Exhibit BB
Other Information

Boardman to Hemingway Transmission Line Project

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Amended Preliminary Application for Site Certificate

June 2017

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ACRONYMS AND ABBREVIATIONS

Amended Project Order	First Amended Project Order, Regarding Statutes, Administrative Rules and Other Requirements Applicable to the Proposed Boardman to Hemingway Transmission Line (December 22, 2014)
BACT	best available control technology
BLM	Bureau of Land Management
CFR	Code of Federal Regulations
CO_2e	carbon dioxide equivalent
CTUIR	Confederated Tribes of the Umatilla Indian Reservation
EFSC or Council	Energy Facility Siting Council
EPA	Environmental Protection Agency
FPA	Forest Practices Act
GHG	greenhouse gas
IPC	Idaho Power Company
kV	kilovolt
NAAQS	National Ambient Air Quality Standards
NERC	North American Electric Reliability Corporation
OAR	Oregon Administrative Rule
ODEQ	Oregon Department of Environmental Quality
ODF	Oregon Department of Forestry
ODOE	Oregon Department of Energy
OEQC	Oregon Environmental Quality Commission
ORS	Oregon Revised Statute
PSD	Prevention of Significant Deterioration
ROW	right-of-way
U.S.C.	United States Code
USFS	United States Forest Service

Exhibit BB
Other Information

1.0 INTRODUCTION

Exhibit BB provides information regarding greenhouse gas (GHG) emissions, compliance with the Oregon Forest Practices Act (FPA), issues raised by the Confederated Tribes of the Umatilla Indian Reservation (CTUIR), and undergrounding the transmission line. Further, this Exhibit includes a comprehensive list of each of Idaho Power Company's (IPC) proposed site certificate conditions.

2.0 APPLICABLE RULES AND AMENDED PROJECT ORDER PROVISIONS

2.1 Site Certificate Application Requirements

Oregon Administrative Rule (OAR) 345-021-0010(1)(bb) provides that Exhibit BB include the following:

> *Any other information that the Department requests in the project order or in a notification regarding expedited review.*

2.2 Amended Project Order Provisions

The Amended Project Order requests the following information:

> *To the extent that the following issues were not addressed in other exhibits, include information in Exhibit BB related to the following:*
>
> *1. Include evidence and analysis related to the use of equipment that emits sulfur hexafluoride or other greenhouse gases that might trigger the application of the ODEQ/EPA's "Tailoring Rule" to one or more components of the proposed facility.*
>
> *2. The proposed project will require the removal of trees in forested areas, and such removal could be classified as a commercial operation. Provide evidence and analysis in Exhibit BB for a determination of whether the construction of the proposed facility is a commercial operation and subject to the requirements of the Oregon Forest Practices Act. If the Act applies, the applicant shall consult with ODF to ensure that the application for site certificate contains adequate evidence for the Council to find that construction of the project will meet the requirements of the Oregon Forest Practices Act. Evidence can be provided in the form of a Notice of Operation and written plans developed in consultation with ODF, such as a Plan for Alternate Practice if reforestation after harvest is not possible.*
>
> *3. If a concern expressed by the Confederated Tribes of Umatilla Indian Reservation (CTUIR) or other tribal government is under Council jurisdiction and not elsewhere addressed in the application for site certificate, the applicant may address the issue in Exhibit BB.*
>
> *4. If it is determined that the Fish Passage rules will be included in and governed by the site certificate, in the event that development of the project will result in obstruction of migratory fish passage, the application for site certificate must include a fish passage plan that complies with OAR Chapter 635, Division 412. (Amended Project Order, p.22)*

> *5. To the extent not substantively addressed in other exhibits, include analysis regarding compliance with applicable laws included in Exhibit CC.*

(Amended Project Order, Section III(bb)).

The Amended Project Order further provides:

> *NOI states that the project will emit no pollutants during operation and does not require air permits from the ODEQ's federally-delegated air program. However, Exhibit BB should address whether the May 2013 "Tailoring Rule" promulgated by the EPA applies to the emissions of greenhouse gases (including sulfur hexafluoride) from facility components. If so, provide evidence that emission sources included in the proposed facility do not exceed permitting thresholds.*

(Amended Project Order, Section III(y)).

> *ODF provides technical review and recommendations regarding compliance with the Oregon Forest Practice Rules. The applicant shall provide analysis of compliance with the Oregon Forest Practice Rules in Exhibit BB.*

(Amended Project Order, Section III(cc)).

> *A portion of the proposed facility would be located on forest land. Construction activities on forest lands would require a Permit to Operate Power Driven Machinery from the Oregon Department of Forestry (ODF). This permit does not relate to the siting of the facility and will therefore not be included in or governed by the site certificate. The applicant should contact ODF to determine the requirements for obtaining this permit, or any other required permits or approvals from ODF.*
>
> *If the removal of trees would be necessary as part of the proposed project development, and such removal is part of a commercial operation, that activity may be subject to the Oregon Forest Practices Act. Information regarding whether the proposed project is subject to the requirements of the Oregon Forest Practices Act should be included in Exhibit BB of the application for site certificate (if not already addressed elsewhere in the application).*

(Amended Project Order, Section III(e)).

The Amended Project Order did not specifically request information on the possibility of undergrounding sections of the Project. However, comments were received from the public regarding the option to place the Project's 500-kilovolt (kV) transmission line underground. Therefore, information on options and constraints for undergrounding 500-kV transmission lines has been included in Section 3.5 of this Exhibit.

Finally, Attachment BB-4 provides a comprehensive list of IPC's proposed site certificate conditions.

3.0 ANALYSIS

3.1 Tailoring Rule

3.1.1 Federal Regulations

Title I of the Clean Air Act charges the Environmental Protection Agency (EPA) with formulating National Ambient Air Quality Standards (NAAQS) for air pollutants. States have primary

responsibility for implementing the NAAQS by developing "State implementation plans." A State must designate each area within its borders as "attainment," "nonattainment," or "unclassifiable" with respect to each NAAQS, and the State's implementation plan must include permitting programs for stationary sources according to the classification of the area where the source is or is proposed to be located.

Stationary sources in areas designated attainment or unclassifiable are subject to the provisions of the Act relating to "Prevention of Significant Deterioration" (PSD). It is unlawful to construct or modify a "major emitting facility" in "any area to which [the PSD program] applies" without first obtaining a permit.[1] To qualify for a permit, the facility must not cause or contribute to the violation of any applicable air-quality standard, and it must comply with emissions limitations that reflect the "best available control technology" (or BACT) for "each pollutant subject to regulation under" the Act.[2] The Act defines a "major emitting facility" as any stationary source with the potential to emit 250 tons per year of "any air pollutant" (or 100 tons per year for certain types of sources).[3]

In addition to the PSD permitting requirements, Title V of the Act makes it unlawful to operate any "major source," wherever located, without a comprehensive operating permit.[4] Title V generally does not impose substantive pollution-control requirements; rather, it is designed to facilitate compliance and enforcement by consolidating into a single document all of a facility's obligations under the Act.

In 2010, EPA concluded stationary sources would be subject to the PSD program and Title V on the basis of their potential to emit GHGs.[5] However, because GHGs are emitted in significantly larger quantities than other Clean Air Act pollutants and in order to prevent an explosive expansion of the PSD program, EPA adopted the Tailoring Rule, whereby it tailored major source thresholds for GHG emissions from new and modified sources under the PSD program.[6] The phase-in consisted of three steps. During Step 1, from January 2 through June 30, 2011, no source would become newly subject to the PSD program or Title V solely on the basis of its GHG emissions. During Step 2, from July 1, 2011, through June 30, 2012, sources with the potential to emit at least 100,000 tons per year carbon dioxide equivalent (CO_2e) of GHGs would be subject to PSD and Title V permitting for their construction and operation. As part of Step 3, EPA decided not to lower the thresholds it had established at Step 2 until at least 2016.[7] The Tailoring Rule defines "greenhouse gases" as "the aggregate group of six greenhouse gases," which includes sulfur hexafluoride (SF_6) (see, e.g., 40 Code of Federal Regulations [CFR] § 51.166(b)(48)(i)).

The U.S. Supreme Court concluded in *Utility Air Regulatory Group v. EPA*, 134 S. Ct. 2427 (2014), that the Clean Air Act neither compels nor permits EPA to adopt an interpretation of the Act requiring a source to obtain a PSD permit based solely on its potential GHG emissions. The Court invalidated the Tailoring Rule, declaring that EPA's decision to replace the statutory applicability thresholds with higher "tailored" ones went beyond the bounds of the agency's statutory authority. Even so, the Court found that EPA reasonably interpreted the Act to require sources that trigger the PSD program for other pollutants to comply with BACT for GHGs. As a result, EPA can no longer regulate sources under the PSD and Title V permit programs based

[1] 42 United States Code (U.S.C.) §§ 7475(a)(1), 7479(2)(C).
[2] Id. § 7475(a)(4).
[3] Id. § 7479(1).
[4] 42 U.S.C. § 7661a(a).
[5] 75 Fed. Reg. 17004 (Apr. 2, 2010).
[6] 75 Fed. Reg. 31514 (June 3, 2010) (codified at 40 CFR parts 51, 52, 70, and 71).
[7] 77 Fed. Reg. 41051 (July 12, 2012).

solely on their emissions of GHGs. But if a source triggers the PSD program for other pollutants, it can be required to comply with BACT for GHGs.

Here, because the PSD and Title V permit programs are no longer triggered by GHG emissions alone and the Project will not emit other regulated air pollutants at levels that require a PSD or Title V permit, the Project does not require a PSD or Title V permit.

3.1.2 Oregon Regulations

In 2011, the Oregon Environmental Quality Commission (OEQC) adopted rules substantively identical to the federal Tailoring Rule GHG permitting rules. While the 2014 Supreme Court decision invalidated EPA's authority to impose the federal GHG permitting requirements, Oregon's rules were not affected by the Supreme Court's decision. The discrepancy between federal and state requirements created uncertainty for the Oregon Department of Environmental Quality (ODEQ), the regulated community, and the public so ODEQ recommended and OEQC adopted a temporary rule on November 5, 2014, that aligned ODEQ's rules with the Supreme Court decision. On April 16, 2015, OEQC approved final amendments to ODEQ's rules, aligning ODEQ's rules with the Supreme Court decision. As a result, ODEQ does not regulate sources under the PSD and Title V permit programs based solely on their emissions of GHGs.

3.2 Oregon Forest Practices Act

The Oregon FPA—Oregon Revised Statute (ORS) 527.610 to 527.770, 527.990 (1) and 527.992—and its implementing regulations at OAR Chapter 629, set standards for commercial activities involving the establishment, management, or harvesting of trees in Oregon's forestlands. The FPA regulates these forest operations on all non-federal lands. Operations on U.S. Department of Agriculture, Forest Service (USFS) and Bureau of Land Management (BLM) lands are not directly regulated, but both agencies may require that operations meet or exceed the FPA requirements.

The Project will require vegetation removal, including the removal of trees within portions of the Site Boundary. This requirement is based on ensuring system reliability consistent with the mandatory system reliability standards developed by the North American Electric Reliability Corporation (NERC), particularly standard FAC-003-3, Transmission Vegetation Management Program (NERC 2013).

As described in this section, removal of trees from the Site Boundary falls within the scope of the FPA. IPC seeks the Energy Facility Siting Council's (EFSC) determination of compliance with the FPA. Specifically, IPC requests that EFSC conclude that the Project will comply with the applicable FPA statutory and administrative rule provisions identified in the Amended Project Order.

3.2.1 Applicability of the Forest Practices Act

The Oregon Department of Forestry (ODF) provides guidance to determine the applicability of the FPA, using the following checklist.

3.2.1.1 Is the activity one of those exempted from being an operation under FPA jurisdiction?

ORS 527.620(12) exempts certain activities from FPA jurisdiction. The clearing of trees from forested portions of Site Boundary does not appear to be an exempt activity under ORS 527.620(12).

3.2.1.2 Is the activity on "forestland"?

"Forestland" is defined in ORS 527.620(7) as "land that is used for the growing and harvesting of forest tree species, regardless of how the land is zoned or taxed or how any state or local statutes, ordinances, rules or regulations are applied." The Project will require removal of trees from State and private lands that are used for growing and harvesting forest tree species, and therefore, those lands would be considered forestland under the FPA. Specifically, the Project would cross portions of the Wallowa-Whitman National Forest and private timber lands located primarily in the Blue Mountains in Umatilla and Union counties.

3.2.1.3 Does the activity relate to the "establishment, management, or harvesting" of forest tree species?

An "operation" includes commercial activities relating to the "establishment, management or harvest" of forest tree species (ORS 527.620(12)). "Forest tree species" include "any tree species capable of producing logs, fiber or other wood materials suitable for the production of lumber, sheeting, pulp, firewood or other commercial forest products except trees grown to be Christmas trees as defined in ORS 571.505 on land used solely for the production of Christmas trees" (ORS 527.620(6)). Here, clearing the right-of-way (ROW) will involve harvesting trees that are suitable for production of commercial forest products. Therefore, the Project likely will involve the harvesting of tree species under the purview of the FPA.

3.2.1.4 Is the activity "commercial"?

Activities are considered "commercial" for purposes of the FPA if they:

> *pertain[ ] to the exchange or buying and selling of commodities or services. This includes any activity undertaken with the intent of generating income or profit; any activity in which a landowner, operator or timber owner receives payment from a purchaser of forest products; any activity in which an operator or timber owner receives payment or barter from a landowner for services that require notification under OAR 629-605-0140; or any activity in which the landowner, operator, or timber owner barters or exchanges forest products for goods or services. This does not include firewood cutting or timber milling for personal use.* (OAR 629-600-0100(11))

In this instance, IPC or the affected landowner will contract with a timber operator to undertake timber removal. Because payment will be received for services that would require notification under OAR 629-05-0140, clearing of the Project ROW likely will be considered a commercial activity under the FPA.

3.2.1.5 Is the activity an "operation"?

As discussed above in Section 3.2.1.3, the Project likely will fall within the statutory definition of an "operation."

3.2.2 Requirements of the Forest Practices Act

3.2.2.1 Notification of Operation

OAR 629-605-0140 requires notification be submitted to the State Forester at least 15 days prior to the commencement of an operation involving harvesting of forest trees, construction of roads, converting forestlands to non-forest use, disposal or treatment of slash, and certain other activities. The notification is not a permit. It is only information to ODF of an operator's intent. Throughout the operation, the landowner or operator is required to follow all forest practice requirements that apply.

On state and private land, IPC plans to contract with a qualified timber operator to perform timber removal as needed for the Project. After the construction contractor finalizes the Project design and at least 15 days prior to commencing forestry activities, IPC or its timber contractor will submit the Notification of Operation to ODF. The USFS will manage timber removal on federal lands.

3.2.2.2 Permit to Operate Power Driven Machinery

If machinery, chainsaws, or other power equipment will be used, a Permit to Operate Power Driven Machinery is also required (see ORS 477.625). The Notification of Operation and Permit to Operate Power Driven Machinery are both addressed in one form that goes to ODF.

After the construction contractor finalizes the Project design and prior to commencing forestry activities, IPC or its timber contractor will obtain the Permit to Operate Power Driven Machinery.

3.2.2.3 Written Plan

Many forestry operations can trigger the additional requirement to submit a written plan that documents how the operation is to be conducted to meet provisions of the FPA. In general, operations conducted within 100 feet of a fish-bearing or a domestic water stream, 100 feet of certain significant wetlands, or 300 feet of areas identified by ODF as important for certain wildlife species require a written plan (see ORS 527-670(3)). ODF reviews the written plans but does not provide a formal approval or disapproval (see ORS 527-670(11)(a)).

After the construction contractor finalizes the Project design and prior to commencing forestry activities, IPC or its timber contractor will submit the written plan of operations.

3.2.2.4 Plan for an Alternate Practice

Oregon law (OAR Chapter 629, Division 610 - Forest Practices Reforestation Rules) generally requires a landowner to be responsible for replanting (or ensuring natural regeneration) of the forest after a final timber harvest and maintaining the seedlings to the point that they are “free to grow” at a stocking level that at least meets the FPA minimum stocking standards (see OAR 629-610-0000). If forestlands will be converted to a use not compatible with maintaining forest tree cover, the landowner must obtain written approval of a Plan for an Alternate Practice from the State Forester providing an exemption from the FPA’s reforestation requirements (see OAR 629-610-0090(1)).

The Plan for an Alternate Practice must include the following information:

- *The specific portion of the operation area necessary for the proposed change in land use;*
- *The intended change in land use and the incompatibility of the land use with forest tree cover;*
- *The intended change in land use is authorized under local land use and zoning ordinances, and all necessary permits and approvals have been obtained, or will be obtained within 12 months following the reduction in tree stocking; and*
- *The county assessor and local planning department have been notified in writing of the proposed change in land use.* (OAR 629-610-0090(2))

Attached hereto as Attachment BB-1 is a draft Plan for an Alternate Practice for the Project. After IPC finalizes the Project design and prior to commencing forestry activities, IPC or its timber contractor will submit a final Plan for an Alternate Practice.

3.2.2.5 Standards for Forest Operations

OAR Chapter 629 sets forth the FPA rules (see ODF 2014). These rules provide standards for the planning and design of forest operations, addressing reforestation, treatment of slash, use of chemicals and other petroleum products, road construction and maintenance, harvesting, water protection, and other issues.

IPC will address the standards in its Notification of Operation, written plan of operations, and Plan for an Alternate Practice.

3.2.3 Evidence of Consultation with ODF

At IPC's request, the Oregon Department of Energy (ODOE) engaged ODF as a reviewing agency for purposes of reviewing, and providing comment on, the draft Plan of an Alternate Practice and Section 3.2 of Exhibit BB regarding FPA compliance. Consultation with ODF regarding the same has been coordinated through ODOE.

3.2.4 IPC's Proposed Site Certificate Condition

IPC requests that the Council approve under ORS 469.401(3) the Plan for an Alternate Practice, a notification of operation, and a written plan of operations (if necessary), and that the approval be included in and governed by the site certificate. To ensure compliance with FPA requirements relevant to those submittals, IPC proposes that the Council adopt the following site certificate conditions:[8]

> ***Other Information Condition 2:*** *During construction, at least 15 days prior to construction in forest lands on non-federal lands, the site certificate holder shall finalize, and submit to the department, a final Plan for an Alternate Practice, a notification of operation, and a written plan of operations (if necessary). The protective measures described in the draft Plan for an Alternate Practice in ASC Exhibit BB, Attachment BB-1, shall be included as part of the final Plan for an Alternate Practice, unless otherwise approved by the department.*
>
> ***Other Information Condition 3:*** *During construction, the site certificate holder shall conduct all work in compliance with the final Plan for an Alternate Practice, notification of operation, and written plan of operations (if necessary) referenced in Other Information Condition 2.*

3.3 Confederated Tribes of the Umatilla Indian Reservation Concerns

No Project features will be located on Umatilla Indian Reservation lands. No ground disturbance will occur on Reservation lands. The Site Boundary includes no Reservation lands. Exhibit C describes the location of the Project and its relating and supporting facilities. Exhibit C, Attachment C-2 provides detailed maps that show the location of the Project in relation to the Umatilla Indian Reservation.

The majority of the concerns expressed by the CTUIR are addressed in other Exhibits within this application, as follows:

- Habitat fragmentation is addressed in Exhibit P1;
- The introduction of weed species is addressed in Exhibit P1, and weed monitoring and treatment are addressed in Exhibit P1, Attachment P1-5, Noxious Weed Plan;

[8] ODF regulates forestry operations on non-federal land only. Therefore, the FPA requirements—including the need to submit a Plan for an Alternate Practice--only apply to forestry operations on non-federal lands.

- Effects to historic properties are addressed in Exhibit S;
- Noise is addressed in Exhibit X;
- Visual analysis is addressed in Exhibit R; and
- Cultural resource impacts are addressed in Exhibit S.

The following issues raised by the CTUIR are not addressed in this application because the resource or issue raised is not relevant to an EFSC siting standard:

- Cumulative impacts are not addressed in this application because consideration of cumulative impacts of the Project is not required by the EFSC process. However, cumulative impacts involved with the Project are fully analyzed in BLM's Environmental Impact Statement.
- CTUIR First Foods are foods of cultural significance to the Tribes and include but are not limited to salmon, wild game, roots, berries, and clear, pure water. Project impacts to First Food resources are not addressed in this application, except to the extent that such resources are addressed as resources protected by a particular EFSC standard (e.g., impacts to anadromous fish species, including salmonids, are analyzed in Exhibits P1 and Q). Project impacts on the First Foods are, however, fully addressed under the Section 106 of the National Historic Preservation Act compliance process that will be memorialized in a Programmatic Agreement for the Project.

3.4 Fish Passage

OAR Chapter 635, Division 412 requires upstream and downstream fish passage at all existing or new artificial obstructions in Oregon waters in which migratory native fish are currently or have historically been present, except under certain circumstances. IPC has identified certain locations where fish passage requirements may be triggered by the location of a Project feature. IPC requests that the Council approve under ORS 469.401(3) the attached Fish Passage Plan, Attachment BB-2, and that the approval be included in and governed by the site certificate. Information related to fish habitat is included in Exhibit P-1. To ensure compliance with the Fish Passage Plan, IPC proposes that the Council include the following conditions in the site certificate providing for the same:

> ***Other Information Condition 1****: Prior to construction, the site certificate holder shall finalize, and submit to the department for its approval, a final Fish Passage Plan. The protective measures described in the draft Fish Passage Plan in ASC Exhibit BB, Attachment BB-2, shall be included as part of the final Fish Passage Plan, unless otherwise approved by the department.*

> ***Other Information Condition 4****: During construction, the site certificate holder shall conduct all work in compliance with the final Fish Passage Plan referenced in Other Information Condition 1.*

3.5 Options for Undergrounding the Transmission Line

Several scoping comments were received requesting consideration for installing the transmission lines underground. In theory, burying transmission lines would eliminate many of the visual impacts of these lines and would reduce the susceptibility of the system to weather and fire hazards. However, because of the high cost of an underground line compared to overhead 500-kV lines, unproven technology over long distances for 500-kV, reliability and reactive compensation issues for long installations, and increased land disturbance, the alternative of placing the 500-kV line underground was not considered feasible for the Project.

3.5.1 Factors Making Undergrounding Impractical for the Project

While underground systems are relatively immune to weather conditions in comparison to overhead lines, they are vulnerable to washouts, seismic activity, and inadvertent excavation, all resulting in extensive and time-consuming repairs. From a visual perspective, reactive compensation stations, similar to a substation in appearance, would be required every 7 to 20 miles depending on the voltage level, terrain, and cable technology for 500-kV underground lines. Combined with the typical open-cut trench excavation required for the entire length of the transmission line route, the visual impacts would be noticeable, although substantially less than an overhead line.

IPC reports that while recent research is developing new techniques for manufacturing, design, construction, and maintenance of underground transmission lines, there are several important issues that make the technology for extra high voltage transmission lines impractical for long length installations as described below:

- Cost—One major reason that utilities do not normally install extra high voltage transmission lines underground is that the construction costs are increased by 12 to 17 times over an overhead counterpart (National Grid 2009). These additional costs must be approved by the public utilities commission and are passed on to all the ratepayers, not just those near the area of underground installation.
- Reliability—While underground systems comparatively have fewer forced outages than overhead lines, damage to the cable or components often results in longer outage durations. When a failure does occur, overhead lines can be quickly visually inspected and repaired. In contrast, underground line cable failures cannot be visually diagnosed. The cable system must be tested with specialized equipment to locate the damaged sections of the cable. Excavation of the line could be required to repair or replace the faulty component or cable, resulting in longer outages than overhead transmission lines.
- Reactive Power Compensation—The capacitive characteristics of the underground cable insulating material and the close proximity of the cables to one another results in the cable system introducing high capacitive reactive loads onto the electrical system. These capacitive reactive loads would have to be offset with inductive compensation at above ground compensation stations located every 7 to 20 miles along the transmission line route.
- Environmental—While access road requirements are similar for both underground and overhead lines, underground transmission lines require a continuous excavation through all habitat types. This is in contrast to overhead lines, which result in a disturbance only at the structure locations. Repair of underground lines can result in extensive ground disturbance as areas are retrenched for access. Furthermore, the potential for fluid (dielectric oil) leaks and pipe corrosion creates additional environmental concerns.

3.5.2 Conclusion Regarding Undergrounding of the Project

Underground cable system installation has historically been justifiable in terms of cost and reliability only in urban or metropolitan areas, and for limited distances. Because of the high cost of an underground line compared to overhead 500-kV lines, unproven technology over long distances for 500-kV, reliability and reactive compensation issues for long installations, and increased land disturbance, the alternative of placing the 500-kV line underground was not considered feasible for the Project. For additional information that IPC considered when evaluating the possibility of undergrounding the transmission line (see Attachment BB-3, Overview of Underground Technologies).

3.6 Comprehensive List of Idaho Power's Proposed Site Certificate Conditions

Attachment BB-4 provides a comprehensive list of the site certificate conditions proposed by IPC throughout this application.

4.0 IDAHO POWER'S PROPOSED SITE CERTIFICATE CONDITIONS

IPC proposes the following site certificate conditions to ensure compliance with the relevant EFSC standards.

Prior to Construction

Other Information Condition 1*: Prior to construction, the site certificate holder shall finalize, and submit to the department for its approval, a final Fish Passage Plan. The protective measures described in the draft Fish Passage Plan in ASC Exhibit BB, Attachment BB-2, shall be included as part of the final Fish Passage Plan, unless otherwise approved by the department.*

During Construction

Other Information Condition 2: *During construction, at least 15 days prior to construction in forest lands on non-federal lands, the site certificate holder shall finalize, and submit to the department, a final Plan for an Alternate Practice, a notification of operation, and a written plan of operations (if necessary). The protective measures described in the draft Plan for an Alternate Practice in ASC Exhibit BB, Attachment BB-1, shall be included as part of the final Plan for an Alternate Practice, unless otherwise approved by the department.*

Other Information Condition 3: *During construction, the site certificate holder shall conduct all work in compliance with the final Plan for an Alternate Practice, notification of operation, and written plan of operations (if necessary) referenced in Other Information Condition 2.*

Other Information Condition 4*: During construction, the site certificate holder shall conduct all work in compliance with the final Fish Passage Plan referenced in Other Information Condition 1.*

5.0 COMPLIANCE CROSS-REFERENCES

Table BB-1 identifies the location within the application for site certificate of the information responsive to the application submittal requirements in OAR 345-021-0010(bb) and the relevant Amended Project Order provisions.

Table BB-1. Compliance Requirements and Relevant Cross-References

Requirement	Location
OAR 345-021-0010(1)(bb)	
Exhibit BB. Any other information that the Department requests in the project order or in a notification regarding expedited review	Exhibit BB, Section 3.0

Requirement	Location
Amended Project Order Provisions	
To the extent that the following issues were not addressed in other exhibits, include information in Exhibit BB related to the following:	
1. Include evidence and analysis related to the use of equipment that emits sulfur hexafluoride or other greenhouse gases that might trigger the application of the ODEQ/EPA's "Tailoring Rule" to one or more components of the proposed facility.	Exhibit BB, Section 3.1
2. The proposed project will require the removal of trees in forested areas, and such removal could be classified as a commercial operation. Provide evidence and analysis in Exhibit BB for a determination of whether the construction of the proposed facility is a commercial operation and subject to the requirements of the Oregon Forest Practices Act. If the Act applies, the applicant shall consult with ODF to ensure that the application for site certificate contains adequate evidence for the Council to find that construction of the project will meet the requirements of the Oregon Forest Practices Act. Evidence can be provided in the form of a Notice of Operation and written plans developed in consultation with ODF, such as a Plan for Alternate Practice if reforestation after harvest is not possible.	Exhibit BB, Section 3.2, Attachment BB-1
3. If a concern expressed by the Confederated Tribes of Umatilla Indian Reservation (CTUIR) or other tribal government is under Council jurisdiction and not elsewhere addressed in the application for site certificate, the applicant may address the issue in Exhibit BB.	Exhibit BB, Section 3.3
4. If it is determined that the Fish Passage rules will be included in and governed by the site certificate, in the event that development of the project will result in obstruction of migratory fish passage, the application for site certificate must include a fish passage plan that complies with OAR Chapter 635, Division 412.	Exhibit BB, Section 3.4; Exhibit P1
5. To the extent not substantively addressed in other exhibits, include analysis regarding compliance with applicable laws included in Exhibit CC.	Exhibit CC
NOI states that the project will emit no pollutants during operation and does not require air permits from the ODEQ's federally-delegated air program. However, Exhibit BB should address whether the May 2013 "Tailoring Rule" promulgated by the EPA applies to the emissions of greenhouse gases (including sulfur hexafluoride) from facility components. If so, provide evidence that emission sources included in the proposed facility do not exceed permitting thresholds.	Exhibit BB, Section 3.1

6.0 REFERENCES

National Grid. 2009. Undergrounding High Voltage Electricity Transmission: The Technical Issues. August. Available at: http://www.northwestcoastconnections.com/docs/supportingdocs/Undergrounding_high_voltage_electricity_transmission_lines_The_technical_issues_INT.pdf.

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ATTACHMENT BB-1
PLAN FOR AN ALTERNATE PRACTICE

PLAN FOR AN ALTERNATE PRACTICE

Boardman to Hemingway Transmission Line Project

1221 West Idaho Street
Boise, Idaho 83702

Amended Preliminary Application for Site Certificate

June 2017

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ACRONYMS AND ABBREVIATIONS

FPA	Forest Practices Act
kV	kilovolt
IPC	Idaho Power Company
NERC	North American Electric Reliability Corporation
OAR	Oregon Administrative Rule
Project	Boardman to Hemingway Transmission Line Project
RMA	Riparian Management Area
ROW	right-of-way

1.0 INTRODUCTION

Idaho Power Company (IPC) is proposing to construct, operate, and maintain the Boardman to Hemingway Transmission Line Project (Project), a high-voltage electric transmission line between Boardman, Oregon, and the Hemingway Station in southwestern Idaho. The Project consists of approximately 296.6 miles of electric transmission line, with 272.8 miles located in Oregon and 23.8 miles in Idaho. The Project includes 270.8 miles of single-circuit 500-kilovolt (kV) transmission line, removal of 12 miles of existing 69-kV transmission line, rebuilding of 0.9 mile of a 230-kV transmission line, and rebuilding of 1.1 miles of an existing 138-kV transmission line into a new right-of-way (ROW).

The Forest Practices Reforestation Rules (Oregon Administrative Rule (OAR) Chapter 629, Division 610) generally require a landowner to replant (or ensuring natural regeneration of) the forest after a timber harvest and maintain the seedlings to the point that they are "free to grow" at a stocking level that meets the Forest Practices Act's (FPA) minimum stocking standards (see OAR 629-610-0000). If forestlands will be converted to a use not compatible with maintaining forest tree cover, the landowner must obtain written approval of a Plan for an Alternate Practice from the State Forester providing an exemption from the FPA's reforestation requirements (see OAR 629-610-0090(1)).

Here, certain portions of the Project will impact forestland and require permanent removal of the forest tree cover in order to ensure the trees do not come into contact with the Project structures or conductors and interrupt the flow of electrical energy across the Project. Vegetation removal and management is dictated by the North American Electric Reliability Corporation's (NERC) mandatory reliability standards, particularly standard FAC-003-3, Transmission Vegetation Management Program (NERC 2016). Because the Project will require permanent clearing of forestland, IPC submits to the Oregon Department of Forestry this Plan for an Alternate Practice allowing for an exemption from the reforestation rules. IPC will finalize the Plan prior to construction in forested lands.

2.0 PLANNED OPERATION

The Project will require the permanent clearing of the transmission line ROW for approximately 36.7 miles on private forestland and 4.5 miles of land administered by the U.S. Department of Agriculture Forest Service. The transmission line equipment will be owned by IPC. IPC will hold access rights to the ROW through easements, leases, grants, or licenses. The clearing operations will produce a linear clearcut on the transmission line ROW, and clearing will also occur along the Project roads. Most of the clearing will be done with ground-based systems used on slopes less than 30 percent and high-lead cable systems for slopes greater than 30 percent or for harvest near streams and their riparian management areas. There may be some areas where a skyline cable system will need to be utilized. IPC does not anticipate the need for helicopter logging. A detailed description of IPC's plans for clearing the ROW is provided in Exhibit K, Attachment K-2, Right-of-Way Clearing Assessment. The affected lands will no longer be available for the maintenance of forest tree cover, requiring the State Forester's approval of a Plan for an Alternate Practice (see OAR 629-605-0100(d)).

3.0 DESCRIPTION OF THE AREA

The Project will cross portions of the Wallowa-Whitman National Forest, Bureau of Land Management–administered public lands, and private timber lands located primarily in the Blue Mountains between McKay Creek—which is located to the east of Pilot Rock—in Umatilla County and the town of North Powder in Union County, Oregon. The operational area of interest

for the acreage estimate is a 125-foot buffer on each side of the transmission line centerline (250-foot-wide corridor), the construction footprint of all Project features outside of the centerline corridor, and a 15-foot buffer each side (30-foot width) of proposed new roads. IPC projects that approximately 776 acres of forested lands will be cleared or harvested in Umatilla and Union counties (Tables 3-1 and 3-2) along the Proposed Route. For the Morgan Lake Alternative Route in Union County, approximately 297 acres of forested lands will be cleared or harvested (Table 3-3). The balance of the 1,249-acre corridor is rangeland (473 acres). Maps showing the locations of the Project-related forest clearing activities are attached as Appendix A.

Table 3-1. Umatilla County - Projected Forest Clearing/Harvest

Landowner	Forest Habitat Type	Timber Classification	Size Class	Acres
Private	DF/Mx GF[1]	Small Sawtimber	9-20”	77.9
		Pole Size	5-8.9”	82.0
	Ponderosa Pine	Small Sawtimber	9-20”	24.5
		Pole Size	5-8.9”	30.0
	Forest-Other[2]	Reproduction	0-5”	31.2
Total Umatilla County				**245.6**

[1] DF/Mx GF = Douglas-fir/Mixed stand with grand fir and associated species.
[2] Reproduction or recently disturbed forests.

Table 3-2. Union County - Projected Forest Clearing/Harvest

Landowner	Forest Habitat Type	Timber Classification	Size Class	Acres
BLM[2]	DF/Mx GF[1]	Small Sawtimber	9-20”	5.4
Private	DF/Mx GF	Small Sawtimber	9-20”	135.6
		Pole Size	5-8.9”	39.9
	Ponderosa Pine	Small Sawtimber	9-20”	150.7
		Pole Size	5-8.9”	6.4
	Forest-Other	Reproduction	0-5”	13.9
USFS[3]	DF/Mx GF	Small Sawtimber	9-20”	77.0
	Ponderosa Pine	Small Sawtimber	9-20”	101.2
Total Union County				**530.1**

[1] DF/Mx GF = Douglas-fir/Mixed stand with grand fir and associated species.
[2] BLM=Bureau of Land Management.
[3] USFS – U.S. Department of Agriculture - Forest Service.

Table 3-3. Union County - Morgan Lake Alternative Projected Forest Clearing/Harvest

Landowner	Forest Habitat Type	Timber Classification	Size Class	Acres
Private	DF/Mx GF[1]	Small Sawtimber	9-20”	135.3
		Pole Size	5-8.9”	12.9
	Ponderosa Pine	Small Sawtimber	9-20”	134.5
		Pole Size	5-8.9”	14.1
Total Morgan Lake Alternate in Union County				**296.8**

[1] DF/Mx GF = Douglas-fir/Mixed stand with grand fir and associated species.

The majority of the route is “small sawtimber” (74 percent) or “pole-sized” (20 percent) stands. About 6 percent of the forested lands were classified as “reproduction.” The rangelands are intermixed across all ownerships. No tilled lands occur on this corridor, but a small acreage of managed pastures occur versus unmanaged grasslands (range).

The majority of the Project is located in upland forest or rangeland areas with broad plateaus and rolling topography (with slopes up to 45 percent) broken by occasional perennial or seasonal streams. Where riparian areas occur in the forested portion of the Project, the riparian management area (RMA) vegetation varies, ranging from shrub dominated communities to conifer dominated stands at higher elevations. Common shrub species found in the RMAs include grey alder (*Alnus incana*), red oiser dogwood (*Cornus* sericea), chokecherry (*Prunus virginiana*), common snowberry (*Symphoricarpos albus*), and black hawthorn (*Crataegus douglasii*). Conifers commonly found in riparian communities include grand fir (*Abies grandis*), Engelmann spruce (*Picea engelmannii*), and Douglas-fir (*Pseudotsuga menziesii*). Quaking aspen (*Populus tremuloides*) is also found in RMAs within the ROW corridor.

4.0 REFORESTATION

IPC seeks an exemption under OAR 629-610-0090 from the reforestation requirements, because no reforestation with commercial tree species will be performed in the ROW. Tall-growing tree species are incompatible with NERC and IPC vegetation management programs designed to ensure reliable transmission of electricity and to avoid interference from trees that might come into contact with the transmission equipment.

IPC will convert the ROW to low-growing shrubs and grasses, with no vegetation that has a mature height of over 10 feet. By selectively managing the floor of the ROW to eliminate tall-growing tree species, the need to disturb the plant community over time will be greatly reduced and nearly eliminated. Long-term maintenance will then be limited to removal of hazard trees along the edges of the corridor that could reach the transmission line, along with treatment of pioneer tree species or noxious weeds that will occasionally invade the ROW.

Agricultural uses are acceptable and encouraged along the powerline ROW, provided they do not interfere with the Project. This can include, but is not limited to, pasture or rangeland, row crops, or other crops that have a mature height under 10 feet.

The intended land use change is under consideration by local, state, and federal agencies. All permits and approvals are currently being sought and will be in place prior to the harvest and clearing operations. The appropriate county assessors and local planning departments will be notified in writing of the proposed change in land use.

Transmission line construction will commence within 12 months of the completion of the harvest operations, and will be complete within 36 months of commencing. The transmission line corridor will be maintained in a non-forested condition to provide for safe operation of the Project.

5.0 STREAMSIDE VEGETATION HARVEST

5.1 Protected Resources

There are a small number of streams that transect the Project route in the forested portion of the Project. The stream types include F, D, and N typed water. Most are seasonal streams that only flow during spring runoff or heavy rainfall. A small number of perennial streams do occur.

Type F: Has fish, may also be used for domestic water

Type D: Used for domestic water, does not have fish
Type N: All other streams

It is unlikely that clearances will be adequate to span any of the stream crossings without removal of tall growing tree species. In all cases, tall growing tree species will need to be removed from the riparian management zones of the streams and by prescription, replanted with low growing tree and shrub species that have a mature height of less than 10 feet.

5.2 List of Streams Affected

A list of streams including name, size, location, stream type, and RMA width will be provided in IPC's final Plan for an Alternate Practice prior to initiation of harvest activities. Prior to activity within 100 feet of type F or D streams, IPC will submit a written plan in accordance with OAR 629-605-0170.

5.3 Planned Resource Protection Measures

The National Electrical Safety Code requires a minimum clearance from various objects. The minimum clearance distances for vegetation management are identified in the Vegetation Management Plan (Exhibit P1, Attachment P1-4). As a result, most stream crossings will require that all tall growing trees and snags within the corridor be felled to avoid tree-wire conflicts and the outages and fires that could result.

No road construction will occur solely as part of the timber harvesting operations within the RMAs. However, road construction may occur in the RMA as part of the power line construction activity. These RMAs will be managed in accordance with the Vegetation Management Plan (Exhibit P1, Attachment P1-4).

Best Management Practices will be used to protect the RMAs and include, but are not limited to:

- Tree falling will be directional away from streams, unless requested otherwise by resource agencies.
- Any slash that enters a stream will be removed by hand for Type F and D streams and wetlands, or yarded if too large to handle by hand.
- Water quality protection will be provided to streams and wetlands. Operations near streams will be limited during periods of heavy rain to reduce potential impacts to the stream.
- Activities on slopes will include erosion and landslide control. Roads and skid trails will be located and managed to avoid erosion, and especially to avoid erosion that could reach a stream.
- Ground based systems will skid logs away from stream courses. Except at stream crossings, operators shall not locate skid trails within 35 feet of Type F or D streams.
- Project roads will be used for harvest access wherever possible.
- No skid roads will be located in the RMAs.
- Cable systems using full suspension will be used to yard across perennial streams when a ground based system cannot be used to avoid the stream.
- Cable harvesting corridors will be limited to the extent necessary to remove cut trees.
- On deep canyon crossings where the wire is high above the ground, it may be possible to leave live conifers. In some cases, creation of short snags may be feasible.

- Desirable understory vegetation within the RMA will be retained to provide shade and soil erosion protection, and to provide biological weed control since they prevent pioneer tree and weed species from invading the site.
- Any down logs that are currently in the RMA will remain in place.
- When necessary, slash piles in the RMA could be burned but could have more value as wildlife habitat in some cases.

6.0 HARVEST UNIT SIZE

The Project ROW will be a continuous linear feature on the landscape, crossing numerous ownership boundaries. No one ownership is contiguous enough to exceed the 120-acre maximum harvest size. However, the entire length of the corridor on private land will exceed the 120-acre maximum. Logging slash will be managed to avoid creation of a fire hazard.

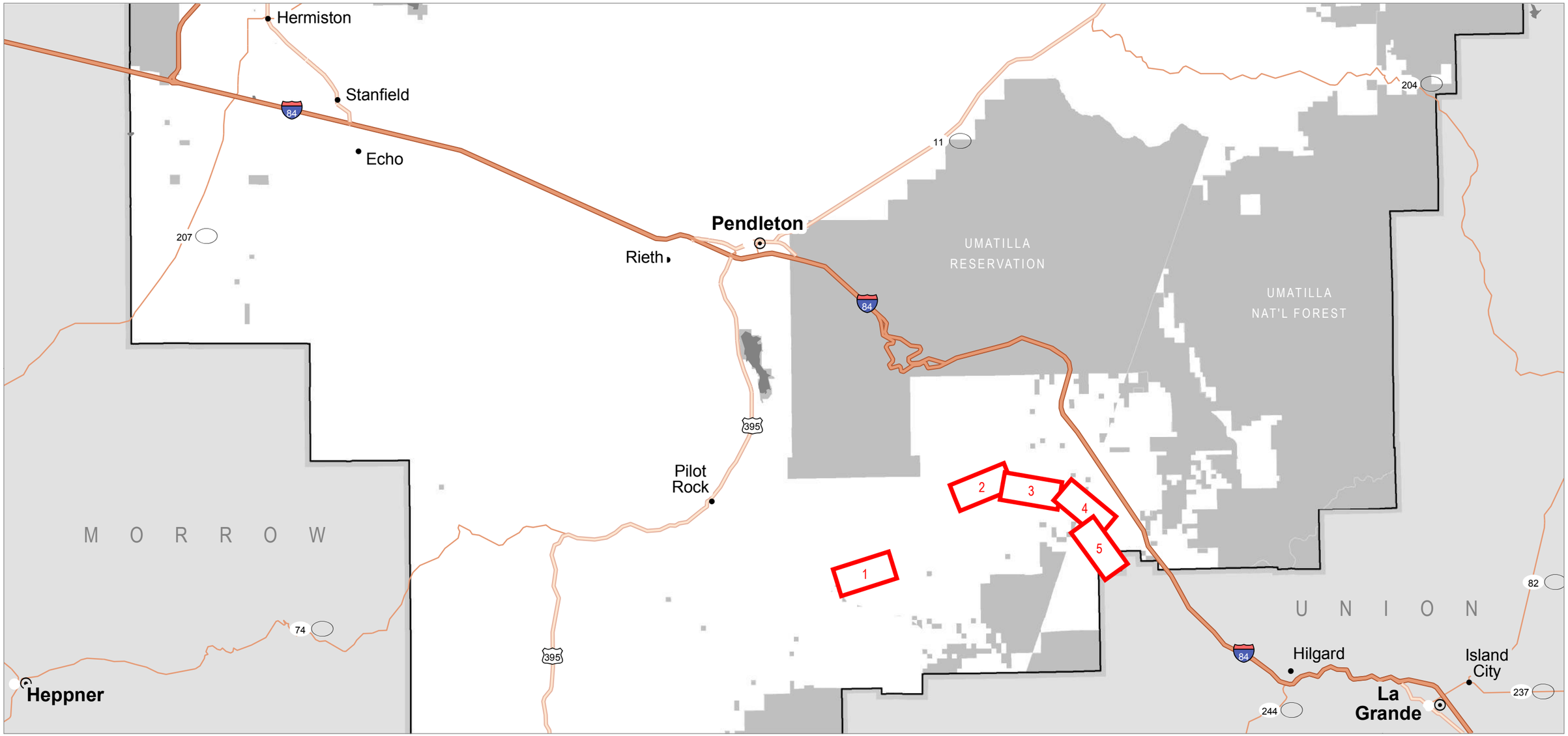
7.0 CONCLUSION

This Plan for an Alternate Practice provides sufficient evidence for the Energy Facility Siting Council to determine that the Project will comply with the provisions of the FPA relevant to converting the forestlands affected by the Project to a use not compatible with the maintenance of forest tree cover (see OAR 629-610-0090).

8.0 REFERENCES

NERC (North American Electric Reliability Corporation). 2016. Transmission Vegetation Management NERC Standard FAC-003-4. Available online at: http://www.nerc.com/_layouts/PrintStandard.aspx?standardnumber=FAC-003-4&title=Transmission%20Vegetation%20Management&jurisdiction=United%20States

APPENDIX A
ESTIMATED FOREST CLEARANCE MAP BOOK



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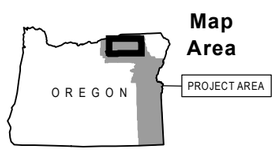

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June 2017

Map Index

Location Map (Map #)

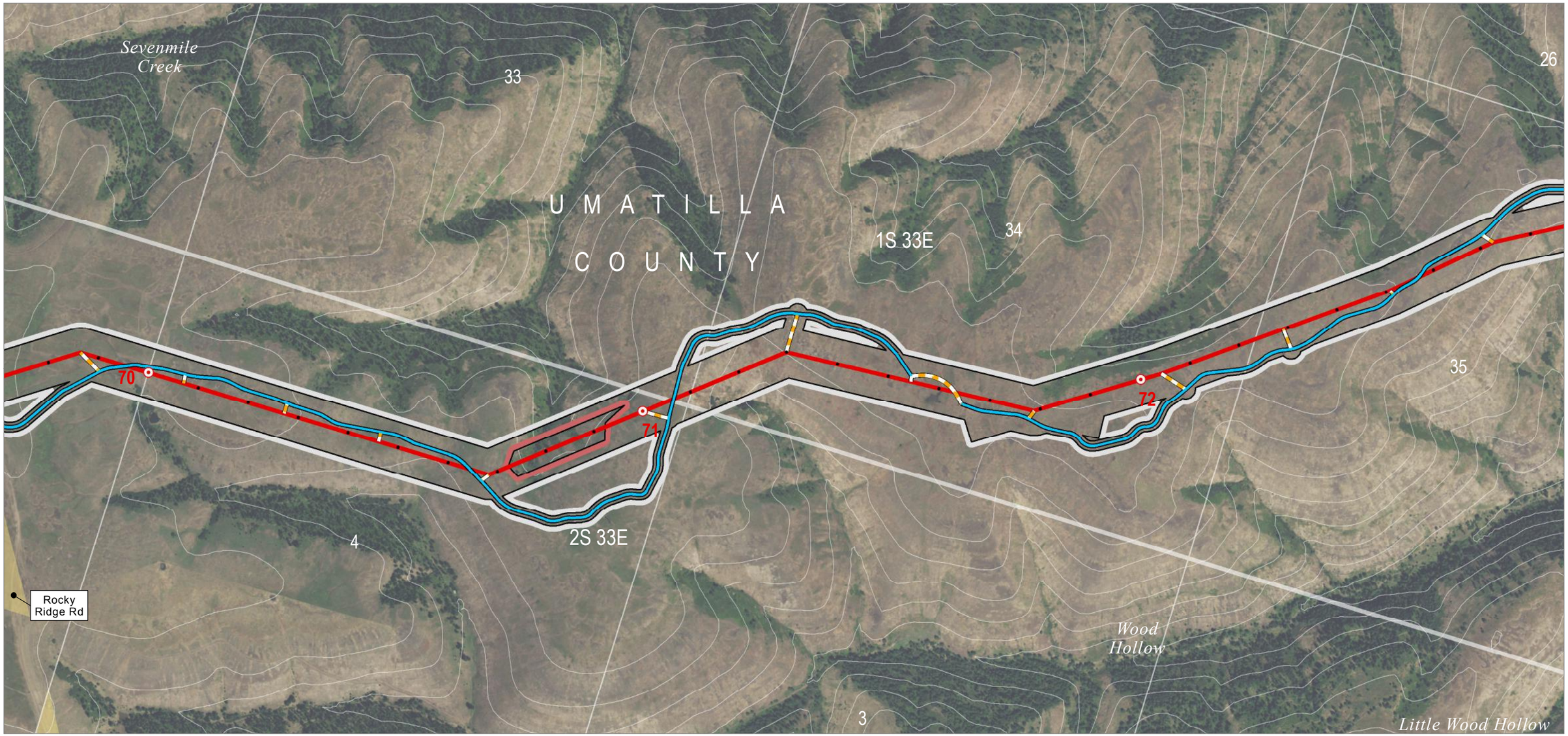
IDAHO POWER An IDACORP Company

Boardman to Hemingway Transmission Line Project

Attachment BB-1
Estimated Forest Disturbance

Umatilla County

Map Index



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Map Area
OREGON
PROJECT AREA

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Project Features

Site Boundary
- Proposed Route

Route Centerline
- Proposed Route

Mileposts
- Mile
- Tenth-mile

Access
- Existing Road, Substantial Modification, 71-100% Improvements
- New Road, Primitive

Estimated Forest Disturbance
- Right of Way Clearance

Land Status
- Bureau of Land Management
- Private

Important Siting Constraints and Other Features
- 100-foot Contours

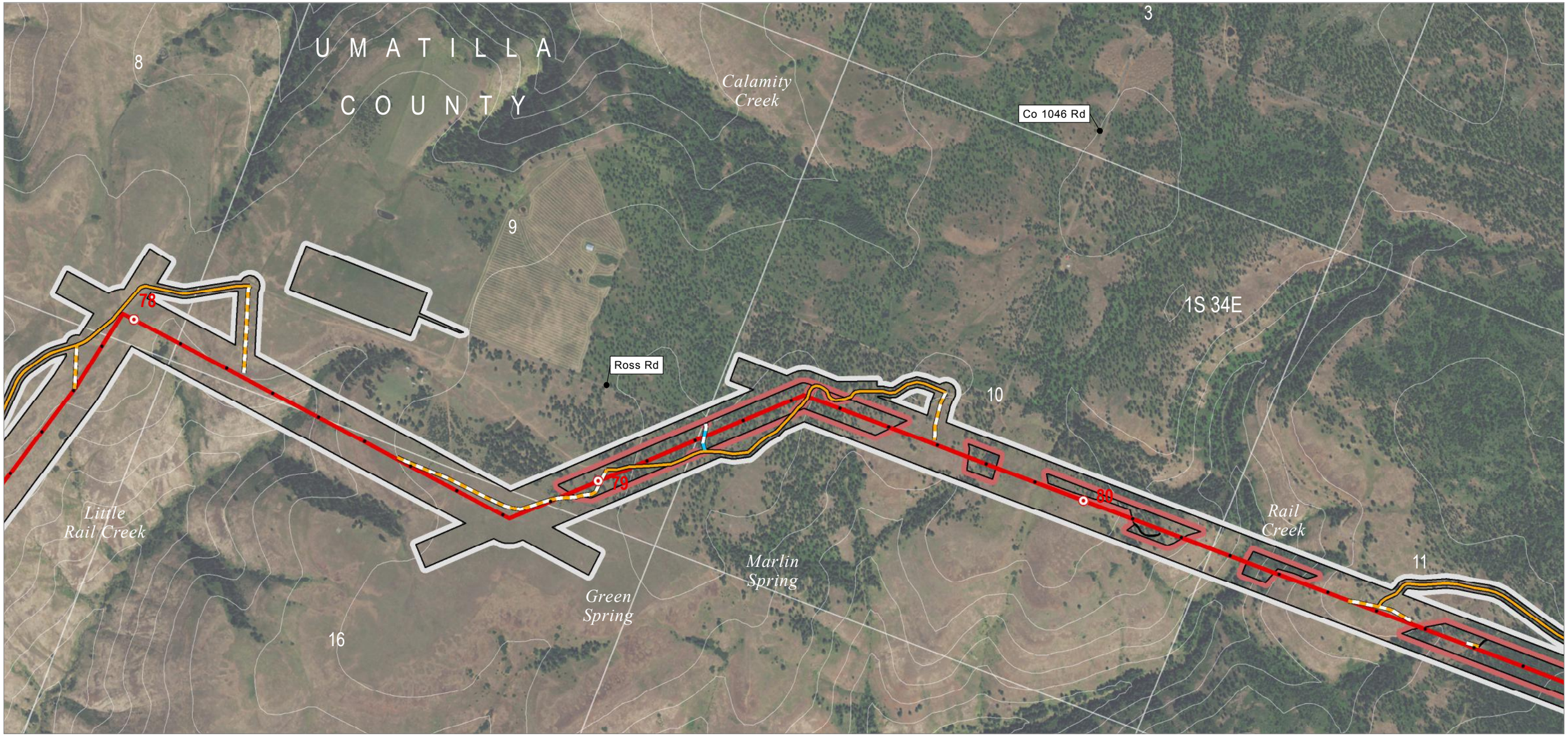
IDAHO POWER
An IDACORP Company

Boardman to Hemingway Transmission Line Project

Attachment BB-1
Estimated Forest Disturbance

Proposed Route
Umatilla County

Map 1



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Map Area

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Project Features

Site Boundary
- Proposed Route

Route Centerline
- Proposed Route

Mileposts
- Mile
- Tenth-mile

Access
- Existing Road, Substantial Modification, 21-70% Improvements
- New Road, Bladed
- New Road, Primitive

Estimated Forest Disturbance
- Right of Way Clearance

Land Status
- Private

Important Siting Constraints and Other Features
- 100-foot Contours

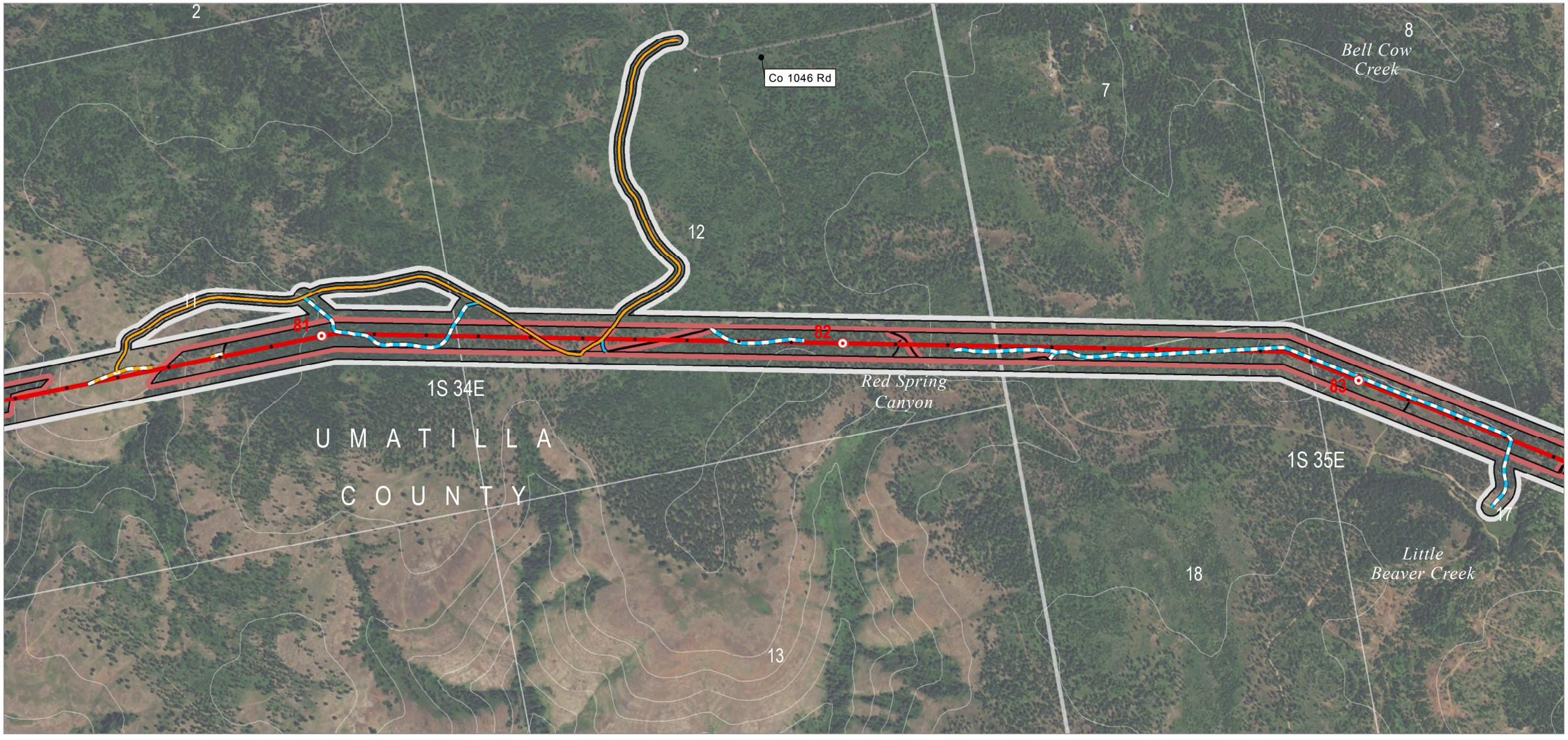
IDAHO POWER
An IDACORP Company

Boardman to Hemingway Transmission Line Project

Attachment BB-1
Estimated Forest Disturbance

Proposed Route
Umatilla County

Map 2



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Project Features

Site Boundary
- Proposed Route

Route Centerline
- Proposed Route

Mileposts
- Mile
- Tenth-mile

Access
- Existing Road, Substantial Modification, 21-70% Improvements
- Existing Road, Substantial Modification, 71-100% Improvements
- New Road, Bladed
- New Road, Primitive

Estimated Forest Disturbance
- Right of Way Clearance

Land Status
- Private

Important Siting Constraints and Other Features
- 100-foot Contours

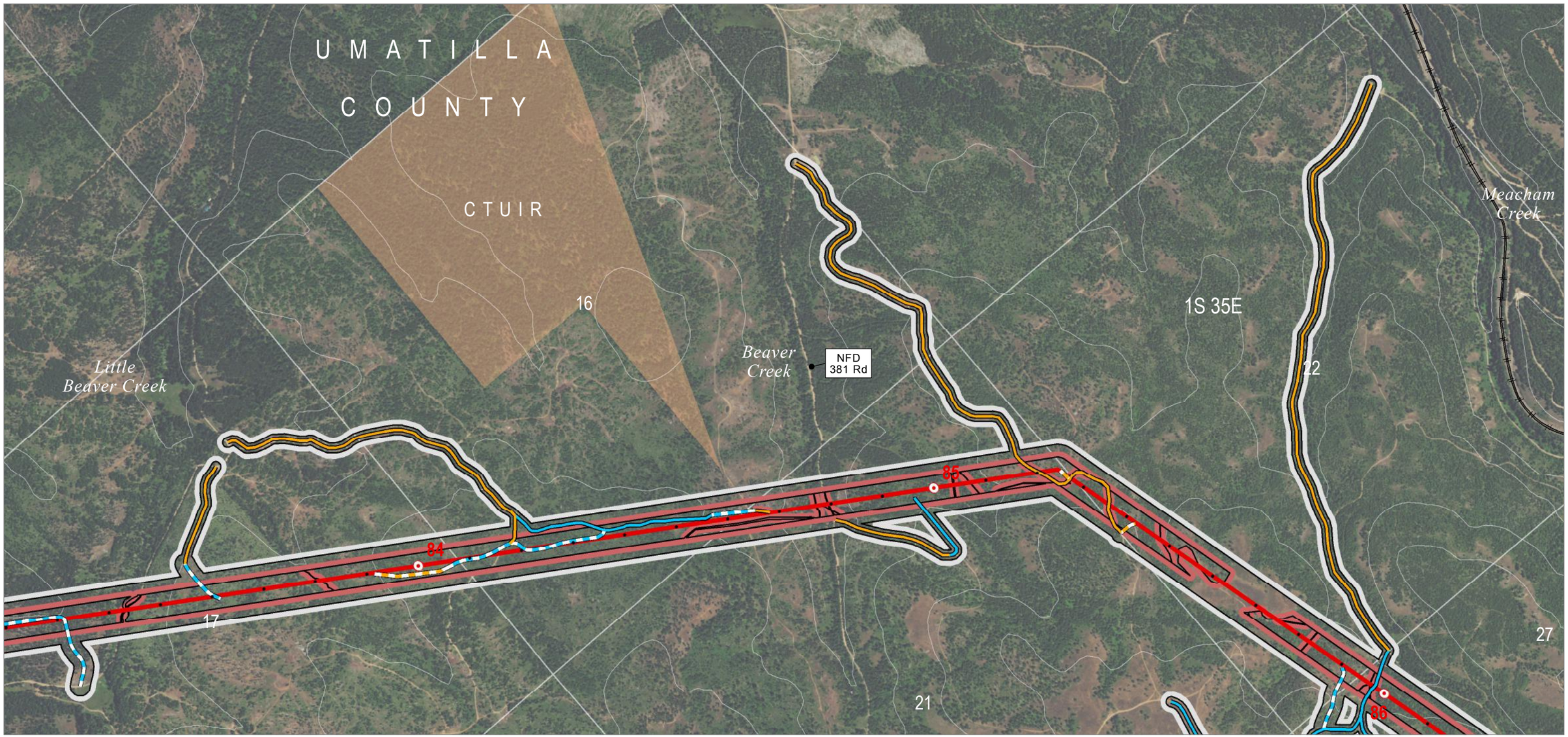
IDAHO POWER
An IDACORP Company

Boardman to Hemingway Transmission Line Project

Attachment BB-1
Estimated Forest Disturbance

Proposed Route
Umatilla County

Map 3



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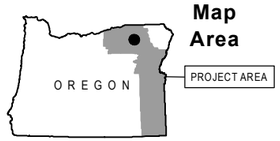

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Project Features

Site Boundary
- Proposed Route

Route Centerline
- Proposed Route

Mileposts
- Mile
- Tenth-mile

Access
- Existing Road, Substantial Modification, 21-70% Improvements
- Existing Road, Substantial Modification, 71-100% Improvements
- New Road, Bladed
- New Road, Primitive

Estimated Forest Disturbance
- Right of Way Clearance

Land Status
- Indian Reservation
- Private

Important Siting Constraints and Other Features
- 100-foot Contours
- Railroads

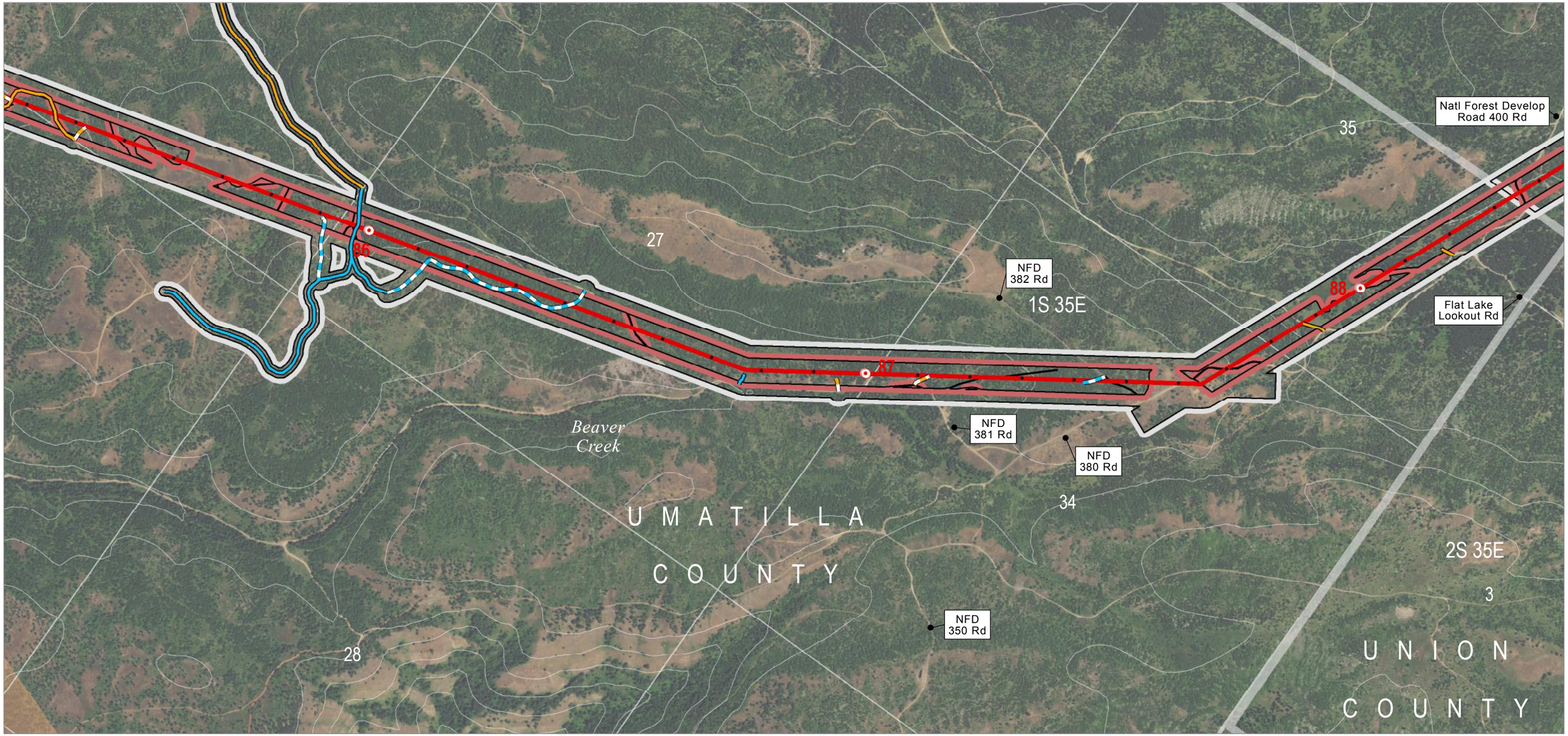
IDAHO POWER
An IDACORP Company

Boardman to Hemingway
Transmission Line Project

Attachment BB-1
Estimated Forest Disturbance

Proposed Route
Umatilla County

Map 4



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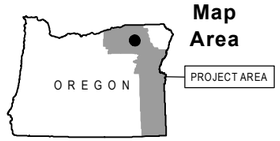

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Project Features

Site Boundary
- Proposed Route

Route Centerline
- Proposed Route

Mileposts
- Mile
- Tenth-mile

Access
- Existing Road, Substantial Modification, 21-70% Improvements
- Existing Road, Substantial Modification, 71-100% Improvements
- New Road, Bladed
- New Road, Primitive

Estimated Forest Disturbance
- Right of Way Clearance

Land Status
- Indian Reservation
- Private

Important Siting Constraints and Other Features
- 100-foot Contours

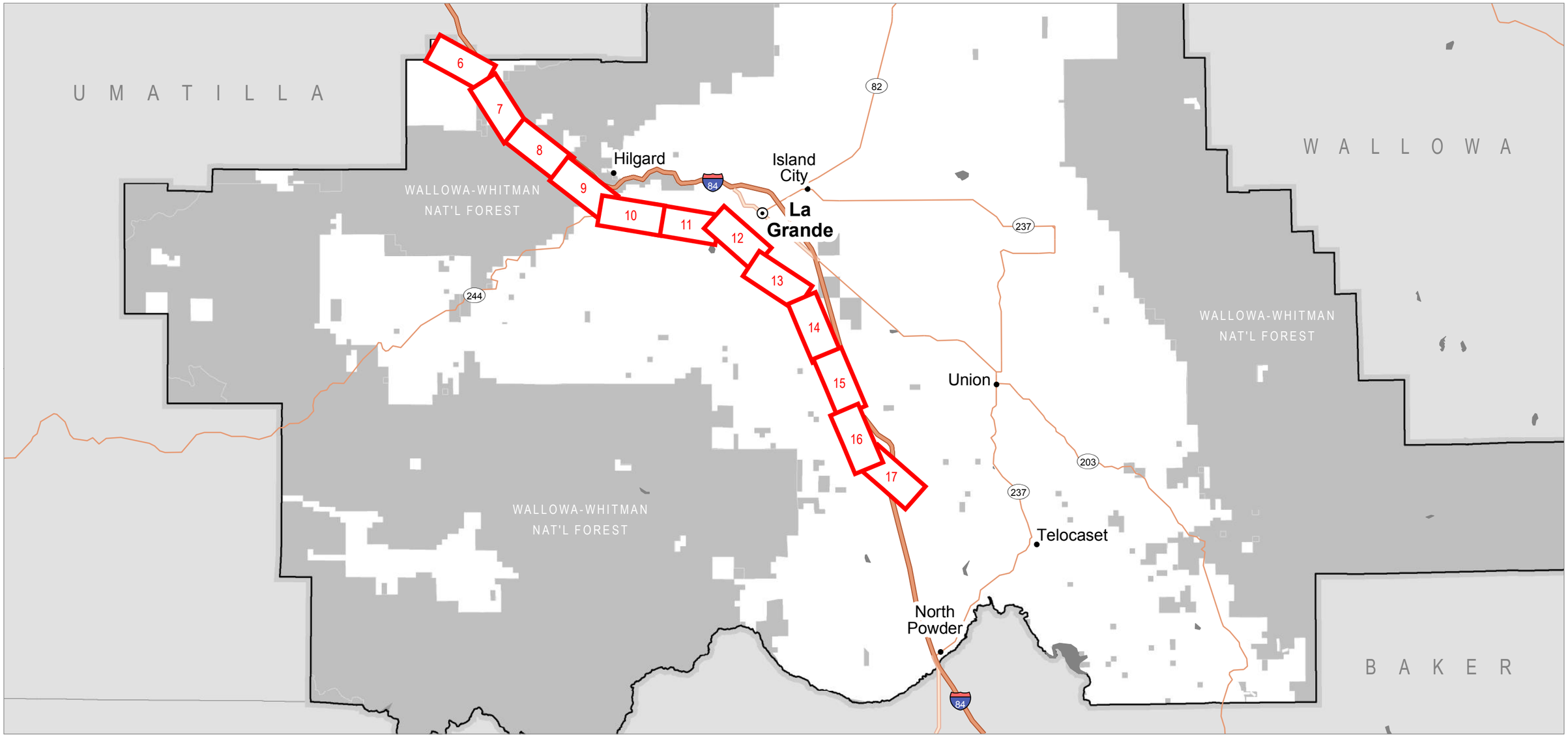
IDAHO POWER An IDACORP Company

Boardman to Hemingway Transmission Line Project

Attachment BB-1
Estimated Forest Disturbance

Proposed Route
Umatilla County

Map 5



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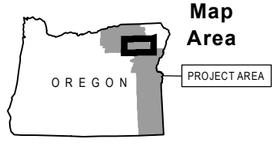
Miles

Map
Area



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June 2017

Map Index

Location Map (Map #)

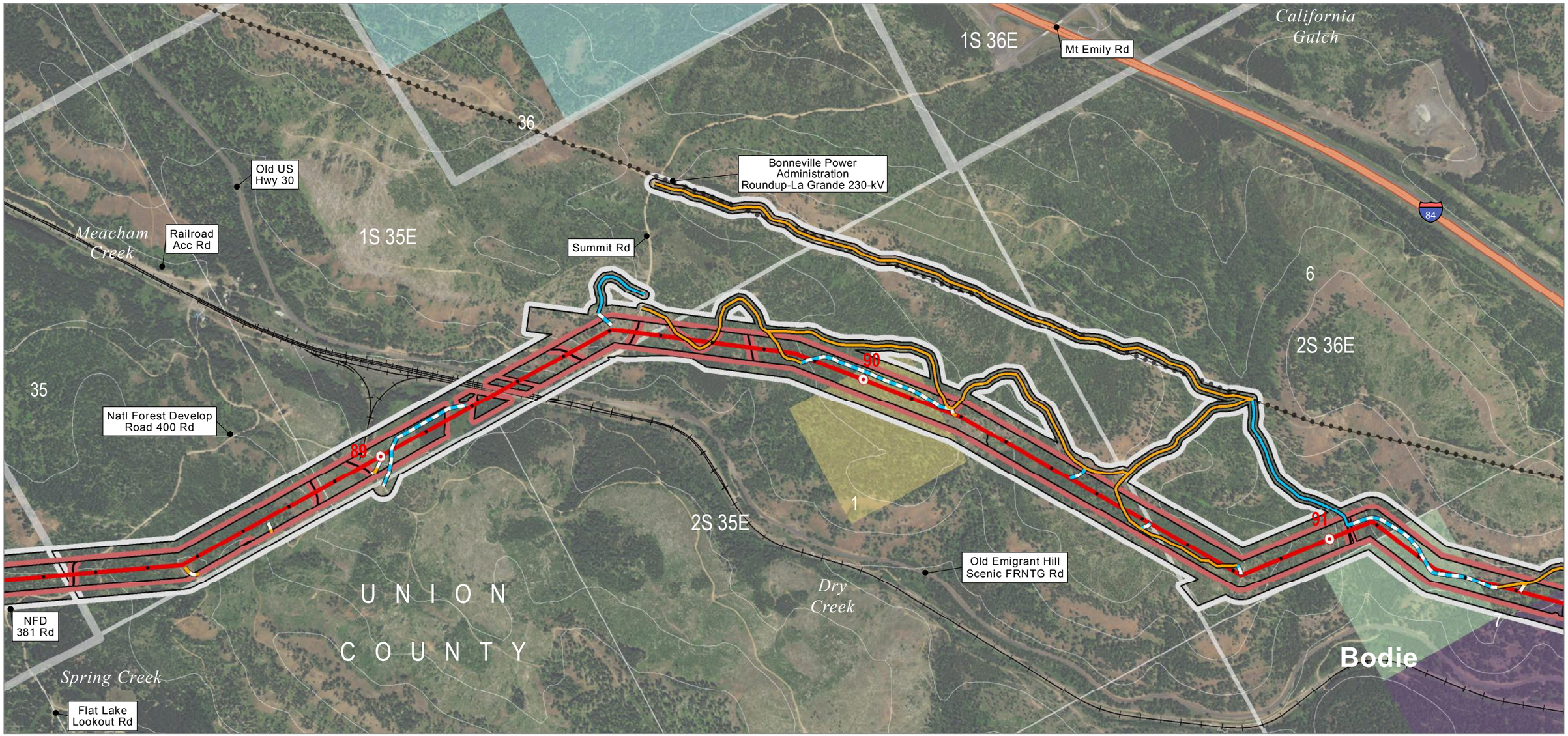
IDAHO POWER
An IDACORP Company

Boardman to Hemingway
Transmission Line Project

Attachment BB-1
Estimated Forest Disturbance

Union County

Map Index



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Map Area

OREGON

PROJECT AREA

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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Project Features

Site Boundary
- Proposed Route

Route Centerline
- Proposed Route

Mileposts
- Mile
- Tenth-mile

Access
- Existing Road, Substantial Modification, 21-70% Improvements
- Existing Road, Substantial Modification, 71-100% Improvements
- New Road, Bladed
- New Road, Primitive

Estimated Forest Disturbance
- Right of Way Clearance

Land Status
- Bureau of Land Management
- Private
- State or Local
- US Forest Service

Important Siting Constraints and Other Features
- 100-foot Contours
- Existing Transmission Lines
- Interstates or Highways
- Railroads
- Designated Utility Corridor (BLM, Forest Service, or West-wide Energy)

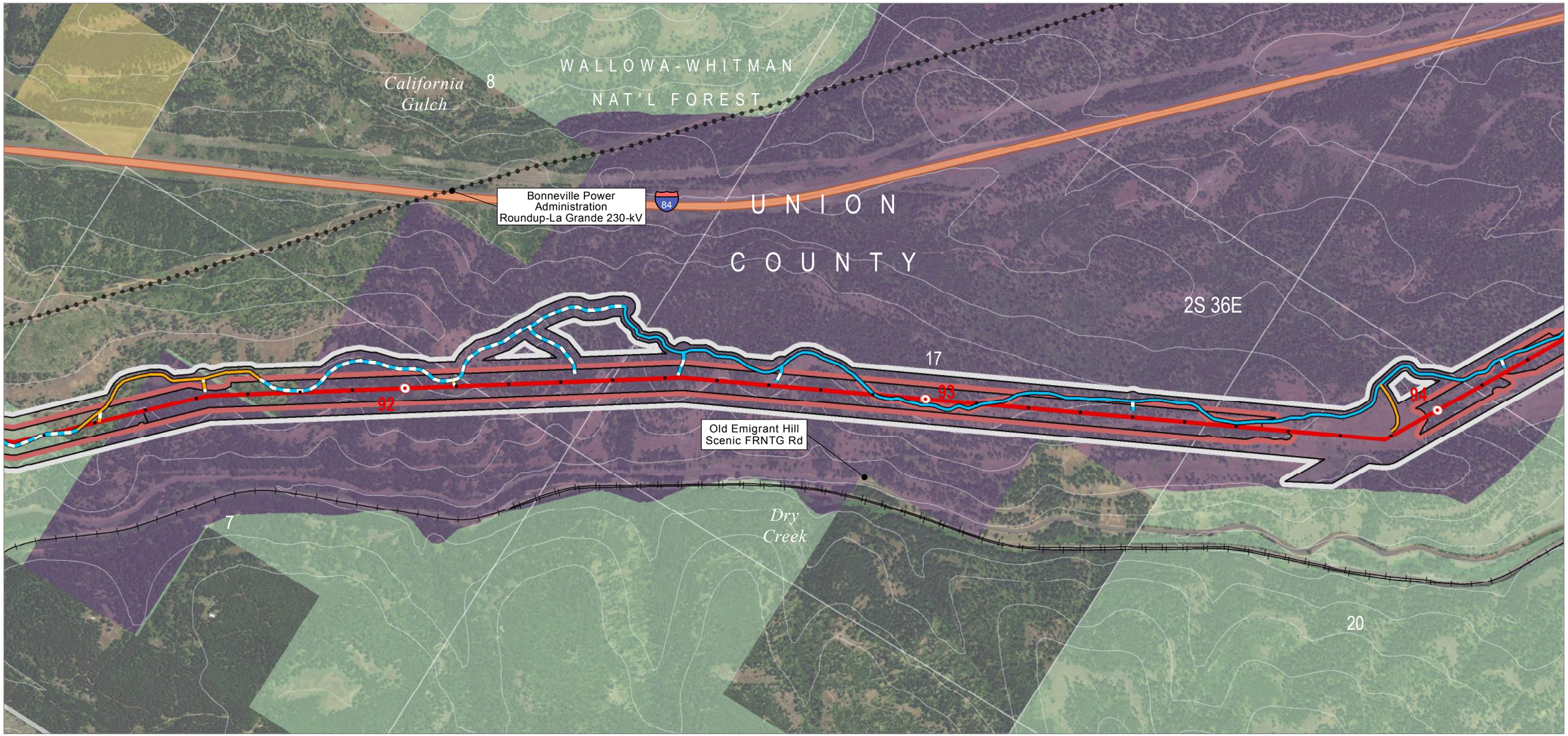
IDAHO POWER. An IDACORP Company

Boardman to Hemingway Transmission Line Project

Attachment BB-1
Estimated Forest Disturbance

Proposed Route
Union County

Map 6



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Project Features

Site Boundary
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Route Centerline
- Proposed Route

Mileposts
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- Tenth-mile

Access
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- Existing Road, Substantial Modification, 71-100% Improvements
- New Road, Bladed
- New Road, Primitive

Estimated Forest Disturbance
- Right of Way Clearance

Land Status
- Bureau of Land Management
- Private
- US Forest Service

Important Siting Constraints and Other Features
- 100-foot Contours
- Existing Transmission Lines
- Interstates or Highways
- Railroads
- Designated Utility Corridor (BLM, Forest Service, or West-wide Energy)

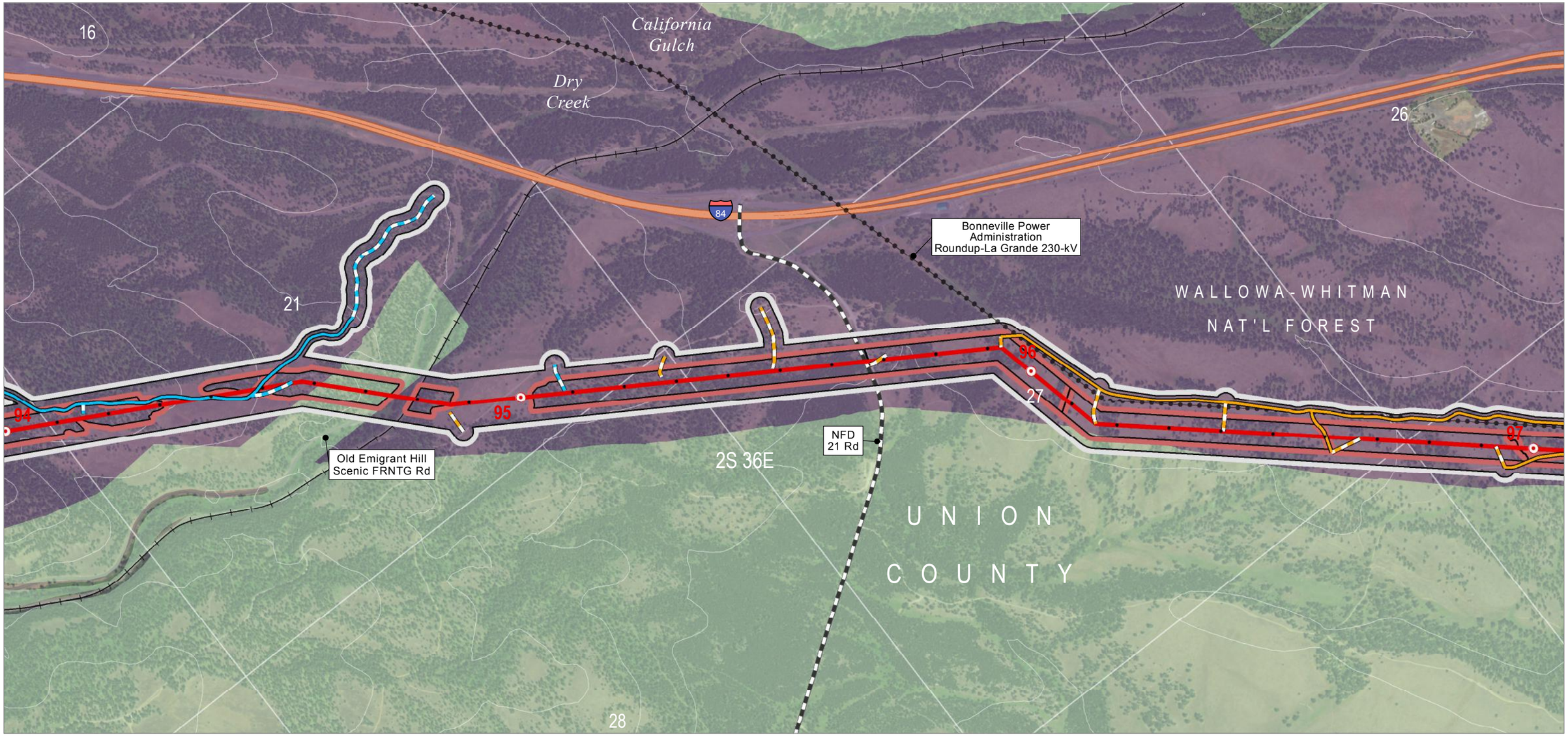
IDAHO POWER An IDACORP Company

Boardman to Hemingway Transmission Line Project

Attachment BB-1
Estimated Forest Disturbance

Proposed Route
Union County

Map 7



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Map Area

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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Project Features

Site Boundary
- Proposed Route

Route Centerline
- Proposed Route

Mileposts
- Mile
- Tenth-mile

Access
- Existing Road, Substantial Modification, 21-70% Improvements
- Existing Road, Substantial Modification, 71-100% Improvements
- New Road, Bladed
- New Road, Primitive

Estimated Forest Disturbance
- Right of Way Clearance

Land Status
- Private
- US Forest Service

Important Siting Constraints and Other Features
- 100-foot Contours
- Existing Transmission Lines
- Interstates or Highways
- Other Major Roads
- Railroads
- Designated Utility Corridor (BLM, Forest Service, or West-wide Energy)

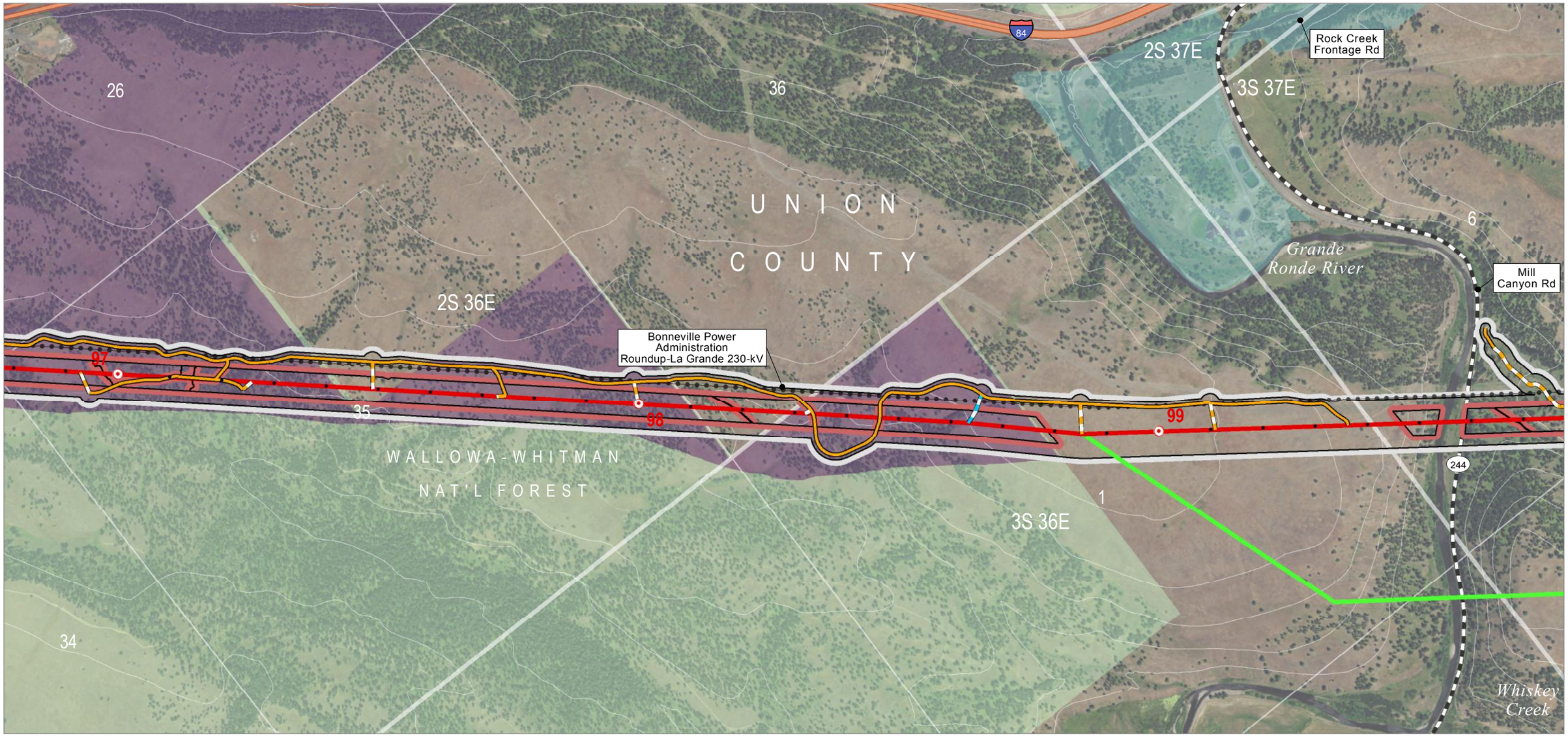
IDAHO POWER An IDACORP Company

Boardman to Hemingway Transmission Line Project

Attachment BB-1
Estimated Forest Disturbance

Proposed Route
Union County

Map 8



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Map Area

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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Project Features

Site Boundary
- Proposed Route

Route Centerline
- Proposed Route
- Alternative

Mileposts
- Mile
- Tenth-mile

Access
- Existing Road, Substantial Modification, 21-70% Improvements
- New Road, Bladed
- New Road, Primitive

Estimated Forest Disturbance
- Right of Way Clearance

Land Status
- Private
- State or Local Wildlife or Parks and Recreation Area
- US Forest Service

Important Siting Constraints and Other Features
- 100-foot Contours
- Existing Transmission Lines
- Interstates or Highways
- Other Major Roads
- Designated Utility Corridor (BLM, Forest Service, or West-wide Energy)

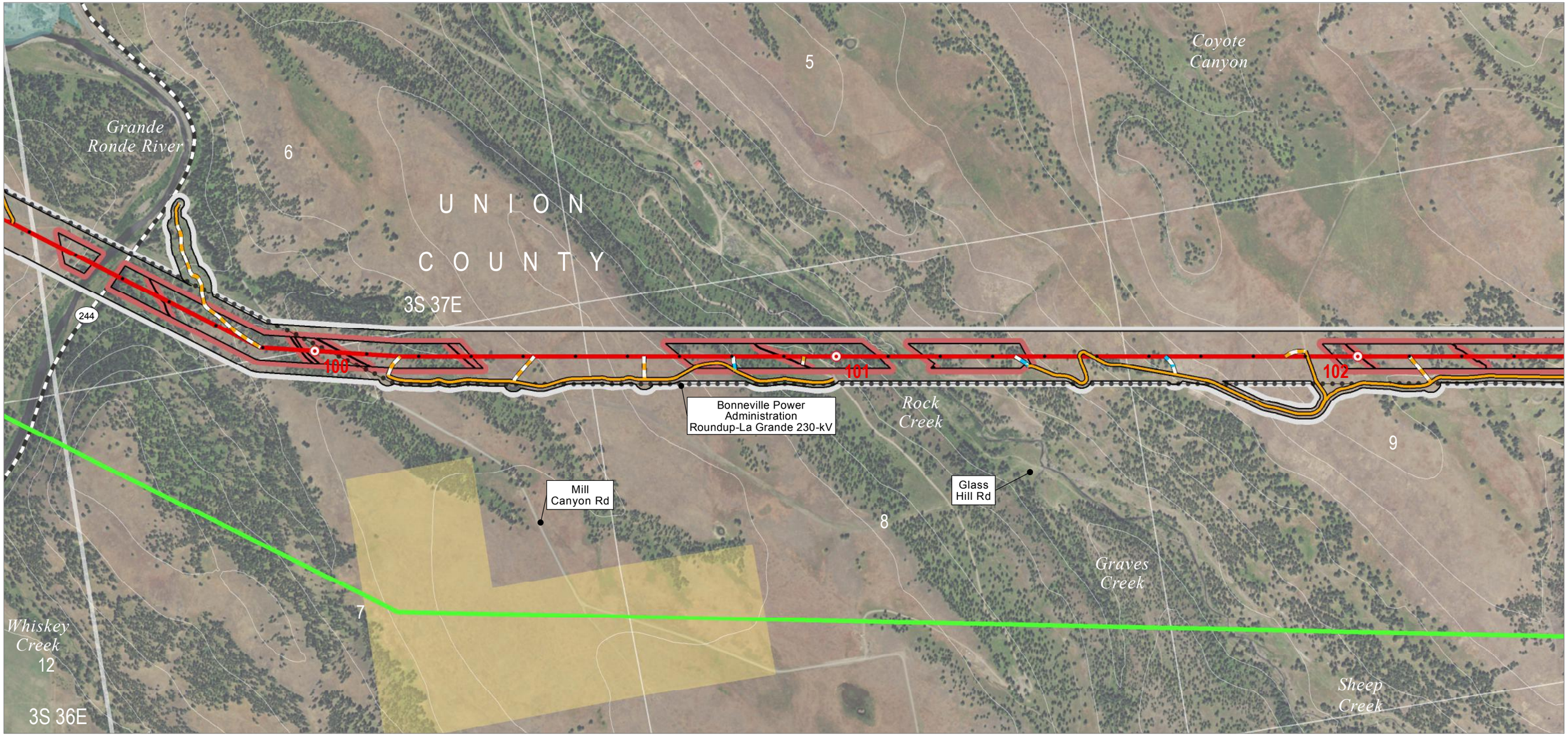
IDAHO POWER
An IDACORP Company

Boardman to Hemingway Transmission Line Project

Attachment BB-1
Estimated Forest Disturbance

Proposed Route
Union County

Map 9



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Map Area

OREGON

PROJECT AREA

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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Project Features

Site Boundary
- Proposed Route

Route Centerline
- Proposed Route
- Alternative

Mileposts
- Mile
- Tenth-mile

Access
- Existing Road, Substantial Modification, 21-70% Improvements
- New Road, Bladed
- New Road, Primitive

Estimated Forest Disturbance
- Right of Way Clearance

Land Status
- Bureau of Land Management
- Private
- State or Local Wildlife or Parks and Recreation Area

Important Siting Constraints and Other Features
- 100-foot Contours
- Existing Transmission Lines
- Other Major Roads

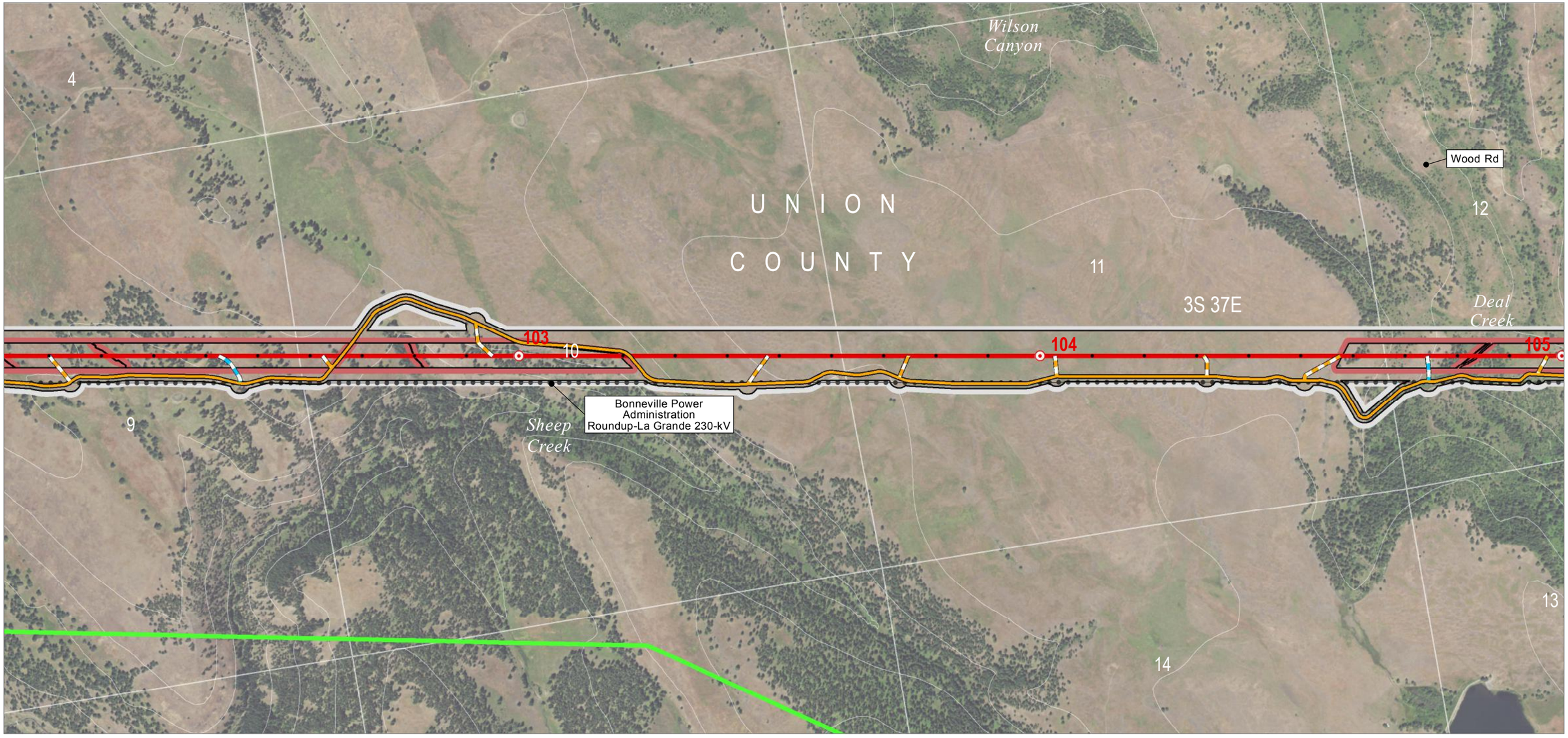
IDAHO POWER An IDACORP Company

Boardman to Hemingway Transmission Line Project

Attachment BB-1
Estimated Forest Disturbance

Proposed Route
Union County

Map 10



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Map Area

OREGON

PROJECT AREA

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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Project Features

Site Boundary
- Proposed Route

Route Centerline
- Proposed Route
- Alternative

Mileposts
- Mile
- Tenth-mile

Access
- Existing Road, Substantial Modification, 21-70% Improvements
- New Road, Bladed
- New Road, Primitive

Estimated Forest Disturbance
- Right of Way Clearance

Land Status
- Private

Important Siting Constraints and Other Features
- 100-foot Contours
- Existing Transmission Lines

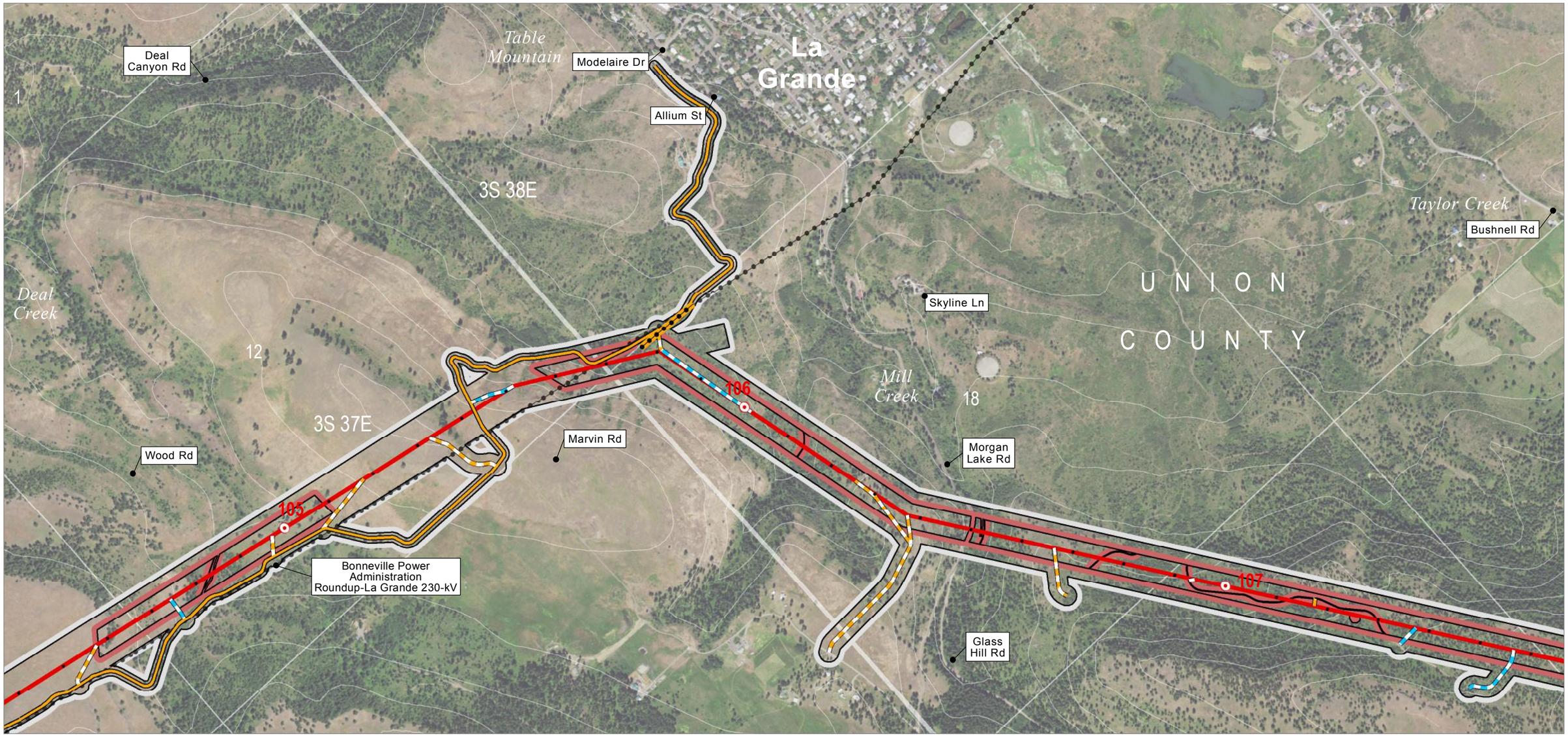
IDAHO POWER An IDACORP Company

Boardman to Hemingway Transmission Line Project

Attachment BB-1
Estimated Forest Disturbance

Proposed Route
Union County

Map 11



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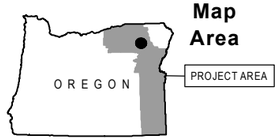
Map Area



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Project Features

Site Boundary
- Proposed Route

Route Centerline
- Proposed Route

Mileposts
- Mile
- Tenth-mile

Access
- Existing Road, Substantial Modification, 21-70% Improvements
- New Road, Bladed
- New Road, Primitive
- Distribution Line to Communication Station (IPC Service Territory Only)

Estimated Forest Disturbance
- Right of Way Clearance

Land Status
- Private

Important Siting Constraints and Other Features
- 100-foot Contours
- Existing Transmission Lines

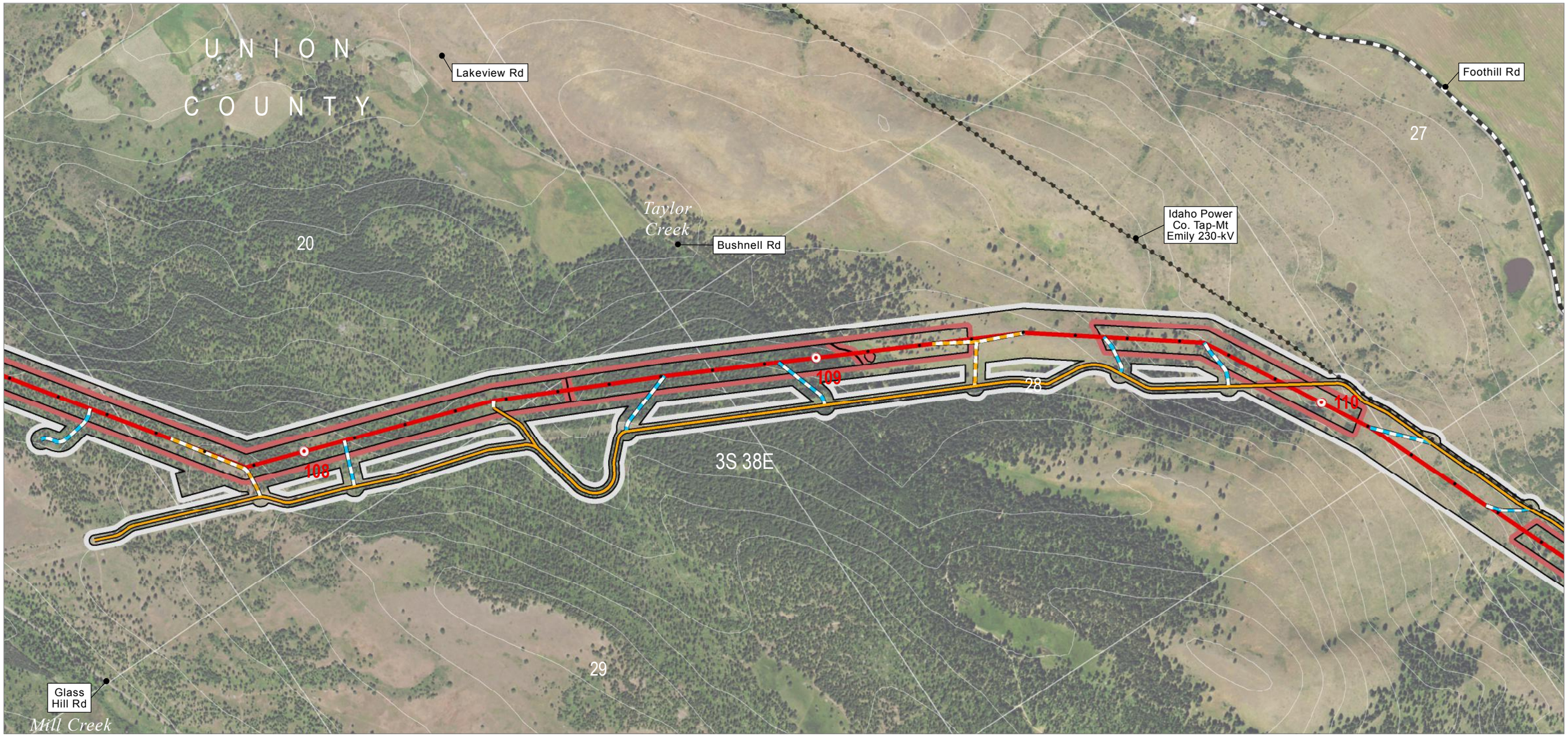
IDAHO POWER An IDACORP Company

Boardman to Hemingway Transmission Line Project

Attachment BB-1
Estimated Forest Disturbance

Proposed Route
Union County

Map 12



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Project Features

Site Boundary
- Proposed Route

Route Centerline
- Proposed Route

Mileposts
- Mile
- Tenth-mile

Access
- Existing Road, Substantial Modification, 21-70% Improvements
- New Road, Bladed
- New Road, Primitive

Estimated Forest Disturbance
- Right of Way Clearance

Land Status
- Private

Important Siting Constraints and Other Features
- 100-foot Contours
- Existing Transmission Lines
- Other Major Roads

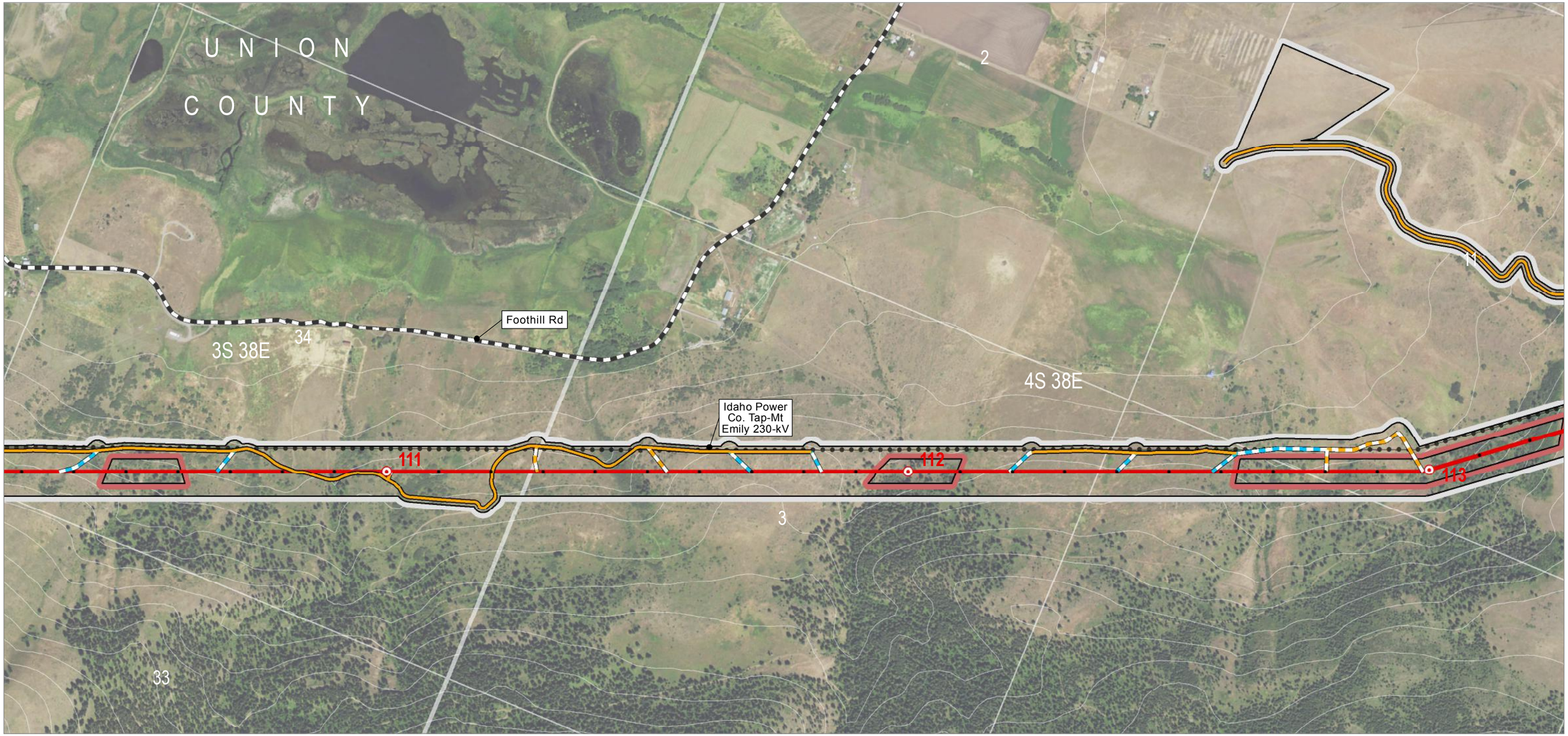
IDAHO POWER
An IDACORP Company

Boardman to Hemingway Transmission Line Project

Attachment BB-1
Estimated Forest Disturbance

Proposed Route
Union County

Map 13



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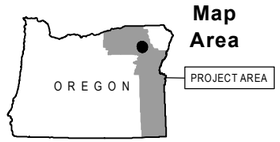
Map Area



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Project Features

Site Boundary
- Proposed Route

Route Centerline
- Proposed Route

Mileposts
- Mile
- Tenth-mile

Access
- Existing Road, Substantial Modification, 21-70% Improvements
- New Road, Bladed
- New Road, Primitive

Estimated Forest Disturbance
- Right of Way Clearance

Land Status
- Private

Important Siting Constraints and Other Features
- 100-foot Contours
- Existing Transmission Lines
- Other Major Roads

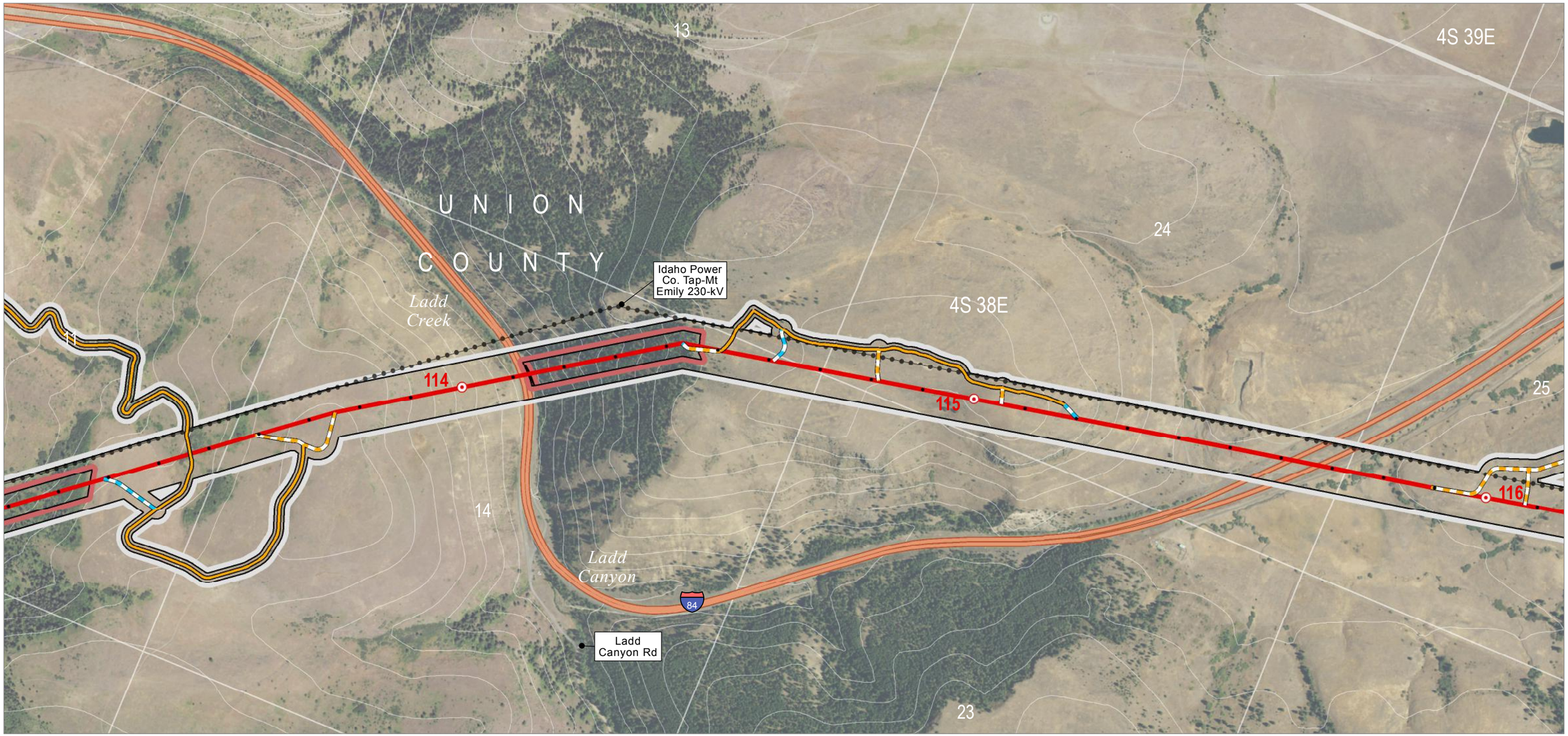
IDAHO POWER
An IDACORP Company

Boardman to Hemingway Transmission Line Project

Attachment BB-1
Estimated Forest Disturbance

Proposed Route
Union County

Map 14



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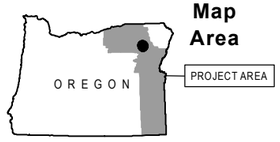
Map Area



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Project Features

Site Boundary
- Proposed Route

Route Centerline
- Proposed Route

Mileposts
- Mile
- Tenth-mile

Access
- Existing Road, Substantial Modification, 21-70% Improvements
- New Road, Bladed
- New Road, Primitive

Estimated Forest Disturbance
- Right of Way Clearance

Land Status
- Private

Important Siting Constraints and Other Features
- 100-foot Contours
- Existing Transmission Lines
- Interstates or Highways

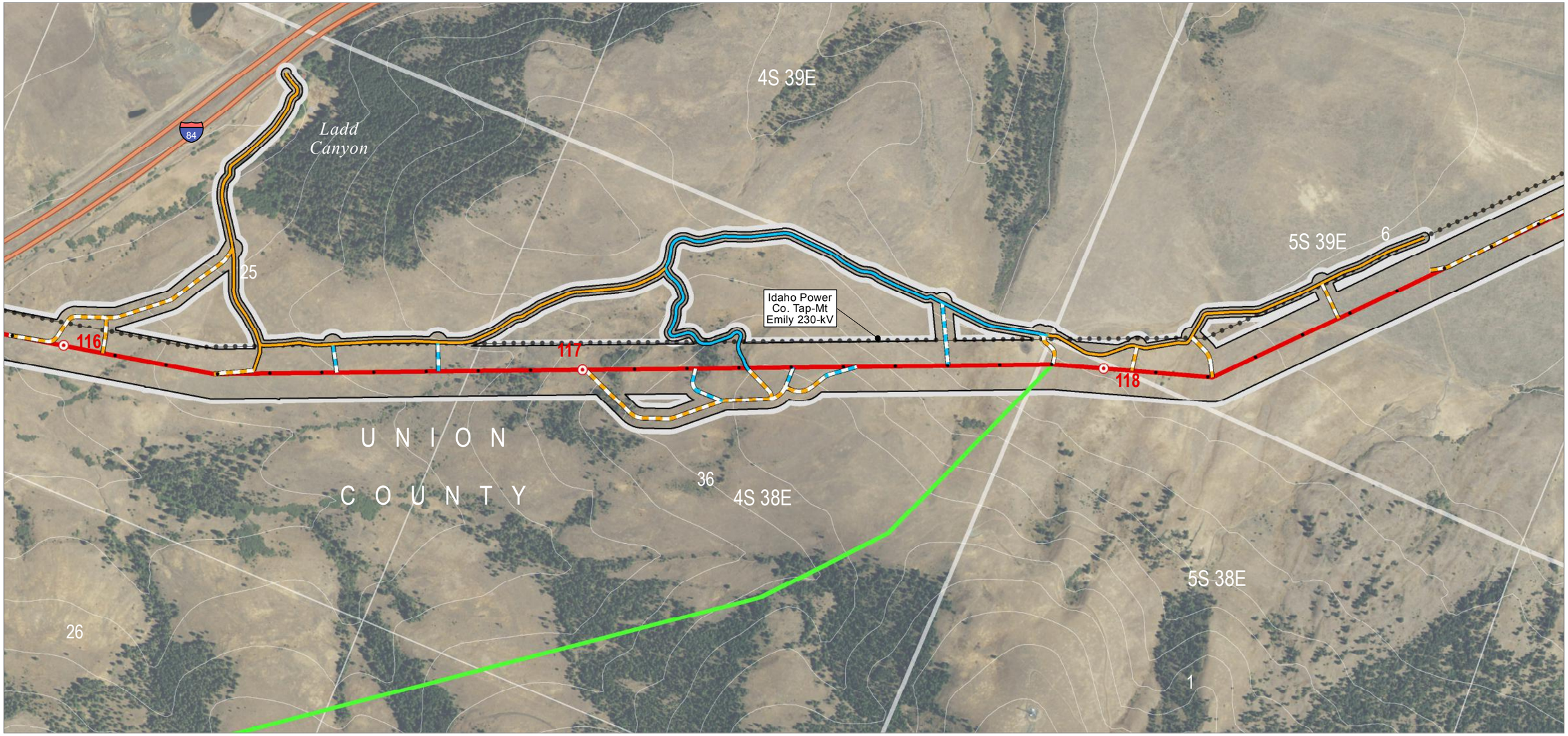
IDAHO POWER
An IDACORP Company

Boardman to Hemingway Transmission Line Project

Attachment BB-1
Estimated Forest Disturbance

Proposed Route
Union County

Map 15



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Map Area

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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Project Features

Site Boundary
- Proposed Route

Route Centerline
- Proposed Route
- Alternative

Mileposts
- Mile
- Tenth-mile

Access
- Existing Road, Substantial Modification, 21-70% Improvements
- Existing Road, Substantial Modification, 71-100% Improvements
- New Road, Bladed
- New Road, Primitive

Land Status
- Private

Important Siting Constraints and Other Features
- 100-foot Contours
- Existing Transmission Lines
- Interstates or Highways

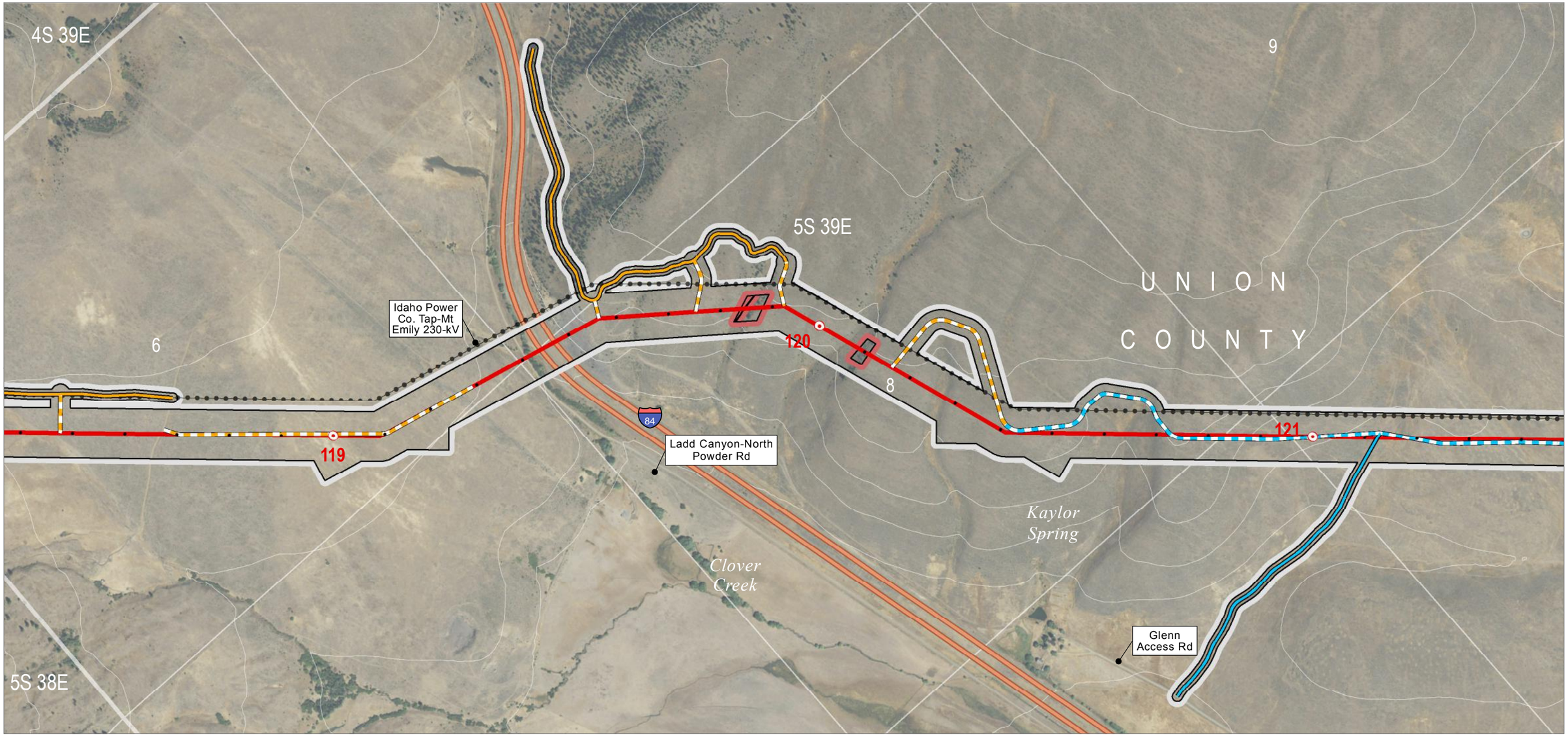
IDAHO POWER An IDACORP Company

Boardman to Hemingway Transmission Line Project

Attachment BB-1
Estimated Forest Disturbance

Proposed Route
Union County

Map 16



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Map Area

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Project Features

Site Boundary
- Proposed Route

Route Centerline
- Proposed Route

Mileposts
- Mile
- Tenth-mile

Access
- Existing Road, Substantial Modification, 21-70% Improvements
- Existing Road, Substantial Modification, 71-100% Improvements
- New Road, Bladed
- New Road, Primitive

Estimated Forest Disturbance
- Right of Way Clearance

Land Status
- Private

Important Siting Constraints and Other Features
- 100-foot Contours
- Existing Transmission Lines
- Interstates or Highways

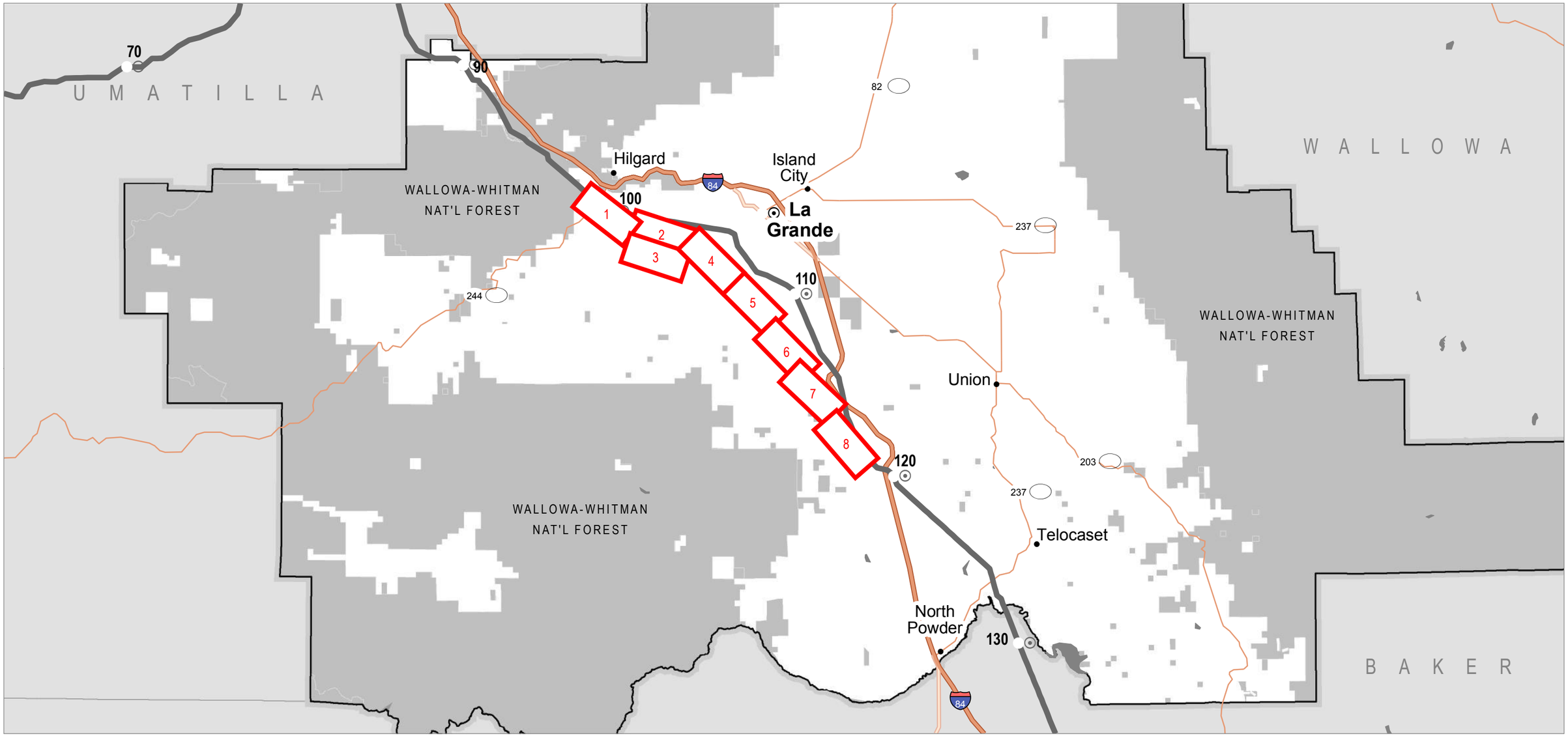
IDAHO POWER An IDACORP Company

Boardman to Hemingway Transmission Line Project

Attachment BB-1
Estimated Forest Disturbance

Proposed Route
Union County

Map 17



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Miles

Map Area

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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June 2017

Map Index

Location Map (Map #)

Project Features

Proposed Route

Ten-mile Marker

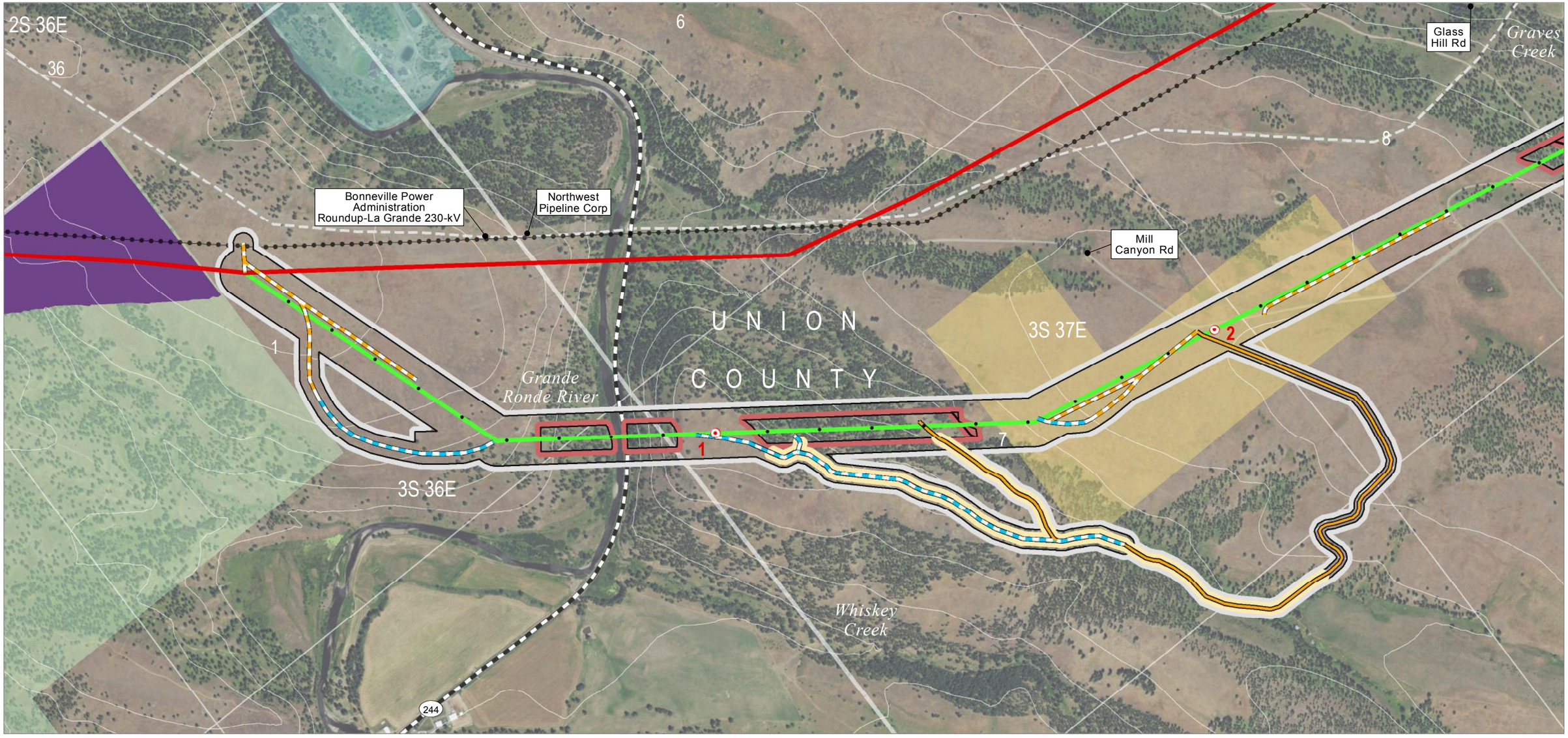
IDAHO POWER An IDACORP Company

Boardman to Hemingway Transmission Line Project

Attachment BB-1
Estimated Forest Disturbance

Morgan Lake Alternative
Union County

Map Index



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Map Area

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June 2017

Project Features

Site Boundary
- Alternative

Route Centerline
- Proposed Route
- Alternative

Mileposts
- Mile
- Tenth-mile

Access
- Existing Road, Substantial Modification, 21-70% Improvements
- New Road, Bladed
- New Road, Primitive

Estimated Forest Disturbance
- Right of Way Clearance
- Access Road Clearance

Land Status
- Bureau of Land Management
- Private
- State or Local Wildlife or Parks and Recreation Area
- US Forest Service

Important Siting Constraints and Other Features
- 100-foot Contours
- Existing Transmission Lines
- Other Major Roads
- Designated Utility Corridor (BLM, Forest Service, or West-wide Energy)

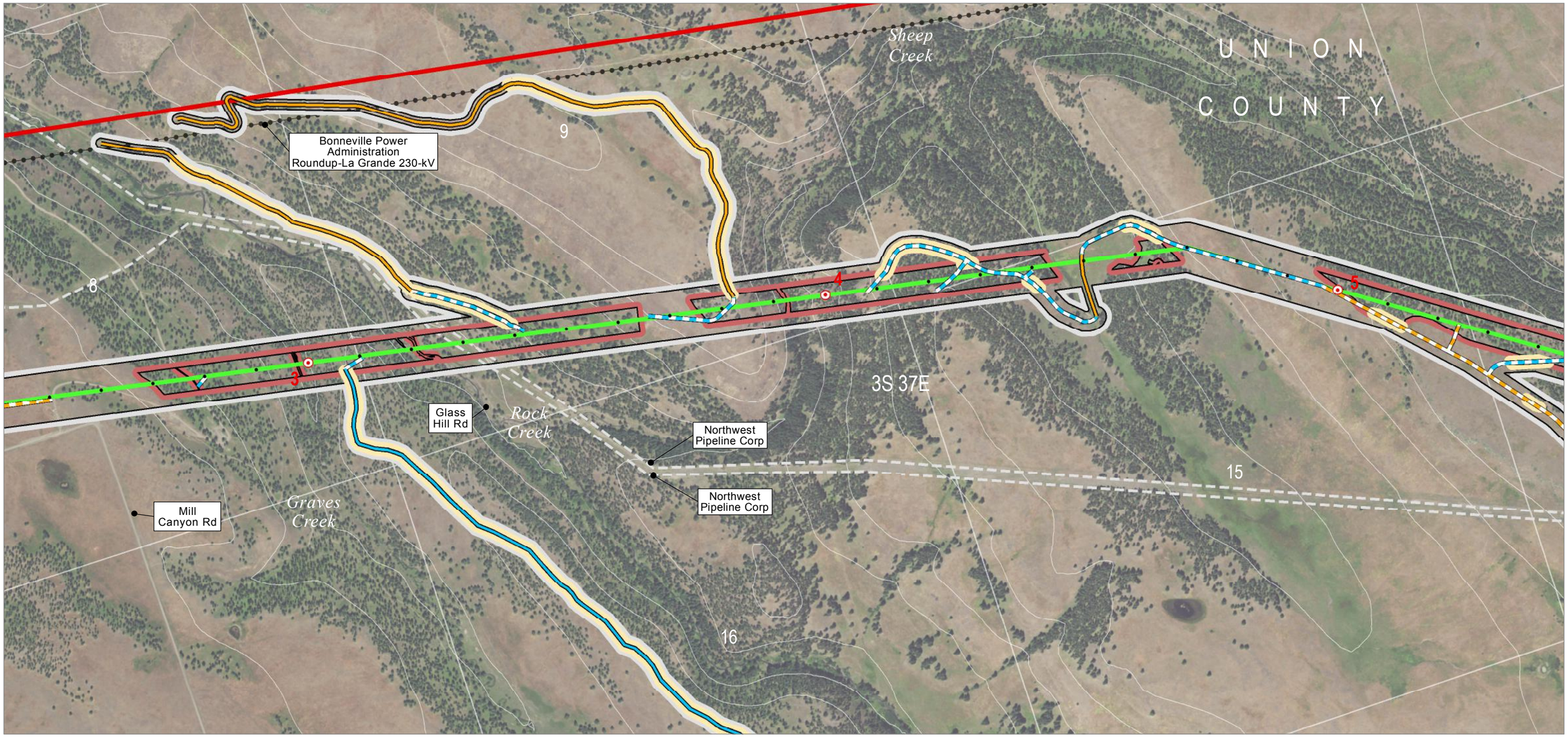
IDAHO POWER An IDACORP Company

Boardman to Hemingway Transmission Line Project

Attachment BB-2
Estimated Forest Disturbance

Morgan Lake Alternative
Union County

Map 18



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Map Area

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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June 2017

Project Features

Site Boundary
- Alternative

Route Centerline
- Proposed Route
- Alternative

Mileposts
- Mile
- Tenth-mile

Access
- Existing Road, Substantial Modification, 21-70% Improvements
- Existing Road, Substantial Modification, 71-100% Improvements
- New Road, Bladed
- New Road, Primitive

Estimated Forest Disturbance
- Right of Way Clearance
- Access Road Clearance

Land Status
- Private

Important Siting Constraints and Other Features
- 100-foot Contours
- Existing Transmission Lines

IDAHO POWER An IDACORP Company

Boardman to Hemingway Transmission Line Project

Attachment BB-2
Estimated Forest Disturbance

Morgan Lake Alternative
Union County

Map 19

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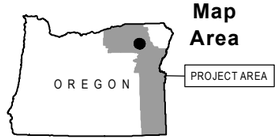
Feet

Map Area



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June 2017

Project Features

Site Boundary

Alternative

Access

Existing Road, Substantial Modification, 71-100% Improvements

Estimated Forest Disturbance

Access Road Clearance

Land Status

Private

Important Siting Constraints and Other Features

100-foot Contours

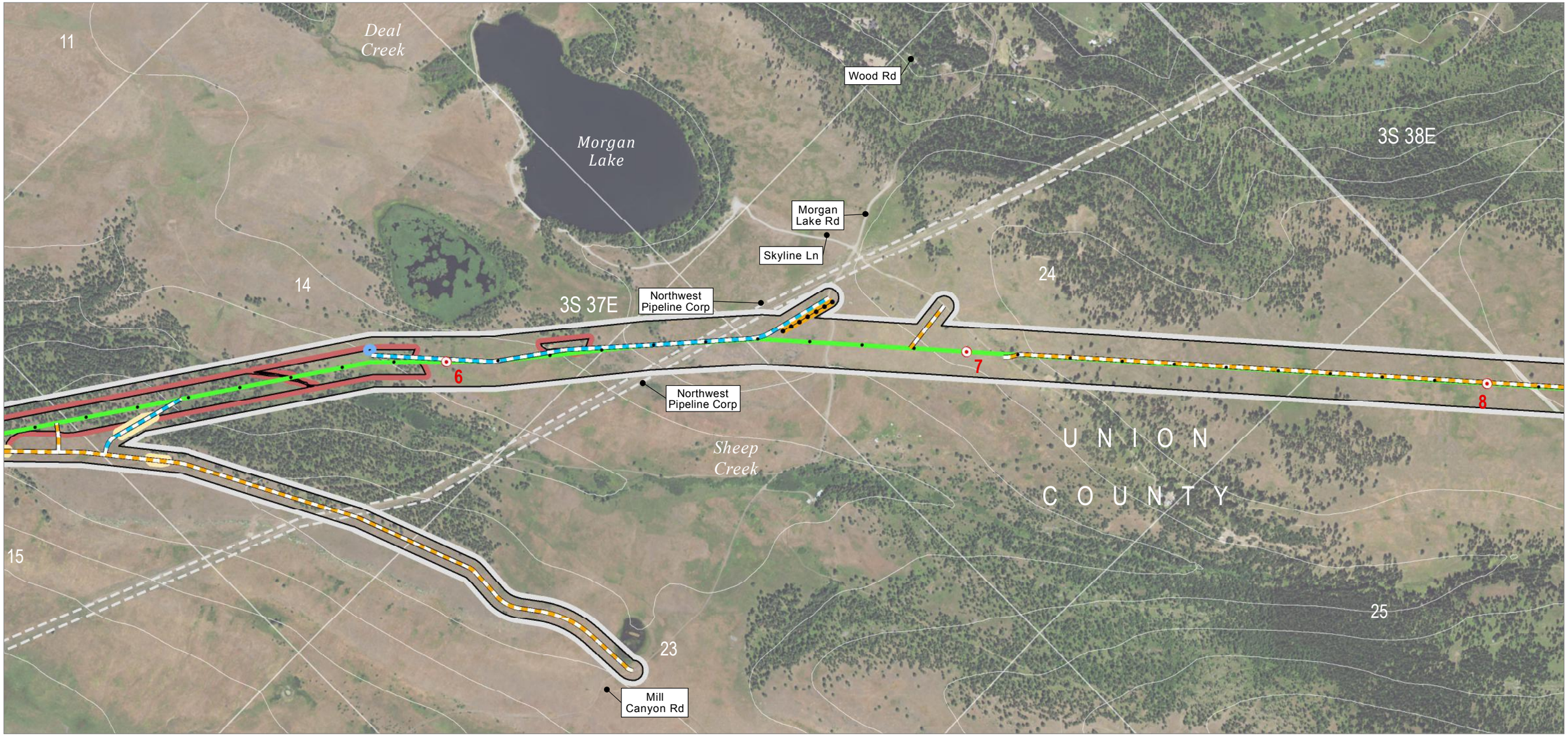
IDAHO POWER
An IDACORP Company

Boardman to Hemingway Transmission Line Project

Attachment BB-2
Estimated Forest Disturbance

Morgan Lake Alternative
Union County

Map 20



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Map Area

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June 2017

Project Features

Site Boundary
- Alternative

Route Centerline
- Alternative

Mileposts
- Mile
- Tenth-mile

Access
- New Road, Bladed
- New Road, Primitive
- Distribution Line to Communication Station (IPC Service Territory Only)

Estimated Forest Disturbance
- Right of Way Clearance
- Access Road Clearance
- Work Area Clearance

Land Status
- Private

Important Siting Constraints and Other Features
- 100-foot Contours

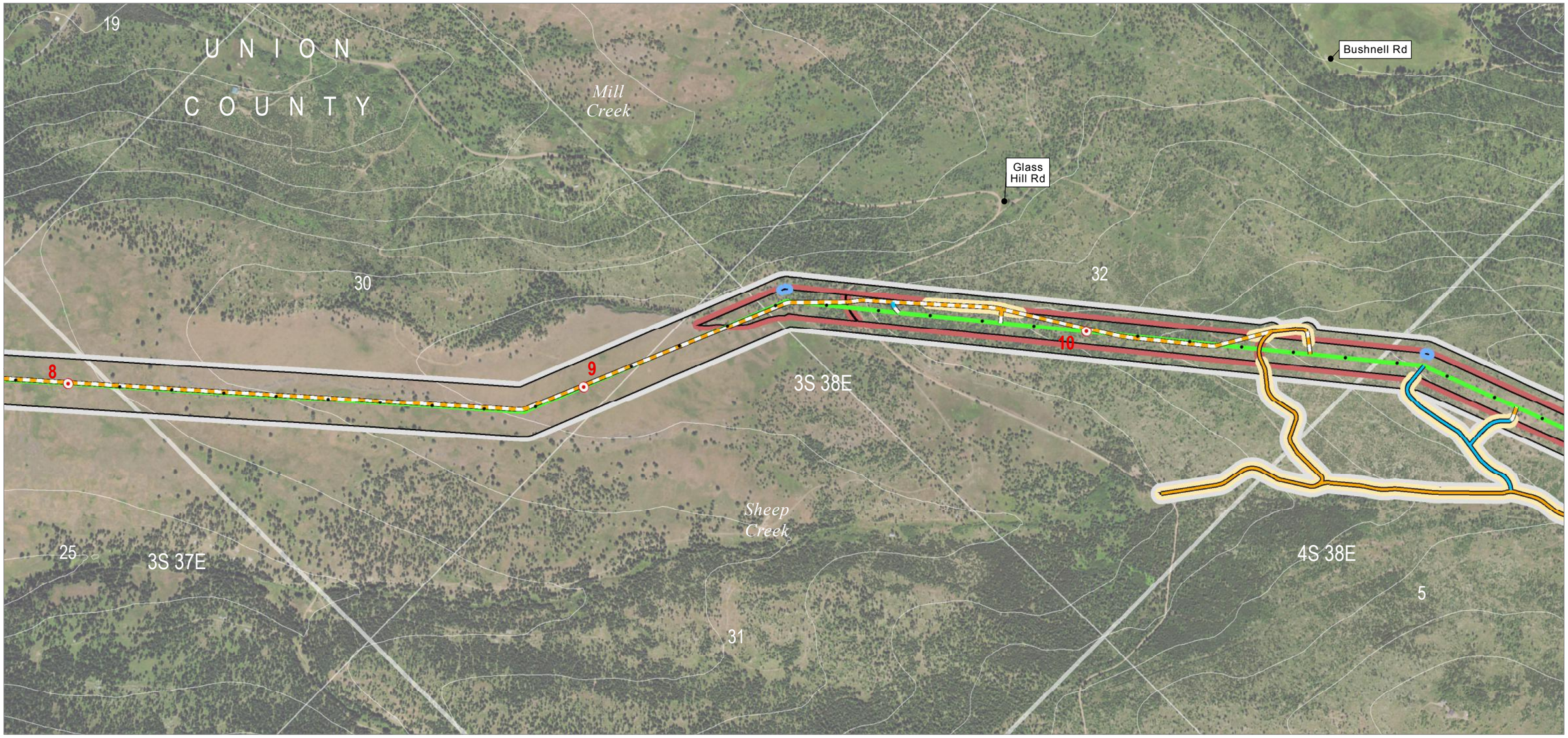
IDAHO POWER
An IDACORP Company

Boardman to Hemingway Transmission Line Project

Attachment BB-2
Estimated Forest Disturbance

Morgan Lake Alternative
Union County

Map 21



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Feet

Map Area

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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June 2017

Project Features

Site Boundary
- Alternative

Route Centerline
- Alternative

Mileposts
- Mile
- Tenth-mile

Access
- Existing Road, Substantial Modification, 21-70% Improvements
- Existing Road, Substantial Modification, 71-100% Improvements
- New Road, Bladed
- New Road, Primitive

Estimated Forest Disturbance
- Right of Way Clearance
- Access Road Clearance
- Work Area Clearance

Land Status
- Private

Important Siting Constraints and Other Features
- 100-foot Contours

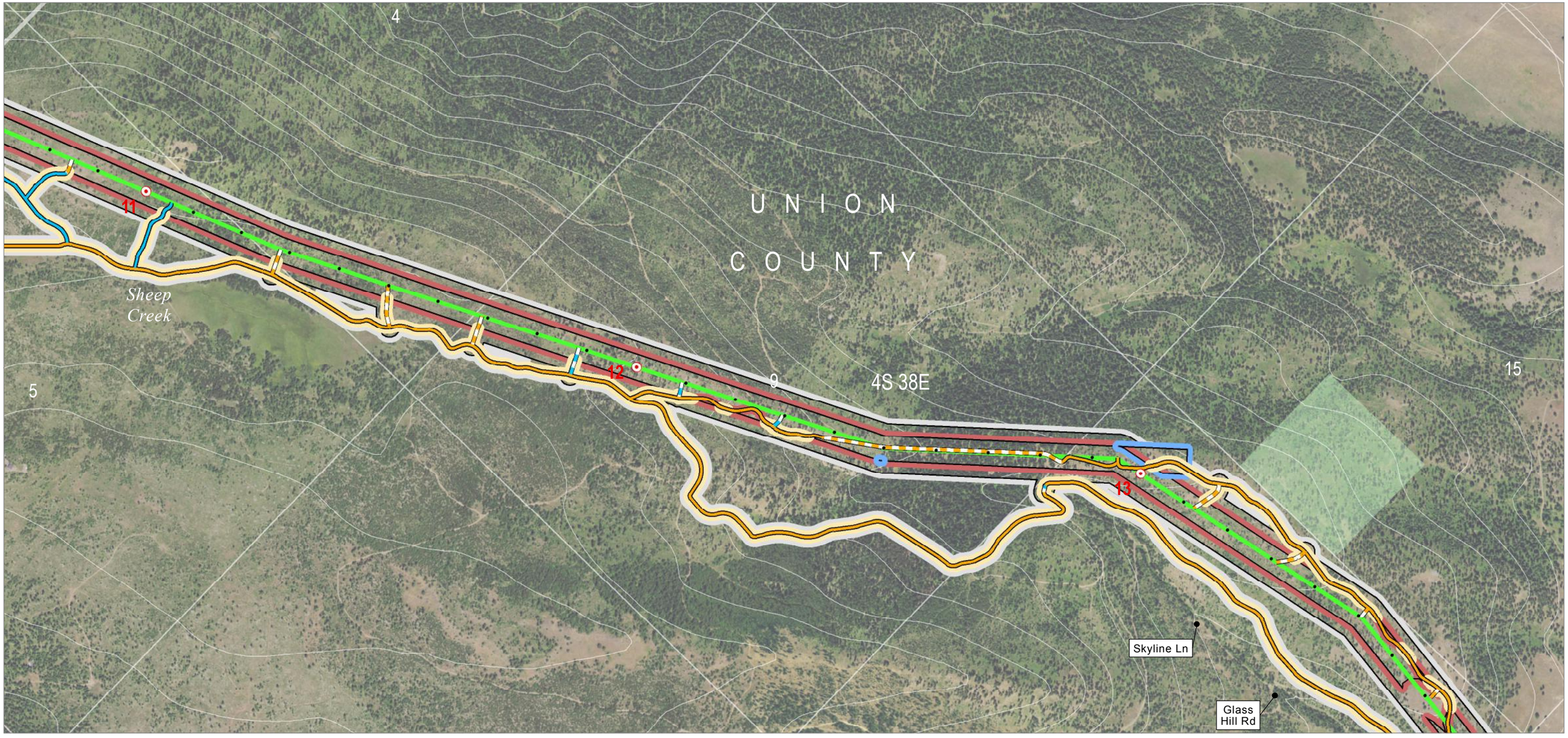
IDAHO POWER An IDACORP Company

Boardman to Hemingway Transmission Line Project

Attachment BB-2
Estimated Forest Disturbance

Morgan Lake Alternative
Union County

Map 22



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June 2017

Project Features

Site Boundary
- Alternative

Route Centerline
- Alternative

Mileposts
- Mile
- Tenth-mile

Access
- Existing Road, Substantial Modification, 21-70% Improvements
- Existing Road, Substantial Modification, 71-100% Improvements
- New Road, Bladed
- New Road, Primitive

Estimated Forest Disturbance
- Right of Way Clearance
- Access Road Clearance
- Work Area Clearance

Land Status
- Private
- US Forest Service

Important Siting Constraints and Other Features
- 100-foot Contours

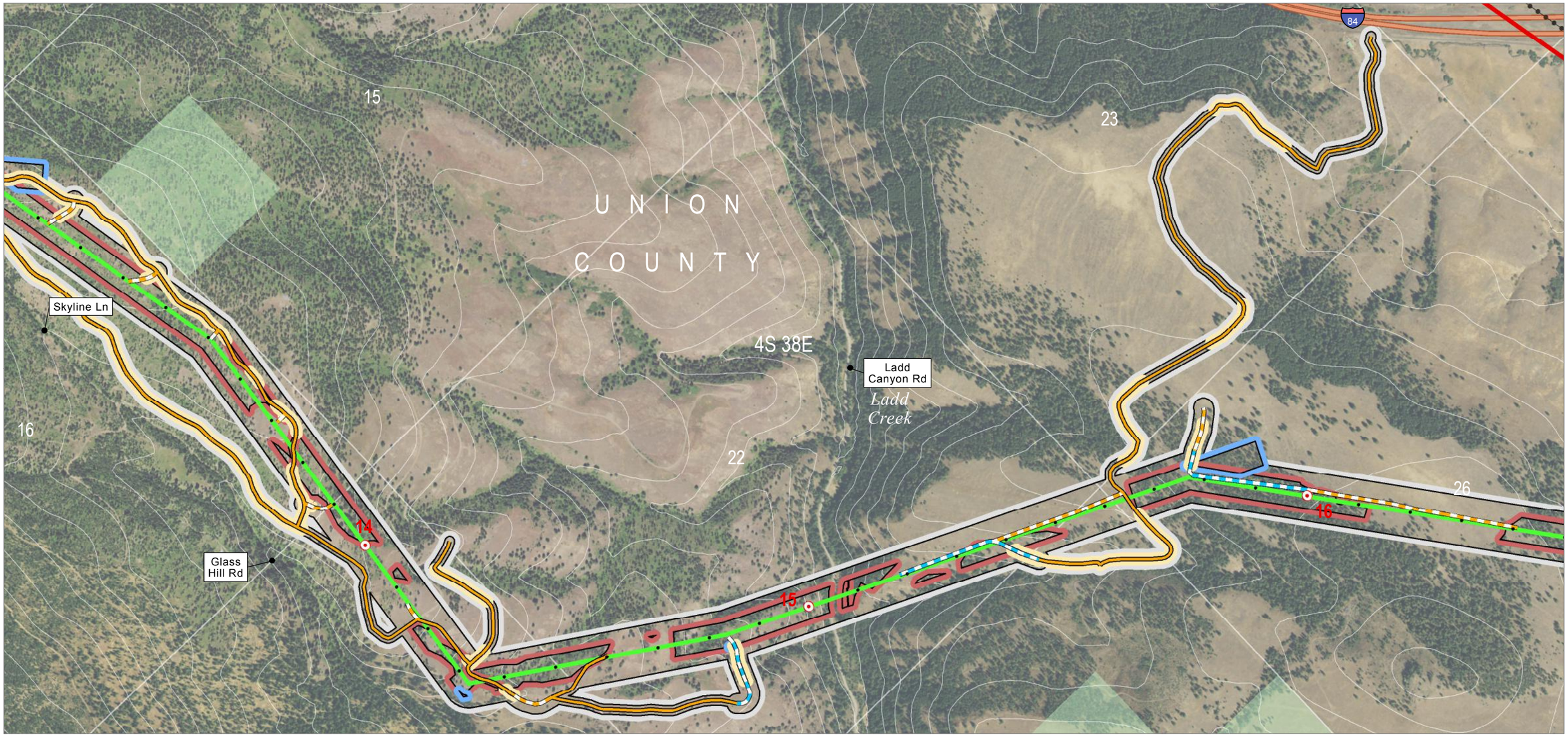
IDAHO POWER
An IDACORP Company

Boardman to Hemingway Transmission Line Project

Attachment BB-2
Estimated Forest Disturbance

Morgan Lake Alternative
Union County

Map 23



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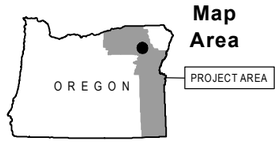
Map Area



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June 2017

Project Features

Site Boundary
- Alternative

Route Centerline
- Proposed Route
- Alternative

Mileposts
- Mile
- Tenth-mile

Access
- Existing Road, Substantial Modification, 21-70% Improvements
- New Road, Bladed
- New Road, Primitive

Estimated Forest Disturbance
- Right of Way Clearance
- Access Road Clearance
- Work Area Clearance

Land Status
- Private
- US Forest Service

Important Siting Constraints and Other Features
- 100-foot Contours
- Existing Transmission Lines
- Interstates or Highways

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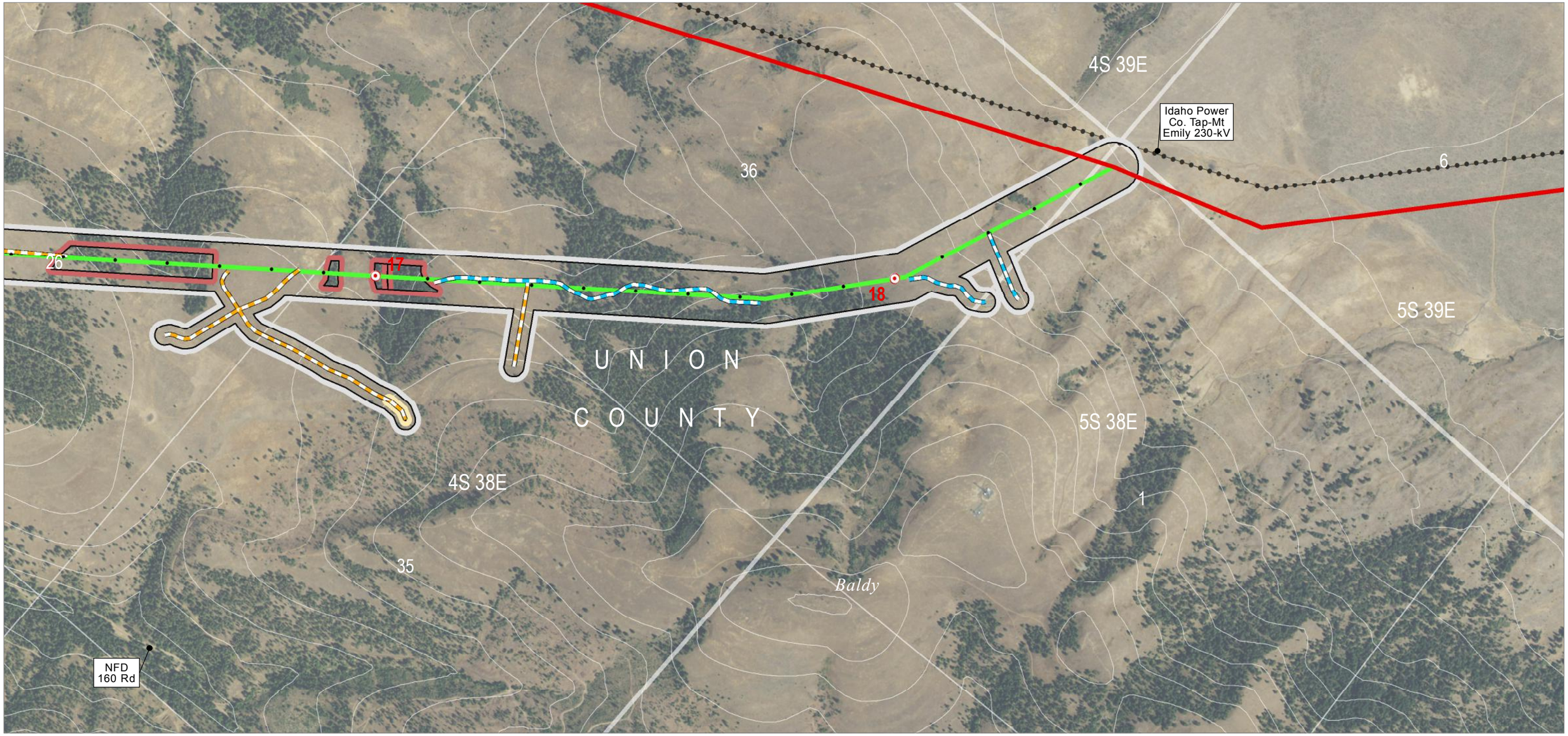
Boardman to Hemingway Transmission Line Project

Attachment BB-2
Estimated Forest Disturbance

Morgan Lake Alternative
Union County

Map 24



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Map Area

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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June 2017

Project Features

Site Boundary
- Alternative

Route Centerline
- Proposed Route
- Alternative

Mileposts
- Mile
- Tenth-mile

Access
- New Road, Bladed
- New Road, Primitive

Estimated Forest Disturbance
- Right of Way Clearance
- Access Road Clearance

Land Status
- Private

Important Siting Constraints and Other Features
- 100-foot Contours
- Existing Transmission Lines

IDAHO POWER An IDACORP Company

Boardman to Hemingway Transmission Line Project

Attachment BB-2
Estimated Forest Disturbance

Morgan Lake Alternative
Union County

Map 25

ATTACHMENT BB-2
FISH PASSAGE PLAN

Fish Passage Plans and Designs

Boardman to Hemingway Transmission Line Project

Prepared for:

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Boise, Idaho 83702

Prepared by:

Tetra Tech

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(208) 389-1030

February 2017

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ACRONYMS AND ABBREVIATIONS

ARBO II	Aquatic Restoration Biological Opinion II
DEM	Digital Elevation Model
ESA	Endangered Species Act
IPC	Idaho Power Company
kV	kilovolt
LiDAR	light detection and ranging
NOAA Fisheries	National Oceanic and Atmospheric Administration, National Marine Fisheries Service
OAR	Oregon Administrative Rules
ODF	Oregon Department of Forestry
ODFW	Oregon Department of Fish and Wildlife
ODOE	Oregon Department of Energy
ORS	Oregon Revised Statues
Project	Boardman to Hemingway Transmission Line Project
USACE	U.S. Army Corps of Engineers

1.0 INTRODUCTION

Idaho Power Company (IPC) is proposing to construct and operate a new, approximately 300-mile-long, single-circuit 500-kilovolt (kV) electric transmission line between northeast Oregon and southwest Idaho known as the Boardman to Hemingway Transmission Line Project (Project). The overhead, 500-kV transmission line will carry energy bi-directionally between the planned Longhorn Station near Boardman in Morrow County, Oregon, and IPC's existing Hemingway Substation, located in Owyhee County, Idaho (Figures 1a and 1b).

To support construction, operation, and maintenance of the Project, the engineering design includes the development of new access roads and improvement of existing roads. As documented in this report, some of this work will require road crossings of fish-bearing streams. These crossings may involve the design and construction of new crossing structures, modifications to existing structures, or use of existing structures with no improvements. Based on Oregon Administrative Rules (OAR) 635-412-0020, new construction affecting fish-bearing streams in Oregon will trigger fish passage rules and regulations and require review by the Oregon Department of Fish and Wildlife (ODFW). ODFW fish passage approvals may be obtained through preparation of a Fish Passage Plan meeting the requirements of OAR 635-412-0035 (see Section 2 for additional details). The purpose of this report is to outline the regulatory criteria and Fish Passage Plans and designs for those fish-bearing stream crossings by Project roads that are anticipated to require ODFW review.

The determination of fish-bearing streams was originally reported in the Fish Habitat and Stream Crossing Assessment Summary Report (Tetra Tech 2014). The report identified a total of 18 fish-bearing streams that would be crossed by roads, which included 1 new and 17 existing road-stream crossings. The report was submitted to the ODFW and Oregon Department of Energy (ODOE) in October 2014 for agency review and approval.

Following the submittal of the Tetra Tech (2014) report, crossing types (and alternatives) for each of the 18 fish-bearing road-stream crossings were identified. These determinations were based on existing structure condition, crossing risk analysis, field data, and analyses that utilized site hydrology, stream characteristics, crossing size, and road ingress/egress. Based on the review and analyses, seven crossing types were identified to assist in separating and grouping the potential alternatives identified for each site: 1) utilization of existing bridges; 2) utilization of existing culverts; 3A) installation of temporary bridge over existing structure; 3B) installation of temporary bridge adjacent to existing structure; 4) installation of temporary timber matting with seasonal restrictions; 5) utilization or improvement of existing fords; 6) installation of new arch or bottomless structure; or 7) installation of new bridge.

The project design team met with representatives of the ODFW and ODOE on October 28, 2014, to discuss the agencies' review of the Tetra Tech (2014) report. During the meeting, the applicable federal, state, and local design criteria and guidelines, as well as the identified crossing types and alternatives for the 18 fish-bearing road-stream crossing sites, were discussed. Crossing Type 1 or 2 was identified as the proposed alternative for 10 of the 18 sites. Based on OAR Chapter 635, Division 412, Fish Passage, these crossing sites were not expected to trigger ODFW fish passage requirements because they are existing structures that do not require any new construction or major replacement. Crossing Types 3A, 4, or 5 were selected as proposed alternatives for the remaining 8 crossing sites; these crossings were deemed likely to trigger ODFW review because they would require some new construction. Of these 8 sites deemed likely to trigger ODFW review, one crossing was subsequently identified for relocation to an alternative road that would not require a fish-bearing road-stream crossing. The removal of this crossing, along with the 10 sites that were not expected to trigger ODFW fish passage requirements, resulted in a total of 7 sites requiring ODFW review.

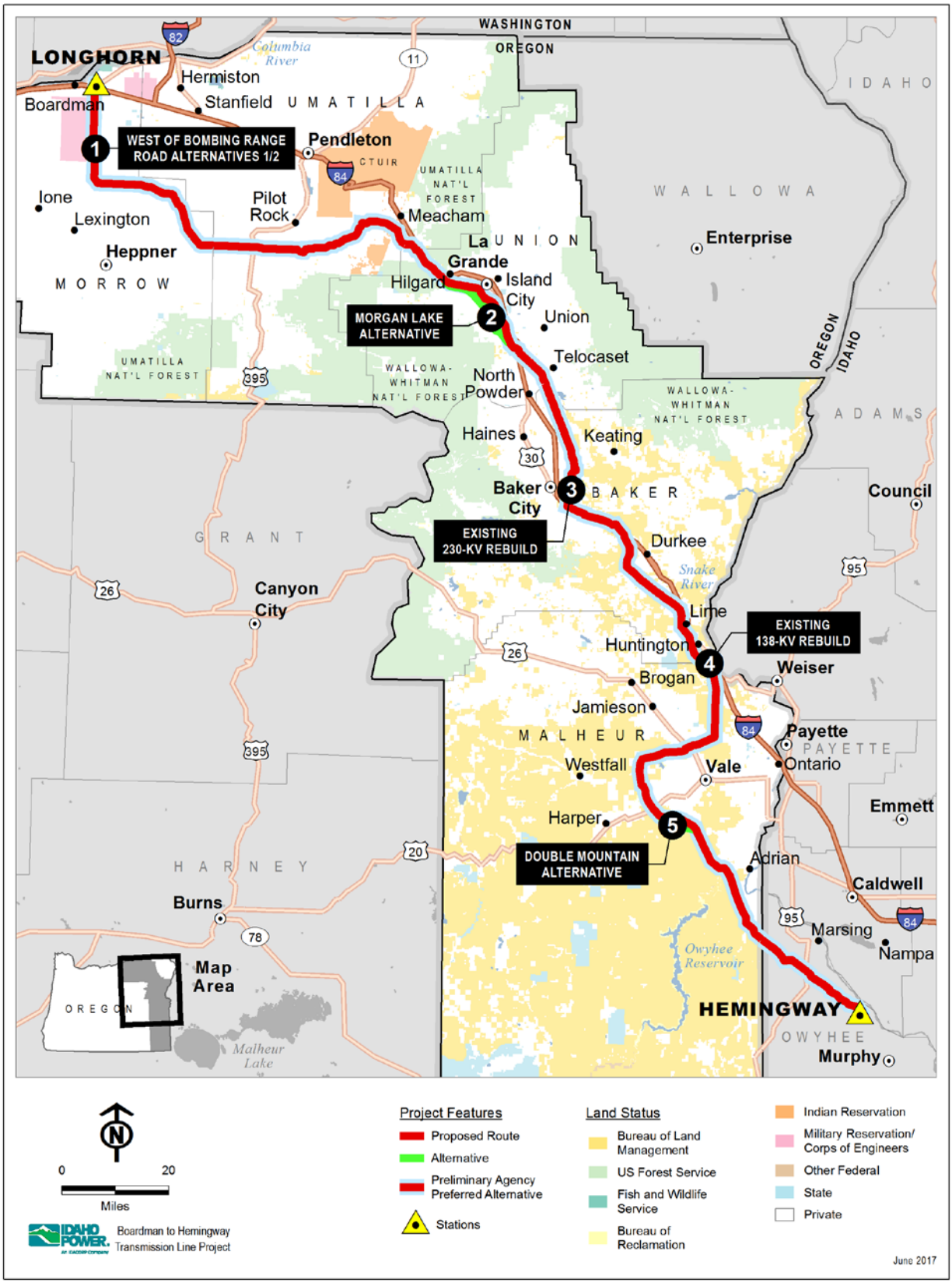

Figure 1a. Project Overview

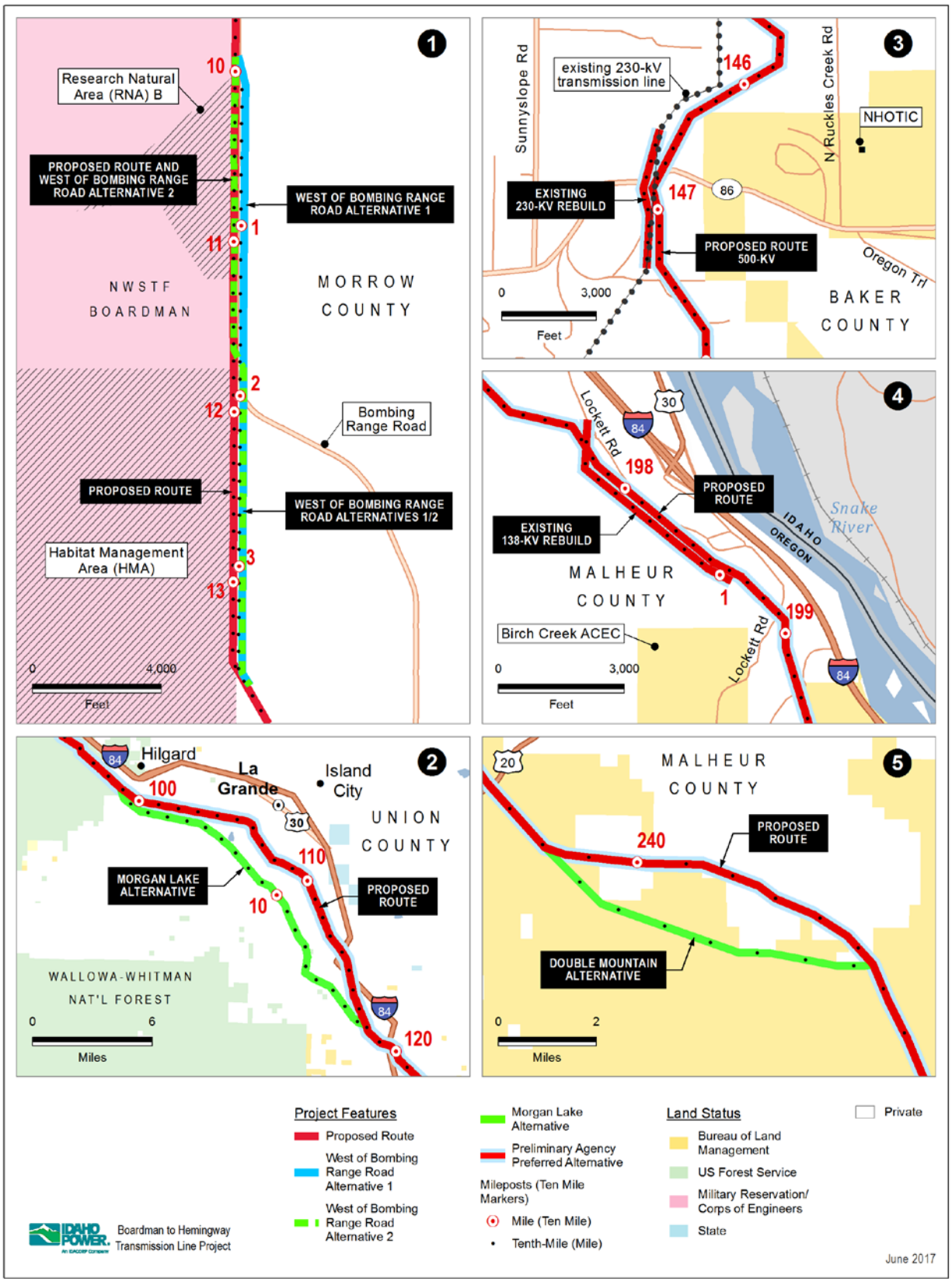

Figure 1b. Detail of Alternatives and 230-kV and 138-kV Rebuilds

In January 2015, the ODFW informed IPC they had reviewed and approved the results and analysis of materials in the Tetra Tech (2014) report, as well as the information presented at the meeting regarding identified proposed and alternative crossing types (Seidel personal comm. 2015a). As part of the approval process, IPC agreed to work with the ODFW in their review of Fish Passage Plans and design drawings for fish-bearing road-stream crossings to ensure that all designs satisfy the ODFW fish passage requirements.

In May 2015, IPC submitted to ODFW the original version of this report documenting the 18 total fish-bearing road-stream crossings, the 10 sites not expected to trigger ODFW review, the 1 crossing removed due to road relocation, and the Fish Passage Plans and designs for the 7 fish-bearing road-stream crossings that required ODFW review.

In June 2015, ODFW provided questions and comments (Seidel personal comm. 2015b) to IPC on the original report. Concurrent to receiving these questions and comments from ODFW, the engineering design associated with the development of new access roads and improvement of existing roads was modified.

This modification to the Project access roads added 2 fish-bearing road-stream crossing sites and removed 4 sites from those originally identified, reducing the total fish-bearing road-stream crossing sites from 18 to 16 (Tetra Tech 2015). Of the 16 sites, 10 were identified as Crossing Type 1 or 2 that utilize an existing bridge or culvert and are not expected to trigger ODFW fish passage requirements. Crossing Types 3A, 4, or 5 were identified for 5 of the 6 other fish-bearing road-stream crossings and would require ODFW review. The remaining site required a new Crossing Type, because the site is a new crossing that does not have an existing ford, culvert, or bridge present. This new Crossing Type, 3C, entailed installation of a temporary bridge over the new crossing location on Cavanaugh Creek (1-025) and would also require ODFW review.

The 4 sites that were removed from the 18 sites in the original report were Straw Ranch Creek (0-271), Unnamed Stream (0-130), Tributary to Ladd Canyon Creek (0-181), and Powell Creek (1-018). These removed sites are no longer included in the analysis and will not be discussed further in this report. The removal of these crossings, along with the 10 sites that were not expected to trigger ODFW fish passage requirements, resulted in a total of 6 fish-bearing road-stream crossing sites requiring ODFW review. In December 2015, ODFW reviewed and approved the Fish Passage Plans and design drawings for these 6 fish-bearing road-stream crossings. ODFW provided 6 unique fish passage approval numbers (PA-09-0016 to -0021), one for each crossing (see Appendix A).

After the approval of the Tetra Tech (2014) report and Tetra Tech (2015) Fish Passage Plans and design drawings, major route modifications were identified in 2016. As a result, additional surveys were conducted in the summer of 2016 to evaluate the new road crossings established by the route modifications. Determination of fish-bearing streams and crossings were reported in the Fish Habitat and Stream Crossing Assessment Summary Report (Tetra Tech 2016). That report includes the evaluation of both the portions of the 2014 routes that are still being considered and the results from the recent (2016) surveys of the route modifications.

The Tetra Tech (2016) report identified a total of 58 fish-bearing streams that would be crossed by access routes within the states of Oregon and Idaho. All routes are on existing roads and all but 4 have existing crossing structures (bridge, culvert, or established ford). Crossing Type 1 or 2 was identified as the proposed alternative for 50 of the 58 sites (see Table 1). Based on OAR Chapter 635, Division 412, Fish Passage, these crossing sites are not expected to trigger ODFW fish passage requirements because they are existing structures that do not require any new construction or major replacement. For crossing R-11312, an existing recycled railcar bridge for a private road, Crossing Type 3A, was identified as the proposed crossing type. This

crossing is deemed unlikely to trigger ODFW fish passage requirements as the temporary bridge can be placed on top of the existing bridge structure without any impact to the stream footprint.

Crossing Types 3A and 3B were selected as proposed alternatives for the remaining seven crossing sites; these crossings were deemed likely to trigger ODFW review because they would require some new construction (see crossings highlighted in green on Table 1). This document describes the types of crossings associated with the seven fish-bearing stream crossings and provides ODFW Fish Passage Plans and designs for those crossings. Crossings R-65725 and R-68790 are also known as crossings 0-325 (ODFW approval number PA-09-0018) and 0-337 (ODFW approval number PA-09-0020), respectively, in the approved 2015 plans and designs. Proposed crossing types for the seven sites include conservation measures to minimize effects to aquatic environments. Utilization of these crossing structures would include conservation measures described in the Application for Site Certificate and applicable individual federal, state, or local environmental compliance requirements.

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Table 1. Road-Stream Crossing Ownership, Risk Summaries, Proposed Crossing Types, and Fish Passage Information

Stream Name	Crossing ID	Nearest Proposed Route Milepost	Owner-ship	Fish Use	Risk Ratings		Crossing Characteristics					ODFW Fish Passage Trigger
					Stream	Project	Existing Crossing Type	Potential Crossing Type(s) [1]		Crossing Type – Explanation	Considerations	
								Proposed	Alternatives			
Little Butter Creek	R-08883	27.8	Private	Resident	Medium	Medium	Culvert	2	3A; 3B	4.7-foot corrugated metal pipe in place.	Culvert is under-sized with limited fill covering pipe. No new construction or major replacement is needed.	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Butter Creek	R-08916	27.9	Private	Resident	Medium	Medium	Bridge	1	–	90-foot steel I-beam with center support bridge in place.	--	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Butter Creek	R-11312	34.2	Private	Resident	Low	Medium	Bridge	3A	–	48-foot railcar bridge in place.	Bridge and abutments outside of the OHW could be replaced with similar railcar. No new construction or major replacement is needed.	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Butter Creek	R-17426	49.9	Private	Resident	Medium	Low	Bridge	1	–	30-foot steel bridge in place.	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
West Birch Creek	R-20404	59.7	Private	Anadromous	Low	Medium	Bridge	1	3B	42-foot steel I-beam bridge in place.	Needs new decking, may need some structural support outside the OHW. No new construction or major replacement is needed.	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
East Birch Creek	R-20809	63.2	Private	Anadromous	Not Rated[2]	Not Rated[2]	NA;[2] Bridge	1	–	A Major Road (asphalt road) crossing that would not be changed from Project actions and not needing to be surveyed	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
California Gulch	R-21694	64.1	Private	Anadromous	Medium	Low	NA;[2] Culvert	2	–	No access to crossing locations, but stream was surveyed.	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
East Birch Creek	R-21604	64.2	Private	Anadromous	Low	Medium	Bridge	1	–	43-foot steel I-beam bridge in place.	Possibly some structural modifications outside the OHW. No new construction or major replacement is needed.	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Ray Creek	R-20492	65.9	Private	Resident	Low	Low	Culvert	2	–	3.5-foot corrugated metal pipe in place.	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Unnamed Stream [1185935454536] (previously Wood Hollow)	R-23502	75.5	Private	Resident	Medium	Medium	NA;[2] Culvert	2	3A; 3B	No access to crossing locations, but stream was surveyed.	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
McKay Creek	R-23514	75.5	Private	Resident	Low	Medium	Bridge	1	–	No access to crossing locations, but stream was surveyed.	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Two mile Creek	R-24303	83.2	Private	Anadromous	Low	Medium	Culvert	2	–	3-foot corrugated metal pipe in place.	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Two mile Creek	R-24242	83.3	Private	Anadromous	Low	Low	Culvert	2	–	4.6-foot corrugated metal pipe in place.	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Unnamed stream [1184504454902]	R-24656	83.8	Private	Anadromous	Medium	Medium	NA;[2] Culvert	2	3A; 3B	No access to crossing locations, but stream was surveyed.	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Beaver Creek	R-24664	84.2	Private	Resident	Low	Low	Culvert	2	–	4-foot corrugated metal pipe in place.	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Beaver Creek	R-24814	84.3	Private	Anadromous	Low	Low	Bridge	2	–	21-foot steel I-beam with concrete decking bridge in place.	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Beaver Creek	R-25593	86.1	Private	Anadromous	High	High	Culvert	2	–	3-foot corrugated metal pipe in place.	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Dry Creek	R-29313	95.0	USFS	Anadromous	Low	Low	Bridge	1	–	36-foot concrete bridge in place.	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.

Table 1. Road-Stream Crossing Ownership, Risk Summaries, Proposed Crossing Types, and Fish Passage Information (continued)

Stream Name	Crossing ID	Nearest Proposed Route Milepost	Owner-ship	Fish Use	Risk Ratings		Crossing Characteristics					ODFW Fish Passage Trigger
					Stream	Project	Existing Crossing Type	Potential Crossing Type(s) [1]		Crossing Type – Explanation	Considerations	
								Proposed	Alternatives			
Grande Ronde River	R-31086	99.2	Private	Anadromous	Not Rated[2]	Not Rated[2]	NA;[2] Bridge	1	–	A Major Road (asphalt road) crossing that would not be changed from project actions and does not needing to be surveyed	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Whiskey Creek	R-31388	99.5	Private	Anadromous	Medium	Medium	Culvert	2	3A; 3B	5-foot corrugated metal pipe in place.	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Rock Creek	R-31715	100.8	Private	Anadromous	Low	Medium	Bridge	2	3A; 3B	50-foot bridge with guard rails in place.	Privately owned existing bridge. Easterly approach angle (76 degrees) may be difficult for crane. No new construction or major replacement is needed.	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Little Graves Creek	R-32785	101.8	Private	Resident	Low	Low	Bridge	1	–	15-foot steel I-beam, wood plank bridge	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Graves Creek	R-32979	102.4	Private	Anadromous	Medium	Medium	NA;[2] Culvert	2	3A; 3B	No access to crossing location, but stream was surveyed.	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Little Rock Creek	R-33010	102.9	Private	Resident	Medium	High	NA[3] Ford	3A	–	No access to crossing location, but stream was surveyed.	Utilize temporary bridge over existing ford with temporary/seasonal restrictions for use of crossing during Project operation and maintenance. Road improvements will be needed.	New construction or major replacement proposed. ODFW Fish Passage Plan anticipated.
Rock Creek	R-33011	102.9	Private	Anadromous	Medium	High	NA[3] Ford	3A	–	No access to crossing location, but stream was surveyed.	Utilize temporary bridge over existing ford with temporary/seasonal restrictions for use of crossing during Project operation and maintenance. Road improvements will be needed.	New construction or major replacement proposed. ODFW Fish Passage Plan anticipated.
Rock Creek	R-33033	103.0	Private	Anadromous	Medium	High	NA[3] Ford	3A	–	No access to crossing location, but stream was surveyed.	Utilize temporary bridge over existing ford with temporary/seasonal restrictions for use of crossing during Project operation and maintenance. Road improvements will be needed.	New construction or major replacement proposed. ODFW Fish Passage Plan anticipated.
Rock Creek	R-33147	103.2	Private	Anadromous	Medium	High	Ford[3]	3A	–	No maintenance and stream washed out bridge and road. Road ends at stream.	Utilize temporary bridge over existing ford with temporary/seasonal restrictions for use of crossing during Project operation and maintenance. Road improvements will be needed.	New construction or major replacement proposed. ODFW Fish Passage Plan anticipated.
Sheep Creek	R-33628	106.4	Private	Anadromous	Medium	Medium	Culvert	2	–	3-foot corrugated metal pipe in place.	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Mill Creek	R-34099	107.2	Private	Anadromous	Low	Medium	Culvert	2	–	3.3-foot concrete pipe in place.	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Unnamed stream [1180502451927]	R-36299	112.9	Private	Resident	Low	Medium	Bridge	1	–	17-foot bridge with eco-block foundation, I-beams (12 inch, 4 total), and 8-inch by 8-inch pressure treated 12-inch by 4-inch planks in place.	Although the road width (10-foot) is narrow, the crossing is adequate for Project construction. Private road used for timber harvest. No new construction or major replacement is needed.	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Ladd Creek Pickup Ditch	R-37179	115.5	Private	Resident	Low	Medium	Bridge	1	–	31-foot steel bridge in place.	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Unnamed stream [1180496451929]	R-37369	115.9	Private	Resident	Medium	Medium	Bridge	1	–	19-foot steel girder bridge in place.	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Unnamed Stream [1180266452136] (previously Ladd Canyon)	R-37969	116.3	Private	Resident	Medium	Medium	Culvert	2	3A; 3B	1.7-foot and 2-foot diameter corrugated metal pipes in place.	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Unnamed stream [1180049451917]	R-38011	116.4	Private	Resident	Low	Medium	Culvert	2	–	4-foot diameter corrugated metal pipe in place.	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.

Table 1. Road-Stream Crossing Ownership, Risk Summaries, Proposed Crossing Types, and Fish Passage Information (continued)

Stream Name	Crossing ID	Nearest Proposed Route Milepost	Owner-ship	Fish Use	Risk Ratings		Crossing Characteristics					ODFW Fish Passage Trigger
					Stream	Project	Existing Crossing Type	Potential Crossing Type(s) [1]		Crossing Type – Explanation	Considerations	
								Proposed	Alternatives			
Unnamed Stream [1180266452136] (previously Ladd Canyon)	R-38059	116.5	Private	Resident	Medium	Medium	Culvert	2	–	4-foot diameter corrugated metal pipe in place.	Near existing residence. No new construction or major replacement is needed.	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Clover Creek	R-41281	124.1	Private	Resident	Low	Medium	Culvert	2	–	6.5-foot diameter corrugated metal pipe in place.	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Gentry Creek	R-44271	131.4	Private	Resident	Medium	High	Culvert	2	3A; 3B	2-foot diameter corrugated metal pipe in place.	May need to add fill above exiting culvert. No new construction or major replacement is needed.	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Alder Creek	R-56681	165.4	Private	Resident	Low	Low	Culvert	2	–	3-foot diameter corrugated metal pipe in place.	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Hill Creek	R-56890	166.1	Private	Resident	Medium	Medium	Culvert	2	–	2-foot diameter corrugated metal pipe in place.	Minor improvements needed including more fill placed above culvert and improve approaches both sides. No new construction or major replacement is needed.	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Burnt River	R-59115	171.3	Private	Resident	Low	Medium	NA;[2] Bridge	1	3A; 3B	No access to crossing location, but stream was surveyed.	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Powell Creek	R-59645	173.9	Private	Resident	Low	Medium	Culvert	2	–	6.5-foot corrugated metal pipe in place.	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Burnt River	R-59830	174.3	Private	Resident	Low	Low	Bridge	1	–	100-foot concrete bridge in place.	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Burnt River	R-61345	178.0	Private	Resident	Low	Low	Bridge	1	–	94-foot concrete bridge in place.	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Shirttail Creek	R-61834	178.7	Private	Resident	Medium	Medium	Culvert	2	–	5-foot corrugated metal pipe in place.	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Dixie Creek	R-64752	185.2	Private	Resident	Not Rated[2]	Not Rated[2]	NA;[2] Bridge	1	–	Good wide major road crossing with railing that would not be changed from Project actions and not needing to be surveyed	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Goodman Creek	R-65725	188.4	Private	Resident	High	Medium	Ford	3B	3A	There is an existing ford in place.	Use temporary bridge over ford with seasonal restrictions.	New construction or major replacement proposed. ODFW Fish Passage Plan approved in 2015 (see Appendix A).
Cavanaugh Creek	R-66818	190.7	Private	Resident	High	High	Ford	3A	3B	There is an existing ford in place.	Use temporary bridge over ford with seasonal restrictions.	New construction or major replacement proposed. ODFW Fish Passage Plan anticipated.
Cavanaugh Creek	R-66868	190.8	Private	Resident	Medium	Medium	Culvert	2	–	6-foot corrugated metal pipe in place.	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Durbin Creek	R-67679	192.8	BLM	Resident	Not Rated[2]	Not Rated[2]	NA;[2] Culvert	2	–	A Major Road crossing that would not be changed from Project actions and not needing to be surveyed	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Benson Creek	R-68790	195.4	Private	Resident	Medium	High	Ford	3A	3B, 5	There is an existing ford in place.	Ford with high cattle use. Stream is sand/silt bed and of low quality. Utilize temporary bridge over existing ford.	New construction or major replacement proposed. ODFW Fish Passage Plan approved in 2015 (see Appendix A).
Benson Creek	R-69626	197.4	Private	Resident	Low	Medium	Bridge	1	–	Major highway bridge	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.

Table 1. Road-Stream Crossing Ownership, Risk Summaries, Proposed Crossing Types, and Fish Passage Information (continued)

Stream Name	Crossing ID	Nearest Proposed Route Milepost	Owner-ship	Fish Use	Risk Ratings		Crossing Characteristics					ODFW Fish Passage Trigger
					Stream	Project	Existing Crossing Type	Potential Crossing Type(s) [1]		Crossing Type – Explanation	Considerations	
								Proposed	Alternatives			
Cottonwood Creek	R-72465	226.8	Private	Resident	Medium	Medium	NA;[2] Culvert	2	3A; 3B	No access to crossing location, but stream was surveyed.	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Poison Creek	R-92529	275.8	Private	Resident	Low	Low	Culvert	2	–	4.6-foot corrugated metal pipe in place.	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Jump Creek	R-92884	277.8	Private	Resident	Medium	Medium	Bridge	1	3A; 3B	25-foot laminated wood bridge in place.	Bridge has 6-ton weight limit. No new construction or major replacement is needed.	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Jump Creek	R-93078	277.9	Private	Resident	Low	Medium	Bridge	1	–	28-foot steel bridge in place.	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Squaw Creek	R-95383	283.3	Private	Resident	Low	Low	Bridge	1	–	24-foot span by 43-foot-wide box culvert/concrete bridge.	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Hardtrigger Creek	R-97770	288.9	BLM	Resident	Medium	High	Culvert	2	–	5-foot corrugated metal pipe in place.	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Reynolds Creek	R-99900	294.1	Private	Resident	Not Rated[2]	Not Rated[2]	Culvert	2	–	A Major Road (asphalt road) crossing, with 3 culverts, that would not be changed from Project actions and not needing to be surveyed	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.

Note: Light green shading identifies those sites anticipated to trigger ODFW Fish Passage rules and are discussed in this report.

[1] Crossing Type (No.)/Description: 1. Utilize existing bridge; 2. Utilize existing culvert; 3A. Install temporary bridge over existing structure; 3B. Install temporary bridge adjacent to existing structure; 4. Install temporary timber matting with seasonal restrictions; 5. Utilize or improve existing ford; 6. Install new arch culvert or bottomless box structure; 7. Install new bridge.
[2] NA = No access; crossing type assumed or assessed from aerial photos.
[3] Primitive ford on private land.
BLM = Bureau of Land Management; OHW = Ordinary High Water; USFS = U.S. Department of Agriculture, Forest Service

2.0 REGULATORY CRITERIA

Summaries of regulatory requirements applicable to the seven crossing sites are presented below. Regulatory requirements specific to an individual road-stream crossing site are presented in Section 4.

2.1 Land Ownership and Criteria

The fish-bearing road-stream crossings for the seven sites along the Project being addressed in this report occur on private or county lands (Table 1). Therefore, only the regulatory criteria specific to private or county lands, as administered by the state, will be applicable at each site.

2.1.1 Federal Criteria

Snake River Basin steelhead (*Oncorhynchus mykiss*) are listed as threatened under the Endangered Species Act (ESA) (71 Federal Register 834) and were identified as present at three of the seven road-stream crossing sites requiring new construction or major replacement (Anadromous Fish Use, Table 1). Since these sites occur within federally designated critical habitat for steelhead, the National Oceanic and Atmospheric Administration, National Marine Fisheries Services (NOAA Fisheries) fish passage and stream crossing criteria apply. No other anadromous fish species or bull trout (*Salvelinus confluentus*) were identified as present at any of the seven sites; therefore, only the NOAA Fisheries criteria apply at the three sites where steelhead are present. Furthermore, none of the seven road-stream crossing sites are on federal lands and thus relevant fish passage or road-stream crossing design criteria for the U.S. Department of Agriculture Forest Service and U.S. Department of Interior Bureau of Land Management do not apply.

Proposed activities in waters of the United States require a permit from the federal government under the Clean Water Act (Section 404 Permit), which is administered by the U.S. Army Corps of Engineers (USACE). However, the Section 404 Permit does not itself establish stream crossing design criteria. In both Oregon and Idaho, the Section 404 Permit is issued in combination with state removal-fill permits under a Joint Permit Application (see Section 2.1.2.1).

2.1.1.1 National Oceanic and Atmospheric Administration, National Marine Fisheries Services

The three crossings of streams that contain ESA-listed steelhead will be designed according to guidelines developed by NOAA Fisheries. Specific criteria and guidelines required by NOAA Fisheries that are applicable for the Stream Simulation design method (NOAA Fisheries 2008) are as follows:

- **Channel width:** The minimum culvert bed width must be greater than bankfull width channel width, and of sufficient vertical clearance to allow ease of maintenance activities. If a stream is not fully entrenched, the minimum culvert bed width should be at least 1.3 times the bankfull width channel width.
- **Channel vertical clearance:** The minimum vertical clearance between the culvert bed and ceiling should be more than 6 feet.
- **Channel slope:** The slope of the reconstructed streambed within the culvert should approximate the average slope of the adjacent stream from approximately ten channel widths upstream and downstream of the site in which it is being placed, or in a stream reach that represents natural conditions outside the zone of the road crossing influence.

- **Culvert slope:** Closed bottom culvert slope should not exceed 6 percent for purposes of maintaining streambed integrity within the road crossing.
- **Embedment:** If a culvert is used, the bottom of the culvert should be buried into the streambed not less than 30 percent and not more than 50 percent of the culvert height, and a minimum of 3 feet. For bottomless culverts, the footings or foundation must be designed for the largest anticipated scour depth.
- **Maximum length of road crossing:** The length of the road crossing structure for streambed simulation for fish passage within a culvert should be less than 150 feet. If the length is greater than 150 feet, a bridge should be considered.
- **Fill materials:** Fill materials should comprise materials of similar size composition to natural bed materials that form the natural stream channels adjacent to the road crossing. The design must demonstrate long term stability of the passage corridor, through assessment of hydraulic conditions through the passage corridor over the fish passage design flow range, and through assessment of the ability of the stream to deliver sufficient transported bed material to maintain the integrity of the streambed over time. Larger material may be used to assist in grade retention and to provide resting areas for migratory fish.
- **Water depth and velocity:** Water depth and velocity must closely resemble those that exist in the reference reach. To provide resting zones, special care should be used to provide areas of greater than average depth and lower than average velocity throughout the length of the streambed simulation, reasonably replicating those found in the adjacent stream. Hydraulic controls to maintain depth at low flows may be required.

2.1.2 State Criteria

This section identifies design criteria for Project access roadways crossing fish-bearing streams located on private or county lands, as administered by the state. There are currently no identified fish-bearing stream crossings for the Project that occur on state lands in Oregon or Idaho. As noted above, all of the seven fish-bearing stream crossings being considered in this report occur on private or county lands in the state of Oregon and, as such, must meet the criteria described below, where applicable.

2.1.2.1 Oregon Department of State Lands

Oregon's Removal-Fill Law (Oregon Revised Statutes [ORS] 196.795-990) requires a permit for activities that remove or place fill material in waters of the state ("removal-fill permit"). The Oregon Department of State Lands issues the permit. "Waters of the state" are defined as "natural waterways including all tidal and non-tidal bays, intermittent streams, constantly flowing streams, lakes, wetlands and other bodies of water in this state, navigable and non-navigable, including that portion of the Pacific Ocean that is in the boundaries of this state." The law applies to all landowners, whether private individuals or public agencies. The removal-fill permit, however, does not include specific stream crossing design criteria. The permit is issued in combination with the USACE under a Joint Permit Application.

2.1.2.2 Oregon Department of Fish and Wildlife

The ODFW regulates fish passage with regard to construction, major replacement, or abandonment of artificial obstructions for streams "in which native migratory fish are currently or were historically present" in waters of the state through OAR Chapter 635, Division 412, Fish Passage. Projects that construct, install, replace, extend, repair or maintain, and remove or abandon dams, dikes, levees, culverts, roads, water diversion structures, bridges, tide gates or

other hydraulic facilities are triggers to Oregon's fish passage rules and regulations. Additional clarification was provided by ODFW (2008a) on fish passage triggers and guidelines for bridges. "Construction" means both "original construction" and "major replacement," which specifically includes (as taken from OAR 635-412-0005):

> *For dikes, berms, levees, roads, or other artificial obstructions that segment estuaries, floodplains, or wetlands:*
>
> > *(i) activities defined under OAR 635-412-0005(9)(d) in all locations where current channels cross the artificial obstruction segmenting the estuary, floodplain, or wetland; or,*
> >
> > *(ii) the cumulative removal, fill, replacement, or addition of over 50 percent by volume of the existing material directly above an historic channel or historically-inundated area.*
>
> *For purposes of culverts, installation, or replacement of a roadbed or culvert, this is further defined as any activity that:*
>
> > *(i) creates a road which crosses the channel;*
> >
> > *(ii) widens a road footprint within a channel, or;*
> >
> > *(iii) fills or removes over 50 percent by volume of the existing roadbed material directly above a culvert, except when this volume is exclusively composed of the top 1 foot of roadbed material.*

When fish passage rules and regulations are triggered, ODFW provides the general requirements for fish passage under OAR 635-412-0035(1), and more specific requirements for various circumstances are listed under OAR 635-412-0035(2-11).

ODFW Fish Passage Plans

If fish passage rules and regulations are triggered, then, based on OAR 635-412-0020, ODFW fish passage approvals will be required, to be obtained by the following means:

> *(a) Individual approvals through a fish passage plan meeting the requirements of OAR 635-412-0035 for the specific artificial obstruction;*
>
> *(b) Programmatic approvals of multiple artificial obstructions of the same type if certain conditions in OAR 635-412-0020 (3)(b) are met; or*
>
> *(c) Pursuant to ORS 527.710(6), install and maintain road-stream crossing structures on non-federal forestlands in compliance with State Board of Forestry, through the Oregon Department of Forestry (ODF), rules and guidelines* [described in Section 2.1.2.3 below]. *These rules and guidelines require concurrence by the ODFW that they meet the purposes of the Department's fish passage program.*

2.1.2.3 Oregon Department of Forestry

The Oregon Department of Forestry (ODF) regulates forest practices on stream crossings for fish-bearing streams through the Forest Practices Administrative Rules, OAR Chapter 629, Division 625. Additional guidance is provided in Forest Practices Technical Note Number 4, Fish Passage Guidelines for New and Replacement Stream Crossing Structures (ODF 2002), which outlines six design strategies for providing fish passage. Stream crossing designs will comply with applicable portions of OAR Chapter 629, Division 625 and Forest Practices Technical Note Number 4 by

designing and constructing stream crossing structures (culverts, bridges, and fords) as outlined below:

- ***Embankment construction:*** *Minimize excavation of side slopes near the channel and minimize the volume of materials in fills to maximum of 15 feet in depth, as possible.*
- ***Erosion Control:*** *Prevent erosion of the fill and channel.*
- ***Passage requirements:*** *Allow migration of adult and juvenile fish upstream and downstream during conditions when fish movement in that stream normally occurs.*
- ***Channel slope:*** *Determine channel slope by measuring the longitudinal profile 200 feet upstream and downstream (400 feet total) of the crossing.*
- ***Structure width:*** *Effective width should be equal to or greater than the active channel width.*
- ***Fords:*** *Fords can be a preferred strategy because they reduce the amount of fill material placed in or adjacent to the active channel and result in the lowest level of channel disturbance during installation short of using a channel-spanning structure or abandoning the crossing entirely. In general, fords:*
  - *Should only be considered on small streams for low traffic roads that are private, gated, and have infrequent use. A reasonable measure of infrequent use is a level of traffic that does not cause a noticeable increase in turbidity (i.e., visible with the eye) that persists downstream of the crossing.*
  - *Fords are best suited when the stream channel has larger cobble and bedrock material exposed.*
  - *In designing a ford, the approaches should be at a 10 percent grade or less and hardened using coarse material (cobble and coarse gravel sized) for several hundred yards to allow the shedding of sediment as vehicles approach the crossing.*
  - *Drainage structures should be used to deflect water away from the stream approaches.*
  - *If the ford is hardened using cobbles in the stream, impermeable geotech fabric may need to be used to keep water on the surface so the ford does not become de-watered and impede fish passage.*
- ***Temporary stream crossing structures:*** *Temporary stream crossing structures may be used under the following conditions:*
  - *Crossing a landslide;*
  - *On slopes greater than 60 percent;*
  - *Adjacent property owner/road alignment restrictions;*
  - *To avoid using parallel roads/trails within 100 feet of the stream; and*
  - *Only alternative is a permanent crossing.*

  Temporary stream crossing structures may include fords, culverts, or bridges and must adhere to the following criteria:
  - *Straightening or shortening any stream channel is not permitted.*
  - *The crossing must be capable of passing the highest flow reasonably expected during the life of the structure, and without ponding water behind the fill or saturating fill soils.*

- *A single channel that is narrow and not deeply incised should be chosen.*
- *Multiple, braided, or side channels, eroded areas, or streambanks with exposed soils should be avoided.*
- *Banks should be less than 5 feet high. Bridges should be used where banks are higher.*
- *Rock, cobble, or gravel rather than clays, decomposed granite soils, or sand should be utilized while avoiding very wet or weak soils slide areas, gullies, or active erosion areas.*
- *The crossing should be approached at right angles and transitioned away from the stream as quickly as possible.*
- *The crossing must withstand erosion by the stream and minimize sedimentation.*
- *The crossing should maintain fish passage on Type F (fish-bearing) streams.*
- *Operators shall remove temporary stream crossing structures promptly after use, prior to seasonal runoff, and construct effective sediment barriers at approaches to channels.*

2.1.3 Local Jurisdiction Criteria

Local requirements (Baker, Malheur, Morrow, Owyhee, and Union counties) do not result in any changes to design decisions at any of the crossing locations due to the utilization of more stringent state design criteria.

2.2 Relevant Codes

The Project road-stream crossings will be designed to standards defined by federal, state, and local jurisdictions. The standards and guides to be used are listed in the subsections below.

2.2.1 Federal Codes and Standards

- Anadromous Salmonid Passage Facility Design (NOAA Fisheries 2008)
- Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects (USDOT 2003)

2.2.2 State Codes and Standards

- ORS 509.580 through 509.910: Fish Passage; Fishways; Screening Devices; Hatcheries Near Dams
- OAR 635-41-0005 through 635-412-0040: Fish Passage
- Oregon Forest Practice Administrative Rules and Forest Practices Act, OAR Chapter 629 (ODF 2014)
- Forest Practices Technical Note Number 4, Fish Passage Guidelines for New and Replacement Structures (ODF 2002)

For construction specifications, the Project will utilize the federal projects standard specifications of the U.S. Department of Transportation noted in Section 2.2.1, with the Oregon Department of Transportation Department supplements:

- Oregon Standard Specifications for Construction (ODOT 2008)

2.2.3 Other Codes and Standards

Other recognized standards will be used where required to serve as guidelines for the design, and when not in conflict with the standards listed in Sections 2.2.1 and 2.2.2 above. In addition, all road components at stream crossings will be designed for HL-93 loads (AASHTO 2003).

3.0 DESIGN CRITERIA AND APPROACH

This section provides design criteria developed for fish-bearing road-stream crossings associated with the Project, a general description of the crossing types associated with the seven fish-bearing road-stream crossing sites, and the process followed in creating the crossing designs.

3.1 Design Criteria

The design criteria for fish-bearing road-stream crossings associated with the Project were developed based on the regulatory criteria presented in Section 2. Site-specific adjustments to the design criteria were applied to each of the seven crossing sites to minimize construction impacts (i.e., adverse effects to water quality and instream aquatic habitat, upstream fish passage, streambank stability, and riparian vegetation) at each location. Site-specific construction and seasonal timing restrictions for each of the seven crossing sites were identified as part of the design criteria. The design criteria include:

- Loading rate for temporary crossings is the AASHTO (2003) HL-93 truck load. If the Contractor selects different construction equipment, structural details and strength requirements of temporary crossings should be verified.
- Single-span structures will maintain a clear, unobstructed opening above the general scour elevation that is at least as wide as 1.5 times the active channel width, whenever feasible. Active channel width is defined as the stream width measured perpendicular to stream flow between the ordinary high water lines, or at the channel bankfull elevation.
- Minimum road width ingress/egress for the crossings is 10 feet.
- For each crossing site, construction and seasonal timing restrictions will be identified based on the following considerations:
  - Construction approach necessary for the installation of the proposed structure;
  - Construction and use of the seven crossing sites would occur at various times throughout the Project timeline and for varying durations, requiring crossing materials be specific to a site rather than being used and transported to all crossing sites (for instance, a temporary bridge).
  - Construction requirements of the structure;
  - Fish windows and upstream passage;
  - Seasonal use of the structure;
  - Duration of structure use (e.g., 3 months versus 1 year);
  - Crossing type needed for Project operations and maintenance once the structure is removed after construction; and
  - Estimated site hydrology and hydraulics.
- Effective erosion control measures and sediment barriers for the road approaches to the various channel crossings will be consistent with those previously identified in the 1200-

C Permit Application for the Project, contained within Exhibit I, Soil Protection, of IPC's Application for Site Certificate.

3.2 Crossing Structure Types

The design process began with assigning a potential crossing structure type for each of the crossing sites. The seven crossing sites include three with existing fords (sites R-65725, R-66818, and R-68790) and four with what has been assumed to be washed-out primitive ford crossings (site R-33010 on Little Rock Creek and sites R-33011, R-33033, and R-33147 on Rock Creek) for which a temporary bridge crossing is proposed (Table 1). Individual site considerations are noted under the "Considerations" column of Table 1.

Out of the eight potential crossing types mentioned in Section 1, two are being considered as options at the seven road-stream crossings discussed in this report: Types 3A and 3B. In addition, Type 5 is offered as an alternative option for crossing R-687901. General descriptions of each of these crossing types are presented below. Site-specific details for the proposed options are provided in Section 4.

Type 3A – Install Temporary Bridge Over Existing Structure

Crossing Type 3A involves placing a temporary bridge over an existing structure (e.g., other bridge, culvert, or ford). Temporary crossings, when assessed over the long term, can have the least effect on stream processes and fish habitat. There are short-term impacts associated with their construction and removal, but these can be minor when compared to the potential impacts caused by a permanent structure, associated maintenance, and potential failure. Temporary bridges are the most efficient stream crossing option for keeping sediment and equipment out of the channel, and can be constructed out of various materials such as timber, railroad cars, railroad ties, logs, steel, or pre-stressed concrete. Temporary bridges will be used on steeper channel gradients, deep water streams, where channel spans are larger, or where stream banks are steep or highly erodible, and where the use of Type 5 structures (see below) would not be feasible.

Type 3B – Install Temporary Bridge Adjacent to Existing Structure

Crossing Type 3B involves placing a temporary bridge adjacent to an existing structure (e.g., other bridge, culvert, or ford). As with the Type 3A crossings, Type 3B crossings, when assessed over the long term, can have the least effect on stream processes and fish habitat. There are short-term impacts associated with their construction and removal, but these can be minor when compared to the potential impacts caused by a permanent structure, associated maintenance, and potential failure. Temporary bridges are the most efficient stream crossing option for keeping sediment and equipment out of the channel, and can be constructed out of various materials such as timber, railroad cars, railroad ties, logs, steel, or pre-stressed concrete. Temporary bridges will be used on steeper channel gradients, deep water streams, where channel spans are larger, or where stream banks are steep or highly erodible.

Type 5 – Utilize or Improve Existing Ford

Crossing Type 5 involves utilizing or improving existing fords. Fords are low-water crossings best suited for short-term use on small streams during low-flow periods and should be used when water depths are less than 1 foot. An existing ford may be utilized when a firm rock base is present; otherwise, fords should be improved by removing soft soils and replacing them with crushed rock. The location of a ford should be in a straight, shallow stream reach, with gentle side slopes and approaches. Rocked fords with imported rock may require 12 inches or more of excavation to embed the rock and regrading back to original bed elevation and stream cross-section shape.

Stream gradient and natural channel shape are maintained. Placed rock is sized to reduce stream velocity and erosion and allow for heavy equipment use. The rock mixture may require the addition of up to 20 percent fines to facilitate traffic stability and maintain water at the surface.

3.3 Design Process

After the initial crossing type was identified for a given site, the process outlined below was followed in developing the design. The process was iterative in order to identify the most effective option for a given site and followed applicable regulatory criteria and guidelines described in Section 2.

- Reviewed field survey site data for each crossing from field surveys;
- Estimated hydrologic characteristics for design flows;
- Utilized existing ground surface from available light detection and ranging (LiDAR) or digital elevation model (DEM) topographic data;
- Estimated channel centerline from upstream to downstream;
- Created profile and sections for existing stream based on LiDAR or DEM surface for crossing location;
- Applied field data to determine upstream and downstream bankfull widths and channel gradients;
- Applied field data to determine dominant substrate material from field surveys;
- Developed designs of the proposed channel bed profile through the stream crossing;
- Identified and evaluated potential structures based on stream bed, bankfull width, embedment guidelines, and channel incision;
- Checked the suitability of the structure and evaluated other potential structure configurations against impacts to aquatic resources, scale, use, and cost; and
- Evaluated designs to determine if ODFW Fish Passage Plans would be required.

Section 4 provides the detailed results for each site from this design process.

3.4 Potential Future Actions

If additional modification to transmission and road routes require the development of new access roads that create stream crossings over fish-bearing streams not identified in the Tetra Tech (2016) report, or if additional stream crossings are discovered during the construction phase, then the following general procedures must be completed:

- If specified by the jurisdictional agency, channel-spanning structures will be designed and constructed to cross waterbodies identified as containing a sensitive fish species. The channel-spanning structures will include installation of a large-diameter culvert, arch culvert, or short span bridge with a stable road surface established over the structure for vehicle passage. Channel-spanning structures will be designed and installed under the guidance of a qualified engineer who, in collaboration with a hydrologist and aquatic biologist, will recommend placement locations; structure gradient, height, and sizing dimensions; and proper construction methods.
- At a minimum, new stream crossings on fish-bearing streams must adhere to ODFW and Idaho Department of Fish and Game fish passage design standards. The Project will adhere to ODFW fish passage designs and to design features similar to the Agency

Operating Procedures identified in the Programmatic Biological Opinion for Aquatic Restoration Activities in the States of Oregon and Washington (ARBO II) (USDC 2013).

- For culvert replacements or new culvert installations on all fish-bearing streams, Project design criteria will include associated work area isolation and fish salvage prior to any new construction. If listed species are involved, the NOAA Fisheries and ARBO II Agency Operating Procedures will apply.
- Stream crossings and in-water work will follow preferred work periods outlined in the ODFW (2008b) Guidelines for Timing of In-Water Work to Protect Fish and Wildlife Resources. Crossings will be reviewed with ODFW and follow the Fish Passage Plans and designs documented for this Project.
- Routine and corrective operations and maintenance activities in streams with listed fish species will be conducted within the designated in-water work windows for each particular stream.
- Additional crossings will not be created without prior agency permitting and approval.

4.0 DESIGN DESCRIPTIONS FOR INDIVIDUAL CROSSINGS

The designs for each of the seven crossing sites were used to evaluate existing and proposed site-specific information and estimates of materials and removal or fill quantities for each crossing. Site-specific data from field surveys conducted in May 2014, June 2016, and August 2016 were used to develop each of the designs. Those data included site characteristics such as bankfull widths, stream gradient, bed material composition, and other field-collected data and are included in the individual ODFW Fish Passage Plans presented in Appendix B. LiDAR or DEM data were used to develop the site topography used in each design. Due to the coarse accuracy of the 1/3 arc-second (10-meter) and 1 arc-second (30-meter) resolution DEMs, assumptions of the topography based on site visits were incorporated into the designs. Design drawings for each site, together with general design and erosion control information, are provided in Appendix C.

Because available topography was used to develop the designs, further refinements to the designs may be necessary during final Project design. Designs for erosion control details (see Drawing G-002 in Appendix C) are based on the 1200-C Permit Application mentioned in Section 3.1 and descriptions provided below.

4.1 Existing and Proposed Crossings

4.1.1 Little Rock Creek, Site R-33010

4.1.1.1 Existing Conditions

The crossing at site R-33010 is a proposed (new) crossing (see Drawing C-101 in Appendix C) and was not surveyed due to lack of access; however, a desktop review of aerial imagery shows a primitive ford and unimproved road on private land. To develop the proposed (new) crossing, data used in the design assumptions included aerial imagery, along with 10-meter resolution LiDAR. Existing road and stream profiles were based on those data. Channel bankfull width was measured at 19 feet and stream gradient at 3 percent upstream and 2 percent downstream of the crossing. Based on an analysis of a crossing near the site (see site R-33147), the stream bed materials consist of a mix of boulders, cobbles, gravels, and fines, with cobbles (40 percent) listed as the dominant substrate. The existing road is on private land and, based on aerial imagery, appears to be less than 10 feet wide.

4.1.1.2 Criteria and Conditions Used for Evaluating Crossing

- **Anticipated Use** – Private land; no public use is anticipated. Project use would be seasonally restricted to periods of low-flow (July to February) conditions. Installation of the crossing would be restricted to the in-water work window (July 1 to October 15), with Project use of the crossing restricted to the low-flow period. The crossing structure would be removed prior to the high-flow period (February to June) and reinstalled during the in-water work window if needed for additional Project construction (e.g., 3 years). The crossing would be permanently removed following the completion of Project construction activities.
- **Stream Hydrology/Flows at Time of Use** – Although no stream gage data are available for this site, nearby stream gages show the high-flow discharges occurring between February and June. Therefore, all activities at this site would be restricted to July through January. The expected stream flows for the site during the low-flow period are expected to be less than a few cubic feet per second.
- **Fish Presence** – Identified as fish-bearing; no fish observed, crossing not surveyed.
- **In-water Work Window** – Any construction activities planned for the proposed crossing structure within the wetted channel must occur during the ODFW designated in-water work window (July 1 to October 15).
- **Channel Width** – Bankfull width measured at 19 feet from aerial imagery.
- **Channel Confinement** – Unconfined at the crossing and moderately confined locally (3- to 4-foot banks).
- **Stream Gradient** – 3 percent at and upstream of the crossing and 2 percent downstream of the crossing.
- **Road Ingress/Egress** – Access was not available to the crossing site. Due to the existing road's poor condition, narrow width, and washed-out crossing, a new road and stream crossing improvements would be necessary.
- **Proposed and Alternative(s) Selected** – A temporary bridge with seasonal restrictions (Type 3A) roadway was considered to be the most viable option for this crossing location. Benefits would include decreases in turbidity and overall reductions in channel bed and bank disturbance. Other alternatives identified for this crossing included improving the existing crossing to an armored ford (Type 5). Under this scenario, local turbidity would continue to be a problem at this location despite improvements to the ford.

4.1.1.3 Proposed Crossing Type Description

Drawings C-102 and C-103 in Appendix C depict the design for the site.

- **Crossing Type** – Temporary bridge with seasonal restrictions on use (Type 3A).
- **Material Sizes/Dimensions/Quantities** – Materials for the temporary bridge would be steel support (or equivalent) with wood decking. Dimensions would be 38 feet long and 13 feet wide. Small quantities of excavation (3 cubic yards) would be needed outside the bankfull channel. Small quantities (3 cubic yards) of angular rock, gravel, or equivalent placed as temporary ramps would also be needed at the ends of the bridge outside the bankfull channel.
- **Stability/Structural Support Needed** – Abutments under the bridge (materials and sizes dependent on local conditions). Small quantities (3 cubic yards) of angular rock,

gravel, or equivalent placed as temporary ramps noted above would be needed at the ends of the bridge.

- **Arrangement** – A temporary bridge would be placed as perpendicularly as possible to the channel. Abutments would be placed 5 feet minimum outside of bankfull width. Inside rise would be set at a minimum of 1.5 feet.
- **Crossing Gradient** – The existing crossing gradient at the crossing is 1 percent. The temporary bridge over the channel would be placed with as minimal a slope as possible to maintain the existing stream gradient as well as the road ingress/egress.
- **Crossing Construction Period** – As stated above, the use of this proposed crossing would be restricted to the period from July to February. Any construction activities for the crossing planned within the wetted channel (e.g., crossing installation) would be restricted to the in-water work window (July 1 to October 15). The proposed crossing must be removed from February to June due to higher flows in the stream. If Project construction requires use of this site beyond one season (e.g., 3 years), the crossing structure would be reinstalled during the in-water work window. If unexpected high flows occur between July and February, the crossing site would be inspected. While the crossing site is designed to handle typical lower seasonal flows during Project construction, unexpected high flows may alter the installed temporary bridge. If this occurs, maintenance to the temporary bridge would be needed, with all activities that are within the wetted channel restricted to the in-water work window.
- **Post-Construction Route Inspection** – After all Project construction activities are complete, the proposed crossing would be removed. For long-term, infrequent access needs, such as route inspections of the towers and lines typically conducted by four-wheel-drive vehicles, the proposed road would be used, and the stream would be forded. The rare use would not adversely affect fish passage or stream habitat. If heavy machinery becomes needed for a repair that would require crossing the stream for access, timber matting or a temporary bridge would be reinstalled, as described above, and used by the equipment to cross the stream. This temporary structure (i.e., timber matting or temporary bridge) would be removed following the repair.

The proposed type for this crossing is expected to trigger ODFW fish passage rules and regulations based on OAR 635-412-0005 (9)(a) because the temporary structure consists of original construction (see Section 2.1.2.2); however, crossing construction would occur outside of the bankfull channel. General requirements listed under OAR 635-412-0035(1) Fish Passage Criteria would be applicable to this road-stream crossing site. Although specific requirements under OAR 635-412-0035 for temporary bridge with seasonal restrictions are not listed, some of the requirements under OAR 635-412-0035(3)(a) for fish passage at road-stream crossing structures such as bridges and culverts may apply.

4.1.2 Rock Creek, Site R-33011

4.1.2.1 Existing Conditions

The crossing at site R-33011 was not surveyed due to lack of access. A desktop review of aerial imagery, however, showed a primitive ford crossing on a private road (see Drawing C-201 in Appendix C). Data used in the design assumptions included aerial imagery, along with 10-meter resolution LiDAR. Existing road and stream profiles were based on those data. Channel bankfull width was measured at 20 feet and stream gradient at 2 percent both downstream and upstream of the crossing. Based on an analysis of a crossing near the site (see site R-33147), the stream bed materials consist of a mix of boulders, cobbles, gravels, and fines, with cobbles

(40 percent) listed as the dominant substrate. The existing road is less than 10 feet wide and on private land.

4.1.2.2 Criteria and Conditions Used for Evaluating Crossing

- **Anticipated Use** – Private land; no public use is anticipated. Project use would be seasonally restricted to periods of low-flow (July to February) conditions. Installation of the crossing would be restricted to the in-water work window (July 1 to October 15), with Project use of the crossing restricted to the low-flow period. The crossing structure would be removed prior to the high-flow period (February to June) and reinstalled during the in-water work window if needed for additional Project construction (e.g., 3 years). The crossing would be permanently removed following the completion of Project construction activities.
- **Stream Hydrology/Flows at Time of Use** – Although no stream gage data are available for this site, nearby stream gages show the high-flow discharges occurring between February and June. Therefore, all activities at this site would be restricted to July through January. The expected stream flows for the site during the low-flow period are expected to be less than a few cubic feet per second.
- **Fish Presence** – Identified as fish-bearing; no fish observed, crossing not surveyed.
- **In-water Work Window** – Any construction activities planned for the proposed crossing structure within the wetted channel must occur during the ODFW designated in-water work window (July 1 to October 15).
- **Channel Width** – Bankfull width measured at 20 feet from aerial imagery.
- **Channel Confinement** – Unconfined at the crossing and moderately confined locally (3- to 4-foot banks).
- **Stream Gradient** – 2 percent at and upstream of the crossing and 2 percent downstream of the crossing.
- **Road Ingress/Egress** – Due to the existing road's poor condition, narrow width, and washed-out crossing, a new road and stream crossing improvements would be necessary.
- **Proposed and Alternative(s) Selected** – A temporary bridge with seasonal restrictions (Type 3A) was considered to be the most viable option for this crossing location. Benefits would include decreases in turbidity and overall reductions in channel bed and bank disturbance. Other alternatives identified for this crossing included improving the existing crossing to an armored ford (Type 5). Under this scenario, local turbidity would continue to be a problem at this location despite improvements to the ford.

4.1.2.3 Proposed Crossing Type Description

Drawings C-202 and C-203 in Appendix C depict the design for the site.

- **Crossing Type** – Temporary bridge with seasonal restrictions on use (Type 3A).
- **Material Sizes/Dimensions/Quantities** – Materials for the temporary bridge would be steel support (or equivalent) with wood decking. Dimensions would be 38 feet long and 13 feet wide. Small quantities of excavation (3 cubic yards) would be needed outside the bankfull channel. Small quantities (3 cubic yards) of angular rock, gravel, or equivalent placed as temporary ramps would also be needed at the ends of the bridge outside the bankfull channel.

- **Stability/Structural Support Needed** – Abutments under the bridge (materials and sizes dependent on local conditions). Small quantities (3 cubic yards) of angular rock, gravel, or equivalent placed as temporary ramps noted above would be needed at the ends of the bridge.
- **Arrangement** – Temporary bridge would be placed as perpendicular as possible to the channel. Abutments would be placed 5 feet minimum outside of bankfull width. Inside rise would be set at a minimum of 1.5 feet.
- **Crossing Gradient** – The existing crossing gradient at the crossing is 2 percent. The temporary bridge over the channel would be placed with as minimal a slope as possible to maintain the existing stream gradient as well as the road ingress/egress.
- **Crossing Construction Period** – As stated above, the use of this proposed crossing would be restricted to the period from July to February. Any construction activities for the crossing planned within the wetted channel (e.g., crossing installation) would be restricted to the in-water work window (July 1 to October 15). The proposed crossing must be removed from February to June due to higher flows in the stream. If Project construction requires use of this site beyond one season (e.g., 3 years), the crossing structure would be reinstalled during the in-water work window. If unexpected high flows occur between July and February, the crossing site would be inspected. While the crossing site is designed to handle typical lower seasonal flows during Project construction, unexpected high flows may alter the installed temporary bridge. If this occurs, maintenance to the temporary bridge would be needed, with all activities that are within the wetted channel restricted to the in-water work window
- **Post-Construction Route Inspection** – After all Project construction activities are complete, the proposed crossing would be removed. For long-term, infrequent access needs, such as route inspections of the towers and lines typically conducted by four-wheel-drive vehicles, the proposed road would be used, and the stream would be forded. The rare use would not adversely affect fish passage or stream habitat. If heavy machinery becomes needed for a repair that would require crossing the stream for access, timber matting or a temporary bridge would be reinstalled, as described above, and used by the equipment to cross the stream. This temporary structure (i.e., timber matting or temporary bridge) would be removed following the repair.

The proposed type for this crossing is expected to trigger ODFW fish passage rules and regulations based on OAR 635-412-0005 (9)(a) because the temporary structure consists of original construction (see Section 2.1.2.2); however, crossing construction would occur outside of the bankfull channel General requirements listed under OAR 635-412-0035(1) Fish Passage Criteria would be applicable to this road-stream crossing site. Although specific requirements under OAR 635-412-0035 for temporary bridge with seasonal restrictions are not listed, some of the requirements under OAR 635-412-0035(3)(a) for fish passage at road-stream crossing structures such as bridges and culverts may apply.

4.1.3 Rock Creek, Site R-33033

4.1.3.1 Existing Conditions

The crossing at site R-33033 was not surveyed due to lack of access. A desktop review of aerial imagery, however, showed a washed-out bridge crossing (see Drawing C-301 in Appendix C). Data used in the design assumptions included aerial imagery, along with 10-meter resolution LiDAR. Existing road and stream profiles were based on those data. Channel bankfull width was measured at 20 feet and stream gradient at 2 percent both downstream and upstream of the crossing. Based on an analysis of crossing near the site (see site R-33147), the stream bed

materials consist of a mix of boulders, cobbles, gravels, and fines, with cobbles (40 percent) listed as the dominant substrate. The existing road is less than 10 feet wide and on private land.

4.1.3.2 Criteria and Conditions Used for Evaluating Crossing

- **Anticipated Use** – Private land; no public use is anticipated. Project use would be seasonally restricted to periods of low-flow (July to February) conditions. Installation of the crossing would be restricted to the in-water work window (July 1 to October 15), with Project use of the crossing restricted to the low-flow period. The crossing structure would be removed prior to the high-flow period (February to June) and reinstalled during the in-water work window if needed for additional Project construction (e.g., 3 years). The crossing would be permanently removed following the completion of Project construction activities.
- **Stream Hydrology/Flows at Time of Use** – Expected to be very low, less than a few cubic feet per second to dry, during periods of use.
- **Fish Presence** – Identified as fish-bearing; no fish observed, crossing not surveyed.
- **In-water Work Window** – Any construction activities planned for the proposed crossing structure within the wetted channel must occur during the ODFW designated in-water work window (July 1 to October 15).
- **Channel Width** – Bankfull width measured at 20 feet.
- **Channel Confinement** – Unconfined at the crossing and moderately confined locally (3- to 4-foot banks).
- **Stream Gradient** – 2 percent at and upstream of the crossing and 2 percent downstream of the crossing.
- **Road Ingress/Egress** – Due to the existing road's poor condition, narrow width, and washed-out crossing, a complete road and stream crossing improvements would be necessary.
- **Proposed and Alternative(s) Selected** – A temporary bridge with seasonal restrictions (Type 3A) was considered to be the most viable option for this crossing location. Benefits would include decreases in turbidity and overall reductions in channel bed and bank disturbance. Other alternatives identified for this crossing included improving the existing crossing to an armored ford (Type 5). Under this scenario, local turbidity would continue to be a problem at this location despite improvements to the ford.

4.1.3.3 Proposed Crossing Type Description

Drawings C-302 and C-303 in Appendix C depict the design for the site.

- **Crossing Type** – Temporary bridge with seasonal restrictions on use (Type 3A).
- **Material Sizes/Dimensions/Quantities** – Materials for the temporary bridge would be steel support (or equivalent) with wood decking. Dimensions would be 38 feet long and 13 feet wide. Small quantities of excavation (3 cubic yards) would be needed outside the bankfull channel. Small quantities (3 cubic yards) of angular rock, gravel, or equivalent placed as temporary ramps would also be needed at the ends of the bridge outside the bankfull channel.
- **Stability/Structural Support Needed** – Abutments under the bridge (materials and sizes dependent on local conditions). Small quantities (3 cubic yards) of angular rock, gravel, or equivalent placed as temporary ramps noted above would be needed at the ends of the bridge.

- **Arrangement** – Temporary bridge would be placed as perpendicular as possible to the channel. Abutments would be placed 5 feet minimum outside of bankfull width. Inside rise would be set at a minimum of 1.5 feet.
- **Crossing Gradient** – The existing crossing gradient at the crossing is 2 percent. The temporary bridge over the channel would be placed with as minimal slope as possible to maintain the existing stream gradient as well as the road ingress/egress.
- **Crossing Construction Period** – As stated above, the use of this proposed crossing would be restricted to the period from July to February. Any construction activities for the crossing planned within the wetted channel (e.g., crossing installation) would be restricted to the in-water work window (July 1 to October 15). The proposed crossing must be removed from February to June due to higher flows in the stream. If Project construction requires use of this site beyond one season (e.g., 3 years), the crossing structure would be reinstalled during the in-water work window. If unexpected high flows occur between July and February, the crossing site would be inspected. While the crossing site is designed to handle typical lower seasonal flows during Project construction, unexpected high flows may alter the installed timber matting. If this occurs, maintenance to reinstall the timber matting would be needed, with all activities that are within the wetted channel restricted to the in-water work window.
- **Post-Construction Route Inspection** – After all Project construction activities are complete, the proposed crossing would be removed. For long-term, infrequent access needs, such as route inspections of the towers and lines typically conducted by four-wheel-drive vehicles, the proposed road would be used, and the stream would be forded. The rare use would not adversely affect fish passage or stream habitat. If heavy machinery becomes needed for a repair that would require crossing the stream for access, timber matting or a temporary bridge would be reinstalled, as described above, and used by the equipment to cross the stream. This temporary structure (i.e., timber matting or temporary bridge) would be removed following the repair.

The proposed type for this crossing is expected to trigger ODFW fish passage rules and regulations based on OAR 635-412-0005 (9)(a) because the temporary structure consists of original construction (see Section 2.1.2.2); however, crossing construction would occur outside of the bankfull channel. General requirements listed under OAR 635-412-0035(1) Fish Passage Criteria would be applicable to this road-stream crossing site. Although specific requirements under OAR 635-412-0035 for temporary bridge with seasonal restrictions are not listed, some of the requirements under OAR 635-412-0035(3)(a) for fish passage at road-stream crossing structures such as bridges and culverts may apply.

4.1.4 Rock Creek, Site R-33147

4.1.4.1 Existing Conditions

Data used in the design assumptions included field surveys conducted in August 2016, along with 10-meter resolution LiDAR. Proposed road and existing stream profiles were based on those data (see Drawing C-401 in Appendix C). Channel bankfull width was measured at 20 feet for the channel at the crossing location, and stream gradient was measured at 2 percent both downstream and upstream of the crossing. Stream bed materials consist of a mix of boulders, cobbles, gravels, and fines, with cobbles (40 percent) listed as the dominant substrate. The existing road is less than 10 feet wide and on private land.

4.1.4.2 Criteria and Conditions Used for Evaluating Crossing

- **Anticipated Use** – Private land; no public use is anticipated. Project use would be seasonally restricted to periods of low-flow (July to February) conditions. Installation of the crossing would be restricted to the in-water work window (July 1 to October 15), with Project use of the crossing restricted to the low-flow period. The crossing structure would be removed prior to the high-flow period (February to June) and reinstalled during the in-water work window if needed for additional Project construction (e.g., 3 years). The crossing would be permanently removed following the completion of Project construction activities.
- **Stream Hydrology/Flows at Time of Use** – Expected to be very low, less than a few cubic feet per second to dry, during periods of use.
- **Fish Presence** – Identified as fish-bearing; no fish observed.
- **In-water Work Window** – Any construction activities planned for the proposed crossing structure within the wetted channel must occur during the ODFW designated in-water work window (July 1 to October 15).
- **Channel Width** – Bankfull width measured at 20 feet.
- **Channel Confinement** – Unconfined at the crossing and moderately confined locally (3- to 4-foot banks).
- **Stream Gradient** – 2 percent at and upstream of the crossing and 2 percent downstream of the crossing.
- **Road Ingress/Egress** – Due to the poor condition of the existing road, narrow width, and washed out crossing, a complete road and stream crossing improvements would be necessary.
- **Proposed and Alternative(s) Selected** – A temporary bridge with seasonal restrictions (Type 3A) was considered to be the most viable option for this crossing location. Benefits would include decreases in turbidity and overall reductions in channel bed and bank disturbance. Other alternatives identified for this crossing included improving the existing crossing to an armored ford (Type 5). Under this scenario, local turbidity would continue to be a problem at this location despite improvements to the ford.

4.1.4.3 Proposed Crossing Type Description

Drawings C-402 and C-403 in Appendix C depict the design for the site.

- **Crossing Type** – Temporary bridge with seasonal restrictions on use (Type 3A).
- **Material Sizes/Dimensions/Quantities** – Materials for the temporary bridge would be steel support (or equivalent) with wood decking. Dimensions would be 38 feet long and 13 feet wide. Small quantities of excavation (3 cubic yards) would be needed outside the bankfull channel. Small quantities (2 cubic yards) of angular rock, gravel, or equivalent placed as temporary ramps would also be needed at the ends of the bridge outside the bankfull channel.
- **Stability/Structural Support Needed** – Abutments under the bridge (materials and sizes dependent on local conditions). Small quantities (2 cubic yards) of angular rock, gravel, or equivalent placed as temporary ramps noted above would be needed at the ends of the bridge.

- **Arrangement** – Temporary bridge would be placed as perpendicular as possible to the channel. Abutments would be placed 5 feet minimum outside of bankfull width. Inside rise would be set at a minimum of 1.5 feet.
- **Crossing Gradient** – The existing crossing gradient at the crossing is 2 percent. The temporary bridge over the channel would be placed with as minimal slope as possible to maintain the existing stream gradient as well as the road ingress/egress.
- **Crossing Construction Period** – As stated above, the use of this proposed crossing would be restricted to the period from July to February. Any construction activities for the crossing planned within the wetted channel (e.g., crossing installation) would be restricted to the in-water work window (July 1 to October 15). The proposed crossing must be removed from February to June due to higher flows in the stream. If Project construction requires use of this site beyond one season (e.g., 3 years), the crossing structure would be reinstalled during the in-water work window. If unexpected high flows occur between July and February, the crossing site would be inspected. While the crossing site is designed to handle typical lower seasonal flows during Project construction, unexpected high flows may alter the installed timber matting. If this occurs, maintenance to reinstall the timber matting would be needed, with all activities that are within the wetted channel restricted to the in-water work window.
- **Post-Construction Route Inspection** – After all Project construction activities are complete, the proposed crossing would be removed. For long-term, infrequent access needs, such as route inspections of the towers and lines typically conducted by four-wheel-drive vehicles, the proposed road would be used, and the stream would be forded. The rare use would not adversely affect fish passage or stream habitat. If heavy machinery becomes needed for a repair that would require crossing the stream for access, timber matting or a temporary bridge would be reinstalled, as described above, and used by the equipment to cross the stream. This temporary structure (i.e., timber matting or temporary bridge) would be removed following the repair.

The proposed type for this crossing is expected to trigger ODFW fish passage rules and regulations based on OAR 635-412-0005 (9)(a) because the temporary structure consists of original construction (see Section 2.1.2.2); however, crossing construction would occur outside of the bankfull channel. General requirements listed under OAR 635-412-0035(1) Fish Passage Criteria would be applicable to this road-stream crossing site. Although specific requirements under OAR 635-412-0035 for temporary bridge with seasonal restrictions are not listed, some of the requirements under OAR 635-412-0035(3)(a) for fish passage at road-stream crossing structures such as bridges and culverts may apply.

4.1.5 Goodman Creek, Site R-65725

4.1.5.1 Existing Conditions

The existing crossing at site R-65725 is an existing primitive ford crossing (see Drawing C-501 in Appendix C). Data from a field survey were used in the design, along with 1 arc-second resolution DEM. Existing road and stream profiles were based on those data. Based on field measurements downstream, the channel bankfull width was 8 feet. Stream gradient at the site was measured at 5 percent upstream of the crossing and 9 percent downstream. Stream bed materials consist of sands (80 percent) and gravels (20 percent). The channel at the downstream survey site was nearly dry at time of field surveys. The existing road is 10 feet wide and on private land.

4.1.5.2 Criteria and Conditions Used for Evaluating Crossing

- **Anticipated Use** – Private land; no public use is anticipated. Project use would be for the duration of Project construction activities (e.g., 3 years), with heavy machinery and four-wheel-drive vehicle use primarily between June and February. Installation of the crossing would be restricted to the in-water work window (July 1 to October 31), with no restrictions on Project use while the crossing is in place. The crossing would be permanently removed following Project construction activities.
- **Stream Hydrology/Flows at Time of Use** – Expected to be very low, less than a few cubic feet per second to dry, during periods of use.
- **Fish Presence** – Identified as fish-bearing; fish were not observed during field surveys.
- **In-water Work Window** – Any construction activities planned for the proposed crossing structure within the wetted channel must occur during the ODFW designated in-water work window (July 1 to October 31).
- **Channel Width** – 8 feet wide at the crossing.
- **Channel Confinement** – Confined upstream and downstream, but unconfined at the crossing due to the ford crossing.
- **Stream Gradient** – 5 percent upstream of the crossing and 9 percent downstream of crossing.
- **Road Ingress/Egress** – The existing road is adequate.
- **Proposed and Alternative(s) Selected** – A temporary bridge adjacent to the existing ford (Type 3B) was chosen as the proposed alternative based on the tight turning radius and steep gradients in the existing ford. Seasonal restrictions on use would require that crossings would only be used during low-flow conditions. The temporary bridge would result in decreases in turbidity and the least amount of channel bed and bank disturbance over time. Timber matting (Type 4) was considered but would be problematic due the steep channel gradient that would make leveling of the crossing for vehicle traffic difficult.

4.1.5.3 Proposed Crossing Type Description

Drawings C-502 and C-503 in Appendix C depict the design for the site.

- **Crossing Type** – Temporary bridge with seasonal restrictions on use (Type 3A).
- **Material Sizes/Dimensions/Quantities** – Materials for the temporary bridge would be steel support (or equivalent) with wood decking. Dimensions would be 53 feet long and 13 feet wide. Small quantities of excavation (3 cubic yards) would be needed outside the bankfull channel. Small quantities (3 cubic yards) of angular rock, gravel, or equivalent placed as temporary ramps would also be needed at the ends of the bridge outside the bankfull channel.
- **Stability/Structural Support Needed** – Abutments under the bridge (materials and sizes dependent on local conditions). Small quantities (3 cubic yards) of angular rock, gravel, or equivalent placed as temporary ramps noted above would be needed at the ends of the bridge.
- **Arrangement** – Temporary bridge would be placed as perpendicularly as possible to the channel. Abutments would be placed 5 feet minimum outside of bankfull width. Inside rise would be set at a minimum of 1.5 feet.

- **Crossing Gradient** – The average existing crossing gradient at the crossing is 7 percent. The temporary bridge over the channel would be placed with as minimal a slope as possible to maintain the existing stream gradient as well as the road ingress/egress.
- **Crossing Construction Period** – Any construction activities for the crossing planned within the wetted channel (e.g., crossing installation) would be restricted to the in-water work window (July 1 to October 31). The crossing would remain in place for the duration of the Project construction activities (e.g., 3 years). If unexpected long duration storm flows occur, site inspection of the crossing would be conducted. While the crossing site is designed to handle short duration storm-flow events throughout Project construction, unexpected long duration storm flows or use by heavy equipment may alter the temporary bridge and/or bridge approaches. If this occurs, maintenance to regrade the bridge approaches or bridge repair would be needed, with all activities that are within the wetted channel restricted to the in-water work window (July 1 to October 31).
- **Post-Construction Route Inspection** – After all Project construction activities are complete, the proposed crossing would be removed. For long-term, infrequent access needs, such as route inspections of the towers and lines typically conducted by four-wheel-drive vehicles, the existing ford would be used. The rare use would not adversely affect fish passage or stream habitat. If heavy machinery becomes needed for a repair that would require crossing the stream for access, the temporary bridge would be reinstalled, as described above, and used by the equipment to cross the stream. The temporary bridge would be removed following the repair.

The proposed type for this crossing is expected to trigger ODFW fish passage rules and regulations based on OAR 635-412-0005 (9)(a) because the temporary structure consists of original construction (see Section 2.1.2.2); however, crossing construction would occur outside of the bankfull channel. General requirements listed under OAR 635-412-0035(1) Fish Passage Criteria would be applicable to this road-stream crossing site. Although specific requirements under OAR 635-412-0035 for temporary bridges are not listed, some of the requirements under OAR 635-412-0035(3)(a) for fish passage at road-stream crossing structures such as bridges and culverts may apply.

4.1.6 Cavanaugh Creek, Site R-66818

4.1.6.1 Existing Conditions

The site R-66818 crossing is an existing ford (see Drawing C-601 in Appendix C). Data used in the design assumptions included field surveys conducted in June 2016, along with 1 arc-second resolution DEM. Existing road and stream profiles were based on those data. Channel bankfull width was measured at 6 feet, and stream gradient was measured at 4 percent upstream of the crossing and 12 percent downstream. Stream bed materials consisted of gravel (30 percent), sand/silts/clay (60 percent), some boulders (5 percent), and some cobble (5 percent). The existing road is 12 feet wide and designated as public use, but was visually assessed in the field to have limited public use. Other local conditions included heavy use by cattle.

4.1.6.2 Criteria and Conditions Used for Evaluating Crossing

- **Anticipated Use** – Private land; no public use is anticipated. Project use would be for the duration of Project construction activities (e.g., 3 years), with heavy machinery and four-wheel-drive vehicle use primarily between June and February. Installation of the crossing would be restricted to the in-water work window (July 1 to October 31), with no restrictions to Project use for the duration of Project construction. The crossing would be permanently removed following Project construction activities.

- **Stream Hydrology/Flows at Time of Use** – Expected to be very low, less than a few cubic feet per second, during periods of use.
- **Fish Presence** – Identified as fish-bearing; fish were not observed during field surveys
- **Channel Width** – 6 feet wide at the crossing
- **Channel Confinement** – Confined upstream and downstream, but unconfined at the crossing due to the ford crossing.
- **Stream Gradient** – 4 percent upstream of the crossing and 12 percent downstream.
- **Road Ingress/Egress** – The existing road is adequate.
- **Proposed and Alternative(s) Selected** – A temporary bridge over the existing ford (Type 3A) was chosen as the proposed type based on the steep gradient in this reach. Seasonal restrictions on use would require that crossings would only be used during low-flow conditions. The temporary bridge would result in decreases in turbidity and the least amount of channel bed and bank disturbance over time. Timber matting (Type 4) was considered but would be problematic due the steep channel gradient that would make leveling of the crossing for vehicle traffic difficult.

4.1.6.3 Proposed Crossing Type Description

Drawings C-602 and C-603 in Appendix C depict the design for the site.

- **Crossing Type** – Temporary bridge with seasonal restrictions on use (Type 3A).
- **Material Sizes/Dimensions/Quantities** – Materials for the temporary bridge would be steel support (or equivalent) with wood decking. Dimensions would be 53 feet long and 13 feet wide. Small quantities of excavation (3 cubic yards) would be needed outside the bankfull channel. Small quantities (3 cubic yards) of angular rock, gravel, or equivalent placed as temporary ramps would also be needed at the ends of the bridge outside the bankfull channel.
- **Stability/Structural Support Needed** – Abutments under the bridge (materials and sizes dependent on local conditions). Small quantities (3 cubic yards) of angular rock, gravel, or equivalent placed as temporary ramps noted above would be needed at the ends of the bridge.
- **Arrangement** –Temporary bridge would be placed as perpendicular as possible to the channel. Abutments would be placed 5 feet minimum outside of bankfull width. Inside rise would be set at a minimum of 1.5 feet.
- **Crossing Gradient** – The average existing crossing gradient at the crossing is approximately 5 to 8 percent as the road traverses the approaches to the existing ford. The temporary bridge over the channel would be placed with as minimal slope as possible to maintain the existing stream gradient as well as the road ingress/egress.
- **Crossing Construction Period** – Any construction activities for the crossing planned within the wetted channel (e.g., crossing installation) would be restricted to the in-water work window (July 1 to October 31). The crossing would remain in place for the duration of the Project construction activities (e.g., 3 years). If unexpected long duration storm-flows occur, site inspection of the crossing would occur. While the crossing site is designed to handle short duration storm-flow events throughout Project construction, unexpected long duration storm-flows or use by heavy equipment may alter the temporary bridge and/or bridge approaches. If this occurs, maintenance to regrade the

bridge approaches or bridge repair would be needed, with all activities that are within the wetted channel restricted to the in-water work window (July 1 to October 31).

- **Post-Construction Route Inspection** – After all Project construction activities are complete, the proposed crossing would be removed. For long-term, infrequent access needs, such as route inspections of the towers and lines typically conducted by four-wheel-drive vehicles, the existing ford would be used. The rare use would not adversely affect fish passage or stream habitat. If heavy machinery becomes needed for a repair that would require crossing the stream for access, the temporary bridge would be reinstalled, as described above, and used by the equipment to cross the stream. The temporary bridge would be removed following the repair.

The proposed type for this crossing is expected to trigger ODFW fish passage rules and regulations based on OAR 635-412-0005 (9)(a) because the temporary structure consists of original construction (see Section 2.1.2.2); however, crossing construction would occur outside of the bankfull channel. . General requirements listed under OAR 635-412-0035(1) Fish Passage Criteria would be applicable to this road-stream crossing site. Although specific requirements under OAR 635-412-0035 for temporary bridges are not listed, some of the requirements under OAR 635-412-0035(3)(a) for fish passage at road-stream crossing structures such as bridges and culverts may apply.

4.1.7 Benson Creek, Site R-68790

4.1.7.1 Existing Conditions

The site R-68790 crossing is an existing ford (see Drawing C-701 in Appendix C). Data used in the design assumptions included field surveys conducted in May 2014, along with 1 arc-second resolution DEM. Existing road and stream profiles were based on those data. Channel bankfull width was measured at 18 feet, and stream gradient was measured at less than 1 percent. Stream bed materials consisted of sand/silts/clay (95 percent) and gravel (5 percent). The existing road is 12 feet wide and designated as public, but was visually assessed in the field to have limited public use. Other local conditions included heavy use by cattle.

4.1.7.2 Criteria and Conditions Used for Evaluating Crossing

- **Anticipated Use** – County road, but low public use is anticipated. Project use would be seasonally restricted to periods of low-flow (July to February) conditions. Installation of the crossing would be restricted to the in-water work window (July to October 31), with Project use of the crossing restricted to the low-flow period. The crossing structure would be removed prior to the high-flow period (February to June) and reinstalled during the in-water work window if needed for additional project construction activities. The crossing would be permanently removed following the completion of Project construction activities.
- **Stream Hydrology/Flows at Time of Use** – Expected to be very low, less than a few cubic feet per second, during periods of use.
- **Fish Presence** – Identified as fish-bearing; however, water quality was considered poor, and fish were not found during electrofishing surveys.
- **In-water Work Window** – Any construction activities planned for the proposed crossing structure within the wetted channel must occur during the ODFW designated in-water work window (July 1 to October 31).
- **Channel Width** – Bankfull width was measured at 18 outside the influence of the existing ford. At 35 feet wide at the ford, the wetted stream width was wider at the

crossing site than at typical locations upstream or downstream (17 feet wide), requiring a structure considerably longer than the typical bankfull width of 18 feet.

- **Channel Confinement** – Confined upstream and downstream, but unconfined at the crossing due to the ford crossing.
- **Stream Gradient** – One percent at the crossing and vicinity.
- **Road Ingress/Egress** – The existing road is adequate.
- **Proposed and Alternative(s) Selected** – A temporary bridge over the existing ford (Type 3A) was chosen as the proposed type over timber matting to limit disturbance in the active channel and ensure fish passage. Seasonal restrictions on use would require that this crossing only be used during low-flow conditions. The temporary bridge would result in less turbidity than timber matting and least amount of channel bed and bank disturbance over time. Timber matting (Type 4) was considered, but would be problematic because the supports would likely need to be placed in the active channel, thus disturbing the active channel and limiting fish passage.

4.1.7.3 Proposed Crossing Type Description

Drawings C-702 and C-703 in Appendix C depict the design for the site.

- **Crossing Type** – Temporary bridge over existing ford with seasonal restrictions on use (Type 3A).
- **Material Sizes/Dimensions/Quantities** – Materials for the temporary bridge would be steel support (or equivalent) with wood decking. Dimensions would be 53 feet long and 13 feet wide. Small quantities of excavation (3 cubic yards) would be needed outside the bankfull channel. Small quantities (2 cubic yards) of angular rock, gravel, or equivalent placed as temporary ramps would also be needed at the ends of the bridge outside the bankfull channel.
- **Stability/Structural Support Needed** – Abutments under the bridge (materials and sizes dependent on local conditions). Small quantities (2 cubic yards) of angular rock, gravel, or equivalent placed as temporary ramps noted above would be needed at the ends of the bridge.
- **Arrangement** – Temporary bridge would be placed as perpendicularly as possible to the channel; however, this site crossing would follow the existing road alignment which deviates from perpendicular, creating the need for the 53-foot-long bridge. The abutments would be placed outside the wetted channel width. Inside rise would be set at a minimum of 1.5 feet. As noted above, the bridge would need to be removed for a period of long duration storm-flow events and reinstalled the following low-flow season, if need for further Project construction.
- **Crossing Gradient** – The existing ford crossing gradient is less than 1 percent. The temporary bridge over the channel would be placed with as minimal a slope as possible to maintain the road ingress/egress. Abutments would be placed to raise the bridge and provide adequate rise between the existing thalweg and the bottom of the bridge, while maintaining the minimal crossing gradient slope.
- **Crossing Construction Period** – As stated above, the use of this proposed crossing would be restricted to the period from July to February. Any construction activities for the crossing planned within the wetted channel (e.g., crossing installation) would be restricted to the in-water work window (July 1 to October 31). The proposed crossing must be removed between February and June due to higher flows in the stream. If

Project construction requires use of this site beyond one season (e.g., 3 years), the crossing structure would be reinstalled during the in-water work window (July 1 to October 31). If unexpected high flows occur between July and February, the crossing site would be inspected. While the crossing site is designed to handle typical lower seasonal flows during Project construction, unexpected high flows may alter the installed timber matting. If this occurs, maintenance to reinstall the timber matting would be needed, with all activities that are within the wetted channel restricted to the in-water work window (July 1 to October 31).

- **Post-Construction Route Inspection** – After all Project construction activities are complete, the proposed crossing would be removed. For long-term, infrequent access needs, such as route inspections of the towers and lines typically conducted by four-wheel-drive vehicles, the proposed road would be used, and the stream would be forded. The rare use would not adversely affect fish passage or stream habitat. If heavy machinery becomes needed for a repair that would require crossing the stream for access, the temporary bridge would be reinstalled, as described above, and used by the equipment to cross the stream. This temporary bridge would be removed following the repair.

The proposed type for this crossing is expected to trigger ODFW fish passage rules and regulations based on OAR 635-412-0005 (9)(a) because the temporary structure consists of original construction (see Section 2.1.2.2); however, crossing construction would occur outside of the bankfull channel. General requirements listed under OAR 635-412-0035(1) Fish Passage Criteria would be applicable to this road-stream crossing site. Although specific requirements under OAR 635-412-0035 for temporary bridges are not listed, some of the requirements under OAR 635-412-0035(3)(a) for fish passage at road-stream crossing structures such as bridges and culverts may apply.

4.2 Summary

Designs for each of the road-stream crossing sites described in Section 4.1 were developed based on the information in Sections 2 and 3 above. Potential impacts to stream habitat during construction and for post-construction purposes will be minimized by designing and constructing effective erosion control measures and sediment barriers at the various road approaches to the channel crossing. For example, the temporary ramps at either end of the temporary bridge crossings can be expanded further, both to increase overall erosion control benefits outside of the bankfull channel and to minimize the amount of sediment contributed to the stream by vehicles. The road-stream crossings expected to trigger OAR 635-412-0020 are summarized in Table 2. Because all of these temporary structures consist of original construction over fish-bearing streams in Oregon, based on fish passage rules and regulations they will require review by the ODFW. The Fish Passage Plans prepared according to ODFW guidelines are provided in Appendix B, and design drawings for the seven road-stream crossing sites with general design and erosion control information are included in Appendix C.

Table 2. Fish-Bearing Road-Stream Crossings Requiring ODFW-Approved Fish Passage Plans and Designs

Stream Name	Crossing ID	Existing Crossing	Proposed Crossing[1]	Erosion and Sediment Control Needed?	Design Type Requires Seasonal Restrictions?[2]	Disturbance within Bankfull Width?
Little Rock Creek	R-33010	NA – Primitive Ford[3]	3A	Yes	Yes	No
Rock Creek	R-33011	NA – Primitive Ford[3]	3A	Yes	Yes	No
Rock Creek	R-33033	NA – Primitive Ford[3]	3A	Yes	Yes	No
Rock Creek	R-33147	Primitive Ford	3A	Yes	Yes	No
Goodman Creek	R-65725	Ford	3B	Yes	Yes	No
Cavanaugh Creek	R-66818	Ford	3A	Yes	Yes	No
Benson Creek	R-68790	Ford	3A	Yes	Yes	No

[1] Crossing Type (No.)/Description: 3A. Install temporary bridge over existing structure, 3B. Install temporary bridge adjacent to existing structure

[2] Seasonal restrictions on use will require that crossings will only be used during low-flow conditions to limit impacts to water quality and avoid periods of fish utilization. Conditions on use may require removal of the structure(s) in cases of extreme flow events.

[3] NA = No access; crossing type assumed or assessed from aerial photos.

5.0 REFERENCES

AASHTO (American Association of State Highway and Transportation Officials). 2003. Standard Specifications for Highway Bridges.

NOAA Fisheries (National Ocean and Atmospheric Administration, National Marine Fisheries Service). 2008. Anadromous Salmonid Passage Facility Design. Northwest Region. Portland, OR. 2008

ODF (Oregon Department of Forestry). 2002. Forest Practices Technical Note Number 4, Fish Passage Guidelines for New and Replacement Stream Crossing Structures. http://www.oregon.gov/ODF/privateforests/docs/FishPassGuidelines.pdf

ODF. 2014. Forest Practice Administrative Rules and Forest Practices Act. Chapter 629, Division 625: Forest Practices Administration. Available online at: http://www.oregon.gov/odf/privateforests/docs/FPArulebk.pdf

ODFW (Oregon Department of Fish and Wildlife). 2008a. Clarification of Fish Passage Triggers and Guidelines for Bridges. Available online at: http://www.dfw.state.or.us/fish/CRP/docs/coastal_coho/permit_streamlining/Newport/ODFW/ODFW%20Fish%20Passage/Passage%20and%20Bridges%20FINAL%20-%20Mar%202008.pdf

ODFW. 2008b. Guidelines for Timing of In-Water Work to Protect Fish and Wildlife Resources. June. Available online at: http://www.dfw.state.or.us/lands/inwater/Oregon_Guidelines_for_Timing_of_%20InWater_Work2008.pdf

ODOT (Oregon Department of Transportation). 2008. Oregon Standard Specifications for Construction. Available online at: http://www.oregon.gov/ODOT/hwy/specs/docs/08book/08_00200.pdf

Seidel, Nigel. 2015a. Email from Nigel Seidel, East Region Energy Coordinator, ODFW, to IPC and Tetra Tech. January 28.

Seidel, Nigel. 2015b. Email from Nigel Seidel, East Region Energy Coordinator, ODFW, to IPC. June 26.

Tetra Tech. 2014. Fish Habitat and Stream Crossing Assessment Summary Report. Prepared for Idaho Power Company. October.

Tetra Tech. 2015. Fish Passage Plans and Designs. Prepared for Idaho Power Company. September.

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USDC (U.S. Department of Commerce). 2013. Reinitiation of the Endangered Species Act Section 7 Formal Programmatic Conference and Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for Aquatic Restoration Activities in the States of Oregon and Washington (ARBO II). United States Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service.

USDOT (U.S. Department of Transportation). 2003. Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects. FP-03 US Customary Units. Federal Highway Administration, Federal Lands Highway.

APPENDIX A
2015 ODFW FISH PASSAGE PLAN APPROVALS

Note

On December 30, 2015, the Oregon Department of Fish and Wildlife (ODFW) issued the following approvals to Idaho Power Company for the six fish passage plans contained in the 2015 Fish Passage Plans and Designs report, concerning stream crossings where ODFW's fish passage authority had been invoked. Two of these crossing sites with approved fish passage plans are included in the current 2016 report—R-65725 (formerly 0-325) and R-68790 (formerly 0-337).

Funkhouser, Zach

From: Greg D Apke [greg.d.apke@state.or.us]
Sent: Wednesday, December 30, 2015 3:37 PM
To: Funkhouser, Zach; Adams, Todd
Cc: Alan Ritchey; Art Martin (art.c.martin@state.or.us); David T Banks; greg.d.apke@state.or.us; Jon Germond; Ken Loffink; WOODS Maxwell; Nick Myatt (nick.a.myatt@state.or.us); Nigel E Seidel; BAILEY Timothy D (Timothy.D.Bailey@state.or.us)
Subject: ODFW Fish Passage Approvals for the Boardman to Hemingway Transmission Line (B2H) Project PA-09-0016 through PA-09-0021
Attachments: ODFW Fish Passage Approval - B2H Transmission Line Project 12-30-2015.pdf

Importance: High

Mr. Funkhouser and Mr. Adams,

Attached is the Oregon Department of Fish and Wildlife's (ODFW) fish passage approval for the six (6) projects associated with the Boardman to Hemingway Transmission Line (B2H) Project. The attached correspondence serves to approval all six of the stream crossings where ODFW's fish passage authority has been invoked. This "batched" approval fulfils ODFW's commitment to streamline the fish passage approvals associated with the project into one efficient fish passage approval for the project. While there are six unique approvals (**PA-09-0016 – 0021**), one for each trigger event, this correspondence serves to comprehensively provide the appropriate fish passage authorization for the project. Please note the specific operational items and provisions of this fish passage approval. These provisions apply to each of the six projects covered by this authorization.

The six projects approved for fish passage include:

IP's Crossing ID and Milepost (from Table 1 in the Fish Passage Application)	ODFW Fish Passage Approval Number	ODFW In-Water Work Window
Clover Creek 0-192, MP 116.4	PA-09-0016 - New Channel Spanning Temporary Timber Matt Crossing, Jimmy Creek Tributary, Union Cty.	July 1 – October 31
Jordan Creek 0-394, MP 2.2	PA-09-0017 – Ford Stream Crossing, Burnt River Tributary, Baker Cty.	July 1 – October 31
Goodman Creek 0-325, MP 183.5	PA-09-0018 - New Temporary Bridge Crossing, Burnt River Tributary, Baker Cty.	July 1 – October 31
Cavanaugh Creek 1-025, MP 185.8	PA-09-0019 - New Temporary Bridge Crossing, Burnt River Tributary, Baker Cty.	July 1 – October 31
Benson Creek 0-337, MP 190.5	PA-09-0020 – New Temporary Bridge Crossing, Snake River Tributary, Baker Cty.	July 1 – October 31
Cottonwood Creek 0-401, MP 221.9	PA-09-0021 - New Channel Spanning Temporary Timber Matt Crossing, Malheur Cty.	November 1 - March 31

Please retain and distribute this correspondence for B2H Project. These fish passage approvals are solely for the purpose of fulfilling Oregon fish passage statutory requirements and responsibilities administered by the Commission or the Department and do not satisfy any other Department, federal, state, or local laws, rules, or regulations, including but not limited to State or Federal Endangered Species Acts, any applicable water rights, approvals or other certificates administered by regulatory authorities.

As the B2H Project approaches the implementation phase(s) please continue to work with Nigel Seidel, ODFW's East Region Energy Coordinator and the two ODFW District Fisheries Biologists (Tim Bailey and David Banks) if issues develop and prior to construction.

Please contact me at 503-947-6228 or by email at greg.d.apke@state.or.us if you have any questions regarding the content of these fish passage approvals.

Thanks, Greg

****

Greg Apke
Oregon Department of Fish and Wildlife - Fish Division
Statewide Fish Passage Program Leader
4034 Fairview Industrial Drive SE
Salem, Oregon 97302
503-947-6228 (office)
503-931-4361 (cell)
greg.d.apke@state.or.us
ODFW Fish Passage Internet Access

****

Oregon
Kate Brown, Governor

Department of Fish and Wildlife
Fish Division
4034 Fairview Industrial Drive SE
Salem, OR 97302
(503) 947-6201
FAX (503) 947-6202
www.dfw.state.or.us/

December 30, 2015

Zak Funkhouser
Permitting Manager
Idaho Power Company
1221 W Idaho Street
Boise ID 83702

and

Todd Adams
B2H Project Manager
Idaho Power Company
1221 W Idaho Street
Boise ID 83702

Re: Boardman to Hemingway Transmission Line Project – ODFW Fish Passage Approvals (PA-09-0016, PA-09-0017, PA-09-0018, PA-09-0019, PA-09-0020, PA-09-0021)

Mr. Funkhouser and Mr. Adams,

Attached are the Oregon Department of Fish and Wildlife (ODFW) Fish Passage Approvals, as required by ORS 509.585, for the six projects within the Idaho Power Company's (IP)/(Applicant) Boardman to Hemingway (B2H) new Transmission Line Project (Project). Associated with this project are infrastructure improvements and upgrades (road-stream crossings) to allow access to IP's new transmission line facility. Of the multiple stream crossings associated with the project, we have identified six (6) stream crossings identified below that have triggered the State of Oregon's fish passage authority.

This correspondence serves to approval all six of the stream crossings where ODFW's fish passage authority has been invoked. This "batched" approval fulfils ODFW's commitment to streamline the fish passage approvals associated with the project into one efficient fish passage approval for the project. While there are six unique approvals (**PA-09-0016 – 0021**), one for each trigger event, this correspondence serves to comprehensively provide the appropriate fish passage authorization for the project.

The six projects approved for fish passage include:

IP's Crossing ID and Milepost (from Table 1 in the Fish Passage Application)	ODFW Fish Passage Approval Number	ODFW In-Water Work Window
Clover Creek 0-192, MP 116.4	PA-09-0016 - New Channel Spanning Temporary Timber Matt Crossing, Jimmy Creek Tributary, Union Cty.	July 1 – October 31
Jordan Creek 0-394, MP 2.2	PA-09-0017 – Ford Stream Crossing, Burnt River Tributary, Baker Cty.	July 1 – October 31
Goodman Creek 0-325, MP 183.5	PA-09-0018 - New Temporary Bridge Crossing, Burnt River Tributary, Baker Cty.	July 1 – October 31
Cavanaugh Creek 1-025, MP 185.8	PA-09-0019 - New Temporary Bridge Crossing, Burnt River Tributary, Baker Cty.	July 1 – October 31
Benson Creek 0-337, MP 190.5	PA-09-0020 – New Temporary Bridge Crossing, Snake River Tributary, Baker Cty.	July 1 – October 31
Cottonwood Creek 0-401, MP 221.9	PA-09-0021 - New Channel Spanning Temporary Timber Matt Crossing, Malheur Cty.	November 1 - March 31

ODFW has reviewed, as required by ORS 509.585 and approves these six fish passage design structures which IP plans to install along the B2H Transmission Line project, located on various tributaries of the Powder and Snake River Basin in Baker, Union, and Malheur Counties. These road-stream crossings have been engineered to either span the corresponding stream's active channel widths or will simulate the natural streambed conditions. ODFW's Fish Passage Program staff reviewed the designs for these six projects and we conclude they are are consistent with and meet Oregon Fish Passage Design Criteria (OAR 635-412-0035(1) and (3)).

These six projects approved by this approval are contingent on specific operational items and provisions which include:

1. All in water work for these six projects shall occur during the ODFW in-water work windows for each waterbody (see above table for specific dates).
2. Temporary water management and fish rescue, salvage, and recovery, is required (as prescribed in OAR 635-412-0035 (10)) prior to all in-water work activities (defined as all work at or below the ordinary high water elevation) associated with the project. Fish salvage activities requires the applicant to obtain State of Oregon Scientific Take Permits from ODFW.
3. Wildlife rescue, salvage, and recovery activities associated with the project requires the applicant to obtain State of Oregon Wildlife Rescue Salvage Permits from ODFW.

4. Fish passage design standards, as defined in OAR 635-412-0035(1) and (3) shall be implemented for all fish passage components of these projects.
5. Idaho Power Company (Applicant) shall be responsible for all maintenance required such that the projects provide adequate passage for native migratory fish. If monitoring by the Applicant or Department indicates that fish passage is not being provided, the Applicant in consultation with the Department shall determine the cause and, during a work period approved by the Department, shall modify the structure as appropriate to rectify problems as necessary. Failure to maintain fish passage for the duration of these approvals shall constitute a violation of these approvals and applicable fish passage laws (ORS 509.610).
6. After project completion, the applicant or your designee, shall maintain, monitor, evaluate, and report on the effectiveness of fish passage as required under OAR 509.610, and shall provide written status reports to the Department's Fish Passage Program annually for the first three (3) years and then a final report at year-5, or as determined by the Department. Reports shall include photographs from established photo-points as part of the fish passage evaluation and monitoring. Monitoring, evaluation, and reporting shall be conducted annually unless problems are observed that may require additional analyses. Fish passage reports shall consist of visual observations, photographs, as-built plan reviews, and future site visits with regards to fish passage at and through the project sites. Reports shall be submitted to the State Fish Passage Coordinator and the La Grande and Malheur Watershed District Fish Biologists. Electronic or hard copy submissions are acceptable.
7. Failure to maintain fish passage at these locations shall constitute a violation of these approvals and applicable fish passage laws (ORS 509.585 and 509.610).
8. The Department shall be allowed to inspect the six projects at reasonable times for the duration of these approvals. Unless prompted by emergency or other exigent circumstances, inspection shall be limited to regular and usual business hours, including weekends.
9. The appropriate ODFW District Fish Biologist shall be contacted 2-weeks in advance and prior to the implementation of these projects.
10. These fish passage approvals in no way purport or authorize take of a federally listed species.

Please retain and distribute this correspondence for your records, as this documents ODFW's six fish passage approvals for the Boardman to Hemingway Project (PA-09-0016 through PA-09-0021). These fish passage approvals are solely for the purpose of fulfilling Oregon fish passage statutory requirements and responsibilities administered by the Commission or the Department and do not satisfy any other Department, federal, state, or local laws, rules, or regulations, including but not limited to State or Federal Endangered Species Acts, any applicable water rights, approvals or other certificates administered by regulatory authorities.

Please contact me at 503-947-6228 or by email at greg.d.apke@state.or.us if you have any questions regarding the content of these fish passage approvals.

Sincerely,

Greg Apke
ODFW Statewide Fish Passage Program Coordinator

Cc:
Nigel Sidel, ODFW East Region Energy Coordinator
Nick Myatt, ODFW La Grande Watershed Manager
Tim Bailey, ODFW La Grande Watershed District Biologist
David Banks, ODFW Malheur Watershed District Biologist
Alan Ritchey, ODFW Screens and Passage Program Manager
Ken Loffink, ODFW Assistant Fish Passage Program Coordinator
Maxwell Woods, Oregon Department of Energy Siting Analyst
Jon Germond, ODFW Land Resources Program Manager
Project Files (PA-09-0016 through PA-09-0021)

APPENDIX B
ODFW FISH PASSAGE PLANS

OREGON DEPARTMENT OF FISH AND WILDLIFE

Fish Passage Plan for a Road-Stream Crossing

- *If you unlock and re-lock this Form, information already entered may be lost in certain versions of MS Word.*
- *If your project includes multiple crossings, please complete this form for each crossing.*

APPLICANT INFORMATION

APPLICANT: Zach Funkhouser **TITLE:**
ORGANIZATION: IDAHO POWER COMPANY
ADDRESS: 1221 W Idaho Street
CITY: Boise **STATE:** ID **ZIP:** 83702
PHONE: (877) 339-0209
FAX:
E-MAIL ADDRESS: ZFunkhouser@idahopower.com

SIGNATURE: _____ **DATE:** _____

AUTHORIZED AGENT (*if any*)**:** Chris James **TITLE:** Hydrologist
ORGANIZATION: Tetra Tech, Inc.
ADDRESS: 3380 Americana Terrace, Suite 201
CITY: Boise **STATE:** ID **ZIP:** 83706
PHONE: (503) 358-7079
FAX:
E-MAIL ADDRESS: Chris.James@tetratech.com

SIGNATURE: _____ **DATE:** _____

OWNER (*if different than Applicant*)**:** **TITLE:**
ORGANIZATION:
ADDRESS:
CITY: **STATE:** **ZIP:**
PHONE:
FAX:
E-MAIL ADDRESS:

SIGNATURE: _____ **DATE:** _____

LOCATION

- **COUNTY** ..... Union
- **ROAD** ..... Private (Morgan Lake Road)
- **RIVER/STREAM** ..... Little Rock Creek, B2H SITE R-33010
- **TRIBUTARY OF** ..... Snake River
- **BASIN** ..... Rock Creek (HUC 170601040306)
- **COORDINATES** [a] ..... Longitude: -118. 179387°W Latitude: 45.293739°N
- **LEGAL DESCRIPTION** ..... ¼ / ¼: NW/NW
  Section: 22 Tax Map #: 03S37E
  Township: 03S Tax Lot #: ROADS
  Range: 37E

[a] *geographic projection using NAD_83 and formatted as decimal degrees to at least 4 places*

STREAM CROSSING INFORMATION

Please indicate measurement units where applicable and see footnotes for supporting descriptions of the information requested.

NEW CROSSING	☐
REPLACEMENT OF EXISTING CROSSING	☐
MODIFICATION OF EXISTING CROSSING	☒

EXISTING CROSSING	• **TYPE/SHAPE** [b]	Washed-out bridge crossing along private road.
	• **MATERIAL** [c]	Native bed material (sand/silt/clay, sand, cobble, boulder).
	• **LENGTH**	Ford span = 19 feet (washed-out bridge, wetted stream width)
	• **INSIDE DIAMETER** (*if round*)	N/A
	OR	
	INSIDE RISE (Height) **AND**	N/A
	INSIDE SPAN (Width)	N/A
	• **CULVERT SLOPE**	N/A
	• **DOES IT CONTROL AN UPSTREAM POND, WETLAND, BACKWATER AREA, OR WATER RIGHT?** [d]	Yes ☐ No ☒
STREAM	• **AVERAGE UPSTREAM ACW** [e,f]	19 feet
	• **AVERAGE DOWNSTREAM ACW** [e,f]	19 feet
	• **UPSTREAM SLOPE** [g]	3%
	• **DOWNSTREAM SLOPE** [g]	2%
	• **DESCRIBE STREAMBED MATERIAL**	Bedrock = 0%, Boulder = 25%, Cobble = 40%, Gravel = 25%, Sand/Silt/Clay = 10%
	• **SIZE OF D_{100} ROCK** [h]	3 inches, estimated from photographs and field surveys.
PROPOSED CROSSING	• **TYPE/SHAPE** [b]	Temporary bridge, 38 feet long x 13 feet wide.
	• **MATERIAL** [c]	Steel, wood decking.
	• **LENGTH**	38 feet (see drawings for details).
	• **INSIDE DIAMETER** (*if round*)	N/A
	OR	
	INSIDE RISE (Height) **AND**	0.5 foot above the 2-year storm event.
	INSIDE SPAN (Width)	34 feet
	• **CULVERT SLOPE**	N/A
	• **BED HEIGHT – INLET** [i,j]	N/A
	• **BED HEIGHT – OUTLET** [i,k]	N/A
	• **BED SLOPE** [i]	2.5% at crossing. No change over existing bed slope.
	• **BED MATERIAL** [i] (*describe and/or fill in %s*)	No change in bed material (see streambed materials description above).
	% FINES (*dirt, silt, sand*)	
	% SMALL ROCK (*½-6" diameter*)	
	% LARGE ROCK (*6"-D_{100}*) [h]	
	% OVER-SIZED ROCK (*D_{150}-D_{200}*) [h]	
	• **BED PLACEMENT METHOD** [i]	Streambed to be left intact.
	• **BED RETENTION MEASURES** [i]	None proposed.
	• **GRADE CONTROL MEASURES** [l]	None proposed.
	• **ADDITIONAL STRUCTURES** [m]	None proposed.
CONSTRUCTION	• **DATE WORK WILL BEGIN**	

	• **DATE WORK WILL BE COMPLETED** ..	
	• **DETAILS** [n]	All work is expected to be outside of the bankfull width. Isolation and fish salvage are not anticipated. Any work within the wetted area will occur within the ODFW designated in-water work window. Bridge may be removed during high-flow periods. No seasonal restrictions on use would occur if the bridge is in place. Effective erosion control measures and sediment barriers for the road approaches such as silt fence, fiber rolls, or equivalent will be placed downgradient of construction area to capture dislodged sediment.
MAINTENANCE	• **WILL THE CROSSING BE INSPECTED FOR DEBRIS AND BED RETENTION (WITHIN, BELOW, AND ABOVE THE CROSSING) AT LEAST ANNUALLY AND AFTER STORM EVENTS?**	Yes ☒ No ☐
	• **IF NEEDED, WILL REMEDIAL MEASURES BE TAKEN AS SOON AS POSSIBLE?**	Yes ☒ No ☐

[b] *e.g., bridge, open-bottomed arch, pipe arch/squashed, round, rectangular*

[c] *e.g., reinforced concrete, concrete, wood, plastic, corrugated metal, metal*

[d] *if "Yes", explain how these will be addressed in a separate attachment*

[e] *"ACW" is the active channel width, which is the stream width between the ordinary high water lines, or at the channel bankfull elevation if the ordinary high water lines are indeterminate; ordinary high water lines are not the same as the wetted width and are typically determined by changes on the bank in vegetation, changes in sediment size and/or color, water lines on the bank, trees, or leaves, or the point where debris (e.g., needles, leaves, twigs, cones) accumulation begins*

[f] *3 measurements 20 feet apart should be averaged; begin measurements approximately 10 ACWs from the inlet (upstream) or outlet (downstream) of the crossing if this distance is outside of the influence of existing artificial obstructions and prior to adjoining tributaries as you move away from the crossing (if not, take measures at locations which fulfill these requirements); indicate measurement locations on the* **Profile Design Drawing**

[g] *take measurements away from the crossing and at the point where ACW measurement begins*

[h] *D_{100} is the average diameter of the 10 largest, naturally-occurring rocks in the stream reach; $D_{150} = D_{100} \times 1.5$; $D_{200} = D_{100} \times 2$*

[i] *"bed" refers to the stream bed within or under the crossing structure*

[j] *depth of fill material or countersinking/embedding (excluding protruding over-sized rock) at the crossing's inlet*

[k] *depth of fill material or countersinking/embedding (excluding protruding over-sized rock) at the crossing's outlet*

[l] *these are measures outside of the crossing structure intended to prevent up- or downstream channel degradation, especially important to consider in locations where an existing smaller culvert is being replaced and there is the potential for upstream channel degradation (i.e., a "headcut") and associated off-site property or passage problems*

[m] *e.g., bed retention measures, weirs, baffles, trash racks, aprons, retaining walls, overflow pipes, channel restoration/scour remediation measures*

[n] *unless already described in an accompanying Department of State Lands Removal-Fill Application, include a description of a) temporary downstream passage, upstream passage, screening, and bypass measures, b) worksite isolation measures, c) fish salvage (note: an ODFW Fish Take Permit may be necessary), d) sediment and erosion control measures, and e) site restoration measures. For more details on Oregon Fill Removal Law see the Oregon Division of State Lands Removal-Fill Guide at* http://oregonstatelands.us/DSL/PERMITS/rfg.shtml .

ADDITIONAL INFORMATION

*Provide this information **only if** the bed within the proposed crossing is not as wide as the active channel width or will not be embedded.*

	High Design Flow [o]	Low Design Flow [p]
Flow [q] (cfs)		
Water Depth in Crossing (in.)		
Water Velocity in Crossing (fps)		
Water Drop [r] at Inlet (in.)		
Water Drop [r] at Outlet (in.)		
Pool Depth Below Outlet (in.)		
Water Drop [r] at Weirs/Baffles (in.)		
Pool Depth Below Weirs/Baffles (in.)		
Depth of Nappe [s] at Weirs/Baffles (in.)		

[o] *High Design Flow is the mean daily average stream discharge that is exceeded 5 percent of the time during the period when ODFW determines that native migratory fish require fish passage*

[p] *Low Design Flow is the mean daily average stream discharge that is exceeded 95 percent of the time, excluding days with no flow, during the period when ODFW determines that native migratory fish require fish passage*

[q] *attach a description of the methodology, calculations, and assumptions used to determine the high and low design flows*

[r] *drop should be measured from the upstream water surface elevation to the downstream water surface elevation*

[s] *the nappe is the water flowing over weirs/baffles*

DESIGN DRAWINGS

Please attach the following design drawings with the specified information on them.

☒ -- **PLAN**, including:
- active channel (i.e., ordinary high water or bankfull lines)
- existing crossing and additional structures
- proposed crossing and additional structures
- dimensions

☒ -- **PROFILE**, including:
- existing grade (measured at the deepest part of the stream channel from 10 ACWs downstream of the outlet [i.e., downstream end of crossing] to 10 ACWs upstream of the inlet [i.e., upstream end of crossing], at 5-foot intervals), including road
- existing crossing and additional structures
- proposed grade (measured at the deepest part of the stream channel from 10 ACWs downstream of the outlet to 10 ACWs upstream of the inlet, at 5-foot intervals), including road
- proposed crossing, bed, and additional structures
- dimensions
- location of **STREAM CHANNEL CROSS-SECTIONS** (see below), *ACW* measurements, and *Slope* measurements
- water surface elevations at high and low design flows for the proposed crossing, **if** the proposed crossing will not be as wide as the active channel width or will not be embedded

☒ -- **CROSS-SECTION OF PROPOSED CROSSING**, including bed details

☐ -- **STREAM CHANNEL CROSS-SECTIONS** *(2 cross-sections total, with one located downstream where the ACW measurements begin and one located upstream where the ACW measurements begin; measurements should be taken at 1-foot intervals perpendicular to the flow of the stream and should encompass the entire active channel plus 0.5 ACW on each side of the stream [for a total cross-section measurement of 2 x ACW]; measurements may be taken with survey equipment or by measuring the distance from a level line to the bottom of the streambed or ground)*

☐ -- **DETAILS OF ADDITIONAL STRUCTURES** *(e.g., grade control measures, bed retention measures, weirs/baffles, trash racks, aprons, retaining walls, overflow pipes, channel restoration/scour remediation measures)*

Please submit this application along with project design plans to the appropriate ODFW District Fish Biologist for the crossing's location. The Complete application can also be sent electronically to the ODFW Fish Passage Coordinator at greg.d.apke@state.or.us and send one signed original paper copy of the application to the ODFW Fish Passage Coordinator at 3406 Cherry Avenue NE, Salem, OR 97303.

• ODFW will use the following criteria to determine the level of review required.

For ODFW Use Only

	YES	NO	N/A
1. Is the bed within the crossing as wide as the active channel:	☐	☐	
2. Is the bed within the culvert at the same slope, and at grades continuous with, the surrounding stream:	☐	☐	
3a. If the crossing is open-bottomed, is there 3 feet of vertical clearance between the active channel width elevation and the inside top of the crossing:	☐	☐	☐
OR			
3b. If the crossing is closed-bottomed, will bed depth within the culvert be 20-50% of the crossing height:	☐	☐	☐
4. Is the bed material that will be used sufficient to assure water depth will be similar to that in the surrounding stream (i.e., will not go sub-surface prematurely):	☐	☐	
5. Are the bed material or retention measures that will be used sufficient to assure that the bed will be maintained through time:	☐	☐	
6. If the crossing is longer than 40 feet, will partially-buried, over-sized rock be placed within the crossing's bed:	☐	☐	☐
7. Will the bed within the crossing be placed during construction:	☐	☐	
8. If trash racks are present, are they above the active channel width elevation and do vertical bars have at least 9 inches of clear space between them:	☐	☐	☐
9. If there is an upstream pond, wetland, or backwater area, has its desired state after construction been determined, and have these considerations been addressed in the design:	☐	☐	☐
10. Are upstream grade control measures satisfactory:	☐	☐	
11. Are the construction timing and measures adequate based on the location:	☐	☐	
12. Are there plans to maintain the crossing:	☐	☐	

- If all answers are "Yes" or "Not Applicable", this plan is eligible for approval by an ODFW biologist.
- If any answer is "No" or there are other concerns, consult with the Fish Passage Coordinator.

APPLICATION IDENTIFIER:
DATE RECEIVED:

APPROVED ☐ **SIGNATURE:** _____ **DATE:** _____

DENIED ☐ **TITLE:**

CONDITIONS:

OREGON DEPARTMENT OF FISH AND WILDLIFE

Fish Passage Plan for a Road-Stream Crossing

- *If you unlock and re-lock this Form, information already entered may be lost in certain versions of MS Word.*
- *If your project includes multiple crossings, please complete this form for each crossing.*

APPLICANT INFORMATION

APPLICANT: Zach Funkhouser **TITLE:**
ORGANIZATION: IDAHO POWER COMPANY
ADDRESS: 1221 W Idaho Street
CITY: Boise **STATE:** ID **ZIP:** 83702
PHONE: (877) 339-0209
FAX:
E-MAIL ADDRESS: ZFunkhouser@idahopower.com

SIGNATURE: _____ **DATE:** _____

AUTHORIZED AGENT (*if any*)**:** Chris James **TITLE:** Hydrologist
ORGANIZATION: Tetra Tech, Inc.
ADDRESS: 3380 Americana Terrace, Suite 201
CITY: Boise **STATE:** ID **ZIP:** 83706
PHONE: (503) 358-7079
FAX:
E-MAIL ADDRESS: Chris.James@tetratech.com

SIGNATURE: _____ **DATE:** _____

OWNER (*if different than Applicant*)**:** **TITLE:**
ORGANIZATION:
ADDRESS:
CITY: **STATE:** **ZIP:**
PHONE:
FAX:
E-MAIL ADDRESS:

SIGNATURE: _____ **DATE:** _____

LOCATION

- **COUNTY** ..... Union
- **ROAD** ..... Private (Morgan Lake Road)
- **RIVER/STREAM** ..... Rock Creek, B2H SITE R-33011
- **TRIBUTARY OF** ..... Snake River
- **BASIN** ..... Rock Creek (HUC 170601040306)
- **COORDINATES** [a] ..... Longitude: -118. 178634°W Latitude: 45.294196°N
- **LEGAL DESCRIPTION** ..... ¼ / ¼: NW/NW
  Section: 22 Tax Map #: 03S37E
  Township: 3S Tax Lot #: ROADS
  Range: 37E

[a] *geographic projection using NAD_83 and formatted as decimal degrees to at least 4 places*

STREAM CROSSING INFORMATION

Please indicate measurement units where applicable and see footnotes for supporting descriptions of the information requested.

NEW CROSSING ☐
REPLACEMENT OF EXISTING CROSSING ☐
MODIFICATION OF EXISTING CROSSING ☒

EXISTING CROSSING	• **TYPE/SHAPE** [b]	Washed-out bridge crossing along private road.
	• **MATERIAL** [c]	Native bed material (sand/silt/clay, sand, cobble, boulder).
	• **LENGTH**	Ford span = 19 feet (washed-out bridge, wetted stream width)
	• **INSIDE DIAMETER** (*if round*)	N/A
	OR	
	INSIDE RISE (Height) **AND**	N/A
	INSIDE SPAN (Width)	N/A
	• **CULVERT SLOPE**	N/A
	• **DOES IT CONTROL AN UPSTREAM POND, WETLAND, BACKWATER AREA, OR WATER RIGHT?** [d]	Yes ☐ No ☒
STREAM	• **AVERAGE UPSTREAM ACW** [e,f]	20 feet
	• **AVERAGE DOWNSTREAM ACW** [e,f]	20 feet
	• **UPSTREAM SLOPE** [g]	2%
	• **DOWNSTREAM SLOPE** [g]	2%
	• **DESCRIBE STREAMBED MATERIAL**	Bedrock = 0%, Boulder = 25%, Cobble = 40%, Gravel = 25%, Sand/Silt/Clay = 10%
	• **SIZE OF D_{100} ROCK** [h]	3 inches, estimated from photographs and field surveys.
PROPOSED CROSSING	• **TYPE/SHAPE** [b]	Temporary bridge, 38 feet long x 13 feet wide.
	• **MATERIAL** [c]	Steel, wood decking.
	• **LENGTH**	38 feet (see drawings for details).
	• **INSIDE DIAMETER** (*if round*)	N/A
	OR	
	INSIDE RISE (Height) **AND**	0.5 foot above the 2-year storm event.
	INSIDE SPAN (Width)	34 feet
	• **CULVERT SLOPE**	N/A
	• **BED HEIGHT – INLET** [i,j]	N/A
	• **BED HEIGHT – OUTLET** [i,k]	N/A
	• **BED SLOPE** [i]	2% at crossing. No change over existing bed slope.
	• **BED MATERIAL** [i] (*describe and/or fill in %s*)	No change in bed material (see streambed materials description above).
	% FINES (*dirt, silt, sand*)	
	% SMALL ROCK (*½-6" diameter*)	
	% LARGE ROCK (*6"-D_{100}*) [h]	
	% OVER-SIZED ROCK (D_{150}-D_{200}) [h]	
	• **BED PLACEMENT METHOD** [i]	Streambed to be left intact.
	• **BED RETENTION MEASURES** [i]	None proposed.
	• **GRADE CONTROL MEASURES** [l]	None proposed.
	• **ADDITIONAL STRUCTURES** [m]	None proposed.
CONSTRUCTION	• **DATE WORK WILL BEGIN**	

	• **DATE WORK WILL BE COMPLETED** ..	
	• **DETAILS** [n]	All work is expected to be outside of the bankfull width. Isolation and fish salvage are not anticipated. Any work within the wetted area will occur within the ODFW designated in-water work window. Bridge may be removed during high-flow periods. No seasonal restrictions on use would occur if the bridge is in place. Effective erosion control measures and sediment barriers for the road approaches such as silt fence, fiber rolls, or equivalent will be placed downgradient of construction area to capture dislodged sediment.
MAINTENANCE	• **WILL THE CROSSING BE INSPECTED FOR DEBRIS AND BED RETENTION (WITHIN, BELOW, AND ABOVE THE CROSSING) AT LEAST ANNUALLY AND AFTER STORM EVENTS?**	Yes ☒ No ☐
	• **IF NEEDED, WILL REMEDIAL MEASURES BE TAKEN AS SOON AS POSSIBLE?**	Yes ☒ No ☐

[b] *e.g., bridge, open-bottomed arch, pipe arch/squashed, round, rectangular*

[c] *e.g., reinforced concrete, concrete, wood, plastic, corrugated metal, metal*

[d] *if "Yes", explain how these will be addressed in a separate attachment*

[e] *"ACW" is the active channel width, which is the stream width between the ordinary high water lines, or at the channel bankfull elevation if the ordinary high water lines are indeterminate; ordinary high water lines are not the same as the wetted width and are typically determined by changes on the bank in vegetation, changes in sediment size and/or color, water lines on the bank, trees, or leaves, or the point where debris (e.g., needles, leaves, twigs, cones) accumulation begins*

[f] *3 measurements 20 feet apart should be averaged; begin measurements approximately 10 ACWs from the inlet (upstream) or outlet (downstream) of the crossing if this distance is outside of the influence of existing artificial obstructions and prior to adjoining tributaries as you move away from the crossing (if not, take measures at locations which fulfill these requirements); indicate measurement locations on the* **Profile Design Drawing**

[g] *take measurements away from the crossing and at the point where ACW measurement begins*

[h] *D_{100} is the average diameter of the 10 largest, naturally-occurring rocks in the stream reach; $D_{150} = D_{100} \times 1.5$; $D_{200} = D_{100} \times 2$*

[i] *"bed" refers to the stream bed within or under the crossing structure*

[j] *depth of fill material or countersinking/embedding (excluding protruding over-sized rock) at the crossing's inlet*

[k] *depth of fill material or countersinking/embedding (excluding protruding over-sized rock) at the crossing's outlet*

[l] *these are measures outside of the crossing structure intended to prevent up- or downstream channel degradation, especially important to consider in locations where an existing smaller culvert is being replaced and there is the potential for upstream channel degradation (i.e., a "headcut") and associated off-site property or passage problems*

[m] *e.g., bed retention measures, weirs, baffles, trash racks, aprons, retaining walls, overflow pipes, channel restoration/scour remediation measures*

[n] *unless already described in an accompanying Department of State Lands Removal-Fill Application, include a description of a) temporary downstream passage, upstream passage, screening, and bypass measures, b) worksite isolation measures, c) fish salvage (note: an ODFW Fish Take Permit may be necessary), d) sediment and erosion control measures, and e) site restoration measures. For more details on Oregon Fill Removal Law see the Oregon Division of State Lands Removal-Fill Guide at* http://oregonstatelands.us/DSL/PERMITS/rfg.shtml .

ADDITIONAL INFORMATION

*Provide this information **only if** the bed within the proposed crossing is not as wide as the active channel width or will not be embedded.*

	High Design Flow [o]	Low Design Flow [p]
Flow [q] (cfs)		
Water Depth in Crossing (in.)		
Water Velocity in Crossing (fps)		
Water Drop [r] at Inlet (in.)		
Water Drop [r] at Outlet (in.)		
Pool Depth Below Outlet (in.)		
Water Drop [r] at Weirs/Baffles (in.)		
Pool Depth Below Weirs/Baffles (in.)		
Depth of Nappe [s] at Weirs/Baffles (in.)		

[o] *High Design Flow is the mean daily average stream discharge that is exceeded 5 percent of the time during the period when ODFW determines that native migratory fish require fish passage*

[p] *Low Design Flow is the mean daily average stream discharge that is exceeded 95 percent of the time, excluding days with no flow, during the period when ODFW determines that native migratory fish require fish passage*

[q] *attach a description of the methodology, calculations, and assumptions used to determine the high and low design flows*

[r] *drop should be measured from the upstream water surface elevation to the downstream water surface elevation*

[s] *the nappe is the water flowing over weirs/baffles*

DESIGN DRAWINGS

Please attach the following design drawings with the specified information on them.

☒ -- **PLAN**, including:
- active channel (i.e., ordinary high water or bankfull lines)
- existing crossing and additional structures
- proposed crossing and additional structures
- dimensions

☒ -- **PROFILE**, including:
- existing grade (measured at the deepest part of the stream channel from 10 ACWs downstream of the outlet [i.e., downstream end of crossing] to 10 ACWs upstream of the inlet [i.e., upstream end of crossing], at 5-foot intervals), including road
- existing crossing and additional structures
- proposed grade (measured at the deepest part of the stream channel from 10 ACWs downstream of the outlet to 10 ACWs upstream of the inlet, at 5-foot intervals), including road
- proposed crossing, bed, and additional structures
- dimensions
- location of **STREAM CHANNEL CROSS-SECTIONS** (see below), *ACW* measurements, and *Slope* measurements
- water surface elevations at high and low design flows for the proposed crossing, **if** the proposed crossing will not be as wide as the active channel width or will not be embedded

☒ -- **CROSS-SECTION OF PROPOSED CROSSING**, including bed details

☐ -- **STREAM CHANNEL CROSS-SECTIONS** *(2 cross-sections total, with one located downstream where the ACW measurements begin and one located upstream where the ACW measurements begin; measurements should be taken at 1-foot intervals perpendicular to the flow of the stream and should encompass the entire active channel plus 0.5 ACW on each side of the stream [for a total cross-section measurement of 2 x ACW]; measurements may be taken with survey equipment or by measuring the distance from a level line to the bottom of the streambed or ground)*

☐ -- **DETAILS OF ADDITIONAL STRUCTURES** *(e.g., grade control measures, bed retention measures, weirs/baffles, trash racks, aprons, retaining walls, overflow pipes, channel restoration/scour remediation measures)*

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• ODFW will use the following criteria to determine the level of review required.

For ODFW Use Only

	YES	NO	N/A
1. Is the bed within the crossing as wide as the active channel:	☐	☐	
2. Is the bed within the culvert at the same slope, and at grades continuous with, the surrounding stream:	☐	☐	
3a. If the crossing is open-bottomed, is there 3 feet of vertical clearance between the active channel width elevation and the inside top of the crossing:	☐	☐	☐
OR			
3b. If the crossing is closed-bottomed, will bed depth within the culvert be 20-50% of the crossing height:	☐	☐	☐
4. Is the bed material that will be used sufficient to assure water depth will be similar to that in the surrounding stream (i.e., will not go sub-surface prematurely):	☐	☐	
5. Are the bed material or retention measures that will be used sufficient to assure that the bed will be maintained through time:	☐	☐	
6. If the crossing is longer than 40 feet, will partially-buried, over-sized rock be placed within the crossing's bed:	☐	☐	☐
7. Will the bed within the crossing be placed during construction:	☐	☐	
8. If trash racks are present, are they above the active channel width elevation and do vertical bars have at least 9 inches of clear space between them:	☐	☐	☐
9. If there is an upstream pond, wetland, or backwater area, has its desired state after construction been determined, and have these considerations been addressed in the design:	☐	☐	☐
10. Are upstream grade control measures satisfactory:	☐	☐	
11. Are the construction timing and measures adequate based on the location:	☐	☐	
12. Are there plans to maintain the crossing:	☐	☐	

- If all answers are "Yes" or "Not Applicable", this plan is eligible for approval by an ODFW biologist.
- If any answer is "No" or there are other concerns, consult with the Fish Passage Coordinator.

APPLICATION IDENTIFIER:
DATE RECEIVED:

APPROVED ☐ **SIGNATURE:** _____ **DATE:** _____

DENIED ☐ **TITLE:**

CONDITIONS:

OREGON DEPARTMENT OF FISH AND WILDLIFE

Fish Passage Plan for a Road-Stream Crossing

- *If you unlock and re-lock this Form, information already entered may be lost in certain versions of MS Word.*
- *If your project includes multiple crossings, please complete this form for each crossing.*

APPLICANT INFORMATION

APPLICANT: Zach Funkhouser **TITLE:**
ORGANIZATION: IDAHO POWER COMPANY
ADDRESS: 1221 W Idaho Street
CITY: Boise **STATE:** ID **ZIP:** 83702
PHONE: (877) 339-0209
FAX:
E-MAIL ADDRESS: ZFunkhouser@idahopower.com

SIGNATURE: _____ **DATE:** _____

AUTHORIZED AGENT (*if any*)**:** Chris James **TITLE:** Hydrologist
ORGANIZATION: Tetra Tech, Inc.
ADDRESS: 3380 Americana Terrace, Suite 201
CITY: Boise **STATE:** ID **ZIP:** 83706
PHONE: (503) 358-7079
FAX:
E-MAIL ADDRESS: Chris.James@tetratech.com

SIGNATURE: _____ **DATE:** _____

OWNER (*if different than Applicant*)**:** **TITLE:**
ORGANIZATION:
ADDRESS:
CITY: **STATE:** **ZIP:**
PHONE:
FAX:
E-MAIL ADDRESS:

SIGNATURE: _____ **DATE:** _____

LOCATION

- **COUNTY** ..... Union
- **ROAD** ..... Private (Morgan Lake Road)
- **RIVER/STREAM** ..... Rock Creek, B2H SITE R-33033
- **TRIBUTARY OF** ..... Snake River
- **BASIN** ..... Rock Creek (HUC 170601040306)
- **COORDINATES** [a] ..... Longitude: -118. 176842°W Latitude: 45.294338°N
- **LEGAL DESCRIPTION** ..... ¼ / ¼: NW/NW
  Section: 22 Tax Map #: 03S37E
  Township: 3S Tax Lot #: ROADS
  Range: 37E

[a] *geographic projection using NAD_83 and formatted as decimal degrees to at least 4 places*

STREAM CROSSING INFORMATION

Please indicate measurement units where applicable and see footnotes for supporting descriptions of the information requested.

NEW CROSSING ☐
REPLACEMENT OF EXISTING CROSSING ☐
MODIFICATION OF EXISTING CROSSING ☒

EXISTING CROSSING	• **TYPE/SHAPE** [b]	Washed-out bridge crossing along private road.
	• **MATERIAL** [c]	Native bed material (sand/silt/clay, sand, cobble, boulder).
	• **LENGTH**	crossing span = 20 feet (washed-out bridge, wetted stream width)
	• **INSIDE DIAMETER** (*if round*)	N/A
	OR	
	INSIDE RISE (Height) **AND**	N/A
	INSIDE SPAN (Width)	N/A
	• **CULVERT SLOPE**	N/A
	• **DOES IT CONTROL AN UPSTREAM POND, WETLAND, BACKWATER AREA, OR WATER RIGHT?** [d]	Yes ☐ No ☒
STREAM	• **AVERAGE UPSTREAM ACW** [e,f]	20 feet
	• **AVERAGE DOWNSTREAM ACW** [e,f]	20 feet
	• **UPSTREAM SLOPE** [g]	2%
	• **DOWNSTREAM SLOPE** [g]	2%
	• **DESCRIBE STREAMBED MATERIAL**	Bedrock = 0%, Boulder = 25%, Cobble = 40%, Gravel = 25%, Sand/Silt/Clay = 10%
	• **SIZE OF D_{100} ROCK** [h]	3 inches, estimated from photographs and field surveys.
PROPOSED CROSSING	• **TYPE/SHAPE** [b]	Temporary bridge, 38 feet long x 13 feet wide.
	• **MATERIAL** [c]	Steel, wood decking.
	• **LENGTH**	38 feet (see drawings for details).
	• **INSIDE DIAMETER** (*if round*)	N/A
	OR	
	INSIDE RISE (Height) **AND**	0.5 foot above the 2-year storm event.
	INSIDE SPAN (Width)	34 feet
	• **CULVERT SLOPE**	N/A
	• **BED HEIGHT – INLET** [i,j]	N/A
	• **BED HEIGHT – OUTLET** [i,k]	N/A
	• **BED SLOPE** [i]	2% at crossing. No change over existing bed slope.
	• **BED MATERIAL** [i] (*describe and/or fill in %s*)	No change in bed material (see streambed materials description above).
	% FINES (*dirt, silt, sand*)	
	% SMALL ROCK (*½-6" diameter*)	
	% LARGE ROCK (*6"-D_{100}*) [h]	
	% OVER-SIZED ROCK (D_{150}-D_{200}) [h]	
	• **BED PLACEMENT METHOD** [i]	Streambed to be left intact.
	• **BED RETENTION MEASURES** [i]	None proposed.
	• **GRADE CONTROL MEASURES** [l]	None proposed.
	• **ADDITIONAL STRUCTURES** [m]	None proposed.
CONSTRUCTION	• **DATE WORK WILL BEGIN**	

	• **DATE WORK WILL BE COMPLETED** ..	
	• **DETAILS** [n]	All work is expected to be outside of the bankfull width. Isolation and fish salvage are not anticipated. Any work within the wetted area will occur within the ODFW designated in-water work window. Bridge may be removed during high-flow periods. No seasonal restrictions on use would occur if the bridge is in place. Effective erosion control measures and sediment barriers for the road approaches such as silt fence, fiber rolls, or equivalent will be placed downgradient of construction area to capture dislodged sediment.
MAINTENANCE	• **WILL THE CROSSING BE INSPECTED FOR DEBRIS AND BED RETENTION (WITHIN, BELOW, AND ABOVE THE CROSSING) AT LEAST ANNUALLY AND AFTER STORM EVENTS?**	Yes ☒ No ☐
	• **IF NEEDED, WILL REMEDIAL MEASURES BE TAKEN AS SOON AS POSSIBLE?**	Yes ☒ No ☐

[b] *e.g., bridge, open-bottomed arch, pipe arch/squashed, round, rectangular*

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[f] *3 measurements 20 feet apart should be averaged; begin measurements approximately 10 ACWs from the inlet (upstream) or outlet (downstream) of the crossing if this distance is outside of the influence of existing artificial obstructions and prior to adjoining tributaries as you move away from the crossing (if not, take measures at locations which fulfill these requirements); indicate measurement locations on the* **Profile Design Drawing**

[g] *take measurements away from the crossing and at the point where ACW measurement begins*

[h] *D_{100} is the average diameter of the 10 largest, naturally-occurring rocks in the stream reach; $D_{150} = D_{100} \times 1.5$; $D_{200} = D_{100} \times 2$*

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[j] *depth of fill material or countersinking/embedding (excluding protruding over-sized rock) at the crossing's inlet*

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[m] *e.g., bed retention measures, weirs, baffles, trash racks, aprons, retaining walls, overflow pipes, channel restoration/scour remediation measures*

[n] *unless already described in an accompanying Department of State Lands Removal-Fill Application, include a description of a) temporary downstream passage, upstream passage, screening, and bypass measures, b) worksite isolation measures, c) fish salvage (note: an ODFW Fish Take Permit may be necessary), d) sediment and erosion control measures, and e) site restoration measures. For more details on Oregon Fill Removal Law see the Oregon Division of State Lands Removal-Fill Guide at* http://oregonstatelands.us/DSL/PERMITS/rfg.shtml .

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*Provide this information **only if** the bed within the proposed crossing is not as wide as the active channel width or will not be embedded.*

	High Design Flow [o]	Low Design Flow [p]
Flow [q] (cfs)		
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Water Velocity in Crossing (fps)		
Water Drop [r] at Inlet (in.)		
Water Drop [r] at Outlet (in.)		
Pool Depth Below Outlet (in.)		
Water Drop [r] at Weirs/Baffles (in.)		
Pool Depth Below Weirs/Baffles (in.)		
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[o] *High Design Flow is the mean daily average stream discharge that is exceeded 5 percent of the time during the period when ODFW determines that native migratory fish require fish passage*

[p] *Low Design Flow is the mean daily average stream discharge that is exceeded 95 percent of the time, excluding days with no flow, during the period when ODFW determines that native migratory fish require fish passage*

[q] *attach a description of the methodology, calculations, and assumptions used to determine the high and low design flows*

[r] *drop should be measured from the upstream water surface elevation to the downstream water surface elevation*

[s] *the nappe is the water flowing over weirs/baffles*

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Please attach the following design drawings with the specified information on them.

☒ -- **PLAN**, including:
- active channel (i.e., ordinary high water or bankfull lines)
- existing crossing and additional structures
- proposed crossing and additional structures
- dimensions

☒ -- **PROFILE**, including:
- existing grade (measured at the deepest part of the stream channel from 10 ACWs downstream of the outlet [i.e., downstream end of crossing] to 10 ACWs upstream of the inlet [i.e., upstream end of crossing], at 5-foot intervals), including road
- existing crossing and additional structures
- proposed grade (measured at the deepest part of the stream channel from 10 ACWs downstream of the outlet to 10 ACWs upstream of the inlet, at 5-foot intervals), including road
- proposed crossing, bed, and additional structures
- dimensions
- location of **STREAM CHANNEL CROSS-SECTIONS** (see below), *ACW* measurements, and *Slope* measurements
- water surface elevations at high and low design flows for the proposed crossing, **if** the proposed crossing will not be as wide as the active channel width or will not be embedded

☒ -- **CROSS-SECTION OF PROPOSED CROSSING**, including bed details

☐ -- **STREAM CHANNEL CROSS-SECTIONS** *(2 cross-sections total, with one located downstream where the ACW measurements begin and one located upstream where the ACW measurements begin; measurements should be taken at 1-foot intervals perpendicular to the flow of the stream and should encompass the entire active channel plus 0.5 ACW on each side of the stream [for a total cross-section measurement of 2 x ACW]; measurements may be taken with survey equipment or by measuring the distance from a level line to the bottom of the streambed or ground)*

☐ -- **DETAILS OF ADDITIONAL STRUCTURES** *(e.g., grade control measures, bed retention measures, weirs/baffles, trash racks, aprons, retaining walls, overflow pipes, channel restoration/scour remediation measures)*

Please submit this application along with project design plans to the appropriate ODFW District Fish Biologist for the crossing's location. The Complete application can also be sent electronically to the ODFW Fish Passage Coordinator at greg.d.apke@state.or.us and send one signed original paper copy of the application to the ODFW Fish Passage Coordinator at 3406 Cherry Avenue NE, Salem, OR 97303.

• *ODFW will use the following criteria to determine the level of review required.*

For ODFW Use Only

	YES	NO	N/A
1. Is the bed within the crossing as wide as the active channel:	☐	☐	
2. Is the bed within the culvert at the same slope, and at grades continuous with, the surrounding stream:	☐	☐	
3a. If the crossing is open-bottomed, is there 3 feet of vertical clearance between the active channel width elevation and the inside top of the crossing:	☐	☐	☐
OR			
3b. If the crossing is closed-bottomed, will bed depth within the culvert be 20-50% of the crossing height:	☐	☐	☐
4. Is the bed material that will be used sufficient to assure water depth will be similar to that in the surrounding stream (i.e., will not go sub-surface prematurely):	☐	☐	
5. Are the bed material or retention measures that will be used sufficient to assure that the bed will be maintained through time:	☐	☐	
6. If the crossing is longer than 40 feet, will partially-buried, over-sized rock be placed within the crossing's bed:	☐	☐	☐
7. Will the bed within the crossing be placed during construction:	☐	☐	
8. If trash racks are present, are they above the active channel width elevation and do vertical bars have at least 9 inches of clear space between them:	☐	☐	☐
9. If there is an upstream pond, wetland, or backwater area, has its desired state after construction been determined, and have these considerations been addressed in the design:	☐	☐	☐
10. Are upstream grade control measures satisfactory:	☐	☐	
11. Are the construction timing and measures adequate based on the location:	☐	☐	
12. Are there plans to maintain the crossing:	☐	☐	

- If all answers are "Yes" or "Not Applicable", this plan is eligible for approval by an ODFW biologist.
- If any answer is "No" or there are other concerns, consult with the Fish Passage Coordinator.

APPLICATION IDENTIFIER:
DATE RECEIVED:

APPROVED ☐ **SIGNATURE:** _____ **DATE:** _____

DENIED ☐ **TITLE:**

CONDITIONS:

OREGON DEPARTMENT OF FISH AND WILDLIFE

Fish Passage Plan for a Road-Stream Crossing

- *If you unlock and re-lock this Form, information already entered may be lost in certain versions of MS Word.*
- *If your project includes multiple crossings, please complete this form for each crossing.*

APPLICANT INFORMATION

APPLICANT: Zach Funkhouser **TITLE:**
ORGANIZATION: IDAHO POWER COMPANY
ADDRESS: 1221 W Idaho Street
CITY: Boise **STATE:** ID **ZIP:** 83702
PHONE: (877) 339-0209
FAX:
E-MAIL ADDRESS: ZFunkhouser@idahopower.com

SIGNATURE: _____ **DATE:** _____

AUTHORIZED AGENT (*if any*)**:** Chris James **TITLE:** Hydrologist
ORGANIZATION: Tetra Tech, Inc.
ADDRESS: 3380 Americana Terrace, Suite 201
CITY: Boise **STATE:** ID **ZIP:** 83706
PHONE: (503) 358-7079
FAX:
E-MAIL ADDRESS: Chris.James@tetratech.com

SIGNATURE: _____ **DATE:** _____

OWNER (*if different than Applicant*)**:** **TITLE:**
ORGANIZATION:
ADDRESS:
CITY: **STATE:** **ZIP:**
PHONE:
FAX:
E-MAIL ADDRESS:

SIGNATURE: _____ **DATE:** _____

LOCATION

- **COUNTY** ..... Union
- **ROAD** ..... Private (Morgan Lake Road)
- **RIVER/STREAM** ..... Rock Creek, B2H SITE R-33147
- **TRIBUTARY OF** ..... Snake River
- **BASIN** ..... Rock Creek (HUC 170601040306)
- **COORDINATES** [a] ..... Longitude: -118. 172486°W Latitude: 45.2920548°N
- **LEGAL DESCRIPTION** ..... ¼ / ¼: NW/NW
  Section: 22 Tax Map #: 03S37E
  Township: 3S Tax Lot #: ROADS
  Range: 37E

[a] *geographic projection using NAD_83 and formatted as decimal degrees to at least 4 places*

STREAM CROSSING INFORMATION

Please indicate measurement units where applicable and see footnotes for supporting descriptions of the information requested.

NEW CROSSING ☐
REPLACEMENT OF EXISTING CROSSING ☐
MODIFICATION OF EXISTING CROSSING ☒

EXISTING CROSSING	• **TYPE/SHAPE** [b]	Washed-out bridge crossing along private road.
	• **MATERIAL** [c]	Native bed material (sand/silt/clay, sand, cobble, boulder).
	• **LENGTH**	crossing span = 20 feet (washed-out bridge, wetted stream width)
	• **INSIDE DIAMETER** (*if round*)	N/A
	OR	
	INSIDE RISE (Height) **AND**	N/A
	INSIDE SPAN (Width)	N/A
	• **CULVERT SLOPE**	N/A
	• **DOES IT CONTROL AN UPSTREAM POND, WETLAND, BACKWATER AREA, OR WATER RIGHT?** [d]	Yes ☐ No ☒
STREAM	• **AVERAGE UPSTREAM ACW** [e,f]	20 feet
	• **AVERAGE DOWNSTREAM ACW** [e,f]	20 feet
	• **UPSTREAM SLOPE** [g]	2%
	• **DOWNSTREAM SLOPE** [g]	2%
	• **DESCRIBE STREAMBED MATERIAL**	Bedrock = 0%, Boulder = 30%, Cobble = 40%, Gravel = 20%, Sand/Silt/Clay = 10%
	• **SIZE OF D_{100} ROCK** [h]	3 inches, estimated from photographs and field surveys.
PROPOSED CROSSING	• **TYPE/SHAPE** [b]	Temporary bridge, 38 feet long x 13 feet wide.
	• **MATERIAL** [c]	Steel, wood decking.
	• **LENGTH**	38 feet (see drawings for details).
	• **INSIDE DIAMETER** (*if round*)	N/A
	OR	
	INSIDE RISE (Height) **AND**	0.5 foot above the 2-year storm event.
	INSIDE SPAN (Width)	34 feet
	• **CULVERT SLOPE**	N/A
	• **BED HEIGHT – INLET** [i,j]	N/A
	• **BED HEIGHT – OUTLET** [i,k]	N/A
	• **BED SLOPE** [i]	2% at crossing. No change over existing bed slope.
	• **BED MATERIAL** [i] (*describe and/or fill in %s*)	No change in bed material (see streambed materials description above).
	% FINES (*dirt, silt, sand*)	
	% SMALL ROCK (*½-6" diameter*)	
	% LARGE ROCK (*6"-D_{100}*) [h]	
	% OVER-SIZED ROCK (*D_{150}-D_{200}*) [h]	
	• **BED PLACEMENT METHOD** [i]	Streambed to be left intact.
	• **BED RETENTION MEASURES** [i]	None proposed.
	• **GRADE CONTROL MEASURES** [l]	None proposed.
	• **ADDITIONAL STRUCTURES** [m]	None proposed.
CONSTRUCTION	• **DATE WORK WILL BEGIN**	

	• **DATE WORK WILL BE COMPLETED** ..	
	• **DETAILS** [n]	All work is expected to be outside of the bankfull width. Isolation and fish salvage are not anticipated. Any work within the wetted area will occur within the ODFW designated in-water work window. Bridge may be removed during high-flow periods. No seasonal restrictions on use would occur if the bridge is in place. Effective erosion control measures and sediment barriers for the road approaches such as silt fence, fiber rolls, or equivalent will be placed downgradient of construction area to capture dislodged sediment.
MAINTENANCE	• **WILL THE CROSSING BE INSPECTED FOR DEBRIS AND BED RETENTION (WITHIN, BELOW, AND ABOVE THE CROSSING) AT LEAST ANNUALLY AND AFTER STORM EVENTS?**	Yes ☒ No ☐
	• **IF NEEDED, WILL REMEDIAL MEASURES BE TAKEN AS SOON AS POSSIBLE?**	Yes ☒ No ☐

[b] *e.g., bridge, open-bottomed arch, pipe arch/squashed, round, rectangular*

[c] *e.g., reinforced concrete, concrete, wood, plastic, corrugated metal, metal*

[d] *if "Yes", explain how these will be addressed in a separate attachment*

[e] *"ACW" is the active channel width, which is the stream width between the ordinary high water lines, or at the channel bankfull elevation if the ordinary high water lines are indeterminate; ordinary high water lines are not the same as the wetted width and are typically determined by changes on the bank in vegetation, changes in sediment size and/or color, water lines on the bank, trees, or leaves, or the point where debris (e.g., needles, leaves, twigs, cones) accumulation begins*

[f] *3 measurements 20 feet apart should be averaged; begin measurements approximately 10 ACWs from the inlet (upstream) or outlet (downstream) of the crossing if this distance is outside of the influence of existing artificial obstructions and prior to adjoining tributaries as you move away from the crossing (if not, take measures at locations which fulfill these requirements); indicate measurement locations on the* **Profile Design Drawing**

[g] *take measurements away from the crossing and at the point where ACW measurement begins*

[h] *D_{100} is the average diameter of the 10 largest, naturally-occurring rocks in the stream reach; $D_{150} = D_{100} \times 1.5$; $D_{200} = D_{100} \times 2$*

[i] *"bed" refers to the stream bed within or under the crossing structure*

[j] *depth of fill material or countersinking/embedding (excluding protruding over-sized rock) at the crossing's inlet*

[k] *depth of fill material or countersinking/embedding (excluding protruding over-sized rock) at the crossing's outlet*

[l] *these are measures outside of the crossing structure intended to prevent up- or downstream channel degradation, especially important to consider in locations where an existing smaller culvert is being replaced and there is the potential for upstream channel degradation (i.e., a "headcut") and associated off-site property or passage problems*

[m] *e.g., bed retention measures, weirs, baffles, trash racks, aprons, retaining walls, overflow pipes, channel restoration/scour remediation measures*

[n] *unless already described in an accompanying Department of State Lands Removal-Fill Application, include a description of a) temporary downstream passage, upstream passage, screening, and bypass measures, b) worksite isolation measures, c) fish salvage (note: an ODFW Fish Take Permit may be necessary), d) sediment and erosion control measures, and e) site restoration measures. For more details on Oregon Fill Removal Law see the Oregon Division of State Lands Removal-Fill Guide at* http://oregonstatelands.us/DSL/PERMITS/rfg.shtml .

ADDITIONAL INFORMATION

*Provide this information **only if** the bed within the proposed crossing is not as wide as the active channel width or will not be embedded.*

	High Design Flow [o]	Low Design Flow [p]
Flow [q] (cfs)		
Water Depth in Crossing (in.)		
Water Velocity in Crossing (fps)		
Water Drop [r] at Inlet (in.)		
Water Drop [r] at Outlet (in.)		
Pool Depth Below Outlet (in.)		
Water Drop [r] at Weirs/Baffles (in.)		
Pool Depth Below Weirs/Baffles (in.)		
Depth of Nappe [s] at Weirs/Baffles (in.)		

[o] *High Design Flow is the mean daily average stream discharge that is exceeded 5 percent of the time during the period when ODFW determines that native migratory fish require fish passage*

[p] *Low Design Flow is the mean daily average stream discharge that is exceeded 95 percent of the time, excluding days with no flow, during the period when ODFW determines that native migratory fish require fish passage*

[q] *attach a description of the methodology, calculations, and assumptions used to determine the high and low design flows*

[r] *drop should be measured from the upstream water surface elevation to the downstream water surface elevation*

[s] *the nappe is the water flowing over weirs/baffles*

DESIGN DRAWINGS

Please attach the following design drawings with the specified information on them.

☒ -- **PLAN**, including:
- active channel (i.e., ordinary high water or bankfull lines)
- existing crossing and additional structures
- proposed crossing and additional structures
- dimensions

☒ -- **PROFILE**, including:
- existing grade (measured at the deepest part of the stream channel from 10 ACWs downstream of the outlet [i.e., downstream end of crossing] to 10 ACWs upstream of the inlet [i.e., upstream end of crossing], at 5-foot intervals), including road
- existing crossing and additional structures
- proposed grade (measured at the deepest part of the stream channel from 10 ACWs downstream of the outlet to 10 ACWs upstream of the inlet, at 5-foot intervals), including road
- proposed crossing, bed, and additional structures
- dimensions
- location of **STREAM CHANNEL CROSS-SECTIONS** (see below), *ACW* measurements, and *Slope* measurements
- water surface elevations at high and low design flows for the proposed crossing, **if** the proposed crossing will not be as wide as the active channel width or will not be embedded

☒ -- **CROSS-SECTION OF PROPOSED CROSSING**, including bed details

☐ -- **STREAM CHANNEL CROSS-SECTIONS** *(2 cross-sections total, with one located downstream where the ACW measurements begin and one located upstream where the ACW measurements begin; measurements should be taken at 1-foot intervals perpendicular to the flow of the stream and should encompass the entire active channel plus 0.5 ACW on each side of the stream [for a total cross-section measurement of 2 x ACW]; measurements may be taken with survey equipment or by measuring the distance from a level line to the bottom of the streambed or ground)*

☐ -- **DETAILS OF ADDITIONAL STRUCTURES** *(e.g., grade control measures, bed retention measures, weirs/baffles, trash racks, aprons, retaining walls, overflow pipes, channel restoration/scour remediation measures)*

Please submit this application along with project design plans to the appropriate ODFW District Fish Biologist for the crossing's location. The Complete application can also be sent electronically to the ODFW Fish Passage Coordinator at greg.d.apke@state.or.us and send one signed original paper copy of the application to the ODFW Fish Passage Coordinator at 3406 Cherry Avenue NE, Salem, OR 97303.

• ODFW will use the following criteria to determine the level of review required.

For ODFW Use Only

	YES	NO	N/A
1. Is the bed within the crossing as wide as the active channel:	☐	☐	
2. Is the bed within the culvert at the same slope, and at grades continuous with, the surrounding stream:	☐	☐	
3a. If the crossing is open-bottomed, is there 3 feet of vertical clearance between the active channel width elevation and the inside top of the crossing:	☐	☐	☐
OR			
3b. If the crossing is closed-bottomed, will bed depth within the culvert be 20-50% of the crossing height:	☐	☐	☐
4. Is the bed material that will be used sufficient to assure water depth will be similar to that in the surrounding stream (i.e., will not go sub-surface prematurely):	☐	☐	
5. Are the bed material or retention measures that will be used sufficient to assure that the bed will be maintained through time:	☐	☐	
6. If the crossing is longer than 40 feet, will partially-buried, over-sized rock be placed within the crossing's bed:	☐	☐	☐
7. Will the bed within the crossing be placed during construction:	☐	☐	
8. If trash racks are present, are they above the active channel width elevation and do vertical bars have at least 9 inches of clear space between them:	☐	☐	☐
9. If there is an upstream pond, wetland, or backwater area, has its desired state after construction been determined, and have these considerations been addressed in the design:	☐	☐	☐
10. Are upstream grade control measures satisfactory:	☐	☐	
11. Are the construction timing and measures adequate based on the location:	☐	☐	
12. Are there plans to maintain the crossing:	☐	☐	

- If all answers are "Yes" or "Not Applicable", this plan is eligible for approval by an ODFW biologist.
- If any answer is "No" or there are other concerns, consult with the Fish Passage Coordinator.

APPLICATION IDENTIFIER:
DATE RECEIVED:

APPROVED ☐ **SIGNATURE:** _____ **DATE:** _____

DENIED ☐ **TITLE:**

CONDITIONS:

OREGON DEPARTMENT OF FISH AND WILDLIFE

Fish Passage Plan for a Road-Stream Crossing

- *If you unlock and re-lock this Form, information already entered may be lost in certain versions of MS Word.*
- *If your project includes multiple crossings, please complete this form for each crossing.*

APPLICANT INFORMATION

APPLICANT: Zach Funkhouser **TITLE:**
ORGANIZATION: IDAHO POWER COMPANY
ADDRESS: 1221 W Idaho Street
CITY: Boise **STATE:** ID **ZIP:** 83702
PHONE: (877) 339-0209
FAX:
E-MAIL ADDRESS: ZFunkhouser@idahopower.com

SIGNATURE: _____ **DATE:** _____

AUTHORIZED AGENT (*if any*)**:** Chris James **TITLE:** Hydrologist
ORGANIZATION: Tetra Tech, Inc.
ADDRESS: 3380 Americana Terrace, Suite 201
CITY: Boise **STATE:** ID **ZIP:** 83706
PHONE: (503) 358-7079
FAX:
E-MAIL ADDRESS: Chris.James@tetratech.com

SIGNATURE: _____ **DATE:** _____

OWNER (*if different than Applicant*)**:** **TITLE:**
ORGANIZATION:
ADDRESS:
CITY: **STATE:** **ZIP:**
PHONE:
FAX:
E-MAIL ADDRESS:

SIGNATURE: _____ **DATE:** _____

LOCATION

- **COUNTY** ..... Union
- **ROAD** ..... Private (Morgan Lake Road)
- **RIVER/STREAM** ..... Goodman, B2H SITE R-65725
- **TRIBUTARY OF** ..... Snake River
- **BASIN** ..... Burnt River (HUC 170502020808)
- **COORDINATES** [a] ..... Longitude: -118. 172486°W Latitude: 45.2920548°N
- **LEGAL DESCRIPTION** ..... ¼ / ¼: NW/NW
  Section: 33 Tax Map #: 13S44E
  Township: 13S Tax Lot #: ROADS
  Range: 44E

[a] *geographic projection using NAD_83 and formatted as decimal degrees to at least 4 places*

STREAM CROSSING INFORMATION

Please indicate measurement units where applicable and see footnotes for supporting descriptions of the information requested.

NEW CROSSING ☐
REPLACEMENT OF EXISTING CROSSING ☐
MODIFICATION OF EXISTING CROSSING ☒

EXISTING CROSSING	• **TYPE/SHAPE** [b]	Unimproved existing ford.
	• **MATERIAL** [c]	Native bed material (sand, gravel).
	• **LENGTH**	Crossing span = 12 feet (existing ford)
	• **INSIDE DIAMETER** (*if round*)	N/A
	OR	
	INSIDE RISE (Height) **AND**	N/A
	INSIDE SPAN (Width)	N/A
	• **CULVERT SLOPE**	N/A
	• **DOES IT CONTROL AN UPSTREAM POND, WETLAND, BACKWATER AREA, OR WATER RIGHT?** [d]	Yes ☐ No ☒
STREAM	• **AVERAGE UPSTREAM ACW** [e,f]	8 feet
	• **AVERAGE DOWNSTREAM ACW** [e,f]	8 feet
	• **UPSTREAM SLOPE** [g]	5%
	• **DOWNSTREAM SLOPE** [g]	9%
	• **DESCRIBE STREAMBED MATERIAL**	Bedrock = 0%, Boulder = 0%, Cobble = 0%, Gravel = 20%, Sand/Silt/Clay = 80%
	• **SIZE OF D_{100} ROCK** [h]	3 inches, estimated from photographs and field surveys.
PROPOSED CROSSING	• **TYPE/SHAPE** [b]	Temporary bridge, 53 feet long x 13 feet wide.
	• **MATERIAL** [c]	Steel, wood decking.
	• **LENGTH**	53 feet (see drawings for details).
	• **INSIDE DIAMETER** (*if round*)	N/A
	OR	
	INSIDE RISE (Height) **AND**	1.5 feet above the 2-year storm event.
	INSIDE SPAN (Width)	30 feet
	• **CULVERT SLOPE**	N/A
	• **BED HEIGHT – INLET** [i,j]	N/A
	• **BED HEIGHT – OUTLET** [i,k]	N/A
	• **BED SLOPE** [i]	2% at crossing. No change over existing bed slope.
	• **BED MATERIAL** [i] (*describe and/or fill in %s*)	No change in bed material (see streambed materials description above).
	% FINES (*dirt, silt, sand*)	
	% SMALL ROCK (*¼-6" diameter*)	
	% LARGE ROCK (*6"-D_{100}*) [h]	
	% OVER-SIZED ROCK (D_{150}-D_{200}) [h]	
	• **BED PLACEMENT METHOD** [i]	Streambed to be left intact.
	• **BED RETENTION MEASURES** [i]	None proposed.
	• **GRADE CONTROL MEASURES** [l]	None proposed.
	• **ADDITIONAL STRUCTURES** [m]	None proposed.
CONSTRUCTION	• **DATE WORK WILL BEGIN**	

	• **DATE WORK WILL BE COMPLETED** ..	
	• **DETAILS** [n]	All work is expected to be outside of the bankfull width Isolation and fish salvage are not anticipated. Any work within the wetted area will occur within the ODFW designated in-water work window. Bridge may be removed during high-flow periods. No seasonal restrictions on use would occur if the bridge is in place. Effective erosion control measures and sediment barriers for the road approaches such as Silt Fence, Fiber Rolls, or Equivalent will be placed downgradient of construction area to capture dislodged sediment.
MAINTENANCE	• **WILL THE CROSSING BE INSPECTED FOR DEBRIS AND BED RETENTION (WITHIN, BELOW, AND ABOVE THE CROSSING) AT LEAST ANNUALLY AND AFTER STORM EVENTS?**	Yes ☒ No ☐
	• **IF NEEDED, WILL REMEDIAL MEASURES BE TAKEN AS SOON AS POSSIBLE?**	Yes ☒ No ☐

[b] *e.g., bridge, open-bottomed arch, pipe arch/squashed, round, rectangular*

[c] *e.g., reinforced concrete, concrete, wood, plastic, corrugated metal, metal*

[d] *if "Yes", explain how these will be addressed in a separate attachment*

[e] *"ACW" is the active channel width, which is the stream width between the ordinary high water lines, or at the channel bankfull elevation if the ordinary high water lines are indeterminate; ordinary high water lines are not the same as the wetted width and are typically determined by changes on the bank in vegetation, changes in sediment size and/or color, water lines on the bank, trees, or leaves, or the point where debris (e.g., needles, leaves, twigs, cones) accumulation begins*

[f] *3 measurements 20 feet apart should be averaged; begin measurements approximately 10 ACWs from the inlet (upstream) or outlet (downstream) of the crossing if this distance is outside of the influence of existing artificial obstructions and prior to adjoining tributaries as you move away from the crossing (if not, take measures at locations which fulfill these requirements); indicate measurement locations on the* **Profile Design Drawing**

[g] *take measurements away from the crossing and at the point where ACW measurement begins*

[h] *D_{100} is the average diameter of the 10 largest, naturally-occurring rocks in the stream reach; $D_{150} = D_{100} \times 1.5$; $D_{200} = D_{100} \times 2$*

[i] *"bed" refers to the stream bed within or under the crossing structure*

[j] *depth of fill material or countersinking/embedding (excluding protruding over-sized rock) at the crossing's inlet*

[k] *depth of fill material or countersinking/embedding (excluding protruding over-sized rock) at the crossing's outlet*

[l] *these are measures outside of the crossing structure intended to prevent up- or downstream channel degradation, especially important to consider in locations where an existing smaller culvert is being replaced and there is the potential for upstream channel degradation (i.e., a "headcut") and associated off-site property or passage problems*

[m] *e.g., bed retention measures, weirs, baffles, trash racks, aprons, retaining walls, overflow pipes, channel restoration/scour remediation measures*

[n] *unless already described in an accompanying Department of State Lands Removal-Fill Application, include a description of a) temporary downstream passage, upstream passage, screening, and bypass measures, b) worksite isolation measures, c) fish salvage (note: an ODFW Fish Take Permit may be necessary), d) sediment and erosion control measures, and e) site restoration measures. For more details on Oregon Fill Removal Law see the Oregon Division of State Lands Removal-Fill Guide at* http://oregonstatelands.us/DSL/PERMITS/rfg.shtml .

ADDITIONAL INFORMATION

*Provide this information **only if** the bed within the proposed crossing is not as wide as the active channel width or will not be embedded.*

	High Design Flow [o]	Low Design Flow [p]
Flow [q] (cfs)		
Water Depth in Crossing (in.)		
Water Velocity in Crossing (fps)		
Water Drop [r] at Inlet (in.)		
Water Drop [r] at Outlet (in.)		
Pool Depth Below Outlet (in.)		
Water Drop [r] at Weirs/Baffles (in.)		
Pool Depth Below Weirs/Baffles (in.)		
Depth of Nappe [s] at Weirs/Baffles (in.)		

[o] *High Design Flow is the mean daily average stream discharge that is exceeded 5 percent of the time during the period when ODFW determines that native migratory fish require fish passage*

[p] *Low Design Flow is the mean daily average stream discharge that is exceeded 95 percent of the time, excluding days with no flow, during the period when ODFW determines that native migratory fish require fish passage*

[q] *attach a description of the methodology, calculations, and assumptions used to determine the high and low design flows*

[r] *drop should be measured from the upstream water surface elevation to the downstream water surface elevation*

[s] *the nappe is the water flowing over weirs/baffles*

DESIGN DRAWINGS

Please attach the following design drawings with the specified information on them.

☒ -- **PLAN**, including:
- active channel (i.e., ordinary high water or bankfull lines)
- existing crossing and additional structures
- proposed crossing and additional structures
- dimensions

☒ -- **PROFILE**, including:
- existing grade (measured at the deepest part of the stream channel from 10 ACWs downstream of the outlet [i.e., downstream end of crossing] to 10 ACWs upstream of the inlet [i.e., upstream end of crossing], at 5-foot intervals), including road
- existing crossing and additional structures
- proposed grade (measured at the deepest part of the stream channel from 10 ACWs downstream of the outlet to 10 ACWs upstream of the inlet, at 5-foot intervals), including road
- proposed crossing, bed, and additional structures
- dimensions
- location of **STREAM CHANNEL CROSS-SECTIONS** (see below), *ACW* measurements, and *Slope* measurements
- water surface elevations at high and low design flows for the proposed crossing, **if** the proposed crossing will not be as wide as the active channel width or will not be embedded

☒ -- **CROSS-SECTION OF PROPOSED CROSSING**, including bed details

☐ -- **STREAM CHANNEL CROSS-SECTIONS** *(2 cross-sections total, with one located downstream where the ACW measurements begin and one located upstream where the ACW measurements begin; measurements should be taken at 1-foot intervals perpendicular to the flow of the stream and should encompass the entire active channel plus 0.5 ACW on each side of the stream [for a total cross-section measurement of 2 x ACW]; measurements may be taken with survey equipment or by measuring the distance from a level line to the bottom of the streambed or ground)*

☐ -- **DETAILS OF ADDITIONAL STRUCTURES** *(e.g., grade control measures, bed retention measures, weirs/baffles, trash racks, aprons, retaining walls, overflow pipes, channel restoration/scour remediation measures)*

Please submit this application along with project design plans to the appropriate ODFW District Fish Biologist for the crossing's location. The Complete application can also be sent electronically to the ODFW Fish Passage Coordinator at greg.d.apke@state.or.us and send one signed original paper copy of the application to the ODFW Fish Passage Coordinator at 3406 Cherry Avenue NE, Salem, OR 97303.

• *ODFW will use the following criteria to determine the level of review required.*

For ODFW Use Only

	YES	NO	N/A
1. Is the bed within the crossing as wide as the active channel:	☐	☐	
2. Is the bed within the culvert at the same slope, and at grades continuous with, the surrounding stream:	☐	☐	
3a. If the crossing is open-bottomed, is there 3 feet of vertical clearance between the active channel width elevation and the inside top of the crossing:	☐	☐	☐
OR			
3b. If the crossing is closed-bottomed, will bed depth within the culvert be 20-50% of the crossing height:	☐	☐	☐
4. Is the bed material that will be used sufficient to assure water depth will be similar to that in the surrounding stream (i.e., will not go sub-surface prematurely):	☐	☐	
5. Are the bed material or retention measures that will be used sufficient to assure that the bed will be maintained through time:	☐	☐	
6. If the crossing is longer than 40 feet, will partially-buried, over-sized rock be placed within the crossing's bed:	☐	☐	☐
7. Will the bed within the crossing be placed during construction:	☐	☐	
8. If trash racks are present, are they above the active channel width elevation and do vertical bars have at least 9 inches of clear space between them:	☐	☐	☐
9. If there is an upstream pond, wetland, or backwater area, has its desired state after construction been determined, and have these considerations been addressed in the design:	☐	☐	☐
10. Are upstream grade control measures satisfactory:	☐	☐	
11. Are the construction timing and measures adequate based on the location:	☐	☐	
12. Are there plans to maintain the crossing:	☐	☐	

- If all answers are "Yes" or "Not Applicable", this plan is eligible for approval by an ODFW biologist.
- If any answer is "No" or there are other concerns, consult with the Fish Passage Coordinator.

APPLICATION IDENTIFIER:
DATE RECEIVED:

APPROVED ☐ **SIGNATURE:** _____ **DATE:** _____

DENIED ☐ **TITLE:**

CONDITIONS:

OREGON DEPARTMENT OF FISH AND WILDLIFE

Fish Passage Plan for a Road-Stream Crossing

- *If you unlock and re-lock this Form, information already entered may be lost in certain versions of MS Word.*
- *If your project includes multiple crossings, please complete this form for each crossing.*

APPLICANT INFORMATION

APPLICANT: Zach Funkhouser **TITLE:**
ORGANIZATION: IDAHO POWER COMPANY
ADDRESS: 1221 W Idaho Street
CITY: Boise **STATE:** ID **ZIP:** 83702
PHONE: (877) 339-0209
FAX:
E-MAIL ADDRESS: ZFunkhouser@idahopower.com

SIGNATURE: _____ **DATE:** _____

AUTHORIZED AGENT (*if any*)**:** Chris James **TITLE:** Hydrologist
ORGANIZATION: Tetra Tech, Inc.
ADDRESS: 3380 Americana Terrace, Suite 201
CITY: Boise **STATE:** ID **ZIP:** 83706
PHONE: (503) 358-7079
FAX:
E-MAIL ADDRESS: Chris.James@tetratech.com

SIGNATURE: _____ **DATE:** _____

OWNER (*if different than Applicant*)**:** **TITLE:**
ORGANIZATION:
ADDRESS:
CITY: **STATE:** **ZIP:**
PHONE:
FAX:
E-MAIL ADDRESS:

SIGNATURE: _____ **DATE:** _____

LOCATION

- **COUNTY** ..... Baker
- **ROAD** ..... Cavanaugh Creek Road
- **RIVER/STREAM** ..... Cavanaugh Creek, B2H SITE R-66818
- **TRIBUTARY OF** ..... Snake River
- **BASIN** ..... Burnt River (HUC 170502020809)
- **COORDINATES** [a] ..... Longitude: -117. 304958°W Latitude: 44.3734541°N
- **LEGAL DESCRIPTION** ..... ¼ / ¼: NW/NW
  Section: 33 Tax Map #: 13S44E
  Township: 13S Tax Lot #: ROADS
  Range: 44E

[a] *geographic projection using NAD_83 and formatted as decimal degrees to at least 4 places*

STREAM CROSSING INFORMATION

Please indicate measurement units where applicable and see footnotes for supporting descriptions of the information requested.

NEW CROSSING ☐
REPLACEMENT OF EXISTING CROSSING ☐
MODIFICATION OF EXISTING CROSSING ☒

EXISTING CROSSING	• **TYPE/SHAPE** [b]	Unimproved existing ford.
	• **MATERIAL** [c]	Native bed material (sand, gravel).
	• **LENGTH**	Crossing span = 12 feet (existing ford)
	• **INSIDE DIAMETER** (*if round*)	N/A
	OR	
	INSIDE RISE (Height) **AND**	N/A
	INSIDE SPAN (Width)	N/A
	• **CULVERT SLOPE**	N/A
	• **DOES IT CONTROL AN UPSTREAM POND, WETLAND, BACKWATER AREA, OR WATER RIGHT?** [d]	Yes ☐ No ☒
STREAM	• **AVERAGE UPSTREAM ACW** [e,f]	8 feet
	• **AVERAGE DOWNSTREAM ACW** [e,f]	8 feet
	• **UPSTREAM SLOPE** [g]	4%
	• **DOWNSTREAM SLOPE** [g]	12%
	• **DESCRIBE STREAMBED MATERIAL**	Bedrock = 0%, Boulder = 5%, Cobble = 5%, Gravel = 30%, Sand/Silt/Clay = 60%
	• **SIZE OF D_{100} ROCK** [h]	3 inches, estimated from photographs and field surveys.
PROPOSED CROSSING	• **TYPE/SHAPE** [b]	Temporary bridge, 53 feet long x 13 feet wide.
	• **MATERIAL** [c]	Steel, wood decking.
	• **LENGTH**	53 feet (see drawings for details).
	• **INSIDE DIAMETER** (*if round*)	N/A
	OR	
	INSIDE RISE (Height) **AND**	0.5 foot above the 2-year storm event.
	INSIDE SPAN (Width)	49 feet
	• **CULVERT SLOPE**	N/A
	• **BED HEIGHT – INLET** [i,j]	N/A
	• **BED HEIGHT – OUTLET** [i,k]	N/A
	• **BED SLOPE** [i]	2% at crossing. No change over existing bed slope.
	• **BED MATERIAL** [i] (*describe and/or fill in %s*)	No change in bed material (see streambed materials description above).
	% FINES (*dirt, silt, sand*)	
	% SMALL ROCK (*½-6" diameter*)	
	% LARGE ROCK (*6"-D_{100}*) [h]	
	% OVER-SIZED ROCK (D_{150}-D_{200}) [h]	
	• **BED PLACEMENT METHOD** [i]	Streambed to be left intact.
	• **BED RETENTION MEASURES** [i]	None proposed.
	• **GRADE CONTROL MEASURES** [l]	None proposed.
	• **ADDITIONAL STRUCTURES** [m]	None proposed.
CONSTRUCTION	• **DATE WORK WILL BEGIN**	

	• **DATE WORK WILL BE COMPLETED** ..	
	• **DETAILS** [n]	All work is expected to be outside of the bankfull width. Isolation and fish salvage are not anticipated. Any work within the wetted area will occur within the ODFW designated in-water work window. Bridge may be removed during high-flow periods. No seasonal restrictions on use would occur if the bridge is in place. Effective erosion control measures and sediment barriers for the road approaches such as silt fence, fiber rolls, or equivalent will be placed downgradient of construction area to capture dislodged sediment.
MAINTENANCE	• **WILL THE CROSSING BE INSPECTED FOR DEBRIS AND BED RETENTION (WITHIN, BELOW, AND ABOVE THE CROSSING) AT LEAST ANNUALLY AND AFTER STORM EVENTS?**	Yes ☒ No ☐
	• **IF NEEDED, WILL REMEDIAL MEASURES BE TAKEN AS SOON AS POSSIBLE?**	Yes ☒ No ☐

[b] *e.g., bridge, open-bottomed arch, pipe arch/squashed, round, rectangular*

[c] *e.g., reinforced concrete, concrete, wood, plastic, corrugated metal, metal*

[d] *if "Yes", explain how these will be addressed in a separate attachment*

[e] *"ACW" is the active channel width, which is the stream width between the ordinary high water lines, or at the channel bankfull elevation if the ordinary high water lines are indeterminate; ordinary high water lines are not the same as the wetted width and are typically determined by changes on the bank in vegetation, changes in sediment size and/or color, water lines on the bank, trees, or leaves, or the point where debris (e.g., needles, leaves, twigs, cones) accumulation begins*

[f] *3 measurements 20 feet apart should be averaged; begin measurements approximately 10 ACWs from the inlet (upstream) or outlet (downstream) of the crossing if this distance is outside of the influence of existing artificial obstructions and prior to adjoining tributaries as you move away from the crossing (if not, take measures at locations which fulfill these requirements); indicate measurement locations on the* **Profile Design Drawing**

[g] *take measurements away from the crossing and at the point where ACW measurement begins*

[h] *D_{100} is the average diameter of the 10 largest, naturally-occurring rocks in the stream reach; $D_{150} = D_{100} \times 1.5$; $D_{200} = D_{100} \times 2$*

[i] *"bed" refers to the stream bed within or under the crossing structure*

[j] *depth of fill material or countersinking/embedding (excluding protruding over-sized rock) at the crossing's inlet*

[k] *depth of fill material or countersinking/embedding (excluding protruding over-sized rock) at the crossing's outlet*

[l] *these are measures outside of the crossing structure intended to prevent up- or downstream channel degradation, especially important to consider in locations where an existing smaller culvert is being replaced and there is the potential for upstream channel degradation (i.e., a "headcut") and associated off-site property or passage problems*

[m] *e.g., bed retention measures, weirs, baffles, trash racks, aprons, retaining walls, overflow pipes, channel restoration/scour remediation measures*

[n] *unless already described in an accompanying Department of State Lands Removal-Fill Application, include a description of a) temporary downstream passage, upstream passage, screening, and bypass measures, b) worksite isolation measures, c) fish salvage (note: an ODFW Fish Take Permit may be necessary), d) sediment and erosion control measures, and e) site restoration measures. For more details on Oregon Fill Removal Law see the Oregon Division of State Lands Removal-Fill Guide at* http://oregonstatelands.us/DSL/PERMITS/rfg.shtml .

ADDITIONAL INFORMATION

*Provide this information **only if** the bed within the proposed crossing is not as wide as the active channel width or will not be embedded.*

	High Design Flow [o]	Low Design Flow [p]
Flow [q] (cfs)		
Water Depth in Crossing (in.)		
Water Velocity in Crossing (fps)		
Water Drop [r] at Inlet (in.)		
Water Drop [r] at Outlet (in.)		
Pool Depth Below Outlet (in.)		
Water Drop [r] at Weirs/Baffles (in.)		
Pool Depth Below Weirs/Baffles (in.)		
Depth of Nappe [s] at Weirs/Baffles (in.)		

[o] *High Design Flow is the mean daily average stream discharge that is exceeded 5 percent of the time during the period when ODFW determines that native migratory fish require fish passage*

[p] *Low Design Flow is the mean daily average stream discharge that is exceeded 95 percent of the time, excluding days with no flow, during the period when ODFW determines that native migratory fish require fish passage*

[q] *attach a description of the methodology, calculations, and assumptions used to determine the high and low design flows*

[r] *drop should be measured from the upstream water surface elevation to the downstream water surface elevation*

[s] *the nappe is the water flowing over weirs/baffles*

DESIGN DRAWINGS

Please attach the following design drawings with the specified information on them.

☒ -- **PLAN**, including:
- active channel (i.e., ordinary high water or bankfull lines)
- existing crossing and additional structures
- proposed crossing and additional structures
- dimensions

☒ -- **PROFILE**, including:
- existing grade (measured at the deepest part of the stream channel from 10 ACWs downstream of the outlet [i.e., downstream end of crossing] to 10 ACWs upstream of the inlet [i.e., upstream end of crossing], at 5-foot intervals), including road
- existing crossing and additional structures
- proposed grade (measured at the deepest part of the stream channel from 10 ACWs downstream of the outlet to 10 ACWs upstream of the inlet, at 5-foot intervals), including road
- proposed crossing, bed, and additional structures
- dimensions
- location of **STREAM CHANNEL CROSS-SECTIONS** (see below), *ACW* measurements, and *Slope* measurements
- water surface elevations at high and low design flows for the proposed crossing, **if** the proposed crossing will not be as wide as the active channel width or will not be embedded

☒ -- **CROSS-SECTION OF PROPOSED CROSSING**, including bed details

☐ -- **STREAM CHANNEL CROSS-SECTIONS** *(2 cross-sections total, with one located downstream where the ACW measurements begin and one located upstream where the ACW measurements begin; measurements should be taken at 1-foot intervals perpendicular to the flow of the stream and should encompass the entire active channel plus 0.5 ACW on each side of the stream [for a total cross-section measurement of 2 x ACW]; measurements may be taken with survey equipment or by measuring the distance from a level line to the bottom of the streambed or ground)*

☐ -- **DETAILS OF ADDITIONAL STRUCTURES** *(e.g., grade control measures, bed retention measures, weirs/baffles, trash racks, aprons, retaining walls, overflow pipes, channel restoration/scour remediation measures)*

Please submit this application along with project design plans to the appropriate ODFW District Fish Biologist for the crossing's location. The Complete application can also be sent electronically to the ODFW Fish Passage Coordinator at greg.d.apke@state.or.us and send one signed original paper copy of the application to the ODFW Fish Passage Coordinator at 3406 Cherry Avenue NE, Salem, OR 97303.

• *ODFW will use the following criteria to determine the level of review required.*

For ODFW Use Only

	YES	NO	N/A
1. Is the bed within the crossing as wide as the active channel:	☐	☐	
2. Is the bed within the culvert at the same slope, and at grades continuous with, the surrounding stream:	☐	☐	
3a. If the crossing is open-bottomed, is there 3 feet of vertical clearance between the active channel width elevation and the inside top of the crossing:	☐	☐	☐
OR			
3b. If the crossing is closed-bottomed, will bed depth within the culvert be 20-50% of the crossing height:	☐	☐	☐
4. Is the bed material that will be used sufficient to assure water depth will be similar to that in the surrounding stream (i.e., will not go sub-surface prematurely):	☐	☐	
5. Are the bed material or retention measures that will be used sufficient to assure that the bed will be maintained through time:	☐	☐	
6. If the crossing is longer than 40 feet, will partially-buried, over-sized rock be placed within the crossing's bed:	☐	☐	☐
7. Will the bed within the crossing be placed during construction:	☐	☐	
8. If trash racks are present, are they above the active channel width elevation and do vertical bars have at least 9 inches of clear space between them:	☐	☐	☐
9. If there is an upstream pond, wetland, or backwater area, has its desired state after construction been determined, and have these considerations been addressed in the design:	☐	☐	☐
10. Are upstream grade control measures satisfactory:	☐	☐	
11. Are the construction timing and measures adequate based on the location:	☐	☐	
12. Are there plans to maintain the crossing:	☐	☐	

- If all answers are "Yes" or "Not Applicable", this plan is eligible for approval by an ODFW biologist.
- If any answer is "No" or there are other concerns, consult with the Fish Passage Coordinator.

APPLICATION IDENTIFIER:
DATE RECEIVED:

APPROVED ☐ **SIGNATURE:** _____ **DATE:** _____

DENIED ☐ **TITLE:**

CONDITIONS:

OREGON DEPARTMENT OF FISH AND WILDLIFE

Fish Passage Plan for a Road-Stream Crossing

- *If you unlock and re-lock this Form, information already entered may be lost in certain versions of MS Word.*
- *If your project includes multiple crossings, please complete this form for each crossing.*

APPLICANT INFORMATION

APPLICANT: Zach Funkhouser **TITLE:**
ORGANIZATION: IDAHO POWER COMPANY
ADDRESS: 1221 W Idaho Street
CITY: Boise **STATE:** ID **ZIP:** 83702
PHONE: (877) 339-0209
FAX:
E-MAIL ADDRESS: ZFunkhouser@idahopower.com

SIGNATURE: _____ **DATE:** _____

AUTHORIZED AGENT (*if any*)**:** Chris James **TITLE:** Hydrologist
ORGANIZATION: Tetra Tech, Inc.
ADDRESS: 3380 Americana Terrace, Suite 201
CITY: Boise **STATE:** ID **ZIP:** 83706
PHONE: (503) 358-7079
FAX:
E-MAIL ADDRESS: Chris.James@tetratech.com

SIGNATURE: _____ **DATE:** _____

OWNER (*if different than Applicant*)**:** **TITLE:**
ORGANIZATION:
ADDRESS:
CITY: **STATE:** **ZIP:**
PHONE:
FAX:
E-MAIL ADDRESS:

SIGNATURE: _____ **DATE:** _____

LOCATION

- **COUNTY** ..... Baker
- **ROAD** ..... Benson Creek Road
- **RIVER/STREAM** ..... Benson Creek, B2H SITE R-68790
- **TRIBUTARY OF** ..... Snake River
- **BASIN** ..... Benson Creek (HUC 170502010205)
- **COORDINATES** [a] ..... Longitude: -117.265213°W Latitude: 44.313367°N
- **LEGAL DESCRIPTION** ..... ¼ / ¼: NW/NW
  Section: 31 Tax Map #: 14S45E
  Township: 14S Tax Lot #: ROADS
  Range: 45E

[a] *geographic projection using NAD_83 and formatted as decimal degrees to at least 4 places*

STREAM CROSSING INFORMATION

Please indicate measurement units where applicable and see footnotes for supporting descriptions of the information requested.

NEW CROSSING ☐
REPLACEMENT OF EXISTING CROSSING ☐
MODIFICATION OF EXISTING CROSSING ☒

EXISTING CROSSING	• **TYPE/SHAPE** [b] ..... Existing ford along county road. • **MATERIAL** [c] ..... Native bed material (sand/silt/clay). • **LENGTH** ..... Ford span = 35 feet (shallow ford, wetted stream width) • **INSIDE DIAMETER** (*if round*) ..... N/A **OR** **INSIDE RISE** (Height) **AND** ..... N/A **INSIDE SPAN** (Width) ..... N/A • **CULVERT SLOPE** ..... N/A • **DOES IT CONTROL AN UPSTREAM POND, WETLAND, BACKWATER AREA, OR WATER RIGHT?** [d] ..... Yes ☐ No ☒
STREAM	• **AVERAGE UPSTREAM ACW** [e,f] ..... 18 feet • **AVERAGE DOWNSTREAM ACW** [e,f] ..... 18 feet • **UPSTREAM SLOPE** [g] ..... 1% • **DOWNSTREAM SLOPE** [g] ..... 1% • **DESCRIBE STREAMBED MATERIAL** ... Bedrock = 0%, Boulder = 0%, Cobble = 0%, Gravel = 5%, Sand/Silt/Clay = 95% • **SIZE OF D_{100} ROCK** [h] ..... 3 inches, estimated from photographs and field surveys.
PROPOSED CROSSING	• **TYPE/SHAPE** [b] ..... Temporary bridge, 53 feet long x 13 feet wide. • **MATERIAL** [c] ..... Steel, wood decking. • **LENGTH** ..... 53 feet (see drawings for details). • **INSIDE DIAMETER** (*if round*) ..... N/A **OR** **INSIDE RISE** (Height) **AND** ..... 0.5 foot above the 2-year storm event. **INSIDE SPAN** (Width) ..... 49 feet • **CULVERT SLOPE** ..... N/A • **BED HEIGHT – INLET** [i,j] ..... N/A • **BED HEIGHT – OUTLET** [i,k] ..... N/A • **BED SLOPE** [i] ..... 1% at crossing. No change over existing bed slope. • **BED MATERIAL** [i] (*describe and/or fill in %s*) . No change in bed material (see streambed materials description above). **% FINES** (*dirt, silt, sand*) ..... **% SMALL ROCK** (*¼-6" diameter*) ..... **% LARGE ROCK** (*6"-D_{100}*) [h] ..... **% OVER-SIZED ROCK** (D_{150}-D_{200}) [h] ... • **BED PLACEMENT METHOD** [i] ..... Streambed to be left intact. • **BED RETENTION MEASURES** [i] ..... None proposed. • **GRADE CONTROL MEASURES** [l] ..... None proposed. • **ADDITIONAL STRUCTURES** [m] ..... None proposed.
CONSTRUCTION	• **DATE WORK WILL BEGIN** .....

	• **DATE WORK WILL BE COMPLETED** ..	
	• **DETAILS** [n]	All work is expected to be outside of the bankfull width. Isolation and fish salvage are not anticipated. Any work within the wetted area will occur within the ODFW designated in-water work window. Bridge may be removed during high-flow periods. No seasonal restrictions on use would occur if the bridge is in place. Effective erosion control measures and sediment barriers for the road approaches such as silt fence, fiber rolls, or equivalent will be placed downgradient of construction area to capture dislodged sediment.
MAINTENANCE	• **WILL THE CROSSING BE INSPECTED FOR DEBRIS AND BED RETENTION (WITHIN, BELOW, AND ABOVE THE CROSSING) AT LEAST ANNUALLY AND AFTER STORM EVENTS?**	Yes ☒ No ☐
	• **IF NEEDED, WILL REMEDIAL MEASURES BE TAKEN AS SOON AS POSSIBLE?**	Yes ☒ No ☐

[b] *e.g., bridge, open-bottomed arch, pipe arch/squashed, round, rectangular*

[c] *e.g., reinforced concrete, concrete, wood, plastic, corrugated metal, metal*

[d] *if "Yes", explain how these will be addressed in a separate attachment*

[e] *"ACW" is the active channel width, which is the stream width between the ordinary high water lines, or at the channel bankfull elevation if the ordinary high water lines are indeterminate; ordinary high water lines are not the same as the wetted width and are typically determined by changes on the bank in vegetation, changes in sediment size and/or color, water lines on the bank, trees, or leaves, or the point where debris (e.g., needles, leaves, twigs, cones) accumulation begins*

[f] *3 measurements 20 feet apart should be averaged; begin measurements approximately 10 ACWs from the inlet (upstream) or outlet (downstream) of the crossing if this distance is outside of the influence of existing artificial obstructions and prior to adjoining tributaries as you move away from the crossing (if not, take measures at locations which fulfill these requirements); indicate measurement locations on the* **Profile Design Drawing**

[g] *take measurements away from the crossing and at the point where ACW measurement begins*

[h] *D_{100} is the average diameter of the 10 largest, naturally-occurring rocks in the stream reach; $D_{150} = D_{100} \times 1.5$; $D_{200} = D_{100} \times 2$*

[i] *"bed" refers to the stream bed within or under the crossing structure*

[j] *depth of fill material or countersinking/embedding (excluding protruding over-sized rock) at the crossing's inlet*

[k] *depth of fill material or countersinking/embedding (excluding protruding over-sized rock) at the crossing's outlet*

[l] *these are measures outside of the crossing structure intended to prevent up- or downstream channel degradation, especially important to consider in locations where an existing smaller culvert is being replaced and there is the potential for upstream channel degradation (i.e., a "headcut") and associated off-site property or passage problems*

[m] *e.g., bed retention measures, weirs, baffles, trash racks, aprons, retaining walls, overflow pipes, channel restoration/scour remediation measures*

[n] *unless already described in an accompanying Department of State Lands Removal-Fill Application, include a description of a) temporary downstream passage, upstream passage, screening, and bypass measures, b) worksite isolation measures, c) fish salvage (note: an ODFW Fish Take Permit may be necessary), d) sediment and erosion control measures, and e) site restoration measures. For more details on Oregon Fill Removal Law see the Oregon Division of State Lands Removal-Fill Guide at* http://oregonstatelands.us/DSL/PERMITS/rfg.shtml .

ADDITIONAL INFORMATION

*Provide this information **only if** the bed within the proposed crossing is not as wide as the active channel width or will not be embedded.*

	High Design Flow [o]	Low Design Flow [p]
Flow [q] (cfs)		
Water Depth in Crossing (in.)		
Water Velocity in Crossing (fps)		
Water Drop [r] at Inlet (in.)		
Water Drop [r] at Outlet (in.)		
Pool Depth Below Outlet (in.)		
Water Drop [r] at Weirs/Baffles (in.)		
Pool Depth Below Weirs/Baffles (in.)		
Depth of Nappe [s] at Weirs/Baffles (in.)		

[o] *High Design Flow is the mean daily average stream discharge that is exceeded 5 percent of the time during the period when ODFW determines that native migratory fish require fish passage*

[p] *Low Design Flow is the mean daily average stream discharge that is exceeded 95 percent of the time, excluding days with no flow, during the period when ODFW determines that native migratory fish require fish passage*

[q] *attach a description of the methodology, calculations, and assumptions used to determine the high and low design flows*

[r] *drop should be measured from the upstream water surface elevation to the downstream water surface elevation*

[s] *the nappe is the water flowing over weirs/baffles*

DESIGN DRAWINGS

Please attach the following design drawings with the specified information on them.

☒ -- **PLAN**, including:
- active channel (i.e., ordinary high water or bankfull lines)
- existing crossing and additional structures
- proposed crossing and additional structures
- dimensions

☒ -- **PROFILE**, including:
- existing grade (measured at the deepest part of the stream channel from 10 ACWs downstream of the outlet [i.e., downstream end of crossing] to 10 ACWs upstream of the inlet [i.e., upstream end of crossing], at 5-foot intervals), including road
- existing crossing and additional structures
- proposed grade (measured at the deepest part of the stream channel from 10 ACWs downstream of the outlet to 10 ACWs upstream of the inlet, at 5-foot intervals), including road
- proposed crossing, bed, and additional structures
- dimensions
- location of **STREAM CHANNEL CROSS-SECTIONS** (see below), *ACW* measurements, and *Slope* measurements
- water surface elevations at high and low design flows for the proposed crossing, **if** the proposed crossing will not be as wide as the active channel width or will not be embedded

☒ -- **CROSS-SECTION OF PROPOSED CROSSING**, including bed details

☐ -- **STREAM CHANNEL CROSS-SECTIONS** *(2 cross-sections total, with one located downstream where the ACW measurements begin and one located upstream where the ACW measurements begin; measurements should be taken at 1-foot intervals perpendicular to the flow of the stream and should encompass the entire active channel plus 0.5 ACW on each side of the stream [for a total cross-section measurement of 2 x ACW]; measurements may be taken with survey equipment or by measuring the distance from a level line to the bottom of the streambed or ground)*

☐ -- **DETAILS OF ADDITIONAL STRUCTURES** *(e.g., grade control measures, bed retention measures, weirs/baffles, trash racks, aprons, retaining walls, overflow pipes, channel restoration/scour remediation measures)*

Please submit this application along with project design plans to the appropriate ODFW District Fish Biologist for the crossing's location. The Complete application can also be sent electronically to the ODFW Fish Passage Coordinator at greg.d.apke@state.or.us and send one signed original paper copy of the application to the ODFW Fish Passage Coordinator at 3406 Cherry Avenue NE, Salem, OR 97303.

• *ODFW will use the following criteria to determine the level of review required.*

For ODFW Use Only

	YES	NO	N/A
1. Is the bed within the crossing as wide as the active channel:	☐	☐	
2. Is the bed within the culvert at the same slope, and at grades continuous with, the surrounding stream:	☐	☐	
3a. If the crossing is open-bottomed, is there 3 feet of vertical clearance between the active channel width elevation and the inside top of the crossing:	☐	☐	☐
OR			
3b. If the crossing is closed-bottomed, will bed depth within the culvert be 20-50% of the crossing height:	☐	☐	☐
4. Is the bed material that will be used sufficient to assure water depth will be similar to that in the surrounding stream (i.e., will not go sub-surface prematurely):	☐	☐	
5. Are the bed material or retention measures that will be used sufficient to assure that the bed will be maintained through time:	☐	☐	
6. If the crossing is longer than 40 feet, will partially-buried, over-sized rock be placed within the crossing's bed:	☐	☐	☐
7. Will the bed within the crossing be placed during construction:	☐	☐	
8. If trash racks are present, are they above the active channel width elevation and do vertical bars have at least 9 inches of clear space between them:	☐	☐	☐
9. If there is an upstream pond, wetland, or backwater area, has its desired state after construction been determined, and have these considerations been addressed in the design:	☐	☐	☐
10. Are upstream grade control measures satisfactory:	☐	☐	
11. Are the construction timing and measures adequate based on the location:	☐	☐	
12. Are there plans to maintain the crossing:	☐	☐	

- If all answers are "Yes" or "Not Applicable", this plan is eligible for approval by an ODFW biologist.
- If any answer is "No" or there are other concerns, consult with the Fish Passage Coordinator.

APPLICATION IDENTIFIER:
DATE RECEIVED:

APPROVED ☐ **SIGNATURE:** _____ **DATE:** _____

DENIED ☐ **TITLE:**

CONDITIONS:

APPENDIX C
DESIGN DRAWINGS

IDAHO POWER COMPANY
BOARDMAN TO HEMINGWAY
TRANSMISSION LINE PROJECT
FISH-BEARING ROAD-STREAM CROSSING DESIGNS

LOCATION MAP

SCALE: 1 INCH = 40 MILES

IDAHO POWER®
An IDACORP Company

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PROJECT DATUM:
HORIZONTAL: HARN/WO OREGON STATE PLANES, NORTH ZONE, INTERNATIONAL FOOT
VERTICAL: NAVD88

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NOT FOR CONSTRUCTION

REV.	DATE	REVISION DESCRIPTION	DRW	ENG	CHK	APP
C	10/28/16	PRELIMINARY DESIGN - 2016	JA	JA	AS	SO
B	08/28/15	PRELIMINARY DESIGN - ODFW COMMENTS AND INDICATIVE DESIGN CHANGES	FM	NV	AS	SO
A	3/30/15	PRELIMINARY DESIGN	WB	NV	AS	SO

IDAHO POWER COMPANY
BOARDMAN TO HEMINGWAY

COVERSHEET

DWG. NO.: G - 001

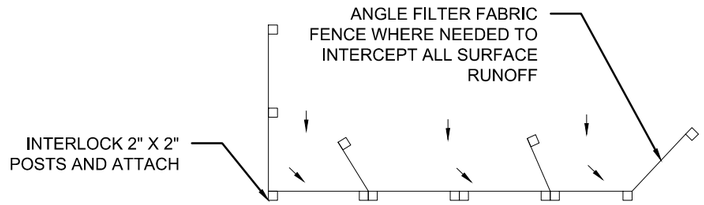
CREATED: 10/28/2016

SHEET: 01 OF 23

SCALE: AS NOTED

GENERAL NOTES:

1. SITE TOPOGRAPHY FOR ALL SITES IS BASED ON EXISTING USGS DEM OR LIDAR AS INDICATED ON SITE SPECIFIC DRAWINGS. ONSITE TOPOGRAPHIC SURVEYS HAVE NOT BEEN COMPLETED. DETERMINATION OF CHANNEL GEOMETRY BASED ON FIELD SURVEYS OF ROAD CROSSINGS AND STREAM HABITAT. CROSSING AND ROAD TOPOGRAPHY SHALL BE FIELD VERIFIED.
2. FOR DESIGN PURPOSES, ORDINARY HIGH WATER AND ACTIVE CHANNEL IS ASSUMED TO BE EQUIVALENT TO BANKFULL WIDTH.
3. ALL CROSSING STRUCTURES ASSUMED TO WITHSTAND HL-93 LOADING. STRUCTURAL DETAILS AND STRENGTH REQUIREMENTS OF TEMPORARY STRUCTURES TO BE VERIFIED BY THE CONTRACTOR PER THE LOADING OF SELECTED CONSTRUCTION EQUIPMENT. CONTRACTOR SHALL SUBMIT FINAL STRUCTURAL PLANS FOR TEMPORARY STRUCTURES SUBJECT TO ENGINEERS APPROVAL.
4. ALL ROADS AT CROSSINGS ASSUMED TO REQUIRE MINIMUM 10 FOOT WIDTH AND SPANNING MINIMUM 1.5 TIMES THE ACTIVE CHANNEL WIDTH, WHENEVER POSSIBLE.
5. ALTERNATIVES CALLING FOR TIMBER MATTING WILL REQUIRE SEASONAL RESTRICTIONS OR LIMITATIONS ON USE; SPECIFIC REQUIREMENTS TO BE DETERMINED PRIOR TO FINAL DESIGNS.
6. ROAD CROSSING SITES R-33010, R-33011, AND R-33033 WERE NOT VISITED AT THE CROSSING LOCATION DUE TO LACK OF ACCESS. ANALYSIS OF EXISTING STRUCTURES AND PROPOSED ALTERNATIVE(S) SELECTED BASED ON AERIAL IMAGERY, USGS DEM, AND OTHER LOCAL DATA.
7. STREAM CROSSING CONSTRUCTION ASSUMED TO OCCUR AT DIFFERENT SITES AT THE SAME TIME. THIS REQUIRES SEVERAL SITES TO HAVE INDIVIDUAL CROSSING MATERIALS, RATHER THAN THE SAME MATERIALS BEING USED AND TRANSPORTED TO ALL CROSSINGS.



SILT FENCE DETAIL (TYP.)
(SCALE NTS)

SILT FENCE NOTES:

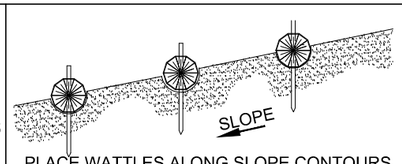
1. SILT FENCE SHALL BE INSTALLED ON SLOPE CONTOURS TO MAXIMIZE PONDING EFFICIENCY.
2. SILT FENCE DRAINAGE AREA OF $\frac{1}{4}$ ACRE PER 100 LINEAR FT.
3. BOTTOM EDGE OF SILT FENCE SHALL BE BURIED MIN. 6" OR TO BOTTOM OF WETTED CHANNEL.
4. POSTS MAY BE 2" X 2" WOOD OR STEEL.
5. POSTS TO BE INSTALLED ON DOWNHILL SIDE OF FABRIC.
6. COMPACT BACKFILLED TRENCH SOIL.
7. SEDIMENT SHALL BE REMOVED WHEN ACCUMULATION REACHES 1/3 OF THE MEASURE HEIGHT. SEDIMENT SHALL BE DISPOSED OF TO AN AREA THAT CAN BE PERMANENTLY STABILIZED.

TEMPORARY EROSION CONTROL NOTES:

1. BEST MANAGEMENT PRACTICES (BMPS) AS REQUIRED BY PERMITTING.
2. INSTREAM WORK WINDOWS FOR WORK REQUIRED WITHIN THE BANKFULL LINE SHALL BE IN ACCORDANCE WITH OREGON DEPARTMENT OF FISH AND WILDLIFE (ODFW) GUIDELINES.
3. WHERE REQUIRED, FISH ISOLATION AND SALVAGE OPERATIONS MUST BE SUPERVISED BY AN EXPERIENCED BIOLOGIST AND COORDINATED WITH ODFW.
4. CALL BEFORE DIGGING 1-800-332-2344 (OR 811).
5. SCHEDULE CONSTRUCTION ACTIVITIES TO AVOID EARTH DISTURBING ACTIVITIES DURING WET WEATHER.
6. AVOID HIGHLY ERODIBLE AREAS SUCH AS STEEP SLOPES WHERE POSSIBLE.
7. CONSTRUCT STABILIZED ROAD ENTRANCES AND EXITS IN LOCATIONS WHERE EXPOSED SOIL OR NEWLY CONSTRUCTED ROADS INTERSECT EXISTING PAVED ROADS. STABILIZED CONSTRUCTION ENTRANCES AND EXITS SHALL BE INSPECTED AND MAINTAINED THROUGHOUT THE CONSTRUCTION ACTIVITIES.
8. TO THE EXTENT PRACTICABLE EXISTING VEGETATION SHALL BE PRESERVED.
9. DUST SHALL BE CONTROLLED DURING CONSTRUCTION ACTIVITIES THROUGH WATER APPLICATION TO THE DISTURBED GROUNDS AND ACCESS ROADS WHERE NECESSARY. OTHER METHODS OF DUST CONTROL MAY INCLUDE BUT NOT BE LIMITED TO POLY SHEETING, VEGETATION OR MULCHING. SPEED LIMITS SHALL BE KEPT TO A MINIMUM TO PREVENT PULVERIZATION OF ROAD SURFACES.
10. FIBER ROLLS, SILT FENCE OR EQUIVALENT EROSION CONTROL METHODS SHALL BE INSTALLED DOWN GRADIENT OF CONSTRUCTION AREAS.
11. GRAVEL SHALL BE PLACED IN LOCATIONS WHERE SOIL BECOMES WET OR MUDDY TO PREVENT EROSION. MULCH SHALL BE PROVIDED TO IMMEDIATELY STABILIZE SOIL EXPOSED AS A RESULT OF CONSTRUCTION ACTIVITIES.
12. JUTE MESH, STRAW MATTING, OR TURF REINFORCEMENT MATTING SHALL BE USED TO STABILIZE SLOPES THAT BECOME EXPOSED DURING CONSTRUCTION ACTIVITIES.
13. SITE TO BE RESTORED TO EXISTING CONDITIONS UPON PROJECT COMPLETION.
14. TEMPORARY CROSSINGS SHALL BE INSPECTED AFTER HIGH FLOW EVENTS FOR ANY DAMAGES AND TO BE REPAIRED IMMEDIATELY TO AVOID ANY OBSTRUCTION IN FISH PASSAGE.

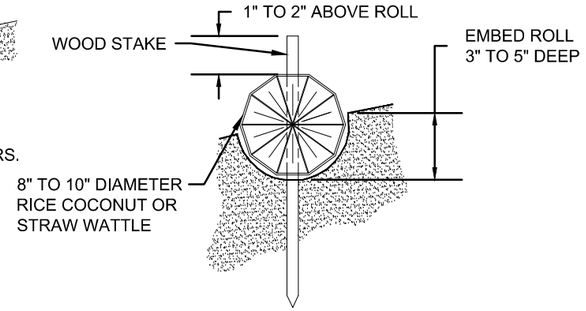
ABBREVIATIONS & ACRONYMS:

ALT	ALTERNATIVE
APPROX	APPROXIMATELY
BMPS	BEST MANAGEMENT PRACTICES
CY	CUBIC YARD
°	DEGREES
DEM	DIGITAL ELEVATION MODEL
DWG	DRAWING
ECO	ECOLOGY
EQUIV	EQUIVALENT
EXIST.	EXISTING
FT, '	FOOT
H	HORIZONTAL
HWY	HIGHWAY
IN, "	INCH
INC	INCORPORATED
KV	KILOVOLT
LIDAR	LIGHT DETECTION AND RANGING
LLC	LIMITED LIABILITY COMPANY
MAX	MAXIMUM
MIN	MINIMUM
NO	NUMBER
NTS	NOT TO SCALE
OC	ON CENTER
ODFW	OREGON DEPARTMENT OF FISH AND WILDLIFE
PROP.	PROPOSED
PTR	PARTNER
TEMP	TEMPORARY
TYP	TYPICAL
USGS	UNITED STATES GEOLOGICAL SURVEY
V	VERTICAL
&	AND
%	PERCENT

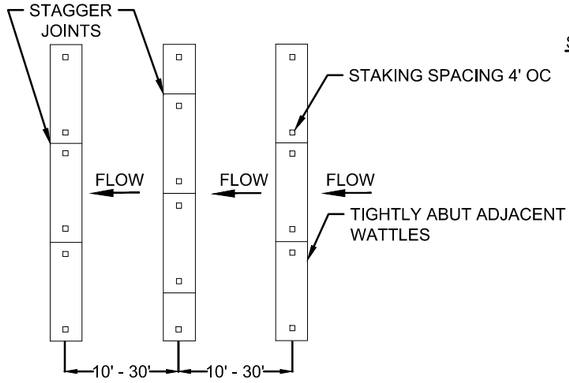


PLACE WATTLES ALONG SLOPE CONTOURS.

PROFILE



SECTION



PLAN VIEW

FIBER ROLL DETAIL (TYP.)
(SCALE NTS)

FIBER ROLLS NOTES:

1. PREPARE SLOPE PRIOR TO INSTALLATION OF FIBER ROLLS. DIG SMALL TRENCHES ACROSS THE SLOPE ON CONTOUR TO PLACE FIBER ROLLS IN.
2. FIBER ROLLS SHALL BE PLACED PERPENDICULAR TO WATER MOVEMENT AND PARALLEL TO THE SLOPE CONTOUR.
3. STAKES SHALL BE 1" X 2" WOODEN STAKES.
4. ADDITIONAL STAKES MAY BE INSTALLED ON DOWNHILL SIDE OF WATTLES, ON STEEP SLOPES OR HIGHLY EROSIVE SOILS.
5. FIBER ROLLS OR WATTLES SHALL BE INSTALLED AT CONTOUR INTERVALS 10-30FT APART DEPENDING ON STEEPNESS OF SLOPE.

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REV.	DATE	REVISION DESCRIPTION	DRW	ENG	CHK	APP
C	10/28/16	PRELIMINARY DESIGN - 2016	JA	JA	AS	SO
B	08/28/15	PRELIMINARY DESIGN - ODFW COMMENTS AND INDICATIVE DESIGN CHANGES	FM	NV	AS	SO
A	3/30/15	PRELIMINARY DESIGN	WB	NV	AS	SO

IDAHO POWER COMPANY
BOARDMAN TO HEMINGWAY

GENERAL NOTES & EROSION CONTROL DETAILS

DWG. NO.: G - 002

CREATED: 10/28/2016

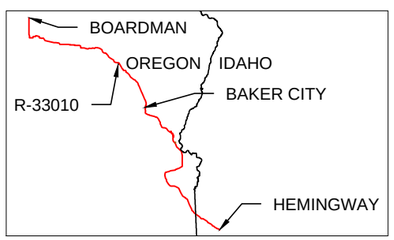
SHEET: 02 OF 23

SCALE: AS NOTED

PHOTO - FACING EAST (AUGUST '16)
FROM SITE R-33147 (SEE NOTE 7)

PHOTO - FACING WEST (AUGUST '16)
FROM SITE R-33147 (SEE NOTE 7)

N
W E
S
0' 50' 100'



MAP INDEX

NOTES:
1. IMAGERY SOURCE: GOOGLE EARTH, 08/30/13.
2. TOPOGRAPHIC DATA SOURCE: USGS LIDAR, APPROXIMATELY 10 METER RESOLUTION.
3. ASSUMED BANKFULL WIDTH: 19FT.
4. STREAM GRADIENT AT CROSSING: 2-3% UNIFORM STREAM REACH.
5. PROPERTY OWNER: FOR THE GI2RLS. LLC.
6. SITE LOCATION: LATITUDE 45.2938°, LONGITUDE -118.1794°.
7. PHOTOGRAPHS FROM SITE R-33147 ON ROCK CREEK NEAR CROSSING R-33010 ARE ASSUMED TO BE VISUALLY SIMILAR AND REPRESENTATIVE OF CROSSING CONDITIONS.

LEGEND:
- EXISTING MAJOR CONTOUR - 5FT
- EXISTING MINOR CONTOUR - 1FT
- BANKFULL WIDTH
- PROPERTY LINE

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REV.	DATE	REVISION DESCRIPTION	DRW	ENG	CHK	APP
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B	08/28/15	PRELIMINARY DESIGN - ODFW COMMENTS AND INDICATIVE DESIGN CHANGES	FM	NV	AS	SO
A	3/30/15	PRELIMINARY DESIGN	WB	NV	AS	SO

IDAHO POWER COMPANY
BOARDMAN TO HEMINGWAY

CROSSING R-33010
EXISTING CONDITIONS
AND SITE PHOTOS

DWG. NO.: C-101
CREATED: 11/14/2016
SHEET: 03 OF 23
SCALE: AS NOTED

Y:\CAD\PROJECTS\106-4422 B2HAPRELIMINARY DESIGN - REV C\SHEET FILES\R-33010.DWG
PLOT DETAILS: ANDREWS, JEREMY
November 23, 2016
1:20 PM

N
W E
S

0' 20' 40'

NOTES:

1. PROPOSED CROSSING TYPE: TEMPORARY RAIL BRIDGE.
2. ALIGNMENT OF CENTER TEMPORARY RAIL BRIDGE TO BE APPROXIMATELY PERPENDICULAR TO STREAM FOR THIS CROSSING. STREAM AND ROAD TOPOGRAPHY TO BE FIELD VERIFIED PRIOR TO FINAL DESIGN.
3. EXCAVATION DURING CONSTRUCTION REQUIRES 0 CY OF CUT/FILL WITHIN BANKFULL WIDTH OF STREAM AND APPROXIMATELY 3 CY OF CUT, 3 CY OF FILL OUTSIDE BANKFULL AS TEMPORARY BASE AND GRAVEL RAMP.
4. ALL EFFECTIVE EROSION CONTROL MEASURES AND SEDIMENT BARRIERS FOR THE ROAD APPROACHES TO THE CHANNEL CROSSING WILL BE EVALUATED AND PLANNED AS NECESSARY DURING FURTHER DESIGN STAGE AND FOR CONSTRUCTION.

LEGEND:

- EXISTING MAJOR CONTOUR - 5FT
- EXISTING MINOR CONTOUR - 1FT
- BANKFULL WIDTH
- A — PROFILE EXTENTS

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REV.	DATE	REVISION DESCRIPTION	DRW	ENG	CHK	APP
C	11/06/16	PRELIMINARY DESIGN - 2016	JA	JA	AS	SO
B	08/28/15	PRELIMINARY DESIGN - ODFW COMMENTS AND INDICATIVE DESIGN CHANGES	FM	NV	AS	SO
A	3/30/15	PRELIMINARY DESIGN	WB	NV	AS	SO

IDAHO POWER COMPANY
BOARDMAN TO HEMINGWAY

CROSSING R-33010
PROPOSED PLAN VIEW

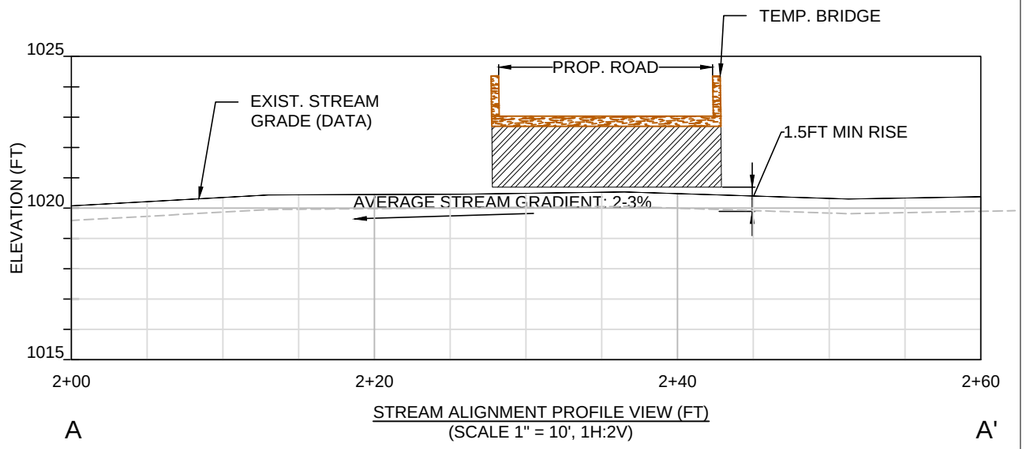
DWG. NO.: C-102

CREATED: 11/14/2016

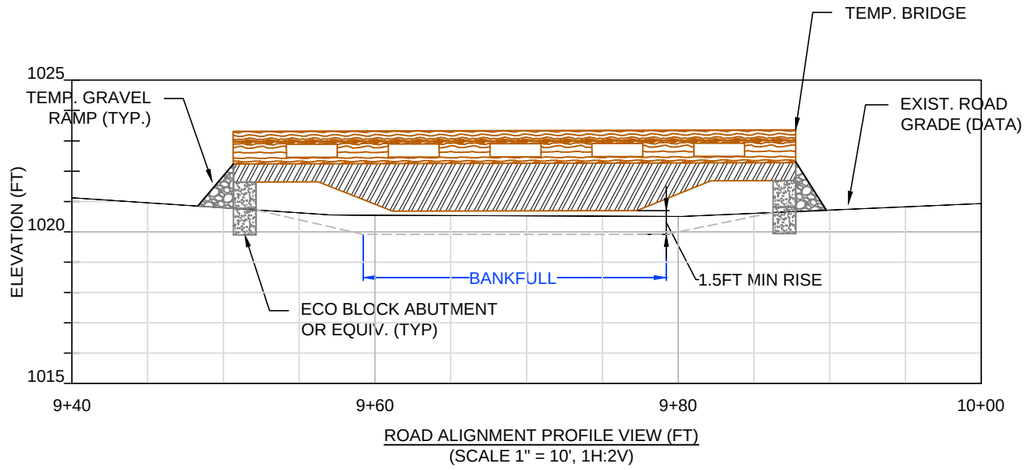
SHEET: 04 OF 23

SCALE: AS NOTED

Y:\CAD\PROJECTS\106-422 B2H\PRELIMINARY DESIGN - REV C\SHEET FILES\R-33010.DWG
PLOT DETAILS: ANDREWS, JEREMY November 23, 2016 1:20 PM



STREAM ALIGNMENT PROFILE VIEW (FT)
(SCALE 1" = 10', 1H:2V)



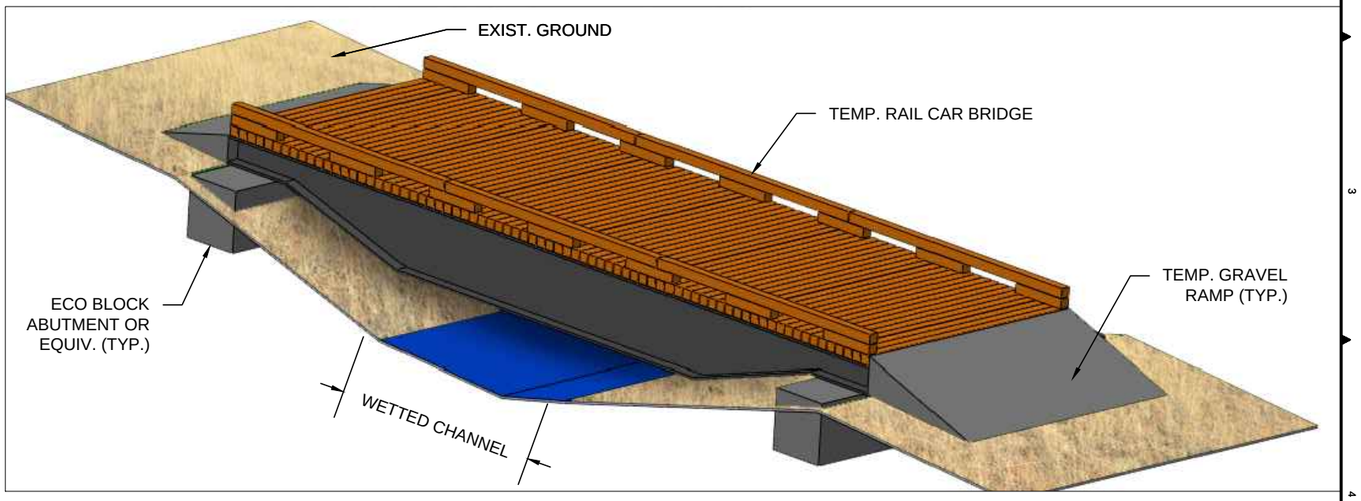
ROAD ALIGNMENT PROFILE VIEW (FT)
(SCALE 1" = 10', 1H:2V)

NOTES:

1. TEMPORARY BRIDGE WILL SPAN WETTED CHANNEL AND NOT REQUIRE SUPPORT IN CENTER OF CHANNEL.
2. AVERAGE BANKFULL WIDTH FOR LITTLE ROCK CREEK 19 FEET. WIDTH SHOWN IN SECTIONS IS WETTED CHANNEL WIDTH AT CROSSING. STREAM CHANNEL TOPOGRAPHY TO BE DETEMINED DURING FURTHER PHASES OF DESIGN.
3. PLACE ABUTMENTS OUTSIDE OF WETTED CHANNEL AND TEMPORARY BRIDGE WITH MIN. 1.5 FT RISE.
4. PLACE TEMPORARY CLEAN ANGULAR ROCK FILL OR EQUIVALENT AS TEMPORARY BASE AND GRAVEL RAMP AS NEEDED OUTSIDE OF BANKFULL AND WETTED CHANNEL WIDTH TO EASE VEHICULAR TRANSITION FROM GROUND ONTO BRIDGE.
5. EXCAVATION MAY BE REQUIRED OUTSIDE OF BANKFULL WIDTH IN ORDER TO MINIMIZE CROSS AND LONGITUDINAL GRADIENTS FOR SAFE VEHICULAR CROSSING. THESE GRADIENTS WILL BE DETERMINED DURING FINAL PHASES OF THE DESIGN.
6. DURING BRIDGE INSTALLATION, IF SOFT GROUND CONDITIONS ARE FOUND, ECO BLOCK ABUTMENT AND BASE MATERIAL MAY NEED TO BE REVISED PER ENGINEER'S APPROVAL.

GENERAL NOTE:

1. EXISTING GROUND (DATA) FROM 10 METER DEM DID NOT MATCH FIELD SURVEY CONDITIONS. EXISTING GROUND (ASSUMED) WAS DRAWN TO MATCH FIELD CONDITIONS. SITE TOPOGRAPHY WILL BE REFINED AT LATER STAGES OF DESIGN.



TEMPORARY BRIDGE TYPICAL (3D VIEW)
(SCALE NTS)

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A	3/30/15	PRELIMINARY DESIGN	WB	NV	AS	SO

IDAHO POWER COMPANY
BOARDMAN TO HEMINGWAY

CROSSING R-33010
PLAN VIEWS AND DETAILS

DWG. NO.: C-103

CREATED: 11/14/2016

SHEET: 05 OF 23

SCALE: AS NOTED

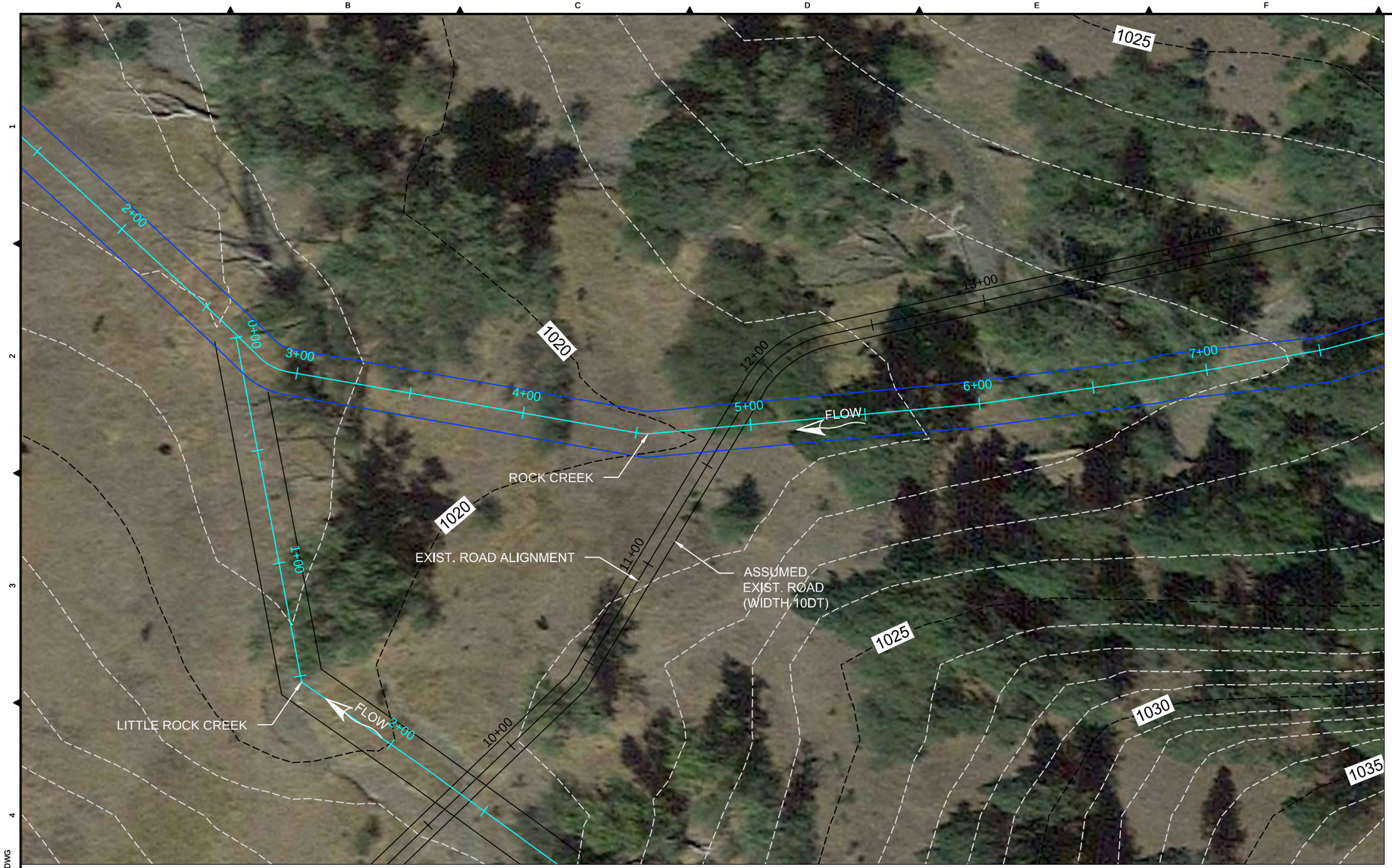
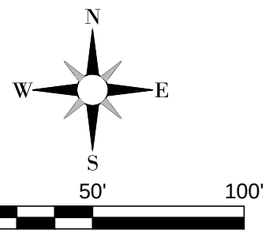
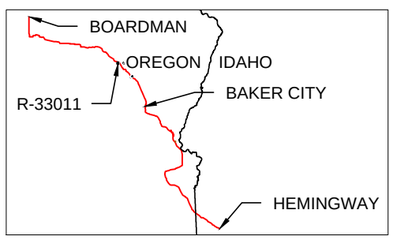


PHOTO - FACING EAST (AUGUST '16)
FROM SITE R-33147 (SEE NOTE 7)

PHOTO - FACING WEST (AUGUST '16)
FROM SITE R-33147 (SEE NOTE 7)





MAP INDEX

NOTES:
1. IMAGERY SOURCE: GOOGLE EARTH, 08/30/2013.
2. TOPOGRAPHIC DATA SOURCE: USGS LIDAR, APPROXIMATELY 10 METER RESOLUTION.
3. ASSUMED BANKFULL WIDTH: 20FT.
4. STREAM GRADIENT AT CROSSING: 2% UNIFORM STREAM REACH.
5. PROPERTY OWNER: FOR THE GI2RLS. LLC.
6. SITE LOCATION: LATITUDE 45.2942°, LONGITUDE -118.1789°.
7. PHOTOGRAPHS FROM SITE R-33147 ON ROCK CREEK NEAR CROSSING R-33011 ARE ASSUMED TO BE VISUALLY SIMILAR AND REPRESENTATIVE OF CROSSING CONDITIONS.

LEGEND:
- EXISTING MAJOR CONTOUR - 5FT
- EXISTING MINOR CONTOUR - 1FT
- BANKFULL WIDTH
- PROPERTY LINE

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A	3/30/15	PRELIMINARY DESIGN	WB	NV	AS	SO

IDAHO POWER COMPANY
BOARDMAN TO HEMINGWAY

CROSSING R-33011
EXISTING CONDITIONS AND SITE PHOTOS

DWG. NO.: C-201

CREATED: 11/06/2016

SHEET: 06 OF 23

SCALE: AS NOTED

Y:\CAD\PROJECTS\106-4422 B2H\PRELIMINARY DESIGN - REV C\SHEET FILES\R-33011.DWG
PLOT DETAILS: ANDREWS, JEREMY November 23, 2016 1:21 PM

N
W E
S

0' 20' 40'

NOTES:

1. PROPOSED CROSSING TYPE: TEMPORARY RAIL BRIDGE.
2. ALIGNMENT OF CENTER TEMPORARY RAIL BRIDGE TO BE APPROXIMATELY PERPENDICULAR TO STREAM FOR THIS CROSSING.
3. EXCAVATION DURING CONSTRUCTION REQUIRES 0 CY OF CUT/FILL WITHIN BANKFULL WIDTH OF STREAM AND APPROXIMATELY 3 CY OF CUT, 3 CY OF FILL OUTSIDE BANKFULL AS TEMPORARY BASE AND GRAVEL RAMP.
4. ALL EFFECTIVE EROSION CONTROL MEASURES AND SEDIMENT BARRIERS FOR THE ROAD APPROACHES TO THE CHANNEL CROSSING WILL BE EVALUATED AND PLANNED AS NECESSARY DURING FURTHER DESIGN STAGES AND CONSTRUCTION.

LEGEND:
- EXISTING MAJOR CONTOUR - 5FT
- EXISTING MINOR CONTOUR - 1FT
- BANKFULL WIDTH
- A — PROFILE EXTENTS

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A	3/30/15	PRELIMINARY DESIGN	WB	NV	AS	SO

IDAHO POWER COMPANY
BOARDMAN TO HEMINGWAY

CROSSING R-33011
PROPOSED PLAN VIEW

DWG. NO.: C-202

CREATED: 11/06/2016

SHEET: 07 OF 23

SCALE: AS NOTED

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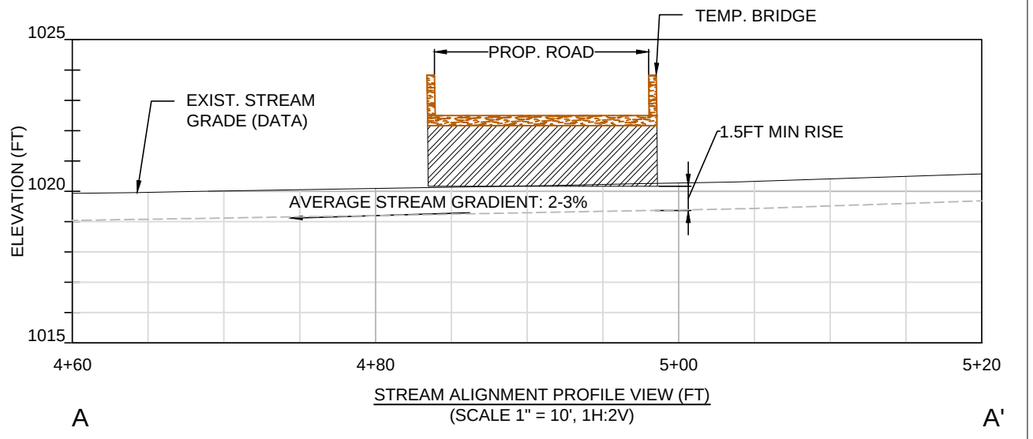
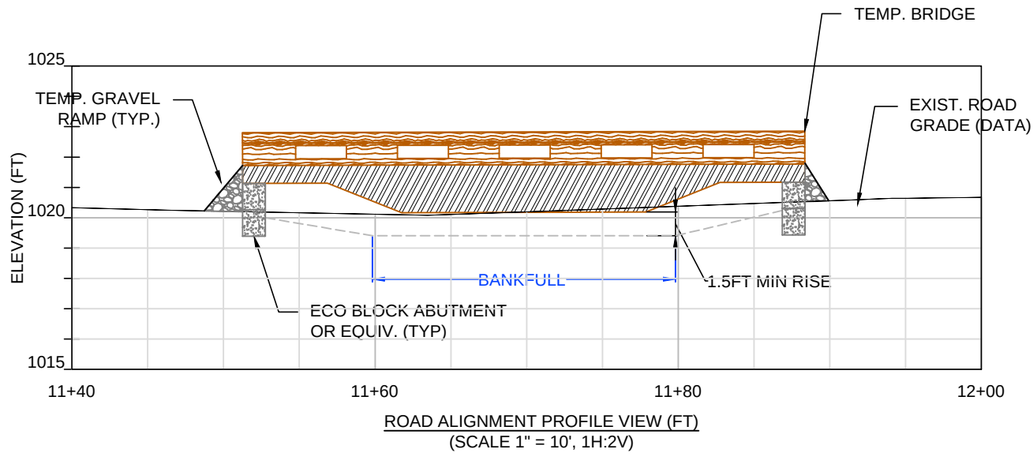
November 23, 2016
1:22 PM



STREAM ALIGNMENT PROFILE VIEW (FT)
(SCALE 1" = 10', 1H:2V)



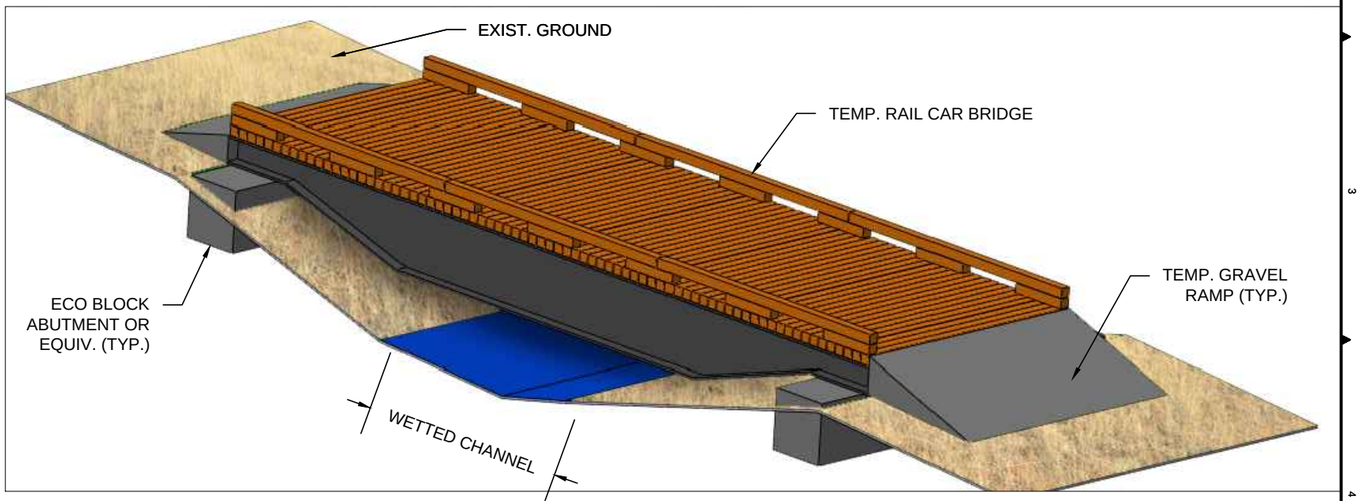
ROAD ALIGNMENT PROFILE VIEW (FT)
(SCALE 1" = 10', 1H:2V)

NOTES:

1. TEMPORARY BRIDGE WILL SPAN WETTED CHANNEL AND NOT REQUIRE SUPPORT IN CENTER OF CHANNEL.
2. AVERAGE BANKFULL WIDTH FOR ROCK CREEK IS 20 FEET. WIDTH SHOWN IN SECTIONS IS WETTED CHANNEL WIDTH AT CROSSING. STREAM CHANNEL TOPOGRAPHY TO BE DETERMNED DURING FINAL FURTHER PHASES OF DESIGN.
3. PLACE ABUTMENTS OUTSIDE OF WETTED CHANNEL AND TEMPORARY BRIDGE WITH MIN. 1.5 FT RISE.
4. PLACE TEMPORARY CLEAN ANGULAR ROCK FILL OR EQUIVALENT AS TEMPORARY BASE AND GRAVEL RAMP AS NEEDED OUTSIDE OF BANKFULL AND WETTED CHANNEL WIDTH TO EASE VEHICULAR TRANSITION FROM GROUND ONTO BRIDGE.
5. EXCAVATION MAY BE REQUIRED OUTSIDE OF BANKFULL WIDTH IN ORDER TO MINIMIZE CROSS AND LONGITUDINAL GRADIENTS FOR SAFE VEHICULAR CROSSING. THESE GRADIENTS WILL BE DETERMINED DURING FINAL PHASES OF THE DESIGN.
6. DURING BRIDGE INSTALLATION, IF SOFT GROUND CONDITIONS ARE FOUND, ECO BLOCK ABUTMENT AND BASE MATERIAL MAY NEED TO BE REVISED PER ENGINEER'S APPROVAL.

GENERAL NOTE:

1. EXISTING GROUND (DATA) FROM 10 METER DEM DID NOT MATCH FIELD SURVEY CONDITIONS. EXISTING GROUND (ASSUMED) WAS DRAWN TO MATCH FIELD CONDITIONS. SITE TOPOGRAPHY WILL BE REFINED AT LATER STAGES OF DESIGN.



TEMPORARY BRIDGE TYPICAL (3D VIEW)
(SCALE NTS)

TETRA TECH
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Bothell, Washington 98011
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IDAHO POWER
An IDACORP Company

NOT FOR CONSTRUCTION

REV.	DATE	REVISION DESCRIPTION	DRW	ENG	CHK	APP
C	11/06/16	PRELIMINARY DESIGN - 2016	JA	JA	AS	SO
B	08/28/15	PRELIMINARY DESIGN - ODFW COMMENTS AND INDICATIVE DESIGN CHANGES	FM	NV	AS	SO
A	3/30/15	PRELIMINARY DESIGN	WB	NV	AS	SO

IDAHO POWER COMPANY
BOARDMAN TO HEMINGWAY

CROSSING R-33011
PLAN VIEWS AND DETAILS

DWG. NO.: C-203

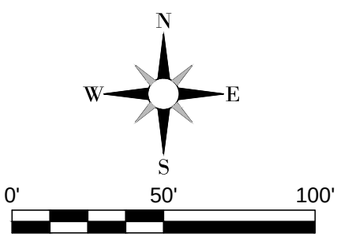
CREATED: 110/06/2016

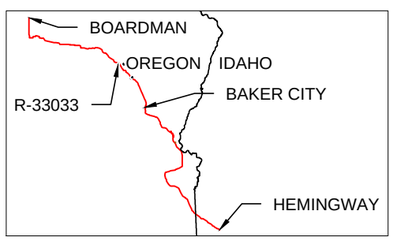
SHEET: 08 OF 23

SCALE: AS NOTED

PHOTO - FACING EAST (AUGUST '16)
FROM SITE R-33147 (SEE NOTE 7)

PHOTO - FACING WEST (AUGUST '16)
FROM SITE R-33147 (SEE NOTE 7)





MAP INDEX

NOTES:
1. IMAGERY SOURCE: GOOGLE EARTH, 08/30/2013
2. TOPOGRAPHIC DATA SOURCE: USGS LIDAR, APPROXIMATELY 10 METER RESOLUTION.
3. ASSUMED BANKFULL WIDTH: 20FT.
4. STREAM GRADIENT AT CROSSING: 2% UNIFORM STREAM REACH.
5. PROPERTY OWNER: FOR THE GIRLS. LLC.
6. SITE LOCATION: LATITUDE 45.2920°, LONGITUDE -118.1727°.
7. PHOTOGRAPHS FROM SITE R-33147 ON ROCK CREEK NEAR CROSSING R-33033 ARE ASSUMED TO BE VISUALLY SIMILAR AND REPRESENTATIVE OF CROSSING CONDITIONS.

LEGEND:
- EXISTING MAJOR CONTOUR - 5FT
- EXISTING MINOR CONTOUR - 1FT
- BANKFULL WIDTH
- PROPERTY LINE

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REV.	DATE	REVISION DESCRIPTION	DRW	ENG	CHK	APP
C	10/28/16	PRELIMINARY DESIGN - 2016 DESIGN	JA	JA	AS	SO
B	08/28/15	PRELIMINARY DESIGN - ODFW COMMENTS AND INDICATIVE DESIGN CHANGES	FM	NV	AS	SO
A	3/30/15	PRELIMINARY DESIGN	WB	NV	AS	SO

IDAHO POWER COMPANY
BOARDMAN TO HEMINGWAY

CROSSING R-33033
EXISTING CONDITIONS
AND SITE PHOTOS

DWG. NO.: C-301

CREATED: 03/06/2015

SHEET: 9 OF 23

SCALE: AS NOTED

Y:\CAD\PROJECTS\106-4422 B2HAPRELIMINARY DESIGN - REV C\SHEET FILES\R-33033.DWG
PLOT DETAILS: ANDREWS, JEREMY November 23, 2016 1:22 PM

N
W E
S
0' 20' 40'

NOTES:

1. PROPOSED CROSSING TYPE: TEMPORARY RAIL BRIDGE.
2. ALIGNMENT OF CENTER TEMPORARY RAIL BRIDGE TO BE APPROXIMATELY PERPENDICULAR TO STREAM FOR THIS CROSSING.
3. EXCAVATION DURING CONSTRUCTION REQUIRES 0 CY OF CUT/FILL WITHIN BANKFULL WIDTH OF STREAM AND APPROXIMATELY 3 CY OF CUT, 3 CY OF FILL OUTSIDE BANKFULL AS TEMPORARY BASE AND GRAVEL RAMP.
4. ALL EFFECTIVE EROSION CONTROL MEASURES AND SEDIMENT BARRIERS FOR THE ROAD APPROACHES TO THE CHANNEL CROSSING WILL BE EVALUATED AND PLANNED AS NECESSARY DURING FURTHER STAGES OF DESIGN AND CONSTRUCTION.

LEGEND:
- EXISTING MAJOR CONTOUR - 5FT
- EXISTING MINOR CONTOUR - 1FT
- BANKFULL WIDTH
- A PROFILE EXTENTS

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IDAHO POWER
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NOT FOR CONSTRUCTION

REV.	DATE	REVISION DESCRIPTION	DRW	ENG	CHK	APP
C	10/28/16	PRELIMINARY DESIGN - 2016 DESIGN	JA	JA	AS	SO
B	08/28/15	PRELIMINARY DESIGN - ODFW COMMENTS AND INDICATIVE DESIGN CHANGES	FM	NV	AS	SO
A	3/30/15	PRELIMINARY DESIGN	WB	NV	AS	SO

IDAHO POWER COMPANY
BOARDMAN TO HEMINGWAY

CROSSING R-33033
PROPOSED PLAN VIEW

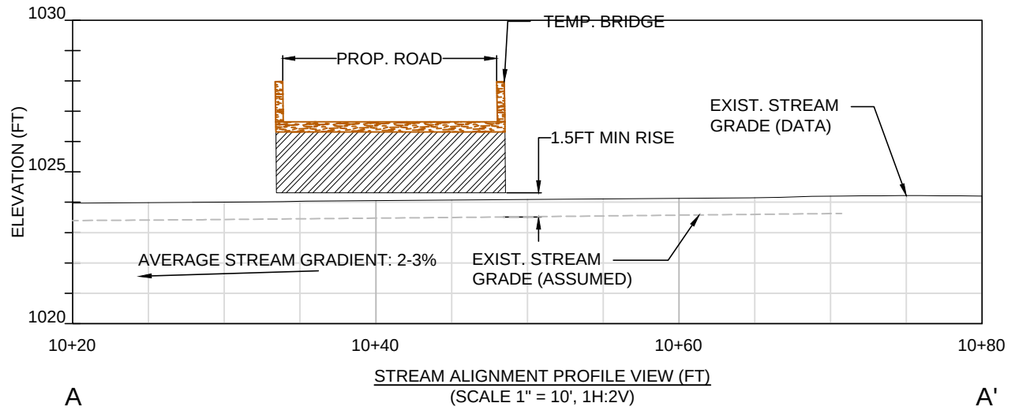
DWG. NO.: C-302

CREATED: 03/06/2015

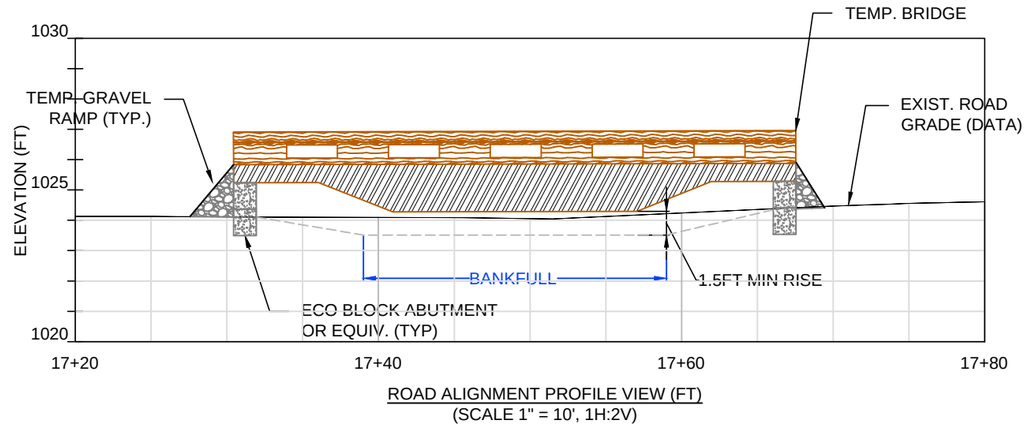
SHEET: 10 OF 23

SCALE: AS NOTED

Y:\CAD\PROJECTS\106-4422 B2HPRELIMINARY DESIGN - REV C\SHEET FILES\R-33033.DWG
PLOT DETAILS: ANDREWS, JEREMY November 23, 2016 1:23 PM



STREAM ALIGNMENT PROFILE VIEW (FT)
(SCALE 1" = 10', 1H:2V)



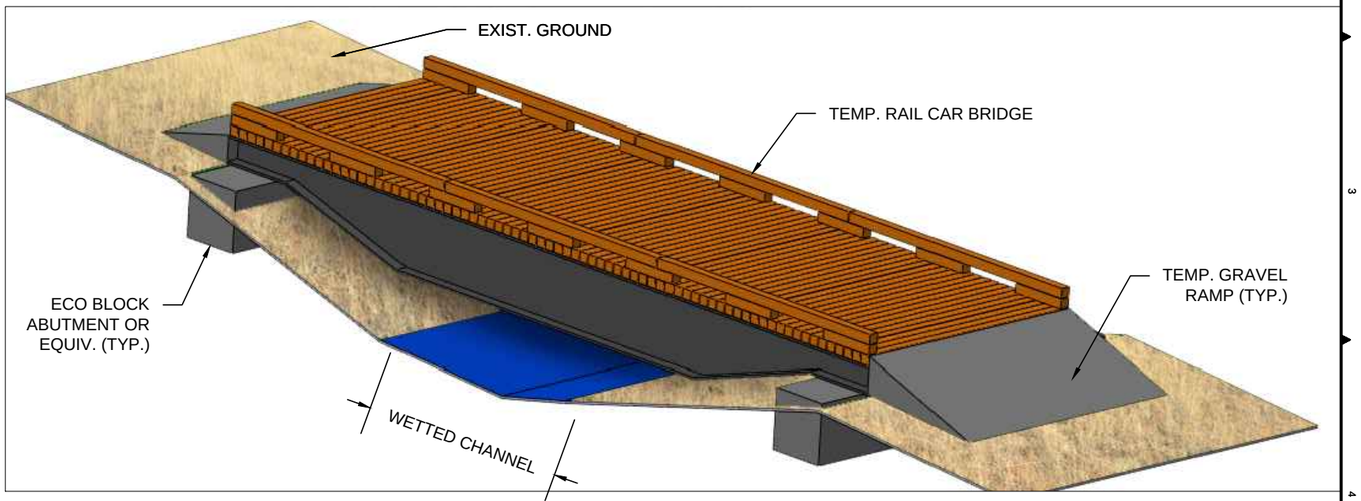
ROAD ALIGNMENT PROFILE VIEW (FT)
(SCALE 1" = 10', 1H:2V)

NOTES:

1. TEMPORARY BRIDGE WILL SPAN WETTED CHANNEL AND NOT REQUIRE SUPPORT IN CENTER OF CHANNEL.
2. AVERAGE BANKFULL WIDTH FOR ROCK CREEK IS 20 FEET. WIDTH SHOWN IN SECTIONS IS WETTED CHANNEL WIDTH AT CROSSING. STREAM CHANNEL TOPOGRAPHY TO BE DETERMINED DURING FINAL FURTHER PHASES OF DESIGN.
3. PLACE ABUTMENTS OUTSIDE OF WETTED CHANNEL AND TEMPORARY BRIDGE WITH MIN. 1.5 FT RISE.
4. PLACE TEMPORARY CLEAN ANGULAR ROCK FILL OR EQUIVALENT AS TEMPORARY BASE AND GRAVEL RAMP AS NEEDED OUTSIDE OF BANKFULL AND WETTED CHANNEL WIDTH TO EASE VEHICULAR TRANSITION FROM GROUND ONTO BRIDGE.
5. EXCAVATION MAY BE REQUIRED OUTSIDE OF BANKFULL WIDTH IN ORDER TO MINIMIZE CROSS AND LONGITUDINAL GRADIENTS FOR SAFE VEHICULAR CROSSING. THESE GRADIENTS WILL BE DETERMINED DURING FINAL PHASES OF THE DESIGN.
6. DURING BRIDGE INSTALLATION, IF SOFT GROUND CONDITIONS ARE FOUND, ECO BLOCK ABUTMENT AND BASE MATERIAL MAY NEED TO BE REVISED PER ENGINEER'S APPROVAL.

GENERAL NOTE:

1. EXISTING GROUND (DATA) FROM 10 METER DEM DID NOT MATCH FIELD SURVEY CONDITIONS. EXISTING GROUND (ASSUMED) WAS DRAWN TO MATCH FIELD CONDITIONS. SITE TOPOGRAPHY WILL BE REFINED AT LATER STAGES OF DESIGN.



TEMPORARY BRIDGE TYPICAL (3D VIEW)
(SCALE NTS)

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REV.	DATE	REVISION DESCRIPTION	DRW	ENG	CHK	APP
C	10/28/16	PRELIMINARY DESIGN - 2016 DESIGN	JA	JA	AS	SO
B	08/28/15	PRELIMINARY DESIGN - ODFW COMMENTS AND INDICATIVE DESIGN CHANGES	FM	NV	AS	SO
A	3/30/15	PRELIMINARY DESIGN	WB	NV	AS	SO

IDAHO POWER COMPANY
BOARDMAN TO HEMINGWAY

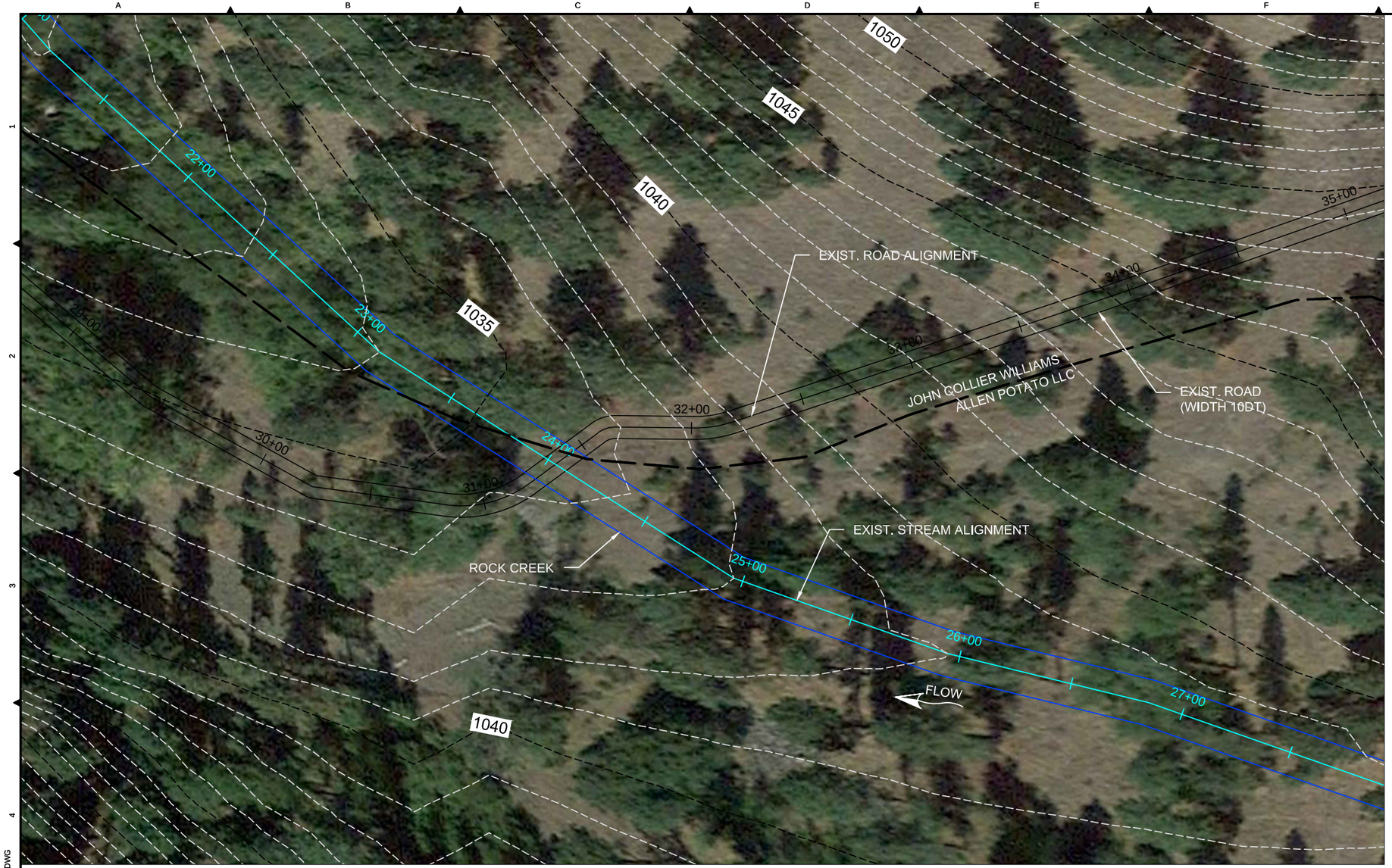
CROSSING R-33033
PLAN VIEWS AND DETAILS

DWG. NO.: C-303

CREATED: 11/06/2016

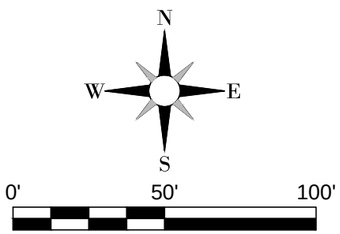
SHEET: 11 OF 23

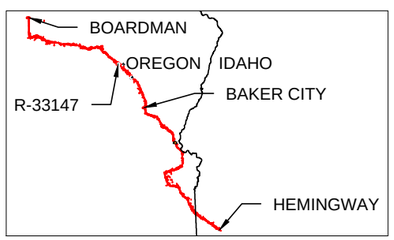
SCALE: AS NOTED



SITE PHOTO - FACING EAST (AUGUST '16)

SITE PHOTO - FACING WEST (AUGUST '16)





MAP INDEX

NOTES:
1. IMAGERY SOURCE: GOOGLE EARTH, 08/30/2013
2. TOPOGRAPHIC DATA SOURCE: USGS LIDAR, APPROXIMATELY 10 METER RESOLUTION.
3. BANKFULL WIDTH: 20FT.
4. STREAM GRADIENT AT CROSSING: 2-3% UNIFORM STREAM REACH.
5. PROPERTY OWNER: JOHN COLLIER WILLIAMS.
6. SITE LOCATION: LATITUDE 45.2920°, LONGITUDE -118.1727°.

LEGEND:
- EXISTING MAJOR CONTOUR - 5FT
- EXISTING MINOR CONTOUR - 1FT
- BANKFULL WIDTH
- PROPERTY LINE

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REV.	DATE	REVISION DESCRIPTION	DRW	ENG	CHK	APP
C	10/28/16	PRELIMINARY DESIGN - 2016	JA	JA	AS	SO
B	08/28/15	PRELIMINARY DESIGN - ODFW COMMENTS AND INDICATIVE DESIGN CHANGES	FM	NV	AS	SO
A	3/30/15	PRELIMINARY DESIGN	WB	NV	AS	SO

IDAHO POWER COMPANY
BOARDMAN TO HEMINGWAY

CROSSING R-33147
EXISTING CONDITIONS
AND SITE PHOTOS

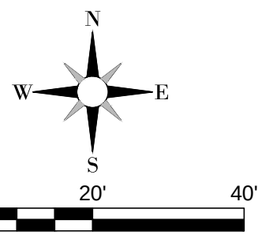
DWG. NO.: C-401

CREATED: 10/28/2016

SHEET: 12 OF 23

SCALE: AS NOTED

Y:\CAD\PROJECTS\106-422 B2H\PRELIMINARY DESIGN - REV C\SHEET FILES\R-33147.DWG
PLOT DETAILS: ANDREWS, JEREMY November 21, 2016 8:02 AM



NOTES:

1. PROPOSED CROSSING TYPE: TEMPORARY RAIL BRIDGE.
2. ALIGNMENT OF CENTER TEMPORARY RAIL BRIDGE TO BE APPROXIMATELY PERPENDICULAR TO STREAM FOR THIS CROSSING.
3. EXCAVATION DURING CONSTRUCTION REQUIRES 0 CY OF CUT/FILL WITHIN BANKFULL WIDTH OF STREAM AND 3 CY OF CUT, 3 CY OF FILL OUTSIDE BANKFULL AS TEMPORARY BASE AND GRAVEL RAMP.
4. ALL EFFECTIVE EROSION CONTROL MEASURES AND SEDIMENT BARRIERS FOR THE ROAD APPROACHES TO THE CHANNEL CROSSING WILL BE EVALUATED AND PLANNED AS NECESSARY DURING FINAL DESIGN FOR CONSTRUCTION AND POST-CONSTRUCTION PURPOSES.

LEGEND:

- EXISTING MAJOR CONTOUR - 5FT
- EXISTING MINOR CONTOUR - 1FT
- BANKFULL WIDTH
- A — PROFILE EXTENTS

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REV.	DATE	REVISION DESCRIPTION	DRW	ENG	CHK	APP
C	10/28/16	PRELIMINARY DESIGN - 2016	JA	JA	AS	SO
B	08/28/15	PRELIMINARY DESIGN - ODFW COMMENTS AND INDICATIVE DESIGN CHANGES	FM	NV	AS	SO
A	3/30/15	PRELIMINARY DESIGN	WB	NV	AS	SO

IDAHO POWER COMPANY
BOARDMAN TO HEMINGWAY

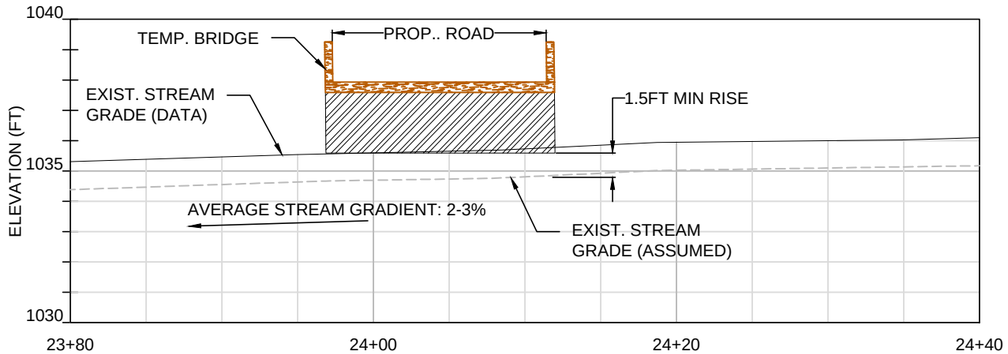
CROSSING R-33147
PROPOSED PLAN VIEW

DWG. NO.: C-402

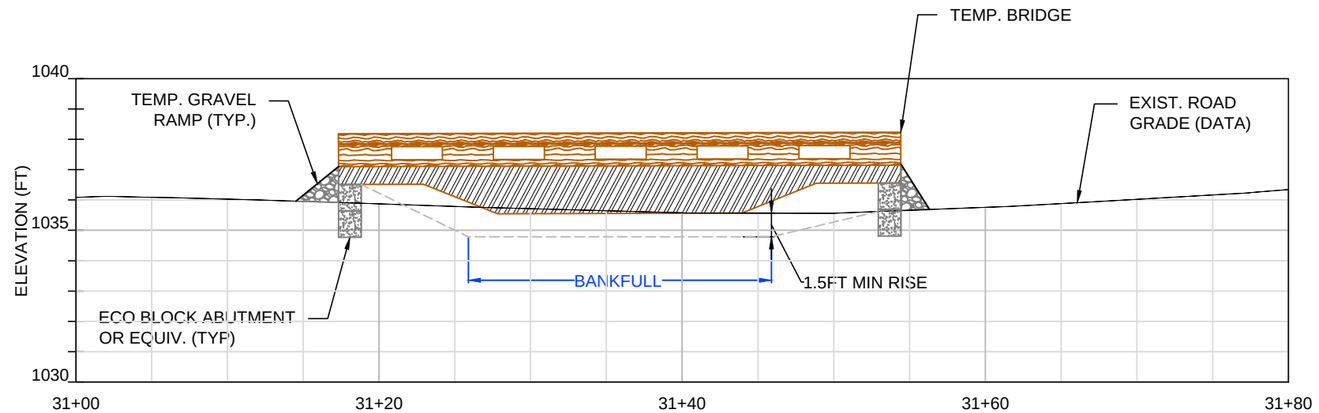
CREATED: 10/28/2016

SHEET: 13 OF 23

SCALE: AS NOTED



STREAM ALIGNMENT PROFILE VIEW (FT)
(SCALE 1" = 10', 1H:2V)



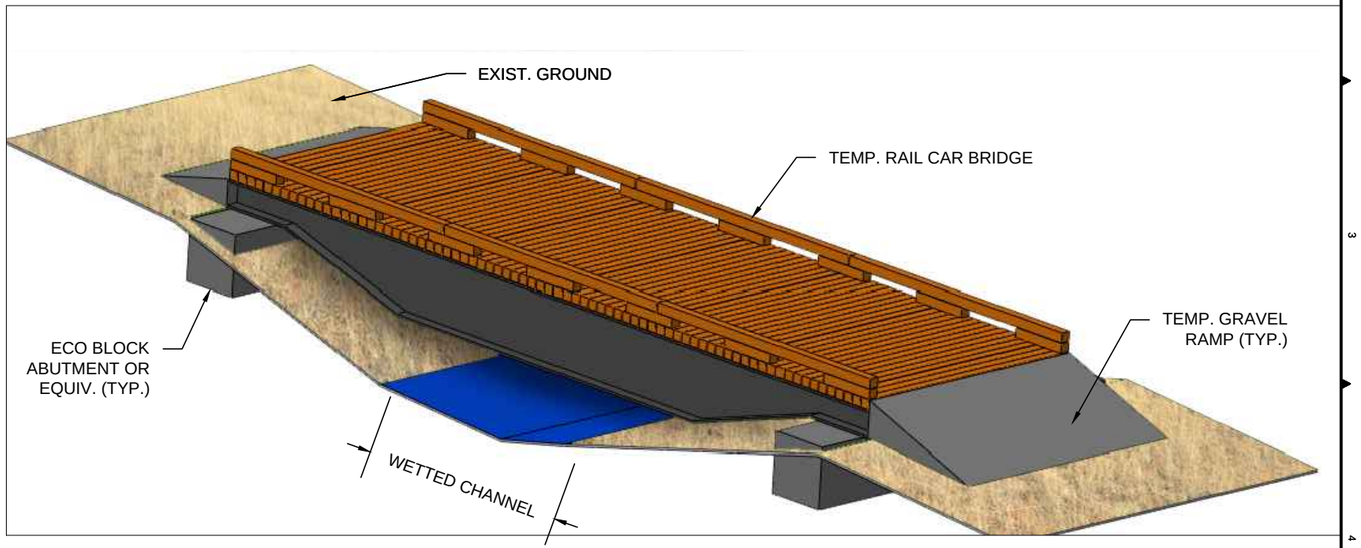
ROAD ALIGNMENT PROFILE VIEW (FT)
(SCALE 1" = 10', 1H:2V)

NOTES:

1. TEMPORARY BRIDGE WILL SPAN WETTED CHANNEL AND NOT REQUIRE SUPPORT IN CENTER OF CHANNEL.
2. AVERAGE BANKFULL WIDTH FOR ROCK CREEK IS 20 FEET. WIDTH SHOWN IN SECTIONS IS WETTED CHANNEL WIDTH AT CROSSING. STREAM CHANNEL TOPOGRAPHY TO BE VERIFIED DURING FINAL PHASES OF DESIGN.
3. PLACE ABUTMENTS OUTSIDE OF WETTED CHANNEL AND TEMPORARY BRIDGE WITH MIN. 1.5 FT RISE.
4. PLACE TEMPORARY CLEAN ANGULAR ROCK FILL OR EQUIVALENT AS TEMPORARY BASE AND GRAVEL RAMP AS NEEDED OUTSIDE OF BANKFULL AND WETTED CHANNEL WIDTH TO EASE VEHICULAR TRANSITION FROM GROUND ONTO BRIDGE.
5. EXCAVATION MAY BE REQUIRED OUTSIDE OF BANKFULL WIDTH IN ORDER TO MINIMIZE CROSS AND LONGITUDINAL GRADIENTS FOR SAFE VEHICULAR CROSSING. THESE GRADIENTS WILL BE DETERMINED DURING FINAL PHASES OF THE DESIGN.
6. DURING BRIDGE INSTALLATION, IF SOFT GROUND CONDITIONS ARE FOUND, ECO BLOCK ABUTMENT AND BASE MATERIAL MAY NEED TO BE REVISED PER ENGINEER'S APPROVAL.

GENERAL NOTE:

1. EXISTING GROUND (DATA) FROM 10 METER DEM DID NOT MATCH FIELD SURVEY CONDITIONS. EXISTING GROUND (ASSUMED) WAS DRAWN TO MATCH FIELD CONDITIONS.



TEMPORARY BRIDGE TYPICAL (3D VIEW)
(SCALE NTS)

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REV.	DATE	REVISION DESCRIPTION	DRW	ENG	CHK	APP
C	10/28/16	PRELIMINARY DESIGN - 2016	JA	JA	AS	SO
B	08/28/15	PRELIMINARY DESIGN - ODFW COMMENTS AND INDICATIVE DESIGN CHANGES	FM	NV	AS	SO
A	3/30/15	PRELIMINARY DESIGN	WB	NV	AS	SO

IDAHO POWER COMPANY
BOARDMAN TO HEMINGWAY

CROSSING R-33147
PLAN VIEWS AND DETAILS

DWG. NO.: C-403

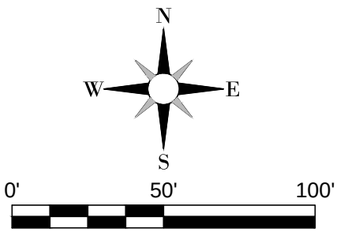
CREATED: 10/28/2016

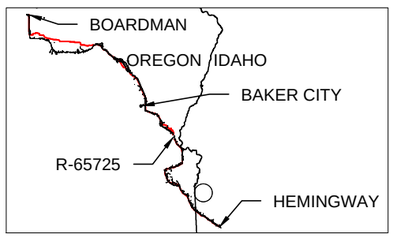
SHEET: 14 OF 23

SCALE: AS NOTED

SITE PHOTO - FACING UPSTREAM (AUGUST '16)

SITE PHOTO - FACING DOWNSTREAM (AUGUST '16)





MAP INDEX

NOTES:
1. IMAGERY SOURCE: GOOGLE EARTH, 8/30/13.
2. TOPOGRAPHIC DATA SOURCE: USGS DEM, APPROXIMATELY 30 METER RESOLUTION.
3. BANKFULL WIDTH: 8FT.
4. STREAM GRADIENT AT CROSSING: 5% UPSTREAM AND 9% DOWNSTREAM OF STREAM CROSSING.
5. PROPERTY OWNER: DURBIN CREEK RANCHES PTR.
6. SITE LOCATION: LATITUDE 44.3994°, LONGITUDE -117.3393°.

LEGEND:
- EXISTING MAJOR CONTOUR - 20FT
- EXISTING MINOR CONTOUR - 4FT
- BANKFULL WIDTH

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IDAHO POWER
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NOT FOR CONSTRUCTION

REV.	DATE	REVISION DESCRIPTION	DRW	ENG	CHK	APP
C	10/28/16	PRELIMINARY DESIGN - 2016	JA	JA	AS	SO
B	08/28/15	PRELIMINARY DESIGN - ODFW COMMENTS AND INDICATIVE DESIGN CHANGES	FM	NV	AS	SO
A	3/30/15	PRELIMINARY DESIGN	WB	NV	AS	SO

IDAHO POWER COMPANY
BOARDMAN TO HEMINGWAY

CROSSING R-65725
EXISTING CONDITIONS AND SITE PHOTOS

DWG. NO.: C-501

CREATED: 10/30/2016

SHEET: 15 OF 23

SCALE: AS NOTED

Y:\CAD\PROJECTS\106-4422 B2HPRELIMINARY DESIGN - REV C\SHEET FILES\R-65725.DWG
PLOT DETAILS: ANDREWS, JEREMY
November 17, 2016
1:41 PM

N
W E
S

0' 20' 40'

NOTES:

1. PROPOSED CROSSING TYPE: TEMPORARY BRIDGE.
2. ALIGNMENT OF CENTER TEMPORARY BRIDGE TO BE APPROXIMATELY PERPENDICULAR TO STREAM FOR THIS CROSSING.
3. EXCAVATION DURING CONSTRUCTION REQUIRES 3 CY OF CUT/FILL WITHIN BANKFULL WIDTH OF STREAM AND 3 CY OF CUT AND 3 CY OF FILL OUTSIDE BANKFULL AS TEMPORARY BASE AND GRAVEL RAMP.
4. ALL EFFECTIVE EROSION CONTROL MEASURES AND SEDIMENT BARRIERS FOR THE ROAD APPROACHES TO THE CHANNEL CROSSING WILL BE EVALUATED AND PLANNED AS NECESSARY DURING FINAL DESIGN FOR CONSTRUCTION AND POST-CONSTRUCTION PURPOSES.

LEGEND:
- EXISTING MAJOR CONTOUR - 20FT
- EXISTING MINOR CONTOUR - 4FT
- BANKFULL WIDTH
- A PROFILE EXTENTS

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IDAHO POWER
An IDACORP Company

NOT FOR CONSTRUCTION

REV.	DATE	REVISION DESCRIPTION	DRW	ENG	CHK	APP
C	10/28/16	PRELIMINARY DESIGN - 2016	JA	JA	AS	SO
B	08/28/15	PRELIMINARY DESIGN - ODFW COMMENTS AND INDICATIVE DESIGN CHANGES	FM	NV	AS	SO
A	3/30/15	PRELIMINARY DESIGN	WB	NV	AS	SO

IDAHO POWER COMPANY
BOARDMAN TO HEMINGWAY

CROSSING R-65725
EXISTING CONDITIONS
AND SITE PHOTOS

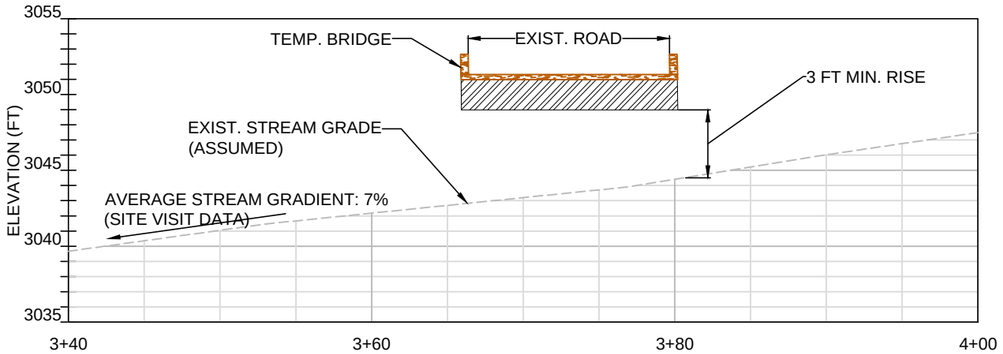
DWG. NO.: C-502

CREATED: 10/30/2016

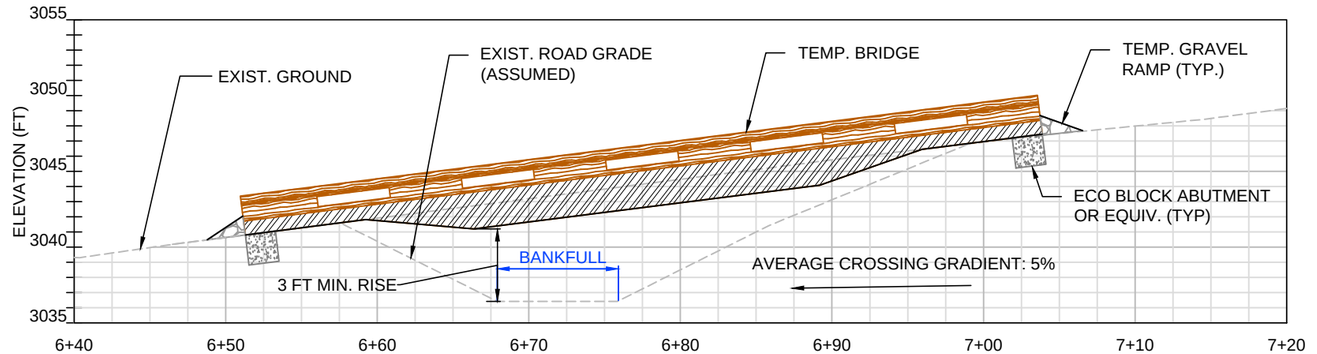
SHEET: 16 OF 23

SCALE: AS NOTED

Y:\CAD\PROJECTS\106-4422 B2H\PRELIMINARY DESIGN - REV C\SHEET FILES\R-65725.DWG
PLOT DETAILS: ANDREWS, JEREMY
November 17, 2016
1:41 PM



STREAM ALIGNMENT PROFILE VIEW (FT)
(SCALE 1" = 10', 1H:1V)



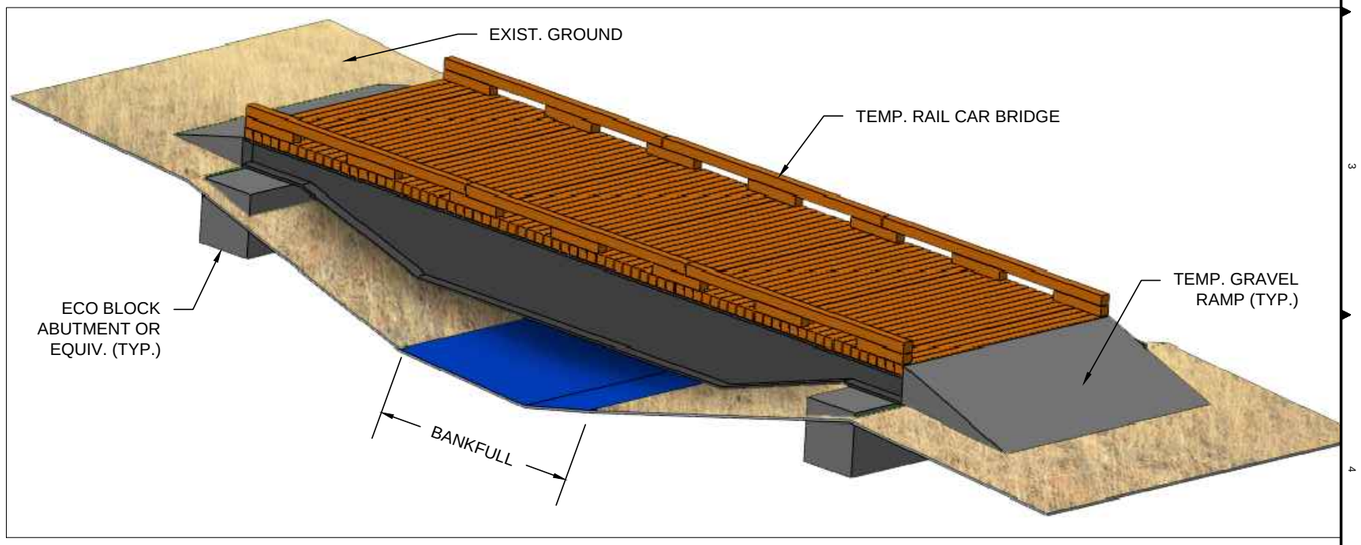
ROAD ALIGNMENT PROFILE VIEW (FT)
(SCALE 1" = 10', 1H:1V)

NOTES:

1. TEMPORARY BRIDGE WILL SPAN BANKFULL CHANNEL AND NOT REQUIRE SUPPORT IN CENTER OF CHANNEL.
2. PLACE ABUTMENTS 5 FT MIN. OUTSIDE OF BANKFULL AND TEMPORARY BRIDGE WITH MIN. 3 FT RISE.
3. PLACE TEMPORARY CLEAN ANGULAR ROCK FILL OR EQUIVALENT AS TEMPORARY BASE AND GRAVEL RAMP AS NEEDED OUTSIDE OF BANKFULL WIDTH TO EASE VEHICULAR TRANSITION FROM GROUND ONTO BRIDGE.
4. EXCAVATION MAY BE REQUIRED OUTSIDE OF BANKFULL WIDTH IN ORDER TO MINIMIZE CROSS AND LONGITUDINAL GRADIENTS FOR SAFE VEHICULAR CROSSING. THESE GRADIENTS WILL BE DETERMINED DURING FINAL PHASES OF THE DESIGN.
5. DURING BRIDGE INSTALLATION, IF SOFT GROUND CONDITIONS ARE FOUND, ECO BLOCK ABUTMENTS AND BASE MATERIAL MAY NEED TO BE REVISED PER ENGINEER'S APPROVAL.

GENERAL NOTE:

1. EXISTING GROUND (DATA) FROM 30 METER DEM DID NOT MATCH FIELD SURVEY CONDITIONS. EXISTING GROUND (ASSUMED) WAS DRAWN TO MATCH FIELD CONDITIONS.



TEMPORARY BRIDGE TYPICAL (3D VIEW)
(SCALE NTS)

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C	10/28/16	PRELIMINARY DESIGN - 2016	JA	JA	AS	SO
B	08/28/15	PRELIMINARY DESIGN - ODFW COMMENTS AND INDICATIVE DESIGN CHANGES	FM	NV	AS	SO
A	3/30/15	PRELIMINARY DESIGN	WB	NV	AS	SO

IDAHO POWER COMPANY
BOARDMAN TO HEMINGWAY

CROSSING R-65725
EXISTING CONDITIONS
AND SITE PHOTOS

DWG. NO.: C-503

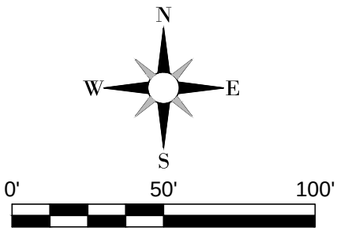
CREATED: 10/30/2016

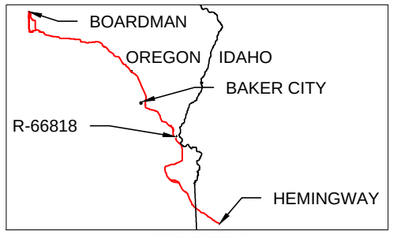
SHEET: 17 OF 23

SCALE: AS NOTED

SITE PHOTO - FACING EAST (JUNE '16)

SITE PHOTO - FACING WEST (JUNE '16)





MAP INDEX

NOTES:
1. IMAGERY SOURCE: GOOGLE MAPS 10/28/16.
2. TOPOGRAPHIC DATA SOURCE: USGS DEM, APPROXIMATELY 30 METER RESOLUTION.
3. BANKFULL WIDTH: 6 FT.
4. STREAM GRADIENT AT CROSSING: 4% UPSTREAM AND 12% DOWNSTREAM OF CROSSING.
5. PROPERTY OWNER: DAVIS, GARY R. & LOIS A.
6. SITE LOCATION: LATITUDE 44.3734°, LONGITUDE -117.3050°.

LEGEND:
- EXISTING MAJOR CONTOUR - 20FT
- EXISTING MINOR CONTOUR - 4FT
- BANKFULL WIDTH
- PROPERTY LINE

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IDAHO POWER COMPANY
BOARDMAN TO HEMINGWAY

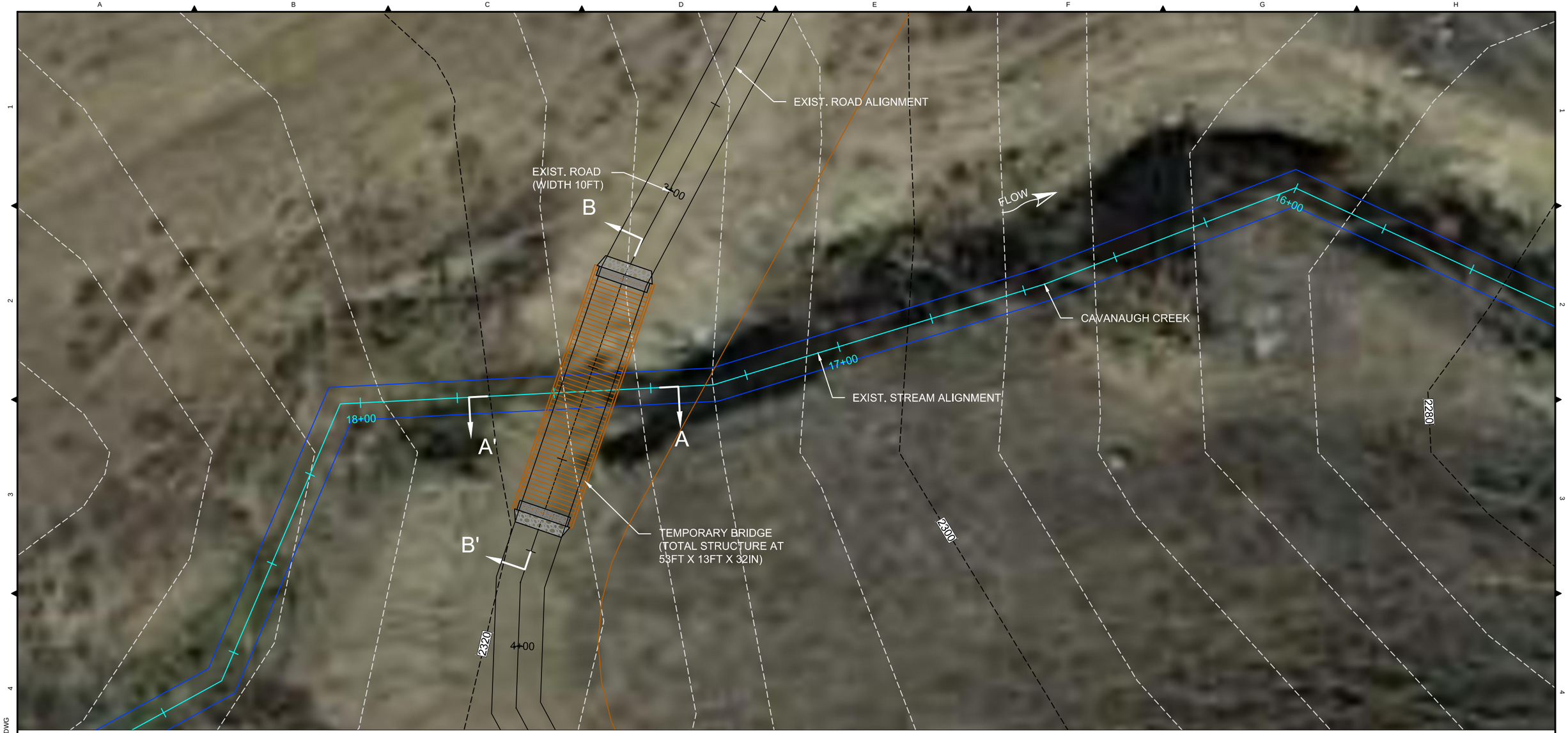
CROSSING R-66818
EXISTING CONDITIONS
AND SITE PHOTOS

DWG. NO.: C-601

CREATED: 10/30/2016

SHEET: 18 OF 23

SCALE: AS NOTED



N
W E
S
0' 20' 40'

NOTES:

1. PROPOSED CROSSING TYPE: TEMPORARY RAIL BRIDGE.
2. ALIGNMENT OF CENTER TEMPORARY RAIL BRIDGE TO BE APPROXIMATELY PERPENDICULAR TO STREAM FOR THIS CROSSING.
3. EXCAVATION DURING CONSTRUCTION REQUIRES 0 CY OF CUT/FILL WITHIN BANKFULL WIDTH OF STREAM AND 3 CY OF CUT, 3 CY OF FILL OUTSIDE BANKFULL AS TEMPORARY BASE AND GRAVEL RAMP.
4. ALL EFFECTIVE EROSION CONTROL MEASURES AND SEDIMENT BARRIERS FOR THE ROAD APPROACHES TO THE CHANNEL CROSSING WILL BE EVALUATED AND PLANNED AS NECESSARY DURING FINAL DESIGN FOR CONSTRUCTION AND POST-CONSTRUCTION PURPOSES.

LEGEND:
- EXISTING MAJOR CONTOUR - 20FT
- EXISTING MINOR CONTOUR - 4FT
- BANKFULL WIDTH
- A PROFILE EXTENTS

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IDAHO POWER COMPANY
BOARDMAN TO HEMINGWAY

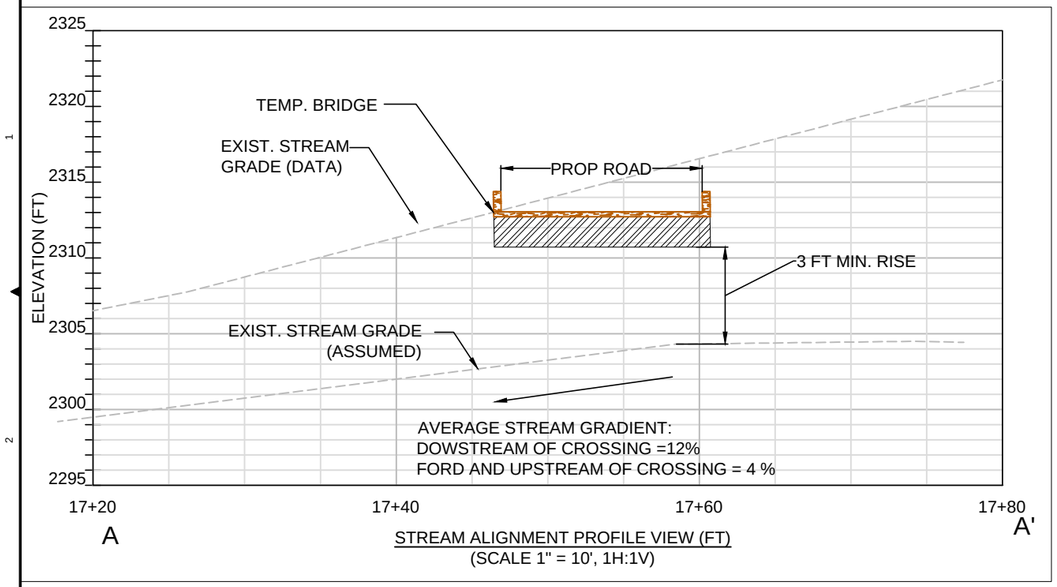
CROSSING R-66818
PROPOSED PLAN VIEW

DWG. NO.: C-602

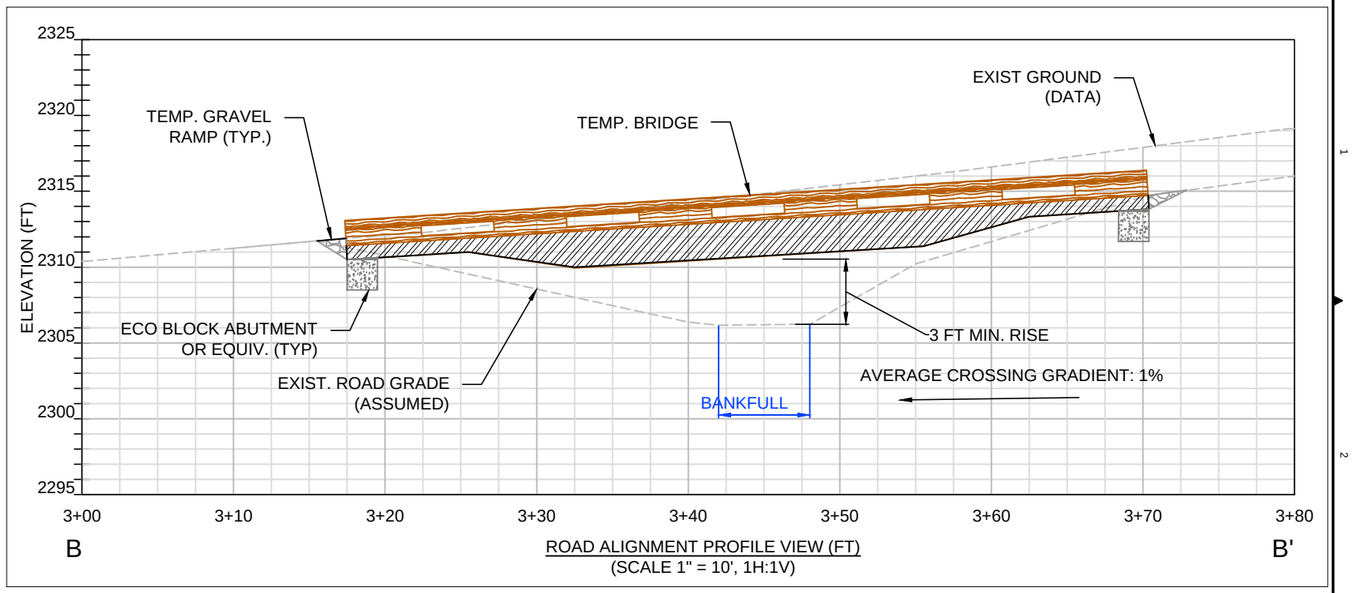
CREATED: 10/30/2016

SHEET: 19 OF 23

SCALE: AS NOTED



STREAM ALIGNMENT PROFILE VIEW (FT)
(SCALE 1" = 10', 1H:1V)



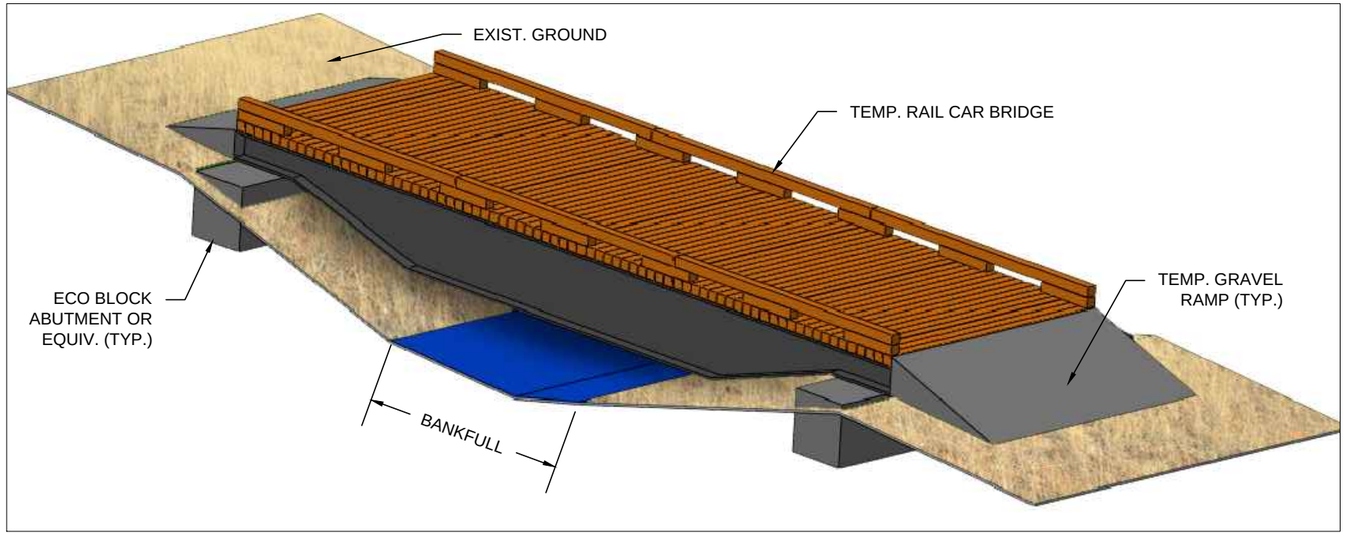
ROAD ALIGNMENT PROFILE VIEW (FT)
(SCALE 1" = 10', 1H:1V)

NOTES:

1. TEMPORARY BRIDGE WILL SPAN BANKFULL CHANNEL AND NOT REQUIRE SUPPORT IN CENTER OF CHANNEL.
2. PLACE ABUTMENTS 5 FT MIN. OUTSIDE OF BANKFULL AND TEMPORARY BRIDGE WITH MIN. 3 FT RISE.
3. PLACE TEMPORARY CLEAN ANGULAR ROCK FILL OR EQUIVALENT AS TEMPORARY BASE AND GRAVEL RAMP AS NEEDED OUTSIDE OF BANKFULL WIDTH TO EASE VEHICULAR TRANSITION FROM GROUND ONTO BRIDGE.
4. EXCAVATION MAY BE REQUIRED OUTSIDE OF BANKFULL WIDTH IN ORDER TO MINIMIZE CROSS AND LONGITUDINAL GRADIENTS FOR SAFE VEHICULAR CROSSING. THESE GRADIENTS WILL BE DETERMINED DURING FINAL PHASES OF THE DESIGN.
5. DURING BRIDGE INSTALLATION, IF SOFT GROUND CONDITIONS ARE FOUND, ECO BLOCK ABUTMENTS AND BASE MATERIAL MAY NEED TO BE REVISED PER ENGINEER'S APPROVAL.

GENERAL NOTE:

1. EXISTING GROUND (DATA) FROM 30 METER DEM DID NOT MATCH FIELD SURVEY CONDITIONS. EXISTING GROUND (ASSUMED) WAS DRAWN TO MATCH FIELD CONDITIONS.



TEMPORARY BRIDGE TYPICAL (3D VIEW)
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B	08/28/15	PRELIMINARY DESIGN - ODFW COMMENTS AND INDICATIVE DESIGN CHANGES	FM	NV	AS	SO

IDAHO POWER COMPANY
BOARDMAN TO HEMINGWAY

CROSSING R-66818
PLAN VIEWS AND DETAILS

DWG. NO.: C-603

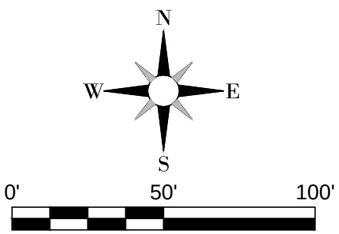
CREATED: 10/28/2016

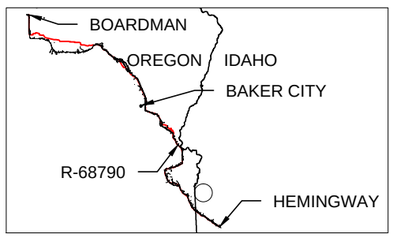
SHEET: 20 OF 23

SCALE: AS NOTED

SITE PHOTO - FACING NORTH (MAY '14)

SITE PHOTO - FACING NORTH (MAY '14)





MAP INDEX

NOTES:
1. IMAGERY SOURCE: GOOGLE EARTH, 8/30/13.
2. TOPOGRAPHIC DATA SOURCE: USGS DEM, APPROXIMATELY 30 METER RESOLUTION.
3. BANKFULL WIDTH: 18FT.
4. STREAM GRADIENT AT CROSSING: <1% UNIFORM STREAM REACH.
5. PROPERTY OWNER: AGAR, BREWSTER V & MARY L ET AL.
6. SITE LOCATION: LATITUDE 44.3134°, LONGITUDE -117.2652°.

LEGEND:
- EXISTING MAJOR CONTOUR - 10FT
- EXISTING MINOR CONTOUR - 2FT
- BANKFULL WIDTH
- PROPERTY LINE

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A	3/30/15	PRELIMINARY DESIGN	WB	NV	AS	SO

IDAHO POWER COMPANY
BOARDMAN TO HEMINGWAY

CROSSING R-68790
EXISTING CONDITIONS
AND SITE PHOTOS

DWG. NO.: C-701

CREATED: 00/00/2016

SHEET: 21 OF 23

SCALE: AS NOTED

Y:\CAD\PROJECTS\106-4422 B2HPRELIMINARY DESIGN - REV C\SHEET FILES\R-68790.DWG
PLOT DETAILS: ANDREWS, JEREMY
November 17, 2016
1:30 PM

N
W E
S

0' 20' 40'

NOTES:

1. PROPOSED CROSSING TYPE: TEMPORARY RAIL BRIDGE.
2. ALIGNMENT OF CENTER TEMPORARY RAIL BRIDGE TO BE APPROXIMATELY PERPENDICULAR TO STREAM FOR THIS CROSSING.
3. EXCAVATION DURING CONSTRUCTION REQUIRES 0 CY OF CUT/FILL WITHIN BANKFULL WIDTH OF STREAM AND 2 CY OF FILL OUTSIDE BANKFULL AS TEMPORARY BASE AND GRAVEL RAMP.
4. ALL EFFECTIVE EROSION CONTROL MEASURES AND SEDIMENT BARRIERS FOR THE ROAD APPROACHES TO THE CHANNEL CROSSING WILL BE EVALUATED AND PLANNED AS NECESSARY DURING FINAL DESIGN FOR CONSTRUCTION AND POST-CONSTRUCTION PURPOSES.

LEGEND:

- EXISTING MAJOR CONTOUR - 10FT
- EXISTING MINOR CONTOUR - 2FT
- BANKFULL WIDTH
- PROPERTY LINE
- A PROFILE EXTENTS

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B	08/28/15	PRELIMINARY DESIGN - ODFW COMMENTS AND INDICATIVE DESIGN CHANGES	FM	NV	AS	SO
A	3/30/15	PRELIMINARY DESIGN	WB	NV	AS	SO

IDAHO POWER COMPANY
BOARDMAN TO HEMINGWAY

CROSSING R-68790
PROFILE VIEWS AND DETAILS

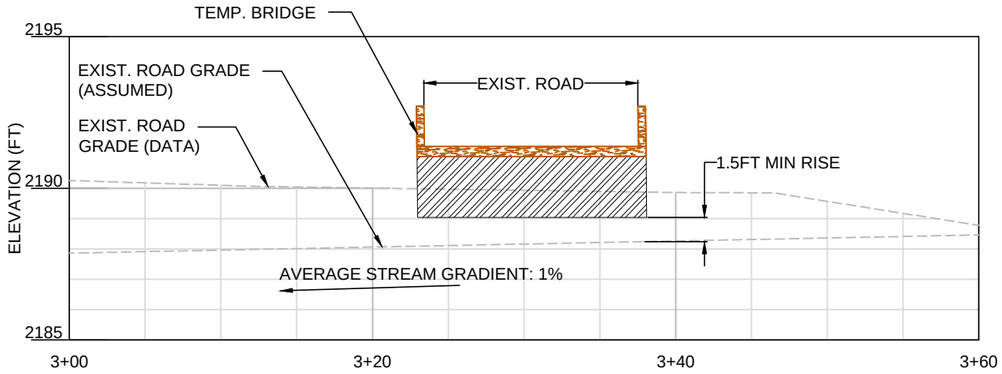
DWG. NO.: C-702

CREATED: 10/28/2016

SHEET: 22 OF 23

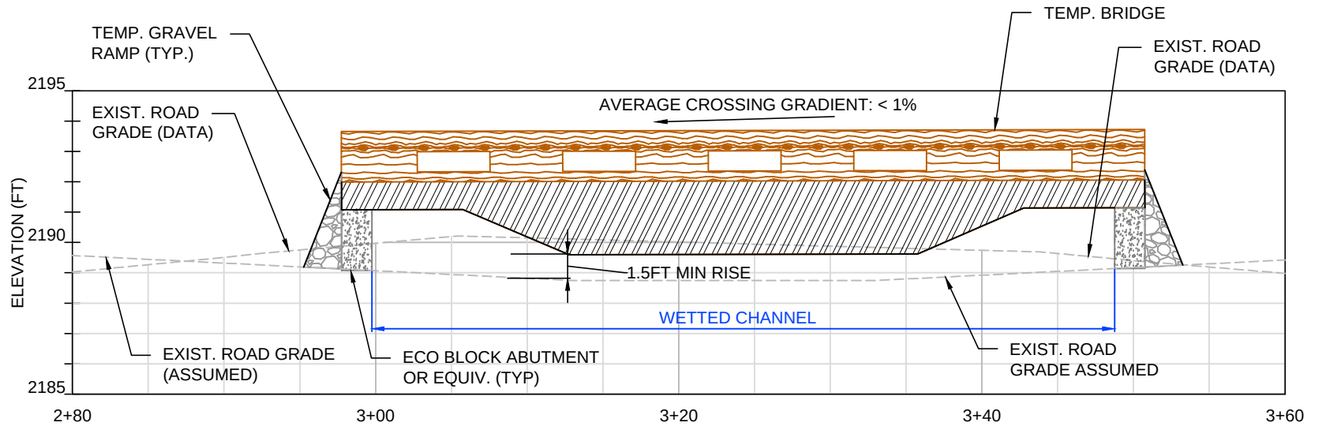
SCALE: AS NOTED

Y:\CAD\PROJECTS\105-4422.B2\PRELIMINARY DESIGN - REV C\SHEET FILES\R-68790.DWG
PLOT DETAILS: ANDREWS, JEREMY November 17, 2016 1:30 PM



A — A'

STREAM ALIGNMENT PROFILE VIEW (FT)
(SCALE 1" = 10', 1H:2V)



B — B'

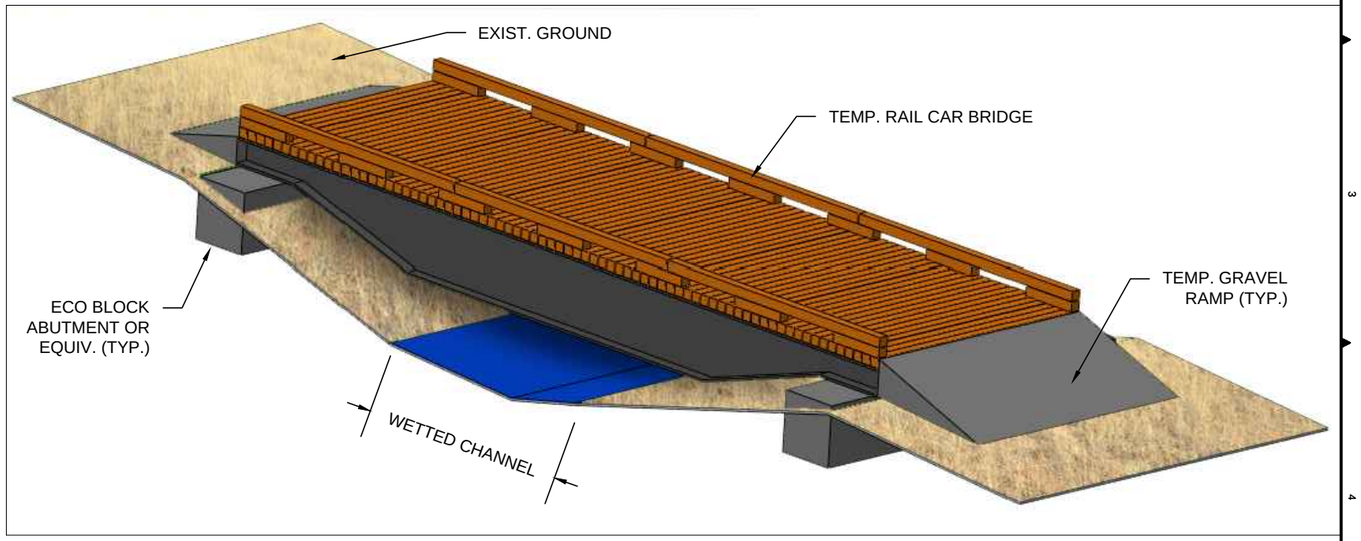
ROAD ALIGNMENT PROFILE VIEW (FT)
(SCALE 1" = 10', 1H:2V)

NOTES:

1. TEMPORARY BRIDGE WILL SPAN WETTED CHANNEL AND NOT REQUIRE SUPPORT IN CENTER OF CHANNEL.
2. AVERAGE BANKFULL WIDTH FOR BENSON CREEK OUTSIDE OF FORD IS 18 FEET. WIDTH SHOWN IN SECTIONS IS WETTED CHANNEL WIDTH AT CROSSING.
3. PLACE ABUTMENTS OUTSIDE OF WETTED CHANNEL AND TEMPORARY BRIDGE WITH MIN. 1.5 FT RISE.
4. PLACE TEMPORARY CLEAN ANGULAR ROCK FILL OR EQUIVALENT AS TEMPORARY BASE AND GRAVEL RAMP AS NEEDED OUTSIDE OF BANKFULL AND WETTED CHANNEL WIDTH TO EASE VEHICULAR TRANSITION FROM GROUND ONTO BRIDGE.
5. EXCAVATION MAY BE REQUIRED OUTSIDE OF BANKFULL WIDTH IN ORDER TO MINIMIZE CROSS AND LONGITUDINAL GRADIENTS FOR SAFE VEHICULAR CROSSING. THESE GRADIENTS WILL BE DETERMINED DURING FINAL PHASES OF THE DESIGN.
6. DURING BRIDGE INSTALLATION, IF SOFT GROUND CONDITIONS ARE FOUND, ECO BLOCK ABUTMENT AND BASE MATERIAL MAY NEED TO BE REVISED PER ENGINEER'S APPROVAL.

GENERAL NOTE:

1. EXISTING GROUND (DATA) FROM 30 METER DEM DID NOT MATCH FIELD SURVEY CONDITIONS. EXISTING GROUND (ASSUMED) WAS DRAWN TO MATCH FIELD CONDITIONS.



TEMPORARY BRIDGE TYPICAL (3D VIEW)
(SCALE NTS)

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A	3/30/15	PRELIMINARY DESIGN	WB	NV	AS	SO

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BOARDMAN TO HEMINGWAY

CROSSING R-68790
PROFILE VIEWS AND DETAILS

DWG. NO.: C-703

CREATED: 10/28/2016

SHEET: 23 OF 23

SCALE: AS NOTED

ATTACHMENT BB-3
OVERVIEW OF UNDERGROUND TECHNOLOGIES

OVERVIEW OF UNDERGROUND TECHNOLOGIES

For 500-kilovolt (kV) alternating current (AC) underground lines, a number of cable technologies exist. While some have long running track records of high reliability, others are relatively new and untested. At the 500-kV voltage level, only a number of underground installations exist, namely in Japan and China. Within the U.S., 500-kV underground installations are limited to test sections. Alberta Electric Systems Operations is conducting a Feasibility Study to place approximately 12 miles underground on the Heartland Transmission Project.[1]

There are five basic technologies to consider for 500-kV AC underground circuits:

1. Solid Dielectric (Cross-Linked Polyethylene [XLPE]);
2. Gas Insulated transmission Line (GIL);
3. Pipe-type (High Pressure Fluid-Filled [HPFF]);
4. Self-Contained Fluid Filled (SCFF); and
5. Superconducting Cables.

Solid Dielectric Cable—Considered only for distances of up to a few miles at the 500-kV voltage level, solid dielectric insulation or XLPE cable construction has been used only in special situations. While the technology is progressively emerging, lack of practical experience results in major reliability concerns for operating larger scale 500-kV underground systems.

Gas Insulated Transmission Line—GIL technology at the 500-kV voltage level has been implemented primarily within substations and not for longer transmission lines. GIL has been incorporated into substation designs with the length typically limited to distances less than 1,000 feet. However, the high cost and lack of experience with longer underground transmission lines, as well as questions of reliability, are more of a concern than with the other more prominent cable technologies.

High Pressure Fluid-Filled Cable—HPFF cable systems are a pipe-type system in which three single-phase cables are located within a single steel pipe (Figure BB-3-1). HPFF cables use Kraft paper insulation or a laminated polypropylene paper insulation that is impregnated with dielectric fluid to minimize the insulation breakdown under electrical stress. Since the system requires a continuous high pressure, pumping plants are required every 7 to 10 miles along the route, assuming relatively flat topography. The pumping plants are responsible for maintaining a constant pressure on the system, but must have large reserve tanks to facilitate the expansion and contraction of the dielectric fluid as the system undergoes thermal cycling. To maintain an operable pipe-type system, cathodic protection must be applied to the cable pipes to mitigate corrosion. This in turn helps prevent fluid leaks, which pose both an operational and an environmental concern. Using an HPFF system does provide high reliability but it also requires additional equipment, resulting in additional opportunity for component failure, while specially trained personnel are required to maintain these systems. Industry sponsored testing has proven that this technology can operate at the 500-kV voltage level; however, there are no 500-kV HPFF pipe-type systems currently installed within the U.S. and few installations can be found throughout the world. That being said, of the available cable technologies, an HPFF cable system may be considered the most logical for a 500-kV system.

[1] Alberta Electric System Operator. 2010. 500 kV AC Underground Transmission Technical Feasibility Study. Available online at: http://www.aeso.ca/downloads/UndergroundStudybackgrounderFeb24.pdf

Figure BB-3-1. Typical HPFF Pipe Installation

Self-Contained Fluid Filled Cable—SCFF cable systems are similar to the HPFF systems. The cable is typically constructed around a hollow tube, used for fluid circulation, and uses the same Kraft paper or laminated polypropylene paper insulation materials. Because the fluid system is "self-contained," the volume of fluid required is less; however, the same distribution of pumping plants would be required. While SCFF cable systems have the longest running history at the extra high voltage levels, their use is typically restrained to long submarine cable installations. This technology has been implemented on inland applications with high reliability at 500-kV voltage levels.

Superconducting Cables—Research is currently underway in the advancement of high-temperature superconductors. Utilizing a unique cable design where all three phases are centered concentrically on a single core, the cables are capable of displaying low electric losses with the same power transfer capabilities as a standard non-superconducting cable. The core, filled with a cryogenic fluid, such as liquid nitrogen, super-cools the conducting material resulting in extremely low losses and high electrical power transfer capacities. Most high temperature superconductor systems are located adjacent to large metropolitan areas, where they are capable of transferring large quantities of power a few thousand feet, at the distribution level. However, technological advances in the last few years have seen the first 138-kV AC system installed in Long Island, New York, in early 2008. Because high-temperature superconductor systems have been established neither at the 500-kV voltage levels nor over long distances, superconducting cable will not be a technology option to consider for the Project.

Design of Cable Systems

The following are key considerations for underground transmission line design for 500-kV cable systems:

- A 500-kV cable system would consist of multiple cables per phase to achieve the target power transfer requirements and to provide redundancy in the case of a cable failure.

- Concrete encased duct banks would be installed at a minimum cover depth of 3 feet, or as required by routing design, and would be backfilled with specially engineered thermally favorable backfill to assist in heat dissipation.
- To obtain further redundancy, multiple duct banks per circuit can be utilized to minimize common mode failures of the cable installation.
- Depending upon installation location, a permanent access road approximately 14 feet wide may be required to perform operation and maintenance procedures.
- The total construction surface impact of the underground cable system is at a minimum approximately 30 feet wide, and includes any permanent access roads.
- Splicing of the cable would be required approximately every 1,500 to 2,000 feet. Splicing would be performed inside large underground vault structures. Vault dimensions would be approximately 12 feet wide by 28 to 40 feet long by 8 to 9 feet deep depending upon the cable manufacturer splice and cable racking requirements.
- Depending on the terrain characteristics, burial depths may need to be increased to avoid heating the soil and changing the conditions of the vegetation and wildlife habitat above the duct bank or pipe type cables.
- Underground to overhead transition stations would be required at each end of the underground transmission line, and at each intermediate reactive compensation and pumping stations. Requiring 2 to 4 acres, each site would consist of pedestal-type termination structures, reactors (similar to a large power transformer in appearance), and pumping plants, dependent upon cable system. In addition to these structures, A-frame dead-end structures, approximately 80 feet tall, would be required at each end of the system.
- Pumping plants would be required every 7 to 10 miles along the route, for either HPFF or SCFF cable systems.
- Reactive compensation would be required every 7 to 20 miles along the route to offset the capacitive reactance of the cable system, depending on the cable technology employed and electrical system requirements.

Reliability and Maintenance

Long-term reliability of underground cable systems is a major concern. Underground 500-kV lines are largely an unproven technology, as they have been implemented in a limited number of circumstances. In conjunction with their limited use, all installations to date have been relatively short compared to the Project, raising concern about the reliability of an extensive cross-country cable system. A catastrophic failure of any portion of the system—underground cable, splices, terminations, or fluid systems—could result in the cable system being inoperable and out of service.

Basic maintenance of the cable systems consists of a thorough yearly inspection, while any fluid systems must be inspected and tested monthly. Inspections include all terminations and splices, all bonding systems, as well as all valves, gauges, switches, and alarms within the pumping plant. Cathodic protection systems are monitored as an ongoing process.

Construction Process

Large open trench installation or the more costly trenchless technologies are utilized to place the cables underground. Construction includes, but may not be limited to clearing of the ROW, trenching, installation of duct banks or pipe networks, installation of vaults, cable splicing and terminating, and termination structure construction.

Trenching—Generally the most common technique for placing underground lines, open cut trenching utilizes a large surface excavation to place the required infrastructure. The typical trench dimensions vary by cable type, voltage level, and required power transfer, but in all cases require a minimum cover depth of 3 feet (see Figure BB-3-2). While a number of cable arrangements can be achieved, soil characteristics and existing infrastructure often play the largest role of how the installations are designed. Trenching operations are typically staged such that a maximum of 300 to 500 feet of trench is open at any one time. Steel plating may be positioned over the open trench to minimize surface disruptions, while traffic controls alleviate congestion through the project area. Emergency vehicle and local access must be coordinated with local jurisdictions as necessary.

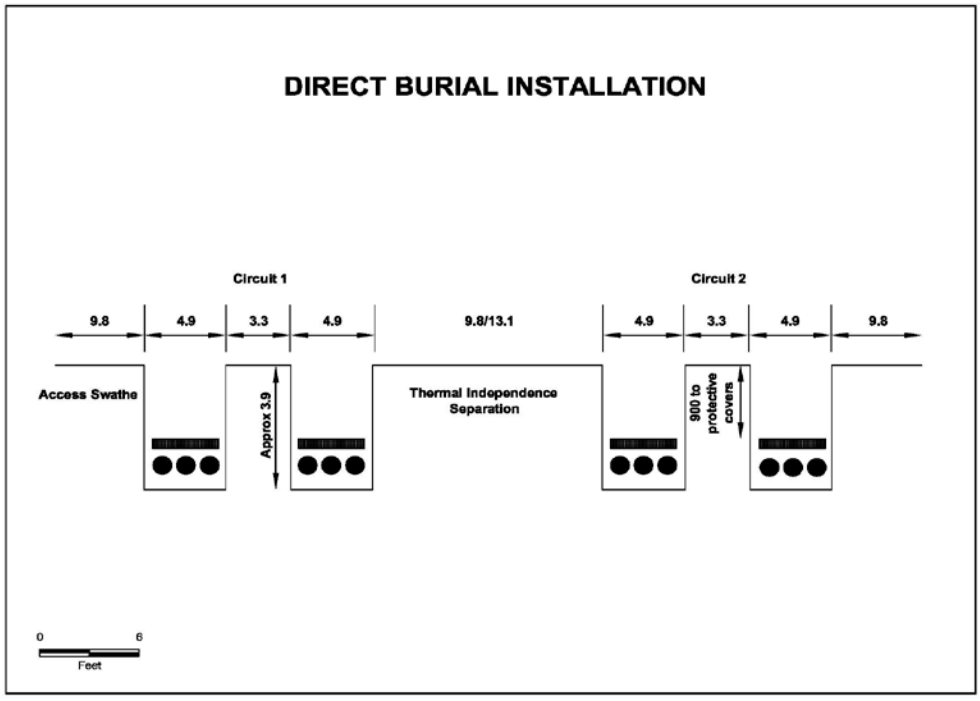

Figure BB-3-2. Typical Direct Burial Installation

Installation—Single- and double-circuit solid dielectric cable systems are often installed in duct bank configurations; another method is duct burial. Figure BB-4-2 illustrates the space requirements. Figure BB-3-3 shows a cable construction ROW.

Figure BB-3-3. Typical Cable Construction ROW with Single Cable Trench Open

Pipe-type cable systems use steel pipes to encase each set of cables. Pipe-type cable systems can be utilized at the 500-kV level.

Vault Installation—In a vault installation (Figure BB-3-4), preformed concrete splice vaults are placed at approximately 1,500- to 2,000-foot intervals depending on the maximum cable per reel length. The vaults, initially used to install the cables into the conduits, are primarily used to house the splice assemblies and to provide access for yearly inspections of the system. The vaults are used to sectionalize segments of cable in the event of a failure to locate the faulted cable and repair the required section. The typical installation time frame of each vault is approximately 1 week beginning with excavation, placement, compaction, and finally resurfacing of the excavated area.

Figure BB-3-4. Typical XLPE Vault Installation

Cable Pulling, Splicing, and Termination—Upon completion of the civil construction, cables are installed within the duct banks or steel pipes. Each cable segment is installed, spliced at each of the vaults along the route, and terminated at the transition sites where the cable connects to overhead conductors. To install the cable, a reel of cable is positioned at one end of a cable section, while a pulling rig is located at the other end. Using wire rope, each section of cable is installed into its respective conduit/steel pipe, while workers apply either water-based lubricant for solid dielectric cable or dielectric fluid for pipe type cable, to the cable jacket to minimize the frictional forces placed on the cables. Before termination or splicing operations begin, the cables are trained into the correct position using heat blankets. This process removes the curvature of the cable from being on the reel while also relieving any longitudinal strain exerted on the cable during pulling operations.

Termination Structure Construction—Because of the large size of cable equipment required for 500-kV lines, large transition sites are the only option. Figure BB-3-5 shows a typical transition station.

Figure BB-3-5. Typical Overhead to Underground Transition Station

Special Construction Methods—In locations where open trench construction is not feasible, such as water crossings, airports, railway crossings, large roadway interchanges, etc., methods of trenchless installation must be utilized. Three main types of trenchless technologies exist. These are:

- Jack and Bore Tunneling
- Horizontal Directional Drilling
- Microtunneling

Jack and Bore Tunneling—Jack and bore tunneling is an auguring operation that simultaneously jacks or pushes a steel casing into the excavated cavity (Figure BB-3-6). As the equipment progresses forward, subsequent casing segments are added, while the spoils are removed through the center of the casing. Upon completing the crossing, the duct system is positioned inside of the steel casing using specially designed spacers, and the entire casing is then backfilled with thermally designed grout. The grout not only solidifies the installation from

any movement, but also helps dissipate heat away from the cable system. For pipe-type cable systems, the jacked casing can double as the cable pipe and may be welded to the trenched cable pipe.

Figure BB-3-6. Typical Jack and Bore Casing Installation

Horizontal Directional Drilling—The horizontal directional drilling method uses a steerable cutting head to create a pilot hole along a predetermined route. Using progressively larger reamers, the hole is enlarged to the intended diameter. A product casing is then pulled through the hole and duct work, using specially designed spacers, and is positioned within the casing. Grout is pumped into the voids within the casing to secure the installation and assist with the thermal transfer of heat away from the cable system. As with the jack and bore method, the casing can be used as the cable pipe in a pipe type cable system.

Microtunneling—Microtunneling resembles the jack and bore method; however, the casing diameters and distances can typically be increased. Microtunneling uses a remotely operated tunneling machine to create the desired diameter hole. A casing is then placed into the excavated hole and duct work is positioned within the casing. As before, the casing is filled with grout, or the casing can be used as the product pipe in a pipe-type cable system.

Construction Time

Installing large segments of underground transmission lines can require as much as twice the construction time of overhead lines, if not more, due to the extensive excavation required to complete the trenching and installation of the cable system infrastructure, cable splicing, and construction of transition stations.

ATTACHMENT BB-4
LIST OF IPC'S PROPOSED SITE CERTIFICATE CONDITIONS

Standard	Condition	Exhibit
General Standard of Review	*None.*	
Organizational Expertise	***Throughout the Life of the Project***	
	***Organizational Expertise Condition 1**: Throughout the life of the Project, the site certificate holder shall be responsible for any matter of non-compliance under the site certificate. Any notice of violation (NOV) issued under the site certificate will be issued to the site certificate holder. Any civil penalties under the site certificate will be levied on the site certificate holder.*	Exhibit D
	***Organizational Expertise Condition 2**: Throughout the life of the Project, within 72 hours after discovery of incidents or circumstances that violate the terms or conditions of the site certificate, the site certificate holder must report the conditions or circumstances to the department, in addition to the requirements of OAR 345-026-0170.*	Exhibit D
	Prior to Construction	
	***Organizational Expertise Condition 3**: Prior to construction, the site certificate holder shall notify the department of the identity and qualifications of the major design, engineering, and construction contractor(s) for the facility. The site certificate holder shall select contractors that have substantial experience in the design, engineering, and construction of similar facilities. The site certificate holder shall report to the department any changes of major contractors.*	Exhibit D
	***Organizational Expertise Condition 4**: Prior to construction, the site certificate holder shall notify the department of the identity and qualifications of the construction manager to demonstrate that the construction manager is qualified in environmental compliance and has the capability to ensure compliance with all site certificate conditions.*	Exhibit D
	***Organizational Expertise Condition 5**: Prior to construction, the site certificate holder shall contractually require all construction contractors and subcontractors involved in the construction of the facility to comply with all applicable laws and regulations and with the terms and conditions of the site certificate. Such contractual provisions shall not operate to relieve the site certificate holder of responsibility under the site certificate.*	Exhibit D
	***Organizational Expertise Condition 6**: Prior to construction, the site certificate holder shall notify the department before conducting any work on the site that does not qualify as surveying, exploration, or other activities to define or characterize the site. The notice must include a description of the work and evidence that its value is less than $250,000 or evidence that the certificate holder has satisfied all conditions that are required prior to construction.*	Exhibit D
	***Organizational Expertise Condition 7**: Prior to construction on a communication station requiring third-party electrical distribution service, the site certificate holder shall provide evidence to the department that the relevant third-party electrical distribution service provider that will construct, own, and operate the distribution line has obtained all necessary approvals and permits for the*	Exhibit D

Standard	Condition	Exhibit
	distribution line and that the site certificate holder has a contract with the third-party provider for use of the distribution line.	
Structural Standard	***Prior to Construction***	
	Structural Standard Condition 1: *Prior to construction, the site certificate holder shall conduct a site-specific geological and geotechnical investigation, and shall submit to the department for its approval a Site-Specific Geological and Geotechnical Report. The investigation and/or report shall address the following:* *a. Subsurface soil and geologic conditions within the site boundary;* *b. Geotechnical design criteria and data for the facility's project features;* *c. Description of potentially active faults that may affect the facility and their potential risk to the facility;* *d. LiDAR or field survey investigation of the site boundary to assess the potential for slope instability and landslide hazards;* *e. Evaluation of potential liquefaction hazards;* *f. Evaluation of potential soil expansion hazards;* *g. Description of groundwater detections and any related potential risk to the facility;* *h. Description of corrosive soils detections and any related potential risk to the facility;* *i. Description of Project features within the 100-year flood zone and any related potential risk to the facility; and* *j. Define and delineate geological and geotechnical hazards to the facility, and means to mitigate the identified hazards.*	Exhibit H
	During Construction	
	Structural Standard Condition 2: *During construction, the site certificate holder shall construct the facility in accordance with the versions of the International Building Code, Oregon Structural Specialty Code, and building codes adopted by the State of Oregon.*	Exhibit H
Soil Protection	***Prior to Construction***	
	Soil Protection Condition 1: *Prior to construction, the site certificate holder shall submit to the department a copy of an Oregon Department of Environmental Quality (ODEQ)-approved construction-related final Spill Prevention Control and Countermeasures Plan (SPCC Plan). The protective measures described in the draft SPCC Plan in ASC Exhibit G, Attachment G-4, shall be included as part of the construction-related final SPCC Plan, unless otherwise approved by the department.*	Exhibit G; Exhibit I; Exhibit K
	Soil Protection Condition 2: *Prior to construction, the site certificate holder shall finalize, and submit to the department for its approval, a final Blasting Plan. The protective measures described in the draft Blasting Plan in ASC Exhibit G, Attachment G-5, shall be included as part of the final Blasting Plan, unless otherwise approved by the department. The final Blasting Plan shall meet the*	Exhibit G; Exhibit I

Standard	Condition	Exhibit
	requirements of the Oregon State Police – Oregon Office of State Fire Marshal for the transportation, storage, and use of explosives.	
	Soil Protection Condition 3: *Prior to construction, the site certificate holder shall submit to the department a copy of an ODEQ-approved construction-related final Erosion and Sediment Control Plan (ESCP). The protective measures described in the draft ESCP Plan in ASC Exhibit I, Attachment I-3, shall be included as part of the construction-related final ESCP Plan, unless otherwise approved by the department.*	Exhibit H; Exhibit I; Exhibit K, Exhibit U; Exhibit V
	During Construction	
	Soil Protection Condition 4: *During construction, the site certificate holder shall conduct all work in compliance with the construction-related final SPCC Plan referenced in Soil Protection Condition 1.*	Exhibit G; Exhibit I
	Soil Protection Condition 5: *During construction, the site certificate holder shall conduct all work in compliance with the final Blasting Plan referenced in Soil Protection Condition 2.*	Exhibit G; Exhibit I
	Soil Protection Condition 6: *During construction, the site certificate holder shall conduct all work in compliance with the final ESCP referenced in Soil Protection Condition 3.*	Exhibit H; Exhibit I; Exhibit U; Exhibit V;
	Prior to Operation	
	Soil Protection Condition 7: *Prior to operation, if the site certificate holder is required by ODEQ statutes or rules to implement a SPCC Plan for operation of the facility, the site certificate holder shall submit to the department a copy of an ODEQ-approved operation-related SPCC Plan.*	Exhibit G; Exhibit I
	During Operation	
	Soil Protection Condition 8: *During operation, the site certificate holder shall conduct all work in compliance with the operation-related SPCC Plan referenced in Soil Protection Condition 7, if applicable.*	Exhibit G; Exhibit I
	Soil Protection Condition 9: *During operation, the site certificate holder shall inspect the Project features for soil impacts as part of the site certificate holder's regular transmission line inspection process and shall implement corrective actions and mitigation measures, if necessary.*	Exhibit I
Land Use	***Prior to Construction***	
	Land Use Condition 1: *Prior to construction, the site certificate holder shall finalize, and submit to the department for its approval, a final Agricultural Assessment. The protective measures described in the draft Agricultural Assessment in ASC Exhibit K, Attachment K-1, shall be included and implemented as part of the final Agricultural Assessment, unless otherwise approved by the department.*	Exhibit K
	Land Use Condition 2: *Prior to construction, the site certificate holder shall finalize, and submit to the department for its approval, a final Right-of-Way Clearing Assessment. The protective measures described in the draft Right-of-Way Clearing Assessment in ASC Exhibit K,*	Exhibit K

Standard	Condition	Exhibit
	Attachment K-2, shall be included and implemented as part of the final Right-of-Way Clearing Assessment, unless otherwise approved by the department.	
	Prior to Construction in Morrow County	
	***Land Use Condition 3**: Prior to construction in Morrow County, the site certificate holder shall provide to the department a copy of the following Morrow County-approved permits, if such permits are required by Morrow County zoning ordinances:* *a. Flood plain development permit, for work in the Flood Plain Overlay Zone;* *b. Utility crossing permit;* *c. Access approach site permit; and* *d. Construction permit to build on right-of-way.*	Exhibit K
	Prior to Construction in Umatilla County	
	***Land Use Condition 4**: Prior to construction in Umatilla County, the site certificate holder shall work with the Public Works Department on building standards for the road improvements and construction, and will ensure road construction is consistent with the Oregon Forest Practices Act.*	Exhibit K
	***Land Use Condition 5**: Prior to construction in Umatilla County, the site certificate holder shall provide to the department a copy of the following Umatilla County-approved permits, if such permits are required by Umatilla County zoning ordinances:* *a. Installation of Utilities on County and Public Roads Permit;* *b. Road Approach and Crossing Permit; and* *c. Flood plain development permit.*	Exhibit K
	Prior to Construction in Union County	
	***Land Use Condition 6**: Prior to construction in Union County, the site certificate holder shall provide to the department a copy of the following Union County-approved permits, if such permits are required by Union County zoning ordinances:* *a. Flood plain development permit;* *b. Road approach permit; and* *c. Work in county right-of-way permit.*	Exhibit K
	Prior to Construction in Malheur County	
	***Land Use Condition 7:** Prior to construction in Malheur County, the site certificate holder shall provide to the department a copy of the following Malheur County-approved permits, if such permits are required by Malheur County zoning ordinances:* *a. Flood plain development permit.*	Exhibit K
	During Construction	
	***Land Use Condition 8**: During construction, the site certificate holder shall conduct all work in compliance with the final Agricultural Assessment referenced in Land Use Condition 1.*	Exhibit K
	***Land Use Condition 9:** During construction, the site certificate holder shall conduct all work in compliance with the final Agricultural Assessment referenced in Land Use Condition 2.*	Exhibit K

Standard	Condition	Exhibit
	Land Use Condition 10: *During construction, the site certificate holder shall limit its transmission line right-of-way in Goal 4 forest lands to no wider than 300 feet. The site certificate holder shall limit its use of the outer 100 feet on each side of the ROW primarily to vegetation maintenance.*	Exhibit K
	<u>During Construction in Morrow County</u>	
	Land Use Condition 11: *During construction in Morrow County, the site certificate holder shall construct the facility to comply with the following setback distances and other requirements:* *In All Zones:* *a. Buildings and the fixed bases of the transmission line towers shall be setback at least 100 feet from the high-water mark of all Goal 5 streams.* *b. Permanent vegetation removal within the riparian zone of all Goal 5 streams shall retain 75% of all layers or stratas of vegetation.* *In the EFU Zone:* *c. Buildings and the fixed bases of the transmission line towers shall be setback as follows: (i) front yards shall be set back at least 20 feet from minor collector road rights-of-way, 30 feet from major collector road rights-of-way, 80 feet from arterial road rights-of-way, and 100 feet from intensive agricultural uses; (ii) side yards shall be set back at least 20 feet from the property line, 30 feet for corner lots, and 100 feet from intensive agricultural uses; and (iii) rear yards shall be set back at least 25 feet from the property line, and 100 feet from intensive agricultural uses.* *d. Buildings and the fixed bases of the transmission line towers shall be set back at least 100 feet from the high-water mark of all streams and lakes.* *In the General Industrial Zone:* *e. Buildings and the fixed bases of the transmission line towers shall be set back at least 50 feet from arterial road rights-of-way, 30 feet from collector road rights-of-way, and 20 feet from lower-class road rights-of-way.* *In the Port Industrial Zone:* *f. Buildings and the fixed bases of the transmission line towers shall be setback as follows: (i) front yards shall be set back at least 30 feet from the property line, and 90 feet from the centerline of any public, county, or state road; (ii) side yards shall be set back at least 10 feet from the property line; and (iii) rear yards shall be set back at least 10 feet from the property line.*	Exhibit K
	Land Use Condition 12*: During construction in Morrow County, the site certificate holder shall complete the following to address traffic impacts in the county:* *a. The site certificate holder shall work with the Morrow County Road Department to identify concerns related to Project construction traffic;* *b. The site certificate holder shall develop a traffic management plan that includes traffic control measures to mitigate the effects of Project construction traffic;* *c. The site certificate holder shall conduct all work in compliance with traffic management plan; and* *d. The site certificate holder shall provide a copy of the traffic management plan to the department.*	Exhibit K

Standard	Condition	Exhibit
	During Construction in Umatilla County	
	Land Use Condition 14: *During construction in Umatilla County, the site certificate holder shall construct the facility to comply with the following setback distances and other requirements:* *In All Zones:* *a. Buildings, the fixed bases of transmission line towers, and new access roads shall be set back from Class I streams at least 25-feet or one-half the stream width, whichever is greater.* *b. Permanent vegetation removal within the riparian zone of all Class I streams shall retain 75% of all layers or stratas of vegetation.* *c. Within the transmission line right-of-way, a maximum of 25% of existing natural vegetation along streams, lakes, and wetlands may be removed, unless necessary for reliability purposes.* *In the EFU Zone:* *d. Buildings shall be setback as follows: (i) at least 30 feet from the property line or private road easement boundary; or (ii) at least 60 feet from the center line of the road, highway, or private road easement, whichever is greater.* *e. Buildings and the fixed bases of the transmission line towers shall be set back at least 100 feet from the high-water mark of all streams, lakes, and wetlands.* *f. Parking lots shall be designed and operated as follows: (i) areas used for standing and maneuvering of vehicles at the multi-use areas will have paved surfaces maintained adequately for all weather use and will be drained as to avoid flow of water across public sidewalks; (ii) parking spaces along the outer boundaries of any multi-use area parking lot will be contained by a curb at least four inches high and set back a minimum of four and one-half feet from the property line, or by a bumper rail; and (iii) artificial lighting, if provided, will not create or reflect glare in a residential zone or on any adjacent dwelling.*	Exhibit K
	Land Use Condition 15: *During construction in Umatilla County, the site certificate holder shall complete the following to address traffic impacts in the county:* *a. The site certificate holder shall work with the Umatilla County Road Department to identify concerns related to Project construction traffic;* *b. The site certificate holder shall develop a traffic management plan that includes traffic control measures to mitigate the effects of Project construction traffic;* *c. The site certificate holder shall conduct all work in compliance with traffic management plan; and* *d. The site certificate holder shall provide a copy of the traffic management plan to the department.*	Exhibit K
	Land Use Condition 16*: During construction in Umatilla County, the site certificate holder shall conduct all work in compliance with the Morrow County-approved permits referenced in Land Use Condition 5, if such permits are required by Umatilla County zoning ordinances.*	Exhibit K
	During Construction in Union County	
	Land Use Condition 17: *During construction in Union County, the site certificate holder shall construct the facility to comply with the following setback distances and other requirements:*	Exhibit K

Standard	Condition	Exhibit
	In All Zones: *a. Buildings, the fixed bases of transmission line towers, and new access roads shall be set back from Class I streams at least 25-feet or one-half the stream width, whichever is greater.* *b. Permanent vegetation removal within the riparian zone of all Class I streams shall retain 75% of all layers or stratas of vegetation.* *In the EFU Zone:* *c. Buildings shall be setback as follows: (i) front yards shall be set back at least 20 feet from property lines and road rights-of-way; (ii) and rear yards shall be set back at least 10 feet from property lines and road rights-of-way.* *In the Agricultural Grazing Zone:* *d. Buildings shall be setback as follows: (i) front yards shall be set back at least 20 feet from property lines and road rights-of-way; and (i) rear yards shall be set back at least 10 feet from property lines and road rights-of-way.*	
	Land Use Condition 18: *During construction in Union County, the site certificate holder shall conduct all work in compliance with the Union County-approved permits referenced in Land Use Condition 6, if such permits are required by Union County zoning ordinances.*	Exhibit K
	During Construction in City of North Powder	
	Land Use Condition 19: *During construction in City of North Powder, the site certificate holder shall construct the facility to comply with the following setback distances and other requirements:* *In the Commercial Interchange Zone:* *a. Buildings shall be setback as follows: (i) front yards shall be set back at least 30 feet from property lines; (ii) side yards shall be setback at least 20 feet from a Residential Zone, street, or corner lot; and (iii) rear yards shall be set back at least 20 feet from a Residential Zone.* *b. Buildings shall not exceed 45 feet in height.*	Exhibit K
	During Construction in Baker County	
	Land Use Condition 20: *During construction in Baker County, the site certificate holder shall construct the facility to comply with the following setback distances and other requirements:* *In the EFU Zone:* *a. Buildings shall be setback as follows: front yards shall be set back at least 20 feet from property lines and road rights-of-way.* *b. Buildings and the fixed bases of transmission line towers shall be set back at least 60 feet from the center line of a road or street or 30 feet from any right-of-way in excess of 60 feet.* *c. Buildings and the fixed bases of transmission line towers shall be set back at least 10 feet from property lines.* *d. Buildings and the fixed bases of the transmission line towers shall be set back at least 50 feet from the high-water mark of naturally-occurring riparian area, bog, marsh, or waterway.*	Exhibit K

Standard	Condition	Exhibit
	During Construction in Malheur County	
	Land Use Condition 21*: During construction in Malheur County, the site certificate holder shall construct the facility to comply with the following setback distances and other requirements:* *In the EFU and ERU Zones:* *a. Buildings shall be setback as follows: (i) at least 40 feet from a street or road right-of-way; and (ii) at least 25 feet from any other property line.* *b. No sight obscuring fence exceeding 3 feet in height shall be placed within the 400-foot street setback, also within this setback shrubbery other than trees shall be maintained at heights not exceeding 3 feet.*	Exhibit K
	Land Use Condition 22: *During construction in Malheur County, the site certificate holder shall conduct all work in compliance with the Malheur County-approved permits referenced in Land Use Condition 7, if such permits are required by Malheur County zoning ordinances.*	Exhibit K
	During Operation	
	Land Use Condition 23*: During operation, the site certificate holder shall limit its transmission line right-of-way in Goal 4 forest lands to no wider than 300 feet. The site certificate holder shall limit its use of the outer 100 feet on each side of the ROW primarily to vegetation maintenance.*	Exhibit K
Protected Areas	*None (see Public Services Conditions 2, 3, and 7; Scenic Resources Conditions 1, 2, and 3)*	Exhibit L
Recreation	*None (see Scenic Resources Conditions 1, 2, and 3)*	Exhibit T
Retirement and Financial Assurance	***Throughout the Life of the Project***	
	Retirement and Financial Assurances Condition 1: *Throughout the life of the Project, the site certificate holder shall prevent the development of any conditions on the site that would preclude restoration of the site to a useful, non-hazardous condition to the extent that prevention of such site conditions is within the control of the certificate holder.*	Exhibit W
	During Construction	
	Retirement and Financial Assurances Condition 2*: During construction, the site certificate holder shall submit to the State of Oregon, through the Council, a bond or letter of credit naming the State of Oregon, acting by and through the Council, as beneficiary or payee. The bond or letter of credit, which may be issued by one or more financial institutions, shall remain in effect during the Construction Phase.* *a. For purposes of this condition, the "Construction Phase" is defined as the period commencing at the time work is performed on the site the cost of which exceeds $250,000—excluding surveying, exploration, or other activities to define or characterize the site—and ending when the facility is placed in service.* *b. The amount of the bond or letter of credit will be increased on a quarterly basis to correspond with the progress of the construction of the facility at the beginning of each quarter. The amount of the bond or letter of credit at the beginning of any such quarterly period will be equal to the product*	Exhibit M; Exhibit W

Standard	Condition	Exhibit
	of (i) the site certificate holder's estimate of the total decommissioning costs for the facility, which is $140,902,000; and (ii) a fraction, the numerator of which is the number of quarters that have passed since commencement of construction, and the denominator of which will be the number of quarters the site certificate holder estimates to complete the Construction Phase; provided that in all cases the number resulting from the calculation shall not exceed 1.0. *c. To begin with, the site certificate holder and the department shall assume a 3-year Construction Phase period comprising twelve quarterly periods. Therefore, for the first quarter of the Construction Phase, the bond or letter of credit will be maintained in an amount equal to one-twelfth (1/12) of the total estimated decommissioning costs. At the end of the first year of construction—i.e., four quarters—the amount of the bond or letter of credit will be equal to four-twelfths (4/12) or 33 percent of the total estimated decommissioning costs.* *d. The amount of the bond or letter of credit may be amended from time to time by agreement of the site certificate holder and the department to account for adjustments in the construction schedule. Such amendments may be made without amendment to the site certificate. The Council authorizes the department to agree to amendments of the amount; however, the Council retains the authority to approve, reject, or modify any amendment of the plan agreed to by the department.*	
	During Operation	
	Retirement and Financial Assurances Condition 3*: During operation, the site certificate holder shall submit to the State of Oregon, through the Council, a bond or letter of credit naming the State of Oregon, acting by and through the Council, as beneficiary or payee. The timing and amount of the bond or letter of credit, which may be issued by one or more financial institutions, shall be based on certain factors, as described in sub-paragraphs (a) through (c) of this condition.* *a. On the date that the facility is placed in service (the "In-Service Date"), the site certificate holder's obligation under Financial Assurance Condition 1 to maintain a bond or letter of credit will terminate and need not be renewed until required under sub-paragraphs (b) and (c) of this condition.* *b. On the fiftieth anniversary of the In-Service Date, the certificate holder shall obtain and begin maintaining a bond or letter of credit in an amount that will increase on an annual basis for the next 50 years. In year 51, the amount of the bond or letter of credit will be set at one-fiftieth (1/50) of the total estimated decommissioning costs. Each year, through the 100th year of service, the bond or letter of credit will be increased by one-fiftieth (1/50) of the estimated decommissioning costs. For instance, in year 75, the bond or letter of credit will be maintained in an amount equal to twenty-five fiftieths (25/50) or 50 percent of the estimated decommissioning costs. Once the bond or letter of credit is in an amount equal to 100 percent of decommissioning costs, it will remain at that level for the life of the facility.* *c. On the fifth anniversary of the In-Service Date, and on each subsequent quinquennial thereafter, the certificate holder will report to the Council on the following subjects: (i) the physical condition of*	Exhibit M; Exhibit W

Standard	Condition	Exhibit
	the facility; (ii) any evolving transmission or electrical technologies that could impact the continued viability of the facility; (iii) the facility's performance in the context of the larger power grid; and (iv) the certificate holder's general financial condition, including the certificate holder's then-current credit rating. Based on the information provided in such reports, or any other information received by the Council, EFSC will consider whether the certificate holder should be required to post a bond or letter of credit—other than the financial assurances set forth in sub-paragraph (b) of this condition—and may make any appropriate order to enforce its determination. This shall include the ability of EFSC to extend the date on which the certificate holder would be required to begin posting the financial assurances set forth in sub-paragraph (b) of this condition.	
	During Retirement	
	Retirement and Financial Assurances Condition 4: *During retirement, the site certificate holder must retire the facility in accordance with a retirement plan approved by the Council if the site certificate holder permanently ceases construction or operation of the facility. The retirement plan must describe the activities necessary to restore the site to a useful, non-hazardous condition, as described in OAR 345-027-0110(5). After Council approval of the plan, the certificate holder must obtain the necessary authorization from the appropriate regulatory agencies to proceed with restoration of the site.*	Exhibit W
	Retirement and Financial Assurances Condition 5: *During retirement, the site certificate holder is obligated to retire the facility upon permanent cessation of construction or operation. If the Council finds that the site certificate holder has permanently ceased construction or operation of the facility without retiring the facility according to a final retirement plan approved by the Council, as described in OAR 345-027-0110, the Council must notify the site certificate holder and request that the site certificate holder submit a proposed final retirement plan to the department within a reasonable time not to exceed 90 days. If the site certificate holder does not submit a proposed final retirement plan by the specified date, the Council may direct the department to prepare a proposed final retirement plan for the Council's approval.* *Upon the Council's approval of the final retirement plan, the Council may draw on the bond or letter of credit described in OAR 345-027-0020(8) to restore the site to a useful, non-hazardous condition according to the final retirement plan, in addition to any penalties the Council may impose under OAR Chapter 345, Division 29. If the amount of the bond or letter of credit is insufficient to pay the actual cost of retirement, the site certificate holder must pay any additional cost necessary to restore the site to a useful, non-hazardous condition. After completion of site restoration, the Council must issue an order to terminate the site certificate if the Council finds that the facility has been retired according to the approved final retirement plan.*	Exhibit W

Standard	Condition	Exhibit
Fish and Wildlife Habitat	***Prior to Construction***	
	Fish and Wildlife Condition 1*: Prior to construction, the site certificate holder shall conduct, as applicable, the following biological surveys on those portions of the site boundary that have not been surveyed at the time of issuance of the site certificate:* *a. Northern Goshawk;* *b. American Three-Toed Woodpecker;* *c. Great Gray Owl;* *d. Flammulated Owl;* *e. Terrestrial Visual Encounter Surveys;* *f. Wetlands; and* *g. Fish Presence and Crossing Assessment Surveys.*	Exhibit P1; Exhibit Q
	Fish and Wildlife Condition 2*: Prior to construction, the site certificate holder shall conduct, as applicable, the following biological surveys on all portions of the site boundary, regardless of whether those portions have been surveyed at the time of issuance of the site certificate:* *a. Washington ground squirrels; and* *b. Raptor Nests.*	Exhibit P1; Exhibit Q
	Fish and Wildlife Condition 3*: Prior to construction, the site certificate holder shall conduct a one-year traffic study in elk habitat (i.e., elk summer range and elk winter range) and sage-grouse habitat (i.e., areas of high population richness, core area habitat, low density habitat, or general habitat).*	Exhibit P2; Exhibit P3
	Fish and Wildlife Condition 4: *Prior to construction, the site certificate holder shall finalize, and submit to the department for its approval, a final Reclamation and Revegetation Plan. The protective measures described in the draft Reclamation and Revegetation Plan in ASC Exhibit P1, Attachment P1-3, shall be included and implemented as part of the final Reclamation and Revegetation Plan, unless otherwise approved by the department.*	Exhibit P1; Exhibit P2; Exhibit P3; Exhibit I; Exhibit Q
	Fish and Wildlife Condition 5: *Prior to construction, the site certificate holder shall finalize, and submit to the department for its approval, a final Vegetation Management Plan. The protective measures described in the draft Vegetation Management Plan in ASC Exhibit P1, Attachment P1-4, shall be included as part of the final Vegetation Management Plan, unless otherwise approved by the department.*	Exhibit P1; Exhibit P3; Exhibit H; Exhibit I; Exhibit R; Exhibit Q
	Fish and Wildlife Condition 6*: Prior to construction, the site certificate holder shall finalize, and submit to the department for its approval, a final Noxious Weed Plan. The protective measures as described in the draft Noxious Weed Plan in ASC Exhibit P1, Attachment P1-5, shall be included and implemented as part of the final Noxious Weed Plan, unless otherwise approved by the department.*	Exhibit P1; Exhibit P2; Exhibit P3; Exhibit Q

Standard	Condition	Exhibit
	***Fish and Wildlife Condition 7**: Prior to construction, the site certificate holder shall finalize, and submit to the department for its approval, a final Fish and Wildlife Habitat Mitigation Plan (HMP).* *a. The final Fish and Wildlife HMP shall include the following, unless otherwise approved by the department:* *i. The areas that were surveyed for biological resources;* *ii. The location of all facility components and related and supporting facilities;* *iii. The areas that will be permanently and temporarily disturbed during construction;* *iv. The protective measures described in the draft Fish and Wildlife HMP in ASC Exhibit P1, Attachment P-6; and* *v. The results of the biological surveys referenced in Fish and Wildlife Condition 1 and Fish and Wildlife Condition 2.* *b. The final Fish and Wildlife HMP shall address the potential habitat impacts through mitigation banking, an in-lieu fee program, development of mitigation projects by the site certificate holder, or a combination of the same.* *i. To the extent the site certificate holder shall develop its own mitigation projects, the final Habitat Mitigation Plan shall:* *1. Identify the location of each mitigation site, including a map of the same;* *2. Identify the number of credit-acres that each mitigation site will provide for the site certificate holder;* *3. Include a site-specific mitigation management plan for each mitigation site that provides for:* *A. A baseline ecological assessment;* *B. Conservation actions to be implemented at the site;* *C. An implementation schedule for the baseline ecological assessment and conservation actions;* *D. Performance measures;* *E. A reporting plan; and* *F. A monitoring plan.* *ii. To the extent the site certificate shall utilize a mitigation bank or in-lieu fee program, the final Habitat Mitigation Plan shall:* *1. Describe the nature, extent, and history of the mitigation bank or in-lieu fee program; and* *2. Identify the number of credit-acres that each mitigation site will provide for the site certificate holder.* *c. Oregon's Elk Mitigation Framework shall be used to calculate the amount of elk habitat compensatory mitigation required for the facility.* *d. The final Fish and Wildlife Habitat Mitigation Plan may be amended from time to time by agreement of the site certificate holder and the department. Such amendments may be made without amendment to the site certificate. The Council authorizes the department to agree to amendments of the plan and to mitigation actions that may be required under the plan; however, the Council retains the authority to approve, reject, or modify any amendment of the plan agreed to by the department.*	Exhibit P1; Exhibit P3; Exhibit Q

Standard	Condition	Exhibit
	Fish and Wildlife Condition 8*: Prior to construction, the site certificate holder shall finalize, and submit to the department for its approval, a final Sage-Grouse Habitat Mitigation Plan.* *a. The site certificate holder shall provide to the department the information necessary for the State of Oregon to calculate the amount of sage-grouse habitat compensatory mitigation required for the facility using Oregon's Sage-Grouse Habitat Quantification Tool.* *b. The final Sage-Grouse Habitat Mitigation Plan shall address the potential sage-grouse habitat impacts through mitigation banking, an in-lieu fee program, development of mitigation projects by the site certificate holder, or a combination of the same.* *i. To the extent the site certificate holder shall develop its own mitigation projects, the final Sage-Grouse Habitat Mitigation Plan shall:* *1. Identify the location of each mitigation site, including a map of the same;* *2. Identify the number of credit-acres that each mitigation site will provide for the site certificate holder;* *3. Include a site-specific mitigation management plan for each mitigation site that provides for:* *A. A baseline ecological assessment;* *B. Conservation actions to be implemented at the site;* *C. An implementation schedule for the baseline ecological assessment and conservation actions;* *D. Performance measures;* *E. A reporting plan; and* *F. A monitoring plan.* *ii. To the extent the site certificate shall utilize a mitigation bank or in-lieu fee program, the final Sage-Grouse Habitat Mitigation Plan shall:* *1. Describe the nature, extent, and history of the mitigation bank or in-lieu fee program; and* *2. Identify the number of credit-acres that each mitigation site will provide for the site certificate holder.* *c. Oregon's Sage-Grouse Habitat Quantification Tool shall be used to calculate the amount of sage-grouse habitat compensatory mitigation required for the facility and the number of credit-acres that each mitigation site will provide for the site certificate holder.* *d. The Sage-Grouse Habitat Mitigation Plan may be amended from time to time by agreement of the site certificate holder and the department. Such amendments may be made without amendment to the site certificate. The Council authorizes the department to agree to amendments of the plan and to mitigation actions that may be required under the plan; however, the Council retains the authority to approve, reject, or modify any amendment of the plan agreed to by the department.*	Exhibit P2

<table>
<tr><th>Standard</th><th>Condition</th><th>Exhibit</th></tr>
<tr><td></td><td>Fish and Wildlife Condition 9: Prior to construction, the site certificate holder shall instruct all construction personnel on the protection of cultural, paleontological, ecological, and other natural resources such as (a) federal and state laws regarding antiquities, paleontological resources, and plants and wildlife, including collection and removal; (b) the importance of these resources; (c) the purpose and necessity of protecting them; and (d) reporting and procedures for stop work.</td><td>Exhibit P1;
Exhibit P2;
Exhibit P3;
Exhibit Q</td></tr>
<tr><td></td><td><u>During Construction</u></td><td></td></tr>
<tr><td></td><td>Fish and Wildlife Condition 10: During construction, the site certificate holder shall not conduct ground-disturbing activities within elk or mule deer winter range between December 1 to March 31. Upon request by the site certificate holder, the department may provide exceptions to this restriction. The site certificate holder’s request must include a justification for the request, including any actions the site certificate holder will take to avoid, minimize, or mitigate impacts to elk and mule deer in the relevant area.</td><td>Exhibit P3</td></tr>
<tr><td></td><td>Fish and Wildlife Condition 11: During construction, the site certificate holder shall not conduct ground-disturbing activities within sage-grouse areas of high population richness, core area habitat, low density habitat, or general habitat between March 1 to June 30. Upon request by the site certificate holder, the department may provide exceptions to this restriction. The site certificate holder’s request must include a justification for the request, including any actions the site certificate holder will take to avoid, minimize, or mitigate impacts to sage-grouse in the relevant area.</td><td>Exhibit P2</td></tr>
<tr><td></td><td>Fish and Wildlife Condition 12: During construction, the site certificate holder shall not conduct ground-disturbing activities within the following timeframes and spatial buffers surrounding occupied nests of certain raptor species. Upon request by the site certificate holder, the department may provide exceptions to this restriction. The site certificate holder’s request must include a justification for the request, including any actions the site certificate holder will take to avoid, minimize, or mitigate impacts to the raptor and its nest.
<table>
<tr><th>Nesting Species</th><th>Spatial Buffers (radius around nest site):</th><th>Temporal Restrictions</th></tr>
<tr><td>Western burrowing owl</td><td>0.25 mile</td><td>April 1 to August 15</td></tr>
<tr><td>Ferruginous hawk</td><td>0.5 mile</td><td>March 15 to August 15</td></tr>
<tr><td>Swainson’s hawk</td><td>0.25 mile</td><td>April 1 to August 15</td></tr>
<tr><td>Great gray owl</td><td>0.25 mile</td><td>March 1 to August 15</td></tr>
<tr><td>Flammulated owl</td><td>0.25 mile</td><td>March 1 to August 15</td></tr>
</table></td><td>Exhibit P1</td></tr>
</table>

Standard	Condition	Exhibit
	***Fish and Wildlife Condition 13**: During construction, if the site certificate holder will be conducting ground-disturbing activities during the migratory bird nesting season between April 1 and July 15, the site certificate holder shall conduct, as applicable, biological surveys for native, non-raptor bird species nests on all portions of the site boundary a maximum of 7 days prior to ground-disturbing activities, regardless of whether those portions have been previously surveyed. If the site certificate holder identifies a native, non-raptor bird species nest, the site certificate holder shall submit to the department for its approval a notification addressing the following:* *a. Identification of the native, non-raptor species observed;* *b. Location of the nest; and* *c. Any actions the site certificate holder will take to avoid, minimize, or mitigate impacts to the nest.*	Exhibit P1
	***Fish and Wildlife Condition 14**: During construction, if the roost of a State Sensitive bat species is observed during the biological surveys set forth in Fish and Wildlife Conditions 1, 2, or 3, the site certificate holder shall submit to the department for its approval a notification addressing the following:* *a. Identification of the State Sensitive bat species observed;* *b. Location of the roost; and* *c. Any actions the site certificate holder will take to avoid, minimize, or mitigate impacts to the roost.*	Exhibit P1
	***Fish and Wildlife Condition 15:** During construction, the site certificate holder shall flag the following environmentally sensitive areas as restricted work zones:* *a. State protected plant species;* *b. Wetlands and waterways that are not authorized for construction impacts;* *c. Areas with active spatial and seasonal restrictions; and* *d. Category 1 habitat.* *The site certificate holder shall submit a mapset showing the location of environmentally sensitive areas and restricted work zones to the department for its approval. The site certificate shall make the mapset available to all construction personnel.*	Exhibit P1; Exhibit P2; Exhibit P3; Exhibit Q
	***Fish and Wildlife Condition 16**: During construction, the site certificate holder shall employ a speed limit of 25 miles per hour on facility access roads, unless the applicable land-management agency or landowner has designated an alternative speed limit.*	Exhibit P1; Exhibit P2; Exhibit P3; Exhibit Q
	***Fish and Wildlife Condition 17:** During construction, the site certificate holder shall conduct all work in compliance with the final Reclamation and Revegetation Plan referenced in Fish and Wildlife Condition 4.*	Exhibit P1; Exhibit P2; Exhibit P3; Exhibit I; Exhibit Q

Standard	Condition	Exhibit
	Fish and Wildlife Condition 18: *During construction, the site certificate holder shall conduct all work in compliance with the final Vegetation Management Plan referenced in Fish and Wildlife Condition 5.*	Exhibit P1; Exhibit P3; Exhibit H; Exhibit I; Exhibit R; Exhibit Q
	Fish and Wildlife Condition 19*: During construction, the site certificate holder shall conduct all work in compliance with the final Noxious Weed Plan referenced in Fish and Wildlife Condition 6.*	Exhibit P1 Exhibit P2; Exhibit Q
	Fish and Wildlife Condition 20*: During construction, the site certificate holder shall commence implementation of the conservation actions set forth in the final Fish and Wildlife HMP referenced in Fish and Wildlife Condition 7.*	Exhibit P1; Exhibit P3;
	Fish and Wildlife Condition 21*: During construction, the site certificate holder shall commence implementation of the conservation actions set forth in the final Sage-Grouse HMP referenced in Fish and Wildlife Condition 8.*	Exhibit P2
	Fish and Wildlife Condition 22: *During construction, the site certificate holder shall construct the transmission line to avian-safe design standards consistent with the site certificate holder's Avian Protection Plan (Idaho Power 2015).*	Exhibit P1; Exhibit P2
	During the Second Year of Operation	
	Fish and Wildlife Condition 23*: During the second year of operation, the site certificate holder shall conduct a one-year traffic study in elk habitat (i.e., elk summer range and elk winter range) and sage-grouse habitat (i.e., areas of high population richness, core area habitat, low density habitat, or general habitat).*	Exhibit P2; Exhibit P3
	During the Third Year of Operation	
	Fish and Wildlife Condition 24*: During the third year of operation, the site certificate holder shall provide to the department a report demonstrating that fish and wildlife habitat mitigation shall be commensurate with the final compensatory mitigation calculations.* *a. The final calculations shall be based on the as-constructed footprint of the facility.* *b. Oregon's Elk Mitigation Framework shall be used to calculate the amount of elk habitat compensatory mitigation required for the facility, and the information from the pre- and post-construction traffic studies shall be used in the calculation.*	Exhibit P1; Exhibit P3

Standard	Condition	Exhibit
	***Fish and Wildlife Condition 25**: During the third year of operation, the site certificate holder shall provide to the department the information necessary for the State of Oregon to calculate the final amount of sage-grouse habitat compensatory mitigation required for the facility using Oregon's Sage-Grouse Habitat Quantification Tool. After receiving the calculations from the State, the site certificate holder shall provide to the department a report demonstrating that sage-grouse habitat mitigation shall be commensurate with the final compensatory mitigation calculations.* *a. The final calculations shall be based on the as-constructed footprint of the facility.* *b. Oregon's Sage-Grouse Habitat Quantification Tool shall be used to calculate the amount of sage-grouse habitat compensatory mitigation required for the facility, and the information from the pre- and post-construction traffic studies shall be used in the calculation.*	Exhibit P2
	During Operation	
	***Fish and Wildlife Condition 26**: During operation, the site certificate holder shall employ a speed limit of 25 miles per hour on facility access roads, unless the applicable land-management agency or landowner has designated an alternative speed limit.*	Exhibit P1; Exhibit P2; Exhibit P3; Exhibit Q
	***Fish and Wildlife Condition 27**: During operation, the site certificate holder shall employ access control on facility access roads within elk habitat (i.e., elk summer range and elk winter range) and sage-grouse habitat (i.e., areas of high population richness, core area habitat, low density habitat, or general habitat), subject to approval by the applicable land-management agency or landowner.*	Exhibit P1; Exhibit P2; Exhibit P3; Exhibit Q
	***Fish and Wildlife Condition 28:** During operation, the site certificate holder shall conduct all work in compliance with the final Vegetation Management Plan referenced in Fish and Wildlife Condition 5.*	Exhibit P1 Exhibit P3 Exhibit H; Exhibit I; Exhibit R; Exhibit Q
	***Fish and Wildlife Condition 29**: During operation, the site certificate holder shall conduct all work in compliance with the final Noxious Weed Plan referenced in Fish and Wildlife Condition 6.*	Exhibit P1; Exhibit P2; Exhibit P3; Exhibit Q
Threatened and Endangered Species	***During Construction***	
	***Threatened and Endangered Species Condition 1:** During construction, the site certificate holder shall not conduct ground-disturbing activities within Category 1 Washington ground squirrel (WAGS) habitat, subject to the following:* *a. The identification and categorization of WAGS habitat shall be based on the surveys referenced in Fish and Wildlife Condition 2 and the results of the surveys shall apply for up to three years.* *b. The site certificate holder may span Category 1 WAGS habitat and may work within Category 1 WAGS habitat, provided such work does not cause any ground disturbance.*	Exhibit Q; Exhibit K

Standard	Condition	Exhibit
	c. If an occupied WAGS colony is encountered in non-Category 1 habitat (based on the surveys referenced in Fish and Wildlife Condition 2), the site certificate holder shall submit to the department for its approval a notification addressing the following: *i. Location of the colony; and* *ii. Any actions the site certificate holder will take to avoid, minimize, or mitigate impacts to the colony.*	
	Threatened and Endangered Species Condition 2*: During construction, the site certificate holder shall not conduct ground-disturbing activities within a 33-foot buffer around threatened or endangered plant species, subject to the following:* *a. If complete avoidance is not possible (for example, if the threatened or endangered plant species is located within 33 feet of an existing road where upgrades are needed), the site certificate holder shall install temporary construction mats over soils where the threatened or endangered plant species have been observed and where construction vehicles will be operated; and* *b. If herbicides are used to control weeds, the site certificate holder shall follow agency guidelines in establishing buffer areas around confirmed populations of threatened or endangered plant species and refrain from using herbicides within those buffers.*	Exhibit Q
Scenic Resources	***During Construction***	
	Scenic Resources Condition 1: *During construction, the site certificate holder shall use dull-galvanized steel for lattice towers and non-specular conductors.*	Exhibit L; Exhibit R; Exhibit T
	Scenic Resources Condition 2: During construction, to avoid significant adverse impacts to the scenic resources at the National Historic Oregon Trail Interpretative Center, the site certificate holder shall construct the Project using tower structures that meeting the following criteria between approximately Milepost 145.1 and Milepost 146.6: a. H-frames; b. Tower height no greater than 130 feet; and c. Weathered steel (or an equivalent coating). Additionally, the site certificate holder shall construct the Project using tower structures that meeting the following criteria between approximately Milepost 146.6 and Milepost 146.7: a. H-frames; b. Tower height no greater than 154 feet; and c. Weathered steel (or an equivalent coating).	Exhibit L; Exhibit R; Exhibit T
	Scenic Resources Condition 3: During construction, to avoid significant adverse impacts to the scenic resources at the Birch Creek Area of Critical Environmental Concern, the site certificate holder shall construct the Project using tower structures that meeting the following criteria between approximately Milepost 199.1 and Milepost 197.9: a. H-frames; and b. Tower height no greater than 100 feet.	Exhibit L; Exhibit R; Exhibit T

Standard	Condition	Exhibit
Historic, Cultural, and Archaeological Resources	***During Construction***	
	Historic, Cultural, and Archaeological Resources Condition 1: *Prior to construction, the site certificate holder shall conduct cultural and historical pedestrian surveys on those portions of the site boundary that have not been surveyed at the time of issuance of the site certificate.*	Exhibit S
	Historic, Cultural, and Archaeological Resources Condition 2: *Prior to construction, the site certificate holder shall finalize, and submit to the department for its approval, a final Historic Properties Management Plan (HPMP). The final HPMP shall include the following, unless otherwise approved by the department:* *a. The areas that were surveyed for historic, cultural, and archaeological resources;* *b. The location of all facility components and related and supporting facilities;* *c. The areas that will be permanently and temporarily disturbed during construction;* *d. The protective measures described in the draft HPMP in ASC Exhibit S, Attachment S-9;* *e. The State Historic Preservation Officer's National Register of Historic Places (NRHP)-eligibility determinations and archaeological resources findings; and* *f. The results of the cultural and historical pedestrian surveys referenced in Historic, Cultural, and Archaeological Resources Condition 1.*	Exhibit S
	Prior to Construction at a Particular Location	
	Historic, Cultural, and Archaeological Resources Condition 3: *Prior to construction at a particular location, the site certificate holder shall, where applicable, conduct enhanced archaeological surveys comprised of subsurface probing in high potential areas, resource boundary subsurface probing, and subsurface testing for NRHP evaluation of unevaluated resources*	Exhibit S
	Historic, Cultural, and Archaeological Resources Condition 4: *Prior to construction at a particular location, the site certificate holder shall submit to the department for its approval a supplement to the final HPMP referenced in Historic, Cultural, and Archaeological Resources Condition 2. The HPMP supplement shall include the following, unless otherwise approved by the department:* *a. The results of the enhanced archaeological surveys referenced in Historic, Cultural, and Archaeological Resources Condition 3; and* *b. Any actions the site certificate holder will take to avoid, minimize, or mitigate impacts to historic, cultural, or archaeological resources in the relevant area.*	Exhibit S
	During Construction	
	Historic, Cultural, and Archaeological Resources Condition 5: *During construction, the site certificate holder shall conduct all work in compliance with the final HPMP referenced in Historic, Cultural, and Archaeological Resources Condition 2 and any HPMP supplements referenced in Historic, Cultural, and Archaeological Resources Condition 4.*	Exhibit S

Standard	Condition	Exhibit
	Within One Year After Construction Is Completed	
	Historic, Cultural, and Archaeological Resources Condition 6: *Within one year after construction is completed, the site certificate holder shall finalize, and submit to the department for its approval, a final Cultural Resources Technical Report. The final Cultural Resources Technical Report shall include the following, unless otherwise approved by the department:* *a. Relevant information in the draft Cultural Resources Technical Report in ASC Exhibit S, Attachment S-6;* *b. The results of the cultural and historical pedestrian surveys referenced in Historic, Cultural, and Archaeological Resources Condition 1; and* *c. The results of the enhanced archaeological surveys referenced in Historic, Cultural, and Archaeological Resources Condition 3.*	Exhibit S
	Historic, Cultural, and Archaeological Resources Condition 7: *Within one year after construction is completed, the site certificate holder shall finalize, and submit to the department for its approval, a final Intensive Level Survey. The relevant information in the draft Intensive Level Survey in ASC Exhibit S, Attachment PS-10, shall be included as part of the final Intensive Level Survey, unless otherwise approved by the department.*	Exhibit S
Public Services	***Prior to Construction***	
	Public Services Condition 1: *Prior to construction, the site certificate holder shall consult with public utilities or private providers operating within existing rights-of-ways to minimize impact to such.*	Exhibit U
	Public Services Condition 2: *Prior to construction, the site certificate holder shall submit to the department for its approval a Helicopter Use Plan, which identifies or provides:* *a. The type of helicopters to be used;* *b. The duration of helicopter use;* *c. Roads or residences over which external loads will be carried;* *d. Multi-use areas and light-duty fly yards containing helipads shall be located: (i) in areas free from tall agricultural crops and livestock; (ii) at least 500 feet from organic agricultural operations; and (iii) at least 500 feet from existing dwellings on adjacent properties; and* *e. Flights shall occur only between sunrise and sunset.*	Exhibit U; Exhibit L; Exhibit K
	Public Services Condition 3: *Prior to construction, the site certificate holder shall finalize, and submit to the department for its approval, a final Transportation and Traffic Plan. The protective measures as described in the draft Transportation and Traffic Plan in ASC Exhibit U, Attachment U-2, shall be included and implemented as part of the final Transportation and Traffic Plan.*	Exhibit U; Exhibit L
	Public Services Condition 4: *Prior to construction, the site certificate holder shall finalize, and submit to the department for its approval, a final Fire Prevention and Suppression Plan. The protective measures as described in the draft Fire Prevention and Suppression Plan in ASC Exhibit*	Exhibit U

Standard	Condition	Exhibit
	U, Attachment U-3, shall be included and implemented as part of the final Fire Prevention and Suppression Plan.	
	Public Services Condition 5: *Prior to construction, the site certificate holder shall submit to the department for its approval an Environmental and Safety Training Plan, which shall address:* *a. Measures for securing multi-use areas and work sites when not in use; and* *b. Drug/alcohol/firearm policies with clear consequences for violations.*	Exhibit U
	During Construction	
	Public Services Condition 6: *During construction, the site certificate holder shall conduct all work in compliance with the Helicopter Use Plan referenced in Public Services Condition 2.*	Exhibit U; Exhibit K; Exhibit L
	Public Services Condition 7: *During construction, the site certificate holder shall conduct all work in compliance with the final Transportation and Traffic Plan referenced in Public Services Condition 3.*	Exhibit U; Exhibit L
	Public Services Condition 8: *During construction, the site certificate holder shall conduct all work in compliance with the final Fire Prevention and Suppression Plan referenced in Public Services Condition 4.*	Exhibit U
	Public Services Condition 9: *During construction, the site certificate holder shall conduct all work in compliance with the Environmental and Safety Training Plan referenced in Public Services Condition 5.*	Exhibit U
	During Operation	
	Public Services Condition 10: *During operation, the site certificate holder shall continue to consult with public utilities or private providers operating within existing rights-of-ways to minimize impacts to such.*	Exhibit U
Waste Minimization	***Prior to Construction***	
	Waste Minimization Condition 1: *Prior to construction, the site certificate holder shall develop a Construction Waste Management Plan, which addresses:* *a. The number and types of waste containers to be maintained at construction sites and construction yards;* *b. Waste segregation methods for recycling or disposal;* *c. Names and locations of appropriate recycling and waste disposal facilities, collection requirements, and hauling requirements to be used during construction;* *d. Recycling steel and other metal scrap;* *e. Recycling wood waste;* *f. Recycling packaging wastes such as paper and cardboard;* *g. Collecting non-recyclable waste for transport to a local landfill by a licensed waste hauler or by using facility equipment and personnel to haul the waste;* *h. Segregating all hazardous and universal wastes such as used oil, oily rags and oil-absorbent materials, mercury-containing lights and lead-acid and nickel-cadmium batteries for disposal by a*	Exhibit U; Exhibit V

Standard	Condition	Exhibit
	licensed firm specializing in the proper recycling or disposal of hazardous and universal wastes; and *i. Discharging concrete truck rinse-out within foundation holes, completing truck wash-down off-site, and burying other concrete waste as fill on-site whenever possible.*	
	During Construction	
	Waste Minimization Condition 2: *During construction, the site certificate holder shall conduct all work in compliance with the Construction Waste Management Plan referenced in Waste Minimization Condition 1.*	Exhibit U; Exhibit V
	Waste Minimization Condition 3: *During construction, the site certificate holder shall provide to the department a report on the implementation of the Construction Waste Management Plan referenced in Waste Minimization Condition 1 in the 6-month construction report required pursuant to OAR 345-026-0080(1)(a).*	Exhibit U; Exhibit V
Carbon Dioxide Emissions	*None.*	
Need Standard for Non-Generating Facilities	*None.*	
Siting Standards for Transmission Lines	***During Construction***	
	Siting Standard Condition 1*: During construction, the site certificate holder shall take the following steps to reduce or manage human exposure to electromagnetic fields:* *a. Constructing all aboveground transmission lines at least 200 feet from any residence or other occupied structure, measured from the centerline of the transmission line;* *b. Constructing all aboveground 500-kV transmission lines with a minimum clearance of 34.5 feet from the ground at normal operating conditions;* *c. Constructing all aboveground 230-kV transmission lines with a minimum clearance of 20 feet from the ground at normal operating conditions;* *d. Constructing all aboveground 138-kV transmission lines with a minimum clearance of 20 feet from the ground at normal operating conditions;* *e. In areas where aboveground transmission line will cross an existing transmission line, constructing the transmission line at a height and separation ensuring that alternating current electric fields do not exceed 9-kV per meter at one meter above the ground surface; and* *f. Constructing all aboveground transmission lines in accordance with the requirements of the 2017 edition of the National Electrical Safety Code.*	Exhibit AA
	During Operation	

Standard	Condition	Exhibit
	Siting Standard Condition 2: During operation, the site certificate holder shall take the following steps to reduce or manage human exposure to electromagnetic fields: *a. Providing to landowners a map of overhead transmission lines on their property and advising landowners of possible health and safety risks from induced currents caused by electric and magnetic fields;* *b. Implementing a program that provides reasonable assurance that all fences, gates, cattle guards, trailers, irrigation systems, or other objects or structures of a permanent nature that could become inadvertently charged with electricity are grounded or bonded throughout the life of the line; and* *c. Implementing a safety protocol to ensure adherence to NESC grounding requirements.*	Exhibit AA
Noise Control Regulations	***During Construction***	
	Noise Control Condition 1: *During construction, the site certificate holder shall use transmission line materials that have been designed and tested to minimize corona noise. The site certificate holder shall use a bundle configuration and larger conductors to limit audible noise, radio interference, and television interference due to corona. The site certificate holder shall maintain tension on all insulator assemblies to ensure positive contact between insulators, thereby avoiding sparking. The site certificate holder shall exercise caution during construction to avoid scratching or nicking the conductor surface, which may provide points for corona to occur.*	Exhibit X
	During Operation	
	Noise Control Condition 2: *During operation, the site certificate holder shall maintain a complaint response system to address noise complaints. If the site certificate holder receives a noise complaint and it is shown that corona noise exceeds the antidegradation standard, the site certificate holder shall provide to the landowner a payment equal to the reasonable cost of installing reasonable acoustic window treatments, as approved by the department. The payment provided for in this condition shall fully resolve any noise complaint related to the Project; no additional mitigation shall be required.* *a. If the complainant's noise sensitive receptor or receptors are included in Appendix X-4 in ASC Exhibit X, the sound level increases set forth in Appendix X-4 will be assumed to be valid for purposes of determining whether the corona noise exceeds the antidegradation standard. If the complainant disagrees with the sound level increases set forth in Appendix X-4, the complainant must provide its own scientific evidence demonstrating that corona noise exceeds the antidegradation standard.* *b. If the complainant's noise sensitive receptor or receptors are not included in Appendix X-4 in ASC Exhibit X, the site certificate holder shall model the sound level increases using the methods set forth in ASC Exhibit X. If the complainant disagrees with the sound level increases modeled by the site certificate holder, the complainant must provide its own scientific evidence demonstrating that corona noise exceeds the antidegradation standard.*	Exhibit X

Standard	Condition	Exhibit
	c. Under any and all circumstances, the site certificate holder may conduct site-specific sound monitoring to confirm the noise levels at the complainant's property, and the complainant must allow such monitoring if requested by the site certificate holder.	
	Noise Control Condition 3: *During operation, the site certificate holder shall notify the department within ten working days of receiving a noise complaint related to the facility. The notification shall include the date the site certificate holder received the complaint, the nature of the complaint, the complainant's contact information, the location of the affected property, and any actions taken, or planned to be taken, by the site certificate holder at the site certificate holder's discretion to address the complaint.*	Exhibit X
Other Information	***Prior to Construction***	
	Other Information Condition 1*: Prior to construction, the site certificate holder shall finalize, and submit to the department for its approval, a final Fish Passage Plan. The protective measures described in the draft Fish Passage Plan in ASC Exhibit BB, Attachment BB-2, shall be included as part of the final Fish Passage Plan, unless otherwise approved by the department.*	Exhibit BB; Exhibit P1; Exhibit Q
	During Construction	
	Other Information Condition 2: *During construction, at least 15 days prior to construction in forest lands, the site certificate holder shall finalize, and submit to the department, a final Plan for an Alternate Practice, a notification of operation, and a written plan of operations (if necessary). The protective measures described in the draft Plan for an Alternate Practice in ASC Exhibit BB, Attachment BB-1, shall be included as part of the final Plan for an Alternate Practice, unless otherwise approved by the department.*	Exhibit BB
	Other Information Condition 3: *During construction, the site certificate holder shall conduct all work in compliance with the final Plan for an Alternate Practice, notification of operation, and written plan of operations (if necessary) referenced in Other Information Condition 2.*	Exhibit BB
	Other Information Condition 4*: During construction, the site certificate holder shall conduct all work in compliance with the final Fish Passage Plan referenced in Other Information Condition 1.*	Exhibit BB; Exhibit P1; Exhibit Q
Waters of this State	***Waters of this State Condition 1****: Prior to construction on the parcels that had been surveyed at the time of the ASC, the site certificate holder shall obtain from the Oregon Department of Lands a Removal-Fill Permit based on the Joint Permit Application in ASC Exhibit J, Attachment J-3.*	Exhibit J
	Waters of this State Condition 2*: Prior to construction on the parcels that had not been surveyed at the time of the ASC, the site certificate holder shall finalize, and submit to the department for its approval, a final Joint Permit Application.*	Exhibit J
	Waters of this State Condition 3*: Prior to construction on the parcels that had not been surveyed at the time of the ASC, the site certificate holder shall obtain from the Oregon*	Exhibit J

Standard	Condition	Exhibit
	Department of Lands a Removal-Fill Permit based on the final Joint Permit Application referenced in Waters of this State Condition 2.	
	***Waters of this State Condition 4**: During construction, the site certificate holder shall conduct all work in compliance with a Removal-Fill Permit.*	Exhibit J