US Army Corps of Engineers ®
Walla Walla District
BUILDING STRONG®

ST. HILAIRE FARMS COLUMBIA RIVER PUMP STATION EXPANSION AND EAST IMPROVEMENT DISTRICT NEW PUMP STATION

REAL ESTATE AMENDMENT AND NEW EASEMENT

MCNARY LOCK AND DAM

ENVIRONMENTAL ASSESSMENT

PM-EC-2018-0043

REMIS Task #624194 and #660324

February 2018

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SECTION 1 - INTRODUCTION

1.1 INTRODUCTION

1.1.1 Background Information

St. Hilaire Brothers Hermiston Farm, LLC (St. Hilaire or JSH Farms) currently owns and operates an existing irrigation pump station located at River Mile 301.7 on the middle Columbia River in Umatilla County, Oregon (Figure 1-1). Their existing station consists of seven 800 horsepower pumps and has a total water withdrawal capacity of approximately 27,600 gallons per minute (gpm) [61.4 cubic feet per second (cfs)]. From the river station a 30-inch cement-mortar lined steel discharge pipe runs south approximately 9,200 feet to the farm's main booster pump station. The main booster pump station currently has two 400 horsepower and four 250 horsepower pumps. This existing pump station provides irrigation water to JSH Farms, which comprises about 4,200 acres of farmland in Umatilla County. JSH Farms operates their irrigation system starting in March, peaking in June through July, and shutting down in October.

In 1972, the U.S. Army Corps of Engineers, Walla Walla District (Corps) issued an easement to Joanne Kosmos for the initial construction of, and subsequent operation and maintenance of, an irrigation pump station in this location. The pump station easement was transferred to St. Hilaire in August 2007. Then in 2013, the Corps issued an easement amendment to St. Hilaire to expand the original easement area by approximately .32 acre (submerged area) and to extend the irrigation water intake pipeline and its appurtenant facilities 180 feet further into the Columbia River. Therefore, the total area in the St. Hilaire easement is currently .6 acre.

Over the last decade, the State of Oregon has given support and committed resources to addressing the water shortage issue in the Lower Umatilla Basin, and specifically in the critical groundwater areas. Only about a third of the permitted groundwater has been allowed to be pumped by the Oregon Water Resource Department (OWRD) in the critical groundwater areas. This has resulted in thousands of acres left fallow each year. At an average estimated value to the economy of around $9,000 per acre, the impact is substantial. The latest effort supported by the Oregon Governor's Office and state legislature, and partially funded through grant monies from OWRD, would be to bring water from the Columbia River to those areas and farmlands impacted by the water shortage.

1.2 PURPOSE AND NEED

The purpose of the proposed action is for St. Hilaire and the East Improvement District (EID) to consolidate the transfer of existing, and issuance of new, "mitigated" Columbia River water rights to a centralized point of diversion for irrigation purposes. The project is needed due to an ongoing and critical groundwater shortage issue in the Lower Umatilla Basin, which is detrimental to farming practices. Alternatives considered must: (1) adequately address critical groundwater shortage in the Lower Umatilla Basin basalt aquifers, (2) be technically feasible, and (3) be environmentally acceptable.

Figure 1-1: Project Location.

1.3 DESCRIPTION OF THE FEDERAL ACTION

This Environmental Assessment (EA) evaluates a number of Federal actions (approvals/permits) associated with a proposed expansion of the St. Hilaire pumping station, and construction of a new pumping station to be owned and operated by the EID, on the middle Columbia River (Lake Wallula), as described in detail below and shown in (Figures 1-3 and 1-4).

The Corps is proposing to amend St. Hilaire's existing pump station Real Estate easement to allow for the expansion of their existing irrigation pump station. The Corps is also proposing to issue a new easement to the EID for the construction of a new pumping station within St. Hilaire's existing easement area/footprint. The new, adjacent pumping station would be owned and operated by EID, which is comprised of nine farms that own over 28,000 acres of farmland. The new EID pump station would also be able to provide water to an additional 29 farms representing an additional 19,000 acres. The Corps also intends to issue St. Hilaire and EID a Clean Water Act (Section 404), and a River and Harbor Act (Section 10), permit for in-water actions associated with expansion and construction of the pump stations, as well as a short-term real estate license for the removal of a section of old Highway 30 in Boardman, Oregon as compensatory mitigation associated with the issuance of such Regulatory permits (Figure 1-2).

The US Fish and Wildlife Service (USFWS) is proposing to issue St. Hilaire and EID separate rights-of-way for pipelines associated with the pump stations, where such pipelines would cross through/over the McNary National Wildlife Refuge (MNWR) at two (2) locations.

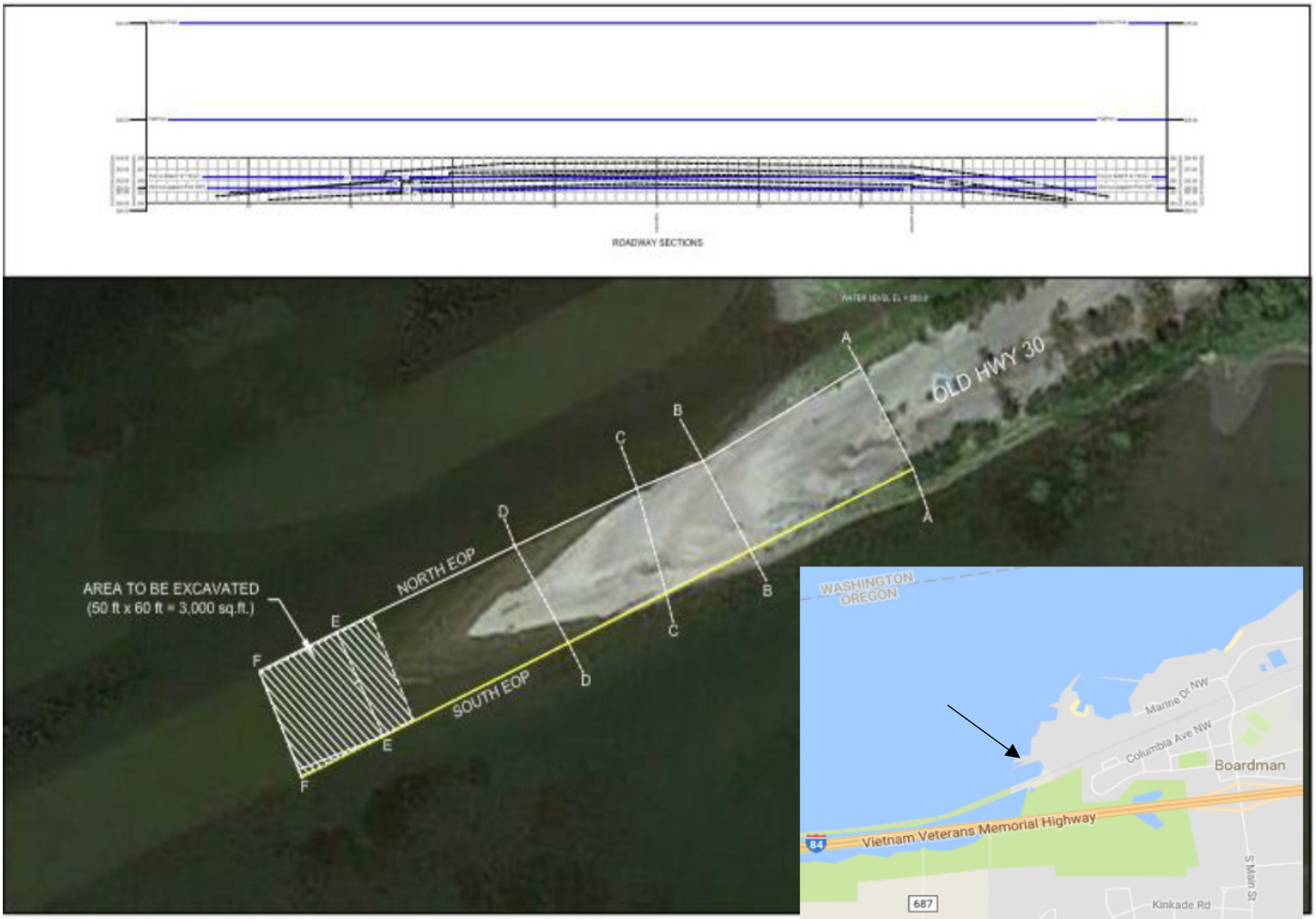

Figure 1-2: Proposed Mitigation Site near Boardman, Oregon.

The proposed expansion of St. Hilaire's pump station would include installation of three new pumps adding 3,800 horsepower, and a new 42-inch diameter discharge pipe; which would increase the station's withdrawal capacity from 61.4 cfs to 100 cfs. The new pumps would be housed in 42-inch diameter "cans" connected to the existing 60-inch diameter intake pipe via three 26-inch diameter steel "pup" pipes. In order to accommodate the new pump cans, the existing station deck would be expanded approximately 15 feet to the east. The new section of 42-inch discharge pipe would then be connected to the pump can "pups" via a manifold. The proposed 42-inch discharge pipe would extend south toward the shoreline and would be supported above the water on two pipe cradles, each secured to the river bed by a pair of 12.75-inch diameter steel piles (Figure 1-3). When this discharge pipe leaves the river, it would be trenched underground through upland and would tie into an existing irrigation pipe approximately 0.5 mile to the south.

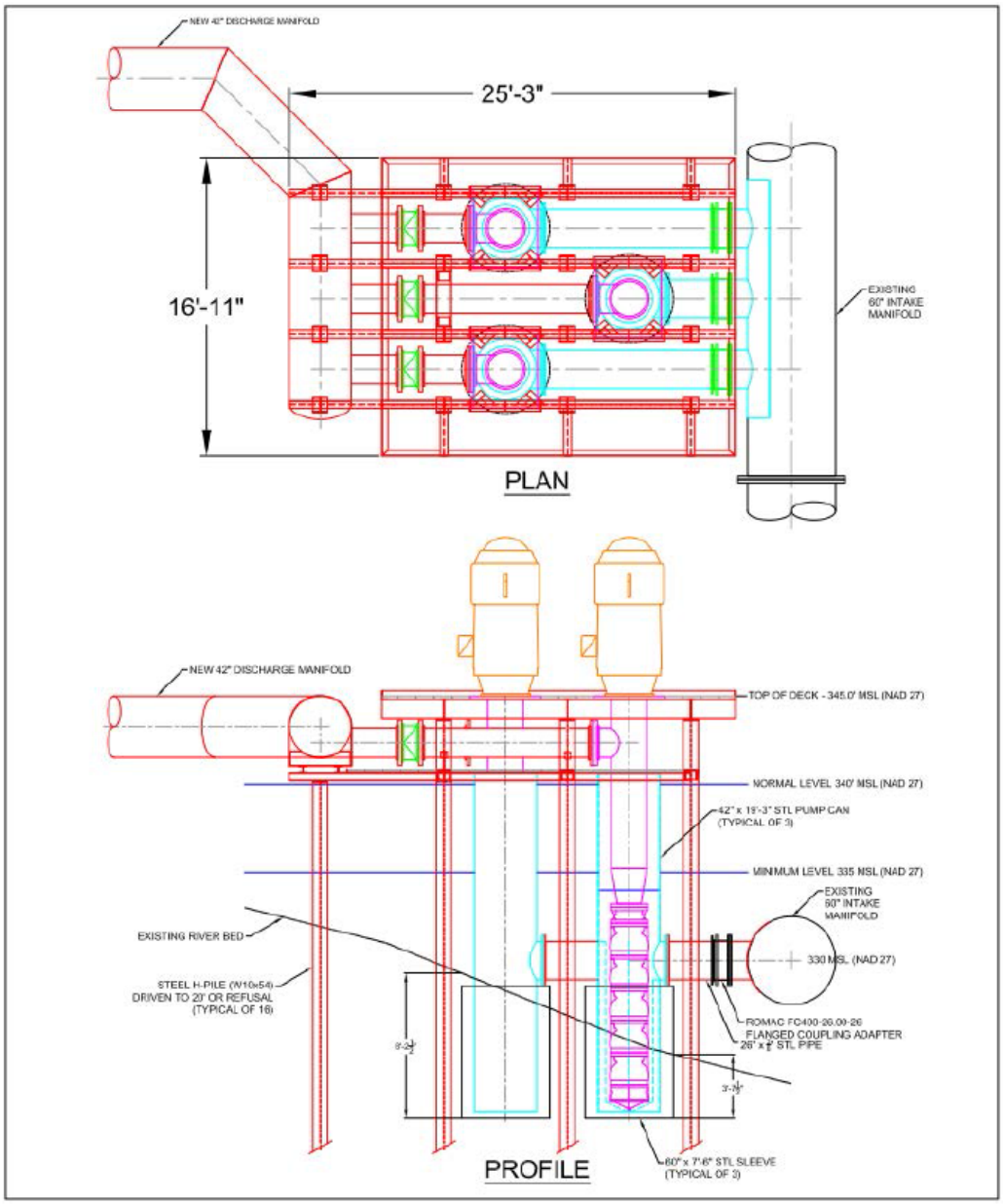

Figure 1-3: St. Hilaire pump station expansion plan and profile.

The proposed new EID pump station would be owned and operated by the EID and would be an entirely new system. It would consist of a new station deck, ten new pumps, a new intake pipe, four new intake screens, and a new discharge pipe. It would be designed for a water withdrawal capacity of up to 200 cfs. The new pump station and intake would extend approximately 350 feet out from the shoreline into the Columbia River.

The compensatory mitigation is being proposed because the expansion/new pump station would cause the permanent displacement of approximately 0.066 acre of aquatic habitat. The proposal is for St. Hilaire to remove approximately 3,000 square feet of existing concrete and asphalt debris from below the ordinary high water mark (OHWM) associated with the old Highway 30 in Boardman, Oregon (located approximately 33 miles downstream) on the

Columbia River (Figure 1-2). The removal of the existing concrete/asphalt debris would increase the available substrate area below the OHWM, therefore providing viable shallow water habitat beneficial for salmonids near the shoreline.

All of the proposed new discharge pipes would be trenched underground through upland as they leave the shoreline site, and would cross through two sections of the MNWR (Figure 1-4) administered by the USFWS. The USFWS is proposing to issue St. Hilaire and EID separate rights-of-way for pipelines associated with the pump stations, where such pipelines would cross through/over the MNWR at two (2) locations. Once the discharge pipes leave Federally managed land they would continue south on private property.

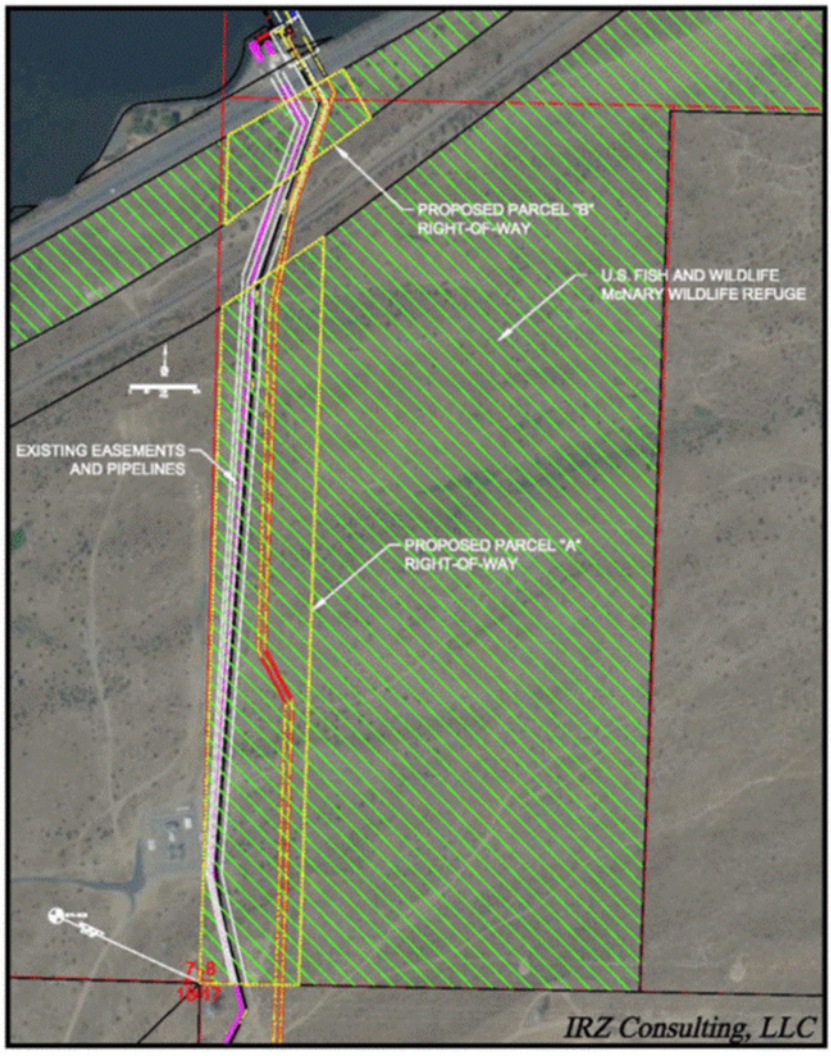

Figure 1-4: Proposed right-of-way across the USFWS McNary Wildlife Refuge.

The Corps of Engineers, Walla Walla District, as the lead Federal agency, has prepared this EA, on behalf of itself and the USFWS, for proposed Federal permits/approvals necessary for an expansion of the St. Hilaire pumping station, and construction of a new EID pumping station, on

the middle Columbia River (Lake Wallula), Umatilla County, Oregon. The Corps is the lead for this EA. The USFWS is a cooperating agency and will assist in the preparation of, and ultimately adopt, the EA and issue their own Finding of No Significant Impact (FONSI) if determined appropriate.

The Corps and the USFWS have prepared this EA in accordance with the Council on Environmental Quality (CEQ) *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act (NEPA),* Title 40 Code of Federal Regulations (CFR), Part 1500-1508 and associated agency supplemental regulations (Engineer Regulation 200-2-2 for the Corps). The objective of the EA is to evaluate potential environmental effects of the Federal Project. If the Corps determines such effects are relatively minor, and would have no significant environmental effects, the Corps would sign a FONSI and would proceed with the Federal action. If the Corps determines the environmental effects would be significant, the Corps would prepare an Environmental Impact Statement (EIS) before a decision is reached on how to implement the Federal Project. Applicable laws under which these effects would be evaluated include but are not limited to, NEPA, the Endangered Species Act, the Clean Water Act, the Clean Air Act, and the National Historic Preservation Act.

The National Environmental Policy Act is a full disclosure law, providing for public involvement in the NEPA process. All persons and organizations that have a potential interest in this proposed action – including the public, other Federal agencies, state and local agencies, Native American tribes, and interested stakeholders – are encouraged to participate in the NEPA process.

1.4 SCOPE OF THE PROPOSED FEDERAL ACTION

This EA does not assess potential effects associated with water intake withdrawals. The Corps and USFWS are not granting St. Hilaire/EID any right to use/withdraw water from the Columbia River. St. Hilaire/EID's right to withdraw water is the result of state issued/recognized water rights. The State of Oregon decides where (and for what purpose) water within the state will be put to beneficial use, not the Corps or USFWS. If St. Hilaire/EID were unable to withdraw such water at the proposed location, it is reasonable to believe they would find an alternative withdrawal site/source, or the state would designate a different beneficial use for such water elsewhere (consumptive or in-stream). Additionally, the proposed Federal action would not increase water withdrawals, as the intent of the St. Hilaire pump station expansion, and construction of the EID pump station, is to consolidate the transfer of existing and new "mitigated" (bucket-for-bucket) Columbia River water rights to a single point of diversion. All proposed new water withdrawal for both stations (38.6 cfs for St. Hilaire and 200 cfs for EID) would be procured through the transfer of existing irrigation water rights totaling 200.00 cfs, and the issuance of 94.11 cfs of new mitigated water rights. The 55.51 cfs of additional available water rights (i.e., beyond the 238.6 cfs withdrawal capacity) would allow the station owners flexibility in transferring water rights based on seasonal use. All new water rights would be mitigated "bucket-for-bucket" at or above the point of impact, as required through the OWRD water-use permit application process (OAR 690-033-0120).

The Federal action described above in Section 1.3 is associated with a larger private irrigation project (LPIP). The expansion of the St. Hilaire pump station and new 42-inch upland discharge pipe would provide an additional 38.6 cfs of irrigation water to the existing St. Hilaire-owned farmland. The EID consists of nine farms whose membership is based on commitment to pay a portion of the development costs based on water usage. Potential water users would install necessary infrastructure at delivery points along the EID pipeline to convey their water allocation to their properties. Secondary systems necessary for infrastructure including booster pump stations and pipelines would be the sole responsibility of the individual farms. The proposed EID pump station would provide water to an additional 29 existing farms representing a change in irrigation water source for 19,000 acres. Water allocations may change if water is delivered to other farms within the EID boundary with curtailed groundwater use.

The LPIP is not, however, being evaluated as (1) a connected action, or (2) an indirect effect of the proposed Federal action. Federal actions generally include all actions which are potentially subject to Federal control and responsibility (40 C.F.R. § 1508.18). Additionally, the scope of a NEPA document should consider connected, cumulative, and similar actions. Actions are connected (i.e., closely related) if they (i) automatically trigger other actions, (ii) cannot or will not proceed unless other actions are taken previously or simultaneously, and (iii) are interdependent parts of a larger action and depend on the larger action for their justification (40 C.F.R. § 1508.25(a) (1) and 40 C.F.R. § 1502.4(a)). If one of the actions might reasonably be completed without the existence of the other, the two actions have independent utility and are not “connected” for NEPA purposes.

In this case, the Corps and USFWS do not have control or responsibility over any aspect of the LPIP. The LPIP is not being funded, authorized, or constructed by any Federal agency. St. Hiliare/EID are free to modify plans/designs/locations for the LPIP without Federal approval. It cannot fairly be said that the proposed Federal action would cause the LPIP to occur. Additionally, alternatives for accessing and withdrawing water to support the LPIP are technically feasible (e.g., a pumping station at Cold Springs Reservoir or use of a combination of surface and groundwater sources) -- even if such alternatives are ultimately determined not to be the most practical/feasible. It is reasonable, therefore, to believe that the LPIP could occur (in whole/part) without the proposed Federal action. The two actions, therefore, have independent utility and are not “connected” for NEPA purposes.

Federal agencies are also required under NEPA to consider the direct, indirect and cumulative effects associated with the Federal action in NEPA documents (40 C.F.R. § 1508.25(c)). Indirect effects are those caused by the Federal action, occur later in time or are farther removed, and are reasonably foreseeable (40 C.F.R. § 1508.8(b)). Federal agencies employ a “but for” analysis when evaluating whether potential effects associated with activities outside the agencies control/responsibility are caused by the Federal action – i.e., but for the Federal action the other/private action would not occur. A "but for" causal relationship, however, is not alone enough to make a Federal agency responsible for such effects. NEPA requires a reasonably close causal relationship between the effect and the alleged cause – i.e., proximate causation.

As stated above, it is reasonable to believe that the LPIP could occur (in whole/part) without the proposed Federal action. The Federal action is, therefore, not the "but for" cause of the LPIP. The LPIP is also subject to numerous non-federal actions/decisions (e.g., easements, financing, state/local permits, etc.), which are outside the control of the Corps or USFWS, but necessary requirements (causes) for the LPIP. Additionally, the proposed Federal action does not grant St. Hiliare/EID any right to use or withdraw water from the Columbia River or any other source. The State of Oregon decides where (and for what purpose) water within the state would be put to beneficial use. The proposed Federal action is simply not considered the proximate cause (close causal relationship) of impacts associated with the LPIP. The proposed Federal action is, therefore, more reasonably considered a link in a larger corridor type project, which lacks the close causal relationship (i.e., proximate causation) required by NEPA.

SECTION 2 - FORMULATION OF ALTERNATIVES

2.1 INTRODUCTION AND SCREENING

The National Environmental Policy Act (NEPA) and 33 CFR Part 230 *Procedures for Implementing NEPA* require a reasonable range of alternatives be considered during the planning process. Alternatives considered under NEPA must include, at least, the proposed action and the "No Action" Alternative, which provides a baseline from which to compare other alternatives. The alternatives identified below were evaluated to determine if they satisfy the purpose and need of the Federal Project (Section 1.2):

(1) Alternative 1: The No Action Alternative (No Change).

(2) Alternative 2: The Proposed Action. The Corps would issue an amendment to St. Hilaire to expand their pump station and issue a new easement to EID for construction and operation of a new pump station to be located immediately adjacent to St. Hilaire's pumping station and within St. Hilaire's existing easement footprint.

(3) Alternative 3: The Corps would issue a new easement to Superior Farms to expand their existing irrigation pump station.

(4) Alternative 4: USFWS would issue an easement to the EID for the installation of a new irrigation pumping station at Cold Springs Reservoir in Umatilla County, Oregon.

(5) Alternative 5: U.S. Bureau of Reclamation (BoR) or USFWS would issue an easement to the EID for the installation of a new irrigation pumping station at McKay Reservoir in Umatilla County, Oregon.

(6) Alternative 6: Groundwater Recharge.

However, in order for any alternative to be acceptable for further evaluation it must meet certain objectives, or screening criteria. Screening criteria help eliminate those alternatives that could not reasonably or practically meet the project purpose and need. In this case, alternatives must: (1) adequately address critical groundwater shortage in the Lower Umatilla Basin basalt aquifers, (2) be technically feasible, and (3) be environmentally acceptable (see Table 2-1 on page 22 for the screening process).

2.2 ALTERNATIVES

2.2.1 Alternative 1 – No Action (No Change)

Under the No Action Alternative, the Corps would not issue an amendment to St. Hilaire's existing easement to expand their pumping station. No modifications to the St. Hilaire pumping

station would occur. The Corps would not issue a new easement to the EID and the proposed new EID pumping station would not be constructed. As such, no new upland distribution pipes would be installed through the proposed USFWS right-of-way.

Implementation of the No Action Alternative would maintain the current level of irrigation water available to farmland currently serviced by St. Hilaire and not allow additional farmland to be supplied water from the new EID pumping station. The No Action Alternative does not meet the project purpose and need; however, it is carried forward to Section 3 for comparative purposes under NEPA.

2.2.2 Alternative 2 – Proposed Action: The Corps would issue an amendment to St. Hilaire to expand their pump station and issue a new easement to EID for construction and operation of a new pump station to be located immediately adjacent to St. Hilaire's pump station and within St. Hilaire's existing easement footprint

Under Alternative 2, the Corps would issue an amendment to St. Hilaire's existing easement to expand their pumping station (Figure 2-1). The proposed expansion of the existing St. Hilaire pumping station would include installation of three new pumps and a new 42-inch diameter discharge pipe, increasing the station's withdrawal capacity from 61.4 cfs to 100 cfs. The new pumps would be housed in 42-inch diameter "cans" connected to an existing 60-inch diameter intake pipe via three 26-inch diameter steel "pup" pipes. The new section of 42-inch discharge pipe would then be connected to the pump can "pups" via a manifold. The new discharge pipe would extend south toward the shoreline and be supported above the water on two pipe cradles, each secured to the river bed by a pair of 12.75-inch diameter steel piles.

At each new pump can location, a 60-inch diameter by 7.5-foot long section of sleeve pipe would be positioned vertically and driven a foot into the river bed using a vibratory hammer. The river bed material inside of these sleeve pipes would be suctioned out. The pipe would be driven further down as material is removed until the desired depths are achieved. This approach would limit the total required volume of excavation to around 16 cubic yards while minimizing impact to existing structures. The suctioned bed material would be side cast back into the river within the existing easement.

The existing station deck would be expanded approximately 15 feet to the east to accommodate the new pump cans. The expanded portion of the station deck would be constructed using metal grates placed over a steel frame, and would be supported over the water by 16 new steel H-piles (W10 x 49). An air-burst system would be installed to facilitate the cleaning of the existing intake screens. This system would consist of a compressor (housed in the existing upland control building), air vessel, steel air lines, control valves, and monitoring and control system. The total overwater area covered by the expanded station deck and new discharge pipe would be approximately 538 square feet (0.012 acre), of which, approximately 404 square feet (0.009 acre) would be grated to allow for 60 percent light penetration. All new steel pilings and H-piles would be installed 20 feet (or to refusal) into the substrate with a vibratory hammer. The proposed 42-inch diameter discharge pipe would be trenched

underground through upland as it leaves the project site, and would eventually tie into an existing irrigation pipe after leaving the MNWR approximately one half mile to the south.

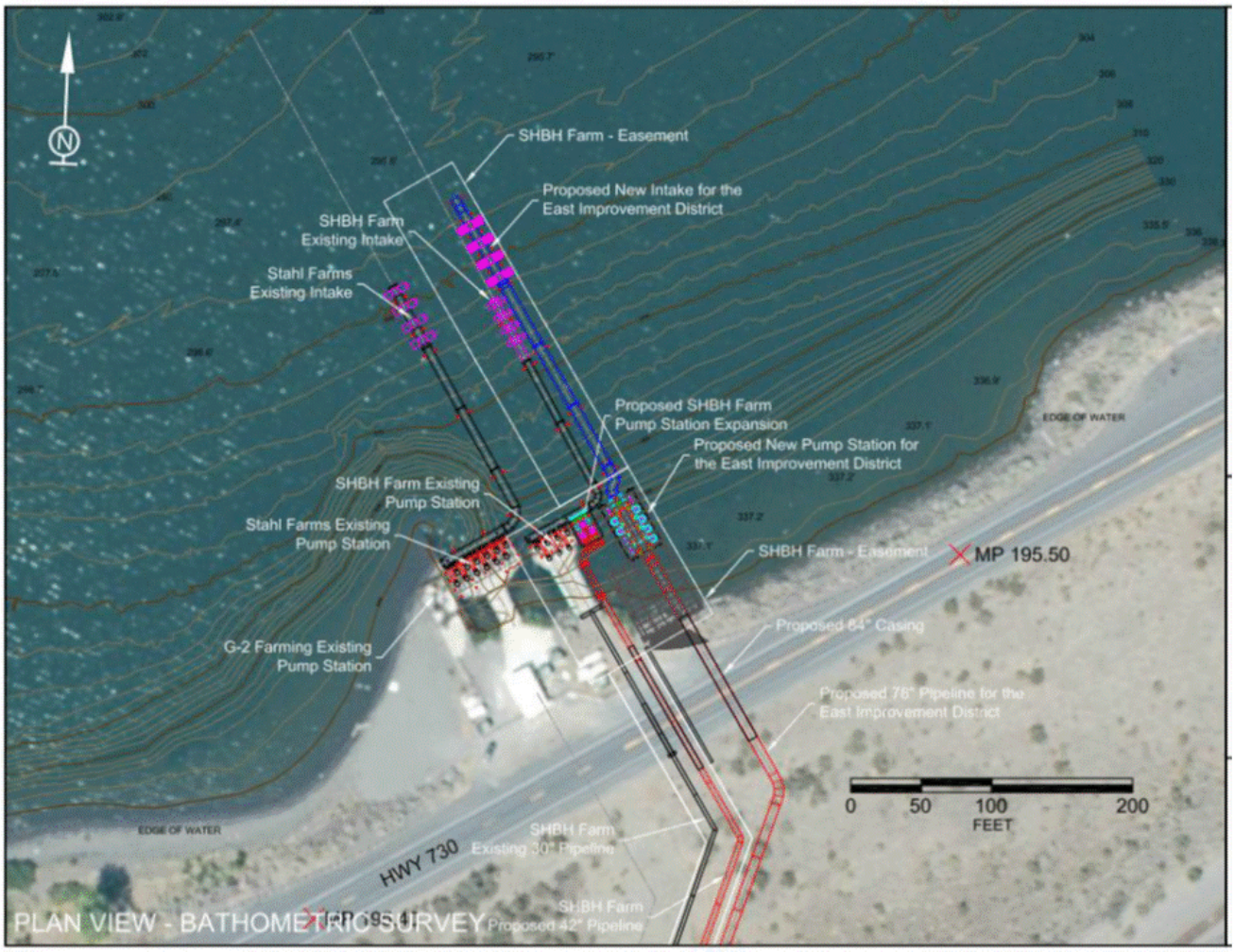

Figure 2-1: Proposed expansion of the St. Hilaire pumping station and construction of new EID pumping station project plan view. IRZ Consulting, LLC, 2017.

The proposed new EID pumping station would include a new station deck, ten new pumps, a new intake pipe, four new intake screens, and a new discharge pipe (Figure 2-2). It would be designed for a withdrawal capacity of up to 200 cfs. The new pumping station and intake would extend approximately 350 feet out from the shoreline of the Columbia River. Each of the four new intakes would measure five feet in diameter by approximately 19 feet in length, and would be affixed with NMFS-approved slotted fish screens (0.069 inch openings) to insure juvenile salmonids are not impinged or entrained in the intake. The intake screens would also be equipped with an air-burst system to facilitate cleaning the screens and maintaining the appropriate approach velocity in compliance with NMFS criteria. The new intake screens would be mounted on a 78-inch diameter by 70-foot long steel manifold.

The manifold would be supported on five cradles, each secured to the river bed by a pair of 12.75-inch diameter steel piles. The manifold would transition to an 84-inch diameter by 170-

foot long section of intake pipe that would be supported on another four cradles, each secured by a pair of steel piles. The intake pipe would then continue another 38 feet as a second manifold. This manifold would be supported on an additional five cradles, secured between pairs of steel H-piles (W10 x 54). The manifold would connect to ten pump cans, five on each side of the manifold, through 30-inch diameter "pup" pipes. Each pump can would be 42 inches in diameter by 21 feet tall. The top of the cans would extend a little over two feet above the normal pool elevation (340 feet NAD 27).

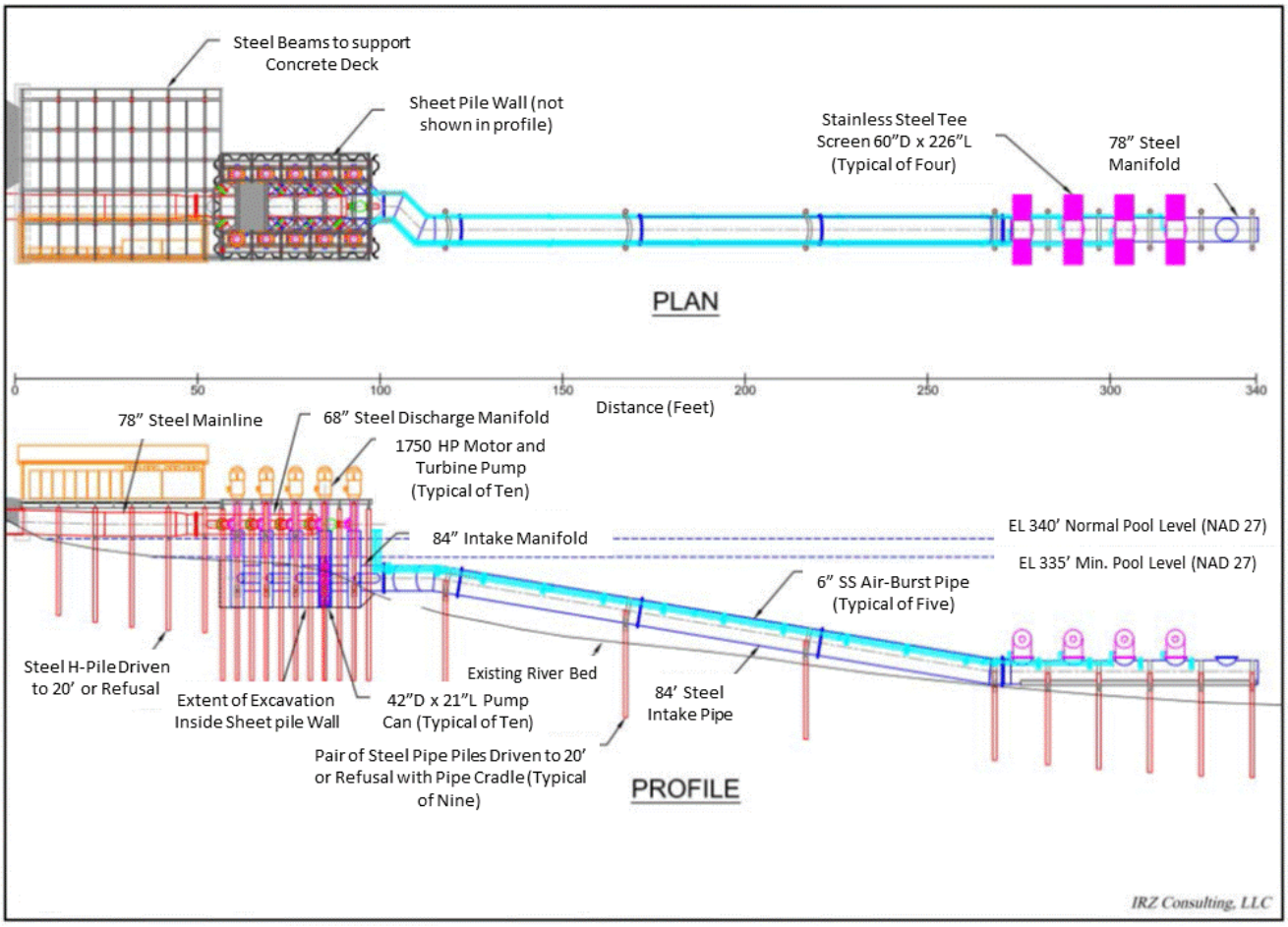

Figure 2-2: New EID Pump Station plan and profile.

The area around the second manifold and pump cans would be enclosed on three sides by a sheet pile wall. Approximately 384 cubic yards (covering an area of 0.028 acre) of bed material would be excavated from inside the sheet pile wall to accommodate the depth of the pump cans. The excavated bed material would be side cast back into the river within the existing easement. Twenty-four steel H-piles (W12 x 96) would be installed inside the sheet pile wall to support a 66-inch diameter by 48-foot long steel discharge manifold on a lower deck, and the pumps (pumps, columns, and motors) on a second, higher deck. Both decks would be constructed using metal grates placed over a steel frame to allow sun light penetration. Between the back of the sheet pile wall and the shore, another 30 steel H-piles (W12 x 96)

would be installed to support the 78- inch diameter discharge pipe and a 2,560 square-foot concrete deck, of which approximately 1,990 square feet would be over the water.

The concrete deck size accounts for the building required to house the electrical equipment and to support the crane required to set the pumps. The overwater area covered by the new station decks and discharge pipe would be around 3,137 square feet (0.072 acre) of which approximately 1,216 square feet (0.028 acre) would be grated to allow for 60 percent light penetration. Waterproof lighting equipped with a daylight sensor would be installed underneath the overwater portions of the new concrete deck to provide lighting during the daytime in order to detract salmonid predators. Upland access to the new station deck from the existing roadway would be provided by a new 450 square-foot gravel access pad.

All new steel pipe pilings (18 total), H-piles (64 total), and sheet piles (54 total) would be installed 20 feet (or to refusal) into the substrate using a vibratory hammer. The proposed 78-inch diameter discharge pipe would be trenched underground through upland as it leaves the project site, and would pass under Highway 730 through a casing, and then proceed south for approximately 9 miles.

All project work conducted below the OHWM of the Columbia River would occur between December 1 and February 28 of the NMFS-preferred in-water work window (IWWW) for the middle Columbia River which is December 1 through March 15, a period when ESA-listed salmonids are least likely to occur within the project action area. It is anticipated that the proposed project would require eight to twelve weeks of in-water work. Divers would direct the in-water work and carry out required welding. All heavy equipment (i.e., crane and excavator) would access the project site via existing roadways, parking areas, disturbed upland area, and/or floating barges.

St. Hilaire and the EID are requesting right-of-way (ROW) from the USFWS through the MNWR (Figure 2-3). The proposed ROW would allow access for the construction of EID's discharge pipe and to perform maintenance of three existing discharge pipes located within three current easements through the ROW area. The proposed ROW would be comprised of two relatively narrow areas of land located near Highway 730. The smaller of the two proposed ROW areas measures 2.07 acres in size and is generally bound to the north by Highway 730 and to the south by Union Pacific Railroad ROW. The larger ROW area measures 14.65 acres in size and runs approximately 2,100 feet (0.4 mile) along the western boundary of tax lot 200 within the MNWR. The length, width, and area (16.2 acres) of the proposed ROW would allow for appropriate spacing between the existing, and newly proposed discharge pipes, providing adequate access for construction equipment and service vehicles. Once the pipelines leave the ROW area they would continue south onto private property. Proposed construction activities within the USFWS ROW would include:

1) Clearing and grading of a 36-foot-wide access road and staging pad along the proposed pipeline routes. The total cleared area would be approximately two acres.

2) Excavating two trenches approximately 20 feet apart within the access road and staging pad. Excavated material would be side-cast next to each trench. One trench would be for the installation of a 78-inch steel pipeline, the second trench would be for the installation of a 42-inch steel pipeline.

3) The trenches would be backfilled using clean material and compacted. The excavated side-cast material would be placed over top to complete the filling of the trench and create a cap over the pipe (Figure 2-4). Once the pipelines have been installed, the exposed areas would be graded and hydro-seeded with a native grass seed mix.

4) Construction would also include installation of new electric overhead and underground transmission lines, and three new transformers within the ROW, to accommodate the increased electricity demands of the proposed new pumps.

Because the expansion of the St. Hilaire pump station, and construction of the new EID pump station, would cause the permanent displacement of approximately 0.066 acre of aquatic habitat, St. Hilaire, has proposed mitigation under the CWA intended to compensate for the loss (Figure 1-2). Their proposal is to remove approximately 3,000 square feet of existing concrete and asphalt debris from below the OHWM associated with the old Highway 30 in Boardman, Oregon (located approximately 33 miles downstream) on the Columbia River. The removal of the existing concrete/asphalt debris would increase the available substrate area below the OHWM, therefore providing viable shallow water habitat beneficial for salmonids near the shoreline.

Water depths within the mitigation area range between 1 to 4 feet. Removal of the concrete/asphalt debris would be conducted using an excavator operating from the roadway. The excavator would start at the far end of the proposed mitigation area and work backwards toward the shoreline, where the debris would be transferred to a dump truck and carried offsite to an appropriate upland disposal location. The Corps would issue a short-term real estate license (to include access to), for this removal action.

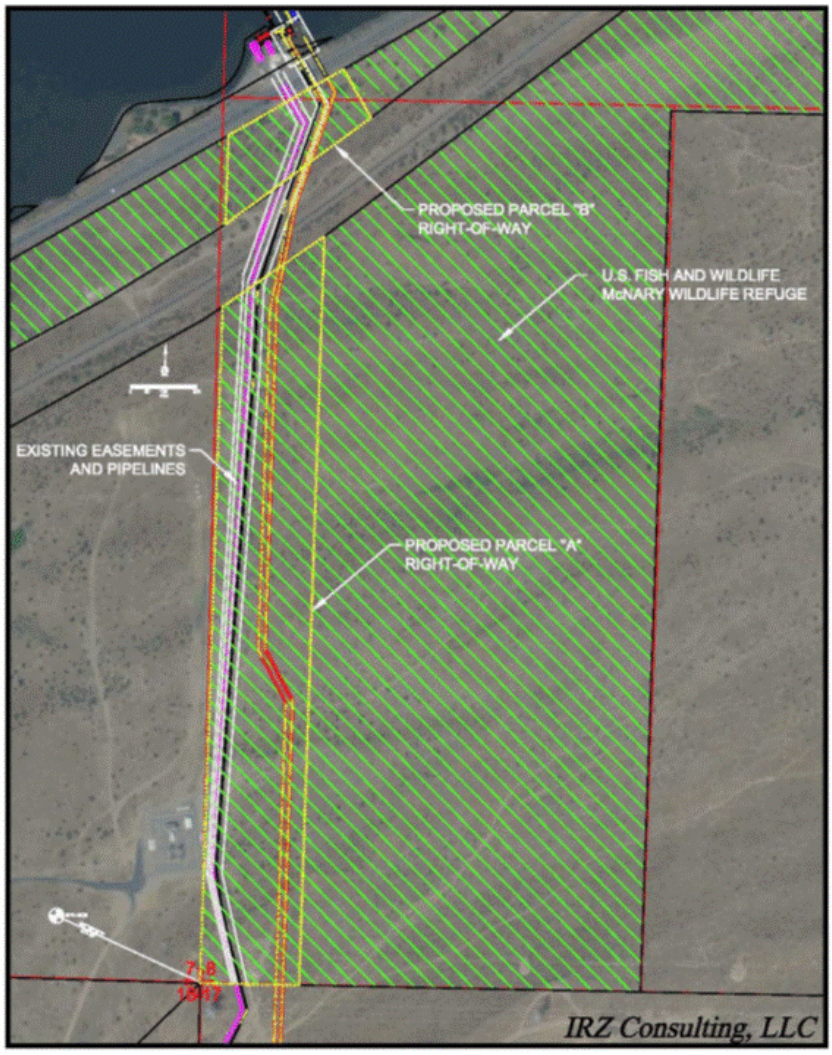

Figure 2-3: Proposed right-of-way across the USFWS McNary Wildlife Refuge.

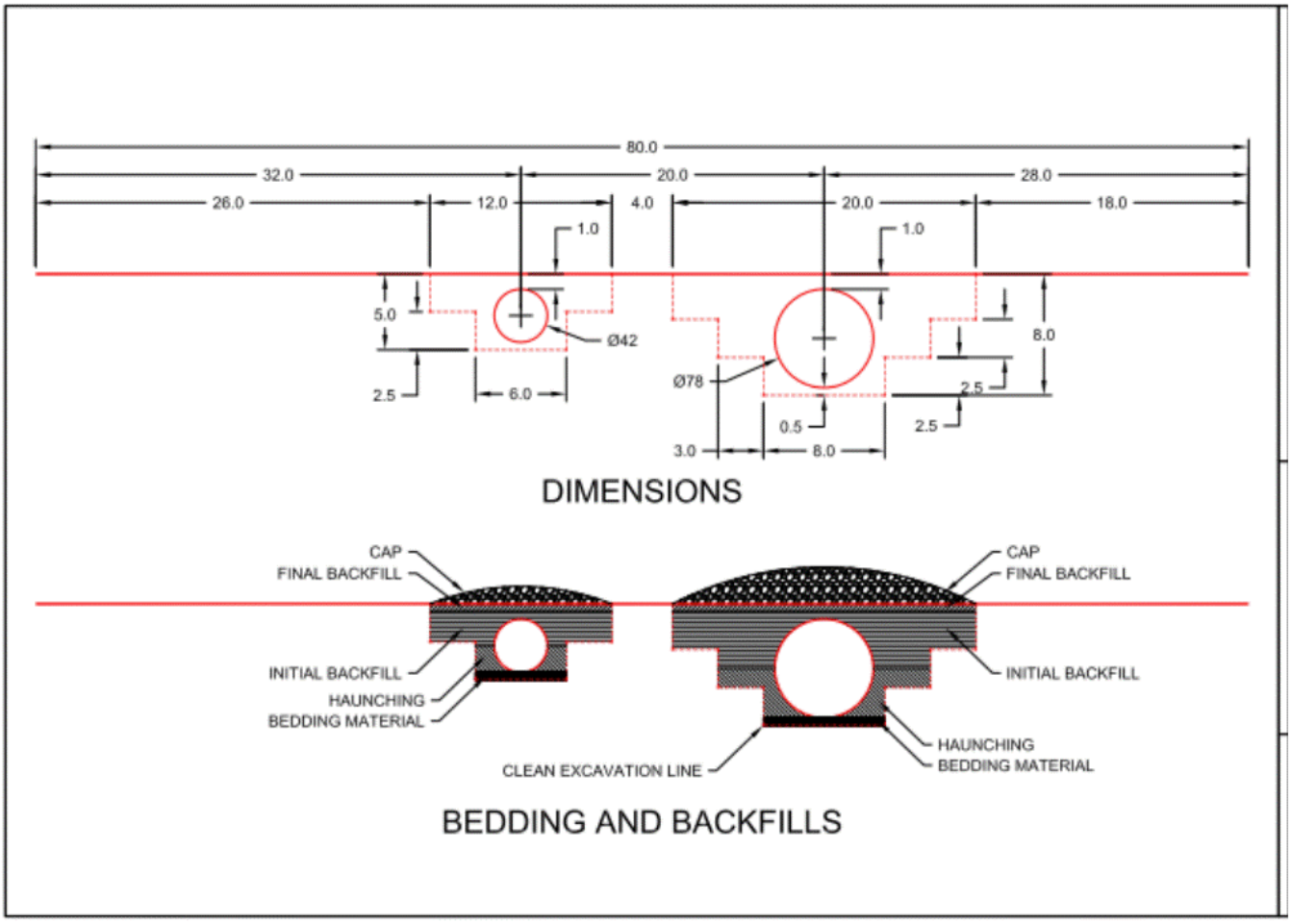

Figure 2-4: Proposed pipe trench cross-sections. The trenches would be backfilled using clean material and compacted. The excavated side-cast material would be placed over top to complete the filling of the trench and create a cap over the pipe.

2.2.3 Alternative 3 – The Corps would issue a new easement to Superior Farms to expand their existing irrigation pump station

Superior Farms currently owns and operates an irrigation pump station located in an area under an existing easement from the Corps that is less than 3,000 square feet. The Superior Farms' Columbia River Pump Station has four pumps with a total of 2,000 horsepower and a pumping capacity of around 10,400 gallons per minute (gpm). The Superior Farms pump station is located approximately one-half mile upstream of the existing St. Hilaire pump station.

The existing Superior Farms pump station essentially takes up the entire 3,000 square foot easement which would not allow room for the proposed expansion to the existing pump station or the construction of the new EID pump station. The size of the new EID Columbia River Pump Station (capacity of 200 cfs and 16,000 total horsepower) would be exactly the same at the Superior Farms location as described above in Section 2.2.2. To build the EID station next to the

Superior Farms station would require an entirely new easement. At the proposed location next to the St. Hilaire station, the intake would extend out from the shoreline approximately 350 feet. If at the location next to the Superior Farms station an intake extending the same distance would reach an adequate water depth then the easement would need to be around 21,000 square feet.

There is no bathymetric survey of the river bottom extending out from the Superior Farms station, but navigational charts suggest that to reach an adequate depth for the required screens the intake may have to extend out as much as 2,000 feet. Also, from this location, some excavation of the river bed may be required to keep the intake pipe on grade, but a bathymetric survey would be required to determine both the distance and extent of excavation.

The pipeline route from the Superior Farms pumping station would be approximately the same length as the pipeline route from the proposed expansion of the St. Hilaire pumping station; however, the route from the St. Hilaire station has less extreme slopes and encounters less surface basalt. Both of these factors would significantly increase the installation costs of a pipeline from Superior Farms (Figure 2-5).

There has not been a geotechnical survey along the route from the Superior Farm's station, but from a visual inspection it was clear that there would be considerable basalt. The difference in installation costs between the Superior Farms station and St. Hilaire station pipeline routes would depend on the extent of basalt which would have to be blasted. The added cost just for blasting and removing rock could range from $200,000 to $400,000. Cost could increase even higher if additional bedding and backfill is required. The probable cost would be at least $300,000 to $500,000 more to expand the Superior Farm's station with no added benefit.

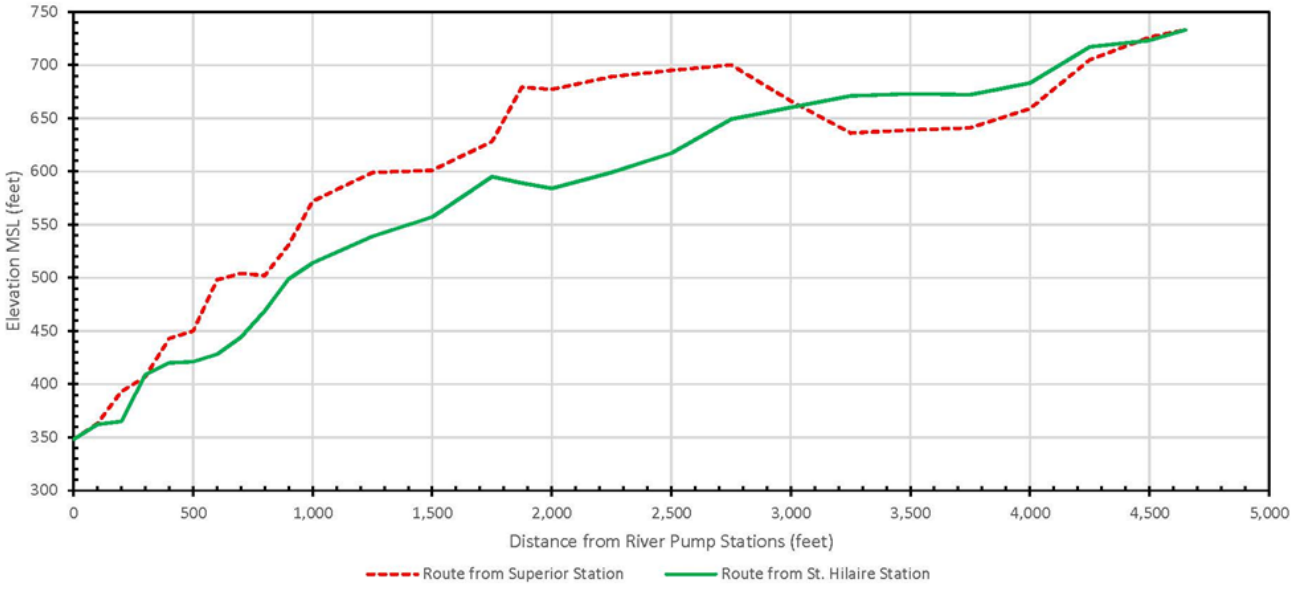

Figure 2-5: A simple plot graph of the profiles for the two routes from their respective starting points, the river pump stations to a common point.

Not as obvious from the graph are the topographies where the routes cross both Highway 730 and the Union Pacific Railroad tracks. The embankment on the south side of the highway and on both sides of the railroad track would make boring for a 78 inch pipe extremely difficult and costly. In addition, the route from Superior Farms dips between approximately 700 feet to 650 feet which could produce a pipeline profile that is not easily drained at the end of the irrigation season.

2.2.4 Alternative 4 - U.S. Fish and Wildlife Service would issue an easement to the EID for the installation of a new irrigation pump station at Cold Springs Reservoir in Umatilla County

Cold Springs Reservoir is located within the Cold Springs National Wildlife Refuge (CSNWR) approximately two miles southeast of Hermiston, Oregon. CSNWR was established primarily to benefit waterfowl and other native birds as the open water attracts large numbers of Canada geese and ducks year round.

Cold Springs Reservoir has water sources directly from Cold Springs Creek, from a gravity-fed canal system draining from the Umatilla River, and from water pumped through a canal system from the Columbia River; although the latter is used infrequently and only in low-water years in the Umatilla River. The three water sources ensure a consistent water supply for irrigation, wildlife, and recreational users.

Cold Springs Reservoir also provides irrigation water to the Hermiston Irrigation District (HID). HID serves approximately 1,200 water users and irrigates about 10,000 acres with 90 miles of canals, ditches, and pipelines. The irrigation season runs from early April into September or until the water supply in the reservoir has been used. The feed canal from the Umatilla River runs from November 1 until Cold Springs Reservoir is full or the Umatilla River flows drop below the target flow for the fishery, usually April or May.

A project called the Umatilla Basin Plan (1988) was introduced to enhance instream flows for fish in the Umatilla River. The Umatilla Basin Plan provides the ability to exchange Umatilla River water for Columbia River water for the benefit of the fishery in the Umatilla River. This is a “bucket for bucket” exchange with the pumping costs from the Columbia River being paid by Bonneville Power Administration. The Umatilla Basin Plan does not provide any additional amount of water to HID, but it does provide a more reliable water supply (http://hermistonid.org/documents-and-data/rules-and-regulations/).

The water supply in Cold Springs Reservoir is already limited to the point that the HID is supplementing from the Columbia River. The limited water supply in Cold Springs Reservoir would not adequately supply the additional 200 cfs of water use requested by the EID. Any additional water withdrawals would need to be supplemented by pumping in more water from the Columbia River or ground water aquifers, especially in low-water years in the Umatilla River. Also a significant amount of new infrastructure would need to be installed within the CSNWR to withdraw and distribute the proposed 200 cfs of water.

National wildlife refuges are set aside to protect fish, wildlife, and plants. The construction, maintenance, and presence of an irrigation pumping station near the open water of the CSNWR would have a negative impact on resident and migratory waterfowl and would not adequately or reliably supply the proposed water use demands without additional supplication from the Columbia River or groundwater aquifers.

Alternative 4 was removed from further consideration because it would not adequately address critical groundwater shortages and would result in substantially more adverse environmental effects.

2.2.5 Alternative 5 - U.S. Bureau of Reclamation or USFWS would issue an easement to the EID for the installation of a new irrigation pump station at McKay Reservoir in Umatilla County, Oregon

McKay Reservoir is an impoundment of McKay Creek, a tributary of the Umatilla River located eight miles south of Pendleton, Oregon. McKay Reservoir is jointly managed by the U.S. Bureau of Reclamation (BOR) and USFWS for irrigation water and wildlife habitat.

The USFWS manages the land within McKay National Wildlife Refuge which encompasses McKay Reservoir while the BOR regulates the water levels within the reservoir. At full pool McKay Reservoir contains 1,300 acres of water, but by late September, only about 250 acres of water remain. McKay Reservoir relies entirely on run-off from the Blue Mountains feeding McKay Creek and in poor snow years the water supply can be limited.

McKay National Wildlife Refuge is part of the Mid-Columbia National Wildlife Refuge Complex (which includes Cold Springs Reservoir). The aquatic and open water habitats of McKay Reservoir provide resting and feeding grounds for wintering waterfowl, wading birds, and migrating shorebirds. Willow and cottonwood stands along the edge of McKay Reservoir offer a variety of food and shelter to wildlife such as osprey, bald eagles, and many species of song birds. Exposed mudflats during late summer drawdown provide high energy foods to migrating shorebirds.

McKay Reservoir also serves as a recreational mecca for residents of nearby Pendleton, Oregon. The shallow water marshes and wetlands are productive for warm water fish and the majority of visitors to McKay Reservoir come during fishing season which is open from March through September. Peak use of the proposed EID system is expected to run from May through August. Other visitors to the refuge engage in bird watching or wildlife photography.

McKay Reservoir furnishes supplementary water to the Stanfield and Westland Irrigation Districts. Westland Irrigation District (WID) supplies water from Umatilla River early in the spring and from McKay Reservoir late in the summer to approximately 14,700 acres of farmland in Umatilla County. WID does not have the ability to switch over to Columbia River water when flows from the Umatilla River drop below a certain point in the summer. As a result, WID depends entirely on water from the Umatilla River and stored water in McKay Reservoir. WID

has sought to tap into Columbia River water to guarantee a full irrigation season for farmers (http://westlandirrigation.com/the-district/).

Stanfield Irrigation District (SID) services approximately 34,700 acres of farmland in Umatilla County. SID receives Columbia River exchange water directly into its system unlike the HID which receives Columbia River exchange water pumped into Cold Springs Reservoir. SID's annual McKay Reservoir storage allotment is used for fish enhancement in the Umatilla River in return for the Columbia River water in accordance with the Umatilla Basin Plan (The Umatilla County Critical Groundwater Task Force 2008).

The water supply in McKay Reservoir is already limited to the point that WID and SID are seeking or utilizing more reliable water sources. The limited water supply would not adequately supply the additional 200 cfs of water use requested by the EID. Any additional water withdrawals would need to be supplemented by pumping in more water from the Columbia River or ground water aquifers, especially in low-water years in the Umatilla River. Also a significant amount of new infrastructure would need to be installed within the McKay National Wildlife Refuge to withdraw and distribute the proposed 200 cfs of water use.

National wildlife refuges are set aside to protect fish, wildlife, and plants. The construction, maintenance, and presence of an irrigation pumping station near the open water, reservoir edge habitats, and mudflats would likely have a negative impact on resident and migratory birds and would not adequately or reliably supply the proposed water use demands without additional supplication from the Columbia River or groundwater aquifers.

Alternative 5 was removed from further consideration because it would not adequately address critical groundwater shortages and would result in substantially more adverse environmental effects.

2.2.6 Alternative 6 – Groundwater Recharge

As stated in Section 1.2 (Purpose and Need), the St. Hilaire/EID project is needed to address critical groundwater shortage in the Lower Umatilla Basin basalt aquifers (i.e., critical groundwater areas, as designated by the OWRD). Under this alternative the proposed expansion of the St. Hilaire pump facilities, and construction of the EID pump facilities, on the middle Columbia River would occur in the same/similar manner as described in Alternative 2 (Proposed Action). The EID discharge pipe would be re-routed to a treatment facility, which would need to be constructed, as surface water used in Aquifer Storage and Recovery (ASR) projects in Oregon are required to comply with national/state drinking water standards (See, OAR 340-040, OAR 333-061-0032 and OAR 690-350-0010(6)). After treatment, the treated surface water would be pumped through a dedicated pipeline network (likely tens of thousands of feet of pipe) into approximately 70 injection wells scattered over thousands of acres.

A report entitled "Umatilla Basin Regional Aquifer Recovery Assessment" was prepared by IRZ Consulting, LLC of Hermiston, Oregon, and aided by GSI Water Solutions, Inc. and HDR, Inc. Portland, Oregon, and presented to OWRD on June 30th, 2009. One of the topics this report

addressed was treatment of surface water for direct injection into confined aquifer wells. The study found that the most widely used forms of disinfection for Columbia River water are chlorine and ultraviolet (UV) light. For systems with a capacity of 150 mgd (230 cfs); a Chlorine Disinfection for Conventional and Membrane Filtration Plants would have a capital cost of around $8.8M and annual operation and maintenance (O&M) costs of $1.5M and a UV Disinfection for Filtration Plants would have a capital cost of around $17.2M and annual O&M costs of $1.2M (in 2008 dollars). These costs are for single large facilities; the total costs for multiple small plants would be higher. These cost are in addition to the costs associated with the proposed EID pump facilities and would involve the cost of pumping water twice, once to the wells and then out of the wells.

The Corps also considered a number of different surface water sources for groundwater recharge (e.g., the Umatilla River and Cold Springs Reservoir), but the Columbia River was determined to be the only adequate source available for groundwater recharge. The EID effort is envisioned to divert and deliver around 70,000 to 80,000 acre-feet of water every year depending on needs. In accordance with Oregon Administrative Regulations (OAR) (e.g., OAR 690-507-0070 (2)) new withdrawals from the Umatilla River available for groundwater recharge are limited to the months of November through May. Also, these withdrawals can be used for artificial recharge, but not for surface storage. St. Hilaire/EID evaluated potential available water from the Umatilla River, using the Bureau of Reclamation's data base, for a 200 cfs withdrawal rate and determined the average potential available diversion was around 45,000 acre-feet annually. The Umatilla River is, therefore, an inadequate/unreliable source of water to meet the needs of the EID (i.e., 70,000 to 80,000 acre-feet). Also, to withdraw water from the Umatilla River may require construction of facilities necessary to provide adequate depth for the size of pumps required (e.g., a dam). Likewise, Cold Springs Reservoir was built as part of the Bureau of Reclamation's Umatilla Basin Project. It provides storage for the Hermiston Irrigation District. With a capacity of only 38,000 acre-feet it is barely adequate to meet the needs of the Hermiston Irrigation District.

Alternative 6 would also be expected to have more adverse environmental effects than the proposed action associated with construction of the additional discharge pipes to the treatment facilities, construction of the treatment facilities, and additional discharge pipes to the approximate 70 underground injection wells. Additionally, under Oregon State regulations (OAR 690-350-0130), for aquifer recharge, 15% of the recharge must be left in the aquifer. Therefore, to get the same benefit there would need to be at least 15% more water pumped from the Columbia River (10,000 to 12,000 acre-feet more annually).

For the reasons stated above, this alternative was removed from further consideration as it (1) would likely not adequately address critical groundwater shortages, (2) result in substantially more adverse environmental effects, and (3) be infeasible for irrigation/farming purposes because of the substantially higher costs.

2.3 SCREENING OF ALTERNATIVES

Table 2-1 lists the six alternatives in the far left column, the three mandatory screening criteria across the top row and whether each alternative meets the screening criteria.

Table 2-1. Alternative Screening Process

Alternatives	Adequately addresses critical groundwater shortage in Lower Umatilla Basin basalt aquifers?	Technically Feasible?	Environmentally Acceptable?
1: No Action	No	Yes	No
2: Proposed Action: The Corps would issue an amendment to the existing St. Hilaire easement and a new easement to EID	Yes	Yes	Yes
3: The Corps would issue a new lease/easement to Superior Farms to expand their existing irrigation pumping station	Yes	Yes	Yes
4: USFWS would issue an easement to the EID for the installation of a new irrigation pumping station at Cold Springs Reservoir	No	Yes	No
5: U.S. Bureau of Reclamation or USFWS would issue an easement to the EID for the installation of a new irrigation pumping station at McKay Reservoir	No	Yes	No
6: Groundwater Recharge	No	No	No

2.4 ALTERNATIVES CARRIED FORWARD

Alternative 1 (No Action), Alternative 2 (Proposed Action), and Alternative 3 (Superior Farms Lease) are carried forward for further consideration in Section 3. Alternatives 2 and 3 were carried forward because they met all three screening criteria objectives. Alternative 1 is carried forward as a baseline analysis for environmental effects caused by Alternative 2 and 3. Alternative 2 is preferred over Alternative 3 because the construction would be easier and less expensive due to terrain. Alternative 2 is proposed on an existing easement and would not require a new easement due to a larger footprint.

Alternative 4 (Cold Springs Reservoir), Alternative 5 (McKay Reservoir), and Alternative 6 (groundwater recharge) were not carried forward because they would not adequately address the purpose and need and because of the environmental impacts associated with the construction and operation.

SECTION 3 - AFFECTED ENVIRONMENT AND ENVIRONMENTAL EFFECTS

3.1 INTRODUCTION

This section describes the existing affected environment (existing condition of resources) and evaluates predicted environmental effects on those resources for each alternative carried forward. Although only relevant resource areas are specifically evaluated for effects, the Corps did consider all resources in the proposed action area and made a determination as to which ones to evaluate. The following resource areas were evaluated: Aesthetics/Visual Resources, Aquatic Resources, Water Quality, Threatened and Endangered Species, Terrestrial Resources/Wildlife, Vegetation, Historic/Cultural Properties, Noise, Climate Change, Socioeconomics, Environmental Justice, Recreation, Land Use, Geology and Soils, and Cumulative Effects. The Corps considered, but did not identify any potential effects, to Air Quality or Hazardous/Toxic Materials.

3.2 AESTHETICS/VISUAL RESOURCES

3.2.1 Affected Environment

Aesthetics or visual resources are the natural and cultural features of the landscape that can be seen and that contribute to the public's appreciative enjoyment of the environment. The aesthetic quality of an area is a measure of one's perception making it a subjective factor to quantify.

The proposed action is located within an arid sagebrush-steppe region near Lake Wallula reservoir on the middle Columbia River, approximately 9.5 miles upstream of McNary Dam. The general topography within the project site ranges from level uplands to steep sloping bluffs and rock outcroppings. The immediate shoreline of the project area is a steep rip-rap bank with sparse vegetation. The proposed project is not located within a National Wild and Scenic River or State Scenic Waterway. Surrounding landscapes are predominately agricultural and the Umatilla County Comprehensive Plan (UCCP) for land use planning and development in Umatilla County does not identify scenic corridors or sensitive protected viewpoints within the proposed project location (Pacific Power 2015). Lake Wallula reservoir, McNary NWR and Cold Springs NWR provide the majority of aesthetic resources within an otherwise arid landscape.

The general topography within the proposed mitigation site is riparian containing both sandy and vegetated areas. There are remnants of an old road that descends into the river and becomes submersed. Nearby there is a marina and a park that add aesthetic value to the surrounding area. The proposed mitigation site is not located within a National Wild and Scenic River or State Scenic Waterway.

3.2.2 Environmental Effects

3.2.2.1 Alternative 1: No Action

Under the No Action Alternative, visual resources would either evolve from the existing condition in a natural process or by routine operation and maintenance activities performed by St. Hilaire. However, these maintenance activities would have minor or no effects to aesthetics. There would be no additional direct positive or negative effects on aesthetic or visual resources under the No Action Alternative.

3.2.2.2 Alternative 2: The Corps would issue an amendment and a new easement (Proposed Action)

The Proposed Action may result in minor, short-term direct impacts to aesthetics resulting from the presence of heavy equipment and materials during construction. The project area includes segments of dirt access roads, partially exposed irrigation pipes, and overhead powerlines; given the existing conditions and limited public use, it is anticipated that visual impacts during project construction would be negligible.

Permanent impacts to visual resources would occur from installation of 970 linear feet of new overhead transmission lines, associated wood poles, and three new transformers. These structures are expected to have minimal impact of visual resources given public use in the area is low, there are no permanent residences within one mile, and there are existing transmission lines and infrastructure that shape visual quality.

There would be no significant impact to any aesthetic or visual resources surrounding the mitigation site.

3.2.2.3 Alternative 3: The Corps would issue a new easement to Superior Farms

The project area contains steep basalt terrain which would need to be blasted and removed to install the distribution pipe. Additional bedding and backfill could also be required. The visual impacts of the construction and blasting activity could be substantial, especially if large areas of basalt outcropping are removed. Other aesthetic and visual effects would be similar to Alternative 2. The expansion of the Superior Farms pumping station may result in minor, short-term direct impacts to aesthetics resulting from the presence of heavy equipment and materials during construction.

3.3 AQUATIC RESOURCES

3.3.1 Affected Environment

The Columbia River Basin has been significantly altered as a result of hydroelectric and agricultural development. Disturbance in the region is greater than a 15% equivalent clear-cut area within the Middle Columbia River watershed. Currently there is only a thin band of

riparian vegetation along the Columbia River as the natural riparian and floodplain was inundated (See Appendix A). Historically, the Columbia River may have had a larger riparian area and small floodplain.

In many places no riparian trees are present at all, often replaced by levees and riprap. Levees were constructed to confine the river and prevent the river from accessing the floodplain. There is little available habitat off the main channel habitats of the middle Columbia River and aquatic species would have difficulty accessing them.

While the Columbia River dams are run-of-river dams that generally pass the incoming river volume, the forebay pools act much like one large pool. The reservoirs are much deeper and wider than the pre-impoundment middle Columbia River and offer few sources of refugia such as large woody debris or multiple smaller pools with riffles/run sequences. Furthermore, upstream dams alter the movement of sediment through the action area, resulting in few accumulations of suitable spawning gravels, most of the substrate consists entirely of sand.

Columbia River flows and depth are moderated by McNary and John Day Dams, as well as the other Federal Columbia River Power System projects. A pump station is located immediately downstream of the proposed project area with associated intakes and pumps. The shoreline is not heavily developed, but US Highway 730 passes just to the south of the river at the location of the proposed action.

Resident fish species include: Rainbow trout (*Oncorhynchus mykiss*), Cutthroat trout (*O. clarki*), bull trout (*Salvelinus confluentus*), mountain whitefish (*Prosopium williamsoni*), largemouth sucker (*Catostomus macrocheilus*), western brook lamprey (*Lampetra richardsoni*) bridgelip sucker (*C. columbianus*), longnose sucker (*C. catostomus*), mountain sucker (*C. platyrhynchus*), northern pikeminnow (*Ptychocheillus oregonensis*), margined sculpin (*Cottus marginatus*), white sturgeon (*Acipenser transmontanus*), Carp (*Cyprinus carpio*), channel catfish (*Ictalurus punctatus*), brown bullhead (*Ameiurus nebulosus*), yellow bullhead (*A. natalis*), black bullhead (*A. melas*), smallmouth bass (*Micropterus dolomieu*), largemouth bass (*M. salmoides*), yellow perch (*Perca flavescens*), and walleye (*Sander vitreus*).

Migratory fish species include: American shad (*Alosa sapidissima*), Chinook salmon (*O. tshawytscha*), Sockeye salmon (*O.nerka*), Coho salmon (O. kisutch), Chum salmon (*O. keta*), pink salmon (*O. gorbuscha*), steelhead (*O. mykiss*), and Pacific lamprey (*L. tridentata*).

Mollusk species include: Western ridged mussel (*Gonidea angulate*), fingernail clams and pea clams (Family *Sphaeriidae*) and non-native Asian clams (*Corbicula fluminea*).

Common aquatic insects include: mayflies, caddisflies, dragonflies, midges, freshwater scuds, and stoneflies.

Amphibian species include: western toad (*Bufo boreas*), bullfrog (*Lithobates catesbeianus*), woodhouse toad (*Bufo woodhouseii*), Pacific tree frog (*Pseudacris regilla*), Columbia spotted frog (*Rana luteiventris*), Great Basin spadefoot (*Spea intermontana*), leopard frog (*Rana pipiens*), and long-toed salamander (*Ambystoma macrodactylum*).

3.3.2 Environmental Effects

3.3.2.1 Alternative 1: No Action

Current effects to aquatic resources are from routine operations (pumping irrigation water) and maintenance activities (increased turbidity or temporary displacement of aquatic species from in-water repairs or spills and leaks from maintenance equipment) performed by St. Hilaire. There would be no additional direct positive or negative effects on aquatic resources under the No Action Alternative.

3.3.2.2 Alternative 2: The Corps would issue an amendment and a new easement (Proposed Action)

Impacts to fish species from the proposed action include possible entrainment during excavation activities (explained in section 2.2.2), potential hydroacoustic disturbances from the vibratory hammer, minor alteration of substrates, and temporary degraded water quality associated with excavation, piling installation, and road excavation.

Short-term, localized project-related increases in background turbidity levels would likely occur as a result of removal of asphalt debris from the proposed mitigation site. Increases in turbidity can reduce forage quantity for fish and benthic organisms and disrupt behavioral patterns such as feeding and sheltering. The project-related turbidity increases would be localized and take part in a small portion of the lateral extent of the Columbia River. Any project related increases in background turbidity from pile driving or asphalt removal would be very limited and highly localized with no long term significant effect.

Effects to both resident and migratory fish species under Alternative 2 include increased area of existing in-water and overwater structures, and reduced forage.

The proposed new structure would include an intake pipe with a slotted fish screen (in compliance with NMFS criteria, NMFS 1996) and air-burst system. The intake pipe would be placed 20 feet deep and 350 from the shoreline to eliminate possible shoreline flows which could attract migrating juvenile salmonids. The depth, distance, screen, and air-burst system all help insure juvenile salmonids would not become impinged or entrained during pumping operations.

The introduction of the new overwater structures would likely temporarily displace resident fish in the immediate in-water work area, but could ultimately provide overhead cover and velocity refuge which could attract resident fish including salmonid predators (See Appendix A).

Proposed conservation measures for decking and overwater structures are discussed above to detract salmonid predators (see Section 2.2.2).

Benthic organisms such as mollusk and aquatic insects could be disturbed by piling installation and excavation. An increase in turbidity from suspension of fine sediments can adversely affect filter feeding macro-invertebrates downstream from the work site (NMFS 2011). Juvenile salmonids prefer shoreline habitat for daytime foraging and any displacement of benthic organisms would reduce forage quantity for fish in the immediate project area. However, benthic organisms present in the adjoining areas of the project are expected to provide adequate foraging (NMFS 2008). No significant effects to benthic organisms are expected (See Appendix A).

There is not likely to be any short-term or long-term permanent effects to local amphibian species due to the size of the overwater expansion (538 square feet), the location of the proposed intake pipe, and the lack of wetlands over the entire project area. Any effects would be localized to the site of shoreline construction and would end when construction is completed causing no long term significant impact.

3.3.2.3 Alternative 3: The Corps would issue a new easement to Superior Farms

Effects to aquatic resources under Alternative 3 would have the same/similar impacts as Alternative 2.

3.4 WATER QUALITY

3.4.1 Affected Environment

Water quality throughout the Columbia River Basin has been affected by dams and diversion structures, water withdrawals, agricultural practices, road construction, mining activities, and general urbanization and development.

Lake Wallula is listed on the Oregon Department of Environmental Quality 303(d) list for a year round temperature exceedance (ODEQ 2012). Based on the Columbia River Data Access in Real Time (DART), 10-year average (2008-2017) temperatures in the McNary forebay range between 3.72°C and 22.24°C (DART 2018). Dams, channel simplification and widening, and vegetation removal are major contributors to increased river temperatures. Increases in water temperature can have a significant effect on salmonid metabolism, growth rate, disease resistance, migration timing, fry emergence, and smoltification (Allen 1987, Bell 1990, Wydoski and Whitney 2003, and NMFS 2009).

Discharge from eight chlorine-bleaching pulp mills also likely affects water quality in the Columbia River Basin. Within Lake Wallula, segments of the Columbia River are designated as category 5 for pH and temperature. Segments are designated as category 4A for total dissolved gas and dioxin. Segments of the Snake River within Lake Wallula are designated as category 5 a break-down product of DDT (known as 4,4'-DDE), chlordane, dieldrin, temperature, total

Polychlorinated Biphenyls (PCBs), total maximum daily load for Dioxin (2, 3, 7, 8-TCDD) of 0.013 parts per quadrillion (ppq) (USACE 2011a and ODEQ 2015). Excess nutrients, low levels of dissolved oxygen, presence of heavy metals, and changes in pH in Lake Wallula reservoir in the middle Columbia can have direct effects to aquatic resources throughout the river system (ODEQ 2015).

Lake Umatilla was not listed on the Oregon Department of Environmental Quality 303(d) list, but several tributaries of the John Day River which drains into Lake Umatilla Reservoir are 303(d) listed for sedimentation (ODEQ 2015).

Median turbidity values typically range from 2 to 3 Nephelometric Turbidity Units (NTUs) in the Columbia River between the confluence of the Snake and confluence with the Yakima River. Washington State water quality regulations indicate that actions shall not cause turbidity to exceed 5 NTU over background limits when the background turbidity is 50 NTU or less (USACE 2011a).

3.4.2 Environmental Effects

3.4.2.1 Alternative 1: No Action

Current effects to water quality are from routine operation and maintenance activities performed by St. Hilaire. There would be no additional direct, or indirect, or cumulative positive or negative effects on water quality under the No Action Alternative.

3.4.2.2 Alternative 2: The Corps would issue an amendment and a new easement (Proposed Action)

Equipment operating near or over the water are potential sources of contamination. Accidental spills of petroleum products could adversely affect water quality. Best management practices (BMPs) have been included as part of the proposed action to greatly reduce the risk of potential adverse effects associated with chemicals. BMPs would be implemented to contain and minimize any potential leaks within the area where it would have short-term adverse effects on water quality and stream macroinvertebrates. All vehicles operated within 150 feet of any stream, waterbody or wetland would be inspected daily for fluid leaks before leaving the vehicle staging area. Any leaks detected must be cleaned and repaired in the vehicle staging area before the vehicle resumes operation. The probability of contamination from construction equipment properly following BMPs is very low, but not discountable.

Additionally, the proposed action would result in moderate, short-term localized increases in background turbidity (discussed above in section 3.3.2.2).

3.4.2.3 Alternative 3: The Corps would issue a new easement to Superior Farms

Effects to water quality under Alternative 3 would be the same/similar as Alternative 2.

3.5 THREATENED AND ENDANGERED SPECIES

3.5.1 Affected Environment

ESA listed species in the project area include Upper Columbia spring run Chinook salmon, Snake River spring/summer Chinook salmon, Snake River fall Chinook salmon, Snake River Evolutionary Significant Unit (ESU) sockeye salmon, Upper Columbia River distinct population segment (DPS) steelhead, Middle Columbia River DPS steelhead, Snake River DPS steelhead, Columbia River bull trout, and gray wolf (*Canis lupus*).

Listing history, distribution, life history, biological requirements, critical habitat, and essential fish habitat for ESA listed fish species in the project area can be found in St. Hilaire and East Improvement District: Columbia River pumping station and intake project Federal Natural Resources Law Compliance and Biological Assessment (See Appendix A).

The Oregon wolf population has increased 20 percent from 2013 to 2014 and is gradually expanding westward. Gray wolves are expected to become established in the mountains of Central Oregon and expand considerably in the Cascade Mountains. Given the current population and the dispersal capabilities of wolves, at this point it is possible for a wolf to show up in almost any part of the state (ODFW 2018a).

Gray wolves are known to exist in the area around Lake Wallula. There are five established wolf packs and one estimated wolf use area totaling around 45 individual wolfs in lands surrounding the project area as of December 2016. One of the six wolf packs was newly discovered in 2016, the other five all showed growth since first being discovered between 2009 and 2014. Four of the six wolf packs were shown to have breeding pairs; a breeding pair is a male and a female that have produced at least two pups surviving to December 31 (ODFW 2018b). However, it is likely that the wolf population is higher due to the fact that verification of wolf numbers is difficult (ODFW 2018a).

Gray wolves have two main life requisite requirements; 1) an abundance of prey species and 2) isolation from human disturbance. Wolves will take a variety of prey species, but the bulk of their prey is composed of ungulates, mainly deer, elk, and moose. Gray wolves are sensitive to human disturbance, particularly near their denning and rendezvous sites. Factors such as road density have been shown to be important indices of levels of disturbance that wolves can tolerate (Mladenoff et al. 1995).

3.5.2 Environmental Effects

3.5.2.1 Alternative 1: No Action

Current effects to threatened and endangered species are from routine operation and maintenance activities performed by St. Hilaire. There would be no additional direct positive or negative effects on threatened and endangered species under the No Action Alternative.

3.5.2.2 Alternative 2: The Corps would issue an amendment and a new easement (Proposed Action)

Direct effects under Alternative 2 include possible entrainment during excavation activities, temporary degraded water quality, minor alteration of substrates associated with excavation and piling installation, and potential hydroacoustic impacts associated with vibratory hammer use proposed for installation of steel pilings.

An in-water work window between December 1 and February 28 would help avoid impacts caused by entrainment of ESA listed fish in excavation buckets or hydroacoustic effects of the vibratory hammer. . A further detailed analysis of these potential effects is provided in St. Hilaire and East Improvement District: Columbia River pumping station and intake project Federal Natural Resources Law Compliance and Biological Assessment (Appendix A).

The proposed alteration of existing substrates would not likely result in long-term direct effects to ESA-listed fish species or their critical habitat given 1) the environmental baseline within the project area has been degraded by development and human activity 2) the project area contains coarse sand substrates and 3) ESA-listed fish are not expected to be present in high numbers during the proposed in-water work window. Any project related increases in background turbidity from pile driving would be very limited and highly localized (Appendix A).

Short-term, localized project-related increases in background turbidity levels would likely occur as a result of removal of asphalt debris from the proposed mitigation site. Increases in turbidity can reduce forage quantity for salmonids and disrupt behavioral patterns such as feeding and sheltering. Salmonid feeding and migratory feeding behavior evolved in systems that periodically experience short-term pulses (days to weeks) of high suspended sediment loads associated with flood events and are adapted to such seasonal high pulse exposures (NMFS 2011).

The project-related turbidity increases would be localized and limited to the in-water work window. Salmonids have been observed to move laterally and downstream to avoid turbid plumes (Lloyd et al. 1987; McLeay et al. 1984; McLeay et al. 1987; Scannell 1988; Servizi and Martens 1991; Sigler et al. 1984) and any salmonids in the system at the time of construction or road removal would avoid the area or otherwise be adapted to sediment pulses. There is not expected to be a long-term significant impact to threatened or endangered species from the asphalt removal.

Indirect effects of a proposed action are those impacts that are reasonably certain to occur after construction of the project is complete. Indirect effects include increased area of existing in-water and overwater structures, and reduced forage.

The proposed new EID pumping station would extend out from the shoreline of the Columbia River approximately 538 square feet. The proposed new structure would include an intake pipe with a slotted fish screen (in compliance with NMFS criteria, NMFS 1996) and air-burst system. The intake pipe would be placed 20 feet deep and 350 from the shoreline to eliminate possible

shoreline flows which could attract migrating juvenile salmonids. Based on the proposed depth and design of the intake, and existing width of the Columbia River at the project site (approximately one mile wide); it is anticipated that while the effects of the proposed project on juvenile fish passage would be minimal, they may be likely to adversely affect anadromous salmonids. Juvenile bull trout would not be expected to occur within the proposed action area, therefore there would be no potential for impingement of bull trout (Appendix A).

The introduction of the new in-water and overwater structures may provide overhead cover and velocity refuge that could attract salmonid predators. Criteria measures for decking and overwater structures are discussed above to detract salmonid predators (see Section 2.2.2). Given the existing baseline conditions within the action area and the proposed mitigation measures, it is anticipated that while potential effects of the new in-water/over-water structures on salmonid predation would be minimal, they may be likely to adversely affect anadromous salmonids. Juvenile bull trout would not be expected to occur within the proposed action area, therefore there would be no potential for increased predation on bull trout (Appendix A).

Juvenile salmonids prefer shoreline habitat for daytime foraging. Any displacement of benthic organisms would reduce forage quantity for fish in the immediate project area. However, benthic organisms present in the adjoining areas of the project are expected to provide adequate foraging (NMFS 2008) and no significant impact to forage quantity is expected.

Because of the low number of anadromous salmonids and bull trout present in the middle Columbia River near the action area during the in-water work window, the risk of harming a listed species during construction is low; if a fish were present near the work area, they would likely leave the area as work commenced. Only temporary, localized impacts to water quality, migration habitat, and substrate characteristics are expected by the proposed action and the Corps determined that the proposed action may affect, but is not likely to adversely affect bull trout (Appendix A).

The Corps, however, determined that the proposed action may affect, and is likely to adversely affect Upper Columbia River spring Chinook salmon, Snake River spring/summer Chinook salmon, Snake River fall Chinook salmon, Snake River sockeye salmon, Upper Columbia River steelhead, Middle Columbia River steelhead, and Snake River steelhead (Appendix A).

Because of the limits on the intensity, extent, and duration of the adverse effects on the environment, the physical and biological features of the critical habitat of ESA listed species in the action area are likely to remain functional, or retain their current ability to become functionally established, to serve the intended conservation role for the species. Therefore, the Corps has determined that the proposed action is not likely to adversely affect critical habitat (Appendix A).

Established wolf packs are to the south and east of Pendleton, Oregon which is about 30 miles from the proposed action area. However, wolf packs are mobile and dynamic and can likely be found anywhere in eastern Oregon, especially during the time subadults disperse from the pack

(ODFW 2018b). Although McNary NWR may meet both gray wolf habitat requirements listed above, there have been no documented wolf sightings in the project area. Any wolves that could be in the area at the time of construction would disperse away from the activity. The proposed action would have no long-term or notable impact on gray wolves.

3.5.2.3 Alternative 3: The Corps would issue a new easement to Superior Farms

Effects to ESA-listed species under Alternative 3 would the same/similar as Alternative 2.

3.6 VEGETATION

3.6.1 Affected Environment

Vegetation within the proposed project area is dominated by species typical of the sagebrush-steppe community in eastern Oregon. The vegetation community includes an overstory of big sagebrush (*Artemisia tridentata*), gray rabbitbrush (*Ericameria nauseosa*), and bitterbrush (*Purshia tridentata*). An understory of native bunchgrasses such as bluebunch wheatgrass (*Pseudoroegneria spicata*), Idaho fescue (*Festuca idahoensis*), and basin wildrye (*Leymus cinereus*); and non-native species such as cheatgrass (*Bromus tectorum*), medusahead (*Taeniatherum caput-medusae*), and tall tumble mustard (*Sisymbrium altissimum*). The entire project area was historically grazed and contains segments of dirt access roads, partially exposed irrigation pipes, and overhead powerlines. The baseline level of disturbance within the proposed area is moderate.

The following ODFW "habitat categories" (as established in Oregon Administrative Rule 635-415-0025) were identified within the proposed ROW:

- Category 2 Habitats (essential and limited)
    - Upland Shrub-Steppe
    - Upland Grassland Non-Native
- Category 3 Habitats (essential, important, and limited)
    - Upland Grassland Native

3.6.2 Environmental Effects

3.6.2.1 Alternative 1: No Action

Under the No Action Alternative, the current vegetation environment would change as growth occurred naturally over time or by routine operation and maintenance activities performed by St. Hilaire. There would be no further direct positive or negative effects on vegetation under the No Action Alternative.

3.6.2.2 Alternative 2: The Corps would issue an amendment and a new easement (Proposed Action)

The Proposed Action would require a total of two acres be cleared and graded to create a 36-foot-wide access road and staging pad along proposed pipeline routes, installation of underground transmission lines, and installation of transformers. There would be little, temporary disturbance to all vegetation except the 500 square feet that would be permanently altered by the installation of the new transformers. All other disturbed areas would be graded and hydro-seeded with a native grass seed mix approved by ODFW to generally match the preconstruction plant species composition. The proposed action would not cause or promote the introduction, spread, movement, or commerce of invasive or exotic species.

3.6.2.3 Alternative 3: The Corps would issue an easement to Superior Farms

Effects to vegetation under Alternative 3 would be the same as Alternative 2.

3.7 TERRESTRIAL RESOURCES/WILDLIFE

3.7.1 Affected Environment

Various forms of wildlife are generally abundant close to riparian corridors. The representative wildlife species that use sagebrush-steppe and adjacent open water (Columbia River) habitat in the vicinity of the proposed project area include many species of mammals, birds, and reptiles. Riparian and wetland habitat is discussed in Section 3.3.1 and upland habitat is discussed in Section 3.6.1.

Mammals: mule deer (*Odocoileus hemionus*), white-tailed deer (*Odocoileus virginianus*), Rocky Mountain elk (*Cervus elaphus nelsoni*), coyote (*Canis latrans*), red fox (*Vulpes vulpes*), American badger (*Taxidea taxus*), striped skunk (*Mephitis mephitis*), cottontail (*Sylvilagus nuttalli*), white-tailed jackrabbits (*Lepus townsendii*), muskrat (*Ondatra zibethicus*), North American beaver (*Castor canadensis*), raccoon (*Procyon lotor*), Virginia opossum (*Didelphis virginiana*), common porcupine (*Erethizon dorsatum*), western small-footed myotis (*Myotis ciliolabrum*), little brown myotis (*Myotis lucifugus*), long-eared myotis (*Myotis evotis*), long-legged myotis (*Myotis volans*), Yuma myotis (*Myotis yumanensis*), canyon bat (*Parastrellus hesperus*), Townsend's big-eared bat (*Corynorhinus townsendii*), big brown bat (*Eptesicus fuscus*), voles (*Microtus sp.*), and mice (*Peromyscus sp.*).

Waterfowl: mallard (*Anas platyrhynchos*), gadwall (*Anas strepera*), cinnamon teal (*Anas cyanoptera*), American wigeon (*Anas Americana*), northern shoveler (*Anas clypeata*), northern Pintail (*Anas acuta*), green-winged teal (Anas carolinensis), canvasback (*Aythya valisineria*), redhead ducks (*Aythya Americana*), lesser Scaup (Aythya affinis), ring-necked duck (*Aythya collaris*), common merganser (*Mergus merganser*), common goldeneye (*Bucephala clangula*), Canada geese (Branta canadensis), tundra swan (*Cygnus columbianus*), American coot (*Fulica*

americana), pied-billed grebe (*Podilymbus podiceps*), eared grebe (*Podiceps nigricollis*), and western grebe (*Aechmophorus occidentalis*).

Shorebirds and waterbirds: long-billed curlew (*Numenius americanus*), killdeer (*Charadrius vociferus*), western sandpiper (*Calidris mauri*), pectoral sandpiper (*Calidris melanotos*), Wilson's phalarope (*Phalaropus tricolor*), sora (*Porzana carolina*), American avocet (*Recurvirostra americana*), black-necked stilt (*Himantopus mexicanus*), common snipe (*Gallinago gallinago*), black-crowned night heron (*Nycticorax nycticorax*), greater yellowlegs (*Tringa melanoleuca*), lesser yellowlegs (*Tringa flavipes*), least sandpiper (*Calidris minutilla*), long-billed dowitcher (*Limnodromus scolopaceus*), belted kingfisher (*Megaceryle alcyon*), American white pelican (Pelecanus erythrorhynchos), double-crested cormorant (*Phalacrocorax auritus*), Caspian tern (*Hydroprogne caspia*), great blue heron (*Ardea herodias*), great egret (*Ardea alba*), and cattle egret (*Bubulcus ibis*).

Game birds: mourning dove (*Zenaida macroura*), California quail (*Callipepla californica*), ring-necked pheasant (*Phasianus colchicus*), Chukar (*Alectoris chukar*), gray partridge (*Perdix perdix*), and wild turkey (*Meleagris gallopavo*).

Woodpeckers: downy woodpecker (*Picoides pubescens*) and northern flicker (*Colaptes auratus*).

Hummingbirds: black-chinned hummingbird (*Archilochus alexandri*), calliope hummingbird (*Selasphorus calliope*), and rufous hummingbird (*Selasphorus rufus*).

Crows, magpies, and blackbirds: black-billed magpie (*Pica hudsonia*), American crow (*Corvus brachyrhynchos*), common raven (*Corvus corax*), red-winged blackbird (*Agelaius phoeniceus*), Brewer's blackbird (*Euphagus cyanocephalus*), brown-headed cowbird (*Molothrus ater*), and yellow-headed blackbird (*Xanthocephalus xanthocephalus*).

Nighthawks, swifts, flycatchers, larks, and swallows: common nighthawk (*Chordeiles minor*), common poorwill (*Phalaenoptilus nuttallii*), white-throated swift (*Aeronautes saxatalis*), western meadowlark (*Sturnella neglecta*), horned lark (*Eremophila alpestris*), western wood-pewee (Contopus sordidulus), gray flycatcher (*Empidonax wrightii*), dusky flycatcher (*Empidonax oberholseri*), eastern kingbird (*Tyrannus tyrannus*), western kingbird (*Tyrannus verticalus*), tree swallow (*Tachycineta bicolor*), northern rough-winged swallow (*Stelgidopteryx serripennis*), violet-green swallow (*Tachycineta thalassina*), bank swallow (*Riparia riparia*), and cliff swallow (*Petrochelidon pyrrhonota*).

Perching birds: American robin (*Turdus migratorius*), hermit thrush (*Catharus guttatus*), American goldfinch (*Carduelis tristis*), orange-crowned warbler (*Vermivora celata*), yellow warbler (*Setophaga petechial*), yellow-rumped warbler (*Setophaga coronate*), Wilson's warbler (*Cardellina pusilla*), warbling vireo (*Vireo gilvus*), marsh wren (*Cistothorus palustris*), winter wren (*Troglodytes hiemalis*), house wren (*Troglodytes aedon*), ruby-crowned Kinglet (*Regulus calendula*), golden-crowned kinglet (*Regulus satrapa*), house finch (*Haemorhous mexicanus*),

purple finch (*Haemorhous purpureus*), blackhead grosbeak (*Pheucticus melanocephalus*), evening grosbeak (*Coccothraustes vespertinus*), Bullock's oriole (*Icterus bullockii*), spotted towhee (*Pipilo maculatus*), vesper sparrow (*Pooecetes gramineus*), lark sparrow (*Chondestes grammacus*), savannah sparrow (*Chondestes grammacus*), white-crowned sparrow (*Zonotrichia leucophrys*), house sparrow (*Passer domesticus*), song sparrow (*Melospiza melodia*), dark-eyed junco (*Junco hyemalis*), cedar waxwing (*Bombycilla cedrorum*), Bohemian waxwing (*Bombycilla garrulous*), European starling (*Sturnus vulgaris*), western tanager (*Piranga ludoviciana*), and sage thrasher (*Oreoscoptes montanus*).

Raptors: osprey (*Pandion haliaetus*), northern harrier (*Circus cyaneus*), red-tailed hawk (*Buteo jamaicensis*), Swainson's hawk (*Buteo swainsonii*), Rough-legged hawk (*Buteo lagopus*), sharp-shinned hawk (*Accipiter striatus*), Cooper's hawk (*Accipiter cooperii*), bald eagle (*Haliaeetus leucocephalus*), golden eagle (*Aquila chrysaetos*), western screech owl (*Megascops kennicottii*), great horned owl (*Bubo virginianus*), barn owl (*Tyto alba*), great gray owl (*Strix nebulosa*), short-eared owl (*Asio flammeus*), long-eared owl (*Asio otus*), northern saw-whet owl (*Aegolius acadicus*), burrowing owl (*Athene cunicularia*), merlin (*Falco columbarius*), prairie falcon (*Falco mexicanus*), American kestrel (*Falco sparverius*), and peregrine falcon (*Falco peregrinus*).

Reptiles: western painted turtle (*Chrysemys picta*), red-eared slider (*Trachemys scripta elegans*), pygmy short-horned lizard (*Phrynosoma douglasii*), western fence lizard (*Sceloporus occidentalis*), sagebrush lizard (*Sceloporus graciosus*), western skink (*Plestiodon skiltonianus*), rubber boa (*Charina bottae*), North American racer (*Coluber constrictor*), gopher snake (*Pituophis catenifer catenifer*), and western rattlesnake (*Crotalus viridis*).

3.7.2 Environmental Effects

3.7.2.1 Alternative 1: No Action

Current effects to terrestrial/wildlife resources are from routine operation and maintenance activities performed by St. Hilaire. There would be no additional direct positive or negative effects on terrestrial/wildlife resources under the No Action Alternative.

3.7.2.2 Alternative 2: The Corps would issue the amendment and the easement (Proposed Action)

The Proposed Action would result in temporary and permanent effects to upland wildlife habitat (Section 3.6.1) within the proposed action area. A total of two acres would be cleared to create a 36-foot-wide access road and staging pad along proposed pipeline routes, installation of underground transmission lines, and installation of transformers.

Approximately 970 linear feet of the proposed new UEC transmission lines would be suspended above ground on poles, the rest of the transmission lines would be placed underground; the

remaining new UEC transmission lines (1,100 linear feet) would be used to replace already existing suspended transmission lines. To reduce potential avian collisions with the new overhead wires, bird-flight diverters (BFD's) would be installed on the power poles and crossbeams. The new suspended lines would be large enough and reflective enough to not require BFDs on the wires.

The two acres of terrestrial wildlife habitat affected by the proposed action is a small fraction of the amount of riparian habitat and upland habitat available in surrounding areas. All vegetation clearing activities for construction would take place outside migratory bird nesting season (April 1 through August 15) to avoid "take" of migratory birds through habitat alterations. All except 500 square feet of disturbed areas would be graded and hydro-seeded with a native grass seed mix; the remaining 500 square feet would be permanently altered by the installation of the new transformers. The minor (temporary) disturbance to vegetation and installation of suspended powerlines (long-term) would have no significant effect on wildlife populations or habitat use.

3.7.2.3 Alternative 3: The Corps would issue an easement to Superior Farms

Effects to terrestrial resources and wildlife under Alternative 3 would be the same/similar as Alternative 2.

3.8 HISTORIC/CULTURAL PROPERTIES

3.8.1 Affected Environment

The area around the Lake Wallula shoreline is an area of rich cultural heritage. Native Americans have lived in this region for more than ten thousand years. The confluence of the Columbia River and the Snake River, just upstream of the project area, was frequented by the Cayuse, Umatilla, Walla Walla, and other peoples. Recorded sites of the prehistoric and historic eras are numerous around the reservoir shoreline. The historic era began with the Lewis and Clark Expedition in 1805.

Types of prehistoric and historic cultural sites which might be encountered include rockshelters, pithouses, fishing stations, fort/trading post remains, townsites, roadways/trails, homesteads and other remains of the long history of human use of the area. Besides remnants of prehistoric and historic daily life, there are areas and specific locations of great traditional significance represented around the Lake Wallula shoreline (ACOE 2011a).

The project is located in a culturally sensitive area along the Columbia River. Preliminary research conducted at the State of Oregon Archaeological archives in Salem revealed ten listed archaeological sites and 11 archaeological surveys easement boundaries. The Corps, Portland District stipulated that an archaeological review and inventory must take place on the project area. The Corps, Walla Walla District determined that an Archaeological Resources Protection Act (ARPA) permit was not required for the in-water core sampling. A letter to this effect was sent to Reiss-Landreau Research (RLR) from the Chief of Real Estate for the Walla Walla District on August 21, 2017.

RLR acquired a right-of access to the upland parcel from US Fish and Wildlife. RLR's field survey consisted of a walkover visual reconnaissance of the entire length of the proposed EID pipeline within Township 05 North, Range 30 East, Section 8 (SW ¼, NW ¼). RLR also monitored the removal of ten in-water substrate core samples within the proposed EID easement boundary, and inspected these samples for cultural resources. After thorough review and reconnaissance, RLR found no evidence of historic/cultural resources.

3.8.2 Environmental Effects

3.8.2.1 Alternative 1: No Action

Implementation of Alternative 1 would result in no changes to any processes affecting cultural resources, and would have no potential to affect historic properties.

3.8.2.2 Alternative 2: The Corps would issue an amendment and a new easement (Proposed Action)

This alternative proposes the Corps would issue two real estate instruments. These easements are required for the appropriate Regulatory Permits and ROWs to be issued by the Corps and USFWS. These actions, when combined, constitute the Federal undertaking as per the National Historic Preservation Act (NHPA) Section 106 and serve to identify the area of potential effect (APE). The cultural resource investigation by RLR did not identify any cultural resources or historic properties within the easement and ROW boundaries. Similarly, no historic properties have been identified within the area intended for mitigation—which is located below the OHWM.

3.8.2.3 Alternative 3: The Corps would issue an easement to Superior Farms

An archaeological review and inventory would need to take place on the Superior Farms project area and an Archaeological Resources Permit Application may be required. A thorough cultural resource investigation has not been conducted for this area of the Superior Farms project and no substrate core samples have been evaluated from below the OHWM in this section of the Columbia River. Compliance with all Federal laws and regulations regarding cultural resources would need to be met prior to any construction on the Superior Farms project area.

3.9 NOISE

3.9.1 Affected Environment

The proposed action is located within a rural area with relatively few noise sources. Sources may include noise generated by existing pump stations, boat operation along Lake Wallula, and vehicle use within the ROW and nearby highway. Because the area is sparsely populated, background noise levels at locations distant from boat traffic and traveled roadways are likely to be between 30 and 40 decibels adjusted (dBA), under calm wind conditions (USACE 2011b). There is a marina and two RV parks, one with a campground, near the mitigation site in

Boardman. New construction, pumping, and asphalt excavation from the river could increase noise in the immediate area of the work.

3.9.2 Environmental Effects

3.9.2.1 Alternative 1: No Action

Local noise would continue as before, with boat operation along Lake Wallula and vehicle use within the ROW as background noise and noise from the irrigation pump (96 - 104 dBA, Depczynski 2005) as the primary source of noise.

3.9.2.2 Alternative 2: The Corps would issue an amendment and a new easement (Proposed Action)

The proposed action would slightly increase localized ambient noise levels within the proposed ROW during construction and mitigation area development in Boardman during asphalt removal. However, given the rural location of the proposed action, it is anticipated that any potential disturbance resulting from slightly elevated short-term ambient noise levels from construction activities would be negligible.

The proposed pile driving would create loud underwater sounds. An oscillating sound is created when a vibratory hammer is used which is conducted through the length of the pile and into surrounding air, water, and substrate. Vibratory hammers have a rapid repetition rate and produce sounds of lower intensity than impact hammers, and are not likely to create injury or death to fish (USACE 2011c).

Vibratory hammers produce sounds of lower intensity, with a rapid repetition rate and longer duration, and with more energy in the lower frequencies (15-26 Hertz) (Carlson et al. 2001 and Nedwell et al. 2003). NMFS's current pile driving thresholds for "physical injury" to fish include a peak pressure of 206 dB and an accumulated SEL of 187 dB for fish greater than two grams, and 183 dB for fish less than two grams. In addition, a 150 dB RMS "harassment" threshold is applied for potential behavioral effects. Peak sound levels associated with vibratory hammer use can exceed 150 decibels, however, the rise time is relatively slow and fish do not appear to habituate to these sounds (i.e., the sound elicits an avoidance response), even after repeated exposure (Dolat 1997 and Knudsen et al. 1997). Average unattenuated sound pressures for vibratory driver installation of 12-inch steel pipe and H-type piles can be as much as 171 dBPEAK, 155 RMS, and 150 SEL (Caltrans 2015).

Limiting work to December 1 through February 28 dramatically reduces the number of ESA listed fish exposed to the oscillating sound pressure waves created by the vibratory pile driving. If fish were to be present in the action area during pile driving they would be subject to potential injury were they to remain within 22 meters of a pile being driven for sufficient time for cumulative effects to result; however, given the low frequencies and short-term and intermittent nature of the vibratory hammer use (likely up to two to four hours per day, over the course of an eight to ten hour day) and proposed conservation measures (i.e., timing of in-

water work and daily “soft-start” procedures); it is reasonably certain that impacts to ESA-listed fish species resulting from vibratory hammer use during piling installation would not result in injury or adverse behavioral effects (See Appendix A).

The installation of new pumps at the proposed project site would increase ambient noise levels to around 96 - 104 dBA (Depczynski 2005). Pumps operating within this sound range already exist at the project location. The addition of new pumps would not elevate noise above nuisance levels due to the remoteness of the project location and the fact that noise levels are already elevated in the area from existing irrigation pumps.

Excavation work for mitigation in Boardman would be done during daytime hours during the in-water work window. Asphalt excavation from the river could increase noise in the immediate area of the work. Sound levels associated with heavy construction equipment range from 80 to 120 dBA and power tools commonly used in construction produce sound levels up to 115 dBA (Spencer and Kolvachik 2007). This excavation action would not have a significant impact given the time of day and year the work would take place.

The overall proposed action would not result in noise emissions greater than the applicable legal limits or nuisance levels. Any noise effects would be temporary and insignificant.

3.9.2.3 Alternative 3: The Corps would issue an easement to Superior Farms

Noise effects under Alternative 3 would be the same/similar as Alternative 2.

3.10 CLIMATE CHANGE

3.10.1 Affected Environment

Evidence for climate change includes increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global mean sea level. The linear warming trend over the last 50 years (0.13 +/- 0.03°C per decade) is nearly twice that for the last 100 years. The total global average temperature increase from 1850 – 1899 to 2001 – 2005 is 0.76 +/- 0.19°C.

Climate records show that the Pacific Northwest has warmed about 1.0°C since 1900, or about 50% more than the global average warming over the same period. The warming rate for the Pacific Northwest over the next century is projected to be in the range of 0.1- 0.6˚ C/decade (USACE 2011a). Average annual temperature in the region is projected to increase by – 16.1 to -12°C by the end of the century. Changes in snowpack, streamflows, and forest cover are already occurring in the Pacific Northwest and future climate change trends would likely continue to influence these changes.

Most models project long-term increases in winter precipitation and decreases in summer precipitation (EPA 2015). Projected precipitation changes for the region are relatively modest and unlikely to be distinguishable from natural variability until late in the 21st century. The

changes in temperature would be expected to diminish the snowpack, alter streamflow timing, increase peak river flows, and increase water temperature.

3.10.2 Environmental Effects

3.10.2.1 Alternative 1: No Action

There would not be any effects to climate change as a result of implementing the No Action Alternative and climate change would not affect current routine operation and maintenance activities performed by St. Hilaire.

3.10.2.2 Alternative 2: The Corps would issue an amendment and a new easement (Proposed Action)

Heavy trucks and machinery would be required for the proposed construction and mitigation asphalt removal. Increased use of internal combustion engines would result in more gasoline and diesel fuel consumption which could result in higher greenhouse gas emissions. Global atmospheric temperatures are correlated to increased atmospheric carbon dioxide levels (IPCC 2001). The emissions from the proposed action would be part of world-wide cumulative contributions to climate change by way of increases in greenhouse gas emission. Given the minuscule contribution of CO2 emissions from construction activities during the proposed action to overall global emissions, effects are considered to be insignificant. There would be extremely negligible effects on climate change as a result of implementing the proposed action.

The JSH Farms irrigation pumping station begins pumping in March, irrigation use peaks May through August, and the pumping station shuts down in October. Climate change could affect pumping station operations by altering stream flow timing and reducing peak flow because of diminished snowpack, but these effects would likely be less pronounced in the mainstem Columbia River than in smaller tributaries.

3.10.2.3 Alternative 3: The Corps would issue an easement to Superior Farms

Climate change effects and affects under Alternative 3 would be the same/similar as Alternative 2.

3.11 SOCIOECONOMICS

3.11.1 Affected Environment

Residents of Umatilla County and Morrow County are the population centers affected by the proposed action. The socioeconomic effects of the proposed action and mitigation would be seen primarily within communities along the Lake Wallula shoreline. Broader economic effects could stem from increased agricultural production outside the study area, which is addressed in Section 3.15 (Cumulative Effects).

- **Population**

  Umatilla County currently has a population around 75,900 residents. The largest cities within Umatilla County are Hermiston and Pendleton with around 17,300 and 16,850 residents, respectively. The current population estimate reflects only a 0.08% increase in the population over the 2000 Census figures. Umatilla County is projected to have 80,500 residents, which is a jump of nearly 8,000 from 2010's census figures (U.S. Census Bureau, 2010-2017 Census). Population growth in Hermiston is projected to make up 53.9% of the total County's growth by 2035 (Portland State University, 2016a). The highest level of education among people aged 25 years and older is shown in Table 3-1 below.

Table 3-1. Highest level of education among people aged 25 years and older in Umatilla County

Level of Education	Percent of Population
Doctorate	0.7
Professional	1
Master's	4.3
Bachelor's	9.5
Associates	10.4
Some College	28.8
High School	29.2
Some High School	9.9
Less than High School	6.1
None	2.1

Source: Statistical Atlas retrieved on January 31 2018 from https://statisticalatlas.com/county/Oregon/Umatilla-County/Education

Morrow County currently has a population of 11, 890 residents. Population growth in Morrow County raised within a narrow range of 0.9 to 1.2 percent annually between 2013 and 2017. The largest city within Morrow County is Boardman with a population of 3,555 residents. Boardman has absorbed more than half of the Morrow County population growth, rising by 320 residents or nearly 10 percent between 2013 and 2017 (Portland State University, 2016b). The highest level of education among people aged 25 years and older is shown in Table 3-2 below.

Table 3-2. Highest level of education among people aged 25 years and older in Morrow County

Level of Education	Percent of Population
Doctorate	0.5
Professional	0.1
Master's	2.2
Bachelor's	6.9
Associates	6.5
Some College	25.7
High School	33.6
Some High School	13.3
Less than High School	9.6
None	1.7

Source: Statistical Atlas retrieved on January 31 2018 from https://statisticalatlas.com/county/Oregon/Morrow-County/Education

- **Employment and Income**

Median household income in Umatilla County is $48,101 which is below the national average of $53,889. The poverty rate of Umatilla County is 17.6% of the population which is higher than the national average of 14.7%. The unemployment rate in Umatilla County as of November 2017 was 4.5% while the national unemployment rate as of November 2017 was 4.1% (U.S. Bureau of Labor Statistics 2017a).

The economy of Umatilla County employs around 32,450 people. The economy is specialized in agriculture, forestry, fishing, hunting, public administration, and utilities. The largest industries in Umatilla County are retail trade (4,251), healthcare and social assistance (3,742), and manufacturing (3,605). The highest paying industries are utilities ($68,750), professional, scientific, or technical services ($48,000), and transportation and warehousing ($47,475) (American Community Survey, US Census 2014a).

Median household income in Morrow County is $54,441 which is above the national average. The poverty rate of Morrow County is 14.6% of the population which is on par with the national average of 14.7%. The unemployment rate in Morrow County as of November 2017 was 4.2% while the national unemployment rate as of November 2017 was 4.1% (U.S. Bureau of Labor Statistics 2017b).

The economy of Morrow County employs around 4,827 people. The economy is specialized in agriculture, forestry, fishing, hunting, mining and quarrying, oil and gas extraction, and management of companies and enterprises. The largest industries in Morrow County are agriculture, forestry, fishing, hunting (1,083), manufacturing (757),

and healthcare and social assistance (393). The highest paying industries are utilities ($67,500), professional, scientific, technical services ($65,000), and transportation and warehousing ($48,088) (American Community Survey, US Census 2014b).

- **Housing**

  The proposed action and mitigation area are rural surrounded mostly by agricultural and industrial development. Housing development on the shores of the middle Columbia River has been slow and incremental as much of the shoreline is controlled by Federal, state, or local jurisdictions.

3.11.2 Environmental Effects

3.11.2.1 Alternative 1: No Action

The No Action Alternative would have neutral to adverse socioeconomic effects in Umatilla County and possibly in the surrounding counties. Under the No Action Alternative there would be no change to the amount of irrigation water being dispersed to the 4,200 acres of farmland currently serviced by the St. Hilaire irrigation pump station and there would be no change in irrigation water dispersal to the 28,000 acres owned by the EID that the new pump station would service, the effects of which are evaluated in detail in Section 3.15 (Cumulative Effects).

3.11.2.2 Alternative 2: The Corps would issue an amendment and an easement (Proposed Action)

If implemented, the proposed action would have a positive effect in Umatilla County. The proposed action would change the irrigation method for 28,000 acres of farmland owned by the EID and for the 19,000 acres of farmland owned by the additional 29 existing farms increasing farmland productivity and generating revenue by about $9,000 per acre of irrigated farmland, the effects of which are evaluated in detail in Section 3.15 (Cumulative Effects).

There would also be minor economic benefits to local businesses in Umatilla County, or surrounding counties, in 2018 and 2019 as a result of contractors working in the project area. More workers may also be employed to keep up with routine maintenance of the proposed pump station.

3.11.2.3 Alternative 3: The Corps would issue an easement to Superior Farms

Socioeconomic effects under Alternative 3 would be similar to Alternative 2.

3.12 ENVIRONMENTAL JUSTICE

3.12.1 Affected Environment

As outlined in Executive Order 12898, Federal agencies must evaluate environmental justice issues related to any project proposed for implementation. This evaluation includes identification of minority and low-income populations, identification of any negative project impacts that would disproportionately affect these low-income (poverty levels are stated in section 3.11.1) or minority groups, and proposed mitigation to offset the projected negative impacts. In Umatilla County the racial composition is predominantly White (66.4%). Native Americans (4.4%), Hispanics (26.4%), and other races (2.6%) also account for a percentage of the areas demographics (U.S. Census Bureau, 2010-2017a).

The racial composition in Boardman is predominately Hispanic/Latino (36.3%), white (59.4%), and other race (4.4%) (U.S. Census Bureau, 2010-2017b).

3.12.2 Environmental Effects

3.12.2.1 Alternative 1: No Action

There would be no significant or disproportionate impact to minority or low-income populations under the No Action Alternative.

3.12.2.2 Alternative 2: The Corps would issue an amendment and a new easement (Proposed Action)

The proposed action and the mitigation action would not have a disproportionate or adverse effect on low-income or minority populations.

3.12.2.3 Alternative 3: The Corps would issue an easement to Superior Farms

Environmental justice under Alternative 3 would be similar to Alternative 2.

3.13 RECREATION

3.13.1 Affected Environment

Recreational activities take place around Lake Wallula throughout the year, with the highest activity levels during the fair-weather periods of late spring, summer, and early autumn. Due to the setting of recreational facilities, most recreation is related to the water resources presented by the Columbia River; boating, swimming, sailboarding, and fishing are common activities. The ROW passes through McNary NWR which receives about 66,000 visitors annually (USGS 2011). Day-use activities on the refuge include picnicking, hiking, fishing, hunting, and wildlife observation. Vehicles including bicycles, motorcycles, and ATVs are allowed on designated routes throughout the refuge and can be parked in designated parking areas for further access into the refuge. Access to other parts of the refuge are limited by gates and poor road conditions which can restrict public use.

Near the mitigation site in Boardman, there is a marina, park, campground, two RV parks, and two baseball fields.

3.13.2 Environmental Effects

3.13.2.1 Alternative 1: No Action

Current effects to recreation are from routine operation and maintenance activities performed by St. Hilaire. There would be no additional or new direct positive or negative effects on recreation under the No Action Alternative.

3.13.2.2 Alternative 2: The Corps would issue an amendment and a new easement (Proposed Action)

Effects to recreation under the proposed action would be restricted to times of active construction. Effects of the proposed action on water dependent activities is expected to be low due to the cold weather at the time of year of the proposed in-water work window (December 1 through February 28). Effects to upland game bird hunting (season September 1 through January 31), shoreline fishing, and other day use activities explained above are also expected to be low due to the remote and mostly inaccessible location of the proposed project area. The new access roads proposed for construction and maintenance of the pump station discharge pipes may increase accessibility to more remote parts of the refuge.

Asphalt excavation from the river could increase noise in the immediate area of the work. Excavation work would be done during daytime hours and during the in-water work window. Road excavation would not have a significant impact on recreation near the mitigation site given the time of day and year the work would take place.

3.13.2.3 Alternative 3: The Corps would issue an easement to Superior Farms

Recreation effects under Alternative 3 would be minimal, short-term, and limited to water dependent activities. The project area and pipeline route would be located on remote areas not used for recreation due to the steepness of topography and lack of any facilities or attractions.

3.14 LAND USE

3.14.1 Affected Environment

The primary land use in Umatilla County is cropland (58.8%), pastureland (30.3%), and woodland (8.2%); other land makes up the remaining 2.7% (USDA 2012a). The project area consists of a private irrigation pump station located on Federally owned land managed by the Corps.

The easement areas are managed by the Walla Walla District for the McNary Lock and Dam Project and the mitigation area is federal land managed by the Portland District as part of the John Day Lock and Dam Project. The proposed project ROW is currently managed by the USFWS as part of the McNary NWR and is undeveloped except for the existing transmission

lines, and three existing, buried irrigation discharge pipes located within three current easements generally running north-south through the ROW.

The primary land use in Morrow County is pastureland (49.6%), cropland (41.7%), woodland (6.3%), and other uses (2.3%) (USDA 2012b). The proposed mitigation site is a submerged part of the old Highway 30 in Boardman. Asphalt excavating equipment would operate from an existing roadway.

3.14.2 Environmental Effects

3.14.2.1 Alternative 1: No Action

Land use would not change under implementation of the No Action Alternative. Any effects would be caused by current routine operation and maintenance activities performed by St. Hilaire. There would be no additional direct positive or negative effects to land use under the No Action Alternative.

3.14.2.2 Alternative 2: The Corps would issue an amendment and a new easement (Proposed Action)

There would be no adverse effect to land use at either the project site or mitigation site under the proposed action.

3.14.2.3 Alternative 3: The Corps would issue an easement to Superior Farms

Effects to land use under Alternative 3 would be similar to the effects under Alternative 2.

3.15 GEOLOGY AND SOILS

3.15.1 Affected Environment

The bedrock geology of the Columbia Basalt Plain consists primarily of thick successions of basaltic lavas. Numerous basaltic formations are distinguished within these lavas, and they are generally known as the Columbia River Basalt Group (CRBG) (Galster and Sager 1989). The Blue Mountains have a core of volcanic and sedimentary rocks. To the north, these core rocks are covered by the CRBG, which, in turn, has been upwarped (a geologic structure whose flanks slope gradually away from the center) slightly by the Blue Mountains.

Pleistocene and contemporary river and alluvial fan deposits consist of gravels and sands with minor amounts of silt and clay. Winds eroded exposed fine-grain sediments. These silt-size sediments, known as loess, have been deposited over large areas during the Pleistocene and into the post-glacial period. These deposits are most common on the upland surfaces of the Columbia Basalt Plain in a region known as the Palouse (Busacca et al. 1985). These materials occur only to a minor extent around the perimeter of the region's reservoirs including Lake Wallula.

Soil types within the project area include: Dune land, Quincy fine sand, Quincy loamy fine sand, Quincy- rock outcrop, rock outcrop xeric Torriorthents complex, Starbuck very fine sandy loam, Taunton fine sandy loam, Winchester sand, and Winchester-Quinton complex. Soil types at the mitigation site in Boardman are Quincy fine sand and Quincy loamy fine sand (NRCS 2018).

3.15.2 Environmental Effects

3.15.2.1 Alternative 1: No Action

Effects to geology and soils would not change under the No Action Alternative. Any effects would be caused by current routine operation and maintenance activities performed by St. Hilaire. There would be no additional direct positive or negative effects to geology and soils under the No Action Alternative.

3.15.2.2 Alternative 2: The Corps would issue an amendment and a new easement (Proposed Action)

The proposed action includes clearing approximately two acres of land for a 36 foot wide access road and staging pad and excavating two trenches within the access road to install the 78-inch steel pipeline and 42-inch steel pipeline. The trenches would be backfilled using clean material and compacted and the excavated side-cast material would be placed over top to complete the filling of the trench and create a cap over the pipe. Once the pipelines have been installed, the exposed areas would be graded. Construction would also include installation of new electric underground transmission lines.

The proposed action is expected to have minor, short-term effects to soils and topography, resulting from earth-moving and construction activities. The proposed construction is not expected to have any long-term effects on the geology or soils of the surrounding areas.

3.15.2.3 Alternative 3: The Corps would issue an easement to Superior Farms

Effects to soils under Alternative 3 would be similar to the effects under Alternative 2. The Superior Farms project area contains steep basalt terrain which would need to be blasted and removed to install the distribution pipes. The impacts to basalt outcroppings in the area could be substantial depending on the amount of blasting necessary for boring the 78-inch pipe through the basalt.

3.16 CUMULATIVE EFFECTS

The National Environmental Policy Act (NEPA) and the Council on Environmental Quality (CEQ) regulations implementing the Act require Federal agencies to consider the cumulative effects of their actions. Cumulative effects are defined as effects “on the environment which result from 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. Cumulative impacts can result from individually minor, but collectively significant actions taking place over a period of time" (40 CFR § 1508.7).

The primary goal of a cumulative effects analysis is to determine the magnitude and significance of the environmental consequences of the proposed action in the context of the cumulative effects of other past, present, and reasonably foreseeable future actions.

The Corps used the technical analysis conducted in this EA to identify and focus on cumulative effects that are "truly meaningful" in terms of local and regional importance. While the EA addresses the effects of alternatives on the range of resources representative of the human and natural environment, not all of those resources need to be included in the cumulative effects analysis – just those that are relevant to the decision to be made on the proposed action. The Corps has identified the following resources that are notable for their importance to the area and potential for cumulative effects. Those resources are:

- Aquatic Resources
- Socioeconomics
- Water Quality
- Threatened and Endangered Species

Resources are discussed in terms of their cumulative effect boundary (spatial and temporal), the historic condition and impacts to the resources, present condition and impacts to the resources, reasonably foreseeable future actions that may affect the resources, and the effects to the resource by the various vegetation maintenance alternatives when added to other past, present, and future actions.

This section evaluates the cumulative effects of actions that could potentially affect the same environmental resources as those discussed earlier in this EA. The scope of this analysis extends beyond the proposed action area to other areas that sustain the resources of concern. A resource may be differentially impacted in both time and space. The implication of those impacts depends on the characteristics of the resource, the magnitude and scale of the project's impacts, and the environmental setting (EPA 1999).

Geology and Soils was not considered for cumulative impact analysis, because it would not be an issue for the No Action or Proposed Action Alternatives; however, it is a major consideration for Alternative 3. A visual inspection of the area surrounding the Superior Farms pump station showed that the discharge pipe would have to be mounted on a steep basalt slope. The added cost just for blasting and removing rock would be considerable with no added benefit for choosing Alternative 3 over Alternative 2. Cost could increase even higher if additional bedding and backfill is required (refer to Section 2.2.3 for details).

3.16.1 Geographic and Temporal Scope of Cumulative Effects Analysis

Guidance for setting appropriate boundaries for a cumulative effect analysis is available from CEQ (1997) and EPA (1999). Generally, the scope of cumulative effects analysis should be

broader than the scope of analysis used in assessing direct or indirect effects. "Geographic boundaries and time periods used in cumulative impact analysis should be based on all resources of concern and all of the actions that may contribute, along with the project effects, to cumulative impacts" (EPA 1999). The analysis should delineate appropriate geographic areas including natural ecological boundaries, whenever possible, and should evaluate the time period of the project's effects.

The resources assessed have experienced various impacts since the mid-1900s. Actions such as construction and operations of dams and associated levee systems, flood control projects, agricultural development, road building, logging, development of cities, and fish harvest have all contributed to the current state of the resources in the area. These actions have negatively and positively affected the resources.

Discussed below are the past, present, and reasonably foreseeable future actions that were considered for the cumulative effects analysis, the effects of the actions on the resources assessed, and a summary of the cumulative effects of the alternatives. Table 3-3 summarizes the geographic and temporal boundaries used in this cumulative effects analysis.

Table 3-3. Summary of geographic and temporal boundaries used in this cumulative effects analysis

Resource	Geographic Boundary	Temporal Boundary
Aquatic Resources Water Quality Threatened and Endangered Species	Lake Wallula Reservoir Columbia River Mile 292.5 to 356.5 AND Boardman shoreline, River Mile 248 to 268	65 Years
Socioeconomic	28,000 acres of farmland owned by: Rupp Ranches Royal Columbia Farms Hawman Farms Bracher Farms Golden Valley Farms Agri-Northwest Farms Golden Canyon Farm Windblown Farms Windy River Farms AND An additional 29 smaller farms located within the project service area totaling 19,000 acres	

The geographic boundary for the cumulative effects analysis for Aquatic Resources, Water Quality, and Threatened and Endangered Species includes actions taking place around Lake Wallula in the middle Columbia and around the shoreline in Boardman. The geographic boundaries for socioeconomic impacts includes the 28,000 acres of existing farmland that would be serviced by the new EID pump station. The new EID pumping station would also provide water to an additional 29 existing farms representing an additional 19,000 acres. The timeframe of 65 years was identified based on the completion of McNary Lock and Dam in 1954; John Day Lock and Dam was completed in 1971. A timeframe of five years into the future has been considered. Only actions that are reasonably foreseeable are included. To be reasonably foreseeable, there must be a strong indication that an action/event will occur or be conducted.

3.16.2 Past, Present, and Reasonably Foreseeable Future Actions and Implications for Resources

The following sections present summaries of past, present, and reasonably foreseeable future actions considered in this cumulative effects analysis, and the effects of those actions on the resources considered.

3.16.2.1 Past Actions

As development increased in the middle Columbia River Basin, the amount of human-caused impact on the rivers and associated resources increased. Development in the region included building numerous dams throughout the watershed and the subsequent formation of their reservoirs.

McNary Lock and Dam was built at River Mile (RM) 292 in 1954. McNary Dam provides for slackwater navigation, hydroelectric power generation, recreation, wildlife habitat, and incidental irrigation. There are two fish ladders for salmon, steelhead, and lamprey passage one on each shore of the dam. The Washington side also has an 86-foot wide, 683 foot long navigation lock that lifts boats an average of 75 feet. McNary Dam was designed to pass a flood of 2,200,000 cfs.

Lake Wallula reservoir formed behind McNary Lock and Dam in 1957. Lake Wallula begins at Columbia River RM 292.5 and extends 64 miles upstream. The Lake Wallula shoreline extends past McNary Beach, Hat Rock State Park, McNary National Wildlife Refuge, and Warehouse Beach, through the Wallula Gap, past the confluence of the Walla Walla River and Sacajawea State Park and the confluence of the Snake River, through the Tri-Cities of Kennewick, Pasco, and Richland, and to the Department of Energy's Hanford Site. Lake Wallula ends ten miles up the Snake River at Ice Harbor Lock and Dam. Lake Wallula has a water surface area of 38,800 acres, with 242 miles of shoreline, and a normal operating range between 340 and 335 feet above sea level.

John Day Lock and Dam was built at RM 216 in 1971. John Day Dam features a navigation lock on the Washington side and fish ladders on both sides. John Day Dam formed Lake Umatilla which runs 76.4 miles up the river channel to the foot of the McNary Dam. Crow Butte, Whitcomb Island, and the Blalock Islands are located within Lake Umatilla and the Umatilla National Wildlife Refuge spans both sides of the reservoir. The proposed mitigation would take place along the shoreline of Lake Umatilla near Boardman.

Other past actions along the middle Columbia River that could have a cumulative impact include the construction of marinas, construction of highways, roads, and railroads, installation of underground irrigation lines, installation of overhead powerlines and associated infrastructure, urban development, industrial growth, agriculture/farming (e.g., St. Hillarie's current pump station), timber harvest, and mining.

3.16.2.2 Effects of Past Actions on Resources

Aquatic Resources

Aquatic resources would have been impacted by the large volumes of sediment from early earth moving practices during dam construction and the general urban development discussed above. Large areas of riparian habitat and wetlands would have been flooded by the formation of Lake Walla and Lake Umatilla resulting in a loss of amphibian habitat. Aquatic resources would have also been affected by increased surface water runoff caused by increased impervious surfaces and loss of riparian vegetation. Surface water runoff was sourced from irrigation water polluted with pesticides and fertilizers, mining activities polluted with extensive chemicals, and roadways polluted with petroleum products. An increase in wastewater disposal into the Columbia River would have also coincided with industrial and residential development around the reservoirs and would have further degraded water quality impacting aquatic resources.

Threatened and Endangered Species

Salmon and steelhead adapted to habitat conditions over thousands of years. These conditions have been substantially changed or no longer exist in the middle Columbia River. For example, the formation of Lake Wallula inundated the Umatilla rapids, a natural feature in the river system. Historic salmon and steelhead returns were estimated at more than eight million fish (Chapman 1986). Native salmonid species in the Columbia River have decreased from historical population levels as a consequence of hydropower development, habitat degradation and loss, and a variety of ocean conditions including currents, pollution, temperatures changes, and nutrient base.

The construction of McNary and John Day Dams have eliminated the primary production areas for some fish species by inundating large amounts of spawning and rearing habitat. The formation of reservoirs and loss of spawning and rearing habitat has contributed to the reduced distribution and abundance of salmon in the system.

Gray wolves nearly disappeared from the lower 48 States in the early part of the 20th century. Predator-control programs that included extensive use of strychnine poison had resulted in their complete extirpation from everywhere except northern Minnesota.

Gray wolf recovery efforts began in the 1980s when the USFWS developed plans for restoring wolf populations to the northern Rocky Mountains. The northern Rocky Mountains recovery effort focused on Idaho, Montana, and Wyoming. In 1995 and 1996, 66 wild wolves were captured in the Canadian Rockies just north of the Montana border, and reintroduced into Yellowstone National Park (31 animals) and the Frank Church Wilderness of central Idaho (35 animals). The wolf population grew quickly after those reintroductions and by 2009 wolves had become established in eastern Oregon. Wolves were not reintroduced into Oregon; they migrated into the state on their own as the Idaho population expanded.

Wolf recovery efforts in the northern Rocky Mountains were highly successful and wolf populations in these areas now far exceed recovery goals. By 2011 the Northern Rocky Mountains Distinct Population Segment (DPS), which includes the eastern third of Oregon and Washington, was removed from the Federal Endangered Species List.

USFWS issued a proposed rule in 2013 to delist the gray wolf in all remaining areas except for the range of the Mexican gray wolf in Arizona and New Mexico. However, that rule has not yet been finalized.

By the end of 2014 a total of 77 wolves and nine known packs had been officially verified in Oregon. Most of Oregon's wolves are concentrated in the northeastern corner of the state, where wolves are not Federally listed. Eight of the nine known packs are located in the forests of northeastern Oregon; the ninth is in the southern Oregon Cascades, south of Crater Lake National Park (ODFW 2018a).

Water Quality

Columbia River water quality has been significantly altered by the construction of McNary and John Day Dams, construction of marinas, construction of highways, roads and railroads, urban development, industrial growth, agriculture, timber harvest, and mining activities. These developments would have led to an increase in impervious surfaces and loss of riparian habitat which would led to increased surface water runoff and erosion of the stream bank into the river.

Activities such as mining, logging, and agriculture have introduced large volumes of sediment from early earth moving practices and lack of care in assuring natural character of basin waterways. Mining has contributed extensive chemicals from runoff during the mining operations. Runoff of irrigation water, polluted with pesticides and fertilizers has contributed excessive nutrients, elevated levels of chemicals, and substantial amounts of sediment to natural waterways. Construction of highways and roads has contributed to increased surface water runoff polluted with petroleum products. Also increased wastewater disposal into the Columbia River would further degrade water quality in the two reservoirs.

Socioeconomics

Nearly 75 percent of the land area of Umatilla County (1,556,051 acres) were farmlands according to the census for 1954. Cropland made up 638,511 acres. Approximately 56,000 acres of the croplands were irrigated. Around 200,000 acres of croplands were planted with wheat and 54,000 acres were planted with peas. Crop agriculture provided about three-fourths of the total farm income for Umatilla County.

Pasture land consisted of 867,529 acres. Pasture lands in Umatilla County supported beef and dairy cattle, sheep, and turkeys. Pasture lands provided the other one-fourth of the county's farm income (U.S. Department of Commerce 1954).

The 1954 census also showed there were 1,885 farms in the county at that time, averaging 825.5 acres each, 340 of those farms were over 1,000 acres in size. Trends in 1954 showed that the number of farms in the county were decreasing, but the average size of the farms was increasing (U.S. Department of Commerce 1954).

3.16.2.3 Present Actions

Present actions include the current operations of McNary and John Day Dams, operation of irrigation water pumping stations, recreation activities, and current land use and development around the reservoirs.

The 16,908 acres surrounding Lake Wallula are public lands used for recreation, wildlife habitat, wildlife mitigation, and water-connected industrial development. Approximately 2,400 acres are licensed either to state or local park agencies, and the USFWS leases approximately 3,500 acres of public lands as part of the McNary National Wildlife Refuge. Port districts own approximately 1,500 acres within the boundary for industrial development. Facilities operated by commercial concessionaires or boat clubs are available at eight locations. Public boat launching facilities are available at 17 locations along the shoreline.

Aquatic Resources

A number of accidentally and intentionally released aquatic species can be found in the Columbia River Basin. These aquatic invasive species can impact the health of the water systems and the native aquatic species that live there. Fifty aquatic invasive species (AIS) were introduced to the middle Columbia River since the 1880s. Most of these AIS were fish (54%), aquatic plants (14%), and crustacea (12%); the remaining 24% were mollusks, bryozoans, hydrozoans, annelids, one amphibian, and one aquatic mammal (Draheim et al. 2007).

Intentional releases by agencies or individuals for the purpose of enhancing wildlife or game fish resources accounted for the largest number of introductions to the middle Columbia. Wildlife stocking conducted or approved by state and Federal agencies were possible mechanisms of introduction for 83% of nonnative fishes, and the American bullfrog. Intentional

release by an individual to establish a population, which was not sanctioned by an agency, was a potential vector for eight fish, aquatic plant, and invertebrate species (Draheim et al. 2007).

Populations of exotic, temperate mesotherms (intermediate between warm-blooded and cold-blooded) and eurytherms (species that can tolerate a wide range of temperatures) seem to thrive in reservoirs once established and can have a detrimental impact on native fish populations. For example, non-indigenous predatory fish such as smallmouth bass and walleye could have a large impact on native salmonid populations through increased predation on out-migrating juveniles (Draheim et al. 2007).

One study conducted in 1984-1985, found resident fish assemblages in Lake Umatilla were dominated by four native taxa and introduced taxa comprised approximately 1.3% of the taxa found (Gray et al. 1984 and Palmer et al. 1986). A follow up study conducted in 1995, found the four dominant native taxa from the first study now comprised only 37.7% of the sample and introduced species comprised 61% of the sample (Barfoot et al. 2002).

Another threat to aquatic resources is the variety of contaminants that enter the Columbia River from point and non-point sources. The main sources of pollution in the middle Columbia River include discharges and runoff from urban, agricultural, and industrial areas. Aquatic resources that use reservoirs such as Lake Umatilla and Lake Wallula for foraging, breeding, and rearing become exposed to the contaminants entering the river. Even when released in small concentrations, contaminants can accumulate in benthic organisms and biomagnify to top level predators. The role of bed sediment in contaminant transfer to biota in the river is unknown (USFWS 2004).

The current dam system causes sedimentary materials to be deposited in lower velocity areas creating problems with aquatic habitat and system management including changes in aquatic biota. Changes to reservoirs due to dredging should not introduce nonindigenous species or contaminates unless dredge spoils are dumped into different reservoirs than they were removed. However, dredged spoils could affect the survival or wellbeing of native organisms or species assemblages by altering water quality or habitat attributes (USACE and EPA 2002).

Threatened and Endangered Species

Endangered salmonid species within the impounded Columbia River are affected by an array of environmental conditions and changes such as increasing water temperatures, changes to water quality parameters, changes to water velocity through reservoirs, habitat degradation, changing turbidity, shifting seasonal patterns, changing volumes of river flow, passage effects at dams, changes in predators and predation rates, agriculture, and overfishing.

Snake River Chinook and steelhead currently pass through eight dams (Bonneville to Lower Granite) and Upper Columbia Chinook and steelhead go through four Federal dams (Bonneville to McNary). Upper Columbia stocks also go through public utility-owned dams above McNary. Adult fish migrate back to their spawning grounds using fish ladders and juvenile fish pass the dams by many routes including: juvenile bypass systems, spillways and turbines, or by

transport in barges or trucks. Major improvements have rendered the lower Columbia and lower Snake River dams more fish friendly for juvenile and adult fish.

For the period from 2005 to 2010 mean juvenile fish travel time from Lower Granite to McNary Dam was 11.2 days, compared to 21.3 days for the same reach during preceding era from 1998 to 2004. System monitoring indicates that the faster migration reflects the combined effects of flow augmentation, spill, and recently installed surface passage systems. Also about a third of the juvenile Chinook and steelhead that migrate through the lower Snake and Columbia Rivers are transported downriver by barge with close to 100% survival (Federal Caucus 2018).

The construction and operation of the Columbia-Snake River hydrosystem and the disposal of dredge spoils in the lower Columbia River and estuary have altered historical habitats and created new, hybrid habitats. These altered habitats support a wide range of predator species including native and non-native predatory fish species, such as northern pikeminnow and small mouth bass, and predator birds such as terns, cormorants, gulls, mergansers, and pelicans.

It is estimated that fish-eating birds consume 35 percent of the juvenile upper Columbia River spring Chinook salmon as they migrate downriver to the Pacific Ocean each spring. Northern pikeminnow also prey on millions of juvenile salmon and steelhead in the reservoirs behind Columbia and Snake River dams every year. Other current causes of salmon mortality in the Columbia River are natural (66%), nonfishing (13%), commercial fishing (13%), tribal (6%), and angling (1%) (OSU 2002).

Another important change is an increasing proportion of hatchery-reared fish in the salmon population. The majority of spring Chinook salmon, summer Chinook salmon, and steelhead counts in recent years showed that most of these fish originated from hatcheries. Only about one-fourth or less of spring/summer Chinook salmon and steelhead that returned to the Snake and upper Columbia Rivers in the past two decades have been of wild origin; thus, about 75 percent of the spring/summer adult Chinook salmon that return to the Snake River are produced in hatcheries. The proportion of wild fish in the salmon population is an issue important to long-term survival of the species because they preserve a diverse and rich store of genetic variation (NRC 1996).

Smith et al. (2002) also examined survival dynamics of fall Chinook salmon from the tailrace of McNary Dam to the tailrace of John Day Dam. Fall Chinook salmon were collected, PIT tagged, and released at McNary Dam. The population was primarily composed of mid-Columbia River stocks, such as the wild population from the Hanford reach. They found that during the summer (1998 to 2001) correlations were not significant between annual survival and the average river condition variables measured at McNary Dam, but the correlation with temperature was considerably higher than for flow and turbidity.

The four highest salmonid returns have all been in the past 15 years and adult spring Chinook returns to Bonneville Dam were the fourth highest on record in 2015 (counts go back to 1938, averaging less than 100,000 per year). The Federal Columbia River Power System Biological Opinion includes a total dam survival performance standards of 96% for spring migrating fish

and 93% for summer migrating fish. Juvenile dam survival estimates of 86 to 99% have been demonstrated at all Snake and Columbia River dams. The latest test results are showing that surface passage, combined with refined spill operations, has reduced the percentage of fish that go through powerhouses, turbines and bypass facilities, decreased fish travel time through the system and increased overall dam survival. Spilling water over hydroelectric dams, rather than running it through turbines, is generally seen as the safest method to get the young salmon and steelhead past the dams on their way to the ocean.

The Corps continues to make modifications to juvenile bypass systems to improve survival. Screened juvenile bypass systems are now in place at seven of the eight Lower Columbia and Snake River dams. These bypass systems guide fish away from turbines by means of submerged screens installed in the turbine intakes. The proportion of juvenile fish passing through non-turbine routes is now typically above 87% for spring migrants and 70% for summer migrants at all dams.

Currently there are 19 known gray wolf packs in the state of Oregon totaling around 112 individuals. Breeding pairs were observed in eight of the wolf packs, but only two wolf packs showed growth between 2015 and 2016. Fifteen of the wolf packs are located in northeastern Oregon and other four are found in the southern Oregon Cascades (ODFW 2018b).

The most common threats to gray wolves are conflict with humans; hunting and trapping, and habitat encroachment. Encroachment can lead to habitat fragmentation causing wolves to cross highways, through developed areas, and across large portions of private land; all increasing the chance of conflict with humans. Gray wolves are still protected under the Endangered Species Act in the western two thirds of Oregon. Although trappings, shootings, and poisonings still occasionally happen, wolf populations and habitat is still protected so cumulative effects to gray wolves would be low (ODFW 2018b).

Water Quality

A variety of contaminants enter the river from point and non-point sources such as industrial discharges and runoff from urban, agricultural, and forested areas. Runoff of irrigation water polluted with pesticides and fertilizers can contribute excessive nutrients, elevated levels of chemicals and substantial amounts of sediment to natural waterways further degrading the water quality of the system.

Urban and rural land uses for residential, commercial, industrial, and recreational activities like boating can contribute pollutants and sediments to surface waters as well. Watercraft using the docks could adversely affect water quality along the shoreline. Many watercraft leak small amounts of fuel and oil. Engines and hydraulic components also leak petroleum products into the bilge water, which is ultimately pumped into the reservoir. Allowing watercraft to be moored increases the occurrence of petroleum products contaminating water along the shoreline. Dock permittees may choose to refuel their watercraft at their private dock rather than on land or at a marina fueling station, thereby increasing the chance of a fuel spill in water. Permittees would not likely have the means to contain or clean up any fuel spill.

Impacts from contaminant spills could be significant depending on the nature and quantity of the contaminants involved. Smaller, more frequent spills may add to the degradation of the aquatic environment. These spills may occur at any time throughout the action area with different parties responsible for the contamination. Turbidity in the water as a result of propeller wash, and wave action against the shoreline caused by boats could also negatively affect water quality.

Discharge from eight chlorine-bleaching pulp mills likely also affects water quality in the Columbia River Basin. Lake Wallula is 303 (d) listed for polychlorinated biphenyls (PCBs) and has a total maximum daily load for Dioxin (2, 3, 7, 8-TCDD) of 0.013 parts per quadrillion (ppq) and total dissolved gas should not exceed 110% of saturation (ODEQ 2012). Excess nutrients, low levels of dissolved oxygen, presence of heavy metals, and changes in pH can all have impacts on water quality.

Socioeconomics

Seventy percent of the land (1,447,321 acres) is divided among 1,658 farms (U.S. Department of Commerce 2007). Umatilla/Hermiston and Milton-Freewater primarily produce irrigated agricultural crops. Umatilla/Hermiston produces more than ninety percent of the field crops (potatoes, mint, etc.), grasses, and legumes in Umatilla County.

Cropland in Umatilla County has decreased 10% from 1,447,321 acres to 1,308,312 acres between 2007 and 2012 (USDA 2012a). A change to a more reliable irrigation source could have a beneficial effect on land use by increasing the amount of productive crop land.

Nine existing farms would be serviced by the proposed project which comprise a total of 28,000 acres of farmland. If no action was taken, the EID farmlands that would be serviced by the proposed pump station would still rely on their current irrigation methods which does not address the critical groundwater shortage issue in the Lower Umatilla Basin and would not address the purpose and need of this project. As a result, thousands of acres of farmland would be left fallow each year.

3.16.2.4 Future Actions

Human population in the region may reach 40 to 100 million by the end of the twenty-first century. Estimates of population growth for the interior Columbia River Basin range from 0.3 percent per year (based on birth and death rates in the 1980s) to 1.6 percent per year (including immigration) by 2040 (McCool and Haynes 1996). The pressures for water uses and related services (e.g., hydroelectricity) would grow as the region's population grows likely requiring additional diversions of water from the Columbia River mainstem and tributaries.

The continued warming rate in the Pacific Northwest could increase agricultural water use demands associated with higher plant water consumption, longer growing season, and increased surface water evaporation. Any changes in snowpack or streamflows due to rising temperatures could cause a marked decrease in surface water runoff during the irrigation

season. Shifts in runoff timing or magnitude could cause more reliance on limited water storage aquifers or other water supplies which would also increase the demand for additional diversions from the Columbia River mainstem and tributaries. Additionally, in-stream water demands associated with ecosystem requirements, hydropower and thermoelectric power production, industrial cooling, navigation, and recreation may increase with rising temperatures (BOR 2016).

Aquatic Resources

Continued warming trends could increase stress on fisheries sensitive to a warming aquatic habitat, increase the risk of watershed vegetation disturbances due to increased fire potential, cause shifts in the geographic range of various species, impact migration timing, and affect the distribution and abundance of pests and pathogens in ecosystems (Draheim et al. 2007 and Isaak et al. 2012). Aquatic ecosystems are expected to be impacted by the potential increased winter flood frequency and intensity and decreased summer flows. Increased winter flooding could affect incubating eggs and juvenile Coho, Chinook, and steelhead survival (Hatten et al. 2014). Decreased summer flows could result in shallower, less suitable aquatic habitat, specifically reducing the availability of sections of river that are important for rearing. Allan et al. (2005) suggest that although freshwater ecosystems would adapt to climate change, native biodiversity in these ecosystems could diminish.

Continued warming could exacerbate invasive species prevalence (Draheim et al. 2007). A recently released report by the Independent Economic Advisory Board at the request of the Northwest Power and Conservation Council found that it is likely that zebra mussels (*Dreissena polymorpha*) and quagga mussels (*Dreissena bugensis*) would eventually colonize some of the large rivers of the Columbia Basin (WDFW 2010). Zebra and quagga mussels are ecosystem changers that are continuing to completely alter the aquatic communities in the Great Lakes and other watersheds where they have become established. Health risks include contamination of water supplies, increased occurrences of blue-green and other toxic algae blooms, ability to concentrate contaminated sediments up to 300,000 times ambient levels and then disperse these into the food chain through direct consumption or through fecal matter, which has then killed wildlife and could sicken humans. They are also a freshwater bio-fouler that can quickly reduce or stop flows in hydro and water supply systems, plug water cooling systems in watercraft motors, and create physical hazards to fish and humans as their shells are capable of cutting skin (Pleus et al. 2010).

Threatened and Endangered Species

Regional population increase could continue to have profound effects on salmonid populations. Nearly all the basin's economic activities have affected Columbia River salmonids and salmonid habitat. The fact that so many human actions have affected salmonid habitat in so many different ways confounds scientific investigations of the relative impacts of a given activity (ies). As a previous National Research Council committee that reviewed Columbia River salmon

management stated, “As long as human populations and economic activities continue to increase, so will the challenge of successfully solving the salmon problem” (NRC 1996).

Increased warming trends in the Pacific Northwest would also likely have a significant impact on salmonid populations. High stream temperatures can cause hundreds or thousands of adult salmonids to die when their thermal tolerances are exceeded. The Washington Climate Change Impacts Assessment (WACCIA) reports that rising stream temperatures would likely reduce the quality and extent of freshwater salmonid habitat. Salmonid die offs due to high stream temperatures are projected to occur more frequently (Isaak et al. 2012) as occurrences of thermal stress and migration barriers to salmonids are projected to double by the 2080s (Mantua et al. 2009).

Additionally, flow augmentation which relies on adequate water storage supplies in the spring and summer months is important to improving anadromous fish migration in the Columbia River. It may become more difficult to meet augmentation objectives for reservoirs that require minimum pools or flows in projected future conditions (BOR 2016).

The Oregon wolf population has increased and gradually expanded westward. Over the next several years wolves are expected to expand considerably in the Cascade Mountains and to become established in the mountains of Central Oregon. Given current population trends and the dispersal capabilities of wolves it is possible for a wolf to show up in almost any part of Oregon. As the human and wolf populations grow in Oregon, conflicts could increase. There could be more wolves crossing highways, developed areas, and large portions of private land. However, if the rule to delist gray wolves in all areas except for Arizona and New Mexico becomes finalized, cumulative effects to gray wolves would no longer be an issue in Oregon.

Water Quality

Climate change is expected to have important consequences for water quality conditions across the Columbia River Basin. In addition to causing increased temperatures and altered flow regimes, climate change also has the potential to alter stream networks and erosion regimes (Lettenmaier et al. 2008 and USFS 2010). Changing weather patterns and the projected increase in fire potential are expected to affect forested watersheds adversely. Upland and riparian vegetation generally act to reduce storm runoff, stabilize streambanks, shade surface water, cycle nutrients, and filter pollutants.

In addition, projections for larger and/or earlier peak flows may require increased spill over dams. In many cases reservoir spill generates total dissolved gas at levels that are potentially lethal to downstream fish populations. Increased spill due to changed peak flows has the potential to adversely affect downstream fisheries (BOR 2016).

Socioeconomics

The proposed action would change irrigation methods for 47,000 acres of farmland that would be serviced by the expanded pump station (28,000 acres EID farms + 19,000 acres additional

existing farms). Ultimately, more reliable irrigation water withdrawal and dispersion would have a positive benefit to all residents of Umatilla County and the surrounding communities by increasing farmland productivity, jobs, and revenue.

Increased farmland productivity could lead to increased permanent and seasonal employment in Umatilla County, and surrounding counties, which could help drop the unemployment rate below the national average.

3.16.2.5 Summary of Cumulative Effects of Past, Present, and Reasonably Foreseeable Future Actions on Resources

Alternative 1: No Action

There would be no cumulative effects to aquatic resources, threatened and endangered species, or water quality under the No Action Alternative beyond the existing conditions created by natural processes or routine operation and maintenance activities performed by St. Hilaire. There would be no additional direct positive or negative cumulative effects under the No Action Alternative.

The No Action Alternative would have adverse socioeconomic impacts. The EID farmlands that would be serviced by the proposed pump station would still rely on their current irrigation methods which does not address the critical groundwater shortage issue in the Lower Umatilla Basin and would not address the purpose and need of this project. As a result thousands of acres of farmland would be left fallow each year.

Alternative 2: The Corps would issue an amendment and a new easement (Proposed Action)

The proposed action would add short-term, negative impacts to aquatic resources, threatened and endangered species, and water quality when combined with cumulative effects from other actions. Effects to aquatic resources and water quality when combined with other actions discussed above would be temporary and have no long-term cumulative impact. Effects to threatened and endangered species would be moderate when combined with cumulative effects from other actions. The introduction of the new in-water and overwater structures may provide overhead cover and velocity refuge that can attract salmonid predators increasing predation on out-migrating juvenile salmonids by non-indigenous predatory fish. Installing grated decks that allow light penetration and waterproof lighting equipped with a daylight sensor under the overwater portions of the new concrete deck would help detract salmonid predators reducing the cumulative impact on salmonids.

There would be a positive socioeconomic impact by switching to a more reliable irrigation water source. Withdrawal and dispersion would have a positive benefit to all residents of Umatilla County and the surrounding communities by increasing farmland productivity, jobs, and revenue.

Alternative 3: The Corps would issue an easement to Superior Farms

Cumulative effects under Alternative 3 would be the same/similar as those for Alternative 2.

Based on the evaluation of potential environmental effects provided in this Section, and the determination in Section 2 above regarding alternatives meeting the purpose and need and screening criteria, Alternative 2 (The Corps would issue an amendment to St. Hilaire and a new easement to EID) was chosen as the Preferred Alternative.

SECTION 4 - COMPLIANCE WITH APPLICABLE ENVIRONMENTAL LAWS AND REGULATIONS

Section 4 identifies the legal, policy, and regulatory requirements that could affect each proposed alternative. The implications for each requirement are discussed with respect to the proposed project. Summaries of compliance and coordination activities for each of the laws, policies or regulation are also provided.

4.1 TREATIES AND NATIVE AMERICAN TRIBES

Treaties are legally binding contracts between sovereign nations that establish those nations' political and property relations. Treaties between Native American tribes and the United States confirm each nation's rights and privileges. In most of these treaties, the tribes ceded title to vast amounts of land to the United States, but reserved certain lands (reservations) and rights for themselves and their future generations. Like other treaty obligations of the United States, Indian treaties are considered to be "the supreme law of the land," and they are the foundation upon which Federal Indian law and the Federal Indian trust relationship is based.

There are several treaties with Native American Tribes which may be applicable to the St. Hilaire/EID pump station project. These include treaties with the Nez Perce Tribe (1855, 1863, 1868), Confederated Tribes of the Umatilla Indian Reservation (1855), Yakama Nation (1855), and the Warm Springs Tribe (1859). Each of the above named Tribes explicitly reserved certain rights, including the exclusive right to take fish in streams running through or bordering reservations, the right to take fish at all usual and accustomed (U&A) places in common with citizens of the territory, and the right of erecting temporary buildings for curing, together with the privilege of hunting, gathering roots and berries, and pasturing their horses and cattle upon open and unclaimed lands. The treaty rights and resources potentially affected by the proposed action primarily relate to fish and fishing.

The proposed action is not expected to have a greater than de minimus effect (if any) on treaty rights or substantially diminish any treaty resource. In-water construction would be limited to the established in-water work window of December 1 through February 28, a time when few ESA-listed fish would be in the area. All heavy equipment (i.e., crane and excavator) would access the project site via existing roadways, parking areas, disturbed upland area, and/or floating barges. The proposed action does not impair access to any usual and accustomed fishing stations. Letters were sent to each of the treaty tribes requesting input on this project and potential effects to treaty rights or resources.

4.2 FEDERAL LAWS

4.2.1 National Environmental Policy Act

The National Environmental Policy Act (NEPA) requires Federal agencies to use a systematic interdisciplinary approach to evaluate the environmental effects of a proposed Federal action prior to implementing that action. This is usually accomplished through preparation of a statement, either an Environmental Impact Statement (EIS) if the action is a major federal action significantly affecting the human environment, or an Environmental Assessment (EA) if the Federal agency has not yet determined the significance of the effects.

The Corps prepared this EA and will circulate it to other Federal, state and local agencies, Tribes, and the public for a 15-day review and comment period. While preparing the EA, the Corps did not identify any impacts that would significantly affect the quality of the human environment. If no such impacts are identified during the public review process, compliance with NEPA would be achieved upon the signing of a Finding of No Significant Impact (FONSI). However, if such impacts are identified during the public review, an EIS would be required. Completion of an EIS and the signing of a Record of Decision would then achieve compliance with NEPA.

4.2.2 Endangered Species Act

The Endangered Species Act (ESA) established a national program for the conservation of threatened and endangered fish, wildlife and plants and the habitat upon which they depend. Section 7(a)(2) of the ESA requires Federal agencies to consult with the U.S. Fish and Wildlife Service (USFWS) and/or National Marine Fisheries Service (NMFS), as appropriate, to ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species or adversely modify or destroy their critical habitats. Section 7(c) of the ESA and the Federal regulations on endangered species coordination (50 CFR §402.12) require that Federal agencies prepare biological assessments of the potential effects of major actions on listed species and their critical habitat.

In compliance with Section 7(a)(2) of the Endangered Species Act, the Corps prepared a Biological Assessment (BA) and initiated Section 7 consultation with the USFWS and NMFS in February 2018. The Corps determined the preferred alternative, as proposed, “may affect, and is likely to adversely affect” Upper Columbia River spring Chinook salmon, Snake River spring/summer Chinook salmon, Snake River fall Chinook salmon, Snake River sockeye salmon, Upper Columbia River steelhead, Middle Columbia River steelhead, and Snake River steelhead; therefore, formal consultation under this Act is required. The Corps also determined that the action “may affect, but is not likely to adversely affect”, bull trout. However, on February 7, 2018, the USFWS requested formal consultation on bull trout and changed the determination to “likely to adversely affect”. There would be no likely adverse effects on critical habitat for any listed species. Compliance with ESA would be considered final when the Corps receives the Biological Opinions from the USFWS and NMFS.

4.2.3 Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act prohibits the taking or possession of and commerce in bald and golden eagles, with limited exceptions, primarily for Native American Tribes. Take under this Act includes both direct taking of individuals and take due to disturbance.

Bald eagles are known to nest throughout Corps managed lands in the Walla Walla District. While all nest sites have not been documented, locations of some are known. None are known to occur in or near the proposed action area, therefore, there would be no effect or take (to include disturbance) of either bald or golden eagles.

4.2.4 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.

Conservation measures would be implemented to ensure that the proposed action would not result in take of migratory birds (see Appendix B, the "Green Sheet" for the measures).

4.2.5 Clean Water Act

The Federal Water Pollution Control Act (33 U.S.C. §1251 et seq., as amended) is more commonly referred to as the Clean Water Act. This act is the primary legislative vehicle for Federal water pollution control programs and the basic structure for regulating discharges of pollutants into waters of the United States. The act was established to restore and maintain the chemical, physical, and biological integrity of the Nation's waters and sets goals to eliminate discharges of pollutants into navigable water, protect fish and wildlife, and prohibit the discharge of toxic pollutants in quantities that could adversely affect the environment. The act has been amended numerous times and given a number of titles and codifications.

Section 402 of the Act, the National Pollutant Discharge Elimination System (NPDES) program, pertains to discharge of pollutants.

Section 402 of the Clean Water Act also regulates ground disturbance that could potentially cause storm water run-off into waters of the U.S. Activities involving construction or soil disturbance on the shoreline or upland have the potential for storm water runoff and would be subject to the storm water provisions of Section 402 if the area of soil disturbance would be more than an acre and would discharge storm water into surface water. The applicant would comply with the applicable Section 402 construction general permit for these site-specific actions.

Discharge of dredged or fill material below the line of ordinary high water requires evaluation under Section 404 of the Clean Water Act. Proposed activities would involve placement of fill

below the ordinary high water mark in the Columbia River, therefore, an individual permit would be issued to St. Hilaire by the Corps of Engineers Portland District Regulatory Branch.

Section 401 of the Act requires a certification from the applicable permitting agency that the discharge of a pollutant or dredged or fill material meets water quality standards. If a permit under either Section 402 or 404 is needed for an action, Section 401 water quality certification is also needed. In this case, the Oregon Department of Environmental Quality (ODEQ), would issue Section 401 Certification to St. Hilaire.

4.2.6 National Historic Preservation Act

The National Historic Preservation Act (NHPA) of 1966, as amended, directs Federal agencies to consider potential effects from the Federal undertaking on cultural properties under their jurisdiction. Implementing regulations, 36 Code of Federal Regulations (CFR) Part 800, requires an agency to consult with the State Historic Preservation Officer (SHPO), Tribes, and interested parties to ensure historic properties are adequately identified, evaluated, and considered in planning for proposed undertakings.

Consultation with the Oregon State Historic Preservation Office (SHPO), Confederated Tribes of the Umatilla Indian Reservation (CTUIR), Confederated Tribes of the Warms Springs Indian Reservation (Warm Springs Tribe), Confederated Colville Tribes (CCT), Nez Perce Tribe (NPT), and the Confederated Tribes and Bands of the Yakama Nation (YN) is on-going; but preliminary efforts have resulted with a finding of No Adverse Effect to Historic Properties (36 CFR § 800.5(d)(1)).

4.2.7 Section 10 of the Rivers and Harbors Act of 1899

Section 10 of the Rivers and Harbors Act requires that regulated activities conducted below the OHW elevation of navigable waters of the U.S. be approved/permitted by the Corps of Engineers. Regulated activities include the placement/removal of structures, work involving dredging, disposal of dredged material, filling, excavation, or any other disturbance of soils/sediments or modification of a navigable waterway.

An individual permit would be issued to St. Hilaire by the Corps of Engineers Portland District Regulatory Branch.

4.3 EXECUTIVE ORDERS

4.3.1 Executive Order 11988, Floodplain Management

This Executive Order outlines the responsibilities of Federal agencies in the role of floodplain management. Each agency must evaluate the potential effects of actions on floodplains and avoid undertaking actions that directly or indirectly induce development in the floodplain or adversely affect natural floodplain values.

The proposed action would not directly or indirectly induce growth in the floodplain or adversely affect natural floodplain values.

4.3.2 Executive Order 11990, Protection of Wetlands

This order directs Federal agencies to take actions to minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands when undertaking Federal activities and programs. It has been the goal of the Corps to avoid or minimize wetland impacts associated with their planned actions.

The proposed action would not result in the destruction, loss, or degradation of wetlands.

4.3.3 Executive Order 12898, Environmental Justice

This order requires Federal agencies to consider and address environmental justice by identifying and assessing whether agency actions may have disproportionately high and adverse human health or environmental effects on minority or low-income populations. Disproportionately high and adverse effects are those effects that are predominantly borne by minority or low-income populations and are appreciably more severe or greater in magnitude than the effects on nonminority or non-low income populations.

This EA considers activities related to the expansion and new construction of private pump stations located on the Columbia River. Alternatives, as proposed, are not expected to disproportionately affect any particular demographic group.

4.3.4 Executive Order 13751, Safeguarding the Nation from the Impacts of Invasive Species

This EO states that it is the policy of the United States to prevent the introduction, establishment, and spread of invasive species, as well as to eradicate and control populations of invasive species that are established. The order directs federal agencies to refrain from authorizing, funding, or implementing actions that are likely to cause or promote the introduction, establishment, or spread of invasive species in the United States unless, pursuant to guidelines that it has prescribed, the agency has determined and made public its determination that the benefits of such actions clearly outweigh the potential harm caused by invasive species; and that all feasible and prudent measures to minimize risk of harm will be taken in conjunction with the actions.

Best Management Practices (BMPs) would be implemented to ensure that the proposed action would comply with EO 13751 (see Appendix B the “Green Sheet” for BMPs).

4.3.5 Executive Order 13175, Consultation and Coordination with Indian Tribal Governments

This EO directs Federal agencies to establish regular and meaningful consultation and collaboration with tribal officials in the development of Federal policies that have tribal implications, to strengthen the United States government-to-government relationships with Indian Tribes, and to reduce the imposition of unfunded mandates upon Indian Tribes.

The Corps has offered Government to Government consultation by letters dated February 16, 2018 on the proposed action with the Confederated Tribes of the Umatilla Indian Reservation (CTUIR), Confederated Tribes of the Warms Springs Indian Reservation (Warm Springs Tribe), Confederated Colville Tribes (CCT), Nez Perce Tribe (NPT), and the Confederated Tribes and Bands of the Yakama Nation (YN).

4.3.6 Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds

This EO directs Federal agencies to ensure that environmental analyses of Federal actions required by NEPA or other established environmental review processes evaluate the effects of actions and agency plans on migratory birds, with emphasis on species of concern.

The conservation measures contained in Appendix B, the Green Sheet, would ensure that the proposed action would not result in take or negatively impact migratory bird species or their habitat.

4.4 STATE STATUTES

Oregon Department of State Lands Removal-Fill Permit (ORS 196.795-990)

Oregon's Removal-Fill Law requires any person who plans to "remove or fill" material in "waters of the state" to obtain a permit from the Oregon Department of State Lands (ODSL).

St. Hilaire submitted a Joint Permit Application and the associated fee to ODSL in September 2017. The permit is currently in the technical review status at ODSL until March 25, 2018.

ODSL would issue the permit to St. Hilaire after the Corps Real Estate Approvals are issued to St. Hilaire.

SECTION 5 - COORDINATION, CONSULTATION, AND PUBLIC INVOLVEMENT

5.1 Agency / Tribal Consultation

5.1.1 NMFS and USFWS

The Corps is consulting with NMFS and USFWS for potential effects to ESA-listed species.

5.1.2 Corps of Engineers Regulatory

St. Hilaire applied for the proper permits required under the CWA and the RHA with the Corps of Engineers Regulatory Branch in Portland in September 2017.

5.1.3 Oregon Department of State Lands

St. Hilaire applied for the proper permit required under Oregon's Removal and Fill Law with Oregon Department of State Lands in September 2017.

5.1.4 Oregon State Historic Preservation Office

The Corps is consulting with the Oregon SHPO for potential effects to historic properties.

5.1.5 Native American Tribes

The Corps is consulting with the Confederated Tribes of the Umatilla Indian Reservation (CTUIR), Confederated Tribes of the Warms Springs Indian Reservation (Warm Springs Tribe), Confederated Colville Tribes (CCT), Nez Perce Tribe (NPT), and the Confederated Tribes and Bands of the Yakama Nation (YN) for potential effects to historic properties, traditional cultural properties (TCPs), and Historic Properties of Religious and Cultural Significance to Indian Tribes (HPRCSIT).

5.2 Public Involvement

This EA is being distributed to Federal, state, and local agencies, Tribes and the public for a 15-day review and comment period. It is available on the Walla Walla District Corps of Engineers website at www.nww.usace.army.mil/Missions/Environmental-Compliance. The distribution list includes the following:

Federal Agencies:

Bonneville Power Administration

Environmental Protection Agency

National Marine Fisheries Service

U.S. Army Corps of Engineers, Portland District

U.S. Bureau of Land Management

U.S. Bureau of Reclamation

U.S. Fish and Wildlife Service

U.S. Forest Service

State Agencies:

Oregon Department of Environmental Quality

Oregon Department of Fish and Game

Oregon Department of State Lands

Oregon Department of Transportation

Oregon State Historic Preservation Office

Local Governments:

Morrow County

Umatilla County

Town of Boardman

Town of Hermiston

Town of Umatilla

Tribes:

Confederated Tribes of the Umatilla Indian Reservation (CTUIR)

Confederated Tribes of the Warms Springs Indian Reservation (Warm Springs Tribe)

Confederated Colville Tribes (CCT)

Nez Perce Tribe (NPT)

Confederated Tribes and Bands of the Yakama Nation (YN)

Other:

Union Pacific Railroad

Port of Umatilla

Port of Morrow

Carl St. Hilaire

IRZ Consulting

Campbell Environmental, LLC

SECTION 6 - REFERENCES

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