

Application Name: Couse Creek Confluence Fish Passage Construction

Application Number: 000-0000-16709

By: Walla Walla Basin Watershed Foundation

Offering Type: Open Solicitation

Application Type: Restoration

OWEB Region: No Location Has Been Entered

County: Umatilla

Coordinates: 45.910346,-118.371062

Applicant:

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Budget Summary:

OWEB Amount Requested: \$117,992
Total Project Amount: \$337,066

Administrative Information

Abstract

Provide an abstract statement for the project. Include the following information: 1) Identify the project location; 2) Briefly state the project need; 3) Describe the proposed work; 4) Identify project partners.

Couse Creek is a tributary of the Walla Walla River located 1.5 miles upstream from the town of Milton-Freewater, in Umatilla County. This stream is used by ESA listed summer steelhead and redband trout, and occasionally ESA listed bull trout and reintroduced chinook salmon. There is a fish passage barrier near the confluence of Couse Creek and the Walla Walla River when steelhead are returning to 8 miles of spawning/rearing areas. Couse Creek transitions from a natural bedrock-controlled channel, past an old concrete and riprap pipe protection structure, and then onto the gravel bed of the Walla Walla River. A 3-4 foot, slanted drop exists at this transition point. Steelhead cannot navigate this drop in late winter and early spring when discharges from the Creek are high, and also at low flows in late spring and early summer.

An engineering assessment, survey, and 60% designs have been completed. BPA funds have funded design work with technical support provided by fisheries co-managers. Following a site assessment and an alternatives analysis, a preferred approach was selected. Final designs will be completed this winter. BPA funds have been secured to cover much of the construction project costs; however, OWEB funds are needed to cover the total cost of the project construction. Construction is scheduled for summer of 2019.

The work consists of removal of old concrete structures and riprap from Couse Creek, construction of a new 400-foot-long lower gradient Couse Creek channel that includes roughened riffles and step pools; placement of habitat boulders, and revegetation of one acre with native trees, shrubs, and grasses. Couse Creek was described in the Walla Walla Subbasin Plan, 2004, as a Priority Protection Area, and fish passage barriers are a priority limiting factor. Recent restoration investments in Couse Creek have included fish passage and habitat work. A Couse Creek watershed habitat assessment is underway. Partners include BPA, ODFW and CTUIR.

Location Information

What is the ownership of the project site(s)?

Public land (any lands owned by the Federal government, the State of Oregon, a city, county, district or municipal or public corporation in Oregon)

What agency(ies) are involved?

City of Milton-Freewater

Private (land owned by non-governmental entities)

Please select one of the following Landowner Contact Certification statements:

I certify that I have informed all participating private landowners involved in the project of the existence of the application, and I have advised all of them that all monitoring information obtained on their property is public record.

I certify that contact with all participating private landowners was not possible at the time of application for the following reasons: Furthermore, I understand that should this project be awarded, I will be required by the terms of the OWEB grant agreement to secure cooperative landowner agreements with all participating private landowners prior to expending Board funds on a property.

Please include a complete list of participating private landowners

Vivian Jorgensen

This grant will take place in more than one county.

Permits

Other than the land-use form, do you need a permit, license or other regulatory approval of any of the proposed project activities?

- Yes
 No

For Details Go to Permit Page

Racial and Ethnic Impact Statement

Racial and Ethnic Impact Statement

- The proposed grant project policies or programs could have a disproportionate or unique POSITIVE impact on the following minority persons. (indicate all that apply)
- The proposed grant project policies or programs could have a disproportionate or unique NEGATIVE impact on the following minority persons. (indicate all that apply)
- The proposed grant project policies or programs WILL HAVE NO disproportionate or unique impact on minority persons.

Insurance Information

- Working with hazardous materials (not including materials used in the normal operation of equipment such as hydraulic fluid)
- Earth moving work around the footprint of a well
- Aerial application of chemicals
- Removal or alteration of structures that hold back water on land or instream including dams, levees, dikes, tidegates and other water control devices (this does not include temporary diversion dams used solely to divert water for irrigation)
- Applicant's staff or volunteers are working with kids related to this project (DAS Risk assessment tool not required, additional insurance is required)
- Applicant's staff are applying herbicides or pesticides (DAS Risk assessment tool not required, additional insurance is required)

Additional Information

This project affects Sage-Grouse.

Problem Statement

Describe the watershed problem(s) that this restoration project seeks to address.

This project addresses fish passage and habitat issues near the mouth of Couse Creek, a tributary to the Walla Walla River. Fish passage barriers and limited connection to floodplain habitat are primary limiting factors in the Walla Walla Basin for ESA listed steelhead and bull trout, and reintroduced spring chinook salmon.

The Walla Walla River at the Couse Creek Confluence is highly constrained, incised, and simplified by the Milton-Freewater levee system and the remnants of an abandoned irrigation ditch. At the northern end of the project site, immediately to the left of the Couse Creek confluence, the Walla Walla River is constrained by an elevated terrace to the west that was built as the old Milton Ditch access road, the remnants of the six-foot-wide Milton Ditch and a six to eight foot tall flood protection berm built out of boulders and river cobbles to protect the Milton Ditch from being washed out by the river in high water events. The design proposes to use a portion of this area for the realigned routing of the Couse Creek and restore the rest to a more naturalized floodplain. Across the Walla Walla River, and also immediately upstream from the Couse Creek confluence are robust flood reduction levees built by the US Army Corps of Engineers in the late 1940s. Channel degradation in the Walla Walla River is an issue and the channel has degraded in areas of the levee system, exposing and undermining the levee toes and requiring levee repairs, and severely limiting channel habitat complexity. By removing the old berm that protected the abandoned Milton Ditch, the River will be able to access the floodplain on its left bank, reducing the degradation to the Walla Walla River bed and providing some opportunity for habitat boulders, pocket water, spawning gravel recruitment, and additional riparian vegetation.

There have been numerous fish habitat and passage restoration projects in the Walla Walla River within the Milton-Freewater Levee system, including at Marie Dorian Park, Zell Diversion, Smith Sill, and Nursery Bridge. Nearby work completed by the Milton-Freewater Water Control District included repairing approximately 500 feet of the levee toe near the Couse Creek Road bridge.

The lower few miles of the Couse Creek channel are straightened and steep. At approximately 150 feet upstream from the mouth the creek is confined to a ten-foot-wide channel up against a bedrock cliff on the left and an historic concrete wall and riprap boulders on the right and a horizontal concrete berm across the creek bed (all built to protect a city water pipe that has since been buried 4 feet below the creek bed). This project will remove the concrete wall, riprap, and concrete berm and install a roughened riffle to maintain a slope and channel much more conducive to fish passage. Below this point the Creek currently pushes through the narrow confines of the abandoned Milton Ditch and the remnants of its riprap push up dam, and then enters the Walla Walla River. The project will route the creek for 200 feet across the restored floodplain where the Milton Ditch and its flood protection berm are removed. The right bank of the abandoned Milton-Freewater ditch will be regraded to remove the push-up berm material used for the ditch and add additional floodplain material near the left bank of the existing Couse Creek near the water line crossing. The newly gained floodplain area will be revegetated with native trees, shrubs, and grasses. Other fish passage and habitat projects in Couse Creek have occurred upstream at the Konen, Shumway/Banks, and Hasso sites. There is an additional partial fish passage barrier located approximately 2.5 miles upstream of this project in Couse Creek. WWBWC staff are working with ODFW and the property owner to develop a solution so this barrier can be fixed in the next year or two.

How have past or current land management practices contributed to the problem?

The Walla Walla Subbasin Plan, completed for the Northwest Power and Conservation Council in 2004, estimates that, under current conditions, roughly 70 percent of the existing riparian corridor is in poor condition for the portion of the Walla Walla River that flows through Oregon. Anthropogenic effects that started prior to 1900 have severely affected the Walla Walla Subbasin, including livestock grazing, timber harvest, intensive agricultural practices, road construction, and stream channelization.

The Milton-Freewater Levee system was constructed in the 1940s and rebuilt between 1966 and 1968 by the USACE, and was recently brought back into USACE and FEMA compliance by the Milton-Freewater Water Control

District. The Milton-Freewater Levee system has been effective at protecting the Milton-Freewater community from flood impacts. However, the levee system and associated infrastructure have also reduced channel complexity, impaired fish passage, reduced floodplain access, and limited riparian vegetation. Lateral connectivity to the historical floodplain is severely limited in the project area. The historical (pre-levee) floodplain of the Walla Walla River is approximately 1,250 feet wide at the confluence and the floodplain of Couse Creek was approximately 400 feet wide above the confluence/alluvial fan. Current floodplain conditions are extremely limited upstream of the Couse Creek Confluence due to the flood levee on both sides of the river. Immediately downstream of the Couse Creek Confluence for approximately 1200 feet, there is only a flood levee on the opposite (right) bank of the river, limiting the floodplain to less than 100 feet.

Much of lower mile and a half of Couse Creek is entrenched about 5-6 feet.

Around 150 feet upstream of the confluence with the Walla Walla River, there is an old concrete berm poured across the creek bed of Couse Creek and a concrete wall and boulder riprap placement installed decades ago alongside Couse Creek on the right bank to protect a municipal water pipe that at the time crossed Couse Creek. These man made structures are a significant contributing factor for the fish passage issue. The pipe has more recently been buried under the creek.

For the last century, the Milton Ditch irrigation water diversion was rebuilt each year across the mouth of Couse creek at the confluence of Couse Creek and the Walla Walla River. This ditch and its push up dam has been abandoned and the irrigators receive their water now from the Little Walla Walla Diversion a mile downstream on the Walla Walla River. However the remnants of a ditch protection berm of imported boulders and piled up river cobbles, and remnants of the boulder push up dam that diverted river flows in to the Milton Ditch contribute to the loss of floodplain habitat and the fish passage problems at this site. The ditch's narrow flood protection berm that runs along the river bank is made of imported boulders and river cobbles and is as tall as eight feet above the creek and ditch and rises abruptly from the river's edge and is as much as 10 feet in height above the river surface. Most of this berm will be removed and the ditch filled in to allow room for a more natural Couse Creek confluence and to re establish the river's floodplain. The levee restriction has resulted in degrading of the Walla Walla River bed and has also impacted the ability of Steelhead to access Couse Creek at lower flows in the latter portion of the adult steelhead migration. Historic clearing of the river channel, construction of the levee, and installing the ditch's flood protection berm limited the establishment of riparian vegetation.

Stream flows in Couse Creek are limited in the summer. The WWBWC habitat assessment includes working with landowners to see if there are water management project opportunities that can lead to protected instream flows at times that are beneficial to steelhead spawning and rearing. Land management and poorly maintained roads in the uplands and floodplains of Couse Creek has contributed to faster runoff, and in some cases erosion gullies, during rain events and snow melts, and higher sediment transport rates in a channelized and entrenched creek channel. The WWBWC habitat assessment project is pursuing opportunities for improvements with willing land and road managers.

The Walla Walla River is 303(d) listed for Temperature. An EPA approved TMDL and WQMP has been completed and identifies the need for additional riparian shade along the leveed reach.

Does this project address one or both of the following:

- Habitat needs for one or more Endangered Species Act-listed species and/or species of concern*
- Concerns identified on 303(d) listed streams*
- No*

Project History

Continuation - Are you requesting funds to continue work on a project previously funded by OWEB where that work did not result in a completed project?

- Yes
 No

Resubmit - Have you submitted, but were not awarded an OWEB application for this project before?

- Yes
 No

Phased - Is proposed work in this application a phase of a comprehensive watershed restoration plan or project?

- Yes
 No

Plans and Salmon

Is the proposed restoration activity(ies) identified in a local assessment or other plan?

- Yes
 No

Provide name of local plan, Watershed assessment or other locally relevant document.

This project is explicitly described in the: Alternatives Analysis and Conceptual Design, Milton-Freewater Levee and Habitat, Walla Walla River, GeoEngineers, 2012.

Couse Creek is described as a Priority Protection area in the Walla Walla Subbasin Plan, Northwest Power and Conservation Council 2004.

Fish passage is described as a priority in the Walla Walla Subbasin Plan, the Middle-Columbia River Steelhead ESA DPS Recovery Plan, NOAA Fisheries 2009, and in the Middle Columbia River Bull Trout Recovery Plan, USFWS 2015.

The Walla Walla Subbasin Stream Temperature TMDL and Water Quality Management Plan, EPA 2005, identifies establishment of healthy riparian areas to provide shade for the Walla Walla River and its tributaries.

The WWBWC Strategic Action Plan identifies Couse Creek Fish Passage.

The WWBWC Annual Work Plan describes the design and implementation of Couse Creek Confluence Fish Passage.

Will this project benefit salmon or steelhead?

- Yes
 No

How will the resulting restoration project benefit salmon or steelhead or their habitat?

This project will provide fish passage for ESA listed steelhead to reach 8 miles of spawning and rearing habitat. This project will provide fish passage for re-introduced spring chinook salmon to reach 8 miles of potential spawning and rearing habitat. There are historical accounts of chinook salmon use in Couse Creek, however it is debatable whether current stream flow conditions would support salmon. This project will provide floodplain

connection, improved riparian shading, and instream habitat improvements in and along the Walla Walla River in a spawning and rearing reach for ESA listed steelhead and for re-introduced spring chinook salmon.

Does the project address a restoration action identified in a regional assessment or recovery plan?

- Yes
- No

Regional Assessments or Recovery Plans
Middle Columbia River Steelhead Distinct Population Segment ESA Recovery Plan

For each plan chosen above, describe how your project is consistent with specific recovery/restoration actions cited in that plan.

2009 Mid-Columbia Steelhead Recovery Plan, Umatilla/Walla Walla MPG (Major Population Group)

"Restore passage and connectivity to habitats blocked or impaired by artificial barriers." Couse Creek barrier will be removed.

"Restore floodplain connectivity and function." This project will restore just under one acre of floodplain.

"Restore channel structure and complexity." This project will install habitat boulders in the Walla Walla River and step pool structures in Couse Creek.

"Restore riparian condition and LWD recruitment." This project will restore riparian vegetation on just under one acre of floodplain.

Proposed Solution

Goal, Objectives, and Activities

State your project goal. A goal statement should articulate desired outcomes (the vision for desired future conditions) and the watershed benefit.

Restore and enhance fish passage at the Couse Creek Confluence by removing a fish barrier to allow Steelhead adults to move into Couse Creek when seeking 8 miles of spawning and rearing areas. Improve one acre of floodplain connection and riparian vegetation shading along 600 feet of the Walla Walla River immediately downstream of the current Couse Creek confluence. Improve habitat complexity in Couse Creek by installing 8 step pool structures. Improve instream habitat complexity in the Walla Walla River with the placement of 10 habitat boulders. These actions will address primary limiting factors in the Walla Walla Basin.

List specific and measurable objectives. Objectives support and refine the goal by breaking it down into steps for achieving the goal. (NOTE: If you quantify your objectives, ensure all numbers match the metrics listed in your selected habitat types.) Provide up to 7 objectives.

Objective #1

Objective

1. Improve fish passage including by removing the existing cement structures (approximately 150 feet upstream of the mouth) to reduce channel velocities and improve fish passage

Describe the project activities. Activities explain how the objective will be implemented.

An existing concrete wall jutting out from the right bank of Couse Creek and a foot-thick concrete apron poured across about 30 linear feet from bank to bank of the bed of Couse creek will be removed, along with boulder riprap along the right bank. Contractor will remove and dispose of concrete rubble. Boulders will be salvaged for utilization in the construction of the roughened riffle. After the removal of these fish passage barriers, the right bank of Couse Creek will be sloped back creating a more natural channel. A roughened riffle will be installed in Couse Creek to reduce scour potential in the area over the existing buried city water pipe. See Objective 4 for roughened riffle.

Objective #2

Objective

2. Improve habitat in Couse Creek and the Walla Walla River

Describe the project activities. Activities explain how the objective will be implemented.

Eight engineered step pool boulder structures will be installed in the realigned Couse Creek channel providing some needed pool habitat in Couse Creek and opportunities for spawning gravel sorting in pool tail outs. The contractor will build each of the step pool boulder structures out of a total of 237 three foot boulders. Each of the step pool rib structure boulders will be supported by underlying footer boulders. The step pool structure will be u-shaped in plan view, arcing upstream, and there are varying widths, depending on Couse Creek channel width. There will be 4 step boulder ribs comprised of 7 surface boulders, 1 step pool boulder rib comprised of 9 surface boulders, and 3 step pool boulder rib comprised of 10 surface boulders. Each of the step pool ribs will be supported by direct contact with buried footer boulders immediately downstream of each surface boulder. The gradient will strictly follow the designed gradient drop along this 400 foot long section of Couse Creek. The contractor will follow the designed pool depth criteria of 1.5 feet , and drop of 0.5 feet to downstream elevations. Each step pool rib will be trenched 8 foot into banks with additional boulders necessary to key structures into proposed channel banks. See attached Plans.

Ten habitat boulders sized 3-5 foot diameter will be placed in the Walla Walla River to create pocket water in what is currently a long riffle constrained by the municipal flood levee on its right bank and with limited habitat features. The habitat boulders will distributed across the 75 foot wide river channel along a 100 foot length centered on the new Couse Creek Confluence. See attached Plans.

Objective #3

Objective

3. Reroute Couse Creek to increase stream length and reduce channel gradient

Describe the project activities. Activities explain how the objective will be implemented.

Couse Creek will be slightly rerouted to the west through the existing floodplain above the Walla Walla River, which will increase the stream length and channel complexity and reduce the channel slope. Channel gradient will be maintained with the utilization of a 100 foot roughened riffle structure and a series of step pools.

If necessary, fish salvage and water isolation will occur prior to construction following the BPA USFWS and NOAA Fisheries Habitat Improvement Project (HIP III) Biological Opinion protocols which are spelled out on the design sheets.

Water rerouting and sediment control BMPS will be utilized as necessary to eliminate, or greatly reduce, turbidity in Couse Creek and the Walla Walla River.

After regrading the Milton ditch and ditch flood protection berm, contractor will establish the new Couse Creek alignment and new grades following the design plans and pre construction staking laid out by the TetraTech engineers. This activity will be followed by the placement of the roughened riffle and step pool structures (objectives 2 and 4).

Objective #4

Objective

4. Install roughened riffle to maintain the desired slope and stability of the realigned Couse Creek channel.

Describe the project activities. Activities explain how the objective will be implemented.

Due to the steepness of the confluence and consistent with morphology observed upstream, a step pool morphology with slopes between 2.19 percent and 1 percent is proposed for the channel profile. This designed slope is less than the existing 2.5 percent channel slope upstream and the design will provide fill over the exposed bedrock and clearance above a buried city water pipe. The channel will then transition to lower slopes through the floodplain and will be consistent with the 1 percent to 2.5 percent slopes typically seen for alluvial fan channels. The existing Couse Creek channel will be plugged with an engineered rock placement to simulate a jam-forced avulsion, and the new Couse Creek alignment will utilize a short section of the old abandoned Milton Ditch then will enter the Walla Walla River. Low flows will be maintained within the new channel and overbank flows will be allowed to flow over the top of the added rock and native fill that will be placed at the current mouth of Couse Creek. Boulders will be placed in the roughened riffle to maintain the grade of the riffle and provide hydraulic resting areas and habitat for the fish passage. A roughened riffle is chosen along with the horizontal boulder sills since the roughened riffle can scour and transport bed material while the maintaining the grade via the boulder sills. While Couse Creek within the Project area is a less entrenched system than upstream reaches of the Project, the reach will transport the existing bed material. Therefore, oversized boulder sills are necessary to maintain the grade of the channel through the Project to resist channel bed degradation.

Contractor will utilize 86 3-foot boulders to build the roughened riffle ribs every 20 feet between each step pool rib. Additional smaller sediment comprised of 12 inch cobbles, and smaller riverbed sediment mix of cobbles, gravel , and finer sediments that adhere to engineer specifications will fill the area between the ribs and fill all interstitial spaces. The riffle will be to a two foot depth. Material to be placed and compacted in maximum 10-12 inch lifts and surface washed in with fines until ponding of water is observed. See section 35 49 50 in the specifications For material size and gradation.

Objective #5

Objective

5. Remove remnants of the old Milton Ditch flood protection berm and push up dam to increase floodplain connectivity.

Describe the project activities. Activities explain how the objective will be implemented.

Four hundred feet of the old Milton Ditch flood protection berm will be removed. Much of this boulder and cobble berm rises abruptly from the Walla Walla River as much ten feet in height. Portions of the boulder push up dam will also be removed. Both of these actions will create a more natural floodplain to be graded and planted with native riparian vegetation. Any of the quarry rock encountered will be salvaged and used in the construction of the roughened riffle and habitat structures if the rock meets the proper engineered specifications. This 0.96 acre area will then be regraded into a more natural floodplain following the designs and staking provided by the TetraTech engineers.

Objective #6

Objective

Control and manage invasive species with revegetation of disturbed area using native species.

Describe the project activities. Activities explain how the objective will be implemented.

Nonnative Himalayan blackberries, reed canary grass, and hounds tongue will be mechanically removed. The reestablished floodplain area will be revegetated with native trees, shrubs, and grasses following the attached Planting plan. Any additional disturbed areas will be regraded and revegetated with native plantings. Plantings will include the following native tree, shrub, and grass species: alder, black cottonwood, ponderosa pine, douglas fir, coyote willow, red osier dogwood, black hawthorn, lewis mock orange, pacificninebark, chokecherry, snowberry, rocky mountain maple, nootka rose, wildrye, idaho fescue, tufted hairgrass, blue wildrye, bluebunch wheatgrass, mountain brome. Plantings will occur in October through December following construction.

List the major project activities and time schedule for each, including post project implementation.

Element	Description	Start Date	End Date
Designs will be finalized from their current 60% status	Designs will be finalized from their current 60% status. There will be a comment and review meeting to review 60% comments received. Then 90% designs will be created informed by comments and discussion with review agencies (ODFW, CTUIR, NOAA, USFWS, Corps). There will be a comment and review meeting to review 90% comments received. Designs will be finalized with potential final adjustments based on agencies input.	10/2018	2/2019
Permitting	Permitting and authorizations for construction will be secured.	10/2018	5/2019
construction staking	Perform construction staking, flagging of sensitive areas, contractor submittals etc	6/2019	6/2019
Mobilize to site and conduct site preparation.	Mobilize to site and conduct site preparation.	6/2019	6/2019
Install temporary erosion and sediment controls.	Install temporary erosion and sediment controls.	6/2019	6/2019
Select Construction contractor	Construction contractor will be selected using a competitive bid process that will include an RFP, site tour, and review of bids with project partners.	5/2019	5/2019
site grading	Excavate channel and floodplain above Ordinary High Water	6/2019	7/2019
Install block nets and salvage fish	Install block nets and salvage fish following HIP III Biological Opinion protocols that are described in the design.	7/2019	7/2019
Install and monitor temporary erosion and sediment controls	Install and monitor temporary erosion and sediment controls.	7/2019	7/2019
Install work area isolation and dewater work areas	Install work area isolation and dewater work areas	7/2019	7/2019
Construct channel and floodplain below Ordinary High Water	Construct channel and floodplain below Ordinary High Water	8/2019	8/2019
Install roughened riffle	Install roughened riffle and wash in fines	8/2019	8/2019
Prewash work areas and pump turbid water to an approved location and monitor for no turbid returns to the stream	Prewash work areas and pump turbid water to an approved location and monitor for no turbid returns to the stream	7/2019	8/2019
Slowly reintroduce flow to the work areas, monitoring for turbidity	Slowly reintroduce flow to the work areas, monitoring for turbidity	8/2019	8/2019
Remove block nets and temporary erosion controls	Remove work area isolation. 7/1/2019 to 9/30/2019 Remove block nets. 7/1/2019 to 9/30/2019 Remove temporary erosion and sediment controls	8/2019	8/2019
Complete as built survey.	Complete as built survey.	9/2019	9/2019
Seed and mulch all disturbed areas	Seed and mulch all disturbed areas	10/2019	10/2019
Site clean-up and demobilization	Site clean-up and demobilization	10/2019	10/2019
Plant trees and shrubs in the fall.	Plant trees and shrubs in the fall.	11/2019	12/2019

Element	Q4 2018	Q1 2019	Q2 2019	Q3 2019	Q4 2019
Designs will be finalized from their current 60% status					
Permitting					
construction staking					

Mobilize to site and conduct site preparation.					
Install temporary erosion and sediment controls.					
Select Construction contractor					
site grading					
Install block nets and salvage fish					
Install and monitor temporary erosion and sediment controls					
Install work area isolation and dewater work areas					
Construct channel and floodplain below Ordinary High Water					
Install roughened riffle					
Prewash work areas and pump turbid water to an approved location and monitor for no turbid returns to the stream					
Slowly reintroduce flow to the work areas, monitoring for turbidity					
Remove block nets and temporary erosion controls					
Complete as built survey.					
Seed and mulch all disturbed areas					
Site clean-up and demobilization					
Plant trees and shrubs in the fall.					

Habitat Types

In which habitat type(s) are you proposing to work?

- Instream Habitat: below the ordinary high water mark (includes in-channel habitat restoration, bank stabilization, flow, fish screening, and fish passage) -- Details will follow.*
- Riparian Habitat: above the ordinary high-water mark of the stream and within the stream's floodplain. -- Details will follow.*
- Upland Habitat: above the floodplain and improves native habitat and watershed function.*
- Wetland Habitat: land or areas covered, often intermittently, with shallow water or have soil saturated with moisture.*
- Estuarine Habitat: tidally influenced areas.*

Instream Habitat

Select all applicable Instream categories.

- Bank stabilization**

✓Fish passage improvement

Select all the actions you propose to implement to address the problem.

Barriers at Road Crossings: Improve fish passage at road crossings.

Non-road Crossing Barriers: Improves fish passage not located at road crossings.

Types of non-road crossing barriers to be improved or removed for the benefit of fish passage (select all that apply).

Diversion dam

Push-up Dam

Non-Diversion Dam

Weirs

Natural debris jam barriers

Tidegates

Natural Boulder/Rock barrier

Landslide

Number of non-road crossings to be treated/removed

1

Fish ladders or engineered bypasses not associated with road crossings

Total stream miles with improved access

8.0

Total number of barriers removed or modified

1

Are you coordinating or do you plan to coordinate with ODFW's fish passage program on this project?

Yes

No

If you have an ODFW project number(s), please enter them below. ODFW fish passage project numbers will be in the form P-XX-XXXX.

ODFW staff are partnering on this project. I do not know if it has been assigned an ODFW Fish Passage Project number yet.

Fish screening project

Instream Flow

✓Instream habitat restoration

Select all the actions you propose to implement to address the problem.

✓ Placement of materials in channel

Does the proposed project follow:

✓ ODFW Guidelines

✓ NOAA Guidelines

Other

What types of instream habitat materials are you proposing to install? (select all that apply)

Large wood

✓ Boulders

Number of structures.

19

Average number of boulders per structure.

17

Average size of boulders per structure (feet)

3

Combination log/boulder

✓ Other materials: Materials that stabilize the streambed

Specify structure type(s):

Beaver dam alternative

✓ Constructed riffle

Weirs installed

Number of structures

1

✓ Channel reconfiguration and connectivity, including alcoves and side channel reconnection

What type(s) of change are you proposing to the channel configuration and connectivity?

The Couse Creek channel will be realigned to a longer, more meandering route with a more gradual slope. Slope will be establishing using a 100-foot-long roughened riffle structure and a series of 8 step pool structures.

Acres off-channel or floodplain habitat connected

1

Number of pools created/added

8

Spawning gravel placement

Beaver reintroduction

Non-native plant control

Nutrient enrichment

Animal species removal

Is the primary purpose of the instream habitat restoration treatment(s) to address water quality limiting factors?

- Yes
 No

Total miles of stream to be treated with all instream habitat restoration treatments

0.094

Stockpiling logs

Riparian Habitat

Select all applicable Riparian categories.

- Riparian road activities
 Fencing and other materials for habitat protection

Vegetation establishment or management

Select all the actions you propose to implement to address the problem.

Planting

For Details Go to Plant Page

Non-native plant control

Specify species

himalayan blackberry, hounds tongue, reed canary grass

Treatment(s) to be applied

- Mechanical (cutting, mowing, girdling, etc.)
 Chemical (pesticides, fungicides, etc.)
 Biological (predators, herbivores, pathogens, etc.)

Acres to be treated

1

- Prescribed burnings, stand thinning, stand conversions, silviculture
 Juniper treatment

- Livestock management
 Debris and Structure Removal

Is an objective of the riparian treatment(s) to address water quality limiting factors?

- Yes
 No

- Sediment
 High Temperature

Total linear stream miles to be treated.

0.15

Total riparian acres to be treated.

1

Left streambank miles to be treated.

0.15

Right streambank miles to be treated.

0.075

Wrap-Up

Public Awareness

Does this proposed project include public awareness activities?

- Yes
 No

Describe these activities, as well as any related products, and explain how the proposed activities relate to the project's objectives.

The WWBWC frequently conducts tours which showcase examples of collaboration, community involvement, and ecological restoration such as this Couse Creek Confluence Fish Passage Project. Tour audiences have and will include, local, state, federal, and tribal officials, school groups, landowners, and media organizations. This project will offer excellent opportunities to showcase projects of this nature in future and how project partners have worked together to complete this project. The WWBWC also provides presentations at WWBWC Board meetings, to local civic groups, County Commissioners, and restoration workshop audiences and this project will be featured. This project will also be posted on the WWBWC website, and described in our quarterly newsletter.

Design

Were design alternatives considered?

- Yes
 No

Describe the design alternatives that were considered and why the preferred alternative was selected.

Design alternatives were developed based on the topographic and geomorphic site surveys conducted by Tetra Tech on September 25 to 28, 2017; evaluation of existing light detection and ranging (LiDAR) data (AeroMetric 2011; Quantum Spatial 2016); evaluation of available background documents (USACE 2010; WWBWC 2014 and 2017); review of the Alternatives Analysis and Conceptual Design: Milton-Freewater Levee and Habitat (GeoEngineers 2012); and discussion with the WWBWC.

The three alternatives that were developed include:

- ? Full Floodplain, Fish Passage, and Habitat Restoration
- ? Partial Floodplain, Fish Passage, and Habitat Restoration
- ? Fish Passage Restoration and Habitat Enhancement

Full Floodplain, Fish Passage, and Habitat Restoration Alternative

This is the most expansive alternative, with the potential to create extensive improvements to aquatic habitats. This is anticipated to be the most expensive option and would require the most extensive land owner cooperation and agency review. This alternative would involve activation of the area downstream of the confluence on river left through diversion of the full flow of Couse Creek and portions of the Walla Walla River seasonal high flows into the abandoned Milton Ditch. The new channel would connect to the Walla Walla River in two locations, adding approximately 1,300 feet of channel length. In the old Milton Ditch, abandoned irrigation diversion, fish screen, and headgate infrastructure would be removed, a culvert and road crossing removed, and a second culvert replaced with a fish passable structure. A large LWD revetment would be added at the downstream end of the new channel for landowner protection and fish habitat.

This alternative would also involve reshaping the "nose" of the confluence to provide additional floodplain access. The passage barrier in Couse Creek would be addressed through removal of the concrete structure, regrading the Couse Creek channel bed, and diverting the flow into the old Milton Ditch. Habitat and floodplain access would be

restored along Couse Creek through floodplain excavation and installation of LWD and boulder clusters upstream of the passage barrier. Boulder clusters and small pools would be added for habitat in the Walla Walla River. The existing municipal water line would be protected, including the resetting of the water valve cover and concrete pad. If this alternative is selected, potential relocation of the municipal water line should be considered to provide additional infrastructure protection.

A potential option includes the consideration of setback of the east bank levee based on landowner cooperation and agency approval. Setting back 2,200 linear feet of the east bank levee by 200 feet would create approximately 10 acres of channel migration, floodwater storage, and/or side channel development area in a reach of the Walla Walla River that is currently highly constrained and simplified.

Partial Floodplain, Fish Passage, and Habitat Restoration Alternative

This alternative would partially reconnect the downstream floodplain, address fish passage, and provide habitat restoration and enhancement in both Couse Creek and the Walla Walla River. This alternative would involve activation of the downstream area on river left through diversion of the full flow of Couse Creek into the upper portion of the abandoned Milton Ditch. The new channel would connect to the Walla Walla River in one location, adding approximately 450 feet of channel length. In the old Milton Ditch, the abandoned fishscreen would be removed to prevent stranding. A large LWD revetment would be added at the downstream end of the new channel for landowner protection and fish habitat.

The passage barrier in Couse Creek would be addressed through removal of the concrete structure, regrading the Couse Creek channel bed, and diverting the flow into the old Milton Ditch. Habitat and floodplain access would be restored along Couse Creek through installation of LWD and boulder clusters upstream of the passage barrier. Boulder clusters and small pools would be added for habitat in the Walla Walla River. The existing municipal water line would be protected, including the resetting of the water valve cover and concrete pad.

Fish Passage Restoration and Habitat Enhancement Alternative

This alternative would restore fish passage in Couse Creek and would provide fish habitat enhancements in Couse Creek and the Walla Walla River. This alternative would involve construction of an alcove and connection of the abandoned Milton Ditch for high flow relief. The new channel would connect to the Walla Walla River in one location, adding approximately 450 feet of high flow channel length. In the old Milton Ditch, the abandoned fish screen would be removed. A large LWD revetment would be added at the downstream end of the new channel for landowner protection and fish habitat.

The passage barrier in Couse Creek would be addressed through removal of the concrete structure, regrading the Couse Creek channel bed, and installing roughened riffles in the mainstem Walla Walla River. Habitat complexity would be enhanced along Couse Creek through installation of LWD and boulder clusters upstream of the passage barrier. Boulder clusters and small pools would be added for habitat in the Walla Walla River. The existing municipal water line would be protected.

Based on the comments received from BPA engineering staff, the fishery co-managers, and the US Army Corps of Engineers on the 15 Percent Design Alternatives submittal (Tetra Tech 2017a), site survey data collected, and the analyses discussed in Section 2, Section 3, and Appendix B of the 15 Percent Design Report, Tetra Tech advanced the design to the 30 percent conceptual design stage (Tetra Tech 2017b). The review team determined that levee setbacks on the east bank increased Project complexity and risk, and should not be part of the Project. Therefore, Alternative 2, the Partial Floodplain, Fish Passage, and Habitat Restoration Alternative was selected, with significant modifications that included realigning the lower portion of Couse Creek and measures to restore gradient and fish passage, as well as adding habitat boulders in the mainstem Walla Walla River (Tetra Tech 2017b).

Select the appropriate level of design for your project.

- No design is required.
- 10-30%: Conceptual design (evaluation of alternatives, concept-level plans, design criteria for project elements, rough cost estimates).
- 30-85%: Preliminary design (selection of the preferred alternative, draft plans, draft design report, preliminary

cost estimates).

● 85-100%: Final design (final design report, plans, and specifications, contracting and bidding documents, monitoring plan, final cost estimate).

If work remains on the project's design, describe the work that remains to be done and when you expect to have it completed. If no design is required put "N/A"

The 60% Basis of Design report and 60% designs have been completed. The 60% design comments from BPA's engineer, NOAA fisheries fish passage and hydraulic engineer, ODFW, and CTUIR fish biologists are currently being reviewed, discussed, and responded to. Anticipated next steps will be additional hydraulic and hydrologic modeling, slight adjustments to design drawings based on comments, development of an adaptive management plan, completion of 90% designs, 90% design review comments and discussion, final adjustments to the design, finalization of the Basis of Design report and final stamped design drawings.

Comments on the 60% designs have been received from BPA engineering and environmental Compliance staff, ODFW, CTUIR, NOAA Fisheries Hydraulics Engineering, and the Corps of Engineers. Based on the comments there are no significant changes to the design anticipated.

Describe the steps you will take to minimize adverse impacts to the site and adjacent lands during and after project implementation.

Adverse effects to fish and wildlife, existing vegetation, and water quality will be minimized using The Environmental Compliance BMPs spelled out in the BPA Habitat Improvement Project (HIP III) guidelines which are the result of consultation between Bonneville Power Administration's Habitat Program and USFWS and NOAA Fisheries.

The BMPs include:

- temporary erosion and sediment controls
- block nets and salvage fish
- and monitor temporary erosion and sediment controls
- work area isolation and dewater work areas
- Prewash work areas and pump turbid water to an approved location and -monitor for no turbid returns to the stream
- removal of nonnative vegetation
- Seed and mulch all disturbed areas
- planting of shrubs and trees

Project Management

List the key individuals, their roles, and qualifications relevant to project and post project implementation. At a minimum include the following: project management, project design, project implementation, and project inspection.

Role	Name	Affiliation	Qualifications	Email	Phone
Project Manager	Brian Wolcott	Walla Walla Basin Watershed Council, Executive Director	Brian has been the director for WWBWC for over 20 years and has overseen the installation of 4 fish passage projects, 2 habitat projects, and dozens of irrigation efficiency projects. Brian has attended Federal and State trainings on restoration.	brian.wolcott@wwbwc.org	(541) 938-2170 Ext.106
Engineer	Chad Bailey	TetraTech, Inc.	Civil Engineer, 12 years experience with river and water projects	Chad.Bailey@tetrattech.com	(425) 482-7771
Construction oversight and permitting lead	Jonathan Thompson	TetraTech, Inc.	11 years of experience with river projects with TetraTech, private construction, and CTUIR Habitat program.	Jonathan.Thompson@tetrattech.com	(425) 482-7678

Optional Monitoring

OPTIONAL: Restoration Project Monitoring

- Salmonid Monitoring*
- Non-salmonid biological monitoring*
- Water (quantity) flow monitoring*
- Water quality monitoring*
- Rangeland monitoring*
- Onsite*
- Downstream*
- Upstream*
- Upslope*

Will effectiveness monitoring will be conducted for this project?

- Yes
- No

Please describe the monitoring activities and any additional sources of funding (amount and source) to support this effort.

Turbidity monitoring will occur for the duration of construction activities following HIP III protocols. BPA funds will cover this work. The WWBWC has a turbidimeter and staff will check upstream and downstream of the project area to ensure standards are met.

WWBWC staff will monitor block nets to ensure that fish do not reenter the work area during construction.

Budget

Item	Unit Type	Unit Number	Unit Cost	OWEB Funds	External Cash	External In-Kind	Total Costs
Salaries, Wages and Benefits							
EXECUTIVE DIRECTOR	Hours	300	\$69.00	\$6,900	\$13,800	\$0	\$20,700
OPERATIONS MANAGER	Hours	100	\$46.00	\$2,300	\$2,300	\$0	\$4,600
Category Sub-total				\$9,200	\$16,100	\$0	\$25,300
Contracted Services							
ENGINEER PERMITTING ASSISTANCE & CONSTRUCTION OVERSIGHT	Each	1	\$24,655.00	\$24,655	\$0	\$0	\$24,655
SITE PREP (MOBILIZATION, DEMOBILIZATION, CLEARING AND GRUBBING)	Each	1	\$27,820.00	\$5,460	\$22,360	\$0	\$27,820
GRADING - NEW COUSE CHANNEL AND FLOODPLAIN	Hours	2074	\$26.00	\$12,663	\$41,261	\$0	\$53,924
GRADING - ROUGHENED RIFFLE	Each	1	\$8,800.00	\$7,989	\$811	\$0	\$8,800
CONCRETE RUBBLE DISPOSAL	Hours	25	\$35.12	\$0	\$878	\$0	\$878
STEP BOULDER RIBS W/ FOOTERS (7 BOULDERS)	Each	4	\$3,380.00	\$3,520	\$10,000	\$0	\$13,520
STEP BOULDER RIBS W/ FOOTERS (7 BOULDERS)	Each	1	\$4,030.00	\$370	\$3,660	\$0	\$4,030
STEP BOULDER RIBS W/ FOOTERS (10 BOULDERS)	Each	3	\$4,420.00	\$3,260	\$10,000	\$0	\$13,260
RIFFLE BOULDERS W/ FOOTERS	Each	43	\$260.00	\$5,720	\$5,460	\$0	\$11,180
RIFFLE 12" COBBLE	Each	328	\$26.00	\$4,038	\$4,490	\$0	\$8,528
WALLA WALLA RIVER HABITAT BOULDERS	Each	10	\$260.00	\$0	\$2,600	\$0	\$2,600
CONSTRUCTION AREA BMPS	Each	1	\$15,600.00	\$0	\$15,600	\$0	\$15,600
TEMPORARY EROSION AND SEDIMENTATION CONTROL	Each	1	\$13,000.00	\$0	\$13,000	\$0	\$13,000
SITE STABILIZATION	Each	1	\$6,500.00	\$2,080	\$4,420	\$0	\$6,500
FLOODPLAIN/RIPARIAN PLANTING	Each	1	\$9,100.00	\$2,600	\$6,500	\$0	\$9,100
STREAM COFFERDAMS	Each	1	\$13,000.00	\$0	\$13,000	\$0	\$13,000
EQUIPMENT RENTAL HOURLY AND OPERATION	Hours	24	\$208.00	\$0	\$4,992	\$0	\$4,992
BYPASS PIPE (INSTALL, OPERATE, REMOVE)	Each	1	\$22,880.00	\$0	\$22,880	\$0	\$22,880
FISH SALVAGE	Each	1	\$3,380.00	\$0	\$3,380	\$0	\$3,380
REMOVAL AND HAUL OF OLD WATER SUPPLY	Each	1	\$2,730.00	\$2,730	\$0	\$0	\$2,730
REMOVAL AND HAUL OF FISH SCREEN	Each	1	\$4,160.00	\$832	\$3,328	\$0	\$4,160
TEMPORARY BRIDGE	Each	1	\$7,800.00	\$0	\$7,800	\$0	\$7,800
PROJECT CLEANUP & REPAIRS	Each	1	\$13,000.00	\$6,500	\$6,500	\$0	\$13,000
CONSTRUCTION STAKING	Each	1	\$7,526.00	\$7,526	\$0	\$0	\$7,526
AS-BUILT SURVEY	Each	1	\$8,067.00	\$8,067	\$0	\$0	\$8,067
Category Sub-total				\$98,010	\$202,920	\$0	\$300,930

Travel							
MILEAGE	Miles	200	\$0.55	\$55	\$54	\$0	\$109
Category Sub-total				\$55	\$54	\$0	\$109
Materials and Supplies							
			\$0	\$0	\$0	\$0	\$0
Category Sub-total				\$0	\$0	\$0	\$0
Equipment and Software							
			\$0	\$0	\$0	\$0	\$0
Category Sub-total				\$0	\$0	\$0	\$0
Other							
			\$0	\$0	\$0	\$0	\$0
Category Sub-total				\$0	\$0	\$0	\$0
Modified Total Direct Cost Amounts				\$107,265	\$219,074	\$0	\$326,339
Indirect Costs							
Federally Accepted 'de minimis' Indirect Cost Rate (up to 10%)	10%			Indirect Cost Total: \$10,727			
Total				\$117,992	\$219,074	\$0	\$337,066

If the budget includes unusually high costs and/or rates, provide justification for those costs and/or rates.

If the budget identifies a contingency amount for specific line item(s) within the Contracted Services and Materials and Supplies budget categories, explain the specific reasons a contingency is needed for each line item. Contingencies are line-item specific and cannot be used for other costs.

Funding and Match

Fund Sources and Amounts

Organization Type	Name	Source Note	Contribution Type	Amount	Description	Status
Federal	Bonneville Power Administration	BPA Habitat Program contract with WWBWC	Cash	\$219,074	BPA funds will cost share materials, construction, and project management, and admin.	Secured
Fund Source Cash Total			\$219,074	Fund Source In-Kind Total		\$0

Match

Contribution Source-Type: Description	Amount
Bonneville Power Administration-Cash: BPA funds will cost share materials, construction, and project management, and admin.	\$219,074
Match Total	\$219,074

Do match funding sources have any restrictions on how funds are used, timelines or other limitations that would impact the portion of the project proposed for OWEB funding?

- Yes
 No

Do you need state OWEB dollars (not Federal) to match the requirements of any other federal funding you will be using to complete this project?

- Yes
 No

Does the non-OWEB funding include NOAA/PCSRF funds?

- Yes
 No

Uploads

Map: [Couse Creek site map.pdf](#) -

Planting Details: [Couse Ck Planting plan.pdf](#) -

Photos: [Couse Creek Fish passage barrier.pdf](#) -

Secured Match Forms: [BPA cost share contract.pdf](#) -

Support Letters: [CTUIR support for the WWBWC Couse Creek project_10.26.18.pdf](#) -

Reports: [Couse Ck Confluence Design 60 Percent summary.pdf](#) -

Figures and Tables: [Couse Creek 60% - HIP Comment Tracking 10 23 18.pdf](#) -

Project Design: [Couse Ck Confluence Design Sheets 60 Percent.pdf](#) -

Plant Page

Planting Questions

Relationship to other conservation programs

This project will use OWEB funds to increase the planting density on CREP acres.

Planting Activities

Describe the current condition of the site(s) to be planted.

Riparian vegetation along the mainstem Walla Walla River near the project consists of a narrow band of continuous vegetation on both banks, punctuated by the occasional gap in canopy coverage. The upper canopy consists of alders (*Alnus* sp.) and black cottonwood (*Populus balsamifera* ssp. *trichocarpa*), with some of the larger alders extending well into the mainstem channel. The middle canopy is primarily black locust (*Robinia pseudoacacia*) and willows (*Salix* sp.) with some alders and black cottonwood present. Ground cover is typically sparse along the leveed banks, and along the west bank is highly infested with invasive non-native plant species, such as Himalayan blackberry (*Rubus armeniacus*), reed canarygrass (*Phalaris arundinacea*), and hounds tongue (*Cynoglossum officinale*). Very little of the soil surface has herbaceous plants because the Himalayan blackberry blocks most light from hitting the forest floor. Vegetation is also limited along the old flood protection rock berm that was built to protect the Milton Ditch from washing out in high water events.

The riparian vegetation community along Couese Creek is very similar to the riparian vegetation along the Walla Walla River. The primary difference is that Couese Creek is primarily shaded by vegetation that occupies the middle canopy, with very few mature trees. Additionally, there is a bedrock wall on river left just above the decaying cement infrastructure, which is mostly barren with only sparse grass growing in a few outcroppings. Along this section, Couese Creek is shaded by riparian vegetation on the right (east) bank, and shaded by the steep slope on the left bank.

Describe how you will prepare the site(s) prior to planting and how those activities are appropriate considering the site conditions described in the previous question.

Site will first be graded to engineered design grades. Planting shall not occur until after rolled erosion control fabric has been placed per Section 01 35 43 ENVIRONMENTAL PROTECTION. Planting zone boundaries 1-2 shall be staked on the Project site by the Contractor at the locations shown on the Drawings before any excavation for planting is made. Planting zone boundaries shall be reviewed to confirm agreement with the staked planting zone boundaries. Existing trees, shrubs, and other plants that are to be preserved shall be fenced off or otherwise barricaded along the dripline to protect them during planting. When obstructions below ground affect the work, adjustments to plant material location, type of plant and planting method shall be done with review by WWBWC staff and engineering firm representative.

Use of any Rolled Erosion Control Product to control erosion or protect young plants shall conform to Section 01 35 43 ENVIRONMENTAL PROTECTION. Grade areas to be seeded to achieve the finished grades and grading drainage patterns indicated on the Drawings. Grading shall be accomplished in accordance with the requirements of Section 35 01 60 STREAM RESTORATION and Section 01 52 00 TEMPORARY CONSTRUCTION FACILITIES. Blend new surfaces to existing areas. C. The ground to be seeded shall be free of large clods or rocks, roots and other material that may interfere with the work and subsequent maintenance operations. Hand picking may be

required. The Rolled Erosion Control Product shall be installed in accordance with the requirements of Section 01 35 43 ENVIRONMENTAL PROTECTION. Seeding shall not commence until Owner's Representative or Engineer has accepted the condition of the prepared areas.

Criteria for planting plan

1. Local stock of native species should be used to the extent possible because these stocks would be best suited to and adapted to local conditions.
2. Final planting plans will be based on the final construction design. Factors such as topography distance to stream channel and side channel shall be taken into account. The final planting plan will be intended to facilitate plant survival and to facilitate project goal of improving aquatic and riparian habitat.
3. To augment survival of riparian plantings:
 - A. Final placement of plants shall be chosen based on microsite conditions, because soil properties and water table depth can vary over short distances, such that species are best matched to their site conditions.
 - B. Site preparation, such as removal of weeds or other species that will compete with seedlings and tilling of the soil shall occur prior to planting.
 - C. If necessary, soil amendment, such as fertilizer, shall be incorporated prior to or during planting.
 - D. If necessary, measures such as tubing, or other animal control techniques, can be utilized to protect woody plants from grazing/herbivory.
 - E. If possible, plants shall be installed in the late fall through early spring to minimize the need for supplemental water and to allow for the option of using bare root plant stock if available.

General planting notes

1. If applicable, supplemental fertilizer may be added to the bottom of each tree and shrub planting hole prior to planting and backfilling. If used, fertilizers shall be slow release products that will not result in nutrient runoff into aquatic systems.
2. If applicable, addition of mulch three inches deep may be placed in an 18 inch diameter ring around each tree and shrub to prevent competition with invasive species.

Riparian planting zone example sequence:

1. Seed bare soil at approximately 30 lbs/acre in selected areas as needed/desired for erosion control.
2. Install plants based on microsite variations within riparian planting zone.
3. Depending on desired density: trees should be planted 10 to 18 feet on center, shrubs should be planted at approximately 4 to 8 feet on center. However, final plant spacing will depend on specific site conditions and desired outcomes and should be designed during final plan design.

Seed mix description:

Seed mix, composed of native species, shall be used on bare soil in selected areas of the riparian planting zones as needed/desired for erosion control.

Live stakes description:

If used, live stakes should be installed along banks of stream and side channel, where applicable. The width of the zone for planting live stakes will depend on site conditions and design characteristics including final grade of bank and moisture availability.

Example sequence:

1. Seed bare soil at approximately 30 lbs/acre in selected areas as needed/desired for erosion control.
2. Install stakes based on microsite variations within riparian planting zone.
3. Depending on desired density, stakes may be planted at approximately 1 to 10 feet on center.

Selection and installation notes:

1. Live stakes should be between 18-48 inches long and at least 1/2" in diameter.
2. Stakes should be cut straight at the tip of the branch and at an angle at the base of Cutting to ensure the correct end is driven into the ground.
3. Keep stakes moist and in a dark place until installed; do not let stakes dry out.

4. Soaking stakes before installation increases survival and growth weight.
5. Drive stakes into the soil so at least 2/3 of its length is underground; leave at least 12 Inches above ground.
6. Use thicker diameter stakes when planting in riprap; thicker diameter stakes will Resist heat and drying better than smaller cuttings.
7. Plant stakes during the dormant season.

Notes:

1. Seed at approximately 30 lbs/acre; final quantity of seed mix per acre will depend on species composition and site conditions.
2. Species to be used for seed mix(es) and final composition should be chosen based on site specific design and conditions (e.g. slope, width of planting zone, moisture availability)
3. All seed mixes should be certified weed-free.

Fill out the table below. Identify the vegetation communities you plan on planting in, the acres each vegetation community encompasses, and the density of your planting.

Vegetation Community	Acres	Density
Wetland	1	77-203 depending on species.

Fill out the table below for each vegetation community listed in the table above, provide the common and scientific names of up to five plants that will be planted, the form(tree, shrub, grass), type of plant (bare root, cutting, etc) and the planting timing.

Vegetation Community	Plants: Common Name	Plants: Scientific Name	Form	Type	Year	Month
Wetland	WHITE ALDER	ALNUS RHOMBIFOLIA	Tree	Rooted	2019	OCTOBER THROUGH DECEMBER
Wetland	BLACK COTTONWOOD	POPULUS BALSAMIFERA, SUBSPECIES TRICHOCARPA	Tree	Rooted	2019	OCTOBER THROUGH DECEMBER
WETLAND	PONDEROSA PINE	PINUS PONDEROSA	Tree	Rooted	2019	OCTOBER THROUGH DECEMBER
WETLAND	DOUGLAS FIR	PSEUDOTSUGA MENZIESII	Tree	Rooted	2019	OCTOBER THROUGH DECEMBER
WETLAND	COYOTE WILLOW	SALIX EXIGUA	Shrub	Rooted	2019	OCTOBER THROUGH DECEMBER
WETLAND	BLACK HAWTHORN	CRATAEGUS DOUGLASII	Shrub	Rooted	2019	OCTOBER THROUGH DECEMBER
WETLAND	LEWIS' MOCK ORANGE	PHILADELPHUS LEWISII	Shrub	Rooted	2019	OCTOBER THROUGH DECEMBER
WETLAND	PACIFIC NINEBARK	PHYSOCARPUS CAPITATUS	Shrub	Rooted	2019	OCTOBER THROUGH DECEMBER
WETLAND	CHOKECHERRY	PRUNUS VIRGINIANA	Shrub	Rooted	2019	OCTOBER THROUGH DECEMBER
WETLAND	SNOWBERRY	SYMPHORICARPOS ALBUS	Shrub	Rooted	2019	OCTOBER THROUGH DECEMBER

WETLAND	ROCKY MOUNTAIN MAPLE	ACER GLABRUM	Shrub	Rooted	2019	OCTOBER THROUGH DECEMBER
WETLAND	NOOTKA ROSE	ROSA NUTKANA	Shrub	Rooted	2019	OCTOBER THROUGH DECEMBER
WETLAND	GREAT BASIN WILDRYE	LEYMUS CINEREUS	Grass	Seeds	2019	OCTOBER
WETLAND	IDAHO FESCUE	FESTUCA IDAHOENSIS	Grass	Seeds	2019	OCTOBER
WETLAND	TUFTED HAIRGRASS	DESCHAMPSIA CESPITOSA	Grass	Seeds	2019	OCTOBER
WETLAND	BLUE WILDRYE	ELYMUS GLAUCUS	Grass	Seeds	2019	OCTOBER
WETLAND	BLUEBUNCH WHEATGRASS	PSEUDOROEGNERIA SPICATA	Grass	Seeds	2019	OCTOBER
WETLAND	MOUNTAIN BROME	BROMUSCARINATUS VAR. MARGINATUS	Grass	Seeds	2019	OCTOBER

Plant Stewardship

After the plantings are installed, will you conduct plant stewardship (“free to grow”)?

- Yes
- No

Are you requesting OWEB funds for plant stewardship activities?

- Yes
- No

Explain how you plan to carry out activities to help the plantings survive and grow over time.

Plants will be watered and any weeds removed.

Measures of Planting Success

Use the table below to explain how you will document and determine success for the plantings.

Vegetation Community	Parameter	Percentages
Wetland	Percent Survival	50%

If, in the course of the 3-5 years following planting, the success rate falls below your standard, what is your plan?

The Walla Walla Basin Watershed Council will organize volunteer tree planting days with local community members, agency staff, and college, and high school students. We will use willow cuttings and rooted cottonwoods that WWBWC staff will gather. This has been a successful activity at previous fish passage and habitat restoration projects that we have completed that needed some supplemental vegetation.

Permit Page

Project Activity Requiring a Permit or License	Name of Permit or License	Entity Issuing Permit or License	Status
Removal/Fill	Oregon Department of State Lands Removal/Fill	Oregon Department of State Lands	Application will be submitted with final design.
Removal/Fill	US Army Corps of Engineers Removal/Fill 404permit	US Army Corps of Engineers	Application will be submitted with final design
US Army Corps of Engineers 408 Levee Alterations	US Army Corps of Engineers 408 Levee Alterations	US Army Corps of Engineers	Initial review completed
Fish passage project	ODFW Fish Passage review	Oregon Department of Fish and Wildlife	ODFW has been providing input on designs
in river habitat and fish passage	BPA Habitat Improvement Project III Biop review	USFWS and NOAA Fisheries	USFWS has been reviewing designs
construction in floodplain	Umatilla County floodplain permit	Umatilla County	application will be submitted with final design



Milton-Freewater

Couse Creek Entrance Fish Passage

© 2016 Google

Google Earth

Imagery Date: 8/14/2016 lat 45.914966° lon -118.371973° elev 1127 ft eye alt 21813 ft



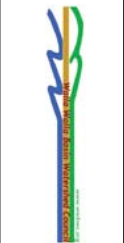
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1994

De Haven St
S Elizabeth St
Pierce St
S Columbia St
College St
SW 8th Ave
Davis St
S Mill St
Chestnut St
SE 15th Ave
S Main St
Appleton Dr
Oregon-Washington Hwy
Uribe Ln
Walla-Walla River Rd
Day Rd
Pr Rd
Spofford Rd
Co 564 Rd
Co 643 Rd
Co 628 Rd
Co 609 Rd



NOT FOR CONSTRUCTION



REV.	DATE	DESCRIPTION
A	10/31/17	15 PERCENT CONCEPTUAL DESIGN
B		
C	7/27/18	30 PERCENT DESIGN
D	11/18/18	60 PERCENT DESIGN

REV.	DATE	DESCRIPTION
A	10/31/17	15 PERCENT CONCEPTUAL DESIGN
B		
C	7/27/18	30 PERCENT DESIGN
D	11/18/18	60 PERCENT DESIGN

REV.	DATE	DESCRIPTION
A	10/31/17	15 PERCENT CONCEPTUAL DESIGN
B		
C	7/27/18	30 PERCENT DESIGN
D	11/18/18	60 PERCENT DESIGN

REV.	DATE	DESCRIPTION
A	10/31/17	15 PERCENT CONCEPTUAL DESIGN
B		
C	7/27/18	30 PERCENT DESIGN
D	11/18/18	60 PERCENT DESIGN

Growth Habit	Scientific Name	Common Name	Percent Composition ²	Propagation Method	Spacing (feet o.c.)	Density per Acre ¹	Quantity ¹
Tree	<i>ALNUS RHOMBIFOLIA</i> ³	WHITE ALDER	40	CONTAINER	15	77	163
	<i>POPULUS BALSAМИFERA</i> SUBSP. TRICHOCARRA	BLACK COTTONWOOD	40	CONTAINER	15	77	163
	<i>PIWUS PONDEROSA</i>	PONDEROSA PINE	10	CONTAINER	15	19	41
	<i>PSEUDOTSUGA MENZIESII</i>	DOUGLAS FIR	10	CONTAINER	15	19	41
	<i>SALIX EXIGUA</i> ³	COYOTE WILLOW	20	LIVE STAKE			427
Shrub	<i>CORNUS SERICEA</i> ³	REDOSIER DOGWOOD	20	LIVE STAKE OR CONTAINER	6	203	427
	<i>CRATAEGUS DOUGLASII</i>	BLACK HAWTHORN	10	CONTAINER	6	102	213
	<i>PHILADELPHUS LEWISII</i>	LEWIS MOCK ORANGE	10	CONTAINER	6	102	213
	<i>PHYSCARPUS CAPRITATUS</i> ³	PACIFIC NINEBARK	10	CONTAINER	6	102	213
	<i>PRUNUS VIRGINIANA</i>	CHOKECHERRY	10	CONTAINER	6	102	213
	<i>SYMPHORICARPOS ALBUS</i>	SNOWBERRY	10	CONTAINER	6	102	213
	<i>ACER GLABRUM</i>	ROCKY MOUNTAIN MAPLE	5	CONTAINER	6	51	107
	<i>ROSA NUTKANVA</i>	NOODIA ROSE	5	CONTAINER	6	51	107

POTENTIAL SPECIES FOR RIPARIAN REVEGETATION
 Acres: 0.96¹

CRITERIA FOR PLANTING PLAN

- LOCAL STOCK OF NATIVE SPECIES SHOULD BE USED TO THE EXTENT POSSIBLE BECAUSE THESE STOCKS WOULD BE BEST SUITED TO AND ADAPTED TO LOCAL CONDITIONS.
- FINAL PLANTING PLANS WILL BE BASED ON THE FINAL CONSTRUCTION DESIGN. FACTORS SUCH AS TOPOGRAPHY, DISTANCE TO STREAM CHANNEL, AND SIDE CHANNEL, SHALL BE TAKEN INTO ACCOUNT. THE FINAL PLANTING PLAN WILL BE INTENDED TO FACILITATE PLANT SURVIVAL AND TO FACILITATE PROJECT GOAL OF IMPROVING AQUATIC AND RIPARIAN HABITAT.
- TO AVOID DAMAGE TO PLANTS, PLANTING OPERATIONS SHOULD BE SCHEDULED TO OCCUR DURING PERIODS OF LOW FLOW AND WATER TABLE DEPTH CAN VARY OVER SHORT DISTANCES, SUCH THAT SPECIES ARE BEST MATCHED TO THEIR SITE CONDITIONS.
- SEEDLINGS AND TILLING OF THE SOIL SHALL OCCUR PRIOR TO PLANTING.
- IF NECESSARY, MEASURES SUCH AS TUBING, OR OTHER ANIMAL CONTROL TECHNIQUES, CAN BE UTILIZED TO PROTECT WOODY PLANTS FROM GRAZING/HERBIVORY.
- IF POSSIBLE, PLANTS SHALL BE INSTALLED IN THE LATE FALL THROUGH EARLY SPRING TO MINIMIZE THE NEED FOR SUPPLEMENTAL WATER AND TO ALLOW FOR THE OPTION OF USING BARE ROOT PLANT STOCK IF AVAILABLE.

GENERAL PLANTING NOTES

- IF APPLICABLE, SUPPLEMENTAL FERTILIZER MAY BE ADDED TO THE BOTTOM OF EACH TREE AND SHRUB PLANTING HOLE PRIOR TO PLANTING AND BACKFILLING. IF USED, FERTILIZERS SHALL BE SLOW RELEASE PRODUCTS THAT WILL NOT RESULT IN NUTRIENT RUNOFF INTO AQUATIC SYSTEMS.
- IF APPLICABLE, ADDITION OF MULCH THREE INCHES DEEP MAY BE PLACED IN AN 18 INCH DIAMETER RING AROUND EACH TREE AND SHRUB TO PREVENT COMPETITION WITH INVASIVE SPECIES.

RIPARIAN PLANTING ZONE EXAMPLE SEQUENCE:

- SEED BARE SOIL AT APPROXIMATELY 30 LBS/ACRE IN SELECTED AREAS AS NEEDED/DESIRED FOR EROSION CONTROL.
- INSTALL PLANTS BASED ON MICROSITE VARIATIONS WITHIN RIPARIAN PLANTING ZONE.
- DEPEND ON DESIRED DENSITY. TREES SHOULD BE PLANTED 10 TO 18 FEET ON CENTER. SHRUBS SHOULD BE PLANTED AT APPROXIMATELY 4 TO 8 FEET ON CENTER. HOWEVER, FINAL PLANT SPACING WILL DEPEND ON SPECIFIC SITE CONDITIONS AND DESIRED OUTCOMES AND SHOULD BE DESIGNED DURING FINAL PLAN DESIGN.

LIVE STAKES DESCRIPTION:

IF USED, LIVE STAKES SHOULD BE INSTALLED ALONG BANKS OF STREAM AND SIDE CHANNEL, WHERE APPLICABLE. THE WIDTH OF THE ZONE FOR PLANTING LIVE STAKES WILL DEPEND ON SITE CONDITIONS AND DESIGN CHARACTERISTICS INCLUDING FINAL GRADE OF BANK AND MOISTURE AVAILABILITY.

EXAMPLE SEQUENCE:

- SEED BARE SOIL AT APPROXIMATELY 30 LBS/ACRE IN SELECTED AREAS AS NEEDED/DESIRED FOR EROSION CONTROL.
- INSTALL STAKES BASED ON MICROSITE VARIATIONS WITHIN RIPARIAN PLANTING ZONE.
- DEPEND ON DESIRED DENSITY. STAKES MAY BE PLANTED AT APPROXIMATELY 1 TO 10 FEET ON CENTER.

SELECTION AND INSTALLATION NOTES:

- LIVE STAKES SHOULD BE BETWEEN 18-48 INCHES LONG AND AT LEAST 1/2" IN DIAMETER.
- STAKES SHOULD BE CUT STRAIGHT AT THE TIP OF THE BRANCH AND AT AN ANGLE AT THE BASE OF CUTTING TO ENSURE THE CORRECT END IS DRIVEN INTO THE GROUND.
- KEEP STAKES MOIST AND IN A DARK PLACE UNTIL INSTALLED. DO NOT LET STAKES DRY OUT.
- SOAKING STAKES BEFORE INSTALLATION INCREASES SURVIVAL AND GROWTH WEIGHT.
- DRIVE STAKES INTO THE SOIL SO AT LEAST 1/2 OF ITS LENGTH IS UNDERGROUND. LEAVE AT LEAST 12 INCHES ABOVE GROUND.
- USE THICKER DIAMETER STAKES WHEN PLANTING IN RIPRAP. THICKER DIAMETER STAKES WILL RESIST HEAT AND DRAMING BETTER THAN SMALLER CUTTINGS.
- PLANT STAKES DURING THE DORMANT SEASON.

SEED MIX DESCRIPTION:

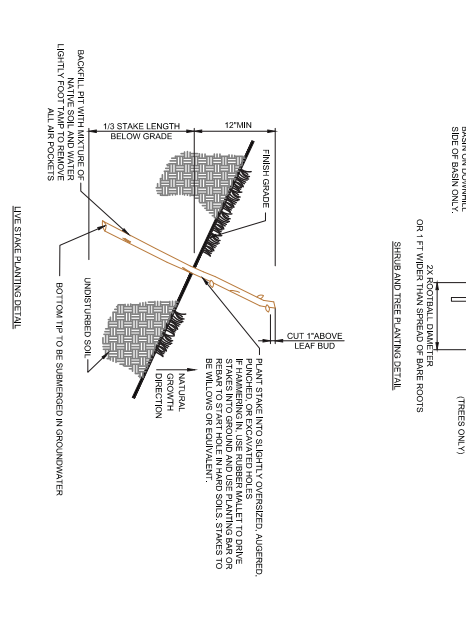
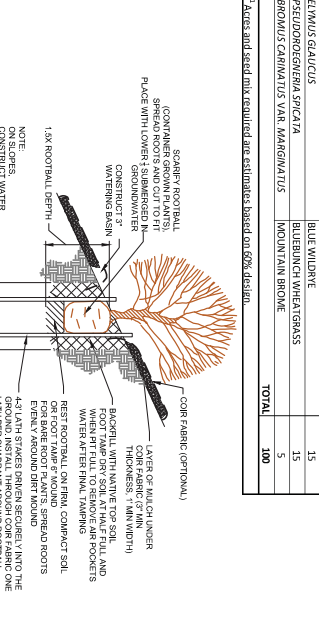
SEED MIX COMPOSED OF NATIVE SPECIES, SHALL BE USED ON BARE SOIL IN SELECTED AREAS OF THE RIPARIAN PLANTING ZONES AS NEEDED/DESIRED FOR EROSION CONTROL.

NOTES:

- SEED AT APPROXIMATELY 30 LBS/ACRE. FINAL QUANTITY OF SEED MIX PER ACRE WILL DEPEND ON SPECIES COMPOSITION AND SITE CONDITIONS.
- SPECIES TO BE USED FOR SEED MIXES) AND FINAL COMPOSITION SHOULD BE CHOSEN BASED ON SITE SPECIFIC DESIGN AND CONDITIONS (E.G. SLOPE, WIDTH OF PLANTING ZONE, MOISTURE AVAILABILITY).
- ALL SEED MIXES SHOULD BE CERTIFIED WEED-FREE.

Scientific Name ²	Common Name	Percent Composition
<i>LEMNAIS CINEREA</i>	GREAT BASIN WILLOW	30
<i>FESTUCA IDAHOENSIS</i>	IDAHO FESCUE	20
<i>DISCHAMPSA CESPITOSA</i>	TUFTED HAIRGRASS	15
<i>LEMNAIS GALICUS</i>	BLUE WILLOW	15
<i>PSEUDOROEGIERIA SPICATA</i>	BLUBUNCH WHEATGRASS	15
<i>BROMUS CARIINATUS</i> VAR. MARGINATUS	MOUNTAIN BROME	5
TOTAL		100

¹ Acres and seed mix required are estimates based on 60% design.





Couse Creek Fish passage barrier



Couse Creek Fish passage barrier



Mail Invoice To:

fwinvoices@bpa.gov
F & W Invoices - KEWB-4
P. O. Box 3621
Portland OR 97208-3621

Contract : 00080649
Release :
Page : 1

Vendor:
WALLA WALLA BASIN WATERSHED FOUNDATION
810 S MAIN STREET
MILTON-FREEWATER OR 97862

Please Direct Inquiries to:


JAY CHONG
Title: CONTRACT SPECIALIST
Phone: 503-230-4007
Fax :

Attn: CHRIS SHEETS

Contract Title: 2007-396-00 EXP WALLA WALLA BASINWIDE TRIB PASSAGE

Total Value : \$666,032.00
Pricing Method: COST, NO FEE
Performance Period: 11/01/18 - 10/31/19

**** NOT TO EXCEED ****
Payment Terms: % Days Net 15


Contractor Signature
BRIAN R. WOLCOTT/EXECUTIVE DIRECTOR
Printed Name/Title
10/22/2018
Date Signed

RACHEL KULAK Digitally signed by RACHEL KULAK
Date: 2018.10.18 10:49:17 -07'00'
BPA Contracting Officer
10/18/2018
Date Signed



Hannah Dondy-Kaplan	COTR	Bonneville Power Administration	(503) 230-4071 / (503) 230-5699	hadondy-kaplan@bpa.gov	P.O. Box 3621 Mailstop - KEC-4 Portland OR 97208-3621
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Jay Chong	Contracting Officer	Bonneville Power Administration	(503) 230-4007 / NA	jxchong@bpa.gov	

Work Element Budget Summary:

<u>Work Element - Work Element Title</u>	<u>EC Needed*</u>	<u>Estimate</u>	<u>(%)</u>
A : 185. Produce Pisces Status Report - Periodic Status Reports for BPA		\$2,000	(0.30 %)
B : 119. Manage and Administer Projects - Admin oversight for Exp Activities		\$5,000	(0.75 %)
C : 165. Produce Environmental Compliance Documentation - Environmental Compliance Documentation for all Exp actions		\$30,000	(4.50 %)
D : 132. Produce (Annual) Progress Report - Annual Progress Report (11-1-17 to 10-31-18)		\$4,600	(0.69 %)
E : 99. Outreach and Education - Youth and adult presentations		\$7,000	(1.05 %)
F : 175. Produce Design and/or Specifications - Lampson Side Channel Entrance Final Design and Permitting	*	\$123,000	(18.47 %)
G : 175. Produce Design and/or Specifications - North Fork WW Push Up Dams Alternatives Assessment/Initial Design - NF8	*	\$62,500	(9.38 %)
H : 175. Produce Design and/or Specifications - North Fork WW Push Up Dams Alternatives Assessment/Initial Design - NF7	*	\$66,500	(9.98 %)
I : 184. Install Fish Passage Structure - Couse Creek Fish Passage Construction	*	\$253,000	(37.99 %)
J : 148. Install Flow Measuring Device - Walla Walla River	*	\$40,000	(6.01 %)



Deliverable Specification: The Couse Creek Fish Passage Construction will be completed according to approved designs.

Work Element Budget: \$253000 (37.99 %)

Planned Metrics: * # of miles of habitat accessed to the next upstream barrier(s) or likely limit of habitable range: 9.00

* # of natural stream crossings installed in the freshwater non-tidal zone: 1

Locations: 1

Primary Focal Species: Chinook (*O. tshawytscha*) - Mid-Columbia River Spring ESU | Steelhead (*O. mykiss*) - Middle Columbia River DPS | Trout, Bull (*S. confluentus*)

Country: US

NPCC Subbasin: Walla Walla

State: OR

HUC5 Watershed: Upper Walla Walla River

County: Umatilla

HUC6 Name: Couse Creek

Salmonid ESUs Present: Middle Columbia River Steelhead DPS (Accessible)

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Environmental compliance requirements complete	11/1/2018	5/31/2019	Inactive	On-the-ground work associated with this work element cannot proceed until this milestone is complete. Milestone is complete when final documentation is received from BPA environmental compliance staff.
B. Discuss HIP3 ESA coverage with BPA EC lead; obtain HIP3 risk determination	11/1/2018	5/31/2019	Inactive	The EC Lead will determine if work under this work element may be able to have full ESA-coverage (NOAA & USFWS) under the 2013 Habitat Improvement Program Biological Opinion (HIP3). The HIP3 has expanded coverage for projects that may pose a moderate to high risk of impacting an ESA-listed species or critical habitat that would normally require a Biological Assessment. For work that qualifies, projects will undergo a review by the BPA-internal Restoration Review Team (RRT). Before conceptual design commences, contact the EC lead for HIP3 consideration, instruction, and information needs and requirements for coverage eligibility. The HIP3 activity categories and risk criteria are located in the "Note" section of the work element background page here: https://www.cbfish.org/WorkElement.mvc/Summary/165
C. Choose contractor for fish passage construction	11/1/2018	5/31/2019	Inactive	A RFP for the fish passage construction will be developed with input from basin fish managers. Proposals will be solicited and a contractor will be chosen through a criteria developed by WWBWC and the basin fish managers. While WWBWC always strives to award contracts to the lowest bidder, qualifications will be a major part of the selection process for this in-stream project.
D. Obtain necessary permits to complete this project	11/1/2018	5/31/2019	Inactive	WWBWC will obtain the necessary permits that are required to complete this project.
E. Clearing and prepping project site	7/1/2019	7/31/2019	Inactive	The Couse Creek Fish Passage project site will be cleared and prepped for construction.
F. Excavation for roughened riffles	7/1/2019	9/30/2019	Inactive	Project site will be excavated for placement of roughened riffles.
G. Install roughened riffles	7/1/2019	9/30/2019	Inactive	Boulders will be placed to create a roughened riffle to repair fish passage issue.
H. Bank protection structures installed	7/1/2019	9/30/2019	Inactive	Logs will be used for bank stabilization.
I. Riparian planting	7/1/2019	9/30/2019	Inactive	Riparian planting will be done to restore river bank stabilization.
J. Site Clean-up	7/1/2019	10/31/2019	Inactive	WWBWC will work with contractor to ensure project site is returned to a reasonable condition.
Deliverable: K. Couse Creek Fish Passage Construction Complete		10/31/2019	Inactive	<i>See the Deliverable Specification above</i>

J: 148. Install Flow Measuring Device

Title: Walla Walla River Flow Gauge at Tumulum Bridge

Description: A flow gauge is necessary at this location to ensure the 20.05 cfs that has been conserved in OR and protected instream through WA as instream water rights actually remains instream. This location is at the downstream end of the worst losing (riverbed seepage) reach of the Walla Walla River in the Oregon half of the watershed. This gauge location will show the conserved water that is passing on to Washington from Oregon instream water rights to assist Washington with protecting that same amount from



Milestone Title	Start Date	End Date	Status	Milestone Description
D. Obtain HIP risk determination	11/1/2018	2/28/2019	Inactive	FOR HABITAT ACTIONS ONLY: The EC Lead will determine if work under this work element may be able to have full ESA-coverage (NMFS & USFWS) under the Habitat Improvement Program Biological Opinion (HIP). The HIP has expanded coverage for projects that may pose a moderate to high risk of impacting an ESA-listed species or critical habitat that would normally require a Biological Assessment. For work that qualifies, projects will undergo a review by the EC Lead and Engineering Technical Services (ETS) team. Before conceptual design commences, contact the EC lead for HIP consideration, instruction, and information needs and requirements for coverage eligibility.
E. Bid out design of instream habitat actions to comply with HIP	11/1/2018	2/28/2019	Inactive	Create design bid package that follows design constraints in HIP guidance. The intent of this milestone is to determine early if proposed habitat actions comply with HIP requirements. If the contractor feels they cannot design within the constraints of the HIP, discuss the proposed action with BPA COR/EC. BPA Engineering Technical Services (ETS) is also available for early review of project designs.
F. Submit designs for BPA engineering review	2/1/2019	4/30/2019	Inactive	Submit designs consistent with development stage for BPA engineering review. Designs may be reviewed at conceptual stage (requiring a brief functional review), or 15% and higher (requiring a complete Basis of Design Report). Submit designs to ECL, COR, and other relevant reviewers.
G. Provide project concepts: 15% preliminary design to the EC and COTR.	11/1/2018	4/30/2019	Inactive	Provide conceptual strategy, restoration approach, or preliminary design (even if at the very earliest stages of development) to the EC-lead and COTR to inform the HIP III risk characterization; and before developing any additional significant technical detail or engineering specifications.
H. Obtain cultural resource clearance for ground-disturbing survey and monitoring actions	11/1/2018	6/30/2019	Inactive	If planning or design work requires ground disturbance including but not limited to geotechnical surveys, ground water monitoring, or well exploration, obtain appropriate cultural resources consultation prior to any ground disturbance. Notify EC lead well in advance of ground disturbing work. On-the-ground work associated with this work element may not proceed until this milestone is complete. Milestone is complete when BPA environmental compliance staff provides final documentation.
I. Provide project concepts: 30% preliminary design to the EC and COTR.	5/1/2019	9/1/2019	Inactive	Design review by EC required, which may include HIP RTT review, before proceeding to the next design phase.
J. Meet with landowners, BPA, and basin partners to review alternatives	9/1/2019	9/30/2019	Inactive	WWBWC will meet with landowners, BPA, basin partners, and fish managers to determine which alternatives best meet goals.
Deliverable: K. North Fork WW Push Up Dam NF8 Alternatives Designed		10/31/2019	Inactive	<i>See the Deliverable Specification above</i>

I: 184. Install Fish Passage Structure

Title: Couse Creek Fish Passage Construction

Description: Couse Creek is a tributary of the Walla Walla River just upstream from Milton-Freewater, and is currently used by steelhead, spring Chinook salmon, redband trout, and occasionally by bull trout. Currently, there is a fish passage issue near the confluence of Couse Creek and the Walla Walla River during lower flows when there are still returning steelhead adults and Chinook salmon adults seeking their spawning areas. Where Couse Creek discharges into the river, Couse Creek transitions from a bedrock-controlled bed onto the gravel bed of the Walla Walla River. A three to four foot, slanted, bedrock drop exists at this transition point. From this point, the Creek continues upstream as a steep, shallow, bedrock controlled bed before gravels and cobbles dominate the bed. Steelhead cannot navigate this drop in late winter and early spring when discharges from the Creek are relatively high. An engineering assessment, survey, and 30% designs to improve fish passage at this location have been completed. BPA funds have covered the costs of initial project design work with technical support provided by ODFW and CTUIR fisheries staff and the WWBWC. Three alternatives have been developed, and final designs are scheduled to be completed by November 2018. With the assistance of BPA EC staff, permitting work has been initiated. Under this contact, construction will be scheduled for summer of 2019. Couse Creek was described in the Walla Walla Subbasin Plan EDT analysis as a Priority Protection Area. The Walla Walla Subbasin Plan identifies addressing fish passage barriers as a priority action. Recent restoration investments in Couse Creek have included fish passage work at the Konen rock quarry culvert replacement bridge project. Also, fish habitat investments have occurred along the Shumway-Banks property.

As previously stated, with the assistance of BPA EC staff, EC work has been initiated for this project.

From: [Gary James](#)
To: [GREER Sue * OWEB](#)
Cc: [Eric Hoverson](#); [Mike Lambert](#); [Brian Wolcott \(brian.wolcott@wwbwc.org\)](#); [DUKE William B](#)
Subject: CTUIR support for the WWBWC Couse Creek project
Date: Friday, October 26, 2018 12:32:32 PM
Attachments: [image001.png](#)

Sue,

Just a quick note to relay CTUIR support of the Couse Creek Confluence Fish Passage project proposal being submitted by the Walla Walla Basin Watershed Council. We have been in close coordination with the WWBWC for the planning of this beneficial project. Thanks, GJames



Couse Creek Confluence Fish Passage Design Project

60 Percent Preliminary Design

Prepared for:



Walla Walla Basin Watershed Council
810 South Main Street
Milton-Freewater, OR 97862

Prepared by:



19803 North Creek Parkway
Bothell, WA 98011
Tel 425-482-7600 Fax 425-482-7652

July 2018

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1. Preface

This report for the Couse Creek Confluence Fish Passage Design (Project) is based on the General Project Data Summary Requirements (GPDSR) Basis of Design Report template for Bonneville Power Administration (BPA) Habitat Improvement Program (HIP III) projects (BPA 2017a). Some formatting changes have been made to the template but the sections and requested information follow the template structure. The GPDSR requirements below are as presented in the GPDSR template. However, the BPA Restoration Review Team (RRT) review stages for the Project will differ slightly from the review junctures suggested by the template. As described below, the Project review will include the 60 percent and 90 percent Design Submittal reviews by the RRT in place of an 80 percent design review.

General Project Data Summary Requirements (GPDSR)

Planning and design documentation of conservation practices should effectively communicate that appropriate planning, analysis, design, and resulting construction documentation are met. The project documentation should provide other persons the means of quickly following the rationale used in determining all features of a design including the design objective(s), data, criteria, assumptions, procedures, and decisions used in design and resulting construction plans, specifications and details. The GPDSR serves as the design submittal framework that is needed to assess and evaluate the adequacy of the proposed project.

The GPDSR criteria were developed using the River Restoration Analysis Tool (RiverRAT) and address the 16 overarching questions proposed within the RiverRAT Framework.

The BPA RRT will review submitted GPDSR documents to determine if the technical deliverables provided are adequate for *functionality (adherence to HIP 3 Conservation Measures)* and technical quality (competent execution of design and project plans – contract documents).

For the Channel Reconstruction activity category, a project-specific Monitoring and Adaptive Management Plan must be included.

Project Review Junctures

15 Percent RRT Review: The Project Sponsor will notify BPA at the 15 percent project concept completion stage and coordinate a site visit to review project concepts, goals, and objectives and confirm the direction and planning for subsequent phases of project design. The site visit will include the review of limiting factors and any pertinent studies or reports

that document restoration targets for implementation and draft project concepts. Additional data that may be presented and reviewed include other data sources, e.g., high resolution aerial photography, topographic maps, Geographic Information System (GIS) – computer-aided drafting (CAD) data layers, or other resource data. BPA will clarify technical documentation requirements with the Sponsor at this stage. BPA will provide functional and technical comments after the site review to be addressed as the Project advances to 30 percent completion.

Submit 30 Percent Design for RRT Review: Sponsor will notify BPA at the 30 percent preliminary design completion stage of the Project. The 30 percent project drawings and preferred project alternatives will be submitted for RRT functional and technical review. The 30 percent design shall demonstrate incorporation of technical comments and recommendations provided at the 15 percent project review. The 30 percent design submittals should include conceptual drawings and specifications including overall site locations, site plans, profiles, cross sections, details, preliminary quantities and provisional technical analyses as summarized in a draft Basis of Design Report using the GPDSR outline. BPA will perform functional and technical review of the 30 percent submittal and provide comments back to the Sponsor to be addressed as the project advances to 60 percent completion.

Submit 60 Percent and 90 Percent Designs for RRT Review: As noted previously, the suggested 80 percent design review will be replaced by 60 percent and 90 percent design reviews. The 60 percent project drawings will be submitted for RRT functional and technical review. Following BPA’s functional and technical review of the 60 percent submittal, BPA’s comments back to the Sponsor will be addressed as the Project advances to the 90 percent level and the 90 percent project drawings will be submitted for RRT functional and technical review. The 90 percent design submittals should include near final drawings and specifications including specific site locations, site plans, profiles, cross sections, details, construction quantities, implementation resource plans and design technical analyses as summarized in a Basis of Design Report addressing the GPDSR requirements. BPA will perform functional and technical review of the 90 percent submittal and provide comments back to the Sponsor to be addressed as the Project advances to completion, after which the Sponsor will submit the final design for BPA’s records.

1.1 NAME AND TITLES OF SPONSOR, FIRMS, AND INDIVIDUALS RESPONSIBLE FOR DESIGN

Project Name: Couse Creek Confluence Fish Passage Design (Project)

Project Location: Couse Creek Confluence, Milton-Freewater, Oregon

Sponsor: Walla Walla Basin Watershed Council (WWBWC), 810 South Main Street, Milton-Freewater, OR 97862

Walla Walla Basin Watershed Council Executive Director: Brian Wolcott

Engineering firm: Tetra Tech, Inc. (Tetra Tech), 19803 North Creek Parkway, Bothell, WA 98011

Project Manager: Chris James

Lead Design Engineer: Chad Bailey, PE, CFM

Water Resources Engineer: Jeremy Andrews, PE

1.2 LIST OF PROJECT ELEMENTS THAT HAVE BEEN DESIGNED BY A LICENSED PROFESSIONAL ENGINEER

Project Design Drawings (see Appendix A)

Other Supporting Reports (see Appendix B)

Engineer's Cost Estimate (see Appendix C)

Construction Specifications (see Appendix D)

1.3 IDENTIFICATION AND DESCRIPTION OF RISK TO INFRASTRUCTURE OR EXISTING RESOURCES

The Project is located on both private property and property held by the City of Milton-Freewater. The adjoining land uses are a mix of rural residential and agriculture, and the land use downstream of the Project remains rural residential for 0.5 river miles (RM), before entering the outskirts of Milton-Freewater. The Project is located within the Milton-Freewater Levee system, which was constructed in the 1940s and rebuilt between 1966 and 1968 by the U.S. Army Corps of Engineers (USACE), and recently repaired by the Milton-Freewater Water Control District to bring the system back into USACE and Federal Emergency Management Agency (FEMA) compliance. The Milton-Freewater Water Control District holds the easement for the Milton-Freewater Levee system, which is almost entirely on private land.

Infrastructure within the Project includes the Milton-Freewater Levee system, a water line for the city of Milton-Freewater that crosses underneath the channel bed of Couse Creek, and a pair of associated valves present on the elevated terrain to the east. One of these is the

original valve, and the second is a modern valve protected by a cement pad. The Couse Creek Road Bridge is a short distance upstream of the Project, and there are three paved vehicle bridges located 0.8, 1.3, and 2.6 miles downstream from the Project, respectively. No utilities other than the municipal water line were reported during a utility locate.

Couse Creek has incised down to bedrock near the mouth, and there is an existing cement structure approximately 150 feet upstream of the mouth that constricts the channel. The bedrock drop and the velocities at the cement structure each present a partial fish passage barrier at various flows. Project actions to address fish passage and improve local habitat conditions are anticipated to include channel, streambank, and floodplain modifications in Couse Creek and in the floodplain downstream from the current mouth of Couse Creek.

1.4 EXPLANATION AND BACKGROUND ON FISHERIES USE (BY LIFE STAGE - PERIOD) AND LIMITING FACTORS ADDRESSED BY PROJECT

Couse Creek is a tributary to the Walla Walla River, flowing 16.2 miles from north to south and joining with the Walla Walla River at approximately RM 47.2 based on United States Geological Survey (USGS) river mile locations. Use of the USGS river mile locations will be used hereafter, and is consistent with river mile locations reported by the USACE (2010). The Project is intended to improve fish passage for all life stages of resident and anadromous salmonids from the confluence with the Walla Walla River up into the spawning and rearing habitats of Couse Creek. The focal species for the Project are summer steelhead (*Oncorhynchus mykiss*) and spring Chinook salmon (*O. tshawytscha*). Other fish species that are expected to benefit from the Project include resident redband trout (*O. mykiss*) and, to a lesser extent, bull trout (*Salvelinus confluentus*).

Steelhead in the Walla Walla River and tributaries belong to the Umatilla-Walla Walla major population group, part of the federally threatened Middle Columbia River (MCR) steelhead distinct population segment (DPS). The MCR DPS of steelhead was listed as threatened on March 25, 1999, and the threatened status was reaffirmed on August 15, 2011 (76 Federal Register 50448). Accessible habitat for steelhead in Couse Creek has been estimated at 14.2 miles (NPCC 2005). Spring Chinook salmon in the Walla Walla River were originally part of the Middle Columbia Spring Chinook Species Management Unit until they were effectively extirpated from the Walla Walla River Subbasin in the 1920s (SRSRB 2011). Recently, spring Chinook salmon were reintroduced into the subbasin by the Confederated Tribes of the Umatilla Indian Reservation Department of Natural Resources in 2000. Bull trout are currently listed under the Endangered Species Act (ESA) as Threatened, and are considered a Candidate species by the State of Washington. The Walla Walla system is one of the

currently occupied bull trout core areas in the Middle Columbia Recovery Unit (USFWS 2015).

The Walla Walla Subbasin Plan (NPCC 2005) assessed summer steelhead and spring Chinook salmon populations in the Walla Walla Subbasin by using the Ecosystem Diagnosis and Treatment (EDT) method. The typical 16 limiting factors that are assessed in the EDT modeling are listed in Table 1-1. The results of the general subbasin-wide analysis indicate that the key limiting factors for summer steelhead were sediment load, habitat diversity, key habitat quantity, and obstructions. The primary limiting factors for spring Chinook salmon below the Mill Creek confluence were sediment load, key habitat quantity, habitat diversity, and water temperature, with flow and predation as secondary limiting factors. In the mainstem Walla Walla reaches between the Mill Creek confluence and Nursery Bridge (Milton-Freewater, OR), channel stability and obstructions also became secondary limiting factors (NPCC 2005).

Table 1-1. EDT Assessed Limiting Factors for Anadromous Species in the Walla Walla River Subbasin

Limiting Factors	
Flow	Water Temperature
Channel Stability	Habitat diversity
Key Habitat Quantity	Obstructions
Withdrawals	Sediment Load
Oxygen	Chemicals
Food	Hatchery Competition
Resident Competition	Predation
Pathogens	Harassment/poaching

Source: NPCC 2005

More thorough coverage of Walla Walla River via the EDT process is provided in Appendix 1 of the Subbasin Plan (NPCC 2005). The Project is located at the mouth of Couse Creek, which is identified in the EDT analysis as the Couse 1 reach of the Couse Creek Drainage geographical area. Limiting factors identified for Couse 1 include water temperature and flows (NPCC 2005). Additionally, Couse Creek is listed by the Oregon Department of Environmental Quality (ODEQ) under Section 303(d) as being potentially limited (category 3, insufficient data) for numerous pollutants/adverse water quality conditions (alkalinity, ammonia, chlorophyll a, dissolved oxygen, e. coli, flow modification, habitat modification, pH, phosphate/phosphorus, sedimentation, and water temperature) (ODEQ 2012).

The 2008 Fish Accords (Three Treaty Tribes-Action Agencies 2008) lists three primary limiting factors for Walla Walla River Summer Steelhead in the Walla Walla River below the

North and South Forks of the Walla Walla River. These limiting factors are identified as in-channel characteristics, passage/entrainment, and riparian/floodplain.

1.5 LIST OF PRIMARY PROJECT FEATURES INCLUDING CONSTRUCTED OR NATURAL ELEMENTS

1.5.1 Project Goal

The overall goal of the Project is to restore and enhance fish passage and habitat within Couse Creek and potentially improve habitat conditions of the Walla Walla River in the near vicinity. These actions will address the primary limiting factors identified in the 2008 Fish Accords (Three Treaty Tribes-Action Agencies 2008).

To address the overall Project goal, the following potential Project objectives were identified:

- Improve fish passage at the site, including by removing the existing cement structure (approximately 150 feet upstream of the mouth) to reduce channel velocities and improve fish passage;
- Improve quality and quantity of habitat in Couse Creek and the Walla Walla River;
- Reroute Couse Creek to increase stream length and reduce channel gradient;
- Assess the need to install roughened riffles to raise the bed elevation of the Walla Walla River (based on available levee freeboard) and increase channel stability;
- Assess the feasibility of a levee setback on the east bank of the Walla Walla River, to increase floodplain connectivity;
- Control and manage invasive species;
- Protect private property from erosion and channel evulsion; and
- Work closely with the WWBWC at each stage of design and obtain consensus on the design before proceeding to the next design stage.

1.5.2 Past Designs

The Alternatives Analysis and Conceptual Design: Milton-Freewater Levee and Habitat report (GeoEngineers 2012) was developed to improve habitat conditions for ESA-listed steelhead and bull trout, while also reducing flood risk to the city of Milton-Freewater and outlying residential areas. Fish passage at the mouth of Couse Creek was specifically addressed in the analysis and conceptual designs, including a discussion of an alternative that focused on providing fish passage and stabilizing the creek bed. The primary recommendation was to improve fish passage by stabilizing the Couse Creek stream bed and the Walla Walla River around the confluence. A secondary recommendation was to stop

degradation and head cutting. The suggested action was to place cobbles and boulders at the mouth of the creek and within the river as part of a channel roughening effort, rather than using rock vanes or weirs. The design plan sheets also indicate establishing off channel alcove habitat, approximately at the start of the old Milton Ditch Line. Other actions considered were variations of smaller roughened stream bed arrangements, and potential modification of the bedrock channel to facilitate passage.

The Couse Creek fish passage alternative ended up being ranked third out of eight proposed project alternatives within the assessment area. Following the completion of the two highest ranked alternatives (Smith and Zell Diversions), the WWBWC selected Tetra Tech to develop the design for this Project.

1.5.3 15 Percent Design Alternatives

Design alternatives were developed based on the topographic and geomorphic site surveys conducted by Tetra Tech on September 25 to 28, 2017; evaluation of existing light detection and ranging (LiDAR) data (AeroMetric 2011; Quantum Spatial 2016); evaluation of available background documents (USACE 2010; WWBWC 2014 and 2017); review of the Alternatives Analysis and Conceptual Design: Milton-Freewater Levee and Habitat (GeoEngineers 2012); and discussion with the WWBWC.

The three alternatives that were developed included:

- Full Floodplain, Fish Passage, and Habitat Restoration — This alternative would create a new channel, remove old irrigation ditch infrastructure, remove a culvert and road crossing, replace a second culvert, and add a large woody debris (LWD) revetment to the channel. The existing municipal line would be protected or moved.
- Partial Floodplain, Fish Passage, and Habitat Restoration — This alternative would re-route Couse Creek through an irrigation ditch, remove a fish screen in an old ditch, add an LWD revetment, remove a concrete structure in Couse Creek, regrade the Couse Creek channel bed, and add boulder clusters and small pools to the Walla Walla River. The existing municipal line would be protected.
- Fish Passage Restoration and Habitat Enhancement — This alternative would partially reconnect the irrigation ditch to the main Couse Creek flow, remove the fish screen, add an LWD revetment, remove a concrete structure, regrade the Couse Creek channel bed, install roughened riffles in the mainstem Walla Walla River, and add boulder clusters and small pools. The existing municipal line would be protected.

1.5.4 30 Percent Conceptual Design

Based on the comments received on the 15 Percent Design Alternatives submittal (Tetra Tech 2017a), site survey data collected, and the analyses discussed in Section 2, Section 3, and Appendix B of the 15 Percent Design Report, Tetra Tech advanced the design to the 30 percent conceptual design stage (Tetra Tech 2017b). The review team determined that levee setbacks on the east bank increased Project complexity and risk, and should not be part of the Project. Therefore, the Partial Floodplain, Fish Passage, and Habitat Restoration Alternative was selected, with significant modifications that included realigning the lower portion of Couse Creek and measures to restore gradient and fish passage, as well as adding habitat boulders in the mainstem Walla Walla River (Tetra Tech 2017b).

It was proposed that the right bank of the abandoned Milton-Freewater ditch would be regraded to remove the push-up berm material used for the ditch and add additional floodplain material near the left bank of the existing Couse Creek near the water line crossing. The floodplain fill would have then be placed outside of the mapped floodway for the Walla Walla River as shown on the FEMA National Flood Hazard Layer for Umatilla County. Couse Creek was proposed to be rerouted to the west through the existing floodplain above the Walla Walla River, which would have increased the stream length and channel complexity. Due to the steepness of the confluence and consistent with morphology observed upstream, a step pool morphology with slopes between 2.5 percent and 1.1 percent was proposed for the channel profile. The 2.5 percent slope matched the existing channel slope upstream and would have provided fill over the exposed bedrock and clearance above the existing water line. The existing concrete wall and apron would have been removed and the right bank would be sloped back. A roughened riffle would be installed in Couse Creek to reduce scour potential in the area of the existing water line. The channel then would have transitioned to lower slopes through the floodplain and would have been consistent with the 1 percent to 4 percent slopes typically seen for alluvial fan channels (Paustian 2010). The existing Couse Creek channel would have been plugged with a log jam to simulate a jam-forced avulsion. Low flows would have been maintained within the new channel and overbank flows would have been allowed to flow over the top of the log jam.

The need to install roughened riffles to raise the bed elevation of the Walla Walla River and increase channel stability was assessed, and it was determined that the riffle element would not be added to the design.

1.5.5 60 Percent Preliminary Design

Based on the comments received on the 30 Percent Conceptual Design submittal (Tetra Tech 2017b), site survey data collected, and the analyses discussed in Section 2 and Section 3, of this report, Tetra Tech advanced the design to the 60 percent preliminary design level (this submittal). The 60 Percent Preliminary Design includes the following changes to the 30 Percent Design:

Removal of Proposed LWD Structure

Based on the comments received on the 30 Percent Conceptual Design submittal (Tetra Tech 2017b), no LWD structures will be installed as a part of the 60 Percent Preliminary Design. Additional fill was added to the former Couse Creek channel where the LWD plug was proposed in the 30 percent conceptual design plans.

Addition of Floodplain Bench

A 10-foot-wide floodplain bench has been added to the roughened riffle in Couse Creek to help spread out the flow and reduce velocities.

1.6 DESCRIPTION OF PERFORMANCE / SUSTAINABILITY CRITERIA FOR PROJECT ELEMENTS AND ASSESSMENT OF RISK OF FAILURE TO PERFORM, POTENTIAL CONSEQUENCES AND COMPENSATING ANALYSIS TO REDUCE UNCERTAINTY

Performance criteria for Project elements are provided in this section. Fish passage criteria (e.g., velocities, jump height, flows) including National Marine Fisheries Service (NMFS) fish passage criteria provided in the Anadromous Salmonid Passage Facility Design (NMFS 2011) and Oregon Department of Fish and Wildlife (ODFW) fish passage criteria provided in Oregon Administrative Rules (OAR) Division 412 are presented in Table 1-2. Performance criteria for Project elements, associated risks to infrastructure or failure to perform, and compensating analyses are summarized in Table 1-3.

Table 1-2. Fish Passage Criteria

Fish Passage Criteria		
Criteria	NMFS^{1/}	ODFW^{2/}
Category	4 – Roughened Channels	635-412-0035 (1) – Roughened Channel Fishway
Salmonid		
Method	Streambed Simulation Design	Stream Simulation Option
Channel Width	Entrenched – bankfull or greater	Equal or greater than active channel width, taken from stream crossing requirements
Channel Slope	Less than 6%	Slope of long-channel bed profile, taken from stream crossing requirements
Max Length	150 feet	NA
Fill Materials	An appropriate mix of bed materials (from fines to boulder sized material) are used such that flow depths of at least 1 foot can be maintained for upstream adult salmonid passage.	Natural bed material with bed retention and hydraulic shadow
Water Depth	Resemble existing stream	At all flows, fall into a receiving pool of sufficient depth, depending on impact velocity and quantity of flow, to ensure that fish and flow shall not impact the stream bottom or other solid features
Water Velocity	Resemble existing stream	Water velocity is greater than 2 feet per second during all flows

NA – not applicable

1/ Anadromous Salmonid Passage Facility Design (National Marine Fisheries Service 2011)

2/ Oregon Department of Fish and Wildlife, Oregon Administrative Rules Division 412

Table 1-3. Project Actions and Performance Criteria

Project Actions	Performance Criteria	Risk Assessment	Compensating Analyses or Measures
Overall	<ul style="list-style-type: none"> Maintenance of a "no-rise" condition in baseflood elevations as determined by LOMR 12-10-1210P, effective September 20, 2013. 	<ul style="list-style-type: none"> Changes to the baseflood elevations may require certification by the USACE and remapping of the FEMA floodway and associated floodplain. Increases in baseflood elevations could compromise levee freeboard or present risks to infrastructure. 	<ul style="list-style-type: none"> No work aside from habitat boulders is proposed within the Walla Walla River, so the proposed design is expected to maintain a "no-rise" condition. Floodplain fill will be placed outside of the mapped floodway for the Walla Walla River as shown on the FEMA National Flood Hazard Layer for Umatilla County. Proposed conditions hydraulic modeling will be completed at a later design stage, and will be used to demonstrate baseflood elevations at the FEMA approved 100-year recurrence interval flow.
Roughened Riffle	<ul style="list-style-type: none"> Riffle boulders stable to proposed 100-year flood hydraulic conditions. Maintenance of surface flow. 	<ul style="list-style-type: none"> Potential for head cutting or avulsions in Couse Creek channel where current water line is buried. 	<ul style="list-style-type: none"> Streambed aggregate will be placed and compacted in lifts and fines washed in until surface flow or ponding is apparent. Bed stability analyses will be provided at the next design phase.
Habitat Boulders	<ul style="list-style-type: none"> Stable to proposed 100-year flood hydraulic conditions. 	<ul style="list-style-type: none"> Undersized boulders could move or become buried, but are generally a low risk. Addition of large quantities of boulders can increase roughness and raise flood stage. 	<ul style="list-style-type: none"> Boulder sizing was based on observations of the largest, immobile boulders present under existing conditions and on sizing calculations detailed in Section 3.6.1. The proposed habitat boulders will be partially buried to the point of being completely overtopped by the 1.5-year flow and spaced out in a density that will not appreciable impact the flood flow areas thereby not increasing the flood stage.
Revegetation	<ul style="list-style-type: none"> Revegetation of all disturbed areas 12-month plant survival of greater than 75 percent. 	<ul style="list-style-type: none"> Potential for low survival. Noxious weed infestations. 	<ul style="list-style-type: none"> Use site appropriate native vegetation. Technical specifications for plant handling, care, installation, and survival. Noxious weeds shall be monitored and removed.

FEMA – Federal Emergency Management Agency; LOMR – Letter of Map Revision; USACE – United States Army Corp of Engineers

1.7 DESCRIPTION OF DISTURBANCE INCLUDING TIMING AND AREAL EXTENT AND POTENTIAL IMPACTS ASSOCIATED WITH IMPLEMENTATION OF EACH ELEMENT

Construction is anticipated to occur during the 2019 in-water work window. According to the ODFW (2008) guidelines, the in-water work window is July 1 to September 30 for the Walla Walla River and July 1 to October 31 for Couse Creek. A detailed construction schedule will be developed as a component of the implementation plan. The specific areal extent of disturbance of 1.0 acre was developed based on the results of refined construction plan designs (see Appendix A) and hydraulic modeling (see Section 3.5 and Appendix B). The developed channel slope for the regraded confluence for Couse Creek will be stable and passable for the focal fish species.

Project construction may result in temporary turbidity releases to the stream, minor impacts to resident fish populations from de-fishing activities, possible spills from construction equipment, dust transport, colonization of disturbed ground by invasive vegetation, damage to existing vegetation along designated access routes, and short-term disturbance issues for landowners.

The National Wetlands Inventory (NWI) shows two types of wetlands in the Project reach, identified as PFOA (Freshwater Forested/Shrub Wetland) and R3UBH (Riverine) along Couse Creek and along river left of the Walla Walla River (Figure 1-1) (NWI 2018). Using methods prescribed by the United States Army Corp of Engineers Wetland Delineation Manual (USACE 1987) and the Arid West Region Supplement (USACE 2008), no wetlands were discovered in the Project study area or adjacent floodplain areas.



HIP III Project Review Comment Tracking

Project Information:

Project Name: Couse Creek Confluence Fish Passage
BPA Project #: 2007-396-00
Contract #: 77247
Sponsor: Walla Walla Basin Watershed Council
Designer: Tetra Tech
PM/COTR: Hannah Dondy-Kaplan
Manager: John T. Skidmore, Oregon Implementation Manager, EWL

Review Information:

Date: July 27, 2018
Review Iteration (%): 60% Design Iteration
Status of Review: Compiling comments
Review Schedule:

- EC Lead to perform functional review and compile comments.
- EC Lead to send comments to Sponsor.
- Sponsor to respond to comments and proceed to next design iteration.

HIP Reviewers:

HIP Program Lead: Daniel A. Gambetta, ECF
EC Lead: Claire McClory, ECF
Technical Lead: Douglas D. Knapp, P.E., EWL

Agency Team Members:

NMFS Branch Chief: Dale Bambrick, NMFS, Columbia Basin Branch Chief
NMFS Reviewer: Rebecca Viray
USFWS Field Office: Gary Miller, USFWS La Grande Field Office
USFWS Reviewer: John Stephenson

Activity Categories:

1c - Headcut and Grade Stabilization
 2a - Improve Secondary Channel and Wetlands
 2c - Protect Streambanks Using Bioeng. Methods
 2d - Install Habitat-Forming Natural Structures
 2f - Channel Reconstruction
Overall Project Risk

Risk Level:

Medium
 Medium
 Medium
 Medium
 Medium
Medium

Documents Reviewed:

Couse Creek Confluence Fish Passage 60% Design Document, July 2018
 Couse Creek Confluence Fish Passage 60% Plans, July 2018

#	Reviewer (Org.)	Date	Document	Page/Section	Comment	Response by (Org.)	Date	Comment	Status (BPA to Update)
1	BPA	2/15/18	General	NA	The BDR and plans are in excellent condition for 30%. Tables 1-4 and 1-5 were very helpful. Responses to the comments below are requested, but BPA approval is not required before proceeding to the next design iteration. The next design iteration of 60% to 80% is recommended (stability calcs to be reviewed at that time). Update 7/27/18: Please provide responses to the remaining open comments.				Open (Requirement)



HIP III Project Review Comment Tracking

#	Reviewer (Org.)	Date	Document	Page/Section	Comment	Response by (Org.)	Date	Comment	Status (BPA to Update)
2	BPA	2/15/18	BDR	Section 5	<p>Recommend adding a simple monitoring and adaptive management plan due to grade control and channel alignment features that could impact fish passage. If a passage barrier did develop, an adaptive management plan would provide the opportunity to efficiently address the problem w/o a new project and consultation.</p> <p>Update 7/27/18: Due to the importance of the grade control features for the success of the project and recommendations from NMFS as well, please provide a monitoring and adaptive management plan for the grade control structures. It is recommended that the structures be monitored seasonally and after high flow events for five years.</p>	Tetra Tech	June 2018	A monitoring and adaptive management plan for grade control and channel alignment will be prepared and managed by the Walla Walla Basin Watershed Council.	Open (Requirement)
3	BPA	2/15/18	BDR	Section 3.4	<p>It is recommended that Walla Walla River backwater effects be analyzed for Couse Creek channel forming flows. The most common failure for channel alignment designs at confluences is sediment transport. Tributary channels are often designed to adequately handle incoming sediment. However, backwater effects from the mainstem are often ignored. During high Couse Creek flows capable of moving sediment, it is likely that flows and stages in the Walla Walla will be high as well. If the Couse Creek channel is backwatered, velocity decrease, sediment drops out, and the stream takes a new alignment. A self-sustaining sediment delta design at the confluence is dynamic, but may provide consistent fish passage.</p>	Tetra Tech	June 2018	The Hydraulic Analysis Technical Memorandum (located in Appendix B – Other Supporting Reports) details the sediment transport and possible shear stress in the 60% design iteration. The memo details the estimated shear stress at the new confluence of Couse Creek and the Walla Walla River and indicates that barrier issues are not anticipated. Details are also included in the design report in Section 3.6.	Closed



HIP III Project Review Comment Tracking

#	Reviewer (Org.)	Date	Document	Page/Section	Comment	Response by (Org.)	Date	Comment	Status (BPA to Update)
4	BPA	2/15/18	Plans	Sheet C-201	Show water line in stream alignment profile view.	Tetra Tech	June 2018	The water line has been added to the design drawings in Appendix A on sheet C-101.	Closed
5	BPA	2/15/18	Plans	Sheet C-305	Consider small pipe to bypass flow at existing passage barrier and concrete wall. It is unclear how the 10'+ diversion channel will fit in the narrow gap between the rock wall (left bank) and concrete wall (right bank).	Tetra Tech	June 2018	The 60% Design Iteration includes a 24" temporary bypass pipe for the construction of the roughened riffle on Sheet C-106 in Appendix A.	Closed
6	BPA	2/15/18	Plans	C-301	All details including cut – fill, excavations and areal disturbance boundaries should prescribe material, compaction and finished surface requirements. Specifically how are exposed construction surfaces to be treated for erosion control, vegetation salvage and revegetation. These locations should reference the applicable project specifications.	Tetra Tech	June 2018	The 60% design drawings include instructions for the erosion and sedimentation control measures. See Appendix A, Sheets C-101 and C-105 for location of best management practices (BMPS) and temporary erosion and sediment control (TESC). In addition, specifications for TESC can be found in Appendix D – Technical Specifications. Channel and floodplain grading compaction specifications can be found in Section 31 23 00 of Appendix D – Technical Specifications. The planting plan in Appendix A, Sheets L-100 & L-101 contains instructions on vegetation salvage and revegetation.	Closed
7	BPA	2/15/18	Plans	NA	Please provide a planting plan, erosion and sedimentation control plan, and stormwater treatment plan in a future design iteration Update 7/27/18: Concur that stormwater plan not needed.	Tetra Tech	June 2018	The planting plan is found in the 60% design drawings (Appendix A) on Sheets L-100 & L-101, and the erosion and sedimentation control plan is found in the design drawings (Appendix A) on Sheets C-101 and C-105.	Closed



HIP III Project Review Comment Tracking

#	Reviewer (Org.)	Date	Document	Page/Section	Comment	Response by (Org.)	Date	Comment	Status (BPA to Update)
8	BPA	2/15/18	Plans	NA	Please provide a dewatering, rewatering and fish salvage plan in the plan sheets in later design iteration.	Tetra Tech	June 2018	The instructions for dewatering and rewatering can be found in the design drawings (Appendix A) on Sheet C-106. Fish salvage plans design drawings on Sheets C-106. Fish salvage instructions are located on Sheets G-004 and G-005.	Closed
9	BPA	2/15/18	Plans	C-203	What shall the resultant jump height of the boulder weirs be during flow flow conditions? < 6 inches is required for juvenile fish passage.	Tetra Tech	June 2018	A Hydraulic Analysis Technical Memorandum detailing the water surface elevation at boulder sills is included in the 60% Design Iteration (Appendix B – Other Supporting Reports). Jump heights at high fish flows are at or less than 0.5 feet. Further details are also located in the design report in Section 3.6.3.	Closed
10	BPA	2/15/18	Plans	C-301	The plans need to include a compaction and material specification to be applied to all locations where fill is to be placed including LWD ballast and excavation locations should prescribe post material removal surface treatments.	Tetra Tech	June 2018	LWD has been removed from designs. Channel and floodplain grading compaction specifications can be found in Section 31 23 00 of Appendix D – Technical Specifications.	Closed
11	BPA	2/15/18	Plans	NA	Staging areas shall be located 150 feet from streams and wetlands. Update 7/27/18: Note that natural materials (bed material, wood, etc.) can be stored within 150 feet if clearly identified in the plans. Equipment, machinery, fuel, etc. must all be staged greater than 150 feet.	Tetra Tech	June 2018	The access and staging areas are proposed to be sited along the south side of Jorgenson Lane, an established road that is in a location more than 150 feet from the Walla Walla River. This location precludes erosion and contamination of either the Walla Walla River or Couse Creek. The location is provided in Appendix A, Sheet C-100.	Closed



HIP III Project Review Comment Tracking

#	Reviewer (Org.)	Date	Document	Page/Section	Comment	Response by (Org.)	Date	Comment	Status (BPA to Update)
12	BPA	2/15/18	Plans	C-203	Boulder weirs should be placed diagonally across the channel or in upstream pointing "V" or "U" configurations (with the apex oriented upstream). The apex should be lower in elevation than the structure wings to support low flow consolidation.	Tetra Tech	June 2018	The designs for the roughened riffle show a V shape with a lowered apex elevation. They are located in Appendix A on sheet C-103.	Closed
13	BPA	2/15/18	Plans	C-203	Please show 1.5-year event in profile to demonstrate that boulders will be topped by 1.5- year event.	Tetra Tech	June 2018	2-year water surface elevation added to the riffle rock detail in Appendix A, Sheet C-104.	Closed
14	BPA	7/27/18	Plans	C-103	What are the large boulders parallel to flow in the roughened riffle plan view on the east side of the channel? Are these needed to protect the pipe? Information needed to determine necessity.	Tetra Tech	October 2018	The design for the roughened riffle includes boulders in the fill material in the existing Couse Creek channel to provide stability and erosion protection during high flows to maintain fish passage as well as protecting the existing infrastructure (i.e., the pipe). In the 90% design the layout of the boulders will be changed to function as both habitat boulders and help the backfilled channel to resist erosion and protect the existing infrastructure. Hydraulic modeling and stability calculations were reevaluated during this 90 percent design phase. The roughened riffle boulders will remain at 3 ft diameter. The step boulders will be increased to 4 ft diameter to resist the additional shear stresses generated at the toe of the steps as compared to the roughened riffle over the existing pipeline.	Request Additional Information
15	NMFS	2/21/18	BDR	NA	NMFS agrees there are great benefits for a Adaptive Management plan related to the grade control and alignment.	Tetra Tech	June 2018	A monitoring and adaptive management plan for grade control and channel alignment will be prepared and managed by the Walla Walla Basin Watershed Council.	Open (Recommendation)



HIP III Project Review Comment Tracking

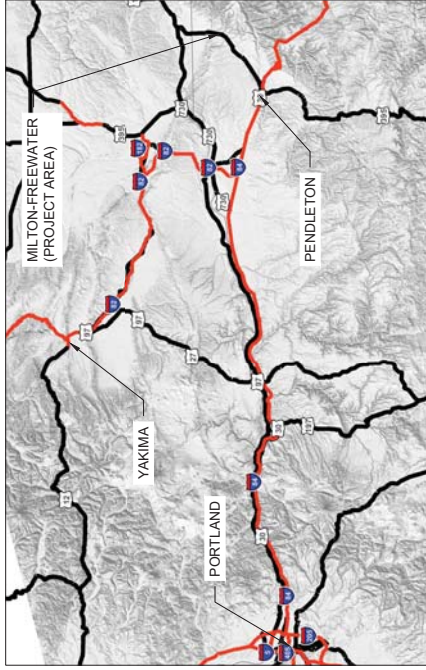
#	Reviewer (Org.)	Date	Document	Page/Section	Comment	Response by (Org.)	Date	Comment	Status (BPA to Update)
16	NMFS	2/21/18	BDR	NA	NMFS wants to emphasize the importance of the sediment transport and hydrological modeling of the Walla Walla River and impacts to Crouse Creek . Several past projects resulted in unplanned additional work needed when dynamic flows of the Walla Walla created scours or barrier issues not anticipated.	Tetra Tech	June 2018	The Hydraulic Analysis Technical Memorandum (Appendix B – Other Supporting Reports) details the sediment transport and possible shear stress in the 60% design iteration. The memo details the estimated shear stress at the new confluence of Couse Creek and the Walla Walla River and indicates that barrier issues are not anticipated. Details are also included in the design report in Section 3.6.2.	For Information Only
17	NMFS – Hydro	10/17/18		NA	I was not able to find any info (I may have missed it somewhere in the document) which details the particle size distribution of the material used in the grade control structures. This data is a key conversation point I would like to address. I think in general I'm comfortable with the approach being used so conceptually I don't have any concerns. I do want to dig deeper into the size and amount of rock being used in the design and how it will be installed.	Tetra Tech	October 2018	<p>Section 35 49 50 in the Project Specifications specifies the gradations for Boulders, Streambed Cobble, Streambed Sediment, and Scour Protection Material.</p> <p>As described in Section 35 49 50 in the Project Specifications and will be included in the 90 percent design Implementation Plan, streambed cobble and streambed sediment shall be placed and compacted in lifts. Fines shall be washed in for each lift until voids within the placed matrix are minimized such that ponding occurs with little to no percolation losses to keep the introduced water on the surface and avoid the creek going subsurface.</p> <p>The 60% Basis of Design report included discussion on the roughened riffle boulder sizing and Attachment B included the calculations. For the 90% design, the step boulders were evaluated separately and sized to be 4 ft min. A revised calculation for the roughened riffle and step boulders is</p>	Open (Requirement)



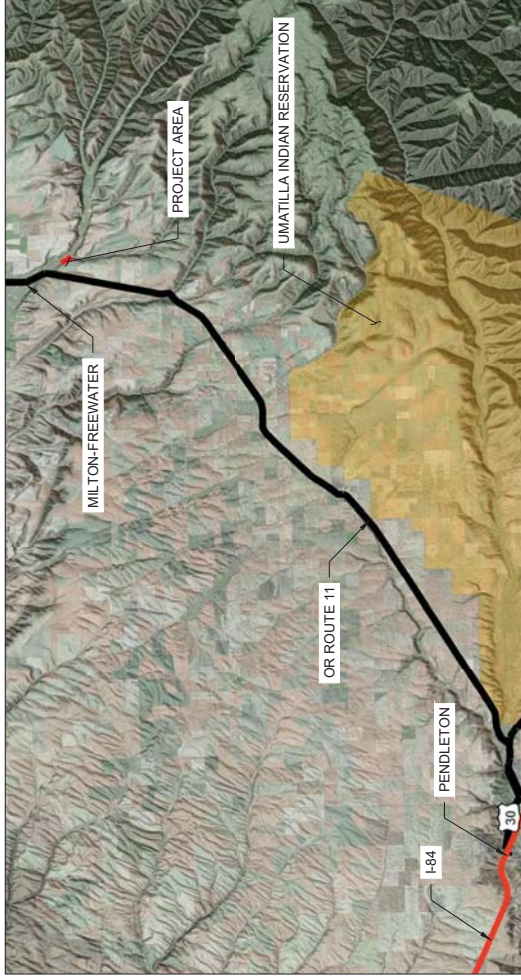
HIP III Project Review Comment Tracking

#	Reviewer (Org.)	Date	Document	Page/Section	Comment		Response by (Org.)	Date	Comment	Status (BPA to Update)
									being provided with this comment tracking using the two methods described in the 60% Basis of Design report.	

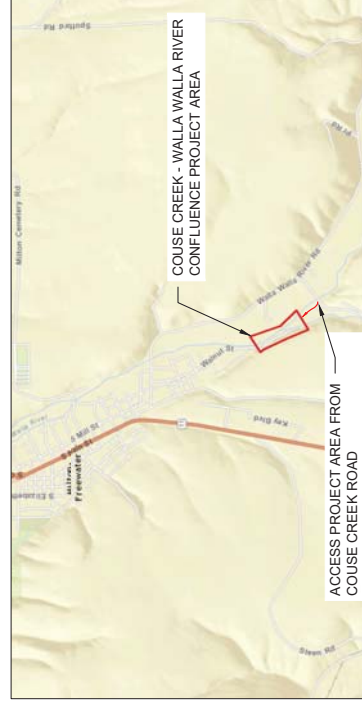
WALLA WALLA BASIN WATERSHED COUNCIL COUSE CREEK CONFLUENCE FISH PASSAGE 60 PERCENT DESIGN



LOCATION MAP
SCALE: NTS



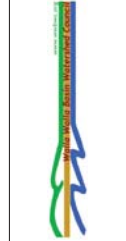
VICINITY MAP
SCALE: NTS



DWG #	TITLE
G-001	COVER SHEET
G-002	GENERAL NOTES
G-003 - G-007	GENERAL NOTES - HIP III TERMS AND CONDITIONS
	CIVIL
E-100	EXISTING CONDITIONS - GENERAL OVERVIEW
C-100	PROPOSED CONDITIONS - GENERAL OVERVIEW
C-101	PROPOSED CONDITIONS - NEW CHANNEL PLAN AND PROFILE
C-102	PROPOSED CONDITIONS - NEW CHANNEL TYPICAL SECTIONS
C-103 - C-104	DETAILS - ROUGHENED RIFFLE
C-105	DETAILS - TESC
C-106	NEW CHANNEL DEWATERING/REWATERING AND ROUGHENED RIFFLE BYPASS
L-100 - L-101	PLANTING PLAN



**NOT FOR
CONSTRUCTION**



REV.	DATE	DESCRIPTION	APP.	DRW.	ENG.	APP.
C	7/2/18	60 PERCENT DESIGN	USA	USA	USA	USA
B	1/9/18	30 PERCENT DESIGN	USA	USA	USA	USA
A	10/31/17	15 PERCENT CONCEPTUAL DESIGN	USA	USA	USA	USA

COUSE CREEK CONFLUENCE FISH PASSAGE
80 PERCENT DESIGN

DWG NO. **G-001**
CREATED: 7/2/18
SHEET

COVER SHEET

1H-1V US US/CM °C %Ø ANSI APP APPROX BMP BPA CHAMP CHK CO CWA CY D DBH DC DIA DWG DRW EG ENG EQV ESA ETC EX FEMA FT. HARN HEC-RAS HIP HUC HZ ID IDFG IE IN L LBS LIDAR LT LWD M	ABBREVIATIONS HORIZONTAL TO VERTICAL EXAGGERATION MICRO SECONDS PER CENTIMETER DEGREE CELSIUS PERCENT DIAMETER AMERICAN NATIONAL STANDARDS INSTITUTE APPROVED BY APPROXIMATE BEST MANAGEMENT PRACTICE BONNEVILLE POWER ADMINISTRATION COLUMBIA HABITAT MONITORING PROGRAM CHECKED BY COUNTY CLEAN WATER ACT CUBIC YARDS DEPTH DIAMETER AT BREAETH HEIGHT DIRECT CURRENT DIAMETER DRAWING DRAWN BY FOR EXAMPLE (LATIN: EXEMPLI GRATIA) ENGINEERED BY EQUIVALENT ENDANGERED SPECIES ACT ETCETERA EXISTING FEDERAL EMERGENCY MANAGEMENT AGENCY (U.S. DEPARTMENT OF HOMELAND SECURITY) FOOT HIGH ACCURACY REFERENCE NETWORK HYDRAULIC ENGINEERING CENTER RIVER ANALYSIS SYSTEM HABITAT IMPROVEMENT PROGRAM HYDROLOGIC UNIT CODE HERTZ IDENTIFICATION IDAHO DEPARTMENT OF FISH AND GAME THAT IS (LATIN: ID EST) INCH LENGTH POUNDS LIGHT DETECTION AND RANGING LEFT LARGE WOODY DEBRIS METER	MAX MI MIN MJR MFWP MNR MS N/A NAVD NEPA NFP NHFA NTS PDC ODFW OHW OWRD PREFAB PRO RT STA TEMP TESC TYP USFS USFWS V W WDFW WSE XS YR	MAXIMUM MILE MINIMUM MAJOR MONTANA FISH WILDLIFE AND PARKS MINOR MILLISECONDS NOT APPLICABLE NORTH AMERICAN VERTICAL DATUM OF 1988 NATIONAL ENVIRONMENTAL POLICY ACT NATIONAL MARINE FISHERIES SERVICE NATIONAL HISTORIC PRESERVATION ACT NOT TO SCALE PULSED DIRECT CURRENT OREGON DEPARTMENT OF FISH AND WILDLIFE ORDINARY HIGH WATER OREGON WATER RESOURCES DEPARTMENT PROPOSED RIGHT STATION TEMPORARY TEMPORARY EROSION AND SEDIMENT CONTROL TYPICAL UNITED STATES FOREST SERVICE UNITED STATES FISH AND WILDLIFE SERVICE VOLTS WITH WASHINGTON DEPARTMENT OF FISH AND WILDLIFE WATER SURFACE ELEVATION CROSS SECTION YEAR	CONSTRUCTION SEQUENCING: 1. BEFORE IN-WATER WORK WINDOW (PRIOR TO JULY 1): • MOBILIZE TO SITE AND SITE PREPARATION. • INSTALL TESC. • EXCAVATE CHANNEL AND FLOODPLAIN ABOVE OHW. 2. IN-WATER WORK WINDOW (JULY 1 TO SEPTEMBER 30 FOR THE WALLA WALLA RIVER AND JULY 1 TO OCTOBER 31 FOR COUSE CREEK): • SALVAGE FISH (WORK TO BE COMPLETED BY OUTSIDE PARTY/OTHERS). • INSTALL AND MONITOR TESC, WORK AREA ISOLATION AND DEWATER WORK AREAS. • CONSTRUCT CHANNEL AND FLOODPLAIN BELOW OHW, ROUGHENED RIFFLES, AND BOULDERS. 3. AFTER IN-WATER WORK WINDOW (SEPTEMBER 30 OR OCTOBER 31): • COMPLETE ANY EXCAVATION REMAINING ABOVE OHW. • REVEGETATE ALL DISTURBED AREAS. • SITE CLEAN-UP AND DEMOBILIZATION. GENERAL NOTES: 1. HORIZONTAL PROJECTION: NAD83 OREGON STATE PLANES, NORTH ZONE, INTERNATIONAL FOOT. 2. VERTICAL PROJECTION: NAVD88. 3. PROJECT ALIGNMENT AND STATIONING BASED ON 2016 LIDAR TOPOGRAPHIC DATA AND FIELD SURVEY EFFORTS PERFORMED BY TETRA TECH IN SEPTEMBER OF 2017. 4. PROPOSED PROJECT DESIGN, CONSTRUCTION ACTIVITIES, AND MATERIALS SUBJECT TO APPROVAL BY LANDOWNER. GENERAL CONSTRUCTION NOTES: 1. THE CONTRACTOR SHALL CONSTRUCT THE RESTORATION DESIGN ELEMENTS IN ACCORDANCE WITH THE PLANS STAMPED "ISSUED FOR CONSTRUCTION". THESE PLANS WILL BE PROVIDED TO THE CONTRACTOR BY THE CONTRACTING AGENCY PRIOR TO CONSTRUCTION. WORK SHALL NOT BE DONE WITHOUT THE CURRENT SET OF APPROVED CONSTRUCTION PLANS. 2. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE BPA HIP III TERMS & CONDITIONS. 3. CONTRACTOR SHALL CONTACT THE OREGON UTILITY NOTIFICATION CENTER 1-800-332-2344 OR (811) BEFORE ANY EXCAVATION WORK BEGINS. 4. THE CONTRACTOR SHALL PURSUE WORK IN A CONTINUOUS AND EFFICIENT MANNER TO ENSURE TIMELY COMPLETION OF THE PROJECT. 5. ALL WORK WITHIN THE ACTIVE CHANNEL SHALL OCCUR WITHIN THE ALLOWABLE FISH WINDOW: WALLA WALLA RIVER (JULY 1 - SEPTEMBER 30) AND COUSE CREEK (JULY 1 - OCTOBER 31). 6. 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DATE C 7/2018 B 1/8/18 A 10/31/17	PLOTTED AS ANSI B (11" X 17") PLAN SHEET FULL SIZE ANSI D (22" X 34") REVISION DESCRIPTION 80 PERCENT DESIGN 60 PERCENT DESIGN 30 PERCENT DESIGN 15 PERCENT CONCEPTUAL DESIGN	DRW ENG APP USA USA CEE USA USA CEE USA USA CEE	COUSE CREEK CONFLUENCE FISH PASSAGE 80 PERCENT DESIGN	DWG NO. G-002	CREATED: 7/20/18 SHEET
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SECTIONS ARE REFERENCED IN THE FOLLOWING MANNER:

SECTION LETTER OR NUMBER

NOTES ARE REFERENCED IN THE FOLLOWING MANNER:

NOTE NUMBER

CONSTRUCTION DETAILS ARE REFERENCED IN THE FOLLOWING MANNER:

SYMBOLS

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DOCUMENTATION: TO BE POSTED ONSITE BY THE CONTRACTOR IN A LOCATION VISIBLE TO THE PUBLIC:

- A) NAME(S), PHONE NUMBER(S), AND ADDRESS(ES) OF PERSON(S) RESPONSIBLE FOR OVERSIGHT.
- B) A DESCRIPTION OF HAZARDOUS MATERIALS THAT WILL BE USED, INCLUDING INVENTORY, STORAGE, AND HANDLING PROCEDURES.
- C) PROCEDURES TO CONTAIN AND CONTROL A SPILL OF ANY HAZARDOUS MATERIAL GENERATED, USED OR STORED ONSITE, INCLUDING NOTIFICATION OF PROPER AUTHORITIES.
- D) A STANDING ORDER TO CEASE WORK IN THE EVENT OF HIGH FLOWS EXCEPT AS NECESSARY TO MINIMIZE RESOURCE DAMAGE (ABOVE THOSE ADDRESSED IN THE DESIGN AND IMPLEMENTATION PLANS) OR EXCEEDANCE OF TAKE OR WATER QUALITY LIMITATIONS.

INSPECTIONS AND MONITORING: PROJECT SPONSOR STAFF OR THEIR DESIGNATED REPRESENTATIVE WILL PROVIDE IMPLEMENTATION MONITORING TO ENSURE COMPLIANCE WITH THIS BIOLOGICAL OPINION, INCLUDING:

- A) GENERAL CONSERVATION MEASURES AND PROJECT DESIGN CRITERIA ARE ADEQUATELY FOLLOWED; AND
- B) EFFECTS TO ESA-LISTED SPECIES ARE NOT GREATER THAN PREDICTED AND TAKE LIMITATIONS ARE NOT EXCEEDED.

HIP III GENERAL AQUATIC CONSERVATION MEASURES APPLICABLE TO ALL ACTIONS:
 THE ACTIVITIES COVERED UNDER THE HIP III ARE INTENDED TO PROTECT AND RESTORE FISH AND WILDLIFE HABITAT WITH LONG-TERM BENEFITS TO ESA-LISTED SPECIES. HOWEVER, CONSTRUCTION ACTIVITIES MAY HAVE SHORT-TERM ADVERSE EFFECTS ON ESA-LISTED SPECIES AND ASSOCIATED CRITICAL HABITAT. TO AVOID AND MINIMIZE THESE SHORT-TERM ADVERSE EFFECTS, BPA HAS DEVELOPED THE FOLLOWING GENERAL CONSERVATION MEASURES IN COORDINATION WITH USFWS AND NMFS. THESE MEASURES WILL BE IMPLEMENTED ON ALL PROJECTS COVERED UNDER THE HIP III.

CLIMATE CHANGE: BEST AVAILABLE SCIENCE REGARDING THE FUTURE EFFECTS WITHIN THE PROJECT AREA OF CLIMATE CHANGE, SUCH AS CHANGES IN STREAM FLOWS AND WATER TEMPERATURES, WILL BE CONSIDERED DURING PROJECT DESIGN.

STATE AND FEDERAL PERMITS: ALL APPLICABLE REGULATORY PERMITS AND AUTHORIZATIONS WILL BE OBTAINED PRIOR TO PROJECT IMPLEMENTATION. THESE PERMITS AND AUTHORIZATIONS INCLUDE, BUT ARE NOT LIMITED TO, THE NATIONAL ENVIRONMENTAL POLICY ACT (NEPA), NATIONAL HISTORIC PRESERVATION ACT (NHPA), STATE AND FEDERAL SECTION 404 OF THE CLEAN WATER ACT (CWA) PERMITS, AND SECTION 401 WATER QUALITY CERTIFICATIONS.

TIMING OF IN-WATER WORK: FORMAL RECOMMENDATIONS PUBLISHED BY STATE AGENCIES SUCH AS THE OREGON DEPARTMENT OF FISH AND WILDLIFE (ODFW), WASHINGTON DEPARTMENT OF FISH AND WILDLIFE (WDFW), IDAHO DEPARTMENT OF FISH AND GAME (IDFG), AND MONTANA FISH WILDLIFE AND PARKS (MFWP) OR INFORMAL RECOMMENDATIONS FROM THE APPROPRIATE STATE FISHERY BIOLOGIST IN REGARD TO THE TIMING OF IN-WATER WORK WILL BE FOLLOWED.

- A) BULL TROUT - UTILIZING STATE RECOMMENDED IN-WATER WORK WINDOWS WILL DECREASE POTENTIAL EFFECTS TO BULL TROUT, BUT THIS ALONE MAY NOT BE SUFFICIENT TO PROTECT LOCAL BULL TROUT POPULATIONS. THIS IS ESPECIALLY TRUE IF WORK WILL OCCUR IN SPAWNING AND REARING AREAS BECAUSE EGGS, ALEVIN, AND FRY ARE PRESENT NEARLY YEAR ROUND. SOME PROJECT LOCATIONS MAY NOT HAVE DESIGNATED IN-WATER WORK WINDOWS FOR BULL TROUT, OR IF THEY DO, THEY MAY DIFFER FROM THE IN-WATER WORK WINDOWS FOR SALMON AND STEELHEAD. IF THIS IS THE CASE, OR IF THE PROPOSED WORK IS TO OCCUR WITHIN BULL TROUT SPAWNING AND REARING HABITATS, THE PROJECT SPONSOR WILL CONTACT THE APPROPRIATE USFWS FIELD OFFICE TO ENSURE THAT ALL REASONABLE IMPLEMENTATION MEASURES ARE CONSIDERED AND AN APPROPRIATE IN-WATER WORK WINDOW IS BEING USED TO MINIMIZE PROJECT EFFECTS.

- B) LAMPREY - THE PROJECT SPONSOR AND/OR THEIR CONTRACTORS WILL AVOID WORKING INSTREAM OR RIVER CHANNELS THAT CONTAIN PACIFIC LAMPREY FROM MARCH 1 TO JULY 1 IN LOW- TO MID-ELEVATION REACHES (<5,000 FEET) IN HIGH-ELEVATION REACHES (>5,000 FEET). THE PROJECT SPONSOR WILL AVOID WORKING INSTREAM OR RIVER CHANNELS FROM MARCH 1 TO AUGUST 1. IF EITHER TIMEFRAME IS INCOMPATIBLE WITH OTHER OBJECTIVES, THE AREA WILL BE SURVEYED FOR NESTS AND LAMPREY PRESENCE, AND AVOIDED IF POSSIBLE. IF LAMPREY ARE KNOWN TO EXIST, THE PROJECT SPONSOR WILL UTILIZE DEWATERING AND SALVAGE BEST MANAGEMENT PRACTICES (BMPs) OUTLINED IN USFWS 2010.

- C) EXCEPTIONS TO ODFW, WDFW, MFWP, OR IDFG IN-WATER WORK WINDOWS WILL BE REQUESTED THROUGH THE VARIANCE PROCESS (PAGE 22 OF THE MOST RECENT HIP III HANDBOOK). WORK AREA ISOLATION AND FISH SALVAGE ACTIVITIES ARE CONSIDERED INCIDENTAL TO CONSTRUCTION-RELATED ACTIVITIES AND SHALL OCCUR DURING STATE-RECOMMENDED IN-WATER WORK WINDOWS.

CONTAMINANTS: THE PROJECT SPONSOR WILL COMPLETE A SITE ASSESSMENT WITH THE FOLLOWING ELEMENTS TO IDENTIFY THE TYPE, QUANTITY, AND EXTENT OF ANY POTENTIAL CONTAMINATION FOR ANY ACTION THAT INVOLVES EXCAVATION OF MORE THAN 20 CUBIC YARDS OF MATERIAL:

- A) A REVIEW OF AVAILABLE RECORDS, SUCH AS FORMER SITE USE, BUILDING PLANS, AND RECORDS OF ANY PRIOR CONTAMINATION EVENTS;
- B) A SITE VISIT TO INSPECT THE AREAS USED FOR VARIOUS INDUSTRIAL PROCESSES AND THE CONDITION OF THE PROPERTY;
- C) INTERVIEWS WITH KNOWLEDGEABLE PEOPLE, SUCH AS SITE OWNERS, OPERATORS, AND OCCUPANTS, NEIGHBORS, OR LOCAL GOVERNMENT OFFICIALS; AND
- D) A SUMMARY, STORED WITH THE PROJECT FILE THAT INCLUDES AN ASSESSMENT OF THE LIKELIHOOD THAT CONTAMINANTS ARE PRESENT AT THE SITE, BASED ON ITEMS 4(A) THROUGH 4(C).

SITE LAYOUT AND FLAGGING: PRIOR TO CONSTRUCTION, THE PROJECT AREA WILL BE CLEARLY FLAGGED TO IDENTIFY THE FOLLOWING:

A) SENSITIVE RESOURCE AREAS, SUCH AS AREAS BELOW ORDINARY HIGH WATER (OHW), SPAWNING AREAS, SPRINGS, AND WETLANDS;

- B) EQUIPMENT ENTRY AND EXIT POINTS;
- C) ROAD AND STREAM CROSSING ALIGNMENTS;
- D) STAGING, STORAGE, AND STOCKPILE AREAS; AND
- E) NO-HERBICIDE-APPLICATION AREAS AND BUFFERS.

TEMPORARY ACCESS ROADS AND PATHS:


- A) EXISTING ACCESS ROADS AND PATHS WILL BE PREFERENTIALLY USED WHENEVER POSSIBLE, AND THE NUMBER AND LENGTH OF TEMPORARY ACCESS ROADS AND PATHS THROUGH RIPARIAN AREAS AND FLOODPLAINS WILL BE MINIMIZED TO LESSEN SOIL DISTURBANCE, SOIL COMPACTION, AND IMPACTS TO VEGETATION.
- B) TEMPORARY ACCESS ROADS AND PATHS WILL NOT BE BUILT ON SLOPES WHERE GRADE, SOIL, OR OTHER FEATURES SUGGEST A LIKELIHOOD OF EXCESSIVE EROSION OR FAILURE. IF SLOPES ARE STEEPER THAN 30%, THE ROAD WILL BE DESIGNED BY A CIVIL ENGINEER WITH EXPERIENCE IN STEEP ROAD DESIGN.
- C) THE REMOVAL OF RIPARIAN VEGETATION DURING CONSTRUCTION OF TEMPORARY ACCESS ROADS WILL BE MINIMIZED. WHEN TEMPORARY VEGETATION REMOVAL IS REQUIRED, VEGETATION WILL BE CUT AT GROUND LEVEL (NOT GRUBBED).
- D) AT PROJECT COMPLETION, ALL TEMPORARY ACCESS ROADS AND PATHS WILL BE OBLITERATED, AND THE SOIL WILL BE STABILIZED AND REVEGETATED. ROAD AND PATH OBLITERATION REFERS TO THE MOST COMPREHENSIVE DEGREE OF DECOMMISSIONING AND INVOLVES DECOMPACTING THE ROAD SURFACE AND ASSOCIATED DITCHES, PULLING THE FILL MATERIAL ONTO THE RUNNING SURFACE, AND RESHAPING TO MATCH THE ORIGINAL CONTOUR.
- E) TEMPORARY ROADS AND PATHS IN WET AREAS OR AREAS PRONE TO FLOODING WILL BE OBLITERATED BY THE END OF THE IN-WATER WORK WINDOW.

TEMPORARY STREAM CROSSINGS:

- A) EXISTING STREAM CROSSINGS WILL BE PREFERENTIALLY USED WHENEVER REASONABLE, AND THE NUMBER OF TEMPORARY STREAM CROSSINGS WILL BE MINIMIZED.
- B) TEMPORARY BRIDGES AND CULVERTS WILL BE INSTALLED TO ALLOW FOR EQUIPMENT AND VEHICLE CROSSINGS OVER PERENNIAL STREAMS DURING CONSTRUCTION. TREATED WOOD SHALL NOT BE USED ON TEMPORARY BRIDGE CROSSINGS OR IN LOCATIONS IN CONTACT WITH OR OVER WATER.
- C) EQUIPMENT AND VEHICLES WILL CROSS STREAMS IN THE WET ONLY WHERE:
 - I. THE STREAMBED IS BEDROCK; OR
 - II. MATS OR OFF-SITE LOGS ARE PLACED IN THE STREAM AND USED AS A CROSSING.
- D) VEHICLES AND MACHINERY WILL CROSS STREAMS AT RIGHT ANGLES TO THE MAIN CHANNEL WHEREVER POSSIBLE.
- E) THE LOCATION OF THE TEMPORARY CROSSING WILL AVOID AREAS THAT MAY INCREASE THE RISK OF CHANNEL RE-ROUTING OR AVULSION.
- F) IMPACTS TO POTENTIAL SPAWNING HABITAT (I.E., POOL TAILOUTS) AND POOLS WILL BE AVOIDED TO THE MAXIMUM EXTENT POSSIBLE.
- G) NO STREAM CROSSINGS WILL OCCUR AT ACTIVE SPAWNING SITES, WHEN HOLDING ADULT LISTED FISH ARE PRESENT, OR WHEN EGGS OR ALEVINS ARE IN THE GRAVEL. THE APPROPRIATE STATE FISH AND WILDLIFE AGENCY WILL BE CONTACTED FOR SPECIFIC TIMING INFORMATION.
- H) AFTER PROJECT COMPLETION, TEMPORARY STREAM CROSSINGS WILL BE OBLITERATED, AND THE STREAM CHANNEL AND BANKS RESTORED.

STAGING, STORAGE, AND STOCKPILE AREAS:

- A) STAGING AREAS (USED FOR CONSTRUCTION EQUIPMENT STORAGE, VEHICLE STORAGE, FUELING, SERVICING, AND HAZARDOUS MATERIAL STORAGE) WILL BE 150 FEET OR MORE FROM ANY NATURAL WATER BODY OR WETLAND, OR ON AN ADJACENT, ESTABLISHED ROAD AREA IN A LOCATION AND MANNER THAT WILL PRECLUDE EROSION INTO OR CONTAMINATION OF THE STREAM OF FLOODPLAIN.
- B) NATURAL MATERIALS USED FOR IMPLEMENTATION OF AQUATIC RESTORATION, SUCH AS LARGE WOOD, GRAVEL, AND BOULDERS, MAY BE STAGED WITHIN THE 100-YEAR FLOODPLAIN.
- C) ANY LARGE WOOD, TOPSOIL, AND NATIVE CHANNEL MATERIAL DISPLACED BY CONSTRUCTION WILL BE STOCKPILED FOR USE DURING SITE RESTORATION AT A SPECIFICALLY IDENTIFIED AND FLAGGED AREA.
- D) ANY MATERIAL NOT USED IN RESTORATION, AND NOT NATIVE TO THE FLOODPLAIN, WILL BE REMOVED TO A LOCATION OUTSIDE OF THE 100-YEAR FLOODPLAIN FOR DISPOSAL.

 TETRA TECH www.tetrattech.com 18801 N. Westwood Blvd., Suite 200 Portland, Oregon 97228 Phone: 425-452-7600 Fax: 425-452-7652		NOT FOR CONSTRUCTION				PLOTTED AS ANSI B (11 X 17), PLAN SHEET FULL SIZE ANSI D (22 X 34) REVISION DESCRIPTION		COURSE CREEK CONFLUENCE FISH PASSAGE 80 PERCENT DESIGN		DWG NO. G-003	
REV.	DATE	DRW	ENG	APP							
C	7/2/18	USA	USA	USA	USA	USA	USA	USA	USA	USA	7/2/18
B	1/9/18	USA	USA	USA	USA	USA	USA	USA	USA	USA	
A	10/21/17	USA	USA	USA	USA	USA	USA	USA	USA	USA	
GENERAL NOTES HIP III TERMS AND CONDITIONS											CREATED: 7/2/18 SHEET:

HIP III GENERAL CONSERVATION MEASURES APPLICABLE TO ALL ACTIONS (CONTINUED):

EQUIPMENT: MECHANIZED EQUIPMENT AND VEHICLES WILL BE SELECTED, OPERATED, AND MAINTAINED IN A MANNER THAT MINIMIZES ADVERSE EFFECTS ON THE ENVIRONMENT (E.G. MINIMALLY-SIZED, LOW PRESSURE TIRES; MINIMAL HARD-TURN PATHS FOR TRACKED VEHICLES; TEMPORARY MATS OR PLATES WITHIN WET AREAS OR ON SENSITIVE SOILS), ALL VEHICLES AND OTHER MECHANIZED EQUIPMENT WILL BE:

- STORED, FUELED, AND MAINTAINED IN A VEHICLE STAGING AREA PLACED 150 FEET OR MORE FROM ANY NATURAL WATERBODY OR WETLAND, OR ON AN ADJACENT, ESTABLISHED ROAD AREA;
- REFUELED IN A VEHICLE STAGING AREA PLACED 150 FEET OR MORE FROM A NATURAL WATERBODY OR WETLAND, OR IN AN ISOLATED HARD ZONE, SUCH AS A PAVED PARKING LOT OR ADJACENT, ESTABLISHED ROAD (THIS MEASURE APPLIES TO ONLY GAS-POWERED EQUIPMENT WITH TANKS LARGER THAN 5 GALLONS);
- BIODEGRADABLE LUBRICANTS AND FLUIDS SHOULD BE USED, IF POSSIBLE, ON EQUIPMENT OPERATING IN AND ADJACENT TO THE STREAM CHANNEL AND LIVE WATER;
- INSPECTED DAILY FOR FLUID LEAKS BEFORE LEAVING THE VEHICLE STAGING AREA FOR OPERATION WITHIN 150 FEET OF ANY NATURAL WATER BODY OR WETLAND; AND
- THOROUGHLY CLEANED BEFORE OPERATION BELOW ORDINARY HIGH WATER, AND AS OFTEN AS NECESSARY DURING OPERATION, TO REMAIN GREASE FREE.

EROSION CONTROL: EROSION CONTROL BEST MANAGEMENT PRACTICES (BMPs) WILL BE PREPARED AND CARRIED OUT, COMMENSURATE IN SCOPE WITH THE ACTION, THAT MAY INCLUDE THE FOLLOWING:

- TEMPORARY EROSION CONTROL BMPs.
 - TEMPORARY EROSION CONTROL BMPs WILL BE IN PLACE BEFORE ANY SIGNIFICANT ALTERATION OF THE ACTION SITE AND APPROPRIATELY INSTALLED DOWNSLOPE OF PROJECT ACTIVITY WITHIN THE RIPARIAN BUFFER AREA UNTIL SITE REHABILITATION IS COMPLETE.
 - IF THERE IS A POTENTIAL FOR ERODED SEDIMENT TO ENTER THE STREAM, SEDIMENT BARRIERS WILL BE INSTALLED AND MAINTAINED FOR THE DURATION OF PROJECT IMPLEMENTATION.
 - TEMPORARY EROSION CONTROL MEASURES MAY INCLUDE FIBER WATTLES, SILT FENCES, JUTE MATTING, WOOD FIBER MULCH AND SOIL BINDER, OR GEOTEXTILES AND GEOSYNTHETIC FABRIC.
 - SOIL STABILIZATION UTILIZING WOOD FIBER MULCH AND TACKIFIER (HYDRO-APPLIED) MAY BE USED TO REDUCE EROSION OF BARE SOIL IF THE MATERIALS ARE NOXIOUS WEED-FREE AND NONTOXIC TO AQUATIC AND TERRESTRIAL ANIMALS. SOIL MICROORGANISMS, AND VEGETATION.
 - SEDIMENT WILL BE REMOVED FROM EROSION CONTROL BMP ONCE IT HAS REACHED 1/3 OF THE EXPOSED HEIGHT OF THE BMP.
 - ONCE THE SITE IS STABILIZED FOLLOWING CONSTRUCTION, TEMPORARY EROSION CONTROL BMPs WILL BE REMOVED.
- B) EMERGENCY EROSION CONTROL BMPs. THE FOLLOWING MATERIALS FOR EMERGENCY EROSION CONTROL WILL BE AVAILABLE AT THE WORK SITE:
- A SUPPLY OF SEDIMENT CONTROL MATERIALS; AND
 - AN OIL-ABSORBING FLOATING BOOM WHENEVER SURFACE WATER IS PRESENT.

DUST ABATEMENT: THE PROJECT SPONSOR WILL DETERMINE THE APPROPRIATE DUST CONTROL MEASURES (IF NECESSARY) BY CONSIDERING SOIL TYPE, EQUIPMENT USAGE, PREVAILING WIND DIRECTION, AND THE EFFECTS CAUSED BY OTHER EROSION AND SEDIMENT CONTROL MEASURES. IN ADDITION, THE FOLLOWING CRITERIA WILL BE FOLLOWED:

- WORK WILL BE SEQUENCED AND SCHEDULED TO REDUCE EXPOSED BARE SOIL SUBJECT TO WIND EROSION.
- DUST-ABATEMENT ADDITIVES AND STABILIZATION CHEMICALS (TYPICALLY MAGNESIUM CHLORIDE, CALCIUM CHLORIDE SALTS, OR LIGNINSULFONATE) WILL NOT BE APPLIED WITHIN 25 FEET OF WATER OR STREAM CHANNELS, AND WILL BE APPLIED SO AS TO MINIMIZE THE LIKELIHOOD THAT THEY WILL ENTER STREAMS. APPLICATIONS OF LIGNINSULFONATE WILL BE LIMITED TO A MAXIMUM RATE OF 0.5 GALLONS PER SQUARE YARD OF ROAD SURFACE, ASSUMING A 50/50 (LIGNINSULFONATE TO WATER) SOLUTION.
- APPLICATION OF DUST ABATEMENT CHEMICALS WILL BE AVOIDED DURING OR JUST BEFORE WET WEATHER, AND AT STREAM CROSSINGS OR OTHER AREAS THAT COULD RESULT IN UNFILTERED DELIVERY OF THE DUST ABATEMENT MATERIALS TO A WATERBODY (TYPICALLY THESE WOULD BE AREAS WITHIN 25 FEET OF A WATERBODY OR STREAM CHANNEL; DISTANCES MAY BE GREATER WHERE VEGETATION IS SPARSE OR SLOPES ARE STEEP).
- SPILL CONTAINMENT EQUIPMENT WILL BE AVAILABLE DURING APPLICATION OF DUST ABATEMENT CHEMICALS.
- PETROLEUM-BASED PRODUCTS WILL NOT BE USED FOR DUST ABATEMENT.

SPILL PREVENTION, CONTROL, AND COUNTERMEASURES: THE USE OF MECHANIZED MACHINERY INCREASES THE RISK FOR ACCIDENTAL SPILLS OF FUEL, LUBRICANTS, HYDRAULIC FLUID, OR OTHER CONTAMINANTS INTO THE RIPARIAN ZONE OR DIRECTLY INTO THE WATER. ADDITIONALLY, UNCURED CONCRETE AND FORM MATERIALS ADJACENT TO THE ACTIVE STREAM CHANNEL MAY RESULT IN ACCIDENTAL DISCHARGE INTO THE WATER. THESE CONTAMINANTS CAN DEGRADE HABITAT, AND INJURE OR KILL AQUATIC FOOD ORGANISMS AND ESA-LISTED SPECIES. THE PROJECT SPONSOR WILL ADHERE TO THE FOLLOWING MEASURES:

- A DESCRIPTION OF HAZARDOUS MATERIALS THAT WILL BE USED, INCLUDING INVENTORY, STORAGE, AND HANDLING PROCEDURES WILL BE AVAILABLE ON-SITE.



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B) WRITTEN PROCEDURES FOR NOTIFYING ENVIRONMENTAL AGENCIES WILL BE POSTED AT THE WORK SITE.

C) SPILL CONTAINMENT KITS (INCLUDING INSTRUCTIONS FOR CLEANUP AND DISPOSAL) ADEQUATE FOR THE TYPES AND QUANTITY OF HAZARDOUS MATERIAL USED AT THE SITE WILL BE AVAILABLE AT THE WORK SITE.

D) WORKERS WILL BE TRAINED IN SPILL CONTAINMENT PROCEDURES AND WILL BE INFORMED OF THE LOCATION OF SPILL CONTAINMENT KITS.

E) ANY WASTE LIQUIDS GENERATED AT THE STAGING AREAS WILL BE TEMPORARILY STORED UNDER AN IMPERVIOUS COVER, SUCH AS A TARPULIN, UNTIL THEY CAN BE PROPERLY TRANSPORTED TO AND DISPOSED OF AT A FACILITY THAT IS APPROVED FOR RECEIPT OF HAZARDOUS MATERIALS.

INVASIVE SPECIES CONTROL: THE FOLLOWING MEASURES WILL BE FOLLOWED TO AVOID INTRODUCTION OF INVASIVE PLANTS AND NOXIOUS WEEDS INTO PROJECT AREAS:

- PRIOR TO ENTERING THE SITE, ALL VEHICLES AND EQUIPMENT WILL BE POWER-WASHED, ALLOWED TO FULLY DRY, AND INSPECTED TO MAKE SURE NO PLANTS, SOIL, OR OTHER ORGANIC MATERIAL ADHERES TO THE SURFACE.
- WATERCRAFT, WADERS, BOOTS, AND ANY OTHER GEAR TO BE USED IN OR NEAR WATER WILL BE INSPECTED FOR AQUATIC INVASIVE SPECIES. WADING BOOTS WITH FELT SOLES ARE NOT TO BE USED DUE TO THEIR PROPENSITY FOR AIDING IN THE TRANSFER OF INVASIVE SPECIES.

WORK AREA ISOLATION & FISH SALVAGE:
ANY WORK AREA WITHIN THE WETTED CHANNEL WILL BE ISOLATED FROM THE ACTIVE STREAM WHENEVER ESA-LISTED FISH ARE REASONABLY CERTAIN TO BE PRESENT, OR IF THE WORK AREA IS LESS THAN 300- FEET UPSTREAM FROM KNOWN SPawning HABITATS. WORK AREA ISOLATION & FISH SALVAGE ACTIVITIES ARE CONSIDERED INCIDENTAL TO CONSTRUCTION-RELATED ACTIVITIES AND SHALL OCCUR DURING THE STATE-RECOMMENDED IN-WATER WORK WINDOWS.

WHEN WORK AREA ISOLATION IS REQUIRED, DESIGN PLANS WILL INCLUDE ALL ISOLATION ELEMENTS, FISH RELEASE AREAS, AND, WHEN A PUMP IS USED TO DEWATER THE ISOLATION AREA AND FISH ARE PRESENT, A FISH SCREEN THAT MEETS NMFS'S FISH SCREEN CRITERIA (NMFS 2011, OR MOST CURRENT). WORK AREA ISOLATION AND FISH CAPTURE ACTIVITIES WILL OCCUR DURING PERIODS OF THE COOLEST AIR AND WATER TEMPERATURES POSSIBLE, NORMALLY EARLY IN THE MORNING VERSUS LATE IN THE DAY, AND DURING CONDITIONS APPROPRIATE TO MINIMIZE STRESS AND DEATH OF SPECIES PRESENT.

FOR SALVAGE OPERATIONS IN KNOWN BULL TROUT SPawning AND REARING HABITAT, ELECTROFISHING SHALL ONLY OCCUR FROM MAY 1 TO JULY 31. NO ELECTROFISHING WILL OCCUR IN ANY BULL TROUT OCCUPIED HABITAT AFTER AUGUST 15. BULL TROUT ARE VERY TEMPERATURE SENSITIVE AND GENERALLY SHOULD NOT BE ELECTROFISHED OR OTHERWISE HANDLED WHEN TEMPERATURES EXCEED 15 DEGREES CELSIUS. SALVAGE ACTIVITIES SHOULD TAKE PLACE DURING PERIODS OF THE COOLEST AIR AND WATER TEMPERATURES POSSIBLE, NORMALLY EARLY IN THE MORNING VERSUS LATE IN THE DAY, AND DURING CONDITIONS APPROPRIATE TO MINIMIZE STRESS TO FISH SPECIES PRESENT.

SALVAGE OPERATIONS WILL FOLLOW THE ORDERING, METHODOLOGIES, AND CONSERVATION MEASURES SPECIFIED BELOW IN STEPS 1 THROUGH 6. STEPS 1 AND 2 WILL BE IMPLEMENTED FOR ALL PROJECTS WHERE WORK AREA ISOLATION IS NECESSARY ACCORDING TO CONDITIONS ABOVE. ELECTROFISHING (STEP 3) CAN BE IMPLEMENTED TO ENSURE ALL FISH HAVE BEEN REMOVED FOLLOWING STEPS 1 AND 2, OR WHEN OTHER MEANS OF FISH CAPTURE MAY NOT BE FEASIBLE OR EFFECTIVE. DEWATERING AND REWATERING (STEPS 4 AND 5) WILL BE IMPLEMENTED UNLESS WETTED INSTREAM WORK IS DEEMED TO BE MINIMALLY HARMFUL TO FISH, AND IS BENEFICIAL TO OTHER AQUATIC SPECIES. DEWATERING WILL NOT BE CONDUCTED IN AREAS KNOWN TO BE OCCUPIED BY LAMPREY, UNLESS LAMPREYS ARE SALVAGED USING GUIDANCE SET FORTH IN USFWS 2010.

STEP 1: ISOLATE:

- BLOCK NETS WILL BE INSTALLED AT UPSTREAM AND DOWNSTREAM LOCATIONS AND MAINTAINED IN A SECURED POSITION TO EXCLUDE FISH FROM ENTERING THE PROJECT AREA.
- BLOCK NETS WILL BE SECURED TO THE STREAM CHANNEL BED AND BANKS UNTIL FISH CAPTURE AND TRANSPORT ACTIVITIES ARE COMPLETE. BLOCK NETS MAY BE LEFT IN PLACE FOR THE DURATION OF THE PROJECT TO EXCLUDE FISH.
- IF BLOCK NETS REMAIN IN PLACE MORE THAN ONE DAY, THE NETS WILL BE MONITORED AT LEAST DAILY TO ENSURE THEY ARE SECURED TO THE BANKS AND FREE OF ORGANIC ACCUMULATION. IF THE PROJECT IS WITHIN BULL TROUT SPawning AND REARING HABITAT, THE BLOCK NETS MUST BE CHECKED EVERY 4 HOURS FOR FISH IMPINGEMENT ON THE NET. LESS FREQUENT INTERVALS MUST BE APPROVED THROUGH A VARIANCE REQUEST.
- NETS WILL BE MONITORED HOURLY ANYTIME THERE IS INSTREAM DISTURBANCE.

REV.	DATE	DESCRIPTION	DRW	ENG	APP	DATE
C	7/21/18	80 PERCENT DESIGN	USA	USA	CEB	7/21/18
B	1/9/18	30 PERCENT DESIGN	USA	USA	CEB	
A	10/21/17	15 PERCENT CONCEPTUAL DESIGN	USA	USA	CEB	

PLOTTED AS ANSI B (11 X 17), PLAIN SHEET FULL SIZE ANSI D (22 X 34)
REVISION DESCRIPTION

COUSE CREEK CONFLUENCE FISH PASSAGE
80 PERCENT DESIGN

DWG NO. **G-004**

CREATED: 7/21/18

SHEET

GENERAL NOTES
HIP III TERMS AND CONDITIONS

HIP III GENERAL CONSERVATION MEASURES APPLICABLE TO ALL ACTIONS (CONTINUED):

STEP 2: SALVAGE: AS DESCRIBED BELOW, FISH TRAPPED WITHIN THE ISOLATED WORK AREA WILL BE CAPTURED TO MINIMIZE THE RISK OF INJURY, THEN RELEASED AT A SAFE SITE:

- REMOVE AS MANY FISH AS POSSIBLE PRIOR TO DEWATERING.
- DURING DEWATERING, ANY REMAINING FISH WILL BE COLLECTED BY HAND OR DIP NETS.
- SEINES WITH A MESH SIZE TO ENSURE CAPTURE OF THE RESIDING ESA-LISTED FISH WILL BE USED.
- MINNOW TRAPS WILL BE LEFT IN PLACE OVERNIGHT AND USED IN CONJUNCTION WITH SEINING.
- IF BUCKETS ARE USED TO TRANSPORT FISH:
 - THE TIME FISH ARE IN A TRANSPORT BUCKET WILL BE LIMITED, AND WILL BE RELEASED AS QUICKLY AS POSSIBLE;
 - THE NUMBER OF FISH WITHIN A BUCKET WILL BE LIMITED BASED ON SIZE, AND FISH WILL BE OF RELATIVELY COMPARABLE SIZE TO MINIMIZE PREDATION;
 - AERATORS FOR BUCKETS WILL BE USED OR THE BUCKET WATER WILL BE FREQUENTLY CHANGED WITH COLD CLEAR WATER AT 15 MINUTE OR MORE FREQUENT INTERVALS.
 - BUCKETS WILL BE KEPT IN SHADED AREAS OR WILL BE COVERED BY A CANOPY IN EXPOSED AREAS.
 - DEAD FISH WILL NOT BE STORED IN TRANSPORT BUCKETS BUT WILL BE LEFT ON THE STREAMBANK TO AVOID MORTALITY COUNTING ERRORS.
 - AS RAPIDLY AS POSSIBLE (ESPECIALLY FOR TEMPERATURE-SENSITIVE BULL TROUT), FISH WILL BE RELEASED IN AN AREA THAT PROVIDES ADEQUATE COVER AND FLOW REFUGE. UPSTREAM RELEASE IS GENERALLY PREFERRED, BUT FISH RELEASED DOWNSTREAM WILL BE SUFFICIENTLY OUTSIDE OF THE INFLUENCE OF CONSTRUCTION.
 - SALVAGE WILL BE SUPERVISED BY A QUALIFIED FISHERIES BIOLOGIST EXPERIENCED WITH WORK AREA ISOLATION AND COMPETENT TO ENSURE THE SAFE HANDLING OF ALL FISH.

STEP 3: ELECTROFISHING: ELECTROFISHING WILL BE USED ONLY AFTER OTHER SALVAGE METHODS HAVE BEEN EMPLOYED OR WHEN OTHER MEANS OF FISH CAPTURE ARE DETERMINED TO NOT BE FEASIBLE OR EFFECTIVE. IF ELECTROFISHING WILL BE USED TO CAPTURE FISH FOR SALVAGE, THE SALVAGE OPERATION WILL BE LED BY AN EXPERIENCED FISHERIES BIOLOGIST AND THE FOLLOWING GUIDELINES WILL BE FOLLOWED:

- THE NMFS' ELECTROFISHING GUIDELINES WILL BE USED (NMFS 2004, [HTTP://WWW.WESTCOAST.FISHERIES.NOAA.GOV/PUBLICATIONS/REFERENCE_DOCUMENTS/ESA_REFS/SECTION4/ELECTRO2000.PDF](http://www.westcoast.fisheries.noaa.gov/publications/reference_documents/esa_refs/section4/electro2000.pdf)).
- INITIAL SITE SURVEYS AND EQUIPMENT SETTINGS
 - IN ORDER TO AVOID CONTACT WITH SPAWNING ADULTS OR ACTIVE REDDS, RESEARCHERS MUST CONDUCT A CAREFUL VISUAL SURVEY OF THE AREA TO BE SAMPLED BEFORE BEGINNING ELECTROFISHING.
 - PRIOR TO THE START OF SAMPLING AT A NEW LOCATION, WATER TEMPERATURE AND CONDUCTIVITY MEASUREMENTS SHALL BE TAKEN TO EVALUATE ELECTROFISHER SETTINGS AND ADJUSTMENTS. NO ELECTROFISHING SHOULD OCCUR WHEN WATER TEMPERATURES ARE ABOVE 18°C OR ARE EXPECTED TO RISE ABOVE THIS TEMPERATURE PRIOR TO CONCLUDING THE ELECTROFISHING SURVEY. IN ADDITION, STUDIES BY NMFS SCIENTISTS INDICATE THAT NO ELECTROFISHING SHOULD OCCUR IN CALIFORNIA COASTAL BASINS WHEN CONDUCTIVITY IS ABOVE 350 µS/CM.
 - WHENEVER POSSIBLE, A BLOCK NET SHOULD BE PLACED BELOW THE AREA BEING SAMPLED TO CAPTURE STUNNED FISH THAT MAY DRIFT DOWNSTREAM.
 - EQUIPMENT MUST BE IN GOOD WORKING CONDITION AND OPERATORS SHOULD GO THROUGH THE MANUFACTURERS PRESEASON CHECKS, ADHERE TO ALL PROVISIONS, AND RECORD MAJOR MAINTENANCE WORK IN A LOGBOOK.
 - EACH ELECTROFISHING SESSION MUST START WITH ALL SETTINGS (VOLTAGE, PULSE WIDTH, AND PULSE RATE) SET TO THE MINIMUMS NEEDED TO CAPTURE FISH. THESE SETTINGS SHOULD BE GRADUALLY INCREASED ONLY TO THE POINT WHERE FISH ARE IMMOBILIZED AND CAPTURED, AND GENERALLY NOT ALLOWED TO EXCEED CONDUCTIVITY-BASED MAXIMA (SEE TABLE 1). ONLY DIRECT CURRENT (DC) OR PULSED DIRECT CURRENT (PDC) SHOULD BE USED.

B) ELECTROFISHING TECHNIQUE

- SAMPLING SHOULD BEGIN USING STRAIGHT DC. THE POWER NEEDS TO REMAIN ON UNTIL THE FISH IS NETTED WHEN USING STRAIGHT DC. IF FISH CAPTURE IS UNSUCCESSFUL WITH INITIAL LOW VOLTAGE, GRADUALLY INCREASE VOLTAGE SETTINGS WITH STRAIGHT DC.
- IF FISH CAPTURE IS NOT SUCCESSFUL WITH THE USE OF STRAIGHT DC, THEN SET THE ELECTROFISHER TO LOWER VOLTAGES WITH PDC. IF FISH CAPTURE IS UNSUCCESSFUL WITH LOW VOLTAGES, INCREASE PULSE WIDTH, VOLTAGE, AND PULSE FREQUENCY (DURATION, AMPLITUDE, AND FREQUENCY).
- ELECTROFISHING SHOULD BE PERFORMED IN A MANNER THAT MINIMIZES HARM TO THE FISH. STREAM SEGMENTS SHOULD BE SAMPLED SYSTEMATICALLY, MOVING THE ANODE CONTINUOUSLY IN A HERRINGBONE PATTERN (WHERE FEASIBLE) THROUGH THE WATER. CARE SHOULD BE TAKEN WHEN FISHING IN AREAS WITH HIGH FISH CONCENTRATIONS, STRUCTURE (E.G., WOOD UNDERCUT BANKS) AND IN SHALLOW WATERS WHERE MOST BACKPACK ELECTROFISHING FOR JUVENILE SALMONIDS OCCURS.

TABLE 1. GUIDELINES FOR INITIAL AND MAXIMUM SETTINGS FOR BACKPACK ELECTROFISHING

VOLTAGE	INITIAL SETTINGS		MAXIMUM SETTINGS		NOTES
	CONDUCTIVITY (µS/cm)	MAX. VOLTAGE	CONDUCTIVITY (µS/cm)	MAX. VOLTAGE	
100 V	100	1100 V	100 - 300	800 V	IN CALIFORNIA COASTAL BASINS, SETTINGS SHOULD NEVER EXCEED 400 VOLTS. ALSO, NO ELECTROFISHING SHOULD OCCUR IN THESE BASINS IF CONDUCTIVITY IS GREATER THAN 350 µS/CM.
	> 300	400 V			
PULSE WIDTH	500 µs	5 ms			
PULSE RATE	30 Hz	70 Hz			IN GENERAL, EXCEEDING 40 Hz WILL INJURE MORE FISH.

THE ANODE WILL NOT INTENTIONALLY CONTACT FISH. ELECTROFISHING SHALL NOT BE CONDUCTED WHEN THE WATER CONDITIONS ARE TURBID AND VISIBILITY IS POOR. THIS CONDITION MAY BE OBSERVED WHEN THE SAMPLER CANNOT SEE THE STREAM BOTTOM IN ONE FOOT OF WATER.

- IF MORTALITY OR OBVIOUS INJURY (DEFINED AS DARK BANDS ON THE BODY, SPINAL DEFORMATIONS, DE-SCALING OF 25% OR MORE OF BODY, AND TORPIDITY OR INABILITY TO MAINTAIN UPRIGHT ATTITUDE AFTER SUFFICIENT RECOVERY TIME) OCCURS DURING ELECTROFISHING, OPERATIONS WILL BE IMMEDIATELY DISCONTINUED. MACHINE SETTINGS, WATER TEMPERATURE, AND CONDUCTIVITY CHECKED, AND PROCEDURES ADJUSTED OR ELECTROFISHING POSTPONED IN ORDER TO REDUCE MORTALITY.

VOLTAGE GRADIENTS MAY BE HIGH WHEN ELECTRODES ARE IN SHALLOW WATER WHERE BOUNDARY LAYERS (WATER SURFACE AND SUBSTRATE) TEND TO INTENSIFY THE ELECTRICAL FIELD. DO NOT ELECTROFISH IN ONE LOCATION FOR AN EXTENDED PERIOD (E.G., UNDERCUT BANKS) AND REGULARLY CHECK BLOCK NETS FOR IMMOBILIZED FISH.

- FISH SHOULD NOT MAKE CONTACT WITH THE ANODE. THE ZONE OF POTENTIAL INJURY FOR FISH IS 0.5 M FROM THE ANODE.
- ELECTROFISHING CREWS SHOULD BE GENERALLY OBSERVANT OF THE CONDITION OF THE FISH AND CHANGE OR TERMINATE SAMPLING WHEN EXPERIENCING PROBLEMS WITH FISH RECOVERY TIME, BANDING, INJURY, MORTALITY, OR OTHER INDICATIONS OF FISH STRESS.
- NETTERS SHOULD NOT ALLOW THE FISH TO REMAIN IN THE ELECTRICAL FIELD ANY LONGER THAN NECESSARY BY REMOVING STUNNED FISH FROM THE WATER IMMEDIATELY AFTER NETTING.

C) SAMPLE PROCESSING AND RECORDKEEPING


- FISH SHOULD BE PROCESSED AS SOON AS POSSIBLE AFTER CAPTURE TO MINIMIZE STRESS. THIS MAY REQUIRE A LARGER CREW SIZE.
- ALL SAMPLING PROCEDURES MUST HAVE A PROTOCOL FOR PROTECTING HELD FISH. SAMPLERS MUST BE AWARE OF THE CONDITIONS IN THE CONTAINERS HOLDING FISH: AIR PUMPS, WATER TRANSFERS, ETC., SHOULD BE USED AS NECESSARY TO MAINTAIN SAFE CONDITIONS. ALSO, LARGE FISH SHOULD BE KEPT SEPARATE FROM SMALLER PREY-SIZED FISH TO AVOID PREDATION DURING CONTAINMENT.
- USE OF AN APPROVED ANESTHETIC CAN REDUCE FISH STRESS AND IS RECOMMENDED, PARTICULARLY IF ADDITIONAL HANDLING OF FISH IS REQUIRED (E.G., LENGTH AND WEIGHT MEASUREMENTS, SCALE SAMPLES, FIN CLIPS, TAGGING).
- FISH SHOULD BE HANDLED PROPERLY (E.G., WETTING MEASURING BOARDS, NOT OVERCROWDING FISH IN BUCKETS, ETC.).
- FISH SHOULD BE OBSERVED FOR GENERAL CONDITION AND INJURIES (E.G., INCREASED RECOVERY TIME, DARK BANDS, VISUALLY OBSERVABLE SPINAL INJURIES). EACH FISH SHOULD BE COMPLETELY REVIVED BEFORE RELEASING AT THE LOCATION OF CAPTURE. A PLAN FOR ACHIEVING EFFICIENT RETURN TO APPROPRIATE HABITAT SHOULD BE DEVELOPED BEFORE EACH SAMPLING SESSION. ALSO, EVERY ATTEMPT SHOULD BE MADE TO PROCESS AND RELEASE ESA-LISTED SPECIMENS FIRST.
- PERTINENT WATER QUALITY (E.G., CONDUCTIVITY AND TEMPERATURE) AND SAMPLING NOTES (E.G., SHOCKER SETTINGS, FISH CONDITION/INJURIES/MORTALITIES) SHOULD BE RECORDED IN A LOGBOOK TO IMPROVE TECHNIQUE AND HELP TRAIN NEW OPERATORS. IT IS IMPORTANT TO NOTE THAT RECORDS OF INJURIES OR MORTALITIES PERTAIN TO THE ENTIRE ELECTROFISHING SURVEY, INCLUDING THE FISH SAMPLE WORK-UP.

VII. THE ANODE WILL NOT INTENTIONALLY CONTACT FISH.

VIII. ELECTROFISHING SHALL NOT BE CONDUCTED WHEN THE WATER CONDITIONS ARE TURBID AND VISIBILITY IS POOR. THIS CONDITION MAY BE OBSERVED WHEN THE SAMPLER CANNOT SEE THE STREAM BOTTOM IN ONE FOOT OF WATER.


- IF MORTALITY OR OBVIOUS INJURY (DEFINED AS DARK BANDS ON THE BODY, SPINAL DEFORMATIONS, DE-SCALING OF 25% OR MORE OF BODY, AND TORPIDITY OR INABILITY TO MAINTAIN UPRIGHT ATTITUDE AFTER SUFFICIENT RECOVERY TIME) OCCURS DURING ELECTROFISHING, OPERATIONS WILL BE IMMEDIATELY DISCONTINUED. MACHINE SETTINGS, WATER TEMPERATURE, AND CONDUCTIVITY CHECKED, AND PROCEDURES ADJUSTED OR ELECTROFISHING POSTPONED IN ORDER TO REDUCE MORTALITY.

REV.	DATE	DESCRIPTION	DRW	ENG	APP	DWG NO.
		FLOTTED AS ANSIS B 111 X 177, PLAIN SHEET FULL SIZE ANSI D (22" X 34")				G-005
		REVISION DESCRIPTION				
C	7/2/18	80 PERCENT DESIGN	USA	USA	CEB	
B	1/9/18	30 PERCENT DESIGN	USA	USA	CEB	
A	10/31/17	15 PERCENT CONCEPTUAL DESIGN	USA	USA	CEB	



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NOT FOR CONSTRUCTION



GENERAL NOTES
HIP III TERMS AND CONDITIONS

COURSE CREEK CONFLUENCE FISH PASSAGE
80 PERCENT DESIGN

CREATED: 7/2/18
SHEET:

HIP III GENERAL CONSERVATION MEASURES APPLICABLE TO ALL ACTIONS (CONTINUED):

STEP 4. DEWATER: DEWATERING, WHEN NECESSARY, WILL BE CONDUCTED OVER A SUFFICIENT PERIOD OF TIME TO ALLOW SPECIES TO NATURALLY MIGRATE OUT OF THE WORK AREA AND WILL BE LIMITED TO THE SHORTEST LINEAR EXTENT PRACTICABLE.

A) DIVERSION AROUND THE CONSTRUCTION SITE MAY BE ACCOMPLISHED WITH A COFFER DAM AND A BY-PASS CULVERT OR PIPE, OR A LINED, NON-ERODIBLE DIVERSION DITCH, WHERE GRAVITY FEED IS NOT POSSIBLE. A PUMP MAY BE USED, BUT MUST BE OPERATED IN SUCH A WAY AS TO AVOID REPETITIVE DEWATERING AND REWATERING OF THE SITE. IMPOUNDMENT BEHIND THE COFFERDAM MUST OCCUR SLOWLY THROUGH TRANSITION, WHILE CONSTANT FLOW IS DELIVERED TO THE DOWNSTREAM REACHES.

B) ALL PUMPS WILL HAVE FISH SCREENS TO AVOID JUVENILE FISH IMPINGEMENT OR ENTRAPMENT, AND WILL BE OPERATED IN ACCORDANCE WITH CURRENT NMFS FISH SCREEN CRITERIA. IF THE PUMPING RATE EXCEEDS 3 CUBIC FEET PER SECOND, A NMFS HYDRO FISH PASSAGE REVIEW WILL BE NECESSARY.

C) DISSIPATION OF FLOW ENERGY AT THE BYPASS OUTFLOW WILL BE PROVIDED TO PREVENT DAMAGE TO RIPARIAN VEGETATION OR STREAM CHANNEL.

D) SAFE REENTRY OF FISH INTO THE STREAM CHANNEL WILL BE PROVIDED, PREFERABLY INTO POOL HABITAT WITH COVER, IF THE DIVERSION ALLOWS FOR DOWNSTREAM FISH PASSAGE.

E) SEEPAGE WATER WILL BE PUMPED TO A TEMPORARY STORAGE AND TREATMENT SITE OR INTO UPLAND AREAS TO ALLOW WATER TO PERCOLATE THROUGH SOIL OR TO FILTER THROUGH VEGETATION PRIOR TO REENTERING THE STREAM CHANNEL.

STEP 5. SALVAGE NOTICE: MONITORING AND RECORDING FISH PRESENCE, HANDLING, AND MORTALITY MUST OCCUR DURING THE DURATION OF THE ISOLATION, SALVAGE, ELECTROFISHING, DEWATERING, AND REWATERING OPERATIONS. ONCE OPERATIONS ARE COMPLETED, A SALVAGE REPORT WILL DOCUMENT PROCEDURES USED, ANY FISH INJURIES OR DEATHS (INCLUDING NUMBERS OF FISH AFFECTED), AND CAUSES OF ANY DEATHS.

CONSTRUCTION AND POST-CONSTRUCTION CONSERVATION MEASURES:

1. **FISH PASSAGE:** FISH PASSAGE WILL BE PROVIDED FOR ANY ADULT OR JUVENILE FISH LIKELY TO BE PRESENT IN THE ACTION AREA DURING CONSTRUCTION, UNLESS PASSAGE DID NOT EXIST BEFORE CONSTRUCTION OR THE STREAM IS NATURALLY IMPASSABLE AT THE TIME OF CONSTRUCTION. IF THE PROVISION OF TEMPORARY FISH PASSAGE DURING CONSTRUCTION WILL INCREASE NEGATIVE EFFECTS ON AQUATIC SPECIES OF INTEREST OR THEIR HABITAT, A VARIANCE CAN BE REQUESTED FROM THE NMFS BRANCH CHIEF AND USFWS FIELD SUPERVISOR. PERTINENT INFORMATION, SUCH AS THE SPECIES AFFECTED, LENGTH OF STREAM REACH AFFECTED, PROPOSED TIME FOR THE PASSAGE BARRIER, AND ALTERNATIVES CONSIDERED, WILL BE INCLUDED IN THE VARIANCE REQUEST.

2. **CONSTRUCTION AND DISCHARGE WATER:**

- A) SURFACE WATER MAY BE DIVERTED TO MEET CONSTRUCTION NEEDS, BUT ONLY IF DEVELOPED SOURCES ARE UNAVAILABLE OR INADEQUATE.
- B) DIVERSIONS WILL NOT EXCEED 10% OF THE AVAILABLE FLOW.
- C) ALL CONSTRUCTION DISCHARGE WATER WILL BE COLLECTED AND TREATED USING THE BEST AVAILABLE TECHNOLOGY APPLICABLE TO SITE CONDITIONS.
- D) TREATMENTS TO REMOVE DEBRIS, NUTRIENTS, SEDIMENT, PETROLEUM HYDROCARBONS, METALS AND OTHER POLLUTANTS LIKELY TO BE PRESENT WILL BE PROVIDED.

3. **MINIMIZE TIME AND EXTENT OF DISTURBANCE:** EARTHWORK (INCLUDING DRILLING, EXCAVATION, DREDGING, FILLING AND COMPACTING) AS POSSIBLE, MECHANIZED EQUIPMENT IS IN STREAM CHANNELS, RIPARIAN AREAS, AND WETLANDS WILL BE COMPLETED AS QUICKLY AS FEASIBLE. MECHANIZED EQUIPMENT WILL BE USED IN STREAMS ONLY WHEN PROJECT SPECIALISTS BELIEVE THAT SUCH ACTIONS ARE THE ONLY REASONABLE ALTERNATIVE FOR IMPLEMENTATION, OR WOULD RESULT IN LESS SEDIMENT IN THE STREAM CHANNEL OR DAMAGE (SHORT- OR LONG-TERM) TO THE OVERALL AQUATIC AND RIPARIAN ECOSYSTEM RELATIVE TO OTHER ALTERNATIVES. TO THE EXTENT FEASIBLE, MECHANIZED EQUIPMENT WILL WORK FROM THE TOP OF THE BANK, UNLESS WORK FROM ANOTHER LOCATION WOULD RESULT IN LESS HABITAT DISTURBANCE.

4. **CESSATION OF WORK:** PROJECT OPERATIONS WILL CEASE UNDER THE FOLLOWING CONDITIONS:

- A) HIGH FLOW CONDITIONS THAT MAY RESULT IN INUNDATION OF THE PROJECT AREA, EXCEPT FOR EFFORTS TO AVOID OR MINIMIZE RESOURCE DAMAGE;
- B) WHEN ALLOWABLE WATER QUALITY IMPACTS, AS DEFINED BY THE STATE CWA SECTION 401 WATER QUALITY CERTIFICATION, HAVE BEEN EXCEEDED; OR
- C) WHEN "INCIDENTAL TAKE" LIMITATIONS HAVE BEEN REACHED OR EXCEEDED.

5. **SITE RESTORATION: WHEN CONSTRUCTION IS COMPLETE:**

- A) ALL STREAMBANKS, SOILS, AND VEGETATION WILL BE CLEANED UP AND RESTORED AS NECESSARY USING STOCKPILED LARGE WOOD, TOPSOIL, AND NATIVE CHANNEL MATERIAL.
- B) ALL PROJECT RELATED WASTE WILL BE REMOVED.
- C) ALL TEMPORARY ACCESS ROADS, CROSSINGS, AND STAGING AREAS WILL BE OBLITERATED, WHEN NECESSARY FOR REVEGETATION AND INFILTRATION OF WATER, COMPACTED AREAS OF SOIL WILL BE LOOSENEED.

C) ALL DISTURBED AREAS WILL BE REHABILITATED IN A MANNER THAT RESULTS IN SIMILAR OR IMPROVED CONDITIONS RELATIVE TO PRE-PROJECT CONDITIONS. THIS WILL BE ACHIEVED THROUGH REDISTRIBUTION OF STOCKPILED MATERIALS, SEEDING, AND/OR PLANTING WITH LOCAL NATIVE SEED MIXES OR PLANTS.

6. **REVEGETATION: LONG-TERM SOIL STABILIZATION OF THE DISTURBED SITE WILL BE ACCOMPLISHED WITH RE-ESTABLISHMENT OF NATIVE VEGETATION USING THE FOLLOWING CRITERIA:**

A) PLANTING AND SEEDING WILL OCCUR PRIOR TO OR AT THE BEGINNING OF THE FIRST GROWING SEASON AFTER CONSTRUCTION. AN APPROPRIATE MIX OF SPECIES THAT WILL ACHIEVE ESTABLISHMENT, SHADE, AND EROSION CONTROL OBJECTIVES, PREFERABLY FORB, GRASS, SHRUB, OR TREE SPECIES NATIVE TO THE PROJECT AREA OR REGION AND APPROPRIATE TO THE SITE WILL BE USED.

C) VEGETATION, SUCH AS WILLOW, SEDGE AND RUSH MATS, WILL BE SALVAGED FROM DISTURBED OR ABANDONED FLOODPLAINS, STREAM CHANNELS, OR WETLANDS.

D) INVASIVE SPECIES WILL NOT BE USED.

E) SHORT-TERM STABILIZATION MEASURES MAY INCLUDE THE USE OF NON-NATIVE STERILE SEED MIX (WHEN NATIVE SEEDS ARE NOT AVAILABLE), WEED-FREE CERTIFIED STRAW, JUTE MATTING, AND OTHER SIMILAR TECHNIQUES.

F) SURFACE FERTILIZER WILL NOT BE APPLIED WITHIN 50 FEET OF ANY STREAM CHANNEL, WATERBODY, OR WETLAND.

G) FENCING WILL BE INSTALLED AS NECESSARY TO PREVENT ACCESS TO REVEGETATED SITES BY LIVESTOCK OR UNAUTHORIZED PERSONS.

H) RE-ESTABLISHMENT OF VEGETATION IN DISTURBED AREAS WILL ACHIEVE AT LEAST 70% OF PRE-PROJECT CONDITIONS WITHIN 3-YEARS.

I) INVASIVE PLANTS WILL BE REMOVED OR CONTROLLED UNTIL NATIVE PLANT SPECIES ARE WELL ESTABLISHED (TYPICALLY 3-YEARS POST-CONSTRUCTION).

7. **SITE ACCESS:** THE PROJECT SPONSOR WILL RETAIN THE RIGHT OF REASONABLE ACCESS TO THE SITE IN ORDER TO MONITOR THE SUCCESS OF THE PROJECT OVER ITS LIFE.

8. **IMPLEMENTATION MONITORING:** PROJECT SPONSOR STAFF OR THEIR DESIGNATED REPRESENTATIVE WILL PROVIDE IMPLEMENTATION MONITORING TO ENSURE COMPLIANCE WITH THE APPLICABLE BIOLOGICAL OPINION, INCLUDING:

A) GENERAL CONSERVATION MEASURES ARE ADEQUATELY FOLLOWED; AND

B) EFFECTS TO LISTED SPECIES ARE NOT GREATER THAN PREDICTED AND INCIDENTAL TAKE LIMITATIONS ARE NOT EXCEEDED.

9. **CWA SECTION 401 WATER QUALITY CERTIFICATION:** THE PROJECT SPONSOR OR DESIGNATED REPRESENTATIVE WILL COMPLETE AND RECORD WATER QUALITY OBSERVATIONS TO ENSURE THAT IN-WATER WORK IS NOT DEGRADING WATER QUALITY. DURING CONSTRUCTION, CWA SECTION 401 WATER QUALITY CERTIFICATION PROVISIONS PROVIDED BY THE OREGON DEPARTMENT OF ENVIRONMENTAL QUALITY, WASHINGTON DEPARTMENT OF ECOLOGY, OR IDAHO DEPARTMENT OF ENVIRONMENTAL QUALITY WILL BE FOLLOWED.

10. **STAGED REWATERING PLAN:** STAGED REWATERING PROVIDED AS A PART OF THE CURRENT PLAN SHEETS.

11. **VARIANCE REQUESTS:** BECAUSE OF THE WIDE RANGE OF PROPOSED ACTIVITIES AND THE NATURAL VARIABILITY WITHIN AND BETWEEN STREAM SYSTEMS, BPA (ON BEHALF OF THE APPLICANT) MAY REQUIRE VARIATIONS FROM CRITERIA SPECIFIED HEREIN. THE SERVICES WILL CONSIDER GRANTING VARIANCES, ESPECIALLY WHEN THERE IS A CLEAR CONSERVATION BENEFIT OR THERE ARE NO ADDITIONAL ADVERSE EFFECTS (ESPECIALLY "INCIDENTAL TAKE") BEYOND THAT COVERED BY THE OPINION. MINOR VARIANCES CAN BE AUTHORIZED BY THE NMFS BRANCH CHIEF AND USFWS FIELD OFFICE SUPERVISOR.

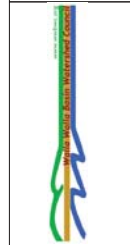
VARIANCE REQUESTS MAY BE SUBMITTED AND APPROVED BY EMAIL CORRESPONDENCE AND WILL INCLUDE:

- 1) NAME AND BRIEF DESCRIPTION OF PROJECT, LOCATION OF PROJECT AND 6TH FIELD HUC NUMBER.
- 2) DEFINE THE REQUESTED VARIANCE AND THE RELEVANT CRITERION BY PAGE NUMBER.
- 3) CURRENT ENVIRONMENTAL CONDITIONS (CURRENT FLOW AND WEATHER CONDITIONS).
- 4) BIOLOGICAL JUSTIFICATION AS TO WHY A VARIANCE IS NECESSARY AND A BRIEF RATIONALE WHY THE VARIANCE WILL EITHER PROVIDE A CONSERVATION BENEFIT OR, AT A MINIMUM, NOT CAUSE ADDITIONAL ADVERSE EFFECTS BEYOND THE SCOPE OF THE OPINION.
- 5) INCLUDE AS ATTACHMENTS ANY NECESSARY APPROVALS BY STATE AGENCIES.



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REV.	DATE	DESCRIPTION	DRW	ENG	APP
C	7/27/18	80 PERCENT DESIGN	USA	USA	USA
B	1/9/18	30 PERCENT DESIGN	USA	USA	USA
A	10/31/17	15 PERCENT CONCEPTUAL DESIGN	USA	USA	USA

COUSE CREEK CONFLUENCE FISH PASSAGE
80 PERCENT DESIGN

GENERAL NOTES
HIP III TERMS AND CONDITIONS

DWG NO. **G-006**
CREATED: 7/9/18
SHEET



HIP III GENERAL CONSERVATION MEASURES APPLICABLE TO ALL ACTIONS (CONTINUED):

TURBIDITY MONITORING PROTOCOL: THE PROJECT SPONSOR SHALL COMPLETE AND RECORD THE FOLLOWING WATER QUALITY OBSERVATIONS TO ENSURE THAT ANY INCREASE IN SUSPENDED SEDIMENT DOES NOT EXCEED THE LIMIT FOR HIP III COMPLIANCE. RECORDS SHALL BE REPORTED ON THE HIP III PCF. IF THE GEOMORPHOLOGY OF THE PROJECT AREA (E.G., SILTY OR CLAYLIKE MATERIALS) OR THE NATURE OF THE ACTION (E.G., LARGE AMOUNTS OF BARE EARTH EXPOSED BELOW THE BANKFULL ELEVATION) SHALL PRECLUDE THE SUCCESSFUL COMPLIANCE WITH THESE TRIGGERS, NOTIFY YOUR EC LEAD WHO SHALL PRE-NOTIFY THE SERVICES OF THE LIKELIHOOD OF AN EXCEEDANCE.

A) TAKE A BACKGROUND TURBIDITY SAMPLE USING A RECENTLY-CALIBRATED TURBIDIMETER IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. OR MEASURE TURBIDITY WITH A VISUAL TURBIDITY OBSERVATION (FIGURE 1). TURBIDITY SHOULD BE MEASURED EVERY 2 HOURS WHILE WORK IS BEING IMPLEMENTED OR MORE OFTEN IF SEDIMENT DISTURBANCE VARIES GREATLY. FREQUENT MONITORING WILL ENSURE THAT THE IN-WATER WORK AREA IS NOT CREATING TURBID CONDITIONS WITHIN THE WATER COLUMN. THE BACKGROUND SAMPLES/VISUAL OBSERVATIONS SHOULD BE TAKEN AT A RELATIVELY UNDISTURBED LOCATION APPROXIMATELY 100 FEET UPSTREAM FROM THE PROJECT AREA. RECORD THE OBSERVATION, LOCATION, AND TIME BEFORE MONITORING AT THE DOWNSTREAM POINT, KNOWN AS THE MEASUREMENT COMPLIANCE POINT.

B) TAKE A SECOND SAMPLE OR OBSERVATION, IMMEDIATELY AFTER EACH UPSTREAM SAMPLE OR OBSERVATION, AT THE MEASUREMENT COMPLIANCE POINT, APPROXIMATELY 50 FEET DOWNSTREAM FROM THE PROJECT AREA. INSTREAMS THAT ARE 30 FEET WIDE OR LESS; 100 FEET DOWNSTREAM FROM THE PROJECT AREA FOR STREAMS BETWEEN 30 AND 100 FEET WIDE; 200 FEET DOWNSTREAM FROM THE PROJECT AREA FOR STREAMS GREATER THAN 100 FEET WIDE; AND 300 FEET FROM THE DISCHARGE POINT OR NONPOINT SOURCE FOR LOCATIONS SUBJECT TO TIDAL OR COASTAL SCOUR. RECORD THE DOWNSTREAM OBSERVATION, LOCATION, AND TIME.

C) COMPARE THE UPSTREAM AND DOWNSTREAM OBSERVATIONS/SAMPLES. IF OBSERVED OR MEASURED TURBIDITY DOWNSTREAM IS MORE THAN UPSTREAM OBSERVATION OR MEASUREMENT (> 10%), THE ACTIVITY MUST BE MODIFIED TO REDUCE TURBIDITY. IF VISUAL ESTIMATES ARE USED, AN OBVIOUS DIFFERENCE BETWEEN UPSTREAM AND DOWNSTREAM OBSERVATIONS SHALL BEAR THE ASSUMPTION OF A (> 10%) DIFFERENCE (FIGURE 1). MARK "YES" OR "NO" ON YOUR DATASHEET. CONTINUE TO MONITOR EVERY 2 HOURS AS LONG AS INSTREAM ACTIVITY CONTINUES.

D) IF EXCEEDANCES OCCUR FOR MORE THAN TWO CONSECUTIVE MONITORING INTERVALS (AFTER 4 HOURS), THE ACTIVITY MUST STOP UNTIL THE TURBIDITY LEVEL RETURNS TO BACKGROUND, AND THE EC LEAD MUST BE NOTIFIED WITHIN 48 HOURS. THE EC LEAD SHALL DOCUMENT THE REASONS FOR THE EXCEEDANCE AND CORRECTIVE MEASURES TAKEN, THEN NOTIFY THE LOCAL NIMFS BRANCH CHIEF AND/OR USFWS FIELD SUPERVISOR AND SEEK RECOMMENDATIONS.



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PLOTTED AS ANSIS B (11" X 17") PLAN SHEET FULL SIZE ANSIS D (22" X 34")

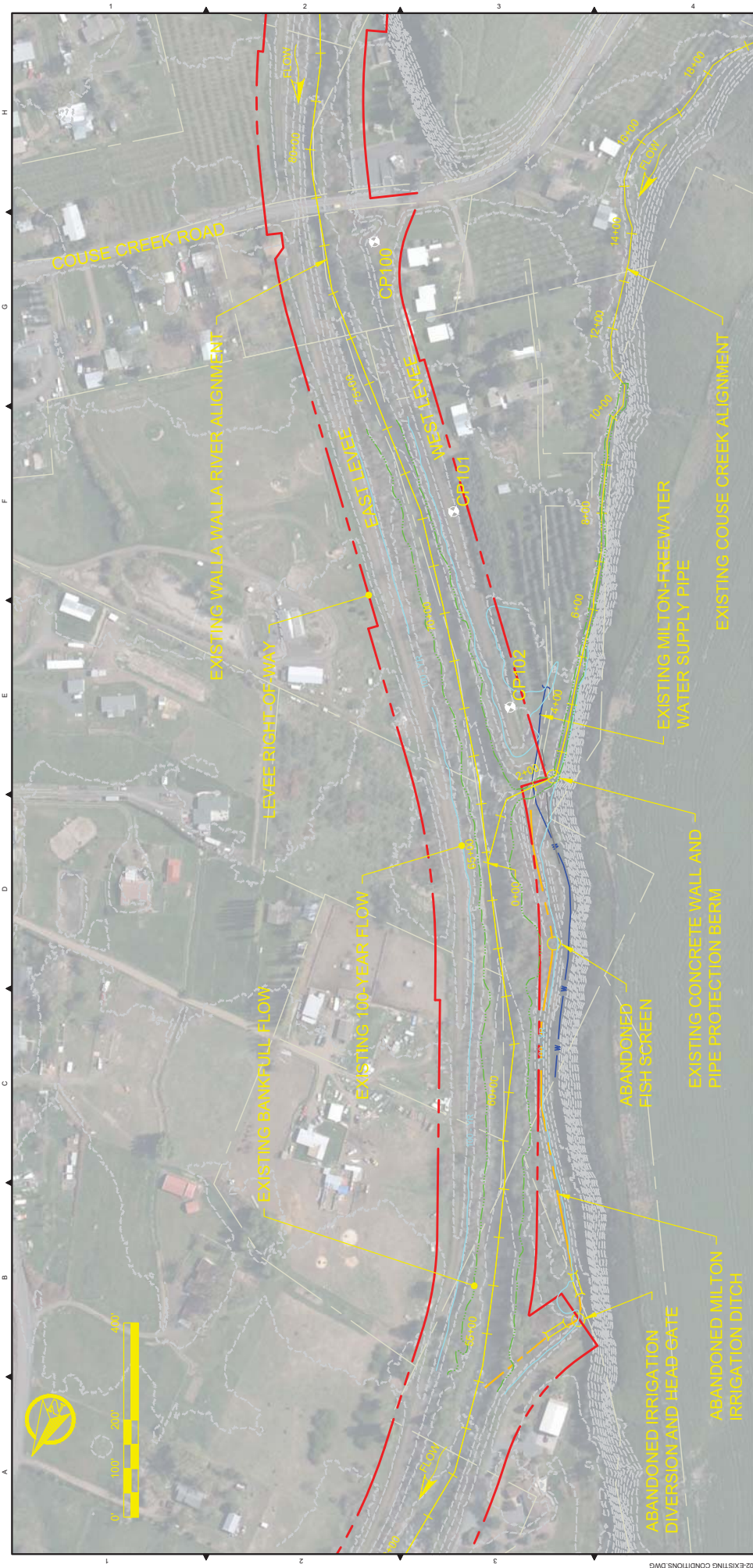
COUSE CREEK CONFLUENCE FISH PASSAGE
80 PERCENT DESIGN

DWG NO. G-007

CREATED:	7/2/18
SHEET:	

GENERAL NOTES
HIP III TERMS AND CONDITIONS

REV.	DATE	DESCRIPTION	DRW	ENG	APP
C	7/2/18	80 PERCENT DESIGN	USA	USA	CEB
B	1/9/18	30 PERCENT DESIGN	USA	CEB	CU
A	10/31/17	15 PERCENT CONCEPTUAL DESIGN	USA	USA	CU



LEGEND:

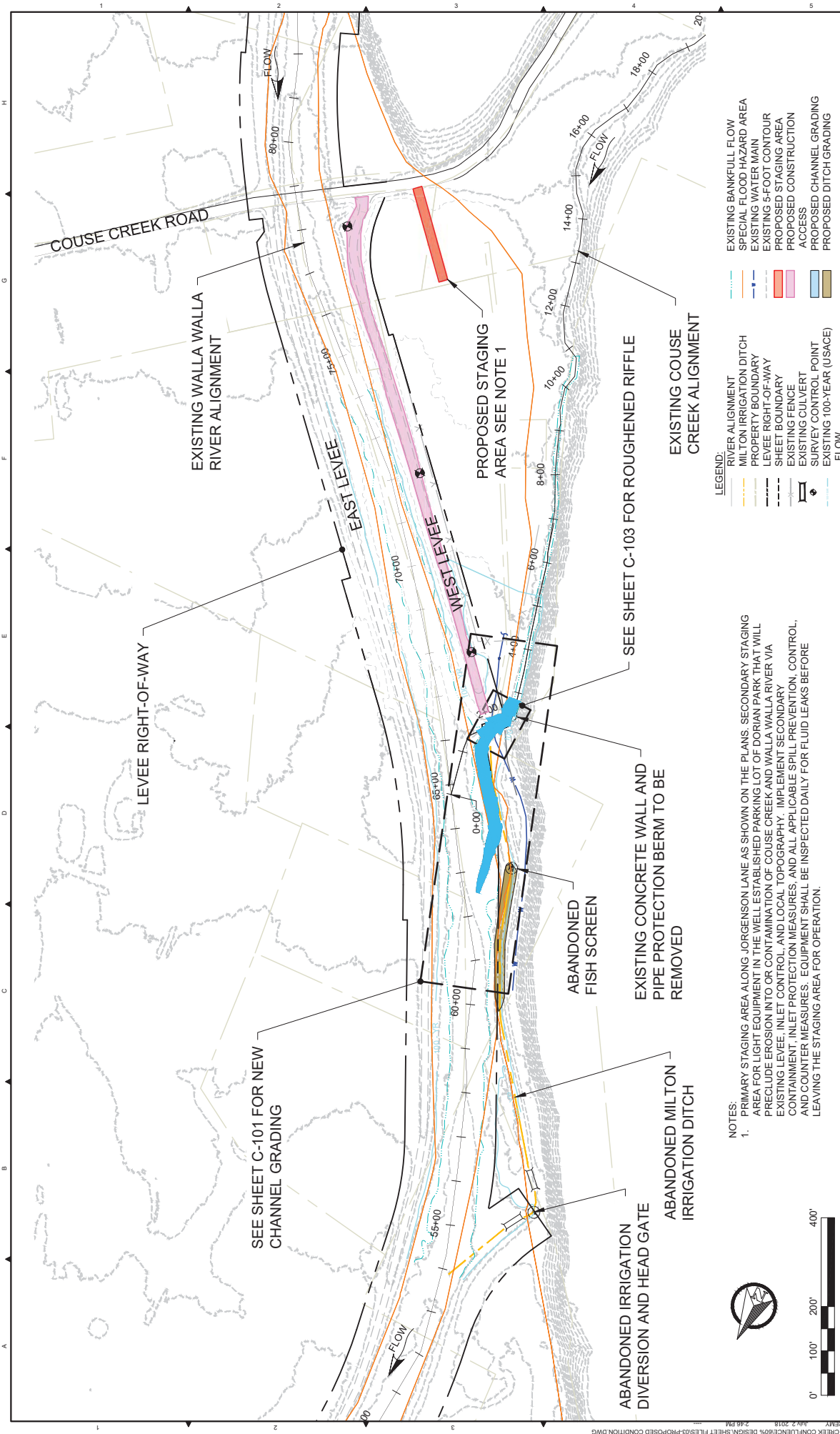
	RIVER ALIGNMENT		EXISTING 100-YEAR (USACE) FLOW
	MILTON IRRIGATION DITCH		EXISTING BANKFULL FLOW
	EXISTING FENCE		EXISTING MILTON-FRESHWATER WATER SUPPLY PIPE
	LEVEE RIGHT-OF-WAY		EXISTING 5-FOOT CONTOUR
	PROPERTY BOUNDARY		
	EXISTING CULVERT		
	SURVEY CONTROL POINT		

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION
100	824169.01	8744794.10	1166.7	CP 100
101	824578.01	8744384.48	1162.3	CP 101
102	824879.28	8744092.32	1157.4	CP 102

NOTES:

- USING METHODS RECOMMENDED IN THE 1987 CORPS OF ENGINEERS WETLAND DELINEATION MANUAL AND ARID WEST REGION SUPPLEMENT. NO WETLANDS WERE DISCOVERED IN THE PROJECT STUDY AREA OR ADJACENT FLOODPLAIN AREAS.

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			<p>EXISTING CONDITIONS</p> <p>GENERAL OVERVIEW</p>	<p>CREATED: 7/2/18</p> <p>SHEET</p>			



NOTES:
 1. PRIMARY STAGING AREA ALONG JORGENSEN LANE AS SHOWN ON THE PLANS. SECONDARY STAGING AREA FOR LIGHT EQUIPMENT IN THE WELL ESTABLISHED PARKING LOT OF DORIAN PARK THAT WILL PRECLUDE EROSION INTO OR CONTAMINATION OF COUSE CREEK AND WALLA WALLA RIVER VIA EXISTING LEVEE, INLET CONTROL, AND LOCAL TOPOGRAPHY. IMPLEMENT SECONDARY CONTAINMENT, INLET PROTECTION MEASURES, AND ALL APPLICABLE SPILL PREVENTION, CONTROL, AND COUNTER MEASURES. EQUIPMENT SHALL BE INSPECTED DAILY FOR FLUID LEAKS BEFORE LEAVING THE STAGING AREA FOR OPERATION.

LEGEND:
 RIVER ALIGNMENT
 MILTON IRRIGATION DITCH
 PROPERTY BOUNDARY
 LEVEE RIGHT-OF-WAY
 SHEET BOUNDARY
 EXISTING FENCE
 EXISTING CULVERT
 SURVEY CONTROL POINT
 EXISTING 100-YEAR (USACE) FLOW
 EXISTING BANKFULL FLOW
 SPECIAL FLOOD HAZARD AREA
 EXISTING WATER MAIN
 EXISTING 5-FOOT CONTOUR
 PROPOSED STAGING AREA
 PROPOSED CONSTRUCTION
 ACCESS
 PROPOSED CHANNEL GRADING
 PROPOSED DITCH GRADING

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REV.	DATE	DESCRIPTION	DRW	ENG	APP	<p>COUSE CREEK CONFLUENCE FISH PASSAGE 80 PERCENT DESIGN</p>	
C	7/2/18	80 PERCENT DESIGN	USA	USA	CEB	<p>C-100</p>	
B	1/9/18	30 PERCENT DESIGN	USA	USA	CEB	<p>CREATED: 7/2/18</p>	
A	10/31/17	15 PERCENT CONCEPTUAL DESIGN	USA	USA	CEB	<p>SHEET</p>	
<p>PROPOSED CONDITIONS GENERAL OVERVIEW</p>						<p>DWG NO. C-100</p>	

SEE SHEET C-101 FOR NEW CHANNEL GRADING

SEE SHEET C-103 FOR ROUGHENED RIFFLE

SEE SHEET C-103 FOR ROUGHENED RIFFLE

ABANDONED IRRIGATION DIVERSION AND HEAD GATE

ABANDONED MILTON IRRIGATION DITCH

ABANDONED FISH SCREEN

EXISTING CONCRETE WALL AND PIPE PROTECTION BERM TO BE REMOVED

LEVEE RIGHT-OF-WAY

EXISTING WALLA WALLA RIVER ALIGNMENT

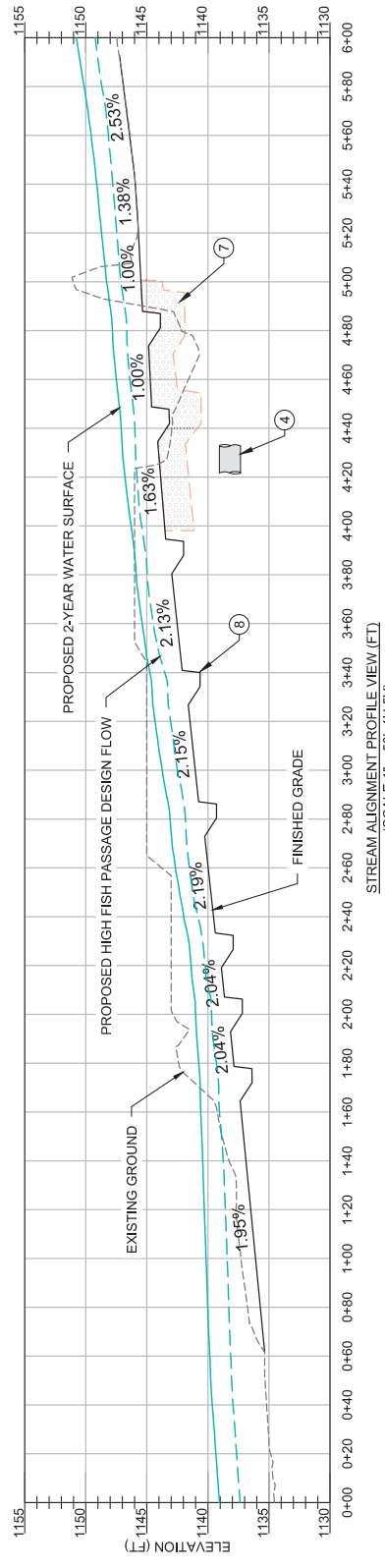
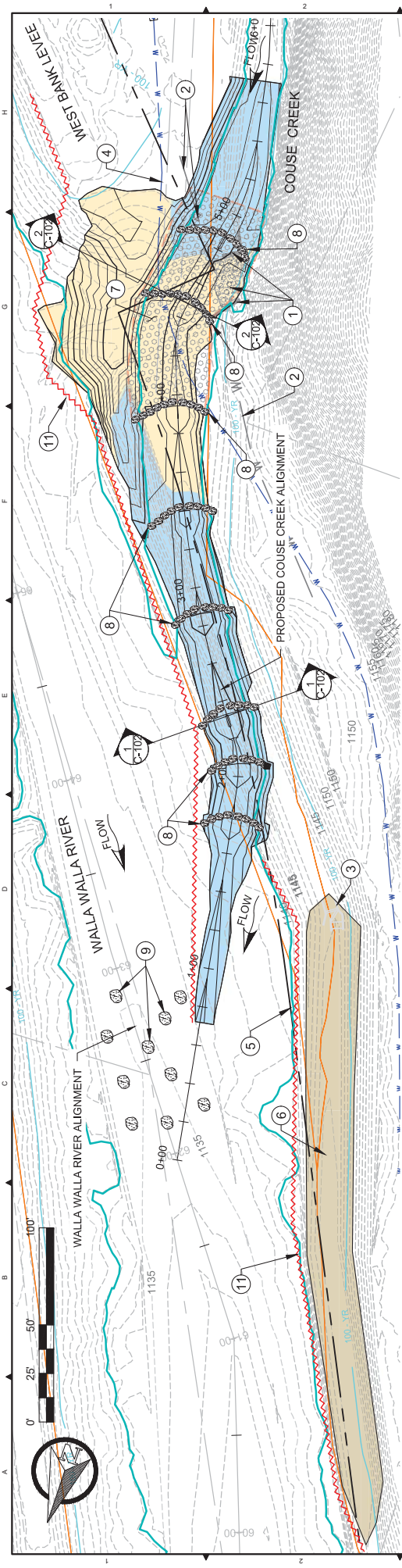
EAST LEVEE

WEST LEVEE

PROPOSED STAGING AREA SEE NOTE 1

EXISTING COUSE CREEK RIVER ALIGNMENT

COUSE CREEK ROAD

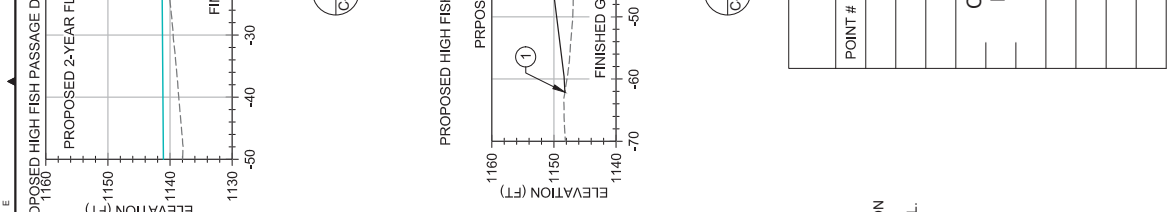
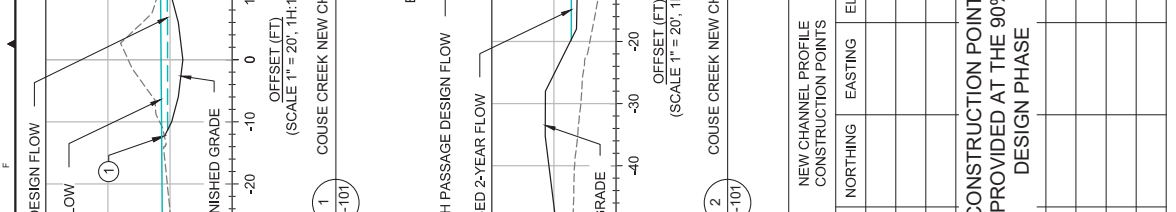
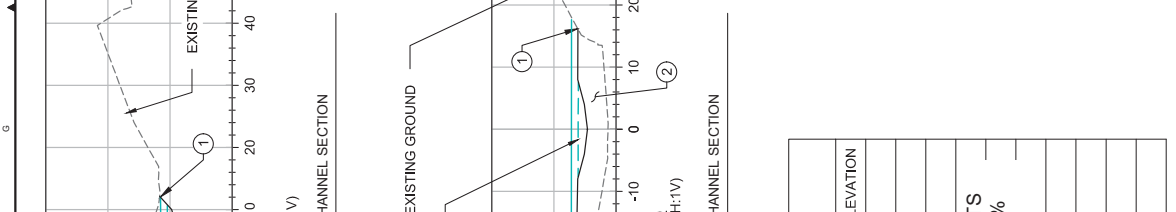


- NOTES:**
1. REMOVE ABANDONED CONCRETE WALLS AND PIPE PROTECTION BERM.
 2. REMOVE ABANDONED PIPE APPURTENANCES. VERIFY APPURTENANCES ARE ABANDONED AND NOT A FUNCTIONAL ELEMENT OF THE CURRENT MILTON-FREEWATER PIPE SUPPLY CONDUIT.
 3. SALVAGE AND PROTECT ABANDONED FISH SCREEN.
 4. PROTECT EXISTING MILTON-FREEWATER WATER SUPPLY PVC PIPE AND APPURTENANCES. LOCATIONS AND ELEVATIONS SHOWN ON THE PLANS ARE APPROXIMATE AND CONTRACTOR SHALL VERIFY IN THE FIELD BEFORE CONSTRUCTION TO BEGIN.
 5. LEVEE RIGHT-OF-WAY.
 6. PLACE EXCESS FILL MATERIAL IN ABANDONED MILTON DITCH. COORDINATE FILL LOCATION IN THE FIELD WITH ENGINEER OR OWNER'S REPRESENTATIVE.
 7. PLACE ROUGHENED RIFFLE. SEE SHEET C-103 FOR ROUGHENED RIFFLE DETAILS.
 8. PLACE 3-FT BOULDERS AS STEP POOLS. SEE SHEET C-103 FOR STEP POOL DETAILS.
 9. PLACE 3-FT TO 5-FT HABITAT BOULDERS IN THE WALLA WALLA RIVER MAINSTEM.
 10. LIMITS OF DISTURBANCE = 0.96 ACRE.
 11. INSTALL TESC BMP PER DETAILS ON SHEET C-105.

- LEGEND:**
- STREAM ALIGNMENT
 - PROPERTY BOUNDARY
 - LEVEE RIGHT-OF-WAY
 - EXISTING 1-FOOT CONTOURS
 - EXISTING 5-FOOT CONTOURS
 - EXISTING FENCE
 - EXISTING WATER MAIN
 - EXISTING 100-YEAR FLOW
 - SPECIAL FLOOD HAZARD AREA
 - LIMITS OF DISTURBANCE
 - SURVEY CONTROL POINT
 - PROPOSED 1-FOOT CONTOURS
 - PROPOSED 5-FOOT CONTOURS
 - PROPOSED HABITAT BOULDERS
 - PROPOSED ROUGHENED RIFFLE
 - PROPOSED CHANNEL CUT
 - PROPOSED CHANNEL FILL
 - PROPOSED DITCH FILL
 - PROPOSED 2-YEAR FLOW
 - PROPOSED HIGH FISH PASSAGE
 - DESIGN FLOW (68.3 CFS)
 - PROPOSED EROSION CONTROL BMP
 - COUSE CREEK CONFLUENCE FISH PASSAGE
 - 80 PERCENT DESIGN


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	<p>PLOTTED AS ANSI B (11" X 17") PLAN SHEET FULL SIZE ANSI D (22" X 34")</p>				<p>COUSE CREEK CONFLUENCE FISH PASSAGE</p> <p>80 PERCENT DESIGN</p>					

NOTES:
 1. DAYLIGHT PROPOSED CHANNEL EXCAVATION TO MATCH EXISTING GRADE.
 2. BACKFILL EXISTING COUSE CREEK CHANNEL.




POINT #	NORTHING	EASTING	ELEVATION
CONSTRUCTION POINTS PROVIDED AT THE 90% DESIGN PHASE			

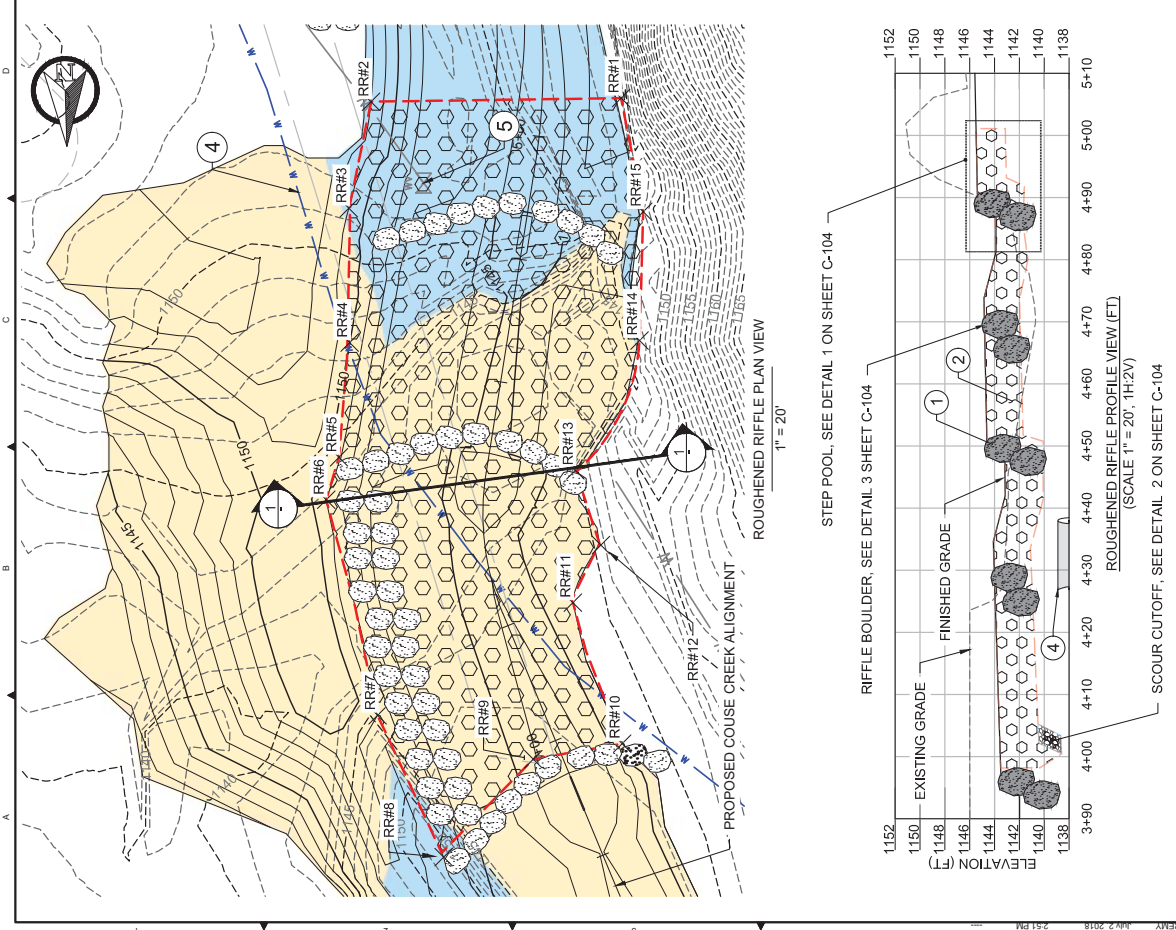
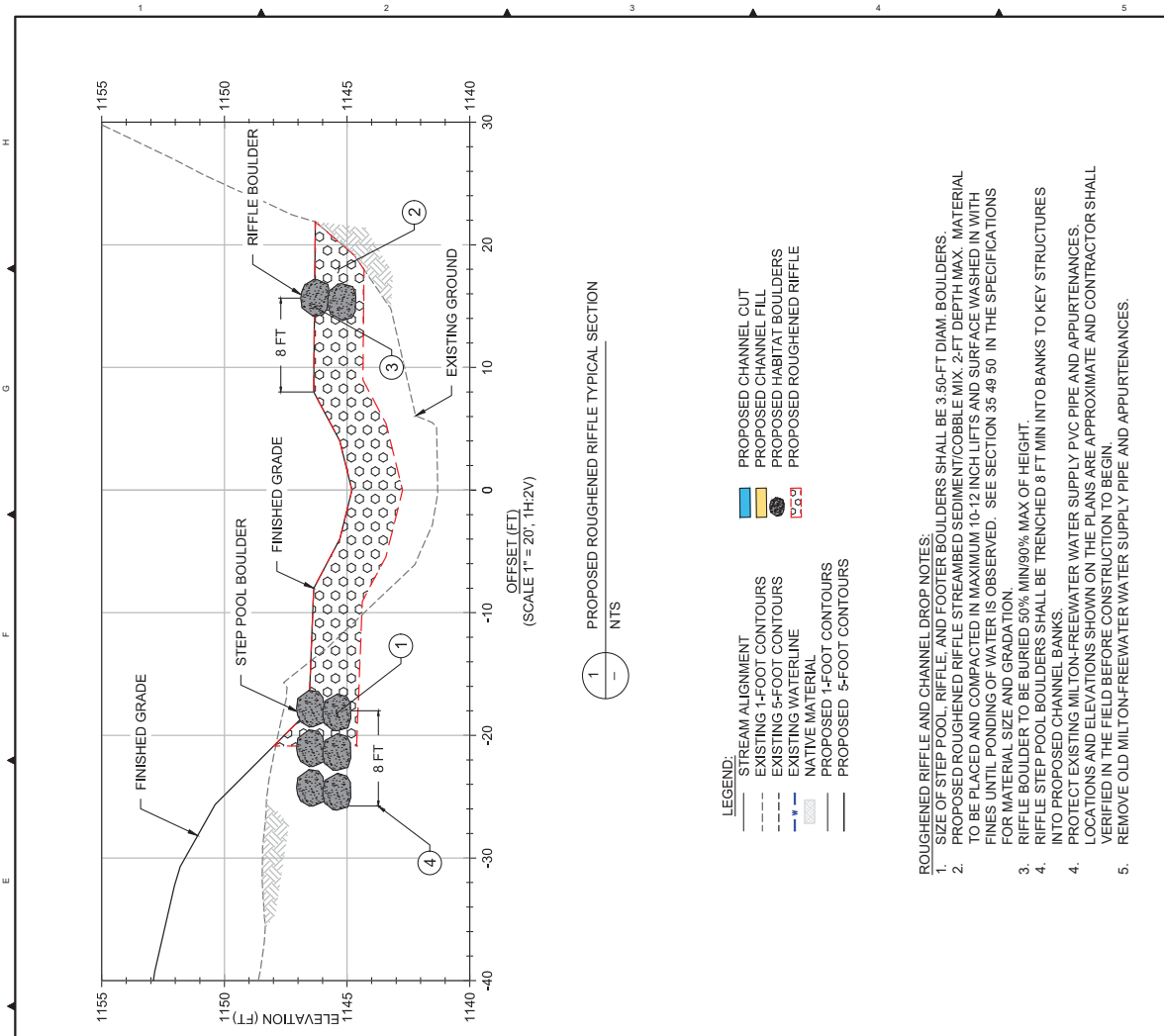
REV.	DATE	DESCRIPTION	DRW	ENG	APP
C	7/27/18	90 PERCENT DESIGN	USA	USA	USA
B	1/8/18	30 PERCENT DESIGN	USA	USA	USA
A	10/31/17	15 PERCENT CONCEPTUAL DESIGN	USA	USA	USA



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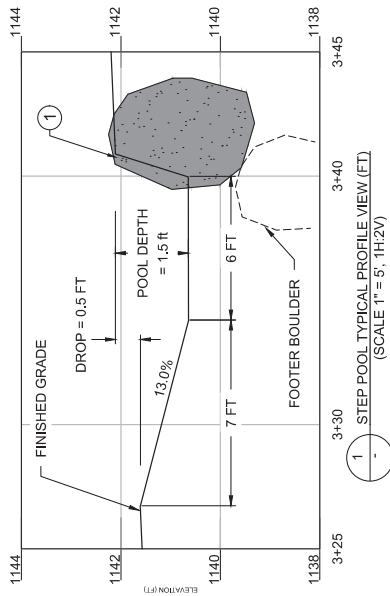


- LEGEND:**
- STREAM ALIGNMENT
 - EXISTING 1-FOOT CONTOURS
 - EXISTING 5-FOOT CONTOURS
 - EXISTING WATERLINE
 - NATIVE MATERIAL
 - PROPOSED 1-FOOT CONTOURS
 - PROPOSED 5-FOOT CONTOURS
 - PROPOSED CHANNEL CUT
 - PROPOSED CHANNEL FILL
 - PROPOSED HABITAT BOULDERS
 - PROPOSED ROUGHENED RIFFILE

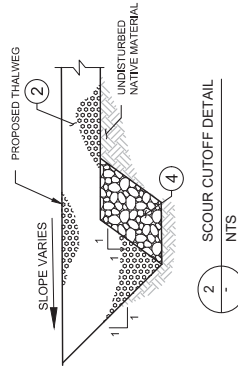
ROUGHENED RIFFILE AND CHANNEL DROP NOTES:

1. SIZE OF STEP POOL, RIFFILE, AND FOOTER BOULDERS SHALL BE 3.50-FT DIAM. BOULDERS. PROPOSED ROUGHENED RIFFILE STREAMBED SEDIMENT/COBBLE MIX. 2-FT DEPTH MAX. MATERIAL TO BE PLACED AND COMPACTED IN MAXIMUM 10-12 INCH LIFTS AND SURFACE WASHED IN WITH FINES UNTIL PONDING OF WATER IS OBSERVED. SEE SECTION 35.49.50 IN THE SPECIFICATIONS FOR MATERIAL SIZE AND GRADATION.
2. RIFFILE BOULDER TO BE BURIED 50% MIN/90% MAX OF HEIGHT INTO PROPOSED CHANNEL BANKS.
3. PROTECT EXISTING MILTON-FREEWATER WATER SUPPLY PVC PIPE AND APPURTENANCES. LOCATIONS AND ELEVATIONS SHOWN ON THE PLANS ARE APPROXIMATE AND CONTRACTOR SHALL VERIFY IN THE FIELD BEFORE CONSTRUCTION TO BEGIN.
4. REMOVE OLD MILTON-FREEWATER WATER SUPPLY PIPE AND APPURTENANCES.

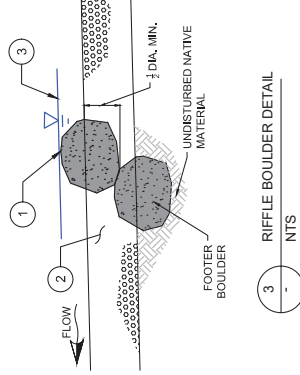
<p>TETRA TECH www.tetratech.com 1845 N. 196th St., Suite 100 Bellevue, WA 98007 Phone: 425-452-7600 Fax: 425-452-7652</p>		<p>NOT FOR CONSTRUCTION</p>				<p>PLOTTED AS ANSIS B (11 X 17) PLAN SHEET FULL SIZE ANSIS D (22 X 34)</p>		<p>COUSE CREEK CONFLUENCE FISH PASSAGE 80 PERCENT DESIGN</p>		<p>DWG NO. C-103</p>	
REV.	DATE	DESCRIPTION	DRW	ENG	APP						
C	7/2/18	80 PERCENT DESIGN	USA	USA	CEB						
B	1/9/18	30 PERCENT DESIGN	USA	USA	CEB						
A	10/31/17	15 PERCENT CONCEPTUAL DESIGN	USA	USA	CEB						
<p>DETAILS ROUGHENED RIFFILE</p>										CREATED:	7/2/18
										SHEET:	



ROUGHENED RIFFLE POINT DATA			
POINT #	NORTHING	EASTING	ELEVATION
1	824938.49	8743942.18	1148.0
2	824939.06	8743982.43	1152.0
3	824956.20	8743986.00	1151.0
4	824977.83	8743985.86	1150.0
5	824996.28	8743987.59	1149.1
6	825003.13	8743989.64	1149.0
7	825037.80	8743981.38	1149.0
8	825060.63	8743970.75	1147.0
9	825044.87	8743956.32	1144.1
10	825042.38	8743942.00	1145.9
11	825019.68	8743949.94	1144.0
12	825010.42	8743945.43	1144.0
13	824998.37	8743949.55	1145.8
14	824977.49	8743939.20	1146.3
15	824956.77	8743938.62	1146.4



- LEGEND:
- STREAM ALIGNMENT
 - EXISTING WATERLINE
 - NATIVE MATERIAL
 - PROPOSED HABITAT BOULDERS
 - PROPOSED ROUGHENED RIFFLE



- ROUGHENED RIFFLE AND CHANNEL DROP NOTES:
- SIZE OF RIFFLE AND FOOTER BOULDER SHALL BE 3/4 FT DIAM. BOULDERS.
 - PROPOSED ROUGHENED RIFFLE STREAMBED SEDIMENT/COBBLE MIX, 2-FT DEPTH MAX. MATERIAL TO BE PLACED IN MAXIMUM 10-12 INCH LIFTS AND SURFACE WASHED IN WITH FINES UNTIL PONDING OF WATER IS OBSERVED. SEE SECTION 35 49 50 IN THE SPECIFICATIONS FOR MATERIAL SIZE AND GRADATION.
 - RIFFLE BOULDER TO BE BURIED 50% MIN/90% MAX OF HEIGHT AND BE COMPLETELY SUBMERGED DURING THE 2-YEAR FLOOD FLOW.
 - PROPOSED STREAMBED COBBLE FOR CUTOFF TRENCH. SEE SECTION 35 49 50 IN THE SPECIFICATIONS FOR COBBLE SIZING AND GRADATION.

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COUSE CREEK CONFLUENCE FISH PASSAGE
80 PERCENT DESIGN

DETAILS
ROUGHENED RIFFLE

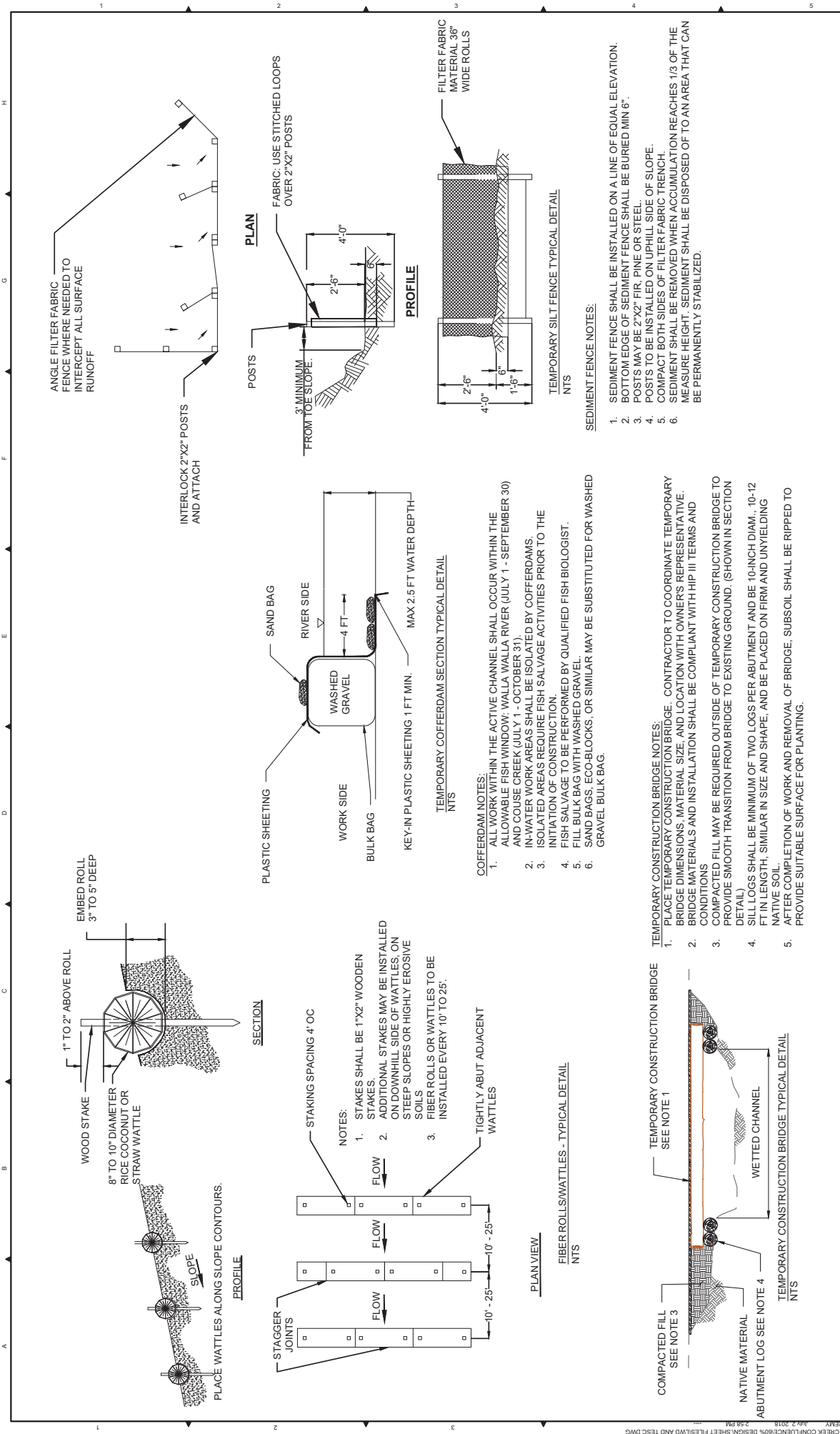
DWG NO. **C-104**

CREATED: 7/2/18
SHEET

PLOTTED AS ANSIS B (11 X 17), PLAN SHEET FULL SIZE ANSIS D (22 X 34)
REVISION DESCRIPTION

REV.	DATE	DRW	ENG	APP
C	7/2/18	USA	USA	CEE
B	1/9/18	USA	CEE	CU
A	10/31/17	USA	USA	CU

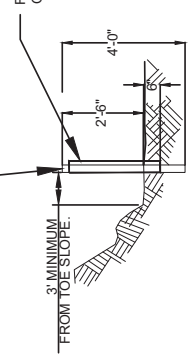
15 PERCENT CONCEPTUAL DESIGN



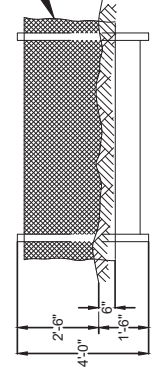
ANGLE FILTER FABRIC FENCE WHERE NEEDED TO INTERCEPT ALL SURFACE RUNOFF

INTERLOCK 2"x2" POSTS AND ATTACH

PLAN



PROFILE

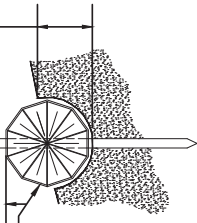


TEMPORARY SILT FENCE TYPICAL DETAIL
NTS

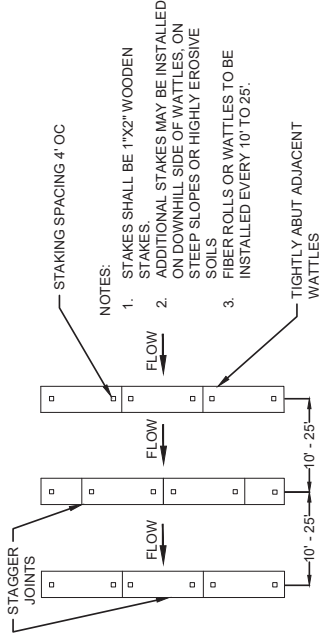
SEDIMENT FENCE NOTES:

1. SEDIMENT FENCE SHALL BE INSTALLED ON A LINE OF EQUAL ELEVATION.
2. BOTTOM EDGE OF SEDIMENT FENCE SHALL BE BURIED MIN 6".
3. POSTS MAY BE 2"x2" FIR, PINE OR STEEL.
4. POSTS TO BE INSTALLED ON UP/HILL SIDE OF SLOPE.
5. COMPACT BOTH SIDES OF FILTER FABRIC TRENCH.
6. SEDIMENT SHALL BE REMOVED WHEN ACCUMULATION REACHES 1/3 OF THE MEASURE HEIGHT. SEDIMENT SHALL BE DISPOSED OF TO AN AREA THAT CAN BE PERMANENTLY STABILIZED.

EMBED ROLL 3" TO 5" DEEP



SECTION



PLAN VIEW

FIBER ROLL/WATTLES - TYPICAL DETAIL
NTS

SAND BAG

RIVER SIDE

4 FT

MAX 2.5 FT WATER DEPTH

KEY-IN PLASTIC SHEETING 1 FT MIN.

WORK SIDE

BULK BAG

WASHED GRAVEL

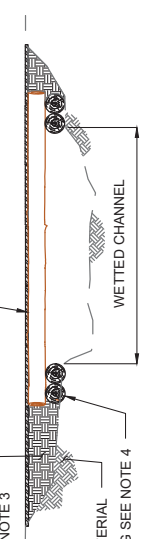
PLASTIC SHEETING

TEMPORARY COFFERDAM SECTION TYPICAL DETAIL
NTS

COFFERDAM NOTES:

1. ALL WORK WITHIN THE ACTIVE CHANNEL SHALL OCCUR WITHIN THE ALLOWABLE FISH WINDOW: WALLA WALLA RIVER (JULY 1 - SEPTEMBER 30) AND COUSE CREEK (JULY 1 - OCTOBER 31).
2. IN-WATER WORK AREAS SHALL BE ISOLATED BY COFFERDAMS.
3. ISOLATED AREAS REQUIRE FISH SALVAGE ACTIVITIES PRIOR TO THE INITIATION OF CONSTRUCTION.
4. FISH SALVAGE TO BE PERFORMED BY QUALIFIED FISH BIOLOGIST.
5. FILL BULK BAG WITH WASHED GRAVEL.
6. SAND BAGS, ECO-BLOCKS, OR SIMILAR MAY BE SUBSTITUTED FOR WASHED GRAVEL BULK BAG.

TEMPORARY CONSTRUCTION BRIDGE
SEE NOTE 1

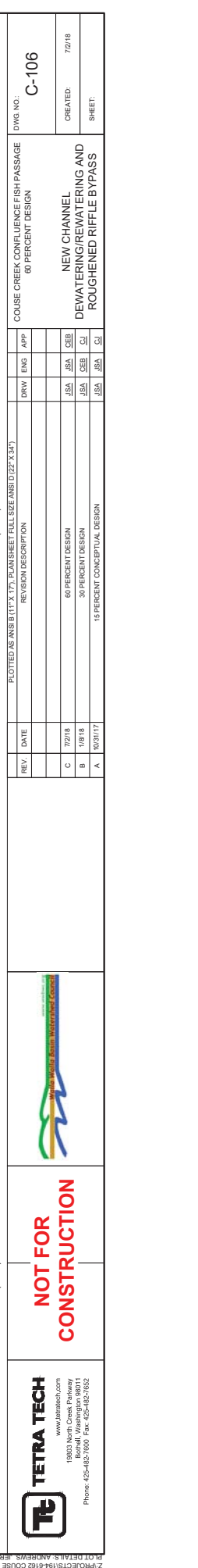
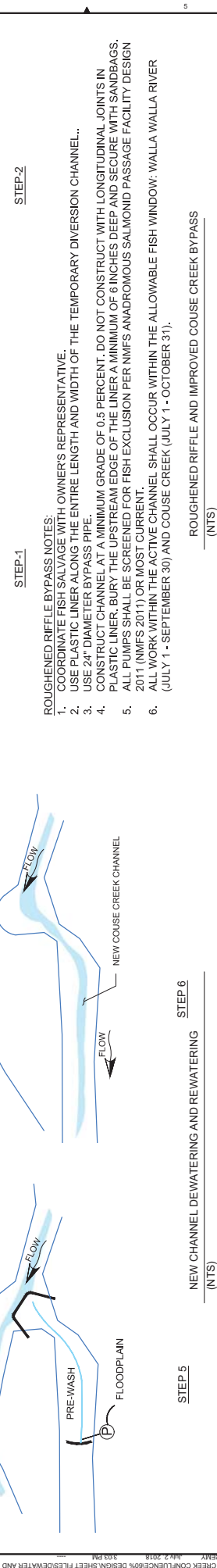
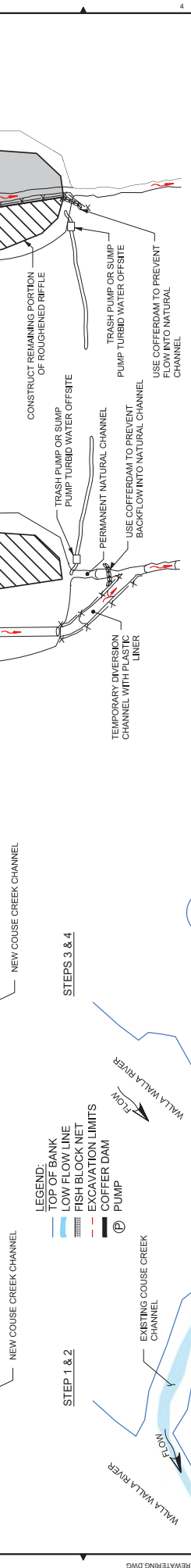
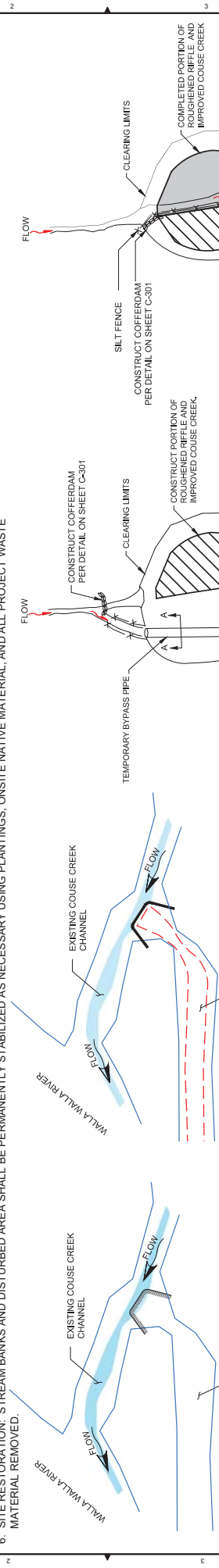
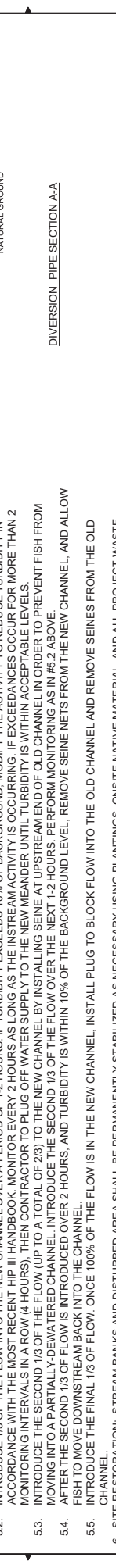
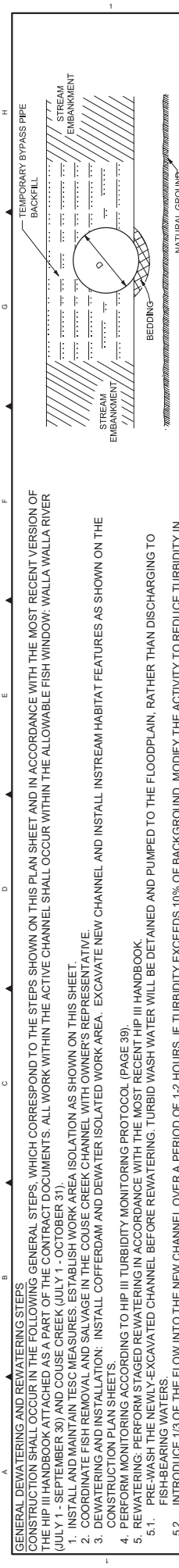


TEMPORARY CONSTRUCTION BRIDGE TYPICAL DETAIL
NTS

TEMPORARY CONSTRUCTION BRIDGE NOTES:

1. PLACE TEMPORARY CONSTRUCTION BRIDGE. CONTRACTOR TO COORDINATE TEMPORARY BRIDGE DIMENSIONS, MATERIAL SIZE, AND LOCATION WITH OWNER'S REPRESENTATIVE.
2. BRIDGE MATERIALS AND INSTALLATION SHALL BE COMPLIANT WITH HIP III TERMS AND CONDITIONS.
3. COMPACTED FILL MAY BE REQUIRED OUTSIDE OF TEMPORARY CONSTRUCTION BRIDGE TO PROVIDE SMOOTH TRANSITION FROM EXISTING GROUND. (SHOWN IN SECTION DETAIL).
4. SILL LOGS SHALL BE MINIMUM OF TWO LOGS PER ABUTMENT AND BE 10-INCH DIAM., 10-12 FT IN LENGTH, SIMILAR IN SIZE AND SHAPE, AND BE PLACED ON FIRM AND UNYIELDING NATIVE SOIL.
5. AFTER COMPLETION OF WORK AND REMOVAL OF BRIDGE, SUBSOIL SHALL BE RIPPED TO PROVIDE SUITABLE SURFACE FOR PLANTING.

<p>TETRA TECH www.tetrattech.com 1845 N. 19th Street Bozali, WA 98011 Phone: 425-452-7600 Fax: 425-452-7652</p>	<p>NOT FOR CONSTRUCTION</p>		REV. DATE	DESCRIPTION	APP.	
			C	80 PERCENT DESIGN	USA	CEB
			B	30 PERCENT DESIGN	USA	CEB
			A	15 PERCENT CONCEPTUAL DESIGN	USA	CEB
<p>COUSE CREEK CONFLUENCE FISH PASSAGE 80 PERCENT DESIGN</p>			DRW	ENG	APP.	
<p>DWG NO. C-105</p>			<p>CREATED: 7/20/18</p>			
<p>DETAILS TECS</p>			<p>SHEET</p>			



ROUGHENED RIFLE BYPASS NOTES:

- COORDINATE FISH SALVAGE WITH OWNER'S REPRESENTATIVE.
- USE PLASTIC LINER ALONG THE ENTIRE LENGTH AND WIDTH OF THE TEMPORARY DIVERSION CHANNEL.
- USE 24" DIAMETER BYPASS PIPE.
- CONSTRUCT CHANNEL AT A MINIMUM GRADE OF 0.5 PERCENT. DO NOT CONSTRUCT WITH LONGITUDINAL JOINTS IN PLASTIC LINER. BURY THE UPSTREAM EDGE OF THE LINER A MINIMUM OF 6 INCHES DEEP AND SECURE WITH SANDBAGS. ALL PUMPS SHALL BE SCREENED FOR FISH EXCLUSION PER NMFS ANADROMOUS SALMONID PASSAGE FACILITY DESIGN 2011 (NMFS 2011) OR MOST CURRENT.
- ALL WORK WITHIN THE ACTIVE CHANNEL SHALL OCCUR WITHIN THE ALLOWABLE FISH WINDOW: WALLA WALLA RIVER (JULY 1 - SEPTEMBER 30) AND COUSE CREEK (JULY 1 - OCTOBER 31).

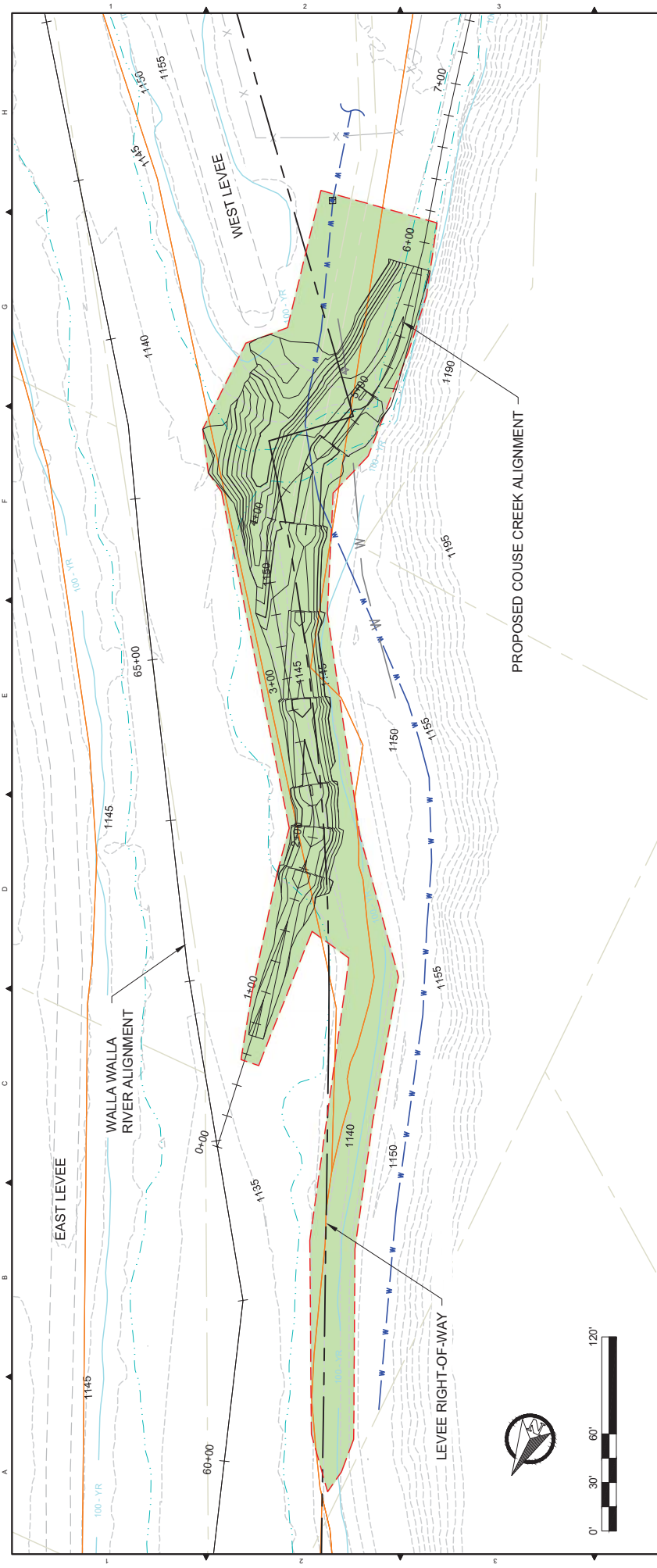
ROUGHENED RIFLE AND IMPROVED COUSE CREEK BYPASS (NTS)

REV.	DATE	DESCRIPTION	DRW	ENG	APP
C	7/20/18	80 PERCENT DESIGN	USA	CEB	CEB
B	1/9/18	30 PERCENT DESIGN	USA	CEB	CJ
A	10/31/17	15 PERCENT CONCEPTUAL DESIGN	USA	USA	CJ

PROJECTS/1914-1914-6182 COUSE CREEK CONFLUENCE FISH PASSAGE
 SHEET NO. C-106
 CREATED: 7/20/18
 NEW CHANNEL DEWATERING/REWATERING AND ROUGHENED RIFLE BYPASS



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NOTES:
 1. RIPARIAN PLANTING AREA = 0.96 ACRES

- LEGEND:**
- RIVER ALIGNMENT
 - PROPERTY BOUNDARY
 - - - LEVEE RIGHT-OF-WAY
 - - - EXISTING FENCE
 - SURVEY CONTROL POINT
 - EXISTING 100-YEAR (USAGE) FLOW
 - EXISTING BANKFULL FLOW
 - SPECIAL FLOOD HAZARD AREA
 - EXISTING WATER MAIN
 - EXISTING 1-FOOT CONTOUR
 - EXISTING 5-FOOT CONTOUR
 - PROPOSED 1-FOOT CONTOUR
 - PROPOSED 5-FOOT CONTOUR
 - PROPOSED RIPARIAN PLANTING

 TETRA TECH <small>www.tetratech.com 1645 N. Washington Blvd., Walla Walla, WA 99015 Phone: 425-452-7600 Fax: 425-452-7652</small>		NOT FOR CONSTRUCTION				PLOTTED AS ANSIS B (11 X 17), PLAN SHEET FULL SIZE ANSIS D (22 X 34) REVISION DESCRIPTION C 7/2/18 60 PERCENT DESIGN B 1/8/18 30 PERCENT DESIGN A 10/31/17 15 PERCENT CONCEPTUAL DESIGN		DRW ENG APP USA USA CEE USA USA CUI	COUSE CREEK CONFLUENCE FISH PASSAGE 80 PERCENT DESIGN	DWG NO.: L-100 CREATED: 7/2/18 SHEET:
PLANTING PLAN										

CRITERIA FOR PLANTING PLAN

1. LOCAL STOCK OF NATIVE SPECIES SHOULD BE USED TO THE EXTENT POSSIBLE BECAUSE THESE STOCKS WOULD BE BEST SUITED TO AND ADAPTED TO LOCAL CONDITIONS.
2. FINAL PLANTING PLANS WILL BE BASED ON THE FINAL CONSTRUCTION DESIGN. FACTORS SUCH AS TOPOGRAPHY DISTANCE TO STREAM CHANNEL AND SIDE CHANNEL SHALL BE TAKEN INTO ACCOUNT. THE FINAL PLANTING PLAN WILL BE INTENDED TO FACILITATE PLANT SURVIVAL AND TO FACILITATE PROJECT GOAL OF IMPROVING AQUATIC AND RIPARIAN HABITAT.
3. TO AUGMENT SURVIVAL OF RIPARIAN PLANTINGS:
 - a. FINAL PLACEMENT OF PLANTS SHALL BE CHOSEN BASED ON MICROSITE CONDITIONS, BECAUSE SOIL PROPERTIES AND WATER TABLE DEPTH CAN VARY OVER SHORT DISTANCES, SUCH THAT SPECIES ARE BEST MATCHED TO THEIR SITE CONDITIONS.
 - b. SITE PREPARATION, SUCH AS REMOVAL OF WEEDS OR OTHER SPECIES THAT WILL COMPETE WITH SEEDLINGS AND TILLING OF THE SOIL SHALL OCCUR PRIOR TO PLANTING.
 - c. IF NECESSARY, SOIL AMENDMENT, SUCH AS FERTILIZER, SHALL BE INCORPORATED PRIOR TO OR DURING PLANTING.
 - d. IF NECESSARY, MEASURES SUCH AS TUBING, OR OTHER ANIMAL CONTROL TECHNIQUES, CAN BE UTILIZED TO PROTECT WOODY PLANTS FROM GRAZING/HERBIVORY.
 - e. IF POSSIBLE, PLANTS SHALL BE INSTALLED IN THE LATE FALL THROUGH EARLY SPRING TO MINIMIZE THE NEED FOR SUPPLEMENTAL WATER AND TO ALLOW FOR THE OPTION OF USING BARE ROOT PLANT STOCK IF AVAILABLE.

GENERAL PLANTING NOTES

1. IF APPLICABLE, SUPPLEMENTAL FERTILIZER MAY BE ADDED TO THE BOTTOM OF EACH TREE AN SHRUB PLANTING HOLE PRIOR TO PLANTING AND BACKFILLING. IF USED, FERTILIZERS SHALL BE SLOW RELEASE PRODUCTS THAT WILL NOT RESULT IN NUTRIENT RUNOFF INTO AQUATIC SYSTEMS.
2. IF APPLICABLE, ADDITION OF MULCH THREE INCHES DEEP MAY BE PLACED IN AN 18 INCH DIAMETER RING AROUND EACH TREE AND SHRUB TO PREVENT COMPETITION WITH INVASIVE SPECIES.

RIPARIAN PLANTING ZONE EXAMPLE SEQUENCE:

1. SEED BARE SOIL AT APPROXIMATELY 30 LBS/ACRE IN SELECTED AREAS AS NEEDED/DESIRED FOR EROSION CONTROL.
2. INSTALL PLANTS BASED ON MICROSITE VARIATIONS WITHIN RIPARIAN PLANTING ZONE.
3. PLANTS SHOULD BE PLANTED AT APPROXIMATELY 4 TO 8 FEET ON CENTER. HOWEVER, FINAL PLANT SPACING WILL DEPEND ON SPECIFIC SITE CONDITIONS AND DESIRED OUTCOMES AND SHOULD BE DESIGNED DURING FINAL PLAN DESIGN.

LIVE STAKES DESCRIPTION:

IF USED, LIVE STAKES SHOULD BE INSTALLED ALONG BANKS OF STREAM AND SIDE CHANNEL, WHERE APPLICABLE. THE WIDTH OF THE ZONE FOR PLANTING LIVE STAKES WILL DEPEND ON SITE CONDITIONS AND DESIGN CHARACTERISTICS INCLUDING FINAL GRADE OF BANK AND MOISTURE AVAILABILITY.

EXAMPLE SEQUENCE:

1. SEED BARE SOIL AT APPROXIMATELY 30 LBS/ACRE IN SELECTED AREAS AS NEEDED/DESIRED FOR EROSION CONTROL.
2. INSTALL STAKES BASED ON MICROSITE VARIATIONS WITHIN RIPARIAN PLANTING ZONE.
3. DEPENDING ON DESIRED DENSITY, STAKES MAY BE PLANTED AT APPROXIMATELY 1 TO 10 FEET ON CENTER.

SELECTION AND INSTALLATION NOTES:

1. LIVE STAKES SHOULD BE BETWEEN 18-48 INCHES LONG AND AT LEAST 1/2" IN DIAMETER.
2. STAKES SHOULD BE CUT STRAIGHT AT THE TIP OF THE BRANCH AND AT AN ANGLE AT THE BASE OF CUTTING TO ENSURE THE CORRECT END IS KEPT INTO THE GROUND.
3. DRIVEN STAKES MOIST AND IN A DARK PLACE UNTIL INSTALLED; DO NOT LET STAKES DRY OUT.
4. SOAKING STAKES BEFORE INSTALLATION INCREASES SURVIVAL AND GROWTH WEIGHT.
5. DRIVE STAKES INTO THE SOIL SO AT LEAST 3/4 OF ITS LENGTH IS UNDERGROUND; LEAVE AT LEAST 1/2 INCHES ABOVE GROUND.
6. USE THICKER DIAMETER STAKES WHEN PLANTING IN RIPRAP; THICKER DIAMETER STAKES WILL RESIST HEAT AND DRYING BETTER THAN SMALLER CUTTINGS.
7. PLANT STAKES DURING THE DORMANT SEASON.

SEED MIX DESCRIPTION:

SEED MIX, COMPOSED OF NATIVE SPECIES, SHALL BE USED ON BARE SOIL IN SELECTED AREAS OF THE RIPARIAN PLANTING ZONES AS NEEDED/DESIRED FOR EROSION CONTROL.

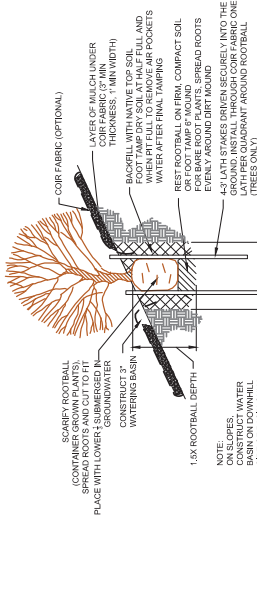
NOTES:

1. SEED AT APPROXIMATELY 30 LBS/ACRE; FINAL QUANTITY OF SEED MIX PER ACRE WILL DEPEND ON SPECIES COMPOSITION AND SITE CONDITIONS.
2. SPECIES TO BE USED FOR SEED MIXES) AND FINAL COMPOSITION SHOULD BE CHOSEN BASED ON SITE SPECIFIC DESIGN AND CONDITIONS (E.G. SLOPE, WIDTH OF PLANTING ZONE, MOISTURE AVAILABILITY)
3. ALL SEED MIXES SHOULD BE CERTIFIED WEED-FREE.

POTENTIAL SPECIES FOR FLOODPLAIN SEED MIX

Scientific Name ²	Common Name	Percent Composition
<i>LETIUM CINCERUS</i>	GREAT BASIN WILDOYE	30
<i>FESTUCA IDAHOENSIS</i>	IDAHO FESCUE	20
<i>DESCHAMPSIA CESPITOSA</i>	TUFTED HAIRGRASS	15
<i>LETIUM GALICUS</i>	BLUE WILDOYE	15
<i>PSEUDOROEGHNERIA SPICATA</i>	BLUEBUNCH WHEAT GRASS	15
<i>BROMUS CARINATUS</i> VAR. <i>MARGINATUS</i>	MOUNTAIN BROME	5
TOTAL		100

¹ Acres and seed mix required are estimates based on 60% design.



POTENTIAL SPECIES FOR RIPARIAN REVEGETATION

Growth Habit	Scientific Name	Common Name	Percent Composition ²	Propagation Method	Spacing (feet o.c.)	Density per Acre ¹	Quantity ¹
Tree	<i>ALNUS RHOMBIFOLIA</i> ³	WHITE ALDER	40	CONTAINER	15	77	163
	<i>POPULUS BALSAMIFERA</i> SUBSP. <i>TRICHOCARPA</i>	BLACK COTTONWOOD	40	CONTAINER	15	77	163
	<i>PINUS PONDEROSA</i>	PONDEROSA PINE	10	CONTAINER	15	19	41
	<i>PSEUDOTSUGA MENZIESII</i>	DOUGLAS FIR	10	CONTAINER	15	19	41
	<i>SALIX EXIGUA</i> ³	COYOTE WILLOW	20	LIVE STAKE	6	203	427
	<i>CORNUS SERICEA</i> ³	REDOSIER DOGWOOD	20	LIVE STAKE OR CONTAINER	6	203	427
Shrub	<i>CRATAEGUS DOUGLASII</i>	BLACK HAWTHORN	10	CONTAINER	6	102	213
	<i>PHILADELPHUS LEWISII</i>	LEWIS' MOCK ORANGE	10	CONTAINER	6	102	213
	<i>PHYSOCARPUS CAPTATUS</i> ³	PACIFIC NINEBARK	10	CONTAINER	6	102	213
	<i>PRUNUS VIRGINIANA</i>	CHOKECHERRY	10	CONTAINER	6	102	213
	<i>SYMPHORICARPOS ALBUS</i>	SNOWBERRY	10	CONTAINER	6	102	213
	<i>ACER GLABRUM</i>	ROCKY MOUNTAIN MAPLE	5	CONTAINER	6	51	107
	<i>ROSA MUTKANA</i>	NOOTKA ROSE	5	CONTAINER	6	51	107

¹ Acres, density per acre, and quantities are estimates based on 60% design, the final species list and quantities will be decided when construction plans are finalized.

² Percent composition adds to 100 for each strata (i.e., tree, shrub).

³ This species should be placed near the bank of the side channel.

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NOT FOR CONSTRUCTION

REV. DATE DESCRIPTION

C	7/2/18	80 PERCENT DESIGN
B	1/9/18	30 PERCENT DESIGN
A	10/31/17	15 PERCENT CONCEPTUAL DESIGN

DRW ENG APP

USA USA CEE

USA USA CEE

USA USA CEE

PLANTING PLAN

DWG NO.: L-101

CREATED: 7/9/18

SHEET