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Walla Walla District
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**U.S. ARMY CORPS OF ENGINEERS
WALLA WALLA DISTRICT**

WATER INTAKE FACILITY EASEMENT RENEWALS

PM-EC-2014-0031

ENVIRONMENTAL ASSESSMENT

November 2015

TABLE OF CONTENTS

SECTION 1.0 - INTRODUCTION

1.0	Introduction.....	1
1.1	Background.....	2
1.2	Purpose and Need	5

SECTION 2.0 – ALTERNATIVES

2.0	Alternatives.....	5
2.1	Alternative 1 (No Action).....	5
2.2	Alternative 2 (Proposed Action).....	6
2.3	Alternative 3	6

SECTION 3.0 – AFFECTED ENVIRONMENT and ENVIRONMENTAL IMPACTS

3.0	Affected Environment.....	7
3.1	Biological Evaluation.....	10
3.2	Cumulative Effects.....	15

SECTION 4.0 – ENVIRONMENTAL REVIEW REQUIREMENTS

4.1	Federal Requirements	18
4.1.1	National Environmental Policy Act.....	18
4.1.2	Clean Air Act, As Amended.....	18
4.1.3	Clean Water Act.....	18
4.1.4	Endangered Species Act of 1973, As Amended.....	18
4.1.5	Fish and Wildlife Coordination Act.....	19
4.1.6	Migratory Bird Treaty Act.....	19
4.1.7	National Historic Preservation Act, As Amended.....	20

SECTION 5.0- COORDINATION

5.0 Coordination 20

SECTION 6.0 - REFERENCES

6.0 References 21

FIGURES

1 Project Location 1
2 McNary and Ice Harbor Water Intake Facility Sites 2
3 Large Commercial-size Water Intake Facility 3
4 Small, Private Residence Water Intake Operation..... 4

TABLES

1 Intake Facility Easement Renewals and Reservoir Location..... 4
2 Relevant Environmental Resources 7
3 Endangered Species Act and Designated Critical Habitats Lists..... 12
4 Effect Determinations for ESA Species in the Project Area..... 13
5 Effect Determinations for Designated Critical Habitat in the Project Area..... 14
6 Coordination List 20

APPENDICES

- Appendix A Endangered Species Act Coordination
- Appendix B Cultural Resources Coordination

1.0 INTRODUCTION

This environmental assessment (EA) considers and describes the potential environmental effects of the U.S. Army Corps of Engineers, Walla Walla District (Corps) issuing easement renewals for 23 water intake facilities (intake facilities) located on Corps-managed Federal lands within the McNary and Ice Harbor reservoirs in southeastern Washington (Figures 1 and 2). The National Environmental Policy Act (NEPA) of 1969 and subsequent implementing regulations promulgated by the Council on Environmental Quality (CEQ), require that an assessment be conducted to determine whether the proposed action constitutes a "...major Federal action significantly affecting the quality of the human environment..." and whether an environmental impact statement is required. The information contained in this EA is considered to be of sufficient depth to define the nature and scope of the impacts associated with the proposed issuing of easement renewals for intake facilities located on Corps-managed lands.

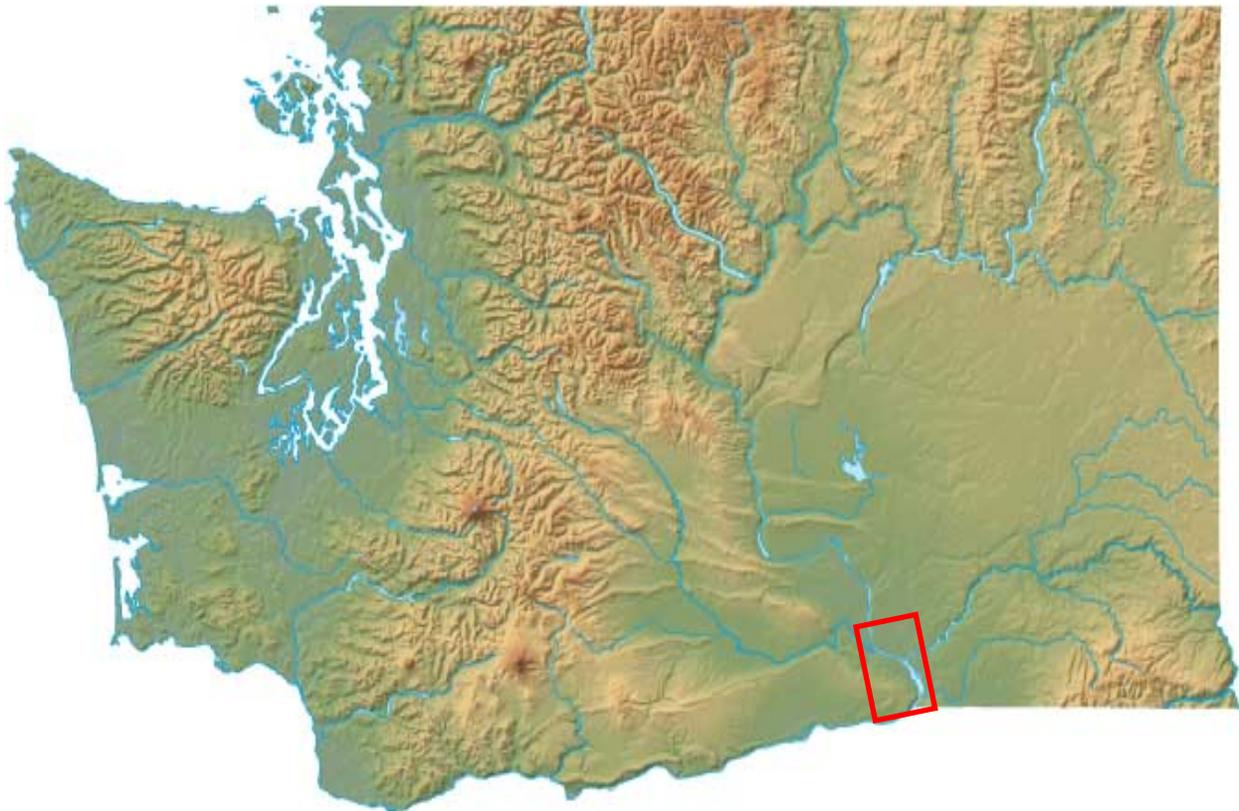


Figure 1: General Location of Intake Facilities within the McNary and Ice Harbor Reservoirs

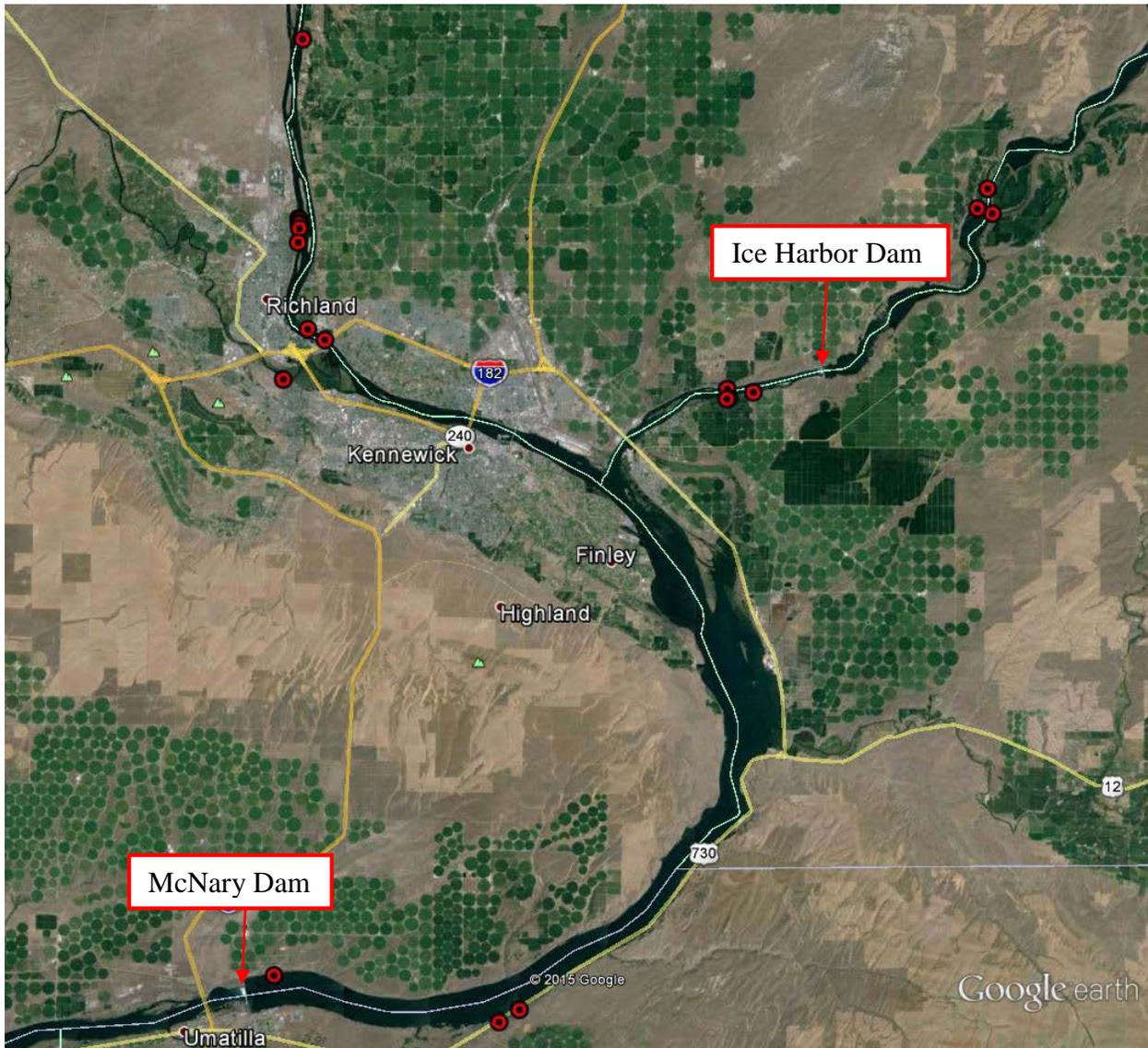


Figure 2; McNary and Ice Harbor Intake Facility Sites (NOTE: The aerial photo encompasses all the identified intake facility locations. However, due to the scale and some of the intake facilities being close together, all 23 individual intake facility sites are not visible in the photo.)

1.1 Background

The Corps' Real Estate (RE) Division routinely issues outgrants (e.g. leases, easements, licenses and rights-of-way) for activities occurring on Federally owned lands managed by the Corps. RE outgrants are issued to Federal and non-Federal agencies, entities, individuals and businesses for domestic, agricultural, commercial and other project purposes. The type of outgrant RE issues is based on the type of activity being proposed.

Large sections of Corps-managed Federal land are located immediately adjacent to and on both sides of the Columbia, Snake and Yakima Rivers and were acquired for Federal civil works project operating purposes. Because of this situation and by default, the Corps has control over long stretches of the shoreline. This has resulted in the Corps RE Division issuing multiple outgrants (i.e. easements) for the installation of water intake facilities along the shoreline. Intake facilities can consist of pumps/pump plants and associated appurtenances such as electrical lines, access roads and water lines and can range in size from large commercial/municipal structures pumping thousands of gallons of water (Figure 3) to private residence operations consisting of a small pump and water line (Figure 4). Currently, the Corps has 23 intake facility easements which are either expired or set to expire within the near future and need to be renewed. The 23 easements are issued to 22 customers (Table 1) and are located at 19 sites. (NOTE: The easement renewals address only the use of Corps-managed Federal land. The easements do not address/authorize the matter of water rights/water withdrawals. Water rights are the purview of the state within which the intake facilities are located – i.e. Washington and Oregon.)



Figure 3: Large Commercial-size Water Intake Facility



Figure 4: Small, Private Residence Water Intake Operation

Table 1: Intake Facility Easement Renewals and Reservoir Location

GRANTEE	RESERVOIR
AgriNorthwest Farmland Reserve	McNary
Roy Anderson	McNary
Badger Mountain Irrigation District	McNary
Broetje Orchards	Ice Harbor
Central Pre-Mix Concrete	McNary
Conley-Schultz	McNary
Flat Top	McNary
Goose Pond	McNary
J B Land	McNary
KAL Farms	McNary
Kosmata	McNary
Lewis	McNary
City of Pasco	McNary
Premier Farms	McNary

City of Richland	McNary
Royale Columbia Farms	McNary
Stacheli	McNary
Stemilt	Ice Harbor (2 easements, 2 locations)
T & R Farms	Ice Harbor
Valley Roz	McNary
Wadhwa	McNary
Zirkle	McNary

1.2 PURPOSE AND NEED

The Corps proposes to renew 23 water intake facility easements which are either expired or set to expire in the near future. The 23 easement renewals are similar actions which involve only the extension of the term of the easement (i.e., do not grant any additional authority to the grantee). The purpose of the proposed action is to effectively process applications for renewal of the 23 water intake facility easements, in accordance with the Corps' real estate rules/policies and other applicable statutes and regulations. The action is needed to address the backlog of expired water intake facility easements in an efficient and cost-effective manner for both the Corps and applicants.

2.0 ALTERNATIVES

This section describes alternatives for meeting the identified project purpose and need.

2.1 Alternative 1 – No Action/No Change

Under the no action alternative, the Corps would not issue renewals for the 23 intake facility easements. Easements already expired would remain in that status and easements nearing expiration would eventually expire. The intake facilities would remain in an acknowledged hold-over tenancy situation, still governed by the expired easements. The holdover tenancy is contrary to Corps real estate rules/policies and could be subject to termination at some point.

Should the latter event occur (i.e. some or all easements terminated), the results would be immediate and adverse. The effects from the loss of water for municipal, agricultural, commercial and residential purposes would directly impact not only the immediate easement holders but varying portions of the population within the region and beyond. An insufficient supply of municipal water could cause water rationing and an increase in utility rates. The loss of water for agricultural and commercial needs would result in a major loss of crops and jobs as well as likely price increases for some products and goods. Residentially, the lack of water would impact the ability to adequately irrigate yards.

Although the “no action” alternative does not meet the project purpose and need, under CEQ guidelines it serves as the project baseline for comparing alternatives and is therefore carried forward for analysis.

2.2 Alternative 2 – (Proposed Action)

Under this alternative, the Corps would issue renewals (term extensions only) for all 23 intake facility easements. The renewals would include intake facility easements which are currently expired as well as those which are set to expire in the near future. The following factors played an important role in the decision to propose this particular approach.

- The renewals are similar actions and the review process for all 23 intake facilities under the NEPA, Endangered Species Act (ESA), National Historic Preservation Act and other applicable laws would be the same whether done individually or combined.
- Nation Marine Fisheries Service (NMFS) and US Fish and Wildlife Service (USFWS) strongly recommended the Corps combine ESA consultation on the 23 intake facility easement renewals to increase efficiency. A combined consultation for easement renewals would be the most efficient and cost effective approach to meeting the Corps’ requirements for review and consultation.
- Renewal costs for each easement holder would be a proportional share of the total administrative costs the Corps would incur for the combined review. Costs per easement holder would be based on the amount of Federal land (i.e. acres) covered under each easement.

This alternative would ensure the continued existence and operation of a portion of the area’s water intake infrastructure that has developed since the construction of the dams on the Columbia and Snake Rivers. It ensures a stable water delivery method is available to meet current and future municipal, agricultural, commercial and residential needs. It also provides the opportunity for continued regional growth and expansion.

2.3 Alternative 3

Under this alternative, the renewal of all 23 easements would be done on an individual basis instead of doing a combined renewal action. The steps/processes used for Alternative 3 would be the same for Alternative 2. The primary difference between an individual and combined approach to renewing the easements would be time and cost. The Corps estimates it could take an additional 6 months or longer to complete all 23 individual easement renewals beyond the time it would take to do a single, “combined” easement renewal (i.e. Alternative 2). This alternative would provide the same benefits as identified for Alternative 2.

Alternative 3 was eliminated from further consideration because it does not address the backlog of expired water intake facility easements in an efficient and cost-effective manner as

recommended by NMFS and USFWS and supported by the applicants, and delays the Corps' ability to comply with the Army Corps of Engineers' real estate rules/policies.

3.0 AFFECTED ENVIRONMENT and ENVIRONMENTAL IMPACTS

This section identifies and assesses the affected environment – i.e. the existing natural, cultural and socioeconomic resources which have the potential to affect or to be affected by the alternatives. Although an extensive range of resources exist within the project area, only those resources determined relevant to the proposed action were included in the affected environment. While the intent is to focus on relevant resources, it is also important to recognize that the relevance of each identified resource to the proposed action is not the same. Some resources figure more prominently to the action than others. This EA does not assess potential effects associated with water intake withdrawals as part of the potential direct/indirect effects of the proposed action or No Action alternatives. Renewing the easements will not grant any right to use/withdraw water from the Columbia, Snake or Yakima rivers and will not increase water withdrawals. The states of Washington and Oregon decide where (and for what purpose) water within the state will be put to beneficial use; the Corps does not. Potential effects associated with water withdrawals are, however, considered in the cumulative effects analysis below (Section 4.2).

Table 2 provides a list of the relevant resources identified for this intake facilities renewal action.

Table 2: Relevant Environmental Resources

Resource/Further Discussion	Potential Environmental Effects
Biological/YES	<p>Under the No Action Alternative, there would be no change in current intake facility operations or potential effects to biological resources.</p> <p>For Alternative 2 (proposed action), the Corps proposes to divide the intake facilities into two categories for the purpose of doing a project biological assessment – i.e. water intake facilities which currently meet NMFS screen mesh size criteria (Category 1) and water intake facilities which currently do not meet NMFS screen mesh size criteria (Category 2). For Category 1, the Corps made a determination of “Not Likely to Adversely Affect” (NLAA) for listed fish species which may occur in the project area and “No Effect” for all other listed species. The existing screens for Category 1 facilities would also be protective of migrating lamprey. Minor maintenance dredging could occur at some sites periodically. It is possible that some juvenile lamprey could be negatively affected. The abundance of juvenile lamprey in sediment around pump intakes is unknown, but is presumed to be low. For Category 2</p>

	<p>water intake facilities, the Corps made a determination of "Likely to Adversely Affect" (LAA) for Snake River Fall Chinook (fry), NLAA for other listed fish species and "No Effect" for all other listed species. For critical habitat, the Corps made determinations of NLAA for fish species and "No Effect" for all other species. Existing screens with mesh openings 1/8 inch or smaller would not impact migrating lamprey. Potential effects from maintenance dredging would be the same as for Category 1 facilities. The Corps determined there would be "No Adverse Effect" to essential fish habitat. The Corps also determined there would be no "take" or no disturbance under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act.</p>
<p>Water Quality/NO</p>	<p>The No Action Alternative would maintain existing conditions and intake facility operations. This would avoid creating any new in-water or ground disturbing activities. There would continue to be inspection and cleaning/maintenance of the intakes and screens which could have a temporary and minor effect on water quality. However, effects from water quality changes would be insignificant and would not adversely affect water quality. Work would be covered under Nationwide Permit Number 3 – Maintenance.</p> <p>Under Alternative 2, some existing intakes would need to be re-screened to meet current NMFS screen criteria. In addition, there would also be inspection and cleaning/maintenance of the intakes and screens. However, in its analysis of the water intake facilities, the Corps' biological assessment indicated that such activities would have only a temporary, minor effect on water quality. Work would be covered under Nationwide Permit Number 3 – Maintenance.</p>
<p>Cultural Resources/NO</p>	<p>The No Action Alternative would maintain existing conditions and therefore avoid ground disturbing activities which could potentially impact cultural resources.</p> <p>Under Alternative 2, screening/re-screening of water intake openings could occur but would not involve ground disturbance (per the Corps' Cultural Resources Record of Internal Review). A review and assessment of each proposed easement renewal site by a Corps staff archaeologist resulted in a determination of "no potential to affect historic properties" (Appendix B).</p>
<p>Visual/NO</p>	<p>The No Action Alternative would maintain existing conditions and therefore would result in no changes to current views.</p>

	<p>Under Alternative 2, conditions would be the same as the No Action Alternative. While some work could occur, it would be of short duration, occur primarily in-water and any resulting changes would not be visible from the surface.</p>
Noise/NO	<p>Under the No Action Alternative there would be no change in the existing noise levels. Most of the intake facilities are located away from populated areas and their operation has no adverse impact on residential, recreational or business centers. Those pumps which are located in municipal areas are either very small (i.e. Figure 4), located in close proximity to areas with high volumes of traffic or are enclosed/covered so their operation would be minimal in terms of generating noticeable levels of noise.</p> <p>Conditions under Alternative 2 would be the same or similar as the No Action Alternative.</p>
Air Quality/NO	<p>The project area is currently in attainment and meets Washington and Oregon ambient air quality standards and would continue to do so under the No Action Alternative.</p> <p>The same air quality conditions and attainment status which exist for the No Action Alternative would also be maintained under Alternative 2.</p>
Environmental Justice (EJ)/NO	<p>The No Action Alternative would maintain existing conditions. The location and current operation of the intake facilities would not create undue impacts or impositions for the general population or for any particular segment of the population.</p> <p>Under Alternative 2, administrative fees would be paid by current easement holders to cover renewal costs (i.e. administrative and fair market fees). Likewise, operation and maintenance of the water intakes would be the sole responsibility of the easement holder. No other individuals or entities would be impacted financially or otherwise by easement renewal costs or requirements.</p>
Climate Change/NO	<p>CEQ uses 25,000 metric tons of carbon dioxide (CO₂)-equivalent GHG emissions on an annual basis as an indicator that a quantitative and qualitative assessment should be provided to decision makers and the public. The No Action Alternative would maintain existing conditions, including operation of the pump plants and therefore, production of some GHG emissions. However, continued operation of the pump</p>

	<p>plants would not generate the annual threshold level of GHG identified by CEQ.</p> <p>The U.S. Global Change Research Program provides the following information for the Northwest: Observed Trends – temperatures generally higher over past 25 years; precipitation lower over the past 35 years for the majority of the time; Future Scenarios – increases in temperature and an overall increase in precipitation for winter, spring and fall, but a decrease in almost all parts of the region for summer.</p> <p>These climate conditions could result in higher or lower river flows, warmer water temperature, and change in annual flow regimes due to such things as electricity demands (hot weather) and endangered species act requirements (i.e. salmon). All these conditions have already occurred in the past but could now occur with more frequency, greater intensity and/or for longer periods of time. Under the No Action alternative, there has been no demonstrable impact to pump plants resulting from climate related conditions. They continue to remain fully operational.</p> <p>The same conditions and situations exist for Alternative 2.</p>
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3.1 Biological

The following discussion and biological assessment is based on dividing the water intake facilities into two “categories” – i.e. water intake facilities which currently meet screen mesh size criteria (Category 1) and water intake facilities which do not currently meet screen mesh size criteria (Category 2). NOTE: The information for this discussion is taken from the “*Multiple Pump Intake Easement Renewals*” Biological Assessment prepared for this project (Appendix A).

For water intake facilities which currently meet screen mesh size criteria, the Corps has determined renewal of those easements are “Not Likely to Adversely Affect” (NLAA) the ESA-listed fish species or their designated critical habitat.

The water intake sites in Category 1 all have either screens with a mesh size of 3/32” or less, or would not impact Snake River fall Chinook fry or possibly juvenile lamprey. The Corps would not require any modification to these screens as long as they continue to function as designed and are cleaned/maintained as needed. When the screen material wears out, it must be replaced with screen material meeting the most recent NMFS screening criteria in effect at the time that its

replacement is required. To comply with this condition, structural modifications may be required to retrofit an existing facility with new screen material.

Periodic intake screen maintenance would occur; the most frequent maintenance being the cleaning/removal of debris and algae from the exterior of the screens. Screen cleaning could occur at any time of year but would occur annually at a minimum, or as often as needed to maintain adequate flow. Some of the screens have automatic cleaning systems.

For these water intake facilities currently meeting screen mesh size criteria, there would be inspection and cleaning of the intakes and screens that could have a temporary, minor effect on water quality. (Maintenance/cleaning would vary and could include brushing off the screen by hand, temporarily removing the screen to clean it, or using divers and a high pressure washer to remove accumulated material from the screen.) Turbidity levels in the immediate areas surrounding the screens could increase temporarily. However, the disturbance caused by the actions would likely cause any salmonids in the area to relocate to adjacent habitat which is unaffected. Effects from water quality changes would be insignificant and are not likely to adversely affect designated critical habitat for ESA-listed fish species. Effects to rearing and migration habitat from the proposed action are expected to be insignificant and are not likely to adversely affect salmon and steelhead critical habitat. The Corps determined there would be “No Effect” on pygmy rabbit, Canada lynx, gray wolf, grizzly bear, Ute ladies’-tresses, White Bluffs bladderpod, Umtanum Desert buckwheat, yellow-billed cuckoo, Washington ground squirrel, northern wormwood, or greater sage-grouse.

For water intake facilities which do not currently meet screen mesh size criteria, the Corps has determined renewal of those easements are “Likely to Adversely Affect” (LAA) Snake River fall Chinook (fry) and their designated critical habitat.

The water intake sites in Category 2 all have screen mesh sizes larger than 3/32” and do not meet NMFS criteria. The Corps proposes to implement a deadline of December 31, 2020 to upgrade these screens. New screens must be in compliance with the most current NMFS intake screening criteria. The approach velocity must not exceed 0.40 ft/s for active screens, or 0.20 ft/s for passive screens. Using these approach velocities would minimize screen contact and/or impingement of juvenile fish.

Once a site is upgraded to the current fish screening criteria, it would not need upgrading again as long as the following conditions are met.

1. The entire screen facility must function as designed.
2. The entire screen facility has been maintained and is in good working condition.
3. When the screen material wears out, it must be replaced with screen material meeting the most recent NMFS screening criteria. To comply with this condition, structural modifications may be required to retrofit an existing facility with new screen material.
4. The facility causes no noted mortality, injury, entrainment, impingement, migration delay or other harm to anadromous fish.

5. When biological uncertainty exists, access to the diversion site by the Corps and NMFS is permitted by the intake facility owner for verification of the above criteria.

Periodic intake screen maintenance would occur; the most frequent maintenance being the cleaning/removal of debris and algae from the exterior of the screens. Screen cleaning could occur at any time of year but would occur annually at a minimum, or as often as needed to maintain adequate flow. Some of the screens have automatic cleaning systems.

For these water intake facilities which do not currently meet NMFS screen mesh size criteria, effects from the pump screens which are larger than 3/32” would occur only to Snake River fall Chinook (fry) and possibly to juvenile lamprey. Screens with larger openings could entrain small fish and trap them against the screen leading to mortality. These fry would originate from salmon that spawned in the mainstem Snake River below Ice Harbor or Lower Monumental dams. In-water work to replace screens is an interrelated effect associated with the inadequate screen material. Screens which can be handled by hand can be replaced at any time of the year. In-water work on larger screens which require the use of heavy equipment or divers would only occur between December 15 and February 28 or August 1 to August 31. In addition to installation, there would also need to be routine maintenance and cleaning of the screens. This would entail the same type and level of activities and ensuing effects as described above for water intake facilities currently meeting screen mesh size criteria. The Corps likewise determined there would be “No Effect” on pygmy rabbit, Canada lynx, gray wolf, grizzly bear, Ute ladies’-tresses, White Bluffs bladderpod, Umatnum Desert buckwheat, yellow-billed cuckoo, Washington ground squirrel, northern wormwood, or greater sage-grouse.

Table 3 provides a current listing of ESA species for the counties included in the project.

Table 3. Endangered Species Act and Designated Critical Habitats Lists for Benton, Franklin and Walla Walla Counties, WA and Umatilla County, OR.

Species	Listing Status	Critical Habitat
Chinook salmon (<i>Oncorhynchus tshawytscha</i>)		
Upper Columbia River spring-run ESU	Endangered	Yes
Snake River spring/summer-run ESU	Threatened	Yes
Snake River fall-run ESU	Threatened	Yes
sockeye salmon (<i>O. nerka</i>)		
Snake River ESU	Endangered	Yes
steelhead (<i>O. mykiss</i>)		
Middle Columbia River DPS	Threatened	Yes
Upper Columbia River DPS	Threatened	Yes
Snake River Basin DPS	Threatened	Yes
bull trout (<i>Salvelinus confluentus</i>)		
Columbia River DPS	Threatened	Yes
pygmy rabbit (<i>Brachylagus idahoensis</i>)		
Columbia Basin DPS	Endangered	No

Canada lynx (<i>Lynx canadensis</i>)		
Contiguous U.S. DPS	Threatened	Not in Project Area
Gray Wolf (<i>Canis lupus</i>)		
U.S.A.: that portion of WA west of the centerline of Highway 395 south of Mesa	Endangered	No
Grizzly Bear (<i>Ursus arctos horribilis</i>)		
	Threatened	No
Ute ladies'-tresses (<i>Spiranthes diluvialis</i>)		
Contiguous U.S. DPS	Threatened	No
Northern Wormwood (<i>Artemisia campestris var. wormskioldii</i>)		
	Candidate	No
Greater Sage-Grouse (<i>Centrocercus urophasianus</i>)		
	Candidate	No
Yellow-billed cuckoo (<i>Coccyzus americanus</i>)		
	Threatened	Not in Project Area
Washington ground squirrel (<i>Urocitellus washingtoni</i>)		
	Candidate	No
Umtanum Desert buckwheat (<i>Eriogonum codium</i>)		
	Threatened	Not in Project Area
White Bluffs bladderpod (<i>Physaria douglasii ssp. tuplashensis</i>)		
	Threatened	Not in Project Area

ESU – Evolutionarily Significant Unit

DPS – Distinct Population Segment

Tables 4 and 5 give effects determinations for ESA listed species and critical habitat respectively.

Table 4. Effect Determinations for ESA Species in the Project Area

Species	Category 1 Determination	Category 2 Determination
NMFS		
Snake River Spring/Summer Chinook	NLAA	NLAA
Snake River Fall Chinook	NLAA	LAA
Upper Columbia River Spring Chinook	NLAA	NLAA
Snake River Sockeye	NLAA	NLAA
Snake River Steelhead	NLAA	NLAA
Upper Columbia River Steelhead	NLAA	NLAA

Middle Columbia River Steelhead	NLAA	NLAA
USFWS		
Bull trout	NLAA	NLAA
Pygmy Rabbit	No Effect	No Effect
Canada lynx	No Effect	No Effect
Gray Wolf	No Effect	No Effect
Grizzly Bear	No Effect	No Effect
Ute ladies'-tresses	No Effect	No Effect
Northern Wormwood	No Effect	No Effect
Greater Sage-Grouse	No Effect	No Effect
Yellow-Billed Cuckoo	No Effect	No Effect
Washington Ground Squirrel	No Effect	No Effect
Umtanum Desert Buckwheat	No Effect	No Effect
White Bluffs Bladderpod	No Effect	No Effect

Table 5. Effect Determinations for Designated Critical Habitat in the Project Area

Species	Critical Habitat Determination
NMFS	
Snake River Spring/Summer Chinook	Not Likely to Adversely Affect
Snake River Fall Chinook	Not Likely to Adversely Affect
Upper Columbia River Spring Chinook	Not Likely to Adversely Affect
Snake River Sockeye	Not Likely to Adversely Affect
Snake River Steelhead	Not Likely to Adversely Affect
Upper Columbia River Steelhead	Not Likely to Adversely Affect
Middle Columbia River Steelhead	Not Likely to Adversely Affect
USFWS	
Bull trout	Not Likely to Adversely Affect
Pygmy Rabbit	None Designated
Canada lynx	No Effect
Gray Wolf	None Designated
Grizzly Bear	None Designated
Ute ladies'-tresses	None Designated
Northern Wormwood	None Designated
Greater Sage-Grouse	None Designated
Yellow-Billed Cuckoo	No Effect
Washington Ground Squirrel	None Designated
Umtanum Desert Buckwheat	No Effect

White Bluffs Bladderpod	No Effect
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While not protected by the ESA, Pacific lamprey are becoming a concern in the region. Lamprey abundance in the middle Columbia and lower Snake Rivers is not well known. The average numbers of adult lamprey counted passing Priest Rapids and Ice Harbor dams since 2010 were 4,879 and 446 respectively. However, the average number counted passing McNary Dam during the same period was only 1,294. Theoretically the number at McNary (downstream-most dam) should be higher than the sum of numbers counted at Priest Rapids and Ice Harbor. There should be no impacts from the action on adult lamprey, but there could be an unknown effect on juvenile lamprey from any maintenance dredging that could occur in the future.

The Corps submitted its determinations to NMFS (listed anadromous fish species) and USFWS (all other listed fish, wildlife and plant species) for review and concurrence. NMFS concurred with the Corps' determinations and provided the following conservation recommendation (Appendix A):

Require immediate upgrade of the existing 1/8-inch screen mesh size to the current 3/32-inches to protect fall Chinook salmon fry in the Hanford Reach (Appendix A).

USFWS has not yet responded. Its comments would be included in the final FONSI, if a FONSI is determined appropriate.

3.2 – Cumulative Effects

The NEPA and CEQ regulations implementing NEPA require federal agencies to consider the cumulative impacts of their actions. Cumulative effects are defined as, “the impact on the environment which results from the incremental impact of an action when added to other past, present and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions” (40 CFR § 1508.7). Cumulative impacts can result from individually minor, but collectively significant actions taking place over a period of time.

This section evaluates the cumulative effects of actions that could potentially affect the environmental resources discussed in this EA. The implication of the impacts depends on the characteristics of the resource, the magnitude and scale of the project's impacts, and the environmental setting. The Corps identified the following resource as notable for its importance to the area and potential for cumulative effects – i.e. threatened and endangered species (fish). This resource is discussed in terms of its cumulative effect boundary (spatial and temporal), the historic condition/impacts to the resource, present condition/impacts to the resource, and reasonably foreseeable future actions which may affect the resource.

The geographic boundaries for the cumulative effects analysis are on both the Columbia and Snake Rivers. The analysis boundary on the Columbia River goes from McNary Dam to Priest

Rapids Dam while for the Snake River, it extends from the Columbia/Snake River confluence to river mile 21 on the Snake River. The analysis boundary, especially for the Columbia River was selected for manageability purposes. Due to the large scale on which Columbia River water rights is operated, the currently available data is imprecise. For this reason, a segment of the River was selected in an effort to try and obtain more exact information. The timeframe for analysis is from 1953 (start of McNary Dam operation) to the present. Reasonably foreseeable actions are included in future undertakings.

The main focus in this section is other water withdrawal actions. Water withdrawn from existing diversion/intake points is part of the environmental baseline, but continued withdrawal in the future would have cumulative effects. There has not been formal adjudication on water withdrawal for the Columbia River Basin, so a precise measurement of water withdrawn, whether by legal certificate or illegally, is not possible. It is unclear exactly how much water is withdrawn from, or discharged to, the Columbia River in the action area.

Some of the past major actions occurring on the Columbia and Snake Rivers within the identified analysis boundaries include:

- Start of McNary Dam operation – 1953
- Start of Ice Harbor Dam operation – 1961
- Start of large scale irrigation projects – e.g. orchards, vineyards, farming (wheat fields), etc.
- Expansion of Tri-Cities population/area – increased demand for/use of municipal water
- Continued issuance of water rights within analysis boundary/timeframe

Presently, there are irrigation networks in Kennewick operated by the Columbia Irrigation District (CID) and the Kennewick Irrigation District (KID). Each deliver untreated Yakima River water through open and closed gravity-flow conduits to agricultural and residential customers. KID flows are around 150 million gallons per day (MGD) (240 cubic feet per second (cfs)) of water from April 1st to October 31st.

Franklin County Irrigation District No. 1 (FCID) was formed in 1919 to supply irrigation water to homes and farms in the rural section of Franklin County, west of Pasco. This facility operates with a 125 horsepower (hp) pump, a 300 hp pump, and a 450 hp pump depending on demand. The FCID withdraws about 18,300 acre-feet (ac-ft) (25.3 cfs), from the Columbia River for irrigation purposes. It also withdraws from wells in the area. FCID has permits or certificates for about 30,000 ac-ft.

The Badger Mountain Irrigation District (BMID) was formed in 1975 to provide irrigation water to land located along the south slopes of Badger Mountain and vicinity. The BMID currently uses six vertical shaft pumps (combined total of 8,000 hp) to deliver irrigation water to approximately 4,800 acres of agricultural and residential land. Water consumption averages between 3.0 and 3.5 ac-ft per acre per year (i.e. between 14,400 and 16,800 ac-ft total).

Besides municipal use, there are approximately 40 private water systems in the area drawing from both wells and the river. The majority of these systems serve small commercial businesses and trailer parks in areas which were not served with city water when they were developed. It is expected that these systems would eventually connect to the city water utility as their infrastructure reaches the end of its design life, or as a city system expands into their area. Connection of existing water systems to the city water utility may require transfer of the owner's water right to the city if the owner's intent is to relinquish all use of an existing water source.

All of the proposed easement renewal locations on the Columbia River within the analysis boundaries total less than 500 cfs. Of this amount, the irrigation withdraw could be as high as 0.62% of the total river flow. The average minimum flow of the Columbia River is 80,440 cfs. The required minimum flow of the Columbia River required by the Washington Department of Ecology is 50,000 cfs (70,000 cfs May 1 to June 15). The current river flow is able to accommodate both withdrawal needs and in-river requirements.

Withdrawal from all of the proposed easement renewal locations on the Snake River add up to less than 200 cfs. Under extremely dry conditions, the minimum rate for Snake River discharge has been recorded as low as 2,700 cfs. (Normally, Snake River discharge during low flow years is much higher than 2,700 cfs.) As with the Columbia River, the current Snake River flow is able to accommodate existing water withdrawal needs. The irrigation withdraw could be as high as 7.4% of the total river flow.

Reduced river flow would have a seasonal minor effect on the ESA-listed salmonids. Water use is regulated by the states. The Corps has no discretion on water rights or how water withdrawn from the river is used and is therefore not being considered as an effect that can be avoided or reduced in this consultation.

Major effects to listed resources near the action area are primarily the result of urban development, agriculture, and associated water diversion and water control activities. The proposed action occurs near or within the largest metropolitan center of southeastern Washington – i.e. Pasco, Kennewick and Richland. Benton and Franklin Counties have a combined population of over 270,000 people (US Census Bureau 2014) and development is projected to continue into the foreseeable future. Additional effects to the mainstem of the Columbia and Snake Rivers would result from the heavy recreational and commercial use of the area. Recreation in the area includes fishing, hunting, boating, bird watching, and swimming, while commercial activities are dominated by year round barge traffic.

By 2017, Pasco is scheduled to have a new water intake facility in operation. It is to be located immediately adjacent to the I-182 Bridge that connects Richland and Pasco. As now planned, the new facility would operate at 12 MGD for the first year and then increase to 18 MGD in 2018 and maintain that capacity.

The municipal and irrigation water withdrawals discussed above have a small impact on the river environment. The approximate total withdrawal amount from each of the cities and the major irrigation suppliers is 577 cfs (415 MGD). The Ecology website shows a total diversionary withdrawal amount of 5,708 cfs (3,689 MGD) which is 11.4 % of the minimum required instream flow. It is 7.1% of the minimum average daily flow. These relatively small diversions could have some impact on migrating salmonids, but the effects would be minimal. Ecology is in the process of trying to find even more water which could be used for beneficial uses, both instream and out of stream.

The effects of the proposed action, when combined with effects of past actions and potential effects of reasonably certain future actions, are not expected to result in any significant or permanent adverse effects to listed fish species, designated critical habitat or, other non-listed fish (e.g. lamprey).

4.0 ENVIRONMENTAL REVIEW REQUIREMENTS.

4.1 Federal Requirements

4.1.1 National Environmental Policy Act

This EA was prepared, and is being circulated to agencies and the public for review and comment, pursuant to requirements of the NEPA. Full compliance with NEPA would be achieved when the FONSI, if one is determined to be appropriate, is signed.

4.1.2 Clean Air Act, As Amended

The project is in an attainment area and meets Washington and Oregon ambient air quality standards. Renewal of the 23 intake facility easements would not impact current conditions. The project area would still meet attainment standards.

4.1.3 Clean Water Act (As Amended)

The proposed project could require the replacement of some existing intake screens to meet current NMFS and Washington and Oregon requirements. The work could involve minimal disturbance to sediments but would be covered under Nationwide Permit Number 3 – Maintenance.

4.1.4 Endangered Species Act of 1973, As Amended

The Corps divided the 23 water intake facilities into two categories - 11 pumping plants which currently meet screen mesh size criteria (Category 1) and 12 pumping plants which currently do not meet screen mesh size criteria (Category 2). Category 1 facilities received a “*Not Likely to Adversely Affect*” (NLAA) determination on all ESA-listed fish species while for Category 2, the

Corps' determination was "*Likely to Adversely Affect*" (LAA) – i.e. specifically applied to Snake River fall Chinook (fry) and NLAA for all other fish species.

The Corps concluded the proposed action (both Category 1 and Category 2 water intake facilities) would have "No Effect" on pygmy rabbit, Canada lynx, gray wolf, grizzly bear, Ute ladies'-tresses, White Bluffs bladderpod, Umtanum Desert buckwheat, yellow-billed cuckoo, Washington ground squirrel, northern wormwood, or greater sage-grouse. It further determined the proposed project would result in no "take" of species listed under the Migratory Bird Treaty Act, and no "take" or disturbance under the Bald and Golden Eagle Protection Act. The Corps also determined there would be "No Effect" to designated critical habitat that may occur in the project area and "No Adverse Effect" to essential fish habitat.

The Corps prepared a Biological Assessment (BA) on the proposed project that included the above listed determinations. As part of required consultation, the BA was submitted NMFS and USFWS on July 14, 2015 with the request for concurrence or a biological opinion on the Corps' determinations. NMFS concurred with the Corps' determinations and provided the following conservation recommendation (Appendix A):

Require immediate upgrade of the existing 1/8-inch screen mesh size to the current 3/32-inches to protect fall Chinook salmon fry in the Hanford Reach.

USFWS has not yet responded. Its comments would be included in the final FONSI if a FONSI is determined appropriate.

4.1.5 Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act (FWCA) authorizes the U.S. Fish and Wildlife Service to evaluate the impacts to fish and wildlife species from proposed Federal water resource development projects which could result in the control or modification of a natural stream or body of water that might have effects on the fish and wildlife resources which depend on that body of water or its associated habitats. The proposed action does not modify a natural water body and therefore does not involve activities subject to the FWCA.

4.1.6 Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) (16 U.S.C. §§ 703-712, as amended) prohibits the taking of and commerce in migratory birds (live or dead), any parts of migratory birds, their feathers, or nests. "Take" is defined in the MBTA to include by any means or in any manner, any attempt at hunting, pursuing, wounding, killing, possessing or transporting any migratory bird, nest, egg, or part thereof. The proposed action would not impact migratory birds as defined under the provisions of the MBTA

4.1.7 National Historic Preservation Act, As Amended

Each of the easement renewal sites was reviewed and assessed for potential cultural resources concerns by a Corps staff archaeologist. The staff archaeologist determined there was “no potential to affect historic properties” for all 23 locations (Appendix B).

5.0 COORDINATION.

Notice of this EA is being made available for public and agency review and comment and is available through the Corps’ website (www.nww.usace.army.mil). Table 6 contains the coordination list.

Table 6. Coordination List

Individual	Organization
Christine Reichgott	Environmental Protection Agency
Michelle Eames	U.S. Fish and Wildlife Service
Erin Britton Kuttel	U.S. Fish and Wildlife Service
Tom Schirm	Washington Department of Fish and Wildlife
Herman Spangle	Washington Department of Ecology
Terri Costello	Washington Department of Ecology
Eric Quaempts	Confederated Tribes of Umatilla Indian Reservation
Audi Huber	Confederated Tribes of Umatilla Indian Reservation
Phil Rigdon	Confederated Tribes and Bands of the Yakama Indian Nation
Aaron Miles	Nez Perce Tribe
Dr. Robert Whitlam	Washington State Department of Archaeology and Historic Preservation
WA Senator Maria Cantwell	U.S. Congress
WA Senator Patty Murray	U.S. Congress
WA Congresswoman Cathy McMorris-Rodgers (5 th District)	U.S. Congress
WA Congressman Dan Newhouse (4 th District)	U.S. Congress
State Senator Mike Hewitt (16 th District)	Washington State Congress
State Rep Terry Nealey (16 th District)	Washington State Congress

State Rep Maureen Walsh (16 th District)	Washington State Congress
State Senator Sharon Brown (8 th District)	Washington State Congress
State Rep Brad Klippert (8 th District)	Washington State Congress
State Rep Larry Haler (8 th District)	Washington State Congress
State Senator Mark Schoesler (9 th District)	Washington State Congress
State Rep Joe Schmick (9 th District)	Washington State Congress
State Rep Mary Dye (9 th District)	Washington State Congress
OR Senator Ron Wyden	U.S. Congress
OR Senator Jeff Merkley	U.S. Congress
OR Congressman Greg Walden	U.S. Congress
State Senator Bill Hansel (29 th District)	Oregon State Congress
State Rep Susan McLain (29 th District)	Oregon State Congress
	Kennewick Irrigation District
	Columbia Irrigation District
	Franklin County Irrigation District No. 1
	Badger Mountain Irrigation District
Diane Driscoll	National Marine Fisheries Service
	Oregon Department of Environmental Quality
Ahmad Qayoumi	City of Pasco
Pete Rogalsky	City of Richland
Gary Deardorff	City of Kennewick

6.0 REFERENCES

U.S. Army Corps of Engineers, Walla Walla District, 2015. Multiple Pump Intake Easement Renewals. McNary and Ice Harbor Projects, Biological Assessment. July 2015

U.S. Environmental Protection Agency, 2011. Greenhouse Gas Emissions; Emission Facts: Greenhouse Gas Emissions from a Typical Passenger Vehicle. Available at www.epa.gov/climatechange/emissions/index.html and www.epa.gov/OMS/climate/420f05004.htm.

APPENDIX A

BIOLOGICAL COORDINATION



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
7600 Sand Point Way NE, Bldg. 1
Seattle, Washington 98115

Refer to NMFS No: 2015-3126

October 2, 2015

Mr. Michael Francis
Walla Walla District, Corps of Engineers
201 North Third Avenue
Walla Walla, Washington 99362-1876

Re: Endangered Species Act Section 7(a)(2) Concurrence Letter and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for the Corps of Engineers, Walla Walla District, Multiple Irrigation Pump Intake Easement Renewals (PM-EC-2014-0031) on the Columbia, Snake and Yakima Rivers.

Dear Mr. Francis:

On July 25, 2015, NOAA's National Marine Fisheries Service (NMFS) received your biological assessment (BA) and request for consultation on the renewal of 23 easements to multiple irrigators for irrigation pump structures on the Columbia, Snake and Yakima Rivers. Your request was in regard to Snake River (SR) fall-run Chinook salmon (*Oncorhynchus tshawytscha*) Middle Columbia River (MCR) steelhead (*Oncorhynchus mykiss*), Upper Columbia River (UCR) steelhead (*O. mykiss*), UCR spring-run Chinook salmon (*O. tshawytscha*), Snake River (SR) spring/summer Chinook salmon (*O. tshawytscha*), SR sockeye (*O. nerka*) and SR steelhead (*O. mykiss*) and their designated critical habitats. The Corps of Engineers' (Corps) authority for this action is presented under Title 10, United States Code, section 2668. This response to your request was prepared by NMFS pursuant to section 7(a)(2) of the ESA, implementing regulations at 50 CFR 402, and agency guidance for preparation of letters of concurrence.

NMFS also reviewed the proposed action for potential effects on essential fish habitat (EFH) designated under the Magnuson-Stevens Fishery Conservation and Management Act (MSA), including conservation measures and any determination that you made regarding the potential effects of the action. This review was pursuant to section 305(b) of the MSA, implementing regulations at 50 CFR 600.920, and agency guidance for use of the ESA consultation process to complete EFH consultation. The proposed action will occur in areas designated as EFH for Chinook salmon (*Oncorhynchus tshawytscha*) and coho salmon (*O. kisutch*). In this case, NMFS concluded the action would adversely affect EFH and one conservation measure is included.

This letter underwent pre-dissemination review using standards for utility, integrity, and objectivity in compliance with applicable guidelines issued under the Data Quality Act (section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001, Public Law 106-554). The concurrence letter will be available through NMFS' Public Consultation Tracking System (<https://pcts.nmfs.noaa.gov/pcts-web/homepage.pcts>). A complete record of this consultation is on file at the Interior Columbia Branch Office in Ellensburg, Washington.

Proposed Action and Action Area

The Corps proposes to renew easement permits for 23 individual irrigation water intakes along the Columbia, Snake and Yakima Rivers. The renewal will extend the easements for 25-years. Some of these intakes are considered by NMFS and the Corps to be acceptable with respect to fish screening and others that need to be improved. The former group (group 1) includes intakes that are screened in compliance with NMFS criteria for salmonid fry protection as presented in 'Anadromous Salmonid Passage Facility Design' (2011) (group 1a), and those that are located in areas where ESA-listed salmon fry are not likely to encounter the screens (1b). The remaining facilities (group 2) are screened but do not meet NMFS screen criteria for fry protection and are located in an area where ESA-listed fry are likely to encounter the screens. The Corps proposes that these facilities will meet NMFS criteria by 2020. The Corps will be responsible for ensuring upgrades to those screens in the second group are completed in the given time period. All renewed permits will require: (1) all screens to be fully functional, operated, and maintained as designed and, (2) any screen replaced due to damage or end of service life will be required to meet NMFS current screen criteria regardless of location.

The nine water intake sites in group 1 all have screens with a mesh size of 3/32-inches or less or have already scheduled upgrades which meet NMFS fish passage criteria. There is one intake site in group 1b, Central Pre-Mix Concrete, that has a screen mesh size that does not meet NMFS criteria (less than 3/32-inches) for passage of fry. The Central Pre-Mix site is located on the Columbia River four miles upstream of the mouth of the Yakima River and 12 miles upstream of the mouth of the Snake River. The location of the Central Pre-Mix withdrawal makes it unlikely that any SR fall Chinook salmon fry will pass the screen and all currently ESA-listed UCR juveniles will be of large enough size that the existing screen is not likely to harm them.

Table 1. Irrigation Pump Intakes and locations and current compliance with NMFS screen criteria. The Yakima and Snake Rivers enter the Columbia River at river mile (RM) 333 and 325, respectively.

Group 1a.(meet NMFS screen mesh size 3/32", renewed permit is "no effect")		
Ref #	Site name and location	Screen mesh size 3/32" or less
1	Stemilt Ag Services	Yes
2	Kosmata	Yes
3	Lewis-O'Hearn	Yes
4	Zirkle	Yes
5	Wadhwa	Yes
6	City of Pasco	Yes
7	Premier Farms	Yes
8	Valley Roz	Yes
9	Anderson (Columbia River, RM 348.3, 25 miles upstream of Snake River)	Yes, prior to next irrigation season
Group 1b (screen mesh size greater than 3/32" but in location unlikely to affect fry size juveniles, NLAA)		
10	Central Pre-Mix Concrete (Columbia River RM 337, 12 miles upstream of Snake River, four miles upstream of Yakima River)	No, 1/8-inches Screen is compliant with ESA under a "grandfather" agreement.
Group 2 (renewed permit will require screen upgrades by 2020, NLAA)		

11	Farmland Reserve (right bank Columbia River RM 293, one mile upstream of McNary Dam)	No, 1/8-inches
12	T&R Farms (left bank of Snake River, approximately RM 20)	No, 1/8-inches
13	Stemilt 2 (left bank of Snake River, approximately RM 20)	No, 1/8-inches
14	Broetje Orchards (left bank of Snake river approximately RM 19)	No, 1/8-inches
15	Flat Top (left bank of Snake River, RM 6.5)	No, 7/64, 7/32, and 1/8-inches
16	Goose Pond Ag Inc. (left bank of Snake River, RM 6.5)	No, 1/5-inches
17	Conley and Schultz (left bank of Snake River, RM 6.5)	No, 4/25-inches
18	Kal Farms (left bank of Snake River, RM 7.2)	No, 1/8-inches
19	Staheli (residential right bank of Columbia River RM 339)	No, 3/16-inches
20	City of Richland (right bank Columbia River, RM 340)	No, 3/8-inches
21	Badger Mountain Irrigation District (Yakima River, RM 3.4)	No, 23/100-inches
22	C-2L Inc. – JB Land, LLC (left bank Columbia River RM 301)	No, 1/8-inches
23	Royale Columbia Farms (left bank Columbia River, RM 301.5)	No, 1/8-inches

The action area for this project is defined as both shorelines of the Columbia River from one mile upstream of McNary Dam at RM 293 upstream to RM 348.3; the left bank of the Snake river between RM 6.5 and RM 20; right bank of the Yakima River at RM 3.4.

Action Agency's Effects Determination

The Corps does not authorize, manage, monitor, or control water rights associated with this action, therefore, no change in existing permitted water withdrawals is proposed. It is the Corps position that these water withdrawals would occur with or without the lease extensions.

The Corps determined that the renewal of 23 easements to multiple irrigators on the Columbia, Snake and Yakima Rivers, for irrigation pump structures/facilities “may affect, but is not likely to adversely affect” (NLAA) Middle Columbia River (MCR) steelhead (*Oncorhynchus mykiss*), Upper Columbia River (UCR) steelhead (*O. mykiss*), UCR spring-run Chinook salmon (*O. tshawytscha*), Snake River (SR) fall-run Chinook salmon (*Oncorhynchus tshawytscha*), SR spring/summer Chinook salmon (*O. tshawytscha*), SR sockeye salmon (*O. nerka*), or SR Basin steelhead (*O. mykiss*) listed as threatened or endangered or their critical habitats designated under the Endangered Species Act (ESA).

As of 2011, NMFS has required all new screens and any old replaced screens to meet the 3/32-inch mesh size to reduce risk to all juvenile life-stages of steelhead and salmon. The Corps effects determination is based on this requirement and the knowledge that the most vulnerable species and age class for this consultation is SR fall-run Chinook salmon fry. The proposed action includes a requirement that any screen facilities within the normal migration corridor of SR fall-run Chinook salmon fry meet NMFS criteria within 5-years. By requiring all non-compliant screens to be upgraded, the Corps determined that the renewal of these easement permits “may affect, but is not likely to adversely affect” MCR steelhead (*Oncorhynchus mykiss*), UCR steelhead (*O. mykiss*), UCR spring-run Chinook salmon (*O. tshawytscha*), SR fall

Chinook salmon (*Oncorhynchus tshawytscha*), SR spring/summer Chinook salmon (*O. tshawytscha*), SR fall Chinook salmon (*O. tshawytscha*), SR sockeye salmon (*O. nerka*) or SR Basin steelhead (*O. mykiss*) listed as threatened or endangered or their critical habitats designated under the Endangered Species Act (ESA) because the effects of the action will be entirely beneficial.

The MCR steelhead Distinct Population Segment (DPS) was listed as threatened on March 25, 1999 (64 FR 14517), the UCR steelhead DPS was listed as endangered on August 18, 1997 (62 FR 43937) and their status was upgraded to threatened on January 5, 2006 (71 FR 834); the UCR spring-run Chinook salmon Evolutionarily Significant Unit (ESU) was listed as an endangered species on March 24, 1999 (64 FR 14308); Snake River Basin steelhead were listed as threatened on August 18, 1997 (62 FR 43937); SR spring/summer-run Chinook salmon were listed as threatened on April 22, 1992 (57 FR 14653); SR fall-run Chinook salmon were listed as threatened on April 22, 1992 (57 FR 14653) and SR sockeye salmon were listed as endangered on November 20, 1991 (56 FR 58619). Following a five-year status review completed in 2010, the listing status of each species was reaffirmed on August 15, 2011 (76 FR 50448).

NMFS designated critical habitat for MCR steelhead, UCR steelhead, UCR spring-run Chinook salmon, and SRB steelhead on September 2, 2005 (70 FR 52630); SR spring/summer-run Chinook salmon on October 25, 1999 (64 FR 57399); SR fall-run Chinook salmon and SR sockeye salmon on December 28, 1993 (58 FR 68543). For MCR steelhead, UCR steelhead, UCR spring-run Chinook salmon and SRB steelhead critical habitat includes the stream channels within the designated stream reaches, and includes a lateral extent as defined by the ordinary high water mark (OHWM) (33 CFR 319.11). Critical habitat for all listed Snake River salmon species includes the bottom and water of the waterways and the adjacent riparian zone. The adjacent riparian zone includes those areas within 300 feet of the OHWM.

The proposed action does not include any changes in existing water rights or water withdrawals, which the Washington State Department of Ecology manages.

ENDANGERED SPECIES ACT

Effects of the Action

Under the ESA, “effects of the action” means the direct and indirect effects of an action on the listed species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action (50 CFR 402.02). The applicable standard to find that a proposed action is not likely to adversely affect listed species or critical habitat is that all of the effects of the action are expected to be discountable, insignificant, or completely beneficial. Beneficial effects are contemporaneous positive effects without any adverse effects to the species or critical habitat. Insignificant effects relate to the size of the impact and should never reach the scale where take occurs. Discountable effects are those extremely unlikely to occur.

The Corps proposes to renew the easement permits for: (1) nine users that meet NMFS screen criteria; (2) one user without required screen upgrades that is unlikely to encounter the fry-sized life stage of any species and; (3) 13 users whose permits will require screens that meet NMFS criteria by 2020.

As mentioned above, NMFS current screen criteria for water withdrawals requires a screen mesh size of 3/32-inches to reduce risk to all juvenile life-stages of steelhead and salmon. The most vulnerable species and age class for this consultation is SR fall-run Chinook salmon fry. Juvenile SR fall-run Chinook salmon fry will migrate downstream the first spring or summer after emerging from the gravels, when they are still very small and screen mesh openings greater than 3/32-inches greatly increases their risk of entrainment. Juveniles of all other species considered in this document remain in their natal streams for up to a year before migrating downstream and they are unlikely to experience an increased risk of entrainment on screen mesh size up to 1/8-inch. Therefore, all screen structures within the migration path of SR fall-run Chinook salmon fry that are currently out of compliance with NMFS criteria, will be required to upgrade to meet criteria within a five-year period (2020) as part of the permit renewal. The Corps also determined that juveniles passing the one screen facility located 4-miles upstream of the Yakima River and 12-miles upstream of the Snake River (Central Pre-Mix), is located far enough upstream of the Snake River so as not to affect ESA-listed SR fall-run Chinook salmon fry, and upriver juveniles that could encounter the screen would be large enough that the 1/8-inch screen size will not adversely affect them. Therefore the Corps will not require the operator of this particular screen to meet NMFS criteria for the protection of ESA-listed species until the existing screen reaches the end of its service life or is replaced due to damage.¹

NMFS concurs with the Corps' determination of "may affect, not likely to adversely affect" for all species listed above. Concurrence is based on the information in the BA and is contingent upon full implementation of the required screen upgrades by 2020. Concurrence is based further on NMFS understanding that the diversion of water at these sites would continue with or without the proposed action and that subsequently installing proper screens at sites that need them will not cause adverse effects to the environment.

Because the project will occur in freshwater habitat, applicable Primary Constituent Elements (PCEs) for the critical habitat of MCR steelhead (*Oncorhynchus mykiss*), UCR steelhead (*O. mykiss*), UCR spring-run Chinook (*O. tshawytscha*), SR Basin steelhead (*O. mykiss*) and the critical elements (CEs) of SR fall Chinook salmon (*Oncorhynchus tshawytscha*), SR spring/summer Chinook (*O. tshawytscha*), SR sockeye (*O. nerka*) critical habitat are those associated with freshwater rearing sites and migration corridors. NMFS has analyzed the potential impacts of renewing these easement permits on designated critical habitat and the PCEs or CEs and has determined that because there will be no change to quantity of water withdrawal and the withdrawals would occur with or without the proposed action impacts to these PCEs and CEs is discountable.

Accordingly, NMFS concurs that the proposed action is not likely to adversely affect critical habitat. This concludes informal consultation on these actions in accordance with 50 CFR 402.14(b)(1). The Corps must reinstate this ESA consultation if: (1) New information reveals effects of the action that may affect listed species in a way not previously considered; (2) The action is modified in a manner that causes an effect to the listed species or designated critical

¹ September 25, 2015 telephone conversation with NMFS hydroengineer Jeff Brown: The CPM location and current screen size is considered to be "grandfathered" into NMFS screen compliance "At the time of upgrade it met existign screen criteria and it is not believed to be currently causing take of ESA-listed species".

habitat that was not previously considered; or (3) A new species is listed, or critical habitat designated, that may be affected by the identified actions.

Reinitiation of Consultation

Reinitiation of consultation is required and shall be requested by the Corps or by NMFS, where discretionary Federal involvement or control over the action has been retained or is authorized by law and (1) new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered; (2) the identified action is subsequently modified in a manner (e.g., if the subsequent installation of screens is likely to be more invasive of the environment than presently anticipated) that causes an effect to the listed species or critical habitat that was not considered in this concurrence letter; or if (3) a new species is listed or critical habitat designated that may be affected by the identified action (50 CFR 402.16). This concludes the ESA portion of this consultation.

Magnuson-Stevens Fishery Conservation and Management Act

Under the MSA, this consultation is intended to promote the protection, conservation and enhancement of EFH as necessary to support sustainable fisheries and the managed species' contribution to a healthy ecosystem. For the purposes of the MSA, EFH means "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity", and includes the associated physical, chemical, and biological properties that are used by fish (50 CFR 600.10), and "adverse effect" means any impact which reduces either the quality or the quantity of EFH. Adverse effects may include direct, indirect, site-specific or habitat-wide impacts, including individual, cumulative or synergistic consequences of actions.

NMFS determined the proposed action would adversely affect EFH as follows:

The operation of the Central Pre-Mix screen, with 1/8-inch screen mesh size, at RM 337, occurs within the Hanford Reach of the Columbia River. The Hanford Reach is a primary spawning area for a population of fall-run Chinook salmon managed under the MSA. When fall-run Chinook salmon fry emerge from the gravels, some numbers of them are likely to pass within the inwater area influenced by the Central Pre-Mix screen with a mesh size large enough to entrain the fry causing injury or death. The continuing operation of this screen creates an inwater area of unsuitable EFH for fall-run Chinook salmon.

NMFS determined that the following conservation recommendations are necessary to avoid, mitigate, or offset the impacts of the larger screen size in an area where fall Chinook salmon fry are located:

- Require immediate upgrade of the existing 1/8-inch screen mesh size to the current 3/32-inches to protect fall Chinook salmon fry in the Hanford Reach.

Within 30 days after receiving these recommendations, you must provide NMFS with a detailed written response (50 CFR 600.920(k)(1)). The number of conservation recommendations should be clearly identified in that response. If your response is inconsistent with the EFH

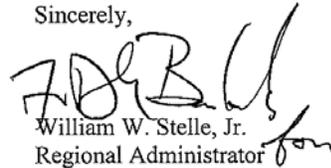
recommendations, you must explain why the recommendations will not be followed, including scientific justification for any disagreements over the anticipated effects of the action and the measures needed to avoid, minimize mitigate or offset such effects.

The Corps must reinitiate EFH consultation with NMFS if the proposed action is substantially revised in a way that may adversely affect EFH, or if new information becomes available that affects the basin for NMFS' EFH conservation recommendations (50 CFR 600.920(1)). This concludes the MSA portion of this consultation.

"Section 7(a)(1) of the ESA directs Federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of threatened and endangered species. The U.S. Army Corp of Engineers also has the same responsibilities, and informal consultation offers action agencies an opportunity to address their conservation responsibilities under section 7(a)(1)."

Please direct questions regarding this letter to Diane Driscoll of the Columbia Basin Branch Field Office at 509-962-8911 x227 or diane.driscoll@noaa.gov.

Sincerely,

A handwritten signature in black ink, appearing to read "WWS", is written over the typed name and title.

William W. Stelle, Jr.
Regional Administrator

References

National Marine Fisheries Service. 2011. Anadromous salmonid passage facility design.

APPENDIX B

CULTURAL RESOURCES COORDINATION



Cultural Resources Record of Internal Review

The following provides a record of internal review regarding the potential for historic properties and effects for:

Project Name:	Real Estate Undertakings with Little or No Potential to Affect Historic Properties
USACE Project Location:	<p><u>McNary Lock and Dam</u>, 23,015 acres located in Benton, Franklin, and Walla Walla Counties, Washington and Umatilla County, Oregon</p> <p><u>Ice Harbor Lock and Dam</u>, 8,150 acres located in Franklin and Walla Walla Counties, Washington</p> <p><u>Lower Monumental Lock and Dam</u>, 11,818 acres located in Columbia, Franklin, Walla Walla, and Whitman Counties, Washington</p> <p><u>Little Goose Lock and Dam</u>, 10,574 acres located in Columbia, Garfield, and Whitman Counties, Washington.</p> <p><u>Lower Granite Lock and Dam</u>, 12,497 acres located in Asotin, Garfield, and Whitman Counties, Washington and Nez Perce County, Idaho</p> <p><u>Dworshak Dam</u>, 43,887 acres located in Clearwater County, Idaho</p> <p><u>Mill Creek Flood Control Project</u>, 549 acres located in Walla Walla County, Washington</p> <p><u>Lucky Peak Dam and Lake</u>, 6,696 acres located in Ada, Boise, and Elmore Counties, Idaho</p>
Landowner:	US Army Corps of Engineers, Walla Walla District
Cultural Report No.:	2015-NWW-002

Introduction:

The National Historic Preservation Act (NHPA) of 1966, as amended, directs federal agencies to assume responsibility for all cultural resources under their jurisdiction. Section 106 of the NHPA requires agencies to consider the potential effects of their actions on properties that are eligible for or listed on the National Register of Historic Places (NRHP). The NHPA implementing regulations, 36 Code of Federal Regulations (CFR) Part 800, requires that the federal agency consult with the State Historic Preservation Officer (SHPO), Tribes and interested parties to ensure that all historic properties are adequately identified, evaluated and considered in planning for proposed undertakings.

Project Description:

The U.S. Army Corps of Engineers, Walla Walla District (Corps) manages approximately 120,000-acres of lands associated with the various multi-purpose water control structures. The Corps real estate office interacts with private, public, and other Federal entities seeking to operate on Corps land for any number of reasons. Real Estate "instruments" allow these entities to conduct their desired activities. Instruments may include leases, licenses, easements, and permits. The issuance, and/or renewal, of the instruments is an undertaking as defined in 36 CFR Part 800, and subject to review under Federal cultural resources law. However, many of these undertakings either have no potential to affect historic properties, or are exempt from external consultation in accordance with the conditions described in Attachment 6 of the Federal Columbia River Power System (FCRPS) Programmatic Agreement. According to the FCRPS

Programmatic Agreement, the Corps may proceed with undertakings on their lands without Section 106 consultation, provided they meet the requirements of Attachment 6 (U.S. Army Corps of Engineers 2009).

Instead of writing individual internal review documents for each real estate undertaking, the Corps will track undertakings that either a) have no potential to affect historic properties, or b) have little or no potential to affect historic properties in accordance with the FCRPS Programmatic Agreement, in a single memo for each fiscal year. Staff archaeologists will determine, on a project-by-project basis, if an undertaking is suitable for attachment to this memo. This report will continue to expand as each individual undertaking is added to the table by the archaeologist assigned to that project. The table will contain a column with the environmental compliance project number, a column to describe the type of real estate instrument and the activity authorized under the real estate instrument (including the real estate REMIS number), the name of the primary reviewer, the name of the peer reviewer, and the dates the activity was added to the list. At the beginning of the fiscal year this memo will be signed by the supervisory archaeologist, certifying the document. The table will be maintained separately. As each project is added to the table, the table can be printed as a PDF and combined with this document, and saved as a third file (retaining both the working table and the original memo). This running final document can then be provided to real estate to complete their files for individual real estate instruments.

There are a number of undertakings that may be appropriate for addition to this list. Examples from the last two years include: 1) renewal of an easement for the Badger Mountain sewer line in Kennewick, WA so the city would not have to remove the abandoned line; 2) issuance of a license to allow Idaho Parks and Recreation to place no-boating buoys in the water near the swim beach at Hells Gate State Park; 3) issuance of a permit to install a fish trap in Penawawa Creek in an area previously surveyed and without cultural resources; 4) issuance of an easement to the Franklin County Public Utility District for an existing power line that had never had an easement. For any activity added to the table the reviewing archaeologist will ensure that the REMIS number is added to the description to ensure that maps can be created using the real estate GIS database.

Certification of Results:

I certify that this investigation was conducted and documented according to Secretary of Interior's Standards and guidelines and that the report is complete and accurate to the best of my knowledge.

ROBERTS.ALICE
K.1392453993

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Date: 2014.10.15 08:59:29 -0700

Alice K. Roberts, Supervisory Archaeologist
U.S. Army Corps of Engineers

References Cited

U.S. Army Corps of Engineers

2009 *Attachment 6: Routine Activities Under this FCRPS Systemwide PA That Do Not Require Section 106 Consultation. Systemwide Programmatic Agreement for the Management of Historic Properties Affected by the Multipurpose Operations of Fourteen Projects of the Federal Columbia River Power System for Compliance with Section 106 of the National Historic Preservation Act.*

EC Project No.	RE Instrument/Project Description	Date/Primary Reviewer	Date/Peer Reviewer
PM-EC-2014-0061 (No Figure)	The Corps proposes to issue an easement to Avista Utilities for where their re-aligned power line will cross the Clearwater River (REMIS No. 109202). Avista has proposed to re-route the power line where it crosses near the Clearwater Casino at the request of the Nez Perce Tribe. Avista will be conducting compliance on the entire Section of re-routed power line. No construction related activities, staging, or future access has been identified for areas on Corps land. Because Avista is doing compliance on the larger project, and the easement is only for where the line will cross above Corps lands, the issuance of the easement has no potential to affect historic properties.	10-14-14 Scott M. Hall	10/14/14 L. Bonstead
PM-EC-2014-0021 (Figure 1)	The Corps plans to amend an easement with the Clearwater Paper Corporation (Corporation), W912EF-2-06-12 in Section 28 T36N, R5W, Nez Perce County, Idaho. The federal action (REMIS No. 339916) will remove an electrical substation on a south Clearwater River shore Lower Granite Project levee along the industrial complex's north perimeter (Figure 1). A single story 1,024 square-foot effluent substation (JJJ Building) will be built immediately to the east requiring an east extension of the existing easement boundary. Foundation excavation down 3 to 6 feet will occur in a 40-foot square area. Similarly constructed (concrete floor and block walls with painted sheet metal roof over wood roof purlins), the substation will also have a wood deck. Electrical and water lines will connect with adjacent facility sources to the west. Since the undertaking's APE lies on a modern levee (1974-present), it has no potential to affect historic properties.	12-22-14 Mary E. Keith	1/13/2015 Alice K. Roberts
PM-EC-2014-0085 (Figure 2)	The MCL PIT Tag Sensing and Screw Trap project is at the three Mill Creek Flood Control Project locations (Diversion Dam, Division Dam and Garrison Creek Channel facility in T 5 N, R 30 East, Section 7. The project has been completed and involves only the Corps to authorize the continued presence of PIT tag sensing equipment in three locations within the Mill Creek Project (Figure 2). The equipment was originally installed by the U.S. Fish and Wildlife Service in 2007 for the purpose of tracking ESA listed salmon and steelhead. All equipment has been attached using brackets and bolts and will eventually be removed. The CTUIR have since taken over the operation and maintenance of the equipment.	1-23-15 Mary E. Keith	2-5-15 Rigden A. Glaab
PM-EC-2014-0031 1 (Figure 3)	The T & R Farms Easement , DACW68-2-75-28, is in Section 13; T10N, R32E, Walla Walla County, Washington. The Corps will renew the easement and ROW for an existing Ice Harbor Lock and Dam Project water pumping plant and its irrigation distribution pipeline to support its operation and maintenance. There are two pipe intakes under future conditions and six water plant pumps. The buried pipelines extend 40 feet out into the reservoir and rest 20 feet below surface. The 3-foot diameter stainless steel pipes are fitted with barrel fish screens. The adjacent Broetje and Flat Top fruit orchard companies share a common irrigation diversion system using Snake River water (Lake Sacagawea) with a water right priority dating to 1985. The modern water pumping plant was constructed in 1975. The federal action (REMIS No. 432486) does not involve any facility alterations, or ground disturbance. No documented sites lie in the project APE. The federal undertaking therefore has no potential to affect historic properties.	1-30-2015 Mary E. Keith	2-5-15 Rigden A. Glaab
PM-EC-2014-0031 2 (Figure 4)	The Broetje Orchards Easement , DACW68-2-76-17 is in Section 24; T10N, R32E, Walla Walla County, Washington. The Corps will renew the easement and ROW for an existing Ice Harbor Lock and Dam Project water pumping plant and its irrigation distribution pipeline to support its operation and maintenance. There is one pipe intake and eight pumps. The buried pipeline extends out into the reservoir for 40 feet and has a 3-foot diameter stainless steel screen at its end. The adjacent Broetje and Flat Top fruit orchard companies share a common irrigation diversion system using Snake River water (Lake Sacagawea) with a water right priority dating to 1985. The water pumping plant is a modern facility that was constructed in 1976. The project has no documented archeological sites in the project APE. It does lie within a place of cultural and religious significance to the Yakama Nation though no specific significance is attached to the immediate project APEAPE (Woody 2006). The federal action (REMIS No. 432486) does not involve any facility alterations, or ground disturbance. No documented sites lie in the project APE. The federal undertaking therefore has no potential to affect historic properties.	1-30-2015 Mary E. Keith	2-5-15 Rigden A. Glaab
PM-EC-2014-0031 3 (Figure 4)	The Stemilt Ag Services Easement , DACW68-2-77-19, is in Section 23; T10N, R32E, Walla Walla County, Washington. The Corps is renewing the Stemilt Ag Service easement and ROW for the water pumping plant and its irrigation distribution pipeline to support its operation and maintenance. The easement grantee's shared	1-30-2015 Mary E. Keith	2-5-15 Rigden A. Glaab

	<p>permit with T&R Farms (DACW68-2-75-28) will be replaced with a separate permit for its water use at the T&R pump Station. There will be two Stemilt pipe intakes under future conditions, and eight pumps. The 3-foot diameter stainless steel pipelines' fish screen will be replaced to meet State Department of Fish and Wildlife requirements. The adjacent Broetje and Flat Top fruit orchard companies share a common irrigation diversion system using Snake River water (Lake Sacagawea) with a water right priority dating to 1985. The modern water pumping plant was constructed under the prior land owner in 1975. The federal action (REMIS No. 543586) does not involve any facility alterations, or ground disturbance. Although four sites (45FR33, 45FR48, 45FR300 and 45FR475) lie within a mile of the easement, there are none within its APEAPE. The federal undertaking therefore has no potential to affect historic properties.</p>		
<p>PM-EC-2014-0031 4 (Figure 5)</p>	<p>The old Borchard Easement, DACW 68-2-72-65, is a 0.25 acre area in Section 28; T9N, R31E, Walla Walla County, Washington. The Corps intends to renew the easement and ROW for the operation and maintenance of the water pump plant and irrigation pipelines now four separate easements: a) Conley and Schultz, b) Flat Top Land, c) Goose Pond Ag. Inc., and d) Valley Roz. The 1971 built pump station is at Snake River Mile 6.5 on the south side of the McNary Reservoir (upper Lake Wallula). Additional facility pumps were added in 1973 and 1978, and one was overhauled in 2009. Priority water rights have been held by the landowners since the 1970s, e.g., Flat Top Land (1971), Goose Pond Ag. Inc. (1972), and Valley Roz Orchards (1978), and Connelly and Schultz (1978).</p> <p>There are eight intakes at the shared pump station: Valley Roz Orchards (No. 1), Conley and Schultz Farms (No. 2 and 3), and Flat Top Farms (No. 4-6) and Washington State Department of Natural Resources (No. 7-8). Flat Top Ranch, LLC has three pumps (150hp, 250hp and 300hp) and an intake pipe with a priority water right since 1971. Goose Pond Ag. Inc. has two pumps under a Corps construction easement and priority water right from 1972. The intake pipes fish screens (nylon or stainless steel) are cleaned annually either using internal water jet nozzles, or manually when inspected.</p> <p>The federal action, (REMIS No.s: Flat Top Farms (517870), Connelly and Schultz (409193), Goose Ponds (839935), and Valley Roz Orchards (546617), will not involve any facility alterations, or ground disturbance. Although there are four sites (45FR6, 45FR283, 45WW12 and Burbank Canal) within a mile of the project's APE. Though no archeological sites are located in the project APE, it is within a place of cultural and religious significance to the Yakama Nation, however, the APE was not identified as having specific cultural significance were identified (Woody 2006). The federal undertaking therefore has no potential to affect historic properties.</p>	<p>1-30-2015 Mary E. Keith</p>	<p>2-5-15 Rigden A. Glaab</p>
<p>PM-EC-2014-0031 5 (Figure 5)</p>	<p>The Premiere Farms Easement, DACW68-2-95-47, is a 0.11 acre area in Section 21; T9N, R31E, Franklin County, Washington. The easement was combined from one held by Johnson (DACW68-2-75-9) dating from 1974, and a second by Peterson (DACW68-2-95-47) from 1994. Each easement was for four water pumps on a shared 1970s water pump platform supported by a shared 1973 priority water right. The Corps will renew the current easement ROW for the operation and maintenance of six water pumps and seven stainless steel pipelines leading east to the Snake River (River Mile 6.5). The intake pipes' fish screens are cleaned annually by hand. The federal action (REMIS No. 753395) does not involve any facility alterations or ground disturbance. There are no documented archeological sites in the project APE, which lies in a place of cultural and religious significance to the Yakama Nation with no specific significance attached to the APE (Woody 2006). The pump plant facility will become 50 years of age within five years and there are four sites within a mile: 45FR6, 45FR283, 45WW12 and Burbank Canal. The pump plant is owned by the easement holder. The federal undertaking therefore has no potential to affect historic properties.</p>	<p>1-30-2015 Mary E. Keith</p>	<p>2-5-15 Rigden A. Glaab</p>
<p>PM-EC-2014-0031 6 (Figure 6)</p>	<p>The Kal Farms Easement, DACW68-2-72-66, is a 1.2 acres area in Section 28; T9N, R31E, Walla Walla County, Washington. The Corps will renew the easement for a ROW serving the operation and maintenance of a water pump plant, and pipeline leading north to the Snake River (River Mile 7). The facility has four pumps (three 800 hp and one 400 hp), and a pipe line with a stainless steel fish screen, which is cleaned annually by hand. The land owner's has held a primary water right since 1970. The modern water pump plant was installed between 1972 and 1974. The federal action (REMIS No. 191080) does not involve any facility alterations or ground disturbance. Although three sites (45WT06, 45WT475 and 45WW13) lie within a mile of the undertaking, no cultural properties are located in its APE. The federal undertaking therefore has no potential to affect historic properties.</p>	<p>1-30-2015 Mary E. Keith</p>	<p>2-5-15 Rigden A. Glaab</p>

<p>PM-EC-2014-0031 7 (Figure 7)</p>	<p>The Roy Anderson Easement, DACW68-2-86-72, is a 1.41 acres area in Section 25; T11N, R28E, Franklin County, Washington. The Corps will renew a ROW easement for a water pump plant and its pipeline extending west to the Columbia River. The facility is located east of Wooded Island's south end at River Mile 348.3. The easement language provides for the facility's operation and maintenance. The 8-inch diameter PCV intake pipe's stainless steel fish screen will be replaced with a Pacific-Ag Pump Rite screen to meet State criteria and cleaned annually. The historic water pumping plant was installed in 1965 with a priority water right for its pumps dating to 1986. There is also a certificate of surface water right on record dating to 1955. The federal action (REMIS No. 533662) does not involve any facility alterations, or ground disturbance.</p> <p>The project APE lies within archeological site 45FR251, a contributing site of the Hanford South Archeological District (45DT31A) (Western Heritage 1983). There are 21 sites within a mile of the project APE: 45FR21, 45FR252, 45FR23, 45BN35, 45BN41, 45BN107, 45BN109, 45BN166, 45BN167, 45BN168, 45BN693, 45BN694, 45BN703, 45BN740, 45BN702, 45BN703, 45BN704, 45BN1240, 45BN1243, 45BN1253, and 45BN1294. Site 45FR251 along with four nearby sites, comprise the Taylor Flat Complex (Cleveland 1976). Barkley et al. (1998) state during construction of the pump station, the immediate shoreline was excavated inland to accommodate the facility and artifacts line the excavated perimeter. The low density fishing camp of the Tucannon and Harder phases was confirmed eligible for the National Register (Hannum 2001 and Thoms 1983:141). The APE lies in a place of cultural and religious significance to the Confederated Tribes of the Umatilla Indian Reservation though with no specific identified significance for the APE (Farrow 2002). The 50 year old facility continues to function as originally designed. Although permanently affixed to Corps land, the facility is owned by the easement holder. The federal undertaking therefore has no potential to affect historic properties.</p>	<p>1-30-2015 Mary E. Keith</p>	<p>2-5-15 Rigden A. Glaab</p>
<p>PM-EC-2014-0031 8 (Figure 8)</p>	<p>The Kosmata Easement, DACW68-2-06-03, is in Section 25; T10N, R28E, Benton County, Washington. The Corps will renew the easement and ROW for this existing McNary Lock and Dam Project water pumping plant and its irrigation distribution pipeline in support its operation and maintenance. There is one pipe intake and pump located on the west side of the Columbia River at the upper end of Lake Wallula (McNary Reservoir). The PVC pump intake pipe with a Pump-Rite model MM-L15 fish screen is annually installed for use during the irrigation season as per owner's water right held since 1980. The PVC slotted fish screen is cleaned manually. The modern residential water pump plant was installed in 1992, a modern feature. The federal action (REMIS No. 735060) does not involve any facility alterations, or ground disturbance. Archaeological sites within a mile of the APE include: 45BN26, 45BN27, 45BN44, 45BN45, 45BN101, 45BN186, 45BN582, 45BN1537, and 45FR19. Although within the Hanford South Archeological District (DT39), no documented sites lie in the project APE. The APE lies in a place of cultural and religious significance to the Confederated Tribes of the Umatilla Indian Reservation though with no specific identified significance for the APE (Farrow 2002). The federal undertaking therefore has no potential to affect historic properties.</p>	<p>1-30-2015 Mary E. Keith</p>	<p>2-5-15 Rigden A. Glaab</p>
<p>PM-EC-2014-0031 9 (Figure 8)</p>	<p>The Lewis O'Hearn Easement, DACW68-2-92-7, is a 0.02 acre area in Section 26; T10N, R28E., Benton County, Washington. The Corps will renew the easement for a ROW serving the operation and maintenance of a water pump and 2-inch diameter stainless steel pipeline leading east to the Columbia River in the upper McNary Reservoir. The partially pipeline's fish screen is cleaned annually by hand. The land owner's has held a primary water right since 1966. The modern residential water pumping plant was installed the same year. The federal action (REMIS No. 016254) does not involve any facility alterations, or ground disturbance and has no archeological sites in its APE. The APE lies in a place of cultural and religious significance to the Confederated Tribes of the Umatilla Indian Reservation though with no specific identified significance for the APE (Farrow 2002). The federal undertaking therefore has no potential to affect historic properties.</p>	<p>1-30-2015 Mary E. Keith</p>	<p>2-5-15 Rigden A. Glaab</p>
<p>PM-EC-2014-0031 10 (Figure 8)</p>	<p>The Zirkle Easement, DACW68-2-01-18, is in Section 25; T10N, R28E, Benton County, Washington. The Corps will renew the easement and ROW for this existing McNary Lock and Dam Project water pumping plant and its irrigation distribution pipeline in support its operation and maintenance. There is one pipe intake and pump located on the west side of the Columbia River at the upper end of Lake Wallula (McNary Reservoir). The pump is out of the water during the winter beginning in November. The PVC pipe has a 4 by 18-inch size fish screen made of stainless steel cleaned of debris manually. The Zirkle Easement has held a water priority right dating to 1980. The modern residential water pump plant dates to 2001. The federal action (REMIS No. 318995) does not involve any facility alterations, or ground disturbance.</p>	<p>1-30-2015 Mary E. Keith</p>	<p>2-5-15 Rigden A. Glaab</p>

	Sites within a mile of the project APE include: 45BN26, 45BN27, 45BN44, 45BN45, 45BN101, 45BN186, 45BN582, 45BN1537, and 45FR19. Although within the Hanford South Archeological District (DT39), no documented sites lie in the project APE. The APE lies in a place of cultural and religious significance to the Confederated Tribes of the Umatilla Indian Reservation though with no specific identified significance for the APE (Farrow 2002). The federal undertaking therefore has no potential to affect historic properties.		
PM-EC-2014-0031 11 (Figure 8)	The Wadhwa Easement , DACW68-2-01-17 is in Section 25; T10N, R28E, Benton County, Washington. The Corps will renew the easement and ROW for an existing McNary Lock and Dam Project water pumping plant and its irrigation distribution pipeline to support its operation and maintenance. There is one pipe intake and pump located on the west side of the Columbia River at the upper end of Lake Wallula (McNary Reservoir). The pump is removed from the reservoir each winter beginning in November. The pipe has a 30 series fish screen made of stainless steel with anodized aluminum insides. The Wadhwa Easement has held a water right with a priority right dating to 1980. The modern water pumping plant dates to 2001. The federal action (REMIS No. 183145) does not involve any facility alterations or ground disturbance. Archeological sites within a mile of the easement include: 45BN26, 45BN27, 45BN44, 45BN45, 45BN101, 45BN186, 45BN582, 45BN1537, and 45FR19. The project APE lies within the Hanford South Archeological District (DT39) and a place of cultural and religious significance to the Confederated Tribes of the Umatilla Indian Reservation. However, the APE includes no sites, and has no specific identified cultural significance (Farrow 2002). The federal undertaking therefore has no potential to affect historic properties.	1-30-2015 Mary E. Keith	2-5-15 Rigden A. Glaab
PM-EC-2014-0031 12 (Figure 8)	The Stacheli Easement , DACW68-2-02-07, is in Section 25; T10N, R28E, Benton County, Washington. The Corps will renew the easement and ROW for the operation and maintenance of a residential water pump plant and irrigation distribution pipeline. The pump and pipe intake lie off the west side of the Columbia River (upper Lake Wallula, McNary Reservoir). The PVC pump intake pipe with a Pump-Rite model MM-L15 fish screen is annually installed for use during the irrigation season. The 1980 priority water right was originally acquired by the previous owner, Fred Albaugh. The PVC slotted fish screen is cleaned manually and the pipe is removed twice daily during the irrigation season. The modern residential water pump plant was installed in 2001. The federal action (REMIS No. 979585) does not involve any facility alterations, or ground disturbance. Those sites within a mile include: 45BN26, 45BN27, 45BN44, 45BN45, 45BN101, 45BN186, 45BN582, 45BN1537, and 45FR19. The project APE lies within the Hanford South Archeological District (DT39) and a place of cultural and religious significance to the Confederated Tribes of the Umatilla Indian Reservation. However, the APE includes no sites, and has no specific identified cultural significance (Farrow 2002). The federal undertaking has no potential to affect historic properties.	1-30-2015 Mary E. Keith	2-5-15 Rigden A. Glaab
PM-EC-2014-0031 13 (Figure 9)	The City of Richland Easement , DA-45-164-CIVENG-63-46, is a 0.86 acre area in Sections 35 and 36; T10N, R28E, Benton County, Washington. The Corps will renew the easement and ROW for the operation and maintenance of a city domestic water supply intake structure, and overflow pipeline from the Snyder Road filtration plant east to the Columbia River (upper Lake Wallula). The 12 gauge galvanized steel pipeline's manually operated rotating screen, 34-foot long by 6.5-foot wide in size, is routinely spray washed. The City of Richland installed the water pumping plant in 1962 and acquired its primary water right. The federal action (REMIS No. 986644) does not involve any facility alterations or ground disturbance. Archeological sites within a mile of the project's APE include: 45BN26, 45BN44, 45BN45, 45BN101, 45BN186, 45BN191, 45BN582, and 45FR19. Although within the Hanford South Archeological District (DT39), no documented sites lie in the project APE. The federal undertaking therefore has no potential to affect historic properties.	1-30-2015 Mary E. Keith	2-5-15 Rigden A. Glaab

<p>PM-EC-2014-0031 14 (Figure 10)</p>	<p>The Central Pre-Mix Concrete Easement, DACW68-2-96-24, is a 0.10 acre area in Section 12; T9N, R28E., Franklin County, Washington. The Corps will renew the easement for the operation and maintenance of a ROW serving a water pump, access road, an electrical line, and a stainless steel intake pipeline that leads east to the Columbia River (River Mile 337). The federal action (REMIS No. 894684) does not involve any facility alterations, or ground disturbance. The pipeline's fish screen is cleaned annually by hand. The prior company owner, Charles Schmitz, acquired a surface water right in 1955 for the purpose to wash gravel. The 1996 Corps easement was for the construction of the water pump plant. The intake pipe was re-furnished in 1994. The project's APE is located within an informally documented cultural property (Farrow 2002) without specific significance documented for the project APE. There are documented sites (45BN23, 45BN24, 45BN329, 45BN583, 45BN1481, and 45FR17) within a mile of the easement, but none within its APE. The project APE lies within a place of cultural and religious significance to the Confederated Tribes of the Umatilla Indian Reservation. However, the APE includes no specific identified areas of cultural significance (Farrow 2002 and Woody 2006). The federal undertaking therefore has no potential to affect historic properties.</p>	<p>1-30-2015 Mary E. Keith</p>	<p>2-5-15 Rigden A. Glaab</p>
<p>PM-EC-2014-0031 15 (Figure 10)</p>	<p>The City of Pasco Easement, DACW68-2-92-4, is a 1.144 acres area in Section 18; T9N, R29E, and Section 31; T9N,R,31E., Franklin County, Washington. The Corps will renew the easement for a ROW serving the operation and maintenance of a water pump plant and 30-inch diameter pipeline leading west to the Columbia River (River Mile 336.1). The pipeline extends to within the US-1658 highway ROW. Its intake pipe fish screen is cleaned annually. The easement primary water right dates to 1963 and a super-ceding water right since 1971. The previous easement holder was Thomas A. Kidwell Farm, Inc. who installed the plant in approximately 1990 and its intake pipe in 2003. The federal action (REMIS No. 321658) does not involve any facility alterations or ground disturbance. Although there are no documented cultural resources in the project APE, there are six archaeological sites within a mile (45BN23, 45BN24, 45BN46, 45BN329, 45BN1481, 45BN1725, 45FR15, 45FR16 and 45FR17). The APE is within an informally documented cultural property of cultural and religious significance to the Confederated Tribes of the Umatilla Indian Reservation (Farrow 2002; Woody 2006). In summary, no archeological sites lie in the project APE, and there are no planned improvements or anticipated ground disturbances. The federal undertaking therefore has no potential to affect historic properties.</p>	<p>1-30-2015 Mary E. Keith</p>	<p>2-5-15 Rigden A. Glaab</p>
<p>PM-EC-2014-0031 16 (Figure 11)</p>	<p>The Badger Mountain Irrigation District, DACW68-2-76-36, is a 1.41 acres area in Section 23; T9N, R28E, Walla Walla County, Washington. The Corps will renew the ROW easement for the operation and maintenance of a water pump plant, two transformers and pipeline leading northeasterly to the Yakima River (River Mile 3.4). The facility irrigates up to 1240 acres annually using pumps and an intake pipeline. The intake's stainless steel fish screen is cleaned annually by hand and mechanically. The land owner's has held a primary water right since 1973. The modern water pumping plant was installed in 1976. The federal action (REMIS No. 744189) does not involve any facility alterations, or ground disturbance. Although there are three sites (45BN51, 45BN296 and 45BN1328) within the project's one mile vicinity, none lie within its APE. The project is located within an informally documented property of cultural and religious significance. However, no specific significance is attached to the immediate project APE (Farrow 2002 and Woody). The federal undertaking therefore has no potential to affect historic properties.</p>	<p>1-30-2015 Mary E. Keith</p>	<p>2-5-15 Rigden A. Glaab</p>
<p>PM-EC-2014-0031 17 (Figure 14)</p>	<p>The Farmland Reserve Easement (formerly AgriNorthwest), DACW68-2-91-11, is a 1.144 acres area in Section 2; T5N, R28E, Benton County, Washington. The easement dates to 1976 then under the "Utah-Idaho Sugar Company" and their priority water right to 1970. Farmland Reserve acquired this easement and its water rights in 2009. The Corps will renew the easement for a ROW serving the operation and maintenance of a water pump plant and pipeline leading south to the Columbia River (River Mile 293). The modern water pump plant was installed in approximately 1980 and additional pumps installed in the 1990s. The intake pipe's fish screen is cleaned annually. The federal action (REMIS No. 842989) does not involve any facility alterations, or ground disturbance. There are no archeological sites in the project APE. However, seven sites (45BN01, 45BN02, 45BN187, 45BN252, 45BN1449, 45UM02, and 45UM03) are within a one-mile vicinity. The nearest site (45BN02) lies inundated on the same Columbia River bench approximately 100 meters from the APE. The use and maintenance of the modern facility would involve no planned ground disturbances</p>	<p>1-30-2015 Mary E. Keith</p>	<p>2-5-15 Rigden A. Glaab</p>

	and no sites lies within the project APE . The APE lies within a place of cultural and religious significance to the Confederated Tribes of the Umatilla Indian Reservation. However, it was not identified as having specific cultural significance (Farrow 2002). Thus, the federal undertaking has no potential to affect historic properties.		
PM-EC-2014-0031 18 (Figure)	The C-2L Incorporated-JB Land, LLC Easement , DACW68-2-73-94, is a 1.85 acre area in Section 18; T5N, R30E, Umatilla County, Oregon. The Corps will renew a ROW easement for the operation and maintenance of a water supply intake structure, and pipeline extending north to the Columbia River (lower Lake Wallula). The AgriNorthwest owned facility at Columbia River Mile 301 irrigates just under a 1000 acres. There are four pumps (500hp each), and a 30-inch diameter pipe line with a stainless steel fish screen cleaned annually by hand. The pipeline ROW crosses under the Pacific Railroad. The land owner's have held a primary water right since 1972. The modern water pumping plant was installed in 1994. The federal action (REMIS No. 030107) does not involve any facility alterations or ground disturbance. There are no documented cultural resources in the project's APE . However, it lies within a place of cultural and religious significance to the Confederated Tribes of the Umatilla Indian Reservation, but attaches no identified specific cultural significance (Farrow 2002). The federal undertaking therefore has no potential to affect historic properties.	1-30-2015 Mary E. Keith	2-5-15 Rigden A. Glaab
PM-EC-2014-0031 19 (Figure 12)	The Royale Columbia Farms Easement currently under C-2L Incorporated-JB Land, LLC Easement, DACW68-2-74-55, is a 0.77 acre area in Sections 7 and 8; T5N, R30E, Umatilla County, Oregon. The Corps will renew the easement for a ROW serving the operation and maintenance of a water pump plant, and pipeline leading northwest to the Columbia River (lower Lake Wallula). The facility is located between State Highway 730/395 and reservoir at Columbia River Mile 301.5 and is used to irrigate 2115 acres south of the highway. The facility uses four pumps (three at 800 hp and one at 400 hp), and a pipe line with a stainless steel fish screen cleaned annually by hand. The land owner's has held a primary water right since 1970. The modern water pumping plant was installed in 1994. Drifting sands have covered two-thirds of the pipeline and a portable dredging system will be used for its removal from the reservoir. The federal action (REMIS No. 620895) does not involve any facility alterations, or ground disturbance. There are five inundated archeological sites within a mile of the project's APE . The nearest site (35UM11) lies approximately 50 meters from the APE. The location, within a place of cultural and religious significance to the Confederated Tribes of the Umatilla Indian Reservation, has no specific identified cultural significance (Farrow 2002). The federal undertaking therefore has no potential to affect historic properties.	1-30-2015 Mary E. Keith	2-5-15 Rigden A. Glaab
PM-EC-2014-0031 20 (Figure 13)	The Superior Easement currently under C-2L Incorporated-JB Land, LLC Easement, DACW68-2-96-24, is a 1.85 acre area in Section 7 and 18; T5N, R30E, Umatilla County, Oregon. The Corps will renew a ROW easement for the operation and maintenance of a water supply intake structure, and pipeline extending northeast to the Columbia River (lower Lake Wallula). The Corps owned pipeline ROW crosses under the Pacific Railroad property. The easement's primary water right (1972-present) supports the modern water pumping plant installed in 1994. The federal action (REMIS No. 030107) does not involve any facility alterations, or ground disturbance. There are no documented cultural resources in the project's APE. However, it lies within a place of cultural and religious significance to the Confederated Tribes of the Umatilla Indian Reservation, but attaches no identified specific cultural significance (Farrow 2002). The federal undertaking therefore has no potential to affect historic properties.		
PM-EC-2014-025 (Figures 15 and 16)	The proposed LaMothe License , a 5-year term real estate instrument, located in Section 19; 9TN, R29E. The license will allow use and maintenance of an existing residential boat launch system. The 8-foot wide by 38-foot long project area is on the northeast side of McNary Reservoir (Lake Wallula) at Columbia River Mile 335. A Corps Operations shoreline permit was issued to a previous land owner in 1985 to construct and use the boat launch under the 1983 Walla Walla District's McNary Shoreline Plan. A new real estate license will allow continued use and maintenance. The boat launch's ground level double rails extend south from the LaMothe's boat house to the Lake Wallula shoreline through a lawn encroachment on Corps land. The shoreline reservoir fluctuation zone has exposed mineral soils due to deflation among riparian plant species. At the end of the boat rails, there are small angular rocks in the reservoir indicating soil loss due to erosion. The owner anticipates using their motor	Mary Keith 2/3/1025	2-5-15 Rigden A. Glaab

	<p>boat about six times a year. A portable dock alongside the motor boat enables boat access at the shoreline.</p> <p>Nearby federal reviews such as Keith's (1999) for land encroachments, and Sharpe et al. (2013) for boat docks along with Dickson's (1999) reservoir-wide inventory document the immediate area's cultural context. The project's APE lies in informally documented properties of cultural and religious significance identified by the Confederated Tribes of the Umatilla Indian Reservation and the Yakama Nation (Farrow 2000 and 2002, Woody 2006). However, there will be minimal annual boat launch use, and no visual, ground surface, access impediments, or fishery disturbances. The project APE is also within historic property 45FR15 (Jaehnig 2001), a contributing archeological site to the Tri-Cities Archeological District (45DT041). Identified by Smith (1947), the site has been re-recorded and monitored (Butler et al. 1998, Dickson 1999 and 2011, and Shellenberger (2013). Historic preservation language in the new license will require the licensee to request additional Corps review under National Historic Preservation Act for any planned ground disturbances, which will document the agency's consideration for potential project affects. The project, as proposed, has no potential to affect historic property 45FR15.</p>		
PM-EC-2014-025 (Figure 17 and 18)	<p>The proposed federal undertaking (REMIS 203504) is a new Corps lease agreement with the Oregon Department of Transportation (ODOT) in Section 5; T5N,R 29E, of Umatilla County, Oregon. The easement will allow the construction and maintenance of new light signals, and associated side wall with two handicap access ramps at the intersection of Devore Road and Highway 730. The sidewalk installation would result in approximately five cubic yards of excavation.</p> <p>The ODOT reviewed this construction project in 2013 for its potential to affect cultural resources examining the entire project APE that runs through the City of Hermiston and the small area on Corps property. The ODOT determined the undertaking will have "No Historic Properties Affected" using the Federal Highway's Administration's (FHWA) Stipulation 4C of a NHPA-based programmatic agreement, between FHWA, ODOT, and OR SHPO, in their review process. An Inadvertent Discovery Plan was created for the project's construction phase.</p> <p>The Oregon SHPO and affected tribes both accepted the State agency's determination. Both the Warm Springs and CTUIR Tribes were consulted. The former tribe required to be notified of cultural resources findings during construction. The CTUIR agreed the Inadvertent Discovery Plan was appropriate for the undertaking after review of additional project information and preliminary plans.</p>	Mary E. Keith February 13, 2015.	

(NOTE: Accompanying Figures are not presented due to site sensitive information that is exempt from public disclosure.)

Acronyms: APE – Area of Potential Effect, a National Historic Preservation Act term.

Corps – Walla Walla District, U.S. Army Corps of Engineers.

CTUIR - Confederated Tribes of the Umatilla Indian Reservation.

ESA Endangered Species Act of 1973

NHPA – National Historic Preservation Act of 1966

NR - National Register of Historic Places

PIT - Passive Integrated Transponder, used with a sensor to read microchip attached to study fish.

PVC - Polyvinyl chloride, a pipe manufacturing material

REMIS – Real Estate Management Information System

ROW – Right-of-Way

T. R.N.E. – Township, Range, Northing, Easting

U.S. - United States

Yakama Nation – Confederated Tribes and Bands of the Yakima Reservation.

References:

Butler, J. and S. Steinmetz

1998 Cultural Resources Site Report, 45FR15, Cultural Resource Protection Program, Confederated Tribes of the Umatilla Indian Reservation. In McNary Reservoir Cultural Resource Inventory Survey Report. Prepared for U.S. Army Corps of Engineers, Walla Walla District under contracts DACW68-68-P-0123 and DACW68-98-P-01234.

Barley, L., J. Wyena, E. Aleck and S. Steinmetz

1998 Cultural Resources Site Report for 45FR251. In *McNary Reservoir Cultural Inventory Survey*. Report prepared by Catherine Dickson for the U.S. Army Corps of Engineers, Walla Walla District by the Confederated Tribes of the Umatilla Indian Reservation, Cultural Resources Protection Program, Pendleton.

Dickson, Catherine E.

1999 McNary Reservoir Cultural Resource Inventory Survey Report. Cultural Resource Protection Program, Confederated Tribes of the Umatilla Indian Reservation. Prepared for U.S. Army Corps of Engineers, Walla Walla District under contracts DACW68-68-P-0123 and DACW68-98-P-01234.

2011 Inventory of Unsurveyed Lands within the Project Area, Umatilla County, Oregon and Franklin and Walla Walla Counties, Washington. Prepared for the U.S Army Corps of Engineers, Walla Walla District, Contract W912EF-08-D-0014, Task Order 10.

Farrow, Tearra

2000 Assessment of Identifiable Traditional Cultural Properties with WRDA '96 Land Conveyance in the Vicinity of Richland, Pasco, and Kennewick, Washington.

2002 Summary Report for the Assessment of Identifiable Traditional Cultural Properties Located on Corps Land of Engineers Land, Southeastern Washington, Northeastern Oregon, and Northwestern Idaho. Cultural Resources Protection Program, CTUIR, Pendleton.

Hartmann, Glenn D

1986 Preliminary Test Excavation at Three Prehistoric Archaeological Sites in Franklin County, Washington. Report 100-56, Eastern Washington University Reports in Archaeology and History, Archeological and Historical Services, Cheney.

Hannum, Michelle M.

2001 Evaluations of 23 Cultural Properties Along the McNary Reservoir, Umatilla County, Oregon and Benton, Franklin and Walla Walla Counties, WA. Hemisphere Field Services, Inc. Minneapolis. Submitted under contract to U.S. Army Corps of Engineers, Walla Walla District, Walla Walla.

Jaehrig, Manfred

2001 McNary Reservoir Site Evaluation II, Benton, Franklin, and Walla Walla Counties, Washington. Submitted to the U.S. Army Corps of Engineers, Walla Walla District, under contract number DACW68-00-P-65.

Keith, Mary

1999 Cultural Resource Inventory Report Tri-Cities Property Encroachments. U. S. Army Corps of Engineers, Walla Walla District, Walla Walla.

Sharpe, James and Raena De Maris

2013 Cultural Resources Survey Report for Nine Boat Docks Within the McNary Reservoir in Benton and Franklin County, Washington. Columbia Valley Archaeological Services, LLC. In McNary Dock Permits and Staircases Licenses for Nine Proposed Docks Under the McNary Shoreline Management Plan by Scott Hall, U.S. Army Corps of Engineers, Walla Walla District, Walla Walla.

Shellenberger, Jon

2013 TCP and Archaeological Monitoring at McNary Reservoir, FY 2012. Prepared for U.S. Army Corps of Engineers, Walla Walla District. Yakama Nation, Toppenish.

Smith, H.

1947 Washington State Archaeological Site Inventory Form, 45FR15. On File at Washington State Department of Archaeology and Historic Preservation, Olympia.

Thoms, Alston

1983 Archaeological Excavations in Upper McNary Reservoir: 1981-1982. Project Report 15, Laboratory of Archeology and History. Washington State University, Pullman.

Western Heritage

1983 Archaeological Site Form 45DT39A, Department of Archeology and Historic Preservation, Olympia. Western Heritage.

Woody, Dave

2006 Identification of Traditional Cultural Property Type/Subtype Locations Associated with the Confederated Tribes and Bands of the Yakama Nation for the McNary and Ice Harbor Reservoirs. Prepared for the U.S. Corps of Engineers, Walla Walla District, Contract No. W912EF-05-C-25.