

ATTACHMENT 5



Oregon

Tina Kotek, Governor

Department of State Lands

775 Summer Street NE, Suite 100

Salem, OR 97301-1279

(503) 986-5200

FAX (503) 378-4844

www.oregon.gov/dsl

State Land Board

Tina Kotek

Governor

Tobias Read

Secretary of State

Elizabeth Steiner

State Treasurer

BEFORE THE DIRECTOR OF THE DEPARTMENT OF STATE LANDS OF THE STATE OF OREGON

In the Matter of Removal-Fill Permit)
Application 65907-RF) Proposed Permit Decision and Order;
) Notice of Right to a Hearing
By Portland Water Bureau)

Short and Plain Statement of the Permitting Decision: The permit application is approved because the Department of State Lands (DSL or the Department) has determined that, when carried out in compliance with all terms and conditions outlined in the permit, the proposed removal-fill activity is consistent with the protection, conservation, and best use of the water resources of this state and will not unreasonably interfere with the paramount policy of this state to preserve the use of its waters for navigation, fishing, and recreation. See ORS 196.825.

I. **Applicable Law:**

- a. ORS Chapter 196 governs removal fill permits in Oregon. The Department administers Oregon's Removal-Fill Law, Oregon Revised Statutes (ORS) 196.795 to ORS 196.990, which protects the state's wetlands and waterways. See ORS 196.805. Unless an exception applies, a person may not remove material from waters of this state or fill waters of this state without a permit from DSL. ORS 196.810. Waters of this state include the all-natural waterways, tidal and non-tidal bays, intermittent streams, constantly flowing streams, lakes, wetlands, the Pacific Ocean that is in the boundaries of this state, and other water bodies. ORS 196.800; Oregon Administrative Rule (OAR) 141-085-0515; OAR 141-093-0100.
- b. Specifically, the statutes that govern removal-fill permits in Oregon, including the permit application at issue in this case, generally include the following:

ORS 196.795 (Administration of State Removal or Fill Permits; General Permits);
ORS 196.800 (Definitions);
ORS 196.805 (Policy);
ORS 196.810 (Removal from Bed or Banks of Waters; Permits; Exceptions);
ORS 196.812 (Removal of Large Woody Debris);
ORS 196.815 (Permit Applications; Fees);
ORS 196.816 (Removal of Materials for Purpose of Maintaining Drainage and Protecting Agricultural Land);
ORS 196.817 (Removal or Fill General Permits);
ORS 196.818 (Wetland Delineation Reports; Fees);
ORS 196.820 (Smith Lake, Bybee Lake Prohibition);
ORS 196.825 (Permit Criteria; Consultation with Other Agencies);
ORS 196.830 (Estuarine Resource Replacement; Other Permit Conditions);

ORS 196.835 (Issuance of Permits; Procedure);
ORS 196.845 (Investigations and Surveys of Location); and
ORS 196.850 (Waiver of Permit Requirement; Notice; Review).
The full text of these statutes may be viewed online at:
https://www.oregonlegislature.gov/bills_laws/ors/ors196.html.

The full text of these statutes may also be inspected in person during normal business hours at:
Oregon Department of State Lands
775 Summer St NE STE 100
Salem, OR 97301.

- c. OAR Chapter 141, Division 85 implement the above statutory scheme and govern removal-fill permits in Oregon. The rules that govern removal-fill permits in Oregon, including the permit application at issue in this case, generally include the following:

Div. 85 Removal-Fill Authorizations:

OAR 141-085-0500 (General);
OAR 141-085-0506 (Policy);
OAR 141-085-0510 (Definitions);
OAR 141-085-0515 (Removal-Fill Jurisdiction by Type of Water);
OAR 141-085-0520 (Removal-Fill Jurisdiction by Volume of Material);
OAR 141-085-0525 (Measuring and Calculating Volume of Removal and Fill);
OAR 141-085-0530 (Exemptions for Certain Activities and Structures);
OAR 141-085-0534 (Exemptions for Certain Voluntary Habitat Restoration Activities);
OAR 141-085-0535 (Exemptions Specific to Agricultural Activities);
OAR 141-085-0540 (Types of Authorizations);
OAR 141-085-0545 (Fees; Amounts and Disposition);
OAR 141-085-0550 (Application Requirements for Individual Permits);
OAR 141-085-0555 (Individual Removal-Fill Permit Application Review Process);
OAR 141-085-0560 (Public Review Process for Individual Removal - Fill Permit Applications);
OAR 141-085-0565 (Department Determinations and Considerations in Evaluating Individual Permit Applications);
OAR 141-085-0575 (Permit Appeals);
OAR 141-085-0580 (Discovery in Contested Cases);
OAR 141-085-0585 (Permit Conditions, Permit Expiration Dates and Permit Transfer);
OAR 141-085-0590 (Renewal and Extension of Individual Removal-Fill Permits);
OAR 141-085-0595 (Permit Requirements and Interagency Coordination for Department of Environmental Quality Approved Remedial Action, Corrections Facilities, Solid Waste Land Fills and Energy Facilities);
OAR 141-085-0665 (Expedited Process for Industrial or Traded Sector Sites);
OAR 141-085-0676 (Emergency Authorizations);
OAR 141-085-0680 (Compensatory Mitigation (CM); Applicability and Principal Objectives);
OAR 141-085-0685 (Functions and Values Assessment);
OAR 141-085-0690 (Eligibility Requirements for CM);
OAR 141-085-0692 (Mitigation Accounting);
OAR 141-085-0694 (Special Requirement for CM);
OAR 141-085-0695 (Administrative Protection of CM Sites);
OAR 141-085-0700 (Financial Security for CM Sites);
OAR 141-085-0705 (Requirements for CM Plans);
OAR 141-085-0710 (Monitoring Requirements for CWM);
OAR 141-085-0715 (Mitigation for Temporary Impacts);

OAR 141-085-0720 (Mitigation Banking Purpose, Applicability and Policies);
OAR 141-085-0725 (Process for Establishing Mitigation Banks);
OAR 141-085-0730 (Establishment of Mitigation Credits);
OAR 141-085-0735 (Release, Use and Sale of Mitigation Credits);
OAR 141-085-0740 (Authorization for Mitigation Banks);
OAR 141-085-0745 (In-Lieu Fee Mitigation);
OAR 141-085-0750 (Payments to and Expenditures from the Oregon Removal-Fill Mitigation Fund);
OAR 141-085-0755 (Advance Mitigation); and
OAR 141-085-0768 (Advance Aquatic Resource Plans).

The full text of these rules may be viewed online at:

<https://secure.sos.state.or.us/oard/viewSingleRule.action?ruleVrsnRsn=15700>.

The full text of these rules may also be inspected in person during normal business hours at:

Oregon Department of State Lands
775 Summer St NE STE 100
Salem, OR 97301.

II. Findings of Fact and Findings of Ultimate Fact:

1. The Department received a complete, written application from applicant on January 15, 2026 for the proposed removal-fill activity consisting of removal of a man-made earthen dam and in-line pond along the mainstem of Johnson Creek to restore pre-disturbance stream-flow and fish passage. Grading, construction of a side channel with riparian breeding ponds, and re-vegetation with native plants will restore native species habitat. Permanent impacts to 1.06 acres of Wetland A (artificially created, PUBHh) and 230 linear feet of Johnson Creek. Temporary impacts to 0.11 acres of Wetland B (PSS).
2. The Department circulated the complete application for 30-day public comment period January 15, 2026 to February 13, 2026 to parties including, affected local, state and federal agencies, affected tribal governments, adjacent landowners, and other parties requesting notification.
3. Public comments were received from Oregon Department of State Lands, Oregon Water Resources Department, and the Confederated Tribes of the Grand Ronde Community of Oregon. The nature of those comments included requirements around an existing water right certificate and cultural resources.
4. There were no comments that required a response to the Department, however consultation with Oregon Department of Fish and Wildlife prompted project design changes and a revised, written application was received by the Department on April 24, 2026.
5. Based on all the information in the agency file in this matter, including the complete application, comments received, applicant response to comments, and the agency's own investigations, the Department concludes as to the determinations in ORS 196.825(1) and (4), OAR 141-085-0565(3), and OAR 141-093-0115:
 - a. The project described in the permit application and as conditioned in the proposed permit, is consistent with the protection, conservation, and best use of the water resources of this state as specified in ORS 196.600 to 196.905;
 - b. The project described in the permit application and as conditioned in the proposed permit would not interfere with the paramount policy of this state to preserve the use of its waters for navigation, fishing, and public recreation.

6. Based on all the information in the agency file in this matter, including the complete application, comments received, applicant response to comments, and the agency's own investigations, the Department concludes, as to the considerations in ORS 196.825(3), OAR 141-085-0565(4), OAR 141-093-0115.
- a. There is an identified public need for the proposed fill or removal and social, economic, or other public benefits likely to result from the proposed fill or removal. The following is from the application. *"The social, economic, and public benefits likely to result from this project include improved conditions for resident cutthroat trout, which provide recreational opportunities for the public and potential downstream benefits to ESA-listed Lower Columbia steelhead and Coho Salmon as well as Pacific Lamprey, which all have economic and cultural value to Indigenous Tribes and commercial and recreational fishing industries. Furthermore, removal of the dam will decrease risk to downstream infrastructure. The 24-inch culvert which provides an outlet for the artificial in-line pond is overwhelmed during flood events and water spills over the top of the dam every few years."*
 - b. There is an identified economic cost to the public if the proposed fill or removal is not accomplished. The following is from the application. *"The range of economic costs to the public if the proposed fill and removal are not accomplished is associated with the increased risk of failure of the dam. Dam failure poses a serious economic risk to downstream infrastructure and private property. Economic costs associated with dam failure could include significant property damage, disruption to or loss of agricultural productivity, loss of land value, environmental damage and cleanup, emergency response costs, and potential insurance cost increases."*
 - c. The application describes two (2) alternatives to the project for which the fill or removal is propose. There are no practicable alternatives with lesser impact to waters of this state.
 - d. The application describes zero (0) alternative sites for the proposed removal or fill as the project proposes removal of an existing man-made berm and rectify historic disturbance to the existing creek. There are no practicable alternative sites with lesser impact to waters of this state.
 - e. The proposed project conforms to sound policies of conservation because adverse effects to the aquatic resources have been reduced to the extent practicable and the proposed permit contains operating conditions for best management practices to further minimize adverse effects. No interference with public health and safety was identified in the application evaluation and public review processes.
 - f. There is not a conflict with existing public uses of the affected waters or adjacent land uses identified in the application evaluation and public review processes.
 - g. The proposed permit is conditioned on future local approval as described in the application's Land Use Compatibility Statement.
 - h. The proposed fill and removal is not for streambank protection.
 - i. No permanent adverse effects to aquatic resources are expected, therefore, compensatory mitigation is not required.

III. Conclusions of Law:

Based on the factors laid out in ORS Chapter 196 and OAR Chapter 141, Division 85, including ORS 196.825, OAR 141-085-0565, and OAR 141-093-0115, DSL should approve the permit application as conditioned in the proposed permit.

IV. Proposed Order:

The Department proposes approving the permit application with conditions and based on the factors laid out in ORS Chapter 196 and OAR Chapter 141, Division 85, including ORS 196.825, OAR 141-085-0565 and OAR 141-093-0130.

As described below, you have the right to request a hearing within 21 days. Prior to the expiration of the 21-day period, this proposed permit decision is not the final agency order on the matter, and the permittee should be aware that the decision could be changed prior to the expiration of the 21-day appeal period—either because the permittee requests a contested case hearing, or as otherwise allowed under the removal fill law. A permittee who begins work under a permit prior to issuance of a final order does so with acceptance of this risk.

V. Hearing:

You are entitled to request a hearing based on this Proposed Order as provided by the Oregon Administrative Procedures Act (ORS chapter 183) and the administrative rules implementing the Administrative Procedures Act, OAR Chapter 137, Division 3. See ORS 196.825(7); OAR 141-001-0005; OAR 141-001-0010; OAR 141-085-0575; OAR 141-093-0130.

If you want a hearing, you must file a written request for a hearing with the Department no later than 21 calendar days from the date of the permit decision. See ORS 196.825(7); OAR 141-085-0575; OAR 141-093-0130. If you are a corporation, partnership, limited liability company, unincorporated association, trust, or government body, you must either have an attorney licensed to practice law in Oregon submit a request for a contested case hearing on your behalf or ratify your hearing request within 28 days. See OAR 137-003-0550.

The Department has determined that due to the complexity of removal-fill permitting, a general denial of the matters or a general objection to all permit conditions in the request for a contested case proceeding does not provide sufficient information for a fair and efficient contested case and a more specific request is warranted. OAR 141-085-0575. All requests for a contested case proceeding under this section shall include a specific list of issues for the contested case proceeding. OAR 141-085-0575. The requester may amend their request to include additional issues or clarify existing issues within 15 days of the date that the case is referred to the Office of Administrative Hearings. OAR 141-085-0575.

You may mail a request for a hearing to:
Department of State Lands
Aquatic Resource Management Program
775 Summer Street NE STE 100
Salem, OR 97301.

If you request a hearing, you will be notified of the time and the place of the hearing. See OAR 137-003-0525. You may be represented by legal counsel at the hearing. ORS 183.417; OAR

137-003-0550. Corporations, partnerships, limited liability companies, unincorporated associations, trusts and government bodies must be represented by an attorney except as provided in OAR 137-003-0555 or as otherwise authorized by law. OAR 137-003-0550. Legal aid organizations may be able to represent you if you have limited financial resources. You will be given information on the procedures, right of representation, and other rights of parties relating to the substance and conduct of the hearing before commencement of the hearing. See ORS 183.413.

VI. Jurisdiction and Authority to Hold a Hearing:

The Department has jurisdiction over the issuance of removal-fill permits pursuant to ORS Chapter 196, and specifically, ORS 196.810. A permit decision constitutes an order in a contested case. See ORS 183.310(2)(a); ORS 196.825(7). If timely requested, a hearing is held as laid out in ORS 183.411 to ORS 183.471, OAR Chapter 137, Division 3, ORS Chapter 196, and OAR Chapter 141, Division 85. ORS 196.825(7).

VII. Final Order and Defaults:

If a request for a hearing is not received by the Department within this 21-day period, your right to a hearing shall be waived and this Proposed Order shall become the Final Order by default. See ORS 196.825(7); OAR 141-085-0575; OAR 141-093-0130.

If you request a hearing and then either withdraw your hearing request, notify the Department or administrative law judge that you will not appear, or fail to appear at a scheduled hearing, the Department may issue a final order by default. See ORS 183.417.

If the Department issues a final order by default, it designates its file on this matter, including any materials submitted by you that relate to this matter, as the record for purposes of supporting its decision.

If you proceed to a contested case hearing, a Final Order will not be issued until after the hearing concludes. See ORS 183.464; OAR 141-085-0575; OAR 141-093-0130.

VIII. Federal Servicemembers Civil Relief Act:

Active duty servicemembers have a right to stay contested case proceedings under the federal Servicemembers Civil Relief Act. See *generally* 50 USC 3901 *et seq.* For more information, contact the Oregon State Bar (800-452-8260), the Oregon Military Department (503-584-3571), or the nearest United States Armed Forces Legal Assistance Office (<http://legalassistance.law.af.mil>). The Oregon Military Department does not have a toll-free telephone number.

Department of State Lands
775 Summer Street, Suite 100
Salem, OR 97301-1279
☎ 503-986-5200

Permit No.:	65907-RF
Permit Type:	Removal/Fill
Waters:	Johnson Creek, Wetlands A, B
County:	Multnomah
Expiration Date:	April 30, 2027

PORTLAND WATER BUREAU

IS AUTHORIZED IN ACCORDANCE WITH ORS 196.800 TO 196.990 TO PERFORM THE OPERATIONS DESCRIBED IN THE REFERENCED APPLICATION, SUBJECT TO THE SPECIAL CONDITIONS LISTED ON ATTACHMENT A AND TO THE FOLLOWING GENERAL CONDITIONS:

1. This permit does not authorize trespass on the lands of others. The permit holder must obtain all necessary access permits or rights-of-way before entering lands owned by another.
2. This permit does not authorize any work that is not in compliance with local zoning or other local, state, or federal regulation pertaining to the operations authorized by this permit. The permit holder is responsible for obtaining the necessary approvals and permits before proceeding under this permit.
3. All work done under this permit must comply with Oregon Administrative Rules, Chapter 340; Standards of Quality for Public Waters of Oregon. Specific water quality provisions for this project are set forth on Attachment A.
4. Violations of the terms and conditions of this permit are subject to administrative and/or legal action, which may result in revocation of the permit or damages. The permit holder is responsible for the activities of all contractors or other operators involved in work done at the site or under this permit.
5. Employees of the Department of State Lands (DSL) and all duly authorized representatives of the Director must be permitted access to the project area at all reasonable times for the purpose of inspecting work performed under this permit.
6. Any permit holder who objects to the conditions of this permit may request a hearing from the Director, in writing, within twenty-one (21) calendar days of the date this permit was issued.
7. In issuing this permit, DSL makes no representation regarding the quality or adequacy of the permitted project design, materials, construction, or maintenance, except to approve the project's design and materials, as set forth in the permit application, as satisfying the resource protection, scenic, safety, recreation, and public access requirements of ORS Chapters 196, 390, and related administrative rules.
8. Permittee must defend and hold harmless the State of Oregon, and its officers, agents and employees from any claim, suit, or action for property damage or personal injury or death arising out of the design, material, construction, or maintenance of the permitted improvements.
9. Authorization from the U.S. Army Corps of Engineers may also be required.

NOTICE: If removal is from state-owned submerged and submersible land, the permittee must comply with leasing and royalty provisions of ORS 274.530. If the project involves creation of new lands by filling on state-owned submerged or submersible lands, you must comply with ORS 274.905 to 274.940 if you want a transfer of title; public rights to such filled lands are not extinguished by issuance of this permit. This permit does not relieve the permittee of an obligation to secure appropriate leases from DSL, to conduct activities on state-owned submerged or submersible lands. Failure to comply with these requirements may result in civil or criminal liability. For more information about these requirements, please contact Department of State Lands, 503-986-5200.

Melinda Butterfield, Operations Manager
Aquatic Resource Management
Oregon Department of State Lands

Melinda Butterfield
Authorized Signature

Digitally signed by Melinda Butterfield
Date: 2026.04.30 07:07:19 -07'00'

ATTACHMENT A

Permit Holder: Portland Water Bureau

Project Name: Cottrell Pond Site Restoration Project

Special Conditions for Removal/Fill Permit No. 65907-RF

READ AND BECOME FAMILIAR WITH CONDITIONS OF YOUR PERMIT.

The project site may be inspected by the Department of State Lands (DSL) as part of our monitoring program. A copy of this permit must be available at the work site whenever authorized operations are being conducted.

1. **Responsible Party:** By signature on the application, Angie Kimpo is acting as the representative of Portland Water Bureau. By proceeding under this permit, Portland Water Bureau agrees to comply with and fulfill all terms and conditions of this permit, unless the permit is officially transferred to another party as approved by DSL. In the event information in the application conflicts with these permit conditions, the permit conditions prevail.
2. **Authorization to Conduct Removal and/or Fill:** This permit authorizes 1.17 acres of wetland and 230 linear feet of waterway impact(s) with associated removal and fill of material in T1S R4E Section 22CD, Tax Lot 300, in Multnomah County, as referenced in the application, map and drawings (See Attachment B for project location), dated April 24, 2026. This permit also authorizes removal and fill activities necessary to complete the required compensatory mitigation.
3. **Work Period in Jurisdictional Areas:** Fill or removal activities below the ordinary high water elevation of Johnson Creek must be conducted between July 15 and August 31, unless otherwise coordinated with Oregon Department of Fish and Wildlife and approved in writing by DSL. If fish eggs are observed within the project area, work must cease, and DSL contacted immediately.
4. **Changes to the Project or Inconsistent Requirements from Other Permits:** It is the permittee's responsibility to ensure that all state, federal and local permits are consistent and compatible with the final approved project plans and the project as executed. Any changes made in project design, implementation or operating conditions to comply with conditions imposed by other permits resulting in removal-fill activity must be approved by DSL prior to implementation.
5. **DSL May Halt or Modify:** DSL retains the authority to temporarily halt or modify the project or require rectification in case of unforeseen adverse effects to aquatic resources or permit non-compliance.
6. **DSL May Modify Conditions Upon Permit Renewal:** DSL retains the authority to modify conditions upon renewal, as appropriate, pursuant to the applicable rules in effect at the time of the request for renewal or to protect waters of this state.

Pre-Construction

7. **Local Government Approval Required Before Beginning Work:** Prior to the start of construction, the permittee must obtain a Type 2 SEC-wr MMC 39.5590, Type 2 Lot of Record

Determination MMC 39.3005, Type 1 Erosion and Sediment Control MMC 39.6225, Type 1 Flood Development Permit MCC 39.5005 from the Multnomah County.

8. **Stormwater Management Approval Required Before Beginning Work:** Prior to the start of construction, the permittee must obtain a National Pollution Discharge Elimination System (NPDES) permit from the Oregon Department of Environmental Quality (DEQ), if one is required by DEQ.
9. **Pre-construction Resource Area Fencing or Flagging:** Prior to any site grading, the boundaries of the avoided wetlands, waterways, and riparian areas adjacent to the project site must be surrounded by noticeable construction fencing or flagging. The marked areas must be maintained during construction of the project and be removed immediately upon project completion.

General Construction Conditions

10. **Water Quality Certification:** The Department of Environmental Quality (DEQ) may evaluate this project for a Clean Water Act Section 401 Water Quality Certification (WQC). If the evaluation results in issuance of a Section 401 WQC, that turbidity condition will govern any allowable turbidity exceedance and monitoring requirements.
11. **Erosion Control Methods:** The following erosion control measures (and others as appropriate) must be installed prior to construction and maintained during and after construction as appropriate, to prevent erosion and minimize movement of soil into waters of this state.
 - a. All exposed soils must be stabilized during and after construction to prevent erosion and sedimentation.
 - b. Filter bags, sediment fences, sediment traps or catch basins, leave strips or berms, or other measures must be used to prevent movement of soil into waterways and wetlands.
 - c. To prevent erosion, use of compost berms, impervious materials or other equally effective methods, must be used to protect soil stockpiled during rain events or when the stockpile site is not moved or reshaped for more than 48 hours.
 - d. Unless part of the authorized permanent fill, all construction access points through, and staging areas in, riparian and wetland areas must use removable pads or mats to prevent soil compaction. However, in some wetland areas under dry summer conditions, this requirement may be waived upon approval by DSL. At project completion, disturbed areas with soil exposed by construction activities must be stabilized by mulching and native vegetative plantings/seeding. Sterile grass may be used instead of native vegetation for temporary sediment control. If soils are to remain exposed more than seven days after completion of the work, they must be covered with erosion control pads, mats or similar erosion control devices until vegetative stabilization is installed.
 - e. Where vegetation is used for erosion control on slopes steeper than 2:1, a tackified seed mulch must be used so the seed does not wash away before germination and rooting.
 - f. Dredged or other excavated material must be placed on upland areas having stable slopes and must be prevented from eroding back into waterways and wetlands.
 - g. Erosion control measures must be inspected and maintained as necessary to ensure their continued effectiveness until soils become stabilized.
 - h. All erosion control structures must be removed when the project is complete, and soils are stabilized and vegetated.

- 12. Fuels, Hazardous, Toxic, and Waste Material Handling:** Petroleum products, chemicals, fresh cement, sandblasted material and chipped paint, material treated with leachable preservatives or other deleterious waste materials must not be allowed to enter waters of this state. Machinery and equipment staging, cleaning, maintenance, refueling, and fuel storage must be at least 150 feet from OHW or HMT and wetlands to prevent contaminants from entering waters of this state. Refueling is to be confined to a designated area to prevent spillage into waters of this state. Barges must have containment system to effectively prevent petroleum products or other deleterious material from entering waters of this state. Project-related spills into waters of this state or onto land with a potential to enter waters of this state must be reported to the Oregon Emergency Response System (OERS) at 1-800-452-0311.
- 13. Archaeological Resources:** If any archaeological resources, artifacts or human remains are encountered during construction, all construction activity must immediately cease. The State Historic Preservation Office must be contacted at 503-986-0674. You may be contacted by a Tribal representative if it is determined by an affected Tribe that the project could affect Tribal cultural or archeological resources.
- 14. Construction Corridor:** There must be no removal of vegetation or heavy equipment operating or traversing outside the designated construction corridor or footprint (Sheet(s) 3-9).
- 15. Operation of Equipment in the Water:** Heavy equipment may be positioned below ordinary high water or highest measured tide if the area is isolated from the waterway and aquatic organism salvage is completed, as shown in (Sheet(s) 6, 14) of the application.
- All machinery operated below ordinary high water (OHW) or highest measured tide (HMT) elevation must use vegetable-based hydraulic fluids, be steam cleaned and inspected for leaks prior to each use, and be diapered to prevent leakage of fuels, oils, or other fluids below OHW or HMT elevation. Any equipment found to be leaking fluids must be immediately removed from and kept out of OHW or HMT until repaired.
- 16. Work Area Isolation:** The work area must be isolated from the water during construction in accordance with the work area isolation plan in the application (Block 4C). All structures and materials used to isolate the work area must be removed immediately following construction and water flow returned to pre-construction conditions.
- 17. Fish Salvage Required:** Fish must be salvaged from the isolation area. Permits from NOAA Fisheries and Oregon Department of Fish and Wildlife, Fish Research are required to salvage fish. Fish salvage permit information may be obtained by contacting ODFW Fish Research at 503-947-6254 or Fish.Research@state.or.us.
- 18. Fish Passage Required:** The project must meet Oregon Department of Fish and Wildlife requirements for fish passage, as required in ORS 509.585. Contact the local ODFW District Fish Biologist (Charles M. Barr, mac.barr@odfw.oregon.gov) to ensure your project meets the state's fish passage requirements.
- 19. Raising or Redirecting Water:** The project must not cause water to rise or be redirected and result in damage to structures or property on the project site as well as adjacent, nearby, upstream, and downstream of the project site.

Voluntary Wetland and Waterway Conditions

20. Mitigation Credits for Voluntary Restoration Projects: DSL will not recognize future mitigation credits for the resource gains generated by this project unless the applicant receives written consent from DSL approving the baseline conditions, including but not limited to a wetland delineation and function assessment, prior to the start of project construction.

21. Acreage and Type: Voluntary wetland and waterway project is authorized to be conducted according to the acreages and methods described in the table below

Pre-Project, Proposed Impacts, Post Project Conditions

Wetland ID / Waterway	Cowardin, HGM ¹ Intermittent , Perennial, ESH ²	Pre-Project		Permanent Impacts		Site Improvements			Post-Project	
		Acres	LF ³	Acres	LF ³	Create (acres)	Restore (acres/L F)	Enhance (acres)	Acres (SqFt)	LF ³
Wetland A	PUBHh, RI	1.06	-	1.06	-	-	-	-	-	-
Wetland B	PSS1, RI	0.24	-	0.11	-	-	0.11	-	0.24	-
Riparian Ponds	PEMJ, RFT	-	-	-	-	0.16	-	-	0.16	-
Wetland Total:		1.30	-	1.17	-	-	-		0.40	-
Johnson Cr	RFT	-	230	-	-	-	486	-	-	716
Intermittent Channel		-	-	-	-	-	400	-	-	400
Waterway Total:		-	230	-	-	-	886	-	-	1,116

Monitoring and Reporting Requirements

22. Post-Construction Report Required: A post-construction report demonstrating as-built conditions and discussing any variation from the approved plan must be provided to DSL within 90 days of site grading, which shall occur during the fall, winter, or spring immediately following the completion of grading within the required planting areas. The post-construction report must include:

- a. A scaled drawing, accurate to 1-foot elevation, clearly showing the following:
 - i. Finished contours of the site.
 - ii. Current tax lot and right-of-way boundaries.
 - iii. Photo point locations.
 - iv. Permanently and temporarily impacted wetland and waterway boundaries identified separately, with square foot listed.
- b. Photos from fixed photo points. This should clearly show the site conditions.
- c. A narrative that describes any deviation from the approved plan.

23. Annual Monitoring Reports Required: Monitoring is required until DSL has officially released the site from further monitoring. The permittee must monitor the site to determine whether the site is meeting performance standards for a minimum period of 3 growing seasons after completion of

all the initial plantings. Annual monitoring reports are required and are due by November 1. Failure to submit the required monitoring report by the due date may result in an extension of the monitoring period, forfeiture of the financial security and/or enforcement action.

24. Extension of the Monitoring Period: The monitoring period may be extended, at the discretion of DSL, for failure of the site to meet performance standards for the final two consecutive years without corrective or remedial actions (such as irrigation, significant weed/invasive plants treatment or replanting) or when needed to evaluate corrective or remedial actions.

25. Contents of the Annual Monitoring Report: The annual monitoring report must include the following information:

- a. Completed Monitoring Report Cover Sheet, which includes permit number, permit holder name, monitoring date, report year, performance standards, and a determination of whether the site is meeting performance standards.
- b. Site location map(s) that clearly shows the impact site and mitigation site boundaries.
- c. Site Plan that clearly shows at least the following:
 - i. The area seeded, with the square foot area listed.
 - ii. The area planted with trees and shrubs, with the square foot area listed.
 - iii. Current tax lot and right-of-way boundaries.
 - iv. Permanent monitoring plot locations that correspond to the data collected and fixed photo-points. These points should be overlaid on the as-built map.
 - v. PEM, PSS, and waterways clearly identified separately and the area (square foot or acreage) of each noted.
 - vi. Creation, restoration, enhancement, and preservations areas identified separately, with the square foot area of each listed.
- d. A brief narrative that describes maintenance activities and recommendations to meet success criteria. This includes when irrigation occurred and when the above ground portion of the irrigation system was or will be removed from the site.
- e. Data collected to support the conclusions related to the status of the site relative to the performance standards listed in this permit (include summary/analysis in the report and raw data in the appendix). Data should be submitted using the DSL Mitigation Monitoring Vegetation Spreadsheet or presented in a similar format as described in DSL's Routine Monitoring Guidance for Vegetation.
- f. Photos from fixed photo points (include in the appendix).
- g. Other information necessary or required to document compliance with the performance standards listed in this permit.

26. Corrective Action May Be Required: DSL retains the authority require corrective action in the event the performance standards are not accomplished at any time within the monitoring period.

Performance Standards

To be deemed successful, the voluntary restoration/enhancement areas must meet the following performance standards, as determined by DSL:

27. Establishment of Permanent Monitoring Locations Required: Permanent plot locations must be established during the first annual monitoring in sufficient number and locations to be representative of the site. The permanent plot locations must be clearly marked on the ground.

28. **Wetland Acreage Required:** The site will have a minimum acreage as shown in the Acreage and Type table above, as determined by a Wetland Delineation Light with data collected during spring of a year when precipitation has been near normal, vegetation has been established, and irrigation has been removed for at least two years. Acreage must be documented on a printed map and in a GIS shapefile (.shp) including attribute information for each unique wetland polygon identifying the size as well as HGM and Cowardin classes.

Herbaceous Wetlands

29. **Bare Substrate Cover:** Bare substrate represents no more than 20% cover.

Shrub-dominated and Forested Wetlands

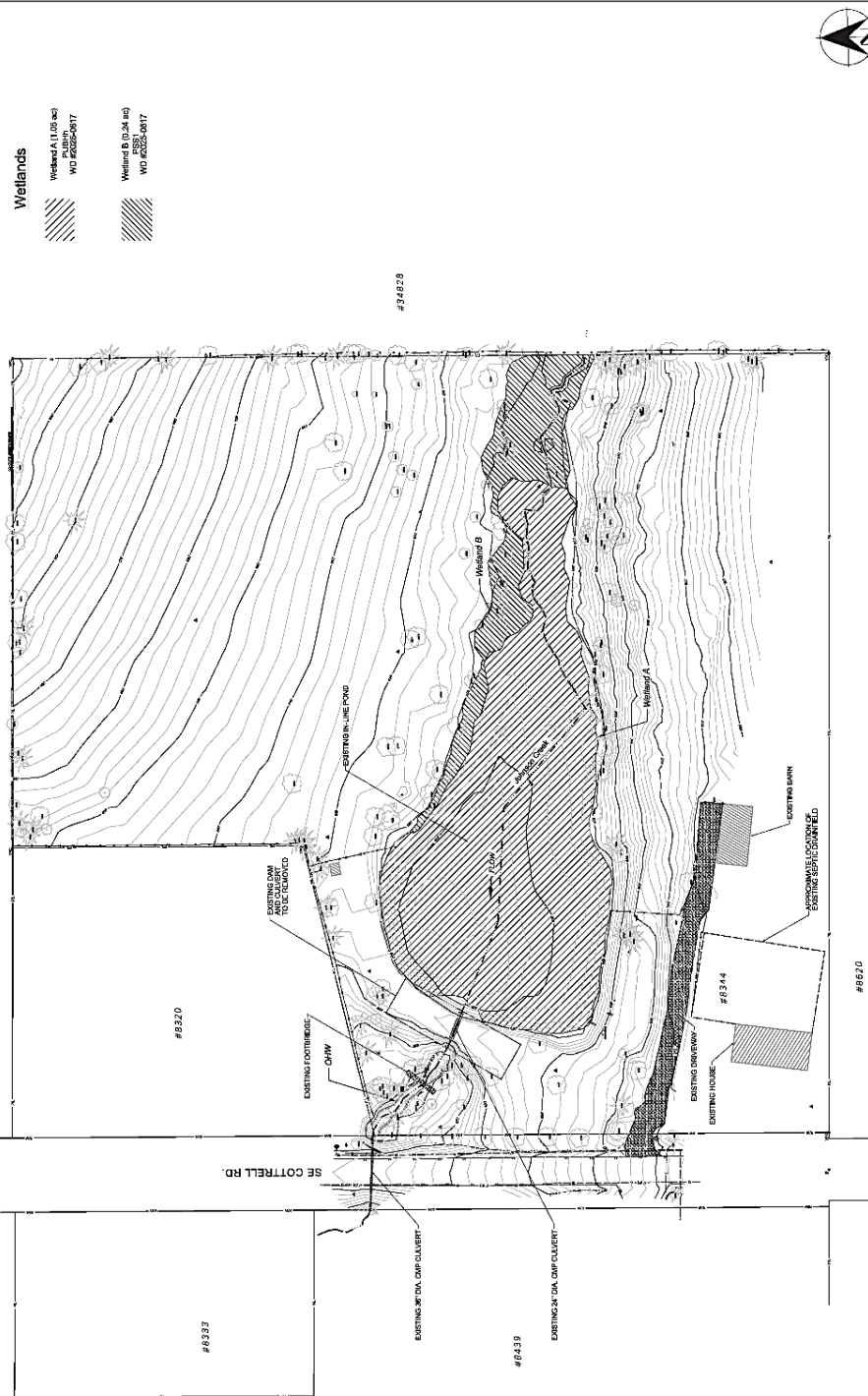
30. **Bare Substrate Cover:** Bare substrate represents no more than 20% cover.

31. **Woody Vegetation:** The density of woody vegetation is at least 1,600 live native plants (shrubs) and/or stems (trees) per acre OR the cover of native woody vegetation on the site is at least 50%. Native species volunteering on the site may be included, dead plants do not count, and the standard must be achieved for 2 years without irrigation.

Monitoring and Reporting Schedule

Report	Requirements	Schedule
Post-Construction	Post-construction report Recorded Protection Instrument	90 days after completion of site grading
First Annual Report	Establishment of permanent monitoring locations Vegetation performance standards Demonstration that wetland hydrology has been accomplished	After one growing season of all proposed plantings
Second Annual Report	Vegetation performance standards	After two growing seasons
Third Annual Report (or final report if the monitoring period has been extended)	Vegetation performance standards	After five growing seasons

Maps and Drawings for Removal/Fill Permit No. 65907-RF

[illegible]





ATTACHMENT 6

REMOVAL

Wetland/Water	Removal Dimensions				Volume (CY)	Time	Material
	Length (FT)	Width (FT)	Height (FT)	Area (SF or AC)			
Johnson Creek (Water B)	10 FT	7 FT	0.75 FT	70 SF	2 CY	Permanent	Existing streambed
PUBHh (Wetland A)				1 AC	5010 CY	Permanent	Pond sediment/silt loam
PSS1 (Wetland B)				0.1 AC	265 CY	Permanent	Pond sediment/silt loam

FILL

Wetland/Water	Fill Dimensions				Volume (CY)	Time	Material
	Length (FT)	Width (FT)	Height (FT)	Area (SF or AC)			
PSS1 (Wetland B)	5 FT	10 FT	3 FT	50 SF	6 CY	Temporary	Upstream diversion dam
Johnson Creek (Water B)	5 FT	10 FT	3 FT	50 SF	6 CY	Temporary	Downstream diversion dam
Johnson Creek (Water B)	5 FT	3 FT	1 FT	15 SF	1 CY	Temporary	Sediment mat bag
Johnson Creek (Water B)	30 FT	7 FT	0.5 FT	210 SF	4 CY	Permanent	Streambed gravel
Johnson Creek (Water B)					5 CY	Permanent	Large wood
PUBHh (Wetland A)					105 CY	Permanent	Large Wood
PUBHh (Wetland A)	540 FT	3 FT	0.5 FT	1620 SF	30 CY	Permanent	Streambed gravel
PUBHh (Wetland A)				1 AC	2140 CY	Permanent	Silt loam
PSS1 (Wetland B)					5 CY	Permanent	Large Wood
PSS1 (Wetland B)	10 FT	3 FT	0.5 FT	30 SF	1 CY	Permanent	Streambed gravel
PSS1 (Wetland B)				0.1 AC	120 CY	Permanent	Silt loam

ATTACHMENT 7



Oregon

Tina Kotek, Governor

Department of Environmental Quality
Headquarters/Portland Administrative Offices
700 NE Multnomah Street, Suite 600
Portland, OR 97232
503-229-5696
TTY 711

May 21, 2026

Angie Kimpo
Portland Water Bureau
1120 SW 5th Avenue Room 405
Portland, OR 97204

RE: 401 Water Quality Certification Approval for Project 2025-426, Cottrell Pond Site Restoration Project

The U.S. Army Corps of Engineers (USACE) has determined that your project will be authorized under Nationwide Permit (NWP) category #27. As described in the application package received and reviewed by the Oregon Department of Environmental Quality (DEQ), the project qualifies for the expedited 401 Water Quality Certification (WQC), subject to the conditions outlined below. If you cannot meet all conditions of this 401 WQC, you may apply for a standard 401 WQC. A standard 401 WQC will require additional information, a public notice that includes a comment period, and a higher review fee.

Certification Decision: Based on information provided by the USACE and the Applicant, DEQ has determined that implementation of eligible activities under the proposed NWP will be consistent with water quality requirements, including applicable provisions of Sections 301, 302, 303, 306, and 307 of the federal Clean Water Act, state water quality standards set forth in Oregon Administrative Rules (OAR) Chapter 340 Division 41, and other appropriate requirements of state law, provided the following conditions are incorporated into the federal permit and strictly adhered to by the Applicant.

Duration of Certification: This 401 WQC for impacts to waters, including dredge and fill activities, is valid for the duration of the USACE permit.

In addition to all USACE national and regional permit conditions, the following 401 WQC conditions apply to all NWP categories that qualify for the expedited 401 WQC.

401 General Certification Conditions

- 1) **Responsible Parties:** This 401 WQC applies to the Applicant. The Applicant is responsible for the work of its contractors and subcontractors, as well as any other entity that performs work related to this 401 WQC.

Authority: OAR 340-048-0015

Justification: DEQ must be aware of responsible parties to ensure compliance.

- 2) **Work Authorized:** Work authorized by this 401 WQC is limited to the work described in the federal permit application and additional application materials (hereafter "the permit application materials"), unless otherwise authorized by DEQ. If the project is operated in a manner that is

not consistent with the project description contained in the permit application materials, the Applicant is not in compliance with this 401 WQC and may be subject to enforcement.

Authority: OAR 340-048-0015

Justification: To ensure the project will comply with water quality standards, DEQ must understand all work involved in the construction and operation of the project.

- 3) **401 WQC On-Site:** A copy of this 401 WQC must be kept on the job site and readily available for reference by the Applicant and its contractors and subcontractors, as well as by DEQ, USACE, National Marine Fisheries Service (NMFS), Oregon Department of Fish and Wildlife (ODFW), and other state and local government inspectors.

Authority: OAR 340-012

Justification: All parties must be aware of and comply with the 401 WQC, including on-site contractors.

- 4) **Revocation:** DEQ may modify or revoke this 401 WQC, in accordance with OAR 340-048-0050, if the project changes, if the project changes or project activities are having an adverse impact state water quality or beneficial uses, or if the Applicant is otherwise in violation of the conditions of this certification. This condition also fully applies to applicable on-site/off-site mitigation plans.

Authority: OAR 340-048-0050

Justification: To ensure the project will comply with water quality standards, DEQ must understand all work involved in the construction and operation of the project.

- 5) **Land Use Compatibility Statement:** In accordance with OAR 340-048-0020(2) (i), each Applicant must submit findings prepared by the local land use jurisdiction that demonstrates the activity's compliance with the local comprehensive plan. Such findings can be submitted using Section 11 of the Joint Permit Application and must be signed by the appropriate local planning official indicating:

- a. "This project is consistent with the comprehensive plan and land use regulations;" or,
- b. "This project will be consistent with the comprehensive plan and land use regulations when the following ... local approvals are obtained," accompanied by the obtained local approvals.
- c. Rarely, "This project is not regulated by the comprehensive plan and land use regulations" will be acceptable.

In lieu of submitting Section 11 of the Joint Permit Application, the Applicant may use DEQ's Land Use Compatibility Statement form found at: [DEQ Land Use Compatibility Form](#)

Authority: OAR 340-048-0020(2) (i), OAR 340-018

Justification: DEQ must ensure compliance with water quality land use laws at the local level.

- 6) **Access:** The Applicant and its contractors must allow DEQ access, with or without prior notice, to the project site, including staging areas and mitigation sites, to monitor compliance with these 401 WQC conditions, including:
- a. Access to any records, logs, and reports that must be kept under the conditions of this 401 WQC;
 - b. To inspect best management practices (BMPs), monitoring, equipment, or methods; and
 - c. To collect samples or monitor any discharge of pollutants.

Authority: OAR 340-048

Justification: DEQ must inspect facilities for compliance with all state rules and laws.

- 7) **Enforcement:** Failure to comply with this order may result in enforcement, including the issuance of civil penalties or other actions. The Applicant is liable for any violations of this Order caused by the work of its contractors and subcontractors, as well as any other entity that performs work related to this 401 WQC.

Authority: OAR 340-012, OAR 340-048

Justification: If the project is not being constructed or operated as proposed, it may not be consistent with water quality requirements.

For Projects That Propose Construction, The Following General Conditions Apply

- 8) **Erosion and Sediment Control:** During construction, erosion control measures must be implemented to prevent soil from entering waters of the state. The Applicant is required to develop and implement an effective erosion and sediment control plan. Refer to DEQ's Oregon Sediment Erosion Control Manual, February 2021 at:
<https://www.oregon.gov/deq/wq/Documents/wqpBMPManual.pdf>
- a. A project that disturbs more than one acre may be required to obtain a National Pollutant Discharge Elimination System (NPDES) 1200-C construction stormwater general permit. Contact the DEQ Stormwater Program for more information at:
<https://www.oregon.gov/deq/wq/wqpermits/Pages/Stormwater-Construction.aspx>
 - b. Unless otherwise authorized by DEQ in writing, the Applicant must:
 - i. Maintain an adequate supply of materials necessary to control erosion at the construction site.
 - ii. Prohibit erosion of stockpiles. Deploy compost berms, impervious materials, or other effective methods during rain events or when stockpiles are not moved or reshaped for more than 48 hours.
 - iii. Inspect erosion control measures daily and maintain erosion control measures as often necessary to ensure the continued effectiveness of measures. Erosion control measures must remain in place until all exposed soil is stabilized.
 1. If monitoring or inspection shows that the erosion and sediment controls are ineffective, the Applicant must act immediately to make repairs, install replacements, or install additional controls as necessary.
 2. If sediment has reached one-third of the exposed height of a sediment or erosion control, the Applicant must remove the sediment to its original contour.
 - iv. Use removable pads or mats to prevent soil compaction at all construction access points through, and staging areas in, riparian or wetland areas to prevent soil compaction, unless otherwise authorized by DEQ. Tire mats, creosote-treated wood, and other deleterious waste materials are prohibited.

- v. Flag or fence off wetlands not specifically authorized to be impacted to protect them from disturbance and/or erosion.
- vi. Place dredged or other excavated material on upland areas (outside of the ordinary high-water mark or wetland boundary) with stable slopes to prevent materials from eroding back into waterways or wetlands.
- vii. Place clean aggregate at all construction entrances and utilize other BMPs, including, but not limited to, truck or wheel washes, when earth-moving equipment is leaving the site and traveling on paved surfaces. Vehicles are prohibited from tracking sediment off site.
- viii. Upon completion of construction activities, stormwater facilities must be inspected and adequately prepared for post-construction stormwater treatment.
- ix. Upon completion of construction activities, stormwater facilities must be tested to ensure they are working and adequately prepared for post-construction stormwater treatment.

Authority: OAR 340-041-0007(8), ORS 468B.025, ORS 468B.050, OAR 340-045

Justification: DEQ must ensure that pollution does not enter waterways.

- 9) **Deleterious Waste Materials:** The Applicant is prohibited from placing biologically deleterious materials and construction debris where it could enter waters of the state, including wetlands (wetlands are waters of the state). This includes but is not limited to petroleum products, chemicals, cement cured less than 24 hours, welding slag and grindings, concrete saw cutting by-products, sandblasted materials, chipped paint, tires, wire, steel posts, asphalt, and waste concrete.

The Applicant must:

- a. Cure concrete, cement, or grout for at least 24 hours before any contact with waters of the state;
- b. Use only clean fill, free of waste and polluted substances;
- c. Employ all practicable controls to prevent discharges of spills of deleterious materials to surface or groundwater;
- d. Maintain at the project construction site, and deploy as necessary, an adequate supply of materials needed to contain deleterious materials during a weather event;
- e. Remove all foreign materials, refuse, and waste from the project area; and
- f. Employ general good housekeeping practices at all times.

Authority: OAR 340-041-0007(8), ORS 468B 0.25, ORS 468B.050

Justification: DEQ must ensure that pollution does not enter waterways.

- 10) **Spill Prevention:** The Applicant must have a spill prevention and control plan. The Applicant must fuel, operate, maintain, and store vehicles, equipment, and construction materials in

areas that will not disturb habitat directly or have the potential to result in discharges. In general, reasonable precautions and controls must be used to prevent any discharges of petroleum products or other harmful or toxic materials from entering the water due to any in-water activities. In addition, the following specific requirements apply:

- a. Vehicle and motorized equipment staging, cleaning, maintenance, refueling, and fuel storage must take place in a vehicle staging area 150 feet or more from any waters of the state, including wetlands (wetlands are waters of the state). DEQ may approve in writing exceptions to this distance if all practical prevention measures are employed and this distance is not possible because of any of the following site conditions:
 - i. Physical constraints that make this distance not feasible (e.g., steep slopes, rock outcroppings);
 - ii. Natural resource features would be degraded as a result of this setback; or
 - iii. Equal or greater spill containment and effect avoidance is provided even if the staging area is less than 150 feet away from waters of the state, including wetlands (wetlands are waters of the state).
- b. If the staging areas are within 150 feet of any waters of the state, as allowed under subsection (a)(iii) of this condition, full containment of potential contaminants must be provided to prevent soil and water contamination, as appropriate.
- c. All vehicles operated within 150 feet of any waters of the state must be inspected daily for fluid leaks before leaving the vehicle staging area. Any leaks detected in the vehicle-staging area must be repaired before the vehicle resumes operation.
- d. Before operations begin and as often as necessary during operation, equipment must be steam cleaned (or undergo an approved equivalent cleaning) until all visible oil, grease, mud, and other visible contaminants are removed if the equipment will be used below the bank of a waterbody.
- e. All stationary power equipment (e.g., generators, cranes, stationary drilling equipment) operated within 150 feet of any waters of the state must be covered by an absorbent mat to prevent leaks, unless other suitable containment is provided to prevent potential spills from entering any waters of the state.
- f. An adequate supply of materials (such as straw matting/bales, geotextiles, booms, diapers, and other absorbent materials) needed to contain spills must be maintained at the project construction site and deployed as necessary.
- g. All equipment operated in state waters must use bio-degradable hydraulic fluid.
- h. A maintenance log documenting equipment maintenance inspections and actions must be kept on-site and available upon request.

Authority: ORS 466.645(1); ORS 468B.025, OAR 340-142-0030(1)(b)(B), OAR 340-041

Justification: DEQ must ensure that pollution does not enter waterways and must be protective of beneficial uses, including fish.

11) Spill and Incident Reporting:

- a. In the event that petroleum products, chemicals, or any other deleterious materials are discharged into state waters or onto land with a potential to enter state waters, the Applicant must report the discharge to the Oregon Emergency Response Service (OERS, 1-800-452-0311) within 24 hours. The Applicant must immediately begin containment and complete cleanup as soon as possible.
- b. If the project operations cause a water quality problem that results in distressed or dying fish, the operator must immediately cease operations, take appropriate corrective measures to prevent further environmental damage, collect fish specimens and water samples, and notify DEQ, ODFW, and other appropriate regulatory agencies.

Authority: ORS 466.645(1), ORS 468B.025, OAR 340-142-0030(1)(b)(B), OAR 340-041

Justification: DEQ must ensure that pollution does not enter waterways and must be protective of beneficial uses, including fish.

12) Vegetation Protection and Site Restoration:

- a. The Applicant must protect riparian, wetland, and shoreline vegetation not proposed for impact in the authorized project area (as defined in the permit application materials) from disturbance through one or more of the following:
 - i. Minimization of project and impact footprint;
 - ii. Designation of staging areas and access points in open, upland areas;
 - iii. Fencing and other barriers demarking construction areas; and
 - iv. Use of alternative equipment (e.g., spider hoe or crane).
- b. If authorized work results in vegetative disturbance and the disturbance has not been accounted for in planned mitigation actions, the Applicant must successfully reestablish vegetation to a degree of function equivalent to or better than before the disturbance. The standard for success is 80 percent cover for native plant species. The vegetation must be reestablished by the completion of authorized work and include:
 - i. Restoring damaged streambanks to a natural slope, pattern, and profile suitable for establishment of permanent woody vegetation, unless precluded by pre-project conditions (e.g., a natural rock wall);
 - ii. Replanting or reseeding each area requiring revegetation before the end of the first planting season following construction;
 - iii. Planting disturbed areas with native plants and trees in all cases except where the use of non-native plant materials may be essential for erosion control; and
 - iv. The use of invasive species to reestablish vegetation is prohibited.
- c. Pesticides (including herbicides) and fertilizers must be applied per manufacturer's instructions by a professionally licensed applicator. If chemical treatment is necessary,

the Applicant is responsible for ensuring that pesticide application laws, including with the NPDES System 2300-A general permit, are met. Please review the information on the following website for more information: [Pesticide Applications into Surface Waters](#)

- i. For pesticide application within stormwater treatment facilities or within 150 feet of waters of the state, the Applicant must adopt an Integrated Pest Management (IPM) plan that describes pest prevention, monitoring, and control techniques with a focus on prevention of inputs to waters of the state, or coverage under an NPDES permit, if required.
 - ii. Pesticides must only be applied during the dry season and direct water application must be avoided.
 - iii. Unless otherwise approved in writing by DEQ, applying surface fertilizer within stormwater treatment facilities or within 50 feet of any stream channel is prohibited.
 - iv. Install wildlife-friendly fencing as necessary to prevent access to revegetated sites by livestock or unauthorized persons.
- d. Minimize soil compaction, especially in areas that are designated for replanting. If soils are compacted, decompact staging areas and work construction areas prior to replanting. Leave topsoil when possible. Chip materials from clear and grub operation and spread on soil surface, unless cleared areas contained invasive species.

Authority: OAR 340-041, OAR 340-048, ORS 468B.025

Justification: Riparian, wetland, and shoreline vegetation help ensure excess sediment does not enter a waterway and help offset potential temperature impacts. DEQ must ensure that pollution does not enter waterways.

- 13) **Post-Construction Buffers:** The Applicant must provide an undisturbed buffer to all remaining waters of the state on site that averages 50-feet from the delineated boundary, unless a smaller buffer is proposed, necessary, and approved as part of the project. If a local jurisdiction has a more stringent buffer requirement, that requirement will take the place of this certification requirement.

Authority: OAR 340-041, ORS 468B.025

Justification: Riparian, wetland, and shoreline buffers help ensure excess sediment does not enter a waterway and help offset potential temperature impacts. DEQ must ensure that pollution does not enter waterways.

- 14) **Previously Contaminated Soil and Groundwater:** If any contaminated soil or groundwater is encountered, it must be handled and disposed of in accordance with the soil and groundwater management plan for the site, as well as local, state and federal regulations. The Applicant must notify the Environmental Cleanup Section of DEQ at 1-800-452-4011.

Authority: OAR 340-041, ORS 468B.025, OAR 340-122, OAR 340-040

Justification: DEQ must ensure that pollution does not enter waterways. As sediments are disturbed, pollutants could become redistributed.

FOR PROJECTS THAT PROPOSE IN-WATER WORK

- 15) **Fish Protection and ODFW Timing:** The Applicant must perform in-water work only within the ODFW preferred time window as specified in the *Oregon Guidelines for Timing of In-Water Work to Protect Fish and Wildlife Resources* ([ODFW In-Water Work Timing Guidance](#)) or as authorized otherwise under a Department of State Lands (DSL) removal/fill permit. Exceptions

to the timing window must be recommended by ODFW or the NMFS as appropriate and approved by DSL when applicable.

Authority: OAR 340-041-0011

Justification: DEQ must be protective of all water quality standards, including beneficial uses such as fish.

- 16) **Aquatic Life Movements:** Any activity that may disrupt the life cycle movements of aquatic life in the waterbody, including those species that normally migrate through the area, is prohibited. The Applicant must provide unobstructed fish passage at all times during any authorized activity, unless otherwise approved authorized as part of the approved application or authorized by DEQ.

Authority: OAR 340-041-0016; OAR 340-041-0028

Justification: DEQ must be protective of all water quality standards, including beneficial uses such as fish.

- 17) **Isolation of In-Water Work Areas:** The Applicant must isolate in-water work areas from the active flowing stream before in-water work begins, unless otherwise authorized as part of the approved application or authorized by DEQ.

Authority: OAR 340-041, OAR 340-045

Justification: DEQ must ensure that pollution does not enter waterways.

- 18) **Cessation of Work:** The Applicant must cease project operations under high-flow conditions that will result in inundation of the project area. Only efforts to avoid or minimize turbidity or other resource damage as a result of inundation of the exposed project area are allowed during high-flow conditions.

Authority: OAR 340-041

Justification: DEQ must ensure that pollution does not enter waterways.

- 19) **Turbidity:** The Applicant must implement BMPs to minimize turbidity during in-water work. Any activity that causes turbidity to exceed 10 percent above natural stream turbidities is prohibited, except as specifically provided below:

- a. **Monitoring:** Turbidity monitoring must be conducted and recorded as described below. Monitoring must occur at two-hour intervals each day when in-water work is being conducted, including while dewatering or work area isolation measures are in place. Monitoring shall begin at the start of all in-water work activities and continue at two-hour intervals thereafter. A properly calibrated turbidimeter is required **unless another monitoring method is proposed and authorized by DEQ in writing.**
 - i. **Representative Background Point:** The Applicant must take and record a turbidity measurement every two hours during in-water work at an undisturbed area approximately 100 feet up-current from the in-water disturbance unless otherwise authorized by DEQ. The background turbidity, location, date, tidal stage (if applicable), and time must be recorded immediately prior to monitoring down-current at the compliance point described below.
 - ii. **Compliance Point:** The Applicant must monitor every two hours approximately 100 feet directly down-current from the disturbance, at approximately mid-depth of the waterbody, *and within any visible plume*. The turbidity, location, date, tidal stage (if applicable), and time must be recorded for each measurement.

- b. **Compliance:** The Applicant must compare turbidity monitoring results from the compliance points to the representative background levels taken during each two-hour monitoring interval. Pursuant to OAR 340-041-0036, short term exceedances are allowed as follows:

MONITORING WITH A TURBIDIMETER EVERY 2 HOURS	
TURBIDITY LEVEL	RESTRICTIONS TO DURATION OF ACTIVITY
0 to 4.99 NTU above background	No restrictions
5 to 29.99 NTU above background	Work may continue maximum of 4 hours. If turbidity remains 5-29.99 NTU above background, stop work and modify BMPs. Work may resume when NTU is 0-4.99 above background.
30 to 49.99 NTU above background	Work may continue maximum of 2 hours. If turbidity remains 30-49.99 NTU above background, stop work and modify BMPs. Work may resume when NTU is 0-4.99 above background.
50 NTU or more above background	Stop work immediately and inform DEQ

The activity must stop immediately and remain stopped for the remainder of that 24-hour work period if an exceedance reaches 50 NTU or more above background, 30 NTU above background for two hours, or 5NTU above background for four hours.

c. **Reporting:**

- i. Record all turbidity monitoring required by subsections (a) and (b) above in daily logs, which must include calibration documentation; background NTUs; compliance point NTUs; comparison of the background and compliance points in NTUs; and the location, date, time, and tidal stage (if applicable) for each reading.
- ii. Keep records on file for the duration of the permit cycle.
- iii. Prepare a narrative discussing all exceedances with subsequent monitoring, actions taken, and the effectiveness of the actions. The Applicant must make available copies of daily logs for turbidity monitoring to regulatory agencies including DEQ, USACE, NMFS, USFWS, and ODFW upon request. An example turbidity log is attached to this certification.

If turbidity monitoring cannot be conducted due to dry conditions, the Applicant must provide photo documentation with a date and time stamp.

- d. **BMPs to Minimize In-stream Turbidity:** The Applicant must implement the following BMPs, unless authorized in writing by DEQ:
- i. Sequence and phasing of work: The Applicant must schedule work activities to minimize in-water disturbance and duration of in-water disturbances.

- ii. Bucket control: All in-stream digging passes by excavation machinery and placement of fill in-stream using a bucket must be conducted in a manner that will minimize turbidity. All practicable techniques such as employing an experienced equipment operator, not dumping partial or full buckets of material back into the wetted stream, adjusting the volume speed or both of the load, or using a closed-lipped environmental bucket must be implemented.
- iii. The Applicant must limit the number and location of stream-crossing events. The Applicant must establish temporary crossing sites as necessary in the least sensitive areas and amend these crossing sites with clean gravel or other temporary methods as appropriate to prevent the discharge of sediments in the waterbody.
- iv. Machinery may not be driven into the flowing channel unless authorized in writing by DEQ.
- v. Excavated material must be placed so that it is isolated from the water edge or wetlands. Excavated materials may not be placed where it could re-enter waters of the state in an uncontrolled manner.
- vi. Containment measures such as silt curtains, geotextile fabric, and silt fences must be in place and properly maintained in order to minimize in-stream sediment suspension and resulting turbidity.

Authority: OAR 340-041-0036, OAR 340-041

Justification: DEQ must ensure that pollution does not enter waterways.

Specific Conditions for Post-Construction Stormwater Management

- 20) **Post-Construction Stormwater Management:** For projects that propose new impervious surfaces or the redevelopment of existing surfaces, the Applicant must submit a post-construction stormwater management plan to DEQ. The plan must be reviewed and approved prior to construction to ensure compliance with water quality standards. The Applicant must implement BMPs as proposed in the stormwater management plan, including construction, operation, and maintenance. If proposed stormwater facilities change due to site conditions, the Applicant must notify DEQ in writing.

In lieu of a complete stormwater management plan, the Applicant may submit documentation of acceptance of the stormwater into a DEQ-permitted NPDES Phase I Municipal Separate Storm Sewer System (MS4).

Authority: ORS 468B.025, ORS 468B.050, OAR 340-045, OAR 340-041

Justification: DEQ must ensure that pollution does not enter waterways.

- 21) **Stormwater Management and System Maintenance:** The Applicant is required to implement effective operation and maintenance practices for the lifetime of the proposed facility. These include but are not limited to:
- a. Protecting stormwater treatment facilities from degradation during construction.

- b. Monitoring facilities for signs of groundwater interception and reconstructing the facilities as needed to prevent interception of sub-surface flow.
- c. Maintenance techniques and frequency for each system component must follow appropriate recommendations in accepted manuals.
- d. Long-term operation and maintenance of stormwater treatment facilities will be the responsibility of entity listed in the post-construction stormwater management plan unless and until an agreement transferring that responsibility to another entity is submitted to DEQ.

Maintenance of stormwater treatment facilities subject to an MS4 permit is regulated by the permit.

Authority: ORS 468B.025, ORS 468B.050, OAR 340-045, OAR 340-041

Justification: DEQ must ensure that pollution does not enter waterways.

- 22) **Corrective Action May Be Required:** DEQ retains the authority to require corrective action in the event the stormwater management facilities are not built or performing as described in the plan.

Authority: ORS 468B.025, OAR 340-041, OAR 340-048

Justification: DEQ must ensure that pollution does not enter waterways.

Category-Specific Conditions

In addition to all national and regional conditions of the USACE permit and the 401 WQC general conditions above, the following conditions apply to the noted specific categories of authorized activities.

NWP 7 – Outfall Structures and Associated Intake Structures:

- 7.1) The following actions are denied expedited 401 WQC:

- a. Discharge outfalls that are not subject to an NPDES permit; and
- b. Outfalls that do not demonstrate pollutant removal to meet water quality standards prior to discharge to waters of the state.

Authority: OAR 340-041, OAR 340-012, OAR 340-048, OAR 340-045

Justification: DEQ must ensure that pollution does not enter waterways. Untreated stormwater is considered pollution.

- 7.2) If an Applicant cannot obtain an NPDES permit or submit a post-construction stormwater management plan that meets DEQ's Guidelines found at: <http://www.oregon.gov/deq/FilterDocs/401wqcertPostCon.pdf>, the Applicant must submit complete project information and a water quality impacts analysis to DEQ in order to undergo a standard 401 WQC evaluation, which includes public participation requirements.

Authority: OAR 340-041, OAR 340-012, OAR 340-048, OAR 340-045

Justification: DEQ must ensure that pollution does not enter waterways. Untreated stormwater is considered pollution.

NWP 13 – Bank Stabilization:

- 13.1) Projects that do not include bioengineering are denied an expedited 401 WQC, unless a registered professional engineer provides a written statement that non-bioengineered solutions are the *only* way to protect an *existing* structure.

Authority: OAR 340-041, OAR 340-012, OAR 340-048

Justification: DEQ must ensure that pollution does not enter waterways. Hard armoring can increase erosion upstream and downstream of the structure.

- 13.2) To apply for certification for a project without bioengineering, the Applicant must submit complete project information and a water quality impacts analysis to DEQ in order to undergo a standard 401 WQC evaluation, which includes public participation requirements.

Authority: OAR 340-041-0059

Justification: DEQ must ensure that pollution does not enter waterways. Hard armoring can increase erosion upstream and downstream of the structure.

NWP 14 – Linear Transportation Projects:

- 14.1) For projects that include bank stabilization, bioengineering must be a component of the project, unless a registered professional engineer provides a written statement that non-bioengineered solutions are the *only* means of protection.

Authority: OAR 340-041, OAR 340-012, OAR 340-048

Justification: DEQ must ensure that pollution does not enter waterways. Hard armoring can increase erosion upstream and downstream of the structure.

NWP 16 – Return Water from Upland Contained Disposal Areas: Water quality criteria and guidance values for toxics, per OAR 340-041-0033, are available in Tables 30, 31, and 40 at: [OAR 340-041 Water Quality Standards](#).

- 16.1) A Modified Elutriate Test (MET) is required for return water in areas with known sediments with contaminants of concern (CoCs). Discharge of return water from contaminated dredged material that exceeds a chronic or acute toxicity water quality standard is prohibited.

Authority: OAR 340-041-0053(b)(A), OAR 340-041

Justification: DEQ must ensure that pollution does not enter waterways.

- 16.2) Water removed with contaminated dredged material that could or does exceed chronic water-quality criteria must be contained and disposed of at an appropriately sized and sealed upland facility by evaporation or infiltration.

Authority: OAR 340-041-0053(b)(A), OAR 340-041

Justification: DEQ must ensure that pollution does not enter waterways.

- 16.3) If a MET is performed for the known CoCs and CoC concentrations are below DEQ chronic water-quality criteria, return water discharge is not limited, provided that the following conditions are met:

- a. The MET must be performed before dredging.
- b. DEQ must approve the list of CoCs and analytical method prior to the Applicant performing the MET.

- c. DEQ must review the results and provide approval of discharge from return water in writing prior to dredging.

Authority: OAR 340-041, OAR 340-012, OAR 340-048

Justification: DEQ must ensure that pollution does not enter waterways.

NWP 20 – Response Operations for Oil or Hazardous Substances:

- 20.1) Coordination with DEQ’s Emergency Response Program is required. See: [DEQ Emergency Response Program](#)

Authority: OAR 340-142-0130(3), OAR 340-041

Justification: DEQ must ensure that pollution does not enter waterways.

NWP 22 – Removal of Vessels:

- 22.1) Coordination with DEQ’s Emergency Response Program is required. See: [DEQ Emergency Response Program](#).

Authority: OAR 340-041, OAR 340-012, OAR 340-048

Justification: DEQ must ensure that pollution does not enter waterways. Vessels may contain various fuels, lubricants, and other possible sources of pollution.

NWP 31 – Maintenance of Existing Flood Control Facilities:

- 31.1) Projects in streams with Temperature TMDLs which result in a net reduction of riparian shade are prohibited.

Authority: OAR 340-041-0028, OAR 340-041

Justification: DEQ must ensure that pollution does not enter waterways.

NWP 38 – Cleanup of Hazardous and Toxic Waste:

- 38.1) For removal of contaminated material from waters, dredging methods are limited to diver-assisted hydraulic suction, hydraulic suction, closed-lipped environmental bucket, or excavation in the dry, unless otherwise authorized by DEQ.

- a. Dredged material disposal must be upland or at a landfill permitted to accept hazardous waste. A DEQ Solid Waste Letter of Authorization or clean fill determination is required, which may include contaminant specific limitations.

Authority: OAR 340-041, OAR 340-012, OAR 340-048

Justification: DEQ must ensure that pollution does not enter waterways.

- 38.2) Discharge to waters of the state resulting from dewatering during dredging or release of return water from an upland facility is prohibited except as provided below:
 - a. All water removed with sediment must be contained and disposed of at an appropriately sized and sealed upland facility by evaporation or infiltration; or
 - b. A Modified Elutriate Test (MET) must be performed for the known Contaminants of Concern (CoCs), and if CoC concentrations are below DEQ chronic water-quality criteria, return water discharge is not limited, provided that the following conditions are met:

- i. The MET must be performed before dredging.
- ii. DEQ must approve the list of CoCs and analytical method prior to the Applicant performing the MET.
- iii. DEQ must review the results and provide approval of discharge from dewatering and return water in writing prior to dredging.

Authority: OAR 340-041, OAR 340-012, OAR 340-048

Justification: DEQ must ensure that pollution does not enter waterways.

- 38.3) Dredged material must be disposed of in compliance with DEQ Rules governing Hazardous Waste (see: [DEQ Hazardous Waste Program](#)) or Solid Waste (see: [DEQ Solid Waste Program](#)).

Authority: OAR 340-041, OAR 340-012, OAR 340-048

Justification: DEQ must ensure that pollution does not enter waterways.

- 38.4) The new in-water surface must be managed to prevent exposure or mobilization of contaminants.

Authority: OAR 340-041, OAR 340-012, OAR 340-048

Justification: DEQ must ensure that pollution does not enter waterways.

NWP 41 – Reshaping Existing Drainage and Irrigation Ditches:

- 41.1) To the extent practicable, the Applicant must work from only one bank in order to minimize disturbance to existing vegetation, preferably the bank with the least existing vegetation.

Authority: OAR 340-041, OAR 340-012, OAR 340-048

Justification: DEQ must ensure that pollution does not enter waterways.

- 41.2) Following authorized work, the Applicant must establish in-stream and riparian vegetation on reshaped channels and side channels using native plant species. Plantings must be targeted to address water quality improvement (e.g., provide shade to water to reduce temperature or provide bank stability through root systems to limit sediment inputs). Planting options may include clustering or vegetating only one side of a channel, preferably the side which provides maximum shade.

Authority: OAR 340-041-0004(5)(a)

Justification: Riparian, wetland, and shoreline buffers help ensure excess sediment does not enter a waterway and helps offset potential temperature impacts. DEQ must ensure that pollution does not enter waterways.

NWP 42 – Recreational Facilities:

- 42.1) For facilities that include turf maintenance actions, the Applicant must develop and implement an Integrated Pest Management Plan (IPM) that describes pest prevention, monitoring, and control techniques with a focus on prevention of chemical and nutrient inputs to waters of the state, including maintenance of adequate buffers for pesticide application near salmonid streams, or coverage under an NPDES permit, if required (information is available at: [Pesticide Applications into Surface Waters](#)).

Authority: OAR 340-041-0033, OAR 340-041

Justification: DEQ must ensure that pollution does not enter waterways, including excess pesticides and fertilizers.

NWP 43 – Stormwater Management Facilities:

43.1) Projects that propose the following elements are denied expedited certification:

- a. In-stream or wetland stormwater facilities; or,
- b. Discharge outfalls not subject to an MS4 NPDES permit.

Authority: OAR 340-041, OAR 340-012, OAR 340-048

Justification: DEQ must ensure that pollution does not enter waterways; stormwater is considered a pollutant.

43.2) To apply for certification for a project with stormwater facilities proposed in wetlands or waters without an NPDES permit or without submittal of an approvable post-construction stormwater management plan per DEQ's Guidelines (at: [DEQ Post-Construction Stormwater Management Guidance](#)), the Applicant must submit complete project information and a water quality impacts analysis to DEQ in order to undergo a standard 401 WQC evaluation, which includes public participation requirements.

Authority: OAR 340-041-0059

Justification: DEQ must ensure that pollution does not enter waterways; stormwater is considered a pollutant.

NWP 44 – Mining Activities:

44.1) Projects that do not obtain an NPDES 700-PM or Individual Permit are denied expedited certification.

Authority: OAR 340-045-0033, OAR 340-041

Justification: DEQ must ensure that pollution does not enter waterways. Excess turbidity can be considered pollution.

44.2) To apply for certification for a project without an NPDES 700-PM or Individual Permit, the Applicant must submit complete project information and a water quality impacts analysis to DEQ in order to undergo a standard 401 WQC evaluation, which includes public participation requirements.

Authority: OAR 340-041-0059

Justification: DEQ must ensure that pollution does not enter waterways.

44.3) The State of Oregon requires an In-Water Blasting Permit to be obtained per OAR 635-425-0000. The Applicant is advised to contact the nearest ODFW office for further information at: [ODFW In-water Timing / Blasting](#)

Authority: OAR 340-041-0011

Justification: DEQ must be protective of all water quality standards, including beneficial uses such as fish.

NWP 51 – Land-Based Renewable Energy Generation Facilities:

51.1) For proposals that include directionally-bored stream or wetland crossings:

- a. All drilling equipment, drill recovery and recycling pits, and any waste or spoil produced, must be completely isolated, recovered, and recycled or disposed of to prevent entry into waters of the state. Recycling using a tank instead of drill recovery/recycling pits is preferable.

- b. In the event that drilling fluids enter a water of the state, the equipment operator must stop work, immediately initiate containment measures, and report the spill to the Oregon Emergency Response System (OERS) at 1-800-452-0311.
- c. An adequate supply of materials needed to control erosion and to contain drilling fluids must be maintained at the project construction site and deployed as necessary.
- d. The Applicant must have a contingency plan in place prior to construction for the inadvertent return of drilling lubricant.

Authority: OAR 340-041, OAR 340-012, OAR 340-048

Justification: DEQ must ensure that pollution does not enter waterways

NWP 53 – Removal of Low-Head Dams:

- 53.1) Projects that do *not* go through a Portland Sediment Evaluation Team (PSET) review if sediments are being dispersed are denied expedited 401 WQC.

Authority: OAR 340-041, OAR 340-012, OAR 340-048

Justification: DEQ must ensure that pollution does not enter waterways. Sediments can be a carrier of contaminants.

- 53.2) To apply for certification for a project without a PSET review, the Applicant must submit complete project information and a water quality impacts analysis to DEQ in order to undergo a standard 401 WQC evaluation, which includes public participation requirements.

Authority: OAR 340-041-0059

Justification: DEQ must ensure that pollution does not enter waterways. Sediments can be a carrier of contaminants.

NWP 54 – Living Shorelines:

- 54.1) Projects that do not include bioengineering are denied expedited certification, unless a registered professional engineer provides a written statement that non-bioengineered solutions are the *only* means of protection.

Authority: OAR 340-041, OAR 340-012, OAR 340-048

Justification: DEQ must ensure that pollution does not enter waterways. Hard armoring can increase erosion in the system.

- 54.2) To apply for certification for a project without bioengineering, the Applicant must submit complete project information and a water quality impacts analysis to DEQ in order to undergo a standard 401 WQC evaluation, which includes public participation requirements.

Authority: OAR 340-041-0059

Justification: DEQ must ensure that pollution does not enter waterways. Hard armoring can increase erosion upstream and downstream of the structure.

NWP 57 – Electric Utility Line and Telecommunications Activities:

- 57.1) For proposals that include directionally-bored stream or wetland crossings:

- a. All drilling equipment, drill recovery and recycling pits, and any waste or spoil produced, must be completely isolated, recovered, and recycled or disposed of to prevent entry

into waters of the state. Recycling using a tank instead of drill recovery/recycling pits is preferable.

- b. In the event that drilling fluids enter a water of the state, the equipment operator must stop work, immediately initiate containment measures, and report the spill to the Oregon Emergency Response System (OERS) at 1-800-452-0311.
- c. An adequate supply of materials needed to control erosion and to contain drilling fluids must be maintained at the project construction site and deployed as necessary.
- d. The Applicant must have a contingency plan in place prior to construction for the inadvertent return of drilling lubricant.

Authority: OAR 340-142-0030, OAR 340-142-0040(1)

Justification: *Drilling equipment and fluids that enter a waterbody would likely cause contamination of that waterbody.*

- 57.2) For proposals that include utility lines through wetlands, include anti-seep collars or equivalent technology to prevent draining the wetlands.

Authority: OAR 340-041, OAR 340-012, OAR 340-048

Justification: *DEQ must ensure that pollution does not enter waterways*

NWP 58 – Utility Line Activities for Water and Other Substances:

- 58.1) For proposals that include directionally-bored stream or wetland crossings:

- a. All drilling equipment, drill recovery and recycling pits, and any waste or spoil produced, must be completely isolated, recovered, and recycled or disposed of to prevent entry into waters of the state. Recycling using a tank instead of drill recovery/recycling pits is preferable.
- b. In the event that drilling fluids enter a water of the state, the equipment operator must stop work, immediately initiate containment measures, and report the spill to the Oregon Emergency Response System (OERS) at 1-800-452-0311.
- c. An adequate supply of materials needed to control erosion and to contain drilling fluids must be maintained at the project construction site and deployed as necessary.
- d. The Applicant must have a contingency plan in place prior to construction for the inadvertent return of drilling lubricant.

Authority: OAR 340-142-0030, OAR 340-142-0040(1)

Justification: *Drilling equipment and fluids that enter a waterbody would likely cause contamination of that waterbody.*

- 58.2) For proposals that include utility lines through wetlands, include anti-seep collars or equivalent technology to prevent draining the wetlands.

- 58.3) For proposals that include new water in-take facilities and withdrawals, a thermal modeling plan must be submitted to DEQ.

Authority: OAR 340-041-0028

Project Name: Cottrell Pond Site Restoration Project
Project Number: 2025-426

Justification: *DEQ must protect designated temperature-sensitive, beneficial uses, including specific salmonid life cycle stages in waters of the State.*

If the Applicant is dissatisfied with the conditions contained in this certification, a hearing may be requested. Such a request must be made in writing to DEQ's Office of Compliance and Enforcement at 700 NE Multnomah Street, Suite 600, Portland, Oregon 97232 within 20 days of the mailing of this certification.

The DEQ hereby certifies that this project complies with the Clean Water Act and state rules, with the above conditions. If you have any questions, please contact 401certifications@deq.oregon.gov or at the address on this letterhead.

Sincerely,



Theresa Burcsu,
Water Quality Manager
Northwest Region

ec: Katrina Stanek, USACE
Kristin Politano, DSL

Project Name:	USACE Project #	DSL Project #
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Name of Inspector(s): Turbidimeter Model: Calibration Standard Type (Circle One) Formazin Solution or Gelex Calibration Standard Expiration Date:			
Sampling Date:	Calibration Values: _____ NTU (Standard) = _____ NTU (Reading) _____ NTU (Standard) = _____ NTU (Reading) _____ NTU (Standard) = _____ NTU (Reading)	*Upstream (Background) Point Location: Latitude: Longitude:	*Downstream (Compliance) Point Location: Latitude: Longitude:

In-Water Work Start Time:	In-Water Work End Time:	Description of In-Water Work:
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Up-stream Sample		Down-stream Sample		Change in Turbidity (NTU)	Observation of waterbody		NOTES (Describe any modifications made to BMPs)
Time	Turbidity (NTU)	Time	Turbidity (NTU)		Tidal Stage	Note any plume, sheen, floatables, color	

401 Water Quality Certification Turbidity Monitoring Report

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** Include a figure with the turbidity sampling forms showing the sampling locations.*

Turbidity: The Applicant must implement appropriate Best Management Practices (BMPs) to minimize turbidity during in-water work. Any activity that causes turbidity to exceed 10% above natural stream turbidity is prohibited except as specifically provided below:

Monitoring: Turbidity monitoring must be conducted and recorded as described below. Monitoring must occur at two-hour intervals each day when in-water work is being conducted, including while dewatering or work area isolation measures are in place. Monitoring shall begin at the start of all in-water work activities and continue at two-hour intervals thereafter. A properly calibrated turbidimeter is required unless another monitoring method is proposed and authorized by DEQ.

Representative Background Point: The Applicant must take and record a turbidity measurement every two hours during in-water work at an undisturbed area. A background location shall be established at a representative location approximately 100 feet up-current of the in water activity unless otherwise authorized by DEQ. The background turbidity, location, date, tidal stage (if applicable), and time must be recorded immediately prior to monitoring down-current at the compliance point described below.

Compliance Point: The Applicant must monitor every two hours. A compliance location shall be established at a representative location approximately 100 feet directly down-current from the disturbance at approximately mid-depth of the waterbody and within any visible plume. The turbidity, location, date, tidal stage (if applicable), and time must be recorded for each measurement.

Compliance: The Applicant must compare turbidity monitoring results from the compliance points to the representative background levels taken during each two-hour monitoring interval. Pursuant to OAR 340-041-0036, short term exceedances of the turbidity water quality standard are allowed as shown in the monitoring table shown here.

Reporting: The Applicant must record all turbidity monitoring required by Condition #19 in daily logs that are kept on file for the duration of the permit cycle. The daily logs must include calibration documentation, background NTUs, compliance point NTUs, location, date, time, and tidal stage (if applicable) for each reading. Additionally, a narrative must be prepared discussing all exceedances with subsequent monitoring, actions taken, and the effectiveness of the actions. The Applicant must make available copies of daily logs for turbidity monitoring to DEQ, USACE, NMFS, USFWS, and ODFW upon request.

BMPs to Minimize In-stream Turbidity: The Applicant must implement the following BMPs, unless otherwise accepted by DEQ:

- Sequence/Phasing of Work – The Applicant must schedule work activities so as to minimize in-water disturbance and duration of in-water disturbances;
- Bucket control – All in-stream digging passes by excavation machinery and placement of fill in-stream using a bucket must be completed so as to minimize turbidity. All practicable techniques such as employing an experienced equipment operator, not dumping partial or full buckets of material back into the wetted stream, adjusting the volume and/or speed of the load, or using a closed-lipped environmental bucket must be implemented;
- The Applicant must limit the number and location of stream-crossing events. Establish temporary crossing sites as necessary in the least sensitive areas and amend these crossing sites with clean gravel or other temporary methods as appropriate;
- Machinery may not be driven into the flowing channel, unless authorized by DEQ; and
- Excavated material must be placed so that it is isolated from the water edge or wetlands, and not placed where it could re-enter waters of the state uncontrolled.

MONITORING WITH A TURBIDIMETER EVERY 2 HOURS	
TURBIDITY LEVEL	Restrictions to Duration of Activity
0 to 4.99 NTU above background	No Restrictions
5 to 29.99 NTU above background	Work may continue maximum of 4 hours. If turbidity remains 5-29 NTU above background, stop work and modify BMPs. Work may resume when NTU is 0-4.99 above background.
30 to 49.99 NTU above background	Work may continue maximum of 2 hours. If turbidity remains 30-49.99 NTU above background, stop work and modify BMPs. Work may resume when NTU is 0-4.99 above background.
50 NTU or more above background	Stop work immediately and inform DEQ

ATTACHMENT 8



CITY OF PORTLAND ENVIRONMENTAL SERVICES



The Portland Building ■ 1120 SW Fifth Ave, Suite 613, Portland, Oregon 97204 ■ Director Ting Lu, Ph.D., P.E.

T E C H N I C A L M E M O R A N D U M

TO: File

FROM: Roslyn Gray, P.E. and Stephanie Trujillo, P.E. (BES)

DATE: May 11, 2026

RE: Johnson Creek Cottrell Pond Dam Removal

Hydrology & Hydraulic Analysis; Streambed Design

This document characterizes the hydrologic regime of Johnson Creek within the Portland Water Bureau Cottrell Pond Dam Removal project reach and documents design criteria for the proposed channel and floodplain geometry, flow split and secondary amphibian pond channel, streambed design, as well as pre- and post-project scour rating of the Cottrell Road culvert downstream of the restoration project.

This tech memo is preceded by the *Cottrell Pond: Multnomah County SEC-wr Review – Hydraulic Analysis*.

Hydrologic Characterization

Design flows for the Johnson Creek Cottrell Pond Dam Removal project were selected by comparing StreamStats estimates to USGS streamflow measurements at 2 locations downstream of the project site.

StreamStats was used to determine high flow conditions, specifically $Q_2 = 17$ cfs and $Q_{25} = 38$ cfs

StreamStats is a USGS tool that provides streamflow estimates based on GIS drainage area delineation for the project site along Johnson Creek. At approximately 0.6 square miles, the drainage area is smaller than the suggested range of the basis regression equation. Additionally, the subject hydrology is influenced by extensive subsurface tiling that creates a flashier hydrologic regime than would occur naturally. Uncertainty inherent to this headwater hydrologic assessment is mitigated by conservative assumptions, safety factors and redundancy in the scour analysis and streambed design.

See **Attachment A – Cottrell Pond StreamStats** for basin characteristics and a range of high flow estimates.

Ph: 503-823-7740 ■ Fax: 503-823-6995 ■ portland.gov/bes ■ An Equal Opportunity Employer

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USGS gage data was used to approximate late summer flow conditions, $Q_{low\ flow} = 0.07\ cfs$

Monthly average flow estimates are based on two representative water years (2023 – 2024 and 2024-2025) recorded by USGS stream gage 14211400 along Johnson Creek at Regner Road in Gresham, Oregon. A scale factor based on relative drainage area was applied to the Regner gage data, to infer average flow rates at Cottrell Pond during the dry season. The summary of monthly flow estimates provided in Table 1 is loosely substantiated by (11) USGS streamflow measurements taken within Johnson Creek at Bluff Road between Nov 2020 – Aug 2025. The gage location at Bluff Road includes 6 mapped tributaries downstream of the Cottrell Pond project and a drainage area of 1.8 square miles. StreamStats indicates the Bluff Road streamflow measurement of 50 cfs approximates the 2-yr flood event. See **Attachment B – USGS Regner Gage Data** for annual hydrographs and **Attachment C – USGS Streamflow Measurements at Bluff Road** for monitoring results.

Table 1. Monthly Average Flow

May	1.06 cfs
June	0.33 cfs
<i>July</i>	<i>0.07 cfs</i>
August	0.07 cfs
Sept	0.08 cfs

Proposed Channel Geometry

Existing upstream channel geometry beyond the zone of influence of the impoundment measures approx. 2 ft deep x 5 ft bottom width x 9 ft top width. The existing channel upstream of the impoundment flows through predominantly silty clay loam within a protected corridor of dense riparian vegetation, downstream of an catchment area impacted by agricultural land use.

The proposed primary channel will measure, on average, 1 ft deep x 2 ft bottom width x 4 ft top width.

The proposed primary channel is undersized relative to the existing reference reach to promote overbank flow through the inset floodplain. The constructed channel will include stone and wood placement to enhance hydraulic roughness, increase critical shear threshold, enhance instream complexity, and provide grade control. In the secondary frog pond channel, vegetation establishment will have a similar effect. These roughness elements will decrease channel conveyance capacity, which will further promote floodplain connectivity and limit stream power exerted on the bed and banks of the constructed channel(s).

Based on bankfull flow depth of 12 inches, conveyance capacity of the proposed primary channel measures approx. 5 cfs through the flat floodplain reach, and approx. 10 cfs through the steepest constructed reach.

Open Channel Flow

Manning's Equation was used to calculate proposed condition open channel flow characteristics within (6) distinct sub-reaches of the project, described in sequence from the downstream project boundary:

- [Cross section A-A] Downstream of existing dam and upstream of Cottrell Road: no physical change to streambed or banks + no change to hydrology under flood conditions (i.e., flood storage volume of existing pond is overwhelmed by Q_2 and provides no measurable flood storage at higher flow events). Thus, no change to scour potential at the Cottrell Road culvert downstream of the project.
- Downstream reach within the project footprint includes existing dam footprint: proposed grade blends with existing 2.5% channel slope + channel geometry directly downstream. Streambed design includes (2) buried riffles to provide grade control, bracketing imported streambed material sized to withstand shear stresses during peak Q_{25} flood conditions.
- [Cross section C-C] Floodplain reach measures approx. 0.8% with wide overbank flow areas: flat gradient maintains low shear stress and limited scour potential; streambed will be constructed within native silt loam and large wood placements will provide hydraulic diversity and habitat complexity. Channel adjustment following construction is anticipated and desirable.
- [Cross section E-E] Transition reach measures approx. 2% with narrowed overbank flow areas: Buried riffle at base of the transition reach will mitigate risk of headcutting. Grade control includes bands of imported streambed stone sized to withstand shear stresses during peak Q_{25} flood conditions, as ballast for engineered large wood jams that span the full flow corridor width. Varied flow conditions including step-pools maintained by local scour are anticipated.
- [Cross section G-G] Steep reach measures approx. 3% through confined flow corridor: Imported streambed material sized to withstand shear stresses during peak Q_{25} flood conditions is based on concentrated stream power through this reach. Grade control is accomplished by constructing a coarse streambed; large wood is added for instream complexity but does not project grade control. (2) buried riffles bracket this reach; the upstream riffle encompasses (2) v-notch weirs to maintain the flow split and may be most prone to failure during flood conditions.
- [Cross section I-I] Upstream of the flow split measures approx. 0.6% to project boundary: proposed streambed slope approximates existing conditions, but proposed channels are shallower than existing channel and include overbank flow areas.

The proposed secondary amphibian pond channel measures approx. 0.8% and does not require imported streambed stone to mitigate scour potential, similar to flat gradients elsewhere within the project reach. The "spillway" of the secondary amphibian pond channel measures approx. 3.5% and will be armored with Class 50 riprap and native vegetation, similar to a stormwater swale.

Scour Potential

Scour potential can be characterized by the ratio of shear stress exerted on the channel surface to threshold shear stress required to move sediment based on grain size and material. Non-cohesive fine grain sediment is subject to transport at relatively low levels of shear stress, on the order of 0.05-0.2 lb/ft². Gravels measuring 0.5" are subject to transport at moderate levels of shear stress, on the order of 0.2 – 0.4 lb/ft² and cobbles are subject to move at 0.4 lb/ft² and above. Cohesive properties of the silt

loam native to the site were not characterized but may add a measure of resistance. Similarly, the stabilizing effect of vegetation establishment is not taken into account.

When the earthen dam is removed, the channel slope increases from existing effective zero-slope through the impoundment, which naturalizes sediment transport and increases scour potential. Fortunately, the risk of headcutting can be mitigated by constructing and/or fortifying higher-energy reaches of the proposed streambed by using a mix of well-graded coarse sediment sized to withstand the Q₂₅ design event; embedding riffles comprised of Class 50 riprap and crushed rock at significant grade breaks; increasing hydraulic roughness throughout with dense establishment of native species such as willow intermixed with stable large wood placements; including a depositional floodplain within the lower sub-reach of the project to buffer anticipated material transport; and resourcing a long-term adaptive management plan to manage site response as needed.

A comparison of proposed and existing Q₂₅ flow characteristics, including shear stress, is provided in Tables 2 and 3. Although the restoration design objective is to provide dynamic stability, a measure of sediment transport, channel migration, and natural fluvial process are desirable and anticipated. Note that cross sections A-A and I-I present the only useful comparison as other sub-reaches fall within the existing impoundment. No change is proposed to hydrology, channel slope, channel geometry, streambed conditions, or existing trees at the downstream project boundary; as such, no measurable change in shear stress results in no change to scour potential at the downstream project boundary. For this reason, and because the impacts of potential sediment transport are absorbed by the proposed floodplain (sub-reach C-C) during the initial site response period, the **Multnomah County culvert within Cottrell Road downstream of the restoration reach retains a scour rating of 100 at the inlet and outlet.** See **Attachment D – Cottrell Road Culvert Pre-Project Inspection Report.**

Table 2. Cottrell Pond Hydraulic Analysis: Q₂₅ Existing Conditions

Cross Section	Slope (%)	Flow Depth (ft)	Velocity (ft/s)	Shear Stress (lb/sf)
I-I	0.60%	2.5	1.14	0.1
A-A	2.50%	1.5	3.74	1.5

Table 3. Cottrell Pond Hydraulic Analysis: Q₂₅ Proposed Conditions

Cross Section	Slope (%)	Flow Depth (ft)	Velocity (ft/s)	Shear Stress (lb/sf)
I-I	0.60%	1.5	1.26	0.2
G-G	3%	1.5	3.11	1.1
E-E	2%	1.5	2.32	0.7
C-C	0.80%	1.5	1.25	0.2
A-A	2.50%	1.5	3.74	1.5

Streambed Sediment Sizing

The streambed design objective is to accommodate channel migration and sediment transport while preventing consequential headcutting and erosion. Areas of unarmored stream bed and banks comprised of native silt loam are subject to erosion, especially under high flow conditions and due to localized scour inherent to stream systems. The risk of destabilizing headcuts is mitigated by significant surface roughness in the form of microtopography and woody debris, vegetation establishment, a measure of tolerance for channel adjustment and migration within the floodplain, and a responsive monitoring and site management plan.

Where tolerable, “deformable” channel(s) will be constructed with and through native soil and sediment. Where anticipated scour potential exceeds the shear threshold of native soil and sediment (i.e., steeper reaches), imported streambed stone will be used to construct streambed and to backfill large wood placements. Given the uncertainty of hydrologic characterization and importance of maintaining the upstream flow split, a scour analysis of Q_{25} through the steepest constructed reach was selected as the design flow event for streambed sediment sizing, and conservatively assumes full stream flow (i.e., no flow split). Applied up to 25% increase in stone size anticipating round rock in place of subangular.

The following references were used to calculate the imported streambed gradation – see **Attachment E – Rock Sizing Calculations**:

ODOT Hydraulics Manual (2014) – Tractive Force Method

ODOT Hydraulics Manual (2014) – Modified Ishbash Relationship

U.S. Army Corps of Engineers Riprap Design for Flood Channels – Maynords Equation

Critical Grain Size Entrainment – Shields Equation

Imported Streambed Gradation		
% Passing by Weight	Rock Size (in)	
20	8	6
30	6	4
40	4	1
10	1	0.8

Existing streambed conditions directly downstream of the existing dam provide a reference streambed sediment gradation that reflects subject hydrology and 2.5% channel slope. Observed stone sizes exhibit a coarser “armoring layer” than anticipated sediment transport through comparable reaches because of the “fire hose” effect of the existing dam outlet (24” dia. culvert). Observed stone sizes substantiate proposed gradation.

The constructed streambed sediment mix will be augmented with an unprescribed amount of native fines required to achieve surface flow during construction.

Buried Riffles & Habitat Boulders

Constructed riffles will be embedded at significant grade breaks along the proposed channel profile and where stream power is concentrated through transition zones. Constructed riffles are intended to persist as stable features to maintain the slope of sub-reaches within the project site and to mitigate the risk of headcutting. Embedded riffles will be extended within adjacent floodplain and streambank surfaces to span the entire flow corridor, to accommodate lateral channel migration.

Class 50 riprap will be used to construct embedded riffles and to protect the toe of approximately 300 LF of newly constructed amphibian pond embankment within the project site. Thickness of constructed riffles = 12-18 inches.

Class 50 RIPRAP		
% Passing by Weight	Weight of Rock (lbs)	
20	50	30
30	30	15
40	15	2
10	2	0

Class 50 RIPRAP		
% Passing by Weight	Rock Size (in)	
20	10	8
30	8	7
40	7	3
10	3	0

Habitat boulders sized 12-18 inches will be placed in clusters to enhance instream complexity and as keystone framework for constructed streambed and buried riffles. Boulders along the face of the existing dam may be repurposed as habitat boulders and/or ballast stone for large wood placements.

V-notch Weir – Flow Split

In addition to removing the artificial impoundment to improve water quality in Johnson Creek, one of the primary project objectives is to enhance habitat for native amphibians. Limiting factors include seasonal hydrology specific to the red-legged frog requiring shallow surface water from winter through spring with ponds that dry out in July to prevent perennial habitat for the predatory bullfrog. The hydrologic assessment indicates that Johnson Creek streamflow shrinks from approx. 0.33 cfs in June to 0.8 cfs during July – September. **To maintain a flow split at 0.33 cfs that “winks out” around 0.8 cfs, two 90° v-notch weirs will be set at 3 inch vertical difference to convey primary channel low flow = 0.8 cfs.** When Johnson Creek exceeds seasonal low flow conditions, depth of flow through the primary channel’s v-notch weir will exceed 3 inches and the secondary channel’s v-notch weir will convey flow to the secondary frog pond channel. Because streamflow becomes so small during the dry season, the vertical difference between the v-notch weirs is necessarily small to achieve the hydraulic objective. The flow split will require maintenance as the v-notch weirs are subject to plugging with sediment, woody debris, and even vegetation. Fortunately, the v-notch weirs are adaptable: to adjust the difference in flow split, either v-notch can be deepened or widened. To decrease flow capacity over either v-notch weir, a small obstruction can be fixed to the upstream face of the v-notch weir to effectively raise the weir elevation and/or decrease conveyance capacity of the v-notch (similar to flashboards in water control structures).

Hydraulic Grade Line

A comparison of existing and proposed Hydraulic Grade Line (HGL) is based on the following criteria:

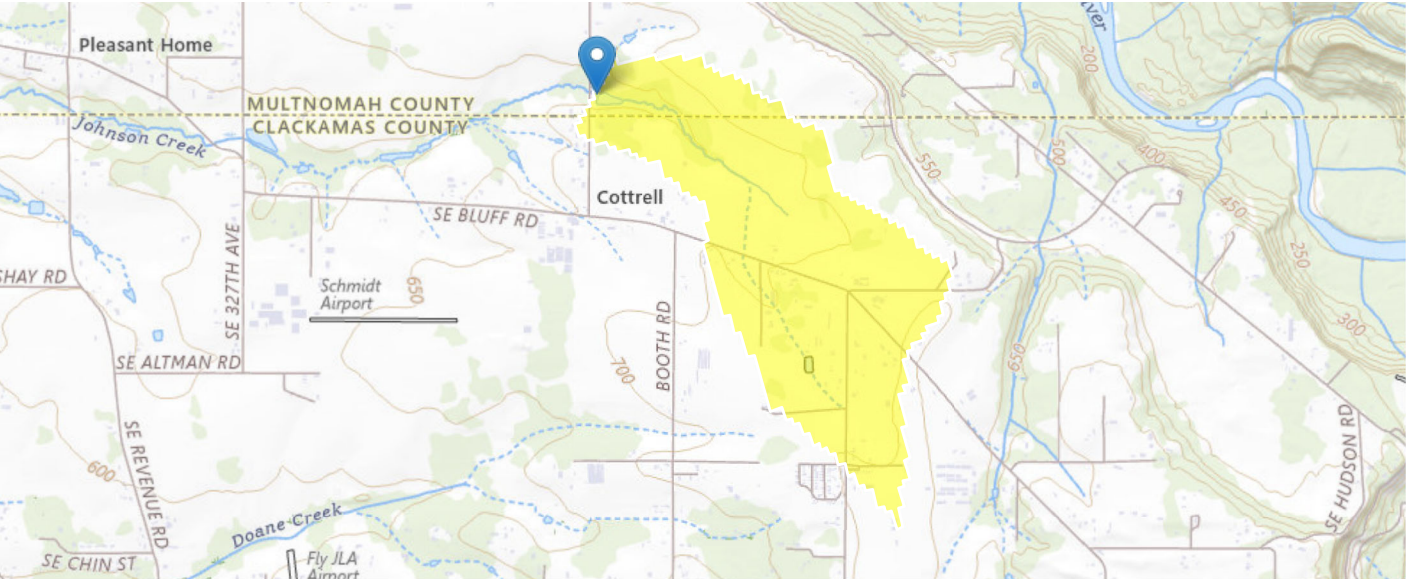
- 25-yr flood event, consistent with other design analyses
 - Proposed flow depth = 1.5 ft over primary v-notch weir
 - Proposed flow depth = 1.25 ft over secondary v-notch weir; assume similar flow depth through secondary frog pond channel
 - It can be assumed that proposed HGL will be lower during flood events smaller than the 25-yr event because the depth of flow through the proposed terrain will be less.
 - It can be assumed that the existing HGL is approximately the same during flood events smaller than the 25-yr event because the existing impoundment routinely overtops at elevation 631.0' during the 2-yr flood event and otherwise maintains a typical water surface = 628.5' elevation controlled by the 24" dia. CMP outlet.
- Existing and proposed HGL match downstream of the existing dam because proposed grade blends with existing grade downstream of the dam, and the subject reach will not experience different hydrology during high flow greater than the 2-yr event at which point the existing impoundment overtops and provides no flood storage.

See **Attachment F – Hydraulic Grade Line Comparison** for an illustration of the approximate drop in water surface elevation along the main channel and the secondary frog pond channel, following removal of the dam.

Attachment A – Cottrell Pond StreamStats

Cottrell Pond StreamStats Report

Region ID: OR
Workspace ID: OR20250630214519364000
Clicked Point (Latitude, Longitude): 45.46243, -122.30549
Time: 2025-06-30 14:45:47 -0700



+ Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
BSLOPD	Mean basin slope measured in degrees	2.61	degrees
DRNAREA	Area that drains to a point on a stream	0.6	square miles
ELEV	Mean Basin Elevation	710	feet
I24H2Y	Maximum 24-hour precipitation that occurs on average once in 2 years - Equivalent to precipitation intensity index	2.14	inches
JANMAXT2K	Mean Maximum January Temperature from 2K resolution PRISM 1961-1990 data	45.5	degrees F
JANMINT2K	Mean Minimum January Temperature from 2K resolution PRISM PRISM 1961-1990 data	33.8	degrees F
MINTEMP	Mean annual minimum air temperature over basin surface area as defined in SIR 2008-5126	41.4	degrees F
ORREG2	Oregon Region Number	10001	dimensionless
SOILPERM	Average Soil Permeability	0.48	inches per hour
WATCAPORC	Available water capacity from STATSGO data using methods from SIR 2005-5116	0.14	inches

Peak-Flow Statistics

Peak-Flow Statistics Parameters [Reg 2B Western Interior LT 3000 ft Cooper]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
BSLOPD	Mean Basin Slope degrees	2.61	degrees	5.62	28.3

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.6	square miles	0.37	7270
ELEV	Mean Basin Elevation	710	feet		
I24H2Y	24 Hour 2 Year Precipitation	2.14	inches	1.53	4.48
ORREG2	Oregon Region Number	10001	dimensionless		

Peak-Flow Statistics Disclaimers [Reg 2B Western Interior LT 3000 ft Cooper]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Peak-Flow Statistics Flow Report [Reg 2B Western Interior LT 3000 ft Cooper]

Statistic	Value	Unit
50-percent AEP flood	17.3	ft^3/s
20-percent AEP flood	25.3	ft^3/s
10-percent AEP flood	30.9	ft^3/s
4-percent AEP flood	38.3	ft^3/s
2-percent AEP flood	43.9	ft^3/s
1-percent AEP flood	49.5	ft^3/s
0.2-percent AEP flood	63	ft^3/s

Peak-Flow Statistics Citations

Cooper, R.M.,2005, Estimation of Peak Discharges for Rural, Unregulated Streams in Western Oregon: U.S. Geological Survey Scientific Investigations Report 2005-5116, 76 p. (<http://pubs.usgs.gov/sir/2005/5116/pdf/sir2005-5116.pdf>)

➤ Low-Flow Statistics

Low-Flow Statistics Parameters [LowFlow Ann Region02 2008 5126]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.6	square miles	3.604	2025.868
MINTEMP	Mean Annual Min Temperature	41.4	degrees F	35.419	41.821

Low-Flow Statistics Disclaimers [LowFlow Ann Region02 2008 5126]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Low-Flow Statistics Flow Report [LowFlow Ann Region02 2008 5126]

Statistic	Value	Unit
7 Day 2 Year Low Flow	0	ft^3/s
7 Day 10 Year Low Flow	0	ft^3/s

Low-Flow Statistics Citations

Risley, John, Stonewall, Adam, and Haluska, Tana,2008, Estimating flow-duration and low-flow frequency statistics for unregulated streams in Oregon: U.S. Geological Survey Scientific Investigations Report 2008-5126, 22 p. (<http://pubs.usgs.gov/sir/2008/5126/>)

➤ Bankfull Statistics

Bankfull Statistics Parameters [Pacific Mountain System D Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.6	square miles	6.1776	8079.9147

Bankfull Statistics Parameters [Cascade Sierra Mountains P Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.6	square miles	43.89957	8079.95331

Bankfull Statistics Parameters [USA Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.6	square miles	0.07722	59927.7393

Bankfull Statistics Parameters [Pac Maritime Mtn CastroJackson 2001]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.6	square miles	54.8	3093

Bankfull Statistics Disclaimers [Pacific Mountain System D Bieger 2015]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Bankfull Statistics Flow Report [Pacific Mountain System D Bieger 2015]

Statistic	Value	Unit
Bieger_D_channel_width	10.8	ft
Bieger_D_channel_depth	0.859	ft
Bieger_D_channel_cross_sectional_area	12.5	ft^2

Bankfull Statistics Disclaimers [Cascade Sierra Mountains P Bieger 2015]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Bankfull Statistics Flow Report [Cascade Sierra Mountains P Bieger 2015]

Statistic	Value	Unit
Bieger_P_channel_width	15.6	ft
Bieger_P_channel_depth	0.712	ft
Bieger_P_channel_cross_sectional_area	11	ft^2

Bankfull Statistics Flow Report [USA Bieger 2015]

Statistic	Value	Unit
Bieger_USA_channel_width	10.3	ft
Bieger_USA_channel_depth	1.08	ft
Bieger_USA_channel_cross_sectional_area	13	ft^2

Bankfull Statistics Disclaimers [Pac Maritime Mtn CastroJackson 2001]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Bankfull Statistics Flow Report [Pac Maritime Mtn CastroJackson 2001]

Statistic	Value	Unit
Bankfull Width	9.95	ft
Bankfull Depth	0.541	ft
Bankfull Area	9.78	ft^2
Bankfull Streamflow	64.7	ft^3/s

Bankfull Statistics Flow Report [Area-Averaged]

Statistic	Value	Unit
Bieger_D_channel_width	10.8	ft
Bieger_D_channel_depth	0.859	ft
Bieger_D_channel_cross_sectional_area	12.5	ft^2
Bieger_P_channel_width	15.6	ft
Bieger_P_channel_depth	0.712	ft
Bieger_P_channel_cross_sectional_area	11	ft^2
Bieger_USA_channel_width	10.3	ft
Bieger_USA_channel_depth	1.08	ft
Bieger_USA_channel_cross_sectional_area	13	ft^2
Bankfull Width	9.95	ft
Bankfull Depth	0.541	ft
Bankfull Area	9.78	ft^2
Bankfull Streamflow	64.7	ft^3/s

Bankfull Statistics Citations

Bieger, Katrin; Rathjens, Hendrik; Allen, Peter M.; and Arnold, Jeffrey G.,2015, Development and Evaluation of Bankfull Hydraulic Geometry Relationships for the Physiographic Regions of the United States, Publications from USDA-ARS / UNL Faculty, 17p. (https://digitalcommons.unl.edu/usdaarsfacpub/1515?utm_source=digitalcommons.unl.edu%2Fusdaarsfacpub%2F1515&utm_medium=PDF&utm_campaign=PDFCoverPages)
Castro, J.M, and Jackson, P.L.Castro, J.M, and Jackson, P.L., 2001, Bankfull Discharge Recurrence Intervals and Regional Hydraulic Geometry Relationships: Patterns in the Pacific Northwest, USA, Journal of the American Water Resources Association, Volume 37, No. 5, 14 p. (<https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1752-1688.2001.tb03636.x>)

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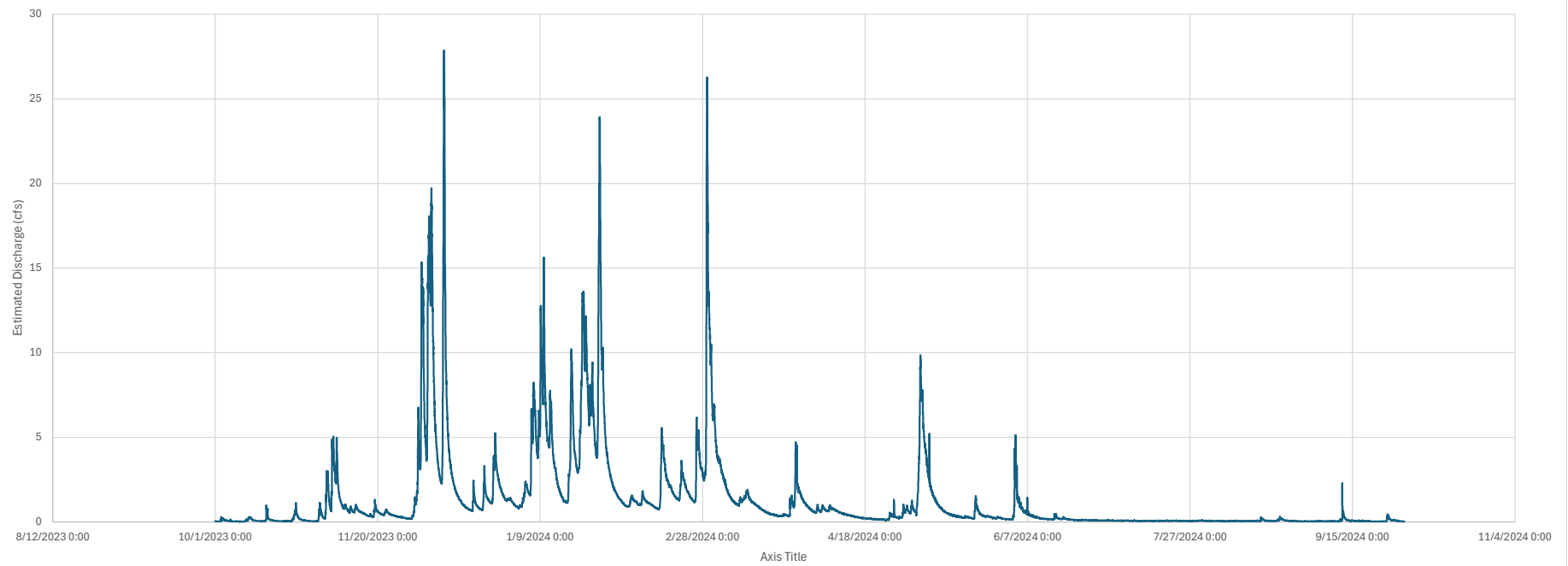
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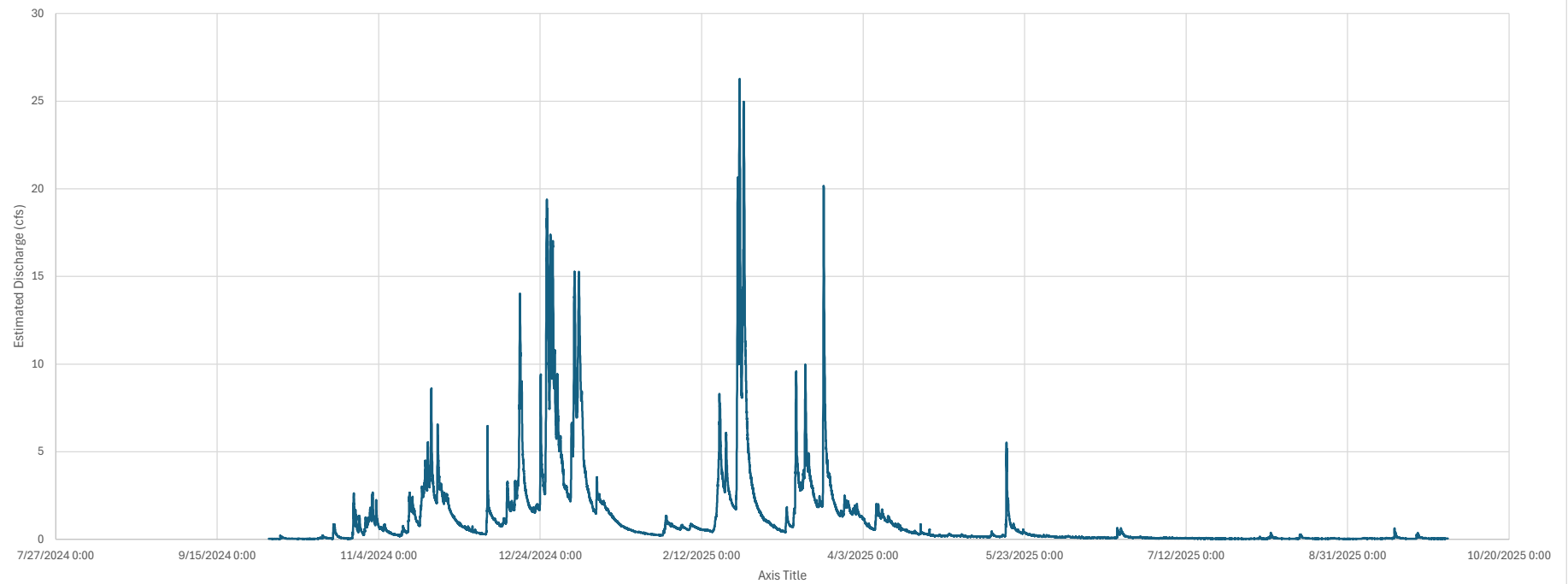
Application Version: 4.29.2
StreamStats Services Version: 1.2.22
NSS Services Version: 2.2.1

Attachment B – USGS Regner Gage Data

Cottrell Pond: WY23-24 Hydrograph Based on USGS Regner Gage Data



Cottrell Pond: WY24-25 Hydrograph Based on USGS Regner Gage Data



Attachment C - USGS Streamflow Measurements at Bluff Road

Date	Time ↕	Time Datum ↕	Measurement Used? ↕	Who ↕	Measuring Agency ↕	Stream flow (ft³/s) ↕	Gage Height (ft)
2025-08-21	13:04:54	PDT	Yes	MJM	USGS	0.42	
2022-02-28	13:34:35	PST	Yes	MCY	USGS	23.1	
2022-01-03	12:56:53	PST	Yes	MCY	USGS	52.1	
2021-12-11	11:59:09	PST	Yes	MCY	USGS	16.3	
2021-11-11	10:35:20	PST	Yes	MCY	USGS	19.1	
2021-11-03	10:03:42	PDT	Yes	MCY	USGS	4.09	
2021-09-18	13:12:30	PDT	Yes	MCY	USGS	8.61	
2021-09-18	10:57:36	PDT	Yes	MCY	USGS	8.18	
2021-07-13	09:40:30	PDT	Yes	AJS/EPK/MCY	USGS	0.48	
2021-06-13	09:53:31	PDT	Yes	MCY/EPK	USGS	1.80	
2020-11-13	13:34	PST	Yes	MCY	USGS	10.5	

Attachment D - Cottrell Road Culvert Pre-Project Inspection Report

Culvert 5343 (near 8344 SE Cottrell Road) Inspection Report

Storm Culvert 5343		View		Edit Inspection	
		Inspection OCI	Previous	Difference	Average
		84	96	-12	90
		Excellent			
		-★★★★★			

Inspection Detail

Status: Complete

Asset: Storm Culvert 5343

ID: 1780

Basic Information

Inspection Date: 10/29/2020

Inspected By: 85

Full Name: Robert Hyde

Urgent Attention: ☐

Follow Up Task:

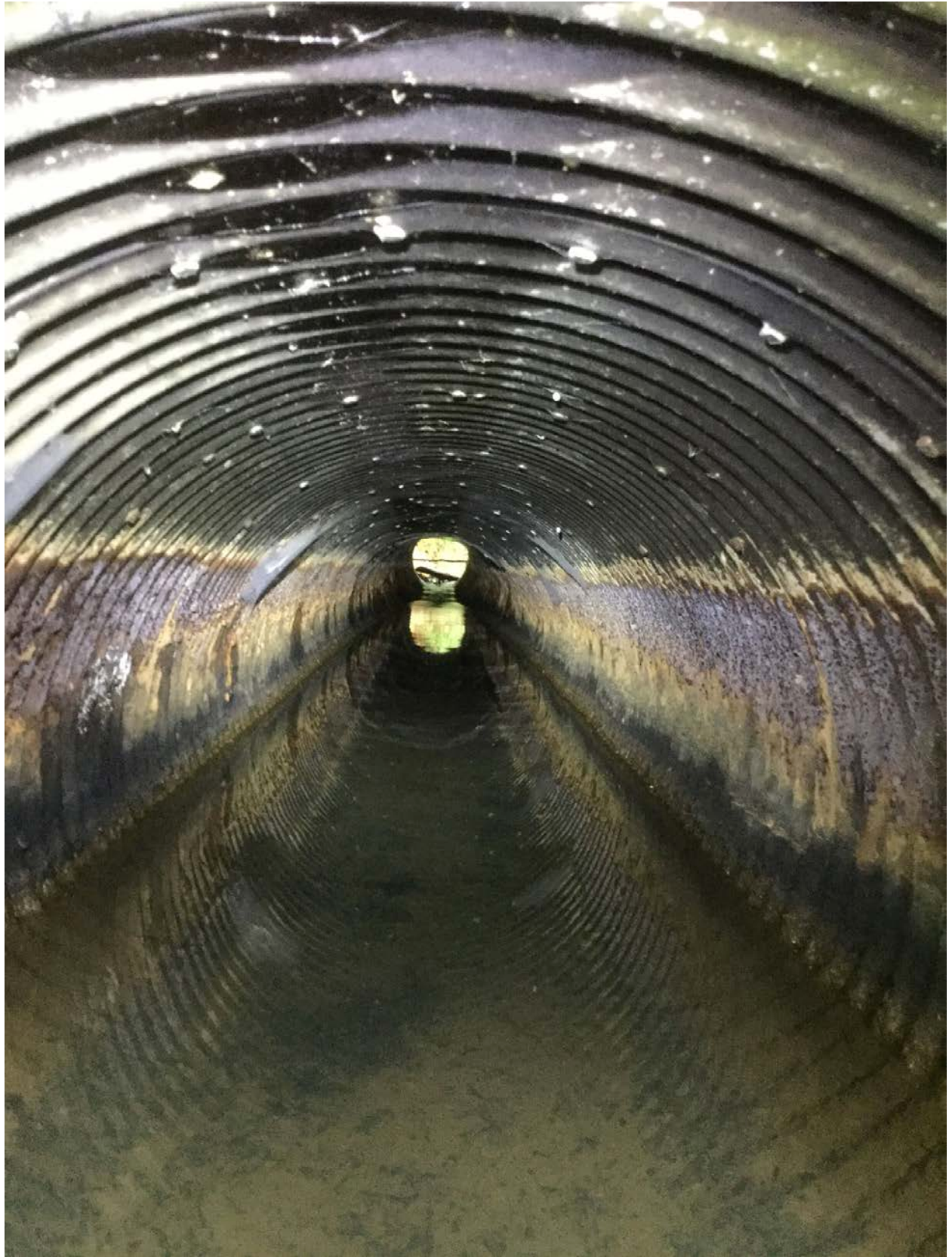
Secondary Follow Up Task:

Maintenance Notes:

Fill Depth over 5 feet: Yes

Fill Depth:

Condition Categories		
Pavement Crack/Patches	Good	100
Sag Roadway/Guardrail	Good	100
Embankment Popouts/Voids	Good	100
Embankment Inlet	Fair	75
Scour Inlet	Good	100
Invert Condition (Metal)	Poor	50
Settlement (Concrete/Plastic)	NI	!
Open Joints	Good	100
Out of Round	Good	100
Cracking	Fair	75
Embankment Outlet	Fair	75
Scour Outlet	Good	100
Structural Blockage	Good	100
General Barrel Condition	Poor	50









Attachment E - Rock Sizing Calculations

Method: Tractive Force
Source: ODOT Hydraulic Manual (2014)
Application: Embankments + channel lining; where tractive forces due to streamflow control the riprap size
Notes: may overestimate riprap size requirements in critical flow conditions

$$D_{50} = \frac{0.001 CV_s^3}{d_{avg}^3 K_1^{1.5}} \quad *eq 15-6$$

D₅₀ =	0.09 ft
D₅₀ =	1.1 in

C =	1.40	
V_{avg} =	3.11 ft/sec	specify design frequency: 25 yr event
d_{avg} =	1.5 ft	
K₁ =	0.534	reference Table 15-8
side slope =	1.5 H : 1V	choose steepest side slopes from Table 15-8 at project boundary tie-ins (actual 1h:1v)

C_{st} =	1.40	
SF =	1.5	reference Table 15-9
r_{curve} =	ft	
w =	ft	
C_{st} =	1.00	
S_s =	2.65	reference Table 15-1 for specific gravity of stone

15.5.1.7.2 Tractive Force Design Relationship

The tractive force design relationship is based on tractive force theory yet has velocity as its primary design parameter. The design assumptions are primarily based on the uniform or gradually varying flow typical of channels with fairly uniform cross-section. The relationships have been verified to be adequate for a variety of rivers, both in natural channels within floodplains and in channels confined within flood levees. This procedure is discussed in detail in the latest versions of references 6 and 7. This method is recommended for these applications where tractive forces due to streamflow control the riprap size]

- riverine embankments,
- channel linings, and
- bridge abutments.

Note: This procedure provides realistic results in most subcritical flow situations. It may overestimate the needed riprap size in some near critical or critical flow applications. In these instances, the ODOT velocity based method or modified Izbash relationship may provide more realistic results. The pier riprap method should also be used to determine rock size on structures where the pier projects through the toe of the abutment protection riprap, and the larger calculated rock size should be used.

The primary equation for the tractive force method follows:

$$D_{50} = \frac{0.001 CV_s^3}{d_{avg}^3 K_1^{1.5}} \quad (\text{Equation 15-6})$$

Where:

D₅₀ =	median riprap equivalent spherical diameter in feet,
C =	correction factor (described in following text),
V_s =	the average velocity in the main channel in feet per second,
d_{avg} =	the average depth in the main channel in feet, calculated as the main channel cross-sectional area in square feet divided by the main channel flow width,
K₁ =	the ratio of the incipient motion tractive force on a sloping surface to the incipient motion tractive force on a level surface and is defined as:

$$K_1 = \left[1 - \frac{\sin^4 \Phi}{\sin^4 \Phi} \right]^{0.5} \quad (\text{Equation 15-7})$$

ODOT Hydraulics Manual

Where:

Φ =	the bank angle with the horizontal in degrees, and
Φ =	41 degrees (the angle of repose of ODOT standard riprap classes).

Table 15-8 lists the K₁ values for various bank angles.

Table 15-8 K ₁ Values		
Bank Slope	Bank Angle (Φ)	K ₁
1V: 1½H	33.69°	0.534
1V: 1½H	29.74°	0.654
1V: 2H	26.57°	0.732
1V: 2½H	21.80°	0.824
1V: 3H	18.43°	0.876

The average flow depth and velocity used in Equation 15-6 are the main channel values. The main channel is defined as the area between the channel banks, as shown in Figure 15-8. The tractive force method can also be used for riprap in overbank areas if the average velocity and depth in the overbank area are used.

Note: The riprap sizes in an overbank area are calculated using main channel values unless it is certain that the main channel will not shift in alignment and scour out the overbank area.

Equation 15-6 is based on a rock riprap specific gravity of 2.65, and a stability factor of 1.2. Equations 15-8 and 15-9 are correction factors for other specific gravities and stability factors. The correction factors computed using Equations 15-8 and 15-9 are multiplied together to form the single correction factor C used in Equation 15-6.

$$C_{st} = \frac{2.12}{(S_s - 1)^{1.5}} \quad (\text{Equation 15-8})$$

Where:

C_{st} =	correction factor for rock specific gravity, and
S_s =	specific gravity of the rock (see Subsection 15.5.1.2 for typical specific gravity values)

$$C_{st} = \left(\frac{SF}{1.2} \right)^{1.5} \quad (\text{Equation 15-9})$$

Where:

C_{st} =	correction factor for stability, and
SF =	the stability factor to be applied.

The stability factor, SF, used in Equations 15-6 and 15-9 is defined as the ratio of the riprap material's critical shear stress and the average tractive force exerted by the flow field. As long as the stability factor is greater than 1, the critical shear stress of the riprap material is greater than the flow induced tractive stress and the riprap is considered to be stable. As mentioned in the preceding discussion, a stability factor of 1.2 was used in the development of Equation 15-6.

The stability factor is used to reflect the level of uncertainty in the hydraulic conditions at a particular site. Equation 15-6 is based on the assumption of uniform or gradually varying flow. However, design needs dictate that the relationship also be applicable in nonuniform, rapidly varying flow conditions often exhibited in natural channels. Flow conditions include debris and/or ice impacts, higher shear stresses at channel bends, or the cumulative effect of high shear stresses and forces from wind and/or boat generated waves. The stability factor is used to increase the design rock size when these conditions must be considered. When a stability factor is selected to accommodate wave action, it is recommended that the riprap stability also be checked with the Hudson relationship. Table 15-9 presents guidelines for the selection of an appropriate value for the stability factor.

Table 15-9 Guidelines for the Selection of Stability Factors

Flow Condition	Stability Factor Range
Uniform flow; Straight or mildly curving reach (curve radius/channel width is more than 30); Impact from wave action and floating debris is minimal; Little or no uncertainty in design parameters.	1.0 – 1.2
Gradually varying flow; Moderate bend curvature (30 is more than curve radius/channel width is more than 10); Impact from waves, ice or floating debris moderate.	1.3 – 1.6
Approaching rapidly varying flow; Sharp bend curvature (curve radius/channel width is less than 10); Significant impact potential from floating debris and/or ice; Significant wind and/or boat generated waves (1 - 2 feet); High flow turbulence; Turbulently mixing flow at bridge abutments; Significant uncertainty in design parameters.	1.7 – 2.0

The average flow depth and velocity used in Equation 15-6 are the main channel values. The main channel is defined as the area between the channel banks, as shown in Figure 15-8. The tractive force method can also be used for riprap in overbank areas if the average velocity and depth in the overbank area are used.

Note: The riprap sizes in an overbank area are calculated using main channel values unless it is certain that the main channel will not shift in alignment and scour out the overbank area.

Equation 15-6 is based on a rock riprap specific gravity of 2.65, and a stability factor of 1.2. Equations 15-8 and 15-9 are correction factors for other specific gravities and stability factors. The correction factors computed using Equations 15-8 and 15-9 are multiplied together to form the single correction factor C used in Equation 15-6.

$$C_{st} = \frac{2.12}{(S_s - 1)^{1.5}} \quad (\text{Equation 15-8})$$

Table 15-1 Specific Gravities of Typical Oregon Riprap Stone
(Based on a 62.4 pound per cubic foot water density.)

Rock Type	Specific Gravity Range of Typical Rock
Andesite	2.5 – 2.8
Basalt/Traprock	2.8 – 3.0
Diabase	2.6 – 3.0
Diorite	2.8 – 3.0
Gneiss	2.6 – 2.9
Granite	2.6 – 2.7
Limestone	2.3 – 2.7
Marble	2.4 – 2.7
Quartzite	2.6 – 2.8
Rhyolite	2.4 – 2.6
Sandstone	2.2 – 2.8

Method: Modified Ishbash

Source: ODOT Hydraulic Manual (2014)

Application: To determine size of the riprap for scour protection

Notes:

D_{50}	=	0.18	ft
D_{50}	=	2.18	in

K = 1.7 *(variable constant; 1.5 for round-nose, 1.7 for rectangular piers)

V = 3.11 ft/s rough average of Q25 max velocity upstream of culvert

S_s = 2.65

g = 32.2 ft/s²

Determine the D_{50} size of riprap using the rearranged Ishbash equation:

$$D_{50} = \frac{0.692(KV)^2}{(S_s - 1)2g} \quad \text{(Equation 15-14)}$$

Where:

D_{50} = median stone diameter in feet,

K = pier shape coefficient ($K = 1.5$ for round-nose piers, $K = 1.7$ for rectangular piers),

V = average velocity approaching the pier in feet per second,

S_s = specific gravity of riprap (normally 2.65),

g = acceleration of gravity (32.2 feet per second per second).

The velocity, V , should be the same velocity that was used to calculate local pier scour. Figure 15-10 can be used to determine the D_{50} size of the riprap necessary to provide scour protection. The upper stability limits for ODOT riprap classes are plotted on Figure 15-10. The next larger riprap class should be used when the required size of stone exceeds the D_{50} of a particular riprap class. For example, for a round-nose pier subjected to a velocity of 9.0 feet per second, the pier should be protected with Class 700 riprap. ODOT standard riprap classes can be used for velocities up to 11.7 and 10.3 feet per second for round-nose and rectangular piers, respectively.

Method: Maynords Equation

Source: U.S. Army Corps of Engineers - HECRAS v 6

Application:

Notes:

D_{30}	=	0.07 m
D_{30}	=	0.20 ft
D_{30}	=	2.36 in

0.421875
0.778499
0.610404

D_r	=	
S_f	=	1.5
C_s	=	0.375 round
C_v	=	1.00
d	=	1.5 ft
γ_w	=	62.4 lb/ft ³
K_1	=	0.534
g	=	32.2 ft/s ²
V	=	3.1 ft/s2
C_t	=	0.5
γ_s	=	165.36 lb/ft ³
R	=	ft
w	=	ft
R/W	=	#DIV/0!
S_s	=	2.65
side slope	=	1.5 H: 1V
θ	=	34 degrees
$\cot(\theta)$	=	2

rough average of Q25 through 3% bed slope re

$$D_{30} = S_f C_s C_v C_T d \left[\left(\frac{\gamma_w}{\gamma_s - \gamma_w} \right)^{1/2} \frac{V}{\sqrt{K_1 g d}} \right]^{2.5} \quad (1)$$

where

D_{30} = riprap size of which 30 percent is finer by weight (for some gradations, use D_r);

$D_r = D_{85}(\min)[D_{15}(\min)]^2$;

S_f = safety factor (minimum = 1.1);

C_s = stability coefficient for incipient failure, thickness = $1D_{100}(\max)$ or $1.5D_{50}(\max)$, whichever is greater ($D_{85}/D_{15} = 1.7$ to 5.2),
= 0.30 for angular rock, and

= 0.375 for rounded rock [note: EM (1) is incorrect, giving 0.36];

D_{85}/D_{15} = gradation uniformity coefficient;

C_v = vertical velocity distribution coefficient,

= 1.0 for straight channels inside of bends,

= $1.283 - 0.2 \log (R/W)$ for outside of bends (1 for $R/W > 26$),

= 1.25 downstream of concrete channels, and

= 1.25 at end of dikes;

R = centerline radius of curvature of bend;

W = water-surface width at upstream end of bend;

C_T = blanket thickness coefficient (see Figure 1);

d = local depth of flow;

γ_w = unit weight of water;

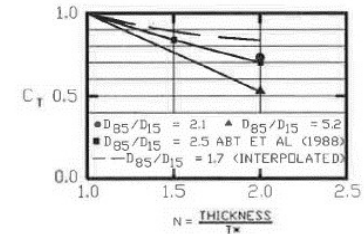
γ_s = unit weight of stone;

V = local depth-averaged velocity;

K_1 = side-slope correction factor; and

g = gravitational constant.

The power of 2.5 in this equation was based on laboratory data from straight, tilting flumes. The extreme values of the power in Equation 1 are from 2 to 3. A power of 2 results in the Isbash equation (no dependence on depth) and is generally used when there is no boundary layer development. A power of 3 results from application of existing shear stress and the Manning-Strickler equations and represents the condition of completely developed boundary layer and a relative roughness (roughness size/depth) that is low enough to yield a constant Shields coefficient. Because most bank and channel riprap protection problems fall somewhere between these two extremes, the 2.5 power was adopted for all bank and channel riprap protection problems, not just the straight, tilting flumes from which it was derived.



WHERE C_T = CORRECTION FOR THICKNESS

= D_{30} FOR THICKNESS OF NT^*

= D_{30} FOR THICKNESS OF T^*

$T^* = 1D_{100}$ OR $1.5D_{50}$, WHICHEVER IS GREATER

FIGURE 1 Correction for riprap blanket thickness.

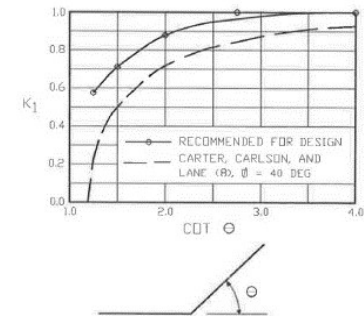


FIGURE 4 Side-slope correction coefficient.

Method: Shields

Source: Based on Entrainment Function after A. Shields (Henderson, 1966)

Application: streambed sediment sizing

Notes: D is the theoretical diameter of a stone that will remain at rest under the specified flow conditions

$$D = 11 \cdot R \cdot S = 11 \cdot \frac{A}{P} \cdot S$$

D	=	0.28 ft
D	=	3.4 in

S = 0.030 ft/ft

A = 6 ft²

P = 7 ft

R = 0.8462 ft

Q = 38 ft³/s

representative cross-section is 802 (RAS model doesn't include weirs - no flow split)

channel slope measured between 816 and 792

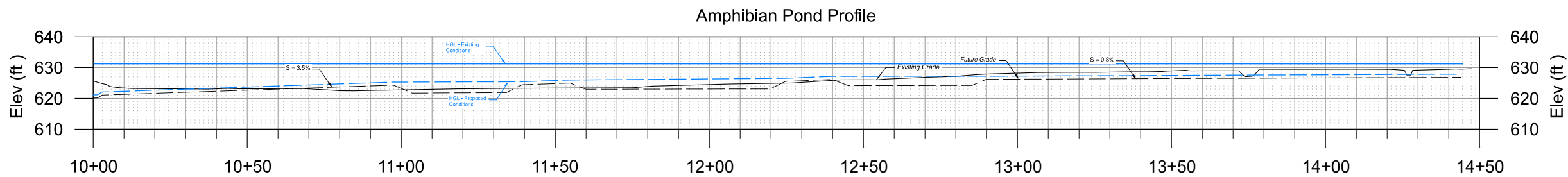
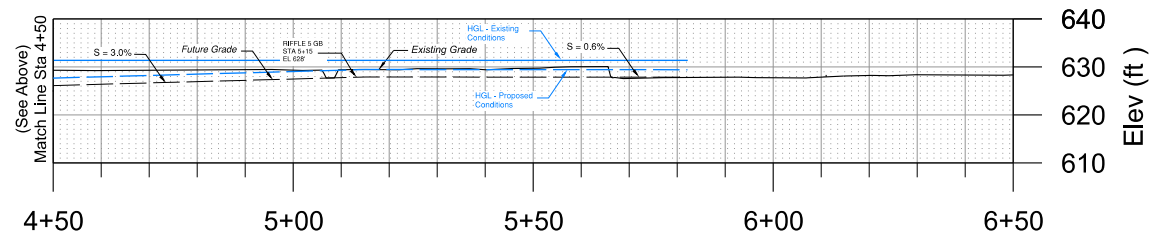
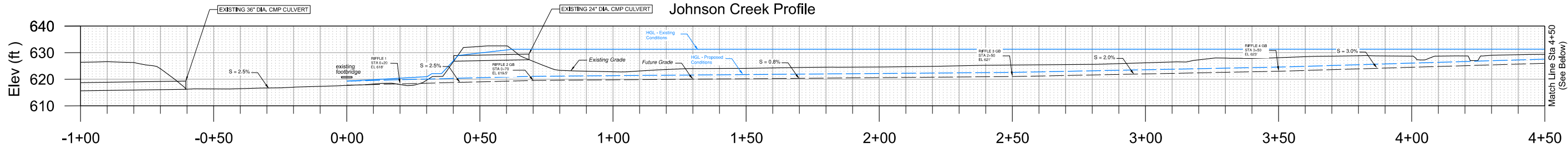
bankfull flow area

bankfull wetted perimeter

bankfull flow event: Q25 = 38 cfs

Attachment F - Hydraulic Grade Line Comparison

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0 10 20
scale in feet

No	Date	Description	Appd	
Revision				
Survey	Mon / Yr	XXXX		

Designed By	Program Mgr	XXXX
CAD Checked By	Const Mgr	
Checked By	Const Supvr	
Project Mgr	Date	



Preliminary

Kenneth M. Ackerman, Principal Engineer, PE No 19424



Cottrell Pond Restoration

Profiles

SAP Project No
W02229

1/4 Section

Sheet No

8 of 13