Application Name: Dry Creek Aiwohi-Cisco Habitat Restoration

Application Number: 218-8205-16255

By: Union SWCD

Offering Type: Upper Grande Ronde Initiative

Application Type: Restoration

OWEB Region: Eastern Oregon
County: Union
Coordinates: 45.491902,-118.028396

Applicant:
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Budget Summary:
OWEB Amount Requested: $110,000
Total Project Amount: $355,195

Administrative Information

Abstract

Provide an abstract statement for the project in 250 words or less. Include the following information: 1) Identify the project location; 2) Briefly state the project need; 3) Describe the proposed work; 4) Identify project partners.

Dry Creek, a perennial fish bearing tributary of Willow Creek located West of Summerville, Oregon in Union County, is a highly productive mid-elevation spawning and rearing habitat for Snake River summer steelhead. Existing conditions indicate an overwidened system where overland flow is limited during summer months. Large sections of Dry Creek flow sub-surface through deep alluvial deposits, but surface flow is typically present throughout the project site, providing critical habitat in the few existing pools during summer months.

Past land use practices have confined the stream to a single channel, resulting in decreased sinuosity and increased channel gradient. This has reduced channel complexity and increased sheer stress on stream banks causing active bank erosion, and thereby impeding riparian vegetation establishment. Over the past 7 years scientific research has been conducted throughout the Dry and Willow Creek Basins (CTUIR, ODFW) with Dry creek designated as a high priority stream for restoration in the Grande Ronde Basin.

Stream temperature data was collected for five years in correlation with a restoration project previously completed downstream. This data indicates that stream temperatures remain cool through the summer months. Additional data indicates that Dry Creek produces more redds than other index reaches in the Grande Ronde Basin. Stream temperatures warm quickly downstream from the project area, suggesting the lower 1 mile of Dry Creek could provide significant summer refugia for steelhead for both upstream and donwstream migrants.

Project actions are intended to increase floodplain connectivity, stream sinuosity, spawning habitat, channel complexity, and riparian plant vigor and diversity. Project partners include review team members from CTUIR, GRMW, ODFW and the landowner, Mary Aiwohi. Implementation funding is being sought through OWEB and BPA.

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)*

✓ *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

Mary Aiwohi

❑*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*

❑*Transporting individuals on the water*

❑*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.

The Willow Creek Watershed provides important habitat for federally listed Snake River summer steelhead, potential spawning and rearing habitat for spring Chinook salmon, and supports a variety of native resident fish species. Past land use practices have significantly impacted the system's ability to produce and maintain viable populations of anadromous fish species. The removal of riparian and wetland vegetation, and intense livestock utilization have decreased floodplain connectivity, de-stabilized stream channels, and decreased riparian and wetland habitat. Straightened reaches of the stream channel have incised, leading to bank erosion and high sediment loading.

Limiting factors were documented for the basin in the Willow Creek Watershed Analysis (GRMW 2001). Key limiting factors include large wood deficiencies, lack of shade, high summer water temperatures, elevated sediment and nutrient inputs, loss of wetlands, stream channelization and stream flow depletion. Additional field surveys conducted throughout the Willow Creek Basin and just below the project site by ODFW and CTUIR in 2010, found severe bank erosion, channel incision and head cutting in localized reaches, reduced stream length, high channel width-to-depth ratios, lack of floodplain connectivity, poor groundwater interaction, and lowered water table.

Recent site visits conducted by USWCD and ODFW found that similar limiting factors applied to the project site. A review of the historical aerial photography from 1947 show Dry Creek having a large meander bend as the creek enters the Aiwohi property. Photographs taken between 1947 and 1957 indicate the stream channel was straightened, removing the oxbow and reducing the stream length by approximately 375 feet. In addition, the site was heavily grazed by livestock under past landowner management. The straightened reach of the project site has deeply incised causing excessive bank erosion (Figure 1). This channel incision has led to erosion of approximately 80% of the stream banks over the entire project reach. Past efforts to maintain stream banks and protect infrastructure have included rock barbs and the addition of concrete rip-rap (Figure 2). These additions have had limited beneficial effects.

The riparian zone is dominated by grass with few residual alder and willows (Figure 3). Spawning gravels are present on the site but only in relation to the few pools that exist. The few existing pools are relatively deep (residual pool depth of 2-3 feet) but lack cover and complexity. The reach is dominated by riffle habitat, which is uncharacteristic for a natural stream with similar stream gradients. Dry Creek throughout the project reach is listed on the 303 (d) list for dissolved oxygen, flow modification, habitat modification, nutrients, sedimentation, and temperature.

Dry Creek has been characterized as a high priority stream for restoration, and one of the highest steelhead producers in the Grande Ronde Basin. Upstream of the project area, the flow is subsurface through the summer months, but maintains surface flow within the project area. The lower mile of Dry Creek provides thermal refugia for steelhead during the summer months. The Aiwohi project would add additional habitat uplift to 4 miles of habitat restoration in the Willow Creek Drainage in a contiguous block.

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

Dry Creek has experienced major changes over the past century related to land management practices. The total stream length of Dry Creek is 14.3 miles. Stream slope is less than 0.01 from the mouth to River Mile (RM) 7, increase slightly from RM 7 to RM 9 up to 0.02, and increase from RM 9 to RM 14.3 to between 0.02 to 0.04. The headwaters originate on land managed by the U.S. Forest Service (RM 14.3 to RM 10) where the stream flows through a confined valley form. The most significant impacts in the headwaters are related to road building and timber harvest.

Below U.S. Forest Service management (RM 10-RM 7) is a mixture of private timber lands and ranch land. This section of the stream is located in a moderately confined valley form. Land management impacts to the stream network consist of timber harvest, road building, grazing, and mining. From RM 7 to the confluence of Dry Creek

with Willow Creek the stream is in an unconfined valley form. The predominant land use in this section of the stream is crop production and grazing, and land management practices have had the most significant impacts on this portion of the stream. The stream was channelized through large portions of this reach to increase farm field space and reduce the flooding risk. This has led to stream incision and a disconnection between the channel and floodplain. Overgrazing and channel incision have dramatically reduced riparian plant communities along the banks of Dry Creek and have led to bank instability and excessively high sediment loading.

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*

Proposed Solution

Goals and Objectives

Provide a goal statement for this restoration application.

The goal of this restoration effort is to enhance and increase natural channel function and processes that improve habitat suitability for spawning and rearing summer steelhead, spring Chinook salmon, and other native fish and wildlife resources.

List the objectives of this restoration application.

1. Increased quantity of large wood pieces (greater than 6-inch diameter and 10 feet long) to greater than 15 per 100 feet of stream length by 2020 and following a discharge greater than a 2-year recurrence interval.

2. Increase the quantity of individual habitat unit types (riffle, pool, glide) to at least 7.5 per 20 times the average bankfull width by 2022 and following the occurrence of at least 3 discharge events greater than a 2-year recurrence.

3. Increase the area of zero velocity habitat and side channel habitat to 20% of the total inundated area at the 2-year recurrence discharge.

4. Increase the area of spawning substrate grain size ranging from fine gravel (>4mm) to small cobble (<64mm) in pool tailout areas by 2022.

5. Increase stem density of native riparian shrub and tree species to a minimum of 195 stems per acre by 2022.

6. Increase native riparian plant species diversity (herbaceous, shrub, tree) to over 600%.

7. Increase the inundated floodplain area to twice (2x) the pre-project condition during peak discharge events greater than the modeled 2-year recurrence.

8. Achieve an average bankfull width/depth ratio less than 30 by 2022 and following the occurrence of a discharge greater than a 2-year recurrence.

9. Increase channel sinuosity to greater than 1.6 by 2022.

10. Decrease channel entrenchment, measured as a ratio between floodprone width of the 25-year recurrence inundation level and the bankfull width, to an increased value greater than 2.2 by 2022.

11.Increase the quantity of pools greater than 3 feet in depth at bankfull flow to greater than 35% of total stream area and at a frequency of length between pools less than 8 times bankfull channel width.

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

Provide OWEB Grant #(s)
216-8205-15453

What was completed with previous OWEB grants?
This was a Technical Assistance grant that paid for the design and permitting of this project.

Why is additional OWEB funding needed?
This funding will allow for the construction of the engineered design completed with the previous grant.

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.
Willow Creek Watershed Assessment (OWEB format, GRMW 2001)
RE: limiting factor such as stream temperature, sediment loading, and channel incision that have been identified through the assessment and the management plan.

Willow Creek Coordinated Resource Management Plan (CRMP, Union SWCD 2002) RE: project scoping, landowner wishes, and project implementation.

Upper Grande Ronde River Restoration Atlas (BPA, GRMW) RE: restoration prioritization

Federal Columbia River Power System (FCRPS Biological Opinion (BiOp) (U.S. Bureau of Reclamation, Bonneville Power Association, US Army Corps of Engineers, 2004); Re: substrate, water quality, quantity, temperature, riparian vegetation.

Northeast Oregon Snake River Recovery Plan (National Marine Fisheries Service, 2010); Re: increased sediment quantity, riparian condition, LWD recruitment and temperature. side channel & wetland conditions, floodplain connection, anthropological barriers, in-stream structural complexity decreased water quantity.

NMFS [National Marine Fisheries Service]. 2014. Endangered Species Act Section 7(a) (2) Supplemental Biological Opinion. Consultation on Remand for Operation of the Federal Columbia River Power System. National Oceanic

and Atmospheric Administration. NWR-2013-9562. Re: basin appropriate passage and limiting factors.

NMFS [National Marine Fisheries Service]. 2013. Draft Proposed ESA Recovery Plan for Snake River Spring/Summer Chinook salmon and Snake River Steelhead. National Marine Fisheries Service, Northwest Region. National Oceanic and Atmospheric Administration. Predecisional document, Accessed March 28, 2014. Re: limiting factors by species.

Bureau of Reclamation (Reclamation). 2014. Upper Grande Ronde River Tributary Assessment, Grande Ronde

River Basin, Tributary Habitat Program, Oregon: Department of Interior, Bureau of Reclamation, Pacific Northwest Region, Boise, Idaho, 74 p RE: limiting factors

Will this project benefit salmon or steelhead?

● Yes
❍ No

✓Snake River Basin - Steelhead

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

The design plan will positively impact steelhead by greatly improving their habitat throughout the project reach. The channelized reach at the upstream portion of the property will be remeandered to increase pool habitat, decrease sedimentation, increase spawning gravel area, and increase stream length. Increased off-channel habitat will be developed in the form of alcoves and a side channel. The addition of these features will create increased juvenile rearing habitat and zero velocity habitat during high flow events. The increase in hyporheic exchange flows and a functioning riparian canopy through the project site will maintain cool temperatures through the critical lower mile of Dry Creek.

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

● Yes
❍ No

Regional Assessments or Recovery Plans
(Draft)Proposed ESA Recovery Plan for Snake River Spring/Summer Chinook & Snake River Steelhead
Northwest Power and Conservation Council Grande Ronde Subbasin Plan
Oregon's Native Fish Conservation Policy
Oregon Conservation Strategy
The Oregon Plan for Salmon and Watersheds

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

The Project will be designed utilizing the strategy and concepts in the five conservation plans listed in the section above. Historical data for Dry Creek is limited, but does indicate that the creek has been a significant steelhead producer to the Upper Grande Ronde MPG. The Draft Recovery Plan for the Upper Grande Ronde for spring Chinook salmon and summer steelhead identify specific limiting factors that this project design will address. The project will create better flow conditions through the project site, and restore both floodplain connectivity and wetland function.

The Grande Ronde Subbasin Plan (NPCC 2004) identifies several management strategies that will be employed in the design of this project. The project design will utilize riparian management strategies that promote riparian and wetland function, exclude livestock degradation through long term easements, and increase and improve wildlife corridors.

The Oregon Plan for Salmon and Watersheds, Oregon's Native Fish Conservation Policy, and the Oregon Conservation Strategy outline strategies for maintaining and enhancing native populations of fish and wildlife populations. The project will be conducted in a high priority reach of Dry Creek (lower valley reach) to promote and enhance conditions for naturally produced steelhead populations. The project will be designed to focus on restoration of both riparian function and increased wetland habitat while greatly improving water quality throughout the project reach and downstream. The project includes voluntary landowner efforts to restore ecological conditions, as well as efforts by project partners from state and federal agencies, the conservation district, the watershed council and the local tribes.

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. -- Details will follow.*

❑ *Estuarine Habitat: tidally influenced areas.*

Instream Habitat

Select all applicable Instream categories.

✓Bank stabilization

How will the bank stabilization improve water quality and/or native fish or wildlife habitat?

The restoration effort for this project reach will focus on the creation of an inset floodplain. The project will set the stream banks back on a 1:6 or 1:7 slope on average of 80 feet on both sides of the creek. This entire area that is impacted by the project will be planted and seeded through CREP funding. The bank sloping and increased riparian vegetation will decrease fine sediments from entering the stream network. A fully functioning riparian community will maintain cool stream temperatures. The project will be protected on both sides of the creek with a 180 foot wide fence that will eliminate grazing from the stream banks further reducing sedimentation and fecal bacteria from reaching the stream.

How do the bank stabilization activities relate to and increase the ecological benefit of the other restoration activities proposed in the application?

The restoration effort proposes to create an inset flood plain that stabilizes stream banks by excavating material and reshaping stream banks. This will create the new base elevation for the large wood structures to be placed. This will also allow for the creation of wetland complexes and high flow side channels. The excavation will also allow for the creation of a new main channel through the project site with increased sinuosity.

Bank Stabilization Materials
Logs
Vegetation
Rootwads

Stream Side Information

Are you proposing to treat one or both sides of the streambank?

- ❍ One side
- ● Both sides

Left side miles treated
0.21

Right side miles treated
0.21

Total miles treated
0.21

❑Fish passage improvement
❑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*

Number of structures.

24

Average number of logs per structure.

8

Average length of logs per structure (feet)

30

Average diameter of logs per structure (feet)

1.2

Provide additional information on the log structures, as relevant.

The large wood structures that are proposed for this restoration effort have been designed to promote a more natural process and functioning stream channel network through the project reach. The project design will change the present amount of functioning large wood pieces (ODFW Aquatic Inventories) from 0 pieces currently to 500 key members per mile of stream. The large wood placement will transform the current flow regime during high flow events from high velocities throughout the project reach to highly variable velocities with significant increases in low and zero velocity sections throughout the project area.

The large wood structures very from location to location but can be broken down into four basic categories based on function. A total of 10 structures will be designed to create, and maintain pool scour and provide overhead cover. A total of ten structures will be designed to encourage scour and deposition and promote channel meanders. The project will have two high flow channels that provide increased area to defuse stream power and two structures will be placed to protect the inlets of these channels. Additionally, 2 structures will be placed to provide instream complexity along with 7 single or double log placements.

❑*Boulders*

✓*Combination log/boulder*

Number of structures

10

Average number of logs per structure.

8

Average length of logs per structure (feet)

30

Average diameter of logs per structure (feet)

1.2

Average number of boulders per structure.
13

Average size of boulders per structure (feet)
2

Average measurement of boulders per structure (feet)
2

Provide additional information on the structures, as relevant.
Boulders will be used to provide additional ballast for large wood structures and to promote microhabitat complexity.

❑*Other materials: Materials that stabilize the streambed*

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

What type(s) of change are you proposing to the channel configuration and connectivity?
Currently the channel through the project area is highly confined with a single thread. Hydraulic modeling for the project area suggest that restoring the stream to a more natural elevation would cause wide scale flooding during moderate flood events. for this reason the project design was developed to create an inset floodplain. The project design will increase the channel sinuosity from 1.15 to 1.81. A total of 5 alcove/wetland complexes will be constructed using existing low areas. two high flow channels will be created. Approximately 10,400 cubic yards of material will be excavated to create the inset floodplain.

Acres off-channel or floodplain habitat connected
2.69

Number of pools created/added
8

❑*Spawning gravel placement*
❑*Beaver reintroduction*
✓*Non-native plant control*

Specify species
Primary weed treatment will deal with thistle species and 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
8.4

❑*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
0.21

❑**Stockpiling logs**

Riparian Habitat

Select all applicable Riparian categories.

❑**Riparian road activities**

✓**Fencing and other materials for habitat protection**

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

✓*Fencing*

Type of fence
Barbed

Height (ft.)
4

Length (miles)
0.58

What other livestock and/or land management practices are you using in conjunction with fencing?
Water Gaps.

Are you proposing to fence one or both sides of the streambank?
❍ One side
● Both sides

Stream miles treated
.21

❑*Exclusion other than fencing*

Miles of fencing and other materials for habitat protection
0.58

Riparian acres protected by fencing and/or other exclusion
8.4

✓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

Reed Canary Grass and Thistle

Treatment(s) to be applied

❑*Mechanical (cutting, mowing, girdling, etc.)*

✓*Chemical (pesticides, fungicides, etc.)*

❑*Biological (predators, herbivores, pathogens, etc.)*

Acres to be treated

8.4

❑*Prescribed burnings, stand thinning, stand conversions, silviculture*

❑*Juniper treatment*

✓Livestock management

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

❑*Riparian pasture management*

❑*Cross fencing installed*

✓*Water gap development*

Number developed

2

❑Debris and Structure Removal

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

● Yes

❍ No

✓pH

✓Sediment

✓Nutrients

✓High Temperature

✓Dissolved Oxygen

✓Bacteria

Total riparian acres to be treated:

8.4

Total riparian streambank miles to be treated
.21

Are you proposing to treat one or both sides of streambank?
❍ One side
● Both sides

Left side of bank (miles)
.21

Right side of bank (miles)
.21

Stream miles
.21

Wetland Habitat

Are you working in artificial or historic wetland habitat? (select one or both)
❑*Artificial wetland*
✓*Historic wetland*

Select all applicable Wetland categories.
❑**Wetland road activities**

✓**Channel modification including creation**

Type of modification to channel
The project proposes the creation of an inset floodplain and stream lengthening through increased sinuosity.

Length of channel created or modified
.21

Miles of wetland habitat treated
.21

Acres of wetland habitat connected
5.4

✓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 plants

Willows will be trenched into wetland areas as part of this grant. All other plantings and fencing will be conducted post project under CREP.

Treatment(s) to be applied

❑*Mechanical (cutting, mowing, girdling, etc.)*

✓*Chemical (pesticides, fungicides, etc.)*

❑*Biological (predators, herbivores, pathogens, etc.)*

Acres to be treated

8.4

✓Fencing and other materials for habitat protection

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

✓*Fencing*

Type of fence

Barbed

Height (ft.)

4

Length (miles)

.58

What other livestock and/or land management practices are you using in conjunction with fencing?

Water Gaps

❑*Exclusion other than fencing*

Miles of fencing and other materials for habitat protection

.58

Wetland acres protected by fencing and/or other exclusion

3.4

❑Structure removal/modification/installation

❑Nonstructural removal and placement protection

Total wetland acres to be treated:

3.4

Wrap-Up

Outcomes

Explain how the proposed restoration activities address the watershed problem described in the Problem Statement and Goals and Objectives.

Primary limiting factors for the Willow Creek Watershed have been identified as large wood deficiencies, lack of shade, high summer water temperatures, elevated sediment and nutrient inputs, loss of wetlands, stream channelization and stream flow depletion. Additionally, subsequent surveys found severe bank erosion, channel incision and head cutting in localized reaches, reduced stream length, high channel width:depth ratios, lack of floodplain connectivity, poor groundwater interaction, and lowered water table that are likely contributing factors for limiting steelhead production in Dry Creek. All of the limiting factors listed above have been observed at this project site with the exception of high summer stream temperatures.

ODFW and the Upper Grande Ronde Restoration Atlas have identified the Dry Creek subwatershed as a priority steelhead area. Surveys have shown the presence of fair to excellent steelhead spawning habitat with generally more redds per mile of stream than other index reaches in the Grande Ronde basin (Johnson 2001). Upstream of the project site, 14 miles of stream length are listed as fish bearing, although large sections of the creek go sub-surface through deep alluvium, stranding fish that were unable to migrate downstream. Surface flow is present just upstream of the project site and is maintained continually through the summer months.

Stream temperature data was collected just below the project site for five years (2010-2014) as part of a CTUIR stream restoration project that restored 4 miles of Dry Creek and Willow Creek. The data indicates that Dry Creek remains relatively cool through the summer months with a maximum temperature of 20.4°C over the five year period of record. Fir Creek, a tributary that combines with Dry Creek to form Willow Creek 0.58 miles downstream of the project boundary, was on average 2°C to 4°C warmer than Dry Creek.

Dry Creek is critical habitat for juvenile salmonids in the lower one-mile of stream during the summer months. During this time, flows in large areas of the mid-basin are subsurface. Water starts to warm at the confluence of Fir and Dry Creeks, and temperatures in Willow Creek downstream often reach lethal limits. Given these factors, the lower one mile of Dry Creek is a natural area for steelhead to migrate from downstream areas to escape high water temperatures.

Pre-project monitoring has been conducted throughout the Willow Creek and Dry Creek channel networks for the past 7 years. ODFW has conducted steelhead spawning ground surveys below the project reach over the past 7 years and consistently found redds, although in low abundance. ODFW (Research) has monitored two CHaMP sites over the past 5 years upstream of the project area.

This implementation proposal seeks to address the limiting factors stated above by constructing an engineered design focused on improving aquatic habitat conditions and reducing land use impacts throughout the project reach. The straightened channel section at the upstream portion of the property will be realigned and meanders will be restored. Large wood complexes will be constructed to slow stream velocities and create backwater areas. The stream banks will be shaped to construct an inset floodplain and allow more frequent overbank flow during high flow events. A new side channel and several alcoves will be created to attenuate high flows and provide zero velocity habitat areas for rearing juvenile salmonids. The new channel alignment will be designed with appropriate pool/riffle sequences for a stream of this size and slope. The existing pools on the downstream portion of the project site will be augmented with additional large wood to create cover and velocity refugia. In combination with streambank sloping, riparian planting will be completed to reduce bank erosion and sedimentation, and promote long term bank stabilization. Floodplain surfaces will be planted with native vegetation and exclusion fence will be constructed to protect the area from livestock impacts. The District will assist the landowner with entering into a long term easement agreement.

This project would add approximately 0.21 miles of stream restoration of Dry Creek to the already completed 0.58 miles downstream, resulting in approximately 4 miles of contiguous stream length of treated floodplain and channel in the Willow Creek Watershed.

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

With BPA's involvement, ESA requirements for listed fish species will be met by using the HIP 4 process. The General Aquatic Conservation Measures identified in the HIP 4 Guidance of Programmatic Requirements and Process are included in the engineered plan set and include direction for timing of in-water work, protection from contaminants, site layout, access planning and stream crossings, staging of materials, equipment management, erosion control, spill prevention, invasive species control, work area isolation, and fish salvage.

The specific actions to reduce adverse impacts to the site and adjacent lands are further detailed in the design drawings, Basis of Design Report and construction specifications. Potential adverse impacts have been considered during the design process and all steps to mitigate, reduce or eliminate these impacts have been included in the process to develop final designs. A primary concern for the project area has been the risk of flooding, as there is limited area for high flows to dissipate. As part of the solution, the design approach is to develop an inset floodplain, rather than raising the stream bed elevation to the existing terrace.

Does this proposed project include outreach 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 Dry Creek project site is located within the Willow Creek Watershed and the District's focus area for implementing improvements in water quality management (SB1010 Plan). This type of restoration project shares common goals with an effort to improve water quality and riparian conditions in coordination with private landowners. The Dry Creek project in combination with past enhancement work completed downstream, will be used as an example of physical conditions and land management changes that are possible. Communication in the local area has already been used to raise awareness in the Dry Creek Subwatershed of the type of technical assistance the USWCD can provide landowners. Additional outreach to neighboring landowners is planned in order to increase the project extent and effectiveness. The project will also be highlighted in the USWCD's Annual Report that is completed each year.

Design

Were design alternatives considered?

● Yes
❍ No

If yes, describe the design alternatives that were considered and why the preferred alternative was selected.

Three design alternatives were considered prior to the selection of the proposed design for the Dry Creek Restoration.

Design Alternative 1) No Treatment

Design Alternative 2) Restore the stream network to a more natural elevation.

Design Alternative 3) Re-meander the stream into old meander scars.

All three alternatives were considered, and positive and negative expected outcomes were identified with all three. Alternative one was not viable given the landowner's concerns for the stream condition and the level of stream degradation. The second alternative was deemed not viable due to concerns of flooding of infrastructure and road networks. The third alternative also would lead to additional flooding issues with both homes and Striker Lane. The proposed design reactivates historic meander scrolls as much as possible, while minimizing flooding issues.

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 time line for the project is to have 80% designs and all of the permitting material sent to the agencies out by March 12, 2018 . Final Design will be completed by April 23, 2018.

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 Over Site and Fiscal Management	Jim Webster	USWCD	The District Manager with over 20 years of experience as a fluvial hydrologist developing natural resource management strategies, managing grant funding, and planning and implementing floodplain and fish habitat restoration projects.	jwebster@unionswcd.org	(541) 913-1313
Project Manager	Aaron Bliesner	USWCD	Project Manager with several years experience funding and implementing complex instream restoration projects.	abliesner@unionswcd.org	(541) 963-1313
Review Team Member	Jake Kimbro	CTUIR	Fish Habitat Biologist with several years experience funding and implementing complex instream restoration projects.	jakekimbro@ctuir.org	(541) 969-7941
Review Team Member	Jesse Steele	GRMW	Union County Project Coordinator with several years experience funding and implementing complex instream restoration projects.	jesse@grmw.org	(541) 663-0570
Review Team Member	Winston Morton	ODFW	Project Manager with several years experience funding and implementing complex instream restoration projects.	winston.h.morton@state.or.us	(541) 962-1837

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

Element	Start Date	End Date
RFP for Construction Contractors	4/2018	5/2018
Award Contract	6/2018	6/2018
Project Implementation (Instream)	8/2018	10/2018
Enroll in CREP Plant and Fence	10/2018	11/2018
Post Project Completion Reporting	12/2018	2/2019
Post Project Monitoring	11/2018	11/2021

Element	Q2 2018	Q3 2018	Q4 2018	Q1 2019	Q2 2019	Q3 2019	Q4 2019	Q1 2020	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021	Q3 2021	Q4 2021
RFP for Construction Contractors															
Award Contract															
Project Implementation (Instream)															
Enroll in CREP Plant and Fence															
Post Project Completion Reporting															
Post Project Monitoring															

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*
✓*Effectiveness monitoring will be conducted for this project*

Budget

Item	Unit Type	Unit Number	Unit Cost	OWEB Funds	External Cash	External In-Kind	Total Costs
Salaries, Wages and Benefits							
Aaron Bliesner (Project Management)	Hours	240	$27.26	$4,362	$0	$2,181	$6,543
Jim Webster (Project and Grant Administration)	Hours	80	$43.54	$1,742	$0	$1,742	$3,484
Mary Aiwohi (Foot Bridge Design and Construction) and Design Review	Match Lump Sum	1	$1,200.00	$0	$0	$1,200	$1,200
Project Partners Design Review (ODFW, CTUIR, and GRMW)	Hours	40	$60.00	$0	$0	$2,400	$2,400
			Category Sub-total	$6,104	$0	$7,523	$13,627
Contracted Services							
Tri County Weed (3 years of weed treatment at 2 applications a year)	Each	6	$1,417.00	$8,502	$0	$0	$8,502
Environmental Controls, Permit Compliance, and BMP's	Each	1	$3,500.00	$3,500	$0	$0	$3,500
Mobilization and Demobilization	Each	1	$10,000.00	$10,000	$0	$0	$10,000
Cleaning, Grubbing, Stockpile, and Disposal	Each	1	$7,170.00	$7,170	$0	$0	$7,170
Temporary Stream Crossing	Each	1	$7,500.00	$7,500	$0	$0	$7,500
Excavation	Cubic yards	10900	$5.00	$54,500	$0	$0	$54,500
Placed Material (In Channel)	Cubic yards	2500	$8.00	$2,792	$17,208	$0	$20,000
Install Bridge Abutments	Each	2	$5,000.00	$0	$10,000	$0	$10,000
Placed material (Placed on Site)	Cubic yards	8400	$4.00	$0	$33,600	$0	$33,600
Hourly Equipment Rental	Hours	47	$170.20	$0	$8,000	$0	$8,000
20' Log With Rootwad 12" DBH Installed	Each	11	$300.00	$0	$3,300	$0	$3,300
30' Log With Rootwad 14-16" DBH Installed	Each	96	$450.00	$0	$43,200	$0	$43,200
40' Whole Tree Installed	Each	11	$500.00	$0	$5,500	$0	$5,500
Slash Material installed	Cubic yards	120	$147.50	$0	$17,700	$0	$17,700
Racking Material (4-10"DBH at Min. 10' in Length) Installed	Each	585	$45.00	$0	$26,325	$0	$26,325
Boulders 2' Dia Installed	Each	128	$65.00	$0	$8,320	$0	$8,320
Vertical Piles (4-6" Dia at 8' length) Installed	Each	130	$60.00	$0	$7,800	$0	$7,800
Dewatering and Temporary Stream Diversions	Each	14	$1,500.00	$0	$21,000	$0	$21,000
Willow Trenching With 1 Stake Per Linear Foot	Each	750	$20.00	$0	$15,000	$0	$15,000
			Category Sub-total	$93,964	$216,953	$0	$310,917
Travel							
Travel to site	Miles	30	$25.00	$0	$750	$0	$750
			Category Sub-total	$0	$750	$0	$750
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							
Project Indirect Costs (BPA)	Each	1	$19,969.00	$0	$19,969	$0	$19,969
Land Use Information Form	Each	1	$30.00	$30	$0	$0	$30
Category Sub-total				$30	$19,969	$0	$19,999
Modified Total Direct Cost Amounts				$100,098	$237,672	$7,523	$345,293
Indirect Costs							
Federally Negotiated Indirect Cost Rate		Override Amount			$8,552		
Post Grant							
Status Reporting Amount	Status Reporting	3	$250.00	$750	$0	$0	$750
Effectiveness Monitoring Amount	Effectiveness Monitoring	1	$250.00	$250	$0	$0	$250
Plant Establishment Amount	Plant Establishment	1	$350.00	$350	$0	$0	$350
Total				$110,000	$237,672	$7,523	$355,195

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

N/A

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.

N/A

Funding and Match

Fund Sources and Amounts

Organization Type	Name	Source Note	Contribution Type	Amount	Description	Status
Landowner	Mary Aiwohi	Design Review and Bridge Construction	In-Kind - Labor	$1,200	Design Review and Bridge Construction	Secured
Tribe	Confederated Tribes of the Umatilla Indian Reservation	Design Review	In-Kind - Labor	$800	Design Review	Secured
Non-Governmental Organization	Union Soil and Water Conservation District	Jim Webster and Aaron Bliesner (Project Management and Implementation)	In-Kind - Labor	$3,923	Project Administration and Management	Secured
Non-Governmental Organization	Grande Ronde Model Watershed	Design Review	In-Kind - Labor	$800	Design Review	Secured
State	Oregon Department of Fish and Wildlife	Design Review	In-Kind - Labor	$800	Design Review	Secured
Federal	Bonneville Power Administration		Cash	$237,672	Project Implementation	Pending
Fund Source Cash Total				**$237,672**	**Fund Source In-Kind Total**	**$7,523**

Match

Contribution Source-Type: Description	Amount
Mary Aiwohi-In-Kind - Labor: Design Review and Bridge Construction	$1,200
Confederated Tribes of the Umatilla Indian Reservation -In-Kind - Labor: Design Review	$800
Union Soil and Water Conservation District-In-Kind - Labor: Project Administration and Management	$3,923
Grande Ronde Model Watershed-In-Kind - Labor: Design Review	$800
Oregon Department of Fish and Wildlife-In-Kind - Labor: Design Review	$800
Bonneville Power Administration -Cash: Project Implementation	$102,477
Match Total	**$110,000**

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

Support Letters: Landowner Letter.pdf -

Planting Details: Vegetation Plan.pdf -

Map: Aiwohi-Cisco Dry Creek Restoration Map.pdf -

Secured Match Forms: Match Funding Form.pdf -

Project Design: Dry Creek Restoration Design30% Reduced.pdf -

Federally Negotiated Indirect Cost Rate Plan: StateFederal Indirect agreement-FY15-Union SWCD.pdf -

Figures and Tables: Aiwohi Dry Creek Inundation Modeling.pdf -

Figures and Tables: UGR Partnership - Aiwohi-Cisco Dry Creek Restoration.pdf - **Excel Budget**

Reports: Aiwohi-Cisco Dry Creek Habitat Restoration IT Comments_Response.pdf - **IT Comments Response**

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.

The project area has a very limited riparian community. Stream side vegetation consists mainly of grasses and non-native willow species.

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.

Stream banks will be lowered to create an inset floodplain. Top soil and sod will be grubbed and stock piled during excavation. These layers will be placed back over the inset floodplain to create a suitable planting medium with existing grasses to aid in plant establishment. During Construction the only planting that will be conducted will be the planting of willow stakes. These will be planted using a backhoe and placed in trenches late in the fall of 2018. All other plantings will be conducted post grant by CREP.

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
CREP	0	0

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	Willow	Salix sp.	Tree	Cutting	2018	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.

The project area will be enrolled in CREP with the maximum buffer width of 180 feet on both sides of the creek. Water rights will be used to water the new plantings for the first three years after planting. The grant will pay for the first three years of weed treatment within the CREP boundary to reduce competition from non-native plant species.

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	60%

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

Plant growth success will be closely monitored for the first three years post construction to meet CREP requirements. Mitigation options will be dictated by CREP requirements. The landowner will continue plantings if the need arises.

Permit Page

Project Activity Requiring a Permit or License	Name of Permit or License	Entity Issuing Permit or License	Status
Fill and removal below ordinary high water	DSL/ACOE Joint Permit	Oregon Department of State Lands and the Army Core	Pending
Excavation	106 Compliance	SHIPO	Pending
Instream Restoration	Section 7 Compliance	NOAA and USFWS	Pending
Instream work in waters of the state	401 and 404 Water Quality Permits	ODEQ	Pending

Mary Aiwohi
67492 Slack Road
Summerville, OR 97876
541-910-2235

April 9, 2017

Dear UCSWCD,

I am writing this letter in hopes that you will consider funding a project to enhance and protect the tributary of Dry Creek that crosses our property in Summerville. The creek and surrounding land are rich in plant and wildlife species, including mule deer, white tail deer, elk, coyotes, foxes, racoons, owls, ducks, hawks, king fishers, turkey, geese, and large steel head. This year we even have nesting pairs of Canadian Geese and Western Bluebirds.

Currently, we have a small flock of sheep grazing the land, which causes far less impact than the previous herd of cattle and horses. The sheep could easily be limited to one crossing area, and if a small bridge were to be added, they would be able to graze the northwest meadow as well.

Somewhere along the way, the natural curves of the creek were removed, thus creating a fast-flowing, destructive straight stretch of water devoid of plant shelter and slow water. I would appreciate your input on the possibility of reintroducing some of those old, curvy water channels (which are still visible) to benefit both the fish and wildlife habitat. I look forward to planting dogwood, willows, and alders on the banks again once the water flow is slackened, thus thwarting the rapid erosion of the west creekbank.

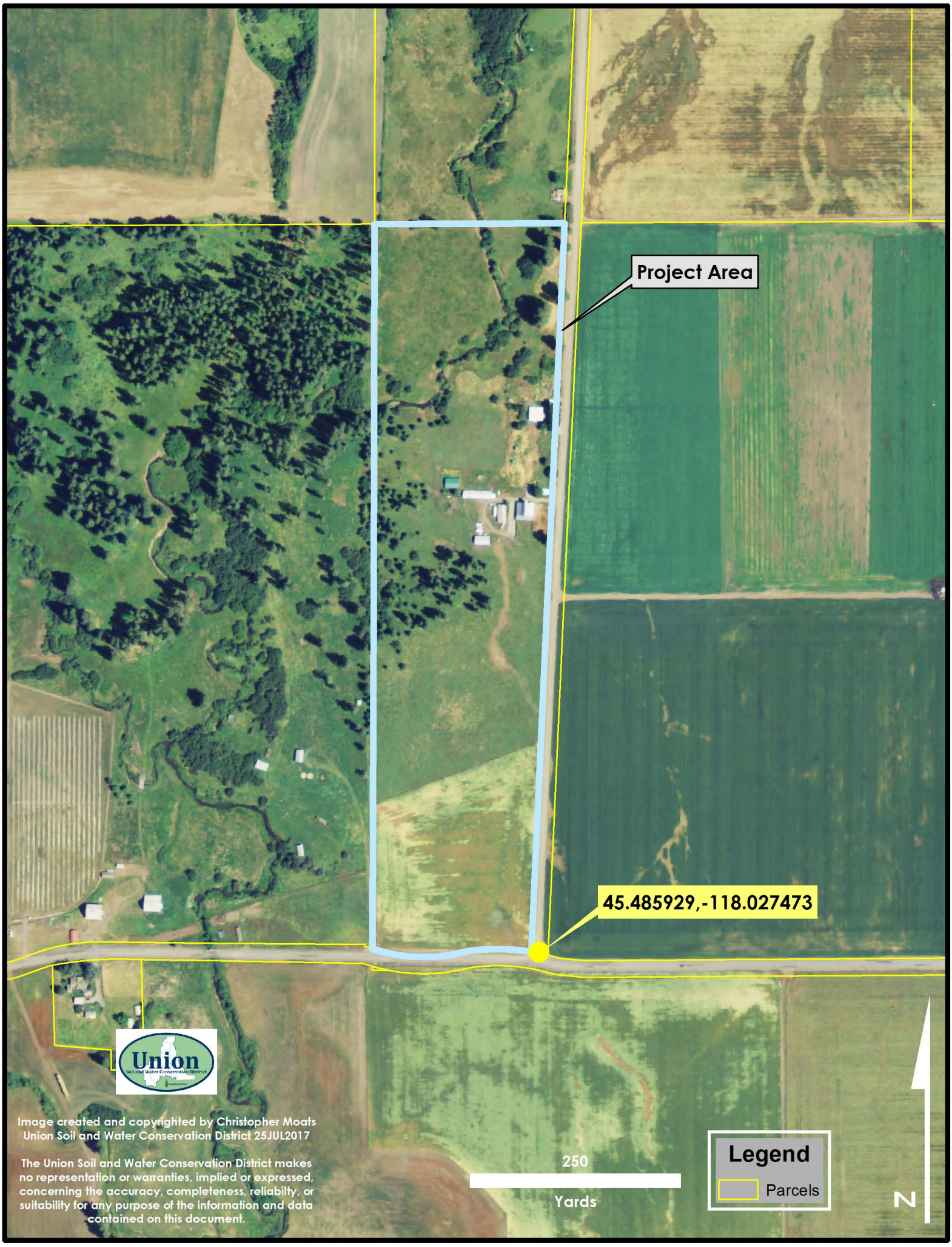
I am excited to have you visit this segment of Dry Creek and to hear any ideas you might have to augment this habitat that I love. I look forward to enhancing and protecting this little piece of paradise.

Thank you for your consideration,

Mary Aiwohi

Mary Aiwohi

See plan Set for Willow Trenching information


Project Area
45.485929,-118.027473
Union
Soil and Water Conservation District
Image created and copyrighted by Christopher Moats
Union Soil and Water Conservation District 25JUL2017
The Union Soil and Water Conservation District makes no representation or warranties, implied or expressed, concerning the accuracy, completeness, reliability, or suitability for any purpose of the information and data contained on this document.
250
Yards
Legend
Parcels
N

MATCH FUNDING FORM

Document here the match funding shown on the budget page of your grant application

OWEB

OWEB accepts all non-OWEB funds as match. An applicant may not use *another OWEB grant* to match an OWEB grant; this includes ODA Weed Board projects because they are funded through OWEB grants. However, an applicant who benefits from a pass-through OWEB agreement with another state agency, by receiving either staff expertise or a grant from that state agency, may use those benefits as match for an OWEB grant. (Example: A grantee may use as match the effort provided by ODFW restoration biologists because OWEB funding for those positions is the result of a pass-through agreement).

At the time of application, match funding for OWEB funds requested does not have to be *secured*, but you must show that at least 25% of match funding has been *sought*. On this form, you do not necessarily need to show authorized signatures ("secured match"), but the more match that is secured, the stronger the application. Identify the type of match (cash or in-kind), the status of the match (secured or pending), and either a dollar amount or a dollar value (based on local market rates) of the in-kind contribution.

If you have questions about whether your proposed match is eligible or not, see Allowable Match document in OGMS http://apps.wrd.state.or.us/apps/oweb/ffscal/nologin.aspx under Technical Assistance application or contact your local OWEB regional program representative (contact information available in the instructions to this application).

Project Name: Dry Creek Alwohl Stream Restoration Applicant: Union SWCD

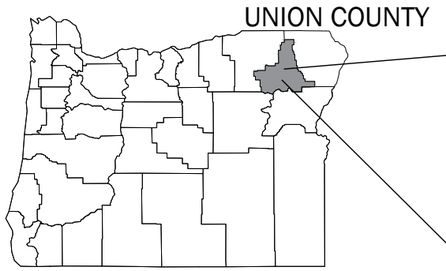
Match Funding Source	Type (√ one)	Status (√ one)*	Dollar Value	Match Funding Source Signature/Date*
Union SWCD	☐ cash ☒ in kind	☒ secured ☐ pending	$3,923.00	2/1/18
ODFW	☐ cash ☒ in kind	☒ secured ☐ pending	$800.00	2/1/18
Umatilla Tribes (CTUIR)	☐ cash ☒ in kind	☒ secured ☐ pending	$800.00	2-1-18
Grande Ronde Model Watershed	☐ cash ☒ in kind	☒ secured ☐ pending	$800.00	01/31/2018
Mary Alwohl (landowner)	☐ cash ☒ in kind	☒ secured ☐ pending	$1200.00	Mary Alwohl 2/2/18
BPA	☐ cash ☐ in kind	☐ secured ☒ pending	$230,630.00	
	☐ cash ☐ in kind	☐ secured ☐ pending		
	☐ cash ☐ in kind	☐ secured ☐ pending		
	☐ cash ☐ in kind	☐ secured ☐ pending		

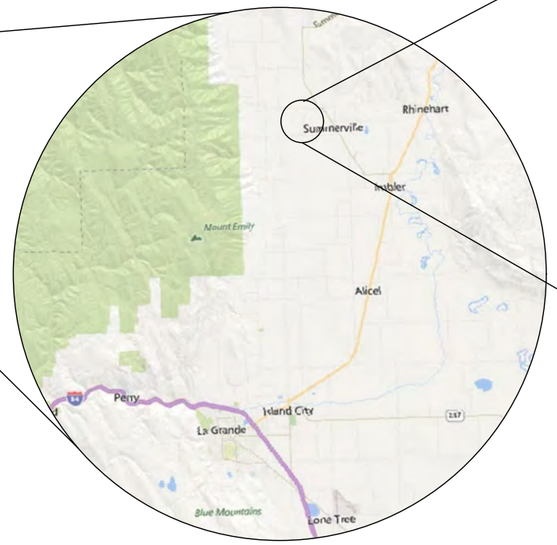
* **IMPORTANT**: If you checked the "Secured" box in the Status Column for any match funding source, you must provide either the signature of an authorized representative of the match source in the final Column, or attach a letter of support from the match funding source that specifically mentions the dollar amount you show in the Dollar Value Column.

AIWOHI DRY CREEK

HABITAT RESTORATION

30% CONCEPTUAL DESIGN





Not to Scale

Not to Scale

PROJECT LOCATION

THE PROJECT SITE IS LOCATED APPROXIMATELY 14 MILES NORTH OF LA GRANDE, OREGON. TO GET TO THE PROJECT SITE FROM LA GRANDE TAKE OR-82 E TO N MCALISTER RD. TURN LEFT ONTO N MCALISTER RD AND FOLLOW FOR 9.6 MILES. CONTINUE ONTO HUNTER ROAD. TURN RIGHT ONTO MCKENZIE LN AND CONTINUE FOR 0.9 MILES. TURN LEFT ONTO SLACK ROAD AND CONTINUE FOR APPROXIMATELY 0.5 MILES. THE PROJECT SITE WILL BE ON THE LEFT.

Sheet Index

Sheet Number	Sheet Title
1.1	Cover Sheet
1.2	Project Goals and Objectives
1.3	Legend and Notes
1.4	Access, Staging and Dewatering
2.1	Existing Conditions Overview
2.2	Existing Plan and Profile
2.3	Existing Plan and Profile
3.1	Proposed Conditions Overview
3.2	Proposed Plan and Profile
3.3	Proposed Plan and Profile
4.1	Channel Sections
4.2	Channel Sections
5.1	Typical Channel Details
5.2	Typical Habitat Details
6.1	Revegetation Plan
7.1	HIP IV General Conservation & Implementation Measures
7.2	HIP IIV General Conservation & Implementation Measures

CONTACT INFORMATION

Union Soil and Water Conservation District
Aaron Bliesner
10507 North McAlister Road
La Grande, OR. 97850
Ph: (541)-963-1313

GeoEngineers Inc.
Tim Hanrahan
523 E. Second Ave.
Spokane, WA. 99202
Ph: (509) 209-2821

NO.	DATE	BY	REVISION

GeoEngineers
523 EAST SECOND AVENUE : SPOKANE, WA 99202 : 509-363-3125 : WWW.GEOENGINEERS.COM

Union Soil and Water Conservation District

AIWOHI DRY CREEK HABITAT RESTORATION
30% CONCEPTUAL DESIGN
LA GRANDE, OREGON

COVER SHEET

DRAWN: BHM	PROJ NO: 19369-002-00
DESIGN: TPH	SHEET 1 OF 17
CHECKED: RSC	DATE: 1.18.2018
SHEET NO. 1.1	

DRAFT SUBMITTAL - NOT FOR CONSTRUCTION

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Aiwohi Dry Creek Restoration Design

Limiting Factor[1]	NOAA Ecological Concern[2]	Aiwohi Dry Creek Restoration Objectives[3]	Action Types[4]	Metric Categories
Large Wood Deficiency	4.2 LWD Recruitment 6.2 Instream Structural Complexity	Increased quantity of large wood Increased quantity and quality of habitat diversity Increased juvenile rearing habitat	Large wood placement Channel reconstruction: pool, riffle, meander	Mapping large wood abundance and location Channel geometry metrics Mapping juvenile rearing habitat
Lack of Shade	4.1 Riparian Condition 5.2 Floodplain Condition	Increased riparian function Increased floodplain connectivity	Riparian planting, fencing, and non-native plant removal Floodplain reconnection: topography and vegetation	Mapping riparian plant community Channel and floodplain geometry metrics Mapping floodplain inundation
High Summer Water Temperatures	4.1 Riparian Condition 8.1 Temperature	Increased in-stream thermal diversity year-round Increased riparian function	Riparian planting, fencing, and non-native plant removal Floodplain reconnection: topography and vegetation Side-channel/off-channel hyporheic restoration	Mapping riparian plant community Channel and floodplain geometry metrics Mapping floodplain inundation Quantify hyporheic hydraulic gradients
Elevated Sediment and Nutrient Inputs	7.2 Increased Sediment Quantity 8.4 Turbidity	Improved sediment sorting and routing Increased riparian function Increased adult spawning habitat	Channel reconstruction: pool, riffle, meander Riparian planting, fencing, and non-native plant removal Floodplain reconnection: topography and vegetation	Quantify grain-size distributions Channel and floodplain geometry metrics Mapping riparian plant community Mapping adult spawning habitat
Loss of Wetlands	5.1 Side Channel and Wetland Conditions	Increased riparian function Site-appropriate native vegetation Increased quantity and quality of habitat diversity	Wetland, alcove, and secondary channel construction Floodplain reconnection: topography and vegetation	Channel and floodplain geometry metrics Mapping riparian plant community Mapping habitat availability
Stream Channelization	5.1 Side Channel and Wetland Conditions 5.2 Floodplain Condition 6.1 Bed and Channel Form 6.2 Instream Structural Complexity	Increased channel complexity Channel morphology closer to fully functional form Increased quantity and quality of habitat diversity Increased quantity of pools Increased stream velocity diversity Increased juvenile and adult habitat Increased floodplain connectivity	Channel reconstruction: pool, riffle, meander Large wood placement Floodplain reconnection: topography and vegetation Wetland, alcove, and secondary channel construction	Channel and floodplain geometry metrics Mapping floodplain inundation Mapping large wood abundance and location Mapping riparian plant community Mapping habitat availability
Stream Flow Depletion	9.2 Decreased Water Quantity 9.3 Altered Flow Timing	Increased channel complexity Increased floodplain connectivity	Side-channel/off-channel hyporheic restoration Floodplain reconnection: topography and vegetation Wetland, alcove, and secondary channel construction	Quantify hyporheic hydraulic gradients Channel and floodplain geometry metrics Mapping floodplain inundation

1. Limiting Factors as defined by Grande Ronde Model Watershed (2001) and applicable to project reach
2. NOAA Ecological Concerns Sub-Category Definitions
3. Union Soil and Water Conservation District
4. BPA Atlas Planning Process

Project Goal:
Enhance and increase natural channel function and processes that improve habitat suitability for spawning and rearing summer steelhead, spring Chinook salmon, and other native fish and wildlife resources

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NO.	DATE	BY	REVISION

GeoEngineers
523 EAST SECOND AVENUE : SPOKANE, WA 99202 : 509-363-3125 : WWW.GEOENGINEERS.COM

Union Soil and Water Conservation District

AIWOHI DRY CREEK HABITAT RESTORATION
30% CONCEPTUAL DESIGN
LA GRANDE, OREGON

PROJECT GOALS AND OBJECTIVES

DRAWN: BHM	PROJ NO: 19369-002-00
DESIGN: TPH	SHEET 2 OF 17
CHECKED: RSC	DATE: 1.18.2018
SHEET NO. 1.2	

GENERAL NOTES:

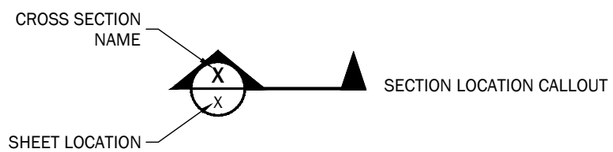
1. These designs and drawings have been prepared for the exclusive use of the Union Soil and Water Conservation District (USWCD) and their authorized agents. No other party may rely on the product of our services unless GeoEngineers Inc. (GeoEngineers) agrees in writing in advance of such use.
2. The drawings contained within should not be applied for any purpose or project except the Dry Creek Project Reach as shown in the Project Area located on Sheet 1.1.
3. These designs and drawings are copyrighted by GeoEngineers, Inc. Any use, alteration, deletion, or editing of this document without explicit written permission from GeoEngineers, Inc. is strictly prohibited. Any other unauthorized use of this document is prohibited.
4. USWCD is advised to contact and to obtain the necessary permits and approvals from all appropriate regulatory agencies (local, state, and federal) prior to construction.
5. Geomorphic conditions can change and these designs are based on conditions that existed at the time the design was performed. The results of these designs may be affected by the passage of time, by manmade events such as construction on or adjacent to the site, or by natural events such as floods, earthquakes, slope instability or groundwater fluctuations. Always contact GeoEngineers before applying these designs to determine if they remain applicable.
6. All rivers, streams, rocks and woody habitat structures are potentially dangerous. These proposed creek improvements are intended to address a wide variety of constraints which target more naturally functioning stream systems and habitat; they are inherently dangerous to people in or around the pond and stream crossing. USCWD and the property owner should address safety concerns appropriately.
7. Potential regulatory changes to flood elevations and flood extents resulting from the proposed enhancements have not been addressed by GeoEngineers as part of this project.
8. In general, the proposed enhancements are intended to result in more stable streambeds, banks and floodplains. However, channel erosion, channel migration and/or avulsions can be expected to occur over time. These channel processes are natural and appropriate for these stream systems.
9. Design specifics for structures shall be confirmed and/or verified by a qualified engineer prior to or during construction at each proposed structure location.
10. These figures were originally produced in color.

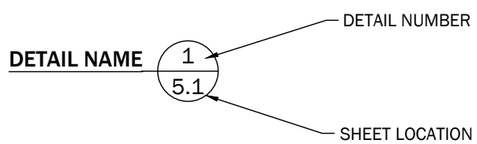
GENERAL CONSTRUCTION NOTES:

1. These plans are conceptual and not for construction.

ABBREVIATIONS:

WSEL	WATER SURFACE ELEVATION
TYP	TYPICAL
FT	FEET
ELEV	ELEVATION
Horiz.	HORIZONTAL
Vert.	VERTICAL
MIN	MINIMUM
MAX	MAXIMUM
NTS	NOT TO SCALE
AC	ACRES
CFS	CUBIC FEET PER SECOND
ACW	ACTIVE CHANNEL WIDTH
OHW	ORDINARY HIGH WATER
SQ-FT	SQUARE FEET
CY	CUBIC YARDS





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NO.	DATE	BY	REVISION

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Union Soil and Water Conservation District

AIWOHI DRY CREEK HABITAT RESTORATION
30% CONCEPTUAL DESIGN
LA GRANDE, OREGON

LEGEND AND NOTES

DRAWN: BHM	PROJ NO: 19369-002-00
DESIGN: TPH	SHEET 3 OF 17
CHECKED: RSC	DATE: 1.18.2018
SHEET NO. 1.3	

Plotted: 01/18/2018, 17:54 | bmiller P:\19\19369002\CAD\00\Channel Design\R01 (30% Design)\19369002_Channel Design_S03_Legend and Notes.dwg

LEGEND

- DISTURBANCE LIMITS
- FLOODPLAIN GRADING LIMITS
- EXISTING DRY CREEK ALIGNMENT
- EXISTING 2-YR INUNDATION
- STAGING AREA
- TEMPORARY CHANNEL CROSSING
- TEMPORARY CHANNEL DIVERSION

NOTES:

1. Sheets are projected in Oregon State Plane, North, International feet. North American Vertical Datum of 1988 (NAVD88).
2. Existing topography provided by RSI, October 2017.
3. Aerial imagery from Bing Maps.
4. Existing inundation boundaries modeled in HEC-RAS V. 5.0.3. 2-yr discharge is equal to 233 cfs.

ACCESS AND STAGING GENERAL NOTES

1. ALL IN-WATER WORK IS SHALL OCCUR BETWEEN JULY 1 - AUGUST 15 OR AS OTHERWISE SPECIFIED IN ENVIRONMENTAL PERMITS.
2. ALL WORK IS SUBJECT TO HIP IV GENERAL AQUATIC CONSERVATION MEASURES (SEE SHEETS 6.1 - 6.2).

(1) ACCESS SITE FROM SLACK ROAD.

(2) TEMPORARY ACCESS ROUTES SHALL MINIMIZE DISTURBANCE TO NATIVE VEGETATION.

(3) INSTALL TEMPORARY CHANNEL CROSSING AT EXISTING FORD.

(4) INSTALL PERIMETER SEDIMENT CONTROLS AROUND STAGING AREAS AND STABILIZE ANY TEMPORARY STOCKPILES.

(5) ISOLATE WORK ZONE USING WORK AREA ISOLATION STRUCTURE. DEWATER ISOLATED WORK AREA AND CONDUCT FISH SALVAGE. FISH PASSAGE SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION.

(6) EXCAVATE CHANNELS AND CONSTRUCT LARGE WOOD STRUCTURES (SEE SHEETS 3.1 - 5.2).

(7) RESTORE DISTURBED AREAS OUTSIDE FLOODPLAIN GRADING LIMITS. EVENLY DISTRIBUTE EXCESS MATERIAL ON SITE WITHIN THE DISTURBANCE LIMITS. STABILIZE WITH NATIVE SEED MIX AFTER CHANNEL EXCAVATION AND LOG STRUCTURE INSTALLATION IS COMPLETE.

N

0 50 100
SCALE IN FEET

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AIWOHI DRY CREEK HABITAT RESTORATION
30% CONCEPTUAL DESIGN
LA GRANDE, OREGON

ACCESS, STAGING AND DEWATERING

DRAWN: BHM	PROJ NO: 19369-002-00
DESIGN: TPH	SHEET 4 OF 17
CHECKED: RSC	DATE: 1.18.2018
SHEET NO. 1.4	

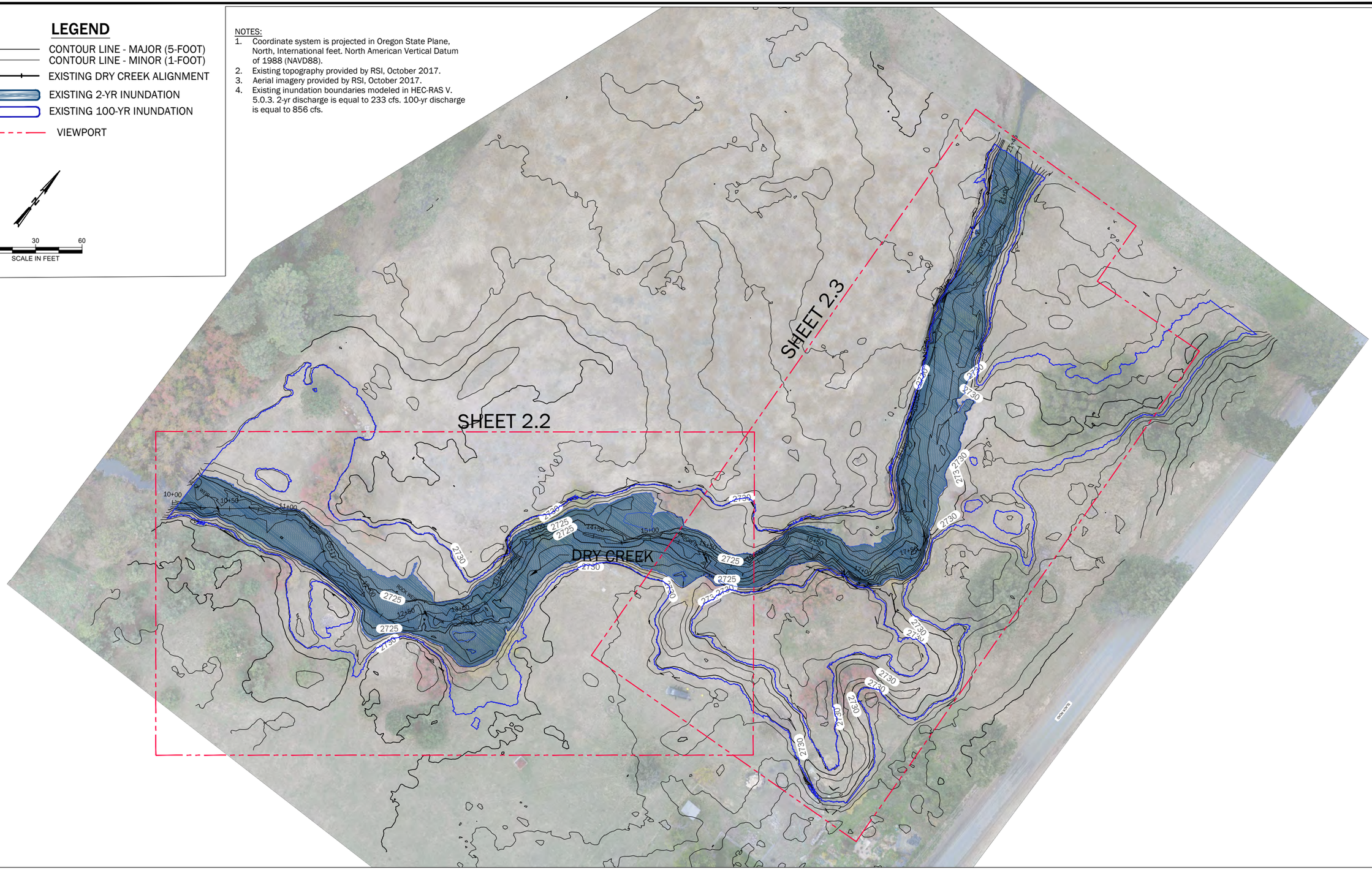
Plotted: 01/18/2018, 17:56 | bmiller
P:\19\19369002\CAD\00\Channel Design\R01 (30% Design)\19369002_Channel Design_S04_Staging_Access_Dewatering.dwg

LEGEND

- CONTOUR LINE - MAJOR (5-FOOT)
- CONTOUR LINE - MINOR (1-FOOT)
- EXISTING DRY CREEK ALIGNMENT
- EXISTING 2-YR INUNDATION
- EXISTING 100-YR INUNDATION
- VIEWPORT

0 30 60
SCALE IN FEET

NOTES:
1. Coordinate system is projected in Oregon State Plane, North, International feet. North American Vertical Datum of 1988 (NAVD88).
2. Existing topography provided by RSI, October 2017.
3. Aerial imagery provided by RSI, October 2017.
4. Existing inundation boundaries modeled in HEC-RAS V. 5.0.3. 2-yr discharge is equal to 233 cfs. 100-yr discharge is equal to 856 cfs.



NO.	DATE	BY	REVISION

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AIWOHI DRY CREEK HABITAT RESTORATION
30% CONCEPTUAL DESIGN
LA GRANDE, OREGON

EXISTING CONDITIONS OVERVIEW

DRAWN: BHM	PROJ NO: 19369-002-00
DESIGN: TPH	SHEET 5 OF 17
CHECKED: RSC	DATE: 1.18.2018
SHEET NO. 2.1	

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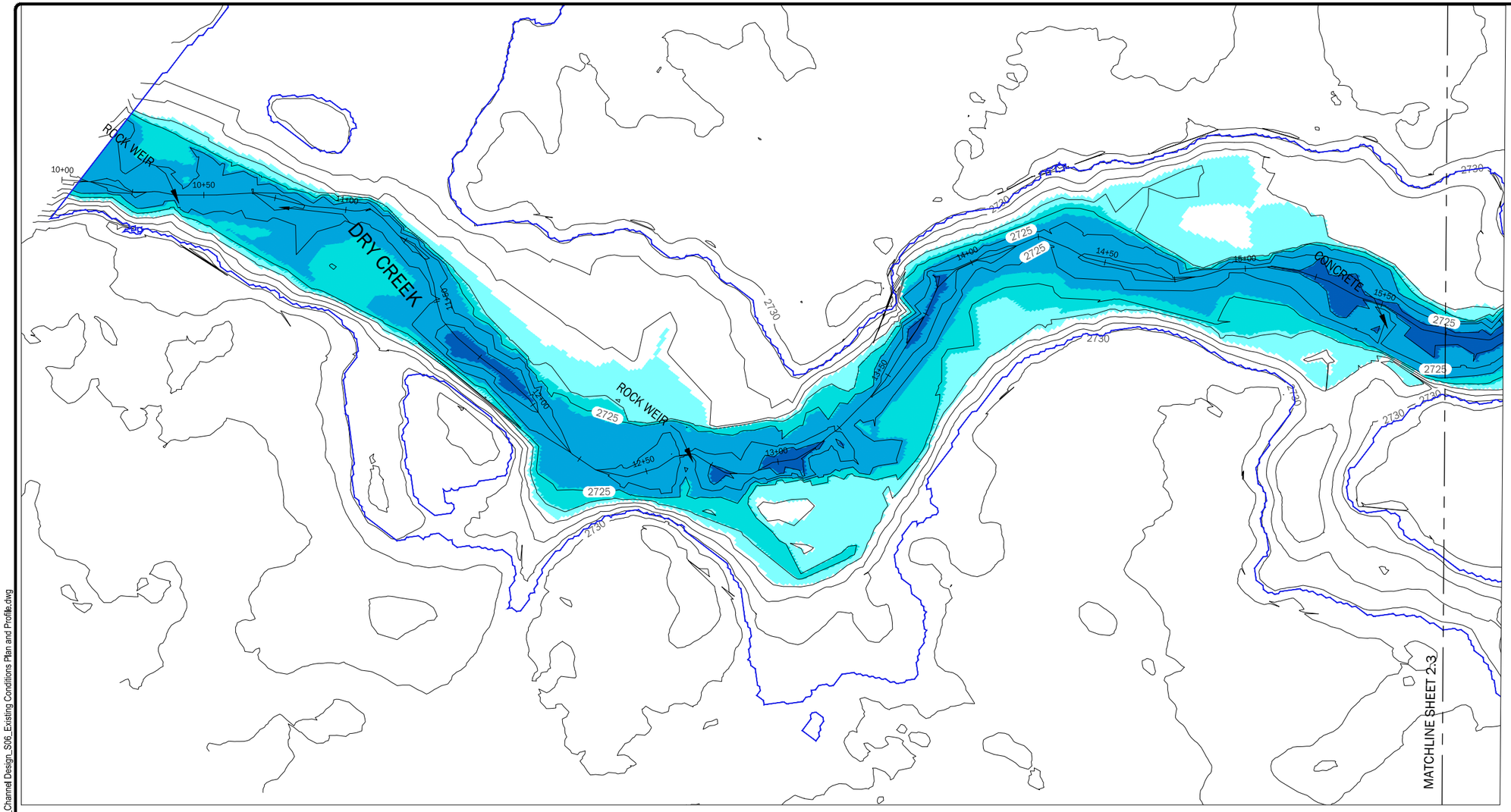
Plotted: 01/18/2018, 17:57 | bmiller P:\19\19369002\CAD\00\Channel Design\R01 (30% Design\19369002_Channel Design_S05_Existing Conditions Overview.dwg



LEGEND

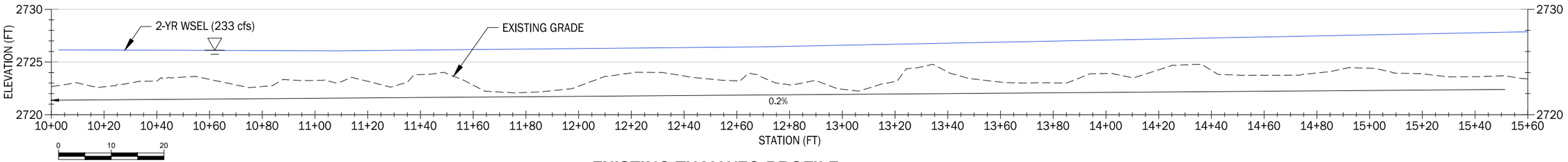
- CONTOUR LINE - MAJOR (5-FOOT)
- CONTOUR LINE - MINOR (1-FOOT)
- EXISTING DRY CREEK ALIGNMENT
- EXISTING 100-YR INUNDATION

2-YR WATER DEPTHS (FT)		
Minimum	Maximum	Color
0.0	1.0	
1.0	2.0	
2.0	4.0	
4.0	5.0	
5.0	6.0	

N

0 20 40
SCALE IN FEET

NOTES:
1. Coordinate system is projected in Oregon State Plane, North, International feet. North American Vertical Datum of 1988 (NAVD88).
2. Existing topography provided by RSI, October 2017.
3. Aerial imagery provided by RSI, October 2017.
4. Existing inundation boundaries modeled in HEC-RAS V. 5.0.3. 2-yr discharge is equal to 233 cfs. 100-yr discharge is equal to 856 cfs.



0 10 20
HORIZONTAL SCALE IN FEET
0 2.5 5
VERTICAL SCALE IN FEET
VERTICAL EXAGGERATION: 4X

EXISTING THALWEG PROFILE

NO.	DATE	BY	REVISION

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AIWOHI DRY CREEK HABITAT RESTORATION
30% CONCEPTUAL DESIGN
LA GRANDE, OREGON

EXISTING PLAN AND PROFILE

DRAWN: BHM	PROJ NO: 19369-002-00
DESIGN: TPH	SHEET 5 OF 17
CHECKED: RSC	DATE: 1.18.2018
SHEET NO. 2.2	

DRAFT SUBMITTAL - NOT FOR CONSTRUCTION

Plotted: 01/18/2018 17:57 | bmiller
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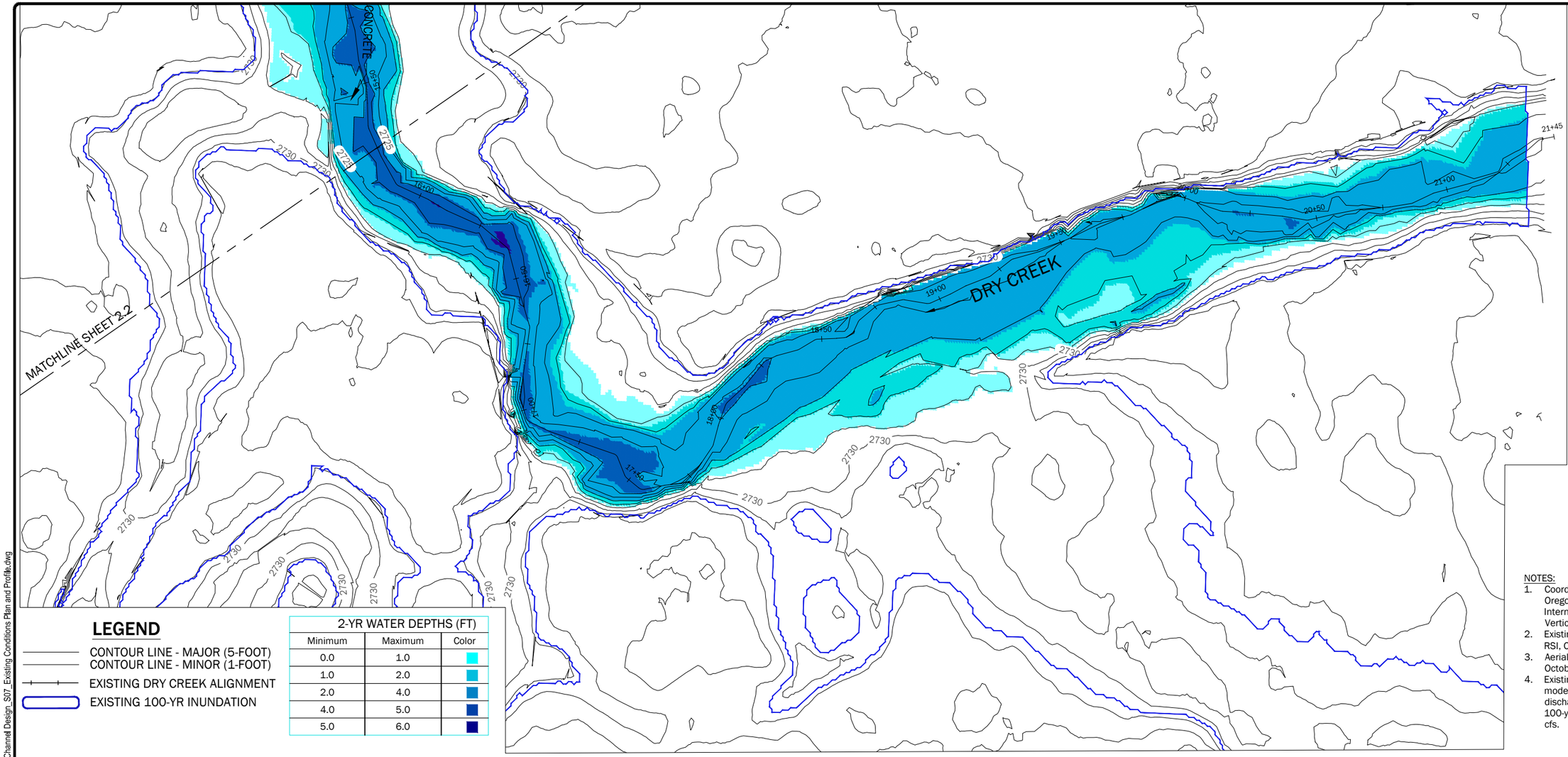


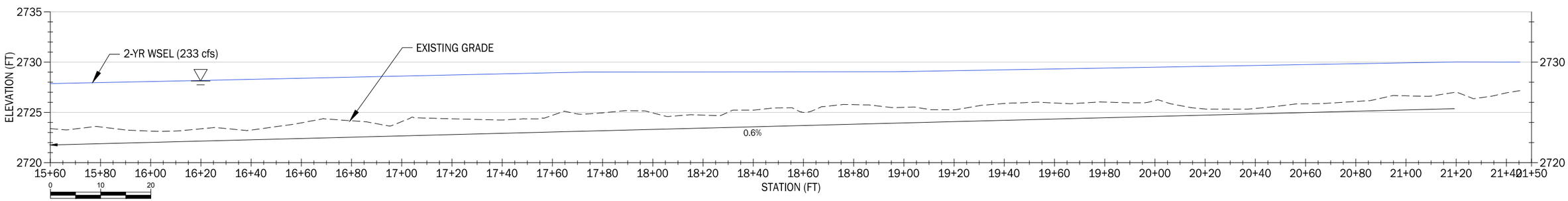
LEGEND

- CONTOUR LINE - MAJOR (5-FOOT)
- CONTOUR LINE - MINOR (1-FOOT)
- EXISTING DRY CREEK ALIGNMENT
- EXISTING 100-YR INUNDATION

2-YR WATER DEPTHS (FT)		
Minimum	Maximum	Color
0.0	1.0	
1.0	2.0	
2.0	4.0	
4.0	5.0	
5.0	6.0	

NOTES:

1. Coordinate systems is projected in Oregon State Plane, North, International feet. North American Vertical Datum of 1988 (NAVD88).
2. Existing topography provided by RSI, October 2017.
3. Aerial imagery provided by RSI, October 2017.
4. Existing inundation boundaries modeled in HEC-RAS V. 5.0.3. 2-yr discharge is equal to 233 cfs. 100-yr discharge is equal to 856 cfs.



EXISTING THALWEG PROFILE

NO.	DATE	BY	REVISION

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EXISTING PLAN AND PROFILE

DRAWN: BHM	PROJ NO: 19369-002-00
DESIGN: TPH	SHEET 7 OF 17
CHECKED: RSC	DATE: 1.18.2018
SHEET NO. 2.3	

DRAFT SUBMITTAL - NOT FOR CONSTRUCTION

Plotted: 01/18/2018, 17:59 | bmiller P:\19\19369002\CAD\00\Channel Design\R01 (30% Design)\19369002_Channel Design_S07_Existing Conditions Plan and Profile.dwg

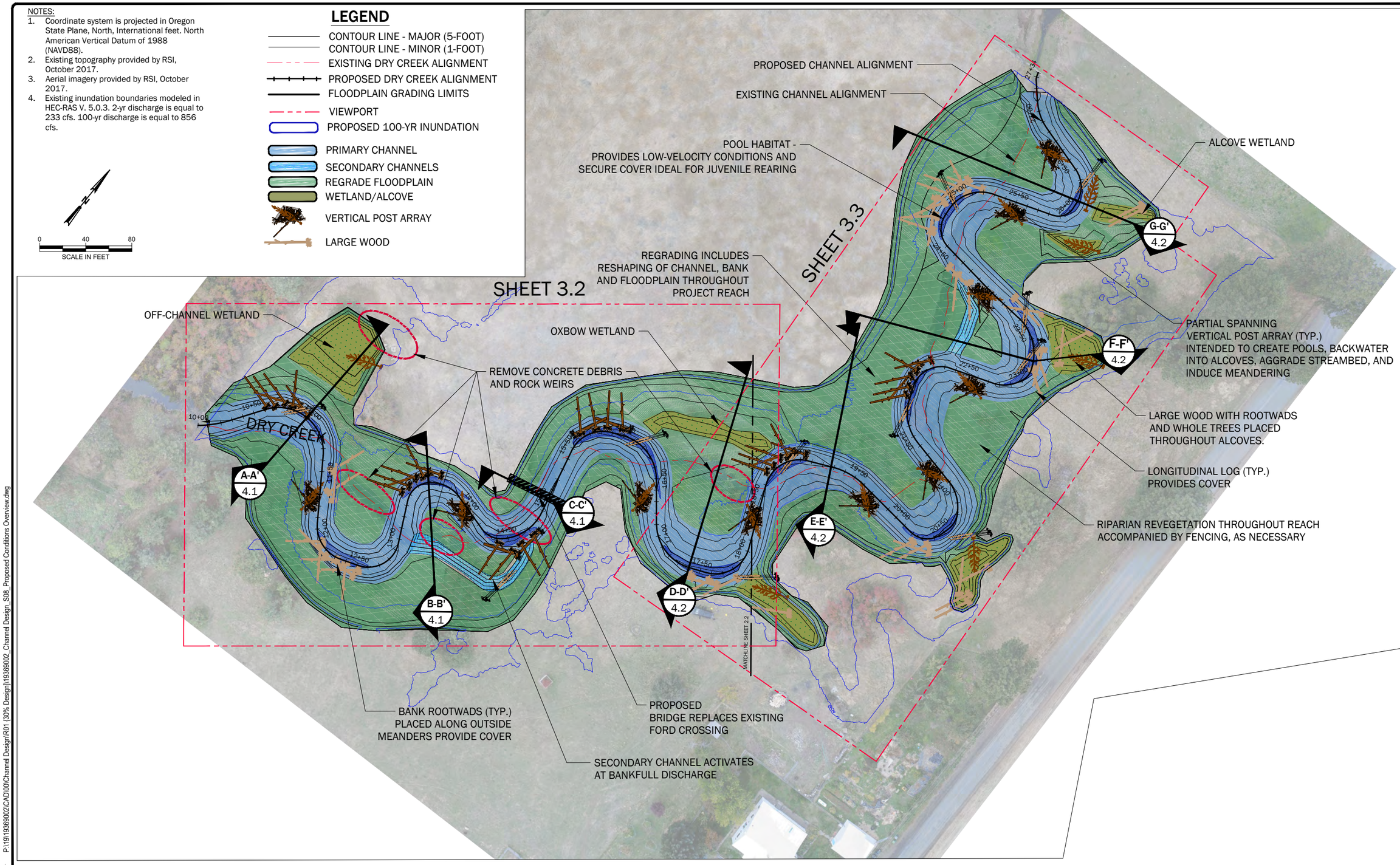
NOTES:

1. Coordinate system is projected in Oregon State Plane, North, International feet. North American Vertical Datum of 1988 (NAVD88).
2. Existing topography provided by RSI, October 2017.
3. Aerial imagery provided by RSI, October 2017.
4. Existing inundation boundaries modeled in HEC-RAS V. 5.0.3. 2-yr discharge is equal to 233 cfs. 100-yr discharge is equal to 856 cfs.

LEGEND

- CONTOUR LINE - MAJOR (5-FOOT)
- CONTOUR LINE - MINOR (1-FOOT)
- EXISTING DRY CREEK ALIGNMENT
- PROPOSED DRY CREEK ALIGNMENT
- FLOODPLAIN GRADING LIMITS
- VIEWPORT
- PROPOSED 100-YR INUNDATION
- PRIMARY CHANNEL
- SECONDARY CHANNELS
- REGRADE FLOODPLAIN
- WETLAND/ALCOVE
- VERTICAL POST ARRAY
- LARGE WOOD

0 40 80
SCALE IN FEET



NO.	DATE	BY	REVISION

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AIWOHI DRY CREEK HABITAT RESTORATION
30% CONCEPTUAL DESIGN
LA GRANDE, OREGON

PROPOSED CONDITIONS OVERVIEW

DRAWN: BHM	PROJ NO: 19369-002-00
DESIGN: TPH	SHEET 8 OF 17
CHECKED: RSC	DATE: 1.18.2018
SHEET NO. 3.1	

DRAFT SUBMITTAL - NOT FOR CONSTRUCTION

Plotted: 01/18/2018, 18:01 | bmiller P:\19\19369002\CAD\00\Channel Design\R01 (30% Design)\19369002_Channel Design_S08_Proposed Conditions Overview.dwg

REMOVE CONCRETE DEBRIS AND ROCK WEIRS

LARGE WOOD WITH ROOTWADS AND WHOLE TREES PLACED THROUGHOUT ALCOVES

OFF-CHANNEL WETLAND

LONGITUDINAL LOG (TYP.) PROVIDES COVER

PARTIAL SPANNING VERTICAL POST ARRAY (TYP.) INTENDED TO CREATE POOLS, BACKWATER INTO ALCOVES, AGGRADE STREAMBED, AND INDUCE MEANDERING

BANK ROOTWADS (TYP.) PLACED ALONG OUTSIDE MEANDERS PROVIDE COVER

SECONDARY CHANNEL ACTIVATES AT BANKFULL DISCHARGE

PROPOSED BRIDGE REPLACES EXISTING FORD CROSSING

DRY CREEK

MATCHLINE SHEET 3.3

LEGEND

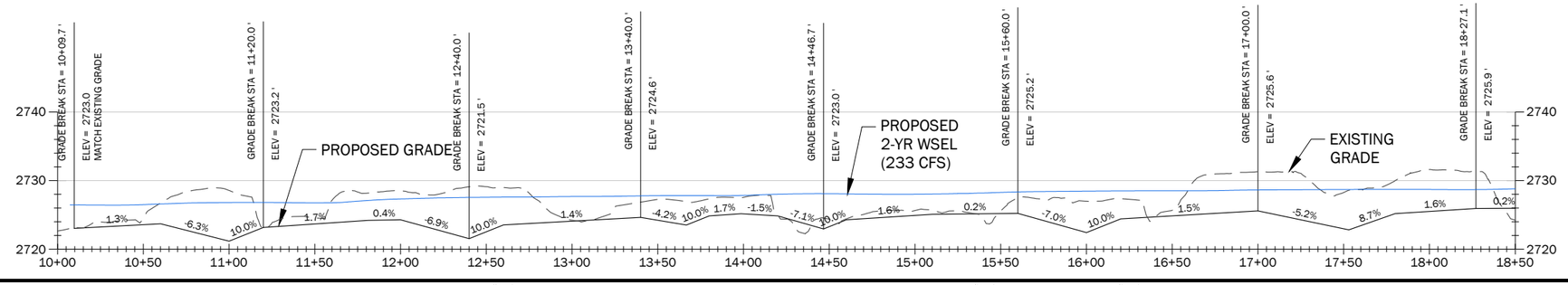
- PROPOSED CONTOUR LINE - MAJOR (5-FOOT)
- PROPOSED CONTOUR LINE - MINOR (1-FOOT)
- EXISTING CONTOUR LINE - MAJOR (5-FOOT)
- EXISTING CONTOUR LINE - MINOR (1-FOOT)
- EXISTING DRY CREEK ALIGNMENT
- PROPOSED DRY CREEK ALIGNMENT
- FLOODPLAIN GRADING LIMITS
- PROPOSED 100-yr INUNDATION
- VERTICAL POST ARRAY
- LARGE WOOD

2-YR WATER DEPTHS (FT)		
Minimum	Maximum	Color
0.0	1.0	
1.0	2.0	
2.0	4.0	
4.0	5.0	
5.0	6.0	

0 20 40
SCALE IN FEET

NOTES:
1. Sheets are projected in Oregon State Plane, North, International feet. North American Vertical Datum of 1988 (NAVD88).
2. Existing topography provided by RSI, October 2017.
3. Aerial imagery provided by RSI, October 2017.
4. Existing and proposed inundation boundaries modeled in HEC-RAS V. 5.0.3. 2-yr discharge is equal to 233 cfs. 100-yr discharge is equal to 856 cfs.

PROPOSED THALWEG PROFILE



0 40 80
HORIZONTAL SCALE IN FEET
0 10 20
VERTICAL SCALE IN FEET
VERTICAL EXAGGERATION: 4X

NO.	DATE	BY	REVISION

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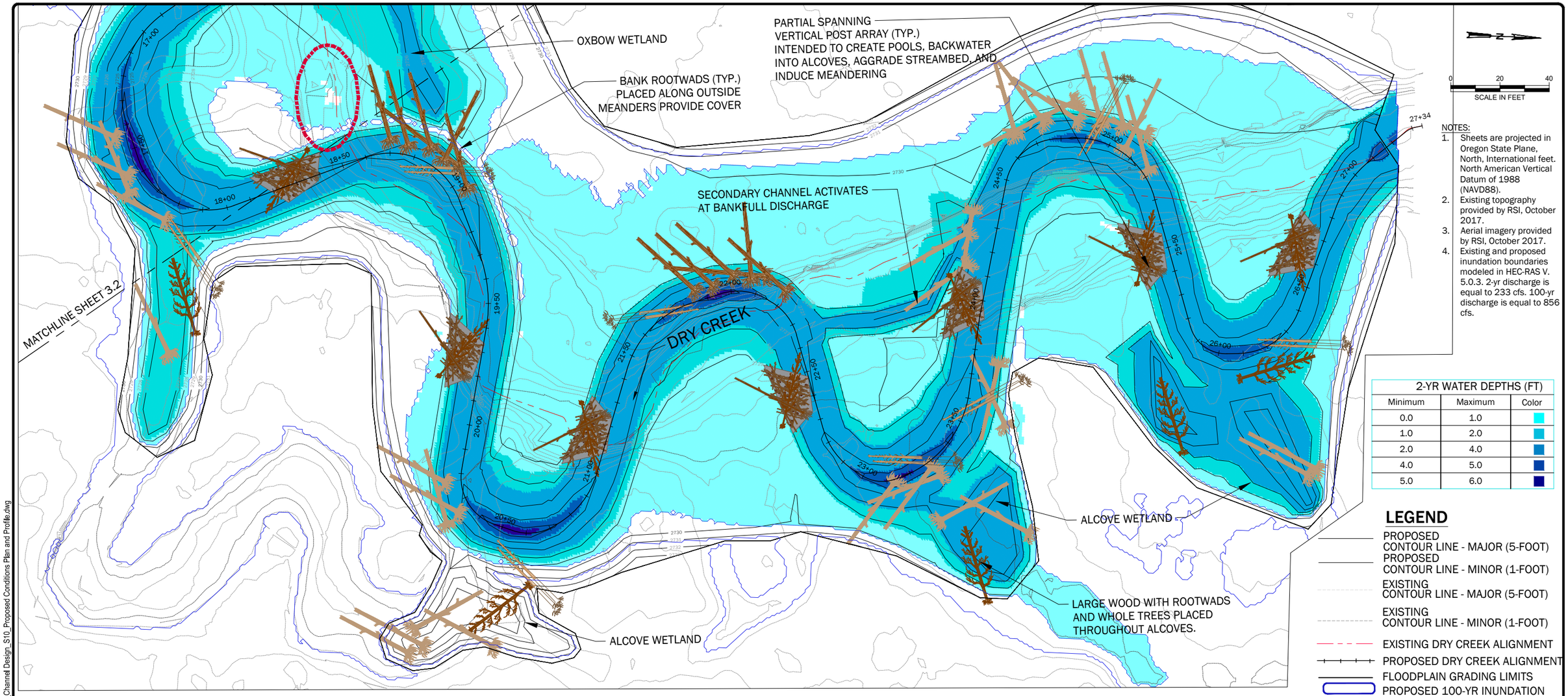
AIWOHI DRY CREEK HABITAT RESTORATION
30% CONCEPTUAL DESIGN
LA GRANDE, OREGON

PROPOSED PLAN AND PROFILE

DRAWN: BHM	PROJ NO: 19369-002-00
DESIGN: TPH	SHEET 9 OF 17
CHECKED: RSC	DATE: 1.18.2018
SHEET NO. 3.2	

DRAFT SUBMITTAL - NOT FOR CONSTRUCTION

Plotted: 01/18/2018 - 18:04 | bmiller P:\19\19369002\CAD\00\Channel Design\R01 (30% Design)\19369002_Channel Design_S09_Proposed Conditions Plan and Profile .dwg



NOTES:

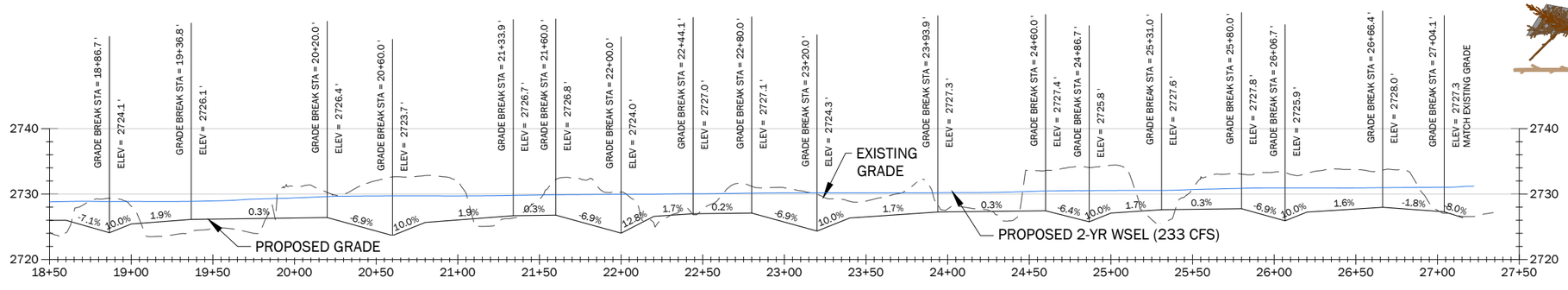
1. Sheets are projected in Oregon State Plane, North, International feet. North American Vertical Datum of 1988 (NAVD88).
2. Existing topography provided by RSI, October 2017.
3. Aerial imagery provided by RSI, October 2017.
4. Existing and proposed inundation boundaries modeled in HEC-RAS V. 5.0.3. 2-yr discharge is equal to 233 cfs. 100-yr discharge is equal to 856 cfs.

2-YR WATER DEPTHS (FT)		
Minimum	Maximum	Color
0.0	1.0	
1.0	2.0	
2.0	4.0	
4.0	5.0	
5.0	6.0	

LEGEND

- PROPOSED CONTOUR LINE - MAJOR (5-FOOT)
- PROPOSED CONTOUR LINE - MINOR (1-FOOT)
- EXISTING CONTOUR LINE - MAJOR (5-FOOT)
- EXISTING CONTOUR LINE - MINOR (1-FOOT)
- EXISTING DRY CREEK ALIGNMENT
- PROPOSED DRY CREEK ALIGNMENT
- FLOODPLAIN GRADING LIMITS
- PROPOSED 100-YR INUNDATION
- VERTICAL POST ARRAY
- LARGE WOOD

PROPOSED THALWEG PROFILE



0 40 80
HORIZONTAL SCALE IN FEET
0 10 20
VERTICAL SCALE IN FEET
VERTICAL EXAGGERATION: 4X

NO.	DATE	BY	REVISION

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AIWOHI DRY CREEK HABITAT RESTORATION
30% CONCEPTUAL DESIGN
LA GRANDE, OREGON

PROPOSED PLAN AND PROFILE

DRAWN:	BHM	PROJ NO:	19369-002-00
DESIGN:	TPH	SHEET	10 OF 17
CHECKED:	RSC	DATE:	1.18.2018
SHEET NO.	3.3		

DRAFT SUBMITTAL - NOT FOR CONSTRUCTION

Plotted: 01/18/2018, 18:06 | bmiller
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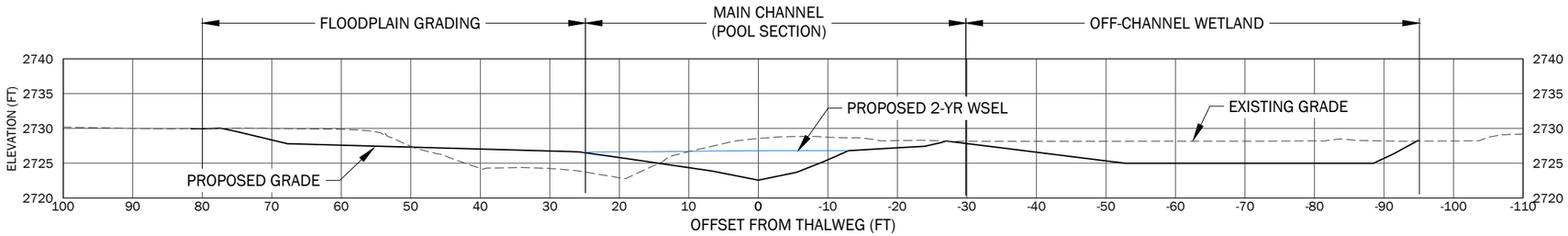
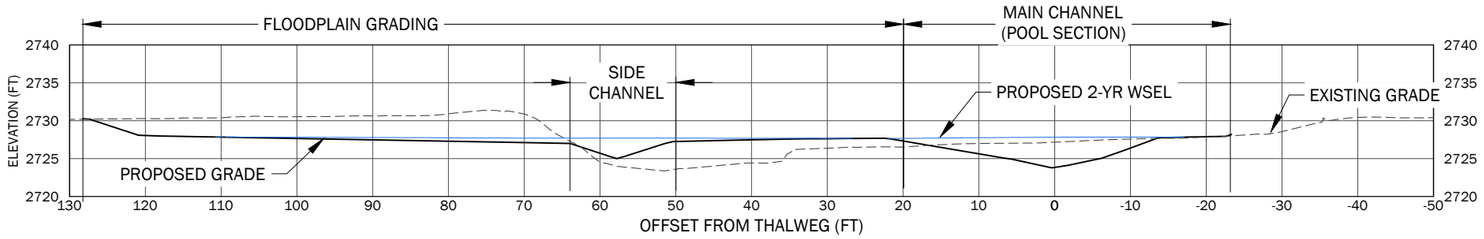
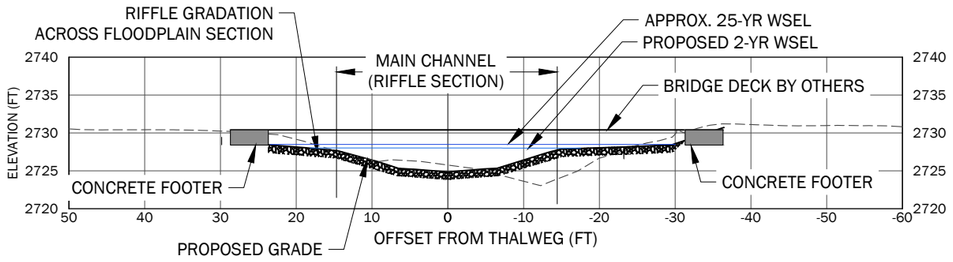
SECTION A-A'



SECTION B-B'



SECTION C-C'
PROPOSED BRIDGE CROSSING



0 10 20
HORIZONTAL SCALE IN FEET
0 5 10
VERTICAL SCALE IN FEET

NOTES:
1. Coordinate system is projected in Oregon State Plane, North, International feet. North American Vertical Datum of 1988 (NAVD88).
2. Existing topography provided by RSI, October 2017.
3. Cross Section face downstream, stationing increases from right to left.
4. Vertical Exaggeration = 2X.

NO.	DATE	BY	REVISION

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AIWOHI DRY CREEK HABITAT RESTORATION
30% CONCEPTUAL DESIGN
LA GRANDE, OREGON

CHANNEL SECTIONS

DRAWN: BHM	PROJ NO: 19369-002-00
DESIGN: TPH	SHEET 11 OF 17
CHECKED: RSC	DATE: 1.18.2018
SHEET NO. 4.1	

DRAFT SUBMITTAL - NOT FOR CONSTRUCTION

Plotted: 01/18/2018, 18:08 | bmiller
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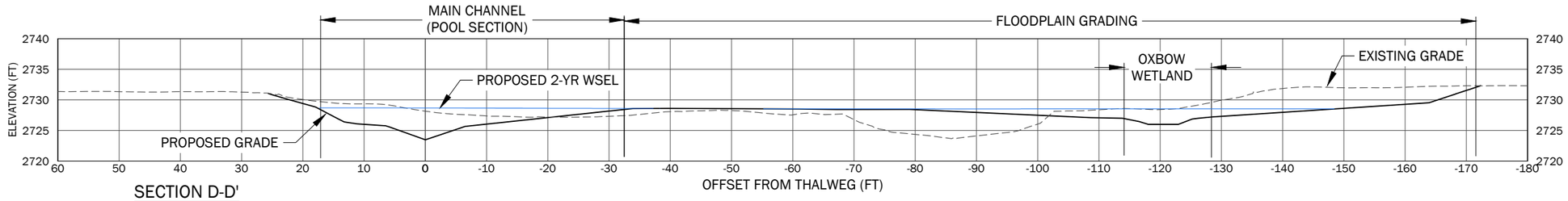
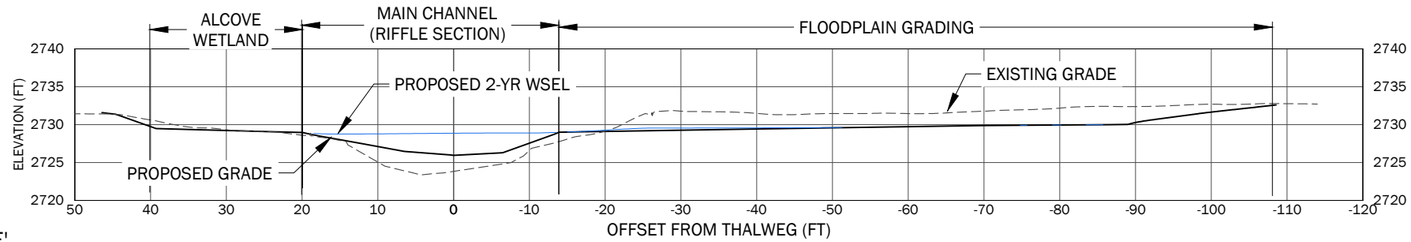
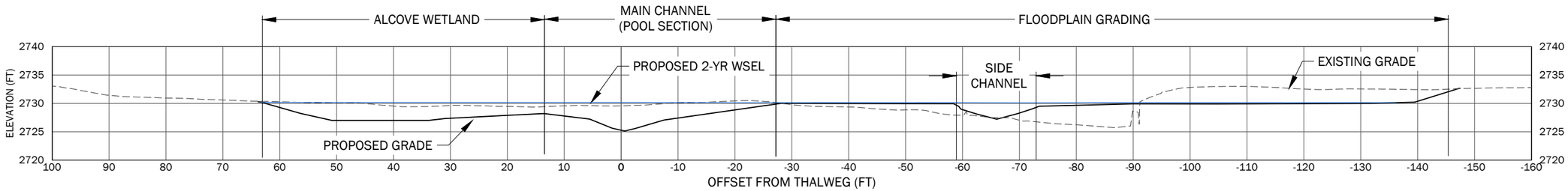


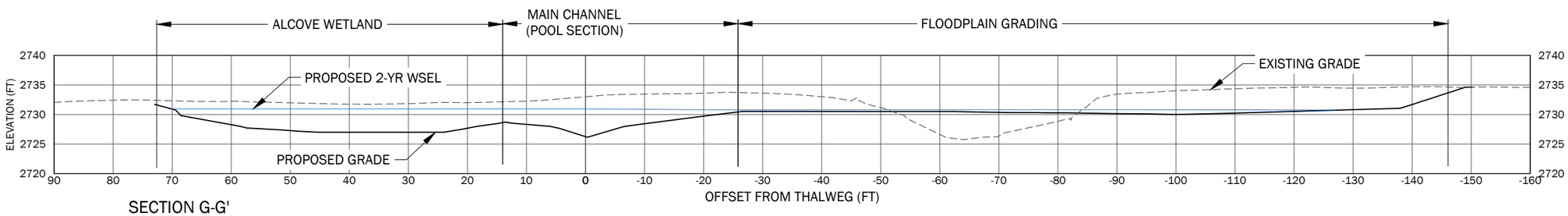
SECTION D-D'



SECTION E-E'



SECTION F-F'



SECTION G-G'

0 10 20
HORIZONTAL SCALE IN FEET
0 5 10
VERTICAL SCALE IN FEET

NOTES:
1. Coordinate system is projected in Oregon State Plane, North, International feet. North American Vertical Datum of 1988 (NAVD88).
2. Existing topography provided by RSI, October 2017.
3. Cross Section face downstream, stationing increases from right to left.
4. Vertical Exaggeration = 2X.

NO.	DATE	BY	REVISION

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AIWOHI DRY CREEK HABITAT RESTORATION
30% CONCEPTUAL DESIGN
LA GRANDE, OREGON

CHANNEL SECTIONS

DRAWN: BHM	PROJ NO: 19369-002-00
DESIGN: TPH	SHEET 12 OF 17
CHECKED: RSC	DATE: 1.18.2018
SHEET NO. 4.2	

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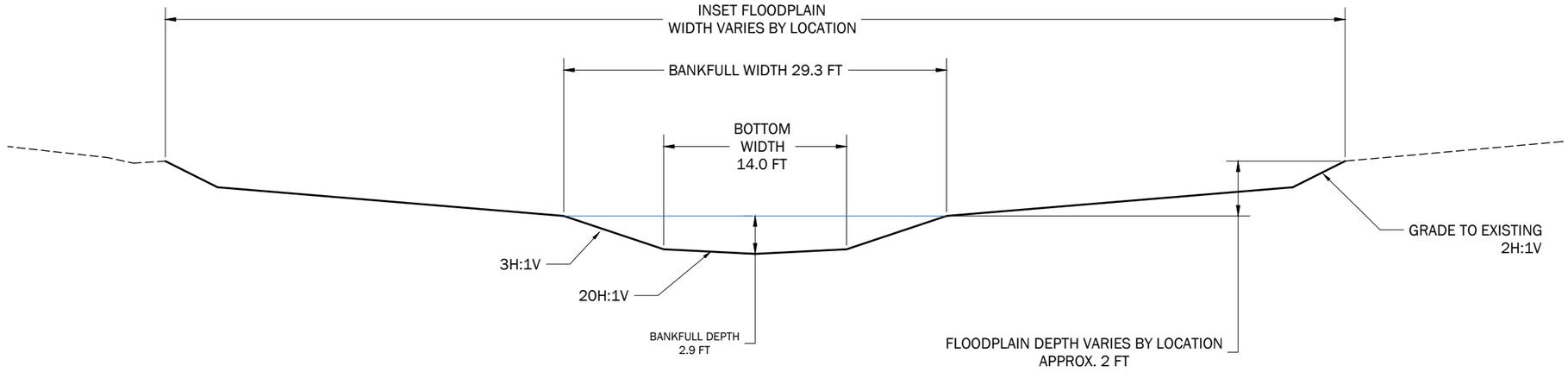
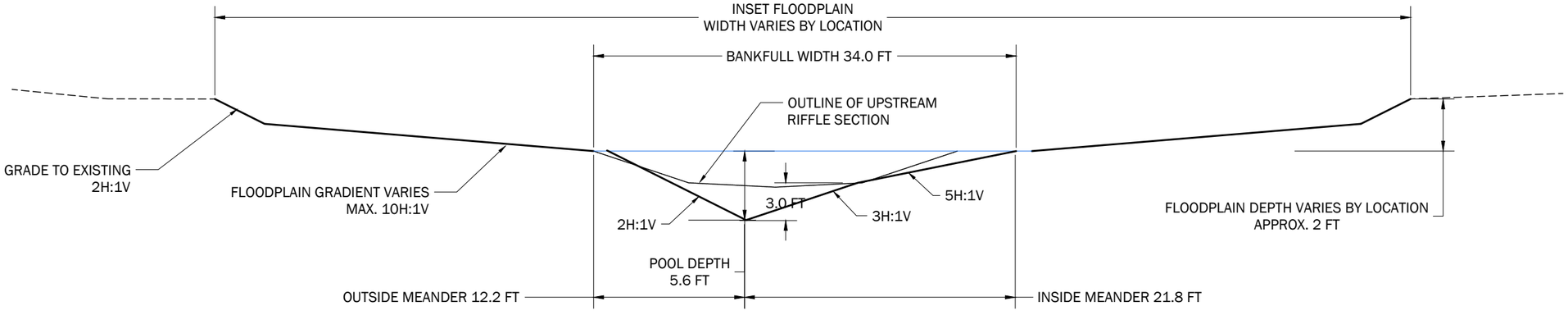
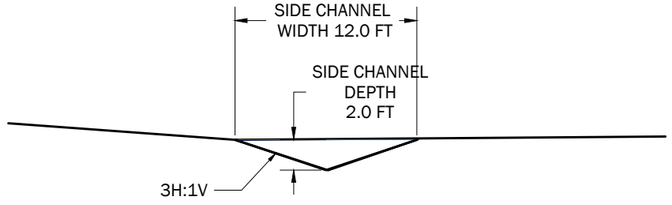
MAIN CHANNEL / RIFFLE SECTION



POOL SECTION



SIDE CHANNEL SECTION



0 5 10
HORIZONTAL SCALE IN FEET
0 5 10
VERTICAL SCALE IN FEET

NOTES:
1. Coordinate system is projected in Oregon State Plane, North, International feet. North American Vertical Datum of 1988 (NAVD88).
2. Existing topography provided by RSI, October 2017.
3. Cross Section face downstream, stationing increases from right to left.
4. No Vertical Exaggeration

NO.	DATE	BY	REVISION

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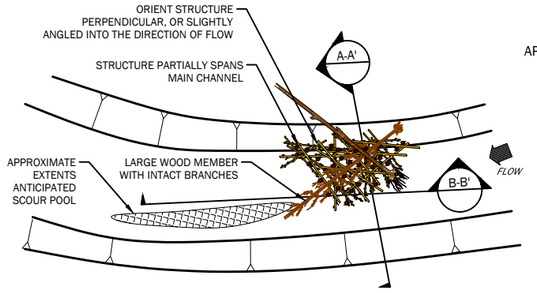
Union Soil and Water Conservation District

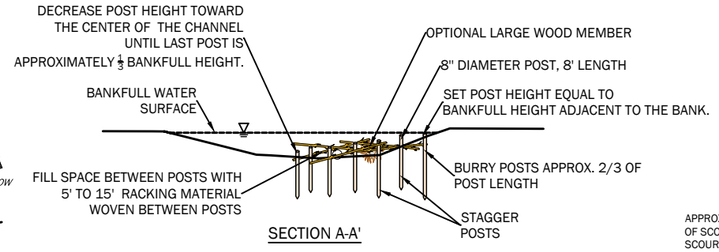
AIWOHI DRY CREEK HABITAT RESTORATION
30% CONCEPTUAL DESIGN
LA GRANDE, OREGON

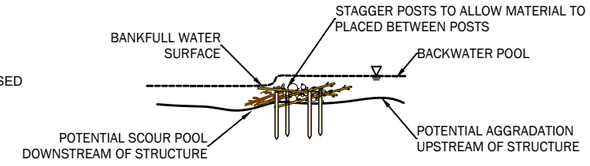
TYPICAL CHANNEL DETAILS

DRAWN: BHM	PROJ NO: 19369-002-00
DESIGN: TPH	SHEET 13 OF 17
CHECKED: RSC	DATE: 1.18.2018
SHEET NO. 5.1	

DRAFT SUBMITTAL - NOT FOR CONSTRUCTION



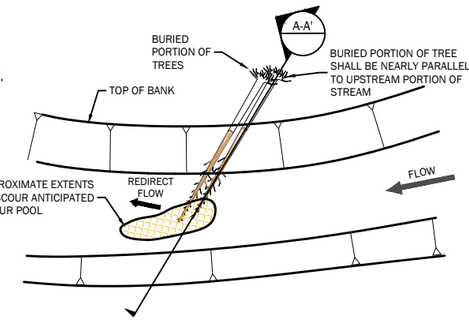




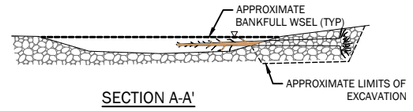
PURPOSE:
- MIMICS FUNCTIONALITY OF FLOODPLAIN WOODY VEGETATION
- USE IN MAIN CHANNEL TO CREATE BACKWATER CONDITIONS, INCREASED FLOODPLAIN INUNDATION AND HYPORHEIC EXCHANGE

DESIGN SPECIFICS:
- USE 8" DIAMETER POSTS, APPROXIMATELY 8' LONG AT 3' SPACING
- STAGGER POSTS SO THEY ARE NOT IN A STRAIGHT LINE
- DRIVE POSTS APPROXIMATELY 4' BELOW GROUND SURFACE
- WEAVE RACKING MATERIAL BETWEEN POSTS
- CAN INCLUDE LARGE WOOD, 12"-18" DBH, 10' TO 20' LENGTH
- STRUCTURE SPANS 40-60% OF THE CHANNEL
- ADDITIONAL DEBRIS IS EXPECTED TO COLLECT OVER TIME

VERTICAL POST ARRAY



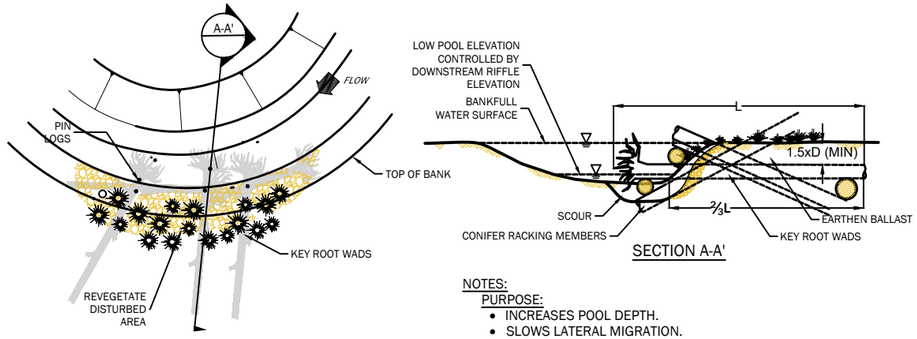
SWEEPER LOGS



NOTES:

PURPOSE:
- REDIRECTS FLOW.
- CREATES SCOUR.
- ENCOURAGES GRAVEL DEPOSITION.

DESIGN SPECIFICS:
- PARTIALLY BURRY LOGS A MINIMUM OF 2/3 TREE LENGTH IF PLACED WITHIN THE MAIN CHANNEL.
- ROOTWAD END SHALL BE BURRIED A MINIMUM OF 1 FT BELOW FINISHED GRADE.
- SWEEPERS MAY BE PLACED INDEPENDENTLY OR INCOPORATED INTO OTHER LARGE WOOD STRUCTURES.
- TREES WITH BRANCHES OR MULTIPLE TRUNKS PREFERRED.

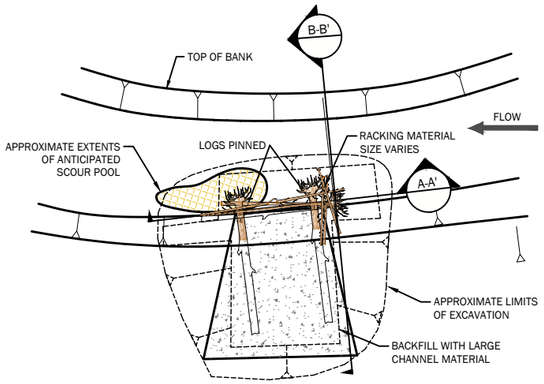


BANK ROOTWADS

NOTES:

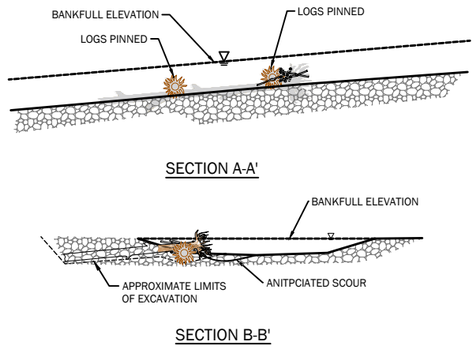
PURPOSE:
- INCREASES POOL DEPTH.
- SLOWS LATERAL MIGRATION.
- REDUCES BANK EROSION.

DESIGN SPECIFICS:
- TOP OF ROOTWAD SHOULD NOT EXTEND MORE THAN ½-FT ABOVE TOP OF BANK. (BANKFULL)
- MEMBERS SHALL EXTEND BELOW CALCULATED SCOUR DEPTH.
- PLACE ROOT WADS ALONG OUTSIDE OF BENDS.
- INSTALL RACKING MEMBERS AND VEGETATION AMONG ROOT WADS WHILE INSTALLING ROOT WADS.
- IRRIGATE VEGETATION AS REQUIRED.
- ALL KEY MEMBERS REQUIRE BALLAST.



LONGITUDINAL LOGS

PURPOSE:
- CREATES LATERAL SCOUR POOL.
- PROMOTES GRAVEL BAR FORMATION.
- CREATES DIVERSE FISH HABITAT.
- PROVIDES COVER.



DESIGN SPECIFICS:
- KEY MEMBERS SHALL BE A MINIMUM LENGTH OF 30 FT AND SHALL HAVE A DIAMETER EQUAL TO 18 TO 24 INCHES.
- THE TOP OF ROOTWADS SHALL NOT EXTEND MORE THAN 0.5 FT ABOVE TOP OF BANK.
- PARTIALLY BURRY THE ROOTWAD ORIENTED PARALLEL TO FLOW THEN PLACE PERPENDICULAR ROOTWADS. PIN ROOTWADS AND BANK MEMBERS TOGETHER.
- INSTALL RACKING MEMBERS WHILE INSTALLING KEY MEMBERS.
- WEAVE RACKING MEMBERS AND SLASH MATERIAL (NOT SHOWN) INTO VOIDS BETWEEN KEY MEMBERS.
- RACKING MEMBER AND SLASH QUANTITIES MAY VARY PER STRUCTURE.
- BACKFILL STRUCTURE IN 1 FT MAXIMUM LIFTS. COMPACT EACH LIFT FOLLOWING PLACEMENT USING EXCAVATOR BUCKET.
- ADDITIONAL BALLASTING IS NEEDED IF TREE DIAMETER (DBH) EXCEEDS 25 INCHES.

NO.	DATE	BY	REVISION

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Union Soil and Water Conservation District

AIWOHI DRY CREEK HABITAT RESTORATION
30% CONCEPTUAL DESIGN
LA GRANDE, OREGON

TYPICAL HABITAT DETAILS

DRAWN: BHM	PROJ NO: 19369-002-00
DESIGN: TPH	SHEET 14 OF 17
CHECKED: RSC	DATE: 1.18.2018
SHEET NO. 5.2	

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NOTES:

1. Sheets are projected in Oregon State Plane, North, International feet. North American Vertical Datum of 1988 (NAVD88).
2. Existing topography provided by RSI, October 2017.
3. Aerial imagery provided by RSI, October 2017.
4. Existing inundation boundaries modeled in HEC-RAS V. 5.0.3. 2-yr discharge is equal to 233 cfs. 100-yr discharge is equal to 856 cfs.

LEGEND

- CONTOUR LINE - MAJOR (5-FOOT)
- CONTOUR LINE - MINOR (1-FOOT)
- EXISTING DRY CREEK ALIGNMENT
- PROPOSED DRY CREEK ALIGNMENT
- FLOODPLAIN GRADING LIMITS
- VIEWPORT
- PRIMARY CHANNEL
- SECONDARY CHANNE
- REGRADE FLOODPLA
- WETLAND/ALCOVE
- VERTICAL POST ARRA
- LARGE WOOD

0 40 80
SCALE IN FEET

PROPOSED CHANNEL ALIGNMENT

EXISTING CHANNEL ALIGNMENT

RESEED DISTURBED AREAS WITH NATIVE SEED MIX

WETLAND SEED MIX OR PLUGS (SEDGES/RUSHES)

WETLAND SEED MIX OR PLUGS (SEDGES/RUSHES)

WILLOW TRENCHES

ADD WILLOW STAKES IN LWM STRUCTURES

WETLAND SEED MIX OR PLUGS (SEDGES/RUSHES)

10+00 10+50 11+00 11+50 12+00 12+50 13+00 14+00 14+50 15+00 15+50 16+50 17+00 17+50 18+00 18+50 19+50 20+00 20+50 21+50 22+50 23+00 23+50 24+50 25+50 26+00 26+50 27+00 27+34

P:\19\19369002\CAD\00\Channel Design\R01 (30% Design)\19369002_Channel Design_S15_Revegetation Plan.dwg
Plotted: 01/18/2018, 18:12 | bmiller

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Union Soil and Water Conservation District

AIWOHI DRY CREEK HABITAT RESTORATION
30% CONCEPTUAL DESIGN
LA GRANDE, OREGON

REVEGETATION PLAN

DRAWN: BHM	PROJ NO: 19369-002-00
DESIGN: TPH	SHEET 15 OF 17
CHECKED: RSC	DATE: 1.18.2018
SHEET NO. 6.1	

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HIP 4 GENERAL AQUATIC CONSERVATION MEASURES APPLICABLE TO ALL ACTIONS

THE ACTIVITIES COVERED UNDER THE HIPIII ARE INTENDED TO PROTECT AND RESTORE FISH AND WILDLIFE HABITAT WITH LONG-TERM BENEFITS TO ESA-LISTED SPECIES. TO MINIMIZE THESE SHORT-TERM ADVERSE EFFECTS AND MAKE THEM PREDICTABLE FOR THE PURPOSES OF PROGRAMMATIC ANALYSIS, BPA WILL INCLUDE IN ALL PROJECTS IMPLEMENTED UNDER THIS HIP III PROPOSED ACTION THE FOLLOWING GENERAL CONSERVATION MEASURES (DEVELOPED IN COORDINATION WITH USFWS AND NMFS).

PROJECT DESIGN AND SITE PREPARATION.

1) STATE AND FEDERAL PERMITS. ALL APPLICABLE REGULATORY PERMITS AND OFFICIAL PROJECT AUTHORIZATIONS WILL BE OBTAINED BEFORE PROJECT IMPLEMENTATION. THESE PERMITS AND AUTHORIZATIONS INCLUDE, BUT ARE NOT LIMITED TO, NATIONAL ENVIRONMENTAL POLICY ACT, NATIONAL HISTORIC PRESERVATION ACT, AND THE APPROPRIATE STATE AGENCY REMOVAL AND FILL PERMIT, USACE CLEAN WATER ACT (CWA) 404 PERMITS, AND CWA SECTION 401 WATER QUALITY CERTIFICATIONS.

2) TIMING OF IN-WATER WORK. APPROPRIATE STATE (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)) GUIDELINES FOR TIMING OF IN-WATER WORK WINDOWS (IWW) WILL BE FOLLOWED.

A) BULL TROUT - WHILE UTILIZING THE APPROPRIATE STATE DESIGNATED IN-WATER WORK PERIOD WILL LESSEN THE RISK TO BULL TROUT, THIS ALONE MAY NOT BE SUFFICIENT TO ADEQUATELY PROTECT LOCAL BULL TROUT POPULATIONS. THIS IS ESPECIALLY TRUE IF WORK IS OCCURRING IN SPAWNING AND REARING AREAS BECAUSE EGGS, ALEVIN, AND FRY ARE IN THE SUBSTRATE OR CLOSELY ASSOCIATED HABITATS NEARLY YEAR ROUND. SOME AREAS MAY NOT HAVE DESIGNATED IN-WATER WORK WINDOWS FOR BULL TROUT OR IF THEY DO, THEY MAY CONFLICT WITH WORK WINDOWS FOR SALMON AND STEELHEAD. IF THIS IS THE CASE, OR IF PROPOSED WORK IS TO OCCUR WITHIN BULL TROUT SPAWNING AND REARING HABITATS, PROJECT PROPONENTS WILL CONTACT THE APPROPRIATE USFWS FIELD OFFICE TO INSURE 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 IN STREAM 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 IN STREAM 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 LAMPREYS ARE KNOWN TO EXIST, THE PROJECT SPONSOR WILL UTILIZE DEWATERING AND SALVAGE PROCEDURES OUTLINED IN US FISH AND WILDLIFE SERVICE BEST MANAGEMENT PRACTICES TO MINIMIZE ADVERSE EFFECTS TO PACIFIC LAMPREY (2010).

C) EXCEPTIONS TO ODFW, WDFW, MFWP, OR IDFG IN-WATER WORK WINDOWS WILL BE REQUESTED THROUGH THE VARIANCE PROCESS (PAGE 2).

3) 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).

4) SITE LAYOUT AND FLAGGING. PRIOR TO CONSTRUCTION. THE ACTION AREA WILL BE CLEARLY FLAGGED TO IDENTIFY THE FOLLOWING:

A) SENSITIVE RESOURCE AREAS, SUCH AS AREAS BELOW ORDINARY HIGH WATER, 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-SPRAY AREAS AND BUFFERS.

5) TEMPORARY ACCESS ROADS AND PATHS.

A) EXISTING ACCESS ROADS AND PATHS WILL BE PREFERENTIALLY USED WHENEVER REASONABLE, AND THE NUMBER AND LENGTH OF TEMPORARY ACCESS ROADS AND PATHS THROUGH RIPARIAN AREAS AND FLOODPLAINS WILL BE MINIMIZED TO LESSEN SOIL DISTURBANCE AND 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%, THEN 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 SURFACE AND DITCH, 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.

6) 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 CROSSING 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 THE STREAM 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) 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.

7) 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 OR 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.

8) 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:

A) STORED, FUELED, AND MAINTAINED IN A VEHICLE STAGING AREA PLACED 150 FEET OR MORE FROM ANY NATURAL WATER BODY OR WETLAND OR ON AN ADJACENT, ESTABLISHED ROAD AREA;

B) 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 ONLY TO GAS-POWERED EQUIPMENT WITH TANKS LARGER THAN 5 GALLONS);

C) BIODEGRADABLE LUBRICANTS AND FLUIDS SHALL BE USED ON EQUIPMENT OPERATING IN AND ADJACENT TO THE STREAM CHANNEL AND LIVE WATER.

D) INSPECTED DAILY FOR FLUID LEAKS BEFORE LEAVING THE VEHICLE STAGING AREA FOR OPERATION WITHIN 150 FEET OF ANY NATURAL WATER BODY OR WETLAND; AND

E) THOROUGHLY CLEANED BEFORE OPERATION BELOW ORDINARY HIGH WATER, AND AS OFTEN AS NECESSARY DURING OPERATION, TO REMAIN GREASE FREE.

9) EROSION CONTROL. EROSION CONTROL MEASURES WILL BE PREPARED AND CARRIED OUT, COMMENSURATE IN SCOPE WITH THE ACTION, THAT MAY INCLUDE THE FOLLOWING:

A) TEMPORARY EROSION CONTROLS.

I. TEMPORARY EROSION CONTROLS 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.

II. 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.

III. TEMPORARY EROSION CONTROL MEASURES MAY INCLUDE FIBER WATTLES, SILT FENCES, JUTE MATTING, WOOD FIBER MULCH AND SOIL BINDER, OR GEOTEXTILES AND GEOSYNTHETIC FABRIC.

IV. 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.

V. SEDIMENT WILL BE REMOVED FROM EROSION CONTROLS ONCE IT HAS REACHED 1/3 OF THE EXPOSED HEIGHT OF THE CONTROL.

VI. ONCE THE SITE IS STABILIZED AFTER CONSTRUCTION, TEMPORARY EROSION CONTROL MEASURES WILL BE REMOVED.

B) EMERGENCY EROSION CONTROLS. THE FOLLOWING MATERIALS FOR EMERGENCY EROSION CONTROL WILL BE AVAILABLE AT THE WORK SITE:

I. A SUPPLY OF SEDIMENT CONTROL MATERIALS; AND

II. AN OIL-ABSORBING FLOATING BOOM WHENEVER SURFACE WATER IS PRESENT.

10) DUST ABATEMENT. THE PROJECT SPONSOR WILL DETERMINE THE APPROPRIATE DUST CONTROL MEASURES 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:

A) WORK WILL BE SEQUENCED AND SCHEDULED TO REDUCE EXPOSED BARE SOIL SUBJECT TO WIND EROSION.

B) DUST-ABATEMENT ADDITIVES AND STABILIZATION CHEMICALS (TYPICALLY MAGNESIUM CHLORIDE, CALCIUM CHLORIDE SALTS, OR LIGNINSULFONATE) WILL NOT BE APPLIED WITHIN 25 FEET OF WATER OR A STREAM CHANNEL 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.

C) 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).

D) SPILL CONTAINMENT EQUIPMENT WILL BE AVAILABLE DURING APPLICATION OF DUST ABATEMENT CHEMICALS.

E) PETROLEUM-BASED PRODUCTS WILL NOT BE USED FOR DUST ABATEMENT.

11) SPILL PREVENTION, CONTROL, AND COUNTER MEASURES. 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) A DESCRIPTION OF HAZARDOUS MATERIALS THAT WILL BE USED, INCLUDING INVENTORY, STORAGE, AND HANDLING PROCEDURES WILL BE AVAILABLE ON-SITE.

B) WRITTEN PROCEDURES FOR NOTIFYING ENVIRONMENTAL RESPONSE 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 MATERIALS 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 TARPAULIN, UNTIL THEY CAN BE PROPERLY TRANSPORTED TO AND DISPOSED OF AT A FACILITY THAT IS APPROVED FOR RECEIPT OF HAZARDOUS MATERIALS.

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

A) 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.

B) WATERCRAFT, WADERS, BOOTS, AND ANY OTHER GEAR TO BE USED IN OR NEAR WATER WILL BE INSPECTED FOR AQUATIC INVASIVE SPECIES.

C) WADING BOOTS WITH FELT SOLES ARE NOT TO BE USED DUE TO THEIR PROPENSITY FOR AIDING IN THE TRANSFER OF INVASIVE SPECIES.

DRAFT SUBMITTAL - NOT FOR CONSTRUCTION

NO.	DATE	BY	REVISION

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Union Soil and Water Conservation District

AIWOHI DRY CREEK HABITAT RESTORATION
30% CONCEPTUAL DESIGN
LA GRANDE, OREGON

HIP IV GENERAL CONSERVATION & IMPLEMENTATION MEASURES

DRAWN: BHM	PROJ NO: 19369-002-00
DESIGN: TPH	SHEET 16 OF 17
CHECKED: RSC	DATE: 1.18.2018
SHEET NO. 7.1	

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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. 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.

- NATIONAL MARINE FISHERIES SERVICE. 2011. ANADROMOUS SALMONID PASSAGE FACILITY DESIGN. NORTHWEST REGION. AVAILABLE ONLINE AT:
HTTP://WWW.NWR.NOAA.GOV/SALMON-HYDROPOWER/FERC/UPLOAD/FISH-PASSAGE-DESIGN.PDF

- U.S. FISH AND WILDLIFE SERVICE. 2010. BEST MANAGEMENT PRACTICES TO MINIMIZE ADVERSE EFFECTS TO PACIFIC LAMPREY.
HTTP://WWW.FWS.GOV/PACIFIC/FISHERIES/SPHABCON/LAMPREY/PDF/BEST%20MANAGEMENT%20PRACTICES%20FOR%20PACIFIC%20LAMPREY%20APRIL%202010%20VERSION.PDF

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 ELECTROSHOCKED 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 IN-STREAM 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 US FISH AND WILDLIFE SERVICE (2010)3.

1) ISOLATE.

A) BLOCK NETS WILL BE INSTALLED AT UPSTREAM AND DOWNSTREAM LOCATIONS AND MAINTAINED IN A SECURED POSITION TO EXCLUDE FISH FROM ENTERING THE PROJECT AREA.

B) 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.

C) 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 FOUR HOURS FOR FISH IMPINGEMENT ON THE NET. LESS FREQUENT INTERVALS MUST BE APPROVED THROUGH A VARIANCE REQUEST.

D) NETS WILL BE MONITORED HOURLY ANYTIME THERE IS INSTREAM DISTURBANCE.

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:

A) REMOVE AS MANY FISH AS POSSIBLE PRIOR TO DEWATERING.

B) DURING DEWATERING, ANY REMAINING FISH WILL BE COLLECTED BY HAND OR DIP NETS.

C) SEINES WITH A MESH SIZE TO ENSURE CAPTURE OF THE RESIDING ESA-LISTED FISH WILL BE USED.

D) MINNOW TRAPS WILL BE LEFT IN PLACE OVERNIGHT AND USED IN CONJUNCTION WITH SEINING.

E) IF BUCKETS ARE USED TO TRANSPORT FISH:

I. THE TIME FISH ARE IN A TRANSPORT BUCKET WILL BE LIMITED, AND WILL BE RELEASED AS QUICKLY AS POSSIBLE;

II. THE NUMBER OF FISH WITHIN A BUCKET WILL BE LIMITED BASED ON SIZE, AND FISH WILL BE OF RELATIVELY COMPARABLE SIZE TO MINIMIZE PREDATION;

III. 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.

IV. BUCKETS WILL BE KEPT IN SHADED AREAS OR WILL BE COVERED BY A CANOPY IN EXPOSED AREAS.

V. DEAD FISH WILL NOT BE STORED IN TRANSPORT BUCKETS, BUT WILL BE LEFT ON THE STREAM BANK TO AVOID MORTALITY COUNTING ERRORS.

F) 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.

G) SALVAGE WILL BE SUPERVISED BY A QUALIFIED FISHERIES BIOLOGIST EXPERIENCED WITH WORK AREA ISOLATION AND COMPETENT TO ENSURE THE SAFE HANDLING OF ALL FISH.

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:

A) THE NMFS'S ELECTROFISHING GUIDELINES (NMFS 2000).

B) ONLY DIRECT CURRENT (DC) OR PULSED DIRECT CURRENT (PDC) WILL BE USED AND CONDUCTIVITY MUST BE TESTED.

I. IF CONDUCTIVITY IS LESS THAN 100 MS, VOLTAGE RANGES FROM 900 TO 1100 WILL BE USED.

II. FOR CONDUCTIVITY RANGES BETWEEN 100 TO 300 MS, VOLTAGE RANGES WILL BE 500 TO 800.

III. FOR CONDUCTIVITY GREATER THAN 300 MS, VOLTAGE WILL BE LESS THAN 400.

C) ELECTROFISHING WILL BEGIN WITH A MINIMUM PULSE WIDTH AND RECOMMENDED VOLTAGE AND THEN GRADUALLY INCREASE TO THE POINT WHERE FISH ARE IMMOBILIZED.

D) THE ANODE WILL NOT INTENTIONALLY CONTACT FISH.

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

F) 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 TO REDUCE MORTALITY.

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 THE TRANSITION, WHILE CONSTANT FLOW IS DELIVERED TO THE DOWNSTREAM REACHES.

B) ALL PUMPS WILL HAVE FISH SCREENS TO AVOID JUVENILE FISH IMPINGEMENT OR ENTRAINMENT, AND WILL BE OPERATED IN ACCORDANCE WITH NMFS'S CURRENT FISH SCREEN CRITERIA (NMFS 20114, OR MOST RECENT VERSION). IF THE PUMPING RATE EXCEEDS 3 CUBIC FEET SECOND (CFS), 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.

4 NATIONAL MARINE FISHERIES SERVICE. 2011. ANADROMOUS SALMONID PASSAGE FACILITY DESIGN. NORTHWEST REGION. AVAILABLE ONLINE AT:
HTTP://WWW.NWR.NOAA.GOV/SALMON-HYDROPOWER/FERC/UPLOAD/FISH-PASSAGE-DESIGN.PDF

5) SALVAGE NOTICE. MONITORING AND RECORDING OF 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 THE FWS FIELD OFFICE SUPERVISOR. PERTINENT INFORMATION, SUCH AS THE SPECIES AFFECTED, LENGTH OF STREAM REACH AFFECTED, PROPOSED TIME FOR THE PASSAGE BARRIER, AND ALTERNATIVESCONSIDERED, 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.

DRAFT SUBMITTAL - NOT FOR CONSTRUCTION

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Union Soil and Water Conservation District

AIWOHI DRY CREEK HABITAT RESTORATION
30% CONCEPTUAL DESIGN
LA GRANDE, OREGON

HIP IIV GENERAL CONSERVATION & IMPLEMENTATION MEASURES

DRAWN: BHM	PROJ NO: 19369-002-00
DESIGN: TPH	SHEET 17 OF 17
CHECKED: RSC	DATE: 1.18.2018
SHEET NO. 7.2	

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State and Local Governments
Indirect Cost Negotiation Agreement

EIN: 93-6007803

Organization:

Union Soil and Water
Conservation District
10507 N. McAlister Road
La Grande, OR 97850

Date: June 30, 2014

Report No(s).: 14-A-0869(13F)
14-A-0870(14P)
14-A-0871(15P)

Filing Ref.:
Initial Negotiation Agreement

The indirect cost rates contained herein are for use on grants, contracts, and other agreements with the Federal Government to which 2 CFR 225 (OMB Circular A-87) applies, subject to the limitations in Section II.A. of this agreement. The rates were negotiated by the U.S. Department of the Interior, Interior Business Center, and the subject organization in accordance with the authority contained in 2 CFR 225.

Section I: Rates

Type	Effective Period From	Effective Period To	Rate*	Locations	Applicable To
Final	07/01/12	06/30/13	5.86%	All	All Programs
Provisional	07/01/13	06/30/14	8.43%	All	All Programs
Provisional	07/01/15	06/30/15	8.43%	All	All Programs

***Base:** Total direct costs, less capital expenditures and passthrough funds.

Treatment of fringe benefits: Fringe benefits applicable to direct salaries and wages are treated as direct costs; fringe benefits applicable to indirect salaries and wages are treated as indirect costs.

Section II: General

A. **Limitations:** Use of the rates contained in this agreement is subject to any applicable statutory limitations. Acceptance of the rates agreed to herein is predicated upon these conditions: (1) no costs other than those incurred by the subject organization were included in its indirect cost rate proposal, (2) all such costs are the legal obligations of the grantee/contractor, (3) similar types of costs have been accorded consistent treatment, and (4) the same costs that have been treated as indirect costs have not been claimed as direct costs (for example, supplies can be charged directly to a program or activity as long as these costs are not part of the supply costs included in the indirect cost pool for central administration).

B. **Audit:** All costs (direct and indirect, federal and non-federal) are subject to audit. Adjustments to amounts resulting from audit of the cost allocation plan or indirect cost rate proposal upon which the negotiation of this agreement was based will be compensated for in a subsequent negotiation.

C. **Changes:** The rates contained in this agreement are based on the organizational structure and the accounting system in effect at the time the proposal was submitted. Changes in organizational structure, or changes in the method of accounting for costs which affect the amount of reimbursement resulting from use of the rates in this agreement, require the prior approval of the responsible negotiation agency. Failure to obtain such approval may result in subsequent audit disallowance.

D. **Rate Type:**

1. Fixed Carryforward Rate: The fixed carryforward rate is based on an estimate of the costs that will be incurred during the period for which the rate applies. When the actual costs for such periods have been determined, an adjustment will be made to the rate for future periods, if necessary, to compensate for the difference between the costs used to establish the fixed rate and the actual costs.

2. Provisional/Final Rates: Within 6 months after year end, a final indirect cost rate proposal must be submitted based on actual costs. Billings and charges to contracts and grants must be adjusted if the final rate varies from the provisional rate. If the final rate is greater than the provisional rate and there are no funds available to cover the additional indirect costs, the organization may not recover all indirect costs. Conversely, if the final rate is less than the provisional rate, the organization will be required to pay back the difference to the funding agency.

3. Predetermined Rate: The predetermined rate contained in this agreement is based on estimated costs which will be incurred during the period for which the rate applies and is normally not subject to subsequent carry-forward adjustments. However, if material changes occur in the grantee/contractor's cost structure, adjustments to the rate may be necessary to compensate for the effects of such changes.

E. **Agency Notification:** Copies of this document may be provided to other federal offices as a means of notifying them of the agreement contained herein.

F. **Record Keeping:** Organizations must maintain accounting records that demonstrate that each type of cost has been treated consistently either as a direct cost or an indirect cost. Records pertaining to the costs of program administration, such as salaries, travel, and related costs, should be kept on an annual basis.

G. **Reimbursement Ceilings:** Grantee/contractor program agreements providing for ceilings on indirect cost rate(s) or reimbursement amounts are subject to the ceilings stipulated in the contract or grant agreements. If the ceiling rate is higher than the negotiated rate in Section I of this agreement, the negotiated rate will be used to determine the maximum allowable indirect cost.

H. **Use of Other Rate(s):** If any federal programs are reimbursing indirect costs to this grantee/contractor by a measure other than the approved rate(s) in this agreement, the grantee/contractor should credit such costs to the affected programs, and the approved rate should be used to identify the maximum amount of indirect cost allocable to these programs.

I. **Central Service Costs:** Where central service costs are estimated for the calculation of indirect cost rate(s), adjustments will be made to reflect the difference between provisional and final amounts.

J. **Other:**

1. The purpose of an indirect cost rate is to facilitate the allocation and billing of indirect costs. Approval of the indirect cost rate does not mean that an organization can recover more than the actual costs of a particular program or activity.

2. Programs received or initiated by the organization subsequent to the negotiation of this agreement are subject to the approved indirect cost rate if the programs receive administrative support from the indirect cost pool. It should be noted that this could result in an adjustment to a future rate.

3. New indirect cost proposals are necessary to obtain approved indirect cost rate(s) for future fiscal or calendar years. The proposals are due in our office 6 months prior to the beginning of the year to which the proposed rate(s) will apply.

Section III: Acceptance

Listed below are the signatures of acceptance for this agreement:

By the State & Local Government:

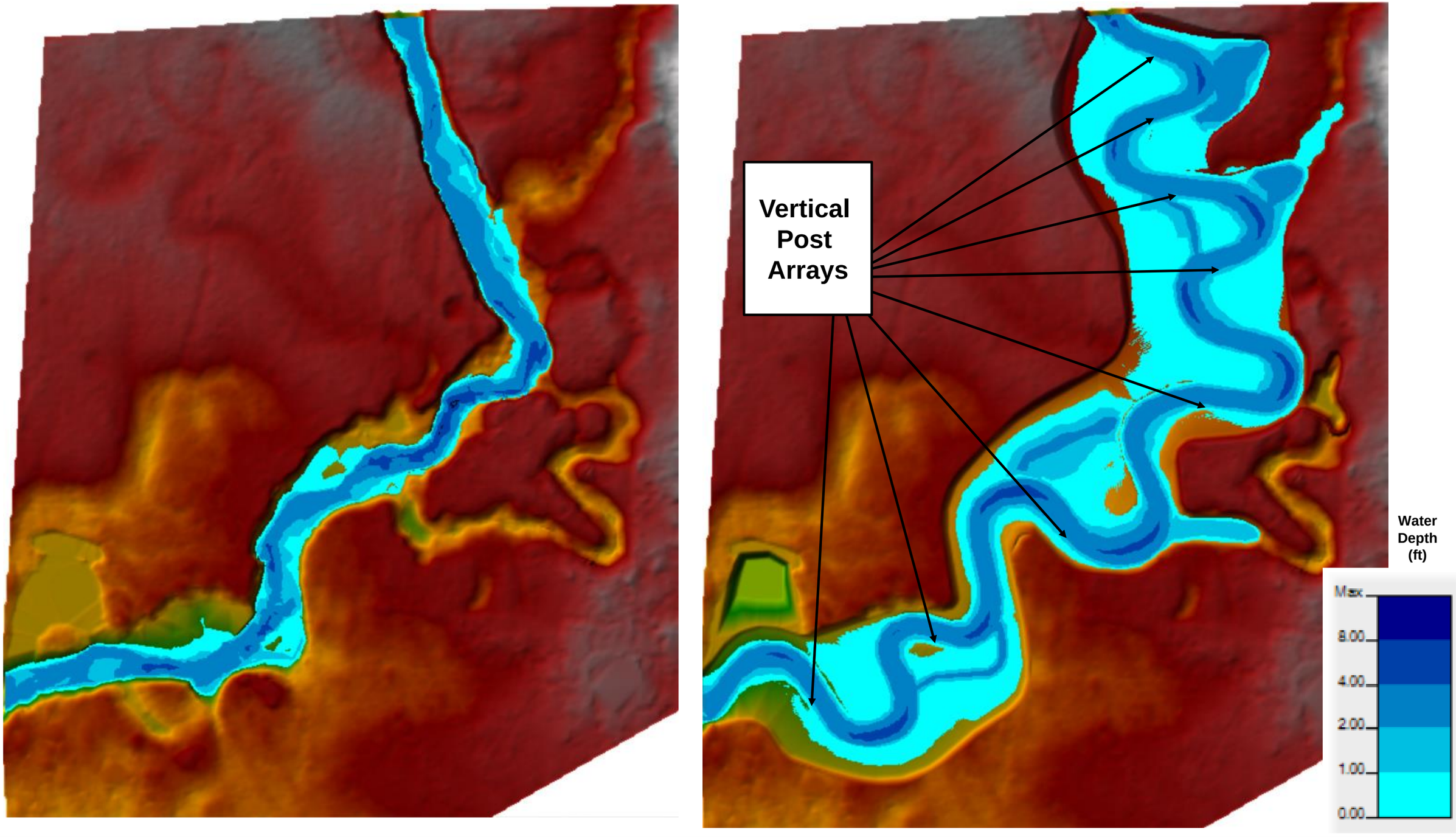
Union Soil and Water Conservation District
State/Local Government

/s/
Signature
Kathryn Frenyea
Name (Type or Print)
District Manager
Title
6/24/14
Date

By the Cognizant Federal Government Agency:

U.S. Department of the Interior
Agency

/s/
Signature
Deborah A. Moberly
Name
Office Chief
Office of Indirect Cost Services
Title
U.S. Department of the Interior
Interior Business Center
Agency
JUN 30 2014
Date
Negotiated by Jacqueline B. Ross
Telephone (916) 566-7003

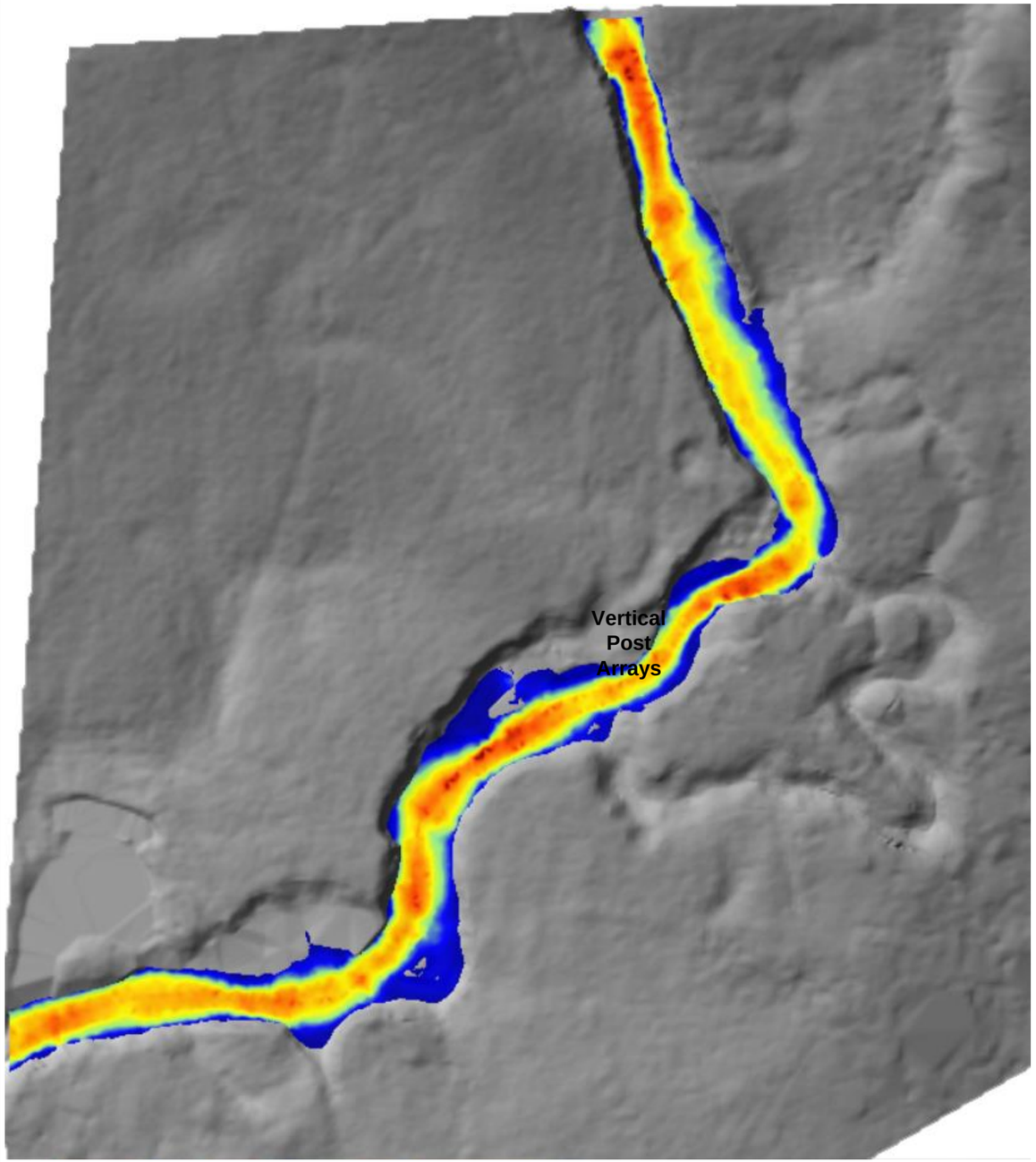


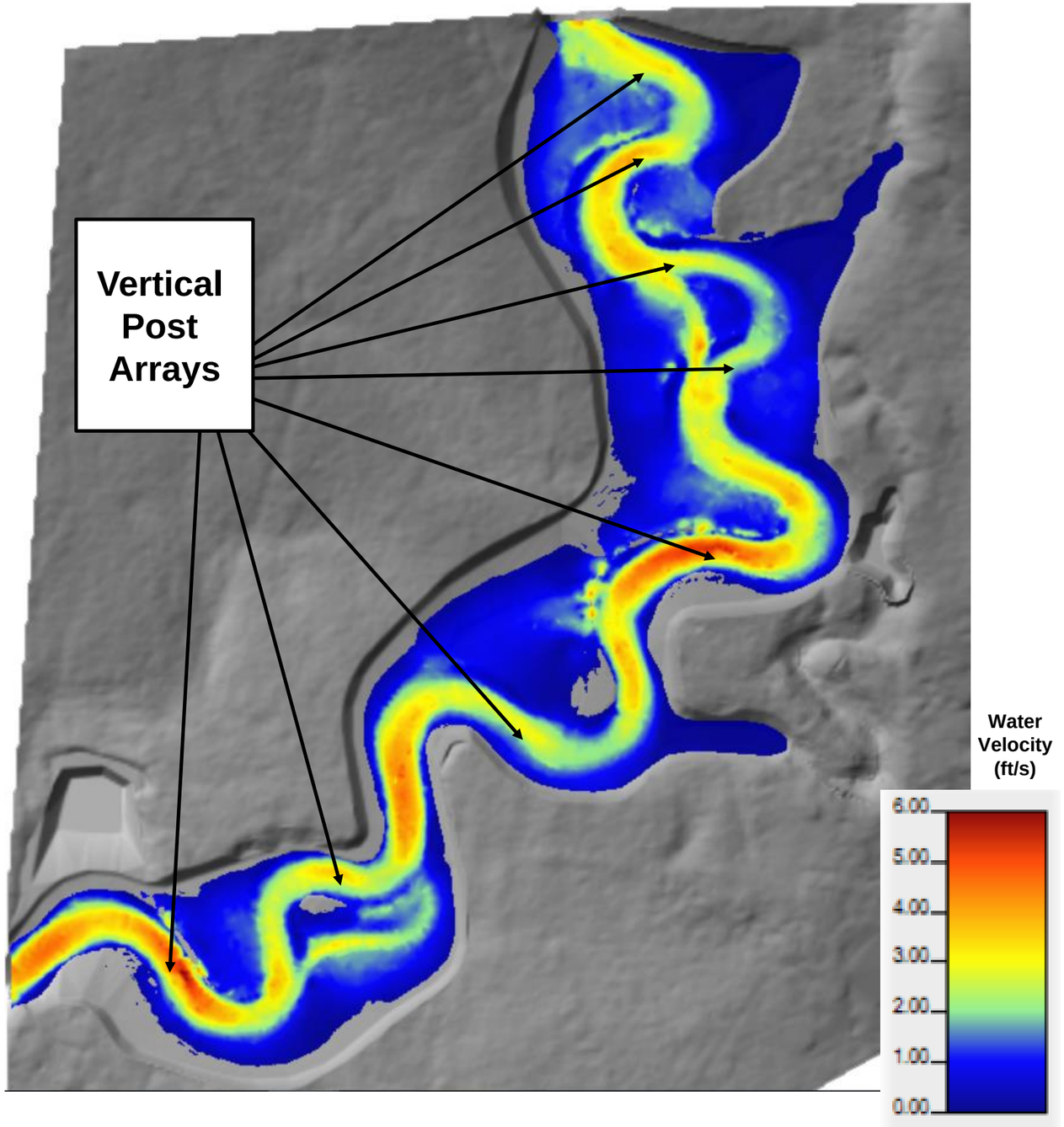
Modeled Water Depths Under Existing (Left) and Proposed (Right) Conditions for the 2-year Flood Discharge

Aiwohi-Sisco Reach Channel Restoration, Dry Creek, La Grande, Oregon

GeoEngineers

Figure B-1



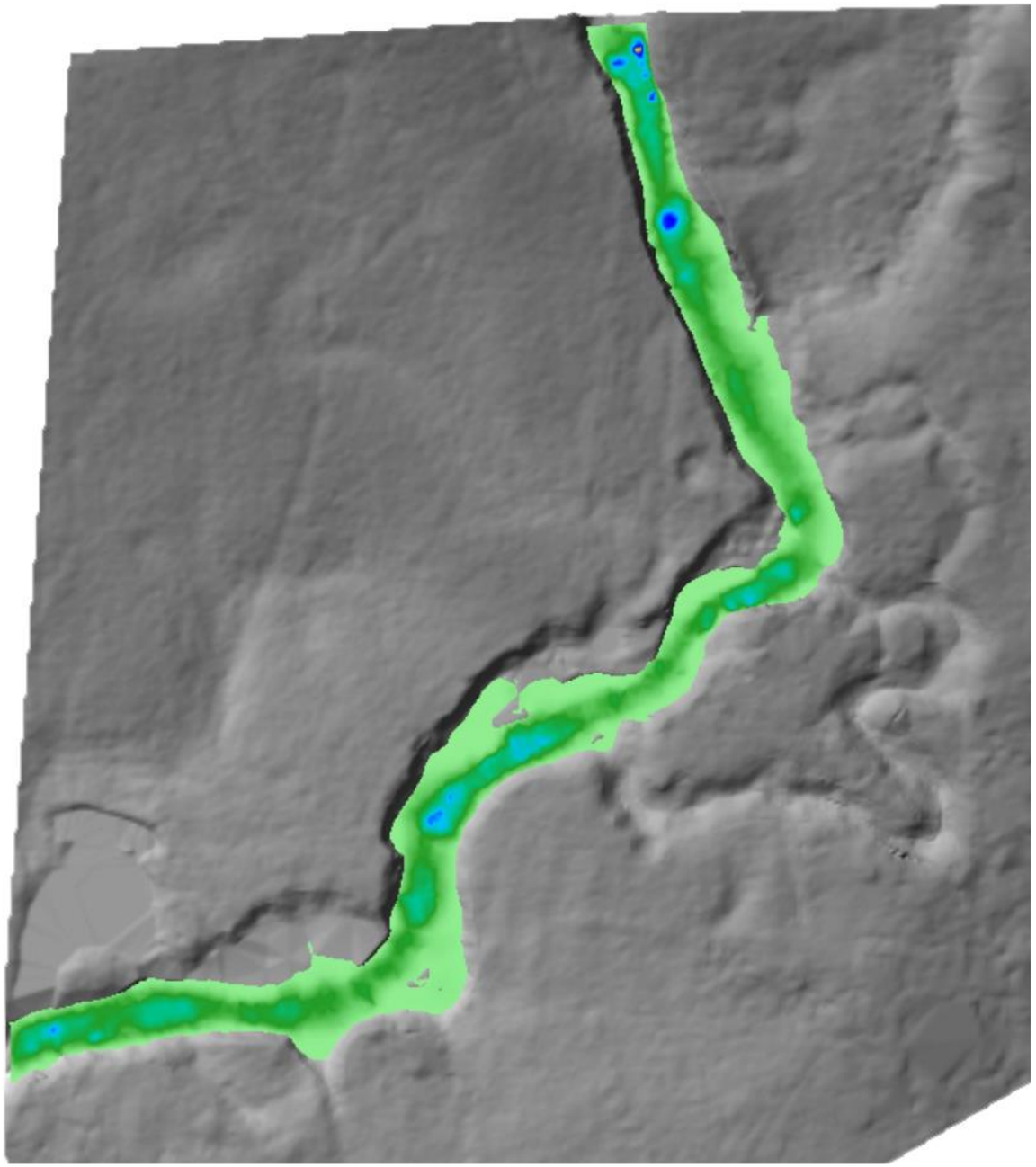


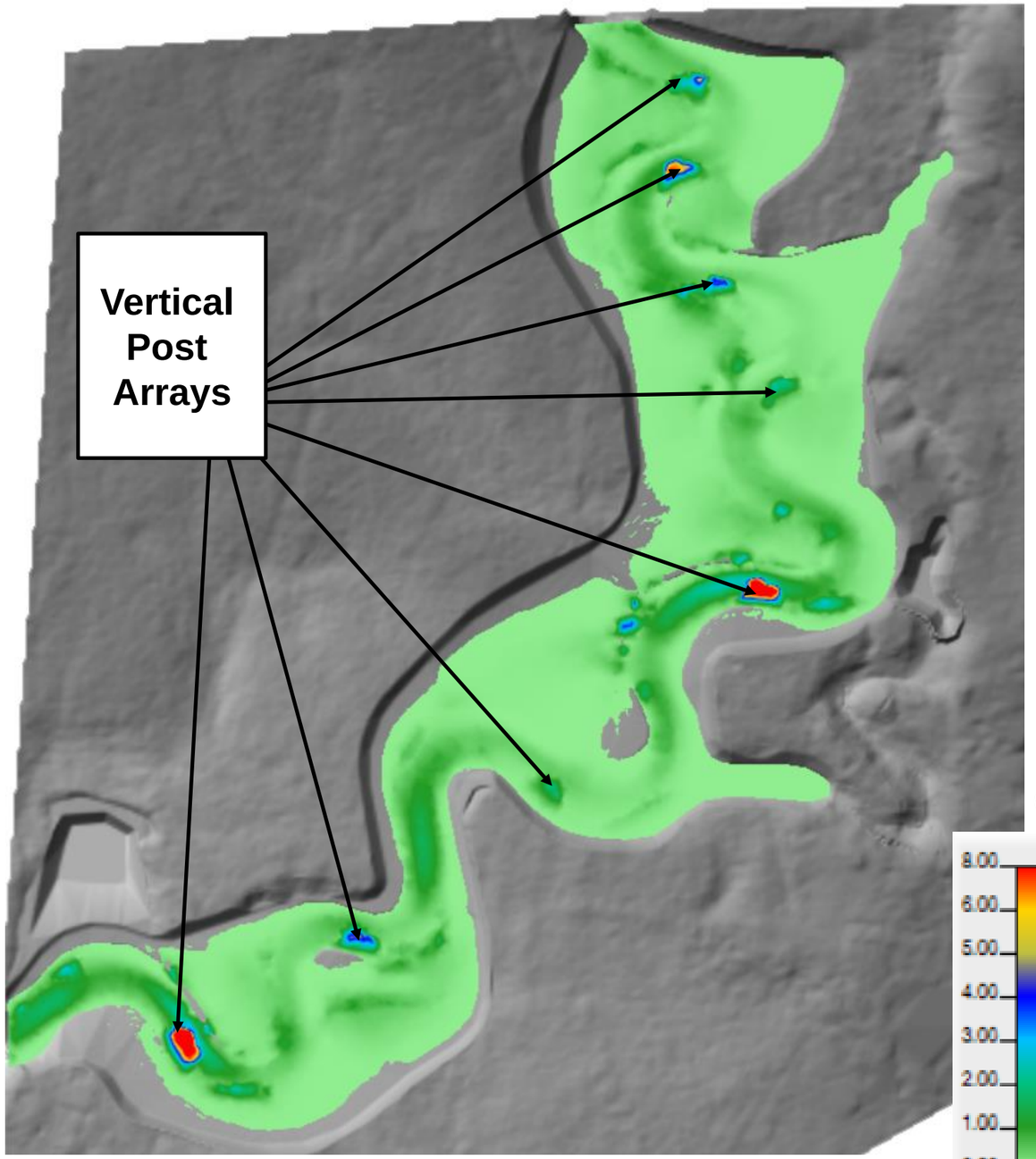
Modeled Velocity Under Existing (Left) and Proposed (Right) Conditions for the 2-year Flood Discharge

Aiwohi-Sisco Reach Channel Restoration, Dry Creek, La Grande, Oregon

GeoEngineers

Figure B-2



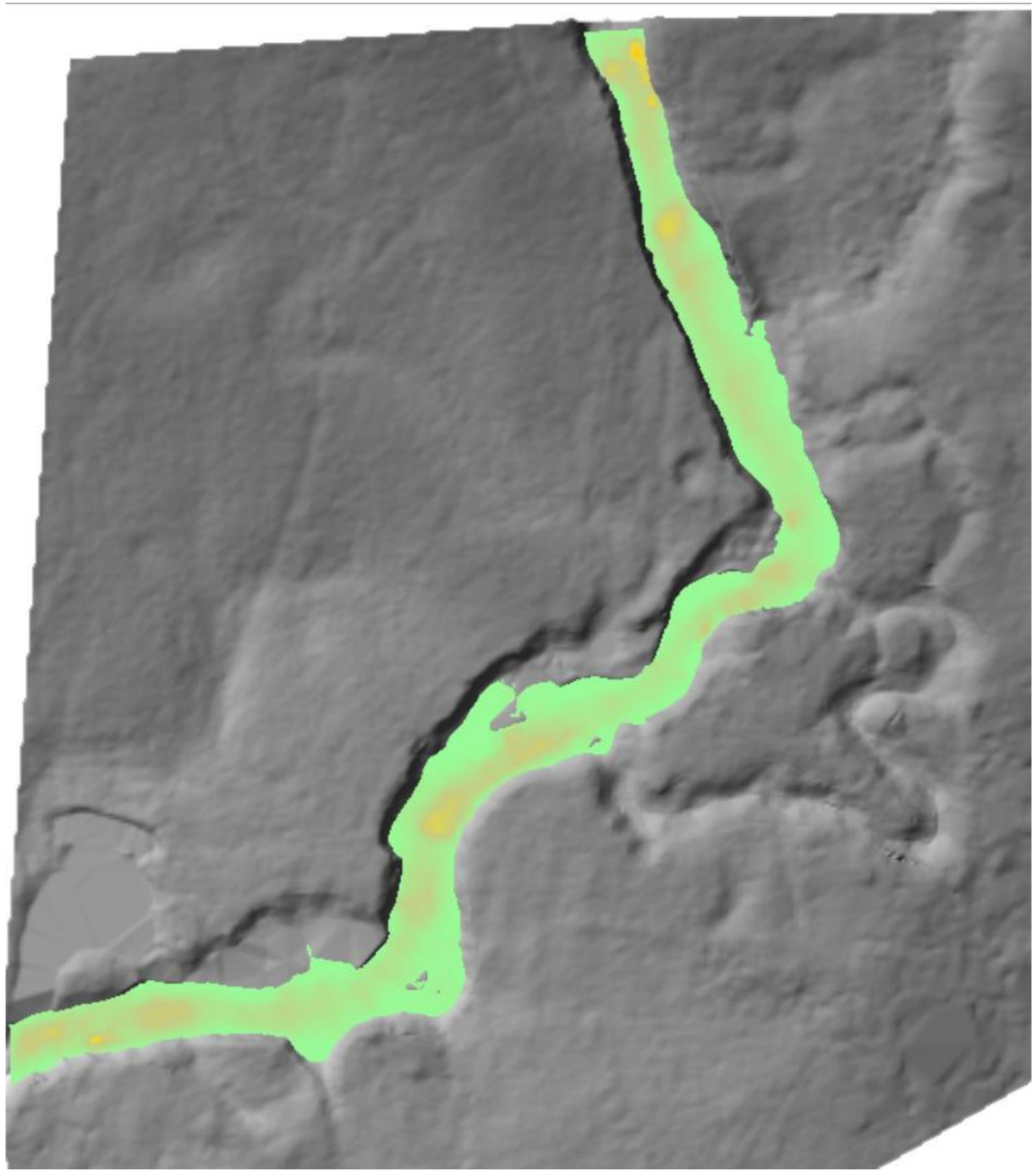


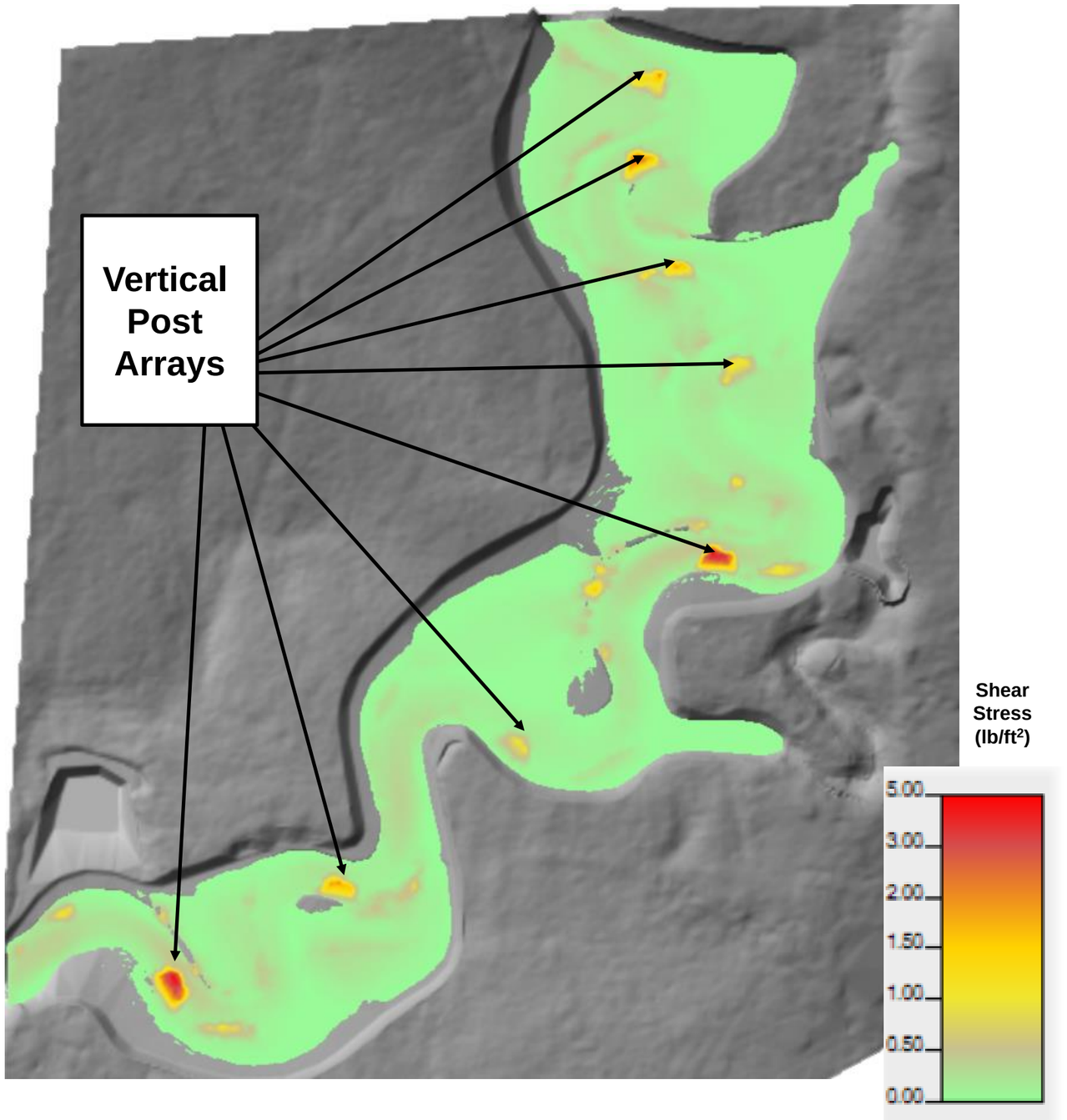
Modeled Stream Power Under Existing (Left) and Proposed (Right) Conditions for the 2-year Flood Discharge

Aiwohi-Sisco Reach Channel Restoration, Dry Creek, La Grande, Oregon

GeoEngineers

Figure B-3





Modeled Shear Stress Under Existing (Left) and Proposed (Right) Conditions for the 2-year Flood Discharge

Aiwohi-Sisco Reach Channel Restoration, Dry Creek, La Grande, Oregon

GeoEngineers

Figure B-4

REMOVE CONCRETE DEBRIS AND ROCK WEIRS

LARGE WOOD WITH ROOTWADS AND WHOLE TREES PLACED THROUGHOUT ALCOVES

OFF-CHANNEL WETLAND

LONGITUDINAL LOG (TYP.) PROVIDES COVER

PARTIAL SPANNING VERTICAL POST ARRAY (TYP.) INTENDED TO CREATE POOLS, BACKWATER INTO ALCOVES, AGGRADE STREAMBED, AND INDUCE MEANDERING

BANK ROOTWADS (TYP.) PLACED ALONG OUTSIDE MEANDERS PROVIDE COVER

SECONDARY CHANNEL ACTIVATES AT BANKFULL DISCHARGE

PROPOSED BRIDGE REPLACES EXISTING FORD CROSSING

DRY CREEK

MATCHLINE SHEET 3.3

LEGEND

- PROPOSED CONTOUR LINE - MAJOR (5-FOOT)
- PROPOSED CONTOUR LINE - MINOR (1-FOOT)
- EXISTING CONTOUR LINE - MAJOR (5-FOOT)
- EXISTING CONTOUR LINE - MINOR (1-FOOT)
- EXISTING DRY CREEK ALIGNMENT
- PROPOSED DRY CREEK ALIGNMENT
- FLOODPLAIN GRADING LIMITS
- PROPOSED 100-yr INUNDATION
- VERTICAL POST ARRAY
- LARGE WOOD

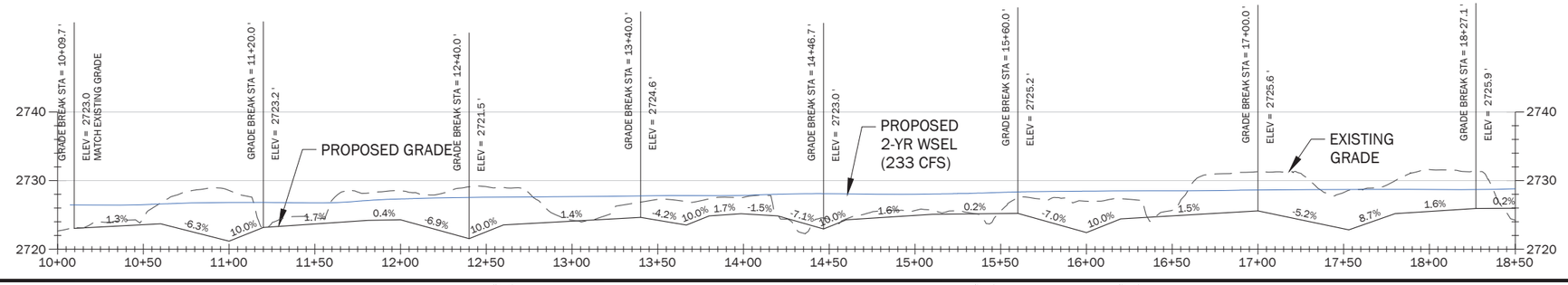
2-YR WATER DEPTHS (FT)		
Minimum	Maximum	Color
0.0	1.0	
1.0	2.0	
2.0	4.0	
4.0	5.0	
5.0	6.0	

0 20 40
SCALE IN FEET

NOTES:
1. Sheets are projected in Oregon State Plane, North, International feet. North American Vertical Datum of 1988 (NAVD88).
2. Existing topography provided by RSI, October 2017.
3. Aerial imagery provided by RSI, October 2017.
4. Existing and proposed inundation boundaries modeled in HEC-RAS V. 5.0.3. 2-yr discharge is equal to 233 cfs. 100-yr discharge is equal to 856 cfs.

PROPOSED THALWEG PROFILE

0 40 80
HORIZONTAL SCALE IN FEET
0 10 20
VERTICAL SCALE IN FEET
VERTICAL EXAGGERATION: 4X



NO.	DATE	BY	REVISION

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Union Soil and Water Conservation District

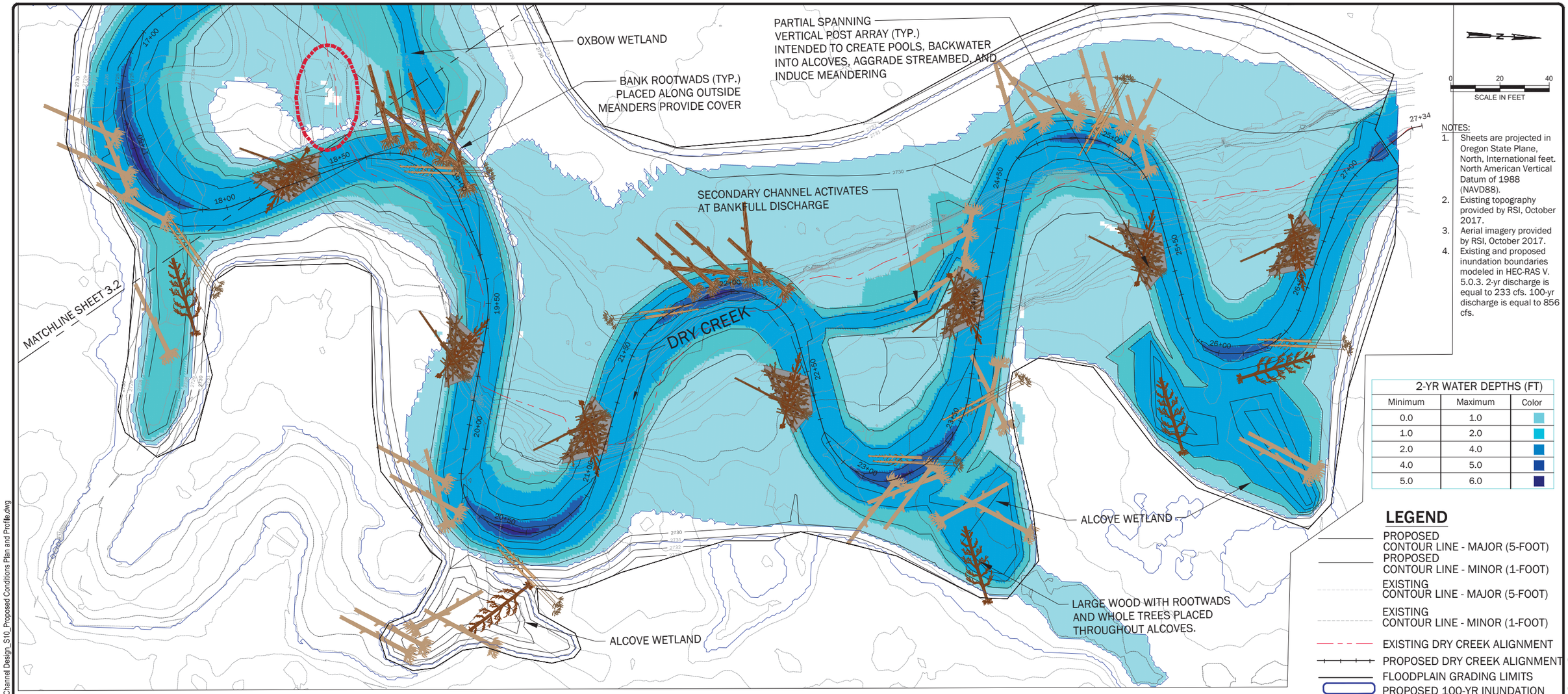
AIWOHI DRY CREEK HABITAT RESTORATION
30% CONCEPTUAL DESIGN
LA GRANDE, OREGON

PROPOSED PLAN AND PROFILE

DRAWN:	BHM	PROJ NO:	19369-002-00
DESIGN:	TPH	SHEET	9 OF 17
CHECKED:	RSC	DATE:	1.18.2018
SHEET NO.	3.2		

DRAFT SUBMITTAL - NOT FOR CONSTRUCTION

Plotted: 01/18/2018 - 18:04 | bmiller
P:\19\19369002\CAD\00\Channel Design\R01 (30% Design)\19369002_Channel Design_S09_Proposed Conditions Plan and Profile .dwg



NOTES:

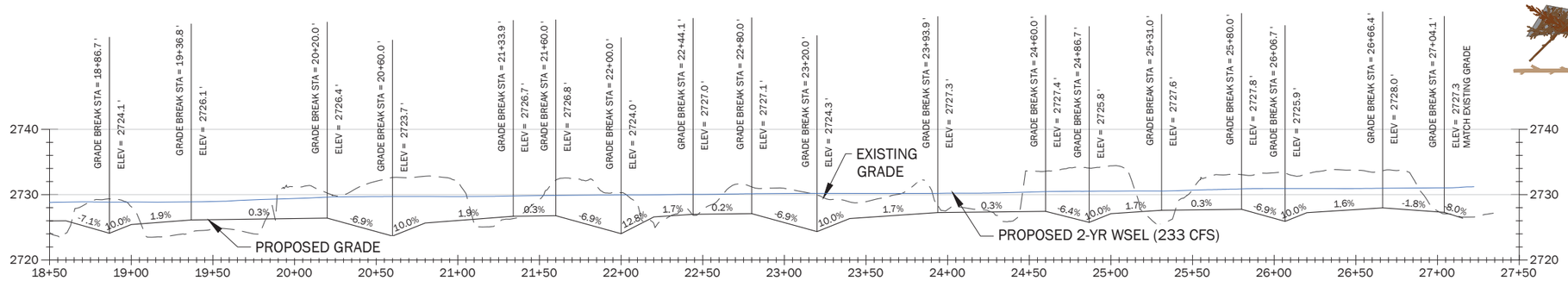
1. Sheets are projected in Oregon State Plane, North, International feet. North American Vertical Datum of 1988 (NAVD88).
2. Existing topography provided by RSI, October 2017.
3. Aerial imagery provided by RSI, October 2017.
4. Existing and proposed inundation boundaries modeled in HEC-RAS V. 5.0.3. 2-yr discharge is equal to 233 cfs. 100-yr discharge is equal to 856 cfs.

2-YR WATER DEPTHS (FT)		
Minimum	Maximum	Color
0.0	1.0	
1.0	2.0	
2.0	4.0	
4.0	5.0	
5.0	6.0	

LEGEND

- PROPOSED CONTOUR LINE - MAJOR (5-FOOT)
- PROPOSED CONTOUR LINE - MINOR (1-FOOT)
- EXISTING CONTOUR LINE - MAJOR (5-FOOT)
- EXISTING CONTOUR LINE - MINOR (1-FOOT)
- EXISTING DRY CREEK ALIGNMENT
- PROPOSED DRY CREEK ALIGNMENT
- FLOODPLAIN GRADING LIMITS
- PROPOSED 100-YR INUNDATION
- VERTICAL POST ARRAY
- LARGE WOOD

PROPOSED THALWEG PROFILE



0 40 80
HORIZONTAL SCALE IN FEET
0 10 20
VERTICAL SCALE IN FEET
VERTICAL EXAGGERATION: 4X

NO.	DATE	BY	REVISION

GEOENGINEERS
523 EAST SECOND AVENUE : SPOKANE, WA 99202 : 509-363-3125 : WWW.GEOENGINEERS.COM

Union Soil and Water Conservation District

AIWOHI DRY CREEK HABITAT RESTORATION
30% CONCEPTUAL DESIGN
LA GRANDE, OREGON

PROPOSED PLAN AND PROFILE

DRAWN: BHM	PROJ NO: 19369-002-00
DESIGN: TPH	SHEET 10 OF 17
CHECKED: RSC	DATE: 1.18.2018
SHEET NO. 3.3	

DRAFT SUBMITTAL - NOT FOR CONSTRUCTION

Plotted: 01/18/2018, 18:06 | bmiller
P:\19\19369002\CAD\00\Channel Design\R01 (30% Design)\19369002_Channel Design_S10_Proposed Conditions Plan and Profile.dwg

BUDGET

Totals automatically round to the nearest dollar

A	B	C	D	E	F	G	H
Itemize projected costs under each of the following categories:	**Unit Number**	**Unit Cost**	**OWEB Funds**	**BPA Funds**	**Cash Match**	**In-Kind Match**	**Total Costs**
	(e.g., # of hours)	(e.g., hourly rate)					(add columns D, E, F)
SALARIES, WAGES AND BENEFITS. List position titles, include only costs of employees charged to this grant.							
Aaron Bliesner (Project Management)	240	$27	4,362			2,181	6,543
Jim Webster (Project and Grant Administration	80	$44	1,742			1,742	3,484
Mary Aiwohi (Foot Bridge Design and Construction and Design Review)	1	$1,200				1,200	1,200
Project Partners Design Review (ODFW, CTUIR, and GRMW)	40	$60				2,400	2,400
SUBTOTAL (1)			6,104	0	0	7,523	13,627
CONTRACTED SERVICES. Labor, supplies, and materials to be provided by *non-staff* for project implementation.							
Tri County Weed (3 years of weed treatment at 2 applications a year)	6	$1,417.00	8,502				8,502
Environmental Controls, Permit Compliance, and BMP's	1	$3,500.00	3,500				3,500
Mobilization and Demobilization	1	$10,000.00	10,000				10,000
Cleaning, Grubbing, Stockpile, and Disposal	1	$7,170.00	7,170				7,170
Temporary Stream Crossing	1	$7,500.00	7,500				7,500
Excavation	10900	$5.00	54,500				54,500
Placed Material (In Channel)	2500	$8.00	2,792	17,208			20,000
Install Bridge Abutments	2	$5,000.00		10,000			10,000
Placed material (Placed on Site)	8400	$4.00		33,600			33,600
Hourly Equipment Rental	47	$170.20		8,000			8,000
20' log with rootwad 2"DBH installed	11	$300.00		3,300			3,300
30' log with rootwad 14-16"DBH installed	96	$450.00		43,200			43,200
40' whole trees installed	11	$500.00		5,500			5,500
Slash material installed	120	$147.50		17,700			17,700
Racking Material (4"-10" DBH at min. 10' in length) installed	585	$45.00		26,325			26,325
Boulders 2" installed	128	$65.00		8,320			8,320
Vertical piles (6"-8" dia at 10' length) installed	130	$60.00		7,800			7,800
Dewatering and Temporary Stream Diversions	14	$1,500.00		21,000			21,000
Willow Trenching with 5 willow stakes per linear foot	750	$20.00		15,000			15,000
SUBTOTAL (2)			93,964	216,953	0	0	310,917
TRAVEL. Mileage, per diem, lodging, etc. Must use current State of Oregon rates.							
Travel to Site Miles	1376	0.545		750			750
							0
SUBTOTAL (3)			0	750	0	0	750
MATERIALS/SUPPLIES. Refers to items that are "used up" in the course of the project. Costs to OWEB must be directly related to the implementation of this grant.							
							0
							0
SUBTOTAL (4)			0	0	0	0	0
EQUIPMENT/SOFTWARE. List portable equipment costing **$300** or more per unit. Must remain property of a governmental entity, tribe, watershed council, SWCD, institution of higher learning or school district.							
SUBTOTAL (5)			0	0	0	0	0
OTHER. Costs must be necessary and reasonable for successful completion of this grant.							
Land Use Information Form	1	30	30				30

A	B	C	D	E	F	G	H
Itemize projected costs under each of the following categories:	**Unit Number**	**Unit Cost**	**OWEB Funds**	**BPA Funds**	**Cash Match**	**In-Kind Match**	**Total Costs**
	(e.g., # of hours)	(e.g., hourly rate)					(add columns D, E, F)
							0
SUBTOTAL (6)			30	0	0	0	30
[Add subtotals above] MODIFIED TOTAL DIRECT COSTS (7)			100,098	217,703	0	7,523	325,324

A	B	C	D	E	F	G	H
Itemize projected costs under each of the following categories:	**Unit Number**	**Unit Cost**	**OWEB Funds**	**BPA Funds**	**Cash Match**	**In-Kind Match**	**Total Costs**
	(e.g., # of hours)	(e.g., hourly rate)					(add columns D, E, F)
GRANT ADMIN. Select one of the methods below. Fill in the requested rate. Compute by multiplying MTDC (7) line by this rate.							
Federally Negotiated Indirect Cost Rate	X	8.43%	8552	19969			28521
Federally Accepted 10% *de minimis*	☐						0
OWEB Negotiated Indirect Cost Rate	☐						0
SUBTOTAL (8)			8552	19969	0	0	28521
POST-GRANT. Pre-paid costs ($3,500 or less) that are associated with either post implementation status reporting or effectiveness monitoring or plant establishment costs. List each separately.							
Post-Implementation Status Reporting ($3,500 or less)	3/yr	250	750				750
Effectiveness Monitoring ($3,500 or less)	1/yr	250	250				250
Plant Establishment ($3,500 or less)	1/yr	350	350				350
SUBTOTAL (9)			1,350	0	0	0	1,350

GRANT BUDGET TOTAL ***Totals automatically round to the nearest dollar**

GRAND BUDGET TOTAL **[Add Totals (10), (11), and (12) as applicable]**	110,000	237,672	0	7,523	355,195

General Review Comments For Aiwohi-Cisco Dry Creek Habitat Restoration

1. Design looks good and includes features proven to be beneficial for higher graded streams. Must wonder if cost-benefit ratio is suitable given this is a tier 3 stream with de-watering and fish passage issues downstream. Project could provide beneficial habitat for steelhead. At this time it would not benefit Chinook until such a time that the passage issues at Royce and Huber diversions are addressed.

The District has attempted to balance the desires of the landowner and review team to achieve significant ecological and biological benefits while meeting budget constraints. Stream temperature and aquatic habitat data for this portion of Dry Creek identifies critical limitations for steelhead. The District has developed this project to further expand past restoration efforts in Willow Creek and Dry Creek in the upstream direction. The landowner has been more supportive of restoring stream function and floodplain processes than any other District project to date and has promoted an aggressive approach to restoring channel form. The budget estimate developed for the 80% design has been reduced by $115,780 in the Final Design by modifying structural features and reducing materials while still meeting project objectives. In tandem with this design effort, the District has been working with all of the landowners that have irrigation interests at both the Royes and Huber diversions for the past year to improve fish passage through engineered designs. Design concepts are currently being developed in collaboration with Reclamation with plans to construct solutions as soon as 2020.

2. Wood structures could be designed with greater complexity. Perhaps adding additional racking. Direct link to larger OAF project.

The 30% design drawings for typical wood structures intentionally omitted the fine detail of racking and slash material to allow reviewers a clearer view of the base structure. The Final Design planset includes additional detail of structure typicals for a vertical post array, longitudinal logs, and bank rootwad (material specifications provided below). Internal discussions between the District and the engineering firm sought to reduce the budget estimate by decreasing the amount of slash material from 286cy to 130cy, and vertical piles from 340 to 120 for a total cost savings of $41,810. This was done in order to improve the cost/benefit ratio and balance between function and cost.

Vertical post array
Piles 13
Slash 6cy
Racking 24
Longitudinal logs
Piles 0
Slash 1.7cy
Racking 9
Bank rootwad
Piles 6
Slash 6cy
Racking 24

3. Cost is high – suggest sponsor and engineer revisit designs to see if there are cost saving opportunities. 80% BDR shows a reduced construction budget of $290,000 so final proposal budget should reflect this or provide justification for why they are not the same.

The District review conducted the 80% design products resulted in modifications that further reduced materials and structures without adversely impacting the overall project goals and objectives. The 80% Basis of Design Report (BDR) included a total construction budget of $289,795 that omitted line items for willow trenching ($15,000) and equipment and staff rental rate ($8,000). These items were added to

the final BDR for a total construction budget of $312,795. The construction budget presented in the BDR only accounts for costs associated with construction materials and a heavy equipment contractor. Additional expenditures to be incurred will include 3 years of weed treatment after implementation, project management, travel, administrative costs, and project monitoring for a total project cost of $355,195.

4. Expensive at rate of cost per stream mile but fully restoring floodplain, as almost none exists in this reach. It's expensive to move so much fill in order to create inset floodplain.

See discussion above.

5. If sufficient funding is available after funding Tier 1 & 2 projects then this project should be funded considering such a willing landowner is available.

We completely agree.

6. Would like to see the HIPIV review by engineer.

The HIPIV RRT, including BPA Engineering, NMFS Hydraulic Engineer, reviewed the 80% design drawings and BDR and responded with no additional comments. The District has been notified to proceed to final design in the following email.

> Hi Aaron,
>
> The RRT has completed its review of the 80% basis of design report. All comments from the 30% review have been addressed. We have no additional technical or functional comments. In addition, Sarah Fesenmeyer and Jeff Brown from NOAA completed their reviews as well. Once final designs are completed, please send us a copy to ensure nothing else needs to be addressed.
>
> Thanks,
>
> ***Travis Kessler***
> (CONTR) SalientCRGT
> Environmental Protection Specialist
> Bonneville Power Administration
> Office: 503.230.5468
> Cell: 971.930.6838
> tdkessler@bpa.gov

7. The increase in pool habitats, structure complexity and off channel habitat would be positive uplift for reach.

We completely agree.

8. Though expenses associated with cutting inset floodplains increase costs, there really are no other alternatives for recreating a floodplain in this reach $335K for .21 miles.

We completely agree.

9. Perhaps the IT should consider a moratorium of near term/future habitat work in Willow basin until passage in lower basin is addressed. Serves notice to prospective partners that CC & UGR Tier 1 & nodes are priority. Should this affect OWEB FIP? I believe so.

This statement was partially addressed in the first response above. The District is collaborating with Reclamation to develop fish passage solutions in Willow Creek while concurrently scoping projects that could improve aquatic habitat conditions, floodplain function, irrigation efficiency upgrades and instream flow throughout Willow Creek Watershed. This watershed is dominated by private land ownership and agricultural use while supporting a steelhead population, and the District is in the best position to implement conservation improvements. This could have a significant impact on previously agreed upon FIP projects that have been planned in the Willow Creek basin and could be discussed further during future IT meetings.

10. Cost seems high for such a small stream and length of channel. This is a great private land opportunity

See discussion above in #1 and #3.

11. Although this project seems costly for a stream system with a partial barrier at the mouth to steelhead, it also has great value in that it adds to improved habitat directly downstream.

See discussion above in #1, #3, and #9.

12. Recommend not funding any more habitat improvements in UGR 4, after this project, until the barriers are removed.

See above for more detail in #1 and #9.

13. Need to prioritize dams on lower Willow Creek prior to additional work in UGR4 after this project.

See above for more detail in #1 and #9.

14. This project increases in importance knowing that there is a plan to address the barriers in Willow Creek.

See above for more detail in #1 and #9.

15. Great detail throughout the application. Excellent specificity of restoration actions and metrics. Just make sure that metrics in application are consistent throughout.

Noted and the application will be checked for consistency.

16. Is there a water right associated with the property? If so, what are the prospects for keeping flow instream to help with low flows?

There is no instream water right for the property.

Budget Comments:

1. Salaries/Wages/Benefits – If Jim's time is really for Grant Admin then this should be included in the Indirect costs category. If this is additional PM time then its fine as is.

Salary costs for Jim in this budget category will be used for project management. Administrative costs of salary are included in the District's indirect cost pool.

2. Materials/Supplies – If contractor is purchasing any of these items for implementation then they should go in the Contracted Services category. Materials/Supplies includes only those items that the grantee (USWCD) will purchase for the project.

This has been addressed and included in the updated budget.

3. Other – do you have a DEQ401 permit you want to pay for with the OWEB funds ($1,000)? This

is now an eligible project expense.

The DEQ401 permit is currently under review and funding will be payed for through the current TA grant.

4. Indirect – Assuming that GRMW board approves the project and we enter into an OWEB grant agreement, OWEB will need a current FNICR before we can release any payments on the grant.

The process for producing a current FNICR has begun and it is anticipated that this will be in place well before project implementation.