# FINDING OF NO SIGNIFICANT IMPACT

## Lake Fork Section 203 Alternative

## Section 203(a), Uinta Basin Replacement Project

## United States Department of the Interior

## Central Utah Project Completion Act Office

## Provo, Utah

## CUPCA - FONSI-01-001

## October 2001

**Recommended:** _____

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**General Manager,** **Date**
**Central Utah Water Conservancy District**

**Approved:** _____

_____

**Program Director** **Date**

# Finding of No Significant Impact Lake Fork Section 203 Alternative—Proposed Action

## Finding

In accordance with the National Environmental Policy Act of 1969 (NEPA), as amended, and the Council on Environmental Quality's (CEQ) Regulation for Implementing the Procedural Provisions of the National Environmental Policy Act (40 CFR Part 1500-1508), the Department of the Interior (Department) has determined that implementing the Lake Fork Section 203 Alternative (Proposed Action) as described in the Final Environmental Assessment for the Section 203(a), Uinta Basin Replacement Project dated October 2001 (Final EA), will not have a significant impact on the quality of the human environment and that an environmental impact statement is not required. A Proposed Action was described in the February 2001 Draft Environmental Assessment for the Section 203(a) Uinta Basin Replacement Project (Draft EA), and was modified in the Final EA in response to the review comments from agencies, groups, and individuals.

## Decision

The Department has made a decision to implement the Proposed Action as described in the Final EA. The following features comprise the Proposed Action: 1) Stabilization of 13 high mountain lakes in the High Uinta's Wilderness Area; 2) Modification of Moon Lake Dam outlet works; 3) Construction of the Enlarged Big Sand Wash Dam and Reservoir; 4) Construction of the Big Sand Wash Feeder Diversion Structure; 5) Construction of the Big Sand Wash Feeder Pipeline; 6) Construction of the Big Sand Wash-Roosevelt Pipeline; and 7) Environmental mitigation and enhancement.

The Proposed Action described in the Draft EA has been modified in response to public and agency review comments. The modifications include: 1) stabilizing 9 high mountain lakes in the Yellowstone drainage; 2) providing year-round instream flows in Yellowstone River from the Yellowstone Feeder Canal heading to the confluence of the Yellowstone and Lake Fork Rivers; and 3) increased stream flows for fishery habitat improvements in the Lake Fork River.

## Reasons for Decision

The Draft EA addressed potential impacts resulting from the construction and operation of the features planned for the Proposed Action. The Final EA was modified to accommodate comments from the Moon Lake Water Users Association (MLWUA), United States Forest Service (FS), U.S. Fish and Wildlife Service (FWS), and many environmental groups, as well

as overwhelming public support to include the stabilization of 9 high mountain lakes in the Yellowstone River drainage. The impacts of stabilizing the 9 high mountain lakes were included in the Twin Pots Alternative in the Draft EA. Therefore, full disclosure of impacts for the modified Proposed Action was available to the public and no further disclosure or review is required under CEQ regulations. Adding 3 cfs year-round instream flow to the Yellowstone River from the Yellowstone Feeder Canal heading to the confluence of the Yellowstone and Lake Fork Rivers provides environmental benefits, but is not considered significant nor a major change in the project operation. The modification to the stream flows for fishery habitat improvement did not change the environmental impacts in any significant way. Therefore, it was determined by the Joint-Lead agencies that the modifications to the Proposed Action presented in the Draft EA could be made without further public review. The Department has also determined that there are no impacts on the Indian Trust Assets of the Ute Tribe, Uintah and Ouray Reservation, and the Final EA documents and supports this determination.

## Public Involvement

The Department received a letter from the Ute Tribal Business Committee on April 29, 1999, that informed the Department of the Tribe's decision not to proceed with the Uintah and Upalco Unit Replacement Projects. Subsequent to that action the Department and Central Utah Water Conservancy District (CUWCD) consulted with the MLWUA to determine their interest in developing a Section 203(a) Uinta Basin Replacement Project. An agreement was reached to proceed with the planning and NEPA analyses for a Section 203(a) Uinta Basin Replacement Project. On February 12, 2001, the Draft EA for the Section 203(a) Uinta Basin Replacement Project was distributed for public review, requesting comments by March 16, 2001. The CUWCD received a request dated February 28, 2001, from the Ute Tribe's attorney requesting a 30-day extension to March 30, 2001, for responding to the Draft EA. On March 16, 2001, the CUWCD received another request from the Ute Tribal attorney requesting a second extension to comment on the Draft EA to April 30, 2001. Both of these extensions were granted.

Several planning and coordination meetings were held with the Ute Tribe, MLWUA, City of Roosevelt, FS, FWS, U.S. Bureau of Indian Affairs, and Duchesne County Water Conservancy District. There were 59 letters of comment on the Draft EA. All comment letters along with responses are included in the Final EA.

On March 16, 2001, a notice was published in the Federal Register announcing the intent to publicly negotiate contracts and agreements for the CUPCA, Section 203(a) Uinta Basin Replacement Project. Notice of formal negotiation was published in local newspapers inviting the public to attend and observe the negotiation sessions.

## Summary of Environmental Impacts

The affected environment (baseline conditions), resources of the human environment, that would be impacted by construction and operation of the Proposed Action are described in the Final EA. It documents the environmental impacts on the quality of the human environment.

The impact analysis in the Final EA focuses on the impacts that would occur from construction and operation of the Proposed Action. The impact analysis incorporates the Standard Construction and Operating Requirements described in Appendix A of the Final EA. It also incorporates the Environmental Commitments shown in Appendix D of the Final EA. The impact analysis is supported by the Final Technical Memorandum that provides detailed information on Water Resources, Wetland Resources, Wildlife Resources, Aquatic Resources, and Cultural Resources.

The environmental analysis indicates that the direct, indirect, and cumulative impacts associated with the Proposed Action are not considered significant.

## Mitigation Measures

The implementation of the Proposed Action would require the CUWCD to undertake one monitoring program. In response to the FWS comment numbers 1, and 2, a monitoring plan, to verify the contaminant levels estimated in the Final EA, will be prepared by the DOI and CUWCD for approval by the FWS. A wetland mitigation plan for Wetland Resources is presented in Appendix A of the Final Technical Memorandum for the Proposed Action.

The environmental commitments are included in Appendix D of the Final EA, are by reference included in and made a part of this FONSI, and obligate the CUWCD and the Department to comply with and/or implement all of these environmental commitments. The purpose of the environmental commitments is to avoid and minimize adverse environmental impacts associated with the construction, operation, and maintenance of the Proposed Action.

# U.S. Department of the Interior

# Final
# Environmental Assessment
# on the
# Section 203(a), Uinta Basin Replacement Project

**Prepared by**

**Central Utah Water Conservancy District**
**October 2001**

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**Don A. Christiansen, General Manager**
**Central Utah Water Conservancy District**

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**U.S. Department of the Interior**

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CHAPTER 1

# General Overview

## 1.1 Introduction

This Final Environmental Assessment (Final EA) was prepared pursuant to requirements of the National Environmental Policy Act (NEPA) of 1969 for the Section 203(a), Uinta Basin Replacement Project (Section 203 Project) proposed by the Department of the Interior (DOI) and the Central Utah Water Conservancy District (CUWCD). This action consists of a proposal to construct a combination of features that will develop water supplies for the Section 203 project area of the Central Utah Project (CUP) in the Uinta Basin of northeastern Utah. The features include the enlargement of an existing non-federal, offstream water storage reservoir; new diversion and water distribution facilities; water conservation; stabilization of high mountain lakes; modification of an existing water storage reservoir's outlet works to provide for instream flows; and fish and wildlife mitigation and enhancement. Descriptions of the Proposed Action and its alternatives are provided in this Final EA in Chapter 2. This EA also serves as the Biological Assessment (BA) and satisfies provisions of Section 7 consultation requirements with the U.S. Fish and Wildlife Service (FWS) under the Endangered Species Act, 16 USC 1531-1544. Results of the consultation with FWS are provided in Chapter 3, Section 3.7 *Threatened and Endangered Species* of this Final EA.

## 1.2 Purpose and Need

### 1.2.1 Purposes of the Proposed Action

The purposes of the Section 203 Project are as follows:

- Stabilize high mountain lakes and restore values compatible with the High Uintas Wilderness
- Provide replacement storage for high mountain lakes' late season irrigation water
- Provide 2,000 acre-feet (ac-ft) of water per year to Roosevelt City for municipal and industrial (M&I) use
- Provide 1,000 ac-ft of M&I water per year to meet future demands in the Lake Fork drainage area
- Facilitate improved water resources management and water conservation in the Uinta Basin by increasing water efficiency, enhancing beneficial use, and developing water storage
- Mitigate and enhance environmental, fish, wildlife, and recreation resources

## 1.2.2 Need for the Proposed Action

There is a need to manage the water supply within the Section 203 project area to provide early and late season irrigation water and M&I water supplies, and to modify and operate water management facilities for environmental purposes. Each need is described in the text that follows.

Irrigators in the Uinta Basin have a need to distribute runoff from the Uinta Mountains on a schedule that better matches the consumptive use of their crops. Because the Uinta Mountains have an east-west orientation, their extensive south-facing slopes are subject to rapid snowmelt during spring thaw. Figure 1.2-1 shows the relationship between runoff and consumptive use of crops. Runoff is insufficient in April and early May, overabundant in late May and June, and insufficient again in July, August, and September.

The need for project irrigation water throughout the Section 203 project area is described in detail in the Final Feasibility Study. The only lands that qualify to receive project irrigation water are those with a secondary water right that could be served from a proposed pipeline extending from Big Sand Wash Reservoir to Roosevelt City or from the Moon Lake Canal below Big Sand Wash Reservoir. Secondary water rights are non-Indian water rights not associated with water rights reserved for Indian reservations through the Winters Doctrine and court decrees that specifically address Indian water rights in the Uinta Basin. Qualifying project lands with secondary water rights total 14,634 acres, and represent a potential demand for 43,902 ac-ft of irrigation water per year (at a diversion water right of 3.0 ac-ft per acre). This exceeds the present available irrigation water supply of 38,048 ac-ft per year by 5,854 ac-ft per year, which represents the need for project irrigation water.

There is a need to provide Roosevelt City with 2,000 ac-ft of additional M&I water. Roosevelt City and the surrounding area is experiencing steady growth. City officials have requested that the project provide water for M&I demand in and around Roosevelt City. In a letter dated April 10, 2001 (see Comment Letter No. 16 in Chapter 4 *Consultation and Coordination* of this Final EA), City Manager Hancock states the proposed project is important in helping to meet the City's future M&I water needs for two reasons. The first reason is that with the industrial and municipal growth the City is beginning to experience with the demand for power and oil and gas products, it is important to develop the infrastructure to accommodate this growth. The letter states there is a movement to begin refining crude oil and distilling corn and grains at the dormant Roosevelt refinery, and future industrial development will require water. The letter states the second reason the proposed project is important is that the Roosevelt area has not yet tapped its economic potential and the future will bring about needs that today we may not realize. The letter notes the importance of taking the appropriate steps to provide for the needs of future development and to be able to help the infrastructure grow with the area.

A detailed *Roosevelt City Municipal Water Source Analysis* was prepared by Horrocks Engineers in 1996 that showed the municipal water source needs for Roosevelt City would continue to increase. Estimated additional needs varied from approximately 2,200 to 7,300 ac-ft of water per year, depending on the assumptions used. The analysis reported that groundwater well production was nearing capacity to maintain peak flows during the summer months. In July of 1994, all municipal wells were in production and were barely able to meet demands. The analysis identified three potential water sources to meet these

**Figure 1.2-1**

**Runoff Hydrograph and Consumptive Use**

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peak flow demands, all of which would require water treatment water and piping to the existing storage and distribution system.

There is also a need to provide an additional M&I water supply for future demands in the project area outside Roosevelt City. There already exists a demand and need for more than 1,000 ac-ft of potable water. Duchesne County and adjacent Uintah County have not yet built the infrastructure necessary to meet this demand because a water supply has not been readily available to the area.

Water conservation to extend current and future water supplies in the project area will be accomplished through the construction of several project features. Two new pipelines will be constructed to convey some of the project area's water supplies, thereby reducing some of the conveyance and seepage losses associated with several existing canals.

Several environmental resource needs within the Section 203 project area have been identified. These include restoration of wilderness values impacted by historic water management facilities, fish passage, instream flows to mitigate past U.S. Bureau of Reclamation (USBR) Project impacts on fish and wildlife habitat, and recreation.

The Proposed Action and its alternatives meet these needs and purposes to varying degrees by providing water storage, improved distribution facilities, water conservation, M&I water, instream flows, and the improvement of environmental resources.

## 1.3 History and Background

The Section 203 Project proposed in this Final EA evolved from features specifically authorized in Section 203(a) of the Central Utah Project Completion Act (CUPCA). These authorized features included: 1) Pigeon Water Dam and Reservoir together with an enclosed pipeline conveyance system; 2) McGuire Draw Dam and Reservoir; 3) Clay Basin Dam and Reservoir; and 4) rehabilitation of the Farnsworth Canal. Project features of the Proposed Action and action alternatives evaluated in this Final EA were developed from the authorized replacement features of the Section 203 legislation. These replacement features were included and evaluated in the alternatives' formulation and development process for the Upalco Unit Draft Environmental Impact Statement (EIS) (CUWCD 1996a). Feasibility of a Section 203 Project also was discussed in the Draft Upalco Unit Replacement Project Feasibility Study (CUWCD 1996b). The Section 203 Project alternatives carried forth in this Final EA are variations of those replacement features and alternatives to meet the project needs to manage the water resources within the project area in order to provide early and late season irrigation water, M&I water supplies, water conservation, and to enhance facilities for environmental purposes. The evolution of these replacement features from the original, authorized features is described in detail in Section 1.7 *Features Considered but Eliminated from Detailed Analysis* of this Final EA.

Agreements providing for compliance with provisions of the CUPCA and for sharing the costs of project development were signed by the CUWCD and DOI on August 11, 1993. Compliance with NEPA is necessary before DOI approval can be given to initiate construction of the Section 203 Project.

# 1.4 Location of the Project

Map 1.4-1 shows the Section 203 project area. It is located in Duchesne County within the Uinta Basin of northeastern Utah. The Lake Fork and Yellowstone Rivers provide the majority of the water for this area. These rivers originate in the Uinta Mountains to the north and drain into the Duchesne River to the south. Map 1.4-2 shows the general ownership of lands in the Section 203 project area.

# 1.5 Authorizing Actions, Permits, and Licenses

Table 1.5-1 presents the actions or permits required to implement the Section 203 Proposed Action. The table briefly describes each action or permit and defines the responsible agency or organization. These actions or permits are those required to complete the NEPA process and obtain DOI approval prior to construction.

# 1.6 Interrelated Projects

The Council on Environmental Quality (CEQ) guidelines for the preparation of EAs require that cumulative impacts be addressed in addition to direct and indirect effects. Cumulative impacts are those incremental impacts that result from the action when added to other past, present, and reasonably foreseeable future actions. This section discusses those potential interrelated projects that may result in cumulative impacts.

## 1.6.1 Past Interrelated Projects

Numerous water projects have influenced the growth and quality of life in the Uinta Basin. Several federal agencies, including the U.S. Forest Service (FS), USBR, and the U.S. Indian Irrigation Service, have been involved in these water development projects. The importance of irrigation for the initial success and survival of communities in the Uinta Basin was well understood. A complex system of irrigation canals and reservoirs has been constructed and maintained for irrigation uses since the late 1800s.

The first decades of the twentieth century clearly demonstrated that the existing irrigation system was inadequate to meet the agricultural needs of all Uinta Basin farmers. Farmers moved quickly to impound the mountain runoff that flowed through and out of the Basin each spring. The mountain waters were stored behind small earth-filled or masonry dams and then released during the hot growing season. The majority of dams allowed farming to continue through brief periods of drought while the larger structures facilitated further agricultural settlement in the Basin. Numerous dams and reservoirs were initially created in the early years, including Kidney Lake (1918), Island Lake (1919), Brown Duck Lake (1919), East Timothy Lake (reconstructed in 1951), Water Lily Lake (1920), and Twin Pots (1921). Other high mountain lakes were also modified during the same time period, including White Miller, Deer, Farmers, Bluebell, Drift, Superior, Five Point, and Milk Lakes.

In the 1930s, interested irrigation companies joined together to raise capital for the Moon Lake Project and to form the Moon Lake Water Users Association. The Moon Lake Project was constructed as a federal water project by the USBR to supplement the water supply for non-Indian lands. The project was constructed to develop 35,261 ac-ft of active water

storage. The dead storage pool at Moon Lake existed before the project as a natural lake. A dam on the south side of the lake was completed in 1937. Other projects were later added to the system to supplement the water supply in the Uinta Basin. Some of the more important projects in the Section 203 project area include Big Sand Wash Reservoir, Twin Pots Reservoir, Brown's Draw Reservoir, and Midview Reservoir, which was part of the original Moon Lake Project.

During most of the past century, cropland was flood-irrigated using the corrugation method, where furrows extend down slopes to distribute the irrigation water on the fields as uniformly as possible. On irrigated pasture, the free-flowing method of flood irrigation was commonly practiced. These irrigation techniques were not water-efficient and tended to decrease the fertility of the soil while increasing the amount of salinity reaching surface water. In the last two decades, the Natural Resources Conservation Service (NRCS), formerly known as the Soil Conservation Service (SCS), has been working with farmers in the Uinta Basin to develop more efficient irrigation systems.

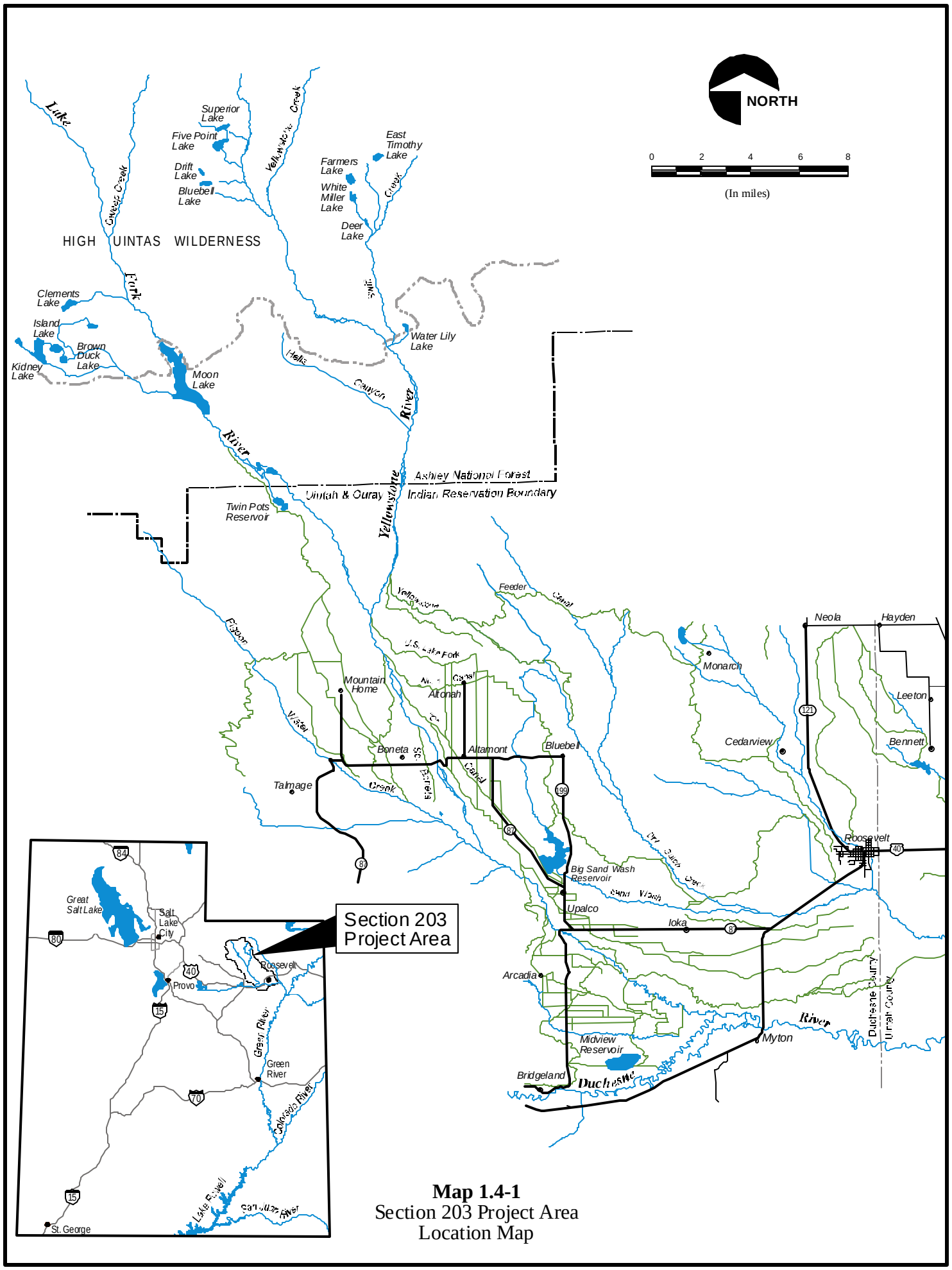
In 1980, the SCS began the Colorado River Salinity Control Program. The goal of the program was to reduce the salinity load from irrigation runoff by assisting farmers in the installation of sprinkler and efficient surface irrigation systems. The program has resulted in increased crop yields and improved overall farm irrigation efficiency. A current project is the Duchesne County Salinity Control Project Phase 1, which includes lining / piping the Red Creek, Class C, Sand Wash Irrigation Company, Payne, and a portion of the Uinta Basin Irrigation Company Canals.

The salinity control program is very popular and has a continuous waiting list. The NRCS develops a priority list based on lands that have the highest salinity problem and that will show the greatest cost benefit for removed salinity. Since 1981, a total of approximately 100,000 acres in Duchesne and Uintah Counties have benefited from the program with improved irrigation systems, most of which use wheel line sprinklers. The NRCS estimates that the cumulative salt load reduction in these two counties is 86,000 tons per year.

### 1.6.2 Effects of Past Projects on Baseline Conditions

This section describes the broad historic context for several important resource areas within the Uinta Basin. The discussion is, by necessity, quite cursory and qualitative in nature since there are few historic, pre-settlement data for most of the resource areas addressed in this EA. However, it provides the reader a general framework for understanding what some of the Basin resources may have been like many years ago and how some activities that have occurred since settlement have contributed to present Basin conditions. These present Basin conditions (i.e., baseline conditions) are described in the Affected Environment section for each resource area and reflect the cumulative effect of all actions that have occurred in the past, plus those actions occurring now.

Resources of the Uinta Basin today probably differ markedly from those of a century ago. It is likely that Basin resources in the late 1800s had remained largely unchanged since the arrival in about A.D. 1200 to 1300 of the ancestors of the modern-day Ute Indians. The initial attraction of non-Indians to the Basin in about 1776 was the prospect of profitable fur trapping, which probably had little overall effect on Basin resources compared to later activities.




**Map 1.4-1**
Section 203 Project Area
Location Map

# Map 1.4-2

# General Land Ownership in the Section 203 Project Area Boundary

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**TABLE 1.5-1**
Section 203 Project Authorizing Actions, Permits, and Licenses

| Agency or Organization | Actions, Permits, and Licenses Required | Description |
|---|---|---|
| **Federal Agencies** | | |
| Central Utah Water Conservancy District (CUWCD) | Approve Proposed Action for construction | The CUWCD Board of Directors must recommend a Proposed Action to the Department of the Interior (DOI) for construction. |
| | Agreement providing for construction, operation and maintenance | Agreement between MLWUA, FS, DOI, and CUWCD regarding how the project would be constructed, operation of facilities, and who would be responsible for the maintenance of the facilities. |
| | Agreement for the transfer of storage water from high mountain lakes to the enlarged Big Sand Wash Reservoir | Agreement as to how high mountain lake water rights would be transferred to the enlarged Big Sand Wash Reservoir; who would be responsible for stabilizing high mountain lakes; and how special use authorizations for high mountain lakes would be canceled. |
| | Contract to provide funding for construction | Contract between CUWCD and DOI for providing funding for 203 Projects. |
| | Water Service Contract | Contract between CUWCD and DOI for the sale and repayment of 3,000 ac-ft of M&I water. |
| | Agreement for modification of Moon Lake Dam outlet works. | USBR will provide final approval of the modifications to the Federal facilities for the outlet works modification. |
| U.S. Department of the Interior (DOI) | Makes decision to construct and requests funds for acquisition of project lands and construction | DOI must approve the NEPA compliance document in order to initiate project construction. |
| | Agreement providing for construction, operation and maintenance | Agreement between MLWUA, FS, DOI, and CUWCD regarding how the project would be constructed, operation of facilities, and who would be responsible for the maintenance of the facilities. |

**TABLE 1.5-1**
Section 203 Project Authorizing Actions, Permits, and Licenses

| Agency or Organization | Actions, Permits, and Licenses Required | Description |
|---|---|---|
| | Agreement for the transfer of storage water from high mountain lakes to the enlarged Big Sand Wash Reservoir | Agreement as to how high mountain lake water rights would be transferred to the enlarged Big Sand Wash Reservoir; who would be responsible for stabilizing high mountain lakes; and how special use authorizations for high mountain lakes would be canceled. |
| | Contract to provide funding for construction | Contract between CUWCD and DOI for providing funding for 203 Projects. |
| | Water Service Contract | Contract between CUWCD and DOI for the sale and repayment of 3,000 acre-feet of M&I water. |
| | Warranty Deed of Easement | MLWUA provides to DOI a temporary property interest to construct the enlarged Big Sand Wash Reservoir, a permanent property interest to construct, operate, and maintain the Big Sand Wash Feeder Pipeline, and the Big Sand Wash–Roosevelt Pipeline, and a permanent property interest to store 12,000 acre-feet of water in the enlarged Big Sand Wash Reservoir. |
| U.S. Bureau of Reclamation | Agreement for modification of Moon Lake Dam outlet works. | USBR will provide final approval of the modifications to the Federal facilities for the outlet works modification. |
| U.S. Fish and Wildlife Service (FWS) | Endangered Species Act (ESA) (Section 7 consultation) | Consultation under Section 7 of ESA is required to determine if the project will affect threatened or endangered species. FWS will prepare a Biological Opinion based on the CUWCD Biological Assessment. |
| | Fish and Wildlife Coordination Act (FWCA) Report | FWS must prepare a FWCA report that determines impacts on fish and wildlife and recommends ways to avoid or mitigate those impacts. |
| | Contaminant Evaluation/ Assessment (Section 205-CUPCA) | Approve a contaminant prevention plan if determined necessary. |

**TABLE 1.5-1**
Section 203 Project Authorizing Actions, Permits, and Licenses

| Agency or Organization | Actions, Permits, and Licenses Required | Description |
|---|---|---|
| U.S. Army Corps of Engineers (COE) | Permit pursuant to Section 404 of the Clean Water Act (CWA) | Will be required for excavation or discharge of fill material into waters of the U.S., including wetlands. |
| | Wetland delineation on non-agricultural land | COE will delineate on non-agricultural lands wetlands that are jurisdictional under Section 404 of the CWA. |
| U.S. Environmental Protection Agency (EPA) | Oversight authority for Section 404 permits | EPA will review 404 permit applications and recommend approval or denial of permits. EPA has authority to veto COE permit approvals. |
| | Administers Water Quality Certification (Section 401) and National Pollutant Discharge Elimination System (NPDES) permits (Section 402) on Indian Reservations | EPA will provide all Section 401 certificates and NPDES permits associated with the project. |
| U.S. Forest Service (FS) | Special waiver by the Regional Forester for certain work in wilderness areas | This will be needed if high mountain lakes' stabilization construction requires camps with more than 14 workers or 15 pack animals and/or uses mechanized/ motorized equipment. |
| | Agreement for the transfer of storage water from high mountain lakes to the enlarged Big Sand Wash Reservoir | Agreement as to how high mountain lake water rights would be transferred to the enlarged Big Sand Wash Reservoir; who would be responsible for stabilizing high mountain lakes; and how special use authorizations for high mountain lakes would be canceled. |
| Utah Reclamation Mitigation and Conservation Commission (URMCC) | Mitigation funding | URMCC may provide funding for modification of Moon Lake Dam outlet works, which will provide instream flows for fish. Funding must be approved by the URMCC for the implementation of the wetland mitigation plan. |

**TABLE 1.5-1**
Section 203 Project Authorizing Actions, Permits, and Licenses

| Agency or Organization | Actions, Permits, and Licenses Required | Description |
|---|---|---|
| **State Agencies** | | |
| Division of State History, State Archaeologist and State Historical Preservation Officer (SHPO) | State Antiquities Permit | Approval of survey and excavation of cultural resources prior to construction. The SHPO will determine if the proposed project will have an impact on culturally or historically sensitive sites listed, or if sites are eligible for listing on the National Register of Historic Places. |
| Utah Division of Wildlife Resources (Wildlife Resources) | Wildlife Resources has responsibility for management of fish and wildlife in the state outside of Indian Reservations and has concurrence responsibility for the FWCA Report | Wildlife Resources will comment on, and concur with FWS on, the FWCA Report. If they cannot concur, they may write their own FWCA Report. |
| Utah Division of Water Quality | Section 401 Water Quality Certificate (CWA)<br><br>Section 402 National Pollutant Discharge Elimination System (NPDES) permit (CWA) | This agency must provide 401 Water Quality Certificates for applicable project features. This agency also will issue NPDES permits. |
| Utah Division of Water Rights | Approval of changes in diversions, new diversions, and issuance of stream alteration permits | Each new or moved point of diversion must be approved by the Division of Water Rights. They also must issue a stream alteration permit for each feature affecting stream beds. |
| | Approval of transfer of irrigation water rights in high mountain lakes to project reservoirs | Operation of the project will require the water rights to be moved to the facility in order for the lakes to be stabilized. |
| | Approve exchange agreements with water users | Exchange agreements will be required to facilitate project operation. |
| | The transfer of the high mountain lakes' storage rights to the enlarged Big Sand Wash Reservoir must be conditionally approved prior to the initiation of construction | Water rights held by MLWUA must be transferred to the enlarged Big Sand Wash Reservoir. |
| | Review plans and specifications for all dam construction | Plans for dams must be reviewed for safety considerations. |

**TABLE 1.5-1**
Section 203 Project Authorizing Actions, Permits, and Licenses

| Agency or Organization | Actions, Permits, and Licenses Required | Description |
|---|---|---|
| Utah Department of Transportation (UDOT) | Encroachment permits | UDOT must issue permits to construct or modify project features on state highway ROWs. |
| **Other Agencies, Organizations, and Landowners** | | |
| Moon Lake Water Users Association, other Water User Associations, and Irrigation Companies | Agreement for the transfer of storage water from high mountain lakes to the enlarged Big Sand Wash Reservoir. | Agreement as to how high mountain lake water rights would be transferred to the enlarged Big Sand Wash Reservoir; who would be responsible for stabilizing high mountain lakes; and how special use authorizations for high mountain lakes would be canceled. |
| | Agreement providing for construction, operation and maintenance | Agreement between MLWUA, FS, DOI, and CUWCD regarding how the project would be constructed, operation of facilities, and who would be responsible for the maintenance of the facilities. |
| | Warranty Deed of Easement | MLWUA provides to DOI a temporary property interest to construct the enlarged Big Sand Wash Reservoir, a permanent property interest to construct, operate, and maintain the Big Sand Wash Feeder Pipeline, and the Big Sand Wash–Roosevelt Pipeline, and a permanent property interest to store 12,000 acre-feet of water in the enlarged Big Sand Wash Reservoir. |
| | Agreement for modification of Moon Lake Dam outlet works. | USBR will provide final approval of the modifications to the Federal facilities for the outlet works modification. |
| Duchesne County Government | Building permits<br><br>Permits to construct in county road right-of-ways (ROWs) | Duchesne County will need to issue building permits for each project feature and permits to construct in county road ROWs. ROWs in question must not be located on Tribal land. |

**TABLE 1.5-1**
Section 203 Project Authorizing Actions, Permits, and Licenses

| Agency or Organization | Actions, Permits, and Licenses Required | Description |
|---|---|---|
| Roosevelt City | City permits and entry into a contract with CUWCD for project water | The City will need to issue construction permits if the new pipeline is within City limits and will need to contract for project water. A petition between the City and CUWCD for M&I project water. |
| Landowners | Project features' implementation | Landowners whose property is directly affected by project construction and/or operation would be consulted regarding planning of pipeline routes and access, and issuing easements, rights-of-way, entry permits, access agreements, and similar items. |

The substantive alteration of historic Basin resources to conditions observed today probably began with a series of events commencing in the late 1800s that provided the impetus for European-American activity in the area. These events included the presence of the Ute Tribe in the Uinta Basin and interactions with non-Indians; the discovery and development of minerals, and later, petroleum resources; and, perhaps most important, the land rush and diversion of water for irrigation by non-Indian settlers.

Development of a predominantly agricultural/ranching life-style in the Uinta Basin over the past century has been a major force in modifying and shaping the Basin's resources as known today, particularly as related to the affected environment being described for the project area. The diversion and use of water for crops and livestock has been critical in the development of an agrarian life-style, but it has resulted in substantially modified hydrologic regimes today compared to historic, pre-development conditions. For example, the FWS (1998) reports that the Duchesne River historically produced an average of about 768,000 acre-feet of water annually to the Green River. Today, some 100 years later, the average annual flow remaining in the Duchesne River at the Green River is approximately 220,000 acre-feet. The FWS concludes in their Final Biological Opinion for endangered fishes in the Duchesne River that historical stream flow reductions of this magnitude have severely diminished both the survival and recovery of the native fishes that inhabit the Duchesne River.

Fish assemblages in tributaries to the Duchesne River probably also differ markedly from native populations of a century ago, due in part to the modified hydrologic regime, a probable gradual decline in water quality, current diversion techniques, and the stocking of non-native fish species. Native salmonids, such as Colorado River cutthroat trout and mountain whitefish, may have been more widely distributed in Duchesne River tributaries, such as the Lake Fork River, a century ago than the non-native salmonids that occur there today. However, there has probably been an overall reduction in habitat quantity and quality suitable for native salmonids, particularly in downstream areas, because of substantially reduced stream flows; potentially higher summer water temperatures because of reduced flows; potentially higher total dissolved solids (TDS) loads and increased stream turbidity because of reduced stream flows and increased agricultural return flows; and the current practice of "dry–damming" some river reaches during summer diversion to divert water into canals.

Purposely stocking or accidentally introducing more than 40 non-native fish species in the Duchesne River Basin since the late 1800s has also altered fish assemblages (FWS 1998). These introductions include various species of centrarchids (sunfishes and basses), ictalurids (catfishes and bullheads), cyprinids (minnows and shiners), and non-native salmonids such as rainbow, brown, brook, and Yellowstone cutthroat trout. Some of these species are better adapted to today's habitat conditions than native species and are therefore able to compete successfully and sometimes replace native species. Others species, like some of the salmonids, hybridize and eliminate pure strains of native species. For example, Colorado River cutthroat trout was the only trout species native to the Duchesne River Basin. Today, no pure strains of this species are known to occur in the Basin because of hybridization with rainbow trout and other subspecies of stocked cutthroat trout.

Water diversions for agriculture as well as other actions related to settlement have also had a marked effect on the amount and type of wetlands and riparian communities, upland

habitats, and associated wildlife occurring in the Uinta Basin. The most dramatic changes have occurred in two areas: river floodplains and upland high deserts.

Prior to settlement by European-Americans, the natural upland vegetation of the Uinta Basin generally consisted of a variety of high desert shrub and shrub/grass communities. Species composition varied considerably depending on elevation, precipitation, aspect, and soil type. The high desert of the project area was interrupted by two major drainages, the Lake Fork and Yellowstone Rivers, as well as several minor ones that drained the south slope of the Uinta Mountains. The Duchesne River drained the lower portion of the Basin from west to east.

The upper portions of the Lake Fork and Yellowstone Rivers, located on what is currently land managed by the FS, consist of classic glacier-formed, U-shaped valleys with fairly wide floodplains that confine the rivers and limit their lateral movement. However, channel movement within the floodplains was undoubtedly substantial over time. Wetlands and riparian communities probably were extensive and occurred across the entire floodplain, as is currently observed in these areas. The river/wetland/riparian systems likely were very dynamic and the location and juxtaposition of cover types changed regularly, especially following the larger spring runoff events. A similar situation likely existed on the smaller drainages, but to a lesser degree.

Below the canyons, the Lake Fork River floodplains were probably very wide historically, with the river moving several miles laterally over time. Wetland and riparian communities likely occurred across the miles-wide floodplains because of the extensive channel movements and the very large amount of water moving through the shallow groundwater system. There is no specific record of the width of this river's floodplains but it does not seem unreasonable, given the magnitude of the runoff events, that the area influenced by this river could have historically been from 1 up to 4 miles wide where there were multiple channels. Of course, it is unlikely that all of the land within the area of influence was either wetland or riparian, but these communities were probably quite extensive within the influence area. River reaches probably were also very dynamic, with new channels being formed and abandoned over time, resulting in considerable changes in plant communities. Wetlands and riparian communities were undoubtedly extensive along the Duchesne River as well.

Four activities implemented following settlement of the Uinta Basin by European-Americans have probably had the greatest influence on the extent and quality of wetland and riparian communities associated with rivers and streams of the project area. These include livestock grazing, land conversion for agriculture, water diversion, and stream channelization. Livestock grazing has reduced the extent, quality, and diversity of pre-settlement wetland and riparian communities throughout the Uinta Basin through a variety of processes. The other three activities have largely occurred below the mouths of river and stream canyons. Conversion, diversion, and channelization have substantially affected wetland and riparian communities by removing vegetation, lowering water tables, reducing shallow groundwater recharge, and interfering with the dynamic processes required to maintain and perpetuate these communities.

The native upland vegetation of the Uinta Basin generally consisted of a variety of high desert shrub and shrub/grass communities. These areas have also been affected by the

activities of European-American settlers. Virtually all natural communities of the Basin have been grazed since settlement. This grazing has reduced species diversity and eliminated or reduced many species such as native bunch grasses and forbs, which are often preferred by livestock. Less palatable species such as sagebrush are probably more dominant than prior to settlement. Exotic species introduced after settlement have also displaced native species on both uplands and along rivers. Fire control has allowed pinyon pine and Utah juniper to occupy much larger areas in the northern portion of the Basin. Large areas of upland plant communities have been converted to agriculture, including irrigated pasture and cropland.

The expansion of irrigation throughout the Uinta Basin has resulted in the development of thousands of acres of wetland and riparian areas throughout the Basin. These areas occur along canals, at the lower ends of irrigated lands, and down-gradient of irrigated lands. While the vast majority of these wetlands and riparian communities are very small, less than 1 acre, some are relatively large, exceeding 10 acres.

Wildlife occurrence in the project area has also changed dramatically. Generally, species that require large blocks of habitat with relatively high plant species diversity or multiaged structure have suffered from direct habitat loss and from reduced plant community diversity. Species that are sensitive to human disturbance, such as sage grouse and many raptor species, have also been adversely affected since settlement, as have species perceived to be a nuisance, such as the prairie dog. Introduced species such as the ring-neck pheasant and starling, as well as red-winged blackbirds and coots, have benefited from the changes.

### 1.6.3 Future Interrelated Projects

An extensive survey was recently conducted to identify other reasonably foreseeable projects potentially occurring within the Uinta Basin that could result in cumulative environmental impacts. Table 1.6-1 summarizes other projects expected to occur in the Basin. Each project was evaluated to determine if it was sufficiently defined (i.e., reasonably foreseeable) to be relevant to potential impacts; within the Section 203 project area of influence; and of a magnitude that would result in a significant cumulative impact. Except for the ongoing Colorado River Salinity Control Program (described previously), which has resulted in a cumulative salt load reduction in the Uinta Basin and should continue to do so under the Proposed Action, no significant cumulative impacts would be expected from the combination of other projects with the Section 203 Project. It also is noteworthy that as part of the proposed project, there is the possibility of developing an alternative wetland mitigation site under the Utah Reclamation Mitigation and Conservation Commission's Lower Duchesne River Wetlands Mitigation Project (see Table 1.6-1). This would provide an opportunity to enhance wetland and riparian habitat quantity and quality in the Duchesne River corridor.

## 1.7 Section 203 Features Considered but Eliminated from Detailed Analysis

This section discusses project features considered but eliminated from further analysis and the associated rationale. As noted in Section 1.3 *History and Background*, Section 203(a) of the CUPCA authorized the construction of four projects to increase efficiency, enhance beneficial use, and achieve greater water conservation. Three of these authorized projects

**TABLE 1.6-1**
Uinta Basin Projects Considered for Cumulative Impact Analysis

| |
|---|
| **Duchesne County Comprehensive Plan Amendment** |
| Plan would provide direction on federal land policy issues within the county. |
| **Gravity Sprinkler Irrigation Development (Colorado River Salinity Control Project)** |
| Sand Wash Canal—200-acre conversion to sprinkler irrigation. Project has been constructed and is in operation. |
| Dry Gulch Irrigation Company—1,800-acre conversion and piping of South Bench Canal. |
| Lower Pioneer Group—481-acre conversion. This project will connect to the USBR project and eliminate the open Pioneer Canal. Preliminary design has been completed. |
| Red Creek Irrigation Company—This project pipes the main canal and converts 692 acres to sprinkler irrigation. |
| Uteland Purdy Ditch Company—1,500-acre conversion on hold by USBR. |
| Payne Canal—Piped the main canal. |
| Uinta Basin Irrigation Company—Piped a portion of the main canal. |
| Lower Strawberry—576-acre conversion. Preliminary design has been completed. |
| K2 System—Application has been made to pipe the main canal and laterals. |
| Farm Creek Irrigation Company—2,100-acre conversion. Half of this has already been converted. |
| T.N. Dodd—Application has been made to pipe the main canal. |
| **Wildlife Reserve Concept (near Myton)** |
| Lands near the county line at Myton have been considered for use as a wildlife reserve to mitigate losses caused by past USBR projects. |
| **Ute Tribe Development** |
| Housing—Work on a $3.5 million single-family housing development is nearing completion. |
| Whiterocks Road Improvement—This is the priority road improvement project on the reservation and is complete. |
| Uintah Canyon Road Improvement—This road improvement project consists of paving and is complete. |
| Independence Road Improvement—This is another secondary priority project to the Whiterocks Road Improvement. Status is uncertain. |
| Fish Hatchery—A fish hatchery at the Youth Camp/Big Springs area has been proposed under CUPCA mitigation 313(c). Status is uncertain. |
| Leland Bench Oilfield Development Project—A NEPA Scoping Announcement has been circulated for this development of 625 oil wells at 40-acre spacing on 25,000 acres located 35 miles southwest of Vernal. |
| **Utah Reclamation Mitigation and Conservation Commission** |
| Strawberry Aqueduct and Collection System of the Bonneville Unit—Aquatic mitigation plan for the Strawberry and Duschene River drainages. |
| Lower Duchesne River Wetlands Mitigation Project with the Department of the Interior and Ute Tribe. |
| Strawberry and Duchesne Rivers Diversion Structure Reconstruction Project. |
| Uinta Basin Irrigation Company—Application has been made to pipe the South Pleasant Valley Canal. |

**TABLE 1.6-1**
Uinta Basin Projects Considered for Cumulative Impact Analysis

| |
|---|
| **U.S. Forest Service** |
| Yellowstone Hydroelectric—A cooperative effort with Moon Lake Electric Cooperative to dredge the existing reservoir on this hydro project. Dredging was completed in 1995, but active sluicing of sediments annually into the Yellowstone River has some impacts on the stream environment and fisheries resource. Improvements to Reservoir Campground to be completed. |
| Revision of Ashley Forest Resource Management Plan—Although scheduled for revision, this plan is not expected to be revised until clear direction is provided. |
| **Utah Department of Transportation** |
| State Route 35 Wolf Creek Road—Involves reconstruction of road, some on new alignments, by FHWA across Forest Service land. |
| **Oil and Gas Well Development (future wells)** |
| About the same number of oil and gas wells are expected to be drilled in Duchesne and Uintah Counties in the next several years as in the past year. As an example, from January through mid-October 1996, 68 wells were drilled in Duchesne County and 34 in Uintah County. |
| **Central Utah Project Water Conservation Credit Projects** |
| Brown & Broadhead Ditch Piping—Pipe the Brown (approximately 2 miles) and Broadhead (approximately 2.4 miles) Canals. Feasibility of combining the two canals into one pipeline will be considered. |
| Farm Creek Irrigation—Convert from open canal to piped pressure irrigation systems. Conserved water is proposed to remain in the Duchesne River. |
| Rhoades Flood to Sprinkler Conversion—On-farm improvement, converting from flood to sprinkler irrigation systems. Project includes pressurized supply line. |
| Altamont Town Irrigation Project—Secondary irrigation system for Altamont residents, includes replacing approximately 12,000 feet of open ditch with a pipeline. |
| Duchesne City Instream Flow Project and East Duchesne Culinary Water Improvement District Instream Flow Project—The DOI has agreed to credit these entities for 275 and 70 acre-feet of water not being used, respectively. The agreement is thought to be for a 5-year period before contract renewal. Water is assumed to be put back into the Duchesne River. |
| **Central Utah Water Conservancy District/Department of the Interior Uintah Unit and Upalco Unit Replacement Projects** |
| Major water development project consisting of water storage, water distribution, recreation, and environmental features. Both projects were discontinued by the DOI in May 1999. |
| **U.S. Bureau of Reclamation** |
| Land Acquisition for Fisherman Access—Seventy to 85 percent of the land has already been acquired. |
| SEED Project—Drilling at Moon Lake Dam to determine safety. |
| Green River—Recovery Implementation Program (RIP)<br>• Study Green and Colorado Rivers<br>• Flooded Bottomlands Program<br>• Hatchery Propagation<br>• Middle Green River Selenium Study |

would have been located in the Lake Fork River drainage basin. They included: 1) Pigeon Water Dam and Reservoir together with an enclosed pipeline conveyance system; 2) Clay Basin Dam and Reservoir; and 3) rehabilitation of the Farnsworth Canal. The fourth project, McGuire Draw Dam and Reservoir, would have been located in the Uinta River drainage basin.

These four authorized projects were evaluated for their engineering, biological, and economic feasibility. The feasibility evaluation indicated that the Pigeon Water site was not economically viable because of the small volume of storage available, the high cost of the structure, and the unreasonably high cost per acre-foot of water. Because of these limitations, alternatives to Pigeon Water Dam and Reservoir were considered and evaluated. The enlargement of the existing Big Sand Wash Reservoir was determined to be the most economically feasible and environmentally acceptable alternative that would provide the same benefits, purposes, and needs as the Pigeon Water site (CH2M HILL/ Horrocks 1994). The feasibility evaluation indicated that the Clay Basin site was not feasible because of deep, active landslides. This significant geologic hazard was identified by the USBR during earlier studies in 1974 and was confirmed in 1991 during feasibility investigations (CH2M HILL 1994). Enlargement of the existing Big Sand Wash Reservoir was also identified as the best alternative that would fulfill the same purposes and needs as the Clay Basin site (CH2M HILL / Horrocks 1995).

The feasibility evaluation indicated that the rehabilitation of Farnsworth Canal was not feasible because of an unacceptable loss of wetlands that would have occurred (CUWCD 1996b). Several pipelines and other project facilities are included in the action alternatives, as more feasible features, to replace the rehabilitation of the Farnsworth Canal. These facilities would contribute more broadly to the authorized objectives of increased efficiency, enhanced beneficial uses, and greater water conservation. Examples of these alternative project features include: stabilizing high mountain lakes; re-establishing natural flow regimes in drainages downstream of stabilized high mountain lakes; providing instream flows for fish between Moon Lake Reservoir and the new Big Sand Wash Feeder Diversion Structure; providing fish passage at the new Big Sand Wash Feeder Diversion Structure; and developing, storing, and efficiently conveying irrigation and M&I water for Basin use through new pipelines and expanded water storage capacity.

The feasibility evaluation also indicated that the construction of McGuire Draw Dam and Reservoir was not feasible (CUWCD 1997). The dam and reservoir site for this project was found to be unacceptable because of unsuitable geologic conditions. The enlargement of the existing Big Sand Wash Reservoir and construction of a new pipeline to convey M&I water to Roosevelt City and irrigation water to the State Road area fulfills the same purposes and needs as McGuire Draw Dam and would benefit numerous residents within the Uinta River watershed.

Although the four projects specifically included in the authorizing legislation were determined to not be feasible for various reasons, there are several feasible alternatives that can be built in the same area that do meet the Congressional mandate to increase water efficiencies, to enhance beneficial use of water, and to achieve greater water conservation. These alternatives are described in detail in Chapter 2 of this Final EA. The proposed expansion of Big Sand Wash Reservoir by 12,000 ac-ft would provide the opportunity to meet these project purposes and needs using the enlarged off-stream storage space

differently for the various alternatives. The Proposed Action and its action alternatives presented in this EA not only are economically feasible and meet these Congressional mandates, but to varying degrees also fulfill the needs and purposes that are identified in Sections 1.2.1 and 1.2.2 of this document. The No Action Alternative presented in this EA would not meet project purpose and need.

CHAPTER 2

# Description of the Proposed Action and Alternatives

## 2.1 Overview of the Proposed Action and Alternatives

This chapter describes the Proposed Action and three alternatives. They are as follows:

- Proposed Action—Lake Fork Section 203 Alternative
- Revised Section 203 Alternative
- Twin Pots Section 203 Alternative
- No Action Alternative

The Proposed Action and each action alternative consist of a combination of features that work together as a unit. Table 2.1-1 lists specific features of the Proposed Action and each action alternative. For the Proposed Action, the features are generally described according to the following:

- Dams and Reservoirs—Water storage capacity and regulation would be provided in the enlarged Big Sand Wash Reservoir, which is an existing off-stream reservoir. The operation of the enlarged dam and reservoir would facilitate the transfer of private water rights from the stabilization of 13 lakes in the High Uintas Wilderness. Four of these lakes are in the upper Lake Fork River drainage and nine are in the upper Yellowstone River drainage. The re-regulation of this non-project water through Moon Lake Reservoir, from the four lakes in the upper Lake Fork River drainage would provide instream flows for fish in selected reaches of the Lake Fork. Increased water supplies stored in an enlarged Big Sand Wash Reservoir would be for M&I and irrigation uses. The enlarged Big Sand Wash Dam and Reservoir would be operated in coordination with the existing Moon Lake Reservoir to provide instream flows for fish in the Lake Fork River from Moon Lake Dam to the Big Sand Wash Feeder Diversion Structure. Water that is currently stored in four high mountain lakes in the Lake Fork drainage would be re-regulated in Moon Lake Reservoir and released to the Lake Fork River. Minor modifications would be made to the Moon Lake outlet works to facilitate the release of these instream flows. Water that is currently stored in the nine high mountain lakes in the upper Yellowstone drainage would follow natural runoff patterns, providing instream flows, with subsequent storage in the enlarged Big Sand Wash Reservoir. Stipulated bypass flows of this high mountain lake water past the Yellowstone Feeder and “C” Canal Diversions also would benefit instream flows.

- Diversion Structure—The new Big Sand Wash Feeder Diversion Structure would divert flows from the Lake Fork River for storage in the enlarged Big Sand Wash Reservoir. The design and operation of the new diversion structure would provide for fish passage, enhance the beneficial use of water, increase water efficiencies, and conserve water.

**TABLE 2.1-1**
*Project Features Associated with the Proposed Action and Alternatives*

| Proposed Action–Lake Fork Section 203 Alternative | Revised Section 203 Alternative | Twin Pots Section 203 Alternative |
|---|---|---|
| **Dams and Reservoirs** | | |
| Big Sand Wash Enlargement (12,000 ac-ft)[a]:<br>- 2,500 ac-ft Irrigation<br>- 3,000 ac-ft M&I[b]<br>- 6,500 ac-ft High Mountain Lakes<br>Moon Lake Dam Outlet Works Modification (winter flow releases) | Big Sand Wash Enlargement (12,000 ac-ft):<br>- 9,000 ac-ft Irrigation<br>- 3,000 ac-ft M&I | Big Sand Wash Enlargement (12,000 ac-ft):<br>- 2,500 ac-ft Irrigation<br>- 3,000 ac-ft M&I<br>- 6,500 ac-ft High Mountain Lakes |
| **Diversion Structures** | | |
| Big Sand Wash Feeder | Big Sand Wash Feeder | Big Sand Wash Feeder<br>Lake Fork–Yellowstone |
| **Pipelines** | | |
| Big Sand Wash Feeder<br>Big Sand Wash–Roosevelt | Big Sand Wash Feeder<br>Big Sand Wash–Roosevelt | Big Sand Wash Feeder<br>Big Sand Wash–Roosevelt<br>Lake Fork–Yellowstone |
| **High Mountain Lakes' Stabilization** | | |
| Lake Fork: Brown Duck Island, Kidney, Clements<br>Yellowstone: Bluebell, Drift, Five Point, Superior, Farmers, East Timothy, White Miller, Deer, Water Lily | | Lake Fork: Brown Duck Island, Kidney, Clements<br>Yellowstone: Bluebell, Drift, Five Point, Superior, Farmers, East Timothy, White Miller, Deer, Water Lily |
| **Fish and Wildlife Mitigation and Enhancement** | | |
| Wetland/Riparian Creation<br>Fish Passage<br>Instream Flows<br>Big Sand Wash Reservoir Boat Ramp | Wetland/Riparian Creation<br>Fish Passage<br>Big Sand Wash Reservoir Boat Ramp | Wetland/Riparian Creation<br>Fish Passage<br>Twin Pots Reservoir Improvement<br>Big Sand Wash Reservoir Boat Ramp |

[a]ac-ft = acre-feet
[b]M&I = Municipal and Industrial

- Pipelines—Pipelines would efficiently convey water to the enlarged Big Sand Wash Reservoir, various irrigators, and Roosevelt City. The Big Sand Wash Feeder Pipeline would deliver non-project, re-regulated instream flows to an enlarged Big Sand Wash Reservoir for irrigation uses. The Feeder Pipeline also would deliver project water to the enlarged Big Sand Wash Reservoir for irrigation and M&I uses. The Big Sand Wash–Roosevelt Pipeline would deliver project M&I water from the enlarged Big Sand Wash Reservoir to Roosevelt City, as well as project irrigation water to the Lower K2 and state road areas of the Dry Gulch Irrigation Company in the Uinta River system located east and northeast of Roosevelt City. The design and operation of these pipelines would increase water efficiencies and conserve water.

- High Mountain Lakes' Stabilization—Stabilization of four high mountain lakes in the upper Lake Fork River watershed and nine high mountain lakes in the upper Yellowstone River watershed would provide constant, year-round lake water levels. Consequently, streamflows originating in the upper watershed would be uncontrolled and follow natural runoff patterns; intrinsic and recreational values within the High Uintas Wilderness would be enhanced; fish habitat and water quality would be improved; and impacts from annual dam maintenance operations in the wilderness area would be eliminated.

- Fish and Wildlife Mitigation and Enhancement—Mitigation and enhancement features would mitigate, replace, improve, and / or enhance fish and wildlife habitat affected by the project. These features could include, but are not limited to: enhancing wetland / riparian habitat; providing fish passage facilities at a new diversion structure; providing instream flows for fish during late summer, early fall, and winter in the Lake Fork River between Moon Lake Reservoir and the Big Sand Wash Feeder Diversion Structure; extending the boat ramp to provide the public access to the enlarged Big Sand Wash Reservoir; and providing bypass flows at the Yellowstone Feeder Canal Diversion for fish.

The Proposed Action and alternatives are described below and are based on feasibility level designs.

# 2.2 Description of the Proposed Action—Lake Fork Section 203 Alternative

## 2.2.1 Introduction

The Proposed Action was formulated to fulfill the same need, with the least long-term environmental impact, as the facilities specifically authorized in Section 203(a) of CUPCA. The following features comprise the Proposed Action: 1) 13 high mountain lakes' stabilization; 2) the modified outlet works at Moon Lake Dam; 3) the Big Sand Wash Feeder Diversion Structure; 4) the Big Sand Wash Feeder Pipeline; 5) the enlarged Big Sand Wash Dam and Reservoir; 6) the Big Sand Wash–Roosevelt Pipeline; and 7) fish and wildlife mitigation and enhancement. Map 2.2-1 shows the locations of specific features of the Proposed Action. The Proposed Action described in this Final EA has been modified from the Draft EA based on comments on the Draft EA (see the Comment Letters in Chapter 4)

that all 13 of the high mountain lakes be stabilized. The following subsections provide descriptions of the project features.

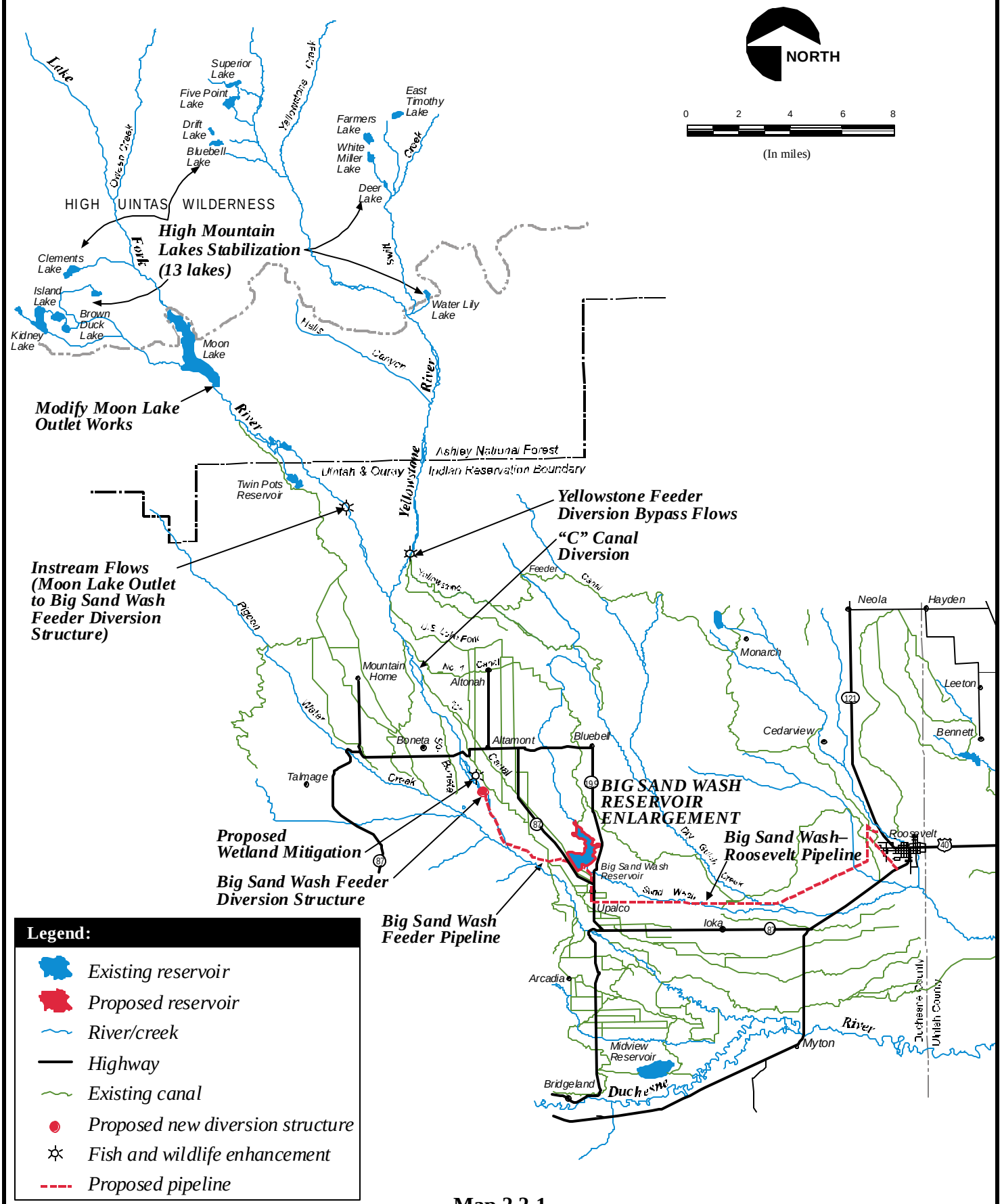
## 2.2.2 Features

### 2.2.2.1 Enlarged Big Sand Wash Dam and Reservoir

The existing Big Sand Wash Dam and Reservoir is an existing off-stream facility with a storage capacity of 12,100 ac-ft. The existing reservoir's active storage capacity would be increased by 12,000 ac-ft under the Proposed Action. The dam and reservoir are located between State Highways 87 and 199, about 1 mile north of the community of Upalco (see Map 2.2-1). They are located on Big Sand Wash, which is a tributary of Dry Gulch Creek. The reservoir's primary water supply is the Lake Fork River approximately 7 miles to the northwest via the "C" Canal. The enlarged reservoir would be on private and state lands.

**2.2.2.1.1 Description of Facilities.** Under the Proposed Action, the existing Big Sand Wash Dam would be raised 26 feet to a height of 136 feet with a crest elevation of 5,918 feet. The two east dikes would be combined and raised to a maximum height of 40 feet. To eliminate the need to relocate State Highway 87, which is immediately west of the enlarged reservoir, the west dike would be replaced with a roller-compacted concrete (RCC) embankment. Table 2.2-1 summarizes the physical features and facilities associated with the existing 12,100-ac-ft reservoir and proposed 12,000-ac-ft enlargement of Big Sand Wash Dam and Reservoir. Map 2.2-2 shows the locations of proposed modifications to the dam.

**2.2.2.1.2 Dam and Reservoir Operations.** The Moon Lake Water Users Association (MLWUA) would own, administer, operate, and maintain the enlarged Big Sand Wash Dam and Reservoir as described in the Operating Agreement. Under the Proposed Action, Big Sand Wash Reservoir would be enlarged to a total storage capacity of 24,100 ac-ft (elevation 5,910 feet). This would consist of 22,900 ac-ft of total active storage capacity plus 1,200 ac-ft for the existing conservation pool and 21 ac-ft for the existing inactive (dead) storage pool. Of this total, the existing 12,100 ac-ft of storage capacity would continue to be owned and allocated to the MLWUA to store 10,900 ac-ft of non-project irrigation water and to the State of Utah for the 1,200 ac-ft conservation and dead storage pool. The United States would have a permanent easement in the enlarged Big Sand Wash Dam and Reservoir and its appurtenant lands and facilities, as described in the Operating Agreement and the Warranty Deed of Easement. This would entitle the United States to 12,000 ac-ft of storage capacity in the enlarged reservoir, and the right to divert, store, and release up to 5,500 ac-ft of project water from the enlarged dam and reservoir using water rights held by the United States. The United States would execute a contract with the MLWUA and the CUWCD according to the terms and conditions of the Operating Agreement regarding compensation, operation, maintenance, etc., associated with the enlarged capacity in the reservoir; the storage of MLWUA's water in the enlarged reservoir that was originally stored in the 13 high mountain lakes; and the coordinated operation of Moon Lake Dam and Reservoir to provide the instream flows for fish. Of the 12,000 ac-ft of enlarged capacity, 6,500 ac-ft would be reserved for the exclusive storage of MLWUA's high mountain lake water rights. Water from the four high mountain lakes in the upper Lake Fork would be re-regulated through Moon Lake Reservoir to ensure instream flows in the Lake Fork River for fisheries.




**Map 2.2-1**
Proposed Action–
Lake Fork Section 203 Alternative

**TABLE 2.2-1**
Physical Features and Facilities of the Existing and Enlarged Big Sand Wash Dam and Reservoir
*Proposed Action–Lake Fork Section 203 Alternative*

| Features | Existing | Enlarged |
|---|---|---|
| **Dam** | | |
| Type | Zoned earth and rock fill | Zoned earth and rock fill |
| Structural height (feet) | 110 | 136 |
| Crest length (feet) | 795 | 900 |
| **East Dikes** | | |
| Type | Earth fill | Earth fill |
| Structural height (feet) | 18 | 40 |
| Crest length (feet) | 1,890 | 3,000 |
| **West Dike** | | |
| Type | Earth fill | Roller-compacted concrete |
| Structural height (feet) | 29 | 48 |
| Crest length (feet) | 1,315 | 4,400 |
| **Spillway** | | |
| Type | Unlined channel | Unlined channel |
| Probable Maximum Flood Design Capacity (cfs) | 3,500 | 3,500 |
| **Intake Structure** | | |
| Type | Single, low level | Single, low level |
| **Outlet Works** | | |
| Conduit type | Reinforced concrete | Steel encased in concrete |
| Maximum discharge (cfs) | 200 | 250 |
| **Probable Maximum Flood (cfs)** | 18,000 | 18,000 |
| **Storage (acre-feet)** | | |
| Inactive (dead) pool | 21 | 21 |
| Conservation pool | 1,200 | 1,200 |
| Active pool | 10,900 | 22,900 |
| Total active | 12,100 | 24,100 |
| **Reservoir (at full pool)** | | |
| Elevation (feet msl) | 5,885 | 5,910 |
| Length (miles) | 1.6 | 2.5 |
| Surface area (acres) | 393 | 650 |
| Shoreline length (miles) | 7 | 12 |
| Maximum depth (feet) | 103 | 128 |
| Mean depth (feet) | 30 | 37 |
| **Conservation Pool Maximum Depth (feet)** | 32 | 32 |
| **Drainage Area (square miles)** | 11.3 | 11.3 |

The Operating Agreement stipulates provisions for these instream flows. The MLWUA would file the necessary applications with and obtain the approval of the Utah State Engineer to transfer these non-project, high mountain lake storage rights to the enlarged reservoir.

The reservoir's primary water supply would come from the Lake Fork River via the "C" Canal and the proposed Big Sand Wash Feeder Pipeline. A small amount of runoff would come from the 11.3-sq.-mi. Big Sand Wash watershed upstream of the dam. Figure 2.2-1 shows estimated end-of-month water surface elevation and storage in the enlarged Big Sand Wash Reservoir for wet, average, and dry years based on the 64-year analysis period (1930 to 1993). Average-year data are an average of all 64 years during the analysis period. Wet-year data are an average of the 4 wettest years by volume (1941, 1944, 1965, 1983), and dry-year data are an average of the 4 driest years by volume (1934, 1977, 1988, 1989) during the analysis period. Generally, the enlarged reservoir would be filled through the winter and spring months. The water diverted for storage in the enlarged reservoir would be allocated to the various storage pools as depicted in Figure 2.2-2. During "dry" years, or years when the total storage is less than 24,100 ac-ft, there would be no shortages to the M&I users, and at no time would the conservation pool be depleted; however, shortages to irrigation would occur.

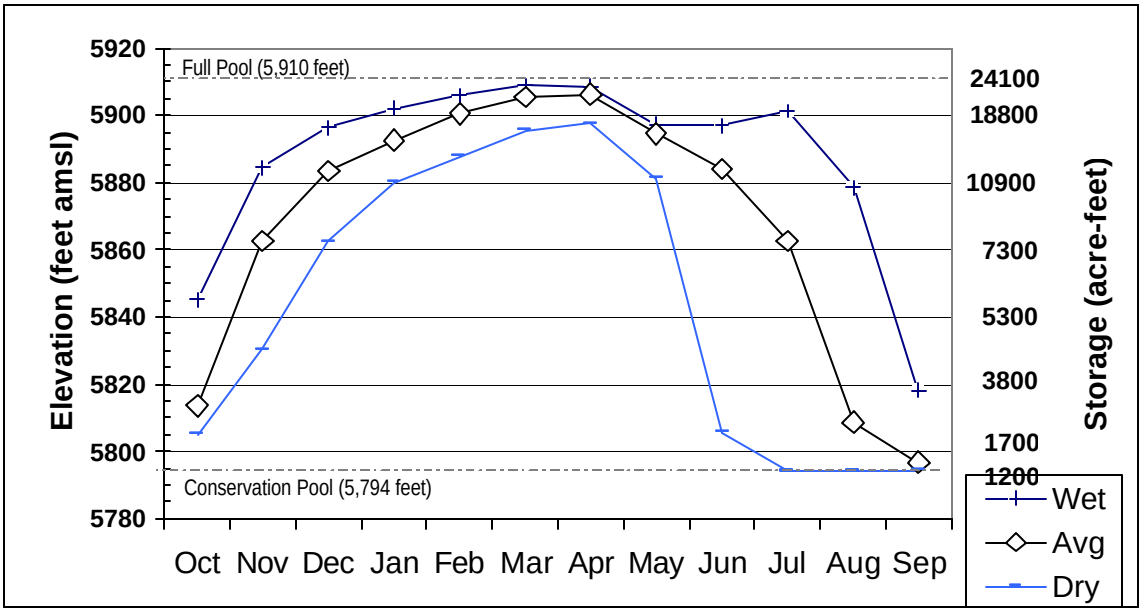



**FIGURE 2.2-1**
Average-, Wet-, and Dry-Year End-of-Month Elevation and Storage for the 12,000-ac-ft Enlarged Big Sand Wash Reservoir
(Proposed Action)

Annual diversions of project and non-project water from the Lake Fork River through the "C" Canal and Big Sand Wash Feeder Pipeline would average 56,469 ac-ft and vary from 23,548 ac-ft (1934) to 72,106 ac-ft (1965). The "C" Canal diversions would average 42,397 ac-ft, with an average of 2,584 ac-ft diverted from the "C" Canal for irrigation. Thus, an average of 39,813 ac-ft would reach Big Sand Wash Reservoir. The Big Sand Wash Feeder Pipeline diversions would average 14,072 ac-ft (8,707 ac-ft in 1939 to 16,434 ac-ft in 1986)

# Map 2.2-2

# Proposed Action—Lake Fork Section 203 Alternative Physical Features and Construction Requirements, Big Sand Wash Dam and Reservoir Enlargement

## Black and white, 11 x 17, page 1 of 2

# Map 2.2-2

# Proposed Action—Lake Fork Section 203 Alternative Physical Features and Construction Requirements, Big Sand Wash Dam and Reservoir Enlargement

## Black and white, 11 x 17, page 2 of 2

from the Lake Fork River to Big Sand Wash Reservoir. This includes an average of 2,817 ac-ft of non-project water bypassed at the "C" Canal Diversion to provide instream flows downstream to the Big Sand Wash Feeder Diversion. On the average, a total of 53,885 ac-ft of water varying from 22,823 ac-ft (1934) to 69,947 ac-ft (1965) would be diverted from the Lake Fork River to Big Sand Wash Reservoir.

Following the irrigation season when the enlarged reservoir starts to refill, the original Big Sand Wash Reservoir space would be filled as it has historically, based on water right priority, stream flows, and the ability to divert flows through existing diversion and conveyance facilities. The storage in the enlargement portion of the reservoir would be allocated first to M&I, then to the high mountain lakes' replacement storage, and then to project irrigation storage pools depending on various factors such as instream flows, diversion point, priority, etc. Annual releases from the enlarged Big Sand Wash Reservoir would average 52,635 ac-ft, and would vary from 22,739 ac-ft to 62,520 ac-ft. Of the 52,635 ac-ft of water released from the enlarged reservoir, 6,908 ac-ft would be released into the Big Sand Wash–Roosevelt Pipeline—which includes 4,963 ac-ft of project water and 1,945 ac-ft of Yellowstone River high mountain lakes water—and 45,727 ac-ft of non-project water would be released into the existing canal system. The difference of 1,250 ac-ft (53,885 to 52,635 ac-ft) between the inflow and outflow of the enlarged Big Sand Wash Reservoir are losses to evaporation and seepage.

Under the Proposed Action, the enlarged Big Sand Wash Reservoir storage space allocations would include the existing 12,100 ac-ft of non-project storage space that would continue to be used to maintain 1,200 ac-ft for the existing conservation and dead pool and the existing 10,900 ac-ft irrigation pool. The 12,000 ac-ft of storage space allocated to the United States would yield 4,963 ac-ft of project water to supply 2,000 ac-ft to Roosevelt City for M&I purposes, 1,000 ac-ft for other future M&I needs in the project area, 1,963 ac-ft for project irrigation purposes, and 6,500 ac-ft of storage space would be reserved for high mountain lakes' replacement storage of non-project water. The project water supply of 4,963 ac-ft would be diverted and conveyed through the Big Sand Wash Feeder Pipeline to the enlarged reservoir where it would be stored and then delivered via the Big Sand Wash–Roosevelt Pipeline to Roosevelt City and other project water users (see Section 2.2.2.3).

**2.2.2.1.3 Construction Requirements.** Construction activities would be localized and occur primarily in and near the reservoir pool. Potential short- and long-term impacts from dam and reservoir construction would be avoided or reduced by following standard construction and operating requirements outlined in Appendix A, *Standard Construction and Operating Requirements*. The construction schedule is shown in Figure 2.2-3.

***Borrow (Material) Areas.*** Approximately 975,000 cubic yards of earth materials would be excavated for processing and sorting. Three borrow areas totaling 62 acres have been identified, including 32 acres outside the enlarged reservoir pool area. Map 2.2-2 shows the general location of the proposed borrow areas.

After borrow materials have been removed, the borrow areas would be resloped to facilitate good drainage and erosion control. Borrow materials not used would be regraded within the borrow areas. For borrow areas outside the enlarged reservoir pool area, site restoration would include grading and scarifying the soil surface for seedbed preparation and

**Figure 2.2-3**

**Construction Schedule for the Revised Section 203 Alternative**

**Black and white, 8-1/2 x 11, page 1 of 1**

revegetation. Within the reservoir pool, a natural layer of armor rock would form on the surface of glacial deposits after the fines have been removed by several years of reservoir water fluctuations.

***Staging Areas and Support Facilities.*** Construction operations would require two staging areas of about 5 acres each. They would be used for operating a batch plant for concrete processing; constructing and using settling ponds for cleaning fines from crushed aggregate; stockpiling and mixing aggregate; and storing other construction materials.

Rights-of-way to the staging areas would be provided by approximately 2.5 miles of temporary haul roads that would be constructed to connect the borrow and staging areas to the Big Sand Wash Dam site and dikes. They also would connect to existing roads in the area to provide access to the proposed construction sites.

A project field office and small maintenance yard would be located adjacent to the staging area just downstream of the dam's right (southern) abutment. Utilities required at the field office would include temporary electrical power, phone service, and water and sanitary facilities. These support facilities and utilities would be removed or incorporated into a permanent operation and maintenance facility upon project completion. Map 2.2-2 shows the approximate locations of the proposed staging areas and field office / maintenance site required during construction.

***Relocations.*** An existing 1,600-kW hydroelectric power plant, located at the northwestern end of the existing Big Sand Wash Reservoir and operated by J&R Energy (formerly Mistletoe Finance Company), would be inundated by the proposed reservoir enlargement. Water for the existing power plant is delivered through the existing "C" Canal. The existing power plant and all related equipment would be eliminated, demolished, removed, or relocated by J&R Energy or MLWUA, under existing contracts between J&R Energy and the MLWUA.

***Land Ownership Changes.*** The enlargement and operation of Big Sand Wash Dam and Reservoir would require acquisition of 98 acres of state land and 340 acres of private land. These lands would be acquired in fee in the name of the MLWUA. On average, lands acquired adjacent to the reservoir would extend about 300 feet horizontally beyond the reservoir high-water elevation. All of the 340 acres of private lands would be permanently encumbered, while habitat on 34 acres of state lands would be temporarily disturbed and restored according to restoration and revegetation guidelines contained in Appendix A, *Standard Construction and Operating Requirements*.

***Construction Force and Principal Equipment.*** The enlargement of Big Sand Wash Dam and Reservoir would begin in the first year of the overall 5-year construction period for the Proposed Action, and would extend over a 3-year construction period. The number of workers required per month would vary between 2 and 40, while the total labor effort would be approximately 100,000 hours.

Personnel requirements would include the owner's management and engineering staff, a resident engineer, and the contractors' field staff, including equipment operators, carpenters, steel workers, surveyors, truck drivers, and laborers. Local personnel would be used to staff the project, although some personnel may be required from nearby communities and outside the local area.

The number of pieces and types of equipment required for construction would vary depending on the stage of the project and specific operations in progress. Motorized equipment would use an estimated 400,000 gallons of petroleum products (diesel, gasoline, and grease). Most motorized equipment would be diesel-powered except for light utility trucks.

#### 2.2.2.2 Modified Outlet Works at Moon Lake Reservoir

The Proposed Action would be operated in conjunction with Moon Lake Reservoir to provide for the release of instream flows for fish in the Lake Fork River downstream to the proposed Big Sand Wash Feeder Diversion Structure. To accomplish this, minor modification of Moon Lake Reservoir's outlet works would be coordinated with MLWUA and the Bureau of Reclamation so that instream flows could be released to the Lake Fork River year-round—including winter—which is not presently possible. Flows naturally discharging from the four stabilized high mountain lakes would enter Moon Lake where they would be re-regulated, then released downstream to the Lake Fork River. Details on instream flow releases are provided in the Operating Agreement and summarized in Section 2.2.2.6.2, *Instream Flows* under the discussion of fish and wildlife mitigation and enhancement.

Table 2.2-2 illustrates the minor changes in Moon Lake's operations under the Proposed Action compared to current conditions. These minor changes would result from the bypass, re-regulation, and release from Moon Lake Dam and Reservoir of an average of 4,347 ac-ft of water once stored in four high mountain lakes in the upper Lake Fork River drainage, which now would be stored in the enlarged Big Sand Wash Reservoir. Under baseline conditions, water surface elevations in Moon Lake fluctuate 40.4 feet during an average water year, from a high of 8127.0 feet (42,036 ac-ft) in June to a low of 8086.6 feet (18,700 ac-ft) in September. Under the Proposed Action, water surface elevations in Moon Lake would fluctuate 39.9 feet during an average water year, from a high of 8128.4 feet (42,995 acre-feet) in June to a low of 8088.5 feet (19,498 acre-feet) in September. The range of monthly differences in water surface elevations would vary from 2.6 feet in August (Proposed Action water level [25,830 ac-ft] higher than baseline [24,412 ac-ft]) to 3.7 feet in March (Proposed Action water level [28,497 ac-ft] lower than baseline [30,676 ac-ft]). The average monthly difference in water surface elevations between the Proposed Action and baseline is approximately 0.4 feet, which equates to an average change in monthly storage of about 300 ac-ft. This is less than a 1 percent change in historical operations and is only being done to provide year around instream flows. The flows naturally discharging from the four stabilized high mountain lakes would enter Moon Lake, be re-regulated, then released downstream to the Lake Fork River as instream flows to benefit fish and the riparian ecosystem.

**TABLE 2.2-2**
Average Monthly Storage and Water Surface Elevation in Moon Lake Reservoir under Baseline Conditions and the Proposed Action

| Month | Baseline | | Proposed Action | |
|---|---|---|---|---|
| | Storage (acre-feet) | Water Surface Elevation (feet) | Storage (acre-feet) | Water Surface Elevation (feet) |
| January | 27,697 | 8,104.6 | 26,722 | 8,102.9 |
| February | 29,231 | 8,107.3 | 27,864 | 8,104.9 |
| March | 30,676 | 8,109.7 | 28,947 | 8,106.0 |
| April | 31,872 | 8,111.7 | 29,719 | 8,108.1 |
| May | 33,220 | 8,113.9 | 31,904 | 8,111.8 |
| June | 42,036 | 8,127.0 | 42,995 | 8,128.4 |
| July | 35,300 | 8,117.2 | 36,811 | 8,119.5 |
| August | 24,412 | 8,098.6 | 25,830 | 8,101.2 |
| September | 18,700 | 8,086.6 | 19,498 | 8,088.5 |
| October | 20,901 | 8,091.5 | 21,213 | 8,092.2 |
| November | 23,923 | 8,097.6 | 23,763 | 8,097.3 |
| December | 25,986 | 8,101.5 | 25,421 | 8,100.5 |

### 2.2.2.3 Diversion Structure

A new diversion structure, the Big Sand Wash Feeder Diversion Structure, would be built with unrestricted fish passage to divert water to the Big Sand Wash Feeder Pipeline and into the enlarged Big Sand Wash Reservoir. Map 2.2-1 shows its location. The design of a typical diversion structure is described below. The potential for incorporating a natural rock weir, or a similar design that promotes upstream fish passage past the diversion structure, would be evaluated during final project design.

**2.2.2.3.1 Description of Facilities.** The new Big Sand Wash Feeder Diversion Structure would provide fish passage at a permanent structure for diverting project and non-project water from the Lake Fork River to the enlarged Big Sand Wash Reservoir. The new diversion structure would be located on the Lake Fork River about 2 miles upstream of the confluence with Pigeon Water Creek and would be operated and maintained by the MLWUA. Its exact location would depend on local site conditions and be determined during final project design. The diversion structure would have a diversion capacity of 70 cfs, a main channel structure length of 100 feet, a width of 40 feet, and a canal inlet structure width of 24 feet. The final design and dimensions of this diversion structure facility would be modified, as necessary, to conform to site-specific conditions, including environmental constraints.

An upstream control weir on the new diversion structure would create a stable water surface for delivering water to the Big Sand Wash Feeder Pipeline. The inlet structure would consist of gates that would regulate the volume of water diverted from the river. The inlet would be oriented 90 degrees to the main river channel.

The diversion structure would be designed to provide upstream and downstream passage for juvenile and adult fish throughout the year. Two weirs below the upstream control weir would create a series of steps over which fish could pass.

Annual diversions of project water from the Lake Fork River at the Big Sand Wash Feeder Diversion Structure would average 4,963 ac-ft, and would vary from 3,000 ac-ft (in some years) to 5,500 ac-ft (many of the years). Annual diversions of non-project water from the Lake Fork River at the Big Sand Wash Feeder Diversion Structure would average 9,109 ac-ft, and would vary from 8,453 ac-ft (1934) to 9,500 ac-ft in most years. The 9,109 ac-ft consists of 4,347 ac-ft of Lake Fork high mountain lakes water, 1,945 ac-ft of Yellowstone high mountain lakes water, and 2,817 ac-ft of "C" Canal bypass water to maintain the instream flows.

#### 2.2.2.3.2 Construction Procedures

***Construction Facilities.*** The diversion structure site would require a staging area of approximately 1.5 acres. The staging area would be fenced and contain a field office and supply area. It would be located near the riverbank but not within wetlands, riparian communities, or areas occupied by the Ute ladies'-tresses orchid, by any other federally listed threatened or endangered species, or by any state or sensitive species. The exact location would be coordinated with the owner of the private property on which the staging area would be located. It may be possible to locate the staging area on the bluff above the river where only sagebrush would be disturbed.

***Access Roads.*** A permanent, gravel-surfaced access road 4,000 feet long and 20 feet wide would be constructed to the Big Sand Wash Feeder Diversion Structure site. Contractors would be required to maintain the site access road, which would include blading and dust control as needed. Access to the roadway would be available to authorized personnel only.

Construction activities would require building a temporary access road leading from the diversion structure site access road into the river channel. To the extent possible, temporary access roads and the diversion structure would be located to minimize disturbance of native vegetation, especially wetlands and riparian areas.

***Construction Areas and Activities.*** The diversion structure construction area would be located in the river channel and along riverbanks. Widths would extend approximately 30 feet past each end of the outside walls of the main channel structure. Lengths would extend from about 100 feet upstream to 100 feet downstream of the main channel structure. The construction area also would include the space within 50 feet of the canal gates. Excavated material would be disposed of at approved landfills. A permanent easement would be acquired for those portions of the structure crossing private property. To the extent possible, the diversion structure would be installed to minimize disturbance of native vegetation, especially wetlands and riparian areas.

Concrete used to construct the diversion structure would be placed during low river flow periods (August through November). Concrete would be hauled from Vernal, Roosevelt, or Duchesne. No site batch plant would be required.

A total of 1.9 acres would be temporarily disturbed and 1.8 acres would be permanently disturbed by the Big Sand Wash Feeder Diversion Structure. These lands are privately owned and would be acquired under temporary and permanent easements, purchased, or acquired by condemnation, if necessary. Areas of temporary disturbance, such as riverbanks, access road, and staging area, would be reclaimed and revegetated, and riparian vegetation would be replanted in areas from which it was removed. There would be no need for instream operation and maintenance activities following the construction of the permanent diversion structure. Short- and long-term impacts from diversion structure activities would be avoided or reduced by following the standard construction and operating requirements contained in Appendix A.

***Schedule, Personnel, and Equipment.*** Construction time for the diversion structure would occur primarily during the second and third years. Construction would occur during the non-irrigation season, following final design and contractor mobilization.

#### 2.2.2.4 Pipelines

Project features include two new pipelines, the Big Sand Wash Feeder Pipeline and the Big Sand Wash–Roosevelt Pipeline. Both the Big Sand Wash Feeder Pipeline and the Big Sand Wash–Roosevelt Pipeline would be federal facilities owned by the United States. Acres that would be required are described in text that follows.

The proposed locations of the Big Sand Wash Feeder Pipeline and the Big Sand Wash–Roosevelt Pipeline are shown on Map 2.2-1. The new Big Sand Wash Feeder Pipeline would begin at the Big Sand Wash Feeder Diversion Structure on the Lake Fork River. It would deliver water 4.3 miles to the inlet structure at the enlarged Big Sand Wash Reservoir. The pipeline would have a design flow of 70 cfs and diameters of 48 inches in the initial 2.2 miles and 42 inches in the latter 2.1 miles.

The Big Sand Wash–Roosevelt Pipeline would deliver project M&I water from the enlarged Big Sand Wash Reservoir to Roosevelt City, as well as project irrigation water and non-project water to the State Road area north of Roosevelt for irrigation use (see Map 2.2-1). The first 13.3 miles of pipeline would have a diameter of 30 inches and a design flow of 35 cfs, then bifurcate to deliver irrigation and M&I waters. The northern bifurcation would deliver project and non-project irrigation water 1.0 mile through a 24-inch-diameter pipeline with a design flow of 20 cfs. The southern bifurcation would deliver project M&I water 1.8 miles through a 20-inch-diameter pipeline with a design flow of 15 cfs.

Pipe is expected to be PVC, ductile iron, concrete cylinder, or concrete-mortar lined and coated steel. The construction right-of-way (ROW) for pipeline installation would be 50 feet wide (124 acres total for both pipelines) and consist of a 25-foot-wide temporary easement for construction and a 25-foot-wide permanent easement for operation and maintenance. The 62 acres associated with the temporary easement would be reclaimed, while the 62 acres associated with the permanent easement would be required for road access and would not be reclaimed to its original condition. Pipeline construction through wetlands and riparian

communities is detailed in Appendix A. Access to the roadway would be available to authorized personnel only.

Approximately 26 acres of land would be required as a temporary construction ROW to construct the Big Sand Wash Feeder Pipeline, and 98 acres of land would be required as a temporary construction ROW to construct the Big Sand Wash–Roosevelt Pipeline—both with 50-foot-wide construction zones. These ROWs would be acquired in the name of the United States. The present ownership of the combined 124 acres consists of private land. Disturbed land would be reclaimed following construction as described above. It is anticipated that staging areas would be located at each end of the pipeline routes and, where appropriate, at intermediate locations near adjacent highway ROWs.

Two construction seasons, with minimal activity during winter, would be required to build the Big Sand Wash Feeder Pipeline. One construction season would be required to build the Big Sand Wash–Roosevelt Pipeline.

The Big Sand Wash Feeder Pipeline and the Big Sand Wash–Roosevelt Pipeline would be operated and maintained by the MLWUA under an agreement with the CUWCD and DOI. Roosevelt City also may be responsible for operating and maintaining some portions of the Big Sand Wash–Roosevelt Pipeline. Annual deliveries through the Big Sand Wash Feeder Pipeline would average 14,072 ac-ft, would vary from 8,707 ac-ft (1939) to 16,434 ac-ft (1986), and consist of 4,963 ac-ft of project water and 9,109 ac-ft of non-project water. Annual deliveries through the Big Sand Wash–Roosevelt Pipeline would average 6,908 ac-ft and would consist of 3,000 ac-ft of project M&I water, 1,963 ac-ft of project irrigation water, and 1,945 ac-ft of Yellowstone high mountain lakes non-project irrigation water used to provide instream flows for fish.

#### 2.2.2.5 High Mountain Lakes' Stabilization

**2.2.2.5.1 Description of Facilities.** Four existing high mountain lakes in the upper Lake Fork River watershed and nine existing high mountain lakes in the upper Yellowstone River watershed that are located in the High Uintas Wilderness would be stabilized under the Proposed Action as a fish and wildlife / wilderness enhancement measure. The MLWUA operates and maintains the 13 existing high mountain lakes under permits from the FS. Map 2.2-1 shows the locations of these lakes in the High Uintas Wilderness.

Table 2.2-3 presents characteristics of these 13 lakes. Lake stabilization would generally consist of removing a portion of the dam embankment to the stabilized level (breach height) and removing or plugging the outlet works. The existing spillways would be left in place or modified to ensure the stabilized elevation is maintained. The proposed stabilized level is based on the Utah Division of Water Rights Dam Safety Classification of "No Hazard." This classification means that no future operation or maintenance of the facility would be required once the stabilization construction was completed. It also means that the downstream effects of dam failure on a stabilized lake would be no more serious than the occurrence of a 100-year natural flood event for that lake's drainage basin.

**TABLE 2.2-3**
High Mountain Lakes Stabilization in the Lake Fork and Yellowstone River Drainages under the Proposed Action–Lake Fork Section 203 Alternative

| Drainage and Lake | Mechanized Equipment Used During Original Dam Construction? | Lake Elevation (feet above MSL) | Present Active Storage at Spillway Crest (acre-feet) | Present Surface Area at Spillway Crest (acres) | Storage at Stabilized Elevation (acre-feet) | Surface Area At Stabilized Elevation (acres) | Drainage Basin Area (square miles) |
|---|---|---|---|---|---|---|---|
| **Lake Fork Drainage** | | | | | | | |
| Brown Duck | Yes | 10,177 | 301 | 33 | 125 | 29 | 4.0 |
| Island | Yes | 10,248 | 655 | 70 | 500 | 58 | 3.5 |
| Kidney | Yes | 10,281 | 3,618 | 202 | 1,800 | 180 | 2.8 |
| Clements | Yes | 10,471 | 601 | 58 | 130 | 31 | 1.7 |
| **Yellowstone River Drainage** | | | | | | | |
| Bluebell | No | 10,891 | 224 | 58 | 145 | 52 | 0.7 |
| Drift | No | 11,066 | 158 | 31 | 41 | 23 | 0.6 |
| Five Point | No | 11,002 | 574 | 83 | 370 | 37 | 2.1 |
| Superior | No | 11,165 | 295 | 40 | 120 | 22 | 2.0 |
| Farmers | No | 10,983 | 692 | 50 | 692 | 50 | 1.0 |
| East Timothy | Yes | 11,005 | 616 | 43 | 85 | 24 | 3.5 |
| White Miller* | No | 10,680 | 239 | 20 | 199 | 18 | 0.5 |
| Deer | No | 10,245 | 110 | 11 | 33 | 6 | 13.0 |
| Water Lily* | No | 9,346 | 115 | 15 | 85 | 12 | 1.0 |

*The storage portion of these lakes is inactive, but the lakes would be stabilized to allow water users to terminate their special use permits with the Forest Service and discontinue the associated maintenance requirements.

An agreement "Transfer of Storage Water from Brown Duck, Island, Kidney, Clements, Bluebell, Drift, Five Point, Superior, Farmers, East Timothy, White Miller, Deer and Water Lily Lakes to Enlarged Big Sand Wash Reservoir" (High Mountain Lakes Agreement) has been signed by the CUWCD, MLWUA, FS, and DOI to provide for the stabilization of the high mountain lakes and transfer of that storage water to the enlarged Big Sand Wash Reservoir. Stabilization will be done by the DOI under a Special Use Authorization between the DOI and FS pursuant to the High Mountain Lakes Agreement. Title to the 13 high mountain lakes would remain with the United States under the jurisdiction of the FS. (See Table 1.5-1 regarding DOI and FS actions, permits, and licenses required for high mountain lakes' stabilization.) When the stabilization is complete, the FS would cancel MLWUA's special use authorizations for these dams.

**2.2.2.5.2 Stabilization Procedures.** The FS uses a minimum tool evaluation guide to determine if, and under what circumstances, motorized or mechanical means of transport or onsite equipment may be necessary to accomplish the goal of stabilizing the high mountain lakes

(reservoirs) to the "no hazard" level. Because each reservoir is different, the work, materials, and equipment needed to accomplish the stabilization would be different at each site.

Stabilization of the high mountain reservoirs would be accomplished in a manner that protects the wilderness values at each site. The minimum tool analysis would determine if motorized or mechanical transport or equipment would be needed to accomplish the stabilization, and at the same time ensure that wilderness values are protected. It is anticipated that much of the construction work associated with stabilizing the four lakes would require motorized and/or mechanical equipment, materials, and supplies that would be delivered to each of the lakes via helicopter. However, until a minimum tool analysis is completed for each lake, the type and amount of motorized/mechanical transportation and/or equipment that may be needed cannot be specifically quantified.

The fundamental process of stabilizing the 13 lakes would be the same at each site. The lake would be drawn down in the fall prior to the summer scheduled for the stabilization work. The dam would be breached, with the embankment material being spread within the lake basin below the old high water level, but above the future high water level of the stabilized lake. Old concrete that cannot be broken up and hauled out of the area would be buried beneath the substrate below the stabilized water line. The outlet works would be removed, or if removal is infeasible, the conduit would be plugged with concrete, and the gate operating mechanism removed from the wilderness area. The breach outlets would be stabilized with some combination of impermeable membranes, filter fabric, gabions, and riprap. Some work may be necessary to ensure a functioning spillway or overflow is provided at some locations.

Campsites for the stabilization work would comply with all existing standards and guidelines in the High Uintas management plan, including full compliance with the group size limits and the number of livestock allowed at each campsite. Construction equipment and supplies would be confined to sites within the existing reservoir area.

#### 2.2.2.6 Fish and Wildlife Mitigation and Enhancement

**2.2.2.6.1 Wetland/Riparian Creation.** The fish and wildlife feature of wetland/riparian creation has been developed as an integral part of this project to avoid a net loss in wetland and riparian habitat from implementation of the Proposed Action. The wetland/riparian creation program that would be implemented under the Proposed Action is described in detail in the Technical Report that has been prepared as a supporting document to this EA.

Permanent impacts from project implementation would occur around the enlarged Big Sand Wash Reservoir. Most temporary impacts would occur along the Big Sand Wash Feeder Pipeline and the Big Sand Wash–Roosevelt Pipeline. One possible site for creating habitat to offset that lost through project implementation is along the Lake Fork River, upstream of the Big Sand Wash Feeder Diversion Structure shown on Map 2.2-1. This location would allow the development and improvement of habitat within an existing complex of wetland/riparian/upland habitats. Approximately 50 acres would be acquired. The URMCC is responsible for funding and implementing mitigation commitments for the Section 203 Project. The URMCC suggested in their comments on the Draft EA that they would like to consider incorporating the wetland mitigation requirement in a major wetland proposal they are preparing along the Duchesne River. Therefore, the URMCC will be

coordinating with the DOI, Utah Division of Wildlife Resources, and FWS in the development of the wetland mitigation whether it will be located as proposed in this Final EA (see Map 2.2-1) or at the alternative site suggested by the URMCC.

It is anticipated that no water rights would need to be purchased given the nature of proposed wetland / riparian habitat development and improvement, but if necessary, they also would be acquired. It is anticipated that an operating agreement would be developed to transfer title to the lands and facilities associated with this wetland / riparian site to Wildlife Resources, who would perform the operation and maintenance activities associated with this wetland / riparian habitat feature of the project.

**2.2.2.6.2 Instream Flows.** Under the Proposed Action, fisheries would be enhanced by returning the streams above Moon Lake Reservoir to their natural flow regimes as a result of high mountain lakes' stabilization. In addition, instream flows for fish would be provided in the Lake Fork River between Moon Lake Reservoir and the Big Sand Wash Feeder Diversion Structure during late summer, fall, and winter through the coordinated operation of the existing Moon Lake Reservoir and the enlarged Big Sand Wash Reservoir. Water that is currently stored in the high mountain lakes would naturally flow into Moon Lake Reservoir following high mountain lakes' stabilization, where it would be re-regulated for subsequent release to the Lake Fork River for instream flow purposes. Table 2.2-4 summarizes these instream flows. As part of the project, minor modifications would be made to the Moon Lake Dam outlet works to facilitate the release of the instream flows. Each year, up to 4,500 ac-ft of high mountain lake water may be released from or passed through Moon Lake Reservoir and would remain in the Lake Fork River downstream to the Big Sand Wash Feeder Diversion Structure, where it would be diverted into the Big Sand Wash Feeder Pipeline and then stored in the enlarged Big Sand Wash Reservoir. The existing "C" Canal Diversion Structure on the Lake Fork River would be operated in a manner to accommodate the passage of instream flows downstream about 4 miles to the Big Sand Wash Feeder Diversion Structure. Instream flows for fish and their associated fish and wildlife benefits are considered a project mitigation for the impacts created by the Moon Lake Project. In addition, and to the extent that water is available, MLWUA agrees to allow up to 70 cfs from sources other than Project Water and High Mountain Lakes Replacement Storage Water to bypass the "C" Canal diversion at the request of the Secretary to enhance the stream fishery between the "C" Canal diversion and the enlarged Big Sand Wash Feeder Diversion, where it will be diverted in priority.

**TABLE 2.2-4**
Instream Flows in the Lake Fork River between Moon Lake Reservoir and the Big Sand Wash Feeder Diversion Structure

| Month | Water Year (Number of Years) | Instream Flow (cfs) |
|---|---|---|
| October 1 through April 30 | Wet (36 out of 100 years) | 10.5 |
| | Average (42 out of 100 years) | 7.0 |
| | Dry (22 out of 100 years) | 3.5 |
| May 1 through July 31 | All years | Normal irrigation releases |

**TABLE 2.2-4**
Instream Flows in the Lake Fork River between Moon Lake Reservoir and the Big Sand Wash Feeder Diversion Structure

| Month | Water Year (Number of Years) | Instream Flow (cfs) |
|---|---|---|
| August 1 through September 30 | Wet (36 out of 100 years | 11 |
| | Average (42 out of 100 years) | 11 |
| | Dry (22 out of 100 years) | 6 |

*Water year defined based on anticipated active storage in Moon Lake Reservoir on October 1, as follows:
- Wet: more than 15,000 ac-ft
- Average: between 4,500 and 15,000 ac-ft
- Dry: less than 4,500 ac-ft

There are four criteria for bypassing this additional water at the "C" Canal diversion: 1) MLWUA's diversion of water must be in priority; 2) the Secretary determines that the bypassed flows will be advantageous for fishery benefits; 3) capacity is available to move the bypassed water through the Big Sand Wash Feeder Pipeline; and 4) changing the point of diversion from the "C" Canal to the Big Sand Wash Feeder Diversion will not reduce the amount of water available to MLWUA, except to the extent of any conveyance losses between the "C" Canal and the Big Sand Wash Feeder Diversion. This bypassed water will be diverted at the Big Sand Wash Feeder Diversion under the provisions of the Warren Act, but will be exempt from a carriage charge as such water is bypassed for instream flow purposes.

Non-project water diverted through the Big Sand Wash Feeder Diversion and Pipeline not identified by DOI for instream flow purposes will be subject to a carriage contract.

The Operating Agreement stipulates further conditions for instream flows that would benefit fish and fish habitat. The MLWUA agrees to reduce its diversions into the Yellowstone Feeder Canal in order to bypass 1,945 ac-ft of water annually past the Yellowstone Feeder Canal Diversion for the downstream diversion at the Big Sand Wash Feeder Diversion and storage in the enlarged Big Sand Wash Reservoir. The volume of water to be bypassed is equal to the average annual yield from the nine high mountain lakes in the Yellowstone River drainage basin that are being stabilized as part of this project. The following schedule will be followed for the bypass of water each year:

| | |
|---|---|
| October 1 through June 30 | 3 cfs |
| July 1 through July 31 | 2.5 cfs |
| August 1 through September 30 | 2 cfs |

The water may be diverted at the Yellowstone Feeder Canal Diversion and returned to the Yellowstone River at or near that diversion for measuring purposes.

The instream flow requirements described here and in Article VI of the Operating Agreement are a project commitment that will be met by the MLWUA, the CUWCD, and

the DOI through the coordinated operation of the Section 203 Project and the Moon Lake Project.

**2.2.2.6.3 Other Fish and Wildlife Mitigation and Enhancement.** Other project-related fish and wildlife features that would be realized under the Proposed Action were referred to previously in discussions of diversion structures (fish passage) and stabilization of high mountain lakes (fish and wildlife / wilderness benefits). In addition, funding will be provided to extend the existing boat ramp to the new high water line of the enlarged Big Sand Wash Reservoir so the public has access.

## 2.2.3 Distribution of Project Water

The United States' use of 5,500 ac-ft of the storage space in the enlarged Big Sand Wash Reservoir is estimated to yield an average annual supply of 4,963 ac-ft of project water. This 4,963 ac-ft of project water would be used to supply 2,000 ac-ft to Roosevelt City for M&I purposes, 1,000 ac-ft for other future M&I needs in the project area, and 1,963 ac-ft for supplemental irrigation purposes.

Secondary water-righted lands in the project area that are currently being irrigated (except for USBR Class 6W [non-arable but irrigated with certificated water rights] lands) and can be served directly from the Big Sand Wash–Roosevelt Pipeline, or possibly by exchange, are candidate lands to receive project irrigation water. The frequency of providing a full water supply on some irrigable project lands would increase, and late season water deliveries could potentially be extended several weeks.

Under the Proposed Action, an average of 1,963 ac-ft of project irrigation water would be delivered to irrigable project lands. This 1,963 ac-ft of project irrigation water would be distributed from the enlarged reservoir directly to eligible project lands via the Big Sand Wash–Roosevelt Pipeline into the existing distribution system of canals and laterals managed by the MLWUA.

The Proposed Action also would deliver 2,000 ac-ft of project M&I water to Roosevelt City via the Big Sand Wash–Roosevelt Pipeline. An additional 1,000 ac-ft of project water would be available each year for future M&I needs within the project service area but outside Roosevelt City. The infrastructure necessary to meet this demand has not been built because a water supply was not readily available to the area around Roosevelt City. Until the necessary infrastructure and the 1,000 ac-ft of M&I water committed for future uses can actually be delivered, DOI and CUWCD will explore opportunities to use this water in an environmentally beneficial manner in the interim. Examples of possible environmentally beneficial uses include maintaining more water for recreation, aquatic habitat, and fish in the enlarged Big Sand Wash Reservoir.

The remaining 6,500 ac-ft of storage capacity in the enlarged reservoir to which the United States would be entitled would be contractually committed to the MLWUA for the exclusive storage of its non-project high mountain lake storage rights associated with the four stabilized lakes in the upper Lake Fork River watershed and the nine stabilized lakes in the upper Yellowstone River watershed. The MLWUA would file the necessary applications with and obtain the approval of the Utah State Engineer to transfer these non-project high mountain lake storage rights to the enlarged Big Sand Wash Reservoir.

Development and operation of the project features and provisions of instream flows for fish would affect the amount and timing of flows in reaches of the Lake Fork River. Information on stream flow regime is presented in Chapter 3, Section 3.2, *Water Resources and Hydrology*. Information on instream flows for fish is presented in Chapter 3, Section 3.4, *Aquatic Resources*.

Several water conservation efforts proposed and occurring within the project area directly or indirectly affect the distribution of project water under the Proposed Action. Conveying irrigation water to the 'State Road' area near Roosevelt through the proposed Big Sand Wash–Roosevelt Pipeline rather than through the Yellowstone Feeder Canal to Browns Draw Reservoir to Dry Gulch will greatly reduce conveyance losses of the existing system (see Map 2.2-1). This action would conserve an estimated 500 ac-ft of water annually. In addition, water currently diverted into the "C" Canal and conveyed to Big Sand Wash Reservoir would be allowed to remain in the Lake Fork River for 4.5 miles for instream flows before being diverted into the proposed Big Sand Wash Feeder Pipeline and conveyed to Big Sand Wash Reservoir (see Map 2.2-1). This action also would reduce conveyance losses and would conserve an estimated 425 ac-ft of water annually. Together, these actions would conserve an estimated 925 ac-ft of water annually.

Although not directly part of the water conservation that would be achieved under the Proposed Action, Roosevelt City's Water Management and Conservation Plan has a bearing on the City's M&I needs and thus the proposed distribution of project water. This plan formally describes the City's water management and water conservation actions, many of which are already in place. The City's water management program charges a flat monthly service fee, depending on the size of the connection meter, for the first 8,000 gallons of water used. The monthly in-city service charge for 8,000 gallons varies from $17 for a meter size of 3/4 inch up to $1,802 for a meter size of 8 inches. The monthly out-of-city service charge for the first 8,000 gallons is 50 percent higher. There is an additional charge for each 1,000 gallons of water used in excess of 8,000 gallons per month. The in-city charge is $1.19 per 1,000 gallons and the out-of-city charge is $1.79 per 1,000 gallons. One intent of these additional charges and out-of-city rates is to conserve water by discouraging its excess use. Other water management and conservation actions include the following:

- Making it illegal to wastefully use water caused by faulty equipment such as taps, valves, leaky joints, pipes, and leaking or overflowing tanks and faucets
- Prohibiting City-provided water for use in powering hydraulic engines, turbines, or other industrial machinery without special permission
- Mandating that all users maintain in good repair all service pipes and connections
- Mandating that if a drought occurs, lawn watering will be rationed and watering will not be allowed during the hot part of the day; and if necessary, watering lawns and gardens may be forbidden
- In case of an earthquake or other emergency, the City has an emergency plan; as a precaution, all citizens should have a three-day water supply

Like many municipal water systems, the City's largest water conservation problems are pipe leakage and meter-facing maintenance. Some of the system leakage has been identified

and repaired, but system leakage could still be up to 10 percent or higher. To address these problems, the City has implemented a water meter rotation program in which 25 percent of the City's meters are rotated out of service every year for calibration. This will ensure a higher degree of accuracy and confidence in the meter's measurements and will allow the City to more effectively identify and eliminate system leakage.

Table 2.2-5 shows recent data on the annual number of active water connections, water consumed, and per capita M&I use for Roosevelt City. These data show that the number of active water connections for Roosevelt City increased steadily from 1,381 connections in 1990, to 1,559 connections in 1995, to 1,721 connections in 2000. The amount of M&I water consumed annually from 1990 to 2000 shows a general downward trend, from a high of 827,000,000 gallons in 1992 to a low of 643,000,000 gallons in 1998. Use of M&I water has declined from 562,000 gallons per connection in 1992 to 385,000 gallons per connection in 1998. Use of M&I water typically exceeded 525,000 gallons per connection per year prior to 1995. However, since 1997, use of M&I water has not exceeded 430,000 gallons per connection per year. Compared on a per capita basis, these M&I values equate to approximately 385 gallons per person per day in 1992 and 264 gallons per person per day in 1998 (see Table 2.2-5). The above data support the City Manager's statement that the "conservation measures are working" (see Comment Letter No. 17 in Chapter 4 *Coordination and Consultation).*

**TABLE 2.2-5**
Annual Number of Active Water Connections, Water Consumed, and Per Capita M&I Use for Roosevelt City from 1990 through 2000

| Year | Active Water Connections | Total Gallons Used | Gallons Per Connection | Gallons Per Capita Per Day |
|---|---|---|---|---|
| 1990 | 1,381 | 743,064,000 | 538,062 | 369 |
| 1991 | 1,444 | 785,850,000 | 544,217 | 373 |
| 1992 | 1,472 | 827,029,000 | 561,840 | 385 |
| 1993 | 1,505 | 731,928,000 | 486,331 | 333 |
| 1994 | 1,545 | 815,164,000 | 527,614 | 361 |
| 1995 | 1,559 | 671,263,000 | 430,573 | 295 |
| 1996 | 1,601 | 717,551,000 | 448,189 | 307 |
| 1997 | 1,640 | 703,602,000 | 429,025 | 294 |
| 1998 | 1,670 | 643,068,000 | 385,071 | 264 |
| 1999 | 1,710 | 689,312,000 | 403,106 | 276 |
| 2000 | 1,721 | 737,321,000 | 428,426 | 293 |

### 2.2.4 Summary of Acres Affected

A total of 98 acres of lands would be temporarily disturbed and restored, while the land use of 518 acres would be permanently changed through ownership, right-of-ways, or easements. Land acquisition would include 98 acres of state lands and 518 acres of private lands. Land would be acquired through willing sellers or condemnations, and temporary or permanent easements.

## 2.3 Revised Section 203 Alternative

### 2.3.1 Introduction

Specific features of the Revised Section 203 Alternative and their locations are shown on Map 2.3-1 and listed in Table 2.1-1. The differences from the Proposed Action are that there would be no stabilization of the 13 high mountain lakes in the wilderness area, no provisions for instream flows in the Lake Fork River between Moon Lake Reservoir and the Big Sand Wash Feeder Diversion Structure, and no provisions for bypass instream flows past the Yellowstone Feeder and "C" Canal Diversions. The following subsections provide descriptions of the features.

### 2.3.2 Features

#### 2.3.2.1 Enlarged Big Sand Wash Dam and Reservoir

The active storage capacity of Big Sand Wash Reservoir would be increased by 12,000 ac-ft. Physical features, facilities, construction requirements, ownership, and maintenance associated with the enlarged Big Sand Wash Dam and Reservoir would be the same as described for the Proposed Action (see Section 2.2.2.1). Operation of the enlarged Big Sand Wash Dam and Reservoir is described below. It would differ slightly from the Proposed Action because of differences in reservoir storage space allocations, the size and distribution of the project water supply, and in the timing of water diverted into and released from the enlarged reservoir.

The reservoir's primary water supply would come from the Lake Fork River via the "C" Canal and the proposed Big Sand Wash Feeder Pipeline. Figure 2.3-1 shows estimated end-of-month water surface elevation and storage in the enlarged Big Sand Wash Reservoir for wet, average, and dry years based on the 64-year analysis period (1930-1993). Wet-, average-, and dry-year estimates were determined using data from the same years of the analysis period as described under the Proposed Action for Big Sand Wash Reservoir. As under the Proposed Action, the enlarged reservoir would generally be filled through the winter and spring months. During "dry" years, or years when the total storage is less than 24,100 ac-ft, there would be shortages to the M&I users but at no time would the conservation pool be depleted, but shortages to project and non-project irrigation would occur.

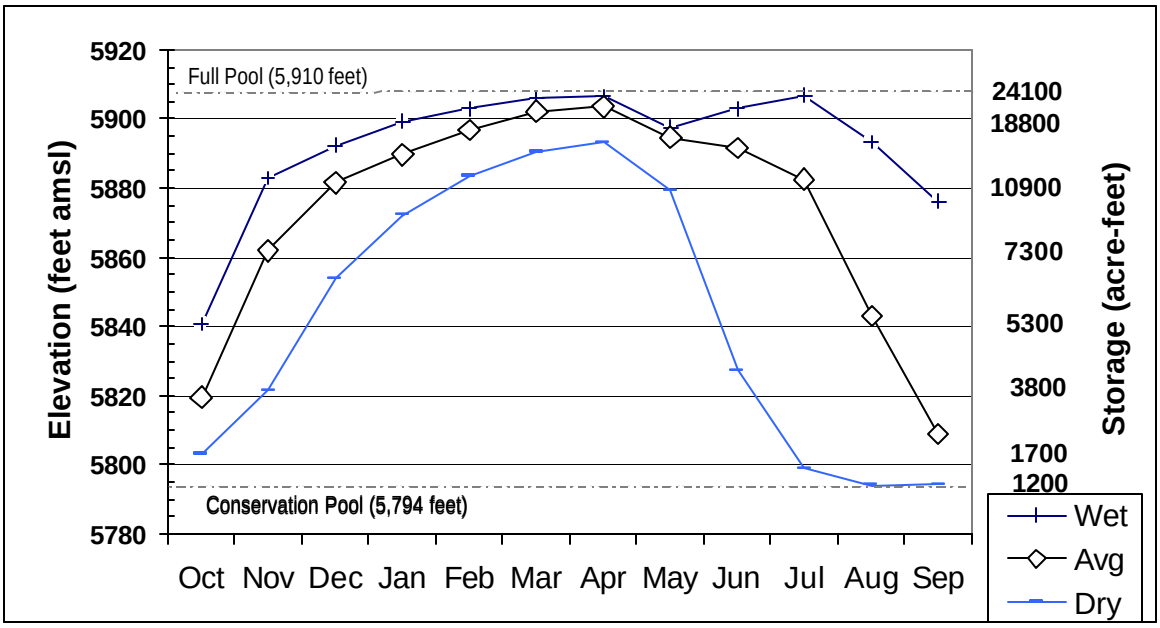



**FIGURE 2.3-1**
Average-, Wet-, and Dry-Year End-of-Month Elevation and Storage for the 12,000-ac-ft Enlarged Big Sand Wash Reservoir
(Revised Section 203 Alternative)

Under the Revised Section 203 Alternative, annual diversions from the Lake Fork River into the enlarged reservoir would average 53,047 ac-ft, and would vary from 20,271 ac-ft to 76,046 ac-ft. Following the irrigation season, when the enlarged reservoir starts to refill, the inflow to the enlarged reservoir would be allocated to the various storage pools for M&I and irrigation. Annual releases from the enlarged Big Sand Wash Reservoir would average 53,383 ac-ft, and would vary from 25,031 ac-ft to 57,515 ac-ft. Of the 53,383 ac-ft of water released from the enlarged reservoir, 10,297 ac-ft of project water would be released into the Big Sand Wash-Roosevelt Pipeline, and 43,086 ac-ft of non-project water would be released into the "C" Canal.

Under the Revised Section 203 Alternative, the enlarged Big Sand Wash Reservoir storage space allocations would include the existing 12,100 ac-ft of non-project storage space that would continue to be used to maintain 1,200 ac-ft for the existing conservation pool and dead pool and the existing 10,900 ac-ft irrigation pool. The 12,000 ac-ft of storage space allocated to the United States would yield 10,297 ac-ft of project water to supply 2,000 ac-ft to Roosevelt City for M&I purposes, 1,000 ac-ft for other future M&I needs in the project area, and 7,297 ac-ft for project irrigation purposes. The project water supply of 12,000 ac-ft would be diverted and conveyed through the Big Sand Wash Feeder Pipeline to the enlarged reservoir where it would be stored and then delivered via the Big Sand Wash–Roosevelt Pipeline to M&I water for Roosevelt City and other project water users, the same as for the Proposed Action.

**Insert Map 2.3-1**

**Revised Section 203 Alternative**

**Color, 8-1/2 x 11, page 1 of 2**

**Insert Map 2.3-1**

**Revised Section 203 Alternative**

**Color, 8-1/2 x 11, page 2 of 2**

#### 2.3.2.2 Diversion Structure

The new Big Sand Wash Feeder Diversion Structure would be constructed, administered, and maintained exactly the same as described for the Proposed Action (see Section 2.2.2.3). However, the operation of the diversion structure would be slightly different from the Proposed Action. Under this alternative, annual diversions of non-project water from the Lake Fork River at the existing "C" Canal Diversion Structure would average 39,610 ac-ft, and would vary from 13,051 ac-ft to 57,569 ac-ft. Annual diversions of water from the Lake Fork River at the Big Sand Wash Feeder Diversion Structure would average 13,437 ac-ft, and would vary from 7,220 ac-ft to 18,477 ac-ft. On average, annual diversions of water at the Big Sand Wash Feeder Diversion Structure would consist of 10,297 ac-ft of project water and 3,140 ac-ft of non-project water.

#### 2.3.2.3 Pipelines

Pipelines would include the proposed Big Sand Wash Feeder Pipeline and the proposed Big Sand Wash–Roosevelt Pipeline. The two pipelines would be constructed, owned, administered, and maintained exactly the same as described for the Proposed Action (see Section 2.2.2.4). However, under this alternative, the two pipelines would be operated slightly different than the Proposed Action (see Section 2.3.2.2).

#### 2.3.2.4 Fish and Wildlife Mitigation and Enhancement

Fish and wildlife mitigation and enhancement measures would be the same as described for the Proposed Action (see Section 2.2.2.6), with two major exceptions. There would be no provisions for instream flows for fish in the Lake Fork River between Moon Lake Reservoir and the Big Sand Wash Feeder Diversion Structure, no provisions for bypass instream flows past the Yellowstone Feeder and "C" Canal Diversions, and no fish and wildlife / wilderness enhancements from stabilizing the high mountain lakes.

### 2.3.3 Distribution of Project Water

The general discussion regarding the distribution of project water and water conservation for the Proposed Action (see Section 2.2.3) also applies to the Revised Section 203 Alternative. The 12,000 ac-ft of storage space in the enlarged Big Sand Wash Reservoir allocated to the United States would yield an average annual supply of 10,297 ac-ft of project water. This 10,297 ac-ft of project water would be used to supply 2,000 ac-ft to Roosevelt City for M&I purposes, 1,000 ac-ft for other future M&I needs, and 7,297 ac-ft for project irrigation purposes. Therefore, the enlarged Big Sand Wash Reservoir would annually provide an average of 18,097 ac-ft of project irrigation water to be used on secondary water-righted lands. This is 7,197 ac-ft more water than the 10,900 ac-ft of non-project irrigation water currently available from the existing Big Sand Wash Reservoir each year for secondary water-righted lands. There would be no replacement storage for high mountain lakes because none would be stabilized. Information on stream flow regime is presented in Chapter 3, Section 3.2, *Water Resources and Hydrology*.

### 2.3.4 Summary of Acres Affected

The amount of land temporarily and permanently disturbed and the amount of land acquisition under the Revised Section 203 Alternative would be identical to the Proposed Action (see Section 2.2.4). Construction schedules for all project features are summarized in Figure 2.3-2.

## 2.4 Twin Pots Section 203 Alternative

### 2.4.1 Introduction

Specific features of the Twin Pots Section 203 Alternative and their locations are shown on Map 2.4-1 and listed in Table 2.1-1. The most significant changes from the Proposed Action are: 1) the rehabilitation and stabilization of Twin Pots Dam and Reservoir as an additional fish and wildlife enhancement measure; 2) no provisions for instream flows in the Lake Fork River between Moon Lake Reservoir and the Big Sand Wash Feeder Diversion Structure; 3) no provisions for bypass instream flows past the Yellowstone Feeder and "C" Canal Diversions; and 4) the inclusion of the Lake Fork–Yellowstone Diversion Structure and Pipeline. High mountain lakes stabilization under the Twin Pots Alternative would be identical to the Proposed Action (see Section 2.2.2.5). The following subsections provide descriptions of the features that would change compared to the Proposed Action.

### 2.4.2 Features

#### 2.4.2.1 Enlarged Big Sand Wash Dam and Reservoir

The active storage capacity of Big Sand Wash Reservoir would be increased by 12,000 ac-ft. Physical features, facilities, construction requirements, ownership, and maintenance associated with the enlarged Big Sand Wash Dam and Reservoir would be the same as described for the Proposed Action (see Section 2.2.2.1). Operation of Big Sand Wash Dam and Reservoir is described below. It would differ from the Proposed Action because of differences in the distribution of the project water supply, and in the timing, location, and amount of water diverted into and released from the enlarged reservoir.

The reservoir's primary water supply would come from the Lake Fork River via the "C" Canal and the proposed Big Sand Wash Feeder Pipeline. Figure 2.4-1 shows estimated end-of-month water surface elevation and storage in the enlarged Big Sand Wash Reservoir for wet, average, and dry years based on the 64-year analysis period (1930-1993). Wet-, average-, and dry-year estimates were determined using data from the same years of the analysis period as described for Big Sand Wash Reservoir under the Proposed Action. As under the Proposed Action, the enlarged reservoir would generally be filled through the winter and spring months. During "dry" years, or years when the total storage is less than 24,100 ac-ft, there would not be any shortages to the M&I users and at no time would the conservation pool be depleted; however, shortages to project and non-project irrigation would occur.

**Figure 2.3-2**

**Construction Schedule for the Revised Section 203 Alternative**

**Black and white, 8-1/2 x 11, page 1 of 1**

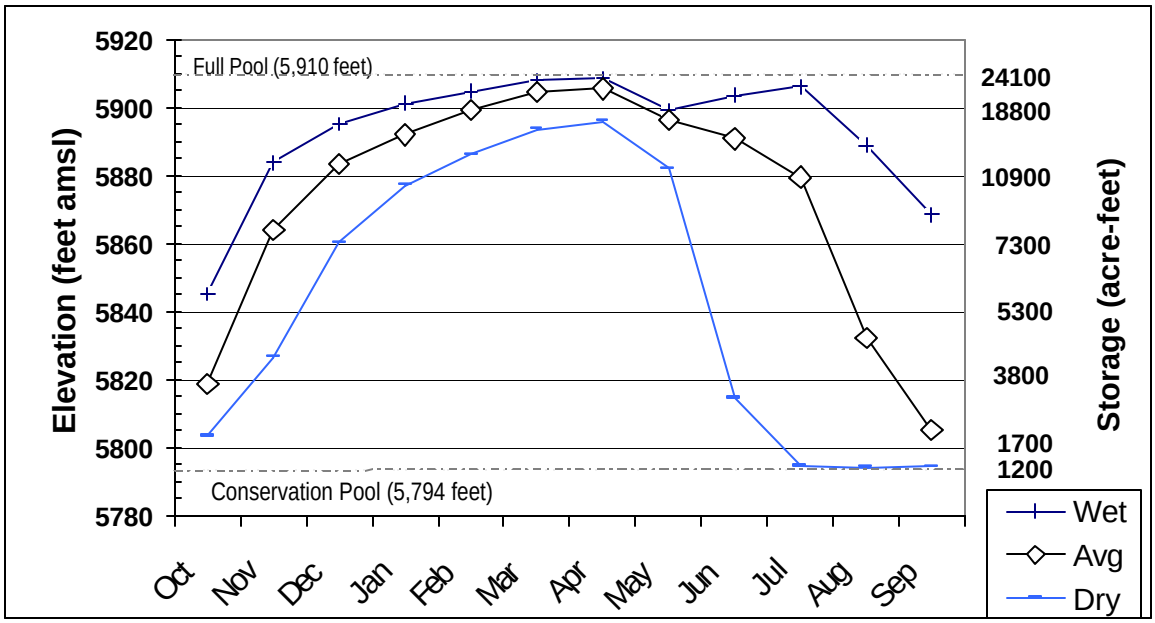



**FIGURE 2.4-1**
Average-, Wet-, and Dry-Year End-of-Month Elevation and Storage for the 12,000-ac-ft Enlarged Big Sand Wash Reservoir
(Twin Pots Section 203 Alternative)

Under the Twin Pots Section 203 Alternative, annual diversions from the Lake Fork River into the enlarged reservoir would average 50,733 ac-ft, and would vary from 19,695 ac-ft to 75,261 ac-ft. Following the irrigation season when the enlarged reservoir starts to refill, the inflow to the enlarged reservoir would be allocated to the various storage pools for M&I, high mountain lakes, and irrigation. Annual releases from the enlarged Big Sand Wash Reservoir would average 51,229 ac-ft, and would vary from 24,494 ac-ft to 57,515 ac-ft. Of the 51,229 ac-ft of water released from the enlarged reservoir, 4,600 ac-ft of project water would be released into the Big Sand Wash-Roosevelt Pipeline and 46,629 ac-ft of non-project water would be released into the "C" Canal.

Under the Twin Pots Section 203 Alternative, the enlarged Big Sand Wash Reservoir storage space allocations would include the existing 12,100 ac-ft of non-project storage space that would continue to be used to maintain the 1,200 ac-ft for the conservation pool and dead pool and the existing 10,900 ac-ft non-project irrigation pool. The United States' use of 5,500 ac-ft of the total storage space in the enlarged reservoir to which it is entitled is estimated to yield 4,600 ac-ft of project water to supply 2,000 ac-ft for Roosevelt City for M&I purposes, 1,000 ac-ft for other future M&I needs, and 1,600 ac-ft for exchange to the rehabilitated Twin Pots Dam and Reservoir. The remaining 6,500 ac-ft of storage space to which the United States would be entitled would be contractually committed to the exclusive storage for the thirteen high mountain lakes' storage replacement of MLWUA's non-project water. The project water supply of 4,600 ac-ft would be diverted and conveyed through the Big Sand Wash Feeder Pipeline to the enlarged reservoir where it would be stored and then either delivered via the Big Sand Wash–Roosevelt Pipeline to Roosevelt City, other M&I users, or to MLWUA's non-project water users in exchange for their water in the rehabilitated Twin Pots Dam and Reservoir.

# Map 2.4-1

# Twin Pots Section 203 Alternative

# Color, 8-1/2 x 11, page 1 of 2

# Map 2.4-1

# Twin Pots Section 203 Alternative

# Color, 8-1/2 x 11, page 2 of 2

### 2.4.2.2 Diversion Structures

Diversion structures would include the Big Sand Wash Feeder Diversion Structure described for the Proposed Action (see Section 2.2.2.3) plus one additional diversion structure. A new concrete diversion structure would be constructed on the Lake Fork River to divert non-project water into the proposed Lake Fork–Yellowstone Pipeline as an additional recreation/wilderness enhancement feature associated with and necessary to facilitate the stabilization of the additional nine high mountain lakes in the upper Yellowstone River drainage under this alternative. The general description of diversion structure facilities presented in Section 2.2.2.3 also applies to these two diversion structures.

The proposed Lake Fork–Yellowstone Diversion Structure would be located approximately 2.2 miles upstream of the county road that crosses the upper Lake Fork River. Access to the site would be gained by constructing a permanent gravel road about 400 feet long and 20 feet wide. The Lake Fork–Yellowstone Diversion Structure would have a capacity of 50 cfs, a main channel structure length of 120 feet and width of 40 feet, and an inlet structure width of 14 feet. Title to the Lake Fork–Yellowstone Diversion Structure would be in the United States. Under a contract with DOI, the MLWUA would administer, operate, and maintain the Lake Fork–Yellowstone Diversion Structure. The structure would be operated to provide fish passage and to prevent fish from entering the Lake Fork–Yellowstone Pipeline. Non-project water would be diverted and conveyed through these federal facilities under a carriage contract.

The coordinated operation of these diversion structures together with Moon Lake Reservoir and the other project facilities would be different from the Proposed Action. Under this alternative, annual diversions of MLWUA's non-project water from the Lake Fork River at the Lake Fork–Yellowstone Diversion Structure would average 11,919 ac-ft, and would vary from 8,756 ac-ft to 12,771 ac-ft. Annual diversions of non-project water from the Lake Fork River at the existing "C" Canal Diversion Structure would average 37,252 ac-ft, and would vary from 12,326 ac-ft to 57,086 ac-ft. Annual diversions of project and non-project water from the Lake Fork River at the Big Sand Wash Feeder Diversion Structure would average 13,481 ac-ft, and would vary from 7,369 ac-ft to 18,175 ac-ft. On average, annual diversions of water at the Big Sand Wash Feeder Diversion Structure would consist of 4,600 ac-ft of project water and 8,881 ac-ft of non-project water.

To construct the two diversion structures, an estimated 3.8 acres of rights-of-way would be acquired and temporarily disturbed but reclaimed, and 2.0 acres would be permanently disturbed. These lands would be acquired under temporary and permanent easements.

### 2.4.2.3 Pipelines

Under the Twin Pots Section 203 Alternative, the proposed Big Sand Wash Feeder Pipeline, the Lake Fork–Yellowstone Pipeline, and the Big Sand Wash–Roosevelt Pipeline would be constructed. Map 2.4-1 shows their locations. The three pipelines would be owned, administered, operated, and maintained the same as described for the Proposed Action (see Section 2.2.2.4). However, with the reduction in the project water supply, the capacity of the Big Sand Wash–Roosevelt Pipeline would be reduced to 22 cfs and the diversions through the Big Sand Wash Feeder and Big Sand Wash–Roosevelt pipelines would be as described in Sections 2.4.2.2 and 2.4.3.

The new 36-inch-diameter Lake Fork–Yellowstone Pipeline would begin at the proposed Lake Fork–Yellowstone Diversion Structure on the Lake Fork River and extend 3.6 miles to the Yellowstone River where it would discharge upstream of the existing Yellowstone Feeder–Payne Diversion Structure. It would have an operational design flow of 50 cfs. Water discharged from the pipeline would meet replacement requirements in the Yellowstone River resulting from stabilization of the nine high mountain lakes in the upper Yellowstone River drainage.

Descriptions of pipeline construction presented for the Big Sand Wash Feeder Pipeline and the Big Sand Wash–Roosevelt Pipeline also apply to the Lake Fork–Yellowstone Pipeline. About 146 acres of land, with a 50-foot-wide construction zone, would be required to construct all three pipelines. Disturbed land would be reclaimed following construction.

#### 2.4.2.4 High Mountain Lakes' Stabilization

High mountain lakes' stabilization would be the same as described for the Proposed Action (see Section 2.2.2.5). It would include the four high mountain lakes in the upper Lake Fork drainage and the nine high mountain lakes in the upper Yellowstone River drainage. Characteristics of these lakes were described in Table 2.2-3.

#### 2.4.2.5 Fish and Wildlife Mitigation and Enhancement

Four fish and wildlife mitigation and enhancement measures would be implemented. Three of the measures, including wetland / riparian creation, fish passage, and extension of the Big Sand Wash Reservoir boat ramp would be the same as for the Proposed Action (see Section 2.2.2.6) except that fish passage and fish screens would be provided at the new Lake Fork–Yellowstone Diversion Structure . The fourth measure, the Twin Pots Reservoir Improvement, is described in the following text.

##### 2.4.2.5.1 Twin Pots Reservoir Improvement

***2.4.2.5.1.1 Description of Facilities.*** The existing Twin Pots Dam and Reservoir are located offstream on an unnamed channel just west of the Lake Fork River (see Map 2.4-1). The reservoir receives water from the Lake Fork River via the Farnsworth Canal. Under the Twin Pots Section 203 Alternative, the existing Twin Pots Dam would be rehabilitated and / or replaced at the same location. It would provide long-term reservoir storage primarily for enhancement through fish and wildlife improvements and recreation activities. The existing facilities are marginally suitable for these uses. Water stored in Twin Pots Reservoir by exchange also may be used by the Ute Tribe for irrigation. A conservation pool would be maintained with a depth that would vary from 38 feet at full pool to at least 15 feet. The improved Twin Pots Dam and Reservoir would be administered, operated, and maintained by the Ute Tribe under an agreement with the Bureau of Indian Affairs (BIA) and DOI. Twin Pots Restoration and improvements would function adequately without rehabilitating the Farnsworth Canal.

Table 2.4-1 summarizes the physical features and facilities proposed for Twin Pots Dam and Reservoir. Map 2.4-2 shows the locations of these facilities.

# Table 2.4-1

## Physical Features and Facilities for the Twin Pots Dam and Reservoir Replacement

## Black and white, 8-1/2 x 11, page 1 of 1

# Map 2.4-2

## Twin Pots Section 203 Alternative Physical Features and Construction Requirements—Twin Pots Dam and Reservoir

## Black and white, 8-1/2 x 11, page 1 of 1

### *2.4.2.5.1.2 Construction Procedures*

***Twin Pots Dam Stabilization.*** Construction activities would be localized and occur primarily in and near the reservoir pool. Potential short- and long-term impacts from dam and reservoir construction would be avoided or reduced by following standard construction and operating requirements outlined in Appendix A.

***Borrow (Material) Areas.*** Borrow material excavation, processing, and handling would be similar to that described for the enlarged Big Sand Wash Reservoir (see Section 2.2.2.1.1). Approximately 57,700 cubic yards of earth materials, including the existing embankment material, would be excavated and processed to construct the new earth and rock fill dam and impervious upstream blanket. One 5-acre borrow area has been identified near the center of the reservoir pool area and is shown on Map 2.4-2. Required riprap and gravel materials would be acquired offsite or from commercial borrow pits near Roosevelt City or Vernal.

A 0.25-mile-long temporary haul road would be constructed to connect the borrow area with existing gravel roads to provide access to the dam site (see Map 2.4-2). About 20 percent of the old dam and borrow material spoils would be deposited in the proposed borrow area within the reservoir. Similarly, spoils left over from borrow area material processing and sorting would be redeposited and regraded in the borrow area.

***Staging Areas and Support Facilities.*** One 0.5-acre staging area would be located immediately north of the proposed borrow area. An area adjacent to the staging area would be used for construction trailer storage, maintenance operations, and a project field office. Utilities would include temporary electrical power, phone service, and water and sanitary facilities, which would be removed after project completion. Map 2.4-2 shows the approximate locations of the proposed staging area and construction field office.

***Construction Force and Principal Equipment.*** Replacement of Twin Pots Dam would begin in the early spring and extend over a 15-month construction period. The number of workers required per month would vary between 2 and 10, while the total labor effort would be approximately 9,500 hours. Personnel requirements and labor pool sources would be similar to those described for Big Sand Wash Dam and Reservoir (see Section 2.2.2.1.1).

The number of pieces and types of equipment required for construction would vary depending on the stage of the project and specific operations in progress. Motorized equipment required for construction would use an estimated 46,600 gallons of petroleum products (diesel, gasoline, and grease). Most motorized equipment would be diesel-powered except for light utility trucks.

Construction contracts would be awarded in late winter or early spring, and initial site preparations and mobilization would begin shortly thereafter. Removal of the existing dam, borrow area excavation, and material processing would begin in the spring. Work on the dam foundation and placement of earth and rock fill materials on the embankment (34,100 cubic yards) would occur during the spring and summer. Work on the new spillway would follow. Miscellaneous work and site cleanup and restoration would continue until the following year (see Figure 2.4-2).

**Figure 2.4-2**

**Construction Schedule for the Twin Pots Section 203 Alternative**

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***Operation and Maintenance Procedures.*** The existing Twin Pots Dam and Reservoir are operated and maintained by the MLWUA, and have an average annual water supply of 3,526 ac-ft that is used primarily for non-project irrigation purposes. Under the Twin Pots Section 203 Alternative, the rehabilitated Twin Pots Dam and Reservoir would be operated primarily to support a year-round fishery, to enhance riparian habitat, and to provide recreational opportunities. Water stored in the rehabilitated Twin Pots Dam and Reservoir would be under water rights owned by the Project or Ute Indian Tribe. MLWUA's water would be transferred to the enlarged Big Sand Wash Reservoir. Twin Pots Reservoir water levels would be maintained by the Tribe or Project water conveyed through the Farnsworth Canal to compensate for reservoir evaporation and seepage losses.

The operation and maintenance of the dam and reservoir would be transferred from the MLWUA to the Ute Tribe pursuant to an agreement among the Ute Tribe, MLWUA, and DOI.

## 2.4.3 Distribution of Project Water

The distribution of project water for the Twin Pots Section 203 Alternative is somewhat different from the Proposed Action (see Section 2.2.3). The United States' use of 5,500 ac-ft of the total storage space in the enlarged Big Sand Wash Reservoir to which it is entitled is estimated to yield an average annual supply of 4,600 ac-ft of project water. This 4,600 ac-ft of project water would be used to supply 2,000 ac-ft to Roosevelt City for M&I purposes, 1,000 ac-ft for other future M&I needs, and 1,600 ac-ft for exchange to the rehabilitated Twin Pots Dam and Reservoir. The remaining 6,500 ac-ft of storage capacity in the enlarged reservoir to which the United States would be entitled would be contractually committed to MLWUA for the exclusive storage of its non-project high mountain lake storage rights associated with the thirteen stabilized lakes in the upper Lake Fork and Yellowstone River watersheds—the same as for the Proposed Action. The MLWUA would file the necessary applications with and obtain the approval of the Utah State Engineer to transfer these non-project high mountain lake storage rights to the enlarged Big Sand Wash Reservoir. Therefore, by exchange and through the transfer of the high mountain lake storage, the enlarged Big Sand Wash Reservoir would annually provide an average of 19,000 (10,900 + 6,500 + 1,600) ac-ft of non-project irrigation water to the MLWUA to be used on secondary water-righted lands. This is the same amount of irrigation water currently available from Big Sand Wash Reservoir, the high mountain lakes, and the existing Twin Pots Reservoir each year for secondary water-righted lands. Information on stream flow regime is presented in Chapter 3, Section 3.2, *Water Resources and Hydrology*. Information on water conservation is the same as presented for the Proposed Action in Section 2.2.3.

## 2.4.4 Summary of Affected Acres

A total of 111 acres (13 acres Tribal, 98 acres non-Tribal) would be temporarily disturbed and restored. An additional 533 acres (15 acres Tribal, 518 acres non-Tribal) would be permanently encumbered through ownership, ROWs, or easements. Land acquisition would include 98 acres of state lands, 28 acres of Tribal lands, and 518 acres of private lands. Construction schedules for project features are summarized in Figure 2.4-2.

## 2.5 No Action Alternative

Under the No Action Alternative, none of the features proposed in the Proposed Action or action alternatives would be constructed. Existing water supply conditions within the Section 203 project area would continue, and the needs and purposes of the project would remain unmet. Anticipated environmental impacts of the project would not occur, and proposed fish and wildlife measures would not be implemented.

Authorization to construct the Section 203 project would terminate in November 2001, pursuant to provisions of Section 203(a) of the CUPCA, and any unexpended budget authority would remain available under Section 202(c) of the CUPCA.