

STILLWATER WILDLIFE MANAGEMENT AREA

Substantiating Report
for
Improvement of Water Supply Facilities

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Prepared
by
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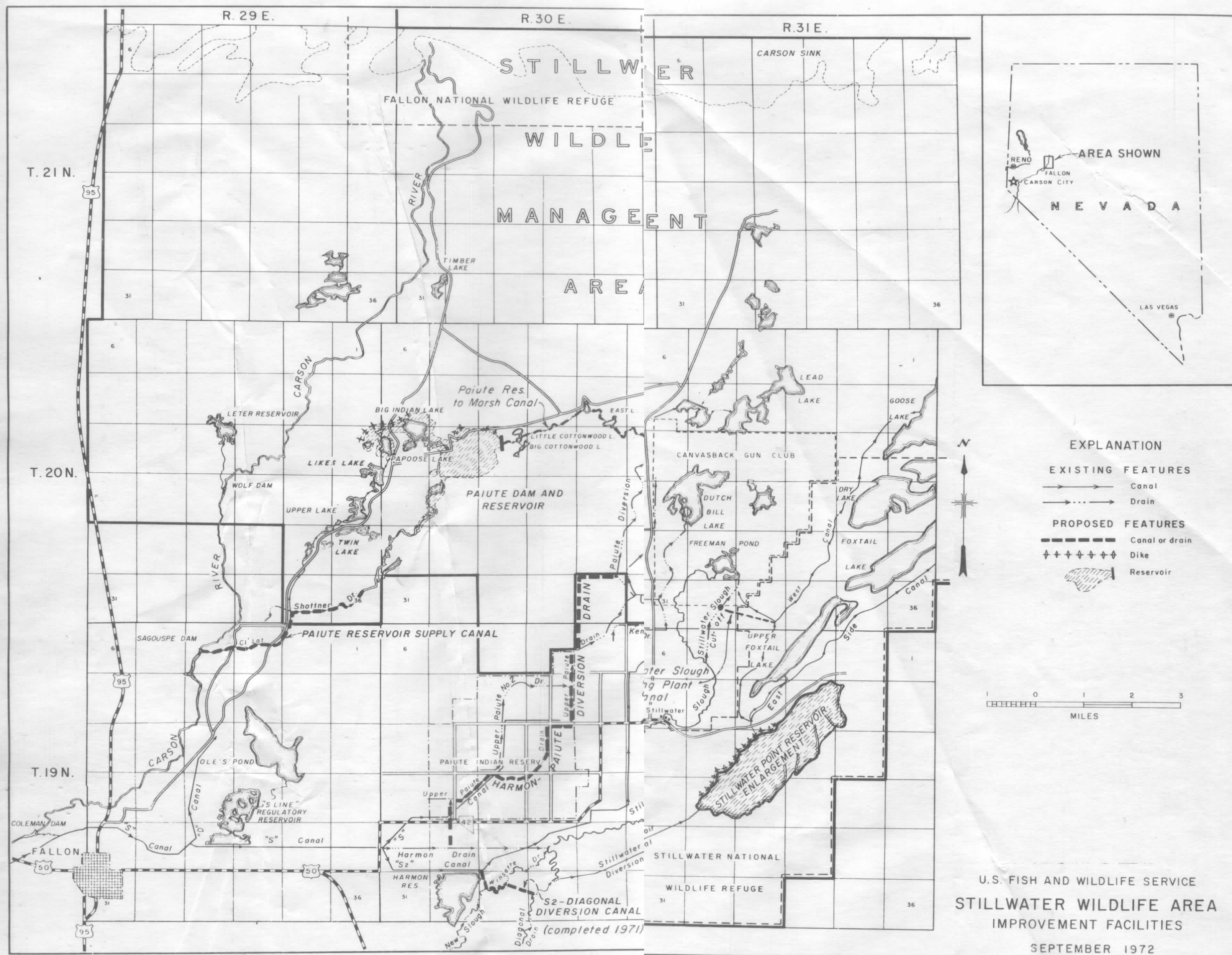


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WATER SUPPLY FACILITIES - STILLWATER WILDLIFE MANAGEMENT AREA

INTRODUCTION

This report is to recommend construction of water storage facilities in, and the improvement of certain drainage and supply channels to, the Stillwater Wildlife Management Area.

The Stillwater Wildlife Management Area contains the area known as the Stillwater National Wildlife Refuge. Hereafter in this report, the Management Area and the Refuge, together, are designated as the "Stillwater Area".

The Stillwater Area is located at the terminus of the Carson River and receives its water supply from drainage and return flows from the Newlands Reclamation Project and from flood spill flows that occur at Lahontan Reservoir on the Carson River.

PURPOSE

The proposed facilities will be used to more efficiently utilize the waters received by the Stillwater Area to meet the objectives of its waterfowl management program.

SCOPE

The proposed facilities will consist of a dam and storage reservoir to be called Paiute Dam and Reservoir located in the west portion of the Stillwater Area; enlargement of the existing Stillwater

Point Reservoir located in the southeast portion of the Stillwater Area; enlargement of a supply canal and drain, from Sagouspe Dam on the Carson River, to supply water to Paiute Reservoir, to be called the Paiute Reservoir Supply Canal; enlargement of the Harmon-Paiute Diversion Drain; construction of a pumping plant and a supply canal from the Stillwater Slough cut-off Canal to the West Canal. See vicinity map for location of proposed features. Except for a portion of the Paiute Reservoir Supply Canal and the Harmon-Paiute Diversion Drain, all features are located within the Stillwater Area. Estimates of work to be done were made by the Bureau of Reclamation, Carson City Project Office, Nevada.

AUTHORIZATION

The proposed facilities are a part of the authorized features of the Washoe Project. The Washoe Project was authorized by the Act of August 1, 1956 (70 Stat. 775), amended by the Act of August 21, 1958 (72 Stat. 705).

HISTORY

The Stillwater Area, along with other wetland areas of the Lahontan Valley in the lower Carson River watershed, has historically been an important waterfowl and migration area. The Paiute Indians hunted these marshes for waterfowl to provide a major source of their food supply. With the settlement of the valley by the white man, the marshes continued to be a major source of food supply to both the Indian and white man.

On completion of Lahontan Dam in 1915 and the subsequent development of irrigable lands within the Newlands Project, the amount of water and the pattern of inflows to the Stillwater Area and the other wetland areas was considerably altered. Desirable waterfowl habitat was drastically reduced with a resultant decline in migratory bird population and production.

In recognition of the decline of the migratory waterfowl population, the Fallon National Wildlife Refuge was established in 1931 to provide a haven and production area for the waterfowl. This refuge comprised approximately 18,000 acres of land, however, because of the lack of a consistent water supply, the refuge was a refuge in name only and never has supported any appreciable waterfowl habitat.

In 1948, the U. S. Fish and Wildlife Service, the Nevada Fish and Game Commission and the Truckee-Carson Irrigation District (custodians of the lands within the Stillwater Area) entered into an agreement to develop and manage approximately 205,000 acres of land in the Carson Sink and the Stillwater Marsh. These are the lands which presently comprise the Stillwater Area. Development of these lands for waterfowl use started in 1949 and to date the Bureau of Sport Fisheries and Wildlife and the Nevada Fish and Game Commission have expended over two million dollars to restore and develop approximately 34,000 acres of waterfowl habitat.

In 1964, a Department of Interior Task Force report on an "Action Program for Resource Development--Truckee and Carson River Basins--California-Nevada" made two recommendations which had an adverse

effect on the water supply to the Stillwater Area. One was for the cessation winter power water at Lahontan Dam, this water was of high quality and was used to flush excess salts out of the waterfowl management units. The second was the maximum allocation of 406,000 acre feet of irrigation water to the Newlands Project.

The implementation of the recommendations of the 1964 Task Force began with the advent of the Secretary of Interiors Rules and Regulations in February, 1967. These regulations directed the Department of Interior to "....maximize the use of the flows of the Carson River in satisfaction of Truckee-Carson Irrigation Districts' water entitlement and minimize the diversion of flows of the Truckee River for District use in order to make available to Pyramid Lake as much water as possible..." Since the cessation of the winter power water and the implementation of the rules and regulations, the water supply to the Stillwater Area has diminished with a resultant loss in waterfowl habitat.

This situation has been further aggravated by the recommendations of the 1971 Pyramid Lake Task Force Report to reduce the water supply below the 406,000 acre-feet figure recommended by the 1964 Interior Task Force. This latest recommended reduction to 331,000 acre-feet makes it even more imperative that the proposed water supply facilities be constructed in order for the Stillwater Area to continue to exist as a viable waterfowl refuge. With the addition of the works proposed in this report, the refuge should remain as a valuable asset to the Pacific Flyway system with a total inflow to the Stillwater Area of 50,000 acre feet.

ESTIMATE OF WORK

Accessibility - All sites are readily accessible over existing

unsurfaced public and private roads and trails.

Right-of-Way - No acquisition of right-of-way is necessary. The reservoirs are in the Stillwater Area and the channels are either in the Area, in reclamation withdrawals or subject to construction of channels under the Withdrawn Lands-Reservation for Ditches Act of 1890 (26 Stat. 391).

Relocations - Rerouting of existing trails in the Paiute Reservoir site and relocation of a shop maintenance area at the Stillwater Point Reservoir enlargement site will be accomplished.

Geology and Embankment Materials - An estimate of seepage losses for the proposed Paiute Dam and Reservoir was made using 16 exploratory auger holes that were drilled and logged. Mechanical soil tests were made and two pump-in tests were performed to determine a percolation factor.

Otherwise, knowledge of geology is limited to that of the regional geology and to that obtained from surface observation, agricultural soils investigations, and observations of existing channel cuts.

The Paiute Reservoir site is underlain by a sequence of clays of the lake-deposited Seho formation. The top of the formation in the main reservoir area is near elevation 3890, which is about the streambed elevation. The clays are overlain by the Fallon and Indian Lakes formations composed mainly of shallow lake or old Carson River sand along with some eolian sands. The proposed

reservoir with operating level of elevation 3900 is therefore surrounded with the above-mentioned sands and is bottomed with the clay which serves as an aquiclude throughout the area.

The estimated seepage loss from the reservoir during a 7-month, December through June, operation period, is 1,160 acre-feet, consisting of 730 acre-feet during a 3-month build-up period and 430 acre-feet during a 4-month storage period.

The water lost will essentially be contained in the area, blending into the regional water table and moving eastward. The ground-water mound built up during the initial operation will probably be only partly dissipated before refilling, thus somewhat decreasing the following year's losses.

The bottom of the reservoir is considered the probable source of embankment material, based on limited reconnaissance exploration.

Surface soils in the vicinity of Stillwater Point Reservoir are generally tighter and finer grained. There has been no apparent problems of seepage from the existing reservoir and it is believed that the material available at the site is satisfactory for the height of embankment needed. The proposed channels will be in areas where experience has indicated no special problems.

Other Materials - Rock satisfactory for embankment protection can probably be obtained in the Stillwater Range to the east.

Probable haul distances will exceed 10 miles for Stillwater Point Reservoir and 20 miles for Paiute Reservoir.

Culvert pipe can be obtained from the Reno area. Requirements for other materials are small and can be supplied from Fallon.

Wave Action - Paiute Reservoir is irregular in shape, with a length of about 2 miles in a west-northwest direction from the hill which forms the right abutment of the dam, and with two arms extending southwesterly up tributary streams.

Paiute Dam and adjacent saddle dike will be exposed to waves caused by the prevailing southwesterly winds acting over about one mile width of reservoir.

Other dikes will be exposed to action of infrequent winds or to short water exposure distances.

Stillwater Point Reservoir is about one mile in width and four miles in length, running in a northeast-southwest direction. The dike to enlarge the reservoir, as well as that existing, is along the southerly portion northwest side of the reservoir, so that prevailing winds parallel it. Southerly winds can act on about 1-1/2 miles of water surface in a direction diagonal to the dike. The reservoir has no riprap protection at present and there have been no apparent difficulties. The increase in capacity will be largely due to increase in depth, with a small increase in area.

Water Supply - Water from Lahontan Reservoir spills and late return flows from irrigation water in the Newlands Project can be collected and stored for more beneficial use in the marshes of the Stillwater Area. In order to use these supplies effectively, it is necessary to provide storage capacity to hold the water until needed. It is also desired that a portion of the water now draining into the area occupied by the Canvasback Gun Club, a private duck club adjacent to the Stillwater Area, be supplied directly to the Stillwater Area.

Reservoir Capacity - Site limitations, rather than water supply, are the principal factors determining capacity. The Paiute Reservoir site is a shallow, sandy basin, limited by the height of its rim. It is estimated that development of about 4,000 to 5,000 acre-feet will be feasible.

Enlargement of the Stillwater Point Reservoir is limited by the elevation of the Stillwater Reservoir Diversion Canal, which supplies it. The limiting elevation could not be determined closely prior to recent surveys, but it was known to be too low to permit development of all the storage capacity needed for the facilities. The use of two reservoirs also permits better use of existing channels for supply and distribution. An additional capacity of about 6,000 acre-feet in Stillwater Point Reservoir is needed.

Channel Requirements - By constructing connecting channels, the Newlands Project system will be used to convey the water supply to

the Stillwater Area. Flow in the Carson River, diverted at Sagouspe Dam, which is now used for irrigation diversions, is the means of supplying Paiute Reservoir. The required canal capacity is estimated at 100 cfs. Stillwater Point Reservoir can be supplied through S₂ Canal and the Diagonal Drain which have a combined capacity of 400 cfs.

Construction of connections and improvements will permit drain water from Fallon Indian Reservation and an area south and southwest of it to be conveyed through Paiute Diversion Drain to discharge into the desired area. Harmon Drain will add an estimated flow of 20 cfs in the maximum month. Record flows in the Upper Paiute Drain at the junction with Paiute Diversion Drain are an instantaneous maximum of 61 cfs, and a maximum monthly mean of 36 cfs.

A 150 cfs supply canal approximately five miles long will be constructed, by enlargement of an existing channel, to supply water to the developed marshes of the Stillwater Area from the Paiute Reservoir.

Other Reservoir Requirements and Conditions - Releases from the reservoirs will be made continuously for a period of several months and outlet capacities need not be large. Due to the very flat slopes, permeability of surface soils, and extremely arid climate, storm drainage into reservoirs will be insignificant. Since inflows will be supplied through the irrigation system, sedimentation will be no problem. Diversions during construction will be no problem. Drains will be constructed to the west of the Stillwater Point Reservoir to intercept seepage. These drains will be used to prevent raising the water table on adjacent private lands.

Project Work Completed - Cost estimates are based on rough reconnaissance studies. The basic estimate of costs is shown on Table 1.

Detailed survey work, including topography of Paiute Reservoir site, has recently been completed. Surveys have indicated no apparent conditions contrary to general assumptions.

PROJECT FEATURES

Paiute Dam and Reservoir - The dam will be of earth, 15 to 20 feet in maximum height, across a small natural drain, with a pipe outlet structure. Shallow dikes about 2 or 3 miles in length will be required, most of them along the northerly side of the reservoir. The reservoir will provide storage capacity of 4,000 to 5,000 acre-feet.

Stillwater Point Reservoir Enlargement - The existing reservoir will be enlarged to increase capacity from 7,000 acre-feet to about 13,000 acre-feet by construction of a shallow dike about 2 miles in length along the northwest side of the reservoir and by modification of the outlet.

Paiute Reservoir Supply Canal - The canal will convey water from the Carson River at Sagouspe Dam to Paiute Reservoir, a distance of about 6 miles. It will use the existing canal, whose capacity will be increased to 150 cfs to Shottner Drain; thence it will follow Shottner Drain, whose capacity will be increased to about 100 cfs.

Paiute Reservoir to Marsh Canal - The canal will convey 150 cfs of water from storage in the Paiute Reservoir to the developed marshes of the Stillwater Area, a distance of about five miles. It will follow an existing natural channel.

Harmon-Paiute Diversion Drain - This drain will intercept Harmon Drain south of Fallon Indian Reservation and by use of new and improved channels, convey water through the reservation, then in a new channel bypassing present points of diversion eastward, to the Paiute Diversion Drain. Diversion from Harmon Drain will increase flows in the Paiute Drains by an estimated 20 cfs in the maximum month. Total length is about 9 miles.

Stillwater Slough Pumping Station and Canal - This pumping plant and canal will intercept water in the Stillwater Slough cut-off Drain and deliver it to the existing West Supply Canal in the Stillwater. The pumping plant will have a 20 cfs capacity and the delivery canal will be approximately 1-1/2 miles long.

Improvements Within the Developed Stillwater Area - These improvements will consist of some unit diking, the construction and possible lining of new internal canals and the purchase of 2 mobile pumps, to more effectively move the water within the developed marsh area.

TABLE 1

COST ESTIMATE OF PROPOSED PROJECT WORK

Description	Cost*
Reservoirs and Dams	
Paiute Dam and Reservoir	\$1,160,000
Stillwaterpoint Reservoir Enlargement (Includes relocation of shop maintenance area and internal improvements)	1,520,000
Canals and Drain Enlargements	
Paiute Reservoir Supply Canal	240,000
Paiute Reservoir to Stillwater Marsh	110,000
Harmon-Paiute Diversion Drain	105,000
Stillwater Slough Pumping Plant and Canal	50,000
Noncontract Costs	
Surveying, design, construction inspection and other miscellaneous engineering overhead costs.	805,000
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Total Cost	\$3,990,000

*Costs include a 20% contingency factor and are based on the August 1972 ENR price level index of 1752. The contingency factor will be reduced as the price level index increases and could be reduced to zero within a two year period at the present rate of increase in the index.

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