RECLAMATION

Managing Water in the West

Environmental Assessment
Sheep Creek Irrigation Company
Cedar Hollow Lateral
Salinity Control Project

PRO-EA-13-001

Provo Area Office
Provo, Utah
Upper Colorado Region

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

November 2013

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

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

Environmental Assessment
Sheep Creek Irrigation Company
Cedar Hollow Lateral
Salinity Control Project

Daggett County, Utah and Sweetwater County, Wyoming
Upper Colorado Region
Provo Area Office
Provo, Utah

prepared by *Provo Area Office*
Provo, Utah

U.S. Department of the Interior
Bureau of Reclamation
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Chapter 1: Purpose and Need for the Proposed Action

1.1 Introduction

This Environmental Assessment (EA) has been prepared by the Bureau of Reclamation (Reclamation) and the Sheep Creek Irrigation Company (SCIC) to assess the potential effects of the Cedar Hollow Lateral Salinity Control Project located in Daggett County, Utah and Sweetwater County, Wyoming. The Federal action evaluated in this document is whether Reclamation should authorize the use of Federal funds to pipe the Cedar Hollow Lateral from the Cedar Hollow Diversion to the end of the line.

This EA has been prepared as required by the National Environmental Policy Act (NEPA), the Council on Environmental Quality (CEQ), and the U.S. Department of the Interior (Interior) regulations implementing NEPA. If potentially significant impacts to the environment from the proposed project 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 Background

1.2.1 Colorado River Basin Salinity Control Program

The Colorado River Basin Salinity Control Act was enacted by Congress in June 1974, with the purpose of protecting the quality of water available in the Colorado River. The Colorado River provides water for approximately 30 million people in the United States and the Republic of Mexico. Water from the Colorado River is currently used to irrigate 4 million acres of land in the United States and 500,000 acres of land in Mexico.

Salinity levels in the Colorado River threaten agricultural, and municipal and industrial water users. 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. Controlling the salinity of the Colorado River remains one of the most important challenges facing Reclamation. 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.

1.2.2 The Sheep Creek Irrigation Company

The SCIC was established in 1899 to deliver irrigation water to users along the north slope of the eastern Uinta Mountains. The SCIC system consists of 22 miles of mountain canals from Tamarack, Jessen, Daggett, and Spirit Lakes, to the Long Park Reservoir, located within the Ashley National Forest. Constructed in 1979, Long Park Reservoir has a storage capacity of 14,000 acre feet and has been recently upgraded to meet U.S. Forest Service standards. The SCIC System consists of the Sheep Creek Canal and six main canal laterals: the Nebeker Lateral, the Antelope Lateral, the South Valley Lateral, the Cedar Hollow Lateral, and the "Wash"/Birch Springs System.

There are approximately 110 miles of canals and laterals in the valley that deliver water to individual stockholders. Water from the SCIC system irrigates approximately 11,400 acres of agricultural land. The SCIC presently holds the water rights to irrigate over 10,000 acres. The major crops grown are alfalfa hay, grass hay, and irrigated pastures. The majority of the SCIC system is comprised of unlined earthen canals. Up to 30 percent of the total flow of irrigation water in these canals and laterals is lost to seepage.

1.3 Purpose and Need for the Proposed Action

The Federal action evaluated in this EA is whether or not Federal funds should be used to implement the proposed project improvements for the Cedar Hollow lateral. The purpose of the proposed project improvements is to replace the existing unlined earthen Cedar Hollow lateral with a pipeline. The proposed 5.42 mile long pipeline running from the Cedar Hollow diversion to the end of the lateral would increase the efficiency of the existing system and conserve water. The proposed project improvements are needed to reduce maintenance on the canal and reduce the salinity contributions resulting from the existing Cedar Hollow lateral, consistent with the purposes of the Colorado River Basin Salinity Control Program. The proposed project improvements are anticipated to reduce the salinity contributions to Colorado River Basin by 2,220 tons annually.

1.4 Decision to be Made

Reclamation must decide whether to authorize the use of Federal Salinity Control Program funds by the SCIC for piping the Cedar Hollow lateral.

1.5 Permits and Authorizations

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

- 404 Permit- This permit (if required) would be issued to the applicant by the U.S. Army Corps of Engineers (USACE) and complies with Section 404 of the Clean Water Act (CWA) for actions on waters of the United States and jurisdictional wetlands.

- Stream Alteration Permit- This permit (if required) would be issued to the applicant by the Utah Department of Environmental Quality and would comply with Section 404 of the CWA for small projects not affecting wetlands.

- Utah Pollution Discharge Elimination System Permit – This permit would be issued to the applicant by the Utah Division of Water Quality and would comply with Section 402 of the CWA for actions disturbing more than one acre of ground or with any discharge.

- Wyoming Pollution Discharge Elimination System Permit - This permit (if required) would be issued to the applicant by the Wyoming Department of Environmental Quality and would comply with Section 402 of the CWA for actions disturbing more than one acre of ground or any discharge.

- Easements with Landowners- Right-of-way would be obtained through Grants of Easement. These easements are required for the following project objectives:

    - Protect SCIC's facilities from encroachment

    - Ensure the ability to access and perform operations and maintenance on SCIC's facilities

1.6 Relationship to Other Projects

In 2006, the Natural Resources Conservation Service (NRCS) completed an EA and issued a FONSI for the Manila-Washam Project. This EA evaluated on-farm improvements for 11,000 water-rights acres in Daggett County, Utah and

Sweetwater County, Wyoming, to reduce salt loading in the Upper Colorado River Basin. Development of this salinity control project started in 2007.

Reclamation completed the Peoples Canal Salinity Control Project EA and issued a FONSI in 2010. This EA analyzed impacts from the proposed replacement of 9.1 miles of the Peoples Canal with a pipeline to reduce the salinity contributions to the Upper Colorado River Basin. This project was located in Sweetwater County, Wyoming and Daggett County, Utah.

The SCIC is currently working with Reclamation on an EA to evaluate the impacts from a proposed project to pipe the South Valley lateral as part of Colorado River Basin Salinity Control Program. The EA is expected to be completed by the end of 2013, with construction anticipated for spring 2014 (pending environmental approval). The South Valley Salinity Control Project and the Cedar Hollow Salinity Control Project are separate and complete projects with independent utility.

All aforementioned projects are being implemented to meet the goals of Reclamation's Salinity Control Program and are expected to have a cumulative positive impact on the water quality in the Colorado River Basin.

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 Cedar Hollow 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. This resource analysis, along with other pertinent information, will guide Reclamation's decision about whether or not to implement the proposed action. The proposed action (Action Alternative) is analyzed in comparison to a No Action Alternative in order to determine potential effects.

If Reclamation decides to implement the proposed action, SCIC would be authorized to proceed with piping the Cedar Hollow lateral in order to reduce the salinity contributions to the Upper Colorado River Basin. If authorized to proceed, the SCIC would construct, operate, and maintain these new pipelines in place of the open Cedar Hollow lateral. As a feature of the Sheep Creek Irrigation Project, the new pipeline's existing and newly acquired easements would be owned and operated by the SCIC.

2.2 No Action Alternative

Under the No Action Alternative, Reclamation would not authorize the use of Federal funds for the piping of the Cedar Hollow lateral. The existing open lateral would continue to be used for delivering irrigation water with no proposed improvements for reducing or eliminating seepage. Approximately 25 to 30 percent of irrigation water being delivered through the Cedar Hollow lateral would be lost to seepage. This seepage would lead to the dissolving of salts in the sandy soils, which would ultimately leads to an increase in the salinity of the Colorado River. These conditions would continue and may worsen in the future under the No Action Alternative. The Colorado River would continue to receive 2,220 tons of salt each year due to canal and lateral seepage. Additionally, the loss of water due to seepage would continue to require far greater than necessary water appropriation for agricultural use.

2.3 Action Alternative

Under the proposed Action Alternative, Reclamation would authorize the use of Federal funds to pipe the Cedar Hollow lateral. This action would reduce the

salinity loading of the Colorado River by 2,220 tons annually. Piping this lateral would reduce the amount of water lost through seepage by up to 30 percent, making more water available for irrigation. This reduction in seepage would not result in a new depletion to the Upper Colorado River Basin. The proposed project would pipe an existing irrigation lateral (off-farm line), any depletion from the project is considered to be historic and have been already accounted for. Furthermore, there is no additional or new water depleted by this project; no new land will be irrigated by this project; and the irrigation season will not be extended by this project.

Additionally, piping this lateral would reduce the amount of ongoing system maintenance. Ongoing maintenance includes: removing the debris from the channels; clearing overgrown vegetation; and replacing outdated valves and gates. The Cedar Hollow lateral is approximately 28,600 feet long. The approximate maximum pipe would be 36-inches in diameter at the start of the line and would decrease to 14-inches near the end of the line. The pipeline would primarily follow the canal alignments, except in minor sections, to increase the efficiency of the alignment and to reduce the number of highway crossings.

Easements

Easements would be required where the existing alignments and the proposed pipeline alignments deviate. All acquired easements would be obtained from landowners in the name of the SCIC. Where deviations from the existing alignment occur a 30-foot wide permanent easement would be needed for operation and maintenance of the pipeline. The construction of the proposed action would result in the acquisition of approximately 4,080 linear feet of new permanent easements from private land owners. In addition, approximately 500 linear feet of new piping would be installed within the right-of-way of existing roads maintained by the State of Utah. Temporary easements for construction within the roadway right-of-way would be obtained from the Utah Department of Transportation. No other easements from publicly owned local, state, or Federal land would be required.

A 100-foot temporary construction easement is required for construction in areas where the proposed alignment deviates from the existing alignments. A 50-foot construction easement (25 feet off of the centerline of the existing alignment) is required for construction activities taking place along the existing alignment of the canal laterals. Construction of the proposed action would temporarily disturb 44 acres of land.

Turnouts, Drains, Services, and Meters

The existing diversion structure at the start of the project would be replaced with a new structure. The new diversion structure would include a screening structure to prevent debris from entering the pipeline. The main pipeline would have splitter boxes to deliver water to individual farms. Gates and valves would be installed to allow operators to better control the allocation of water along this system. This

would provide distribution and allocation of the delivered water for improvements of on-farm irrigation water management. There would also be a 16-inch diameter overflow line from the last structure to a natural drainage at the end of the line.

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 staging areas
- 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

2.3.1.1 Trench Excavation

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 trenches, and used as backfill after pipe installation. In critical areas top soil would be separated from other material to preserve it to be placed as the last layer.

2.3.1.2 Pipe and Appurtenance Installation

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

At various points determined during design, construction would be required to install drain valves, air-vacuum valves, and air-release valves. These valves would be installed to facilitate filling and operation of the system, and to allow any excess water at the end of the irrigation season to drain from the pipes. The air-vacuum valves are typically installed on top of the pipe to vent air during pipe filling and to allow air into the pipe while it drains.

After installing the pipe, backfill would be placed around the pipe. In established agricultural areas, the preserved top soil would be placed last to minimize impacts and facilitate a speedy recovery. Backfill would be mechanically compacted. Soil in work areas would be spread evenly, to blend with the natural topography and maintain local drainage patterns. Stockpiled topsoil would then be spread evenly over previously vegetated areas and reseeded with native or agricultural vegetation species, as appropriate.

2.3.1.3 Crossing

The proposed project would require two crossings beneath State Highway 43. No full roadway closures are anticipated for the proposed project. Minor traffic impacts are possible as construction vehicles enter and exit the roads.

2.3.1.4 Quality Control Procedures

After backfilling and completion of construction activities, the contractor would provide quality control of construction through visual inspection and hydrostatic testing. Each segment or reach of pipe would be filled with water and pressurized for hydrostatic 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 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 area (Figure 2, Proposed Project Alignment). The staging area would be used to stockpile the pipe, place equipment, and park construction vehicles. Staging areas have been assessed to determine potential project impacts during the duration of construction. These impacts are discussed further in Chapter 3 of this document.

2.3.3 Land Disturbance

The proposed pipeline alignment described in Section 2.3 totals approximately 5.42 miles in length and would require a maximum construction width of 100 feet. Construction activities would be confined to this 100-foot width where there are existing easements.

2.3.4 Transportation Requirements

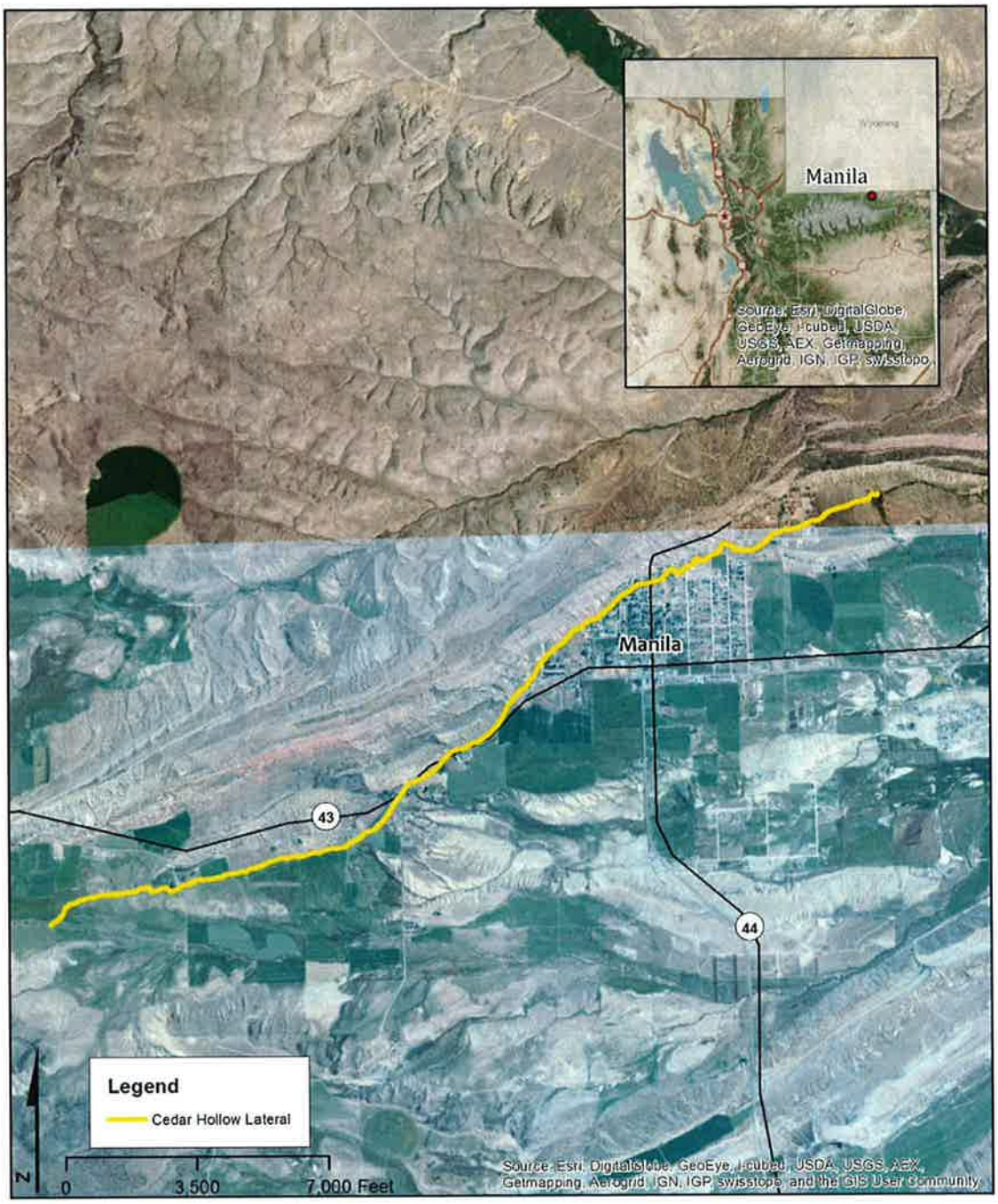
Transportation to the project would follow existing access roads, wherever possible, to minimize disturbance to the existing vegetation. If necessary, any new access routes would be within the proposed construction easement.

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 a SCIC 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. Monitoring and treatment will continue until the success criteria are met for two successive years without human intervention. These actions will provide that disturbed areas are returned to a natural state as appropriate. Chapter 3 presents the impact analysis for resources after SOPs have been successfully implemented.



Cedar Hollow Lateral Salinity Control
Vicinity Map

Projection: NAD 83 State Plane Utah North

J-U-B ENGINEERS, INC.

Figure 1. - Project Location Map

Figure 2. - Proposed Project Alignment

Chapter 3: Affected Environment and Environmental Consequences

3.1 Introduction

This chapter describes the existing environment of the project area and 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 or would not be impacted by the No Action or Action Alternatives were eliminated from further analysis. The eliminated resources 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 direct effects on public health.
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 or adjacent to the project area.
Noise	There would be no long-term increases of noise. Noise levels are expected to be elevated during construction, but no new noise would be generated from the proposed action after construction.
Energy Requirements and Conservation Potential	There are no impacts to energy requirements and conservation potential within the project area from the proposed action.

Resource	Rationale for Elimination from Further Analysis
Urban Quality and Design of the Built Environment	The proposed action is located in a rural setting on residential and agricultural lands. The proposed project improvements located within the City of Manila are constrained to the existing canal easement. There would be no impacts to the urban quality and design of the built environment from the proposed action.

3.3 Affected Environment

3.3.1 Air Quality

Air Quality in the project area is regulated by the U.S. Environmental Protection Agency (EPA), the Wyoming Department of Environmental Quality and the Utah 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. If the levels of a criteria pollutant in an area are higher than the NAAQS, then the air is designated as a nonattainment area. Areas that meet the NAAQS for criteria pollutants are designated as attainment areas.

The project area is in attainment for all criteria pollutants.

3.3.2 Water Resources

The canal system managed by the SCIC consists of 22 miles of mountain canals from Tamarack, Jessen, Daggett, and Spirit Lake to Long Park Reservoir, located in the Ashley National Forest. The SCIC maintains and operates five main canal laterals: Nebeker Lateral, Antelope Lateral, South Valley Lateral, Cedar Hollow Lateral, and what is known as "the Wash". The water delivered through SCIC system has been a historic depletion to the Upper Colorado River System. Maintenance to these systems (off-farm lines), including piping to reduce seepage, do not represent new depletions to the Upper Colorado River System.

The entire system stores up to 13,700 acre-feet in Long Park Reservoir. Long Park Reservoir is a large reservoir located on the north slope of the Uinta Mountains. The reservoir was built in the 1970's to store agricultural water. The reservoir has a small, natural, watershed, but is primarily fed by the Sheep Creek, which collects the run-off from Carter Creek, Weyman Creek, Beaver Creek, and Sheep Creek. This effectively captures the drainage from a 12 mile stretch off the north slope of the Uinta Mountains.

The Birch Spring Draw is a stream that flows next to the Cedar Hollow Diversion. Flaming Gorge reservoir is located approximately 2 miles from the project action area. There are no natural lakes or rivers in the project action area.

3.3.3 Water Quality

The portion of the Cedar Hollow lateral in Wyoming is classified as a 4a waterway, an artificial canal that is not known to support fish (Wyoming Department of Environmental Quality 2013). In Utah, the Cedar Hollow Lateral is designated a Class 4 waterway, a waterway that is protected for agricultural uses including irrigation of crops and stock watering (Utah Department of Water Quality 2013).

The Sheep Creek 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 Sheep Creek project area contribute to an estimated 13,000 tons of salt per year from the Manila-Washam Unit to the Colorado River Basin. This salt loading degrades the water quality of the basin and its tributaries.

3.3.4 Hydrology

There are no natural lakes or rivers in the project action area. The Birch Spring Draw flows adjacent to the Cedar Hollow diversion structure. The irrigation water traveling through the Cedar Hollow Lateral comes from the Logan Park Reservoir. The Cedar Hollow Lateral receives supplemental hydrology in the form of run-off from the adjacent hillsides and other higher elevations.

The wetland hydrology within the study area is derived from irrigation waters that are drawn from the Birch Spring Draw. All the irrigation induced ditches/waters and the sloped wetlands identified in the project study area are hydrologically linked directly to and from the Birch Spring Draw. The Birch Spring Draw flows into the Flaming Gorge Reservoir.

An annual average of 2,220 tons of salt reaches the Upper Colorado River Basin due to deep percolation of water conveyed by the Cedar Hollow Lateral. The salt is being transported through seepage from the Cedar Hollow Lateral. The salts are being leached from the gypsum rich saline marine shale.

3.3.5 Upland Vegetation Resources

The majority of the land in the project area is comprised of human-altered vegetation, primarily used for agriculture and residential uses. Agricultural activities in the project area have replaced native upland vegetation with alfalfa and pasture grasses. Non-agricultural vegetation such as cheatgrass (*Bromus tectorum L.*) and thistle (*Cirsium)* are more common in disturbed areas along roadways.

In addition to the human-altered environment, the project area contains upland vegetation species. Upland vegetation species in the project area include big

sagebrush *(Artemisia tridentate)*, rabbit brush (*Chrysothamnus spp.*), juniper (*Juniperus spp.*) and wheatgrass (*Agropyron sp.*).

3.3.6 Wetands and Riparian Resources

Riparian vegetation exists in places along the Cedar Hollow Lateral. The riparian vegetation is primarily contained within a 10-foot width strip along the canal. Riparian vegetation consists of willows (*Salix spp.*), wire rush (*Juncus balticus*), and narrowleaf cottonwood (*Populous augustifolia*). Reed canarygrass (*Phalaris arundinacea*) and Canada thistle (Cirsium arvense) are also found in locations along the lateral.

A field investigation and wetland delineation for the proposed project was performed on June 18, 2013. The field survey determined that the majority of the wetland hydrology within the project area is derived from irrigation waters that are drawn from the canals and laterals that make up the SCIC system. A detailed description of the wetland and riparian resources, located in and adjacent to the project area is found in Appendix A, Wetland Delineation.

3.3.7 Fish and Wildlife Resources

Wildlife resources in the general vicinity of the proposed project include big game, small mammals, raptor, water fowl, and upland game birds. A biological evaluation was prepared for the project and is located in Appendix B, Biological Evaluation.

Fish

Fish habitat in the general area is found in the Flaming Gorge Reservoir and the Birch Draw. The Cedar Hollow Lateral contains no fish habitat.

Wildlife

The foothills surrounding the town of Manila provide both summer and winter habitat for big game. Species known to occur in the area include mule deer (*Odocoileus hemionus*), Elk (*Cervus elaphus nelsoni*), and occasionally moose (*Alces alces*).

In addition to the big game species, many small mammals frequent the general vicinity of the project area. These species include coyote (*Canis latrans*), pocket gopher (*Thomomys talpoides*), raccoon (*Procyon lotor*), and striped skunk (*Mephitis mephitis*).

Birds

Various raptors, water fowl and upland game birds species may be found in and near project area. Red-tailed hawk (*Buteo jamaicensis*), American kestrel (*Falco sparverius*), turkey vulture (*Cathartes aura*), Canada goose (*Branta Canadensis*), mallard (*Anas platryrhynchos*), mourning dove (*Zenaida macroura*), and California quail (*Callipepla californica*) are all known to frequent the general area.

Reptiles and Amphibians
Reptiles and amphibians that may occur in the project area include the tiger salamander (*Ambystoma tigrinum*), Great Basin rattlesnake (*Crotalus viridis*), northern sagebrush lizard (*Sceloporus graciosus graciosus*), and prairie rattlesnake (*Crotalus viridis*).

3.3.8 Special Status Species

3.3.8.1 Federally Listed Species
The Endangered Species Act (ESA) lists for Daggett and Sweetwater Counties include five endangered species, two threatened species and two candidate species. Species listed as endangered include the black-footed ferret (*Mustela nigripes*), bonytail chub (*Gila elegans*), Colorado pikeminnow (*Ptychocheilus lucius*), humpback chub (*Gila cypha*), and razorback sucker *(Xyrauchen texanus).* The Canada lynx (*Lynx Canadensis*) and Ute ladies-tresses *(Spiranthes diluvialis)* are listed as threatened species and the Greater sage-grouse *(Centocercus urophasianus)* and yellow-billed Cuckoo *(Coccyzus americanus)* are candidate species. These species and the status of documented occurrences in the project area are detailed in Table 3.2.

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

Species/Critical Habitat	Status	Documented Occurrences in Project Area
Black-footed ferret *(Mustela nigripes)*	Endangered-extirpated	No
Bonytail chub *(Gila elegans)*	Endangered	No
Colorado pikeminnow *(Ptychocheilus Lucius)*	Endangered	No
Humpback chub *(Gila cypha)*	Endangered	No
Razorback sucker *(Xyrauchen texanus)*	Endangered	No
Canada lynx *(Lynx Canadensis)*	Threatened	No
Ute ladies-tresses *(Spiranthes diluvialis)*	Threatened	No
Greater Sage-grouse *(Centrocercus urophasianus)*	Candidate	No
Yellow-billed cuckoo *(Coccyzus americans)*	Candidate	No

3.3.8.2 Species of Concern

The Utah Division of Wildlife Resources (UDWR) maintains a central database for species of concern in Utah. On March 19, 2013, the UDWR provided a response letter regarding information on ESA species and State listed species of special concern within the proposed project action area. The UDWR has recent records of occurrence for two species of concern in the project action area, the bald eagle (*Haliaeetus leucocephalus*) and the white-tailed prairie dog (*Cynomys leucurus*). The UDWR also documented within a two-mile radius of the site, recent records for short-eared owl (*Asio flammeus*) and a historical occurrence of Canada lynx (*Lynx canadensis*).

The USFWS's Wyoming Field Office maintains a central database for species of concern in Wyoming. On June 21, 2013, the U.S. Fish & Wildlife Service provided a response letter regarding information on ESA species and State listed species of special concern within the proposed project action area. There are four species listed as species of special concern in Wyoming near the project action area. These are the pygmy rabbit (*Brachylagus ideahoensis*), mountain plover (*Charadrius montanus*), the white-tailed prairie dog (*Cynomys leucurus),* and they Wyoming pocket gopher *(Thomomys clusius)*. Species of concern that have the potential to occur in the project area are detailed in Table 3.3.

Table 3.3
Species of Concern with Potential Habitat in the Project Area

Species/Critical Habitat	Scientific Name	County	Documented Occurrence in the Vicinity of the Project Area
Bald Eagle	*Halieaeetues leucocephalus*	Daggett County	Yes
Mountain Plover	*Charadrius montanus*	Sweetwater County	Yes
Pygmy rabbit	*Brachylagus idahoensis*	Sweetwater County	Yes
Short-eared owl	*Asio flammeus*	Daggett County	Yes
White-tailed prairie dog	*Cynomys leucurus*	Daggett County & Sweetwater County	Yes
Wyoming pocket gopher	*Thomomys clusius*	Sweetwater County	Yes

Follow up coordination from the USFWS dated October 29, 2013, indicates that there are three known bald eagle nests within the general vicinity of the project area. According to the USFWS, a single pair of bald eagles uses one of these nests each year (alternating between the three nests from year to year). Therefore, any one of the three nests has the potential to be active during the proposed

construction season. The following table details the distance of each known nest from the project alignment.

Table 3.4
Known Bald Eagle Nests

Nest Identifier	Approximate Distance from the Project
Nest No.1	1,500 feet
Nest No. 2	1,575 feet
Nest No. 3	8,950 feet

3.3.9 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 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 consists of a 100 foot wide linear corridor, approximately 40,055 feet (7.59 miles) in length, which covers the area impacted by the proposed pipeline and an overflow ditch. The APE also includes seven block areas which will be used for construction equipment/pipeline staging and habitat replacement. The total area included in the APE is approximately 108.81 acres.

3.3.9.1 Cultural Resources Status

A Class I records search and a Class III cultural resource inventory were completed for the APE, as defined in the Action Alternative and analyzed for the proposed action, by Sagebrush Consultants, L.L.C. (Sagebrush), in March and April 2013, respectively. Eight previously conducted cultural resource inventories and five previously recorded cultural resource sites were identified within one mile of the APE as a result of the Class I records search. A total of 108.81 acres were inventoried during the Class III cultural resource inventory to

identify any cultural resources within the APE. One previously recorded cultural resource site (42DA915/48SW17017) and one isolated resource were identified and recorded during the inventory (Pagano and Johnson 2013a and Pagano and Johnson 2013b).

In accordance with 36 CFR 800.4, site 42DA915/48SW17017 was evaluated for significance in terms of NRHP eligibility. The significance criteria applied to evaluate cultural resources are defined in 36 CFR 60.4 as follows:

The quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and

A. That are associated with events that have made a significant contribution to the broad patterns of our history; or

B. That are associated with the lives of persons significant in our past; or

C. That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

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

Sagebrush recommends site 42DA915/48SW17017 (Sheep Creek Canal), eligible for the NRHP under Criterion A (Pagano and Johnson 2013a and Pagano and Johnson 2013b). The proposed action involves replacing a portion of the open, earthen Sheep Creek Canal with an HDPE pipeline. The pipeline would be installed within the existing canal prism and buried. The proposed action would cause an alteration to the characteristics of site 42DA915/48SW17017 which make it eligible for the NRHP and would, therefore, have an effect on the property according to 36 CFR 800.16(i).

In accordance with 36 CFR 800.5, the criteria of adverse effect were applied to site 42DA915/48SW17017. An adverse effect is defined as an effect that could diminish the integrity of a historic property's location, design, setting, materials, workmanship, feeling, or association. The proposed action would diminish the integrity of the Sheep Creek Canal and would, therefore, have an adverse effect to the historic property.

In compliance with 36 CFR 800.4(d)(2) and 36 CFR 800.11(e), a copy of the Class III cultural resource inventory reports and a determination of historic properties affected have been submitted to the Utah State Historic Preservation Office (SHPO), the Wyoming SHPO, the Advisory Council on Historic Preservation (ACHP), and Tribes, which may attach religious or cultural significance to historic properties possibly affected by the proposed action for consultation (Appendix C, Cultural Resources Correspondence).

Pursuant to 36 CFR 800.6(c), a Memorandum of Agreement (MOA) would be developed to resolve the adverse effects to site 42DA915/48SW17017. Signatories to the MOA would include all parties that assume a responsibility under the agreement, including, but not limited to, Reclamation, Utah SHPO, Wyoming SHPO, the Sheep Creek Irrigation Company, and if they choose to participate, the ACHP.

3.3.10 Paleontological Resources

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

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

The potential impact area for paleontological resources is consistent with the APE for cultural resources, as described in Section 3.3.8.

3.3.10.1 Paleontological Resources Status

A paleontological file search of the potential impact area in Daggett County, Utah, was conducted by Martha Hayden, Paleontological Assistant for the Utah Geological Survey (UGS). In a letter dated April 16, 2013, the UGS stated that no paleontological localities recorded in the UGS files are located in the potential impact area. Further, Quaternary and Recent alluvial deposits that are exposed within the potential impact area have a low potential for yielding significant fossil localities. The UGS stated, however, that on the north side of the potential impact area there are exposures of the Eocene Wasatch Formation that has the potential for yielding significant vertebrate fossil localities. The UGS recommended that if these deposits will be impacted by ground disturbing activities, that the potential impact area be evaluated by a permitted paleontologist in order to determine and mitigate any potential impacts to paleontological resources. Otherwise, unless fossils are discovered as a result of construction activities, this project should

have no impact on paleontological resources (Appendix D, Paleontological Resources Correspondence).

As a result of the UGS recommendation, a paleontological literature search, Government (state and Federal) database search, and a field survey were conducted over the entire potential impact area in both Daggett County, Utah and Sweetwater County, Wyoming, by Paleo Mentors, Inc. The literature search and database search showed that only relatively insignificant vertebrate fossils, such as fish scales and teeth and invertebrate and microfossils, which are all from the Eocene Wasatch Formation, have been found in the general vicinity of the potential impact area. The field survey was conducted by in April 2013. No fossils were observed during the inventory and, according to Paleo Mentors, Inc., the probability of discovering fossils during construction is very low.

3.3.11 Soil Sedimentation and Erosion

The soils in the project area are primarily comprised of sandy loams and outcrop complexes with slopes ranging from 3-9 percent. The composition of the soil in the project area includes: Goslin Fine Sandy Loam (78.3 percent), McFadden fine sandy loam (1.2 percent), and Redcreek-Blackhall-Rock outcrop complex (19.9 percent). Soil erosion has a rating of moderate along most of the project area, with some places listed as severe due to the slope. Soil erosion is common within the project area, in areas surrounding ditches and in areas that receive periods of heavy wind (NRCS Soil Survey, 2013).

3.3.12 Indian Trust Assets

Indian Trust Assets (ITAs) are legal interests in property held in trust by the United States for federally recognized Indian tribes or individuals. Interior's policy is to recognize and fulfill its legal obligations to identify, protect, and conserve the trust resources of federally recognized Indian tribes and tribal members, and to consult with the tribes on a government-to-government basis whenever plans or actions affect tribal trust resources, trust assets, or tribal safety (please refer to the Departmental manual, 512 DM 2). Under this policy, as well as Reclamation's ITA policy, Reclamation is committed to carrying out its activities in a matter which avoids adverse impacts to ITAs when possible, and to mitigate or compensate for such impacts when it cannot. All impacts to ITAs, even those considered insignificant, must be discussed in the trust analyses in NEPA compliance documents and appropriate compensation or mitigation must be implemented. Trust assets may include lands, minerals, hunting and fishing rights, traditional gathering grounds, and water rights. Impacts to ITAs are evaluated by assessing how the action affects the use and quality of ITAs. Any action that adversely affects the use, value, quality, or enjoyment of an ITA is considered to have an adverse impact on the resources.

3.3.12.1 Indian Trust Assets Status

Reclamation contacted the Bureau of Indian Affairs (BIA), Uintah and Ouray Agency in Fort Duchesne, Utah, and the Wind River Agency in Fort Washakie,

Wyoming, to identify any potential impacts to ITAs as a result of the proposed action.

3.3.13 Environmental Justice

According to the 2010 U.S. Census data, Manila has a total population of 310 residents. Of these residents, 302 (97 percent) were identified as white, while the remaining eight residents are identified as an ethnic minority. Data regarding the economic standing of residents located along the project corridor was not available at the time that this EA was prepared. However, U.S. Census data indicates that 10.8 percent of Daggett County residents' incomes were below the poverty level. The information obtained from the U.S. Census indicates that a minority and/or low income population may exist in the general vicinity of the project area.

3.3.14 Public Safety, Access, and Transportation

Major transportation resources in the area include Utah State Highway 43, Utah State Highway 44, and Wyoming State Highway 530. Wyoming State Highway 530 turns into Utah State Highway 43 in Utah, and runs parallel to the Sheep Creek Canal in Manila. Utah State Highway 44 runs perpendicular to the canal and State Highway 43. Highway 44 begins in Manila and continues south towards the Ashley National Forest, before wrapping around Meadow Park and Eagle Basin to the east. Local roads in the area are developed on a grid system and provide local access and mobility for residents in Manila.

3.3.15 Prime, Unique and Statewide Important Farmlands

A review of the Natural Resources Conservation Service's (NRCS's) Soil Survey, indicates that the project area does not contain any prime, unique or statewide important farmland (Appendix E, Soil Survey).

3.3.16 Visual Resources

The visual resources within the project area are generally related to the area's population, agricultural activities, and adjacent topographic features. The elevation of the proposed project area ranges from 6,200 to 6,700 feet above sea level. Most of the project area has been previously disturbed and converted to agricultural or residential uses. The project area is located in a valley within adjacent hillsides with slopes ranges from 3 percent to 35 percent. Flaming Gorge Reservoir is located in the general project area.

3.4 Environmental Consequences

3.4.1 Air Quality

No Action Alternative

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

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

3.4.2 Water Resources

No Action Alternative
Under the No Action Alternative, water from the lateral would continue to seep into the soil and ultimately contribute to the concentrated salt loads in the waterways of the Upper Colorado River Basin. This seepage would result in a significant loss of the irrigation water that runs through the Cedar Hollow lateral.

Action Alternative
The Action Alternative would eliminate seepage from the Cedar Hollow lateral, thereby improving the efficiency of the irrigation system. The Action Alternative would also prevent seepage from carrying salt to the adjacent waterways and ultimately the Colorado River Basin. This action would not result in a new depletion to the Colorado River System and therefore, would have no negative impact on water resources in the area.

3.4.3 Water Quality

No Action Alternative
Under there No Action Alternative, there would be long-term minor to moderate adverse impacts to the water quality in the area. Salt loads from the deep percolation of seepage from the Cedar Hollow lateral would continue to degrade water quality in the area.

Action Alternative
The Action Alternative would reduce seepage from the lateral. The reduced seepage will result in an estimated 2,220 fewer tons of salt from annually reaching the Colorado River. This would result in minor long-term reduced salinity in the local waterways and improvements to the long-term water quality of the Colorado River Basin.

3.4.4 Hydrology

The hydrology in the project area would remain unaltered in its current state under the No Action Alternative.

Action Alternative
The Action Alternative would prevent seepage and increase the efficiency of water delivery through the Cedar Hollow Lateral. This would result in an estimated 30 percent increase in water traveling to agricultural users along the

lateral. Run-off that was previously collected by the open lateral would sheet flow over the piped lateral. The Action Alternative would not impact the hydrology of natural water resources within the vicinity of the project area.

3.4.5 Upland Vegetation Resources

No Action Alternative

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

Action Alternative

Under the Action Alternative, the area disturbed by construction activities would be in residential, upland and agricultural areas. Most of the areas where construction would take place are already altered from their natural state. Upland areas would experience short-term losses of vegetation. 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 little 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 composition 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 impacts 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.

BMPs would be followed to reduce impacts to native vegetation, including staging materials 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.

3.4.6 Wetlands and Riparian Resources

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

would likely increase their dominance within the project area, resulting in degradation of habitat quality.

Action Alternative
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 primarily within the existing lateral except for a few minor areas that may shift the canal alignment slightly. The Action Alternative may impact 0.16 acres of sloped wetland (Appendix A, Wetland Delineation).

According to the USACE 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. Under this exemption, no Nationwide Permit is required for the impact to wetlands within the project area. Consultation with USACE is warranted prior to construction of the Action Alternative to confirm whether the proposed project qualifies for an irrigation exemption.

Riparian habitat would be impacted by the piping of this lateral. Piping would result in a total loss of ditch-induced riparian habitat. These areas may see increases in non-native species including tamarisk and Russian olive; these two species may be able to out-compete native species for limited water supplies when irrigation flows cease. 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 SCIC through Habitat Replacement and Management Plan, approved by Reclamation, following coordination with Federal and state wildlife officials (Appendix F, Habitat Replacement Plan). 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). The habitat quality score (HQS) for the proposed project area was evaluated onsite by a team of qualified resource specialists. After viewing the entire alignment, the HQS was developed and agreed upon by each resource specialist.

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

3.4.7 Fish and Wildlife Resources

No Action Alternative
Under the No Action Alternative, fish and wildlife habitat would remain in its current condition, and there would be no gains or losses to these resources.

Salinity loading of the Colorado River Basin would continue at current rates, which may affect water quality within the drainage, thereby impacting the wildlife using the area.

Action Alternative

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

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

During the construction period and during pipeline maintenance, there could be a short-term displacement (approximately 3 to 6 months) of wildlife that normally occupies the immediate project area. All construction activities would occur within a 100-foot wide area along the proposed pipeline alignment. Generally, wildlife would move easily and find alternative areas for forage and cover, and may return after construction and maintenance operations have been completed. Some upland habitats would experience short-term disturbance until native vegetation components within these areas are restored (two to three growing seasons).

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

Impacts to big game would include, short-term disturbances 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.

The proposed action would result in a decrease in salinity, which would improve water quality in the Colorado River Basin and potentially indirectly benefit fish within the Colorado River System. Furthermore, the proposed action would not result in a new depletion to Colorado River System and would therefore result in no long-term impacts to Colorado River fish species.

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 total habitat value that would be lost long-term would be mitigated through the implementation of a habitat replacement plan that has been approved by Reclamation (Appendix F, Habitat Replacement Plan).

3.4.8 Special Status Species

3.4.8.1 Federally Listed Species

No Action Alternative

Salinity loading of the Colorado River Basin would continue at current rates due to seepage from the Cedar Hollow lateral, which would impact water quality within the drainage, thereby impacting wildlife using the area. There would continue to be minor direct or indirect impacts to threatened, endangered, or candidate species from the continued salt loading in the Colorado River Basin. Any existing impacts to federally listed species and their habitat from the salt loading would continue under the No Action Alternative.

Action Alternative

There have been no documented occurrences of federally listed threatened, endangered, or candidate species within the project area. Biological site surveys completed in June 2013, determined that the Action Alternative would have "No Effect" on federally listed species (Appendix B, Biological Evaluation).

3.4.8.2 Species of Special Concern

No Action Alternative

There would be no impact to species of special concern under the No Action Alternative.

Action Alternative

As indicated in Section 3.3.8, there are three known bald eagles nest in the general vicinity of the project area. Two of these nests are within a 1-mile radius of the project area. Biological monitoring would be performed to determine if these nests become active during construction. If it is determined that there is an active bald eagle nest within a 1-mile radius of the proposed project, then BMPs would be implemented to minimize any potential impacts to the eagles. BMPs would follow the guidelines set forth in the Utah Field Office Guidelines for Raptor Protection from Human and Land Use Disturbances. BMPS would include, but would not be limited to, limiting construction activities that occur

from January 1 through August 15, from 1 hour after sunrise to 1 hour prior to sunset.

The biological evaluation for proposed project indicates that the project footprint contains previously disturbed, developed areas associated with residential and agricultural uses (Appendix B, Biological Evaluation). There would be no long term direct or indirect impact to any other species of special concern from the Action Alternative.

3.4.9 Cultural Resources

No Action Alternative

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

Action Alternative

Under the Action Alternative, there would be an adverse effect to the Sheep Creek Canal (42DA915/48SW17017). The open, earthen irrigation canal would be replaced with a buried HDPE pipeline. Mitigation measures for the adverse effect to the Sheep Creek Canal will be outlined in a MOA, in accordance with 36 CFR 800.6(c).

3.4.10 Paleontological Resources

No Action Alternative

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

Action Alternative

Under the Action Alternative, there would be ground-disturbing activities which have the potential to disturb subsurface fossil material. There are, however, no known paleontological localities within the potential impact area. Further, no fossils were observed during the field inventory. Therefore, the Action Alternative is not anticipated to have an impact on paleontological resources.

3.4.11 Soil Sedimentation and Erosion

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. BMPs 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.

3.4.12 Indian Trust Assets (ITAs)

No Action Alternative

Under the No Action Alternative, there would be no foreseeable impacts to ITAs. The existing conditions would remain intact and would not be affected.

Action Alternative

Under the Action Alternative, there would be no foreseeable impacts to ITAs. There are no identified ITAs that would be impacted by the proposed action and implementation of the Action Alternative would, therefore, likely have no effect on ITAs.

3.4.13 Environmental Justice

No Action Alternative

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

Action Alternative

The project area lies on privately owned land in Daggett County, Utah and Sweetwater County, Wyoming. After a review of the 2010 Census information and socioeconomic data available for Manila, populations that could potentially be affected by the proposed project were evaluated. While a minority population may exist in the general project area, implementation of the Action Alternative would not disproportionately affect low-income or minority populations. The proposed action would not involve population relocation, health hazards, hazardous waste, property takings, or substantial economic impacts. The Action Alternative would therefore, have no adverse effects to human health or the environment, and would not disproportionately affect minority and low-income populations.

3.4.14 Public Safety, Access, and Transportation

No Action Alternative

Transportation resources would not be impacted by the No Action Alternative.

Action Alternative

The proposed action may cause limited delays along State Highway 43, due to construction vehicles entering and exiting the highway. Although no temporary road closures are planned, any temporary road or access closure would be coordinated with local law enforcement and emergency services.

3.4.15 Prime, Unique and Statewide Important Farmlands

No Action Alternative

The No Action Alternative would continue to allow salts to accumulate in the irrigation laterals that deliver water to agricultural users in the area. Furthermore,

under the No Action Alternative, up to 30 percent of irrigation water would be lost to seepage resulting in less water available for agricultural use. The No Action Alternative may result in a minor long-term negative impact on farmland in the general vicinity of the project area.

Action Alternative
A review of the NRCS Soil Survey indicates that there is no prime, unique, or statewide important farmland in the project area. Given the nature of the proposed project (piping an existing canal), and the fact that no permanent right-of-way would be required for project implementation, there would be no impact to farmland from the Action Alternative.

3.4.16 Visual Resources

No Action Alternative
There would be no impact to visual resources from the No Action Alternative.

Action Alternative
Under the Action Alternative, the proposed pipeline would be buried and the site would be restored to its original condition. Visual impacts associated with construction activities would be temporary. There would be no long-term impacts to the visual resources within the project area.

3.4.17 Cumulative Impacts

Cumulative impacts result from the incremental impact of the action, when added to other past, present, and reasonable foreseeable future actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

In 2007, the NRCS began development of on-farm salinity control projects within the Manila-Washam project area. This project addressed new depletions to the Colorado River System from the proposed on-farm projects. In 2010, Reclamation obligated funding for People's Canal Salinity Control Project, located in Sweetwater County, Wyoming and Daggett County, Utah. The SCIC is currently working with Reclamation on an EA to evaluate the impacts from a proposed project to pipe the South Valley lateral as part of Colorado River Basin Salinity Control Program. The aforementioned salinity control projects and the Cedar Hollow Salinity Control Project are being implemented to meet the goals of Reclamation's Salinity Control Program, and are expected to have a cumulative positive impact on the water quality in the Colorado River Basin.

There are no other known Federal, state, or local projects occurring within the Project Area. The Action Alternative would comply with all relevant federal, state and local permits. The proposed area and duration of disturbance under the Action Alternative are small and short-term and long-term impacts are not expected to create negative cumulative impacts to environmental resources.

3.4.18 Summary of Environmental Consequences

Table 3.5 provides a summary of the environmental consequences for each resource evaluated in this EA. Resource impacts are outlined for both the No Action and the Action Alternative. Mitigation, if required, is also detailed under the description of the Alternative.

Table 3.5
Summary of Environmental Consequences

Resource	No Action Alternative	Action Alternative
Air Quality	No Effect	Minor short-term effects due to fugitive dust and equipment exhaust from construction activity. Mitigate with BMPs.
Water Resources	Water lost to seepage will continue at a rate 30 percent annually. Long- term minor to moderate impacts.	Long-term benefit due to increased efficiency of the water delivery system.
Water Quality	Continued salt loading of the Colorado River Basin. Long-term minor to moderate impacts.	Long-term benefits to water quality from the decreased salinity.
Hydrology	No Effect	Long-term benefit to the water delivery system. No effect to the natural hydrology.
Upland Vegetation Resources	No Effect	Short-term upland vegetation loss with the potential for an increase in invasive plants. BMPs will be employed to decrease the likelihood of invasive species.
Wetland and Riparian Resources	No Effect	There would be permanent loss of riparian areas along the lateral channel.
Fish and Wildlife Resources	No Effect	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 riparian areas once the lateral is piped. A Habitat Replacement Plan will be implemented to replace wildlife values foregone (Appendix F).
Special Status Species-Federally Listed Species	No Effect	No Effect
Special Status Species-Species of Concern	No Effect	It is anticipated that there would be No Effect.
Cultural Resources	No Effect	Adverse Effect to the Sheep Creek Canal (42DA915/48SW17017). A MOA outlining mitigation measures for the adverse effect will be signed and implemented prior to the commencement of construction activities.

Resource	No Action Alternative	Action Alternative
Paleontology	No Effect	Potential effects to subsurface fossil material.
Soil Sedimentation and Erosion	No Effect	Minor short-term effects during and shortly after construction. Mitigate with BMPs.
Indian Trust Assets	No Effect	No Effect
Environmental Justice	No Effect	No Effect
Public Safety, Access, and Transportation	No Effect	Minor temporary disruptions are possible along Highway 43 due to construction traffic entering and exiting the roadway.
Prime, Unique and Statewide Important Farmlands	Minor direct or indirect impacts may occur due to inefficiency of the existing water delivery system.	No Effect
Visual Resources	No Effect	Minor temporary impacts from construction activities.
Cumulative Impacts	No Effect	Cumulative impacts from the proposed action and related actions were assessed during the resource evaluation. This analysis determined that there were no adverse cumulative impacts.

Chapter 4: Environmental Commitments

The following environmental commitments would be implemented as an integral part of the proposed action for the piping of the SCIC Cedar Hollow lateral.

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

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

3. **State Stream Alteration Permit-** Before implementing the selected alternative, the contractor would obtain a State Stream Alteration Permit from the Utah State Engineer. The conditions and requirements of the State Stream Alteration Permit would be strictly adhered to by 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, must provide immediate telephone notification of the discovery to Reclamation's Provo Area Office Archaeologist. Work would stop until the proper authorities are able to assess the situation onsite. This action would promptly be followed by written confirmation to the responsible Federal agency official, with respect to Federal lands. The Utah SHPO, Wyoming SHPO, and interested Native American Tribal representatives would be promptly notified. Consultation would begin immediately. This requirement is prescribed under the Native American Graves Protection and Repatriation Act (43 CFR Part 10); and the Archaeological Resources Protection Act of 1979 (16 U.S. C. 470).

   A MOA will be executed to mitigate for the adverse effect to the Sheep Creek Canal (42DA915/48SW17017). Mitigation for the adverse effects to the canal, set forth in the stipulations of the MOA, must be completed before construction activities associated with the proposed action begin.

5. **Paleontological Resources-** Should vertebrate fossils be encountered by the proponent during ground disturbing activities, construction must be

suspended until a permitted paleontologist can be contacted to assess the find.

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

7. **Roads-** Existing roads would be used whenever possible for project activities.

8. **Disturbed Areas-** During construction, topsoil would be saved and then redistributed after completion of construction activities. Subsequently, disturbed areas resulting from the project would be smoothed, shaped, contoured, and reseeded to as near their pre-project condition as practicable. Seeding and planting would occur at appropriate times with weed-free seed mixes of native plants and agricultural grasses on disturbed areas, where appropriate.

9. **Habitat Replacement-** A plan to replace wildlife values foregone has been prepared by the applicant and approved by Reclamation following coordination with the USFWS, UDWR, and the WDGF. Total acreage of wildlife habitat predicted to be lost is 3.84 acres of riparian habitat along the lateral. The Habitat Replacement Plan is located in Appendix F.

10. **Sage Grouse Monitoring-** Prior to initiating construction activities and as the project proceeds, the applicant would ensure that surveys and monitoring will be conducted to confirm 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 UDWR, 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.

11. **Bald Eagle Monitoring** - Prior to construction, Reclamation will confirm if there are active bald eagle nests within a 1-mile radius of the proposed piping corridor. If there is an active bald eagle nest within a 1-mile radius of the proposed piping corridor, then BMPs, including biological monitoring consistent with the Utah Field Office Guidelines for Raptor Protection from Human and Land Use Disturbances, will be implemented and followed through the construction process. If a nest is determined to be active during the construction, then construction operations hours will be limited to 1 hour after sunrise to 1 hour prior to sunset during the nesting period (i.e. January 1 through August 15).

Chapter 5: Consultation and Coordination

5.1 Introduction

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

5.2 Scoping

Reclamation sent the EA to interested individuals, groups, stakeholders, municipalities, organizations, and agencies for review and comment. One comment was received during the comment period which ended on September 30, 2013. Follow up phone conversations were had between Reclamation and Wyoming and Utah USFWS offices concerning this letter. This comment, issued by the USFWS was evaluated and the EA has been updated accordingly.

5.3 Public Involvement

The public involvement process began in March 2013, when representatives from the SCIC and the project team delivered informational fliers to residences along the project corridor. Since that time, SCIC staff and the members of the project team, have met with the Manila City Council and held subsequent meetings with residents to discuss the project. Stakeholder concerns have been considered throughout the environmental process and the development of the Action Alternative. These public involvement activities are described in detail in Appendix G, Public Involvement Report.

5.4 Native American Tribes

Reclamation conducted Native American consultation throughout the public involvement process. Consultation letters and copies of the Class III cultural resource inventory reports have been sent to the Ute Indian Tribe of the Uintah and Ouray Reservation, the Northwestern Band of Shoshoni Nation of Utah, 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(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 in 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. No tribal responses were received.

5.5 Utah Geological Survey

Reclamation requested a paleontological file search from the Utah Geological Survey to determine the nature and extent of paleontological resources within the potential impact area. File search results and recommendations from the UGS were received in a letter dated April 16, 2013.

5.6 State Historic Preservation Offices

Copies of the Class III cultural resource inventory reports, and a determination of historic properties affected for the proposed action, were submitted to Utah SHPO and Wyoming SHPO. Reclamation received concurrence on its determination of historic properties affected from the Utah SHPO and Wyoming SHPO, on August 13, and August 27, 2013, respectively.

5.7 Bureau of Indian Affairs

In a letter dated August 16, 2013, Reclamation's archeologist requested an evaluation of ITAs that may be potentially impacted by the proposed action from the Bureau of Indian Affairs (BIA), Uintah and Ouray Agency, and Wind River Agency. No response was received from either BIA agency.

Chapter 6: Preparers

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

Table 6.1
List of Preparers

Name	Title/Position	Contributions
Agency Representatives		
Kerry Schwartz	Water and Environmental Resources Division Manager, Bureau of Reclamation, Provo Area Office	Project Coordination and Oversight
Brian Joseph	Archaeologist, Bureau of Reclamation, Provo Area Office	Cultural Resources, Paleontological Resources, and Indian Trust Assets
Shane Mower	Biologist, Bureau of Reclamation, Provo Area Office	Biological Resources Oversight
Peter Crookston	Acting Environmental Group Chief	NEPA and ESA Oversight
Mark Quilter	Basin States Program Manager, Utah Department of Agriculture and Food	Project Manager
Consultants		
Brian Deeter	Project Engineer, J-U-B Engineers, Inc.	Project Manager
Jon Frazier	Design Engineer, J-U-B Engineers, Inc.	Alternative Analysis
Nate Smith	Design Engineer, J-U-B Engineers, Inc.	Alternative Analysis
Marti Hoge	Environmental Lead, J-U-B Engineers, Inc.	NEPA Oversight
Vincent Barthels	Biologist, J-U-B Engineers, Inc.	Biological and Wetland Resources
Jordan Hansen	GIS Specialist, Gateway Mapping, Inc.	GIS, Document Graphics
Becky Lang	Environmental Planner, J-U-B Engineers, Inc.	Affected Environment Environmental Consequences
Brooks Britt, Ph.D.	Paleontologist, Paleo Mentors Inc.	Paleontological Resources
Sandy Chynoweth Pagano	Archaeologist, Sagebrush Consultants	Cultural Resources
Wendy Simmons Johnson	Principal Investigator, Sagebrush Consultants	Cultural Resources

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Chapter 8: Abbreviations and Acronyms

AIRFA	American Indian Religious Freedom Act
APE	Area of Potential Effect
ARPA	Archaeological Resources Protection Act
BGEPA	Bald and Golden Eagle Protection Act
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
BMPs	Best Management Practices
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
CWA	Clean Water Act
DEQ	Department of Environmental Quality
DPS	Distinct Population Segment
E.O.	Executive Order
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FONSI	Finding of No Significant Impact
Department	Department of the Interior

ITAs	Indian Trust Assets
MBTA	Migratory Bird Treaty Act
MOA	Memorandum of Agreement
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
PM 10	Particulate Matter 10 Micrograms per Cubic Meter
PM 2.5	Particulate Matter 2.5 Micrograms per Cubic Meter
PRPA	Paleontological Resources Preservation Act
RCRA	Resource Conservation and Recovery Act
Reclamation	Bureau of Reclamation
SARA	Superfund Amendments and Reauthorizations Act
SCIC	Sheep Creek Irrigation Company
SOPs	Standard Operating Procedures
UDWR	Utah Department of Wildlife Resources
UGS	Utah Geological Survey
USACE	U.S. Army Corps of Engineers
USFS	U.S. Forest Service
USHPO	Utah State Historic Preservation Office

USFWS	U.S. Fish and Wildlife Service
WYSHPO	Wyoming State Historic Preservation Office

Appendix A

Wetland Delineation

Wetland/Stream Delineation Report

Proposed Cedar Hollow Lateral Piping Project

Located in Sections 17 and 18, Township 3 North, Range 20 East, and Sections 13, 22, 23, 24, 27, and 28, Township 3 North, Range 19 East, Daggett County, Utah; and, Sections 21 and 28, Township 12 North, Range 109 West, Sweetwater County, Wyoming.

August 2013

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2. Wetland Delineation Maps (Sheets 1 through 9)
3. National Wetland Inventory Map
4. Soil Survey Information
5. Wetland Field Data Forms
6. Photo Inventory

Introduction

This wetland delineation was authorized by Sheep Creek Irrigation Company in order to properly define the wetland and stream boundaries within a 47.8 acre study area [see Vicinity Map and Wetland Delineation Maps (sheets 1 through 9) in the Appendix]. The field investigation was conducted on March 14th and June 18th, 2013 by Vincent Barthels, Biologist with J-U-B ENGINEERS, Inc. This wetland delineation report was prepared pursuant to the U.S. Army Corps of Engineers (USACE) Wetland Delineation Manual Technical Report Y-87-1 (1987 Manual), the Arid West Regional Supplement (2008) and 33 CFR 328.3.

The proposed project correlated to this wetland/stream delineation is located in Sections 17 and 18, Township 3 North, Range 20 East; Sections 13, 22, 23, 24, 27, and 28, Township 3 North, Range 19 East, Daggett County, Utah; and, Sections 21 and 28, Township 12 North, Range 109 West, Sweetwater County, Wyoming. This piping project would be designed to minimize encroachment into any identified wetlands or streams to the greatest extent possible. The goal of this report is to identify and quantify the wetlands and irrigation/stream channels [i.e. below the ordinary high water mark (OHWM)] within the defined study area.

Proposed Project Action linked to the Defined Study Area

Sheep Creek Irrigation Company proposes to replace the earthen, unlined Cedar Hollow Canal Lateral with a pipeline. The proposed project would reduce seepage of the irrigation waters and eventually reduce salinity delivery to the Colorado River Basin. The Cedar Hollow Lateral is part of a more complex irrigation system that provides water for agricultural purposes on the lands surrounding the canal. Very little habitat change is expected to occur due to the fact that the project will be piping an existing canal.

The project area evaluated in this wetland delineation also includes a habitat replacement site linked to the proposed piping project. A habitat replacement plan was developed for the proposed project to meet the funding requirements established under the Bureau of Reclamation's Colorado River Basin Salinity Program. The habitat replacement site is detailed in the attached exhibits.

Directions to the Project Action Area:

From Salt Lake City, Utah, travel East on I-80 following signs for Cheyenne/Interstate 80 (entering Wyoming). Take exit 34 for I-80 toward Fort Bridger. Keep right at the fork and merge onto I-80 BUS E. Take a right onto WY-414 S (entering Utah). Continue onto UT-43 E. Take a right onto UT-44 S/Main St once you arrive in Manila, Utah.

Methods

The wetland delineation was conducted using methodology described in the USACE Wetland Delineation Manual (1987 Manual) and the Arid West Regional Supplement (2008). Specific investigations were performed at eight individual soil test pits (STPs), scattered throughout the defined project study area. STPs were established in order to identify the presence/absence of hydrophytic plant communities, wetland hydrology, and hydric soils. The STPs were marked with wooden lathe and green flagging. Wetland boundary and OHWM stakes were set in the field using yellow and pink pinned flags.

Professional land surveying was performed by J-U-B ENGINEERS, Inc. to capture the established STP markers and wetland/stream boundaries set in the field using a Trimble R8 GNSS RTK (Real Time Kinematics) Global Positioning System (GPS) unit. This system has an accuracy of about +/- 10mm (0.03 feet) + 1ppm RMS Horizontal, and +/- 20mm (0.06 feet) + 1 ppm vertical. The survey points were downloaded into ACAD Civil 3D 2013 to convert established survey waypoints into

the developed Wetland Delineation Maps, which aided in the determination of wetland and stream features within the defined study area. Photos were taken to properly document pertinent locations (see Appendix - Photo Inventory).

Sources of information used for this investigation included:

1. Manila, UT; Jessen Butte, UT; Antelope Wash, WY; and Linwood Canyon, WY USGS Quad Maps;
2. National Wetland Plant List (Lichvar 2012);
3. Additional Plant identification references (see references);
4. National Wetland Inventory (NWI) Map accessed via http://www.charttiff.com/WetLandMaps/main.htm (see Appendix - NWI Map);
5. Web Soil Survey (USDA/NRCS 2013) (see Appendix - Soil Survey Information);
6. Munsell Soil Chart (2000 Edition); and,
7. Hydric Soils Information (USDS/NRCS 2013).

Discussion

Topography

The topography of the project study area contains varying degrees of hillside (5-35% slopes). The landform contained within the study area can be characterized as a valley. The elevation of the study area falls within the range of 6,200 feet to 6,700 feet above sea level.

Climate

The project area, based on data abstracted from Flaming Gorge, UT 2864 weather station, has an average annual temperature of 44.1 degrees Fahrenheit. The average annual rainfall is 12.79 inches and the average annual snowfall is 58.8 inches. The growing season typically 124 days falls between May 19th and September 20th (USDA/NRCS 2013).

General Habitat Descriptions

Description of the Eco-regions of the United States describes the defined study area as an Intermountain Semi-desert and Desert Province (Bailey 1995). The study area is largely undeveloped and supports agricultural land uses.

Interstate or Foreign Commerce Connection

Agriculture correlated to the irrigation waters derived from the Cedar Hollow Lateral is a possible connection to Interstate or Foreign Commerce. It should be noted that the proposed project study area and pipeline alignment cross the Utah/Wyoming border.

Hydrology

The majority of the wetland hydrology within the study area is derived from irrigation waters that are drawn from the Birch Spring Creek (also known as Birch Spring Draw). All the irrigation induced ditches/waters and the sloped wetlands identified in the project study area are hydrologically linked directly to and from the Birch Spring Creek. In addition, the Cedar Hollow Lateral receives supplemental hydrology in the form of run-off from higher adjacent elevations.

Birch Spring Creek flows into the Flaming Gorge Reservoir, which is a considered to be a navigable Water of the U.S. Based on the connectivity to the Flaming Gorge Reservoir, the Cedar Hollow Lateral and wetland areas located in the defined project study area are likely to be deemed jurisdictional. The jurisdictional authority stems to the USACE under Section 404 of the Clean Water Act (CWA).

Soils

There are nine mapped soil types identified for the defined project study area. The soils information provided in Table 1 represent the majority of soils in the project study area. For complete soils information, please see the attached Soil Survey Information (in the Appendix).

Table 1 - Mapped soil types encountered within the study area.

Soil Type	Description	Slope
Goslin fine sandy loam (42.4% of study area)	Deep, well drained soils that form in course textured alluvium derived from red sandstone. Found on fan aprons, fan pediments, and alluvial terraces.	3-10%
McFadden fine sandy loam (22.6% of study area)	Very deep, well drained soils formed in alluvium. These soils are on fan remnants.	0-10%
Redcreek-Blackhall-Rock outcrop complex (14.9% of study area)	A combination of two different soils mixed with rock. The Redcreek series consists of shallow, well drained soils formed in residuum reworked by wind and weathered from calcareous sandstone. The Blackhall series consists of very shallow, well drained soils that form in material weathered from sandstone.	6-35%

Plant Communities

Table 2 illustrates the wetland indicator status of the dominant plant species that were encountered within the study area (Lichvar 2012).

Table 2 - Common vegetation encountered within the study area.

Common Name	Scientific Name	Wetland Indicator Status
Alfalfa	*Medicago sativa*	UPL
Antelope brush	*Purshia tridentata*	UPL
Baltic rush	*Juncus balticus*	FACW
Cheat grass	*Bromus tectorum*	UPL
Clover	*Trifolium spp.*	FAC
Common plantain	*Plantago major*	FAC
Common spike-rush	*Eleocharis palustris*	OBL
Cottonwood	*Populus deltoides*	FAC
Creeping buttercup	*Ranunculus repens*	FAC
Crested wheatgrass	*Agropyron cristatum*	UPL
Dyer's Woad	*Isatis tinctoria*	UPL
Garrison creeping meadow foxtail	*Alopecurus arundinaceus*	FACW
Greasewood	*Sarcobatus vermiculatus*	FAC
Indian rice-grass	*Achnatherum hymenoides*	UPL
Kentucky bluegrass	*Poa pratensis*	FAC
Mountain brome	*Bromus marginatus*	UPL
Nebraska sedge	*Carex nebrascensis*	OBL
Orchard grass	*Dactylis glomerata*	FACU
Poison hemlock	*Conium maculatum*	FACW
Quack grass	*Elymus repens*	FAC
Rabbit-brush	*Chrysothamnus viscidiflorus*	UPL
Rabbit-foot grass	*Polypogon monspeliensis*	FACW

Common Name	Scientific Name	Wetland Indicator Status
Rocky Mountain juniper	*Juniperus scopulorum*	UPL
Russian olive	*Elaeagnus angustifolia*	FAC
Sagebrush (tall)	*Artemisia spp.*	FACU
Salt grass	*Distichlis spicata*	FAC
Seaside arrow-grass	*Triglochin maritima*	OBL
Soft-stem bulrush	*Schoenoplectus tabernaemontani*	OBL
Tumble mustard	*Sisymbrium altissimum*	UPL
Utah juniper	*Juniperus osteosperma*	UPL
Water sedge	*Carex aqutilis*	OBL
Whitetop	*Cardaria draba*	UPL
Wiggins' cholla	*Cylindropuntia echinocarpa*	UPL

Wetland/Stream Classifications

The NWI Map indicates that a mosaic of fringe freshwater palustrine emergent temporarily flooded habitats exist along the town of Manila (see NWI map in the Appendix). Based on the vegetation communities observed, a palustrine emergent temporarily flooded (PEMA) wetland characterization would consistent with the onsite conditions.

Findings

Field data forms reflect the conditions as assessed in the field and can be found in the Appendix of this report. The following subsections summarize the findings at the individual STPs, how the wetland boundary and OHWMs were determined, and discusses the classification and functionality of the irrigation channel, intermittent stream channel and the identified wetlands.

Field Investigations:

(STP #1 & #2):

These paired STPs are located inland of the OHWM of the left bank of the Cedar Hollow lateral. These STPs were established perpendicular to the inlet structure where water is diverted from Birch Spring Creek. STP #1 and STP #2 were located 55 feet and 80 feet north of the inlet structure respectively. STP #1 represents the typical upland setting with vegetation that included quackgrass, whitetop, alfalfa, and mountain brome. Saturation was observed at a depth of 23 inches. STP #2 characterizes a spring fed swale that parallels Birch Spring Creek in close proximity to the inlet structure. This emergent swale also receives tail water from adjacent irrigation practices. STP #2 meets all three of the wetland criteria. The water table was observed at a depth of 4 inches, and the vegetation was composed entirely of either OBL or FACW species. The vegetation at STP #2 included Garrison creeping meadow foxtail, soft-stem bulrush, Nebraska sedge, and Baltic rush.

(STP #3 & #4):

These STPs established a transect perpendicular to the Cedar Hollow Lateral and Robin May's stock pond. STP #3 was located 91 feet north of the stock pond (halfway between the canal and the pond), and STP #4 was located 9 feet within the wetland boundary. STP #3 was dug at a low topography break, along the anticipated pipeline alignment. At STP #3, there were no indications of saturation or the water table within 29 inches of the surface. Vegetative communities at STP #3 consisted of UPL and FAC species. Species encountered included: quackgrass, rabbitbrush, mountain brome, alfalfa, Kentucky bluegrass, and Baltic rush. At STP #4

the water table was encountered at a depth of 8 inches. The most prevalent vegetative species at STP #4 were OBL and FACW communities which included common spike-rush, Baltic rush, and Garrison creeping meadow foxtail. In addition, to the hydrologic and vegetation indicators, a hydrogen sulfide odor was present, indicating that hydric soils were present at STP #4.

(STP #5 & #6):
This pair of STPs were established along a transect linked to the sloped wetland that is contained within the habitat replacement site. STP #5 was characterized as an upland setting. STP #5 was dry to a depth of 20 inches and no redox features were encountered in the soil profile. The vegetative community at STP #5 included rabbitbrush, greasewood, Russian olive, alfalfa, whitetop, orchard grass, mountain brome, quackgrass, Dyer's woad, and common plantain. At STP #6 the vegetation was dominated by OBL and FACW species such as Baltic rush, seaside arrow-grass, poison hemlock, and water sedge. The water table was encountered at a depth of 7 inches and the presence of a hydrogen sulfide odor indicated that hydric soils were present.

(STP #7 & #8):
STP # 7 and STP # 8 were located near the alignment of the optional gravity system drain line (i.e. option #2). STP #7 is a wetland location that was dominated by FAC communities. The dominant vegetation included salt grass, Baltic rush, and Russian olive. At this location there were also a number of cottonwood trees. The water table at STP #7 was encountered 10 inches below the surface. The vegetative community at STP #8 was largely dominated by UPL and FAC communities, species included rabbitbrush, greasewood, crested wheatgrass, and cheatgrass. The soil was dry to a depth of 26 inches, and no modeling was observed in the soil. STP #8 also contained a large portion of bare ground, approximately 50%.

How the wetland and irrigation/stream boundaries were chosen:
The wetland boundary was determined primarily by the distinct vegetation and topography shifts. Vegetation shifts were linked between the aforementioned hydrophytic species and upland and/or transitional species. Hydric soil indicators and wetland hydrology further substantiated the delineated boundaries. The Cedar Hollow Lateral and the Birch Spring Creek OHWMs were delineated in accordance with 33 CFR 328.3.

Wetland identification, classification and functionality:
The wetland features located within the defined study area and identified on the wetland/stream delineation map are classified as sloped or digressional wetlands, linked to waters originating from the Cedar Hollow Canal/Birch Spring Creek (see wetland/stream delineation map for the precise location of these features within the defined study area). Depending on the prevalent vegetative community present, the identified wetlands were generally classified as Palustrine Emergent Temporarily Flooded (PEMA) wetlands, in accordance with Cowardin's system (1979).

The wetlands and irrigation/stream channels identified in this report share several important functions and values that include: the ability to protect and improve water quality; flood storage; ground water recharge; and, provide seasonal wildlife habitat. These wetlands generally

act as very gently sloped catch basins. These wetlands filter the water by degrading or breaking down pollutants.

Summary of features identified in the defined project study area:

Within the 47.8 acre defined study area, the following features have been delineated:

- Approximately 27,977 linear feet of existing irrigation canal. The average channel width of Cedar Hollow is 5.98 feet; therefore, the area below the OHWM that is anticipated to be piped equals 3.84 acres.
- 5.7 acres of Palustrine Emergent (PEMA) wetlands.

Conclusion

Assuming that the 1st overflow piping alignment is implemented, there are no anticipated wetland impacts. Approximately 100 linear feet of Birch Spring Creek will be temporarily impacted in conjunction with the installation of the replacement diversion structure and the outlet of the new overflow drainage pipeline.

The Cedar Hollow Lateral flows through the defined project study area that encompasses approximately 47.8 acres. The enclosed wetland/stream delineation maps illustrate the delineated features located within the defined project study area. Based on the nature and scope of this proposed project, coordination with the USACE is warranted. The USACE should be sent a copy this delineation report with a concurrence or validation request. It should be noted, however, that final authority rests with the appropriate regulatory agencies.

Respectfully submitted by:

Vincent J. Barthels, Biologist

J-U-B ENGINEERS, Inc.

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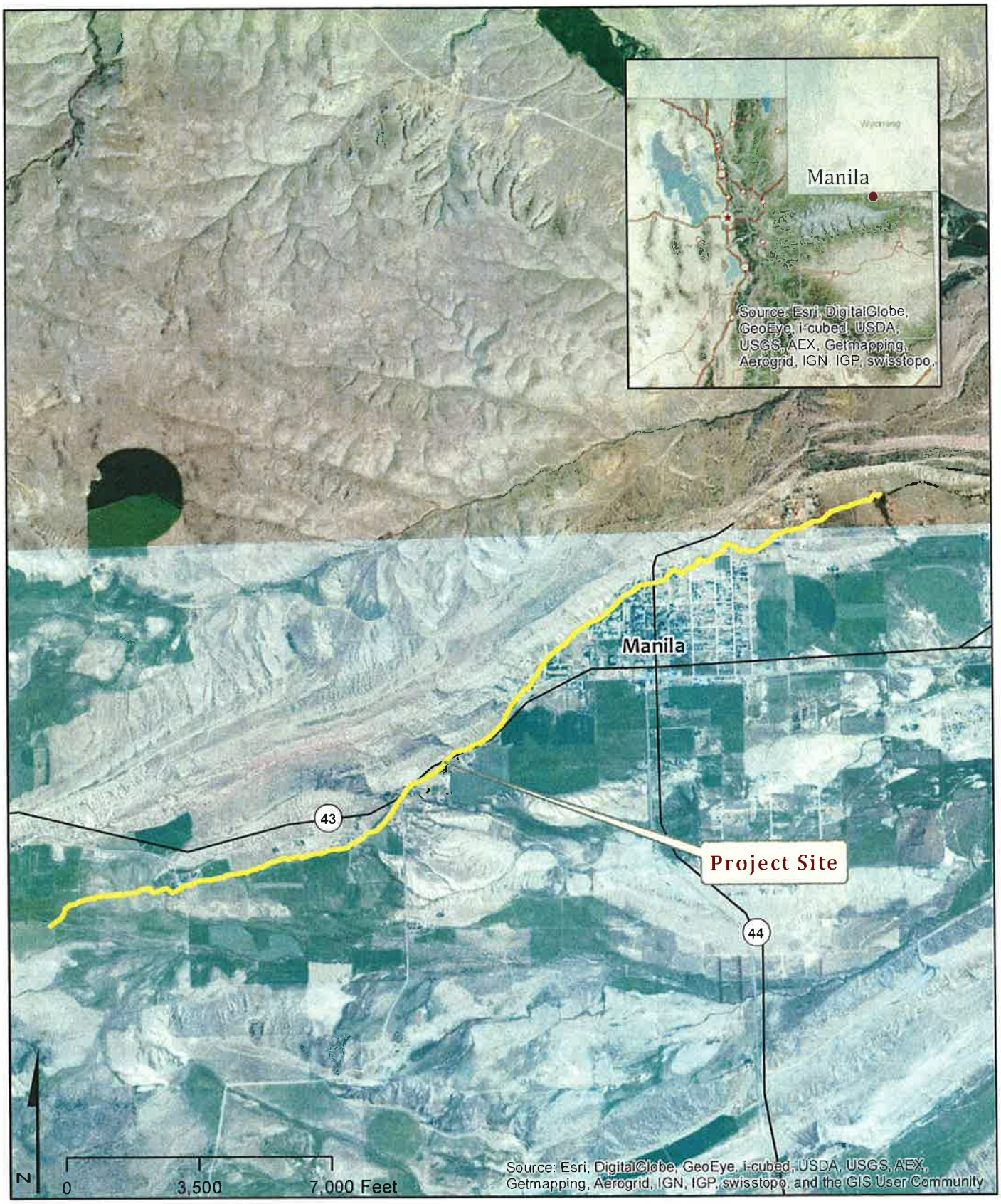
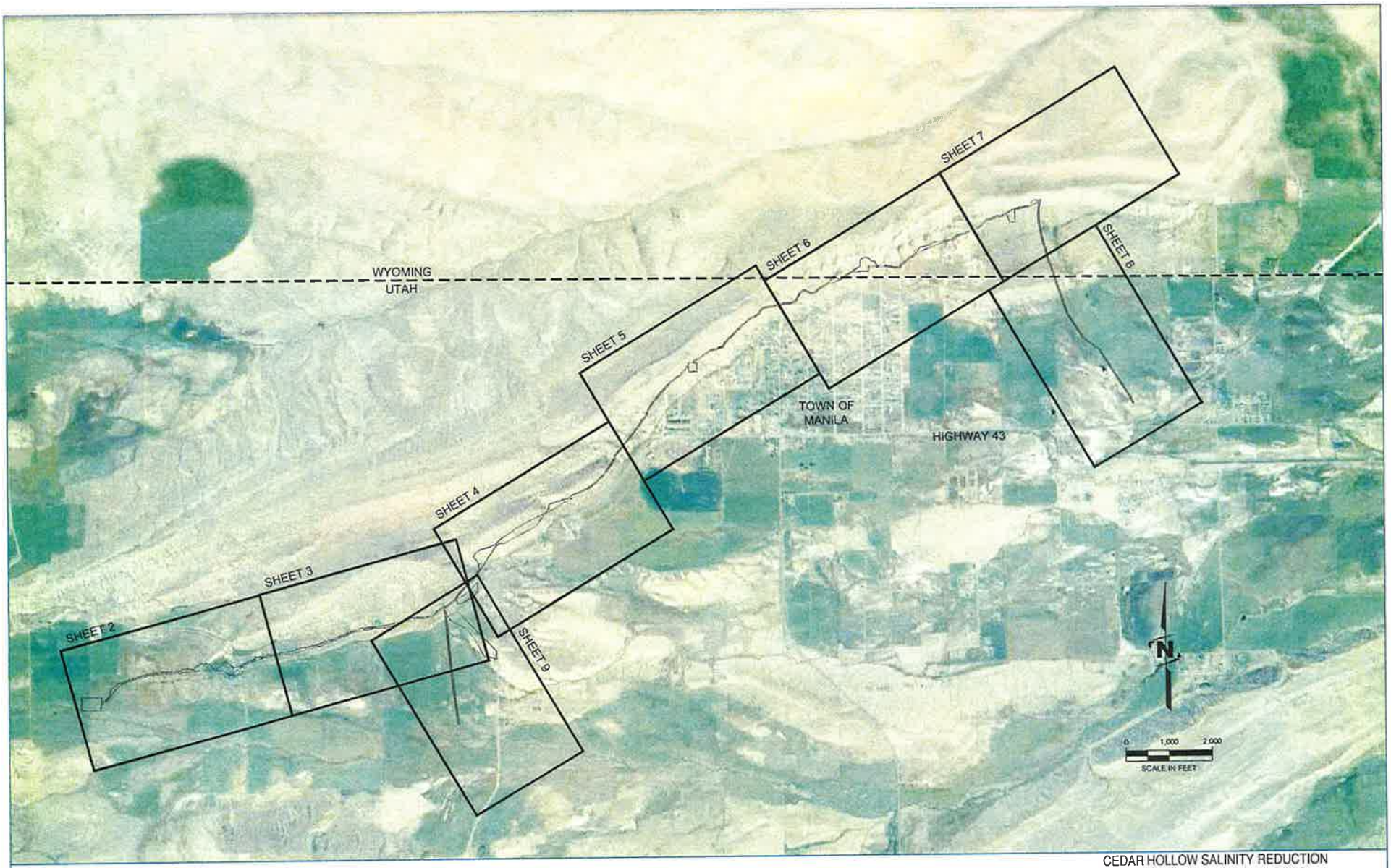


Cedar Hollow Lateral Salinity Control
Vicinity Map

Projection: NAD 83 State Plane Utah North

J-U-B ENGINEERS, INC.



CEDAR HOLLOW SALINITY REDUCTION
SHEEP CREEK IRRIGATION CO.

SHEET INDEX OF WETLAND DELINEATION MAPS

SHEET 1 OF 9

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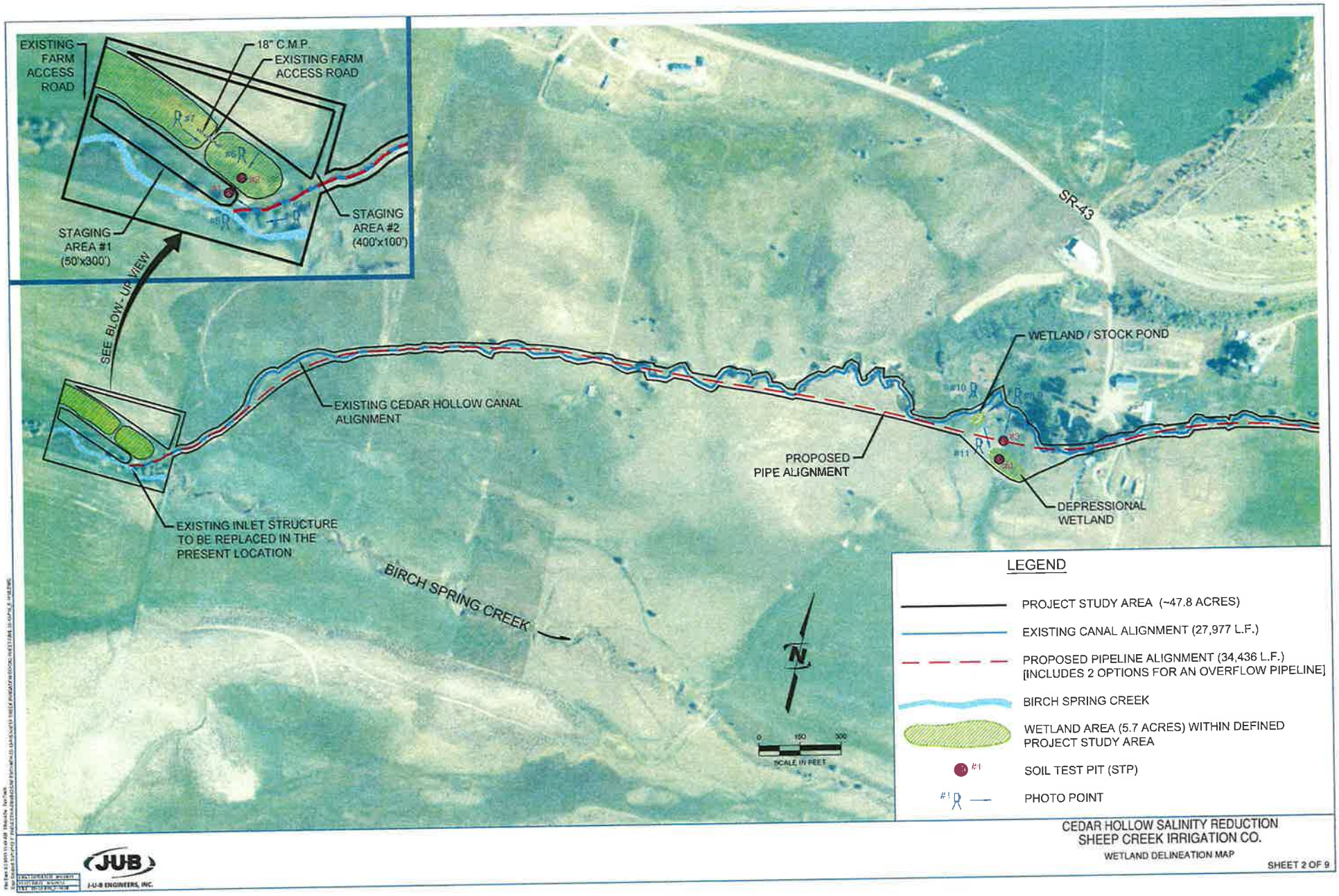

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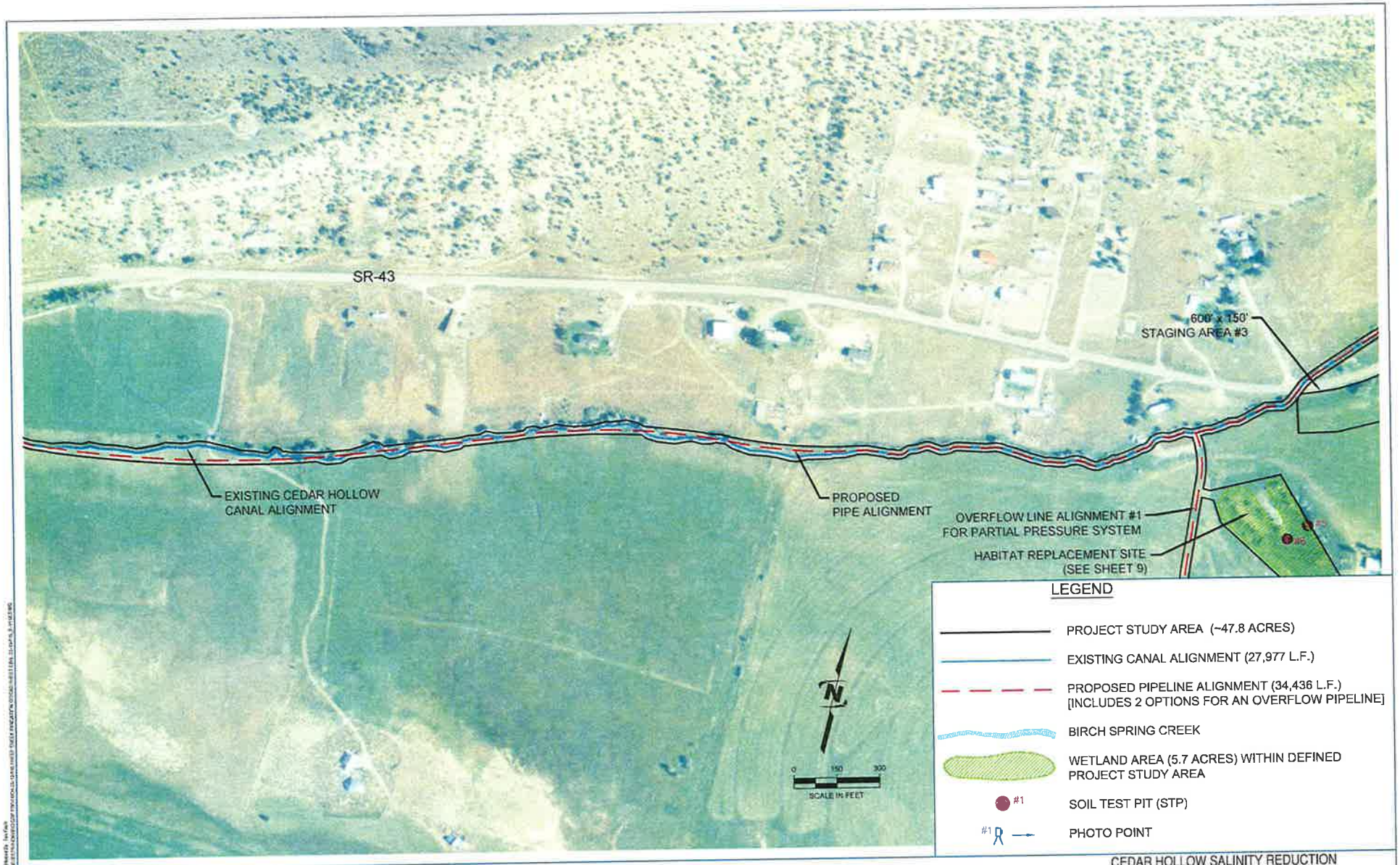
CEDAR HOLLOW SALINITY REDUCTION
SHEEP CREEK IRRIGATION CO.
WETLAND DELINEATION MAP



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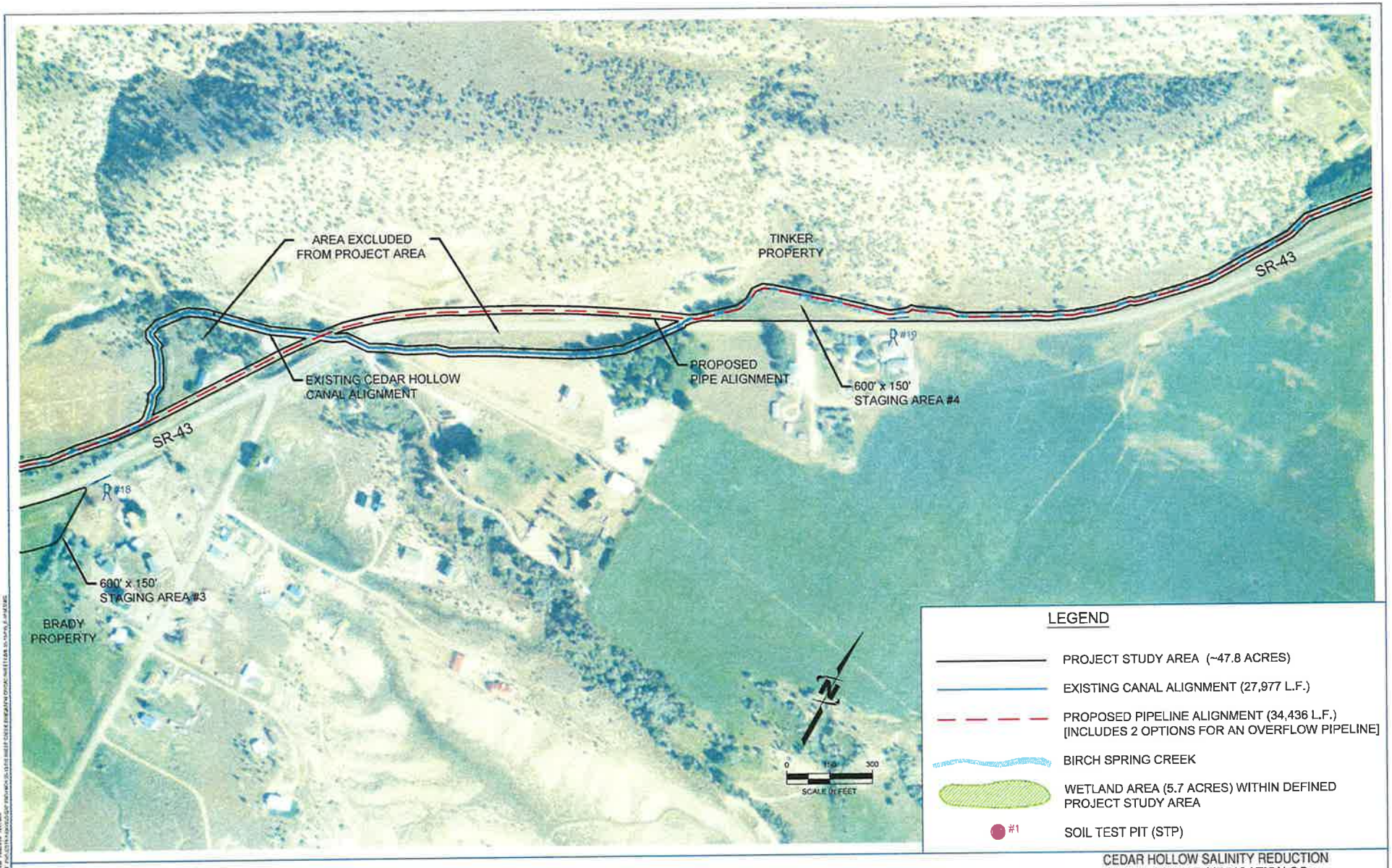
CEDAR HOLLOW SALINITY REDUCTION
SHEEP CREEK IRRIGATION CO.
WETLAND DELINEATION MAP



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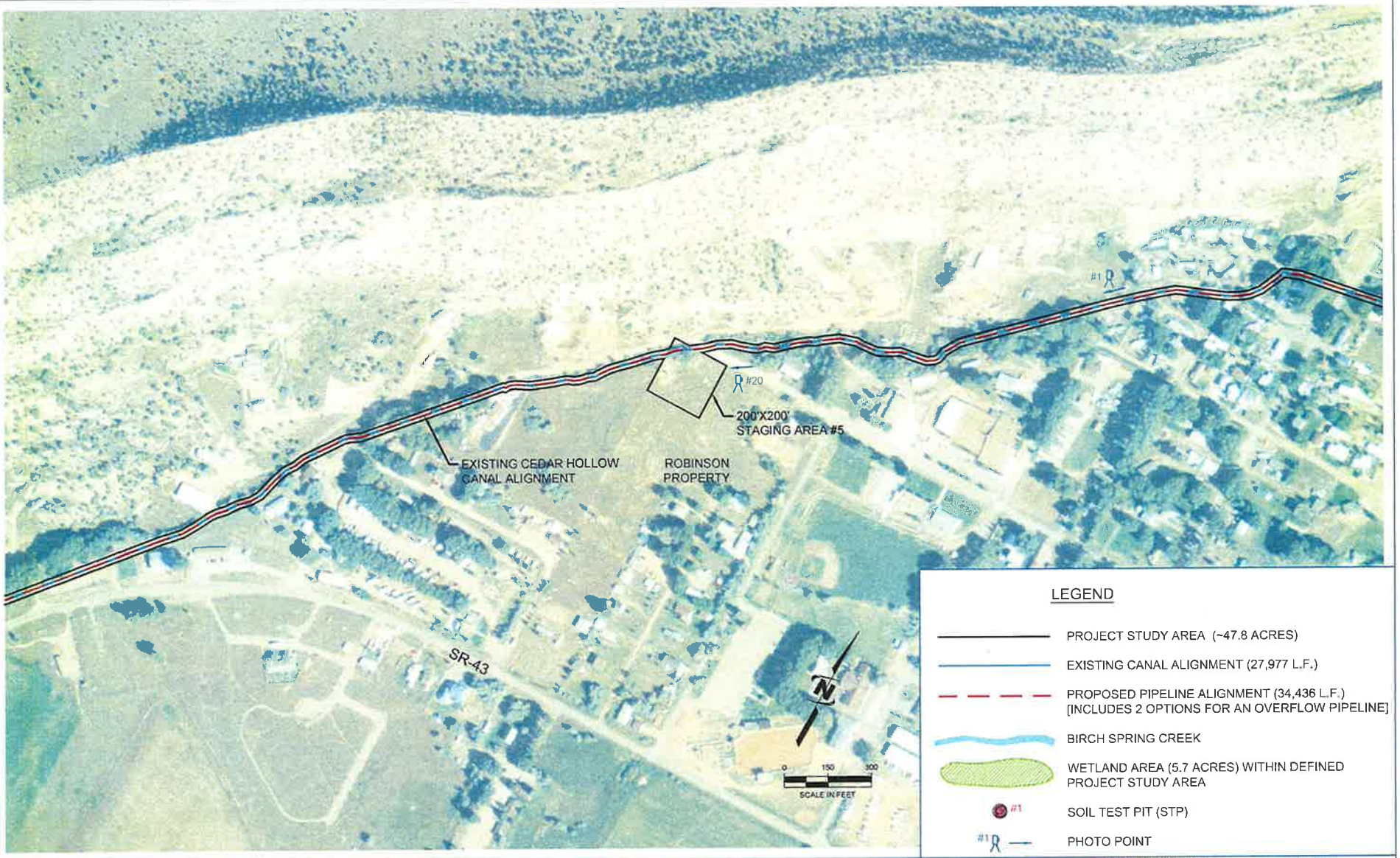
CEDAR HOLLOW SALINITY REDUCTION
SHEEP CREEK IRRIGATION CO.
WETLAND DELINEATION MAP



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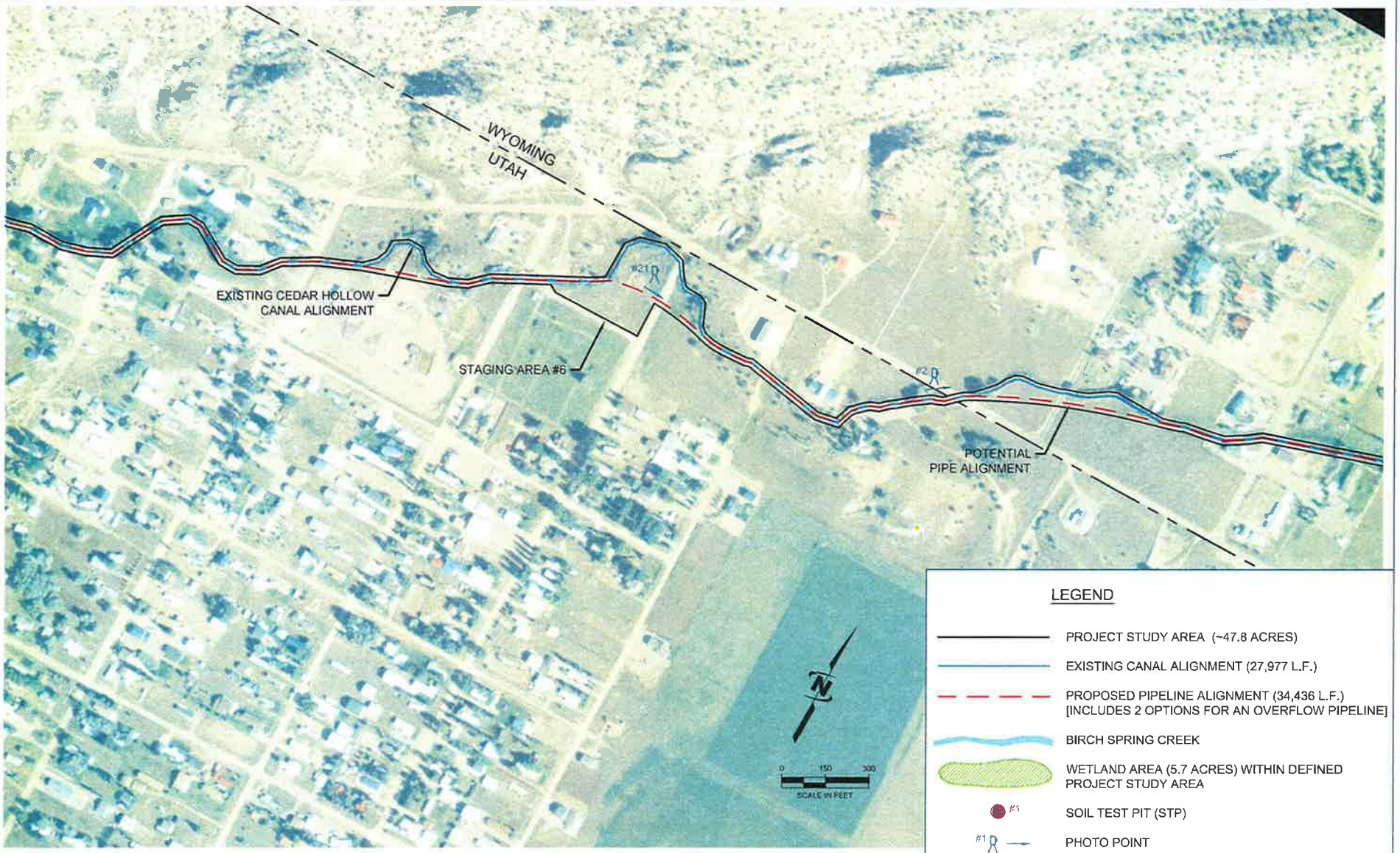
CEDAR HOLLOW SALINITY REDUCTION
SHEEP CREEK IRRIGATION CO.
WETLAND DELINEATION MAP



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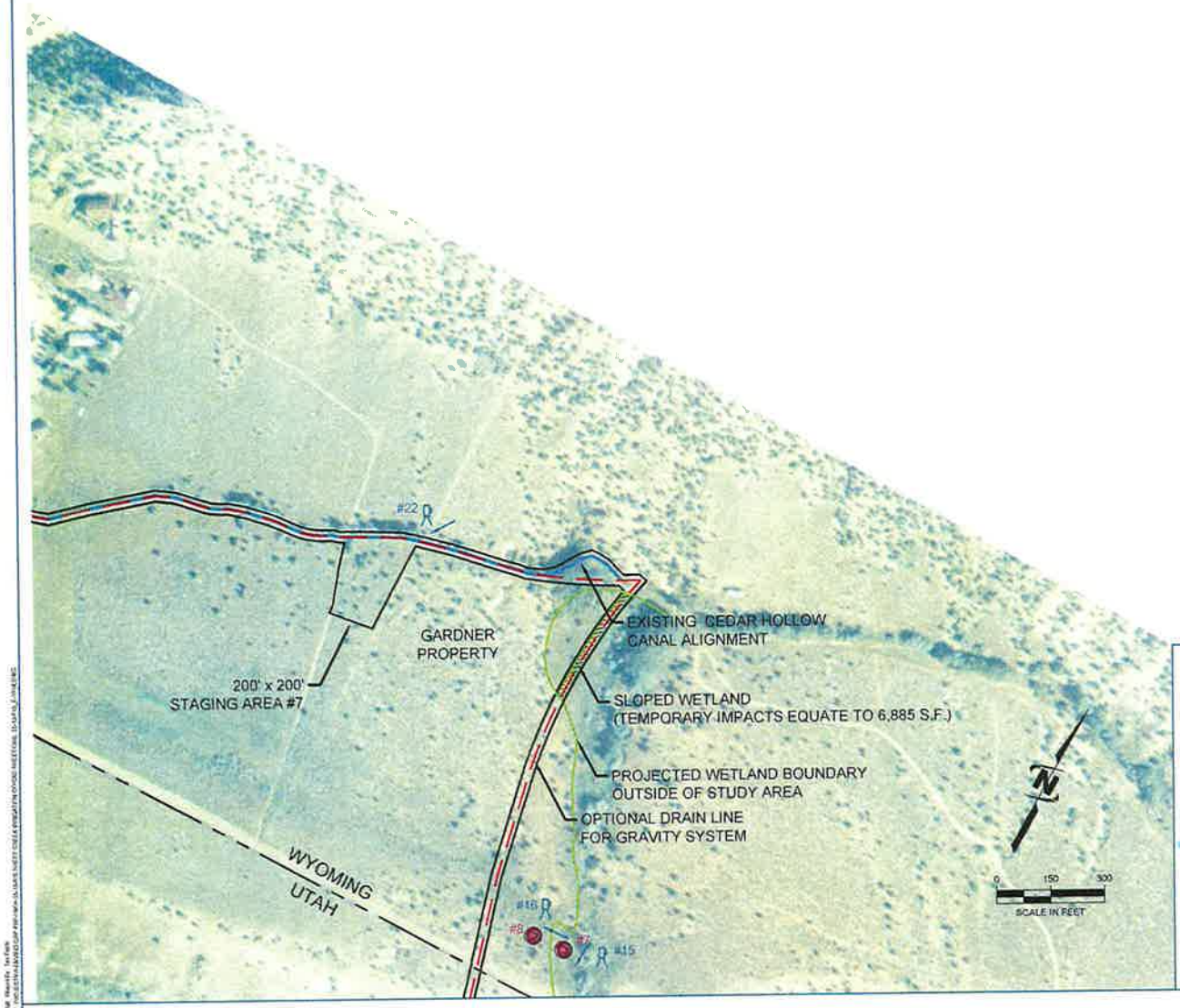
CEDAR HOLLOW SALINITY REDUCTION
SHEEP CREEK IRRIGATION CO.

WETLAND DELINEATION MAP



LEGEND

- PROJECT STUDY AREA (~47.8 ACRES)
- EXISTING CANAL ALIGNMENT (27,977 L.F.)
- PROPOSED PIPELINE ALIGNMENT (34,436 L.F.) [INCLUDES 2 OPTIONS FOR AN OVERFLOW PIPELINE]
- BIRCH SPRING CREEK
- WETLAND AREA (5.7 ACRES) WITHIN DEFINED PROJECT STUDY AREA
- #1 SOIL TEST PIT (STP)
- #1 PHOTO POINT

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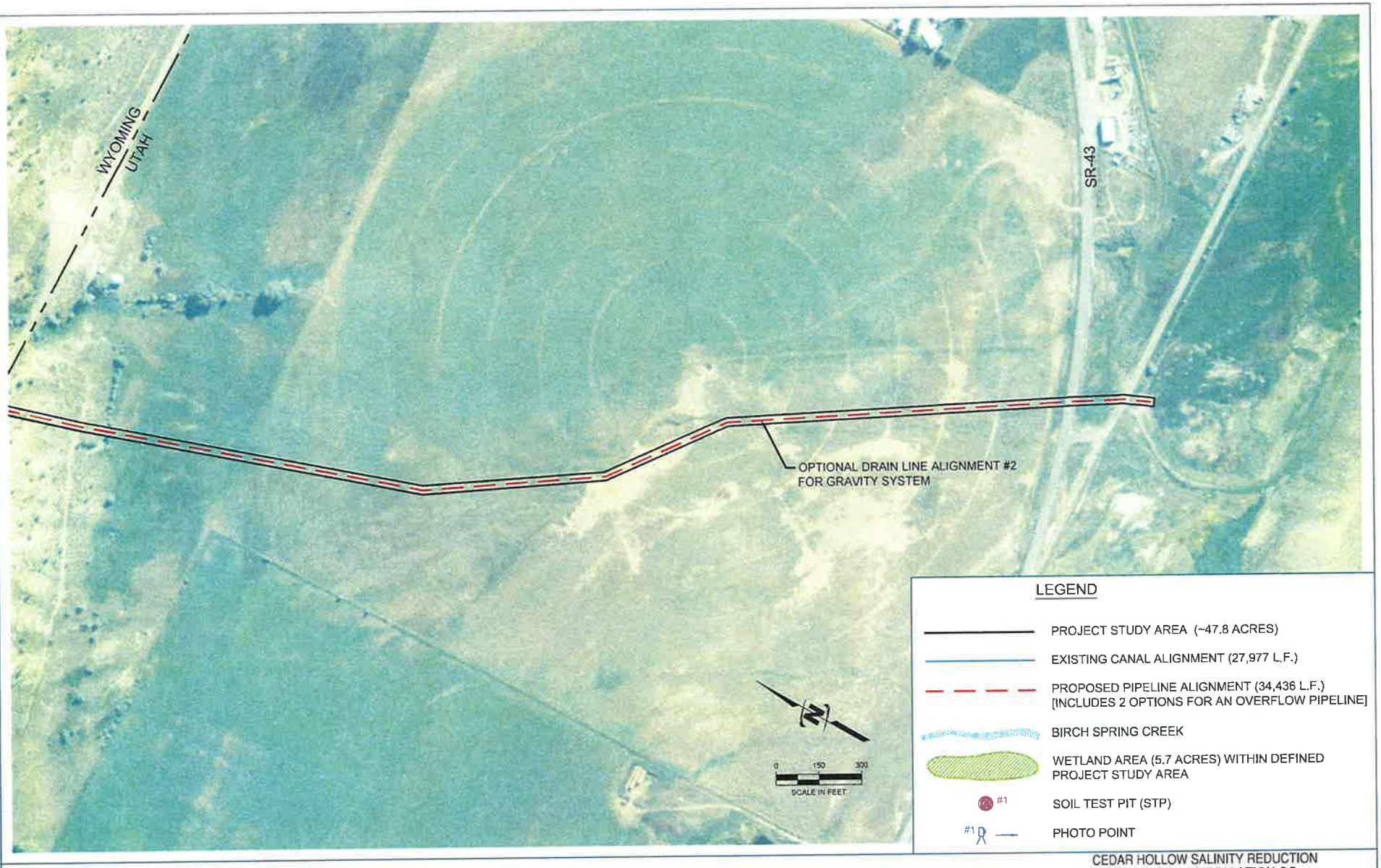
CEDAR HOLLOW SALINITY REDUCTION
SHEEP CREEK IRRIGATION CO.
WETLAND DELINEATION MAP



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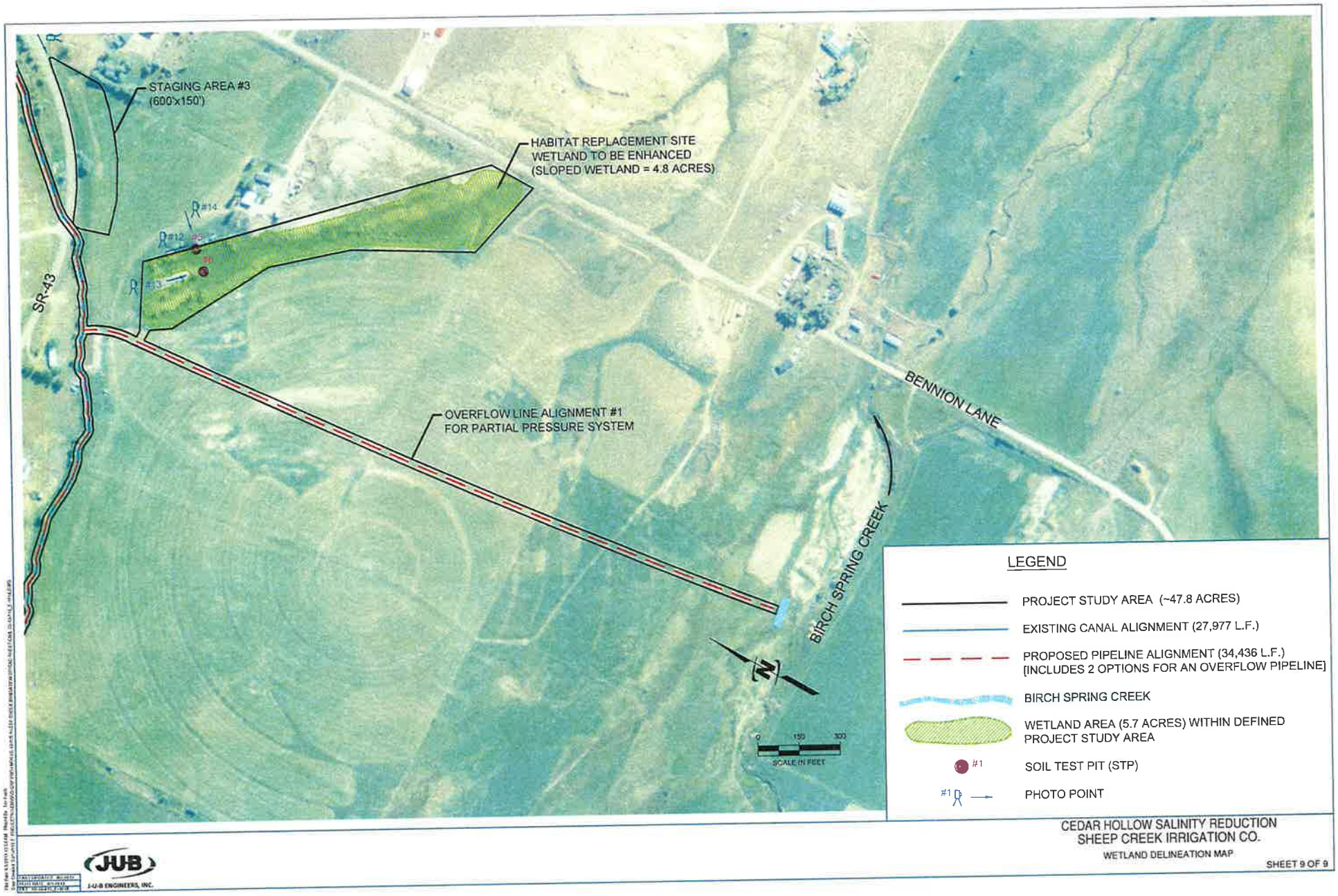
CEDAR HOLLOW SALINITY REDUCTION
SHEEP CREEK IRRIGATION CO.
WETLAND DELINEATION MAP



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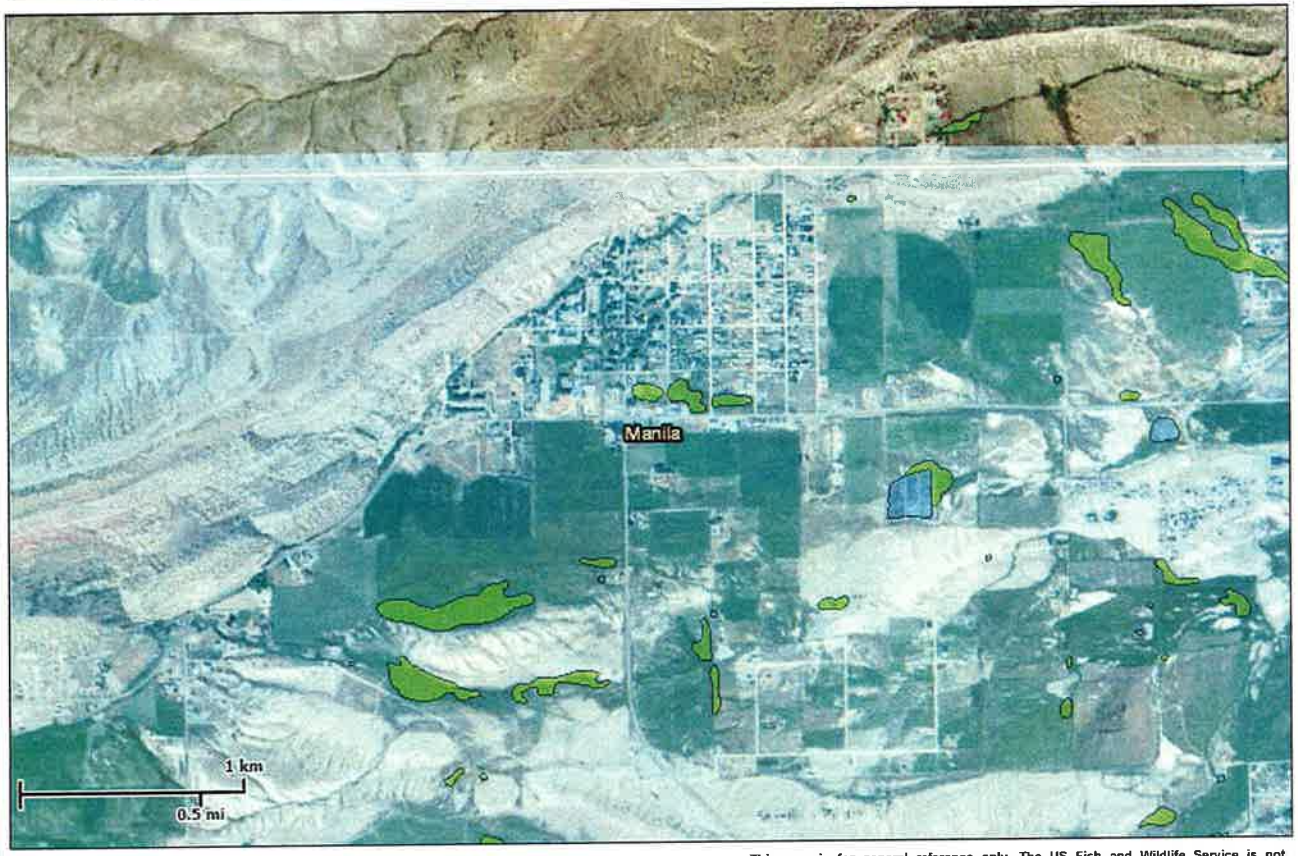
CEDAR HOLLOW SALINITY REDUCTION
SHEEP CREEK IRRIGATION CO.
WETLAND DELINEATION MAP

U.S. Fish and Wildlife Service

National Wetlands Inventory

Mar 19, 2013



Wetlands

- Freshwater Emergent
- Freshwater Forested/Shrub
- Estuarine and Marine Deepwater
- Estuarine and Marine
- Freshwater Pond
- Lake
- Riverine
- Other

Riparian

- Herbaceous
- Forested/Shrub

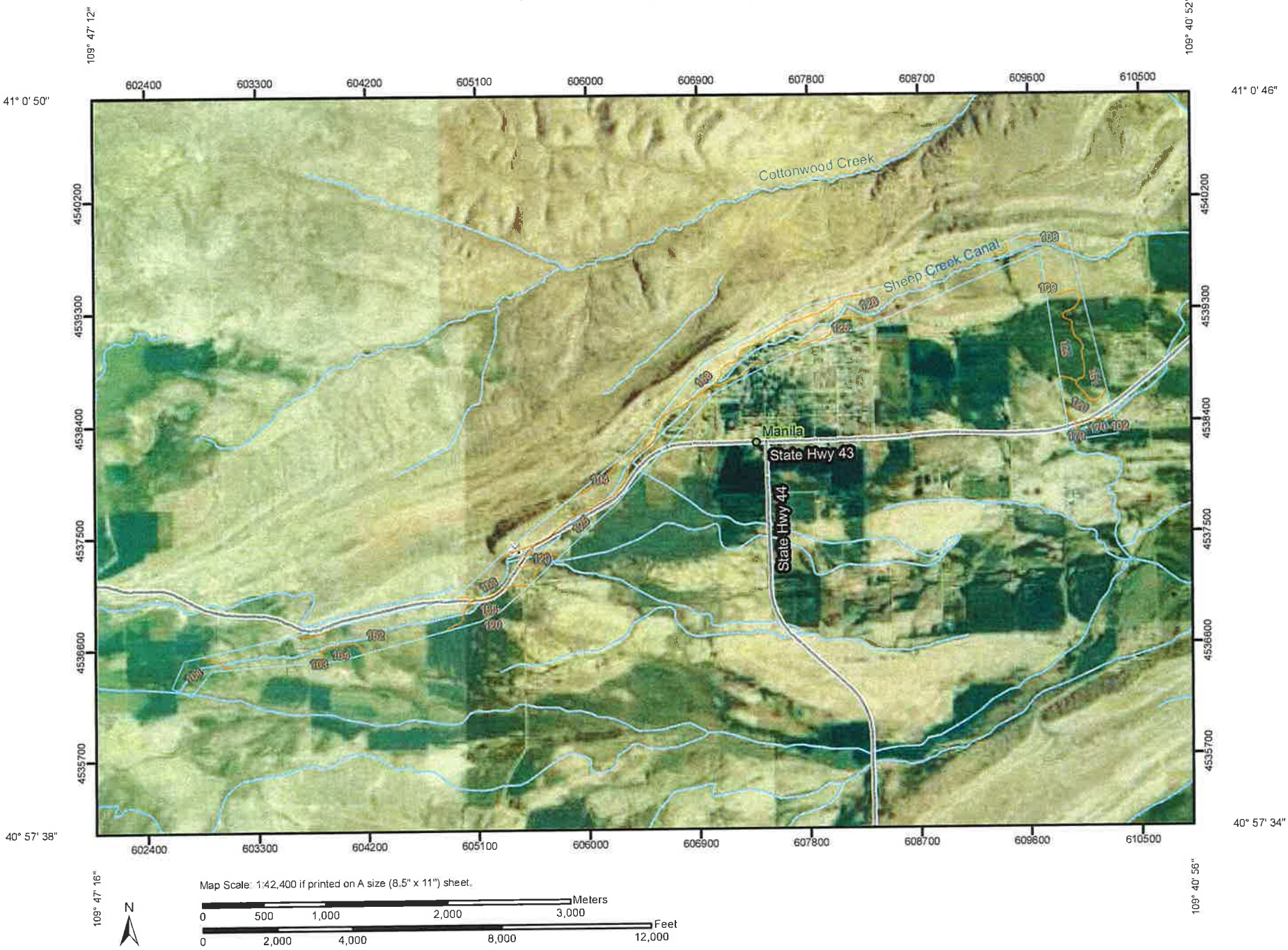
Riparian Status

- Digital Data

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

User Remarks:

Soil Map—Henrys Fork Area, Utah-Wyoming, Parts of: Daggett and Summit Counties, Utah and Sweetwater and Uinta Counties, Wyoming
(Cedar Hollow Salinity Reduction Project)



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Units

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other

Special Line Features
- Gully
- Short Steep Slope
- Other

Political Features
- Cities

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

MAP INFORMATION

Map Scale: 1:42,400 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 12N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Henrys Fork Area, Utah-Wyoming, Parts of: Daggett and Summit Counties, Utah and Sweetwater and Uinta Counties, Wyoming
Survey Area Data: Version 9, Mar 29, 2011

Date(s) aerial images were photographed: 9/1/2006; 8/10/2006

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Henrys Fork Area, Utah-Wyoming, Parts of: Daggett and Summit Counties, Utah and Sweetwater and Uinta Counties, Wyoming (WY638)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
104	Blackhall-Rentsac complex, 6 to 25 percent slopes	3.8	0.6%
120	Dollard-Moyerson complex, 6 to 25 percent slopes	30.5	4.9%
125	Goslin fine sandy loam, 3 to 6 percent slopes	108.8	17.5%
126	Goslin fine sandy loam, 6 to 10 percent slopes	154.7	24.9%
152	McFadden fine sandy loam, 0 to 6 percent slopes	107.3	17.3%
153	McFadden fine sandy loam, 6 to 10 percent slopes	32.8	5.3%
161	Poposhia loam, 0 to 3 percent slopes	29.0	4.7%
162	Poposhia loam, 3 to 6 percent slopes	0.0	0.0%
163	Poposhia loam, 6 to 10 percent slopes	0.1	0.0%
164	Poposhia clay loam, 0 to 3 percent slopes	27.4	4.4%
165	Poposhia clay loam, 3 to 6 percent slopes	18.2	2.9%
168	Redcreek-Blackhall-Rock outcrop complex, 6 to 35 percent slopes	92.8	14.9%
169	Rentsac very channery sandy loam-Rentsac channery sandy loam-Rock outcrop complex, 20 to 35 percent slopes	1.4	0.2%
170	Rhoamett silty clay, 0 to 5 percent slopes	11.0	1.8%
179	Salt flats	3.5	0.6%
Totals for Area of Interest		**621.3**	**100.0%**

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Cedar Hollow Lateral Piping Project City/County: Daggett County Sampling Date: 6-18-13

Applicant/Owner: Sheep Creek Irrigation Company State: UT Sampling Point: STP #1 (Upland)

Investigator(s): Vince Barthels, J-U-B ENGINEERS, Inc. Section, Township, Range: NE 1/4 Sec. 28, T. 3N, R. 19E

Landform (hillslope, terrace, etc.): Valley Local relief (concave, convex, none): Convex Slope (%): 0-3

Subregion (LRR): D Lat: 40.9712024° N Long: 109.7803146°W Datum: NAD 27

Soil Map Unit Name: Poposhia clay loam NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? No Are "Normal Circumstances" present? Yes X No ____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No X	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes _____	No X	

Remarks:
This STP is situated 55 feet landward (north) of the inlet structure along the left bank of the Cedar Hollow Canal.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1. *None*			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 10' radius)			
1. *Elymus repens*	50	YES	FAC
2. *Bromus marginatus*	30	YES	UPL
3. *Cardaria draba*	10	NO	UPL
4. *Medicago sativa*	10	NO	UPL
5.			
6.			
7.			
8.			
	_____ = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1. None			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	_____	x 1 =	_____
FACW species	_____	x 2 =	_____
FAC species	50	x 3 =	150
FACU species	_____	x 4 =	_____
UPL species	50	x 5 =	250
Column Totals:	100 (A)		400 (B)

Prevalence Index = B/A = 4.0

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks:
Based on the dominance test, the parameter is nearly met; however, it should be noted that the prevalence index worksheet yields a 4.0, which correlates to a FACU community.

SOIL

Sampling Point: STP #1 (Upland)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-4	10 YR 5/4	100					Sand	Contained 50% cobbles
4-16	10 YR 5/4	100					Sand	No cobbles
16-24	10 YR 5/3	95	10 YR 5/6	5	C	M	Sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: N/A

Depth (inches): N/A

Hydric Soil Present? **Yes** _____ **No** X

Remarks: Redox features started 16 inches below surface.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes X No _____ Depth (inches): 23

Wetland Hydrology Present? **Yes** _____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

N/A

Remarks:

Saturation encountered at a depth of 23 inches. Saturation observed is likely linked to lateral seepage from the canal lateral/Sheep Creek.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Cedar Hollow Lateral Piping Project City/County: Daggett County Sampling Date: 6-18-13

Applicant/Owner: Sheep Creek Irrigation Company State: UT Sampling Point: STP #2 (Wetland)

Investigator(s): Vince Barthels, J-U-B ENGINEERS, Inc. Section, Township, Range: NE 1/4 Sec. 28, T. 3N, R. 19E

Landform (hillslope, terrace, etc.): Valley Local relief (concave, convex, none): Convex Slope (%): 0-3

Subregion (LRR): D Lat: 40.9712098° N Long: 109.7803144° Datum: 27 NAD

Soil Map Unit Name: Poposhia clay loam NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? No Are "Normal Circumstances" present? Yes X No ____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

STP #2 is located 80 feet landward (north) of the inlet structure, along the left bank. STP #2 captures an emergent wetland area (linked by an 18-inch CMP) that parallels Birch Spring Draw in close proximity to the inlet structure. This feature was delineated to ensure staging areas would not encroach into these identified wetland areas.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1. None			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 10' radius)			
1. *Alopecurus arundinaceus*	40	YES	FACW
2. *Carex nebrascensis*	30	YES	OBL
3. *Juncus balticus*	20	YES	FACW
4. *Schoenoplectus tabernaemontani*	10	NO	OBL
5.			
6.			
7.			
8.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1. None			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	40	x 1 =	40
FACW species	60	x 2 =	120
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	100 (A)		160 (B)

Prevalence Index = B/A = 1.6

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

X Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

Hydrophytic vegetation parameter is fulfilled.

SOIL

Sampling Point: STP #2 (Wetland)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-6	10 YR 4/3	100					Fine Sand	
6-21	(Gley) N 4/1	98	10 YR 5/6	2	C	M	Fine Sand	organic streaking observed in rhizosphere

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- X Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: N/A

Depth (inches): N/A

Hydric Soil Present? Yes X No ___

Remarks: Distinct redox concentrations present within a gleyed sandy matrix

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
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- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes X No ___ Depth (inches): 1

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 4

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

USGS Gauge # 12471000

Remarks:

Hydrology parameter fulfilled. Water coming from a combination of tail (irrigation) water and lateral seepage from Birch Spring Draw.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Cedar Hollow Lateral Piping Project City/County: Daggett County Sampling Date: 6-18-13

Applicant/Owner: Sheep Creek Irrigation Company State: UT Sampling Point: STP #3 (Upland)

Investigator(s): Vince Barthels, J-U-B ENGINEERS, Inc. Section, Township, Range: NW 1/4 Sec. 27, T. 3N, R. 19E

Landform (hillslope, terrace, etc.): Valley Local relief (concave, convex, none): Concave Slope (%): 0-6

Subregion (LRR): D Lat: 40.9732025° N Long: 109.7683679° W Datum: NAD 27

Soil Map Unit Name: McFadden fine sandy loam NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? No Are "Normal Circumstances" present? Yes X No ____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____ No X	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes _____ No X	

Remarks:

STP #3 is located 91 feet north of Tobin May's stock pond; halfway between the Cedar Hollow lateral and the southerly wetland/stock pond.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: _____)			
1. None			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 10' radius)			
1. *Chrysothamnus viscidiflorus*	20	YES	UPL
2.			
3.			
4.			
5.			
	20 = Total Cover		
Herb Stratum (Plot size: 10' radius)			
1. *Elymus repens*	40	YES	FAC
2. *Bromus marginatus*	20	YES	UPL
3. *Poa pratensis*	15	NO	FAC
4. *Medicago sativa*	10	NO	UPL
5. *Juncus balticus*	5	NO	FACW
6.			
7.			
8.			
	90 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1. None			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 10 % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species _____	x 1 =	_____
FACW species 5	x 2 =	10
FAC species 55	x 3 =	165
FACU species _____	x 4 =	_____
UPL species 50	x 5 =	250
Column Totals: 110 (A)		425 (B)

Prevalence Index = B/A = 3.86

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks:

Vegetative parameter is not fulfilled. FACU community present.

Sampling Point: STP #3 (Upland)

SOIL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-5	10 YR 3/3	100					Silty Loam	
5-29	10 YR 5/4	90	10 YR 5/8	10		M	Fine Sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- X Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: N/A

Depth (inches): N/A

Hydric Soil Present? **Yes** X **No** ___

Remarks: Relic hydric soils present at this STP. Currently there are 2 stock ponds with piping connecting them hydrologically.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) **(Riverine)**
- ___ Sediment Deposits (B2) **(Riverine)**
- ___ Drift Deposits (B3) **(Riverine)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

N/A

Remarks:

STP #3 was dry to a depth of 29 inches.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Cedar Hollow Lateral Piping Project City/County: Daggett County Sampling Date: 6-18-13

Applicant/Owner: Sheep Creek Irrigation Company State: UT Sampling Point: STP #4 (Wetland)

Investigator(s): Vince Barthels, J-U-B ENGINEERS, Inc. Section, Township, Range: NW 1/4 Sec. 27, T. 3N, R. 19E

Landform (hillslope, terrace, etc.): Valley Local relief (concave, convex, none): Concave Slope (%): 0-6

Subregion (LRR): D Lat: 40.9730818° N Long: 109.7683679° W Datum: 27 NAD

Soil Map Unit Name: McFadden fine sandy loam NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? No Are "Normal Circumstances" present? Yes X No ____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

STP #4 is located 9 feet within the wetland boundary of the southern stock pond on May's property. This STP is located near a shallow oval shaped stock pond south of the Cedar Hollow Lateral.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: _____)			
1. None			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1. None			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 10' radius)			
1. *Eleocharis palustris*	40	YES	OBL
2. *Juncus balticus*	25	YES	FACW
3. *Alopecurus arundinaceus*	15	NO	FACW
4. *Ranunculus repens*	5	NO	FAC
5.			
6.			
7.			
8.			
	85 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1. None			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 15 % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	40	x 1 =	40
FACW species	40	x 2 =	80
FAC species	5	x 3 =	15
FACU species	_____	x 4 =	_____
UPL species	_____	x 5 =	_____
Column Totals:	85 (A)		135 (B)

Prevalence Index = B/A = 1.59

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

X Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

Vegetative parameter fulfilled. OBL-FACW community is present. 15% open water present.

Sampling Point: STP #4 (Wetland)

SOIL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10 YR 4/1	95	10 YR 5/8	5			Silty Clay	
6-22	10 YR 4/2	90	10 YR 5/8	10			Clay Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- X Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: N/A

Depth (inches): N/A

Hydric Soil Present? Yes X No ___

Remarks:

Hydrogen sulfide odor present in the upper profile.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes X No ___ Depth (inches): 8

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 4

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

USGS Gauge # 12471000

Remarks:

Indications of wetland hydrology were present at this STP.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Cedar Hollow Lateral Piping Project City/County: Daggett County Sampling Date: 6-18-13

Applicant/Owner: Sheep Creek Irrigation Company State: UT Sampling Point: STP #5 (Upland)

Investigator(s): Vince Barthels, J-U-B ENGINEERS, Inc. Section, Township, Range: SE 1/4 Sec. 23, T. 3N, R. 19E

Landform (hillslope, terrace, etc.): Valley Local relief (concave, convex, none): Concave Slope (%): 3-6

Subregion (LRR): D Lat: 40.9768925° N Long: 109.7468737° W Datum: NAD 27

Soil Map Unit Name: Poposhia clay loam, 3 to 6 percent slopes NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? No Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No X	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes _____	No X	

Remarks:

STP #5 is located on the northeast side of the proposed habitat replacement site along an established transect that is oriented perpendicular with the sloped wetland. Ant hills were observed between STP #5 and the wetland boundary.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 10' radius)			
1. *Sarcobatus vermiculatus*	10	YES	FAC
2. *Elaeagnus angustifolia*	10	YES	FAC
3. *Chrysothamnus viscidiflorus*	5	NO	UPL
4.			
5.			
	25 = Total Cover		
Herb Stratum (Plot size: 10' radius)			
1. *Medicago sativa*	20	YES	UPL
2. *Cardaria Draba*	20	YES	UPL
3. *Bromus marginatus*	20	YES	UPL
4. *Dactylis glomerata*	10	NO	FACU
5. *Elymus repens*	10	NO	FAC
6. *Plantago major*	10	NO	FAC
7. *Isatis tinctoria*	10	NO	UPL
8.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1. None			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 40% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species	40	x 3 =	120
FACU species	10	x 4 =	40
UPL species	75	x 5 =	375
Column Totals:	125 (A)		535 (B)

Prevalence Index = B/A = 4.28

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks:

Vegetative parameter is not fulfilled. FACU community present.

SOIL

Sampling Point: STP #5 (Upland)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-20	2.5 YR 5/2	100					Sandy Loam	No Modeling Observed

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: N/A

Depth (inches): N/A

Hydric Soil Present? Yes _____ No X

Remarks:

No hydric indicators or redox features were observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

N/A

Remarks:

STP #5 was dry to a depth of 20 inches.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Cedar Hollow Lateral Piping Project City/County: Daggett County Sampling Date: 6-18-13

Applicant/Owner: Sheep Creek Irrigation Company State: UT Sampling Point: STP #6 (Wetland)

Investigator(s): Vince Barthels, J-U-B ENGINEERS, Inc. Section, Township, Range: SE 1/4 Sec. 23, T. 3N, R. 19E

Landform (hillslope, terrace, etc.): Valley Local relief (concave, convex, none): Concave Slope (%): 3-6

Subregion (LRR): D Lat: 40.9766683° N Long: 109.7470551° W Datum: NAD 27

Soil Map Unit Name: Poposhia clay loam, 3 to 6 percent slopes NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? No Are "Normal Circumstances" present? Yes X No ____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks: STP #6 is located within the proposed 4.8 acre sloped wetland that will be enhanced as the habitat replacement site.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: _____)			
1. None			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 10' radius)			
1. *Elaeagnus angustifolia*	15	YES	FAC
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 10' radius)			
1. *Juncus balticus*	50	YES	FACW
2. *Triglochin maritima*	20	YES	OBL
3. *Conium maculatum*	12	NO	FACW
4. *Carex aquatilis*	10	NO	OBL
5. *Poa pratensis*	5	NO	FAC
6. *Trifolium spp.*	2	NO	FAC
7. *Ranunculus repens*	1	NO	FAC
8.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1. None			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	30	x 1 =	30
FACW species	62	x 2 =	124
FAC species	23	x 3 =	69
FACU species	_____	x 4 =	_____
UPL species	_____	x 5 =	_____
Column Totals:	115 (A)		223 (B)

Prevalence Index = B/A = 1.94

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

X Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

Vegetative parameter fulfilled. FACW-OBL community present.

SOIL

Sampling Point: STP #6 (Wetland)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-5	2.5 YR 3/2	100					Silt	Organic
5-19	2.5 YR 4/2	95	10 YR 5/6	5	M	C	Silty Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- X Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: N/A

Depth (inches): N/A

Hydric Soil Present? Yes X No ___

Remarks:

Redox features were observed at this STP; hydrogen sulfide odor present in the upper profile.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes X No ___ Depth (inches): 2

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 7

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

USGS Gauge # 12471000.

Remarks:

Hydrology parameter fulfilled.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Cedar Hollow Lateral Piping Project City/County: Sweetwater County Sampling Date: 3-4-13

Applicant/Owner: Sheep Creek Irrigation Company State: WY Sampling Point: STP #7 (Wetland)

Investigator(s): Vince Barthels, J-U-B ENGINEERS, Inc. Section, Township, Range: SE 1/4 Sec. 21, T. 12N, R. 109W

Landform (hillslope, terrace, etc.): Valley Local relief (concave, convex, none): Concave Slope (%): 6-10

Subregion (LRR): D Lat: 40.9986469° N Long: 109.6985603° W Datum: NAD 27

Soil Map Unit Name: Goslin fine sandy loam NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? No Are "Normal Circumstances" present? Yes X No ____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes _____ No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks: STP #7, paired with STP #8 is located within the wetland boundary near the optional gravity system drain line (i.e. alignment #2).

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 10' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Populus deltoides*	5	YES	FAC
2.			
3.			
4.			
	5 = Total Cover		
Sapling/Shrub Stratum (Plot size: 10' radius)			
1. *Elaeagnus angustifolia*	10	YES	FAC
2. *Purshia tridentata*	5	NO	UPL
3.			
4.			
5.			
	15 = Total Cover		
Herb Stratum (Plot size: 10' radius)			
1. *Distichlis spicata*	45	YES	FAC
2. *Juncus balticus*	45	YES	FAC
3. *Polypogon monspeliensis*	5	NO	FACW
4. *Cardaria draba*	5	NO	UPL
5.			
6.			
7.			
8.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1. None			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	_____	x 1 =	_____
FACW species	5	x 2 =	10
FAC species	105	x 3 =	315
FACU species	_____	x 4 =	_____
UPL species	10	x 5 =	50
Column Totals:	120 (A)		375 (B)

Prevalence Index = B/A = 3.13

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

Based on the dominance test, the parameter is met; however, it should be noted that the prevalence index worksheet yields a 3.13, which correlates to a FAC community.

SOIL

Sampling Point: STP #7 (Wetland)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-0.25	Salt Crust	100						
0.25-3	10YR 2/1	100					Silt	<30% Organics
3-15	10 YR 4/2	90	7.5 YR 4/6	10			Sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- X Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: N/A

Depth (inches): N/A

Hydric Soil Present? Yes X No ___

Remarks:

Common redox features as well as organics were observed in the upper profile.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) **(Riverine)**
- ___ Sediment Deposits (B2) **(Riverine)**
- ___ Drift Deposits (B3) **(Riverine)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes X No ___ Depth (inches): 10

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 4

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

USGS Gauge # 12471000.

Remarks:

Hydrology parameter fulfilled.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Cedar Hollow Lateral Piping Project City/County: Sweetwater County Sampling Date: 3-4-13

Applicant/Owner: Sheep Creek Irrigation Company State: WY Sampling Point: STP #8 (Upland)

Investigator(s): Vince Barthels, J-U-B ENGINEERS, Inc. Section, Township, Range: SE 1/4 Sec. 21, T. 12N, R. 109W

Landform (hillslope, terrace, etc.): Valley Local relief (concave, convex, none): Concave Slope (%): 6-10

Subregion (LRR): D Lat: 40.9986125° N Long: 109.6990142° W Datum: NAD 27

Soil Map Unit Name: Goslin fine sandy loam NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? No Are "Normal Circumstances" present? Yes X No ____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____ No X	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____ No X	
Wetland Hydrology Present?	Yes _____ No X	

Remarks: STP #8 is located immediately outside of the project study area, near the optional gravity system drain line (i.e. alignment #2). The projected wetland boundaries in this area are illustrated on the Wetland Delineation Map (Sheet 7).

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: _____)			
1. None			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 10' radius)			
1. *Chrysothamnus viscidiflorus*	20	YES	UPL
2. *Sarcobatus vermiculatus*	20	YES	FAC
3. *Artemisia spp.*	10	NO	FACU
4. Juniperus osteosperma	10	NO	UPL
5.			
	60 = Total Cover		
Herb Stratum (Plot size: 10' radius)			
1. *Agropyron cristatum*	5	YES	UPL
2. *Bromus tectorum*	5	YES	UPL
3.			
4.			
5.			
6.			
7.			
8.			
	10 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1. None			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 30 % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 25% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species 20	x 3 = 60
FACU species 10	x 4 = 40
UPL species 40	x 5 = 200
Column Totals: 70 (A)	300 (B)

Prevalence Index = B/A = 4.3

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks:

FACU vegetative community present; parameter is not fulfilled.

SOIL

Sampling Point: STP# 8 (Upland)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-2	10 YR 3/4	100					Fine Sand	
2-26	7.5 YR 5/6	100					Fine Sand	No mottling observed

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: N/A

Depth (inches): N/A

Hydric Soil Present? Yes _____ No X

Remarks:

No hydric indicators or redox features were observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

N/A

Remarks:

STP dry to a depth of 26 inches.

Photo Inventory

The following 22 photos were taken on March 14th and June 18th, 2013.

Photo 1: Looking at the Cedar Hollow lateral in mid-March, outside of the irrigation season. The channel is generally dry outside of the irrigation season. Scattered Russian olives, coyote willow, and cottonwoods have recruited along the banks of the lateral.

Photo 2: Another mid-March look at the lateral, outside of the irrigation season. Mixtures of reed canary grass, Garrison meadow foxtail, and smooth brome dominate the herbaceous structure along the banks of the lateral.

Photo 3: Looking upstream (westerly) at the existing diversion structure that feeds the Cedar Hollow lateral from Birch Spring Draw. This structure is planned to be replaced within the same footprint.

Photo 4: Stemming from the diversion structure (Photo #3) this photo illustrates the start of the Cedar Hollow lateral.

Photo 5: Soil Test Pit (STP) #1 is an upland location and is situated 55 feet landward (north) of the inlet structure, on the left bank.

Photo 6: STP #2 is a wetland location that is paired with STP #1. STP #2 is located 80 feet landward (north) of the inlet structure, on the left bank.

Photo 7: View of the emergent wetland that is situated adjacent/parallel to Birch Spring Draw immediately north of the inlet structure. A mixture of Garrison meadow foxtail, Nebraska sedge, Baltic rush and soft-stem bulrush dominates this wetland area.

Photo 8: STP #3 is an upland location that is 91 feet north of a depressional wetland/stock pond. This STP is located halfway between the lateral and the depressional wetland. STP #3 was dug at a low topography break along the anticipated pipeline alignment.

Photo 9: STP #4 is a depressional wetland. This STP is 9 feet within the wetland boundary and is paired with STP #3. Common spike-rush dominates this wetland area.

Photo 10: View of the stock pond next to Birch Spring Draw. Water is piped from this stock pond into the wetland area illustrated in Photo 9.

Photo 11: Another view of the wetland captured by STP #4. A manmade dike constructed along the southern side impounds the water in this wetland.

Photo 12: STP #5 is marked with the lathe and orange flagging. STP #5 is an upland location on the northeast side of habitat replacement site. Ant hills were observed between STP #5 and the wetland boundary (pink pinned flag).

Photo 13: STP #6 captures the sloped wetland feature within the habitat replacement site. The wetland component of habitat replacement site is dominated by Baltic rush, seaside arrow grass, and scattered Russian olives.

Photo 14: A perpendicular view looking along transect #3, which contains STP #5 and #6. The habitat replacement site contains a sloped wetland feature.

Photo 15: Looking at STP #7, which is a wetland pit, nearest to the eastern terminus of the project footprint. STP #7 helps to identify a sloped wetland feature located near the overflow pipe alignment option #2. The water table was located at a depth of 10 inches at STP #7.

Photo 16: Looking at STP #8, which is the upland pit that is paired with STP #7. This upland area contains scattered tall sage brush, rabbit-brush, junipers and greasewood.

Photo 17: This photo illustrates the sloped wetland feature near the eastern overflow alignment option #2. This photo was taken looking southerly, just north of STP #7 (Photo 15).

Photo 18: Looking at staging area #3; this photo was taken from the northeast corner, along Hwy 43. The area is dominated by mountain brome, salt grass, alfalfa, and whitetop. This is an irrigated pasture field (not a wetland), located immediately downslope of Hwy 43.

Photo 19: Looking at staging area #4; this photo was taken from the eastern corner looking westerly, along Hwy 43. This upland area is dominated by crested wheatgrass, mountain brome, quackgrass, rabbit-brush, and tall sagebrush.

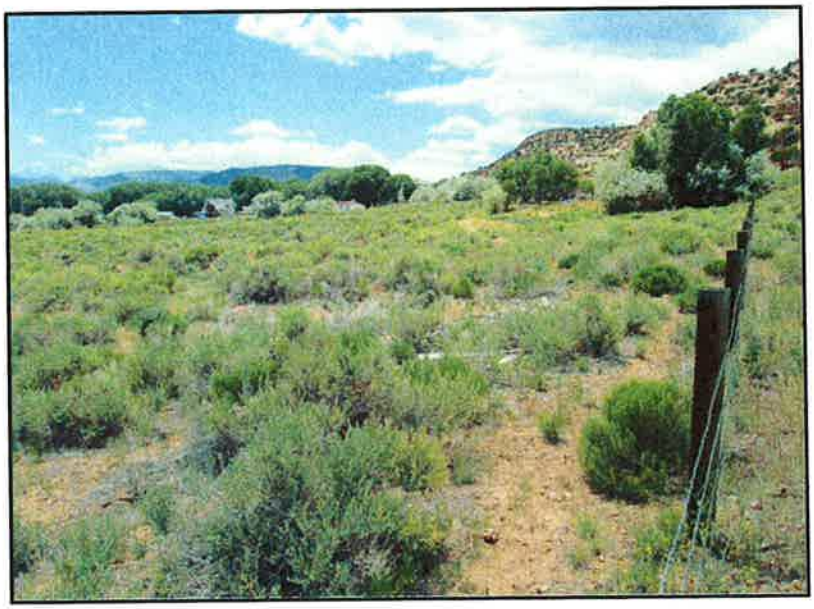

Photo 20: Looking at staging area #5, from the northeast corner along 1st West St. This area is dominated by cheatgrass, rabbit-brush, greasewood, crested wheatgrass, tumble mustard, and Wiggins' cholla.

Photo 21: Looking at staging area #6, from 4th East St., easterly along the new pipeline alignment. This is the southeast corner of the staging area. This area was previously used as a dump site for the Town of Manila. The area is dominated by crested wheatgrass and cheatgrass. The entire staging area is an upland site.

Photo 22: Looking at staging area #7, from the northeast corner of the staging area. The area is dominated by cheatgrass, rabbit-brush, sage, juniper, and Indian ricegrass. The entire staging area is an upland site.

Appendix B

Biological Evaluation

No Effects Determination for the 2013 Sheep Creek Irrigation Company Cedar Hollow Lateral Salinity Control Project Daggett County, Utah and Sweetwater County, Wyoming

The following No Effects Determination has been prepared, as required by Section 7(c) of the Endangered Species Act (ESA), for the proposed 2013 Sheep Creek Irrigation Company Cedar Hollow Lateral Salinity Control Project located in Daggett County, Utah and Sweetwater County, Wyoming. A site review was conducted on March 13th and 14th and July 18th, 2013 by Vincent Barthels, qualified biologist with J-U-B Engineers, Inc. This report will serve as the analysis of potential impacts resulting from the proposed project on species listed as endangered, threatened, proposed, or candidate and designated or proposed critical habitat protected under the ESA. In addition, State Sensitive Species that could potentially be affected by the proposed project will also be analyzed.

Proposed Action

The Bureau of Reclamation (USBR) has programmed the use of federal funds, under their Colorado River Basin Salinity Control Program, to allow Sheep Creek Irrigation Company to replace the existing unlined earthen canal lateral with 5.3 miles (27,977 linear feet) of pipeline. The proposed new piping alignment is illustrated on the attached Biological Assessment Exhibits. This irrigation infrastructure project would reduce the amount of water lost through seepage along the canal and subsequently reduce the salinity loading of the Colorado River Basin by a total of approximately 2,220 tons annually. Replacing this open unlined earthen canal with buried HDPE pipe would also improve the efficiency of the water delivery system in the project service area.

The proposed project replaces over 5 miles of the Cedar Hollow Lateral using HDPE piping that ranges from 34 inches in diameter at the upstream end to 20 inches in diameter near the downstream end. This project primarily follows the existing earthen canal, with two possible drainage pipe locations. There may be some minor shifting of the original canal alignment within the project to increase the efficiency of the delivery system.

The large majority of the earthwork for the proposed project would be done using a track-hoe. All surfaces would be restored to existing conditions. All phases are planned to be constructed during the non-irrigation period. The seven individual areas that would be used to stage construction equipment and materials are shown on Sheet 9 of the attached Biological Assessment Exhibits. The attached exhibits also illustrate the location of the 6.65-acre habitat replacement site, which is a requirement of the Salinity Control Program. The habitat replacement site is included in the project action area footprint.

New easements would not be required for the majority of the piping. In areas where the proposed piping alignment deviates from the existing alignment, new easements may be required. These easements would be on private property through open agricultural fields. In some locations that are apparent on the map, existing city or county ROW may be used. The dedication of individual water rights would remain unaltered post project implementation.

Best Management Practices (BMPs) would be in place to minimize direct, short-term construction impacts. Planned BMPs herein are intended to restore vegetative structure and minimize erosion. These measures include planting barren locations (post-construction) with native

vegetation. BMPs are mandatory and would become part of the project design. They would include, but are not limited to the following:

1. Temporary erosion sediment control (TESC) structures would be in effect during construction.
2. Excavation, staging areas and the new pipeline installation would only occur within staked limits of the project action area.
3. All disturbed upland areas would be re-seeded upon project completion with a dry land seed mix.
4. Develop the 6.65-acre habitat replacement site consistent with the developed habitat replacement plan. The habitat replacement strategy involves installing wildlife friendly fencing; installing and restoring native woody vegetation/re-plantings; allocating a permanent water supply; installation of a perching pole, and noxious/weed and grazing management.

General Project Location and Habitat Descriptions

The proposed project is located in Sections 17 & 18, T. 3N, R. 20E and Sections 13, 22-24, 27 & 28, T. 3N, R. 19E, in Daggett County, Utah and Sections 21 & 28, T. 12N, R. 109W in Sweetwater County, Wyoming. Land use within the project vicinity is primarily agricultural. The project action area ranges between 6,200 and 6,700 feet above sea level. This project traverses through the town of Manila, Utah. The defined project action area footprint encompasses 47.8 acres (see Biological Assessment Exhibits).

Description of the Ecoregions of the United States describes the proposed action area as an Intermountain Semidesert and Desert Province (Bailey 1995). The undeveloped land cover is dominated by sagebrush communities. Soils throughout the project action area consist of Goslin fine sandy loam, McFadden fine sandy loam, and Redcreek-Blackhall-Rock outcrop complex. In this ecoregion, streams are not abundant, and when they are present, they are typically ephemeral or intermittent.

The habitat in the project action area can be characterized as pre-developed, since most of the project action area footprint does not contain natural, undisturbed habitat. A large percentage of the new pipe alignment would be situated within an existing irrigation canal or within planted agricultural fields. Fish bearing habitat is not present along the pipeline alignment. As a separate technical report, a wetland delineation report was completed for the entire proposed alignment. The wetland report details the vegetation assemblages that were encountered.

The photos below (taken on July 18th) illustrate the project action area from two different vantage locations. The left photo is facing southwest looking towards the diversion weir, representing the western terminus or start of the project action area. The photo to the right demonstrates the canal at high water, near the western limits of the town of Manila or a relatively central location along the pipe alignment.

Endangered Species Act (ESA) Consultation

Colectively, ten species are on the U.S. Fish and Wildlife Service's (USFWS) ESA lists for Daggett County, Utah and Sweetwater County, Wyoming.

Table 1 - A summary of ESA listed species for the defined project area (USFWS Daggett County List dated April 2, 2013 and Sweetwater County List dated May 2012)

Common Name	Scientific Name	ESA Status	County	Effect Determination
Black-footed ferret	*Mustella nigripes*	Endangered	Sweetwater	No Effect (NE)
Bonytail	*Gila elegans*	Endangered	Daggett & Sweetwater	No Effect (NE)
Canada lynx	*Lynx canadensis*	Threatened	Daggett	No Effect (NE)
Colorado pikeminnow	*Ptychocheilus lucius*	Endangered	Daggett & Sweetwater	No Effect (NE)
Gibbens' beardtongue	*Penstemon gibbensii*	Petitioned	Daggett	No Effect (NE)
Greater sage-grouse	*Centrocercus urophasiunus*	Candidate	Daggett & Sweetwater	No Effect (NE)
Humpback chub	*Gila cypha*	Endangered	Daggett & Sweetwater	No Effect (NE)
Razorback sucker	*Xyrauchen texanus*	Endangered	Daggett & Sweetwater	No Effect (NE)
Ute ladies'-tresses	*Spiranthes diluvialis*	Threatened	Daggett & Sweetwater	No Effect (NE)
Western yellow-billed cuckoo	*Coccyzus americanus occidentalis*	Candidate	Daggett & Sweetwater	No Effect (NE)

The Utah Division of Wildlife Resources (UDWR) maintains a central database for species of concern in Utah. On March 19, 2013, the UDWR provided a response letter (see attached) regarding information on ESA species and State listed species of special concern within the proposed project action area. The UDWR has recent records of occurrence for two species of concern in the project action area, the bald eagle (*Haliaeetus leucocephalus*) and the white-tailed prairie dog (*Cynomys leucurus*). The UDWR also documented within a two-mile radius of the site, recent records for short-eared owl (*Asio flammeus*) and a historical occurrence of Canada Lynx (*Lynx canadensis*).

The USFWS's Wyoming Field Office maintains a central database for species of concern in Wyoming. On June 21, 2013, the USFWS provided a response letter (see attached) regarding information on ESA species and State listed species of special concern within the proposed

project action area. There are four species listed as special concern in Wyoming near the project action area. These are the pygmy rabbit (*Brachylagus ideahoensis*), mountain plover (*Charadrius montanus*), the white-tailed prairie dog (*Cynomys leucurus),* and they Wyoming pocket gopher *(Thomomys clusius).*

Table 2 - A summary of the species of special concern for defined project area (UDWR letter dated March 19, 2013 & USFWS letter dated June 21, 2013)

Species	Scientific Name	County	Effect Determination
Bald eagle	*Haliaeetus leucocephalus*	Daggett (UT)	No Effect (NE)
Mountain plover	*Charadrius montanus*	Sweetwater (WY)	No Effect (NE)
Pygmy rabbit	*Brachylagus idahoensis*	Sweetwater (WY)	No Effect (NE)
Short-eared owl	*Asio flammeus*	Daggett (UT)	No Effect (NE)
White-tailed prairie dog	*Cynomys leucurus*	Daggett (UT) & Sweetwater (WY)	No Effect (NE)
Wyoming pocket gopher	*Thomomys clusius*	Sweetwater (WY)	No Effect (NE)

Species Specific Habitat Requirements and Determination of Effect

The following subsection briefly discusses the species mentioned above and their habitat descriptions; and, then provides an effect determination for each individual species.

Bald eagle

Bald eagles are a large dark raptorial bird with a white head and a white tail when mature. They eat mostly fish but will eat some small mammals, such as rabbits (Stokes 1996). The bald eagle constructs massive nests on cliff edges or in large trees. Eagles congregate in feeding areas in late winter and early springs. Bald eagles generally select habitat located near water. In a survey of 2,732 nests, 99% were within 200 meters (650 ft) of the water and averaged only 40 meters (130 ft) from the shoreline (Stalmaster 1987). Eagle perches are generally close to the water, especially those used for foraging. Nearly all birds will perch within 50 meters (165 ft) of a shoreline, because fish, waterfowl, seabirds, and other prey can be acquired there (Stalmaster 1987). Eagles select trees within that habitat for nesting and perching sites. The most important characteristic of the nesting tree is that it is the tallest in the forest stand. Selecting a tall tree ensures a structure that will adequately support a large nest, provide an open flight path to and from the nest, and have a panoramic view of the surrounding terrain (Stalmaster 1987). An eagle's nesting season is between the start of February, when they initiate construction of their nests and mid-August when the young fledge the nest. The incubation period ranges between 31 and 46 days (Alsop 2001). Hatchlings can remain in the nest for 70 to 98 days (Alsop 2001).

Based on information obtained from the UDWR and USFWS, there are recent documented occurrences of the bald eagle within the vicinity of the defined project area. These occurences are likely linked to the close proximity of the Flaming Gorge Reservoir. The proposed project action does not impact any riparian areas along natural streams or lakes, including potential nesting or perching locations for the bald eagle. Fish are absent in the Cedar Hollow Canal. The bald eagle's prey base and foraging opportunities should not be affected by this project. Therefore, a no effect determination is warranted for the bald eagle.

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 reintroduced in certain parts of eastern Utah and southwestern Wyoming (UDWR 2011).

The UDWR has recent records of white-tailed prairie dogs near the project action area. Habitat for prairie dogs occur in sandy soils, typically in the sage brush dominated communities. Habitat conditions for these prairie dog 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 dogs or the ferret's life cycles.

The USFWS recommends surveys for ferrets if greater than 200 acres of disturbance of white-tailed prairie dog towns is expected. This project would disturb approximately 47.8 acres of ground, a large percentage of which consists of planted agricultural fields. Therefore a survey is not warranted for the proposed project. Based on the discountable habitat impacts associated with potential black-footed ferrets, a no effects determination is warranted for this project.

Bonytail chub

The bonytail chub is a federally listed endangered minnow that is originally native to the Colorado River system. The near extinction of the bonytail can be linked back to flow regulation or alteration, habitat loss, and competition and predation by exotic fishes. Bonytail are opportunistic feeders; their prey includes: insects, zooplankton, algae, and higher plant matter. Bonytails spawn in the spring and summer over gravel substrate. Currently, many bonytail are raised in fish hatcheries and released into the wild when they are large enough to survive in their natural environment. Bonytail prefer stream habitat that consists of eddies, pools, and backwaters near swift current in large rivers (UDWR 2010).

Based on the information obtained from the UDWR and USFWS, there are no recent documented occurrences of the bonytail within the vicinity of the defined project area and this project would not encroach or affect any fish habitat. A no effect determination is warranted for the bonytail.

Canada lynx

The Canada lynx is normally found in dense forested areas with an abundance of windfalls, swamps and brushy thickets (Maas 1997). Lynx require heavy cover for concealment when stalking prey. In terms of their prey base, lynx depend on snowshoe hares. In addition, lynx are most likely to persist in areas that receive deep snowfall, for which the lynx is highly adapted (Maas 1997). In the western U.S., lynx occurrences generally are found only above 4,000 feet in elevation (McKelvey et al. 2000).

Dense forested areas that provide heavy coverage and foraging opportunities are lacking within the project action area. The project action area lacks suitable habitat for lynx, does not have a prey base of snowshoe hare, and the scope and nature of the proposed construction activity would not impact any Canada Lynx passing through the project area. This project would have no effect on Canada Lynx or its habitat.

Colorado pikeminnow

The Colorado pikeminnow is a federally listed endangered minnow that is originally native to the Colorado River system; currently, their range is limited to the upper Colorado River system. The near extinction of the Colorado pikeminnow can be linked to flow regulation or alterations (e.g.

the installation of dams), habitat loss, and competition and predation by non-native fishes. Colorado pikeminnows are mainly piscivorous, meaning they eat fish; younger pikeminnows also eat insects and other invertebrates. They spawn in the spring and summer over gravel or smaller cobble substrate situated in riffle habitat. Adult Colorado pikeminnows prefer medium to large rivers. Young pikeminnows prefer slow-moving backwaters. Historical accounts of six-foot long Colorado pikeminnows make this species the largest minnow in North America (UDWR 2011).

Based on information obtained from the UDWR and USFWS, there are no recent documented occurrences of the Colorado pikeminnow within the vicinity of the defined project area. The project area does not contain fish habitat; therefore, a no effect determination is warranted.

Gibbens' beardtongue

Gibben's beardtongue is a federally petitioned species that occurs in northeastern Utah, northwestern Colorado, and in south-central Wyoming with occurrences restricted to the southern Washakie Basin and North Platte River Valley in Carbon and Sweetwater counties. A perennial herb in the figwort family, Gibben's beardtongue has a glandular inflorescence with blue flowers that bloom from mid-June to early August or September. Habitats include barren shale or sandstone slopes, and are often found on slopes that are steep and sparsely vegetated with bluebunch wheatgrass, Indian ricegrass, needle grass and thread grass. Threats to this species include grazing, mineral development, roads, recreation and weeds. Drought induced declines have also been reported (WYNDD 2013).

Based on information obtained from the UDWR and USFWS, there are no recent documented occurrences of the Gibben's beardtongue within the vicinity of the defined project area (see attached UDWR letter). The new pipeline alignment does not traverse through shale or sandstone slopes. Therefore, a no effect determination is warranted for Gibben's beardtongue.

Greater sage-grouse

The greater sage-grouse is a federally listed candidate species. As the name implies, greater sage-grouse are found only in areas where sagebrush is abundant (Colorado Division of Wildlife 2009). The largest of all grouse, the greater sage-grouse is up to 30 inches long, 2 feet tall, and weighs from 2 to 7 pounds (USFWS 2010). Male greater sage-grouse have a white breast ruff, mottled gray-brown overall, a black belly, black throat and bib, and long stiff spike like tail feathers. Females have a mottled gray-brown overall, a black belly, a white throat, and lack the yellow eye comb seen in the males. Diet consists of evergreen leaves, plain sagebrush shoots, blossoms, leaves, pods, buds, and insects (Alsop 2001). Dependent on sagebrush for food and cover, required habitat consists of relatively open flats or rolling sagebrush hills at elevations ranging from 4,000 to 9,000 feet above sea level (Colorado Division of Wildlife 2009, USFWS 2010). Land clearing and overgrazing by livestock are documented threats to this species' habitat.

Based on a review of the Wyoming Game and Fish Department's Sage Grouse database, the project action area does not fall within a designated core breeding area and there are no known active leks within a two-mile radius of the proposed action area. In accordance with the State of Wyoming's Executive Order 2011-5, the construction of agricultural/irrigation water pipelines are considered "exempt *(de minimis)* activities" if the construction activities are more than 0.6 miles from known leks. Furthermore, the proposed construction activities are planned to be completed before the start of the critical breeding season window (i.e. March 15th). A large percentage of the proposed project action area is in a pre-disturbed or pre-developed setting, due to the on-going agricultural practices and residential/rural development. Therefore, a no

effect determination is warranted for the greater sage-grouse and its habitat based on the scope and nature of this project.

Humpback chub

The humpback chub is a federally listed endangered minnow that is originally native to the upper Colorado River system. Humpback chub originally thrived in the fast, deep, whitewater areas of the Colorado River and its major tributaries. Man-induced flow alterations such as dams have changed the turbidity, volume, current speed, and temperature of the water in rivers and has contributed to significant population declines. Documented occurrences of the humpback chub in Utah are now confined to a few whitewater areas in the Colorado, Green, and White Rivers. Humpback chub mainly eat insects and other invertebrates, and occasionally algae and fish. The species spawns during the spring and summer in shallow, backwater areas with cobble substrate. Younger individuals reside in shallower, turbid habitats until they are large enough to move into whitewater areas (UDWR 2011).

Based on information obtained from the UDWR and the USFWS, there are no recent documented occurrences of the humpback chub within the vicinity of the defined project area. The project area is not within the areas that this species inhabits and would not impact any fish habitat; therefore, a no effect determination is warranted for the humpback chub.

Mountain plover

The Mountain Plover is a fairly large bird of about 21-23 cm. Breeding birds have sandy brown coloring with white on the forehead throat and chest, bright white under the wings, a black crown, black bill, and a distinctive black stripe extending from the back of the bill to the eye. Non-breeders look similar to breeders, but the black coloring on the crown and face is replaced by pale brown coloring with some slight variation in coloring on the rest of the body. Juvenile birds are similar to non-breeding birds, but the feathers of the upper part of the body are slightly darker brown, the crown is less dark, and the plumage on the face is more buff than white.

Based on information obtained from the UDWR, there are no recent documented occurrences of the mountain plover within the vicinity of the defined project area. The proposed project action does not impact any riparian areas along natural streams or lakes, including potential nesting or perching locations for the mountain plover. The mountain plover's diet base and foraging opportunities will also not be affected by this project. Therefore, a no effect determination is warranted for the mountain plover.

Pygmy rabbit

The smallest rabbit species in North America, the pygmy rabbit measures 9.2-11.6 inches in length, weighs a slight 0.88-1.02 lbs, and is able to fit in the palm of a hand. Pygmy rabbits are generally limited to areas of deep soils with tall, dense sagebrush which they use for cover and food (Green and Flinders 1980). The pygmy rabbit is the only native leporid that digs burrows. Suitable pygmy rabbit habitat is found in areas with deeper soils, as recognized by distinctly taller patches of sagebrush. This species diet consists of sagebrush, grasses, and forbs. Conversion of sagebrush grasslands, habitat fragmentation, fire, invasive plants, and overgrazing are considered potential threats to pygmy rabbits. The pygmy rabbit is widely dispersed throughout Utah and can be found in the southwestern counties of Wyoming.

Based on information obtained from the USFWS, there are no recent documented occurrences of the pygmy rabbit within the vicinity of the defined project area. Suitable habitat for the species is also lacking in the project area. A large percentage of the proposed project action area is in a

pre-disturbed or pre-developed setting, due to the on-going agricultural practices and residential/rural development. Therefore, a no effect determination is warranted for the pygmy rabbit.

Razorback sucker

The razorback sucker is a federally listed endangered sucker fish that is originally native to the Colorado River system. The near extinction of the razorback sucker can be linked to flow regulation or alterations, habitat loss, and competition and predation by non-native fishes. Razorback suckers mainly eat algae, zooplankton, and other aquatic invertebrates. They spawn between February and June. Adult razorback suckers prefer slow backwater habitats. The largest current concentration of razorback suckers can be found in Lake Mohave (an impounded water-body), located along the Arizona - Nevada USBRder (UDWR 2011).

Based on information obtained from the UDWR, there are no recent documented occurrences of the razorback sucker within the vicinity of the defined project area (see attached UDWR letter). This project would not impact any fish habitat. Razorback suckers are native to, and found exclusively within the Colorado River system; therefore, a no effect determination is warranted for the razorback sucker.

Short-eared owl

The short-eared owl is a medium sized, mostly brown owl with a big head and a short neck (Alsop 2001). This nomadic owl prefers grasslands, marshes, and other open type habitats to feed on rodents, small birds, and large insects. They often use fence posts as perches. Similar to the grasshopper sparrow, this owl constructs a nest in April primarily on the ground in grasslands. In winter some owls migrate south as far as Mexico, whereas others remain in the breeding grounds as a permanent (year-round) resident (UDWR 2011).

The project action area lacks suitable habitat for short-eared owls based on the construction timing, and the scope and nature of the proposed construction activity would not impact any short-eared owls passing through the project area. This project would have no effect on short-eared owls or their habitat.

Ute ladies'-tresses

Ute ladies'-tresses is a perennial orchid, 8 to 20 inches tall, with white or ivory flowers clustered into a spike arrangement at the top of the stem. Ute ladies'-tresses typically blooms from late July through August. However, it may bloom in early July or still be in flower as late as early October, depending on location and climatic conditions. Ute ladies'-tresses 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). Soils where Ute ladies'-tresses have been found typically range from fine silt/sand, to gravels and cobbles, as well as to highly organic and peaty soil types. Ute ladies'-tresses is not found in heavy or tight clay soils or in extremely saline or alkaline soils. Ute ladies'-tresses typically occurs in small, scattered groups found primarily in areas where vegetation is relatively open.

The habitat conditions associated with man-made laterals and canals are not conducive for Ute ladies'-tresses populations. Based on habitat conditions coupled with a lack of known species occurrence in the project action area, a no effect determination is warranted for this species.

Western yellow-billed cuckoo

The western yellow-billed cuckoo is a federally listed candidate species. As the name suggests, this avian species has a yellow lower mandible. It has rufous wings that contrast against the gray-brown wing coverts and upperparts. The underparts are white and they have large white spots on a long black undertail (Alsop 2001). The cuckoo 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 (Ehrlich et al. 1992). Its incubation/nestling 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. Yellow-billed cuckoos arrive in Utah in late May or early June and breed in late June through July. Cuckoos typically start their southerly migration by late August or early September (Parrish et al. 1999). Yellow-billed cuckoos are considered a riparian obligate and are usually found in large tracts of cottonwood/willow habitats with dense sub-canopies (below 33 ft).

Riparian habitat required for the western yellow-billed cuckoo is not present within the project action area. A no effects determination is warranted for the yellow-billed cuckoo and its habitat.

White-tailed prairie dog

The white-tailed prairie dog is found in western Wyoming and western Colorado with small areas in eastern Utah and southern Montana. The largest populations are in Wyoming where they are known colloquially as "chiselers". This prairie dog species lives at an elevation between 5,000 and 10,000 feet, generally a higher elevation than other prairie dog species. Its predators include black-footed ferrets, badgers, and golden eagles. White-tailed prairie dogs are only in around 8% of their original territory. It is also threatened by shooting, and a disease called Sylvatic Plague that affects all prairie dogs. This animal lives in small communities that are vulnerable to being wiped out by all of these issues. This species appears in the IUCN Red List of Threatened Species, with a status of least concern, last assessed in 1996.

A large percentage of the project action area consists of planted agricultural fields. Based on the discountable habitat impacts associated with potential white-tailed prairie dog towns, a no effect determination is warranted for this project.

Wyoming pocket gopher

Wyoming pocket gophers are characterized by a heavily muscled head without a noticeable neck, strong front limbs with long nails used for digging, small ears, small eyes, and fur-lined cheek pouches used to carry food. Adult Wyoming pocket gophers typically have a body length (not including the tail) of 4.4 to 5.3 inches, and a weight of 1.6 to 2.5 ounces. The Wyoming pocket gopher is genetically unique from other pocket gophers and can be differentiated by being smaller and paler, with a yellow cast to the coat, especially in younger animals. The dorsal coat is uniform in color, and the margins of the ears are fringed with whitish hairs. Very few individuals have been captured to date, with all occurrences in Sweetwater and Carbon Counties. The Wyoming pocket gopher is believed to occur primarily in small 'islands' of low or sparsely vegetated areas found interspersed within sagebrush habitats. These islands are characterized by having less big sagebrush (*Artemisia tridentata*), more winterfat (*Krascheninnikovia lanata*), more Gardner's saltbush (*Atrzplex gardneri*), more bare soil, and fewer surface rocks than the surrounding area.

Based on information obtained from the USFWS, there are no recent documented occurrences of the Wyoming pocket gopher within the vicinity of the defined project area. A large percentage

of the proposed project action area is in a pre-disturbed or pre-developed setting, due to the on-going agricultural practices and residential/rural development. Therefore, a no effect determination is warranted for the Wyoming pocket gopher.

Conclusion

The findings in this report suggest that there is no critical or sensitive habitat located within the defined project action area (47.8 acres) specific to the ESA listed and state sensitive species discussed herein. A large percentage of the proposed project footprint contains pre-developed earthen seasonal irrigation channel or pre-disturbed areas associated with ongoing agricultural and residential/rural uses. Pristine, natural and undisturbed vegetative communities and habitat is lacking in the project action area. There should be no direct or indirect impacts to the sixteen species or their habitats discussed in this report as a result of the proposed irrigation piping project. It should be noted, that the final authority rests with the appropriate regulatory agencies.

Submitted by:

Vincent Barthels, Biologist
J-U-B Engineers, Inc.

List of Attachments:

1. Vicinity Map
2. Project Summary Exhibits (Sheets 1 through 19)
3. ESA Species Listings for Daggett and Sweetwater Counties, Utah and Wyoming (dated: April 2013 and May 2012)
4. UDWR Response Letter (dated: March 7, 2013)
5. USWFS Letter (dated: June 21, 2013)

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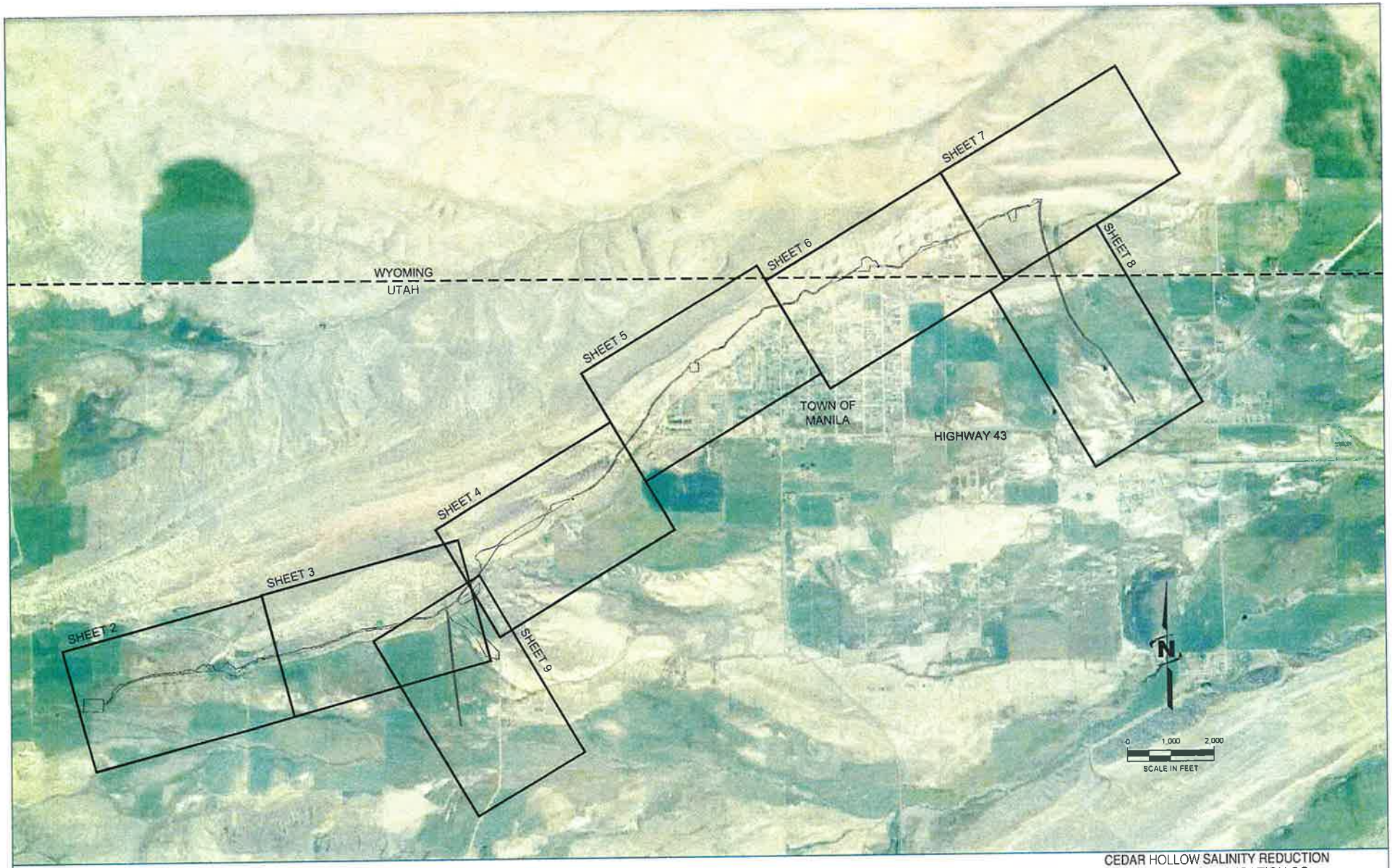

CEDAR HOLLOW SALINITY REDUCTION
SHEEP CREEK IRRIGATION CO.

SHEET INDEX OF BIOLOGICAL ASSESSMENT EXHIBITS

SHEET 1 OF 9

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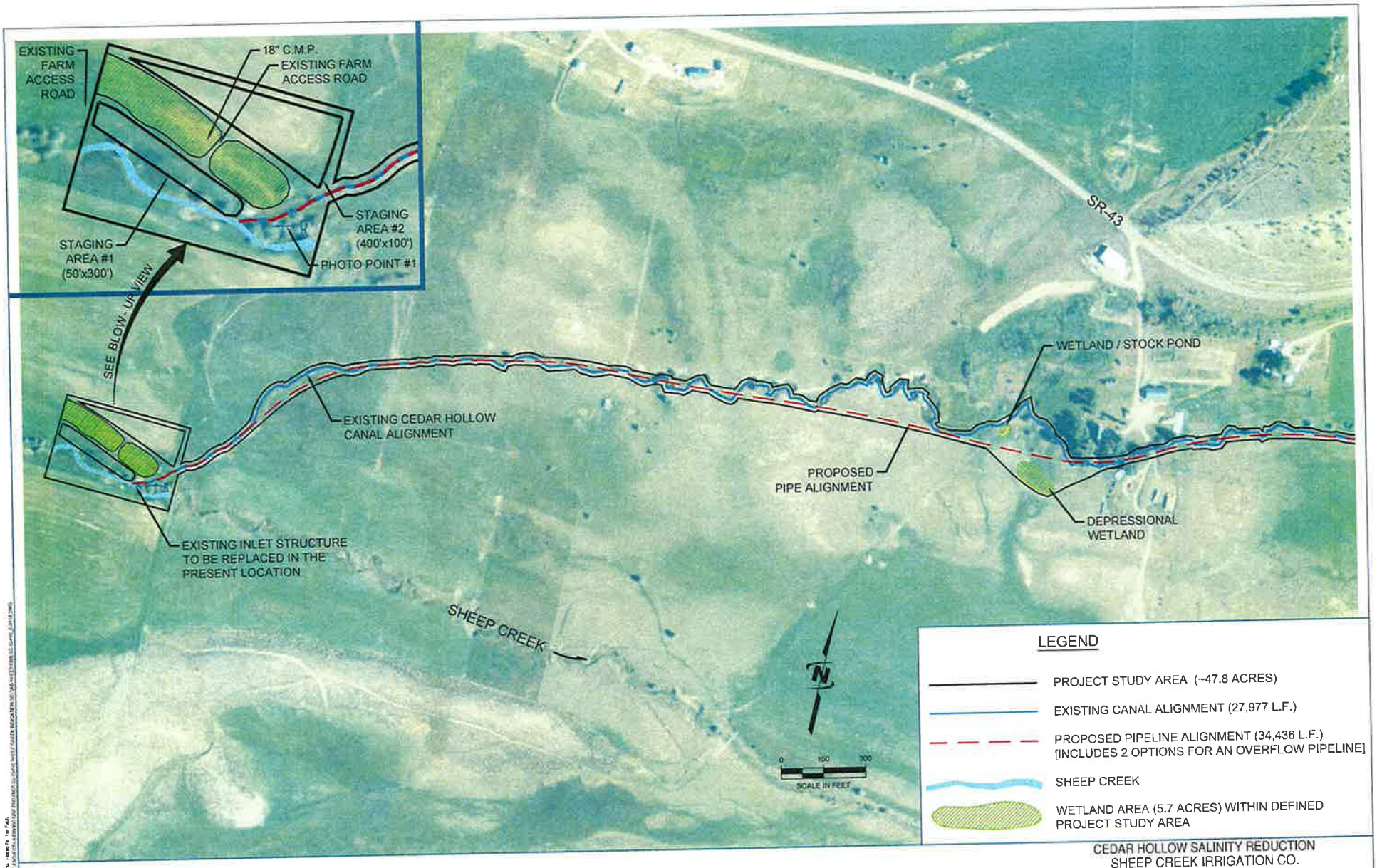

CEDAR HOLLOW SALINITY REDUCTION
SHEEP CREEK IRRIGATION CO.

BIOLOGICAL ASSESSMENT EXHIBITS

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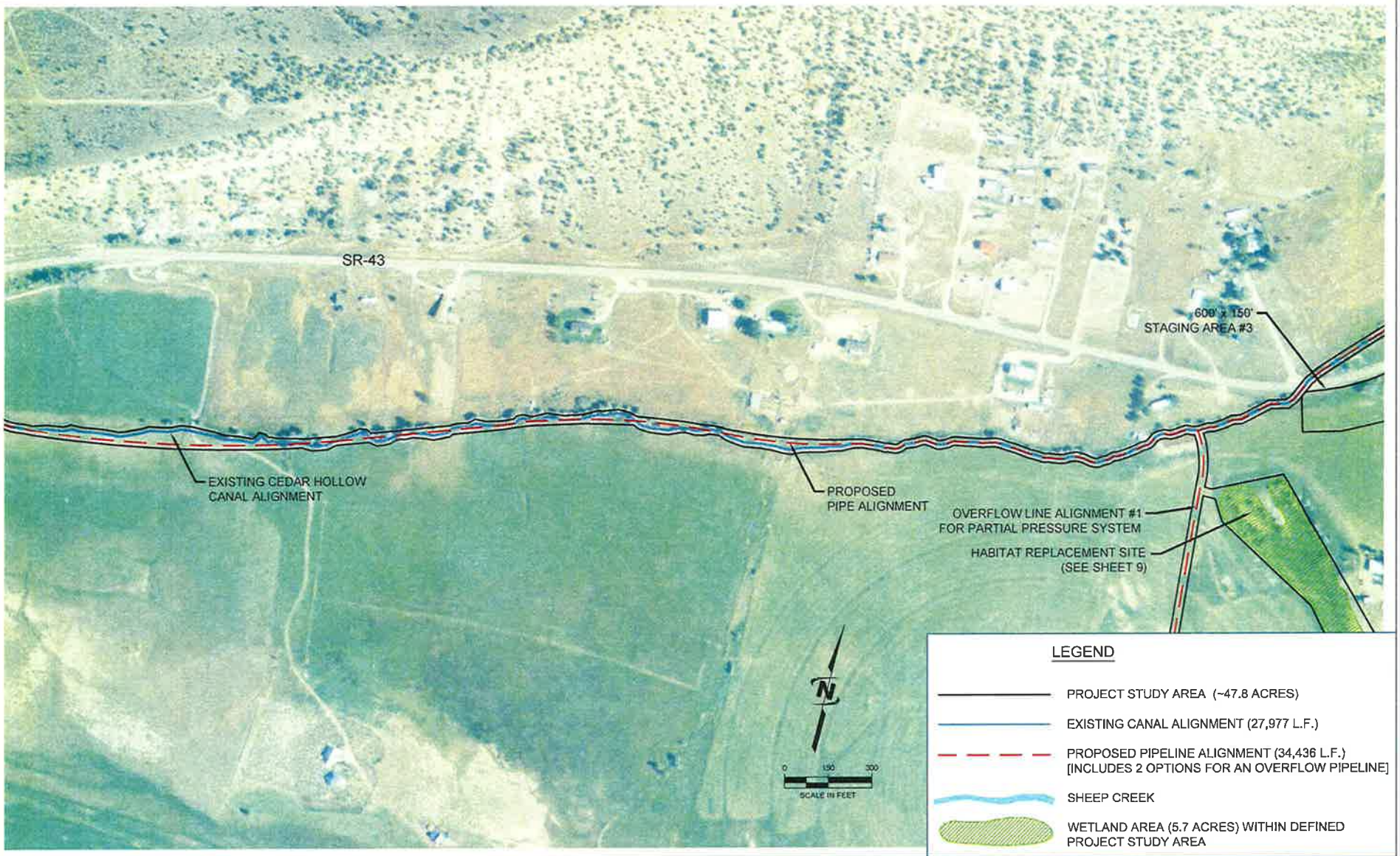

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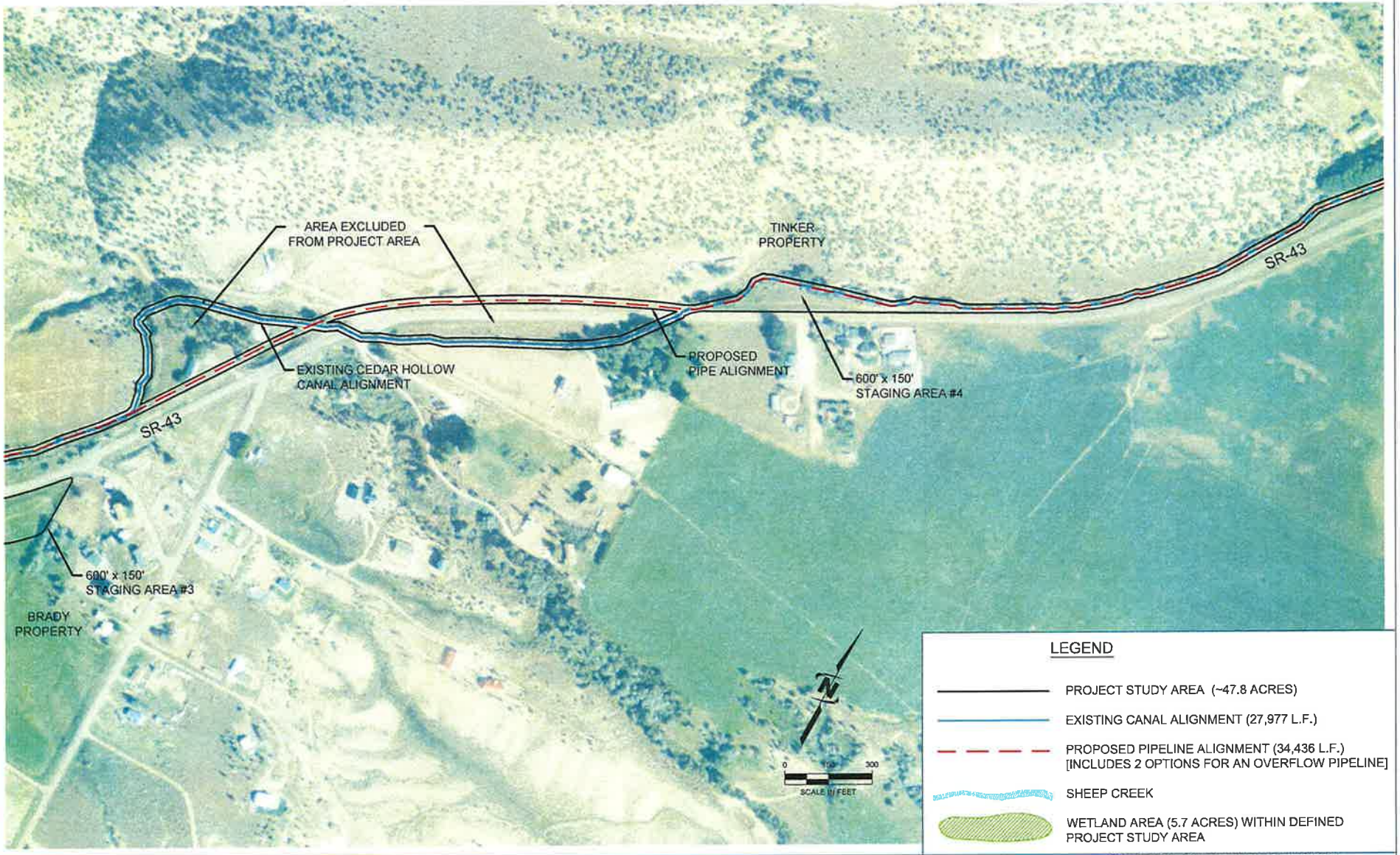

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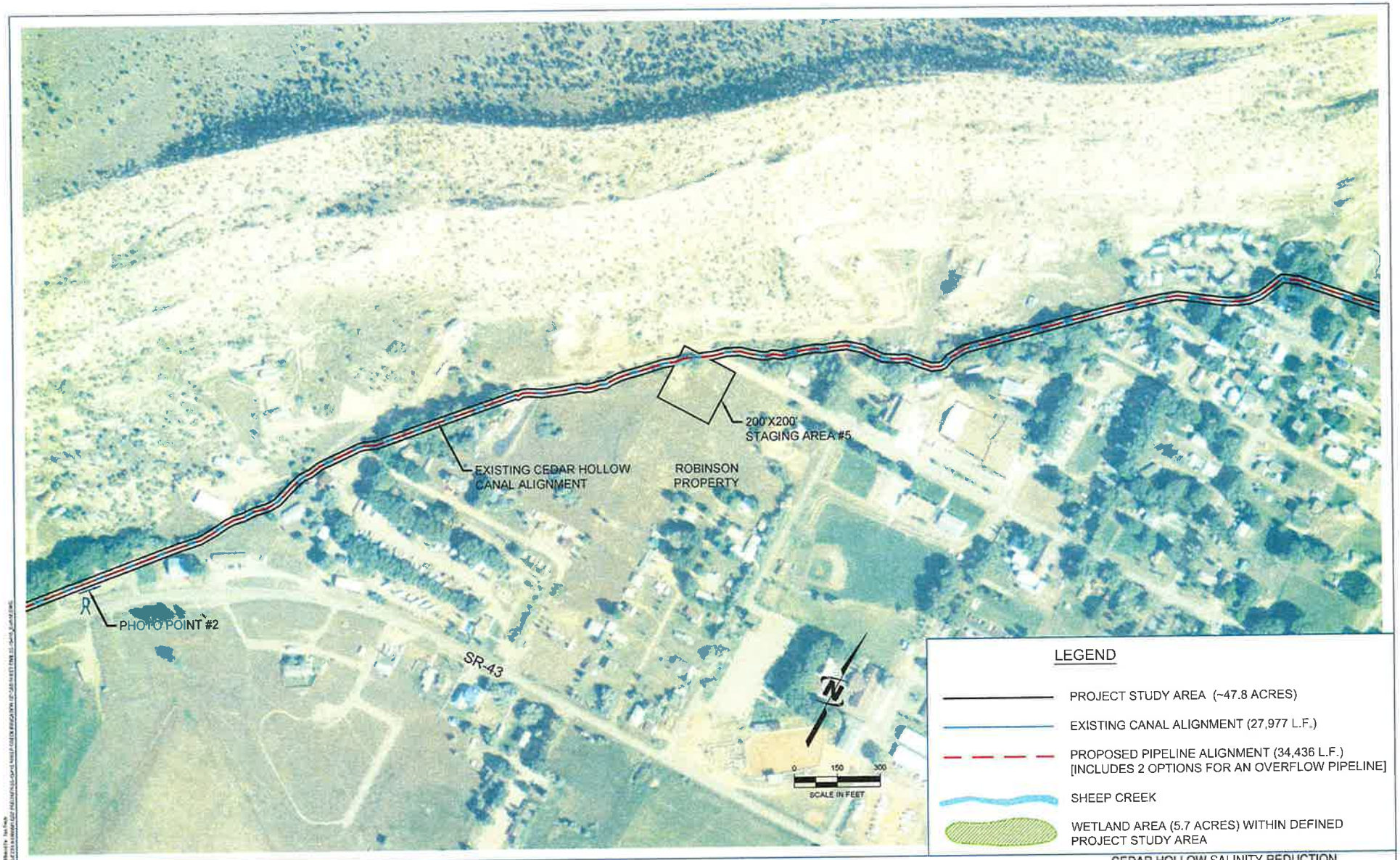

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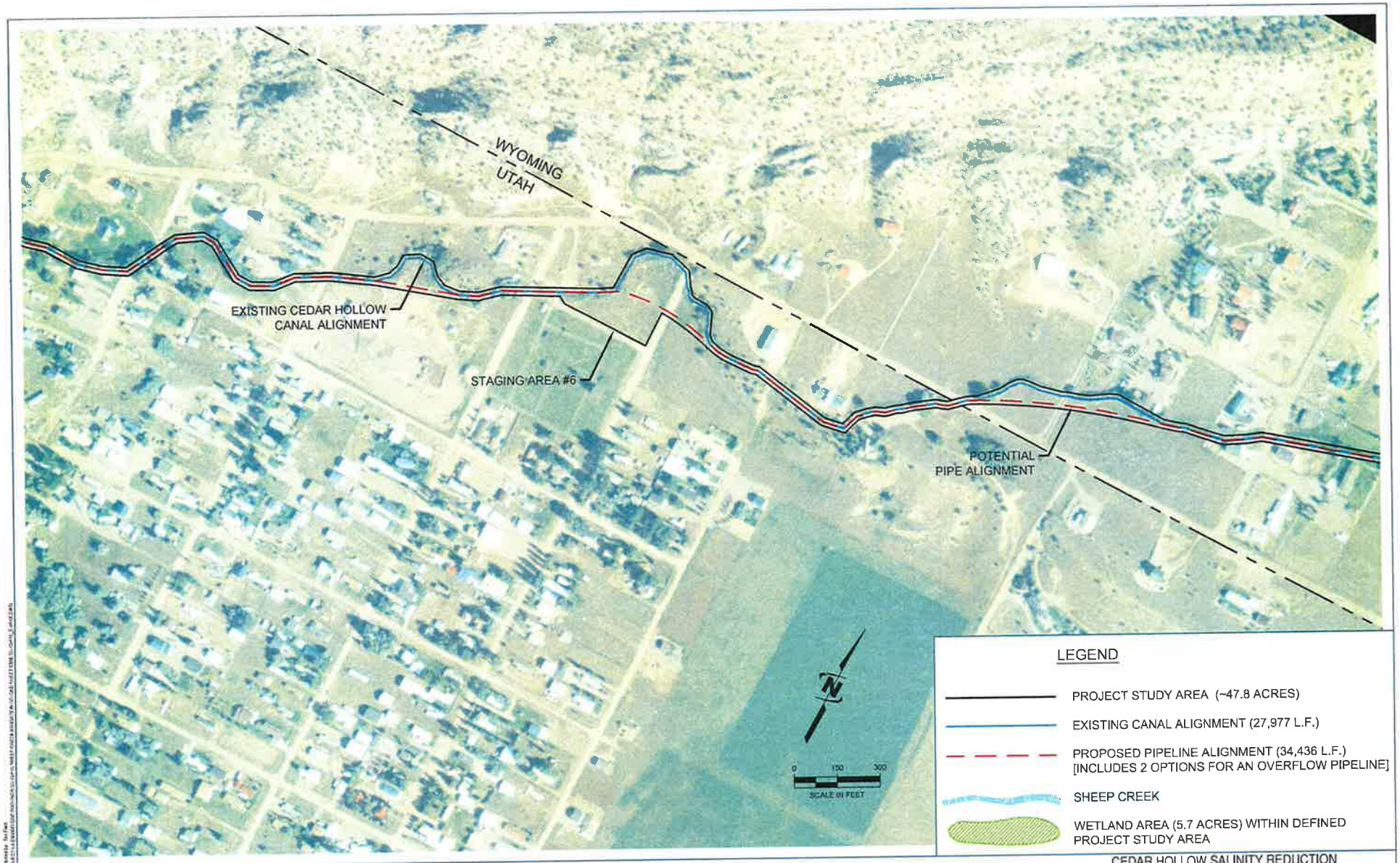
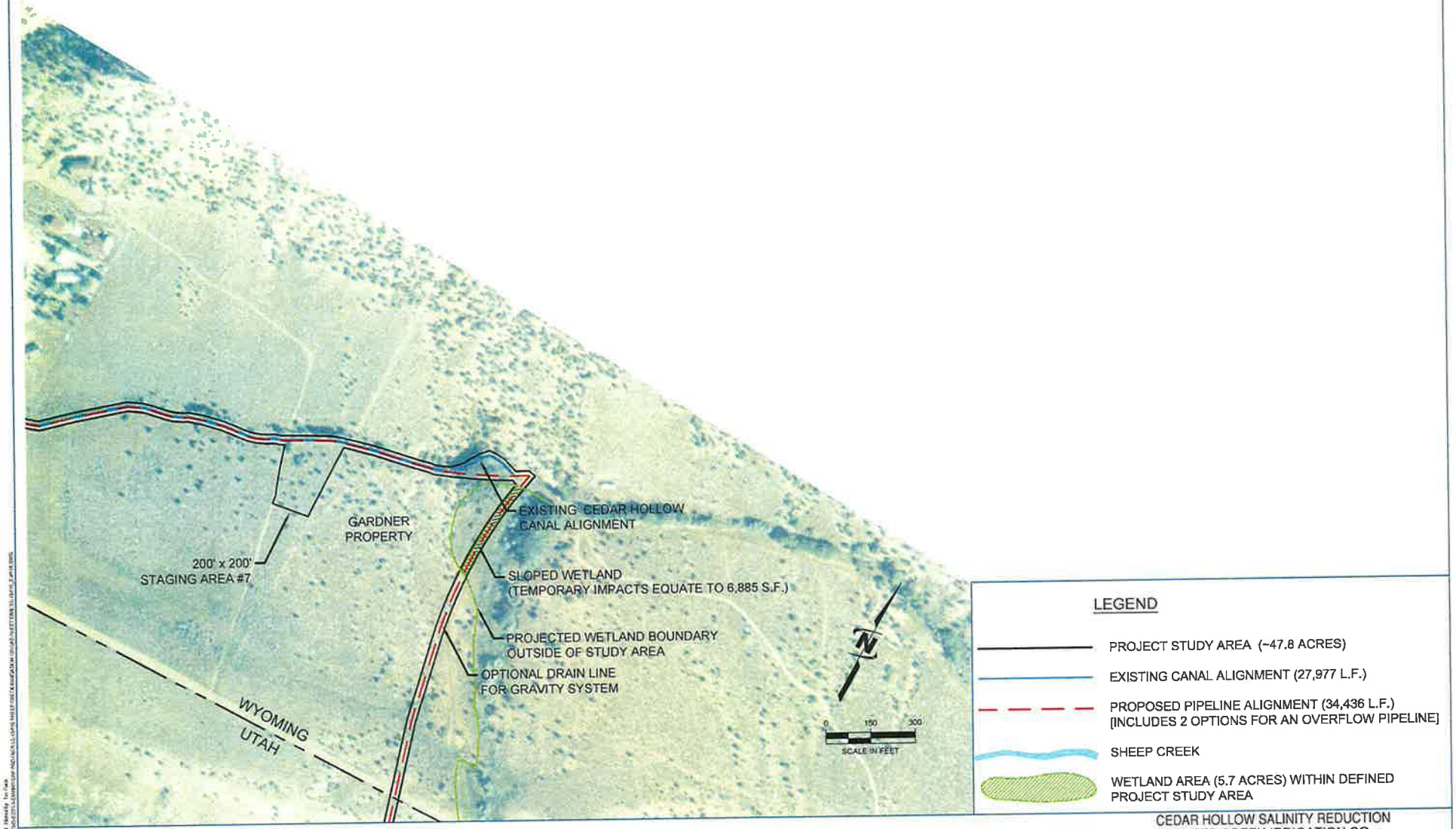


CEDAR HOLLOW SALINITY REDUCTION
SHEEP CREEK IRRIGATION CO.
BIOLOGICAL ASSESSMENT EXHIBITS

SHEET 6 OF 9

JUB
J-U-B ENGINEERS, INC.

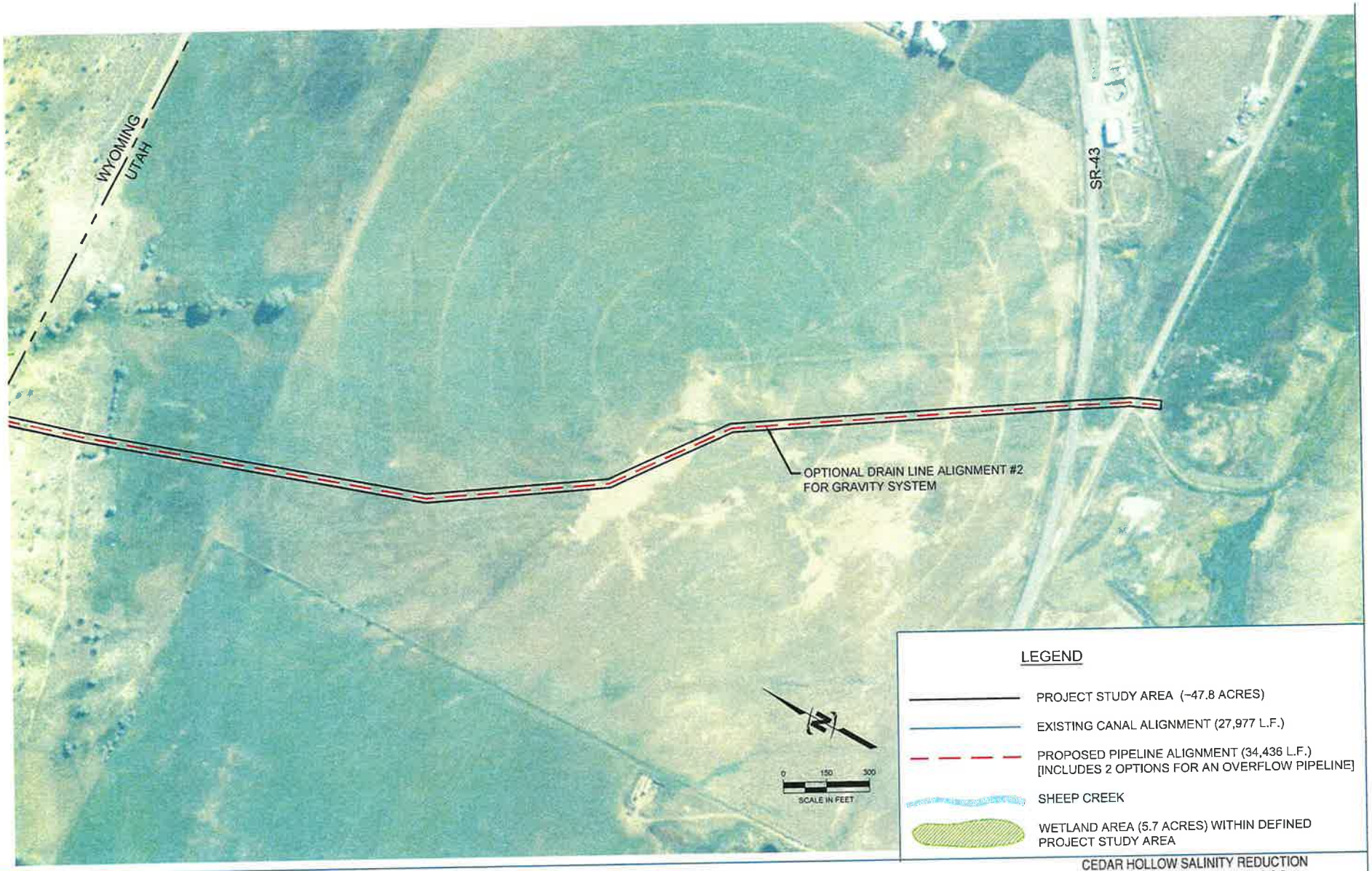


JUB

J-U-B ENGINEERS, INC.

CEDAR HOLLOW SALINITY REDUCTION
SHEEP CREEK IRRIGATION CO.

BIOLOGICAL ASSESSMENT EXHIBITS



CEDAR HOLLOW SALINITY REDUCTION
SHEEP CREEK IRRIGATION CO.
BIOLOGICAL ASSESSMENT EXHIBITS

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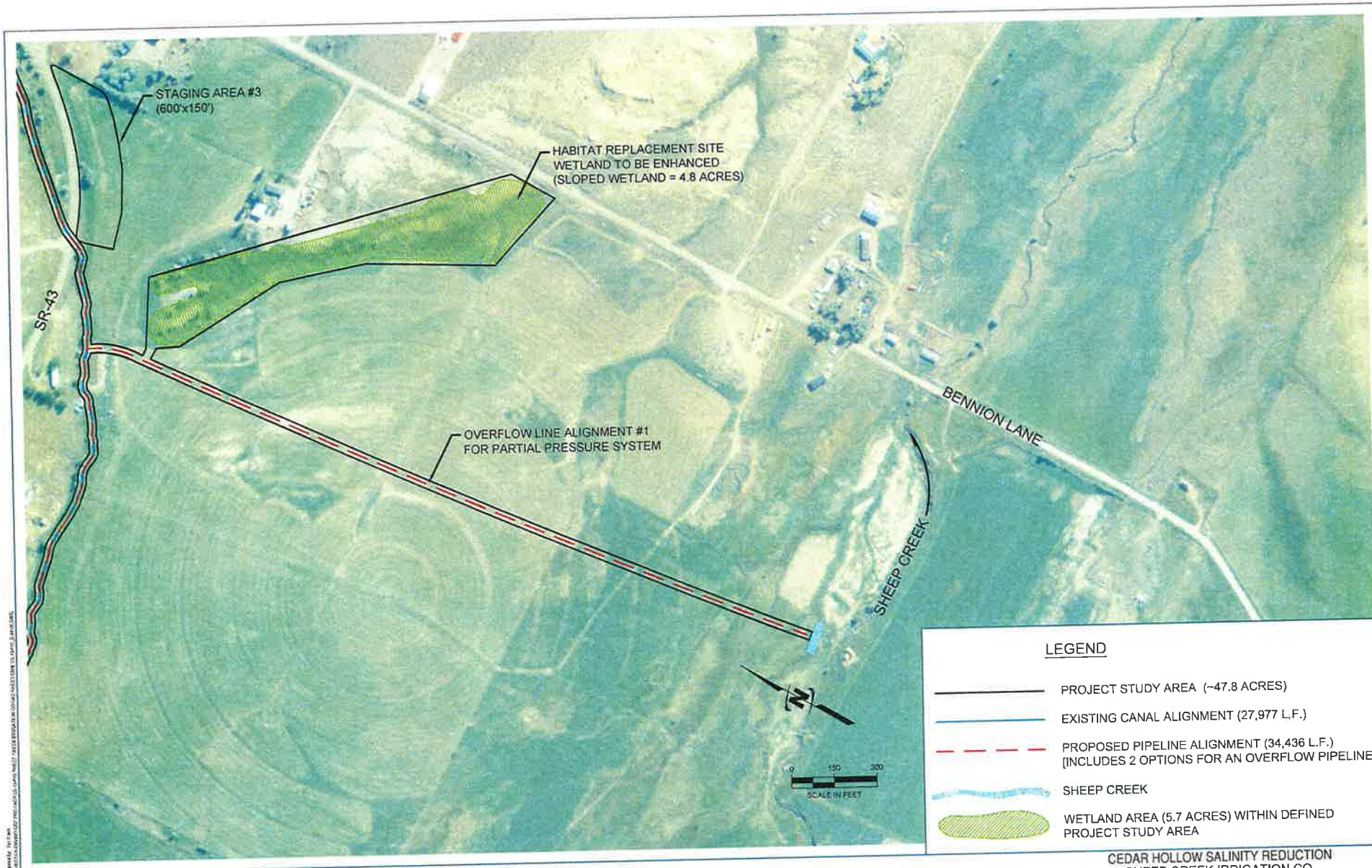
J-U-B ENGINEERS, INC.



CEDAR HOLLOW SALINITY REDUCTION
SHEEP CREEK IRRIGATION CO.
BIOLOGICAL ASSESSMENT EXHIBITS

SHEET 9 OF 9

JUB
J-U-B ENGINEERS, INC.

Appendix C

Cultural Resources Correspondence

ORIGINAL

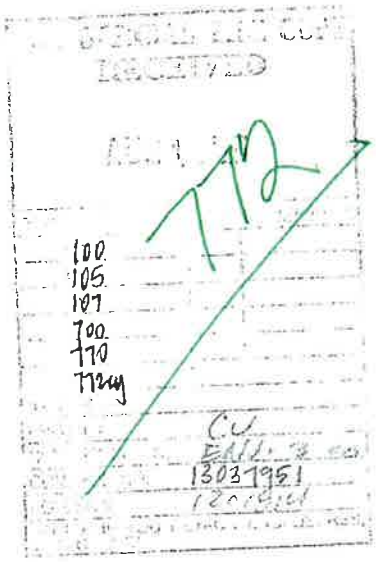
GARY R. HERBERT
Governor

GREG BELL
Lieutenant Governor

Julie Fisher
Executive Director
Department of
Heritage & Arts

Utah Division of
State History

Brad Westwood
Director



COPY

August 13, 2013

Jeffrey D'Agostino
Chief, Environmental Group
Bureau of Reclamation
Provo Area Office
302 East 1860 South
Provo, Utah 84606-7317

RE: Cultural Resources Inventory of the Sheep Creek Irrigation Company Cedar Hollow Salinity Reduction Project - Daggett County, Utah

For future correspondence, please reference Case No. 13-0912

Dear Mr. D'Agostino:

The Utah State Historic Preservation Office received your request for our comment on the above-referenced undertaking on August 13, 2013. We concur on a finding of Adverse Effect for this undertaking. We look forward to working on an MOA. Please consider a variety of mitigation measures, with emphasis on a public product.

This letter serves as our comment on the determinations you have made, within the consultation process specified in §36CFR800.4. If you have questions, please contact me at 801-245-7263 or Lori Hunsaker at 801-245-7241 *lhunsaker@utah.gov*.

Sincerely,

Chris Merritt, Ph.D.
Senior Preservation Specialist
cmerritt@utah.gov

ARTS. PARKS. HISTORY.
Wyoming State Parks & Cultural Resources

State Historic Preservation Office
2301 Central Ave., Barrett Bldg. 3rd Floor
Cheyenne, WY 82002
307-777-7697
FAX: 307-777-6421
http://wyoshpo.state.wy.us

August 27, 2013

Jeffrey D'Agostino
Chief, Environmental Group
USDI Bureau of Reclamation
Upper Colorado Region
Provo Area Office
302 East 1860 South
Provo, UT 84606-7317

Re: A Cultural Resources Inventory of the Sheep Creek Irrigation Company Cedar Hollow Salinity Reduction Project - Daggett County, Utah and Sweetwater County, Wyoming (SHPO File # 0813ECK013)

Dear Mr. D'Agostino:

Thank you for consulting with the Wyoming State Historic Preservation Office (SHPO) regarding the referenced undertaking. We have reviewed the associated report and find the documentation meets the Secretary of the Interior's Standards for Archaeology and Historic Preservation (48 FR 44716-42). We concur with your determination that site 48SW17017 is eligible for listing in the National Register of Historic Places.

We agree that site 48SW17017 will be adversely impacted. In accordance with 36 CFR § 800.6, we recommend the Bureau of Reclamation, Provo Area Office develop a Memorandum of Agreement (MOA), specifying the terms under which the adverse effects to the historic property will be minimized or mitigated. The agency official, SHPO and the Advisory Council (should they choose to participate) are the signatories and consulting parties to the MOA. The agency official and the SHPO, in agreement with the agency official, may choose to invite additional parties to be signatories and to concur in the MOA. Invited signatories and consulting parties may include Native American tribes that attach religious or cultural significance to the historic property and any party that assumes a responsibility under the MOA.

Please refer to SHPO project #0813ECK013 on any future correspondence regarding this undertaking. If you have any questions, please contact Beth King at 307-777-6179.

Sincerely,

Elizabeth C King

Elizabeth C. King
Historic Preservation Specialist

Appendix D

Paleontological Resources Correspondence

GARY R. HERBERT
Governor
GREG BELL
Lieutenant Governor

State of Utah
DEPARTMENT OF NATURAL RESOURCES
MICHAEL R. STYLER
Executive Director
Utah Geological Survey
RICHARD G. ALLIS
State Geologist/Division Director

April 16, 2013

Brian Joseph, Archaeologist
U. S. Bureau of Reclamation
Provo Area Office, PRO-772
302 East 1860 South
Provo, UT 84606-7317

RE: Paleontological File Search and Recommendations for the Cedar Hollow Lateral Salinity Reduction Project, Daggett County, Utah
U.C.A. 79-3-508 compliance; literature search for paleontological specimens or sites

Dear Brian:

I have conducted a paleontological file search for the Cedar Hollow Lateral Salinity Reduction Project in response to your request of April 16, 2013.

There are no paleontological localities recorded in our files within this project area. Quaternary and Recent alluvial deposits that are exposed along this project right-of-way have a low potential for yielding significant fossil localities (PFYC 2). However, on the north side of the pipeline right-of-way there are exposures of the Eocene Wasatch Formation that has the potential for yielding significant vertebrate fossil localities (PFYC 4). If these deposits will be impacted by ground disturbing activities, we recommend that this project be evaluated by a permitted paleontologist in order to determine and mitigate any potential impacts to paleontological resources. Otherwise, unless fossils are discovered as a result of construction activities, this project should have no impact on paleontological resources.

If you have any questions, please call me at (801) 537-3311.

Sincerely,

Martha Hayden
Paleontological Assistant

1594 West North Temple, Suite 3110, PO Box 146100, Salt Lake City, UT 84114-6100
telephone (801) 537-3300 • facsimile (801) 537-3400 • TTY (801) 538-7458 • *geology.utah.gov*

Paleontology Survey Report
Sheep Creek Irrigation Company
Salinity Control Project
Cedar Hollow Lateral
Manila, Utah

Prepared for
J-U-B Engineers, Inc.
2875 South Decker Lake Drive Suite 575
Salt Lake City, Utah 84119

Prepared by
Brooks B. Britt, Ph.D.

Paleo Mentors, Inc.
545 Robin Road
Orem, Utah 84097
E-mail: brooks.britt@gmail.com
Phone: 801.616.9419

7 May 2013

EXECUTIVE SUMMARY

The proposed Cedar Hollow Lateral route (Figure 1) is located almost entirely on disturbed, unconsolidated Quaternary alluvium along with limited exposures of the Wasatch Formation. A literature search and a field survey of the canal route indicates that no significant fossils have been found along the canal lateral. The likelihood of encountering important fossils during construction is low. Thus, there are no paleontological reasons to restrict the project. If, however, fossils are encountered during construction a qualified paleontologist should be contacted.

RESULTS AND RECOMMENDATIONS

At the request of J-U-B Engineers, Inc., a literature search, government (state and federal) database search, and paleontological field survey of the Manila, Utah area (including relevant portions of Sweetwater County Wyoming) were conducted. The literature review and review of the records provided by the Utah Geological Survey for both federal and state lands indicate that only relatively insignificant vertebrate fossils, such as fish scales and teeth, plus invertebrate and microfossils, none of which are from the Wasatch Formation, have been reported from the Manila, Utah vicinity (Unpublished Utah Geological Survey paleontological database for Daggett County and references contained therein). Outcrops within 50 feet of the ROW centerline were field checked for fossil on 27 April 2013. Along the canal lateral, exposures of the interfingered Green River and Wasatch Formations range from lacustrine mudstones to alluvial fan pebble conglomerates. Most of the bedrock is highly fractured, often at a centimeter-scale because the canal parallels, and is in close proximity to, Laramide reverse faults located on the north flank of the Uinta Mountains (Sprinkel, 2006). No fossils were observed in any of the outcrops.

No paleontological monitoring is recommended during this project. However, if fossils are observed during construction (1) the BLM paleontologist should be notified immediately via phone or email (contact information is provided below), (2) construction should be halted within 50 feet of the discovery until the paleontologist has evaluated the find, and (3) construction will resume once the specimen has been documented and mitigated (in the case that the fossil is deemed significant).

Contact Information

Robin L. Hansen
BLM Geologist
Vernal Field Office
Vernal, Utah 84078
170 S. 500 W.
E-mail Robin_L_Hansen@blm.gov
Mobile 801.564.1691
Office 435.781.2777

Brent Breithaupt
BLM Paleontologist
Wyoming State Office
5353 Yellowstone Rd.
Cheyenne, WY 82009
E-mail bbreitha@blm.gov
Office 307.775.6052

REFERENCE CITED

Sprinkel, D.A., 2006. Interim geologic map of the Dutch John 30' x 60' quadrangle, Daggett and Uintah Counties, Utah, Moffat County Colorado, and Sweetwater County, Wyoming. Utah Geological Survey OFR 491DM.

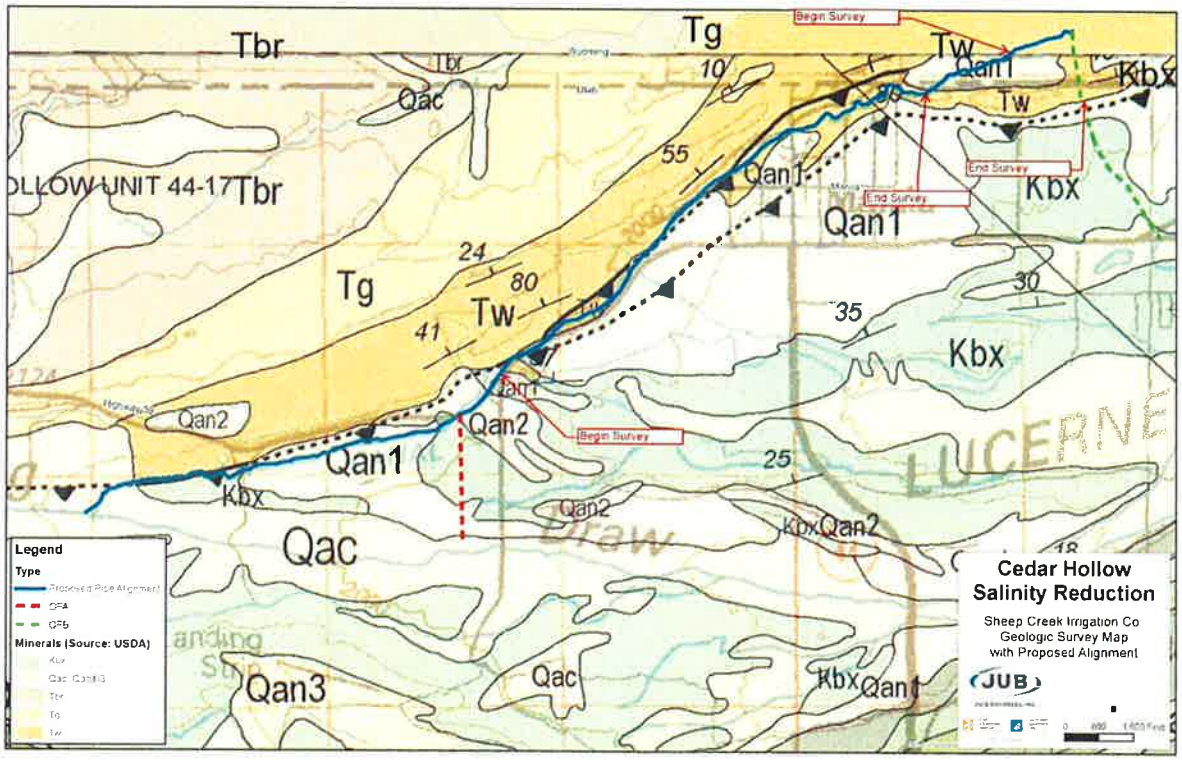


Figure 1. Geologic map showing canal lateral (blue line). Abbreviations of geologic formations and unit descriptions are provided in Table 1. Geologic Map from Sprinkle (2006).

Formation	Map ID	Era	Period	Age	Lithology	PFYC
Unnamed – Colluvium and alluvium	Qan Qac	Cenozoic	Quaternary	Pleistocene - Holocene	gravel, sand, and silt	2
Bridger	Tbr	Cenozoic	Paleogene	Eocene	shale, sandstone, limestone	5
Green River	Tg	Cenozoic	Paleogene	Eocene	mudstone, limestone, siltstone	4
Wasatch	Tw	Cenozoic	Paleogene	Eocene	shale, siltstone, sandstone	5
Baxter (Mancos) Shale	Kbx	Mesozoic	Cretaceous	Late	shale, siltstone, limestone	2

Table 1. Geologic Formations in the study area. The BLM's PFYC (Potential Fossil Yield Class) ranks formations based on the probability of containing significant fossils. Low PFYC numbers have a low potential, high numbers (the highest is 5) have a high potential of containing fossils.

GARY R. HERBERT
Governor
GREG BELL
Lieutenant Governor

State of Utah
DEPARTMENT OF NATURAL RESOURCES
MICHAEL R. STYLER
Executive Director
Utah Geological Survey
RICHARD G. ALLIS
State Geologist/Division Director

April 16, 2013

Brian Joseph, Archaeologist
U. S. Bureau of Reclamation
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RE: Paleontological File Search and Recommendations for the Cedar Hollow Lateral Salinity Reduction Project, Daggett County, Utah
U.C.A. 79-3-508 compliance; literature search for paleontological specimens or sites

Dear Brian:

I have conducted a paleontological file search for the Cedar Hollow Lateral Salinity Reduction Project in response to your request of April 16, 2013.

There are no paleontological localities recorded in our files within this project area. Quaternary and Recent alluvial deposits that are exposed along this project right-of-way have a low potential for yielding significant fossil localities (PFYC 2). However, on the north side of the pipeline right-of-way there are exposures of the Eocene Wasatch Formation that has the potential for yielding significant vertebrate fossil localities (PFYC 4). If these deposits will be impacted by ground disturbing activities, we recommend that this project be evaluated by a permitted paleontologist in order to determine and mitigate any potential impacts to paleontological resources. Otherwise, unless fossils are discovered as a result of construction activities, this project should have no impact on paleontological resources.

If you have any questions, please call me at (801) 537-3311.

Sincerely,

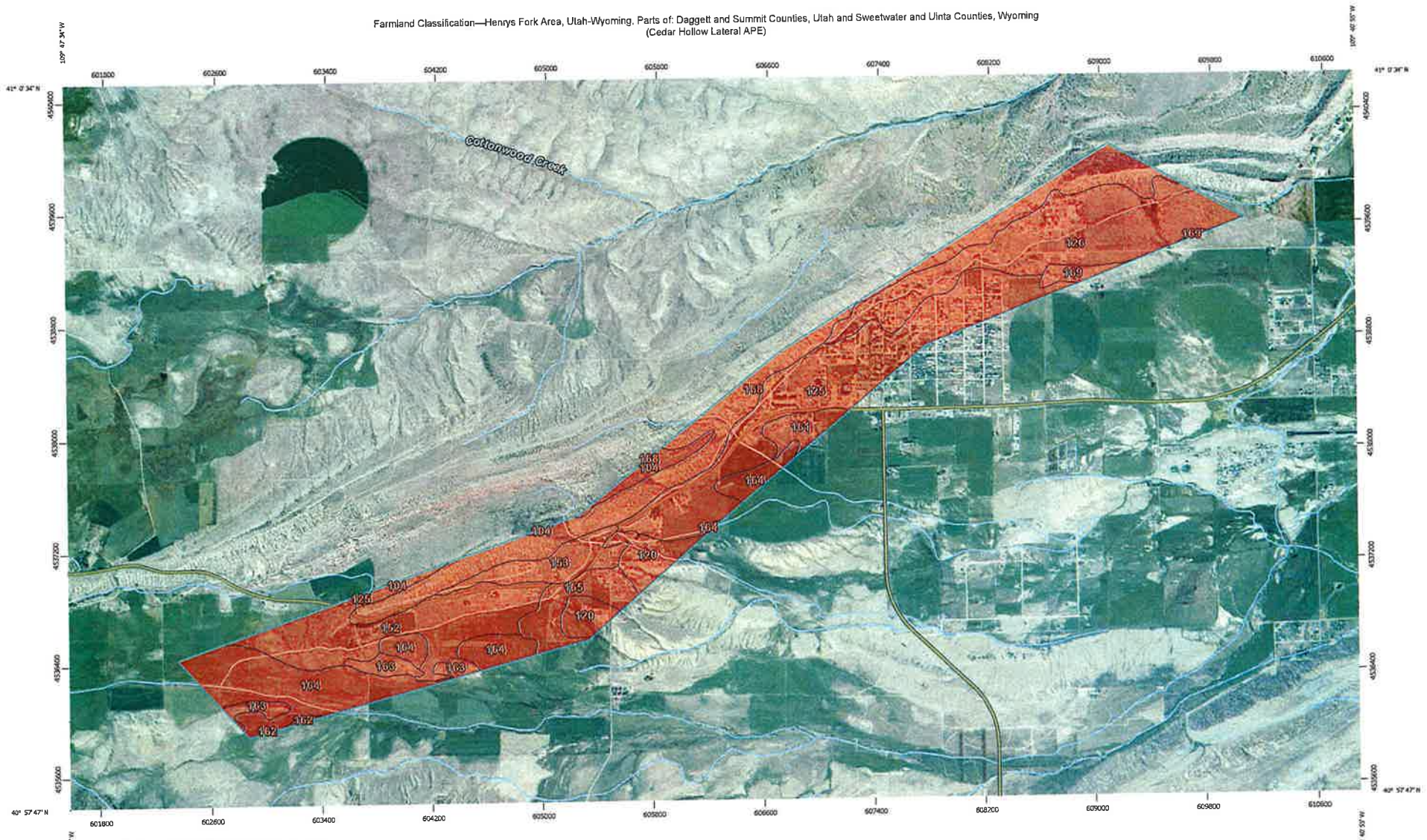
Martha Hayden
Paleontological Assistant

1594 West North Temple, Suite 3110, PO Box 146100, Salt Lake City, UT 84114-6100
telephone (801) 537-3300 • facsimile (801) 537-3400 • TTY (801) 538-7458 • *geology.utah.gov*

Appendix E

Soil Survey

Farmland Classification—Henrys Fork Area, Utah-Wyoming. Parts of: Daggett and Summit Counties, Utah and Sweetwater and Uinta Counties, Wyoming
(Cedar Hollow Lateral APE)



Map Scale: 1:25,100 if printed on B landscape (17" x 11") sheet.

N

Meters: 0 350 700 1400 2100

Feet: 0 1000 2000 4000 6000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 12N WGS84

Natural Resources Conservation Service

Web Soil Survey
National Cooperative Soil Survey

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- Not prime farmland
- All areas are prime farmland
- Prime farmland if drained
- Prime farmland if protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated
- Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated and drained
- Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if subsoiled, completely removing the root inhibiting soil layer
- Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Prime farmland if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance
- Farmland of local importance
- Farmland of unique importance
- Not rated or not available

Soil Rating Lines

- Not prime farmland
- All areas are prime farmland
- Prime farmland if drained
- Prime farmland if protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated
- Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated and drained
- Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if subsoiled, completely removing the root inhibiting soil layer
- Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Prime farmland if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance
- Farmland of local importance
- Farmland of unique importance
- Not rated or not available

Soil Rating Points

- Not prime farmland
- All areas are prime farmland
- Prime farmland if drained
- Prime farmland if protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated
- Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated and drained
- Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if subsoiled, completely removing the root inhibiting soil layer
- Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Prime farmland if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance
- Farmland of local importance
- Farmland of unique importance
- Not rated or not available

Water Features

MAP INFORMATION

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Henrys Fork Area, Utah-Wyoming, Parts of: Daggett and Summit Counties, Utah and Sweetwater and Uinta Counties, Wyoming
Survey Area Data: Version 9, Mar 29, 2011

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 27, 2010—Sep 20, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Farmland Classification

Farmland Classification— Summary by Map Unit — Henrys Fork Area, Utah-Wyoming, Parts of: Daggett and Summit Counties, Utah and Sweetwater and Uinta Counties, Wyoming (WY638)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
104	Blackhall-Rentsac complex, 6 to 25 percent slopes	Not prime farmland	31.8	2.3%
120	Dollard-Moyerson complex, 6 to 25 percent slopes	Not prime farmland	58.4	4.2%
125	Goslin fine sandy loam, 3 to 6 percent slopes	Not prime farmland	274.5	19.5%
126	Goslin fine sandy loam, 6 to 10 percent slopes	Not prime farmland	242.5	17.3%
152	McFadden fine sandy loam, 0 to 6 percent slopes	Not prime farmland	171.0	12.2%
153	McFadden fine sandy loam, 6 to 10 percent slopes	Not prime farmland	54.4	3.9%
161	Poposhia loam, 0 to 3 percent slopes	Not prime farmland	26.1	1.9%
162	Poposhia loam, 3 to 6 percent slopes	Not prime farmland	1.8	0.1%
163	Poposhia loam, 6 to 10 percent slopes	Not prime farmland	32.9	2.3%
164	Poposhia clay loam, 0 to 3 percent slopes	Not prime farmland	197.8	14.1%
165	Poposhia clay loam, 3 to 6 percent slopes	Not prime farmland	53.5	3.8%
168	Redcreek-Blackhall-Rock outcrop complex, 6 to 35 percent slopes	Not prime farmland	244.8	17.4%
169	Rentsac very channery sandy loam-Rentsac channery sandy loam-Rock outcrop complex, 20 to 35 percent slopes	Not prime farmland	14.9	1.1%
Totals for Area of Interest			**1,404.3**	**100.0%**

Description

Farmland classification identifies map units as prime farmland, farmland of statewide importance, farmland of local importance, or unique farmland. It identifies the location and extent of the soils that are best suited to food, feed, fiber, forage, and oilseed crops. NRCS policy and procedures on prime and unique farmlands are published in the "Federal Register," Vol. 43, No. 21, January 31, 1978.

Rating Options

Aggregation Method: No Aggregation Necessary

Tie-break Rule: Lower

Appendix F

Habitat Replacement Plan

Appendix F

Habitat Replacement Plan

Habitat Replacement Plan for the Sheep Creek Irrigation Company Cedar Hollow Piping Project (Daggett County, Utah)

Final Report Dated:

Aug 8, 2013

Prepared by: Vincent Barthels, Biologist
J-U-B ENGINEERS, Inc.
W. 422 Riverside, Suite 304
Spokane, WA 99201
(509) 458-3727 (Office)
(509) 951-9564 (Cell)
vbarthels@jub.com

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Habitat Replacement Site Description: 4
Habitat Replacement Site - Existing Conditions and Land Use: 4
Habitat Replacement Site - Current HQS and THV: 5
Habitat Replacement Site Management Concerns: 5
Habitat Replacement Site Prescribed Enhancements: 5
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Functional Comparison (current conditions vs. anticipated design) 10
General Maintenance and Monitoring: 13
Conclusion: 13
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APPENDICES

Appendix A - Maps, Diagrams, and Supporting Information

1. Vicinity Map
2. Project Summary Exhibit
3. Planting Details
4. Typical Perimeter Fence (4-wire) Design
5. Exclusionary Fencing Design
6. Perching Pole Detail

Appendix B - Habitat Replacement Evaluation and Supplementary Information

1. Reclamation Habitat Assessment Protocol
2. Total Habitat Value (THV) Letter Report [dated 4-1-13]
3. USBR verification letter [dated 4-16-13]
4. Conservation Easement Agreement between Ned Brady & Sheep Creek Irrigation Company

Appendix C - Photo Inventory

Appendix D - Biological Cost Opinion

Introduction:

The Bureau of Reclamation (USBR) has programmed the use of federal funds, under their Salinity Program, to allow the project proponent (i.e. Sheep Creek Irrigation Company) to replace approximately 27,977 linear feet of the Cedar Hollow Irrigation Lateral with a pipeline. The proposed Salinity Reduction Project is scheduled to commence during the winter of 2013/2014 and should be completed by April 2014. This irrigation infrastructure project is estimated to reduce the salinity loading into the Colorado River Basin by a cumulative total of 2,220 tons annually. Replacing this open, unlined, earthen, canal with buried HDPE pipe would also reduce the amount of water lost through seepage along this canal, improving the efficiency of the water delivery system in the project service area.

This report was authorized by the project sponsor, Sheep Creek Irrigation Company, to develop a Habitat Replacement Plan (HRP) strategy for the Cedar Hollow Salinity Project located in Daggett County, Utah and portions of Sweetwater County, Wyoming. The development of an approved HRP is a USBR requirement under their Salinity Program, in accordance with Public Law 98-569. The objective of this HRP is to meet or exceed the USBR's requirements for Habitat Replacement.

Habitat Replacement Requirements:

This report documents the potential impacts on wildlife habitat value from the proposed desalinization project. USBR has developed a standardized habitat assessment protocol named "Basin-wide Salinity Control Program: Procedures for Habitat Replacement" (USBR 2013). USBR's protocol takes into account ten separate categories (e.g. vegetative diversity and water supply) to rate habitat quality (scores range between 0 and 10) and uses a standard formula to determine the Total Habitat Value (THV). The formula equates to THV = Area (in acres) X Habitat Quality Score (HQS).

In determining the THV correlated to the Cedar Hollow Project, the project action area was visited and rated according to the aforementioned USBR assessment protocol. The canal lateral area was calculated based on the length of the canal proposed to be piped, multiplied by the average channel width below the ordinary high water mark. The HQSs were generated based on site visits conducted by biologist Vincent Barthels (project consultant with JUB), on March 13th and 14th, 2013. The final calculated THV for the Cedar Hollow lateral, associated with impacts correlated to "artificial riparian habitat," is presented in Table 1.

Table 1: Calculated THV for the Sheep Creek Irrigation Company Salinity Reduction Project.

Sheep Creek Irrigation Company Projects	Total Habitat Value (THV)
Cedar Hollow Piping Project	**15.36**

The Total Habitat Value (THV) for the canal replacement activities equates to 15.36 for the proposed project. The calculated THV was submitted to the USBR and a letter of concurrence or verification was received on April 16th, 2013 (see Appendix B).

Habitat Replacement Site Description:

The first two exhibits (located in Appendix A) illustrate the location of the 6.65 acre Habitat Replacement Site (HRS) that is located in Section 23, Township 3 North, Range 19 East in Daggett County, Utah. *Description of the Eco-regions of the United States* describes the proposed HRS as being situated in an Intermountain Semi-desert Province (Bailey 1995). Soils throughout the HRS consist of sandy loams and silty clays.

The HRS ranges between 6,540 and 6,580 feet above sea level. Vegetation within HRS consists of Baltic rush, arrow-grass, cattails, salt grass, sedges, musk thistles, common sunflowers, white-top, poison hemlock, common mullein, rabbit-foot brush, foxtail barley, knapweed, greasewood, and Russian olives. The HRS can be characterized as a sloped wetland. Consistent with the Cowardin's (1979) ecological classification system, the HRS would be characterized as a **PEM1C** (palustrine, emergent, persistent, seasonal) wetland feature.

Habitat Replacement Site - Existing Conditions and Land Use:

The potential HRS has been grazed by cattle for several consecutive years, which has damaged a large percentage of the woody vegetative assemblages and emergent hydrophytic vegetation that had historically functioned within this wetland area. Intensive cattle grazing in this area is likely a contributing factor to weedy species recruitment (e.g. poison hemlock, thistle, white-top and knapweed), as well as to the trampling/stressing of the herbaceous understory and woody vegetative cover.

Due to observed degradation of vegetative assemblages, this site in its entirety can be characterized as "somewhat disturbed" and containing low to moderate quality functioning habitat. The ecological value and functions of the mesic (sloped) wetland

and immediately adjacent buffer areas could easily be enhanced by implementing prescriptive measures discussed in later portions of this document.

Habitat Replacement Site - Current HQS and THV:

The 6.65-acre HRS contains a sloped wetland feature. Consistent with the USBR's Habitat Assessment Protocol (discussed on page 3 of this plan), the acreage correlated to the HRS and the current or baseline HQS for the HRS are presented in Table 2.

Table 2: Calculated Area and baseline HQS for the HRS.

Feature contained within the Habitat Replacement Site (HRS)	Area (in acres)	Baseline Habitat Quality Score (HQS)
Sloped Wetland	6.65	2.8

Based on the numbers presented in Table 2, the current or baseline THV of the HRS equates to:

Baseline THV of the HRS = 6.65 X 2.8 = 18.6

Habitat Replacement Site Management Concerns:

A conservation easement will be secured with Ned H. Brady, private property owner working in cooperation with Sheep Creek Irrigation Company to implement this HRP. A copy of the conservation easement agreement will be located in Appendix B (Item # 4).

Habitat Replacement Site Prescribed Enhancements:

The crux of this report is to detail some of the potential habitat enhancements (e.g. wildlife friendly fencing; installing and restoring native woody vegetation/re-plantings; allocating a permanent water supply; installation of a perching pole, and noxious weed and grazing management) that can be incorporated into the habitat replacement strategy. The primary goal of this HRP is to provide sufficient data to applicable regulatory agencies to enable them to make informed decisions regarding the viability of the proposed site improvements. As part of this process, a site assessment was conducted to determine the current physical characteristics of the site. These characteristics were then contrasted with a set of enhancement and improvement alternatives. The work culminated in the formulation of specific prescriptive measures

geared toward enhancing the natural site conditions, thereby, improving the THV of the HRS.

This HRP illustrates the proposed implementation of well-planned restoration measures that will result in the development of a biologically capable and enhanced HRS that can provide functional wildlife habitat.

Proposed Action:

The Sheep Creek Irrigation Company is proposing to enhance the HRS into a better functioning sloped wetland feature. The local needs that are driving the proposed action are discussed in greater detail in the subsequent sections.

Open space

The HRS is surrounded by agricultural uses. Agricultural uses have had impacts on open space and marginal riparian and wetland areas in the vicinity. Open spaces provide habitat for native plants and animals that cannot live in disturbed environments. Additionally, the preservation of open space benefits the environment by combating air pollution, attenuating noise, controlling wind, providing erosion control and moderating temperatures. Open space also protects surface and ground water resources by filtering trash, debris, and chemical pollutants before they enter a water system. Open space preservation promotes sustainable land uses. As part of this proposed action, the property will be modified to include 6.65-acres of enhanced open space that will support a diverse and native vegetative community. The property will be preserved in perpetuity (or at least 50 years) and restricted from human development.

Wildlife habitat

The sloped wetland feature contained within the HRS provides suitable habitat components for many wildlife species. This site is planned to be modified to provide a diverse habitat for wildlife, including: birds of prey (raptors), California quail, cottontail rabbits, deer, elk, wild turkey, and many small mammals. The elimination of grazing, coupled with noxious weed control, the implementation of dedicated irrigation waters and native re-plantings will allow for the establishment of higher quality forage opportunities and overall habitat.

This site should serve to provide refuge for an increased number of individual species that are currently being driven out by the current agricultural land use. As part of this proposed action, wildlife habitat on the property will be enhanced and preserved, which will help attenuate habitat losses associated with the proposed piping project within the general vicinity.

Limitation established for the HRS

1. Motorized vehicles will be prohibited in the HRS. Posted signs detailing this limitation will be installed near the three gates providing access into the HRS.
2. Livestock grazing is prohibited within the HRS, except for utilizing specific livestock (e.g. goats) to target weedy species removal (e.g. white-top or knapweed).

Enhancement efforts

Baseline existing conditions are discussed throughout this document and are illustrated in the photo inventory (see Appendix C). The existing conditions have been compared to a series of enhancement alternatives. The following recommended enhancement measures are intended to support a benefit to wildlife habitat.

The following seven activities are expected as part of the proposed HRS improvements:

1. Site investigation and development of the supporting reports;
2. Installation of wildlife-friendly fencing surrounding the perimeter of the HRS and a perching pole near the northern end of the HRS;
3. Allocation of a dedicated water supply;
4. Eliminating grazing - grazing management;
5. Implementation of weed control measures;
6. Restoration of a native plant community including eradication of Russian olives; and,
7. Data collection and annual biological monitoring for the first 5 years post implementation of the HRS.

A feasible construction window for this type of site development activity is estimated at 30 days; however, it is suspected that development would not occur over a continual 30-day period, but in stages over several years, to allow for the site's successional development and to reduce the impact on wildlife.

The subsequent portions of this HRP provide detail centered on the individual enhancements elements or components.

Fencing

The perimeter fencing efforts should be completed in Year 1 of this project. Approximately 3,400 linear feet of wildlife friendly fence and 3 gates will be installed surrounding the entire HRS. Based on the preferences of the land owners, 4-wire wildlife friendly fence will be installed around the perimeter of the HRS (see Typical Perimeter Fence (4-wire) Designs in Appendix A). These wildlife friendly fences are designed to prohibit cattle from entering and grazing this area. Should livestock inadvertently enter the HRS, they should be removed immediately by directing the livestock to one of the three gates as a means of exit.

In addition to the more permanent perimeter fencing, temporary wire mesh exclusion fencing will be placed around dense clusters of woody vegetation plantings to prohibit excessive wildlife browsing, and to aid in the acclimation and survival of the plantings (see Exclusionary Fence Designs in Appendix A). The exclusionary fencing can be utilized and shifted throughout the site as needed.

Perching Pole

The perching pole should be installed during Year 1. The installation of the pole should follow the specifications outlined in the detail sheet (see Perching Pole Detail in Appendix A).

Dedicated water supply

The first and most critical component of this plan involves the dedication and installation of an irrigation system. The irrigation system will include: two parallel two-inch irrigation lines, with rainbirds installed and evenly spaced every 60 feet (see Project Summary Map in Appendix A). The irrigation waters will be supplied by a combination of ten water shares, all of which will be purchased for the duration of the easement agreement. Additionally, yearly maintenance for the water system will be accounted for by Sheep Creek Irrigation Company.

Signage

Signage will be installed surrounding the HRS to inform the public that this area is designated as a HRS, and that off-road vehicles are prohibited within the site.

Restoration of a native vegetative community

This project implements 300 re-plantings. Four specific species are recommended for the re-plantings; all of which are native to Daggett County. The planting schedule (Table 3) prescribes 160 stake plantings and 140 total five-gallon shrubs or trees. The re-planting enhancement recommendations are intended to create a functioning wetland and adjacent buffer area.

Prior to installing any of the re-plantings on this site, the plan is to install the perimeter fencing and dedicated irrigation system. In addition the first year will include extrication of the existing Russian olives. Approximately 300 Russian olives are planned for removal from the site. One of the overarching goals of this HRP is to limit Russian olive recruitment in the HRS and to encourage the establishment of native vegetation.

It should be noted that the re-plantings should be installed in phases to ensure the least amount of mortality, the maximum regeneration potential, and to assess annual planting success. During Year 1, approximately 50% of the proposed plantings should be installed; then, in Year 2 an additional 30% of the plants should be installed; and, finally, in Year 3 the remaining 20% of the total recommended plantings should be installed on site.

Planting quantities, placement and species selection will be modified contingent on the success of the plantings installed in previous years, coupled with the regeneration of the existing vegetative assemblages. The Project Summary Exhibit (see Appendix A) illustrates the general location of the prescribed re-plantings.

Table 3: Recommended Plant Schedule.

Common Name	Scientific Name	Quantities (Size)
Buffaloberry	*Shepherdia argentea*	40 (5-gallon or large nursery sized)
Narrow-leaf cottonwood	*Populus angustifolia*	60 (5-gallon or large nursery sized)
Coyote willow	*Salix exigua*	160 stake plantings (1/2" minimum diameter)
Woods rose	*Rosa woodsii*	40 (5-gallon or large nursery sized)
These species are recommended based on native flora documented adjacent to the project area. Only native plants should be utilized.		

Due to potential drought in this area, the vegetation should be planted late in the growing season (mid-September to late-October).

Planting protocol

All plants should be laid out in their designated areas. Holes should be dug in a square shape that measures twice the size of the plant's container (see Appendix A - Planting Details). The sides of the hole must be scored so that the roots have an increased chance of traveling outside the hole. The roots of the plant should be loosened slightly, and then placed in the hole in an upright position that is level with the ground surface. A fertilizer packet should then be applied to each root ball. The shrub re-plantings are to be no smaller than 5-gallon nursery size. It is highly recommended that plant stock of mature size be obtained, where feasible, to maximize the survivability of the transplant. Groupings of installed 5-gallon nursery sized plantings shall receive temporary exclusionary fencing (see Typical Detail in Appendix A), which should offer some protection from wildlife browsing for the first few years after the plantings are installed. After at least one year post installation, and after the plants are given an opportunity to acclimate to the new setting, the temporary exclusionary fencing may be taken down, re-used on the site, and/or removed from the site.

Every 5-gallon nursery sized planting should receive two inches of water applied, by hand, directly after planting is complete. When these steps have been completed, a representative from J-U-B ENGINEERS, Inc. or Sheep Creek Irrigation Company will visit the site for a final walk through (as-built) inspection and will document successful implementation.

Specific instructions for the planting of the wetland seed mix (Baltic rush and salt grass) or stake plantings (i.e. coyote willows) can be referenced on the Planting Detail Sheet, respectively (see Appendix A).

Post-construction, an "as-built" report shall be developed. For this project, five continuous years of annual monitoring is recommended post construction. Monitoring efforts are discussed in further detail in a later section of this report.

Functional Comparison (current conditions vs. anticipated design):

In accordance with the USBR's established evaluation protocol, by rating the existing 6.65-acre property's functions and comparing it to the anticipated improvements, the HRS should endure a HQS increase of 2.5 points. The overall functional score of the enhanced area will increase based on the establishment of the following characteristics:

- Increased native vegetation diversity, overall health and stratification;
- Decreased prevalence of noxious weeds and Russian olives;
- Installation of a perching pole;
- Dedicated water supply; and,
- Measurably less human and livestock engagement on the property.

Table 4 illustrates the HQSs before and after construction of the HRS. Scoring comparisons for each of the Habitat Evaluation parameters are provided below.

Table 4: Summary of Habitat Quality Scores; pre and post construction of the HRS.

Habitat Status	Vegetative Diversity	Stratification	Native Species vs. Nonnative Species	Noxious Weeds	Overall Vegetative Condition/Health	Interspersion of Open Water with Vegetation	Connectivity	Uniqueness or Abundance	Water Supply	Alteration	Overall HQS
Pre-Construction	3	3	4	4	2	2	3	2	4	1	2.8
Post-Construction	5	6	7	7	5	4	7	5	4	3	5.3

Table 5 illustrates the net effect in terms of HQSs and provides a summary of the predicted THV for the impacted project areas, as well as, the HRS.

Table 5: Summary of Calculated Values: Net Effect of HQSs and THV.

Feature	Area (in acres)	HQS before project (baseline score)	Anticipated Habitat Quality Score (HQS) 5 years post project implementation	Net HQS	Net Effect to the Total Habitat Value (THV)
Project disturbance area	3.84	4.0	N/A	N/A	15.36
Sloped wetland feature	6.65	2.8	5.3	+2.5	16.63

In terms of THV, the project impacts equate to -15.36; whereas the project enhancements equate to +16.63. Based on the estimated THV illustrated in Table 5, this HRP would produce a relatively small surplus of THV at the HRS, which equates to 1.27 = (16.63 - 15.36).

Likelihood of long-term success

Based upon previous designs of similar nature, the proposed enhancement plan has a high probability of successfully promoting a higher functioning habitat for waterfowl, resident birds, ungulates and aquatic life. Generally speaking, habitat values would be increased based on vegetative structure enhancements, increases in overall richness of native herbaceous and shrub species, and the decrease of undesired weedy species. Dedicated irrigation waters will help to ensure the success of the proposed new native re-plantings.

General Monitoring and Maintenance:

To maintain a healthy living environment for re-plantings, the irrigation system will provide a reliable source of water. The goal is to establish an 80% survival rate for the first five years after planting. Plants that die during this period will be removed and replaced. The Biological Cost Opinion incorporates a "replanting contingency budget" (see Appendix D).

To ensure a higher probability of the success for the new plantings, a minimum of five years of monitoring efforts is recommended. An initial photo inventory of the constructed site should be recorded from six to eight representative photo points. The

status of the property should be summarized in a yearly report, with photos taken annually from the established photo points, beginning one year after the completion of the fencing component of this plan. Sheep Creek Irrigation Company or their designated authorized agent shall produce an annual monitoring report and submit it to the USBR's Environmental Group no later than December 15th of each applicable year.

After the trees and shrubs have been established for a period of no less than five years, the site will be considered part of the zero landscape area, meaning additional monitoring or maintenance efforts will no longer be warranted. At the applicable time, a detailed planting plan (construction designs) shall be completed prior to any site development activities.

Noxious weeds onsite will be identified and eliminated using the recommended herbicide protocol outlined in AquamasterTM herbicide. AquamasterTM herbicide (by Monsanto) is the herbicide selected for this specific application. AquamasterTM is a non-selective, glyphosate [N-(phosphonomethyl) glycine], aquatic herbicide that controls emerged vegetation in environments where water is present. AquaMasterTM is highly effective on more than 190 species of emerged weeds, including a wide range of annual and perennial grasses, broadleaf weeds and sedges. It works in most aquatic settings better than other weed control options, because it offers application flexibility and has favorable environmental characteristics. Further, when AquamasterTM is applied according to label directions, water use restrictions are limited to applications within ½ mile of potable surface water sources. AquamasterTM must be purchased and applied by a Utah State Licensed Applicator. Treatment applications must be in accordance to the labeled directions, established by Monsanto. Areas where noxious weeds are eliminated in high densities (i.e. > 1,000 square feet) will be re-seeded with native grass seed mix (i.e., salt grass and Baltic rush) towards the end of the growing season.

AquamasterTM herbicide shall also be used in concert with the eradication of the Russian olive trees. Russian olive trees shall be cut down with a chain saw. Immediately following the cutting, AquamasterTM herbicide shall be applied to the remaining stump of the trunk. Cut portions of the Russian olives shall be hauled away from the HRS. Removal of the cut trees should be completed in a fashion that limits any portions (especially seeds) from remaining on the HRS.

Once this plan has been approved by the USBR, all of the aforementioned general monitoring and maintenance measures discussed within the final plan will be entirely budgeted for, financed, and implemented by Sheep Creek Irrigation Company. Sheep Creek Irrigation Company is committed to five years of monitoring and long-term maintenance measures for the life of the project or 50 years (until 2063).

Conclusion:

This HRP has been developed consistent with the Salinity Control Program Requirements, managed by USBR. The plan enhances an area that encompasses approximately 6.65-acres. The HRS is estimated to yield a total habitat value (THV) increase of 16.63 [5 years post project implementation], which is 1.27 more than what is required for the Cedar Hollow Piping Project that Sheep Creek Irrigation Company is proposing.

The elimination of livestock grazing; the installation of perimeter fencing, 300 re-plantings, and a perching pole; the dedication of an irrigation system; coupled with the clearing of the noxious weeds and Russian olives, will provide a more ecologically rich site with a more diverse native vegetative community. Functionally, the 6.65-acre site will increase the wildlife habitat potential, ultimately providing habitat for resident birds, waterfowl, ungulates, small mammals and other native plant species.

By summing the aforementioned project attributes it is evident that this project will yield beneficial effects to the natural environment, specifically to the vegetative communities and the sloped wetland area that currently exist. If you have any further questions or concerns, please contact me at 509-458-3727 or via email at vbarthels@jub.com.

Respectfully submitted by:

Vincent Barthels, Biologist

J-U-B ENGINEERS, Inc.

References Cited:

Bailey, R.G. 1995. Description of the Eco-regions of the United States. 2d ed. rev. and expanded (1st ed. 1980). Misc. Publ. No. 1391 (rev.), Washington, DC: USDA Forest Service. 108 p.

Bureau of Reclamation (USBR). March 2013. Basin-wide Salinity Control Program: Procedures for Habitat Replacement. U.S. Department of the Interior.

USBR. 2012. Hancock-State Road Salinity Reduction Project, Uintah and Duchesne Counties, Utah. Final Environmental Assessment. U.S. Department of the Interior. Bureau of Reclamation. Upper Colorado Region. Salt Lake City, Utah.

Cowardin, L.M., V. Carter, F.C. Golet and E.T. LaRue. 1979. Classification of Wetlands and Deepwater Habitats of the United States. FWS/OBS-79/31. U.S. Fish and Wildlife Service.

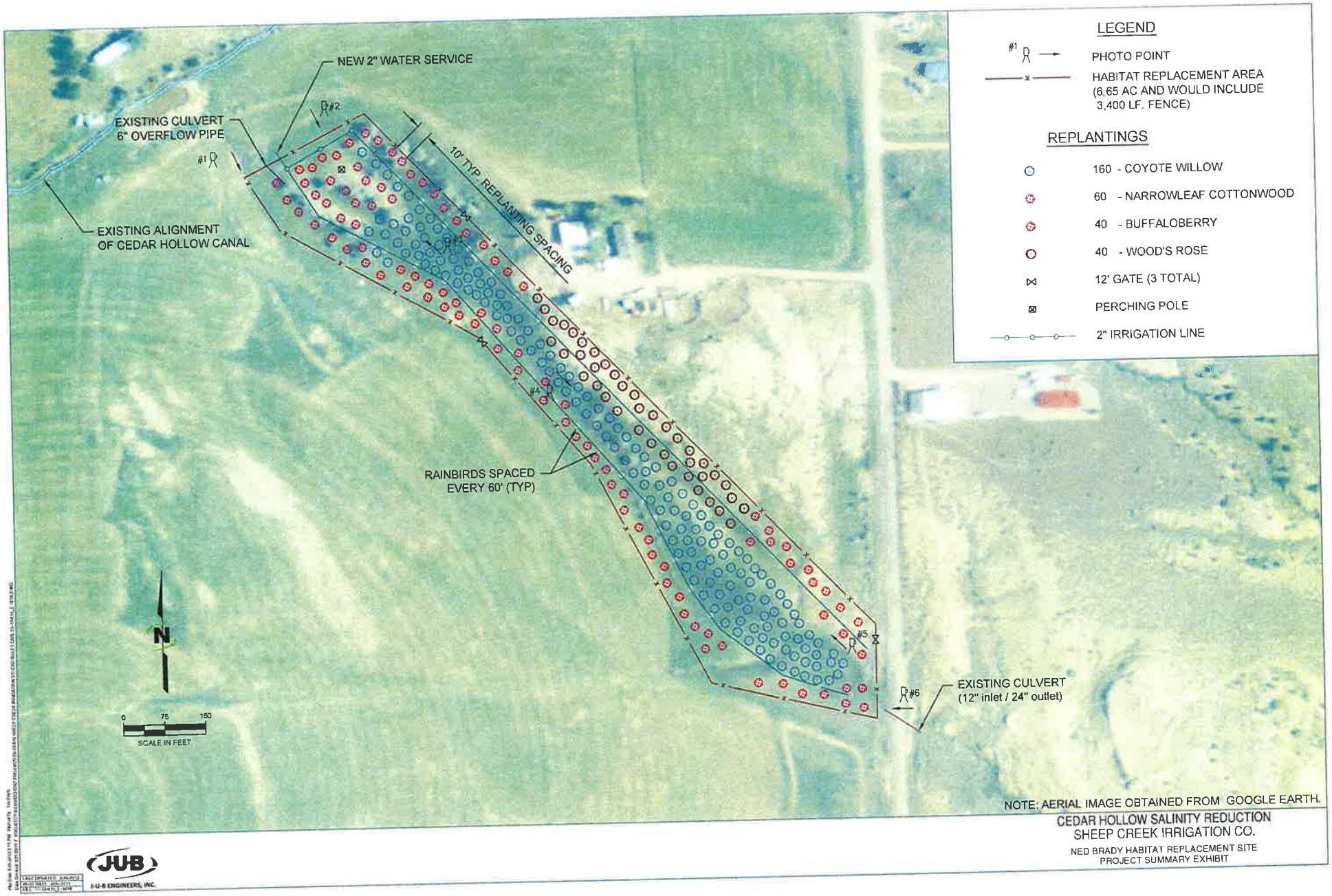
Hanophy, Wendy. 2009. Fencing with wildlife in mind. Colorado Division of Wildlife, Denver, CO. 36 pp.

APPENDIX A

Cedar Hollow Lateral Salinity Control Project Habitat Replacement Site Vicinity Map

Projection: NAD 83 State Plane Utah North

J·U·B ENGINEERS, INC.

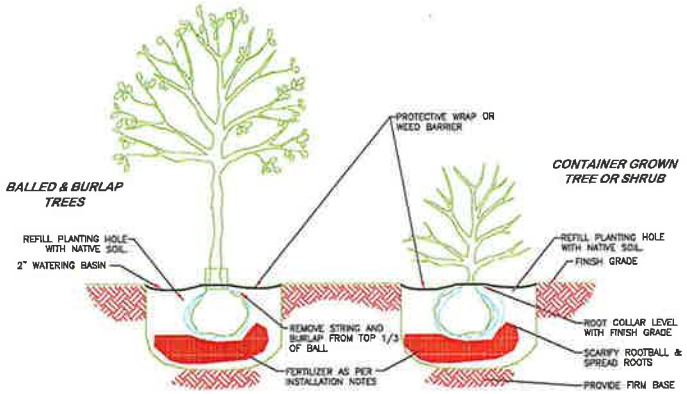


NOTE: AERIAL IMAGE OBTAINED FROM GOOGLE EARTH.

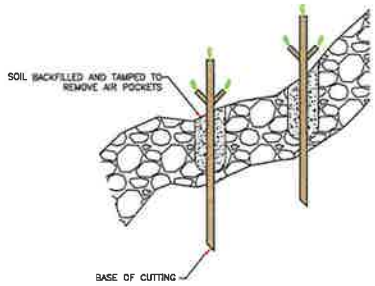
CEDAR HOLLOW SALINITY REDUCTION
SHEEP CREEK IRRIGATION CO.

NED BRADY HABITAT REPLACEMENT SITE
PROJECT SUMMARY EXHIBIT

JUB
J-U-B ENGINEERS, INC.



SHRUB & TREE
PLANTING DETAIL
NOT TO SCALE



WILLOW STAKE
PLANTING DETAIL
NOT TO SCALE

INSTALLATION NOTES:

1. ALL PLANTING AND SITE PREPARATION OPERATIONS SHALL BE CONDUCTED ACCORDING TO AMERICAN NURSERYMAN'S ASSOCIATION GUIDELINES.
2. ALL PLANT MATERIALS SHALL BE NATIVE TO THE UTAH REGION. PLANT MATERIAL SHALL BE FROM NATIVE STOCK, NO CULTIVARS OR HORTICULTURAL VARIETIES WILL BE ALLOWED.
3. ALL PLANT MATERIAL SCHEDULED FOR INSTALLATION WILL BE IDENTIFIED IN THE PLANT SCHEDULE FOR THIS PROJECT. PROPOSALS FOR SUBSTITUTIONS REQUIRE THE APPROVAL OF THE PROJECT BIOLOGIST.
4. THE REQUIREMENTS OF ALL NURSERY GROWN PLANT MATERIALS ARE IDENTIFIED IN THE PLANT SCHEDULE AND SHALL BE CONTAINERIZED, OR BALLED AND BURLAPPED. ONLY SOUND, HEALTHY, VIGOROUS PLANTS, FREE OF DEFECTS, DISEASED, AND ALL FORMS OF INFESTATIONS WILL BE ACCEPTED.
5. DIG, PACK, TRANSPORT, AND HANDLE ALL PLANTS WITH CARE TO ENSURE PROTECTION FROM INJURY. STORE PLANTS IN THE MANNER NECESSARY TO ACCOMMODATE THEIR HORTICULTURAL REQUIREMENTS. HEEL-IN PLANTS IF NECESSARY TO KEEP THEM FROM DRYING OUT.
6. TREES AND SHRUBS SHALL BE KEPT SATURATED AND SHADED UNTIL THE ACTUAL TIME OF INSTALLATION. DO NOT ALLOW PLANTINGS TO DRY OUT OR SIT IN THE SUN PRIOR TO OR DURING INSTALLATION. IMMEDIATELY SATURATE REPLANTINGS AFTER PLANTING TO AVOID CAPILLARY STRESS.
7. EXCAVATE CIRCULAR PLANTING PITS WITH VERTICAL SIDES AND INSTALL PLANTS AS SHOWN IN THE ENHANCEMENT AREA DETAILS. BACKFILL EXCAVATED PITS WITH NATIVE SOIL.
8. A PROTECTIVE WRAP OR WEED BARRIER SHALL BE PLACED IN A 3 FT RADIUS AT THE TREE TRUNK. THIS WILL DISCOURAGE COMPETETION AMONGST OTHER PLANT SPECIES.
9. INSTALL TRANSPLANTER TYPE FERTILIZER, SUCH AS OSMOCOTE SLOW RELEASE FERTILIZER (16-16-16 ANALYSIS) OR EQUAL. APPLICATION RATE SHALL BE AS SPECIFIED BY THE MANUFACTURER. FERTILIZER WILL BE ALLOWED IN PLANTING PITS ONLY.

INSTALLATION NOTES:

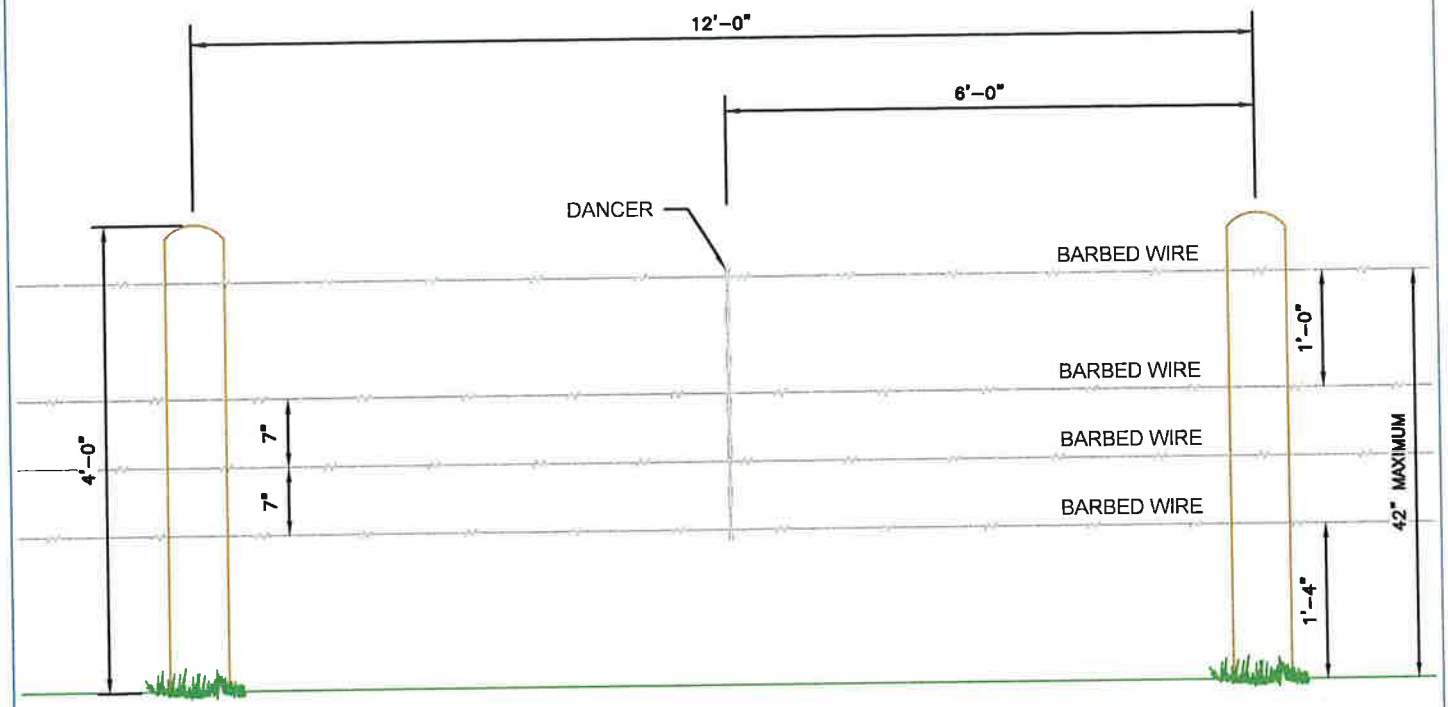
1. LARGE DIAMETER CUTTINGS OR STAKES SHOULD BE AT LEAST 1/2" IN DIAMETER.
2. TERMINAL BUD ON EACH CUTTING SHALL BE REMOVED.
3. CUTTING SHALL HAVE 2/3 OF TOTAL LENGTH PLANTED BELOW GROUND. 4 TO 6 BUDS SHALL BE UNDERGROUND AND 2 TO 3 BUDS ABOVE GROUND ON EACH CUTTING. BASE OF CUTTING SHALL EXTEND INTO GROUNDWATER.
4. SOIL SHALL BE TAMPED AROUND EACH CUTTING TO ENSURE NO AIR POCKETS REMAIN AROUND CUTTING.
5. CUTTINGS OR STAKES SHALL BE SOAKED AT LEAST 24 HOURS, BUT NOT MORE THAN 7 DAYS, PRIOR TO PLANTING.

GRASS SEED NOTE:

1. WHEN RESEEDING WETLAND BARREN LOCATION IN THE HRS UTILIZE ANY COMBINATION OF BALTIC RUSH AND SALT GRASS (*Juncus balticus* AND *Distichlis stricta* RESPECTIVELY) AT A DISPERSAL RATE OF 60 LBS/ACRE.

JUB

SHEEP CREEK IRRIGATION COMPANY
HABITAT REPLACEMENT PLAN
PLANTING DETAILS

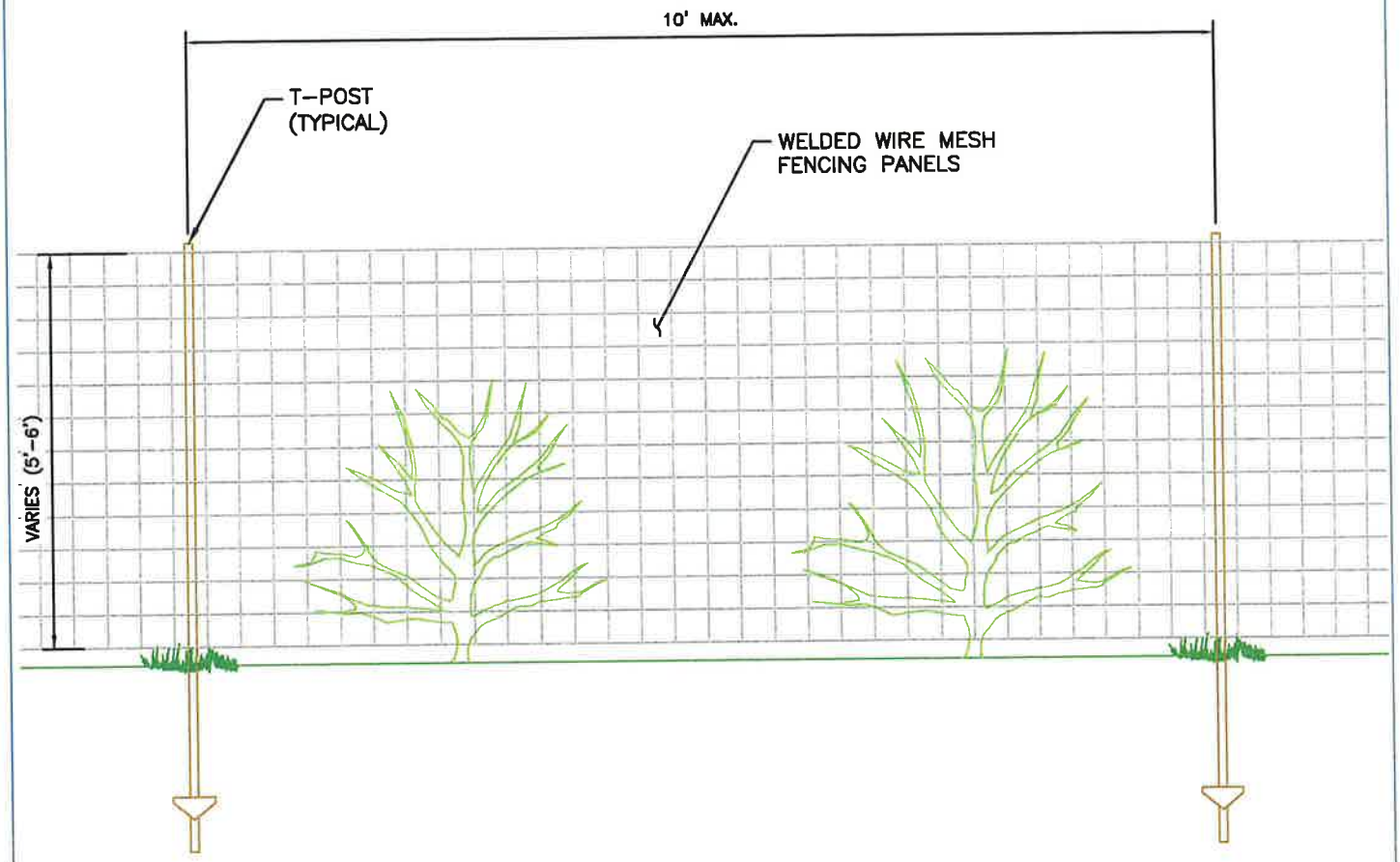


NOTE:
TYPICAL FENCE DESIGN MODELED FROM HANOPHY'S (2009) IDEAL WILDLIFE – FRIENDLY FENCE DETAIL.

REFERENCE CITED:
HANOPHY, WENDY. 2009. FENCING WITH WILDLIFE IN MIND. COLORADO DIVISION OF WILDLIFE, DENVER, CO. 36 pp.

J·U·B
Environmental Group
CAD FILE: 55-11-040_E-101_Fence Detail

SHEEP CREEK IRRIGATION COMPANY
HABITAT REPLACEMENT PLAN
TYPICAL PERIMETER FENCE (4-WIRE) DESIGN

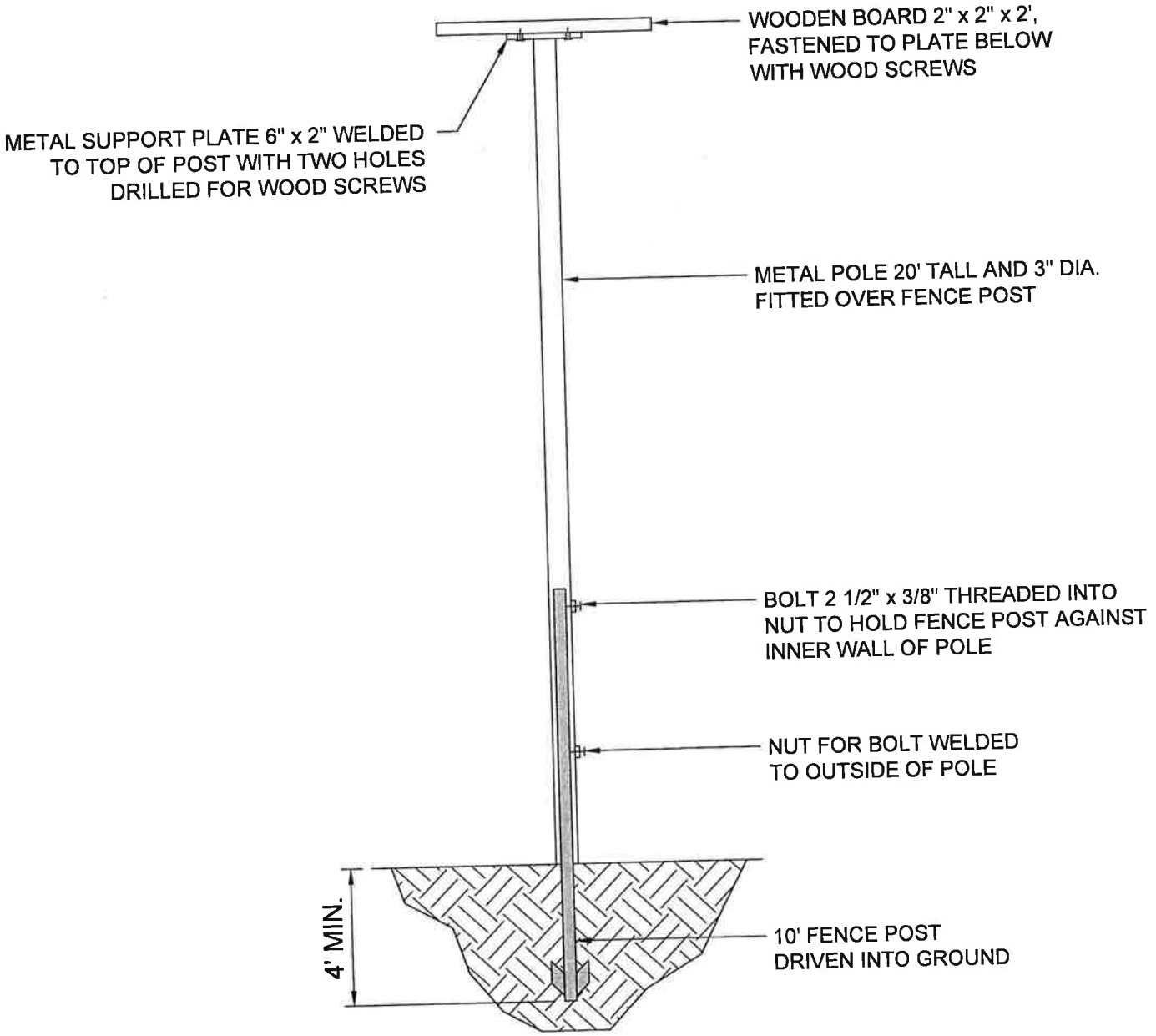


NOTE:
TYPICAL FENCE DESIGN YIELDS PANELS WITH WIRE DIAMETER (3-6mm) AND MESH (50-80mm x 50-80mm).

J·U·B
• Environmental Group •

CAD FILE: 55-11-040_E-101_Fence Detail

SHEEP CREEK IRRIGATION COMPANY
HABITAT REPLACEMENT PLAN
TYPICAL EXCLUSIONARY FENCE DESIGN



NOTES:

1. PERCH SHOULD BE ASSEMBLED IN A WORKSHOP ACCORDING TO THIS DIAGRAM. THE 2' LENGTH OF 2" x 2" UNTREATED PINE BOARD SHOULD BE BOLTED TO THE 6" PIECE OF FLAT METAL THAT HAS BEEN ARC WELDED TO ONE END OF THE METAL POLE. TWO HOLES 1/2" IN DIAMETER SHOULD BE DRILLED IN THE POLE APPROXIMATELY 18" AND 48" FROM THE BOTTOM. NUTS FOR THE 2 1/2" x 3/8" BOLTS SHOULD BE ARC WELDED TO THE OUTSIDE OF THE POLE IN ALIGNMENT WITH THESE HOLES.

2. TO INSTALL THE POLE, DRIVE THE FENCE POST ABOUT HALF WAY INTO THE GROUND, MAKING SURE IT IS VERTICAL. FIT THE POLE OF THE BIRD PERCH OVER THE POLE, WITH THE POST INSIDE THE POLE. THE POLE SHOULD REST ON THE GROUND BUT NOT BE DRIVEN INTO THE GROUND. COAT THE NUTS WITH GREASE OR OTHER PRODUCT TO PREVENT RUST, AND THEN INSERT THE TWO BOLTS INTO THE NUTS AND TIGHTEN THE BOLTS AGAINST THE POST; THE POST MAY HAVE TO BE ROTATED SO THAT THE BOLTS REST AGAINST A FLAT PORTION OF THE POST.

CEDAR HOLLOW SALINITY REDUCTION
SHEEP CREEK IRRIGATION CO.

NED BRADY HABITAT REPLACEMENT SITE
PERCHING POLE DETAIL

LAST UPDATED: 6/21/2013
PLOT DATE: 6/21/2013
FILE: 85-13-015_E-101X

J-U-B ENGINEERS, INC.

APPENDIX B

J-U-B COMPANIES | THE LANGDON GROUP | GATEWAY MAPPING INC.

J·U·B ENGINEERS, INC.

April 1, 2013

U.S. Department of the Interior
Bureau of Reclamation
302 East 1860 South
Provo, Utah 84606
ATTN: Jeff D'Agostino, Environmental Group Chief

RE: Sheep Creek Irrigation Company Cedar Hollow Piping Project – Concurrence Request linked to habitat replacement needs.

Mr. D'Agostino:

The intent of this letter is to serve three primary purposes, which include: (1) to provide the Bureau of Reclamation (BOR) a detailed project narrative for the proposed Sheep Creek Irrigation Company Cedar Hollow Piping Project; (2) to quantify the anticipated habitat replacement requirements correlated to the Cedar Hollow Piping Project; and, (3) to request concurrence from the BOR with regard to the quantified total habitat value (THV) units estimated for the Cedar Hollow Piping Project.

Project narrative:
The proposed Sheep Creek Irrigation Company piping project is located nearest the Town of Manila, Utah. It is scheduled to commence during the winter of 2013 / 2014 and should be completed by April 2014. This project involves piping approximately 27,977 linear feet of the Cedar Hollow irrigation lateral, which is currently an open and unlined conveyance channel or ditch. Based on a recent survey (2013) conducted by J-U-B ENGINEERS, Inc., the average width (i.e. ordinary high water mark (OHWM) to OHWM) of the Cedar Hollow lateral equates to 5.98 feet. This project is estimated to reduce the salinity loading into the Colorado River Basin by a cumulative total of 2,220 tons annually. The proposed piping alignment is illustrated on the attached project summary exhibit.

The Cedar Hollow lateral is proposed to be piped with HDPE pipe ranging in size from 34" to 12" in diameter. The piping would initiate at the existing intake structure; minor modifications to the intake structure are required to transition into the new pipe. This project does not include constructing a new water impoundment structure. The installation of the piping would include: demolition of all existing canal structures, excavation, backfilling, and surface restoration to install the pipe. Also included in the project is installation of all standpipes, air valve assemblies, drains, valves and other incidental items associated with piping the existing lateral. Existing turnouts will be maintained, which yields a total of 9 turnouts along the new pipeline alignment. Turnouts include construction of concrete dissipation boxes, installation of valves, air/vacs, owner furnished meters and electrical equipment, and all other appurtenances associated with the project. The project will also include backfilling the existing lateral with native material. After re-grading the lateral to match adjacent grades, disturbed or barren soils will be seeded with a native upland grass seed mix at a rate of at least 40 lbs of seed per acre.

a 422 W. Riverside, Suite 304, Spokane, WA 99201 *p* 509 458 3727 *f* 509 458 3762 *w* www.jub.com

United States Department of the Interior

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

RECEIVED
APR 18 2013
J-U-B ENGINEERS INC

IN REPLY REFER TO:

PRO-776
ENV-4.00

APR 16 2013

Mr. Vincent Barthels
Biologist, Environmental Group
J-U-B Engineers, Inc.
422 West Riverside Avenue, Suite 304
Spokane, WA 99201

Subject: Habitat Replacement Requirements for the 2013/2014 Sheep Creek Irrigation Company Cedar Hollow Lateral Salinity Control Project – Daggett County, Utah and Sweetwater County, Wyoming

Dear Mr. Barthels:

The Provo Area Office understands that the proposed Sheep Creek Irrigation Company piping project is scheduled to commence the winter of 2013/2014 and should be completed by April 2014. This irrigation infrastructure improvement project would reduce the amount of water lost through seepage along the Cedar Hollow lateral and subsequently reduce the salinity loading of the Colorado River Basin by an estimated total of 2,200 tons annually. This project should improve the efficiency of the water delivery system in the project service area by replacing approximately 5.4 linear miles of open, unlined, earthen, irrigation canal with buried HDPE pipe.

Based on the information presented in your letter dated April 1, 2013, Reclamation concurs with the total habitat value (THV) of 15.36 credits quantified for the proposed Cedar Hollow lateral project. Reclamation looks forward to working in cooperation with the Sheep Creek Irrigation Company to review a Habitat Replacement Plan that will adequately address and compensate for the loss of 15.36 units of THV.

Should you have any questions or comments, please contact Mr. Bryson Code at 801-379-1185 or by e-mail at bcode@usbr.gov.

Sincerely,

for

Jeffrey D'Agostino
Chief, Environmental Group

cc: Brian Deeter, P.E.
J-U-B Project Manager
466 North 900 West
Kaysville, UT 84037

Mr. Ned Brady
President, Sheep Creek
Irrigation Company
P.O. Box 303
Manila, UT 84046

Evaluating habitat impacts and habitat replacement needs:

The anticipated action area was systematically walked and/or driven on March 13th and 14th, 2013, by Vincent Barthels, Biologist, from J-U-B ENGINEERS, Inc., to assess and rate the habitat conditions. During the site visits, irrigation waters were not actively diverted into the lateral; nonetheless, the OHWM was determined based on physical criteria (e.g. evident scour lines, water staining, and vegetative transitions). The adjacent photo illustrates the Cedar Hollow lateral near the middle of the proposed piping alignment; this segment of the lateral traverses through the north end of the Town of Manila.

This letter report documents the potential impacts on wildlife habitat value from the proposed desalinization project. The BOR has developed a standardized habitat assessment protocol (dated: March 2013), named "Evaluating habitat impacts and avoidance options Habitat Replacement for Salinity Control Projects." BOR's protocol takes into account ten separate categories (e.g. vegetative diversity and water supply) to rate habitat quality (scores range between 0 & 10) and uses a standard formula to determine the Total Habitat Value (THV). The formula equates to THV = Area (in acres) X the net change in Habitat Quality Scores (HQS).

The "Area" for the proposed project = 27,977' X 5.98' = 167,302.46 square feet = 3.84 acres

Table 1 summarizes the areas and HQS for the Cedar Hollow lateral. The canal lateral Area was calculated based on the length of the canal proposed to be piped multiplied by the average channel width below the OHWMs. The HQS was determined for the entire lateral based on scoring the entire designated Area.

Table 1: Summary of Habitat Quality Scores for the Cedar Hollow Lateral.

Riparian Feature	Vegetative Diversity	Stratification	Native Species vs. Nonnative Species	Noxious Weeds	Overall Vegetative Condition/Health	Interspersion of Open Water with Vegetation	Connectivity	Uniqueness or Abundance	Water Supply	Alteration	Overall HQS
Cedar Hollow Irrigation Canal	4	6	4	7	5	1	3	4	4	2	4.0

THV Units = 3.84 acres (Area) X 4.0 (HQS) = 15.36.

No adjacent fringe wetlands were identified that are anticipated to be impacted by the proposed project. Based on the proposed project action combined with the BOR's standardized evaluation protocol, **the Cedar Hollow lateral piping project should require 15.36 THV units.**

If you concur with the calculated THV for the proposed Cedar Hollow lateral project, please offer Sheep Creek Irrigation Company or J-U-B ENGINEERS, Inc. (the project consultant) a brief letter to this effect.

I greatly appreciate your time and expertise and look forward to hearing from you soon in regard to this matter. If you have any questions regarding this concurrence request, please do not hesitate to contact me. I can be reached at vbarthels@jub.com or on my office phone at 509-458-3727.

Sincerely,

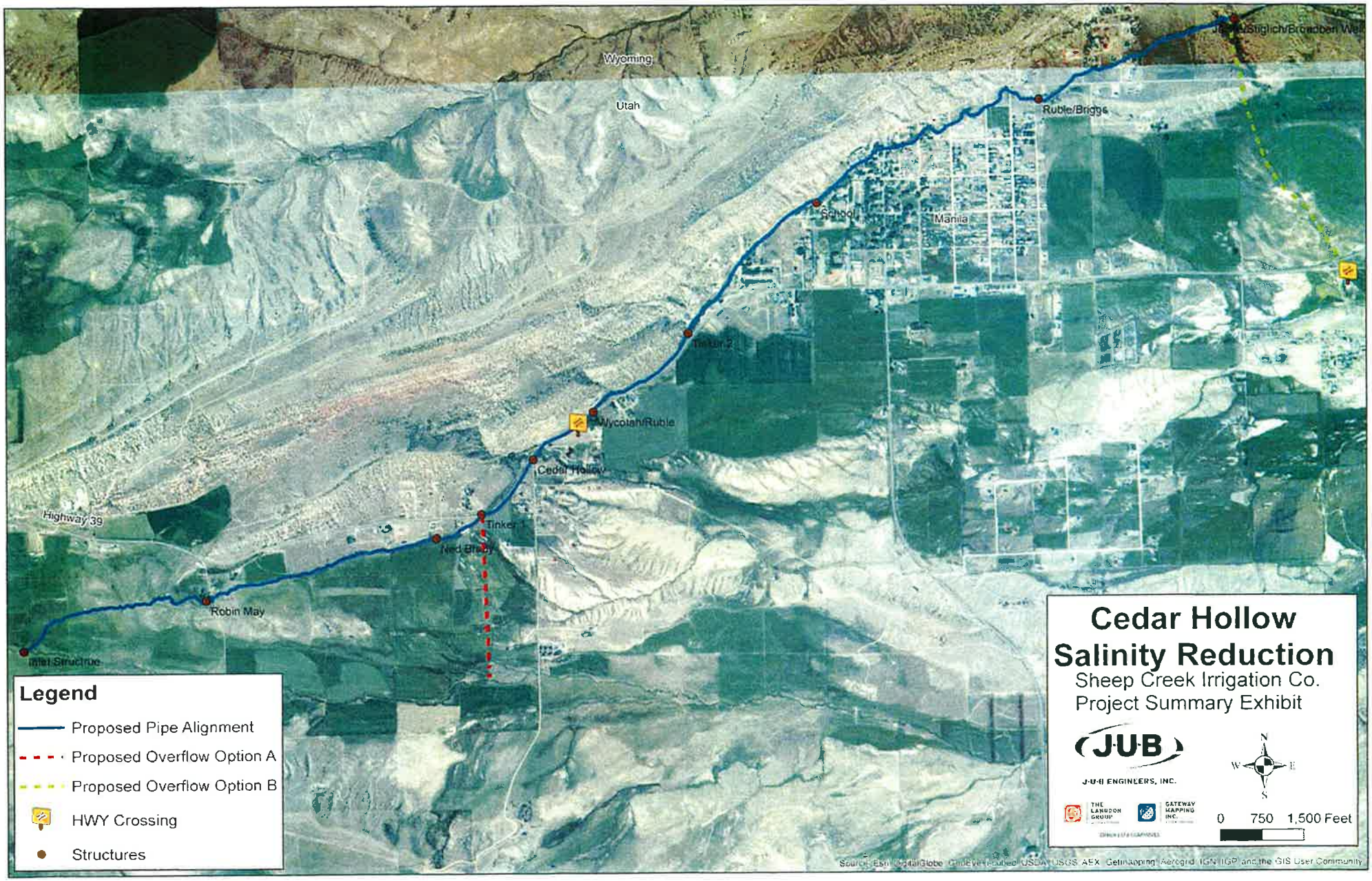
4-1-13

Vincent Barthels, Biologist
J-U-B ENGINEERS, Inc.

List of Attachment:

1. Project Summary Exhibit

C: Brian Deeter, P.E., J-U-B Project Manager – w/ attachments
Ned Brady, President of Sheep Creek Irrigation Company – w/ attachments


Wyoming
Utah
Ruble/Briggs
School
Manila
Tinker 2
Wycolah/Ruble
Cedar Hollow
Highway 39
Tinker 1
Ned Brady
Robin May
Inlet Structrue
Legend
Proposed Pipe Alignment
Proposed Overflow Option A
Proposed Overflow Option B
HWY Crossing
Structures
Cedar Hollow
Salinity Reduction
Sheep Creek Irrigation Co.
Project Summary Exhibit
J-U-B ENGINEERS, INC.
THE LANDON GROUP
GATEWAY MAPPING INC.
N
W
E
S
0 750 1,500 Feet

APPENDIX C

Photo Inventory

The following six photos were taken on March 14th, 2013.

Photo 1: This photo illustrates the North West corner of the Habitat Replacement Site (HRS). An existing 6" overflow pipe, stemming from the stock/irrigation pond toward the north, enters the HRS at this location.

Photo 2: This photo illustrates the north central look of the HRS. All of the trees in the foreground are Russian olives. Approximately 300 Russian olive trees are planned to be removed from this site. The perching pole will be installed 100 feet from this pink flag.

Photo 3: This is a photo of the central portion of the HRS. Intensive cattle grazing in this area is evident. Baltic rush, salt grass, arrow-grass and scattered sedges dominant the herbaceous stratum within the HRS.

Photo 4: This shows a different view of the central portion of the HRP. The southern portion of the HRS lacks any woody vegetation, except for some greasewood on the outer most peripheries.

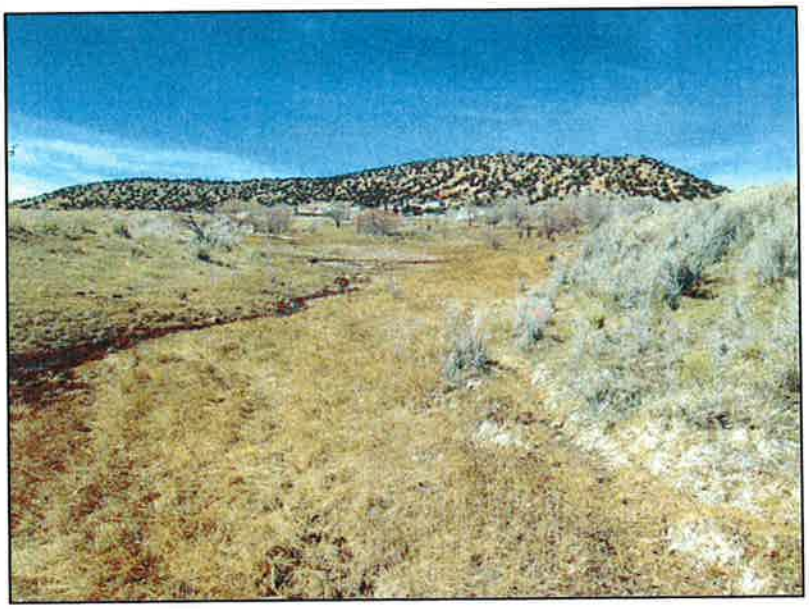


Photo 5: This is a picture of the southern end of the HRS. Greasewood is present on the right side of the photo.

Photo 6: This photo shows the 12-inch outlet pipe that is located at the south end of the HRS. This pipe traverses through Bennion Lane. No modifications are proposed to this pipe.

APPENDIX D

Biological Cost Opinion for the Sheep Creek Irrigation Company 6.65 Acre proposed Habitat Replacement Site			
Enhancements	**Quantity**	**Estimated Cost per unit**	**Total Cost**
4-Wire Perimeter Fencing (Materials and Installation Labor)	3,400	$4 per LF	$13,600
12' metal corral panel gate (Materials and Installation Labor)	3	$150 per gate	$450
Exclusionary Fencing; includes mesh panels and metal T-posts (Materials and Installation Labor)	250 LF	Total sum for materials and installation	$1,500
Fencing (Maintenance)	50 years	$125 per year	$6,250
Irrigation System (Materials and Installation Labor)	2,800 LF	$3.50 per ft.	$9,800
Irrigation System Maintenance	50 years	$100 per year	$5,000
Dedicated Water Shares	10 Shares	$860.00 per year	$43,000
Coyote Willow Stake Plantings and Installation Labor	160	$5	$800
Narrowleaf Cottonwood Plantings and Installation Labor	60	$50	$3,000
Buffaloberry Plantings and Installation Labor	40	$50	$2,000
Wood's Rose Plantings and Installation Labor	40	$50	$2,000
Replanting Contingency	1	(20% of total planting budget)	$1,560
Weed Control (annual)- Materials and Labor	5 years	$800 per year	$4,000
Removal of Russian Olive trees	1	Lump sum	$2,000
Biological monitoring and development of yearly reports	5 years	$1,500 per year	$5,000
Fence replacement	3,400	$4 per LF	$13,600
Land Lease to Sheep Creek Irrigation Company	50 years	Total sum	$33,750
		Grand Total	**$147,310**

Appendix G

Public Involvement Report

Cedar Hollow Lateral
Public Involvement Summary

Public Involvement (PI) efforts have been a key component of the environmental study. Numerous property owners along the canal will be affected by proposed piping and covering of the existing open canal channel. Trees, vegetation, landscaping features and other vertical obstructions (fences, bridges, retaining walls, structures, etc.) on private property within the canal easement will potentially be affected by project design and construction. The project team has worked to inform and engage the local community and address concerns through one-on-one visits, group meetings and informational fliers posted around town and on city and county websites and newsletters.

Public Outreach Activities (March 2013 – July 2013)

Meeting with Manila Town Officials (March 5, 2013) – The project team held an informational meeting with officials of the Sheep Creek Irrigation Company, mayor and municipal staff of the Town of Manila to explain the project's scope, schedule and environmental study process.

Door-to-Door Visits, Information Flier Delivery (March 5 and 14, 2013) – Door-to-door visits were conducted in an effort to make personal contact with all property owners adjacent to the canal through Manila. Andy Neff of The Langdon Group visited with residents, business owners and school officials to explain the project and answer questions. Andy spoke with approximately 20 property owners and delivered approximately 60 informational fliers.

Community/Web Posts (March 2013) - The information flier was posted at town hall, county courthouse and post office. The flier was also provided to Manila for posting to its town website and to Daggett County for posting to its website and newsletter.

Manila Town Council and Informal Stakeholder Meeting (March 14, 2013) – J-U-B Project Manager, Brian Deeter, and Andy Neff attended the Manila Town Council meeting to provide a project update and field questions. Following the presentation, Brian and Andy met informally with residents in a "mini open house" setting to further explain project scope, schedule and expected impacts and to receive public input. About 15 residents attended this information session.

Individual Stakeholder Meetings and Phone/Email Contacts (March 2013 – July 2103) - The project information flier distributed throughout the community included Andy's contact phone number and email address. Andy has fielded inquiries and requests for information from citizens throughout the environmental study. Individual meetings have been scheduled as requested on-site with property owners to discuss concerns related to property impacts. Many of the residences along the canal are seasonal homes so making personal contact has been a challenge. The project team has made efforts to contact seasonal home owners and inform them of the project.

One-on-one field meetings were scheduled with individual property owners on July 10, 2013 to provide a design update and address property impact concerns. Brian Deeter and J-U-B design engineer, Jon Frazier, conducted these visits as they walked the project corridor. They also made an effort to contact affected property owners by knocking doors.

Stakeholder Concerns

- Drainage – The open canal channel has historically served as a storm drain feature for Manila. It is located at the base of hills above town and aids in the collection and drainage of storm water run-off. Some town officials and residents are concerned when the canal is piped and covered that flooding and potential property and street damage may become an issue during heavy storm run-off.
- Landscaping – Several residents adjacent to the canal have expressed concerns about the loss of trees, vegetation, berms and other landscape features they've added to their property within the canal easement. Others are concerned that trees and vegetation near the canal that currently receive water lost from the canal through seepage will not survive when the water source is enclosed in pipes. Other residents are concerned with the loss of aesthetics and recreational opportunities they have enjoyed on their properties for many years with the open water feature the canal provides.
- Utilities and Private Crossings – Several residents have notified the project team of buried utility lines that may be affected by excavation for pipe installation. Some residential driveways and streets will also affected by these activities.