MARCH 1997

BILLY SHAW DAM AND RESERVOIR

Environmental Assessment and Finding of No Signficant Impacts DOE/EA-1167

BONNEVILLE POWER ADMINISTRATION

DISCLAIMER

U. S. DEPARTMENT OF ENERGY
Bonneville Power Administration

Billy Shaw Dam and Reservoir
Finding of No Significant Impacts (FONSI)

Summary: This notice announces BPA's decision to fund the construction, operation, and maintenance of the Billy Shaw Dam and Reservoir on the Duck Valley Reservation. This project is part of a continuing effort to address system-wide fish and wildlife losses caused by the development of the hydropower system in the Columbia River Basin. BPA has prepared an Environmental Assessment (EA) (DOE/EA-1167) evaluating the potential environmental impacts of the proposed project. Based on the analysis in the EA, BPA has determined that the Proposed Action is not a major Federal action significantly affecting the quality of the human environment, within the meaning of the National Environmental Policy Act (NEPA) of 1969. Therefore, the preparation of an Environmental Impact Statement (EIS) is not required and BPA is issuing this FONSI.

ADDRESS: For additional copies of this EA/FONSI, please call BPA's toll-free document request line: 800-622-4520.

FOR FURTHER INFORMATION, CONTACT: Kathy Fisher - ECN, Bonneville Power Administration, P.O. Box 3621, Portland, Oregon, 97208-3621, phone number 503-230-4375, fax number 503-230-5699.

SUPPLEMENTARY INFORMATION: Under provisions of the Pacific Northwest Electric Power Planning and Conservation Act of 1980 (Act), BPA protects, mitigates, and enhances fish and wildlife and their habitats affected by the construction and operation of the Federal hydroelectric system in the Columbia River Basin. This is accomplished through funding of measures that are consistent with the Northwest Power Planning Council's (Council) Fish and Wildlife Program and other purposes of the Act [16 U.S.C. 839b(h)(10)(A)]. The site-specific fish and wildlife mitigation projects that BPA funds are intended to help reach the Council's mitigation goals and are "in addition to, not in lieu of, other expenditures authorized or required from other entities under other agreements or provisions of law."

The Proposed Action is for BPA to fund the construction and operation of the Billy Shaw Dam and Reservoir (Project) on the Duck Valley Reservation (Reservation). It is consistent with the objectives of the Council's Program goals and satisfies the Council's recommendation to implement an additional lake fishery at Coyote Sink on the Duck Valley Reservation. Developing the Project would help BPA meet the need to provide off-site mitigation in the Duck Valley area for the loss of salmon and steelhead caused by the construction and operation of the Federal hydroelectric dams and reservoirs on the Columbia River. The No Action Alternative considered in the EA would not satisfy BPA's need to provide off-site mitigation in the Duck Valley Reservation area for salmon and steelhead.

The Project would include the construction of an earthen dam to create a reservoir in the Billy Shaw Slough on the Reservation. The water for the new reservoir would come from natural high spring flows that would be diverted from the Owyhee River at the China Diversion Dam and supplied through the Duck Valley Canal and the new Billy Shaw Feed Canal. The new reservoir would have a surface area of 174 hectares (430 acres) and volume of 3300 acre-feet. The reservoir would be stocked with trout from an existing fish hatchery.

Some environmental impacts would occur as a result of the Project, but the impacts would not be significant. Approximately 223 hectares (550 acres) of vegetation and wildlife habitat would be removed or disturbed by the Project. Approximately 174 hectares (430 acres) of suitable foraging habitat for various animal species, including federally listed bald eagles, and suitable nesting habitat for burrowing owls and pygmy rabbits would be permanently replaced by a reservoir. An additional 49 hectares (120 acres) of habitat would be temporarily disturbed by construction activities. The vegetation and habitat disturbance and removal would not be significant because similar vegetation and habitat is plentiful in the area. The impact area represents less than 3% of the Billy Shaw Slough monotypical vegetation and habitat communities.

Another vegetation related impact would be the increase in plant diversity along the reservoir shoreline. This impact would not be significant because only native plants would be used for reseeding and revegetating disturbed areas. This would prevent non-native plants from being introduced into the local area by the Project.

Soil disturbance from construction and maintenance activities would increase the risk of erosion. However, the impact would not be significant because it would be limited to localized increases in erosion and runoff.

Although foraging habitat for bald or golden eagles would be replaced by the new reservoir, the reservoir may contribute to increased site use by bald or golden eagles, especially at the reservoir or riparian fringe areas. No other threatened or endangered wildlife are known to occur within the area. Impacts to the bald eagle would not be significant because similar foraging opportunities are plentiful in the area. Increased site utilization by bald or golden eagles would not significantly impact any other wildlife resource.

The addition of the reservoir would increase the amount of fish habitat in the area. The Project design and location would prevent the reservoir fish from leaving the reservoir so there would be no impacts to other aquatic environments.

Approximately 1.2 hectares (3 acres) of intermittent wetlands would be permanently replaced by the reservoir. The impacts would not be significant because the wetlands are not part of a complete and interrelated wetland area. New wetlands and riparian areas would naturally develop in shallow areas around the reservoir perimeter and would offset the loss of the existing intermittent wetlands.

The Project would be developed within an area prone to spring flooding from the Owyhee River. The Project would reduce seasonal flooding below the dam site and would alter normal runoff patterns. No impacts to lives or property would occur because no facilities or habitation exist within the area.

Impacts from construction activities on visual resources, employment and economic opportunities, air quality, and public health and safety would be minor and of short duration. After project construction, the reservoir would attract additional wildlife and diversify the viewing opportunities in the valley.

The location of the Project borrow site was not identified in the EA because it is not known at this time. However, impacts to vegetation, wildlife, and cultural resources would not be significant because preconstruction surveys would be conducted if an undeveloped borrow site is selected for use. If the surveys determine the presence of sensitive resources such as endangered species or historic properties, then the borrow site would either be relocated or appropriate mitigation measures would be applied to ensure any impacts are at a level below significant.

As stated in *Chapter IV - Permit Requirements and Contacts* of the EA, the Project is subject to certain regulatory requirements. A permit to fill in wetlands under Section 404 of the Clean Water Act would be required. The Nevada Division of Environmental Protection may require a *letter of water quality certification* or a *rolling stock water pollution control permit*. The U. S. Army Corps of Engineers would require an Impoundment Permit for the emplacement of the reservoir. In accordance with the National Historic Preservation Act, a Class III cultural resources survey was conducted and found no significant resources. The Nevada State Historic Preservation Officer concurred in a letter dated June 17, 1996 that the Project site was not eligible for the National Register of Historic Places. In accordance with the requirements of the Fish and Wildlife Coordination Act, the U. S. Fish and Wildlife Service (USFWS) was consulted about this Project. The Project is consistent with the Endangered Species Act because the EA confirmed that no plant or animal species federally listed as threatened or endangered would be adversely affected by the Project.

Floodplain Statement of Findings: This is a Floodplain Statement of Findings prepared in accordance with 10 C.F.R. Part 1022. A Notice of Floodplain and Wetlands Involvement was published in the *Federal Register* on May 17, 1996 and a floodplain and wetlands assessment was incorporated in the EA. BPA proposes to fund the construction of an earth dam and reservoir in the Billy Shaw Slough of the Duck Valley Reservation near Owyhee, Nevada. The Proposed Action would be located in the floodplain because that area offers the topographical qualities needed to fill and maintain a permanent reservoir. The alternative to the Proposed Action, the No Action Alternative, would not satisfy BPA's need to provide off-site mitigation on the Duck Valley Reservation for the loss of salmon and steelhead. The Proposed Action conforms to applicable State or local floodplain protection standards.

Preliminary designs for the spillway and outlet works of the dam included the small dam criteria available from the U. S. Department of Agriculture Natural Resources Conservation Services (NRCS). The inflow design floods were computed based upon NRCS, Idaho Department of Water Resources, and Nevada Division of Water Resources criteria for structures of this size and hazard classification. Although studies indicated that a probable maximum flood event could be stored without the use of the spillway, an emergency spillway would be included in the plan. These design considerations would minimize any potential harm to the floodplain should a significant flood event occur. Also, the downstream hazard classification for the reservoir site is

flood event occur. Also, the downstream hazard classification for the reservoir site is considered low because no permanent or temporary human habitation or permanent property development lies in the floodplain downstream from the proposed damsite.

BPA will endeavor to allow 15 days of public review after publication of this statement of findings before implementing the Proposed Action.

Determination: Based on the information in the EA, as summarized here, BPA determines that the Proposed Action is not a major Federal action significantly affecting the quality of the human environment within the meaning of NEPA, 42 U.S.C. 4321 et seq. Therefore, an EIS will not be prepared and BPA is issuing this FONSI.

Issued in Portland, Oregon, on March 3, 1997.

Alexandra B. Smith

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Chapter I - Need for and Purpose of Action

1.1 Introduction

Development of the hydropower system in the Columbia River Basin has harmed many species of fish and wildlife. The Northwest Power Act calls upon the Northwest Power Planning Council (Council) to include measures in its Columbia River Basin Fish and Wildlife Program (Program) to address system-wide fish and wildlife losses. The Act further states that the Council may include in its Program measures that provide off-site mitigation; that is, mitigation off of the site(s) of the hydro project(s) that caused the need to mitigate. The Program includes a goal "to recover and preserve the health of native resident fish injured by the hydropower system, where feasibile, and, where appropriate, to use resident fish to mitigate for anadromous fish losses in the system." The Council receives and reviews proposals to mitigate for salmon and steelhead losses and refers approved measures to BPA for funding.

Under the Council's Fish and Wildlife Program, the Shoshone-Paiute Tribes of the Duck Valley Reservation (Tribes) requested and received funds from BPA to study the feasibility of developing a lake fishery on the Reservation. The feasibility study is complete and the Tribes are now asking BPA to fund construction of a reservoir and development of the lake fishery. The new lake fishery would provide off-site mitigation for the loss of the salmon and steelhead caused by the Federal hydropower system.

1.2 Underlying Need for Action

The construction and operation of the system of federal hydroelectric dams and reservoirs on the Snake and Columbia rivers adversely affected anadromous and resident fish, including related spawning grounds and habitat. BPA needs to provide off-site mitigation in the Duck Valley area for these system-wide affects. To meet this need in a manner consistent with the objectives of the Council's Program, BPA is considering a proposal to fund the design, construction, and management of the Billy Shaw Dam and Reservior on the Duck Valley Reservation of Idaho and Nevada.

1.3 Purposes (Objectives or Decision Factors)

Objectives to consider in deciding how to best meet this need are:

1) Consistent with the Council's Program;
   - complement the existing and future activities of the Federal and the region's State fish and wildlife agencies and appropriate Indian tribes.
   - utilize, where equally effective alternative means of achieving the same sound biological objective exist, the alternative with the minimum economic cost.
   - consistent with the legal rights of appropriate Indian tribes in the region.
2) Provide a reservoir sufficient to support a trout fishery;

3) Enhance fish, wildlife and migratory waterfowl habitat on the Duck Valley Reservation;

4) Avoid or minimize possible adverse environmental impacts.

Chapter II - Proposed Action and Alternatives

2.1 Proposed Action

The Proposed Action is for BPA to fund the design, construction, operation, and maintenance of the Billy Shaw Dam and Reservoir (Project).

2.1.1 Project Location and Existing Uses

The Project site is located within the Billy Shaw Slough which occupies approximately 98 km^2 (38 mi^2) in the south-central portion of the Duck Valley Reservation. The Billy Shaw Slough is an intermittent stream which flows northward in a wide, gently sloped drainage channel in moderately dissected alluvial terrain that has not been developed for agriculture. Intermittent stream drainages trend generally northward in channels, joining the Owyhee River about 8 km (5 mi) to the north of the proposed Project site. The Project would be located about 11 km (7 mi) west of the town of Owyhee and west/southwest of the Owyhee Airport. The legal description of the site is Section 15, T47N, R1E. A location map is included inFigure 1.

2.1.2 Proposed Site Development

As proposed, the Tribe or BPA would execute a contract for the design and construction of an earthen dam with a spillway and outlet works to create a reservoir at the Billy Shaw Slough. The reservoir would be operated primarily for sport fishing and would be maintained at or near full pool (1631-m (5351 ft) elevation) year round. The reservoir would have a surface area of 174 ha (430 ac) and a volume of 3300 acre-feet. Water releases would occur through the outlet works as needed for fisheries management, operation and maintenance of the dam and facilities, or in the event of extreme flood events on the watershed immediately upstream from the reservoir. The design would include an outlet to allow almost complete emptying of the reservoir for maintenance, inspection, or fishery management purposes. A site development diagram is included in Figure 2.

The preliminary dam design estimates that the dam embankment would have a structural height of 12 m (42 ft) (9.7 m (32 ft) from the original ground surface), a length of about 914 m (3000 ft), a crest width of 6 m (20 ft), and a maximum base width of 55 m (180 ft). The upstream face of the embankments would be protected with riprap and the downstream face would be seeded with native vegetation. The reservoir, at normal pool elevation of 1631 m (5351 ft), would extend about 4 km (2.5 mi) upstream on the Billy Shaw Slough and an additional 0.8 to 1.6 km (0.5 to 1 mi) upstream on several tributaries. The side slopes are fairly gentle, with the steepest slopes on the east valley side near the proposed damsite.

Construction of the Project would involve the following activities (measurements may change slightly based on final engineering design):

- clear vegetation, roots, and debris from new construction areas and borrow sites;
- excavate, haul, mix, place, and compact earth fill in a 12 m (42 ft) high, 914 m (3000 ft) long dam, dike, and key trench (material from reservoir site);

- excavate, haul, and place rock fill, riprap, and sand and gravel in dam (material from offsite);
- excavate, backfill, and compact spillway area and place concrete, steel, and concrete pressure pipe;
- excavate, backfill, and compact outlet works area (place concrete and pipe, install two butterfly valves and operators, and construct valve-operating "tunnel" and energy dissipater);
- relocate approximately 3.2 km (2 mi) of gravel roadway (Tribal Road #3);
- construct approximately 5 km (3.2 mi) of access roads;
- construct a 0.9 m (36-in) diameter by 3.7 m (12-ft) long fish screen, gate structure, and check structure[1] on the Duck Valley Canal;
- construct rock gabions and place riprap, as needed, in the 2.4 km (1.5-mi) long Billy Shaw Feed Canal from Duck Valley Canal to Coyote Hole Reservoir and rehabilitate the downstream outlet;
- obtain approximately 29,000 m^3 (38,000 yd^3) of riprap materials from undetermined borrow sites;
- reclaim and revegetate new borrow and staging areas and vegetate recreation areas and downstream embankment of dam; and,
- stock reservoir with trout from an existing fish hatchery.

2.1.2.1 Water Supply

Due to low annual precipitation and the small Billy Shaw Slough watershed, there would not be adequate runoff to initially fill the reservoir nor to maintain a full pool during the summer months. Therefore, the natural high spring flows would be diverted from the Owyhee River at the China Diversion Dam and supplied through the Duck Valley Canal and the new Billy Shaw Feed Canal. Water flow from the Wildhorse Reservoir provides some of the Owyhee River water at the China Diversion Dam, but much of it comes from tributaries below the Wildhorse Reservoir. It is expected that the natural flows at China Diversion Dam would be sufficient to initially fill and maintain full pool of the Billy Shaw Reservoir. However, water from the Wildhorse Reservoir may occasionally be requested to maintain full pool at the Billy Shaw Reservoir.

The Wildhorse Reservoir was developed to provide irrigation water to the Duck Valley Reservation. According to the Nevada Department of Conservation and Natural Resources, Division of Wildlife (NDW), the Wildhorse Reservoir contains about 72,000 acre-feet and 2,830 surface acres of water when at full capacity. On average, the Tribe withdraws about 26,000 acre-feet per year from the Reservoir for irrigation purposes and the water level of the Reservoir drops about 5.8 m (19 feet). Average annual recharge from spring runoff to the Reservoir is 30,000 acre-feet. An agreement exists between the U.S. Forest Service and the Bureau of Indian Affairs (BIA), managing agency of the Wildhorse Reservoir, to maintain a minimum of 5,000 acre-feet of water in the Reservoir for adequate flow amounts in the Owyhee River. This amount is less than

[1] A check structure is an overflow weir placed in a canal to maintain the water surface in the canal at a fixed or designed elevation. The steady water surface from the check structures would provide a constant flow in the delivery structure for diversion of water in to Billy Shaw Slough and eventually Billy Shaw Reservoir.

the 10,000 to 15,000 acre-feet that the NDW would prefer to manage and maintain their existing fishery (B. Layton, NDW, pers. comm.).

As documented in the report *Flow Estimation of Owyhee River above Duck Valley Indian Reservation* (NRCE, 1992), the average annual gage flow of the Owyhee River above the Wildhorse Reservoir is about 31,000 acre-feet and increases to 102,300 acre-feet at the China Dam (below the Wildhorse Reservoir). Gage flow measurements indicate that much of the Owyhee River water at the China Dam comes from tributaries below the Wildhorse Reservoir. Water diversions for initial reservoir filling would occur during the spring months of April 1 through May 30 when average monthly flows at China Diversion Dam are between 25,986 and 30,915 acre-feet. The 3,300 acre-feet required for the initial filling represents approximately 11 to 13 percent of the average monthly flows at the China Diversion Dam for April and May. The percentage would decrease if the reservoir is filled over a two year period.

The filling of the reservoir could be accomplished in approximately 55 days if the maximum diversion rate is maintained. However, the Tribe may choose to fill the reservoir over a two year period to avoid or minimize requests for water withdrawals from the Wildhorse Reservoir. After initial filling, refills may be necessary to make up for evaporation and seepage losses, to perform maintenance, or to conduct management activities. The project would be designed to retard reservoir seepage loss beneath or around the dam. The soils within the embankment foundation footprint area would be stripped to about 2 feet below the ground surface on the abutments. A cutoff trench, backfilled with onsite embankment borrow materials, would extend under the entire length of the embankment. The refill rate and periods would depend on available water supply.

2.1.2.2 Billy Shaw Feed Canal

The reservoir water supply will be turned out of the Duck Valley Canal at the new Billy Shaw Feed Canal beginning in R 51 E, T 46 N, Section 2. The Billy Shaw Feed Canal would include a new canal check, fish screen, and delivery structure. The delivery structure would be located immediately upstream of the check structure and would include a gated outlet, fish screen and paddlewheel to prevent undesirable fish from entering the Billy Shaw Reservoir. The Billy Shaw Feed Canal would carry flows up to 30 cubic feet per second without causing erosion damage to the waterway. The waterway would follow a 2.4 km (1.5 mile) long drainage channel which has a gradient too steep to allow flows of this magnitude without significant damage and thus resulting in high annual maintenance costs. Following the natural channel alignment would allow the channel to be constructed with the minimum amount of excavation. Low cost drop structures, constructed from gabion units, would be located as required along the waterway until the slope of the natural channel, as it approaches Coyote Sink, would allow velocities low enough to prevent appreciable erosion.

The water supply would flow through Coyote Sink and into the upper reaches of the Billy Shaw Reservoir. The waterway could be widened at selected points along its length to provide a number of inexpensively constructed potholes for watering wildlife.

2.1.2.3 Water Rights

The United States and the Tribes believe that the Executive Orders which established and expanded the Duck Valley Reservation reserved sufficient water to effect the purposes of the

Reservation. The primary purpose of the Reservation was to establish a permanent homeland for the Tribes, including sufficient land and water to support homes, agriculture, fishing, hunting, and other activities. Water rights sufficient to establish a replacement fishery at Billy Shaw Reservoir would be included in the reserved water rights.

The Tribes and the United States, acting as the Tribes' trustee, have filed claims for water rights in ongoing water right adjudications in both Nevada and Idaho. The United States has established a Federal Water Rights Negotiation Team to assist in negotiating settlements in lieu of litigation. The federal team consists of members from the Bureau of Indian Affairs, the Bureau of Reclamation, the U. S. Fish and Wildlife Service, the Interior Department's Solicitor's Office, and the U.S. Department of Justice.

The Tribes and the United States believe that in light of the 1877 Executive Order, the Tribes hold senior water rights within the Owyhee River watershed in Nevada. The present negotiations between Tribal, State, and Federal governments and upstream water users will likely lead to a settlement which quantifies the Tribes' rights and assures sufficient water for fish and wildlife enhancement as represented by the Billy Shaw Reservoir proposal. Even if it is assumed that the Tribes' reserved water rights do not include water for a replacement fishery, there is available water during the spring flood season so that a junior state-based water right could provide water for the proposed Reservoir.

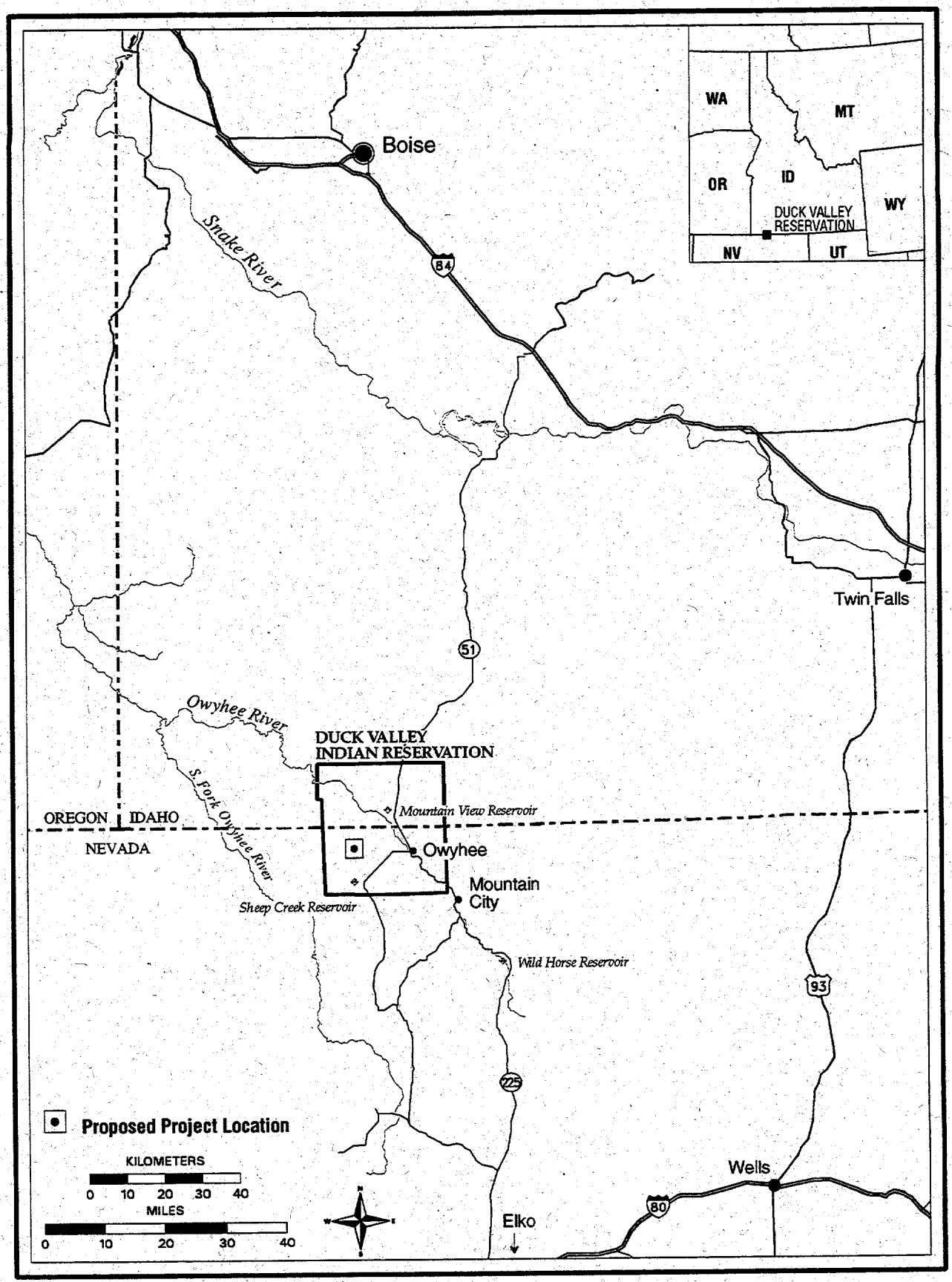

Figure 1 Project Location Map

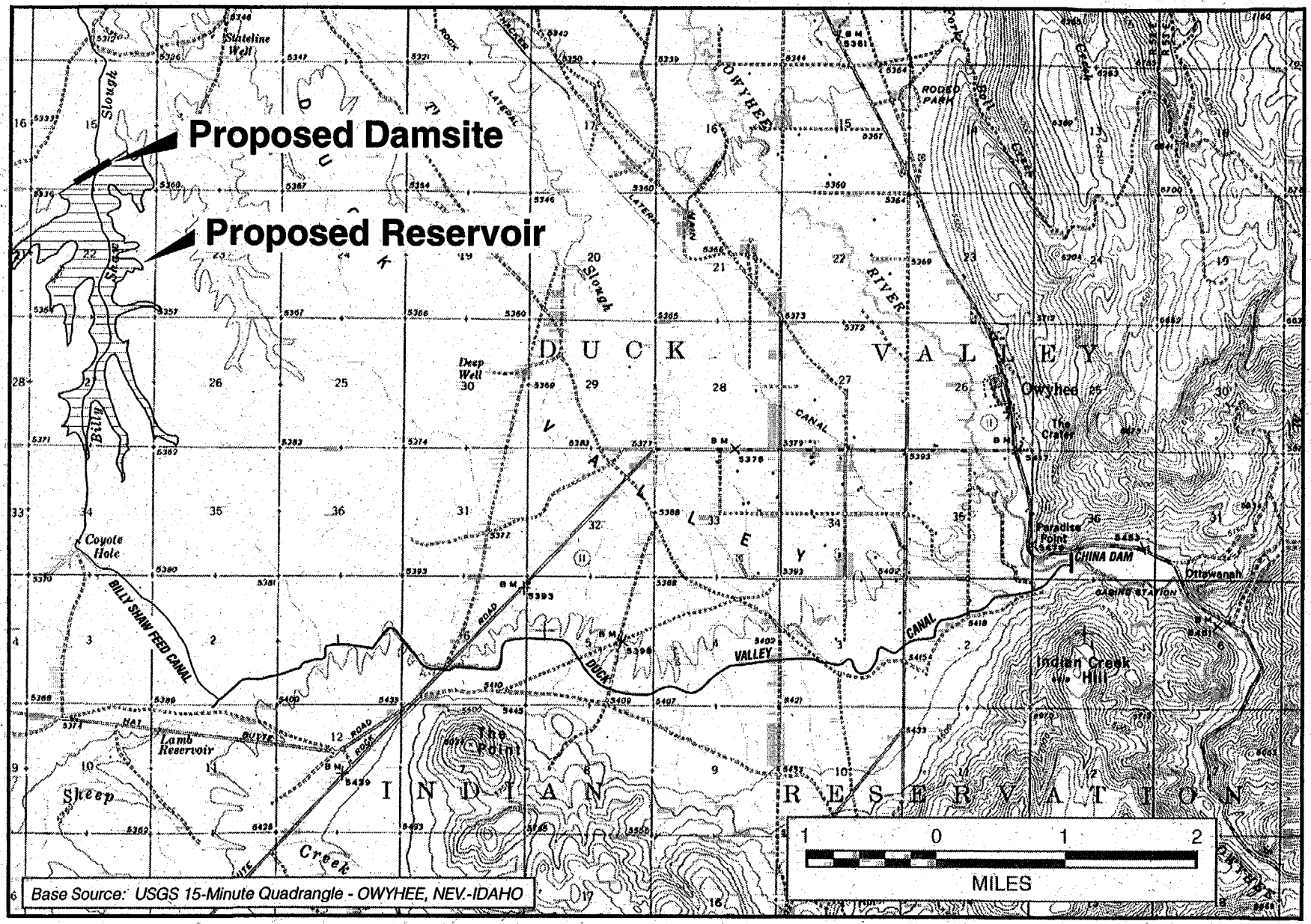

Figure 2 Site Development Plan

2.2 Alternatives Considered but Eliminated from Detailed Study

2.2.1 Alternative Site Locations

Two other sites, located within a few miles of the Billy Shaw site, were considered for development as reservoirs. The Pleasant Valley site is located 3 km (2 mi) downstream from the Billy Shaw site. The Airport site is located about 3 km (2 mi) east of the Billy Shaw site. Technically, a dam could be constructed at any of the three sites. All three sites are located in similar habitat settings, contain similar wildlife species, and have similar access needs. Therefore, the lake that would provide the best fishery was selected for detailed analysis. Fisheries experts provided depth and volume criteria, including a recommendation of a minimum water depth of 4.6 to 4.9 m (15 to 16 ft) for native species such as trout to survive in a reservoir setting.

The Pleasant Valley site was eliminated early in the study by the Tribal Council as not meeting the depth criteria provided by the fisheries experts. The results of the Airport and Billy Shaw sites comparison are shown in Table 2.1.

Table 2.1 Comparison of Reservoir Criteria

Reservoir Site	Water Surface @ 1631-m elevation (hectares)	Reservoir Capacity @ 1631-m elevation (ac-ft)	Maximum Depth (m)	% of Reservoir @ 4.6-m or greater depth (%)	Shoreline (km)
Airport	107	2000	7.6	74	16.3
Billy Shaw	174	3300	8.4	76	27.8

The State of Nevada Department of Conservation and Natural Resources questioned whether the Coyote Hole Reservoir, just south of the Billy Shaw Slough, could be improved for lake fishing at a lower cost than building the Billy Shaw Dam. Because of topography, the Coyote Hole Reservoir could not be developed to support the reservoir depth and size needed to meet the Project objectives and therefore was not analyzed as a reasonable alternative to the proposed action. (Dodson, December 1996).

The Billy Shaw site was selected for detailed analysis because its greater depth and storage volume capability would better support a trout fishery. It also exhibits a shoreline configuration that would provide more suitable habitat for wildlife and waterfowl enhancement.

2.3 No Action Alternative

Under the No Action Alternative, the Billy Shaw Dam and Reservoir would not be constructed. Consequently, none of the environmental impacts or enhancements associated with the Project would occur. The 2.6 km^2 (1 mi^2) site would remain desert shrub habitat with about 1.2 ha (3 ac) of wetland, none of which are biologically unique to the area. Other proposals are available to assist BPA in satisfying it's need to mitigate for salmon and steelhead losses incurred in the areas blocked by the Federal hydropower system. However, these proposals would not mitigate for salmon and steelhead losses in the Duck Valley Reservation.

Table 2.2 provides a summary comparison of the ability of the two alternatives for this project - the Proposed Action to fund the construction and operation of the Billy Shaw Reservoir, and the No Action Alternative - to meet the project objectives. The decision factors are the purposes outlined in Section 1.3 of this document.

Table 2.2 Predicted Performance Summary

Decision Factors	Proposed Action	No Action
1. Consistent with the Council's Program:		
– complement activities of the fish and wildlife agencies and appropriate Indian tribes.	Complements activities of Shoshone-Paiute Tribes	no
– utilize, where equally effective alternative means of achieving the same sound biological objective exist, the alternative with the minimum economic cost.	Meets the biological objectives with minimum costs.	Least cost but does not meet biological objectives.
– consistent with the legal rights of appropriate Indian tribes in the region.	Partial mitigation for loss of anadromous fish.	Does not mitigate loss of anadromous fish.
2. Reservoir depth sufficient to support a trout fishery	yes	no
3. Enhance fish, wildlife, and migratory waterfowl habitat on the Duck Valley Reservation	yes	no
4. Avoid or minimize possible adverse environmental impacts	yes	yes

Chapter III - Affected Environment, Environmental Consequences, and Mitigation Measures

3.1 Geology and Soils

3.1.1 Affected Environment

The Duck Valley Reservation lies within the northern margin of the Basin and Range Physiographic Province. This province is characterized by north-south trending mountain ranges and wide alluvial filled basins. Elevations range from 1600 m (5300 ft) at the valley floor to about 2750 m (9000 ft) in surrounding mountains.

The more recent deposits found in the valleys and covering most of the older rocks consist of interfingering layers and lenses of gravel, sand, silt, and clay of alluvial origin. Very recent thin deposits of silt, sand, and gravel occur in the bottom of the drainages.

The U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS) soil classification criteria was referenced to identify the surface soils in the vicinity of Billy Shaw Slough as Burmah Variant-Torney complex soils. These soils are characterized as having very slow to slow permeability, a slight water erosion hazard, a high to very high available water capacity, and slow runoff.

3.1.2 Environmental Consequences

During Project construction vegetation would be removed and soil disturbed. This would increase the risk of erosion and mass soil movement. Construction equipment and traffic would compact the soils, thereby increasing the erosion potential and causing a loss in soil productivity. Where necessary to cross streamcourses, stream flow could be obstructed and the stream course characteristics could change. Overall impacts would be limited to localized increases in erosion and runoff.

3.1.3 Mitigation Measures

The following mitigation measures, if implemented, would reduce the potential for erosion and other impacts to earth resources:

- Promptly reseed or revegetate disturbed areas, including borrow sites.
- Include standard erosion control practices in the dam and reservoir design.
- Install runoff devices where appropriate.
- Minimize impacts by marking clearing and construction limits.
- Design and install culverts or other structures for stream crossings to provide unobstructed stream flow and minimal change to stream course characteristics.
- Limit construction and maintenance activities when soil is wet to reduce soil compaction, rutting, gullying, and the resultant loss of soil productivity.
- Establish sites for disposal of excess fill material.

3.2 Botanical Resources

3.2.1 Affected Environment

The Nevada Natural Heritage Program (NNHP), and the United States Fish and Wildlife Service (USFWS) were contacted to gain information regarding special-status plant species and vegetation communities that might exist on the Project area. No federally listed threatened, endangered, or candidate species were identified as occuring within the Project area. However, plant species of concern identified by the NNHP and USFWS as occuring within the Project area are listed in Table 3.1. (Cooper, 1996) (Mendoza, 1996) (Ruesink, 1996). Although species of concern are not federally protected, the USFWS is concerned about projects that may contribute to a declining trend in populations.

Table 3.1 Botanical Species of Concern Identified During Presurvey Investigations

Plant Species	Nevada Distribution	Habitat Association
Antennaria arcuata Meadow or Arching pussytoes	NE Nevada, south of Belcher's Meadow, Elko County.	Edges of seasonal moist meadows at 1585 - 1980 m (5200 - 6500 ft).
Erigeron latus Broad fleabane	South end of Wildhorse Reservoir, northern Elko County, Nevada.	Rock outcrops at 1585 - 2650 m (5200 - 8700 ft).
Ivesia rhypara var. *rhypara* Grimy ivesia	High Rock Lake, northern Washoe County, near IL ranch, NE Elko County, Nevada.	Barren tuffaceous clay hillsides, elevations 1460 - 1680 m (4800 - 5500 ft).
Lathyyrun grimesii Grimes vetchling	Independence Mountains west-facing slopes, south of Jack Creek, North Fork summit, Elko County, Nevada.	Stony clay talus slopes at 2015 - 2135 m (6600-7000 ft).
Phacelia minutissima Least phacelia	Gold Creek and Stump Creek, both in Independence Mountains, Elko County, Nevada.	Gravelly soil on moist slopes to sunny flats in mountains at 1830 - 2380 m (6000 - 7800 ft).
Trifolium leibergii Leiberg clover	North Fork of Humboldt River, Independence Mountains, NW Elko County.	Shady talus slopes at 1980 - 2440 m (6500 - 8000 ft).

Botanical surveys conducted on the Project site in October 1995 and January 1996 did not discover the presence of any species of concern. The surveys determined that the Billy Shaw Slough is a xeric, or very dry, shrub steppe vegetative community. For the most part, the shrub cover is Great Basin shrub including sagebrush and rabbitbrush, and grasses including Idaho fescue and wheat grass. The lowland areas of the reservoir site are seasonally flooded ephemeral desert washes. The wash bottoms are sandy and primarily barren of vegetation. Increased vegetative cover occurs in the upland areas. The Project area is typical for the Duck Valley Reservation and is horizontally and vertically uniform in vegetative cover, slope, and elevation.

Historical land uses, such as grazing, appear to have changed the vegetative cover or composition on Reservation lands. As a result, rabbitbrush, Idaho fescue, and increased amounts of sagebrush are present in the Billy Shaw Slough stream bed area. Herb layers have been eliminated and plant diversity has decreased because of grazing and seasonal flooding.

Locations for the borrow site and sand and gravel pits have not been identified and botanical surveys were not performed at those sites. Given the habitat associations shown inTable 3.1,

grimy ivesia, broad fleabane, Leiberg clover, and grimes vetchling could possibly occur in the borrow pits. If an undeveloped borrow site is selected for use, preconstruction plant surveys would be conducted.

3.2.2 Environmental Consequences

The Project would remove approximately 223 ha (550 ac) or less than 2.6 km^2 (1 mi^2) of the xeric shrub steppe and grassland vegetation communities. These plant communities in the Project area are not unique or distinct on the Reservation or within the Owyhee River basin. The impact area includes the reservoir and spillway, ephemeral washes, borrow pits, and upland knolls for road improvements. Plant diversity along the reservoir shoreline would increase due to the addition of the water resource.

3.2.3 Mitigation Measures

Mitigation measures that could reduce the Project related adverse impacts to botanical resources include:

- Promptly reseed or revegetate disturbed areas with native vegetation.
- Minimize impacts by marking the clearing and construction limits.
- Limit, to the extent practical, construction and maintenance activities during wet periods and the early growing season to minimize soil disturbance and damage to plants.
- If the preconstruction plant survey determines it necessary, either relocate to another borrow site or apply appropriate mitigation measures to avoid potentially significant impacts to special status plant species.

3.3 Wildlife

The Duck Valley Reservation is known to provide habitat for various mammals, birds, amphibians and reptiles. Literature review and consultations with the USFWS, Nevada Natural Heritage Program, and NDW, were used to determine potential species to be evaluated. Wildlife surveys were conducted concurrently with the Project botanical surveys to identify wildlife species that are present. Surveys have not been conducted on the borrow sites because their locations are not known at this time.

3.3.1 Affected Environment

Animal species of concern identified by the wildlife agencies are listed in Table 3. 2. In addition to these species of concern, the Duck Valley Reservation is home to various large and small mammals. Antelope, mule deer, bobcat, and coyote are frequently observed within the Reservation as well as within the Billy Shaw Slough. Small and medium-sized mammals observed within the slough include least chipmunk, sagebrush vole, deer mouse, ground squirrel, white-tailed jackrabbit, and black-tailed jackrabbit.

Numerous migratory waterfowl, shorebirds, and raptors are also known to inhabit the Duck Valley Reservation. Known species include, but are not limited to, Canada Goose, pintail, lesser scaup, northern shoveler, avocet, white-faced ibis, western sandpiper, red-tailed hawk, northern harrier, great horned owl, golden eagle, sage grouse, California quail, American kestrel, and rough-legged hawk.

Reptiles and amphibians reported to occur within the Reservation include great basin rattlesnake, valley garter snake, Pacific tree frog, great basin gopher snake, and horned lizard.

The major reservoirs on the Reservation are resting and nesting resources for migratory waterfowl, neotropical migrants, shorebirds, and wading birds within this arid habitat. The reservoirs also support various native game fish and non-native fish.

The upland boundaries of the impact area are suitable for nesting of burrowing owls. The Project area is neither critical habitat for nesting and/or reproduction by the bird species present nor critical for the survival of the local burrowing owl population.

The lowland areas of the Project site are suitable foraging grounds and the upland fringes provide suitable nesting habitat for the pygmy rabbit.

Spotted frogs, identified as potentially present on the Project site, prefer to dwell around permanent bodies of water. It is unlikely that spotted frogs utilize the Project area because no permanent bodies of water are located in the slough.

Table 3. 2 Animal Species of Concern Identified During Presurvey Investigtions

Species	Scientific Name
Amphibians:	
Spotted frog	*Rana pretiosa*
Mammals:	
Pygmy rabbit	*Brachylagus idahoensis*
Spotted bat	*Euderma maculatum*
Small-footed myotis	*Myotis ciliolabrum*
Long-eared myotis	*Myotis evotis*
Fringed myotis	*Myotis thysanodes*
Long-legged myotis	*Myotis volans*
Yuma myotis	*Myotis yumanensis*
Pale Townsend's big-eared bat	*Plecotus townsendii pallescens*
Pacific Townsend's big-eared bat	*Plecotus townsendii townsendii*
Birds:	
Northern goshawk	*Accipiter gentilis*
Western burrowing owls	*Athene cunicularia hypugea*
Ferruginous hawk	*Buteo regalis*
Black tern	*Chlidonias niger*
Least bittern	*Ixobrychus exilis hesperis*
White-faced ibis	*Plegadis chihi*
Fish:	
Interior redband trout	*Oncorhynchus mykiss gibbsi*

3.3.2 Environmental Consequences

As proposed, the Project would remove wildlife habitat in less than 2.6 km^2 (1 mi^2) of the approximately 98 km^2 (38 mi^2) of the Billy Shaw Slough. Wildlife species would be temporarily disturbed by the construction noise. Intrusion of the area by hunters, fishermen, and tourists also

would minimally impact use of the area by wildlife. The habitat in the Project area is not unique or distinct on the Reservation or within the Owyhee River basin.

The NDW expressed concerns that the water withdrawals from the Wildhorse Reservoir and the Owyhee River may adversely affect the associated fishery and other wildlife resources. As stated in Section 2.1.2.1 of this document, the proposed action would minimize and, if possible, avoid water withdrawals from the Wildhorse Reservoir. The Wildhorse Reservoir would not be used to initially fill the Billy Shaw Reservoir, but on rare occasions may be used to provide some water to maintain full pool. Because water withdrawals from Wildhorse Reservoir would be rare and limited to supplementing flows from the Owyhee River downstream from the Wildhorse Reservoir, impacts to the associated fisheries and wildlife resources of the Wildhorse Reservoir would be minor.

Annual evaporation, as estimated by the Nevada Division of Water Resources in a report titled "Alternative Plans for Water Resources Use, Snake River Basin, Area VI, State of Nevada, 1974", is 2.7 acre-feet per acre. Using this estimate, the Billy Shaw Reservoir evaporation would average 1161 acre-feet per year. This amount represents approximately 1% of the Owyhee River's average annual flow at the China Diversion Dam and between 4 and 5% of the average monthly flows for April and May. These spring flows usually cause flooding in the southern and northern areas of the valley and the amounts used to fill and maintain the full pool of the Billy Shaw Reservoir would not be sufficient to adversely affect the fishery and wildlife resources of the Owyhee River.

Reservoir seepage loss beneath or around the dam would be minimal because of the proposed cutoff trench in the dam design. During the first fill of the reservoir there will be some water losses to bank storage in the soils around the reservoir as the soils are changed from a dry to a wet state.

The loss of less than 3% of the Billy Shaw Slough's monotypical desert shrub habitat would be offset by the added presence of a year round water supply in an area generally devoid of water resources. The reservoir would provide a valuable water resource for small and large resident and migratory birds in the region. Water resources including open water, potholes, and riparian fringes are critical for breeding and successful brood-rearing for wading birds, marsh birds, shorebirds, and migratory waterfowl. The enhancement of riparian fringes would also contribute to added support of a wide diversity of amphibian species.

The proposed Billy Shaw reservoir aquatic resources would be subject to the impact of drought, sediment deposition, inflow water quality, and temperature fluctuations during both the winter and summer. The Project feasibility study estimates a lake area of 174 ha (430 ac) with a normal depth at full pool of 8.4 m (27.5 ft) and over 134 ha (330 ac) with a depth of 4.6 m (15 ft) or greater. These depths, if maintained, would protect aquatic resources (Burge, 1990). The addition of a designed outlet at the reservoir would aid in maintaining water levels and provide the capability to drain the reservoir in order to manage the aquatic vegetation community. The reservoir would enhance the biodiversity of the aquatic community within the Reservation.

The arid nature of the habitat appears to limit the game fish diversity of the site resources. However, certain species such as the native redband trout can tolerate unstable reservoir environments and feed in temperatures exceeding 82 degrees F. (28 degrees C.) (Behnke, 1992) (Kunkel, 1976 and Personal Communication with C.M. Kunkel, 1995). The reservoir would increase the suitable habitat available for a more diverse fish population.

3.3.3 Habitat Assessment

3.3.3.1 Habitat Suitability Index Models

The habitat suitability assessment conducted for this Project used the USFWS (USFWS, 1987) Habitat Suitability Index (HSI) Models. HSI models are a tool commonly used to evaluate habitat quality for selected economic indicator or surrogate species. The model was chosen to assess potential impacts of the reservoir emplacement to specific habitats and associated wildlife species.

Habitat quality is defined as a measurement of "habitat conditions in the study area, and the standard of comparison is the optimum habitat conditions for the same evaluation species" (USFWS, 1981). An HSI score of 1.0 is considered the optimum habitat criteria for a subject; a score of 0.5 represents average habitat conditions for a subject. Since it was not practical to identify all biological resources on the site, indicator species were selected to represent the site's biological resources. The pronghorn, sage grouse, and lesser scaup were selected as the indicator species in the Project area. The sage grouse and pronghorn were selected because the sagebrush vegetation community is critical to the survival of these subjects. The lesser scaup was selected as representative of migratory waterfowl which may utilize the future water resources that would result if the Project is constructed. Since the reservoir design is not completed, a qualitative assessment of the proposed reservoir's water resource was conducted for the redband trout.

3.3.3.2 Habitat Evaluation Procedure

The Habitat Evaluation Procedure (HEP) was developed by USFWS to evaluate habitat conditions, measure loss of habitat, and establish potential mitigative requirements for a site undergoing development (USFWS, 1980). HEP uses Habitat Units (HU) as a single value which combines the habitat quality, as expressed by the HSI, and the habitat area. HU's are the product of the HSI and the area for the site. The HU's averaged over the duration of the Project are expressed as Average Annual Habitat Units (AAHU's). The change in AAHU's is used to evaluate the current and future impacts to wildlife that could occur as a result of construction and operation of a project.

3.3.3.3 Habitat Impact

The result of the Project HSI analysis for the sage grouse was 0.77, or a habitat quality of above average for the winter range of this subject within the Project area. The estimated habitat loss for this species was 424 AAHU's.

The HSI for the antelope at this site was 0.58, indicating a habitat quality of slightly above average. The Project would remove less than 0.5% of the areas total antelope habitat and have a habitat loss of 319 AAHU's.

The result of the HSI for the lesser scaup future scenario (waterfowl surrogate species) was 0.86, or a habitat quality of above average within the Project area. The estimated net gain would be 387 AAHU's for this subject with a gain of 182 ha (450 ac) of habitat.

The Project would enhance fish habitat with the addition of a 174 ha (430-ac) reservoir with an expected normal pool depth of 8.4 m (27.5 ft). Over 134 ha (330 ac) of the reservoir would be at a depth of greater than 4.6 m (15 ft), a habitat indicated to be suitable for the rainbow trout or other such adaptive game fish species. Assuming an HSI of 0.5, a net habitat gain of 215 AAHU's for fish would be expected from the Project.

A net loss of 141 AAHU's would occur as a result of the Project. This loss is qualitative in nature and would not reflect the projected species diversity gain and habitat enhancement across the site including increased brood habitat for migratory waterfowl, enhanced habitat for big game animals, and increased habitat for shore, marsh, and wading birds.

The Project would remove approximately 223 ha (550 ac) of suitable foraging habitat for various animal species. It would also remove some suitable nesting habitat for burrowing owls and pygmy rabbits. The reservoir may contribute to increased site utilization by bald and golden eagles for foraging, especially at the reservoir and riparian fringe areas.

Altered vegetation patterns along the reservoir shoreline, borrow pits, parking lots, and road slopes would affect the movement, burrowing, and/or nesting of birds, mammals, reptiles, and amphibians within these areas. The emplacement of the reservoir would create a permanent water source on the western aspect of the site with a potential for increased site utilization by antelope, mule deer, game birds, passerines, neotropical migrants, waterfowl shorebirds, and marsh birds. Site utilization by waterfowl, shorebirds, and marsh birds may increase during migration, nesting, and brood rearing periods.

Animals that use the area to forage would not be significantly impacted by the Project because similar foraging opportunities are plentiful around the site. Furthermore, the reservoir would enhance the habitat for migratory and resident birds with increased cover and nesting opportunities along the shore edge and increased food sources such as amphibians, small aquatic species, and invertebrate species.

3.3.4 Mitigation Measures

Mitigation measures that would reduce Project related adverse impacts to the wildlife resources include:

- Clear and excavate outside of the avian breeding season.
- Reseed or revegetate disturbed areas after construction.
- Minimize impacts by marking the clearing and construction limits.
- Plant riparian vegetation along reservoir shoreline.
- If an undeveloped borrow site it selected for use, conduct a preconstruction survey to identify wildlife species. If the survey determines it necessary, either relocate to

another borrow site or apply appropriate mitigation measures to avoid potentially significant impacts to wildlife.

- Limit withdrawals from the Wildhorse Reservoir to ensure that water levels do not drop below the level needed to maintain the existing fishery resource.

3.4 Endangered and Threatened Species

The NDW, Nevada Natural Heritage Program, and the USFWS were contacted to assess the potential presence of state protected and/or federal threatened and endangered plant and animal species within the Duck Valley Reservation. Surveys were conducted concurrently with the Project botanical surveys to determine the presence of endangered or threatened species.

3.4.1 Affected Environment

The Nevada Natural Heritage Program responded that they "have no records of any endangered, threatened, candidate, or sensitive plants or animal species occurring within the area." (Cooper, 1996). The Nevada State Office and Snake River Basin Office of the USFWS knew of no endangered or proposed species within the Project area, but did state that the federally threatened bald eagle may occur within the Project area. Survey results determined that the Project site is suitable foraging habitat for bald eagles. A population of bald eagles is also known to winter in the vicinity of the Project area (Bradley, USFWS, May 1995, pers. comm.) and may exist in areas potentially available as borrow sites. Preconstruction surveys to determine the presence of threatened and endangered species would be conducted in the borrow sites if undeveloped sites are selected for use.

No threatened or endangered plant species were identified as having potential to exist in the Project vicinity. The botanical surveys did not identify the presence of any threatened or endangered plants.

3.4.2 Environmental Consequences

The Project would remove approximately 223 ha (550 ac) of suitable foraging habitat for bald eagles. Bald eagles that use the area to forage would not be adversely affected by the Project because similar foraging opportunities are plentiful around the site. Nesting and roosting opportunities for the population of wintering bald eagles would not be reduced because the project site does not contain any suitable habitat for those functions. The reservoir may contribute to increased site utilization by bald eagles for foraging, especially at the reservoir and riparian fringe areas.

3.4.3 Mitigation Measures

Mitigation measures that would reduce the Project related adverse impacts to the bald eagle include:

- Reseed or revegetate disturbed areas after construction.
- Minimize impacts by marking clearing and construction limits.
- Conduct a preconstruction survey to determine if bald eagles utilize the borrow site. If the preconstruction survey determines it necessary, either relocate to another borrow site or apply appropriate mitigation measures to avoid potentially significant impacts to bald eagles.

3.5 Wetlands and Floodplains

3.5.1 Affected Environment

The lowland areas of the Billy Shaw Slough are seasonally flooded ephemeral desert washes. These intermittent wetlands occupy approximately 1.2 ha (3 ac) of the Project site in the narrow, winding bottom of the slough. The banks are steep, undercut, and eroded with an average height of 0.3 to 0.6 m (1 to 2 ft). The bottoms are sandy, primarily barren of vegetation, and intermittently saturated during the fall and winter months. Some riparian fringes exist along the edges and provide resting opportunities and serve as foraging and water sources for various waterfowl and mammals. Some invertebrates and amphibians also utilize the riparian fringes. Wet meadows and emergent wetlands exist further east of the Project area.

The saturated zones or intermittent riverine areas are defined as waterways of the United States (USFWS, 1988) and would require a permit to place dredged or fill material into these locations. No permanent or temporary human habitation or permanent property development lies in the floodplain downstream from the damsite.

3.5.2 Environmental Consequences

The Project would reduce seasonal flooding below the dam site and would alter normal runoff patterns. The Project would not effect lives or property because no facilities or habitation exist within the area.

Approximately 1.2 ha (3 ac) of ephemeral intermittent wetlands would be flooded by the reservoir. Wetlands and riparian areas would naturally develop in some of the shallow areas around the reservoir perimeter.

3.5.3 Mitigation Measures

In addition to erosion and sediment control measures that would be required under the National Pollutant Discharge Elimination System (NPDES) Nationwide Permit, the following mitigation measures would minimize environmental consequences from the proposed development:

- Limit movement of equipment across riverine areas where possible and implement measures to protect the integrity of stream channels.
- Revegetate all disturbed soils with native plants following completion of construction.
- Implement and maintain erosion and sedimentation control techniques where appropriate throughout the construction period.
- Design the reservoir with developed fringe areas and side channels to support prairie potholes and wetland vegetation.
- Plant the developed fringe areas with native wetland vegetation.

3.6 Cultural Resources

3.6.1 Affected Environment

A Class III cultural resources survey found and documented (SAIC, 1996) one small prehistoric site of lithic scatter (three flakes) within the Project area. The lithic scatter was found in a water

drainage and may have been redeposited from its original location or washed down from a site further up the drainage. No other artifacts were found within the Project area. Surveys have not been conducted on the borrow site or sand and gravel pits because their locations are not known at this time.

3.6.2 Environmental Consequences

The lack of associated cultural materials, as well as concerns regarding the contextual integrity of the site, reduce the sites ability to yield significant cultural information. Based on the results of a detailed analysis, this Project would have no effect on cultural resources. The site has already contributed all the information possible concerning regional archaeological research themes. The Nevada State Historic Preservation Office concurred with this finding in a letter dated June 16, 1996. If appropriate, a preconstruction survey to determine the presence of cultural and historical resources would be conducted in the borrow sites.

3.6.3 Mitigation Measures

- A contractual construction specification to stop work and immediately notify the Duck Valley Reservation cultural resources office if evidence of a prehistoric or historic cultural resource is discovered would reduce or eliminate potential cultural impacts from construction of the Project.
- If the preconstruction survey determines it necessary, either relocate to another borrow site or apply appropriate mitigation measures to avoid potentially significant impacts to cultural resources.

3.7 Aesthetics

3.7.1 Affected Environment

Because of the elevation changes and unique terrain, there are several locations where panoramic views of the Billy Shaw Slough can be viewed from elevated terraces. One of these, identified in the Natural Resources Planning Study, prepared December 1991, lies northeast of the study area. The present view onto the valley floor is of undeveloped desert shrub brush lands.

3.7.2 Environmental Consequences

Viewers would have the temporary visual impact of construction activities rather than natural views and the potential for short-term loss of wildlife viewing from this particular vista location. Following construction the reservoir would attract additional wildlife to a concentrated location and diversify the visual resources in the valley.

3.8 Socio-economic

3.8.1 Affected Environment

According to the 1990 Census estimates, 1,096 persons lived on the Duck Valley Reservation of which 1,003 were Native Americans. The current population is estimated to be almost 1,200 persons and a 1.4 percent annual growth rate over the next 25-year period is predicted.

Unemployment and poverty levels at the Reservation are high compared to the states and counties. The poverty rate is twice that of Owyhee County and the unemployment rate is at least four times greater than Elko County and the states of Idaho and Nevada.

The service sector accounts for the largest occupation and employment categories in the Reservation area, nearly three times greater than other occupations or industry employment. Because the Reservation is home to both Kindergarten through Grade 12 school and a regional hospital, a majority of the service jobs relate to education and health services. State and county service jobs are diversified among several occupational sub-categories. Employment figures for the Reservation are considerably lower than the averages for the surrounding counties and states.

Two small reservoirs on the Reservation, Sheep Creek Reservoir and Mountain View Reservoir, are operated by the Tribe for fishing and recreation opportunities. The off reservation Wildhorse Reservoir, operated by the Bureau of Indian Affairs, also provides irrigation water for agricultural production on the Reservation. These existing reservoirs have had extremely productive trout fisheries and have supported excellent quality fishing even with a high rate of harvest. The Sheep Creek and Mountain View reservoirs support a large number of angler-days annually and provide an economic benefit to the Tribe. For example, during the period February 27 through September 17, 1987, nearly 1,700 tribal fishing permits were sold (BOR, 1988). The Tribe issues fishing permits on the Reservation waterways and camping permits at Wildhorse, Sheep Creek, and Mountain View reservoirs to provide sources of economic opportunity.

3.8.2 Environmental Consequences

Residents of the Reservation may be hired during final design and data gathering, during actual construction, and for operation and maintenance of the facilities. A minimum of one and a half person years of long-term employment is estimated for operations and maintenance of the dam and roadways. Additional personnel may be hired to manage fishery programs, take surveys, or raise and monitor the growth progress of fish in the reservoir and wildlife in the area.

Economic opportunities would be realized from additional recreationists attracted to the trout fishery at the reservoir. Currently, 12,000 to 16,000 non-Indians annually visit the two fishing lakes on the Reservation. This number would likely increase as the trout fishery develops. It is not expected that revenues would be reduced to the other recreation sites nor would there be any loss of agricultural income.

The improved employment and economic opportunities would slightly reduce the levels of unemployment and poverty on the Reservation. The short-term population increase during the construction phase of the Project would not pose any significant burden to the Reservations existing public services.

3.9 Air Quality

Negative impacts to air quality from the Project would be low and short-term. Intermittent long-term air quality impacts during dry conditions may occur as recreationists travel the gravel roadway to the reservoir. Dust and exhaust emissions from construction equipment would occur

during the construction period. Construction vehicles traveling in the area might create dust. Most of the roads on the Reservation are currently unpaved and the Project would not cause major increases in dust or exhaust emissions.

Contract specifications requiring application of dust abatement measures (generally by applying water to access routes) as needed would minimize or reduce construction dust. Exhaust emissions would be minimized by operating and maintaining vehicles and equipment properly. Slash burning would be prohibited and any vegetative debris would be hauled to an approved landfill or used in reclaiming borrow areas. This latter method should provide good ground cover for wildlife and would reduce erosion potential.

3.10 Health and Safety

The emplacement of the Billy Shaw reservoir would not present a long-term impact to human health. Design factors would be included in the dam and associated facilities to prevent public injury. Roadways would be designed to current safety standards, and guardrails installed where necessary. During construction, increased vehicle traffic would occur along routes for construction crews and equipment. Vehicle safety personnel should be required to direct traffic as needed. Also, the health of construction workers and staff may be impacted during the construction phase by noise and dust during heavy equipment operations. The implementation of a site health and safety plan, including dust control practices, should significantly reduce the potential for negative health impacts.

Table 3.3 summarizes the affected environment, potential impacts, and available mitigation measures for the Proposed Action and the No Action alternatives.

Table 3.3 Summary of Potential Environmental Impacts and Mitigation

Resource	Affected Environment	Potential Impacts (Proposed Action)	Potential Impacts (No Action)	Mitigation Measures
Geology & Soils	• Burmah Variant-Torney soils have a slight water erosion hazard, a high to very high available water capacity, and slow runoff.	• Erosion and mass soil movement. • Soil compaction. • Loss of soil productivity. • Obstruction of stream flow at crossings. • Localized increase in erosion and runoff.	• No impact	• Reseed or revegetate disturbed areas. • Include standard erosion control practices in designs. • Mark clearing and construction limits. • Design and install culverts at streamcrossings.
Botanical Resources	• Dry shrub steppe vegetative community is typical for area.	• Permanent removal of approximately 223 ha (550 ac) of common vegetative community. • Increased plant diversity along the reservoir shoreline.	• No impact	• Plant riparian vegetation along shoreline. • Reseed or revegetate disturbed areas with native plants. • Mark clearing and construction limits. • Limit construction and maintenance activities during wet periods and the early growing season. • If necessary, conduct preconstruction surveys in the borrow sites. Either relocate to another borrow site or apply appropriate mitigation measures to avoid potentially significant impacts.
Wildlife	• Various large and small mammals. • Migratory waterfowl, shorebirds, and raptors. • Reptiles and amphibians. • Foraging and nesting habitat for pygmy rabbits • Nesting habitat for burrowing owls.	• Removal of approximately 223 ha (550 ac) of wildlife habitat. • Temporary wildlife disturbance during construction. • Enhanced habitat for various bird species. • Habitat would support wider diversity of amphibian species. • Increased habitat for trout.	• No impact	• Remove vegetation outside of the avian breeding season. • If necessary, conduct preconstruction surveys in the borrow sites. Either relocate to another borrow site or apply appropriate mitigation measures to avoid potentially significant impacts.
Endangered & Threatened Species	• Foraging habitat for bald eagles.	• Removal of approximately 223 ha (550 ac) of existing bald eagle foraging habitat. • Potential increased site utilization by bald eagles at the reservoir and riparian fringe areas.	• No impact	• Reseed or revegetate disturbed areas after construction. • Mark clearing and construction limits. • If necessary, conduct preconstruction surveys to determine if bald eagles utilize the borrow sites. Either relocate to another borrow site or apply appropriate mitigation measures to avoid potentially significant impacts.

Resource	Affected Environment	Potential Impacts (Proposed Action)	Potential Impacts (No Action)	Mitigation Measures
Wetlands and Floodplains	• Seasonally flooded lowlands. • Approximately 1.2 ha (3 ac) of ephemeral desert washes (wetlands).	• Eliminate seasonal runoff below the dam site. • Desert washes replaced by reservoir.	• No impact.	• Limit movement of equipment across riverine areas where possible. • Implement measures to protect stream channel integrity. • Revegetate disturbed soils with native plants after construction. • Implement and maintain erosion and sedimentation control techniques where appropriate throughout the construction period.
Cultural Resources	• One small prehistoric site of lithic scatter (three flakes).	• No impact.	• No impact.	• Contract requirement to stop work and notify Tribe if cultural discovery. • If necessary, conduct preconstruction surveys in the borrow sites. Either relocate to another borrow site or apply appropriate mitigation measures to avoid potentially significant impacts.
Aesthetics	• Present view of undeveloped desert shrub brush lands.	• Temporary impact of construction activities. • Short-term loss of wildlife viewing. • Enhanced long-term wildlife viewing opportunities.	• No impact.	• Require dust abatement on roadways during construction.
Socio-economic	• Relatively high poverty and unemployment rates.	• Slight improvement of employment rate. • Slight decrease in poverty level.	• No impact.	
Air Quality	• Some fugitive dust present because of unpaved roads.	• Short-term increase of dust and exhaust emissions during construction period. • Minor increase in fugitive dust from additional roads and traffic.	• No impact.	• Require dust abatement on roadways. • Operate and maintain vehicles to minimize exhaust emissions. • Prohibit slash burning.
Health and Safety		• Increased vehicle traffic along construction routes. • Increased presence of noise and dust during heavy equipment operations.	• No impact.	• Design dam and associated facilities to prevent public injury. • Design roadways to current safety standards and install guardrails where necessary. • Use vehicle safety personnel to direct traffic as needed during construction period. • Implement a site health and safety plan, including dust control practices.

Chapter IV - Permit Requirements and Contacts

4.1 Permits

In accordance with National Environmental Policy Act guidelines and in support of the environmental assessment, a regulatory review was conducted to evaluate the permit requirements for the construction of Billy Shaw reservoir. A summary of the regulatory requirements for the Project are included in Table 4.1.

Table 4.1 Regulatory Analysis of Proposed Billy Shaw Dam and Reservoir

Applicable Regulations	Comments
Clean Water Act (CFR 40) and (CFR 33 Part 330) CWA Section 401 EPA Section 404 Nevada Division of Environmental Protection	The Project may require a permit under the CWA (Section 401 and EPA Section 404) to fill in wetlands. The Nevada Division of Environmental Protection may require a *letter of water quality certification* or a *rolling stock water pollution control permit.*
Fish and Wildlife Coordination Act (FWCA) (CFR 50)	The Project is subject to FWCA. The act requires that the USFWS be consulted prior to emplacement of the reservoir within the Billy Shaw Slough.
US Army Corps of Engineers (USACOE) Permit for Discharge (CFR 33 Part 323)	A permit for discharge into waterways of the United States would be required
National Environmental Policy Act (NEPA) (CFR 33 Part 230) (CFR 40 Part 1500)	This Environmental Assessment (EA) is prepared in accordance with NEPA implementing regulations. BPA will consider the findings from this EA to make a decision on the Project.
National Historic Preservation Act Cultural Resources	A Class III cultural resources survey found no significant resources. The Nevada State Historic Preservation Officer concurred in a letter dated June 17, 1996 that the Project site was not eligible for the National Register of Historic Places.
US Army Corps of Engineers (USACOE) Impoundment Permit (CFR 33 Part 322)	A permit for the emplacement of the reservoir would be required for this Project.
Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703-711) (50 CFR Part 10, 50 CFR 21)	The MBTA makes it unlawful to take, possess, buy, sell, purchase, or barter any migratory bird listed in 50 CFR Part 10, including feathers or other parts, nests, eggs, or products, except as allowed by implementing regulations (50 CFR 21). The Project would not intentionally take any MBTA listed birds.
Endangered Species Act (CFR 50 Part 17/Part 402) Section 7 consultation	No state or federal threatened or endangered species or critical habitat is present on site. Suitable foraging habitat for bald eagles.

Non - Applicable Regulations	*Comments*
Federal Insecticide Fungicide and Rodenticide Act (FIFRA) (CFR 40)	FIFRA regulates the handling, application and disposal of pesticide products. The Project would not utilize pesticide products.
Toxic Substance Control Act (TSCA) (CFR 40)	TSCA regulates the manufacture and use of toxic chemicals. The Project would not manufacture or use toxic substances.
Resource Conservation and Recovery Act (RCRA) (CFR 40)	RCRA regulates the storage, handling and disposal of solid and hazardous wastes. The Project would not handle, manufacture, store or dispose of hazardous waste.
Safe Drinking Water Act (SDWA) (CFR 40)	SDWA regulates the protection of drinking water aquifers. The emplacement would not impact a principle or sole-source aquifer
Wild and Scenic Rivers (WSR) (CFR 23)	The emplacement of the reservoir would not impact a designated wild or scenic river
Executive Order 11988, Floodplain Management and DOE Guidelines (10 CFR 1022)	A Notice of Floodplain and Wetland Involvement for the Billy Shaw Dam and Reservoir was published in the Federal Register on May 17, 1996. The proposed dam and reservoir would reduce flooding to the downstream area within the Billy Shaw Slough and would avoid hazards associated with floodplain development. This Environmental Assessment serves as a floodplain and wetland assessment.

4.2 Contacts

During this assessment, several local, state, and federal agencies were contacted for information and supporting data including:

USFWS, Elko, Nevada

USFWS, Ft. Collins, Colorado

USFWS, Reno, Nevada

USFWS, Boise, Idaho

Nevada Department of Conservation and Natural Resources, Division of Wildlife

Nevada Department of Environmental Protection

Nevada Natural Heritage Program

Oregon Department of Fish and Game, Bend

Oregon Department of Fish and Game, Prineville

US Army Corps of Engineers

Bureau of Land Management, Elko, Nevada

Idaho Department of Fish and Game

Bureau of Indian Affairs, Elko, Nevada

Bureau of Indian Affairs, Portland, Oregon

Shoshone-Paiute Tribe of the Duck Valley Reservation

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