHWM, equates to approximately 23.9 feet. Hydrophytic vegetation located below the OHWM can be characterized [with a relative frequency] as: creeping meadow foxtail (*Alopecurus arundinaceus)* [80%]; baltic rush (*Juncus balticus*) [15%]; and, common spikerush (*Eleocharis palustris*) combined with sedges (*Carex spp.*) [5%]. Adjacent dominant upland vegetation include: big sagebrush (*Artemisia tridentata*), rabbit-brush (*Chrysothamnus spp.*), western wheatgrass (*Pascopyrum smithii*), crested wheatgrass (*Agropyron cristatum*) and blue-bunch wheatgrass (*Pseudoroegneria spicata*). Soils in and adjacent to the channel can be characterized as either sands or sandy loam with 20% gravels.

Eden # 7 Lateral (E-7): The E-7 piping project starts at the intake that takes off from the Eden Canal, which is located in the NE ¼ of Section 28, Township 25 N, Range 105 W. E-7 spans from the diversion on the Eden Canal to the end of the line. A total of 4.1 linear miles of this lateral is proposed to be piped. The approximate maximum pipe diameter would be 48-inches and would decrease downstream.

This irrigation lateral is classified as a R4SBFx (riverine, intermittent, streambed, semi-permanently flooded, excavated) system on the Fifteen Spring and Farson, WY NWI Maps.

The typical channel width, measured from the OHWM to OHWM, equates to approximately 13.9 feet. Hydrophytic vegetation located below the OHWM can be characterized [with a relative frequency] as: creeping meadow foxtail (*Alopecurus arundinaceus*) [90%]; baltic rush (*Juncus balticus*) [5%]; and, common spikerush (*Eleocharis palustris*) combined with sedges (*Carex spp.*) [5%]. Adjacent dominant upland vegetation include: big sagebrush (*Artemisia tridentata*), rabbit-brush (*Chrysothamnus spp.*), western wheatgrass (*Pascopyrum smithii*), crested wheatgrass

(*Agropyron cristatum*) and blue-bunch wheatgrass (*Pseudoroegneria spicata*). Soils in and adjacent to the channel can be characterized as either sands or sandy loam with 20% gravels.

Eden # 8 Lateral (E-8): The E-8 piping project starts at the intake that takes off from the Eden Canal, which is located in the NE ¼ of Section 28, Township 25 N, Range 105 W. Lateral E-8 is approximately 3,734 feet long, and spans from the diversion point off the Eden Canal to the end of the line. A total of 0.7 linear miles of this lateral is proposed to be piped. The existing E-8 would be replaced with an approximate maximum diameter of 12-inch pipe, which would decrease downstream. Under the Action Alternative, The proposed E-8 pipeline lateral alignment would be outside of the existing ditch lateral and approximately 4,800 feet of ditch between the existing E-8 turnout from the Eden Canal and the end of the line would be abandoned and filled. The E-8 alignment would require the permanent acquisition of approximately 3,300 square feet of right-of-way.

This irrigation lateral is not classified on the Fifteen Spring, WY NWI Map. It should be noted that E-8 is similar to the E-7 and therefore, should be labeled as a R4SBCx (riverine, intermittent, streambed, seasonally flooded, excavated) system on the Fifteen Spring, WY NWI Map.

The typical channel width, measured from the OHWM to OHWM, equates to approximately 11.2 feet. Hydrophytic vegetation located below the OHWM can be characterized [with a relative frequency] as: creeping meadow foxtail (*Alopecurus arundinaceus*) [90%]; baltic rush (*Juncus balticus*) [5%]; and, common spikerush (*Eleocharis palustris*) combined with sedges (*Carex spp.*) [5%]. Adjacent dominant upland vegetation include: big sagebrush (*Artemisia tridentata*), rabbit-brush (*Chrysothamnus spp.*), western wheatgrass (*Pascopyrum smithii*), crested wheatgrass (*Agropyron cristatum*) and blue-bunch wheatgrass (*Pseudoroegneria spicata*). Soils in and adjacent to the channel can be characterized as either sands or sandy loam with 20% gravels.

Eden #13 Lateral (E-13): The E-13 piping project starts at the intake that takes off from the Eden Canal, which is located in the NE ¼ of Section 11, Township 24 N, Range 106 W. A total of 5.1 linear miles of this lateral is proposed to be piped. The proposed pipeline would replace the existing open water channel with an enclosed pipeline that would have an approximate diameter ranging from 48" to 12". The proposed pipeline would follow the existing E-13 alignment, except for two places. One area where the pipeline would deviate from the existing alignment would be a new connection from the Eden Canal which would connect E-13 opposite the old Haystack outlet and would head west for approximately 5,000 feet, crossing under Eden Second East and connecting into the existing E-13 lateral ditch. The piped lateral E-13 would parallel US 191 on the west side for approximately 2,600 feet between the existing crossing under US 191 and Eden West Second North. The other alignment deviation is situated near US 191. The Wyoming Department of Transportation (WYDOT) is currently developing plans for improvements to US 191 in this area. Because of this, two alignment alternatives (Proposed Action Option A and Option B) exist for the pipeline throughout this stretch. Depending on the specifics of the new roadway alignment, the pipeline easement may be contained within WYDOT right-of-way immediately west of the roadway (Proposed Action Option A), or it may be contained within private property immediately west of the WYDOT right-of-way (Proposed Action Option B).

This irrigation lateral is classified as a R4SBFx (riverine, intermittent, streambed, semi-permanently flooded, excavated) system on the Farson, WY NWI Map.

The typical channel width, measured from the OHWM to OHWM, equates to approximately 16.7 feet. Hydrophytic vegetation located below the OHWM can be characterized [with a relative frequency] as: creeping meadow foxtail (*Alopecurus* arundinaceus) [90%]; baltic rush (*Juncus balticus*) [5%]; and, common spikerush (*Eleocharis palustris*) combined with sedges (Carex) [5%]. Adjacent dominant upland vegetation include: big sagebrush (Artemisia tridentata), rabbit-brush (Chrysothamnus spp.), western wheatgrass (Pascopyrum smithii), crested wheatgrass (Agropyron cristatum) and blue-bunch wheatgrass (Pseudoroegneria spicata). Soils in and adjacent to the channel can be characterized as either sands or sandy loam with 20% gravels.

ESA Consultation

The species listing obtained from the USFWS indicated that the range of three individual species warranted ESA consideration for this project (see attached USFWS letter, dated July 2, 2009). The piping of the open canal should lead to decreased evaporation and infiltration rates, which in turn lessens the degree of water consumption for irrigation. Therefore, the Colorado River System ESA listed fish species were not included in this assessment, since the anticipated project should lead to less consumptive use of irrigation water. This species listing was derived from habitat conditions coupled with potential species occurrence within the project vicinity.

Table 1- Summary of ESA listed species

Common Name	Scientific Name	ESA Status	Effects Determination
Black-footed ferret	*Mustela nigripes*	Endangered	No Effect (NE)
Blowout Penstemon	*Penstemon haydenii*	Endangered	No Effect (NE)
Ute ladies'-tresses	*Spiranthes diluvialis*	Threatened	No Effect (NE)

Species Specific Habitat Requirements and Determinations of Effect

Black-footed ferret: The Black-footed ferret is known to live in underground prairie dog burrows and eat prairie dogs as their main source of food. They are nocturnal mammals that breed during the months of March and April. These ferrets are an endangered ESA listed species that are being re-introduced in certain parts of eastern Utah and southwestern Wyoming (UDWR 2009).

White-tailed prairie dog towns are considered common in Sweetwater County, Wyoming. Habitat for these "towns" occur landward of the wetted irrigation laterals or canals. Habitat conditions for these "towns" are not linked to the individual laterals or canals (i.e. below the wetted channel), because of the associated effect of flooding that would not be conducive to the prairie dog's or the ferret's life cycles.

No surveys were conducted for black-footed ferrets in the anticipated project action area. The USFWS recommends surveys for ferrets if greater than 200 acres of disturbance of white-tailed prairie dog towns is expected (see attached letter from USFWS). Based on the fact that this project disturbs only approximately 60 acres, and a large percentage of the project action areas consist of man-made or artificially created open irrigation laterals or canals, a survey would not appear to be warranted in this case. Based on the discountable habitat impacts associated with potential black-footed ferrets, a "no effects" determination is warranted for this project.

Blowout Penstemon: The Blowout penstemon is a perennial herb that grows on sand blowouts or dunes. This plant has greenish-blue linear waxy leaves and whorls of milky-blue to pale lavender long tubular flowers. It typically flowers in mid June to early July. All the known occurrences of this species in Wyoming are on federal of state lands located in the northern parts of Carbon County (Fertig 2001 and 2008).

Sand blowouts and dunes do not occur in the project action area. There are no documented occurrences of Blowout penstemon in Sweetwater County, Utah. Based on habitat conditions coupled with a lack of species occurrence in the project action area, a "no effects" determination is warranted for this species.

Ute ladies'-tresses: The Ute ladies'-tresses is a member of the orchid family. It was first described in 1984 and was federally listed as Threatened by the USFWS under the ESA in January, 1992 (USFWS, 1995). Populations have been found in Utah, Colorado, Wyoming, Montana, Nevada, Idaho, and Washington. The elevation ranges in which populations have been found vary from 750 to 7,000 feet, with most populations above 4000 feet. In terms of elevations, it is noted in the letter dated July 2, 2009 from USFWS, that this species is not known to occur in Wyoming above 5,500 feet. It is found in wetlands and riparian areas, including spring habitats, mesic meadows, river meanders and floodplains. They require open habitats, 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 (*Phalaris arundinacea*). The survey time for the species, as identified by the USFWS (1995), is mid-August through mid-September.

The project action area is at least 1,000 feet in elevation above the known range of Ute ladies'-tresses species occurrence in the State of Wyoming. The habitat conditions associated with a man-made or artificially created lateral or canal are not conducive for Ute ladies'-tresses populations. Based on habitat conditions coupled

Reference Cited

Fertig, Walter. 2001. 2000 survey of Blowout penstemon (Penstemon haydenii) in Wyoming. Prepared for the Bureau of Land Management Wyoming State Office by the Wyoming Natural Diversity Database. University of Wyoming. Laramie, Wyoming.

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