RECLAMATION

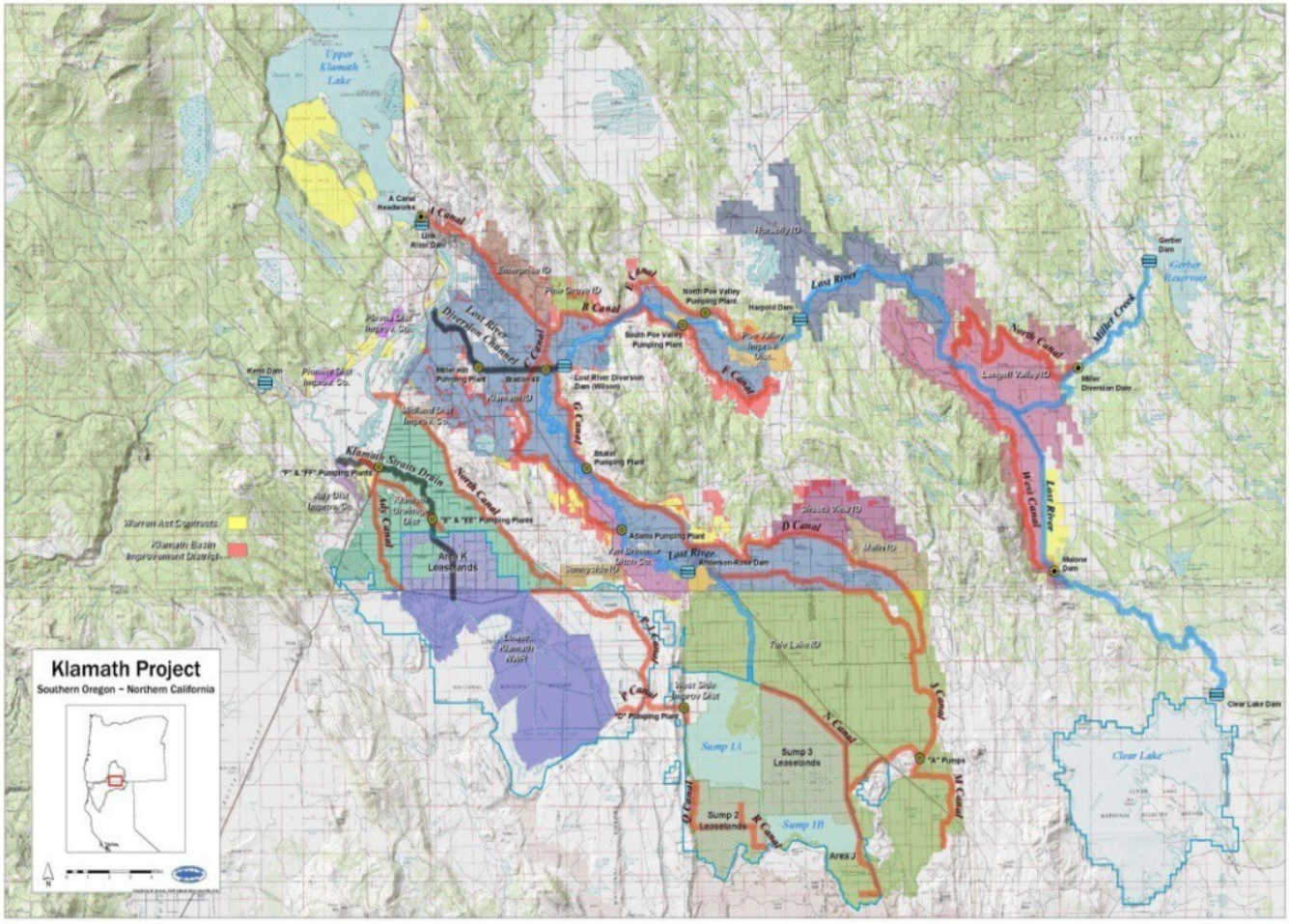
Managing Water in the West

Draft Environmental Assessment

Contracts for Conveyance and/or Exchange of Non-Project Water through Klamath Project Facilities

Oregon and California

2017-EA-004



U.S. Department of the Interior
Bureau of Reclamation
Mid-Pacific Region
Klamath Basin Area Office

February 2018

Mission Statements

The Department of the Interior protects and manages the Nation's natural resources and cultural heritage; provides scientific and other information about those resources; and honors its trust responsibilities or special commitments to American Indians, Alaska Natives, and affiliated island communities.

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

List of Acronyms Abbreviations

CFR	Code of Federal Regulations
CWA	Clean Water Act
EA	Environmental Assessment
ESA	Endangered Species Act
ITA	Indian Trust Asset
MBTA	Migratory Bird Treaty Act
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
OWRD	Oregon Water Resources Department
Project	Klamath Project
Reclamation	Bureau of Reclamation
USFWS	United States Fish and Wildlife Service

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Chapter 1 Introduction and Background Information

1.1 Introduction

The Bureau of Reclamation, Klamath Basin Area Office is proposing to enter into contracts with district and/or individual water users within the existing Klamath Project (Project) service area to convey and/or exchange non-Project water through the Project facilities (see map in Appendix A). The use of Project facilities and/or Project water to convey and/or exchange non-Project water will allow Project water users to utilize existing supplemental groundwater water supplies when Project surface water is limited or unavailable. The amount of conveyance and/or exchange capacity available under such contracts will necessarily be limited to the extent excess capacity and/or Project water is available to facilitate such operations. The proposed contracts will be for a term of five years or less, expiring no later than 2022.

This Environmental Assessment (EA) evaluates the potential effects of the proposed contracting action. The proposed conveyance and/or exchange of non-Project water would occur during the spring-summer irrigation season (March 1 to November 15). This analysis describes the existing environmental resources in the area where the contracts would be implemented, evaluates the potential effects of the No Action and the Proposed Action Alternatives on these resources, and proposes measures to avoid, minimize, or mitigate adverse effects, if any, for the Proposed Action Alternative.

The EA has been prepared in accordance with the National Environmental Policy Act (NEPA) (42 U.S.C. §4321 et seq.), the Council on Environmental Quality Regulations for implementing the Procedural Provisions of NEPA (40 Code of Federal Regulations (CFR) Parts 1500-1508), and the Department of the Interior regulations for the Implementation of the NEPA (43 CFR Part 46). If there are no significant environmental impacts identified as a result of the analyses, a Finding of No Significant Impact can be developed and signed to complete the NEPA compliance process.

1.2 Background

Authorized by the Secretary of the Interior on May 15, 1905, pursuant to the Reclamation Act of 1902 (32 Stat. 388), the Project provides surface water for irrigation and related purposes to approximately 230,000 acres in southern Oregon and northern California. Project deliveries are made in accordance with approximately 160 contracts between Reclamation and districts or individuals, executed between 1918 and 1972, which provide for the perpetual right to receive water from the Project. The water supply for the Project comes from three principal storage reservoirs – Upper Klamath Lake, Gerber, and Clear Lake – in addition to direct diversions from both the Lost and Klamath rivers.

The main irrigation season for the Project occurs in the spring-summer period (March 1 to

November 15), although there is limited amount of irrigation that occurs during the fall-winter period. Crops typically grown on the Project include alfalfa, pasture grass, small grains, potatoes and onions. The annual crop production on the Project is worth approximately $160-200 million.

In addition to surface water supplies from the Project, districts and individuals have developed groundwater wells, which provide a supplemental water supply in the event that water available from the Project is insufficient or otherwise unavailable. The ownership, depth, capacity, point of discharge, and designated place of use of these groundwater wells varies on case-by-case basis. The laws of the States of Oregon and California govern the construction and use of groundwater wells for irrigation purposes in the respective states.

1.3 Need for the Proposal

Surface water supplies available from the Project for irrigation demands of existing Project contractors are constrained at times due to hydrologic conditions and biological requirements associated with federally threatened and endangered species. To offset restrictions in Project water availability, existing Project contractors have developed supplemental groundwater supplies in accordance with state law. In some cases, Project facilities are the only practically feasible means of conveying supplemental groundwater to its intended place of use. In some cases, the groundwater can be used by exchange to meet other Project demands, thereby making Project water available to lands that otherwise would not receive Project water. The proposed contracts are intended to cover these situations where Project facilities and/or Project water is needed to facilitate the efficient and effective use of supplemental, non-Project groundwater.

1.4 Authority

The Warren Act (Act of February 21, 1911, ch. 141, 36 Stat. 925, 43 U.S.C. §§523-525) authorizes Reclamation to contract with individuals and entities for the use of excess storage and/or conveyance in Federal Reclamation facilities for irrigation purposes. This type of contract is commonly called an “excess capacity contract.”

Section 14 of the Reclamation Project Act of 1939 (Act of August 4, 1939, ch. 418, 53 Stat. 1187, 1197; 43 U.S.C. §389) authorizes Reclamation to contract for the exchange or replacement of water as necessary and in the interests of the United States and the project.

1.5 Regulatory Compliance Laws

Compliance with the following applicable laws and regulations would be required prior to and during implementation of the Proposed Action Alternative.

National Environmental Policy Act (NEPA) (42 U.S.C. §4321 et seq.)
Under NEPA, federal agencies must consider the environmental consequences of proposed major actions. The spirit and intent of NEPA is to protect and enhance the environment through

well-informed federal decisions, based on sound science. NEPA is premised on the assumption that providing timely information to the decision maker about the potential environmental consequences of proposed action alternatives would improve the quality of federal decisions. Thus, the NEPA process includes the systematic interdisciplinary evaluation of potential environmental consequences expected to result from implementing a proposed action.

National Historic Preservation Act (NHPA), as amended (54 U.S.C. §300101 et seq.)
The NHPA requires Federal agencies to consider historic preservation values when planning their activities. 54 U.S.C. § 306108, commonly known as Section 106 of the NHPA, requires Federal agencies to take into account the effects of their undertakings on cultural resources that are included, or eligible for inclusion, in the National Register of Historic Places. Such cultural resources are known as historic properties. The regulatory process for implementing Section 106 of the NHPA is described at 36 CFR Part 800. Reclamation also uses findings obtained through the Section 106 process to assess impacts to cultural resources under NEPA.

Federal Migratory Bird Treaty Act of 1918 (MBTA), as amended (16 U.S.C. §§703-712)
The MBTA prohibits the take, harm, or trade of any migratory bird species and requires that an agency must have a policy in place to prevent harm to such species as a result of that agency's actions. The United States Fish and Wildlife Service (USFWS) is the agency charged with administering and enforcing the MBTA. A 1972 amendment to the act included owls, hawks, and other birds of prey.

Endangered Species Act (ESA), as amended (16 U.S.C. §1531 et seq.)
The ESA requires Federal agencies to ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of any listed species (according to the lists maintained by USFWS and the National Marine Fisheries Service (NMFS)) or result in the destruction or adverse modification of habitat critical to such species' survival. To ensure against jeopardy, each Federal agency must consult with the USFWS and/or NMFS.

Clean Water Act (CWA), as amended (33 U.S.C. §1251 et seq.)
The CWA strives to "restore and maintain the chemical, physical, and biological integrity of the Nation's water." If water quality is potentially affected by a proposed action, a National Pollutant Discharge Elimination System (NPDES) permit (administered by the states) under Section 402 of the CWA is required. If a project has the potential to result in placement of materials into waters of the United States, a Dredge-and-Fill permit under Section 404 of the CWA would be required from the United States Army Corps of Engineers. Prior to issuances of either a NPDES or Dredge-and-Fill permit, certification under Section 401 of the CWA (as it relates to States and Tribes review and approval of the proposed action) would be also required.

Chapter 2 Alternatives

This EA considers two possible actions including the No Action Alternative and the Proposed Action Alternative. The No Action Alternative reflects conditions without the Proposed Action and serves as a basis of comparison for determining potential effects to the human environment as a result of implementing the Proposed Action Alternative.

2.1 No Action Alternative

Under the No Action Alternative, Reclamation would not execute and issue the proposed contracts for the conveyance and/or exchange of Non-Project water through Project facilities. Districts and individual water users within the Project would be confined to either using available surface water supplies provided under their respective water service contracts with Reclamation or obtaining non-Project water by means other than conveyance and/or exchange using Project facilities.

2.2 Proposed Action Alternative

Under the Proposed Action, Reclamation would enter into excess capacity and/or exchange contracts for a period of not to exceed five years, ending no later than 2022. The conveyance and/or exchange capacity would be dependent upon the excess capacity and/or available Project water being available to facilitate the conveyance and/or exchange.

The non-Project water conveyed and/or exchanged under the proposed contracts would be used for irrigation purposes on lands with a contract or agreement to receive water from the Project. Pumping and conveyance would be limited to use of existing wells, meters, pipes, water diversion, and field delivery facilities, and no new construction would occur.

Chapter 3 Affected Environment & Environmental Consequences

This EA analyzes two alternatives including the No Action Alternative and the Proposed Action Alternative. The No Action Alternative reflects conditions without the Proposed Action and serves as a basis of comparison for determining potential effects to the human environment as a result of implementing the Proposed Action Alternative.

Cumulative impacts are described for each resource analyzed in detail. Cumulative impacts result from the incremental impact of the action, when added to other past, present, and reasonably foreseeable future actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

3.1 Resources Not Analyzed in Detail

Effects on several environmental resources were examined and found to be minor. For the reasons noted below, the following resources were eliminated from further review in this EA.

3.1.1 Indian Trust Assets

Indian Trust Assets (ITAs) are legal interests in assets that are held in trust by the United States for federally recognized Indian tribes or individuals. A portion of the activity area does extend

into a portion of the Klamath Tribal Designated Statistical Area (see Appendix C). Given, however, that the Proposed Action is administrative in nature, no impacts to Indian hunting or fishing resources is expected. As such, Reclamation anticipates a determination that the Proposed Action will not have any impacts on ITAs.

3.1.2 Indian Sacred Sites

Sacred sites are defined in Executive Order 13007 (May 24, 1996) as "any specific, discrete, narrowly delineated location on Federal land that is identified by an Indian tribe, or Indian individual determined to be an appropriately authoritative representative of an Indian religion, as sacred by virtue of its established religious significance to, or ceremonial use by, an Indian religion; provided that the tribe or appropriately authoritative representative of an Indian religion has informed the agency of the existence of such a site." The Proposed Action Alternative would not affect and/or prohibit access to and ceremonial use of Indian sacred sites.

3.1.3 Environmental Justice

Executive Order 12898 requires each Federal agency to identify and address disproportionately high and adverse human health or environmental effects, including social and economic effects of its program, policies, and activities on minority populations and low-income populations. Reclamation has not identified adverse human health or environmental effects on any population as a result of implementing the Proposed Action Alternative. Since there would be no impact to any populations, there would be no adverse human health or environmental effects to minority or low-income populations as a result of implementing the Proposed Action Alternative.

3.1.4 Cultural Resources

Cultural Resources is a broad term that includes prehistoric, historic, architectural, and traditional cultural properties. The NHPA is the primary Federal legislation that outlines the Federal Government's responsibilities related to cultural resources. The effects of an agency's proposed actions on significant cultural resources (i.e., historic properties) are determined by following the Section 106 process as described at 36 CFR Part 800. Following this process, Reclamation reviewed the Proposed Action Alternative and determined it has no potential to cause effects on historic properties, pursuant to 36 CFR §800.3(a)(1) (see Appendix B). As such, Reclamation has no further obligations under Section 106 of the NHPA. The Proposed Action Alternative, which involves the use of existing facilities to convey water, would result in no impacts to cultural resources.

3.2 Resources Analyzed in Detail

3.2.1 Water Resources

3.2.1.1 Affected Environment

The water resources potentially affected would be groundwater and Project surface water resources. Groundwater resources could be affected when contractors pump groundwater from private wells and convey and/or exchange it through Project facilities under the proposed contracts. Surface water could be affected when private pumped groundwater is pumped into Project facilities and mixes with Project surface water supplies being conveyed and/or exchange through the same Federal facilities

3.2.1.2 Environmental Consequences

No Action Alternative:

Under the No Action Alternative, Reclamation would not enter into the proposed contracts with districts and individuals. Project facilities would only be used for storage and conveyance of Project water supplies and Project water would not be available for exchange. In drought conditions, when Project water supplies are limited, Project water users would not be able to convey and/or exchange non-Project water supplies through Project facilities, and instead would either have to forego the use of supplemental water supplies or develop an alternative means of conveying or exchanging non-Project water. Under the No Action Alternative, no impacts to surface or groundwater would occur.

Proposed Action Alternative:

Under the Proposed Action Alternative, groundwater resources from various geographic locations within or near Project boundaries would be used, potentially impacting groundwater reservoirs. Impacts to these reservoirs (e.g., drawdown) is monitored and regulated by the (in the State of Oregon) the Oregon Water Resources Department (OWRD). OWRD would be the entity that deems well use and reservoir drawdown either acceptable and or not allowed. Districts and individuals would be required to provide information to Reclamation demonstrating that the proposed use of groundwater is consistent with state law.

As the Proposed Action Alternative would allow non-Project water to enter into Project facilities and/or be exchanged for Project water, overall water quantities within the Project canals would be expected to increase. The amount of increase would be limited to the excess capacity of the canals, compliance with local groundwater management plans and consistent with state water law. Non-Project water conveyed and/or exchanged through Project facilities would only be used for irrigation purposes on established agricultural lands. Conveyance and/or exchange of non-Project water in Project facilities would occur through existing wells, meters, pipes, water diversion, and field delivery facilities.

Surface water quality within the Project canals could be impacted when groundwater or other forms of non-Project water is introduced and mixes with Project surface water, thereby changing the composition of the Project surface water. To reduce the potential for non-Project water degrading or contributing to poor water quality entering and being conveyed through Project facilities, minimum water quality standards and assurances, as outlined in the Quality Assurance Project Plan (see Appendix D) would be implemented by contractors in coordination with Reclamation.

Contractors would be responsible for accurate water measurement and associated costs, as well as assuring the non-Project water meets water quality standards for acceptance of non-Project water into Project facilities as specified in Appendix D. The proposed contracts would state that non-Project water introduced into Project facilities would be of such quality, as determined by the Contracting Officer, as to not degrade the quality of Project water. Further, water quality data and testing associated with non-Project water introduced into Project facilities would be, at the direction of the Contracting Officer and evaluated by Reclamation technical staff.

Pursuant to the proposed contracting terms, non-Project water would be required to be tested for approved water quality standards per the terms of the contract, prior to its introduction into Reclamation facilities. Performing this measure and complying with the standards outlined in

Appendix D and as defined in the contracts would ensure that water transported through the canals does not impair existing uses, including downstream users, or negatively impact existing Project water quality conditions.

3.2.1.3 Cumulative Impacts

Historic hydrological conditions and other factors within the Project result in fluctuating water supplies that drive requests for water service actions. Annually, Reclamation reviews and approves a myriad of actions related to these water service actions. In some cases, multi-year projects are approved following proper environmental review. Reclamation has determined that the Proposed Action Alternative and its attendant environmental water quality and monitoring commitments would not result in any adverse cumulative impacts to the water resources within Project facilities or water districts they serve. Furthermore, as a result of the monitoring by both OWRD and Reclamation, the Proposed Action Alternative would have no significant cumulative impacts on either surface water or groundwater resources.

3.2.2 Biological Resources

3.2.2.1 Affected Environment

Federally listed threatened and endangered species that occur within or near lands served by Project canals are shown in Tables 1.1-3. The following species lists were obtained January 31, 2018, by accessing the USFWS database for species that may occur within Klamath County, Oregon and both Modoc and Siskiyou Counties, California: http://www.fws.gov/klamathfallsfwo/es/es.html; (USFWS, 2018).

Table 1.1 Listed, Proposed, and Candidate Species that may occur in Klamath County, Oregon

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Klamath Falls Fish and Wildlife Office
1936 California Avenue, Klamath Falls, Oregon 97601
(541) 885-8481 FAX (541)885-7837
kfalls@fws.gov

LISTED, PROPOSED, AND CANDIDATE SPECIES THAT MAY OCCUR IN KLAMATH COUNTY, OREGON

Status: **Endangered**

Phylum	Common Name	Scientific Name	Critical Habitat
Fish	Lost River sucker	*Deltistes luxatus*	Designated
Fish	Shortnose sucker	*Chasmistes brevirostris*	Designated
Mammal	Gray wolf	*Canis lupus*	
Plant	Applegate's milk-vetch	*Astragalus applegatei*	
Plant	Greene's tuctoria	*Tuctoria greenei*	Designated

Status: **Threatened**

Phylum	Common Name	Scientific Name	Critical Habitat
Bird	Northern spotted owl	*Strix occidentalis caurina*	Designated
Bird	Yellow-billed cuckoo (Western DPS)	*Coccyzus americanus occidentalis*	Proposed
Fish	Bull trout	*Salvelinus confluentus*	Designated
Amphibian	Oregon spotted frog	*Rana pretiosa*	Designated
Plant	Slender Orcutt grass	*Orcuttia tenuis*	Designated

Status: **Proposed**

Phylum	Common Name	Scientific Name	Critical Habitat
Mammal	Wolverine	*Gulo gulo luscus*	

Status: **Candidate**

Phylum	Common Name	Scientific Name
Plant	Whitebark Pine	*Pinus albicaulis*

Updated December 14, 2017

Table 1.2 Listed, Proposed, and Candidate Species that may occur in Siskiyou County, California

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Klamath Falls Fish and Wildlife Office
1936 California Avenue, Klamath Falls, Oregon 97601
(541) 885-8481 FAX (541)885-7837
kfalls@fws.gov

LISTED, PROPOSED, AND CANDIDATE SPECIES THAT MAY OCCUR IN SISKIYOU COUNTY, CALIFORNIA

Status: **Endangered**

Phylum	Common Name	Scientific Name	Critical Habitat
Fish	Lost River sucker	*Deltistes luxatus*	Designated
Fish	Shortnose sucker	*Chasmistes brevirostris*	Designated
Mammal	Gray wolf	*Canis lupus*	
Invertebrate	Shasta crayfish	*Pacifistacus fortis*	
Plant	Yreka phlox	*Phlox hirsute*	
Plant	Greene's tuctoria	*Tuctoria greenei*	Designated
Plant	Gentner's fritillary	*Fritillaria gentneri*	Designated

Status: **Threatened**

Phylum	Common Name	Scientific Name	Critical Habitat
Bird	Northern spotted owl	*Strix occidentalis caurina*	Designated
Bird	Yellow-billed cuckoo (Western DPS)	*Coccyzus americanus occidentalis*	Proposed
Amphibian	California red-legged frog	*Rana aurora draytonii*	Designated
Amphibian	Oregon spotted frog	*Rana pretiosa*	
Plant	Slender Orcutt grass	*Orcuttia tenuis*	Designated

Status: **Proposed**

Phylum	Common Name	Scientific Name	Critical Habitat
Mammal	Wolverine	*Gulo gulo luscus*	

Status: **Candidate**

Phylum	Common Name	Scientific Name
Plant	Whitebark Pine	*Pinus albicaulis*

Updated December 14, 2017

Table 1.3 Listed, Proposed, and Candidate Species that may occur in Modoc County, California

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Klamath Falls Fish and Wildlife Office
1936 California Avenue, Klamath Falls, Oregon 97601
(541) 885-8481 FAX (541)885-7837
kfalls@fws.gov

LISTED, PROPOSED, AND CANDIDATE SPECIES THAT MAY OCCUR IN MODOC COUNTY, CALIFORNIA

Status: **Endangered**

Phylum	Common Name	Scientific Name	Critical Habitat
Fish	Lost River sucker	*Deltistes luxatus*	Designated
Fish	Shortnose sucker	*Chasmistes brevirostris*	Designated
Plant	Greene's tuctoria	*Tuctoria greenei*	Designated

Status: **Threatened**

Phylum	Common Name	Scientific Name	Critical Habitat
Bird	Northern spotted owl	*Strix occidentalis caurina*	Designated
Bird	Yellow-billed cuckoo (Western DPS)	*Coccyzus americanus occidentalis*	Proposed
Amphibian	Oregon spotted frog	*Rana pretiosa*	
Plant	Slender Orcutt grass	*Orcuttia tenuis*	Designated

Status: **Proposed**

Phylum	Common Name	Scientific Name	Critical Habitat
Mammal	Wolverine	*Gulo gulo luscus*	

Status: **Candidate**

Phylum	Common Name	Scientific Name
Plant	Whitebark Pine	*Pinus albicaulis*

Note:
The gray wolf (*Canis lupus*) is listed as endangered in portions of Washington (west of State Route 97 from the Canadian border to Highway 17, west of Highway 17 to State Route 395, and west of State Route 395 to the Oregon border), Oregon (west of the of the center line of Highway 395 and Highway 78 north of Burns Junction and that portion of Oregon west of the center line of Highway 95 south of Burns Junction), and all of California [see 73 FR 10514]. Radio-collared wolves (OR-7 and OR-25) have dispersed from northeastern Oregon through portions of many counties including Klamath and Jackson County in southern Oregon, and through portions of Siskiyou, Modoc, Shasta, Lassen, Plumas, and Tehama Counties in California. Resident wolves are not known to occur in Modoc County at this time. Please contact the U.S. Fish and Wildlife Service office issuing this list (see letterhead for contact information) with questions about the potential for gray wolf presence in proposed project areas.

Updated December 14, 2017

3.2.2.2 Environmental Consequences

No Action Alternative:

Under the No Action Alternative, Project facilities would only be used for storage and conveyance of Project water supplies. Project water users could still utilize Non-Project water sources, but would have to do so without the use of Project facilities. The status quo of historic Project water supply deliveries would continue and the No Action Alternative would have no effect on Federally-listed species or their critical habitat.

Proposed Action Alternative:

The potential impacts to all species and their habitats included in Tables 1.1, 1.2, and 1.3, as a result of the Proposed Action Alternative, have been considered, and it has been determined that the Proposed Action Alternative would have no effect on these species or their habitats. There would be no change in land use patterns of cultivated or fallowed fields that have some value to listed species or to birds protected under the MBTA. Groundwater transported through Project facilities would use existing facilities with no need for any new construction in or near Project waterways. Water quality assurance as defined in Appendix D and pursuant to the terms of the proposed excess capacity contract would ensure that inputs of Non-Project water do not degrade existing Project water quality. These conditions would ensure that there would be no direct or indirect impact to Federally-listed species or their critical habitat or other biological resources as a result of implementing the Proposed Action Alternative.

3.2.2.3 Cumulative Impacts

As the Proposed Action Alternative is not expected to result in any direct or indirect impacts to biological resources, there would be no cumulative impacts to biological resources.

3.2.3 Socioeconomics

3.2.3.1 Affected Environment

The agricultural industry significantly contributes to the overall economic stability of the Klamath Basin. Water supplies, including Project water and non-Project water resources, allow irrigators to accurately plan for the types of crops they can grow and secure loans to purchase agricultural supplies. The economic variance may include fluctuating agricultural prices, insect infestation, changing hydrologic conditions, increased fuel, and power costs.

3.2.3.2 Environmental Consequences

No Action Alternative:

Under the No Action Alternative, the local and regional agricultural economy would remain similar to existing conditions, which fluctuates with market and hydrologic conditions. In years of drought, with limited Project water supplies, farmers would not be able to use Project facilities to convey and/or exchange non-Project water, and in some cases may not be able to access or utilize supplemental groundwater supplies. Farmers without a supplemental water supply may need to temporarily fallow irrigable land. The loss of irrigable land, even temporarily, may impact local agricultural production and employment, but those changes would likely reflect those that occur under the existing conditions. These actions under the No Action Alternative could have an adverse effect to local and regional economics.

Proposed Action Alternative:
Under the Proposed Action Alternative, there would be a reduced potential for involuntary irrigation curtailments due to limited surface water supplies. Non-Project water conveyed and/or exchanged under the Proposed Action Alternative could provide water users with flexibility to optimize existing water supplies and independently respond to drought. As a result, the Proposed Action Alternative could result in a reduction in the number of temporarily idled agricultural lands, thereby helping to stabilize and possibly increase land yields and agricultural revenues, especially in years of limited Project water supplies. Non-Project water conveyed through Federal facilities under the Proposed Action Alternative could increase the overall water available water supply for Project water users while potentially reducing the need for and level of resource intensive drought mitigation measures or more expensive water supply alternatives.

3.3 Environmental Commitments

In addition to those standards outlined in Appendix D, Reclamation would include the following (or similar) stipulations in the proposed contracts to ensure environmental consequences are reduced under the Proposed Action Alternative.

- Contractors would be required to confirm with Reclamation that the proposed use of groundwater is consistent with state law.
- Non-Project water stored and/or conveyed through Project facilities would only be used for irrigation purposes on established agricultural lands.
- There would be no new construction or excavation occurring as part of the Proposed Action Alternative. Conveyance and/or exchange of non-Project water would occur through existing wells, meters, pipes, water diversion, and field delivery facilities.
- Contractors would comply with all applicable Federal, state, and local laws and regulations.

Chapter 4 Consultation and Coordination

This section presents the agencies and parties that were coordinated or consulted with during development of the document.

4.1 Public Review Period

Reclamation will provide a two week public review and comment period for this EA. The public comment period will be accompanied by an issuance of a Reclamation news release. The EA will be available online at https://www.usbr.gov/mp/nepa/nepa_project_details.php?Project_ID=21661 and in hardcopy at the following location:

Bureau of Reclamation, Klamath Basin Area Office
6600 Washburn Way,
Klamath Falls, Oregon 97603

4.2 Persons or Agencies Consulted During Development of EA

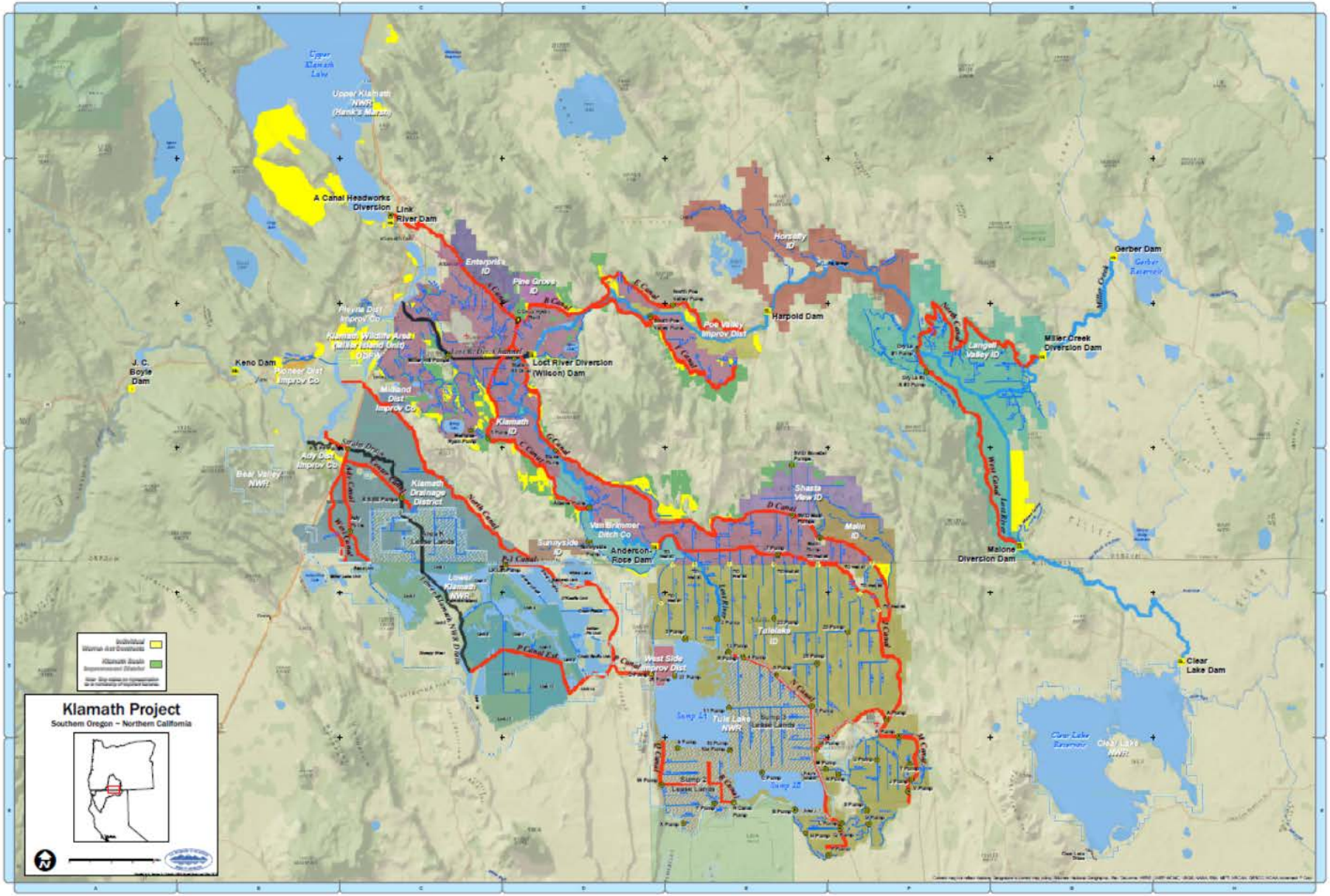
- Klamath Irrigation District
- Tulelake Irrigation District
- Langell Valley Irrigation District
- Oregon Department of Environmental Quality
- North Coast Regional Water Quality Control Board

Chapter 5 References

United States Fish and Wildlife Service, (2018). Information Resources: Listed, proposed, and Candidate Species Lists (Klamath County, Oregon, Modoc and Siskiyou counties, California) Website: http://www.fws.gov/klamathfallsfwo/es/es.html

Appendices

Appendix A: Map - Klamath Project Irrigation Districts for Conveyance/Exchange Contracts



Appendix B: Cultural Resources Coordination and Compliance

MID-PACIFIC REGION
CULTURAL RESOURCES COMPLIANCE REQUEST

To: Cultural Resources Branch MP-153
Email to: BOR MPR Cultural Resources Section

ADMINISTRATIVE NEEDS
Request Date: 2/7/2018
Requesting Office: KBAO
Project Name: Contracts for Conveyance and/or Exchange of Non-Project Water through Klamath Project Facilities
NEPA or Project Number: KBAO-EA-2017-004
Reclamation Point of Contact: Kirk Young byoung@usbr.gov 541-880-2589
NEPA Point of Contact: Kirk Young byoung@usbr.gov 541-880-2589
Target Date for Completion: 2/8/2018
Funding: 18XR0680A1 RX.00124955.0000000
Work Requested: Cultural Resources Assessment and Compliance.
PROJECT INFORMATION NEEDS
Reclamation's Action: *(Define Reclamation's action: permit, license, approval, funding, planning, letter of consent, etc.)* The Bureau of Reclamation, Klamath Basin Area Office (KBAO) is proposing to enter into contracts with district and/or individual water users within the existing Klamath Project (Project) service area to convey and/or exchange non-Project water through the Project facilities.
Reclamation's Role: Sole Agency
Other Agencies Involved: *(Identify and define other Federal agency roles: cooperating; lead for NEPA, NHPA, other; partners; etc.)(Identify other agencies such as state or irrigation districts and their roles: managing partners, CEQA lead, applicant, etc.)* Potentially all Klamath Project irrigation districts and/or individuals therein

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Project Description: Under the Proposed Action, Reclamation would enter into excess capacity and/or exchange contracts for a period of not to exceed five years, ending no later than 2022. The conveyance and/or exchange capacity would be dependent upon the excess capacity and/or available Project water being available to facilitate the conveyance and/or exchange. The non-Project water conveyed and/or exchanged under the proposed contracts would be used for irrigation purposes on lands with a contract or agreement to receive water from the Project. Pumping and conveyance would be limited to use of existing wells, meters, pipes, water diversion, and field delivery facilities, and no new construction would occur. The Warren Act (Act of February 21, 1911, ch. 141, 36 Stat. 925, 43 U.S.C. §§523-525) authorizes Reclamation to contract with individuals and entities for the use of excess storage and/or conveyance in Federal Reclamation facilities for irrigation purposes. This type of contract is commonly called an "excess capacity contract." Section 14 of the Reclamation Project Act of 1939 (Act of August 4, 1939, ch. 418, 53 Stat. 1187, 1197; 43 U.S.C. §389) authorizes Reclamation to contract for the exchange or replacement of water as necessary and in the interests of the United States and the project.
Project Location and Land Ownership: *(Specify location, County and State, and entire project area. Include map on USGS Topo or Satellite image. Include legal description; GIS shape file; UTM coordinates.)(Identify Reclamation land status, other federal land, and other land status.)* **GENERAL:** The Klamath Project and the Districts associated with the proposed action are located in Klamath County, Oregon and in both Modoc and Siskiyou County in California. Multiple townships are included in the proposed action area (see map in Attachment A).
NEPA and/or Studies/Plans: *(Identify level of NEPA: CEC, EA, EIS; joint document. Other studies: Feasibility Study, Resources Management Plan, etc. Identify previously associated NEPA and/or studies/plans.)* EA
Supplemental Information: *(Photographs; plans and specifications; cultural resources report; CEQA report; grant application; other related reports, documents, and information; etc.)* Site map in Attachment A.

PROCESS:

- MP153 logs project into Tracking Database and assigns Cultural Resource (CR) Contact
- CR Contact assesses and coordinates cultural resources compliance needs
    - Applicable federal laws; level of consultations
    - Survey needs-use of existing studies, in-field surveys, consultants, etc.
    - Levels of cultural resources documentation required
    - Contracting needs
    - Cost estimates, scheduling
    - Review of reports and NEPA document language to meet regulatory requirements

CULTURAL RESOURCES COMPLIANCE
Division of Environmental Affairs
Cultural Resources Branch (MP-153)

MP-153 Tracking Number: 18-KBAO-061

Project Name: Contracts for Conveyance and/or Exchange of Non-Project Water through Klamath Project Facilities

NEPA Document: KBAO-EA-2017-004

NEPA Contact: Kirk Young, Natural Resources Specialist

MP 153 Cultural Resources Reviewer: Joanne Goodsell, Archaeologist

Date: February 7, 2018 JOANNE GOODSELL Digitally signed by JOANNE GOODSELL Date: 2018.02.07 14:58:46 -08'00'

Reclamation proposes to enter into excess capacity and/or exchange contracts with Klamath Project (Project) irrigation districts and/or individuals therein. Under the Proposed Action Alternative, Reclamation would enter into such contracts for a period not to exceed five years, ending no later than 2022. The conveyance and/or exchange capacity would be dependent upon excess capacity and/or Project water being available to facilitate the conveyance and/or exchange. The non-Project water conveyed and/or exchanged under the proposed contracts would be used for irrigation purposes on lands with an existing contract or agreement to receive water from the Project. Pumping and conveyance would be limited to use of existing wells, meters, pipes, water diversion, and field delivery facilities. No new construction would occur as part of the Proposed Action Alternative.

Reclamation determined the Proposed Action Alternative constitutes a Federal undertaking, as defined at 36 CFR § 800.16(y), that has no potential to cause effects to historic properties pursuant to 36 CFR § 800.3(a)(1). As such, Reclamation has no further obligations under Title 54 U.S.C. 306108, commonly known as Section 106 of the National Historic Preservation Act (NHPA). The proposed action would result in no impacts to cultural resources.

This document conveys the completion of the NHPA Section 106 process and NEPA cultural resources review for this undertaking. Please retain a copy in the administrative record for this action. Should changes be made to this project, additional NHPA Section 106 review, possibly including consultation with the State Historic Preservation Officer, may be necessary.

1

Appendix C: Indian Trust Asset Coordination and Consultation

Indian Trust Assets
Request Form (MP Region)

Submit your request to your office's ITA designee or to MP-400, attention Deputy Regional Resources Manager.

Date: 2/7/2018

Requested by (office/program)	Kirk Young, Natural Resource Specialist, KBAO
Fund	18XR0680A1
WBS	RX.00124955.0000000
Fund Cost Center	25320000
Region # (if other than MP)	
Project Name	Contracts for Conveyance and/or Exchange of Non-Project Water through Klamath Project Facilities
CEC or EA Number	KBAO-EA-2017-004
Project Description (attach additional sheets if needed and include photos if appropriate)	Under the Proposed Action, Reclamation would enter into excess capacity and/or exchange contracts for a period of not to exceed five years, ending no later than 2022. The conveyance and/or exchange capacity would be dependent upon the excess capacity and/or available Project water being available to facilitate the conveyance and/or exchange. The non-Project water conveyed and/or exchanged under the proposed contracts would be used for irrigation purposes on lands with a contract or agreement to receive water from the Project. Pumping and conveyance would be limited to use of existing wells, meters, pipes, water diversion, and field delivery facilities, and no new construction would occur. The Warren Act (Act of February 21, 1911, ch. 141, 36 Stat. 925, 43 U.S.C. §§523-525) authorizes Reclamation to contract with individuals and entities for the use of excess storage and/or conveyance in Federal Reclamation facilities for irrigation purposes. This type of contract is commonly called an "excess capacity contract." Section 14 of the Reclamation Project Act of 1939 (Act of August 4, 1939, ch. 418, 53 Stat. 1187, 1197; 43 U.S.C. §389) authorizes Reclamation to contract for the exchange or replacement of water as necessary and in the interests of the United States and the project.

***Project Location (Township, Range, Section, e.g., T12 R5E S10, or Lat/Long cords, DD-MM-SS or decimal degrees). Include map(s)**	**GENERAL:** The Klamath Project and the Districts associated with the proposed action are located in Klamath County, Oregon and in both Modoc and Siskiyou County in California. Multiple townships are included in the proposed action area (see map in Exhibit B).

Kirk Young — Signature | KIRK YOUNG — Printed name of preparer | 2/7/2018 — Date

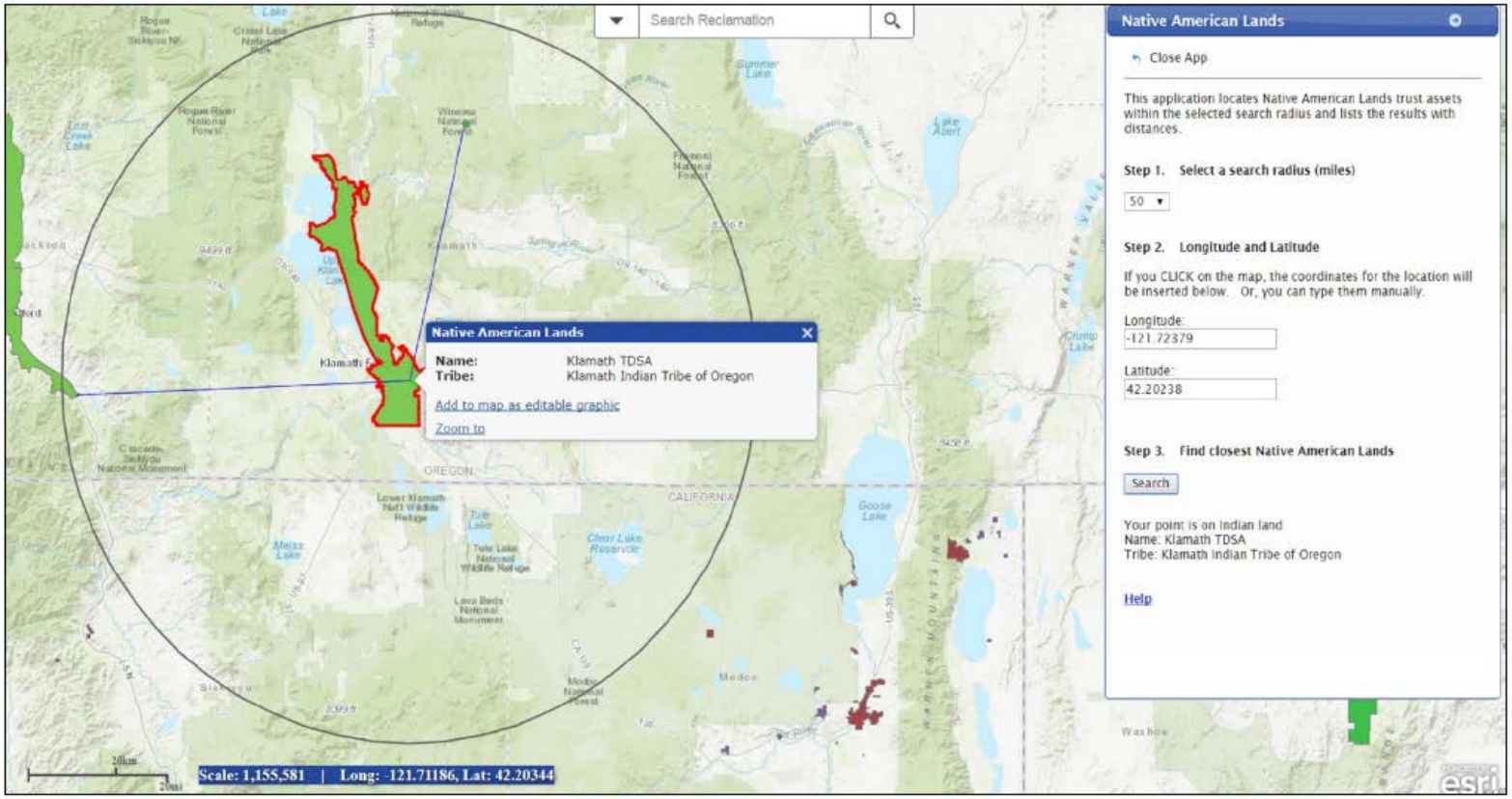
ITA Determination:

The proposed **Contracts for Conveyance and/or Exchange of Non-Project Water through Klamath Project Facilities** activity is located within the **Klamath Tribal Designated Statistical Area (TDSA)** as a portion of Reclamation's Klamath Project, and thus the activity area, extends into the TDSA (see attached image in Exhibit A).

Although the proposed activity is within the Klamath TDSA, the nature of the action includes issuance of contracts for conveyance and/or exchange of non-Project water through existing Klamath Project facilities, and no impacts to Indian hunting or fishing resources or water rights is anticipated. It is reasonable to assume that the proposed action **will not** have any impacts on ITAs.

Kristen L. Hiatt — Signature | Kristen L. Hiatt — Printed name of approver | 2/8/18 — Date

Exhibit A: Map of Nearest ITA to Proposed Project.



Appendix D: Water Quality Standards and Testing

RECLAMATION
Managing Water in the West

Discharge of Non-project Water into Klamath Project Facilities

Water Quality Monitoring - Quality Assurance Project Plan

U.S. Department of the Interior
Bureau of Reclamation Mid-Pacific Region
Klamath Basin Area Office

February 2018

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Discharge of Non-project into Klamath Project Facilities

Quality Assurance Project Plan

_____ _____

Klamath Basin Area Office Representative Date

_____ _____

Irrigation District Representative or Contractor Date

Contents

Project Management

I. Roles and Responsibilities

The Klamath Basin Area Office (KBAO) will maintain and review this quality assurance project plan (QAPP). The plan will be updated as needed. KBAO will also review submitted water quality documentation and perform assessment and oversight as outlined in this QAPP.

Entities, which could include irrigation districts and/or individuals, contracting with KBAO to transport non-Project water will be responsible for certain procedures required under this QAPP, including collecting water quality samples, measuring physical water quality parameters, procuring analysis of samples from approved laboratories, ensuring adequate data management for test results, and reporting results to KBAO.

The irrigation districts include Langell Valley Irrigation District (LVID), Klamath Irrigation District (KID), and Tulelake Irrigation District (TID). The designated representatives for the irrigation districts are identified below:

Rick Carlson, 541-880-2562	KBAO Point of Contact
John Hancock, 541-545-6344	LVID Manager
John Wolf, 541-882-6661	KID Manager
Brad Kirby, 530-667-2249	TID Manager

II. Problem Definition/Background

The Klamath Project (Project) is a Bureau of Reclamation project that provides irrigation and drainage services to approximately 230,000 acres of farmland in southern Oregon (62 percent) and northern California (38 percent), including two national wildlife refuges. The main sources of water for the Project include Upper Klamath Lake, the Klamath River, Clear Lake Reservoir, Gerber Reservoir, and the Lost River. The Lost River, including Clear Lake and Gerber reservoirs, is located in a closed basin.

Reclamation, in accordance with the Warren Act of 1911 (43 U.S.C. §§523-525), is negotiating "excess capacity contracts" with the irrigation districts for the use of excess capacity in Project facilities for the conveyance of non-project water to Project lands. "Non-Project water" includes surface or ground water that is either:

1. Pumped, diverted, and/or stored based upon the exercise of water rights not belonging to the United States, or;
2. Not appropriated by or allocated to a Reclamation project.

Non-Project water entering Project facilities under the proposed contracts must meet minimum water quality standards to ensure that it does not adversely impact Project supplies or stream flows. Standards for water quality are intended to protect the beneficial uses of state regulated waterways receiving water discharged from the Project, as well as Reclamation's agricultural exemption from the requirements of the Clean Water Act.

This QAPP establishes mandatory criteria and standards to be implemented by KBAO, irrigation districts, and individuals contractors for the testing of non-project water and for handling of the resulting data.

III. Project/Task Description

The overall goal of this program is to measure and analyze the quality of non-Project water before it enters Project facilities, and at appropriate intervals thereafter. General tasks for this program are listed below:

1. Collect water samples from non-Project water sources before it enters Project facilities.
2. Measure and record physical water quality parameters at the time of sample collection.
3. Perform analysis of chemical constituents of water samples via approved water quality testing laboratories that are state accreditated or Reclamation approved (Exhibit A).
4. Compare the results of the analysis to the water quality standards identified in this QAPP.
5. Measure and record water flow and quantity data as specified in the contractual agreement.
6. Manage data and transmit results to KBAO in a timely manner.
7. Coordinate with KBAO regarding additional testing and possible actions to be taken based on test results.

IV. Approval/Disapproval Process

Reclamation must provide approval of each non-Project water source before it can be allowed to enter Project facilities. Water quality testing must be completed prior to such approval, and the water quality results will be one factor in determining whether or not to approve a non-Project water source. Approval of a non-project water source may be rescinded by Reclamation at any time.

Sample collection and subsequent laboratory testing must be performed annually for each non-Project water source before it enters Project facilities. Testing for all constituents listed in Table 1a (Oregon) or 1b (California) is required. On-site instantaneous testing of physical parameters listed in Table 3 is required. Additional on-site instantaneous testing of parameters listed in Table 3 also is required monthly during continuous non-project water introduction into Reclamation facilities, if applicable. KBAO will work with the irrigation districts and individual contractors to develop standard operating procedures (SOPs) for sampling. The irrigation districts and/or individual contractors will provide the appropriate documentation for each sample, as described in the following sections, to Reclamation.

Reclamation may, at any time, require additional water quality testing on a non-Project water source. Reclamation may also elect not to require testing on a non-Project water source, if conditions so warrant.

Based on the annual water quality testing and any required supplemental testing, KBAO will either approve or disapprove each non-Project water source. KBAO may disapprove a non-Project water source if test results indicate that it may adversely impact the water quality of Project supplies or stream flows. KBAO will provide its approval or disapproval of the non-project source within 30 days after all required water quality documentation has been received. The decision to approve or disapprove a non-Project water source will be made by Reclamation's

contracting officer and the KBAO Area Manager, and communicated to the irrigation districts and/or individual contractors in writing.

V. Water Quality Standards

Tables 1a and 1b below list the water quality parameters and standards required of non-Project water entering Project facilities. Table 1a shows the standards for non-Project water sources in Oregon, while Table 1b shows the standards for non-project water sources in California. The standards are based on sources indicated in the footnotes of each table.

Table 1a. Water Quality Standards and Reporting Limits for Acceptance of Groundwater into Klamath Project Canals within Oregon.

Constituent	Units	Maximum Concentration	Desired Limit for Reporting	CAS Registry Number	Analytical Method
Alkalinity	µg/L	20,000 (1)	500		SM 2320 A
Aluminum	µg/L	750 (2)	50	7429-90-5	EPA 200.7
Ammonia as N	mg TAN/L	1.0 to 7.3 (2) dependent upon temp. and pH	0.05	7664-41-7	EPA 350.1
Antimony	µg/L	5.1 (1)	6	7440-36-0	EPA 200.8
Arsenic	µg/L	10 (2)	2	7440-38-2	EPA 200.8
Barium	µg/L	1000 (1)	100	7440-39-3	EPA 200.7
Beryllium	µg/L	5.3 (1)	1	7440-41-7	EPA 200.7
Bicarbonate	µg/L	61,000 (4)	500	71-52-3	SM 2320 B
Boron	µg/L	700 (3)	50	7440-42-8	EPA 200.7
Cadmium	µg/L	5 (2)	1	7440-43-9	EPA 200.7
Chloride	µg/L	40,000 (4)	500	16887-00-6	EPA 300.1
Chromium, total	µg/L	100 (2)	10	7440-47-3	EPA 200.7
Cobalt	µg/L	50 (3)	10	7440-48-4	EPA 200.8
Copper	µg/L	1300 (1)	50	7440-50-8	EPA 200.7
Dissolved Oxygen	mg/L	Min conc. 4 (7)	0.05		
Hardness	mg/L	Metal toxicity calculation (1)			SM 2340 B
Iron	µg/L	1000 (1)	5	7439-89-6	EPA 200.7
Lead	µg/L	15 (2)	1	7439-92-1	EPA 200.8
Magnesium	µg/L	16,000 (4)	100	7439-96-4	EPA 200.7
Manganese	µg/L	50 (2)	1	7439-96-5	EPA 200.7
Mercury	µg/L	2 (2)	1	7439-97-6	EPA 245.1
Molybdenum	µg/L	10 (3)	10	7439-98-7	EPA 200.7
Nickel	µg/L	140(1)	10	7440-02-0	EPA 200.7
Nitrate + Nitrite as N	µg/L	10,000 (2)	10	7727-37-9	EPA 300.1
Orthophosphate	µg/L	50 (2)	10	14265-44-2	EPA 365.1
pH	units	6.5 to 9	0.1		EPA 150.1
Selenium	µg/L	4.6 (1)	3	7782-49-2	EPA 200.8
Silver	µg/L	100 (2)	10	7440-22-4	EPA 200.7
Sodium	µg/L	69,000 (3)	500	7440-23-5	EPA 200.7
Specific Conductance	µS/cm	1000 (2)	2		SM 2510B
Sulfate	µg/L	500,000 (2)	1000	14808-79-8	EPA 300.1
Total Phosphorus	µg/L	110 (6)	10	14265-44-2	EPA 365.3
Total Dissolved Solids	µg/L	450,000 (3)	10,000		
Temperature	°C	No measurable increase	0.05		
Thallium	µg/L	2 (2)	1	7440-28-0	EPA 200.8
Vanadium	µg/L	100 (3)	10	7440-62-2	EPA 200.8
Zinc	µg/L	2100(1)	100	7440-66-6	EPA 200.7

(1) Oregon Department of Environmental Quality Division 41, Water Quality Standards: Beneficial Uses, Policies, and Criteria
(2) National Maximum Contaminant Level or National Recommended Quality Criteria, EPA
(3) Ayers, R. S. and D. W. Westcot, 1985. *Water Quality for Agriculture*, Food and Agriculture Organization of the United Nations – Irrigation and Drainage Paper No. 29, Rev. 1, Rome.
(4) Spectrum Analytic, Inc. Guide to Interpreting Irrigation Water Analysis. Washington C.H., Ohio*http://www.spectrumanalytic.com/support/library/ftIA_Guide_to_Interpreting_Irrigation_Water_Analysis.htm*
(5) Moyl Moyle, P. B. 2002. Inland fishes of California. Revised and expanded edition.
(6) Oregon Department of Environmental Quality, Upper Klamath Lake Total Maximum Daily Load, 2002.
(7) Oregon Department of Environmental Quality, Upper Klamath and Lost River Subbasins Total Maximum Daily Load and Water Quality Management Plan, 2010.

Table 1b. Water Quality Standards and Reporting Limits for Acceptance of Groundwater into Klamath Project Canals within California.

Constituent	Units	Maximum Concentration	Detection Limit for Reporting	CAS Registry Number	Analytical Method
Alkalinity	µg/L	20,000 (1)	500		SM 2320 A
Aluminum	µg/L	1000 (1)	50	7429-90-5	EPA 200.7
Ammonia as N	mg TAN/L	7.3 to 1.0 (5) dependent upon temp. and pH	0.05	7664-41-7	EPA 350.1
Antimony	µg/L	6 (1)	6	7440-36-0	EPA 200.8
Arsenic	µg/L	10 (1)	2	7440-38-2	EPA 200.8
Barium	µg/L	1000 (1)	100	7440-39-3	EPA 200.7
Beryllium	µg/L	4 (1)	1	7440-41-7	EPA 200.7
Bicarbonate	µg/L	61,000 (4)	500	71-52-3	SM 2320 A
Boron	µg/L	500 (2)	50	7440-42-8	EPA 200.7
Cadmium	µg/L	5 (1)	1	7440-43-9	EPA 200.7
Chloride	µg/L	40,000 (4)	500	16887-00-6	EPA 300.1
Chromium, total	µg/L	50 (1)	10	7440-47-3	EPA 200.7
Cobalt	µg/L	50 (3)	10	7440-48-4	EPA 200.8
Copper	µg/L	1000 (2)	50	7440-50-8	EPA 200.7
Dissolved Oxygen	mg/L	5 (2)	0.05		
Hardness	µg/L	400,000 (2)			SM 2340 B
Iron	µg/L	300 (1)	5	7439-89-6	EPA 200.7
Lead	µg/L	15 (1)	1	7439-92-1	EPA 200.8
Magnesium	µg/L	16,000 (5)	100	7439-96-4	EPA 200.5
Manganese	µg/L	50 (1)	1	7439-96-5	EPA 200.7
Mercury	µg/L	2 (1)	1	7439-97-6	EPA 245.1
Molybdenum	µg/L	10 (3)	10	7439-98-7	EPA 200.7
Nickel	µg/L	100(1)	10	7440-02-0	EPA 200.7
Nitrate + Nitrite as N	µg/L	10,000 (1)	10	7727-37-9	EPA 300.1
Orthophosphate	µg/L	50 (5)	10	14265-44-2	EPA 365.1
pH	units	7 to 9 (2)	0.1		EPA 150.1
Selenium	µg/L	5 (1)	3	7782-49-2	EPA 200.8
Silver	µg/L	100 (1)	10	7440-22-4	EPA 200.7
Sodium	µg/L	69,000 (3)	500	7440-23-5	EPA 200.7
Specific Conductance	µS/cm	1000 (2)			SM 2510B
Sulfate	µg/L	250,000 (1)	1000	14808-79-8	EPA 300.1
Total Phosphorus	µg/L	100 (5)	10	14265-44-2	EPA 365.3
Total Dissolved Solids	µg/L	450,000 (3)	10,000		
Temperature	°Fahrenheit	< 5°F above natural receiving water temp.	0.05		
Thallium	µg/L	2 (1)	1	7440-28-0	EPA 200.8
Vanadium	µg/L	100 (3)	10	7440-62-2	EPA 200.8
Zinc	µg/L	5000 (1)	100	7440-66-6	EPA 200.7

(1) Title 22. The Domestic Water Quality and Monitoring Regulations specified by the State of California Health and Safety Code (Sections 4010-4037), and Administrative Code (Sections 64401 et seq.), as amended.
(2) California Regional Water Quality Control Board, North Coast Region, Water Quality Control Plan for the North Coast Region.
(3) Ayers, R. S. and D. W. Westcot, *Water Quality for Agriculture* , Food and Agriculture Organization of the United Nations - Irrigation and Drainage Paper No. 29, Rev. 1, Rome (1985).
(4) Spectrum Analytic, Inc. Guide to Interpreting Irrigation Water Analysis. Washington C.H., Ohio*http://www.spectrumanalytic.com/support/library/rfA_Guide_to_Interpreting_Irrigation_Water_Analysis.htm*
(5) National Recommended Quality Criteria , EPA

Table 2. Quality Assurance Acceptance Criteria

Result	Precision	Contamination
≥ 5 x RL	≤ 20% RPD	≤ 2 x RL, or ≤ 10% of the lowest production sample result
< 5 x RL	± 1 x RL	

Table 3. Physical Water Quality Parameters and Data Quality Objectives

Parameter	Method/range	Units	Detection Limit	Sensitivity	Precision	Accuracy
pH	pH meter	pH units	2.0	0.1 unit	± 0.2 units	± 0.2 units
Dissolved Oxygen (DO)	DO meter	mg/L	0.5	0.1 mg/L	± 10%	± 10%
Conductivity	Conductivity meter	µS/cm	10	10 µS/cm	± 10%	± 10%
Temperature	Temperature Probe	Celsius degrees	0.1	0.1 Celsius degrees	± 10%	± 10%

VI. Special Training/Certifications

The irrigation districts and/or individual contractors will be required to adhere to KBAO approved SOPs for collecting samples and water quality field parameter data.

Water quality samples collected for analysis must be sent to laboratories with state accreditation or from the list of Reclamation approved laboratories (Exhibit A) for each analyte to be tested.

VII. Documentation and Records

Field Logbook

Field logbooks are to be used when samples are collected. Logbook entries should include the following information:

- Project name
- Site name
- Sample collection date and time
- Weather/sampling conditions
- Samples collected (i.e., regular, replicates, blanks)
- Sample identification number
- Sampling methods
- Decontamination procedures
- Parameters and constituents to be tested

- Source (Ground Water or Surface Water)
- Field measurements
- Water clarity
- Unusual conditions that might affect the samples

After entering the required information, logbook entries are signed by all field personnel. The logbook is then securely stored in the irrigation district office and/or individuals place of business.

Instrument Calibration Sheet

Irrigation districts and/or individual contractors are required to perform testing of physical water quality parameters, identified in Table 3, when each sample is collected. Measuring these parameters will require appropriate instruments, and these instruments must be calibrated prior to and after sampling.

Instrument calibration sheets document the information from an initial calibration, performed prior to instrument use, and information from a verification check, performed after all sampling for that day is completed. Calibration sheets should include:

- Project name(s)
- Date
- Time(s)
- Field sampler's name
- Instrument type
- Instrument number
- Standard value
- Initial value
- Adjusted value
- Post value

The calibration sheets are to be filed with the irrigation districts and/or individual contractors and copies provided to KBAO within one week of sampling for review and records retention.

Field Sheet

Field sheets document initial sampling information, including:

- Project name
- Sampler name
- Sample identification number
- Sample collection date and time
- Samples collected (i.e., regular, replicates, blanks)Site name
- Parameters and constituents to be tested
- Source (Ground Water or Surface Water)
- Measurements of physical water quality parameters
- Additional relevant information(e.g., weather condtions, collection difficulties, etc.)

Field sheets are to be completed when each sample is collected, and then filed with the rrigation districts and/or individual contractor, and copies provided to KBAO.

A copy of each field sheet, along with the corresponding chain of custody form and analytical report, is to be provided to the Project Manager within one week of receipt of the analytical report from the approved water quality laboratory, as further described below. The Project Manager will review submitted field sheets and accompanying documentation and retain copies for records.

Chain of Custody

Chain of Custody (COC) forms document the custody of samples from the time samples are collected to the time they are delivered to the laboratory. Irrigation district personnel and/or individual contractors are to initiate COC documentation while in the field. Information recorded on the COC form includes:

- Project name
- Project manager
- Title and signature of sample collector
- Name of the designated analytical laboratory
- List of sample identification numbers
- Date and time samples were collected
- Sample type (surface water or ground water)
- Number of containers per sample identification number
- Analysis requested
- Point of contact and phone number of sample collection entity
- Date, time, and signatures of all parties responsible for receiving and relinquishing the samples from the time of collection to the time of delivery to the laboratory

Signed COC forms accompany all samples to the laboratory. A copy of the COC form is returned to the irrigation district and/or individual contractor by the laboratory, and then filed with the corresponding field sheet and analytical report for each sample. Copies are to be provided to KBAO within one week of receipt for review and records retention.

Analytical Report

The water quality laboratory generates an analytical report for each water sample. The water quality constituents to be analyzed are listed in Tables 1a (Oregon) and 1b (California). The analytical report lists the results for each parameter, as well as the case narrative, reporting limits, analysis methods, sampling and analysis dates, and the laboratory's quality control results.

Following review by the irrigation district and/or individual contractors, copies of the analytical reports are stored with the field sheets and COC forms. Copies of all documentation (i.e., field sheet, COC form, and analytical report) for each sample are to be provided to KBAO within one week of receipt of the analytical report from the laboratory, for review and records retention (see section XVI – Reports to Reclamation).

Data Management

Irrigation districts and/or individual contractors will establish and maintain a data management procedure for test results. This process is described in detail with section XIV – Data Management of this QAPP. KBAO may request a copy of the data at any time.

Data Generation and Acquisition

The following subsections provide a general description of the data generation and acquisition process. Reclamation staff will work with the irrigation districts and/or individual contractors to develop detailed SOPs pertinent to each data generation and acquisition subsections, if applicable.

VIII. Sampling Methods

Prior to initial sampling, KBAO staff will provide training and onsite oversight. The following is a general description of sampling protocols:

- Prior to sampling, instrument calibration is performed, with the results recorded on an instrument calibration sheet, as described in section VII.
- At each non-project water source, samples are collected from the point of discharge or diversion, and the appropriate information is entered into the corresponding field logbook and field sheet.
- In the case of groundwater wells, prior to collecting a sample, the well is to be turned on and allowed to run until three well casing volumes are discharged. Onsite physical parameters will be measured during the sampling process. The sample is then collected directly into precleaned sample bottles.
- In the case of surface water, grab samples will be collected directly into the sample bottles from the central portion of surface flow. Under certain circumstances, width or depth integrated samples may be required if grab samples are thought not to be representative of the overall water quality.
- For external quality assurance (QA) sites, a sequential replicate sample is collected immediately after collection of the original sample.
- Blank samples also are collected in the field using deionized water.
- All QA samples are given identification numbers not know to the laboratory (blind).

IX. Sample Handling and Custody

Immediately after collection and while in transit, samples are to be placed on blue ice and stored in coolers or refrigerators at 39°F (4°C). From the sampling site, samples are to transported for shipping to the contract laboratory. Following collection and through transportation, custody of the sample is documented via a COC form.

As described further in section XI, the irrigation district and/or individual contractor will incorporate blind QA samples into sampling batches. Following QA sample incorporation, the irrigation District will ship the samples to the laboratory. The samples are to be packed in coolers on blue ice, and shipped to the laboratory with the corresponding COC form. Upon receipt, the laboratory will document receiving the samples on the COC form with the date of receipt and the identification of the receiving laboratory representative.

Samples are collected using appropriate bottles (see section X), and shipped to the contract laboratory in a timely manner to ensure the required holding times are met. Water quality laboratories must receive a sample in time to prepare and analyze the samples before they potentially deteriorate as indicated in section X.

X. Required Bottle Sizes and Sample Holding Times

Irrigation districts and/or individual contractors are to adhere to the bottle size and holding time requirements identified by the water quality laboratory completing the analytical report, given the water quality parameters to be tested.

XI. Quality Control

Quality control procedures and protocols are fully outlined in the Reclamation Mid-Pacific Region Environmental Monitoring Branch's document titled "Standard Operating Procedures for Quality Assurance", dated May 2009. The following is a brief summary of the quality control procedures that apply to samples collected for this QAPP.

Quality Assurance (QA) Samples

QA samples are to be incorporated into sample batches that are submitted to the laboratory for water quality analysis in order to assess the laboratory's ability to prepare and analyze samples with an acceptable level of precision and accuracy without introducing contamination. If any of the QA samples do not meet the criteria stated in Table 2, all samples submitted to the laboratory are to be reanalyzed. If the laboratory is unable to confirm the original result upon reanalysis, a bracket of samples or the entire batch of samples are submitted for reanalysis. Due to the nature of the samples, microbiological samples cannot be reanalyzed. The two types of QA samples to be used for this project are described below.

Sequential Replicate QA Samples

Sequential replicate samples of non-project water being analyzed are incorporated to assess the contracted laboratory's precision. They are incorporated at a rate of ten percent of the production samples. If less than ten production samples are collected, at least one duplicate sample is incorporated. Precision is assessed using relative percent difference (RPD):

$$RPD = \frac{|R - D|}{\left(\frac{(R + D)}{2}\right)} (100)$$

RPD	=	Relative Percent Difference
R	=	Regular Sample Result
D	=	Duplicate Sample Result

Contamination QA Samples

Deionized water blank samples are incorporated into sample batches to be analyzed by a contracted laboratory in order to to assess potential sample contamination. Contamination QA samples are to be incorporated at a rate of five percent of the production samples. If less than 20 production samples are collected, at least one blank sample is incorporated.

Laboratory Quality Control Samples

The laboratory is responsible for incorporating quality control (QC) samples at the frequencies specified for the analytical method being used and their laboratory standard operating procedures (SOP). The results of the QC samples are assessed based on the acceptance criteria for the analytical method and the laboratory SOP. If any laboratory QC samples do not meet the established acceptance criteria, the laboratory follows the corrective action protocols detailed for the analytical method or by the laboratory SOP.

Holding Times

The date of the sample analysis and preservation used is compared to the date the sample was collected to ensure the sample was prepared and analyzed within the appropriate holding time for a given parameter. If the required holding time is exceeded, the Irrigation District will consult the Project Manager to determine if re-sampling is required. If re-sampling is not required, the Irrigation District will qualify the data as necessary.

XII. Instrument/Equipment Testing, Calibration, Inspection, and Maintenance

Field

Portable (hand held) instruments are calibrated according to manufacturer's protocol. For each sampling episode (whether taking place in one day, or over a number of days), instruments are calibrated every day and within four hours of taking the first measurement. Calibrations are verified with calibration standards within four hours of recording the last measurement of the day. All calibration information is recorded on a calibration sheet.

Laboratory

Maintenance procedures for instruments used by the contract laboratories for this project are detailed in the contract laboratory's QA manual. All instrument maintenance is documented in logbooks. Instrument calibration procedures are specified in the analytical methods for each parameter.

XIII. Inspection/Acceptance for Supplies and Consumables

Pre-preserved, certified clean bottles, certified calibration standards, and certified reference materials are to be procured from qualified vendors. All bottles and reagents are inspected prior to use. If any damage or contamination is suspected, packages are not to be accepted.

XIV. Data Management

The field sample identification (ID) number assigned for this project is KPNP- (Unique Location Identifier) [*number*]. Numbers are assigned sequentially, beginning with 001.

Irrigation Districts and/or individual contractors are to enter the data from field measurements of physical water quality parameters and analytical results from laboratories into a Microsoft Excel spreadsheet database. The irrigation district and/or individual contractor is responsible for verifying the correctness of the data in the project database prior to submission to KBAO.

Within one week following receipt of analytical reports from contracted laboratories, the irrigation district and/or individual contractor must submit copies of the project database, field sheets, COC

forms, and analytical reports for all samples collected. If there is any delay in submitting the required material, the irrigation districts and/or individual contractors will notify and obtain approval from KBAO.

Following submission of above documentation to KBAO, the irrigation districts and/or individual contractor must file copies of the material in project binders. Project binders must include all completed calibration sheets, field logbooks, field sheets, COC forms, analytical reports, and a printed copy of the project database. Project binders are to be secured in a locked file cabinet in the irrigation district office and/or individual contracotor. must be signed out when removed.

Assessment and Oversight

XV. Assessments and Response Actions

KBAO will periodically assemble a Quality Assurance Team (QAT) to perform laboratory, field, and documentation audits, as further described below.

Laboratory Audits

The three-tier audit consists of reviewing an approved laboratory's QA Manual, reviewing the laboratory's performance evaluation (PE) sample results, and conducting an intensive, on-site audit of the laboratory. During an on-site audit, the QAT will evaluate the laboratory's expertise in conducting analyses, capability of generating valid data, ability to effectively support the data, and integrity of their QA/QC practices. Laboratory audits are conducted every three years. The audit reports are issued to the laboratory. The laboratory then issues a response with corrective actions to the audit. At that time, the QAT will determine whether or not to approve the laboratory for water quality testing under the subject excess capacity contracts.

Field Audits

The field audit consists of reviewing the Irrigation District's sampling and testing protocols, submitting PE samples and reviewing the results, and accompanying the field sampler during the sample collection process. The QAT assesses the field sampler's expertise in collecting representative samples. Field audits are conducted every two years. The field audit reports are sent to the field sampler and to the field sampler's Supervisor. The Supervisor is responsible for issuing corrective actions.

Documentation Audits

The yearly documentation audits are performed on a percentage of field logbook entries along with the corresponding field sheets and field instrument calibration sheets. The QAT assesses if documentation is adequate, if all entries have been recorded, and whether or not the work was performed in accordance with Reclamation's documentation protocol.

XVI. Reports to Reclamation

Within one week following receipt of analytical reports from contracted laboratories, the Irrigation District must submit copies of the project database, field sheets, COC forms, and analytical reports for all samples collected. If there is any delay in submitting the required material, the irrigation district and/or individual contracotr will notify and obtain approval from KBAO.

KBAO will provide its approval or disapproval of a given non-Project source within 30 days of receipt of all required water quality documentation.

Data Validation and Usability

XVII. Data Review, Verification, and Validation

If all QA samples meet the acceptance criteria identified in Table 2 and all samples are analyzed within the appropriate holding time, all data is accepted as valid. If a result is confirmed after reanalysis, the result is accepted as valid. Data may be qualified if results demonstrate unacceptable QA, if the laboratory QC sample results are unacceptable, or if the holding times were exceeded. Based on the qualification, KBAO will determines the usability of the data.

XVIII. Verification and Validation Methods

KBAO validates the data by following the guidelines in the Reclamation's document titled "SOPs for Quality Assurance", dated May 2009. Validation consists of reviewing the results of QA samples, holding times, and calibration sheets.

If any of the QA samples do not meet the acceptance criteria stated in Table 2, the samples are submitted for reanalysis. If the laboratory confirms the original result, the original data is accepted based on the laboratory demonstrating that sample preparation and instrumentation was run properly on the initial analysis. If the original result cannot be confirmed, the laboratory must then analyze a bracket of samples or the entire batch of samples an additional time for the parameter. The bracket of samples or the entire batch of samples that has been analyzed an additional time is then evaluated for the parameter to see if the results meet the acceptance criteria in Table 2. Professional judgment is used to decide which set of data to accept and whether or not the data should be qualified if both sets of data demonstrate unacceptable QA sample results.

XIX. Reconciliation with User Requirements

Any qualified results will be identified tby the irrigation districts and/or individual contractors prior to submission of water quality data to KBAO. Additionally, if results are qualified, the result will be marked with a footnote on the data table submitted to KBAO, with appropriate detail on the qualification.

Exhibit A

Reclamation Mid-Pacific Region Approved Laboratories

Approved Laboratory List for the Reclamation Mid-Pacific Region

Alpha Analytical Laboratories, Inc.	**Address**	208 Mason Street, Ukiah, CA 95482
	Contact	Adam Angulo
	P/F	916-686-5190
	Email	adam@alpha-labs.com
	Methods	*Inorganics in Water, Organics in Water*

APPL Laboratory	**Address**	908 North Temperance Avenue, Clovis, CA 93611
	Contact	Renee Patterson, Project Manager
	P/F	(559) 275-2175 / (559) 275-4422
	Email	rpatterson@applinc.com, danderson@applinc.com
	Methods	*Inorganics in Water/Soil, Organics in Water/Soil*

Basic Laboratory	**Address**	2218 Railroad Avenue Redding, CA 96001
	Contact	Josh Kirkpatrick, Nathan Hawley, Melissa Hawley
	P/F	(530) 243-7234 / (530) 243-7494
	Email	jkirkpatrick@basiclab.com (QAO and PM), nhawley@basiclab.com, mhawley@basiclab.com (invoices), poilar@basiclab.com (sample custody), khawley@basiclab.com (sample custody)
	Methods	*Inorganics in Water/Soil, Organics in Soil, Hazardous Waste in Water/Soil*

Brooks Applied Labs	**Address**	18804 North Creek Parkway, Bothell, WA 98011
	Contact	Jeremy Maute
	P/F	206-632-6206 / 206-63-6016
	Email	jeremy@brooksapplied.com
	Methods	*Selenium Speciation*
Calscience Environmental Laboratories (under Eurofins ownership)	**Address**	7440 Lincoln Way, Garden Grove, CA 92841
	Contact	Don Burley
	P/F	714-895-5494 (ext. 203)/714-894-7501
	Email	DBurley@calscience.com
	Methods	*Organics in Water*

Eurofins Eaton Analytical, Inc. (formerly MWH Laboratories)	**Address**	750 Royal Oaks Drive Ste. 100, Monrovia, CA 91016 180 Blue Ravine Rd., Folsom, CA 95630
	Contact	Linda Geddes
	P/F	(626) 386-1100, Linda - (626) 386-1163, Rita cell (916) 996-5929, Rick - (626) 386-1157
	Email	LindaGeddes@eurofinsus.com
	Methods	*Organics in Water*

Fruit Growers Laboratory	**Address**	853 Corporation Street, Santa Paula, CA 93060
	Contact	David Terz, QA Director
	P/F	(805) 392-2024 / (805) 525-4172
	Email	davidt@fglinc.com
	Methods	*Inorganics in Water(Gross Alpha)*

Oilfield Environmental & Compliance	**Address**	307 Roemer Way Ste 300, Santa Maria, CA 93454
	Contact	Will update when assigned a PM
	P/F	805-922-4772
	Email	info@oecusa.com
	Methods	*(Approval Pending) Hazardous Waste in Water/Soil*

Pacific EcoRisk	**Address**	2250 Codelia Road, Fairfield, CA 94534
	Contact	Stephen L. Clark
	P/F	(707) 207-7760 / (707) 207-7916
	Email	slclark@pacificecorisk.com
	Methods	*Toxicity in Water/Sediments*

Physis	**Address**	1904 East Wright Circle, Anaheim, CA 92806
	Contact	Will update when assigned a PM
	P/F	1-714-602-5320 ext 204
	Email	markbaker@physislabs.com
	Methods	*(Approval Pending) Inorganics in Soil*

South Dakota Agricultural Laboratories	**Address**	Brookings Biospace, 1006 32nd Avenue, Suites 103,105, Brookings, SD 57006-4728
	Contact	Regina Wixon, Annie Mouw (sample custodian)
	P/F	(605) 692-7325/(605) 692-7326
	Email	regina.wixon@sdaglabs.com, annie.mouw@sdaglabs.com
	Methods	*Selenium in Water/Soil/Sediments/Tissue (Plant/Animal)*

Western Environmental Testing Laboratories	**Address**	475 East Greg Street # 119 Sparks, NV 89431
	Contact	Logan Greenwood (PM), Andy Smith (QA Manager)
	P/F	(775) 355-0202 / (775) 355-0817
	Email	logang@wetlaboratory.com, andy@wetlaboratory.com
	Methods	*Inorganics in Water*

California Laboratory Services	**Address**	3249 Fitzgerald Road, Rancho Cordova, CA 95742
	Contact	Scott Furnas
	P/F	(916) 638-7301 / (916) 638-4510
	Email	janetm@californialab.com (QA), scottf@californialab.com (PM)
	Methods	*Organics/Inorganics in water, Biological*

Moore Twining Associates, Inc.	**Address**	2527 Fresno St., Fresno, CA 93721 USA
	Contact	Juli Adams (Lab Director), Maria Manuel (QA Manager)
	P/F	(559) 268-7021
	Email	julia@mooretwining.com, mariam@mooretwining.com
	Methods	*BOD*