THE HONORABLE THOMAS S. ZILLY

UNITED STATES DISTRICT COURT
WESTERN DISTRICT OF WASHINGTON
AT SEATTLE

UNITED STATES OF AMERICA, Plaintiff, v. BOBBY WOLFORD TRUCKING & SALVAGE, INC., and KARL FREDERICK KLOCK PACIFIC BISON, LLC, Defendants, and THE TULALIP TRIBES OF WASHINGTON, Intervenor.	No. 2:18-cv-00747-TSZ **CONSENT DECREE**

WHEREAS, the Plaintiff, the United States of America, on behalf of the United States Environmental Protection Agency ("EPA"), filed the Complaint herein against Defendants Bobby Wolford Trucking & Salvage, Inc., ("Wolford Trucking") and Karl Frederick Klock Pacific Bison, LLC, ("KFKPB") (collectively, "Defendants"), alleging that Defendants violated Section 301(a) of the Clean Water Act ("CWA"), 33 U.S.C. § 1311(a);

WHEREAS, the Complaint alleges that Defendants violated CWA Section 301(a) by discharging dredged or fill material and/or controlling and directing the discharge of dredged or fill material into waters of the United States at a site located in Snohomish County, Washington, (the "Site") and more fully described in the Complaint, without authorization by the United States Department of the Army ("the Corps");

WHEREAS, the Complaint seeks (1) to enjoin the discharge of pollutants into waters of the United States in violation of CWA Section 301(a), 33 U.S.C. § 1311(a); (2) to require Defendants, at their own expense and at the direction of EPA, to restore and/or mitigate the damages caused by their unlawful activities; and (3) to require Defendants to pay civil penalties as provided in 33 U.S.C. § 1319(d);

WHEREAS, the Tulalip Tribes of Washington ("Tulalip Tribes"), which has no liability for the alleged violations of the CWA in the Complaint filed herein, has been joined as a party in this matter for the purpose of facilitating the restoration and preservation of the Site by accepting transfer of property subject to the conditions herein and conducting restoration actions on that property as described herein;

WHEREAS, this Consent Decree is intended to constitute a complete and final settlement of the United States' claims under the CWA set forth in the Complaint regarding the Site;

WHEREAS, the United States, Defendants, and the Tulalip Tribes agree that settlement of this case is in the public interest and that entry of this Consent Decree is the most appropriate means of resolving the United States' claims under the CWA against Defendants in this case; and

WHEREAS, the Court finds that this Consent Decree is a reasonable and fair settlement of the United States' claims against Defendants in this case, and that this Consent Decree adequately protects the public interest in accordance with the CWA and all other applicable federal law.

THEREFORE, without further adjudication of any issue of fact or law, and upon consent of the parties hereto by their authorized representatives, it is hereby ORDERED, ADJUDGED and DECREED as follows:

I. JURISDICTION AND VENUE

1. This Court has jurisdiction over the subject matter of these actions and over the parties pursuant to 28 U.S.C. §§ 1331, 1345, and 1355, and CWA Section 309(b), 33 U.S.C. § 1319(b).

2. Venue is proper in the Western District of Washington pursuant to CWA Section 309(b), 33 U.S.C. § 1319(b), and 28 U.S.C. § 1391(b) and (c), because Defendants conduct business in this District, the subject property is located in this District, and the causes of action alleged herein arose in this District.

3. The Complaint states claims upon which relief can be granted pursuant to CWA Sections 301, 309, and 404, 33 U.S.C. §§ 1311, 1319, and 1344.

II. APPLICABILITY

4. The obligations of this Consent Decree shall apply to and be binding upon Defendants and Tulalip Tribes, their officers, directors, agents, employees and servants, and their successors and assigns and any person, firm, association, or corporation who is, or will be, acting in concert or participation with any of the Defendants or the Tulalip Tribes whether or not such person has notice of this Consent Decree. In any action to enforce this Consent Decree against a Defendant and/or the Tulalip Tribes, neither the Defendant nor the Tulalip Tribes shall raise as a defense the failure of any of its officers, directors, agents, employees, successors or assigns or any person, firm, or corporation acting in concert or participation with a Defendant and/or the Tulalip Tribes, to take any actions necessary to comply with the provisions hereof.

III. SCOPE OF CONSENT DECREE

5. This Consent Decree shall constitute a complete and final settlement of all civil claims for injunctive relief and civil penalties alleged in the Complaint against Defendants and their officers, directors, shareholders, members, employees, and agents under CWA Section 301 concerning the Site.

6. It is the express purpose of the parties in entering this Consent Decree to further the objectives set forth in CWA Section 101, 33 U.S.C. § 1251. All plans, studies, construction, remedial maintenance, monitoring programs, and other obligations in this Consent Decree or resulting from the activities required by this Consent Decree shall have the objective of causing Defendants to achieve and maintain full compliance with, and to further the purposes of, the CWA.

7. Defendants' and the Tulalip Tribes' obligations under this Consent Decree are independent and set forth as to each Defendant and the Tulalip Tribes below.

8. Except as in accordance with this Consent Decree, Defendants, and Defendants' agents, successors, and assigns are enjoined from discharging any pollutant on or from the Site into waters of the United States, unless such discharge complies with the provisions of the CWA and its implementing regulations.

9. The parties acknowledge that Nationwide Permit 32, found at 82 Fed. Reg. 1,860 (Jan. 6, 2017), authorizes any fill that was placed as of the date of entry of this Consent Decree in the areas identified in Appendix A appended hereto, to remain in place, subject to the conditions provided in the Nationwide Permit and this Consent Decree. The parties further acknowledge that Nationwide Permit 32 authorizes the discharge of dredged or fill material insofar as such discharge is necessary to complete the work required to be performed pursuant to this Consent Decree. Any such discharge of dredged or fill material necessary for work required by this Consent Decree shall be subject to the conditions of the Nationwide Permit and this Consent

Decree. No later than thirty (30) days after entry of this Consent Decree, Wolford Trucking shall apply to the Corps for authorization under Nationwide Permit 32, and will timely respond to all requests for information by the Corps.

10. This Consent Decree is not and shall not be interpreted to be a permit or modification of any existing permit issued pursuant to CWA Sections 402 or 404, 33 U.S.C. §§ 1342 or 1344, or any other law. Nothing in this Consent Decree shall limit the ability of the Corps to issue, modify, suspend, revoke, or deny any individual permit or any nationwide or regional general permit, nor shall this Consent Decree limit EPA's ability to exercise its authority pursuant to Section 404(c) of the CWA, 33 U.S.C. § 1344(c).

11. This Consent Decree in no way affects or relieves Defendants or the Tulalip Tribes of their responsibility to comply with any applicable federal, state, or local law, regulation, or permit.

12. This Consent Decree in no way affects the rights of the United States as against any person not a party to this Consent Decree.

13. The United States reserves any and all legal and equitable remedies available to enforce the provisions of this Consent Decree and applicable law.

14. With the exception of Paragraphs 1 and 2, nothing in this Consent Decree shall constitute an admission of fact or law by any party.

IV. SPECIFIC PROVISIONS

Environmental Covenant

15. KFKPB shall, within thirty (30) days of completion of the survey and lot line adjustment pursuant to Paragraph 19 of this Consent Decree, execute an Environmental Covenant in the form of Appendix B attached hereto and incorporated by reference, and shall

submit the Environmental Covenant to the Snohomish County Auditor for recording in the real property records of Snohomish County.

16. KFKPB shall comply with the terms and conditions of the Environmental Covenant as a requirement of this Consent Decree.

Transfer of Property

17. KFKPB shall transfer by quit claim deed the following real property (collectively "the Property"), free of any leasehold interest, together with any and all structures, improvements, and fixtures thereon to the Tulalip Tribes following the determination by the Tulalip Tribes that title is acceptable and that there are no hazardous substances on the property requiring removal or remediation:

A. All of Snohomish County Tax Parcel No. 27071000100100 consisting of 34.22 acres.

B. All of Snohomish County Tax Parcel No. 27071000100300 consisting of 2.4 acres.

C. All of Snohomish County Tax Parcel No. 27071000100200 consisting of 37.6 acres.

D. That portion of Snohomish County Tax Parcel No. 27071000200100 east of line starting approximately 500 feet East from the Northwest corner of the parcel running south to a point approximately 500 feet East from the Southwest corner of the parcel consisting of 39.46 acres less that portion of the parcel west of said line.

E. That portion of Snohomish County Tax Parcel No. 27070300300500 east of line starting approximately 800 feet East from the Northwest corner of the parcel running south to a point approximately 500 feet East from the Southwest corner of the parcel consisting of 84 acres less that portion of the parcel west of said line.

F. That portion of Snohomish County Tax Parcel No. 27070300300300 east of line starting approximately 800 feet East from the Southwest corner of the parcel running North south to a point intersecting the North boundary of the parcel consisting of 26.75 acres less that portion of the parcel west of said line.

18. KFKPB shall within a reasonable time after entry of this Consent Decree, and at its own cost and expense, contract to have a survey performed to delineate the western boundary

of the parcels described in Paragraph 17 subparagraphs D, E, and F as illustrated in Appendix A to be transferred and to prepare a property description of the property to be transferred.

19. KFKPB shall within thirty (30) days of receiving a survey report and property description apply to Snohomish County to segregate and otherwise establish new tax parcels for the portions of Tax Parcel Nos 27070300300300, 27070300300500, and 27071000200100 that will be transferred to the Tulalip Tribes.

20. KFKPB reserves its water right under Certificate No. 6 Page 2999 dated March 24, 1948 (Certificate S1-*06508CWRIS) which currently includes a portion of the real property to be transferred as an authorized place of use. Historic beneficial use of the water right has not occurred on the property to be transferred.

21. The Tulalip Tribes agrees that the transfer of property shall exclude and except any interest or right in the water right under Certificate No. 6 Page 2999 dated March 24, 1948 (Certificate S1-*06508CWRIS), which has never been exercised or applied for the beneficial use of water on the property described in Paragraph 17.

22. Under this Consent Decree, the Tulalip Tribes and its representatives (including environmental consultants, architects, and engineers) have been or will be afforded the right and opportunity to enter upon the property and to make inspections of the property that the Tulalip Tribes determines are necessary or desirable after consultation and agreement with KFKPB, which agreement shall not be unreasonably withheld, including the conduct of soil, water, environmental, and engineering tests. The Tulalip Tribes represents that it is knowledgeable in real estate matters and that, upon completion of the inspections contemplated or permitted by this Consent Decree, the Tulalip Tribes will have made all of the investigations and inspections the Tulalip Tribes determines are necessary in connection with its acceptance of the Property. KFKPB shall pay all real property taxes on the property up to the date of conveyance to the Tulalip Tribes. Any outstanding taxes will be prorated on an annual basis.

23. The Tulalip Tribes acknowledges that notwithstanding any prior or contemporaneous oral or written representations, statements, documents, or understandings, this

Consent Decree constitutes the entire understanding of the parties with respect to the subject matter hereof and supersedes any prior or contemporaneous oral or written representations, statements, documents, or understandings.

24. The Tulalip Tribes agrees that it is acquiring the Property to be transferred in wholly an "AS-IS" condition, at no cost to the Tulalip Tribes beyond the obligations undertaken in this Consent Decree and subject to the conditions in paragraph 26 below.

25. The parties agree that the Property shall be transferred in the form of a quit claim deed attached hereto as Appendix D subject to determination of the property description determined from the survey and lot segregation application described above.

26. KFKPB shall place the quit claim deed in escrow within thirty (30) days of receiving a property description and obtaining a lot line adjustment from Snohomish County. The escrow will be subject to instruction that the quit claim deed shall be recorded upon the Tulalip Tribes' written approval of title and acceptance of the deed, and a determination by the Tulalip Tribes that it has identified no hazardous substances on the Property requiring removal or remediation or that the Tribe has decided to accept ownership despite the presence of hazardous substances. KFKPB shall provide the United States with written notice of closing, at the addresses specified in Section IX of this Consent Decree. If the Tulalip Tribes determines that title is objectionable and title objections are not cleared, or that hazardous substances may be present on the Property, the Tulalip Tribes, in its sole discretion, may accept or reject ownership of the property. If the Tulalip Tribes has not accepted ownership of the Property within sixty (60) days from and after the date Wolford Trucking has completed its Restoration Obligations under Paragraph 29 of this Consent Decree and EPA has approved all Wolford Trucking Completion Reports pursuant to Paragraph 32, the escrow shall be terminated and the quit claim deed to the Tulalip Tribe shall be null and void.

27. The Tulalip Tribes agrees that it is acquiring title to the Property subject to the Environmental Covenant.

28. The Tulalip Tribes shall comply with the terms and conditions of the Environmental Covenant as a requirement of this Consent Decree.

Restoration and Rehabilitation

29. Wolford Trucking shall fully perform the restoration projects identified as Wolford Trucking's Restoration Obligations as set forth in Appendix C, appended hereto and incorporated herein by reference. For purposes of the identification requirement of Section 162(f)(2)(A)(ii) of the Internal Revenue Code, 26 U.S.C. § 162(f)(2)(A)(ii), performance of restoration projects pursuant to this Paragraph is restitution or required to come into compliance with law.

30. The Tulalip Tribes shall oversee Wolford Trucking's restoration projects as set forth in Appendix C. The Tulalip Tribes shall fully perform the restoration projects identified as Tulalip Tribes' Restoration Obligations as set forth in Appendix C, appended hereto and incorporated herein by reference, subject to the conditions in paragraph 26. Under no circumstance shall the Tulalip Tribes be responsible for completing Wolford Trucking's obligations under this Consent Decree or the costs associated therewith, either before or after transfer of the property.

31. KFKPB shall allow Wolford Trucking and the Tulalip Tribes limited access to the Property for the sole and exclusive purpose of implementing restoration work set forth in Appendix C and performing any other activities undertaken to comply with federal, state, or county law. The Tulalip Tribes agrees that it shall not access the Property for any other purpose including access to conduct environmental site assessments in accordance with paragraph 22 of this Consent Decree without prior notice to and consent by KFKPB. Access for Tulalip Tribes consultants to conduct environmental site assessments in accordance with paragraph 22 of this Consent Decree shall not be unreasonably withheld. The Tulalip Tribes agrees that it assumes all risk of injury or damage resulting from access to the property and waives and releases KFKPB

from any and all claims that result from its access to the Property. Wolford Trucking shall provide proof of insurance within minimum coverage of $1 million per instance and $3 million for total coverage naming KFKPB as an additional insured for any damages, claims or injuries resulting from site investigation and implementing restoration work. Wolford Trucking assumes all risk of damages and liability incurred during access to the property for the purposes of implementing the restoration work set forth in Appendix C and further agree to waive, indemnify, and defend KFKPB from any and all claims against KFKB related to the restoration work. The scope of Wolford Trucking's defense and indemnity obligations to KFKPB shall be limited to the insurance coverage required under this paragraph.

32. Within thirty (30) days of completing the restoration activities described in Appendix C, Wolford Trucking and the Tulalip Tribes shall each provide EPA with a separate Completion Report, which shall include photographs of the Site conditions before and after implementation of Wolford Trucking and the Tulalip Tribes' respective restoration activities described in Appendix C. EPA will review and, if appropriate, approve each Completion Report. If EPA determines that Wolford Trucking and/or the Tulalip Tribes have not fully satisfied the requirements of the restoration activities described in Appendix C, EPA will provide Wolford Trucking and/or the Tulalip Tribes with a written description of the actions necessary to fully satisfy the requirements of Appendix C. EPA's approval of each Completion Report or written description of the actions necessary to fully satisfy the requirements of Appendix C will be provided to Wolford Trucking and the Tulalip Tribes within a reasonable time, not to exceed thirty (30) days from receipt of Wolford Trucking and the Tulalip Tribes' submission.

33. To ensure that all parcels of land identified in Paragraph 17 remain undisturbed, KFKPB shall, within thirty (30) days of receiving a property description and obtaining a lot line adjustment from Snohomish County, record a certified copy of this Consent Decree with the

Auditor's Office, in Snohomish County, Washington. Thereafter, each deed, title, or other instrument conveying an interest in any property identified in Paragraph 17 shall contain a notice stating that the property is subject to this Consent Decree, and to the Environmental Covenant, and shall reference the recorded location of the Consent Decree and Environmental Covenant and any restrictions applicable to the property under this Consent Decree.

Civil Penalties

34. Wolford Trucking shall pay a civil penalty to the United States in the amount of three hundred thousand dollars ($300,000.00), within thirty (30) days of entry of this Consent Decree.

35. Wolford Trucking shall make the above-referenced payments by FedWire Electronic Funds Transfer ("EFT" or wire transfer) to the U.S. Department of Justice account in accordance with instructions provided to Wolford Trucking by the Financial Litigation Unit ("FLU") of the United States Attorney's Office for the Western District of Washington after entry of this Consent Decree. The payment instructions provided by the FLU will include a Consolidated Debt Collection System ("CDCS") number, which Wolford Trucking shall use to identify all payments required to be made in accordance with this Consent Decree. The FLU will provide the payment instructions to:

Connie Sue M. Martin
Schwabe Williamson & Wyatt
U.S. Bank Centre
1420 Fifth Avenue, Suite 3400
Seattle, Washington 98101

on behalf of Wolford Trucking. Any payments received by the U.S. Department of Justice after 4:00 P.M. (Eastern Time) will be credited on the next business day.

36. Upon payment of the civil penalty required by this Consent Decree, Wolford Trucking shall provide written notice, at the addresses specified in Section IX of this Consent Decree, that such payment was made in accordance with Paragraphs 34 and 35.

37. Civil penalty payments pursuant to this Consent Decree (including stipulated penalty payments under Section VIII) are penalties within the meaning of Section 162(f) of the Internal Revenue Code, 26 U.S.C. § 162(f), or of 26 C.F.R. § 1.162-21, and are not tax-deductible expenditures for purposes of federal law.

V. NOTICES AND OTHER SUBMISSIONS

38. Within thirty (30) days after the deadline for completing any task set forth in Appendix C of this Consent Decree, Wolford Trucking shall provide the United States with written notice, at the addresses specified in Section IX of this Consent Decree, of whether or not that task has been completed.

39. If the required task has been completed, the notice shall specify the date when it was completed. If the task was not or has not been completed within the scheduled time for such completion required by the Consent Decree, the notice shall explain the reasons for any delay in completion and state the anticipated date of completion.

40. In all notices, documents or reports submitted to the United States pursuant to this Consent Decree, the submitting party shall, by signature of a senior management official, certify such notices, documents and reports as follows:

> I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering such information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

VI. RETENTION OF RECORDS AND RIGHT OF ENTRY

41. Until ten (10) years after entry of this Consent Decree, Wolford Trucking and the Tulalip Tribes shall preserve and retain all records and documents now in their possession or control or which come into their possession or control that relate in any manner to the performance of the tasks in Appendix C regardless of any corporate retention policy to the contrary. Until ten (10) years after entry of this Consent Decree, Wolford Trucking and the Tulalip Tribes shall also instruct their contractors and agents to preserve all documents, records, and information of whatever kind, nature or description relating to the performance of the tasks in Appendix C.

42. At the conclusion of the document retention period, Wolford Trucking and the Tulalip Tribes shall notify the United States at least ninety (90) days prior to the destruction of any such records or documents by it, and, upon request by the United States, the party providing notification shall deliver any such records or documents to EPA. Wolford Trucking and the Tulalip Tribes may assert that certain documents, records, and other information are privileged under the attorney-client privilege or any other privilege recognized by federal law. If a party asserts such a privilege, it shall provide the United States with the following: (1) the title of the document, record, or information; (2) the date of the document, record, or information; (3) the name and title of the author of the document, record, or information; (4) the name and title of each addressee and recipient; (5) a description of the subject of the document, record, or information; and (6) the privilege asserted by Wolford Trucking or the Tulalip Tribes. However, no documents, reports or other information created or generated pursuant to the requirements of the Consent Decree shall be withheld on the grounds that they are privileged.

43. A. Until termination of this Consent Decree, the United States and its authorized representatives and contractors shall have authority at all reasonable times to enter the Property described in Paragraph 17 to:

1) Monitor the activities required by this Consent Decree;

2) Verify any data or information submitted to the United States;

3) Obtain samples;

4) Inspect and evaluate Wolford Trucking's and the Tulalip Tribes' restoration and/or mitigation activities; and

5) Inspect and review any records required to be kept under the terms and conditions of this Consent Decree and the CWA.

B. This provision of this Consent Decree is in addition to, and in no way limits or otherwise affects, the statutory authorities of the United States to conduct inspections, to require monitoring and to obtain information from Defendants and the Tulalip Tribes as authorized by law.

VI. DISPUTE RESOLUTION

44. Any dispute that arises with respect to the meaning or requirements of this Consent Decree shall be, in the first instance, the subject of informal negotiations between the United States, Defendants, and/or the Tulalip Tribes affected by the dispute to attempt to resolve such dispute. The period for informal negotiations shall not extend beyond thirty (30) days beginning with written notice by one party to the other affected party or parties that a dispute exists, unless agreed to in writing by those parties. If a dispute between the United States and Defendants cannot be resolved by informal negotiations, then the position advanced by the United States shall be considered binding unless, within fourteen (14) days after the end of the informal negotiations period, Defendants file a motion with the Court seeking resolution of the dispute. The motion shall set forth the nature of the dispute and a proposal for its resolution. The United States shall have thirty (30) days to respond to the motion and propose an alternate resolution. In resolving any such dispute, Defendants shall bear the burden of proving by a preponderance of the evidence that the United States' position is not in accordance with the

objectives of this Consent Decree and the CWA, and that Defendants' position will achieve compliance with the terms and conditions of this Consent Decree and the CWA.

45. If the United States believes that a dispute is not a good faith dispute, or that a delay would pose or increase a threat of harm to the public or the environment, it may move the Court for a resolution of the dispute prior to the expiration of the thirty (30) day period for informal negotiations. Defendants shall have fourteen (14) days to respond to the motion and propose an alternate resolution. In resolving any such dispute, Defendants shall bear the burden of proving by a preponderance of the evidence that the United States' position is not in accordance with the objectives of this Consent Decree, and that Defendants' position will achieve compliance with the terms and conditions of this Consent Decree and the CWA.

46. The filing of a motion asking the Court to resolve a dispute shall not extend or postpone any obligation of Defendants under this Consent Decree, except as provided in Paragraph 55 below regarding payment of stipulated penalties.

47. Any dispute with the Tulalip Tribes shall be subject to the 30-day informal dispute resolution process as set forth above. If the dispute is not resolved through informal negotiations, either party may file a motion requesting that the Court resolve the dispute.

VII. FORCE MAJEURE

48. Defendants and the Tulalip Tribes shall perform the actions required under this Consent Decree within the time limits set forth or approved herein, unless the performance is prevented or delayed solely by events which constitute a Force Majeure event. A Force Majeure event is defined as any event arising from causes beyond the control of Defendants, including their employees, agents, consultants and contractors, which could not be overcome by due diligence and which delays or prevents the performance of an action required by this Consent Decree within the specified time period. A Force Majeure event does not include, *inter alia*, increased costs of performance, changed economic circumstances, changed labor relations,

normal precipitation or climate events, changed circumstances arising out of the sale, lease or other transfer or conveyance of title or ownership or possession of a site, or failure to obtain federal, state or local permits.

49. If Defendants and/or the Tulalip Tribes believe that a Force Majeure event has affected Defendants' and/or the Tulalip Tribes' ability to perform any action required under this Consent Decree, Defendants and/or the Tulalip Tribes shall notify the United States in writing within seven (7) calendar days after the event at the addresses listed in Section IX. Such notice shall include a discussion of the following:

A. what action has been affected;

B. the specific cause(s) of the delay;

C. the length or estimated duration of the delay; and

D. any measures taken or planned by Defendants and/or the Tulalip Tribes to prevent or minimize the delay and a schedule for the implementation of such measures.

Defendants and/or the Tulalip Tribes may also provide to the United States any additional information that they deem appropriate to support their conclusion that a Force Majeure event has affected their ability to perform an action required under this Consent Decree. Failure to provide timely and complete notification to the United States shall constitute a waiver of any claim of Force Majeure as to the event in question.

50. If the United States determines that the conditions constitute a Force Majeure event, then the deadline for the affected action shall be extended by the amount of time of the delay caused by the Force Majeure event. Defendants and/or the Tulalip Tribes shall coordinate with EPA to determine when to begin or resume the operations that had been affected by any Force Majeure event.

51. If the parties are unable to agree whether the conditions constitute a Force Majeure event, or whether the length of time for fulfilling the provision of the Consent Decree at issue should be extended, any party may seek a resolution of the dispute under the procedures in Section VI of this Consent Decree.

52. Defendants and/or the Tulalip Tribes shall bear the burden of proving (1) that the noncompliance at issue was caused by circumstances entirely beyond the control of Defendants and/or the Tulalip Tribes and any entity controlled by Defendants and/or the Tulalip Tribes, including their contractors and consultants; (2) that Defendants and/or the Tulalip Tribes or any entity controlled by Defendants and/or the Tulalip Tribes could not have foreseen and prevented such noncompliance; and (3) the number of days of noncompliance that were caused by such circumstances.

VIII. STIPULATED PENALTIES

53. After entry of this Consent Decree, if a Defendant fails to timely fulfill any requirement applicable to that Defendant under the Consent Decree (including Appendix C), the nonperforming Defendant shall pay a stipulated penalty to the United States for each violation of each requirement of this Consent Decree as follows:

A.	For Day 1 up to and including Day 30 of non-compliance	$1,000.00 per day
B.	For Day 31 up to and including Day 60 of non-compliance	$2,000.00 per day
C.	For Day 61 and beyond of non-compliance	$3,000.00 per day

Such payments shall be made without demand by the United States on or before the last day of the month following the month in which the stipulated penalty accrued. Tulalip Tribes shall not be subject to stipulated penalties.

54. Any disputes concerning the amount of stipulated penalties, or the underlying violation that gives rise to the stipulated penalties, that cannot be resolved by the parties pursuant to the Dispute Resolution provisions in Section VI and/or the Force Majeure provisions in Section VII shall be resolved upon motion to this Court as provided in Paragraphs 44 and 45.

55. The filing of a motion requesting that the Court resolve a dispute shall stay a Defendant's obligation to pay any stipulated penalties with respect to the disputed matter pending resolution of the dispute. Notwithstanding the stay of payment, stipulated penalties shall continue to accrue from the first day of any failure or refusal to comply with any term or condition of this Consent Decree. In the event that a Defendant does not prevail on the disputed issue, stipulated penalties shall be paid by that Defendant as provided in this Section.

56. To the extent that a Defendant demonstrates to the Court that a delay or other non-compliance was due to a Force Majeure event (as defined in Paragraph 48 above) or otherwise prevail on the disputed issue, the Court shall excuse the stipulated penalties for that delay or non-compliance.

57. In the event that a stipulated penalty payment is applicable and not made on time, interest will be charged in accordance with the statutory judgment interest rate provided for in 28 U.S.C. § 1961. The interest shall be computed daily from the time the payment is due until the date the payment is made. The interest shall also be compounded annually.

58. A Defendant liable for stipulated penalties shall make any payment of a stipulated penalty by FedWire Electronic Funds Transfer ("EFT" or wire transfer) to the U.S. Department of Justice account in accordance with instructions provided to Defendants by the Financial Litigation Unit of the United States Attorney's Office for the Western District of Washington. The payment instructions provided by the FLU will include a Consolidated Debt Collection System ("CDCS") number, which Defendants shall use to identify all payments required to be

made in accordance with this Consent Decree. The FLU will provide the payment instructions to:

Connie Sue M. Martin
Schwabe Williamson & Wyatt
U.S. Bank Centre
1420 Fifth Avenue, Suite 3400
Seattle, Washington 98101

and

James A. Tupper, Jr.
Tupper Mack Wells, PLLC
2025 First Avenue, Suite 1100
Seattle, Washington 98121

on behalf of Defendants. Any payments received by the U.S. Department of Justice after 4:00 P.M. (Eastern Time) will be credited on the next business day. Further, upon payment of any stipulated penalties, the Defendant making payment shall provide written notice, at the addresses specified in Section IX of this Decree.

IX. ADDRESSES

59. All notices and communications required under this Consent Decree shall be made to the parties through each of the following persons and addresses:

A. TO EPA:

Patrick Johnson
U.S. EPA, Region 10
Office of Regional Counsel
1200 Sixth Ave, Suite 155
Mail Stop 11-C07
Seattle, Washington 98101
johnson.patrick@epa.gov

Krista Rave-Perkins
U.S. EPA, Region 10
Enforcement and Compliance Assurance Division
1200 Sixth Avenue, Suite 155
Mail Stop 20-C04
Seattle, Washington 98101

rave-perkins.krista@epa.gov

B. TO THE UNITED STATES DEPARTMENT OF JUSTICE

Section Chief
Environmental Defense Section
Environment and Natural Resources Division
U.S. Department of Justice
P.O. Box 7611
Washington, D.C. 20044

C. TO DEFENDANT KARL FREDERICK KLOCK PACIFIC BISON LLC:

James A. Tupper, Jr.
Tupper Mack Wells, PLLC
2025 First Avenue, Suite 1100
Seattle, Washington 98121

D. TO DEFENDANT BOBBY WOLFORD TRUCKING AND SALVAGE, INC.:

Connie Sue Martin
Schwabe, Williamson & Wyatt
1420 Fifth Avenue, Suite 3400
Seattle, Washington 98101

E. TO THE TULALIP TRIBES:

Tulalip Office of Reservation Attorney
Attn: Tim Brewer
6406 Marine Drive
Tulalip, Washington 98271

Brett Shattuck
Tulalip Natural Resources Department
6406 Marine Drive
Tulalip, Washington 98271

X. COSTS OF SUIT

60. Each party to this Consent Decree shall bear its own costs and attorneys' fees in this action. Should a Defendant subsequently be determined by the Court to have violated the terms or conditions of this Consent Decree, that Defendant shall be liable for any costs or

attorneys' fees incurred by the United States in any action against Defendant for noncompliance with or enforcement of this Consent Decree.

XI. PUBLIC COMMENT

61. The parties acknowledge that after the lodging and before the entry of this Consent Decree, final approval by the United States is subject to the requirements of 28 C.F.R. § 50.7, which provides for public notice and comment. The United States reserves the right to withhold or withdraw its consent to the entry of this Consent Decree if the comments received disclose facts which lead the United States to conclude that the proposed judgment is inappropriate, improper, or inadequate. Defendants and the Tulalip Tribes agree not to withdraw from, oppose entry of, or to challenge any provision of this Consent Decree, unless the United States has notified Defendants and the Tulalip Tribes in writing that it no longer supports entry of the Consent Decree.

XII. CONTINUING JURISDICTION OF THE COURT

62. This Court shall retain jurisdiction over this action in order to enforce or modify the Consent Decree consistent with applicable law or to resolve all disputes arising hereunder as may be necessary or appropriate for construction or execution of this Consent Decree. During the pendency of the Consent Decree, any party may apply to the Court for any relief necessary to construe and effectuate the Consent Decree.

XIII. MODIFICATION

63. Upon its entry by the Court, this Consent Decree shall have the force and effect of a final judgment. Any modification of this Consent Decree shall be in writing and shall not take effect unless signed by the United States, Defendants, and the Tulalip Tribes and approved by the Court.

XIV. TERMINATION

64. This Consent Decree may be terminated by either of the following:

A. Defendants, the Tulalip Tribes, and the United States may at any time make a joint motion to the Court for termination of this Consent Decree or any portion of it; or

B. Defendants may make a unilateral motion to the Court seeking to terminate that Defendant's obligations under this Consent Decree after each of the following has occurred:

1. As to each Defendant, when that Defendant has obtained and maintained compliance with all provisions of this Consent Decree applicable to the Defendant and the CWA for twelve (12) consecutive months;

2. As to each Defendant, when that Defendant has paid all penalties and other monetary obligations hereunder and no penalties or other monetary obligations are outstanding or owed to the United States;

3. As to each Defendant, the Defendant has certified compliance pursuant to subparagraphs 1 and 2 above to the Court and all Parties; and

4. EPA, within forty-five (45) days of receiving such certification from a Defendant or Defendants, has not contested in writing that such compliance has been achieved. If EPA disputes a Defendant's full compliance, this Consent Decree shall remain in effect pending resolution of the dispute by the Parties or the Court, pursuant to section VI.

C. The Tulalip Tribes may make a unilateral motion to the Court seeking to terminate the Tulalip Tribes' obligations under this Consent Decree after:

1. The Tulalip Tribes has certified either its compliance with its obligations under this Consent Decree or its inability to comply with such obligations due to any Defendant's failure to comply with this Consent Decree; and

2. EPA, within forty-five (45) days of receiving such certification from the Tulalip Tribes, has not contested in writing that such compliance has been or

cannot be achieved. If EPA disputes the Tulalip Tribes' certification, this Consent Decree shall remain in effect pending resolution of the dispute by the Parties or the Court, pursuant to section VI.

IT IS SO ORDERED.

Dated and entered this 8th day of December, 2020.

THE HONORABLE THOMAS S. ZILLY
United States District Court Judge
Western District of Washington

The undersigned consents to the entry of this Consent Decree in *United States v. Bobby Wolford Trucking & Salvage, Inc., et al.*, subject to the public notice requirements of 28 C.F.R. § 50.7:

FOR THE UNITED STATES OF AMERICA:

United States Department of Justice
Environment and Natural Resources Division

10/19/2020
DATE

KENT E. HANSON
Environmental Defense Section
Environment and Natural Resources Division
United States Department of Justice
P.O. Box 7611
Washington, D.C. 20026

The undersigned consents to the entry of this Consent Decree in *United States v. Bobby Wolford Trucking & Salvage, Inc., et al.*, subject to the public notice requirements of 28 C.F.R. § 50.7:

FOR THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY:

Date: 10-13-2020

MARK POLLINS
Division Director
Water Enforcement Division
Office of Civil Enforcement
Office of Enforcement and Compliance Assurance
U.S. Environmental Protection Agency

The undersigned consents to the entry of this Consent Decree in *United States v. Bobby Wolford Trucking & Salvage, Inc., et al.*, subject to the public notice requirements of 28 C.F.R. § 50.7:

FOR BOBBY WOLFORD TRUCKING & SALVAGE, INC.:

10/13/2020
DATE

ROBERT C. WOLFORD
Governor
Bobby Wolford Trucking & Salvage, Inc.

October 14, 2020
DATE

CONNIE SUE M. MARTIN
Schwabe Williamson & Wyatt
U.S. Bank Centre
1420 Fifth Avenue, Suite 3400
Seattle, Washington 98101

The undersigned consents to the entry of this Consent Decree in *United States v. Bobby Wolford Trucking & Salvage, Inc., et al.*, subject to the public notice requirements of 28 C.F.R. § 50.7:

FOR KARL FREDERICK KLOCK PACIFIC BISON, LLC:

10/18/2020
DATE

DEREK KLOCK
Managing Member
Karl Frederick Klock Pacific Bison, LLC

10/19/20
DATE

JAMES A. TUPPER, JR.
Tupper Mack Wells, PLLC
2025 First Avenue, Suite 1100
Seattle, Washington 98121

The undersigned consents to the entry of this Consent Decree in *United States v. Bobby Wolford Trucking & Salvage, Inc., et al.*, subject to the public notice requirements of 28 C.F.R. § 50.7:

FOR THE TULALIP TRIBES OF WASHINGTON:

10/14/2020
DATE

DocuSigned by:
Teri Gobin
7F0A44895428425...
TERI GOBIN
Tulalip Tribes Chairwoman
6406 Marine Drive
Tulalip, Washington 98271

10.14.20
DATE

TIM BREWER
Tulalip Tribes Reservation Attorney
6406 Marine Drive
Tulalip, Washington 98271


F
E
D
C
B
A
Skykomish River
Ben Howard Rd
0
200
400ft

When Recorded Return to:

ENVIRONMENTAL COVENANT

Grantor:	Karl Frederick Klock Pacific Bison, LLC
Grantee/Holder:	Karl Frederick Klock Pacific Bison, LLC
Legal Description (abbreviated): ☐ Complete legal on EXHIBIT A	
Assessor's Tax Parcel Identification No(s):	[PLACEHOLDER] 27071000100100, 27071000100200, 27071000100300, and parts of 27071000200100, 27070300300500, and 27070300300300
Reference No. of Related Documents:	

RECITALS

a. This instrument is an Environmental Covenant ("Covenant") entered into by and between by Karl Frederick Klock Pacific Bison, LLC as both "Grantor" and "Holder" pursuant to the Uniform Environmental Covenants Act ("UECA"), Chapter 64.70 RCW.

b. This Covenant concerns real property ("Property") located in Snohomish County, State of Washington, legally described in Exhibit A, and illustrated in Exhibit B, both of which are attached. If differences exist between these two Exhibits, the legal description in Exhibit A shall prevail.

c. The Property is the subject of an environmental response project consisting of environmental restoration to be conducted under the Clean Water Act, 33 U.S.C. § 1251 *et seq*.

d. The purpose of this Covenant is to restrict activities on and uses of the Property to protect the environment, including waters of the United States and the integrity of restoration actions conducted on the Property.

e. The United States and Karl Frederick Klock Pacific Bison, LLC ("KFKPB"), Bobby Wolford Trucking & Salvage, Inc. ("BWT"), and the Tulalip Tribes entered into a Consent Decree ("CD") in the matter of *United States of America v. Bobby Wolford Trucking & Salvage, Inc. and Karl Frederick Klock Pacific Bison and Tulalip Tribes*, Civil Action No. 2:18-cv-00747-TSZ, in the United States District Court for Western District of Washington. Under the CD, KFKPB agreed to transfer the Property to the Tulalip Tribes by quitclaim deed on the condition that the Tulalip Tribes accepts the Property.

f. KFKPB agreed that it shall designate and preserve the Property as partial implementation of the terms of the CD subject to the terms and restrictions described in this Covenant, as a condition of settlement in the matter of *United States v. Bobby Wolford Trucking, et al*.

g. KFKPB desires to convey to itself as Holder this Covenant for the purpose of subjecting the property to protective provisions, restrictions, and affirmative obligations set forth herein (collectively "Activity and Use Limitations") for the protection of wetlands and waters and other environmental functions and values, and so that after the completion of restoration actions required under any court order in *United States v. Bobby Wolford Trucking, et al*., the Property shall remain substantially in a natural condition forever.

h. This Covenant grants the United States Environmental Protection Agency, Region 10 ("EPA") certain rights under UECA and as specified in this Covenant. EPA signs this Covenant as an "agency" as defined in UECA. Any right held by EPA as an "agency" under UECA and this Covenant is not an interest in real property nor is it an ownership interest which gives rise to liability under the Model Toxics Control Act ("MTCA"), chapter 70.105D RCW, or the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA"), 42 U.S.C. § 9601 *et seq*.

COVENANT

Section I. GRANT OF COVENANT

KFKPB, as Grantor and fee simple owner of the Property, hereby grants to itself, and its successors and assignees, as Holder, the following covenants. This Covenant shall be binding on KFKPB and any successors in interest. It is the intent of the Grantor that such covenants shall supersede any prior interests the Grantor has in the property, shall run with the land and shall be binding on all current and future owners of the Property, any portion of the Property, or any interest in the Property.

Section II. PURPOSE OF THE COVENANT

The purpose of this Covenant is to preserve, protect, and maintain the Property, including its air space and subsurface, in the condition substantially as it exists after the completion of restoration actions performed as required by the CD, in accordance with the restoration plan approved by a court ("Restoration Plan"), and as it naturally evolves thereafter with respect to the special structure and distribution of plant communities, the age of vegetation, and use of habitats by faunal species, without the requirement for human maintenance. Consistent with that stated purpose, by acceptance and recordation of this Covenant, KFKPB and any successors in interest are hereby restricted from using the Property, now or at any time in the future, for the purposes specifically set out below.

Section III. ACTIVITY AND USE LIMITATIONS ON THE PROPERTY

Any activity on or use of the Property by KFKPB, its successors in interest, subsequent property owners, and the personal representatives, heirs, successors, and assigns of either KFKPB or subsequent property owners, and any other occupiers and users other than activities or uses permitted under Section IV that is inconsistent with the purposes of this Covenant is prohibited. Without limiting the generality of the foregoing, and except when an activity approved by and conducted in accordance with the Restoration Plan is necessary to accomplish restoration or maintenance requirements, the following activities and uses are expressly prohibited in, on, over, and under the Property:

A. Structures. The construction of man-made structures, including, but not limited to the construction, removal, placement, preservation, maintenance, alteration, or decoration of any buildings, roads, paths, utility lines (other than the existing Bonneville Power Administration lines), billboards, or other advertising. This restriction does not include bat boxes, bird nesting boxes, bird feeders, bee boxes, and the placement of signs or fences for safety purposes or boundary demarcation. Temporary access roads for the purpose of restoration activities shall not be prohibited uses. Temporary structures for traditional cultural uses and low impact foot paths to reach such structures shall not be prohibited uses.

B. Demolition. The demolition of fencing structures constructed for the purpose of demarcation of the Property for public safety.

C. Soils. Any activities that cause the removal, excavation, disturbance, or dredging of soil, sand, peat, gravel, or aggregate material of any kind, or any change in the topography of the land, including any discharges of dredged or fill material, ditching, extraction, drilling, driving of piles, mining, or excavation of any kind, except as conducted as part of the Restoration Plan, , or as permitted by the United States Army Corps of Engineers ("Corps") for activities consistent with the requirements of this Covenant.

D. Waters and Wetlands. Any human activities, other than those conducted in accordance with the Restoration Plan, that cause the draining, dredging, damming, flooding, impounding, changing the grade or elevation, impairing the flow or circulation, or reducing the reach of waters, including wetlands.

E. Waste or Debris. The storage, dumping, depositing, abandoning, or discharging of materials or debris of any nature on, in, over, or underground or into surface or groundwater, except for storm water discharges that would naturally flow to the waters and wetlands in their restored and enhanced conditions and any maintenance associated with those storm water discharges. This prohibition does not apply to any materials or debris on the Property at the time of the entry of the CD referenced above or the completion of restoration provided for the in CD.

F. Non-Native Species. The planting or active introduction of non-native plant or faunal species.

G. Herbicides, Insecticides and Pesticides. The use of herbicides, insecticides, or pesticides, or other chemicals, except as may be necessary to control invasive plant species that threaten activities conducted under the Restoration Plan and the natural character of the Property. State-approved municipal application programs necessary to protect the public health and welfare shall not be prohibited uses under this provision.

H. Removal of Vegetation. The mowing, cutting, pruning, or active removal of any kind, including disturbance, destruction, or the collection, of any trees, shrubs, or other vegetation, except for pruning, cutting or removal for:

i. Safety purposes;

ii. Control in accordance with accepted forestry management practices for diseased vegetation;

iii. Control of non-native species and noxious weeds;

iv. Scientific or nature study; or

v. Collection of native species by the Tulalip Tribes for traditional cultural uses.

I. Agricultural Activities. Use of any portion of the Property for agricultural, horticultural, aquacultural, silvicultural, livestock production, or grazing activities, except that crops planted in accordance with an existing lease of certain portions of the Property may continue to be planted, cultivated and harvested to the extent that those activities do not delay or otherwise interfere with implementation of the Restoration Plan.

J. Industrial, Commercial and/or Residential Activities. Conversion of or expansion onto, any portion of the Property for industrial, commercial, or residential activities.

K. Other. Other acts, uses, excavation, or discharges which adversely affect fish and other faunal species habitat or interfere with the preservation of lands, waterways, or other aquatic resources on the Property.

The Activity and Use Limitations imposed by the Covenant shall apply to the Property, and any subdivided portion thereof, in perpetuity unless terminated by court order, or by consent or other event specified by and pursuant to UECA. Each Activity and Use Limitation imposed by the Covenant shall run with the land, shall pass with each and every portion of the Property, and shall apply to and bind all successors in interest, and their lessees, authorized agents, employees, or persons acting under their direction or control. The Activity and Use Limitations contained in this Covenant do not apply to, nor have any effect on, any property owned by KFKPB other than the Property described in this Covenant.

IV. PERMITTED USES

Notwithstanding the foregoing, this Covenant shall not apply to any use or activity associated with any work on the Property required by the Restoration Plan, including construction, planting, maintenance, monitoring, long-term management, or any other restoration work specified therein.

Notwithstanding the foregoing, this Covenant shall not apply to any interest, right-of-way, easements, or other property rights for the operation and maintenance of pre-existing structures or infrastructure such as buildings and utilities that are present on, over, or under the Property senior to the interest of KFKPB in the property. or established prior to the recording date of this Covenant.

Notwithstanding the foregoing, the Activity and Use Limitations contained in this Covenant will not apply to, nor have any effect on, any treaty rights, including any treaty rights of the Tulalip Tribes, including tribal member access for gathering, hunting, fishing, cultural ceremonies and temporary camps.

V. RIGHT OF INSPECTION AND ACCESS TO THE PROPERTY

EPA shall have the right to enter, go upon, and inspect the Property, and to take such actions as are reasonably necessary to monitor and verify compliance with this Covenant one time per year, and at other times if EPA provides prior reasonable notice of additional inspections. Except in the event of an emergency or if EPA has reasonable evidence that a violation of this Covenant is or has occurred, such entry shall be upon prior reasonable notice to the property owner.

VII. BREACH AND CURE OF ACTIVITY AND USE LIMITATIONS

If KFKPB, or its successors in interest, become aware of any event or action that constitutes or may constitute a breach of the Activity and Use Limitations, KFKPB, or its successors in interest, shall notify EPA within thirty (30) days of becoming aware of the event or

action, and KFKPB, or its successors in interest, shall remedy any breach of the Activity and Use Limitations within sixty (60) days of becoming aware of the event or action, or such other time as may be reasonable to remedy the breach, or as agreed to by KFKPB, or its successors in interest, and EPA.

VIII. ENFORCEMENT

KFKPB, and its successors in interest; EPA or its successor; the State of Washington Department of Ecology ("Ecology"); any person whose interest in the Property or whose collateral or liability may be affected by the alleged violation of the Covenant; and any municipality or other unit of local government in which the Property is located shall have authority to enforce this Covenant by maintaining a civil action for injunctive or other equitable relief against any person or entity that violates or attempts to violate this Covenant, including the owners of the Property and any other person in possession of or using the Property, provided that no violation of this Covenant shall result in a forfeiture or reversion of title. In any enforcement action, EPA or any holder or other enforcing party shall be entitled to a complete restoration for any violation. The Covenant may not be enforced against KFKPB as to violations of the Covenant committed by a third party, EPA or another state or federal agency.

Notwithstanding its rights under this Covenant, EPA shall be entitled to any other judicial remedy available at law, such as civil or criminal penalties. EPA's rights under this Covenant are in addition to, and shall not limit, enforcement rights available under other provisions of law, under any applicable permit or certification, or under the any court order. Nothing herein shall limit the right of the Corps to modify, suspend, or revoke any applicable permit.

No omissions or delay on the part of EPA or any holder or other enforcing party at any time in acting to require performance of any term of this Covenant shall be taken or held to be a waiver of such term or in any way affect the rights of EPA or any holder or enforcing party to enforce such term.

VIV. RESERVATION OF RIGHTS

Notwithstanding any provision of this Covenant, EPA retains all access and enforcement authorities under any applicable statute or rule. Nothing in this Covenant shall affect the ability of EPA to enforce the terms of any Consent Decree or any other agreement relating to the restoration of the Property entered into by EPA and KFKPB or any other party. Nothing in this Covenant shall affect the obligations of KFKPB or any other responsible party under such Consent Decrees or any other agreement relating to the Property.

X. RECORDATION OF THE COVENANT AND COPIES

KFKPB shall record this Covenant in the county recorder's office of Snohomish County in which the Property is located within sixty (60) days of executing this Covenant. KFKPB shall provide EPA with proof of recordation within thirty (30) days of recordation.

KFKPB, or its successors in interest, shall record any amendment or termination of this Covenant in the county recorder's office of Snohomish County in which the Property is located within sixty (60) days of executing such an amendment or termination. KFKPB, or its successors in interest, shall provide EPA with proof of recordation within thirty (30) days of the recordation.

In addition, KFKPB, or its successors in interest, shall provide a copy of the recorded Covenant and any recorded amendment or termination of this Covenant to the following: (a) each person identified in Exhibit C or later identified as holding a recorded interest in the Property; (b) each person in possession of the Property at the time the Covenant, amendment, or termination is recorded; (c) Snohomish County; and (d) Ecology. Neither EPA nor Ecology has required notice to any other party. The validity of this Covenant is not affected by failure to provide a copy of the Covenant as required under this section.

XI. MODIFICATION

Modifications, changes, or alterations to the provisions in this Covenant must be by amendment to this Covenant made in writing and executed by KFKPB, or its successor in interest, and EPA. Any amendment to this Covenant by consent of KFKPB, or its successor in interest, and EPA must be consistent with the CD, the Restoration Plan, and the conservation purposes of this Covenant. Except for an assignment undertaken pursuant to a governmental reorganization, assignment of this Covenant to a new holder is an amendment and requires consent of KFKPB, or its successor in interest, and EPA.

XII. TERMINATION

This Covenant and the Activity and Use Limitations contained therein is perpetual unless EPA determines that the intended benefits of the Covenant can no longer be realized and it is so ordered by a court, or by consent of KFKPB, or its successor in interest, and EPA.

All costs of terminating this Covenant, including the cost of any remediation or abatement of any environmental condition related to the Activity and Use Limitations pertaining to the Property, shall be borne by the party seeking such termination.

XIII. NOTICE OF AND CONVEYANCE OF THE PROPERTY

KFKPB or any successor in interest shall provide written notice to EPA in which the Property is located, including the name and address of all then-owners and/or occupants of the Property, or any part thereof at least thirty (30) days prior to the transfer of a specified interest in the Property or any part thereof. Any successor in interest to KFKPB shall incorporate the terms of this Covenant in any deed or other legal instrument that transfers any interest in all or a portion of the Property. Interests subject to this Covenant include, but are not limited to, changes

in use of the Property, application for building permits located within the Property, or proposals for any site work within the Property other than pursuant to the Restoration Plan. EPA shall not, by reason of this Covenant, have the ability to approve, disapprove, or otherwise affect the conveyance of the Property except as provided by law. This condition shall not apply to any conveyance by KFKPB to the Tulalip Tribe under a quit claim deed provided for in the CD.

XIV. CONCURRENCE OF SUBSEQUENT OWNERS PRESUMED

All subsequent transferees, purchasers, lessees, or possessors of the Property shall be deemed by their acceptance of title, purchase, leasing, or possession of the Property to be in accord with the provisions of this Covenant and to agree for and among themselves, and their successors in interest, that the Activity and Use Limitations established herein must be adhered to and that their interest in the Property shall be subject to the such Activity and Use Limitations. Any and all obligations of KFKPB under this Covenant shall terminate upon recordation of the conveyance by KFKFB to the Tulalip Tribe under a quit claim deed provided for in the CD.

XV. NOTICES

All notices required or permitted to be given hereunder shall be in writing and mailed in the United States Mail, postage prepaid, by certified or registered mail, return receipt requested, to the appropriate address indicated below or at such other place or places as KFKPB, or its successors-in interest, EPA or its successors-in-interest, may, from time to time designate in a written notice provided to the other. Notices deposited in the United States Mail in accordance with the terms of this provision shall be deemed received three (3) days after the date of mailing.

OWNER/HOLDER: Karl Frederick Klock Pacific Bison, LLC

EPA: United States Environmental Protection Agency, Region 10
Attn: Krista Rave-Perkins, Wetland Enforcement Specialist
1200 Sixth Avenue, Suite 155, M/S 20-C04
Seattle, Washington 98101

XVI. PARTIAL INVALIDITY AND SEVERABILITY

If any portion of this Covenant, terms set forth therein, or the application thereof to any person or circumstance is determined to be invalid for any reason, the remaining provisions of this Covenant, or application of such provision to persons or circumstances other than those as to which it has been found invalid shall remain in full force and effect as if such invalidated portion had not been included therein.

EFFECTIVE DATE

The effective date of this instrument shall be the date the fully executed Covenant is recorded at the county recorder's office.

EXECUTED as of the date the last party executes.

GRANTOR:
Karl Frederick Klock Pacific Bison, LLC

By: _____
Name: _____

GRANTEE/HOLDER:
Karl Frederick Klock Pacific Bison, LLC

By: _____
Name: _____

AGENCY:
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, REGION 10

By: _____
Name: _____

STATE OF WASHINGTON } ss.

COUNTY OF _____

I certify that I know or have satisfactory evidence that _____ is the person who appeared before me, and said person acknowledged that (he/she) signed this instrument, on oath stated that (he/she) was authorized to execute the instrument and acknowledged it as the _____ of Karl Frederick Klock Pacific Bison, LLC, to be the free and voluntary act of such party for the uses and purposes mentioned in the instrument.

DATED this _____ day of _____ , 2020.

_____
Printed Name _____
NOTARY PUBLIC in and for the State of Washington, residing at _____
My Commission Expires _____

4837-0044-0265, v. 1

Klock Property Ecosystem Restoration - Basis of Design

Prepared for submission to the Court as an appendix to the Consent Decree in *United States v. Bobby Wolford Trucking & Salvage, Inc. and Karl Frederick Klock Pacific Bison, LLC*, No. 2:18-cv-747-TSZ (W.D. Wash.)

Prepared by –

Lyndon C. Lee, Ph.D. PWS
L.C. Lee & Associates, Inc.

Paul DeVries, Ph.D. PE
R2 Resource Consultants

Brett Shattuck
Restoration Ecologist
Tulalip Tribes

June 22, 2020

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Appendices

1. Introduction and Objectives

This Basis of Design (BOD) report focuses on restoration of the structure and functioning of waters of the United States, including wetland ecosystems (waters/wetlands) on a portion of the Klock Property. This property consists of an approximately 187.9-acre area within the overall Klock holdings. It is located east of the City of Monroe along the south bank (river left) of the Skykomish River in unincorporated Snohomish County, Washington (Figures 1 and 2; Photographs 1 and 2). The latitude/longitude coordinates for the approximate centroid of the Klock Property are 47° 50' 54.86" N/121° 53' 37.22" W. Ben Howard Road forms the south boundary of the Klock Property. The property is located within Section 10, Township 27 North, Range, 7 East. It is comprised of Snohomish County Tax Parcel Nos. 27071000100100, 27071000100300, and 27071000100200 and parts of 27070300300300, 27070300300500, 27071000200100. These latter three tax parcels will be the subject of a lot line adjustment.

The two main objectives of this BOD are to -

(1) Describe and specify appropriate measures to mitigate impacts of stream re-routing, mechanical clearing, filling, and earthwork activities within the riverine waters/wetlands that occur on the Klock Property with the goal of restoring natural riverine waters/wetland ecosystem structure and functioning.

(2) Provide Design Criteria and Performance Standards including grading, sediment and erosion control, and planting plans, work sequencing, Project Targets, and Project Standards and other materials that will be necessary to successfully execute restoration measures on the Klock Property.

2. Background

The Klock Property is owned by Karl Frederick Klock Pacific Bison, LLC. The restoration measures that are the focus of this BOD are part of a negotiated settlement between Karl Frederick Klock Pacific Bison, LLC (Klock), Bobby Wolford Trucking & Salvage, Inc. (BWT), and the U.S. Environmental Protection Agency (EPA) resolving alleged violations of the Clean Water Act. This BOD incorporates and builds upon past work by Anchor QEA completed in August of 2017. It uses elements of the Anchor BOD combined with new work to refine the restoration approach to tailor it to the current settlement agreement.

The Klock Property is the main focus of this BOD because this is the area where stream rerouting, mechanical clearing, filling, and earthwork activities were undertaken by Klock and BWT (Figure 2; Photographs 1, 2, 3, 4, 5, 6, 7). The Klock Property includes a large generally "U" shaped secondary river channel or Main "Oxbow" system that has been part of the active floodplain and channel system of the Skykomish River since at least 1938. Depending on the water surface elevation or "stage" of frequently occurring (2-5 year recurrence interval events) flood events or floodwaters, this Main Oxbow system is be directly and regularly connected to

the Skykomish River at both its upstream and downstream ends during moderate to high water events in the main channel of the Skykomish River (Photographs 1, 2, 3, 4, and 6).

The eastern portions of the Main Oxbow system include a complex network of small secondary and tertiary channels that are embedded within it and which are regularly inundated by and connected to flood flows from the main channel of the Skykomish River. In addition, a perennial tributary stream enters the southeastern portion of the Klock Property via a culvert that was installed by Snohomish County through the ballast/fill prism of Ben Howard Road. The tributary then flows generally west on the Klock Property in an excavated ditch/swale system that was developed by Klock to direct stream flow to the west. The ditch/swale system runs generally parallel to Ben Howard road until it reaches a culvert that was installed by Klock (Photographs 6 and 7). The stream then flows north for approximately 500 ft. until it intersects and flows into the Main Oxbow channel (Figure 3 – Areas 4.1.1 and 4.1.2). The area that includes the junction of the Main Oxbow system and the southeastern tributary stream is dominated by a mosaic of relatively degraded third or fourth growth forested, scrub/shrub, and emergent waters/wetlands. This mosaic also includes seasonal ponds and shallow open water features that flow when they are connected to the main channel of the Skykomish River and exist as residual ponded features when water levels recede. Some agricultural and Christmas tree production areas are also included in the Klock Property (Figures 2 and 3).

3. Overview of the Klock Property Ecosystem Restoration Goals

A. Overall Goal - The overall goal of recommended work on the Klock Property is to restore natural riverine waters/wetland ecosystem structure and functioning within the project area.

B. Secondary Goals - In order to accomplish the Overall Goal of the restoration we have articulated several secondary goals as follows:

1. Reconnect the Main Oxbow to the main channel of the Skykomish River by excavating the Main Oxbow outlet fill and redistributing clean fill on site and excavating the Main Oxbow reconnection channel through the fill removal area and redistributing clean fill materials on-site. (Work areas 1.1, 1.2 and 1.1.2 in Figure 3)

2. Connect the existing secondary and tertiary channel network that exists within the northeast section of the Main Oxbow system to the main channel of the Skykomish River by excavating a channel north of the North/South access road and redistributing clean fill materials on-site. (Work areas 1.1,1.2, and 1.1.2 in Figure 3)

3. Clean up the Central Disposal Pit area by:

    a. Excavating the south end of Central Pit access road and redistributing clean fill materials on-site (Work area 2.1.1 in Figure 3)

b. Excavating the North end of pit access road and redistributing clean fill materials on-site. (Work area 2.1.2 in Figure 3)
c. Cleaning up the Central Pit area as necessary to satisfy Federal, Washington State, and Snohomish County requirements. (Work area 2.2 in Figure 3)

4. Complete bulk and fine grading and site clean-up work to support establishment of a forested plant community. (Work area 2.2 in Figure 3)

5. Maintain access and maintenance vehicle circulation on the site by creating
a. An at-grade crossing at north end of north-south access road. (Work area 3.1.1 in Figure 3)
b. An at-grade crossing in middle of north-south access road. (Work Area 3.1.2 in Figure 3)

6. Reestablish waters/wetland conditions at several sites within the Main Oxbow complex by removing fill at stations 57+00; 65+00 & 68+00 at the south end of the north-south access road, and by redistributing clean fill materials on site (Work areas 3.1.1, 3.1.2, and 3.1.3 in Figure 3)

7. Restore the small tributary stream that enters the southeastern portion of the Klock property by removing the stream from the existing culvert and routing it through a newly excavated tributary channel system. This restored stream will have a riparian buffer that is 50 ft. in width on the left and right channel banks. The 50-ft. width will be measured from the left and right channel bank ordinary high water marks. During the process of excavating the new channel, the existing pipe/culvert will be destroyed and abandoned or removed and disposed and clean fill materials from the newly excavated channel will be redistributed on site. (Work area 4.1.1 and 4.1.2)

8. Clean up the western side of the Main Oxbow system by removing all plastic hay bales from the SW Corner of the Main Oxbow and by hauling off and disposing of these materials off site. (Work area 5.1 in Figure 3)

9. Remove unauthorized fill materials from the main channel of the Skykomish River at low water by removing concrete blocks and solid/non-granular materialsin the river channel and along the river bank at the NE corner of the site. These materials will be hauled off site and disposed. (Work area 6.1 in Figure 3)

10. Establish a mosaic of forested, scrub/shrub, and emergent native plant communities throughout the project area by -

a. Purchasing and propagating bare root conifers, and on-site cuttings/live stakes of native willows, black cottonwoods, and native shrubs
b. Installing native plants as specified, and
c. Completing necessary weed control and if, necessary, temporary irrigation measures that will allow restoration plantings to become established and thrive.

4. Construction Approach

A. Permitting, Staffing, Workforce: The construction approach to the Klock Property restoration will involve obtaining necessary U.S. Federal, Washington State, and Snohomish County permits. It will include bulk and finish earthwork, site cleanup, site stabilization/sediment and erosion controls, procurement, propagation and planting of native species, weed controls, and if necessary, temporary irrigation. Consistent with the terms and conditions of the Consent Decree, BWT will be responsible for permitting, earthwork, site cleanup, initial site stabilization/sediment and erosion controls, and procurement or propagation of native plants. The Tulalip Tribes will perform Construction Oversight, planting operations, weed control, and if necessary, irrigation.

In the process of executing this restoration project, grading and earthwork areas need to be initially graded in bulk and any required cleanup of unsuitable materials should be completed. These activities will be the responsibility of BWT. Then, achievement of finish grades suitable for restoration plantings and development of faunal habitat complexity should be directed by a qualified wetland scientist/ecologist who is a member of the Construction Oversight Team (COT). "Finish" grades can include lofting of any compacted soils via two-way discing or shallow tillage to break up soil compaction and increase aeration porosity in the upper parts of soil profiles.

B. Timing - Restoration activities are designed and presented in this BOD with the assumptions that construction/earthwork will take place during the dry season of the year in which all necessary permits are obtained. Although conditions in any given year vary, the dry construction season in the Puget Sound lowlands usually spans the interval from July 1 - September 30 in any given year. This BOD also assumes that any in-water work will occur during "fish windows" specified by the Washington State Department of Fish and Wildlife. EPA shall be notified a minimum of ten days in advance of the commencement of any construction/earthwork on the Klock Property.

C. Staging Areas and Equipment Access Routes - Restoration activities at the Klock Property will involve commissioning and decommissioning of staging areas and access roads (nonpermanent features not identified in the final design) and may include seeding of areas disturbed by construction activity, where appropriate. Any native vegetation removed during construction will be bucked and neatly scattered along the access routes within the site limits. Nonnative and invasive vegetation will be hauled off site, composted, buried, or burned consistent with the requirements of fire season burn bans. Staging areas will be returned to preconstruction grades and stabilized with appropriate erosion and sediment control "Best Management Practices" (BMPs). Restoration and erosion and sediment control BMPs may be necessary along the heavy equipment access routes.

D. Sediment and Erosion Control Systems - As introduced above, construction activities will occur during dry periods in the summer and early fall months. Standard construction BMPs will be used to prevent water turbidity, erosion, and sedimentation. Washington State Department of Transportation standard sediment and erosion control BMP's are offered at:

https://wsdot.wa.gov/Design/Standards/default.htm#StandardPlans

In addition, Appendix 2 (Construction Plans, Sheet C-20) of this BOD report offers standard/typical drawings for revegetation measures.

These BMPs include but are not limited to various types of sediment fencing, energy dissipation structures, coverage of stockpiles, use of pump/biobag systems, placement of organic matter, and hand or hydro seeding techniques for exposed soils with specified native upland, wetland, or riparian seed mixes.

BWT shall be prepared to deal with potential river and stream runoff and wet conditions within specified construction intervals and in intervening periods when the site is too wet to work. After bulk and finish grade earthwork and contouring is completed, graded areas will be seeded with an appropriate native seed mix. Upland graded areas that are relatively well drained will be seeded with a native upland seed mix. Graded areas that are somewhat poorly drained, poorly drained, and/or wetland will be seeded with a wetland seed mix. Seeding shall occur between March 15 and September 15 and may include the application of an approved fertilizer, seed, and mulch purchased by BWT.

E. Species and Habitat Protections - BWT is responsible for all necessary species and habitat protection measures per U.S. Federal, Washington State, and Snohomish County permit and regulatory requirements. As introduced above in this section, construction activities will occur during dry periods in the summer and early fall months. Any in-water work will occur within specified "fish windows" identified by the State of Washington Department of Fish and Wildlife. Water diversion and fish removal and exclusion measures will be conducted in association with any in-water work and permit requirements. Care will be taken to ensure that (a) no waters/wetland areas are disturbed in the process of establishing site access, and (b) established native vegetation will be maintained as much as possible. Erosion and sedimentation BMPs will be used to prevent harm to faunal species and their habitats due to the occurrence of conditions such as water turbidity, high energy water flows, erosion, and sedimentation.

5. Hydrologic Records and Calculations

A. Skykomish River – Summary of Early Anchor QEA Analyses

The Skykomish River is the primary source of surface water to the Klock property during flood events. A gage analysis was performed by Anchor QEA (August, 2017) to characterize flow conditions when Light Detection and Ranging (LiDAR) was flown on November 7 and 8, 2003, and additionally on April 7, 2014 (Figures 3 and 4). The Anchor QEA analysis was performed in an effort to understand differences between the 2003 and 2014 LiDAR sets and to approximate an ordinary high water elevation for restoration planning and permitting purposes.

The Anchor QEA hydrologic analysis was performed using daily flow data from U.S. Geological Survey (USGS) gage 12150800, Snohomish River near Monroe, Washington. This gage is

located ten river miles downstream of the Klock Property at the Highway 522 bridge and best represents flow conditions on the site because it is the gage with the closest proximity to the Klock Property. Mean daily discharge and flow stage data were compiled for the days LiDAR data were collected to compare flow conditions in the Skykomish River and determine if differences in elevation could be attributed to standing water on the site (Table 1 and Figure 5). Annual peak flow data were also ranked for 53 years of record to determine the magnitude of flow events that may cause minor flooding outside of the Main Oxbow channel. The 2014 LiDAR data set was identified as having been flown on the rising limb of the flow hydrograph. At the time of the flight, water levels were still well below a 2 or 3-year events. This means that some minor differences in water surface elevations are to be expected in the Main Oxbow channel. However, significant differences in water surface elevations outside the Main Oxbow channel represent post-2003 earthwork and site modifications on the Klock Property. Figure 7 shows water depths in the main oxbow system on the Klock Property over the estimated historical terrain from 2003 LiDAR (*Prior to* Klock/BWT Operations). The water depth plot is for a recurrence interval flooding event of approximately 2 years. River discharge volume (Q) = 47,000 cubic feet per second (cfs) at the Klock Property, 1-D and 2-D modeling results of OHW.

Figure 8 shows water depths in the main oxbow system on the Klock Property over the existing terrain from 2014 LiDAR (*Post* Klock/BWT Operations). The water depth plot is for a recurrence interval flooding event of approximately 2 years. River discharge volume (Q) = 47,000 cfs at the Klock Property, 2-D modeling results of OHW.

B. Anchor QEA Characterization of the Southeastern Unnamed Tributary Stream

In August of 2017, Anchor QEA examined peak flow hydrology in the unnamed stream system that flows into the Klock Property through a culvert installed under Ben Howard Road at the southeast corner of the Klock Property. Flow in this stream system was estimated using regression equations for streams in Washington Hydrologic Region 2 (Knowles and Sumioka 2001; Sumioka et al. 1998) and the online StreamStats program for Washington (USGS 2012). The regression equations estimate peak flows for specified return periods including the 25-year and 100-year events (Figure 6). The values were used in the assessment and sizing of culverts and at-grade crossings are shown in Table 2.

C. Flood Modeling for the 2020 Klock Property Ecosystem Restoration Basis of Design

In developing this BOD, we considered the June 2017 Anchor QEA hydrologic data summarized immediately above and combined these data with our field observations of reference conditions on the Klock Property and additional hydrologic analyses. Appendix 3 presents the technical basis of hydraulic modeling used in developing and assessment of proposed earthwork actions for the Klock Property Ecosystem Restoration BOD. Appendix 4 provides an "Evaluation of Effects of Proposed Floodplain Restoration Activities on 100-year Flood Peak Water Surface Elevation." In general, the reference conditions that do exist on the Klock Property appear to be "oversized." In other words, reference channel cross sectional and longitudinal geometries are

generally large enough to accept frequently occurring flows from the Skykomish River main channel system. Recognizing that the Skykomish River is a large and powerful system, our design approach in this BOD allows for a natural evolution of the preliminary Main Oxbow and channel cuts required by this BOD. This evolution will be driven in timing and scope by natural river processes that occur during frequently occurring and large flood events within the Skykomish River.

6. Design Criteria and Performance Standards

Table 3 lists restoration tasks on the Klock Property assuming execution of an environmental covenant that is part of the negotiated settlement. Figures 9 and 10 show the Klock Property task work areas listed in Table 3 on a LiDAR map base (Figure 9) and an Orthophoto Map base (Figure 10). The work area numbers in Figures 9 and 10 are registered to Table 3 tasks. Below, each restoration task is introduced, a Task Lead is assigned, and the work necessary to complete the task is discussed, specified, and if appropriate, keyed to the construction drawings in Appendix 2. In addition, performance standards in the form of Project Targets and Project Standards are specified for each task and summarized for all tasks in Table 4.

A. Task 0 – Permitting (Task Lead is BWT)

1. This BOD was developed to support required Federal, Washington State, and Snohomish County permitting for the Klock Property restoration (Table 5 lists potential required permits). Consistent with conditions in the Consent Decree for this case, all permitting, including the cost to obtain necessary permits, and compliance with all permit conditions is the responsibility of BWT.

2. Performance Standards:

Project Target = Obtain all necessary Federal, Washington State and Snohomish County permits

Project Standard = All necessary permits obtained prior to commencement of work

B. Task 1 – Main Oxbow Restoration (Task Lead is BWT)

1.1 Excavate the Main Oxbow outlet floodplain fill & redistribute clean fill on site.

a. Sediment and Erosion Control Systems

1. Construction activities will occur during dry periods in the summer and early fall months.

2. Standard construction BMPs will be used to prevent water turbidity, erosion, and sedimentation. Washington State Department of Transportation standard sediment and erosion control BMP's are offered at:

https://wsdot.wa.gov/publications/fulltext/Standards/english/PDF/h10.10-00_e.pdf

https://wsdot.wa.gov/publications/fulltext/Standards/english/PDF/h10.15-00_e.pdf

In addition, Appendix 2 (Construction Plans, Sheet tC-20) for this BOD report offers standard/typical drawings for some sediment and erosion control measures. These BMPs include but are not limited to various types of sediment fencing, energy dissipation structures, coverage of stockpiles, distribution of organic material, use of pump/biobag systems, and hand or hydro seeding of exposed soils with specified upland, wetland or riparian native seed mixes.

3. BWT will be prepared to deal with potential river and stream runoff and wet conditions within specified construction intervals and during intervening periods when the site is too wet to work.

4. After bulk and finish grade earthwork and contouring is completed, graded areas will be hand or hydro seeded with an appropriate native upland, wetland, or riparian seed mix Tables 22, 23, 24, and 25.

5. Seeding shall occur between March 15 and September 15 and may include the application of an approved fertilizer, seed, and mulch.

b. Species/Habitat Protections

1. BWT is responsible for all necessary species and habitat protection measures per U.S. Federal, Washington State, and Snohomish County permit and regulatory requirements.

2. Construction activities will occur during dry periods in the summer and early fall months. Although conditions in any given year vary, the dry construction season in the Puget Sound lowlands usually spans the interval from July 1-September 30 in any given year.

3. Any in-water work will occur within specified "fish windows" identified by the State of Washington Department of Fish and Wildlife.

4. Water diversion and fish removal and exclusion measures will be conducted in association with any in-water work and permit requirements.

5. Care will be taken to ensure that (a) no waters/wetland areas are disturbed in the process of establishing site access, and (b) established native vegetation will be maintained as much as possible.

6. Erosion and sedimentation BMPs as described immediately above will be used to prevent harm to faunal species and their habitats due to the possible occurrence of conditions such as water turbidity, high energy water flows, erosion, and sedimentation.

c. Earthwork

1. Bulk excavations and redistribution of excavated fill

(a) The goal of the excavation under this task is to restore the floodplain topography in the vicinity of the oxbow outlet to resemble topography prior to the alleged Clean Water Act violations. The grading design accomplished this by comparing LiDAR data collected in 2004 against the EPA's 2014 LiDAR data. The comparison indicated the cut should start at around elevation 78 and extend up to elevation 81, with finished grading elevation contour lines situated at approximately the same locations as before (Construction Plans, Sheets C-1 and C-12).

(b) Sorting of fill materials - Throughout this task, BWT shall identify any excavated fill materials that are suitable and unsuitable for redistribution on the Klock Property. BWT determinations will be checked daily (or more frequently if necessary) by the COT to evaluate compliance with all restoration grading plans, permit conditions, and applicable laws. This sorting function will facilitate compliance with Federal, State, and County requirements regarding handling of unsuitable fill materials or hazardous waste. Suitable fill materials will be cleared for on-site redistribution. Unsuitable fill materials or hazardous waste will be hauled off site and disposed of consistent with all Federal, State, and County permit requirements.

2. Finish grades, including microtopographic features such as mounding, excavation of small floodplain depressions, or installation of large wood for habitat features will be directed in the field by a qualified wetland scientist/ecologist who is a member of the COT.

d. Performance Standards

Project Target = Remove approximately 16,470 yds^3 of fill material from the downstream end of the Main Oxbow floodplain and redistribute clean fill on the Klock Property.

Project Standard = Remove specified fill volumes and achieve bulk and finish grade elevations and earthwork contours consistent with Construction Plans, Sheet C-11 and C-12.

1.2 Excavate oxbow reconnection channel through fill removal area and redistribute clean fill materials on-site

a. Sediment and Erosion Control Systems - as above for Task 1.1 (Tables 22, 23, 24 and 25 for erosion Control Mixes)

b. Species/Habitat Protections - as above for Task 1.1

c. Earthwork

1. Bulk excavations and redistribution of excavated fill

(a) Sorting of fill materials - Throughout this task, BWT shall identify any excavated fill materials that are suitable and unsuitable for redistribution on the Klock Property. BWT determinations will be checked daily (or more frequently if necessary) by the COT to evaluate compliance with all restoration grading plans, permit conditions, and applicable laws. This sorting function will facilitate compliance with Federal, State, and County requirements regarding handling of unsuitable fill materials or hazardous waste. Suitable fill materials will be cleared for on-site redistribution. Unsuitable fill materials or hazardous waste will be hauled off site and disposed of consistent with all Federal, State, and County permit requirements.

2. Finish grades, including microtopographic features such as mounding, excavation of small floodplain depressions, or installation of large wood for habitat features will be directed in the field by a qualified wetland scientist/ecologist who is a member of the COT.

d. Performance Standards

Project Target = Reconnect the downstream end of the Main Oxbow to the Skykomish River, using cut volume sufficient to meet the total 32,000 CY requirement.

Project Standard = reconnection achieved consistent with the Construction Plans, Sheets C-11 and C-12.

1.3 Excavate channel north of North/South access road & redistribute clean fill materials on-site

a. Sediment and Erosion Control Systems - as above for Task 1.1 and see Tables 20 and 21 for erosion control mixes.

b. Species/Habitat Protections - as above for Task 1.1

c. Earthwork

1. Bulk excavations and redistribution of excavated fill

(a) The goal of the excavation under this task is to restore a high flow channel topography in the vicinity of the powerlines to resemble topography prior to the Clean Water Act non-compliance actions. The grading design accomplished this by comparing LiDAR data collected in 2004 against the EPA's 2014 LiDAR data. The comparison indicated the cut invert should be around elevation 77, and the side slopes should be relatively steep to match upstream and downstream slopes of the adjacent floodplain terrace edge. The width of the cut is approximately in line with upstream and downstream portions that were not filled (See Construction Plans, Sheet C-10).

(b) Sorting of fill materials - Throughout this task, BWT shall identify any excavated fill materials that are suitable and unsuitable for redistribution on the Klock Property. BWT determinations will be checked daily (or more frequently if necessary) by the COT to evaluate compliance with all restoration grading plans and permit conditions. This sorting function will facilitate compliance with Federal, State, and County requirements regarding handling of unsuitable fill materials or hazardous waste. Suitable fill materials will be cleared for on-site redistribution. Unsuitable fill materials or hazardous waste will be hauled off site and disposed of consistent with all Federal, State, and County permit requirements.

2. Finish grades, including microtopographic features such as mounding, excavation of small floodplain depressions, or installation of large wood for habitat features will be directed in the field by a qualified wetland scientist/ecologist who is a member of the COT.

d. Performance Standards

Project Target = Remove and redistribute clean fill to achieve reconnection of this northern end of the secondary/tertiary channel network to the main Skykomish River channel

Project Standard = reconnection achieved consistent with the Construction Plans, Sheet C-10.

C. Task 2.1 – Central Pit Access Road (Task Lead is BWT)

2.1.1 Excavate south end of Central Pit access road and redistribute clean fill materials on-site

a. Sediment and Erosion Control Systems - as above for Task 1.1 (Table 17)

b. Species/Habitat Protections - as above for Task 1.1

c. Earthwork

1. Bulk excavations and redistribution of excavated fill

(a) The goal of the excavation under this task is to allow maintenance access to restoration areas and to restore the topography of the southern high flow channel. This work will allow unhindered flow during overbank flooding. The grading design accomplishes this goal by matching the invert elevation and width of each cut location to upstream and downstream topography. The side slopes are specified to be less steep than upstream or downstream, at 5H:1V grade to permit future vehicle access as needed. See Construction Plans, Sheet C-7.

(b) Sorting of fill materials - Throughout this task, BWT shall identify any excavated fill materials that are suitable and unsuitable for redistribution on the Klock Property. BWT determinations will be checked daily (or more frequently if necessary) by the COT to evaluate compliance with all restoration grading plans, permit conditions, and applicable laws. This sorting function will facilitate compliance with Federal, State, and County requirements regarding handling of unsuitable fill materials or hazardous waste. Suitable fill materials will be cleared for on-site redistribution. Unsuitable fill materials or hazardous waste will be hauled off site and disposed of consistent with all Federal, State, and County permit requirements.

2. Finish grades, including microtopographic features such as mounding, excavation of small floodplain depressions, or installation of large wood for habitat features will be directed in the field by a qualified wetland scientist/ecologist who is a member of the COT.

d. Performance Standards

Project Target = Excavate and redistribute clean fill materials to achieve reconnection of the Main Oxbow reaches that are immediately northeast and southwest of the south end of the Central Pit Access Road.

Project Standard = reconnection achieved consistent with the Construction Plans, Sheet C-7.

2.1.2 Excavate North end of pit access road and redistribute clean fill materials on-site

a. Sediment and Erosion Control Systems - as above for Task 1.1 (Table 18 for sediment and erosion control mixes)

b. Species/Habitat Protections - as above for Task 1.1

c. Earthwork

1. Bulk excavations and redistribution of excavated fill

(a) The goal of the excavation under this task is to restore the topography of the northern high flow channel, to allow access to restoration areas and unhindered flow during overbank flooding. The grading design accomplished this goal by matching the invert elevation and width of each cut location to upstream and downstream topography. The side slopes were specified to be less steep than upstream or downstream, at 5H:1V grade to permit future vehicle access as needed. See Construction Plans, Sheet C-8.

(b) Sorting of fill materials - Throughout this task, BWT shall identify any excavated fill materials that are suitable and unsuitable for redistribution on the Klock Property. BWT determinations will be checked daily (or more frequently if necessary) by the COT to evaluate compliance with all restoration grading plans, permit conditions, and applicable laws. This sorting function will facilitate compliance with Federal, State, and County requirements regarding handling of unsuitable fill materials or hazardous waste. Suitable fill materials will be cleared for on-site redistribution. Unsuitable fill materials or hazardous waste will be hauled off site and disposed of consistent with all Federal, State, and County permit requirements.

2. Finish Grades - including microtopographic features will be directed in the field by a qualified wetland scientist/ecologist who is a member of the COT.

d. Performance Standards

Project Target = Excavate and redistribute clean fill materials to achieve reconnection of the Main Oxbow reaches that are immediately northeast and southwest of the north end of the Central Pit Access Road.

Project Standard = reconnection achieved consistent with the Construction Plans, Sheet C-8).

D. Task 2.2 Central Pit Cleanup (Task Lead is BWT)

2.2.1 Central Pit cleanup measures as necessary to satisfy Federal, Washington State, and Snohomish County requirements

a. Sediment and Erosion Control Systems - as above for Task 1.1 (Table 30 for sediment and erosion control mixes)

b. Species/Habitat Protections - as above for Task 1.1

c. Earthwork

1. Bulk excavations and redistribution of excavated fill

(a) See Construction Plans, Sheet C-16.

(b) Sorting of fill materials - Throughout this task, BWT shall identify any excavated fill materials that are suitable and unsuitable for redistribution on the Klock Property. BWT determinations will be checked daily (or more frequently if necessary) by the COT to evaluate compliance with all restoration grading plans, permit conditions, and applicable laws. This sorting function will facilitate compliance with Federal, State, and County requirements regarding handling of unsuitable fill materials or hazardous waste. Suitable fill materials will be cleared for on-site redistribution. Unsuitable fill materials or hazardous waste will be hauled off site and disposed of consistent with all Federal, State, and County permit requirements.

2. Finish grades, including microtopographic features such as mounding, excavation of small floodplain depressions, or installation of large wood for

habitat features will be directed in the field by a qualified wetland scientist/ecologist who is a member of the COT.

d. Performance Standards

Project Target = Remove all unsuitable fill materials from the Central Pit work area and haul off site consistent with Federal, Washington State, and Snohomish County Requirements. After fill removals, regrade the work area with smooth transitions to the surrounding landscape, with an upper target elevation around 83'.

Project Standard = Unsuitable fill removals and finish grading achieved consistent with the Construction Plans, Sheet C-16.

2.2.2 Regrading/Reclamation work to support riparian forest establishment (west)

1. Finish grades - including microtopographic features will be directed in the field by a qualified wetland scientist/ecologist who is a member of the COT.

2. Performance Standards

Project Target = Create a finish grade surface suitable for reforestation of this work area via planting of native tree, shrub and undergrowth species

Project Standard = finish grading achieved consistent with field direction of the COT.

E. Task 3 – North South Access Road (Task Lead is BWT)

3.1.1 Create at-grade crossing at north end of north-south access road

This at-grade crossing may require over excavation then importing/placement of some course rock to enable continued maintenance access to restoration and powerline areas. A course gravel/cobble mix may be sufficient, but installation of angular rock would have more certainty regarding long term stability and power line access.

a. Sediment and Erosion Control Systems – as above for Task 1.1 (Table 19 for sediment and erosion control mixes)

b. Species/Habitat Protections - as above for Task 1.1

c. Earthwork

1. Bulk excavations and redistribution of excavated fill

(b) The goal of the excavation under this task is to restore the topography of the northern high flow channel, to allow unhindered flow during overbank flooding, and to provide a ford access for the Bonneville Power Administration (BPA) without the need to install a larger culvert. The grading design accomplishes this goal by matching the invert elevation and width of each cut location to upstream and downstream topography. The side slopes are specified to be less steep than upstream or downstream, at 10H:1V grade to permit future vehicle access as needed by BPA. The cut will be mostly rocked with quarry spalls per WSDOT standard specification 9-13.1(5), which is sized to resist entrainment during the 100-year flood. The rock cover extends upstream and downstream of the access road to help accommodate future changes in grade upstream and downstream. See Construction Plans, Sheet C-9.

(b) Sorting of fill materials - Throughout this task, BWT shall identify any excavated fill materials that are suitable and unsuitable for redistribution on the Klock Property. BWT determinations will be checked daily (or more frequently if necessary) by the COT to evaluate compliance with all restoration grading plans, permit conditions, and applicable laws. This sorting function will facilitate compliance with Federal, State, and County requirements regarding handling of unsuitable fill materials or hazardous waste. Suitable fill materials will be cleared for on-site redistribution. Unsuitable fill materials or hazardous waste will be hauled off site and disposed of consistent with all Federal, State, and County permit requirements.

2. Finish Grades - including microtopographic features will be directed in the field by a qualified wetland scientist/ecologist who is a member of the COT.

Performance Standards

Project Target = Excavate and redistribute clean fill materials to achieve reconnection of the Main Oxbow reaches that are immediately northeast and southwest of the 3.1.1 Work area identified in Figures 9 and 10.

Project Standard = reconnection achieved consistent with the Construction Plans, Sheet C-9.

3.1.2 Create at-grade crossing in middle of north-south access road

This at-grade crossing may require over excavation then importing/placement of course rock to enable continued access.

a. Sediment and Erosion Control Systems – as above for Task 1.1(Table 16 for sediment and erosion control mixes)

b. Species/Habitat Protections – as above for Task 1.1

c. Earthwork

1. Bulk excavations and redistribution of excavated fill

(a) The goal of the excavation under this task is to restore the topography of the southern high flow channel, to allow unhindered flow during overbank flooding, and provide a ford access for BPA without the need to install a larger culvert. The grading design accomplishes this goal by matching the invert elevation and width of each cut location to upstream and downstream topography. The side slopes were specified to be less steep than upstream or downstream, at 10H:1V grade to permit future vehicle access as needed by BPA. The cut will be mostly rocked with quarry spalls per WSDOT standard specification 9-13.1(5), which is sized to resist entrainment during the 100-year flood. The rock cover extends upstream and downstream of the access road to help accommodate future changes in grade upstream and downstream. See Construction Plans, Sheet C-6.

(b) Sorting of fill materials - Throughout this task, BWT shall identify any excavated fill materials that are suitable and unsuitable for redistribution on the Klock Property. BWT determinations will be checked daily (or more frequently if necessary) by the COT to evaluate compliance with all restoration grading plans, permit conditions, and applicable laws. This sorting function will facilitate compliance with Federal, State, and County requirements regarding handling of unsuitable fill materials or hazardous waste. Suitable fill materials will be cleared for on-site redistribution. Unsuitable fill materials or hazardous waste will be hauled off site and disposed of consistent with all Federal, State, and County permit requirements.

2. Finish grades will be directed in the field by a qualified wetland scientist/ecologist who is a member of the COT.

d. Performance Standards

Project Target = Excavate and redistribute clean fill materials to achieve reconnection of the Main Oxbow reaches that are immediately northeast and southwest of the 3.1.2 Work area identified in Figures 9 and 10.

Project Standard = reconnection achieved consistent with the Construction Plans, Sheet C-6.

3.1.3 Remove fill at stations 57+00; 65+00 & 68+00 at the south end of the west-east access road, redistribute clean fill materials on site

a. Sediment and Erosion Control Systems - as above for Task 1.1 (Tables 13, 14 and 15 for sediment and erosion control mixes)

b. Species/Habitat Protections - as above for Task 1.1

c. Earthwork

1. Bulk excavations and redistribution of excavated fill

(a) The goal of the excavation under this task is to restore a high flow channel topography where the cut invert elevation, width, and side slopes approximately match upstream and downstream. See Construction Plans, Sheet C-3, C-4, C-5.

(b) Sorting of fill materials - Throughout this task, BWT shall identify any excavated fill materials that are suitable and unsuitable for redistribution on the Klock Property. BWT determinations will be checked daily (or more frequently if necessary) by the COT to evaluate compliance with all restoration grading plans, permit conditions, and applicable laws. This sorting function will facilitate compliance with Federal, State, and County requirements regarding handling of unsuitable fill materials or hazardous waste. Suitable fill materials will be cleared for on-site redistribution. Unsuitable fill materials or hazardous waste will be hauled off site and disposed of consistent with all Federal, State, and County permit requirements.

2. Finish grades, including microtopographic features such as mounding, excavation of small floodplain depressions, or installation of large wood for habitat features will be directed in the field by a qualified wetland scientist/ecologist who is a member of the COT.

d. Performance Standards

Project Target = Remove and redistribute clean fill materials from these three work areas and complete finish grades with smooth transitions to surrounding landscapes. See Construction Plans C-3, C-4, and C-5.

Project Standard = Fill removed and redistributed in three work areas, graded smooth transitions to surrounding landscapes

F. Task 4 – Tributary Stream Daylighting and Restoration (Task Lead is BWT)

4.1.1 Excavate tributary channel with riparian buffer (50 ft either side of the left and right channel bank ordinary high water marks. Abandon/destroy function of pipe under the tree farm and redistribute clean fill materials on site. Allow for small vehicle access to the SE portion of the property.

a. Sediment and Erosion Control Systems - as above for Task 1.1 (Table 26 for sediment and erosion control mixes)

b. Species/Habitat Protections - as above for Task 1.1

c. Earthwork

1. Bulk excavations and redistribution of excavated fill

(a) See Construction Plans, C-13. This task requires excavation of a new southeastern tributary channel and establishment of a riparian buffer that is located 50 ft either side of the left and right channel bank ordinary high water marks. The task also involves abandonment/destruction or disposal of the existing culvert/pipe system that conveys tributary flows under tree farm area, and redistribution of clean fill materials on site. The invert elevation, width, and side slopes approximately match the upstream channel and downstream topography. The course of the channel cut follows lower elevations to minimize the volume of cut required.

(b) Sorting of fill materials - Throughout this task, BWT shall identify any excavated fill materials that are suitable and unsuitable for redistribution on the Klock Property. BWT determinations will be checked daily (or more frequently if necessary) by the COT to evaluate compliance with all restoration grading plans, permit conditions, and applicable laws. This sorting function will facilitate compliance with Federal, State, and County requirements regarding handling of unsuitable fill materials or hazardous

waste. Suitable fill materials will be cleared for on-site redistribution. Unsuitable fill materials or hazardous waste will be hauled off site and disposed of consistent with all Federal, State, and County permit requirements.

2. Finish grades, including microtopographic features such as mounding, excavation of small floodplain depressions, or installation of large wood for habitat features within the newly established stream channel or buffer will be directed in the field by a qualified wetland scientist/ecologist who is a member of the COT.

d. Performance Standards

Project Target = Abandonment of existing culvert/pipe system and establishment of a new tributary channel and associated buffer

Project Standard = Culvert/pipe system abandoned and construction of new channel and buffer consistent with the Construction Plans, Sheet C-13.

G. Task 5 – Hay Bale Removal- Southwest Corner of Main Oxbow (Task Lead is BWT)

5.1.1 Remove all plastic hay bales from the SW Corner of the main oxbow haul off site and dispose

a. Methods of removal - Use a track hoe equipped with a thumb or equivalent to load the existing and deteriorated pile of plastic covered hay bales into dump trucks and either haul and dispose off site all plastic from the bales and redistribute the hay on site as mulch.

b. Performance Standards

Project Target = Removal of the existing pile of plastic covered hay

Project Standard = No residual stockpiled and plastic covered hay

H. Task 6 – Northeast Corner of the Klock Property in the River Channel (Task Lead is BWT)

6.1.1 At low water, remove concrete blocks and other fill materials (solid/non-granular) in the river channel and along the river bank at the NE corner of the site. Haul off site and dispose.

a. Timing of work - Perform this work at low water and within required fish windows per permitting requirements.

b. Reconnaissance - Prior to initiating work and at low water, assess the best and least intrusive method(s) for removal of fill materials at this work location. The timing, approach and exit routes for equipment, and methods of removal of concrete for this in-water work will be coordinated by a qualified Wetland scientist/ecologist who is a member of the COT.

c. Removal of Concrete Materials - After reconnaissance, use the best and least intrusive method(s) for removal of solid/non-granular fill materials. Completion of this in-water work will be closely monitored/directed by a qualified wetland scientist/ecologist who is a member of the COT.

d. Performance Standards

Project Target = Remove concrete blocks and other fill materials (solid/non-granular) in the river channel and along the river bank at the NE corner of the site. Haul off site and dispose or re-use for other ranch operations.

Project Standard = No residual solid/non-granular fill materials in the river channel at this location.

I. Task 7 – Purchase Plants, Plant Installations, Irrigation, and Weed Control

7.1.1 - Purchase Plants Purchase all specified bare root conifers, and either purchase or prepare on site cuttings/live stakes of native willows, black cottonwoods, and native shrubs **(Task Lead is BWT)**

a. Provenance - Purchase native plants only from the NW Puget Sound Lowland Provenance, which includes lower elevation/valley areas within Snohomish, northern King, Skagit and Whatcom Counties

b. Approval of Vendor(s) - Vendors must demonstrate competence and use of best management practices in procuring, propagating and growing healthy and vigorous native plant stock. Prior to procurement, the COT needs to approve all vendors.

c. Vouching - Prior to transfer of procured/propagated stock, all plant materials need to be inspected and vouched with respect to the correct genus and species, overall health and vigor, and weed free conditions.

e. Performance Standards

Project Target = On time procurement and transfer of healthy native tree, shrub, and undergrowth plants to the Tulalip Tribes.

Project Standard = Transfer of healthy native plants in quantities that are consistent with the plant take off schedules shown on the Construction Plans, Sheet C-18 and in Tables 13-30.

7.1.2 – Install procured plants or propagated plants throughout the site as specified in the planting plan (approximately 19.4 acres) **(Task Lead is Tulalip Tribes)**

a. Table 6 lists general information on "Candidate" Tree, Shrub, Graminoids, Forbs/Ferns/Fern Allies Species for the Klock Property Restoration. This information includes identification of plant form (ie. tree, shrub, graminoid, etc.), Latin name (genus and species), common name, stock specifications (e.g. 1 gallon pots, live cuttings, bare root), National Wetland Plant Indicator Status, and microsite preferences for the Klock Property Restoration.

b. Tables 7, 8, 9, 10, and 11 List Plant Assemblages as follows:

Assemblage A = Upland and Dry Sites

Assemblage B = Primarily Wet, Seasonally Wet, or Wetlands

Assemblage C =Riparian Areas

Assemblage D = Low Growing Riparian Areas

Assemblage E = Native Emergent Plants and Erosion Control

c. Table 12 Shows Planting Phases (Year 1 and Year 2) for the Klock Property Ecosystem Restoration. Table 12 is repeated in slightly different format in Appendix 2 – Construction Plans, Sheet C-19.

d. Tables 13 through 31 are the Plant Take-Off Tables (Plant species, quantities, stock, etc.) for each planting area. These tables are repeated in slightly different format in Appendix 2 – Construction Plans, Sheet C-19.

e. Details – Appendix 2 – Construction Plans, Sheet C-19 shows several details or typicals for installation of trees, shrubs, emergent, live cuttings, etc.

f. Performance Standards

Project Target = Year 1 and Year 2 phased planting of up to 19.4 acres with native tree, shrub, and undergrowth species (Table 12).

Project Standard = Installation of healthy native tree, shrub and undergrowth plants consistent with the plans and take off schedules (Tables 13-31) and the same Take-Offs shown on Construction Plans, Sheet C-20.

7.1.3 – Irrigation 2-year irrigation of planted stock during dry season - if necessary

a. Performance Standards

Project Target = Irrigate if necessary to ensure survival of planted stock

Project Standard = Minimal plant mortality due to water stress during the first three growing seasons. Target survival rate is >50% overall after 5 years.

7.1.4 – Year 2 and 3 Weed Controls

Complete mechanical and if necessary chemical weed control measures - Years 2 and 3

a. Performance Standards

Project Target = All restoration areas are dominated by native species and on a trajectory to become relatively free of non-native invasive weeds

Project Standard = Restoration area plantings are free to grow/not impeded by weeds and canopy cover is dominated by native species.

J. Task 8.0 – Construction Oversight

a. Membership, Role, and Authorities of the COT – Members of the COT will be determined by Tulalip tribes staff members Misters Brett Shattuck and Kurt Nelson. The Tribes will also designate roles for various team members. The overall role of the COT is to inspect the site during construction, monitor the progress and quality of the work, and determine if the work is proceeding in a manner that is consistent with all project plans and specifications, and consistent with conditions of all Federal, Washington State, and Snohomish County permits. The COT will have a designated Lead and single point of contact. The COT Lead can delegate certain tasks to COT members if the need arises. Specifically, the COT Lead can -

1. Change Work Protocols - At any time, the COT Lead will have the authority to recommend to BWT changes to work protocols for purposes of compliance with all permit conditions, and/or achievement of Project Targets and Project Standards.

2. Stop Work - At any time, the COT Lead will have the authority to stop work to request that the appropriate government agency determine compliance with all permit conditions, and/or that EPA determine achievement of Project Targets and Project Standards.

3. Inspect and Change Construction Layouts - Initial construction work layouts will be the responsibility of BWT. Layouts will be checked regularly by the COT Lead to evaluate compliance with all permit conditions and consistency with restoration plans and specifications.

4. Inspect and Change Grade Controls - All grade controls will be the responsibility of BWT. They will be checked regularly by the COT to evaluate compliance with all restoration grading plans and specifications and permit conditions. BWT shall modify grade controls if COT determines that such modifications are necessary to comply with restoration grading plans and specifications and permit conditions.

5. Identify Unsuitable Fill Materials - Initial sorting and documentation of suitable and unsuitable fill materials will be the responsibility of BWT. These BWT determinations will be checked daily (or more frequently if necessary) by the COT to evaluate compliance with all restoration grading plans and permit conditions.

6. Inspect and Change Sediment and Erosion Control Systems and BMPs - Development of the Stormwater Pollution Prevention Plan (SWPPP) and installation and maintenance of all best management practices (BMPs) shown in the SWPPP is the responsibility of BWT. The COT Lead will have the responsibility for inspection and approval of initial installations and subsequent maintenance and adaptive management. Standard record keeping consistent with conditions of the General Permit and the SWPPP is the responsibility of BWT and is subject to regular inspection(s) by the COT Lead.

7. Inspect and Change Species and Habitat Protections - Development, installation, and maintenance of all species and habitat protections is the responsibility of BWT. The COT Lead will have the responsibility for inspection and evaluation of initial installations and subsequent maintenance and adaptive management. Record keeping sufficient to document the safe and meaningful operation of species and habitat protections is the responsibility of BWT and is subject to regular inspection(s) by the COT Lead.

8. Alert Regulatory Agencies - Compliance with all federal, state and county issued permits and regulatory requirements associated with this work is the responsibility of BWT. The COT Lead will communicate with BWT when there is a potential or observed deviation from permit or regulatory requirements, with the intent of maintaining compliance through collaboration. If non-compliance continues, the COT Lead will alert the appropriate regulatory agency(ies) to request enforcement intervention.

b. Reporting - Daily Logs of activities will be maintained by BWT documenting, at a minimum -

1. Fill volumes sorted to suitable and unsuitable (exported)
2. The locations and volumes of clean fill materials redistributed on site
3. Types and volumes of unsuitable fill materials exported off site and documentation of the destination facilities for exported fill ("cradle to grave" documentation)
4. Maintenance and documentation of all BMPs necessary to comply with the SWPPP before, during, and after work
5. Maintenance of all BMPs for species and habitat protections
6. Photographs showing progress of work

7. Construction Schedule and Sequencing

a. Earthwork is scheduled for implementation in the dry season immediately after all permitting is completed. This will likely be in 2021.
b. Phase 1 planting and maintenance will likely initiate in the fall of 2021.
c. Phase 2 planting will likely initiate in the fall of 2022.
d. Refinement of construction sequencing will occur as required by permits and in coordination between BWT and the COT Lead.

8. Monitoring/Adaptive Management/Contingency Measures

a. Unsuitable Materials/Hazardous Waste: During and/or at the close of their earthwork/construction tasks, BWT is responsible for submitting documentation of compliance with U.S. Federal, Washington State, and Snohomish County protocols for handling a removal of unsuitable fill materials from all work areas.

b. Construction/Earthwork Final Report: BWT is responsible for submitting documentation and registered professional survey certification of finish grades to EPA after the close of their construction efforts. These are Drawings of Record. This documentation/certification will be submitted to EPA no more than 30 calendar days following completion of earthwork and construction. The submittal will be in the form of a construction/earthwork final report that includes a finished project summary, short narratives summarizing work completed in each work area, and a summary of how completed work achieved Project Targets and Project Standards articulated in Table 3 of this BOD. The Narrative should be supported by the certified Drawings of Record. Within 30 calendar days following completion of earthwork and construction, BWT shall contact EPA to schedule and participate in a site visit with EPA.

c. Documentation of Plantings and Performance: The Tulalip Tribes will be responsible for the following monitoring and reporting activities:

1. Submittal of documentation for plants actually installed in each work area (Planting Take-offs installed) no more than 30 calendar days after the end of Phase 1 planting (Year 1 - fall), and no more than 30 days after the end of Phase 2 planting (Year 2 - fall). These documentations/certifications will be presented to EPA in the form of short "End of Phase 1 Planting/Phase 1 Time Zero" and "End of Phase 2/Phase 2 Time Zero" reports that include narratives or tables summarizing plantings completed in each work area.

2. Following the "Time Zero" Reports summarized immediately above, and at the end of the first, third, and fifth growing seasons following each phase of plantings (i.e. Phase 1 and Phase 2), document via narratives and photographs the following –

a. "Free growing/not impeded by weeds" conditions in each planting area
b. "Dominant canopy coverage by native species" in each planting area
c. A short description of
(1) Any irrigation measures used and locations for irrigation
(2) Weed control measures used and their locations
(3) Recommended or implemented adaptive management or contingency measures necessary to ensure that Project Targets and Project Standards are met.

9. Reporting

All reporting, notices, and communications required in the BOD shall be made to the following individuals:

(1) Patrick B. Johnson
Assistant Regional Counsel
United States Environmental Protection Agency, Region 10
1200 Sixth Avenue
Suite 155, Mail Stop 11-C07
Seattle, Washington 98101
(206) 553-6905
Johnson.patrick@epa.gov

(2) Krista Rave-Perkins
Surface Water Enforcement Section
Enforcement and Compliance Assurance Division
United States Environmental Protection Agency, Region 10
1200 Sixth Avenue
Suite 155, Mail Stop 20-C04
Seattle, Washington 98101
(206) 553-6686
Rave-perkins.krista@epa.gov

10. Appendices

Appendix 1 - List of Abbreviations Used in This Basis of Design Report

BMPs – Best Management Practices

BPA – Bonneville Power Administration

BOD – Basis of Design Report

BWT – Bobby Wolford Trucking and Salvage, Inc.

CFS – Cubic feet per second

CID – Criminal Investigation Division (of the EPA)

COT – Construction Oversight Team

CWA – Clean Water Act

EPA – Environmental Protection Agency

HPA – Hydraulic Projects Approval

LiDAR – Light detection and ranging

SWPPP – Storm Water Pollution and Prevention Plan

USGS – U.S. Geological Survey

Appendix 2. Construction Plan Sheets and Specifications

Appendix 3. Flood Modeling for the Klock Property Restoration Basis of Design

I. Methods

We used a two-dimensional (2-D) hydrodynamic model developed previously for Snohomish County (WSE, 2018) to evaluate flooding patterns in the vicinity of the Klock property with and without restoration earthwork. The model domain extends along the Skykomish River from just above the Sultan River to its confluence with the Snoqualmie River and a portion of the Snoqualmie and Snohomish Rivers upstream of the SR 522 bridge. The model terrain was developed from a combination of LiDAR and bathymetry data collected variously over the 2014-2016 period (Figure 1; WSE 2018). Because the WSE (2018) model had been calibrated to simulate high flow events, the surface roughness properties were kept the same in our simulations.

The magnitude of the 100-year flood was estimated for the reach using flows established by Snohomish County Surface Water Management (SWM) as part of the FEMA Flood Insurance Study hydrology, effective September 16, 2005 (Figure 2). The flows were provided by SWM engineer David Lucas through email correspondence on February 21, 2019. The corresponding magnitude used in the analyses is Q_{100} = 168,200 cfs. This was derived from the flows in Figure 2, adding an estimated 900 cfs for small inflows, and accounting for downstream attenuation.

In earlier runs where the 2D model terrain was modified to represent topography associated with different scenarios, it was determined that a proposed total cut of 32,000 CY would result in minor changes to the 100 year flood (Q_{100}) water surface elevation, whereas an alternative, smaller proposed cut volume of 20,240 CY would not (R2 2019). This information guided layout of the proposed earthwork design in the current preliminary design plan set prepared by R2.

The WSE (2018) model terrain was subsequently modified to represent the preliminary design plan actions and run again to compare against the existing conditions for an evaluation of changes in the 100-year flood levels with the proposed project (Figure 3). In addition, the model output was used to evaluate substrate mobility in the vicinity of the two fords proposed for the BPA transmission line access road.

The 2-D model mesh network from the WSE (2018) model was further modified in the vicinity of proposed project actions to more accurately simulate hydraulics in the vicinity of each location (Figure 4). Specifically, the original WSE (2018) model mesh size of 100 ft was reduced to approximately 20 ft, as illustrated in Figure 5. To conserve budget, the original WSE/SWM mesh was used for simulating existing conditions and the modified mesh network was used for simulating project actions.

II. Results

The model results were used to specify a stable rock mix for the two proposed ford locations for the BPA transmission line access road, and to characterize the resulting changes in 100-year

flood water surface elevations. The ford rock placement extended upstream and downstream of the ford to accommodate local adjustments associated with adjacent future erosion.
Ford Rock Sizing: The modeling predicted that maximum velocity at the two proposed ford locations for the BPA transmission line access road was approximately 4.1 ft/s during the 100-year flood peak flow, with a flow depth of approximately 4.0 ft. This value was evaluated for incipient motion conditions using two independent equations. In the first approach, Shields' equation (e.g., Raudkivi 1990) was used to evaluate shear stress τ and corresponding critical median grain size D_{50cr}:

$$\tau_{cr}^{*} = \frac{\tau}{(S_s - 1)\rho g D_{50cr}}$$

where the submerged specific gravity (S_s-1) = 1.5 (typical lower range for commercially available aggregates; larger values preferred for additional stability) and the dimensionless critical shear stress $\tau^*_{cr} = 0.03$, which is a characteristic lower bound value for initiation of motion (Buffington and Montgomery 1997; Recking and Pitlick 2013). Shear stress was estimated from shear velocity (u_*) as:

$$\tau = \rho u_*^2$$

where shear velocity was estimated using the integrated form of logarithmic law of the wall equation was used to estimate shear velocity respectively (Richards 1982):

$$\frac{V}{u_*} = 5.75 log\left(\frac{d}{D_{65}}\right) + 6.00$$

where V = mean column velocity, d = depth, and y = height above the bed. The characteristic substrate size D_{65} was set to an initial estimate of 4" corresponding to quarry spalls. The mean column velocity and depth values were extracted from the 2D model results.

The second approach was based on empirical relations established between velocity and stable stone size, using the Isbash relation (USACE 1994):

$$U_{cr} = C[2gD_{50cr}(S_s - 1)]^{1/2}$$

where U_{cr} = characteristic velocity mobilizing the stone and the factor C =0.86 (Recking and Pitlick 2013).

The critical D_{50cr} was estimated using each method, and the larger of the two selected. A side slope correction was then applied to estimate the stable D_{50cr} on a 10H:1V side slope (specified for the slopes on both sides of the ford for easy vehicle access), using an estimated stream-wise slope = 0.005 and the equations of Simons and Senturk (1992; in Mooney et al. 2007). The resulting D_{50} values were then compared with mixes in WSDOT's 2020 standard specifications, from which it was confirmed that quarry spalls (specification 9-13.1(5)) resulted in a stability safety factor in excess of 3.0. Quarry spalls are a standard substrate for vehicle access during construction, and can be expected to remain stable in place for many years after placement (barring more extensive erosion originating away from the ford location).

Changes in 100 Year Flood Water Levels: The simulations indicate that the proposed grading will increase flows in the oxbow and excavated channels during the 100-year flood peak flow (Figure 5). Peak water levels will be elevated in the vicinity of fill areas, and lowered over the floodplain where most of the previous fill occurred. Changes within the river main stem channel are predicted to be within +/- 0.1 ft depending on location. We expect the river to adjust its boundary over time in response.

III. References

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Mooney, D.M., C.L. Holmquist-Johnson, and S. Broderick. 2007. Rock ramp design guidelines. U.S. Department of the Interior, Bureau of Reclamation.

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Simons, D.B., and F. Sentürk. 1992. Sediment Transport Technology Water and Sediment Dynamics. Water Resources Publication, Littleton, Colorado.

U.S. Army Corps of Engineers (USACE). 1994. Hydraulic Design of Flood Control Channels. Engineering Manual EM 1110-2-1601.

Watershed Science & Engineering. 2018. Ben Howard Road flooding analysis: Lower Skykomish River Hydraulic Modeling. Report prepared for Snohomish County Public Works. August.

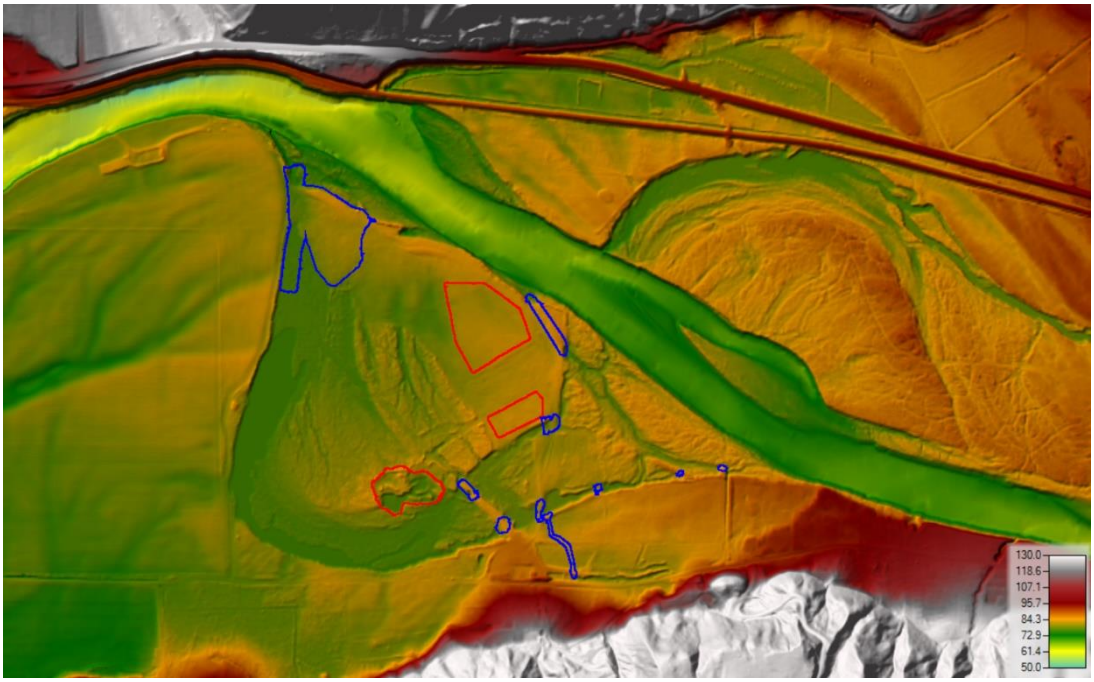

Figure 1. Existing terrain in the vicinity of the Klock Property simulated using the 2D HEC-RAS model. Blue polygons denote the areas that will be excavated, red polygons areas where fill will be placed.

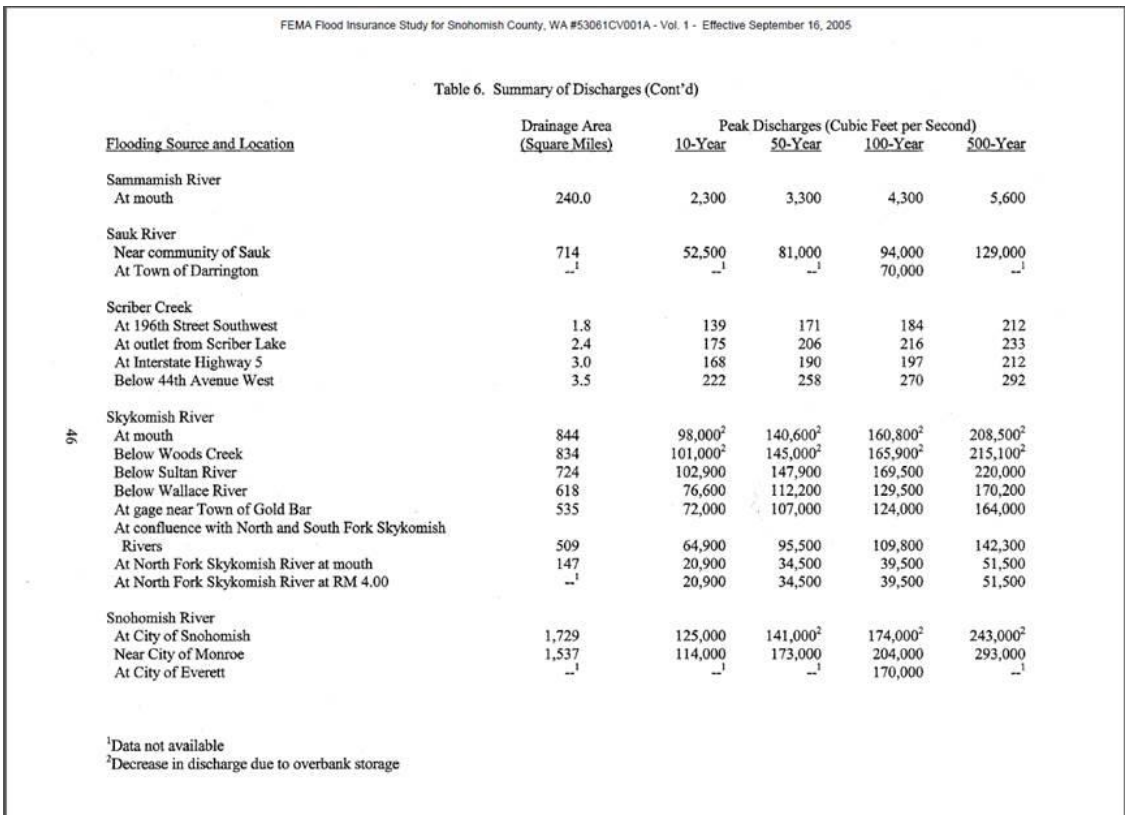

Table 6. Summary of Discharges (Cont'd)

Flooding Source and Location	Drainage Area (Square Miles)	Peak Discharges (Cubic Feet per Second) 10-Year	50-Year	100-Year	500-Year
Sammamish River					
At mouth	240.0	2,300	3,300	4,300	5,600
Sauk River					
Near community of Sauk	714	52,500	81,000	94,000	129,000
At Town of Darrington	--[1]	--[1]	--[1]	70,000	--[1]
Scriber Creek					
At 196th Street Southwest	1.8	139	171	184	212
At outlet from Scriber Lake	2.4	175	206	216	233
At Interstate Highway 5	3.0	168	190	197	212
Below 44th Avenue West	3.5	222	258	270	292
Skykomish River					
At mouth	844	98,000[2]	140,600[2]	160,800[2]	208,500[2]
Below Woods Creek	834	101,000[2]	145,000[2]	165,900[2]	215,100[2]
Below Sultan River	724	102,900	147,900	169,500	220,000
Below Wallace River	618	76,600	112,200	129,500	170,200
At gage near Town of Gold Bar	535	72,000	107,000	124,000	164,000
At confluence with North and South Fork Skykomish Rivers	509	64,900	95,500	109,800	142,300
At North Fork Skykomish River at mouth	147	20,900	34,500	39,500	51,500
At North Fork Skykomish River at RM 4.00	--[1]	20,900	34,500	39,500	51,500
Snohomish River					
At City of Snohomish	1,729	125,000	141,000[2]	174,000[2]	243,000[2]
Near City of Monroe	1,537	114,000	173,000	204,000	293,000
At City of Everett	--[1]	--[1]	--[1]	170,000	--[1]

[1]Data not available
[2]Decrease in discharge due to overbank storage

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Figure 2: FEMA Flood Insurance Study hydrology, provided by Snohomish County Surface Water Management, Department of Public Works.

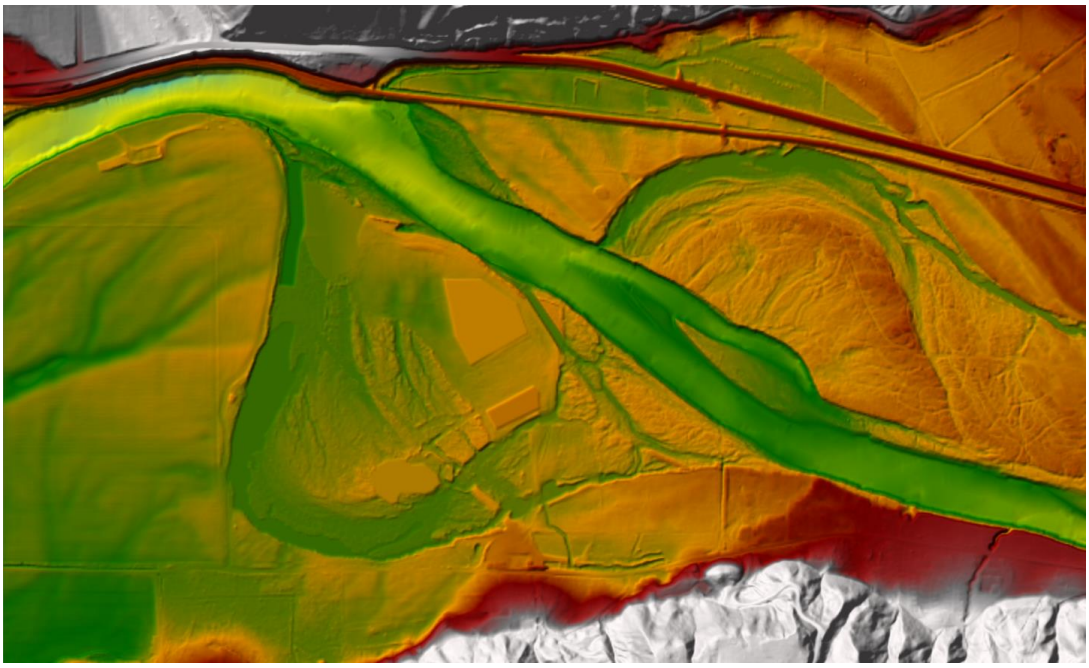

Figure 3. Proposed terrain in the vicinity of the Klock Property simulated using the 2D HEC-RAS model.

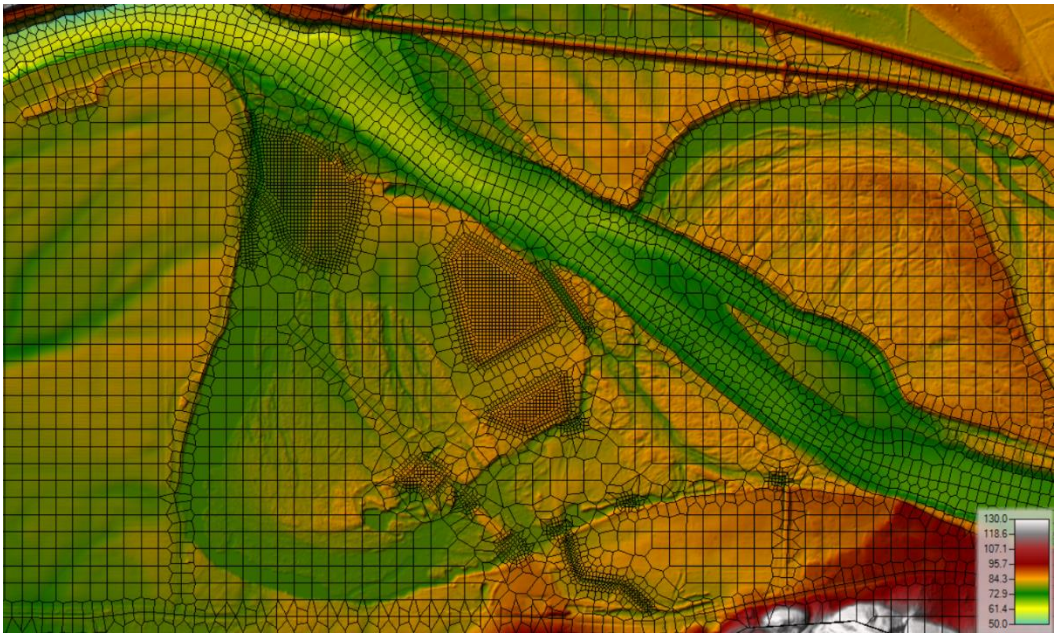

Figure 4. HEC-RAS 2-D hydraulic model mesh network in the vicinity of the Klock Property. Areas proposed for cut and fill were simulated using a finer mesh than elsewhere within the 100-year flood zone.

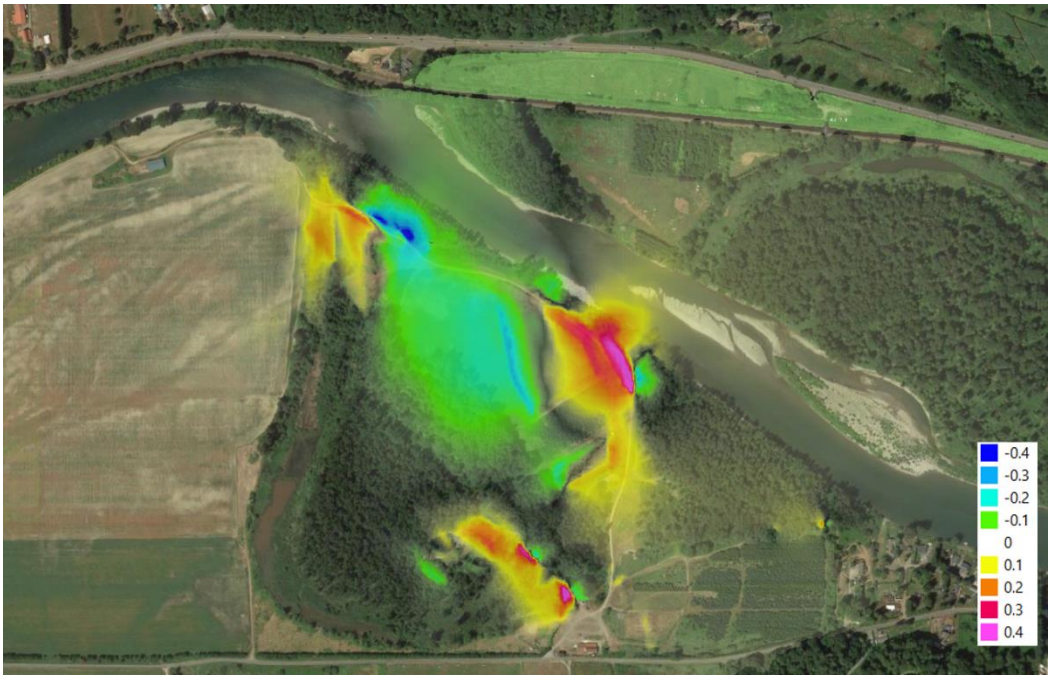

Figure 5. Predicted changes (units=ft) in 100-year flood water surface elevations associated with the proposed Klock Property restoration design compared with existing conditions.

Appendix 4. No Rise Calculations Technical Memorandum

RESOURCE CONSULTANTS INC.

15250 NE 95TH STREET
REDMOND, WA 98052
425.556.1288
r2usa.com

Technical Memorandum – Draft

Date: June 11, 2020 Project Number: 2079.01/TM102

To: File

From: Paul DeVries, Ph.D., P.E., C.F.P. (R2); Chiming Huang, Ph.D., P.E. (R2); Lyndon Lee (LCLA)

Project: Klock Property Restoration

Subject: Evaluation of Effects of Proposed Floodplain Restoration Activities on 100 year Flood Peak Water Surface Elevation

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11. Background

The proposed activities that are the subject of this memorandum involve restoring the structure and functioning of waters of the United States, including wetland ecosystems (waters/wetlands) on floodplain areas of the Klock Property. This property consists of an approximately 187.9-acre area within the overall Klock holdings. It is located east of the City of Monroe along the south bank (river left) of the Skykomish River in unincorporated Snohomish County, Washington (Figure 1). The latitude/longitude coordinates for the approximate centroid of the Klock Property are 47° 50' 54.86" N/121° 53' 37.22" W. Ben Howard Road forms the south boundary of the Klock Property. The property is located within Section 10, Township 27 North, Range, 7 East. It is comprised of Snohomish County Tax Parcel Nos. 27071000100100, 27071000100300, and 27071000100200 and parts of 27070300300300, 27070300300500, 27071000200100. These latter three tax parcels will be the subject of a lot line adjustment.

The Klock Property is owned by Karl Frederick Klock Pacific Bison, LLC. The restoration measures that are the focus of this evaluation are part of a negotiated settlement of Clean Water Act non-compliance issues among Karl Frederick Klock Pacific Bison, LLC (Klock), Bobby Wolford Trucking & Salvage, Inc. (BWT), and the U.S. Environmental Protection Agency Region 10 (EPA). The key goal of the settlement is to restore the property from impacts associated with stream rerouting, mechanical clearing, filling, and earthwork activities that were undertaken by Klock and BWT.

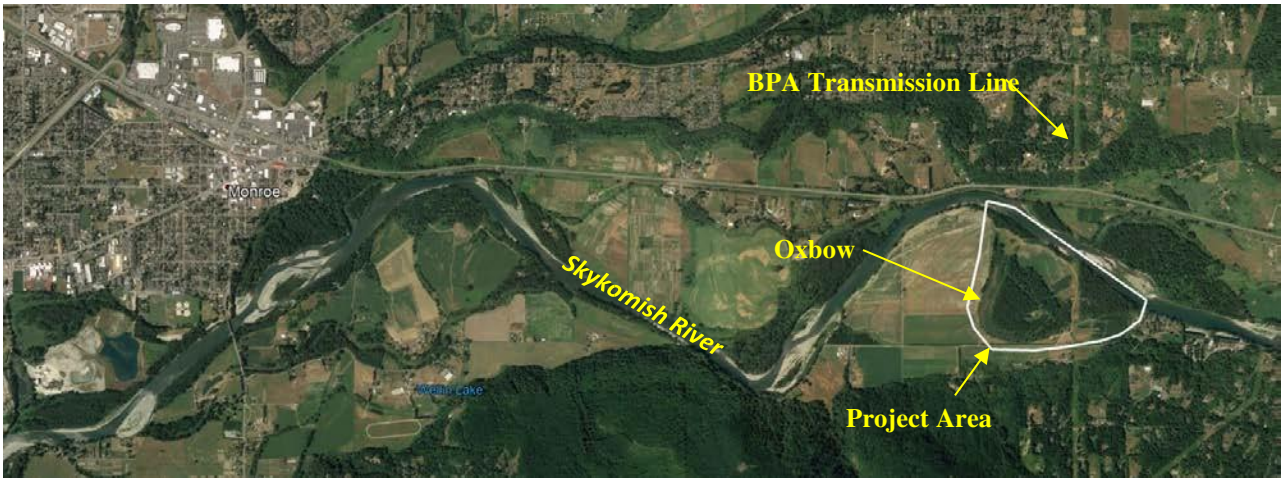


Figure 1. Location of project area targeted for floodplain restoration earthwork activities, and selected landmarks.

The project area encompasses a large, generally "U" shaped secondary river channel or "oxbow" system that has been part of the active floodplain and channel system of the Skykomish River since at least 1938. During moderate to high water events in the main channel of the Skykomish River and depending on the elevation or "stage" of frequently occurring flood events or floodwaters (2-5 year recurrence interval), this oxbow system can be directly and regularly connected to the Skykomish River at both its upstream and downstream ends. The oxbow system includes a complex network of small secondary and tertiary channels that are embedded within it and which are regularly inundated by and connected to flood flows from the main channel of the Skykomish River. The area that includes the oxbow system is dominated by a mosaic of third or fourth growth forested, scrub/shrub, and emergent waters/wetlands plant communities. This mosaic also includes seasonal open water features that flow when they are connected to the main channel of the Skykomish River or alternatively, they exist as residual ponded features when water levels recede. Some agricultural and Christmas tree production areas are also included in the property.

Proposed earthwork activities consist of the following actions to restore floodplain connectivity Figure 2):

- Removal of fill placed in and around the downstream end of the oxbow and adjoining floodplain (indicated by #9 & #10 in Figure 2).
- Removal of fill placed in a former high flow channel (#8).
- Removal of culverts and fill at two locations along BPA's transmission line access road that currently restrict flows through two floodplain high flow channels that are part of the oxbow flow path network, and creating rock fords in their place (#4 & #7).
- Removal of fill at five other locations in floodplain high flow channels that are part of the oxbow flow path network (#1, #2, #3, #5, and #6).

- Daylighting and additional excavation of a channel to connect an upland tributary draining under Ben Howard Road with the oxbow flow path network (#11).
- Removing concrete ecology blocks from the river's edge.
- Cleaning out contaminated soils and debris disposed of in a central floodplain pit area surrounded by the oxbow flow path network, and hauling the material offsite, followed by placing some of the spoils from the above excavations within the pit area and refilling to approximate local floodplain elevations (#14).
- Placing the remainder of spoils from the above excavations at two higher ground areas on the floodplain near the BPA transmission line corridor to keep the excavated native materials on site (#12 and #13).

This technical memorandum documents the flood modeling analysis that was performed to evaluate effects of these proposed restoration earthwork activities on the 100 year flood peak water surface elevation (WSE).

12. Hydrology

The magnitude of the 100-year flood (Q_{100}) was estimated for the reach using flows established by Snohomish County Surface Water Management (SWM) as part of the FEMA Flood Insurance Study hydrology, effective September 16, 2005 (Figure 3). The flows were provided by SWM engineer David Lucas through email correspondence on February 21, 2019. The corresponding magnitude used in the analyses is Q_{100} = 168,200 cfs. This was derived from the flows in Figure 3, adding an estimated 900 cfs for small inflows, and accounting for downstream attenuation.

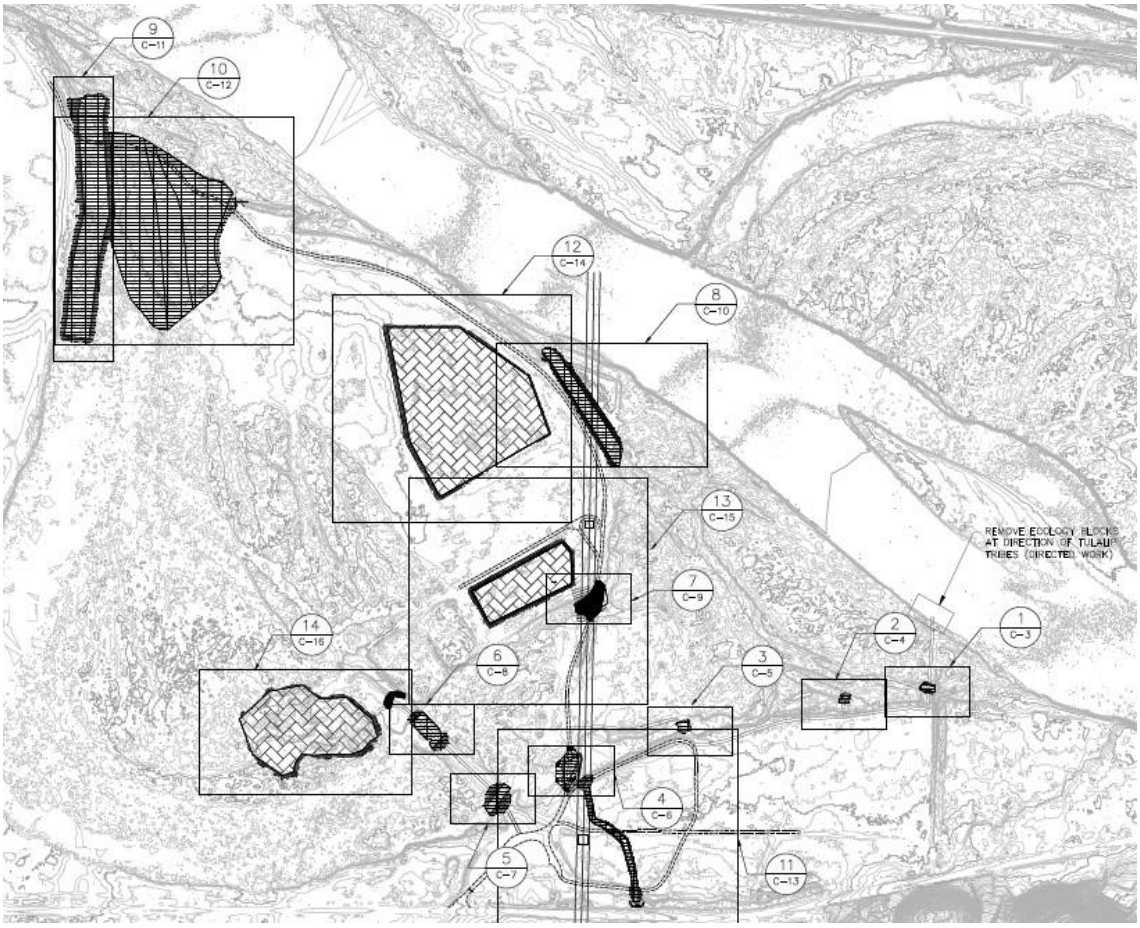


Figure 2. Map of proposed floodplain restoration earthwork activities.

Table 6. Summary of Discharges (Cont'd)

Flooding Source and Location	Drainage Area (Square Miles)	Peak Discharges (Cubic Feet per Second) 10-Year	50-Year	100-Year	500-Year
Sammamish River					
At mouth	240.0	2,300	3,300	4,300	5,600
Sauk River					
Near community of Sauk	714	52,500	81,000	94,000	129,000
At Town of Darrington	--[1]	--[1]	--[1]	70,000	--[1]
Scriber Creek					
At 196th Street Southwest	1.8	139	171	184	212
At outlet from Scriber Lake	2.4	175	206	216	233
At Interstate Highway 5	3.0	168	190	197	212
Below 44th Avenue West	3.5	222	258	270	292
Skykomish River					
At mouth	844	98,000[2]	140,600[2]	160,800[2]	208,500[2]
Below Woods Creek	834	101,000[2]	145,000[2]	165,900[2]	215,100[2]
Below Sultan River	724	102,900	147,900	169,500	220,000
Below Wallace River	618	76,600	112,200	129,500	170,200
At gage near Town of Gold Bar	535	72,000	107,000	124,000	164,000
At confluence with North and South Fork Skykomish Rivers	509	64,900	95,500	109,800	142,300
At North Fork Skykomish River at mouth	147	20,900	34,500	39,500	51,500
At North Fork Skykomish River at RM 4.00	--[1]	20,900	34,500	39,500	51,500
Snohomish River					
At City of Snohomish	1,729	125,000	141,000[2]	174,000[2]	243,000[2]
Near City of Monroe	1,537	114,000	173,000	204,000	293,000
At City of Everett	--[1]	--[1]	--[1]	170,000	--[1]

[1]Data not available
[2]Decrease in discharge due to overbank storage

Figure 3. FEMA Flood Insurance Study hydrology, provided by Snohomish County Surface Water Management, Department of Public Works.

13. Hydraulic Modeling Methods

We used a two-dimensional (2-D) HEC-RAS hydraulic model developed previously for Snohomish County (WS&E 2018) to evaluate flooding patterns in the vicinity of the Klock property with and without corrective earthwork. The model domain extends along the Skykomish River from just above the Sultan River to its confluence with the Snoqualmie River and a portion of the Snoqualmie and Snohomish Rivers upstream of the SR 522 bridge. The model terrain was developed from a combination of LiDAR and bathymetry data collected variously over the 2014-2016 period (Figure 4; WS&E 2018). Because the model had been calibrated to simulate high flow events, the surface roughness properties were kept the same in our simulations.

During project scoping, the 2-D model terrain was modified to represent topography associated with different net excavation volumes under negotiation. The modeling guided layout of the proposed earthwork design for the volume agreed to as part of the settlement. The WS&E (2018) model terrain was subsequently modified to represent the preliminary design plan

actions, and run to compare against existing conditions for an evaluation of changes in the 100year flood levels with the proposed project (Figure 5). The 2-D model mesh network was also further modified in the vicinity of proposed project actions to more accurately simulate hydraulics in the vicinity of each location, where the original WS&E (2018) model mesh size of 100 ft was reduced to approximately 20 ft at locations where earthwork is proposed (Figure 6).

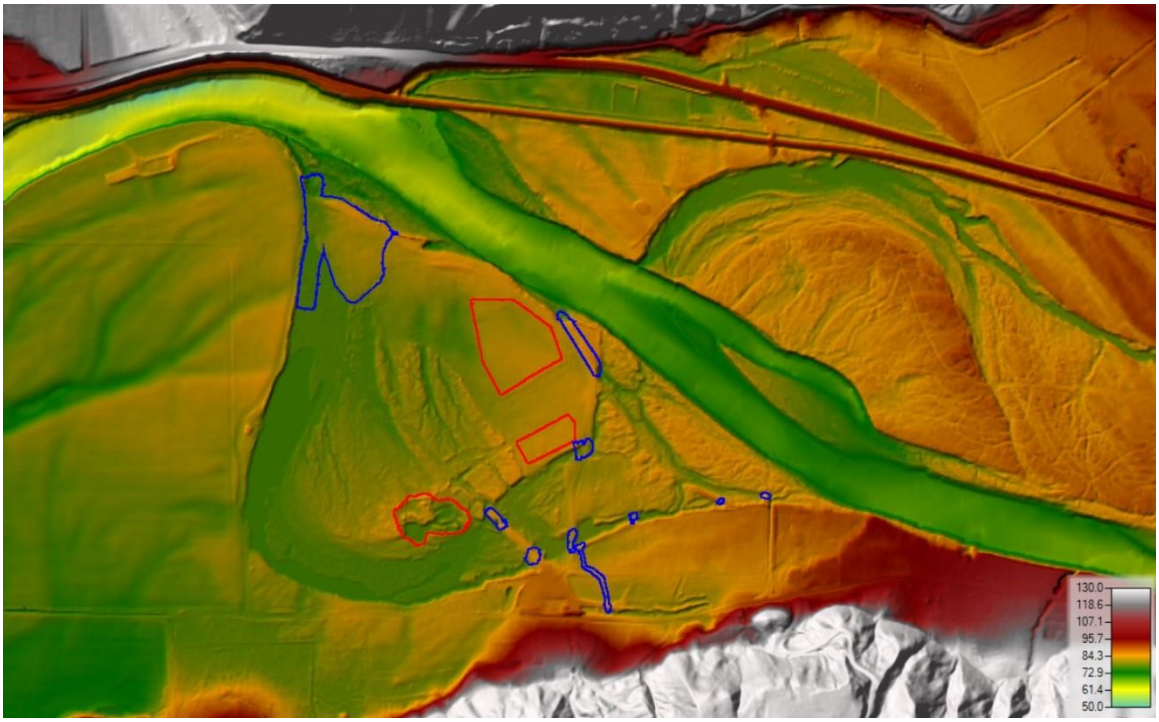


Figure 4. Existing HEC-RAS 2-D model terrain in the vicinity of the Klock Property. Blue polygons denote the areas that will be excavated, red polygons areas where fill will be placed.

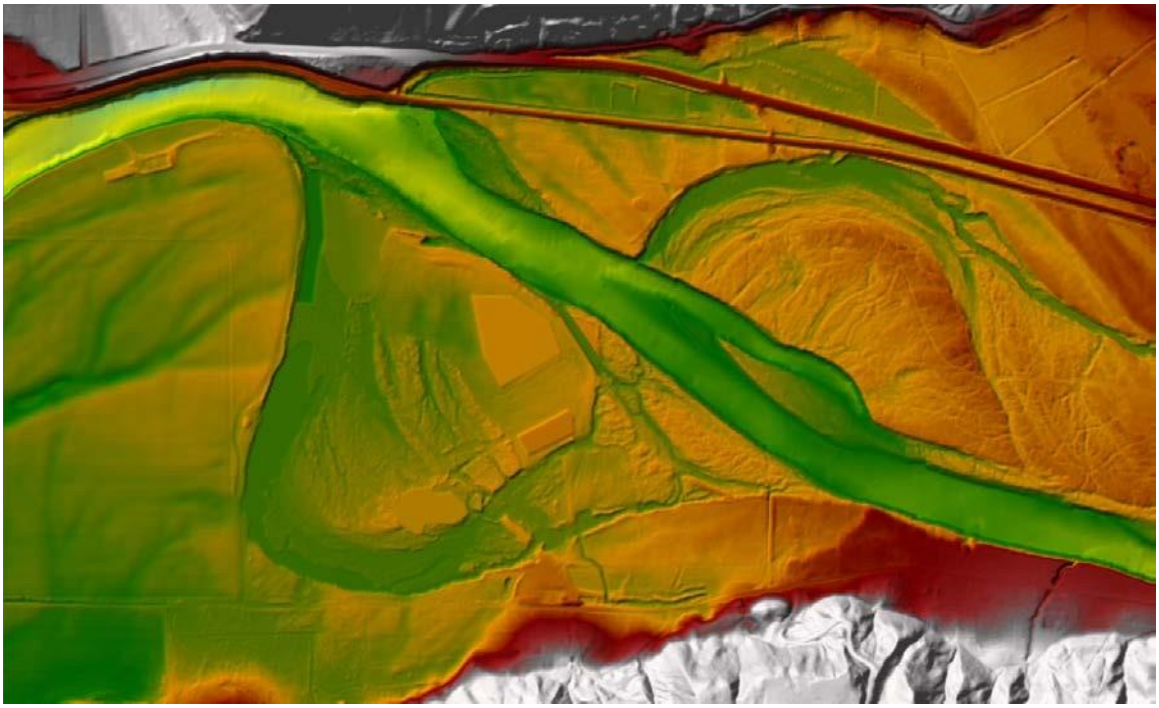


Figure 5. HEC-RAS 2-D model terrain in the vicinity of the Klock Property, modified to reflect proposed earthwork.

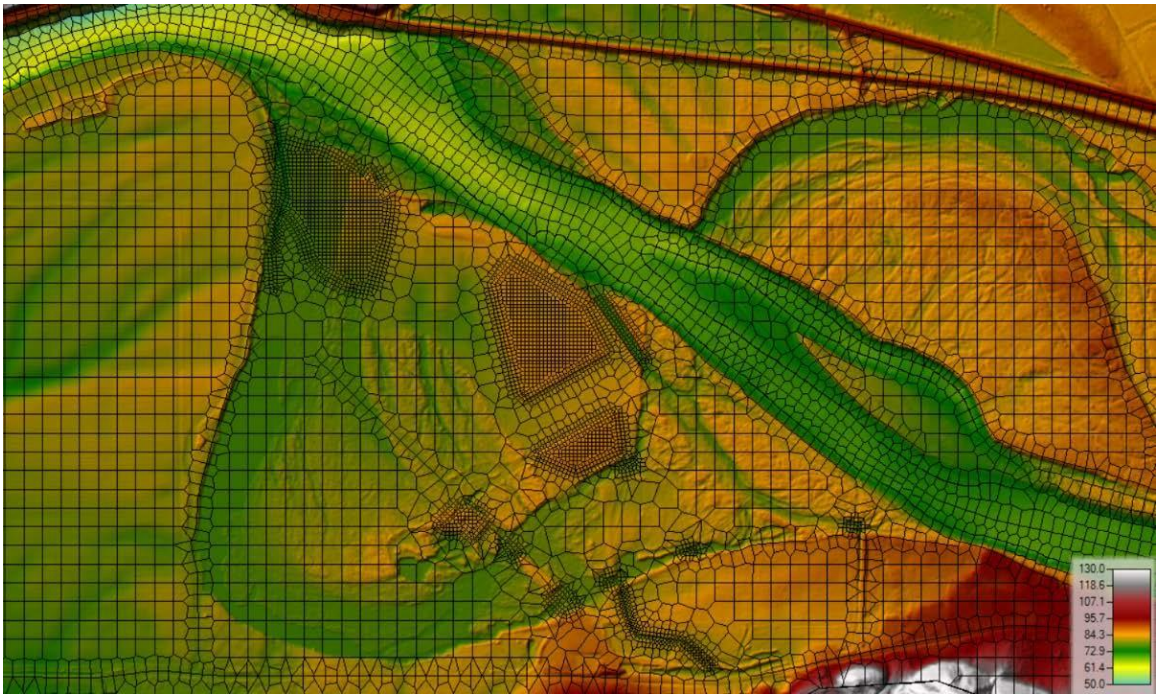


Figure 6. HEC-RAS 2-D hydraulic model mesh network in the vicinity of the Klock Property.

14. Modeling Predictions and Interpretation

The simulations indicate that the proposed grading will increase flows in the oxbow and excavated channels during the 100 year flood peak flow, thereby increasing local WSEs

compared with existing conditions due to the enhanced floodplain connectivity (Figure 7). Peak water levels will be elevated in the vicinity of the upstream side of the fill areas, and lowered over the floodplain in response to fill removal.

Changes within the river mainstem channel are predicted to be mostly within +/- 0.02 ft depending on location (Figure 7), which corresponds to well within modeling accuracy and measurement error. Greatest changes are in the vicinity where floodplain channel excavation is proposed, followed by the fill areas. Within the mainstem channel proper, the central area near the excavated channel (#8 in Figure 2) is predicted to have the greatest local rise, generally less than 0.10 ft. We expect the river to adjust its morphology locally in this area over time as a compensatory response, where the WSEs should decrease again.

The proposed restoration earthwork activities are not predicted to result in a floodplain-wide increase in WSEs. Consistent with FEMA (2009) Appendix E guidelines, no structures are predicted to be affected by increased WSEs associated with the proposed earthwork.

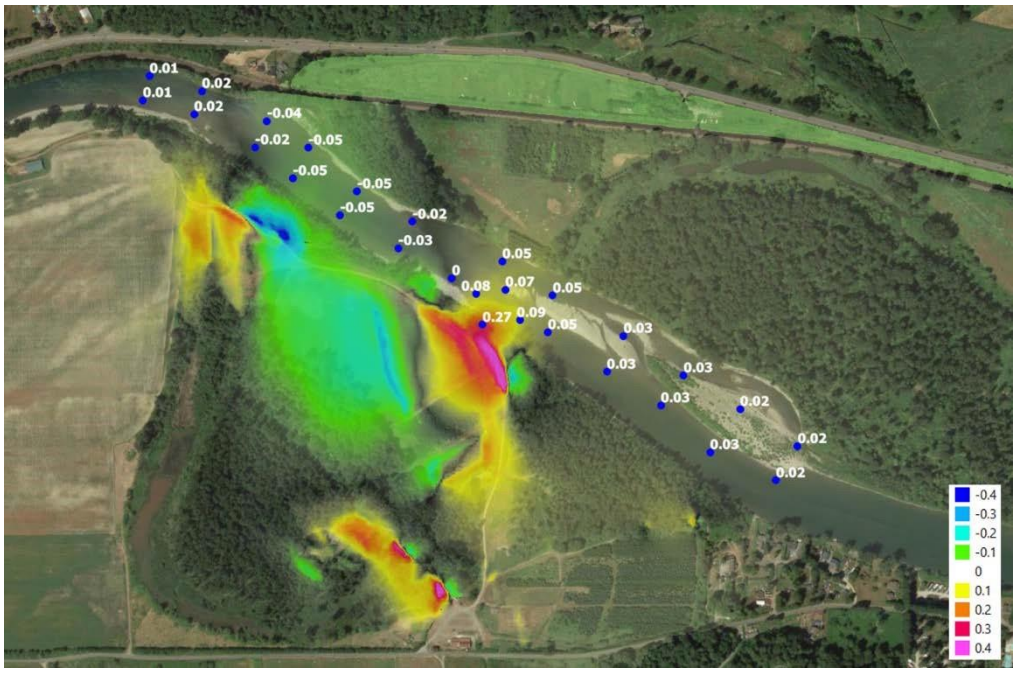


Figure 7. Predicted changes (units=ft) in 100-year flood water surface elevations associated with the proposed design relative to existing conditions.

15. References

Federal Emergency Management Agency (FEMA). 2009. National Flood Insurance Program Floodplain Management Guidebook. Region 10, 5th Edition, March. Bothell, WA.

Watershed Science & Engineering (WS&E). 2018. Ben Howard Road flooding analysis: Lower Skykomish River Hydraulic Modeling. Report prepared for Snohomish County Public Works. August.

Tables 13-31 Planting Area Takeoffs

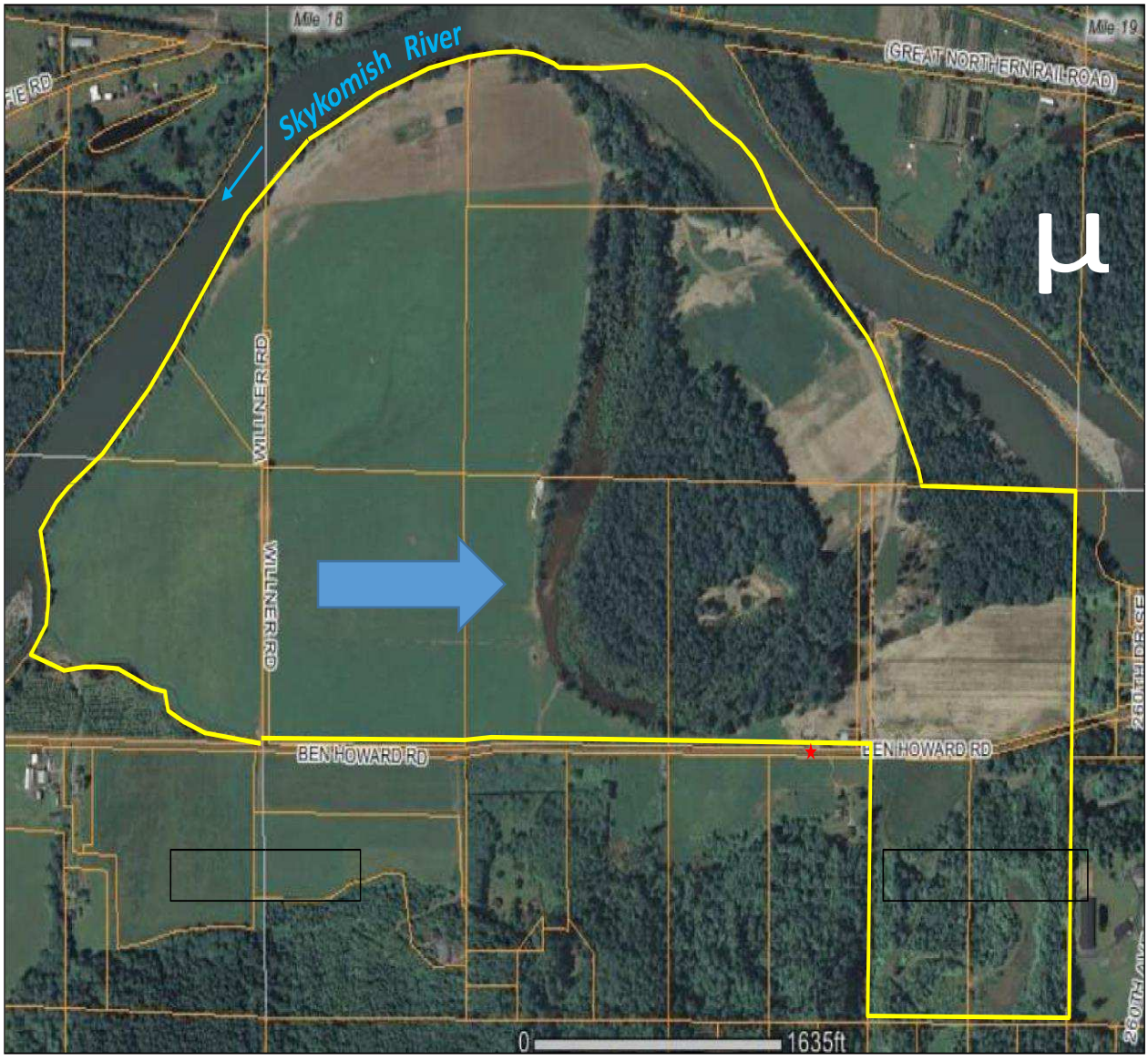
Figures 1-10

Photographs 1-7

Figure 1. General vicinity map for the Klock Property, east of the City of Monroe in unincorporated Snohomish County, Washington

Note:
Source of photograph = Google Earth
North is up
Area Outlined in red is the approximate eastern half of the Klock Property

Figure 2. Close up - Approximate extent of the Klock Ownership with approximate tax parcel boundaries. The Main oxbow waters/wetland complex is located in the eastern half of the property. North is up. The blue arrow indicates the main oxbow area in the eastern half of the Klock Property.

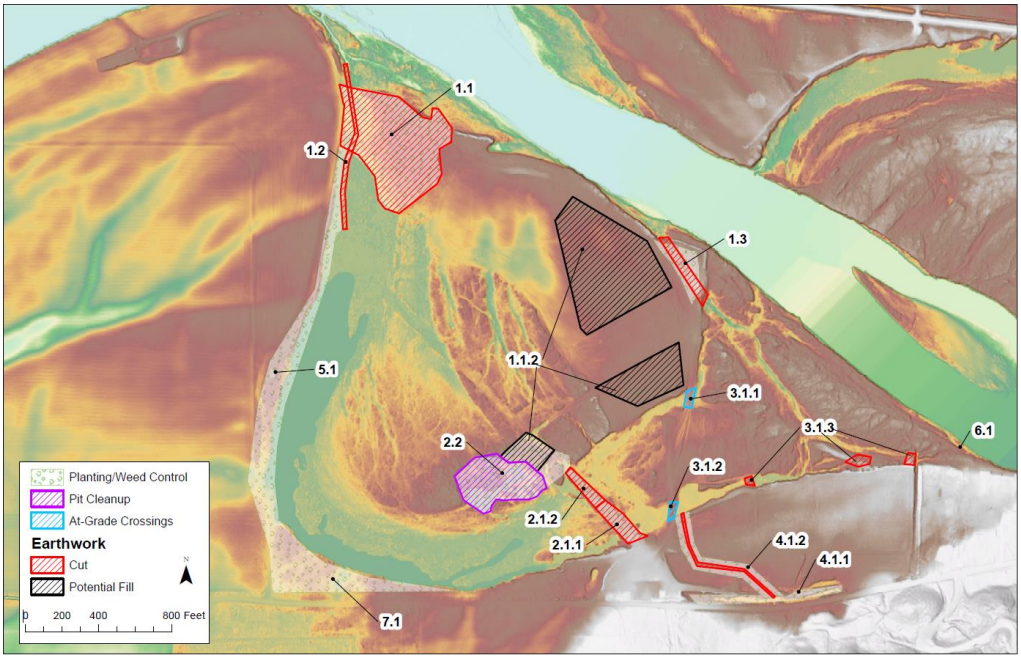


Source: Snohomish County Online Property http://gis.snoco.org/maps/property/viewer.

Figure 3 –

A. Restoration Work Areas on the Klock Property, Snohomish County, WA – LIDAR Base. Numbers in this figure key to Tasks enumerated in Table 3.

Lidar Base



B. Aerial Photograph Base

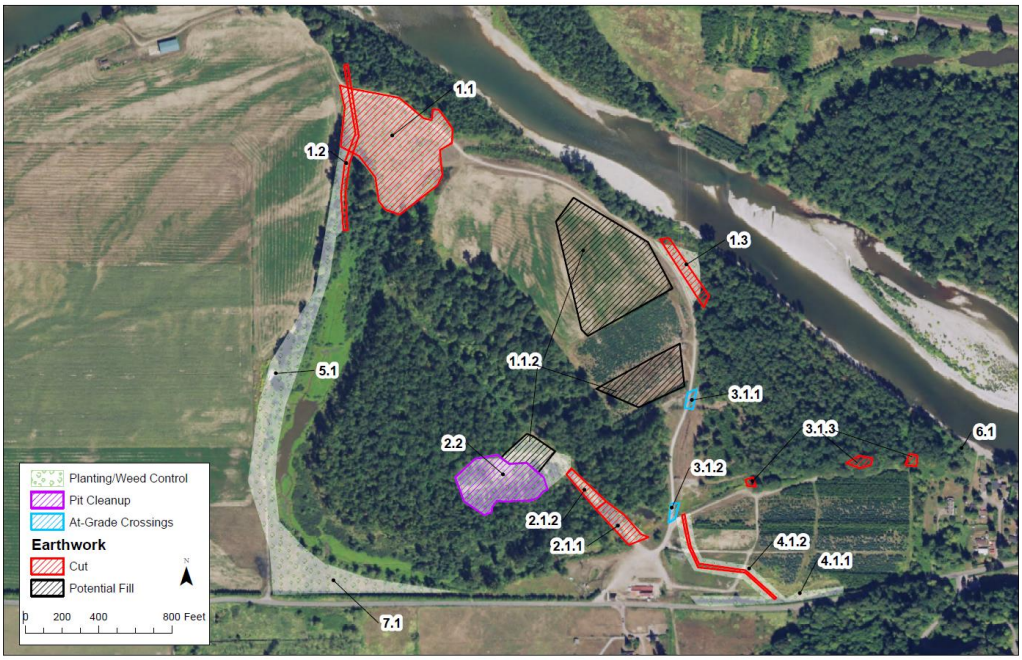


Figure 4. 2003 shaded relief Light Detection and Ranging (LIDAR) image of the Klock Property – eastern half including the main oxbow waters/wetland complex. North is up. This image was taken *before* Klock/Wolford stream rerouting, mechanical clearing, filling, and earthwork operations. The blue arrow indicates the main oxbow area in the eastern half of the Klock Property.

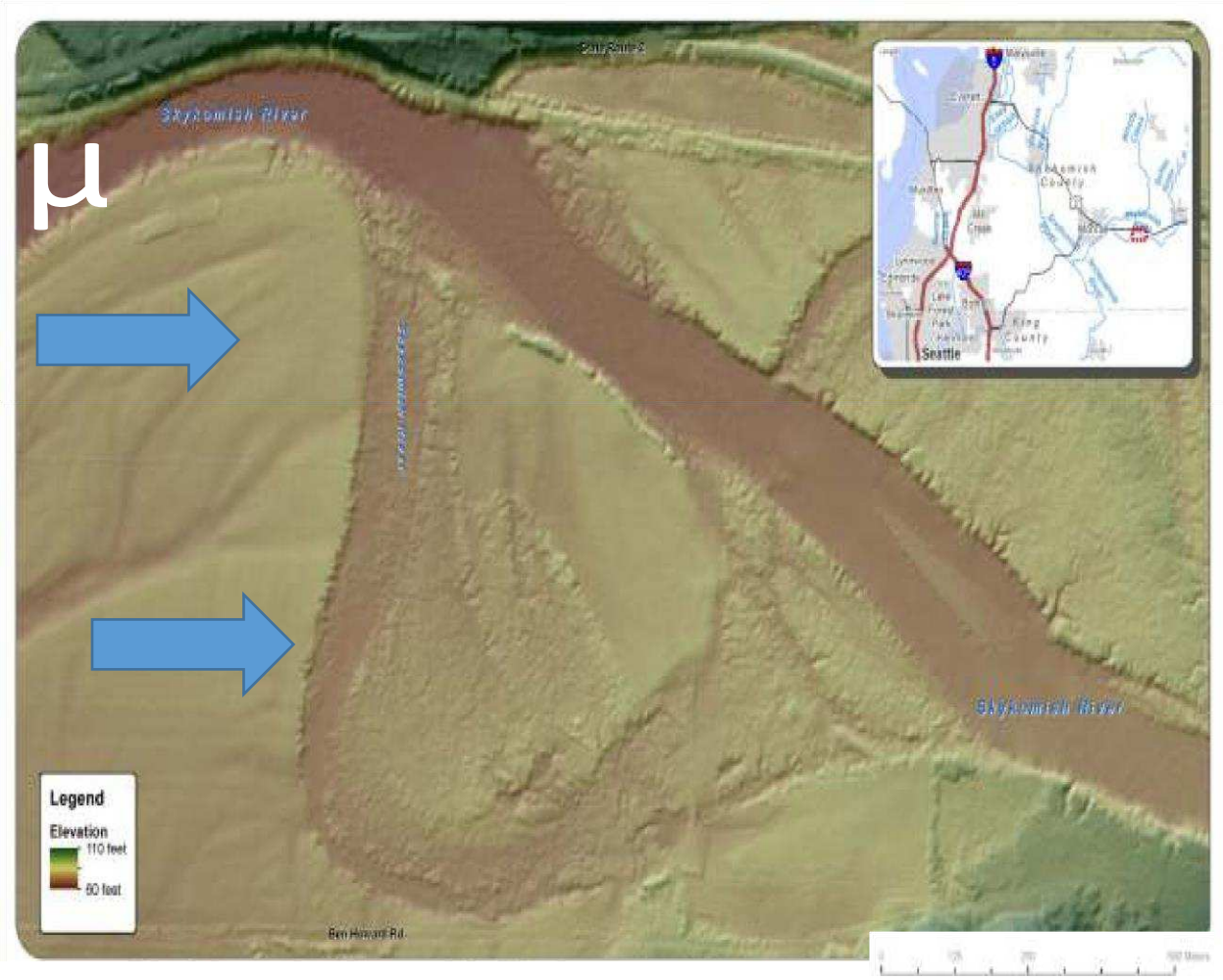


Figure 5. 2014 Grey scale Light Detection and Ranging (LIDAR) Image of the Eastern portion of the Klock Property showing the main oxbow system and its relationship to the main channel of the Skykomish River.

Notes:
North is Up
This image was taken *after* Klock/Wolford stream rerouting, mechanical clearing, filling, and earthwork operations.
Blue Arrow Indicates the main oxbow area in the eastern half of the Klock Property

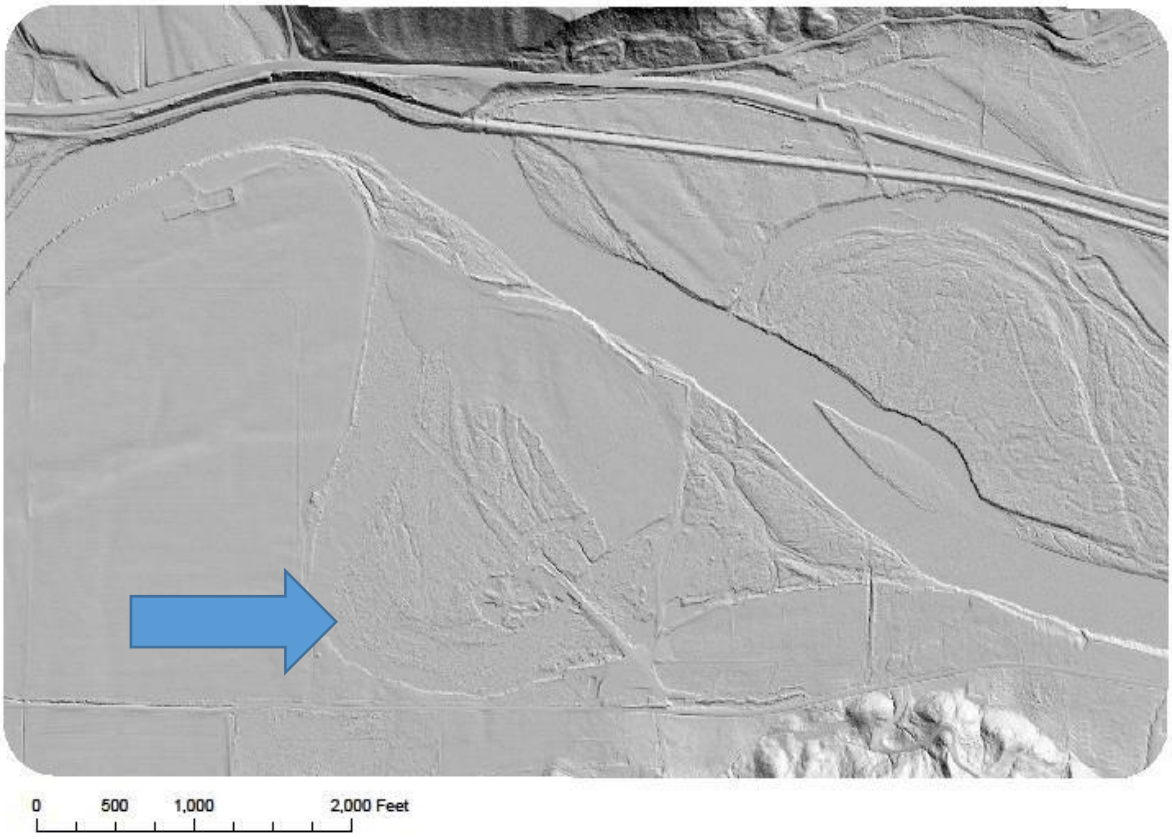


Figure 6. River Gauge Comparison During 2003 and 2014 LIDAR Flights. Monroe USGS Gauge. (Source, anchor QEA, June, 2017)

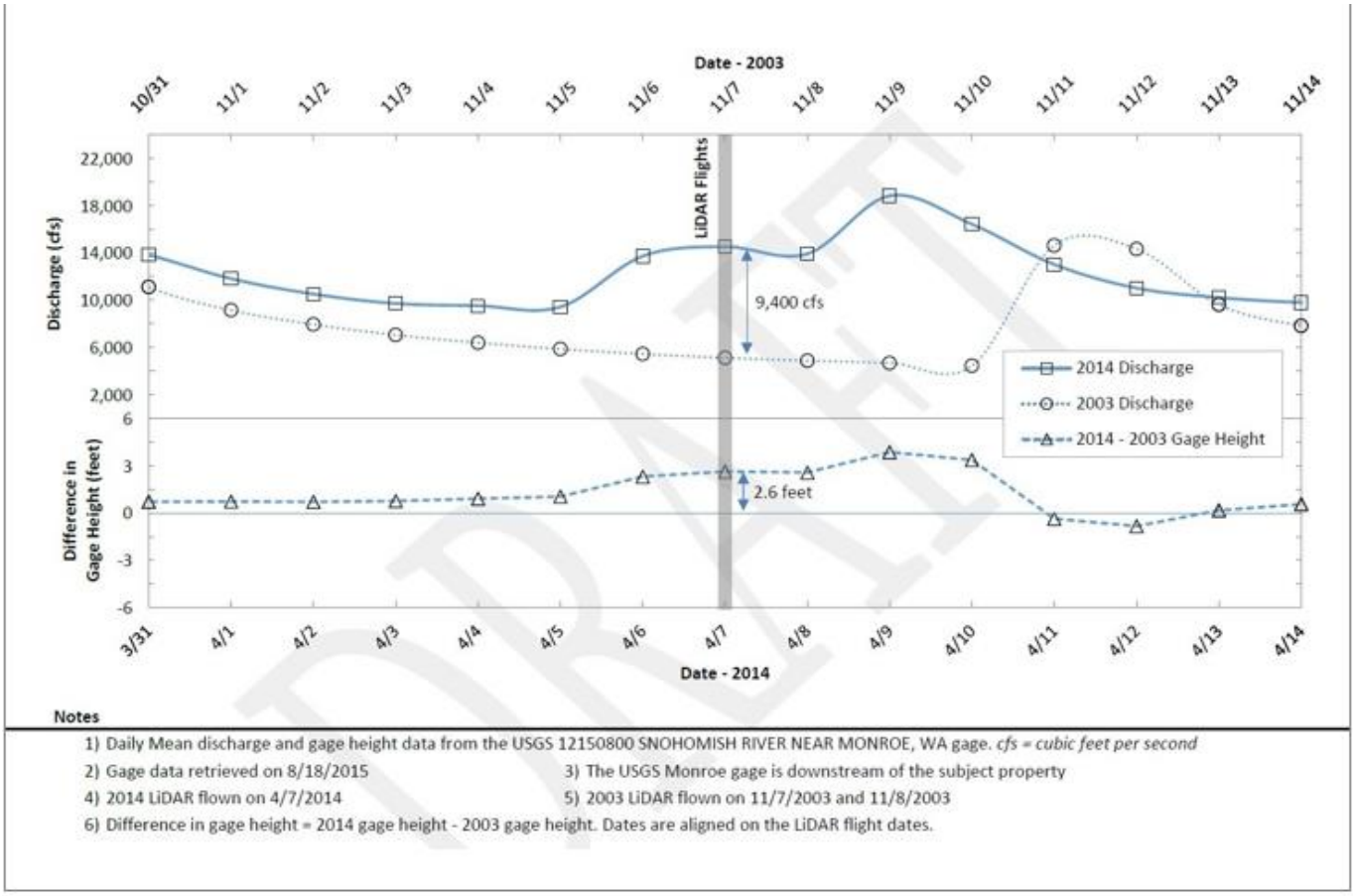


Figure 7. StreamStats Peak Flow Hydrology summary for the unnamed stream in the southeast corner of the Klock Property (Source Anchor QEA, 2017).

Return Period (yr)	Drainage Area, A (sq. mi)	Mean Annual Precipitation, P (inches)	Regression Peak Flow (cfs)	Peak Flow plus Std. Error, Q +stder (cfs)	Peak Flow Value, Q_{Rtn} (cfs)
2	0.23	55.8	11	17	20
10	0.23	55.8	20	30	20
25	0.23	55.8	25	38	30
50	0.23	55.8	29	45	30
100	0.23	55.8	33	51	40

Regression Formulas applicable to **Ungaged drainage basins in Western Washington**, see sources

Peak Discharge Regression Equations

per Knowles et. al. 2001 for Region 2, Table 1, page 3

$Q_2 = 0.090 \times A^{0.877} \times P^{1.51}$

$Q_{10} = 0.129 \times A^{0.868} \times P^{1.57}$

$Q_{25} = 0.148 \times A^{0.864} \times P^{1.59}$

$Q_{50} = 0.161 \times A^{0.862} \times P^{1.61}$

$Q_{100} = 0.174 \times A^{0.861} \times P^{1.62}$

Valid Range	Min	Max
A	0.08 sq. mi	3020 sq. mi
P	23 in/yr	170 in/yr

Notes:
1. Q_2 *standard error of prediction is 56%*
2. Q_{10} *standard error of prediction is 53%*
3. Q_{25} *standard error of prediction is 53%*
4. Q_{50} *standard error of prediction is 53%*
5. Q_{100} *standard error of prediction is 54%*
6. *Regression equations have a limited range, see table*

Input Data

Basin drainage area
Delineated using the USGS Washington StreamStats web map.

Mean annual precipitation
Output from the USGS Washington StreamStats web map.

Output Data

Peak Flow Value
Rounded value from the regression equation up to the nearest 10 cfs.

References

The National Flood-Frequency Program—Methods for Estimating Flood Magnitude and Frequency in Washington
Knowles, S.M. and S.S. Sumioka, 2001. The National Flood-Frequency Program—Methods for Estimating Flood Magnitude and Frequency in Washington, 2001. U.S. Geological Survey Fact Sheet FS-016-01, 4 p.

Magnitude and Frequency of Floods in Washington
Sumioka, S.S., D.L. Kresch, and K.D. Kasnick, 1998. Magnitude and Frequency of Floods in Washington. U.S. Geological Survey Water-Resources Investigations Report 97-4277, 91 p.

USGS Washington StreamStats
U.S. Geological Survey, 2012. The StreamStats program for Washington, online at http://water.usgs.gov/osw/streamstats/Washington.html

Mean Annual Precipitation Map
U.S. Weather Bureau, 1965. State of Washington, mean annual precipitation, 1930-1957: Portland, Oregon, Soil Conservation Service, map M-4430, 1 sheet [no scale].

Study Area: Washington
NAD 1983 Latitude: 47.8467 (47 50 48)
NAD 1983 Longitude: -121.8895 (-121 53 23)
Drainage Area: 0.23 mi2

Peak-Flow Basin Characteristics

100% Region 2 (0.23 mi2)

Parameter	Value	Regression Equation Valid Range	
		Min	Max
Drainage Area (square miles)	0.23	0.08	3020
Mean Annual Precipitation (inches)	55.8	23	170

Peak-Flow Statistics

Statistic	Value	Unit	Standard Error (percent)	Equivalent years of record	90-Percent Prediction Interval	
					Min	Max
PK2	10.8	cfs	56	1		
PK10	19.9	cfs	53	1		
PK25	24.9	cfs	53	2		
PK50	29.4	cfs	53	2		
PK100	33.2	cfs	54	3		

Figure 8. Water depths in the main oxbow system on the Klock Property over the estimated historical terrain from 2003 LIDAR (*Prior to* Klock/Wolford Operations). The water depth plot is for a recurrence interval flooding event of approximately 2 years. River discharge volume (Q) = 47,000 cfs at Klock property, 1-D and 2-D modeling results of OHW.

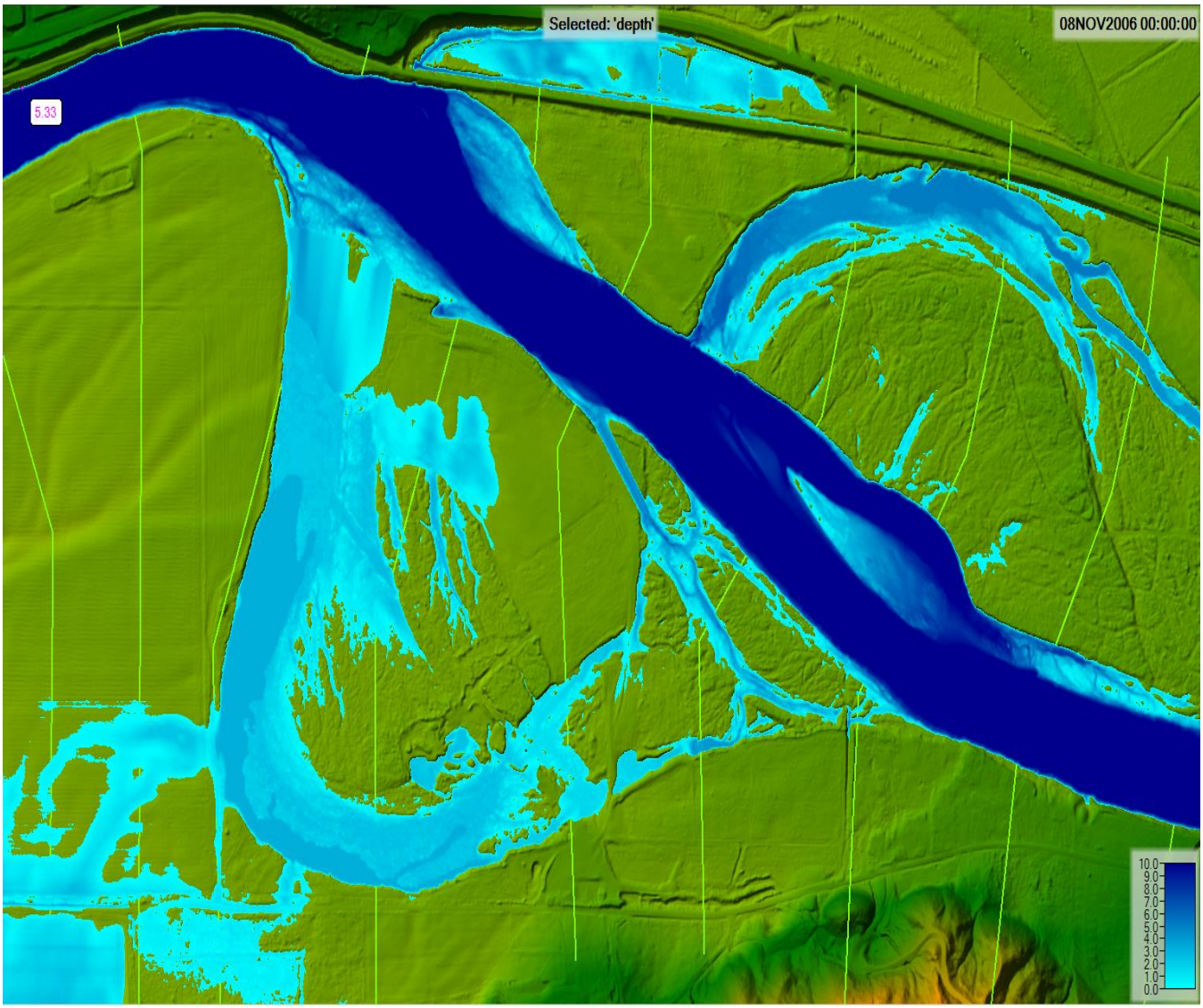


Figure 9. Water depths in the main oxbow system on the Klock Property over the existing terrain from 2014 LIDAR (*Post* Klock/Wolford Operations). The water depth plot is for a recurrence interval flooding event of approximately 2 years. River discharge volume (Q) = 47,000 cfs at Klock property, 2-D modeling results of OHW.

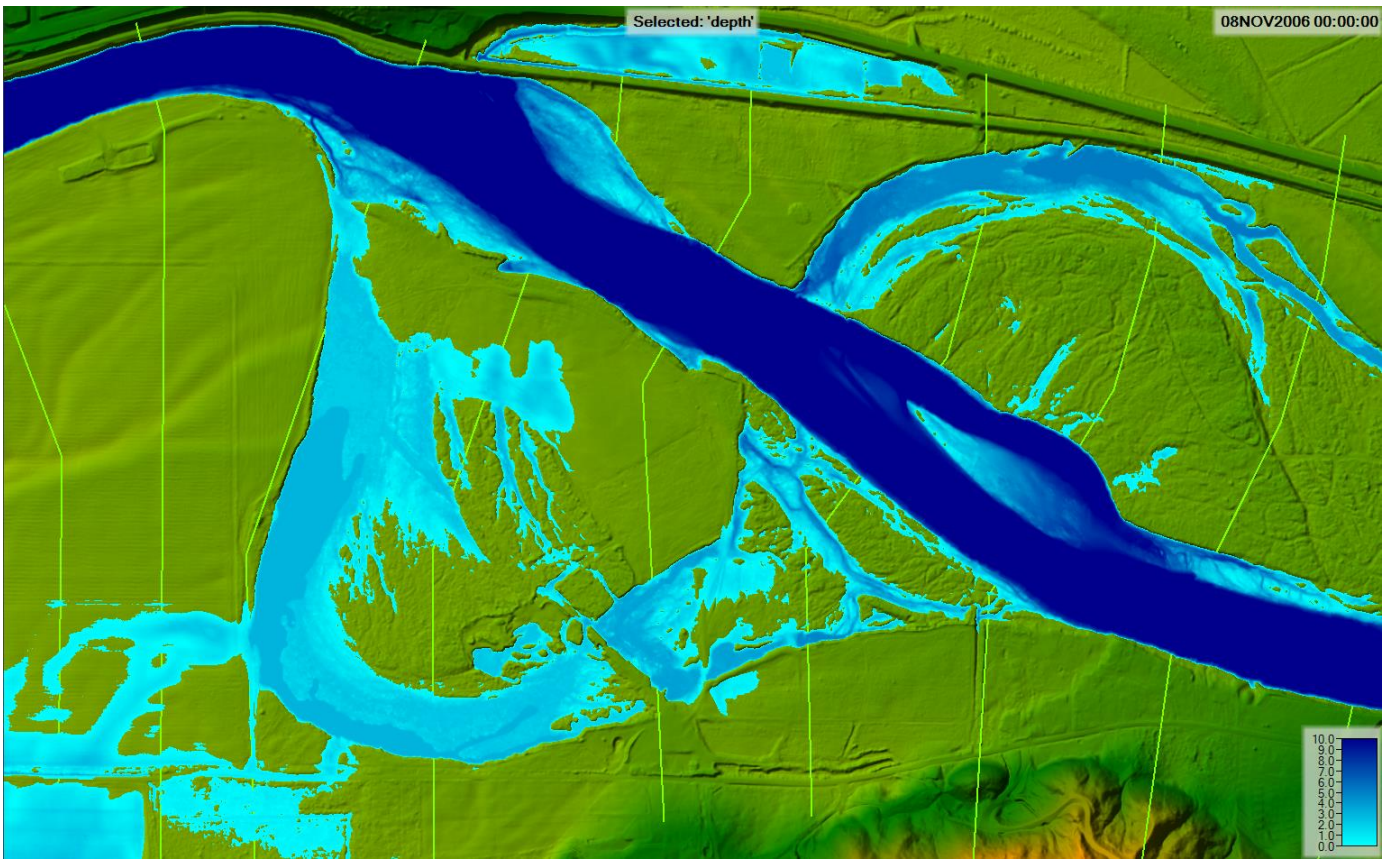


Figure 10 A. – Restoration work Areas on the Klock Property, Snohomish County, WA – Ortho Photograph Base. Note - Numbers in this figure key to Tasks enumerated in Table 3).

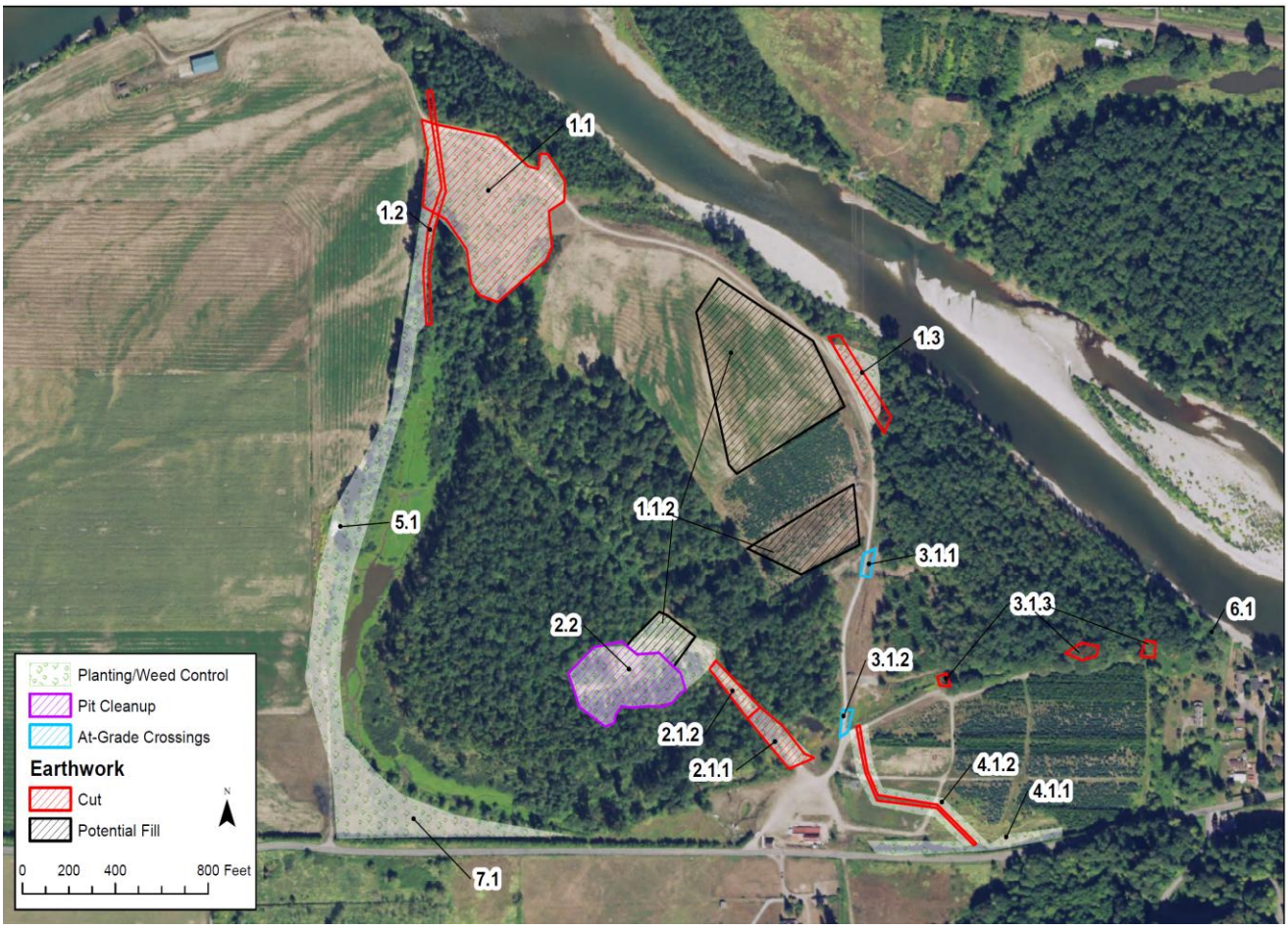
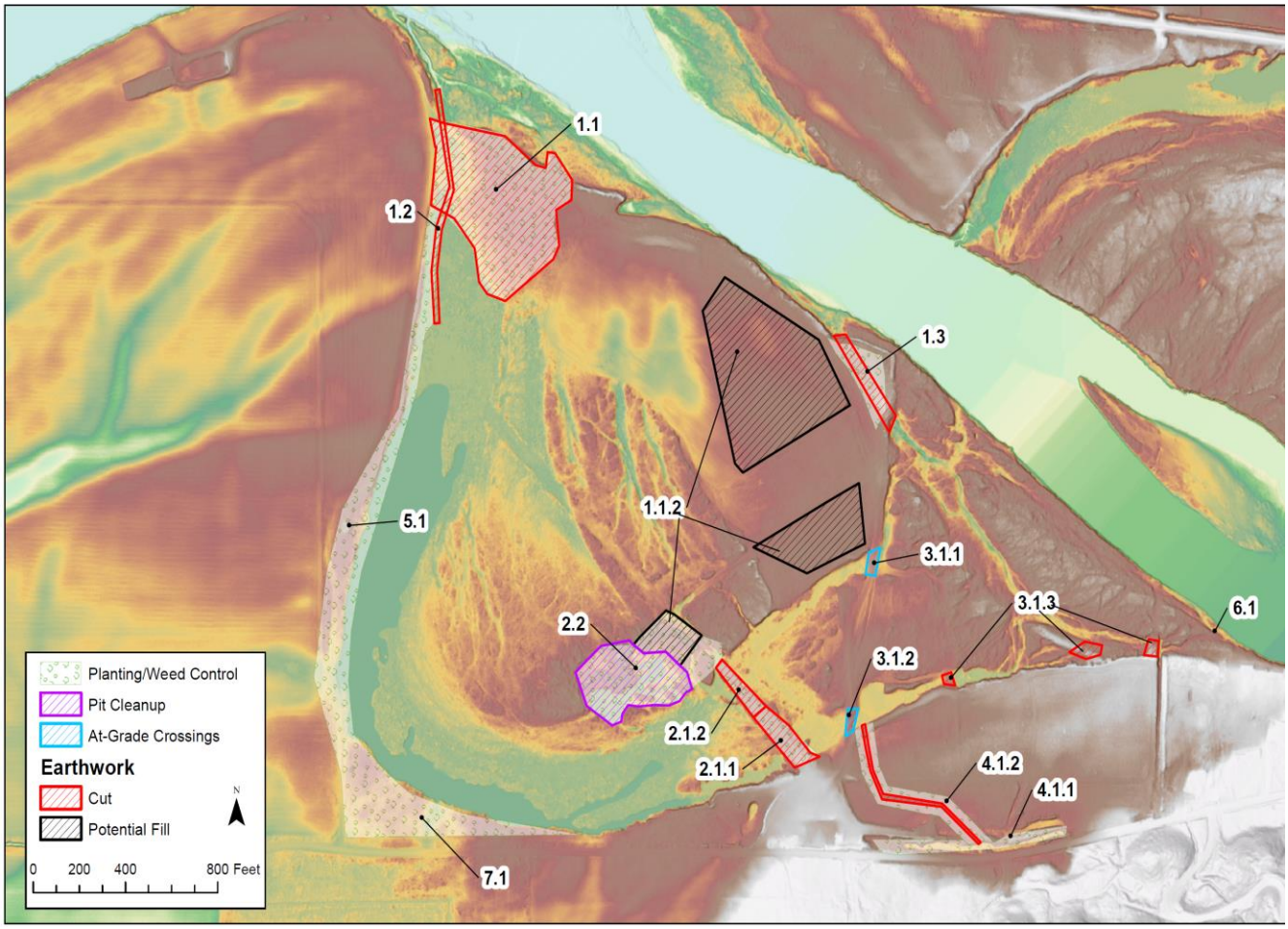


Figure 10 B. – Restoration work Areas on the Klock Property, Snohomish County, WA – LIDAR Base. Note - Numbers in this figure key to Tasks enumerated in Table 3).



Photograph 1. 2010 Google Earth Image of the eastern portion of the Klock Property. Note filling and earthwork activity in the northern portion of the property and in the Central Disposal Pit, and along the Powerline Access Road.

Photograph 2. EPA/CID, March 2010 Photograph of the main oxbow system and Central Disposal Pit area on the Klock Property. View is North Northeast. Note filling in the oxbow outlet and in the Central Disposal Pit areas.

Photograph 3. EPA/CID, March 2010 photograph of mechanical clearing and filling and earthwork activities in the downstream (outlet) end of the main oxbow feature on the Klock Property. View is looking upstream (south) into the oxbow outlet.

Photograph 4. EPA/CID, March 2010 photograph of mechanical clearing and filling and earthwork activities in the downstream (outlet) end of the main oxbow feature on the Klock Property. View is downstream (north) through the oxbow outlet to the main channel of the Skykomish River. Note the pile of bagged (white plastic) rolls of hay placed in wetlands in the southwestern (lower left) corner of the photograph.

Photograph 5. EPA/CID, March 2010 photograph of the main ranch complex and access road to the Central Disposal Pit area on the Klock Property. Note ponding in the Central Disposal Pit area and earthwork at the northern end of the powerline access road. View is generally northwest.

Photograph 6. EPA/CID, March 2010 photograph of the main ranch complex, main oxbow, access road to the Central Disposal Pit area on the Klock Property. Note ponding in the Central Disposal Pit area and in the main oxbow. Also note earthwork in the SE Tributary Stream due east of the Klock barn. View is generally west.

Photograph 7. December 19, 2011 – EPA photograph of the main ranch complex on the Klock Property and earthwork activities in the SE Tributary Stream System north of Ben Howard Road and immediately east of the Klock barn. View is west.

Table 1 - LIDAR Gage Comparison, U.S. Geological survey (USGS) Gage 12150800 on the Snohomish River

Date	Gage Height (NAVD88 feet)	Discharge (cfs)	Return Period
11/7/2003 to 11/8/2003	2.7	6,000	Not Significant
4/7/2014	5.4	14,500	< 1-year[1]

Notes:

1. 1-year flood from 53-year flood frequency analysis determined to be 26,300 cubic feet per second (cfs)
2. NAVD88: North American Vertical Datum of 1988

Table 2 - Peak Flow Design Hydrology for the Unnamed Tributary Stream in the Southeastern Corner of the Klock Property

Return Period (years)[1]	Flow (cubic feet per second)
2	11
25	25
100	33

Note:
1. 25-year and 100-year flows have standard errors of 53% and 54%, respectively.

Table 3 - Restoration Tasks on Klock Property Assuming Execution of Environmental Covenant - (v. June 22, 2020)

		Tasks To Be Completed By Bobby Wolford Trucking (BWT)	Estimated Earthwork (CY)	Quantities Acres (AC)	Design Notes
0	Permitting				
		Obtain all necessary Federal, Washington State and Snohomish County Permits prior to the start of work	N/A	N/A	
1	Main Oxbow Restoration				
1.1		Excavate oxbow outlet fill & redistribute clean fill on site. Ensure compliance with all Federal, WA State and County laws and regulations. **	25,000***	6.2	
1.2		Excavate oxbow reconnection channel through fill removal area and redistribute clean fill materials on-site	1,480	0.5	Assume Approx. 950 LF
1.1.2		Excavate channel north of N/S access road & redistribute clean fill materials on-site	5000	0.1	Assume 75 LF x 18' wide
2.1	Central Pit - Access Road				
2.1.1		Excavate south end of pit access road and resdistribute clean fill materials on-site	5000	0.1	Modified action eliminates 36'x48" Culvert
2.1.2		Excavate North end of pit acces road and redistribute clean fill materials on-site	3000	0.1	Assume 135 LF x 18' wide
2.2	Central Pit - Cleanup				
2.2		Pit cleanup measures as necessary to satisfy WA State and Snohomish Couty requirements	300	1.2	
2.2		Regrading/Reclamation work to support riparian forest establishment (west)	120	1.6	See also Riparian restoration plant procurement listed in Item 7.1
3.1	North-South Access Road				
3.1.1		Create at-grade crossing at north end of north-south access road	80	0.1	Assume 70 LF x 18' wide
3.1.2		Create at-grade crossing in middle of north-south access road	90	0.1	Modified Action eliminates 25'x48" Culvert
3.1.1; 3.1.2; 3.1.3		Remove fill at stations 57+00; 65+00 & 68+00 at the south end of the north-south access road, redistribute clean fill materials on site	2150	0.1	Modified Action eliminates 45'x48" Culvert
4.1	Tributary Stream Daylight and Restore				
4.1.1		Excavate tributary channel with riparian buffer (50 ft either side of the left and right channel bank ordinary high water marks	0	0.6	Assume 670 LF, Riparian restoration in Item 7.1
4.1.2		Abandon/destroy function of pipe under tree farm, and redistribute clean fill materials on site			
5.1	SW Corner of Main Oxbow				
5.1		Remove all plastic hay bales from the SW Corner of the main oxbow haul off site and dispose	N/A	N/A	
6.1	NE Corner of the Klock Property in the River Channel				
6.1		At low water, remove concrete blocks and other fill materials (solid/non-granular) in the river channel and along the river bank	N/A	N/A	Remove & haul off estimated 6 - 12 concrete blocks - final block totals TBD in field at low water
		at the NE corner of the site. Haul off site and dispose.			
7.1	Purchase Plants				
7.1		Purchase all specified bare root conifers, and either purchase or prepare on site cuttings/live stakes of native willows,	N/A	N/A	
		black cottonwoods, and native shrubs			
		Tasks To Be Completed By Tulalip Tribes			
7.1.2	Install Plants	Install procured or propagated plants throughout the site as specified in the planting plan (approx 17.3 acres)	N/A		Final planting take-off will be specified in the final Basis of Design document
7.1.3	Irrigation	2-year irrigation of planted stock during dry season - if necessary	N/A		Need for irrigation TBD in response to field conditions in Years 1, 2, and 3
7.1.4	Year 2 and 3 weed control	Complete mechanical and if necessary chemical weed control measures - Years 2 and 3	N/A		Complete weed control as needed to achieve planting goals via mechanical clearing, hand clearing, herbicide application or all
8	Construction Oversight	Construction oversight	N/A	N/A	Assumes 30 days of construction and 95 days of planting. Cost assumes at least biweekly 12-hr visits or equal time spread across more days as needed and all travel/documentation costs.

Notes:

*Task numbers in this version of Table 3 generally track numbers contained in the Anchor Environmental Basis of Design (BOD) (August 2017). Changes to BOD Tasks are listed in the Design Notes Section above.

**Throughout this work plan, all grading, on-site redistribution of fill materials, and other restoration measures assume full compliance with all Federal, Washington State, and Snohomish County laws and regulations.

*** Approximately 32,000 cubic yards of material needs to be removed from the Main Oxbow Channel work area and redistributed on-site or hauled off-site to meet or exceed County No-Rise requirements

Table 4 – Task by Task Summary of Project Targets, Project Standards, Measurement Methods, Success Criteria, & Contingency Measures for the Klock Property Restoration, Snohomish County, Washington					
TASK (Number and Name)	**PROJECT TARGETS**	**PROJECT STANDARDS, IMPLEMENTATION PROCEDURES**	**MEASUREMENT METHODS**	**SUCCESS CRITERIA**	**RECOMMENDED FIRST RESPONSE CONTINGENCY MEASURES**
0 - Permitting	Obtain all necessary permits for the Klock Property Restoration	Federal, Washington State, and Snohomish County permits	N/A	All necessary permits obtained	N/A
Main Oxbow Channel					
1.1 – Excavate the Main Oxbow outlet fill & redistribute clean fill on site.	Remove fill from the downstream end of the Main Oxbow and redistribute clean fill on the Klock Property	Remove specified fill volumes and achieve bulk and finish grade elevations and earthwork contours consistent with plans in C-11 and C-12	1. Documented fill volume removals 2. As-built topographic survey 3. Photographic documentation of finished grades	Achieve fill volume removal quantities and design grades	N/A – complete specified grading and redistribution of clean fill materials
1.2 - Excavate oxbow reconnection channel through the fill removal area and redistribute clean fill materials on-site	Reconnect the downstream end of the Main Oxbow to the Skykomish River	Reconnection achieved consistent with plans in C-11	1. Documented fill volume removals 2. As-built topographic survey 3. Photographic documentation of finished grades	Achieve fill volume removal quantities and design grades	N/A – complete specified grading and channel connection

Table 4 – Task by Task Summary of Project Targets, Project Standards, Measurement Methods, Success Criteria, & Contingency Measures for the Klock Property Restoration, Snohomish County, Washington					
TASK (Number and Name)	**PROJECT TARGETS**	**PROJECT STANDARDS, IMPLEMENTATION PROCEDURES**	**MEASUREMENT METHODS**	**SUCCESS CRITERIA**	**RECOMMENDED FIRST RESPONSE CONTINGENCY MEASURES**
1.3 - Excavate channel north of North/South access road & redistribute clean fill materials on-site	Remove and redistribute clean fill to achieve reconnection of this northern end of the secondary/tertiary channel network to the main Skykomish River channel	Reconnection achieved consistent with plans in C-10	1. Documented fill volume removals 2. As-built topographic survey 3. Photographic documentation of finished grades	Achieve fill volume removal quantities and design grades	N/A – complete specified grading and channel connection
Central Pit Access Road					
2.1.1 - Excavate south end of Central Pit access road and redistribute clean fill materials on-site	Excavate & redistribute clean fill materials to achieve reconnection of Main Oxbow reaches that are northeast and southwest of the south end of the Central Pit Access Road.	Reconnection achieved consistent with plans in C-7	1. Documented fill volume removals 2. As-built topographic survey 3. Photographic documentation of finished grades	Achieve fill volume removal quantities and design grades	N/A – complete specified grading and channel connection

Table 4 – Task by Task Summary of Project Targets, Project Standards, Measurement Methods, Success Criteria, & Contingency Measures for the Klock Property Restoration, Snohomish County, Washington					
TASK (Number and Name)	**PROJECT TARGETS**	**PROJECT STANDARDS, IMPLEMENTATION PROCEDURES**	**MEASUREMENT METHODS**	**SUCCESS CRITERIA**	**RECOMMENDED FIRST RESPONSE CONTINGENCY MEASURES**
.2 - Excavate North end of pit access road and redistribute clean fill materials on-site	Excavate and redistribute clean fill materials to achieve reconnection of the Main Oxbow reaches that are immediately northeast and southwest of the north end of the Central Pit Access Road.	Reconnection achieved consistent with plans in C-8	1. Documented fill volume removals 2. As-built topographic survey 3. Photographic documentation of finished grades	Achieve fill volume removal quantities and design grades	N/A – complete specified grading and channel connection

Table 4 – Task by Task Summary of Project Targets, Project Standards, Measurement Methods, Success Criteria, & Contingency Measures for the Klock Property Restoration, Snohomish County, Washington					
TASK (Number and Name)	**PROJECT TARGETS**	**PROJECT STANDARDS, IMPLEMENTATION PROCEDURES**	**MEASUREMENT METHODS**	**SUCCESS CRITERIA**	**RECOMMENDED FIRST RESPONSE CONTINGENCY MEASURES**
Central Pit Cleanup					
2.2.1 - Central Pit cleanup measures as necessary to satisfy Federal, Washington State, and Snohomish County requirements	Remove all unsuitable fill materials from the Central Pit work area and haul off site consistent with Federal, Washington State, and Snohomish County Requirements. After fill removals, regrade the work area with smooth transitions to the surrounding landscape.	Unsuitable fill removals and finish grading achieved consistent with plans in C-16	1. Documented fill volume removals 2. As-built topographic survey 3. Photographic documentation of finished grades	Achieve removal of unsuitable fill and design grades	N/A – complete specified unsuitable fill removal(s) and finish grading

Table 4 – Task by Task Summary of Project Targets, Project Standards, Measurement Methods, Success Criteria, & Contingency Measures for the Klock Property Restoration, Snohomish County, Washington					
TASK (Number and Name)	**PROJECT TARGETS**	**PROJECT STANDARDS, IMPLEMENTATION PROCEDURES**	**MEASUREMENT METHODS**	**SUCCESS CRITERIA**	**RECOMMENDED FIRST RESPONSE CONTINGENCY MEASURES**
2.2.2 – Complete bulk and finish grading and site cleanup work to support establishment of a mosaic of a forested plant community	Create a finish grade surface suitable for reforestation of this work area	Finish grading achieved consistent with field direction of the Construction Oversight Team.	1. Documented fill volume removals 2. As-built topographic survey 3. Photographic documentation of finished grades	Achieve finish grades suitable for planting	N/A – achieve specified finish grades for planting

Task 3 – North South Access Road					
3.1.1 - Create at-grade crossing at north end of north-south access road	Excavate and redistribute clean fill materials to achieve reconnection of the Main Oxbow reaches that are immediately northeast and southwest of the 3.1.1 work area identified in Figures 9 and 10 of this BOD	Reconnection achieved consistent with plans in C-9	1. Documented fill volume removals 2. As-built topographic survey 3. Photographic documentation of finished grades	Achieve fill volume removal quantities and design grades	N/A – complete specified grading and channel connection/at grade crossing

Table 4 – Task by Task Summary of Project Targets, Project Standards, Measurement Methods, Success Criteria, & Contingency Measures for the Klock Property Restoration, Snohomish County, Washington					
TASK (Number and Name)	**PROJECT TARGETS**	**PROJECT STANDARDS, IMPLEMENTATION PROCEDURES**	**MEASUREMENT METHODS**	**SUCCESS CRITERIA**	**RECOMMENDED FIRST RESPONSE CONTINGENCY MEASURES**
3.1.2 - Create at-grade crossing in middle of north-south access road	Excavate & redistribute clean fill materials to achieve reconnection of the Main Oxbow reaches that are immediately northeast and southwest of the 3.1.2 work area	Reconnection achieved consistent with plans in C-6	1. Documented fill volume removals 2. As-built topographic survey 3. Photographic documentation of finished grades	Achieve fill volume removal quantities and design grades	N/A – complete specified grading and channel connection/at grade crossing
3.1.3 - Remove fill at stations 57+00; 65+00 & 68+00 at the south end of the north-south access road, redistribute clean fill materials on site	Remove and redistribute clean fill materials from these three work areas and complete finish grades with smooth transitions to surrounding landscapes	Fill removed and redistributed in three work areas, graded smooth transitions to surrounding landscapes	1. Documented fill volume removals 2. As-built topographic survey 3. Photographic documentation of finished grades	Achieve fill volume removal quantities and design grades	N/A – complete specified fill removals and grading

Table 4 – Task by Task Summary of Project Targets, Project Standards, Measurement Methods, Success Criteria, & Contingency Measures for the Klock Property Restoration, Snohomish County, Washington					
TASK (Number and Name)	**PROJECT TARGETS**	**PROJECT STANDARDS, IMPLEMENTATION PROCEDURES**	**MEASUREMENT METHODS**	**SUCCESS CRITERIA**	**RECOMMENDED FIRST RESPONSE CONTINGENCY MEASURES**
Task 4 – Tributary Stream Daylight and Restore					
4.1.1 - Excavate tributary channel with riparian buffer (50 ft either side of the left and right channel bank ordinary high water marks. Abandon/destroy function of pipe under tree farm, and redistribute clean fill materials on site	Abandonment of existing culvert/pipe system and establishment of a new tributary channel and associated buffer	Culvert/pipe system abandoned and construction of new channel and buffer consistent with plans in C-13	1. Documented culvert/pipe decommissioning and new tributary channel construction 2. As-built topographic survey 3. Photographic documentation of finished grades	Achieve culvert/pipe decommissioning and channel construction to design grades & establish buffer	N/A – complete specified culvert/pipe decommissioning, channel construction and buffer establishment

Task 5 – Hay Bale Removal- Southwest Corner of Main Oxbow					
5.1.1 - Remove all plastic hay bales from the SW Corner of the main oxbow haul off site and dispose	Removal of the existing pile of plastic covered hay	No residual stockpiled and plastic covered hay	Photographic documentation of hay bale removal	No hay bales remaining	N/A

Table 4 – Task by Task Summary of Project Targets, Project Standards, Measurement Methods, Success Criteria, & Contingency Measures for the Klock Property Restoration, Snohomish County, Washington					
TASK (Number and Name)	**PROJECT TARGETS**	**PROJECT STANDARDS, IMPLEMENTATION PROCEDURES**	**MEASUREMENT METHODS**	**SUCCESS CRITERIA**	**RECOMMENDED FIRST RESPONSE CONTINGENCY MEASURES**
Task 6 – Northeast Corner of the Klock Property in the River Channel					
6.1.1 - At low water, remove concrete blocks and other fill materials (solid/non-granular) in the river channel and along the river bank at the NE corner of the site. Haul off site and dispose.	Remove concrete blocks and other fill materials (solid/non granular) in the river channel and along the river bank at the NE corner of the site. Haul off site and dispose.	No residual fill materials in the river channel	Photographic documentation of concrete block removals	No residual concrete block materials remaining	N/A

Table 4 – Task by Task Summary of Project Targets, Project Standards, Measurement Methods, Success Criteria, & Contingency Measures for the Klock Property Restoration, Snohomish County, Washington					
TASK (Number and Name)	**PROJECT TARGETS**	**PROJECT STANDARDS, IMPLEMENTATION PROCEDURES**	**MEASUREMENT METHODS**	**SUCCESS CRITERIA**	**RECOMMENDED FIRST RESPONSE CONTINGENCY MEASURES**
Task 7 – Purchase plants, Plant Installations, Irrigation, and Weed Control					
7.1.1 - Purchase Plants Purchase all specified bare root conifers, and either purchase or prepare on site cuttings/live stakes of native willows, black cottonwoods, and native shrubs	On time procurement and transfer of healthy native tree, shrub, and undergrowth plants to the Tulalip Tribes	Transfer of healthy native plants in quantities that are consistent with the plant take off schedules shown on plan sheet C-19	Documentation of successful transfer of procured plants via receipts/sign off from Tulalip Tribes	Transfer of healthy native plants in quantities that are consistent with the plant take off schedules shown on plan sheet C-19	If BWT fails on time procurement, then transfer responsibility for procurement (not payment) to Tulalip Tribes.
7.1.2 – Install procured plants or propagated plants throughout the site as specified in the planting plan (approximately 19.4 acres)	1-2 year phased planting of up to 19.4 acres with native tree, shrub, and undergrowth species.	Installation of healthy native tree, shrub and undergrowth plants consistent with the plans and take off schedules shown on plan sheets C-18 and C-19	Documentation of Plant installations consistent with plant take off tables by planting zone.	Installation of healthy native tree, shrub and undergrowth plants consistent with the plans and take off schedules shown on plan sheet C-18 and C-19	N/A - or if for some reason planting is delayed, then revise phased plantings to complete installation of take off schedules

Table 4 – Task by Task Summary of Project Targets, Project Standards, Measurement Methods, Success Criteria, & Contingency Measures for the Klock Property Restoration, Snohomish County, Washington					
TASK (Number and Name)	**PROJECT TARGETS**	**PROJECT STANDARDS, IMPLEMENTATION PROCEDURES**	**MEASUREMENT METHODS**	**SUCCESS CRITERIA**	**RECOMMENDED FIRST RESPONSE CONTINGENCY MEASURES**
7.1.3 – Irrigation 2year irrigation of planted stock during dry season - if necessary	Irrigate if necessary to ensure survival of planted stock	Minimize plant mortality due to water stress during the first three growing seasons.	1. Documentation of irrigation efforts and schedules 2. Minimal mortality (<50% planted stock loss) due to water stress during first three growing seasons	Establishment of > 400 stems per acre of woody native plant species after year 3 growing season	1. Call irrigation procedures early 2. Apply more water if needed over broader areas 3. Set up temporary but automatic irrigation regimes
7.1.4 – Year 2 and 3 Weed Controls	All restoration areas are dominated by native species and on a trajectory to become relatively free of non-native invasive weeds	Restoration area plantings are free to grow/not impeded by weeds and canopy cover is dominated by native species.	Documentation of - 1. % Canopy Coverage by planting Zone 2. Dominance of planting zones canopy coverage by native species 3. Photographs of representative conditions by planting zone	Restoration area plantings are free to grow/not impeded by weeds and canopy cover is dominated by native species.	1. More frequent mechanical controls 2. Use of EPA Registered herbicides 3. Clearing and replanting areas that are lost to weeds 4. Some combination of the above

Table 5. Table of Potentially Required Permits for the Klock Property Restoration
(Note: Additional permits may be required)

PERMIT	AGENCY
Clean Water Act (CWA) Section 404/Nationwide 32	United States Army Corps of Engineers
Water Quality Certification (CWA) Section 401	Washington State Department of Ecology
Section 7 Consultation for Endangered Species	National Marine Fisheries Service/USFWS
Section 106 – Historic Preservation	DAHP and Tribes
Hydraulic Projects Approval (HPA)	Washington Department of Fish and Wildlife
Construction Storm water General Permit	Washington State Department of Ecology
State Environmental Policy Act	Snohomish County
Shoreline Permit	Snohomish County
Land Disturbing Activity Permit	Snohomish County
Critical Aras Permit	Snohomish County
Flood Hazard Permit	Snohomish County

Table 6. Candidate Tree, Shrub, Graminoids, Forbs/Ferns/Fern Allies/Emergent Species and Specifications for the Klock Property Restoration

Scientific Name	Common Name	Nat'l Wetland Indicator status	Preferred Stock	Microsite/Planting Preferences	Other
TREES					
Abies grandis	Grand fir	FACU	2/0 or jumbo bare root from northern Puget Sound lowlands Provenance	Moist microsites not subject to regular flooding and above elevation 76 ft	Conifer – shade tolerant
Acer macrophyllum	Big Leaf Maple	FACU	1 gallon pots from northern Puget Sound lowlands Provenance or volunteers from seed	Moist microsites throughout the site not subject to regular flooding and above elevatin 76 ft	Broad Leaf Deciduous
Alnus rubra	Red alder	FAC	Volunteers or seed collected on the Klock Property or from other local sources or 1 gallon pots	Anywhere on site above elevation 76 ft	Broad Leaf Deciduous, fixes nitrogen

Table 6. Candidate Tree, Shrub, Graminoids, Forbs/Ferns/Fern Allies/Emergent Species and Specifications for the Klock Property Restoration

Fraxinus latifolia	Oregon Ash	FACW	Live cuttings from local sources	Anywhere on site elevation 76 ft or above	Broad Leaf Deciduous and able to grow through reed canary grass
Picea sitchensis	Sitka Spruce	FAC	2/0 or jumbo bare root from northern Puget Sound lowlands Provenance	Moist microsites not subject to regular overbank flooding and above elevation 76 ft	Conifer – shade tolerant and able to grow through reed-canary grass
Populus trichocarpa	Black Cottonwood	FACW	Live cuttings from the Klock property or from other local sources	Anywhere on site elevation 76 ft or above	Broad Leaf Deciduous
Pseudotsuga menziesii	Douglas-fir	FACU	2/0 or jumbo bare root from northern Puget Sound lowlands Provenance	Mounds or microsites Elevation 78 or above	Conifer – Intermediate shade tolerance

Table 6. Candidate Tree, Shrub, Graminoids, Forbs/Ferns/Fern Allies/Emergent Species and Specifications for the Klock Property Restoration

Rhamnus purshiana	Cascara	Upland	Live cuttings from the north Puget Sound lowlands Provenance; 1 gallon pots	Interior forest or nearly level terrain not subject to long term flooding or soil saturation	Intermediate shade tolerance to shade tolerant. Young individuals can withstand full sun
Salix scouleriana	Scouler Willow	FAC	Live cuttings from the Klock property or from other local sources	Mounds or nearly level microsites not subject to long term flooding or soil saturation Favors wet microsites and can withstand some flooding or long duration ponding	Broad Leaf Deciduous; Generally shade intolerant

Table 6. Candidate Tree, Shrub, Graminoids, Forbs/Ferns/Fern Allies/Emergent Species and Specifications for the Klock Property Restoration

Salix sitchensis	Stika Willow	FACW	Live cuttings from the Klock property or from other local sources	Mounds or nearly level microsites not subject to long term flooding or soil saturation Favors wet microsites and can withstand some flooding or long duration ponding	Broad Leaf Deciduous; Generally shade intolerant
Salix hookeriana	Hooker Willow	FACW	Live cuttings from the Klock property or from other local sources	Mounds or nearly level microsites not subject to long term flooding or soil saturation Favors wet microsites and can withstand some flooding or long duration ponding	Broad Leaf Deciduous; Generally shade intolerant

Table 6. Candidate Tree, Shrub, Graminoids, Forbs/Ferns/Fern Allies/Emergent Species and Specifications for the Klock Property Restoration

Salix lucida ssp. lasiandra	Pacific Willow	FACW	Live cuttings from the Klock property or from other local sources	Mounds or nearly level microsites not subject to long term flooding or soil saturation Favors wet microsites and can withstand some flooding or long duration ponding	Broad Leaf Deciduous; Generally shade intolerant
Salix prolixa (S. rigida mackenzieana)	MacKenzie Willow	OBL	Live cuttings from the Klock property or from other local sources	Mounds or nearly level microsites not subject to long term flooding or soil saturation Favors wet microsites and can withstand some flooding or long duration ponding	Broad Leaf Deciduous; Generally shade intolerant
Thuja plicata	Western Red Cedar	FAC	2/0 or jumbo bare root from northern Puget Sound lowlands Provenance	Moist microsites and mounds not subject to regular flooding and above elevation 76 ft	Conifer – Shade tolerant

Table 6. Candidate Tree, Shrub, Graminoids, Forbs/Ferns/Fern Allies/Emergent Species and Specifications for the Klock Property Restoration

SHRUBS					
Acer circinatum	Vine maple	FAC	1 gallon pots from northern Puget Sound lowlands Provenance	Moist microsites above elevation 76 ft	Shade tolerant and favors moist microsites
Cornus stolonifera	Red Osier Dogwood	FACW	Cuttings from local sources	Anywhere on site and can withstand some flooding but not long duration ponding/strongly anoxic conditions	
Lonicera involucrata	Twinberry	FAC	1 gallon pots from northern Puget Sound lowlands Provenance	Favors wet microsites and can withstand some flooding or long duration ponding	
Oemleria ceraciformis	Osoberry/ Indian Plum	FACU	1 gallon pots or live cuttings from northern Puget Sound lowlands Provenance	Moist woods on sites that are not regularly subject to inundation or saturation of soils	Intermediate shade tolerance - can withstand full sun

Table 6. Candidate Tree, Shrub, Graminoids, Forbs/Ferns/Fern Allies/Emergent Species and Specifications for the Klock Property Restoration

Physocarpus capitatus	Ninebark	FACW	One gallon pots	Anywhere on site not subject to regular flooding and above elevation 76 ft	Intermediate shade tolerance
Ribes sanguineum or hudsonianum	Goose Berry	FACU (R. San.) or FACW (R. hud.)	1 gallon pots from northern Puget Sound lowlands Provenance	Anywhere on site above elevation 76 ft	Intermediate shade tolerance to full sun in younger plants
Rosa nutkana	Nootka Rose	FAC	1 gallon pots from northern Puget Sound lowlands Provenance	Anywhere on site above elevation 76 ft	
Rubus parviflorus	Thimbleberry	FACU	1 gallon pots from northern Puget Sound lowlands Provenance	Anywhere on site above elevation 76 ft	
Rubus spectabilis	Salmonberry	FAC	1 gallon pots from northern Puget Sound lowlands Provenance	Anywhere on site above elevation 76 ft	

Table 6. Candidate Tree, Shrub, Graminoids, Forbs/Ferns/Fern Allies/Emergent Species and Specifications for the Klock Property Restoration

Sambucus racemosa	Elderberry	FACU	Cuttings from local sources or 1 gallon pots from northern Puget Sound lowlands Provenance	Anywhere on site above elevation 76 ft	
Spiraea douglasii	Hardhack	FACW	Live cuttings or 1 gallon pots from northern Puget Sound lowlands Provenance	Favors wet microsites and can withstand some flooding or long duration ponding/saturated soils	
Symphoricarpos albus	Snowberry	FACU	1 gallon pots from northern Puget Sound lowlands Provenance	Uplands including micro mound tops; Above elevation 77 – drier microsites	Can withstand full sun

Table 6. Candidate Tree, Shrub, Graminoids, Forbs/Ferns/Fern Allies/Emergent Species and Specifications for the Klock Property Restoration

Graminoids, Forbs, Ferns and Fern Allies					
Agrostis alba	Red top	FAC	Seed by hand on mineral soils or incorporate into native seed mix and hydroseed	Somewhat poorly drained to (early) seasonally saturated sites	
Athyrium feli-femina	Lady fern	FAC	1 gallon pots	Moist microsites and fringes of shallow depressions or along Main Oxbow edges on siste that can be saturated for brief periods (1-2 monts) early in the growing season	Shade tolerant; does not do well in full sun
Festuca rubra	Red fescue	FAC	Hand seed or incorporate into native seed mix for hydro seeding	Bare mineral soil areas where turf forming grasses are prescribed	Somewhat shade tolerant; Can withstand full sun and seasonal (early) saturation of soils

Table 6. Candidate Tree, Shrub, Graminoids, Forbs/Ferns/Fern Allies/Emergent Species and Specifications for the Klock Property Restoration

Juncus effusus	Slough sedge	FACW	Propagate in flats then section into plugs or squares	Moist micro-depressions and the margins of the Main Oxbow	Shade tolerant and robust
Poa secunda	Bluegrass	FACU	Hand seed or incorporate into native seed mix for hydroseeding	Bare mineral soil areas where turf forming grasses are prescribed	Somewhat shade tolerant; Can withstand full sun and seasonal (early) saturation of soils
Scirpus microcarpus	Panicled bulrush	OBL	Hand seed or divide 1 gallon pots into plugs	Moist depressions and/or saturated soils on nearly level terrain	Can withstand full sun

Table 6. Candidate Tree, Shrub, Graminoids, Forbs/Ferns/Fern Allies/Emergent Species and Specifications for the Klock Property Restoration

Native Hydroseed Mix			Native Hydroseed mix to be applied following grading/ground disturbance activities for erosion control and invasive species suppression.		
Agrostis alba	Red top	FAC	Hand seed or incorporate into native seed mix for hydroseeding		
Elymus glaucus	Blue wildrye	FACU	Hand seed or incorporate into native seed mix for hydroseeding		
Festuca rubra	Red fescue	FAC	Hand seed or incorporate into native seed mix for hydroseeding	Bare mineral soil areas where turf forming grasses are prescribed	Somewhat shade tolerant; Can withstand full sun and seasonal (early) saturation of soils
Glyceria elata	Tall Managrass	FACW	Hand seed or incorporate into native seed mix for hydroseeding		

Table 6. Candidate Tree, Shrub, Graminoids, Forbs/Ferns/Fern Allies/Emergent Species and Specifications for the Klock Property Restoration

Hordeum brachyantherum	Meadow Barley	FACW	Hand seed or incorporate into native seed mix for hydroseeding		
Poa secunda	Bluegrass	FACU	Hand seed or incorporate into native seed mix for hydroseeding		
Scirpus microcarpus	Panicled bulrush	OBL	Hand seed or incorporate into native seed mix for hydroseeding		

Table 7. Plant Assemblage A (Primarily Upland and Dry Sites)

Scientific Name	Common Name	Nat'l Wetland Indicator Status	Preferred Stock	Microsite Preferences	Quantity/Density
TREES	Primary assemblage component with minimum density of 400 trees per acre				
Abies grandis	Grand fir	FACU	2/0 or jumbo bare root from northern Puget Sound lowlands Provenance	Moist microsites not subject to regular flooding and above elevation 76 ft	Potential tree for added diversity. Small quantity/density.
Acer macrophyllum	Big Leaf Maple	FACU	1 gallon pots from northern Puget Sound lowlands Provenance	Moist microsites not subject to regular flooding and above elevation 76 ft	Potential tree for added diversity. Small quantity/density. Likely natural recruitment.
Alnus rubra	Red alder	FAC	Seed collected on the Klock Property or from other local sources or 1 gallon pots	Anywhere on site above elevation 76 ft	Potential tree for added diversity. Small quantity/density. Likely natural recruitment.

Table 7. Plant Assemblage A (Primarily Upland and Dry Sites)

Fraxinus latifolia	Oregon Ash	FACW	Live cuttings from local sources	Anywhere on site above elevation 76 ft	Potential tree for added diversity. Small quantity/density.
Picea sitchensis	Sitka Spruce	FAC	2/0 or jumbo bare root from northern Puget Sound lowlands Provenance	Moist microsites not subject to regular overbank flooding and above elevation 76 ft	Moderate quantity/density where moist microsites allow.
Populus trichocarpa	Black Cottonwood	FAC	Live cuttings from the Klock property or from other local sources	Anywhere on site above elevation 76 ft	Moderate quantity/density where moist microsites allow.
Pseudotsuga menziesii	Douglas-fir	FACU	2/0 or jumbo bare root from northern Puget Sound lowlands Provenance	Mounds or microsites Elevation 78 ft or above	Primary tree with large quantities and densities in dry sites.

Table 7. Plant Assemblage A (Primarily Upland and Dry Sites)

Salix scouleriana	Scouler Willow	FAC	Live cuttings from the Klock property or from other local sources	Mounds or nearly level microsites not subject to long term flooding or soil saturation Favors wet microsites and can withstand some flooding or long duration ponding	Broad Leaf Deciduous; Generally shade intolerant
Salix sitchensis	Stika Willow	FACW	Live cuttings from the Klock property or from other local sources	Mounds or nearly level microsites not subject to long term flooding or soil saturation Favors wet microsites and can withstand some flooding or long duration ponding	Broad Leaf Deciduous; Generally shade intolerant

Table 7. Plant Assemblage A (Primarily Upland and Dry Sites)

Salix hookeriana	Hooker Willow	FACW	Live cuttings from the Klock property or from other local sources	Mounds or nearly level microsites not subject to long term flooding or soil saturation Favors wet microsites and can withstand some flooding or long duration ponding	Broad Leaf Deciduous; Generally shade intolerant
Salix lucida ssp. lasiandra	Pacific Willow	FACW	Live cuttings from the Klock property or from other local sources	Mounds or nearly level microsites not subject to long term flooding or soil saturation Favors wet microsites and can withstand some flooding or long duration ponding	Broad Leaf Deciduous; Generally shade intolerant

Table 7. Plant Assemblage A (Primarily Upland and Dry Sites)

Salix prolixa (S. rigida mackenzieana)	MacKenzie Willow	OBL	Live cuttings from the Klock property or from other local sources	Mounds or nearly level microsites not subject to long term flooding or soil saturation Favors wet microsites and can withstand some flooding or long duration ponding	Broad Leaf Deciduous; Generally shade intolerant
Rosa nutkana	Nootka Rose	FAC	1 gallon pots from northern Puget Sound lowlands Provenance	Anywhere on site above elevation 76 ft	Moderate quantity/density.
Rubus parviflorus	Thimbleberry	FACU	1 gallon pots from northern Puget Sound lowlands Provenance	Anywhere on site above elevation 76 ft	Potential for added diversity. Small quantity/density.
Rubus spectabilis	Salmonberry	FACU	1 gallon pots from northern Puget Sound lowlands Provenance	Anywhere on site above elevation 76 ft	Potential for added diversity. Small quantity/density.

Table 7. Plant Assemblage A (Primarily Upland and Dry Sites)

Sambucus racemosa	Elderberry	FACU	Cuttings from local sources or 1 gallon pots from northern Puget Sound lowlands Provenance	Anywhere on site above elevation 76 ft	Potential for added diversity. Small quantity/density.
Symphoricarpos albus	Snowberry	FACU	1 gallon pots from northern Puget Sound lowlands Provenance	Above elevation 77 – drier microsites	Potential for added diversity. Small quantity/density.

Table 7. Plant Assemblage A (Primarily Upland and Dry Sites)

Native Hydroseed Mix			Native Hydroseed mix to be applied following grading/ground disturbance activities for erosion control and invasive species suppression.		
Agrostis alba	Red top	FAC	Hand seed or incorporate into native seed mix for hydroseeding		
Elymus glaucus	Blue wildrye	FACU	Hand seed or incorporate into native seed mix for hydroseeding		
Festuca rubra	Red fescue	FAC	Hand seed or incorporate into native seed mix for hydroseeding	Bare mineral soil areas where turf forming grasses are prescribed	Somewhat shade tolerant; Can withstand full sun and seasonal (early) saturation of soils

Table 7. Plant Assemblage A (Primarily Upland and Dry Sites)

Hordeum brachyantherum	Meadow Barley	FACW	Hand seed or incorporate into native seed mix for hydroseeding		
Poa secunda	Bluegrass	FACU	Hand seed or incorporate into native seed mix for hydroseeding		

Table 8. Plant Assemblage B (Primarily Wet, Seasonally Wet, or Wetlands)

Scientific Name	Common Name	Nat'l Wetland Indicator Status	Preferred Stock	Microsite Preferences	Quantity/Density
TREES		Primary assemblage component with minimum density of 400 trees per acre			
Abies grandis	Grand fir	FACU	2/0 or jumbo bare root from northern Puget Sound lowlands Provenance	Moist microsites not subject to regular flooding and above elevation 76 ft	Potential tree for added diversity. Small quantity/density.
Acer macrophyllum	Big Leaf Maple	FACU	1 gallon pots from northern Puget Sound lowlands Provenance	Moist microsites not subject to regular flooding and above elevation 76 ft	Potential tree for added diversity. Small quantity/density. Likely natural recruitment.
Alnus rubra	Red alder	FAC	Seed collected on the Klock Property or from other local sources or 1 gallon pots	Anywhere on site above elevation 76 ft	Potential tree for added diversity. Small quantity/density. Likely natural recruitment.
Fraxinus latifolia	Oregon Ash	FACW	Live cuttings from local sources	Anywhere on site elevation 76 ft or above	Potential tree for added diversity. Small quantity/density.

Table 8. Plant Assemblage B (Primarily Wet, Seasonally Wet, or Wetlands)

Picea sitchensis	Sitka Spruce	FAC	2/0 or jumbo bare root from northern Puget Sound lowlands Provenance	Moist microsites not subject to regular overbank flooding and above elevation 76 ft	Primary tree with large quantities and densities in moist/wet sites.
Populus trichocarpa	Black Cottonwood	FAC	Live cuttings from the Klock property or from other local sources	Anywhere on site elevation 76 ft or above	Primary tree with large quantities and densities in moist/wet sites.
Pseudotsuga menziesii	Douglas-fir	FACU	2/0 or jumbo bare root from northern Puget Sound lowlands Provenance	Mounds or microsites Elevation 77 or above	Moderate quantity/density where dry microsites allow.
Salix scouleriana	Scouler Willow	FAC	Live cuttings from the Klock property or from other local sources	Mounds or nearly level microsites not subject to long term flooding or soil saturation Favors wet microsites and can withstand some flooding or long duration ponding	Broad Leaf Deciduous; Generally shade intolerant

Table 8. Plant Assemblage B (Primarily Wet, Seasonally Wet, or Wetlands)

Salix sitchensis	Stika Willow	FACW	Live cuttings from the Klock property or from other local sources	Mounds or nearly level microsites not subject to long term flooding or soil saturation Favors wet microsites and can withstand some flooding or long duration ponding	Broad Leaf Deciduous; Generally shade intolerant
Salix hookeriana	Hooker Willow	FACW	Live cuttings from the Klock property or from other local sources	Mounds or nearly level microsites not subject to long term flooding or soil saturation Favors wet microsites and can withstand some flooding or long duration ponding	Broad Leaf Deciduous; Generally shade intolerant
Salix lucida ssp. lasiandra	Pacific Willow	FACW	Live cuttings from the Klock property or from other local sources	Mounds or nearly level microsites not subject to long term flooding or soil saturation Favors wet microsites and can withstand some flooding or long duration ponding	Broad Leaf Deciduous; Generally shade intolerant

Table 8. Plant Assemblage B (Primarily Wet, Seasonally Wet, or Wetlands)

Salix prolixa (S. rigida mackenzieana)	MacKenzie Willow	OBL	Live cuttings from the Klock property or from other local sources	Mounds or nearly level microsites not subject to long term flooding or soil saturation Favors wet microsites and can withstand some flooding or long duration ponding	Broad Leaf Deciduous; Generally shade intolerant
Thuja plicata	Western Red Cedar	FAC	2/0 or jumbo bare root from northern Puget Sound lowlands Provenance	Moist microsites and mounds not subject to regular flooding and above elevation 76 ft	Primary tree with large quantities and densities in moist/wet sites.

Table 8. Plant Assemblage B (Primarily Wet, Seasonally Wet, or Wetlands)

SHRUBS		Moderate assemblage component with minimum density of 100 shrubs per acre			
Acer circinatum	Vine maple	FAC	1 gallon pots from northern Puget Sound lowlands Provenance	Moist microsites above elevation 76 ft	Potential for added diversity. Small quantity/density.
Cornus stolonifera	Red Osier Dogwood	FACW	Cuttings from local sources	Anywhere on site and can withstand some flooding but not long duration ponding/strongly anoxic conditions	Primary shrub with large quantities and densities in moist/wet sites.
Lonicera involucrata	Twinberry	FAC	1 gallon pots from northern Puget Sound lowlands Provenance	Favors wet microsites and can withstand some flooding or long duration ponding	Moderate quantity/density.
Physocarpus capitatus	Ninebark	FACW	One gallon pots	Anywhere on site not subject to regular flooding and above elevation 76 ft	Moderate quantity/density.
Ribes sanguineum	Goose Berry	FACW	1 gallon pots from northern Puget Sound lowlands Provenance	Anywhere on site above elevation 76 ft	Potential for added diversity. Small quantity/density.

Table 8. Plant Assemblage B (Primarily Wet, Seasonally Wet, or Wetlands)

Rosa nutkana	Nootka Rose	FAC	1 gallon pots from northern Puget Sound lowlands Provenance	Anywhere on site above elevation 76 ft	Moderate quantity/density.
Rubus parviflorus	Thimbleberry	FACU	1 gallon pots from northern Puget Sound lowlands Provenance	Anywhere on site above elevation 76 ft	Potential for added diversity. Small quantity/density.
Rubus spectabilis	Salmonberry	FAC	1 gallon pots from northern Puget Sound lowlands Provenance	Anywhere on site above elevation 76 ft	Potential for added diversity. Small quantity/density.
Sambucus racemosa	Elderberry	FACU	Cuttings from local sources or 1 gallon pots from northern Puget Sound lowlands Provenance	Anywhere on site above elevation 76 ft	Potential for added diversity. Small quantity/density.
Spiraea douglasii	Hardhack	FACW	1 gallon pots from northern Puget Sound lowlands Provenance	Favors wet microsites and can withstand some flooding or long duration ponding	Potential for added diversity. Small quantity/density.

Table 8. Plant Assemblage B (Primarily Wet, Seasonally Wet, or Wetlands)

Native Hydroseed Mix			Native Hydroseed mix to be applied following grading/ground disturbance activities for erosion control and invasive species suppression.		
Agrostis alba	Red top	FAC	Hand seed or incorporate into native seed mix for hydroseeding		
Festuca rubra	Red fescue	FAC	Hand seed or incorporate into native seed mix for hydroseeding	Bare mineral soil areas where turf forming grasses are prescribed	Somewhat shade tolerant; Can withstand full sun and seasonal (early) saturation of soils
Juncus effusus	Slough sedge	FACW	Propagate in flats then section into plugs or squares	Moist microdepressions and the margins of the Main Oxbow	Shade tolerant
Glyceria elata	Tall Managrass	FACW	Hand seed or incorporate into native seed mix for hydroseeding		
Hordeum brachyantherum	Meadow Barley	FACW	Hand seed or incorporate into native seed mix for hydroseeding		
Scirpus microcarpus	Panicled bulrush	OBL	Hand seed or incorporate into native seed mix for hydroseeding		

Table 9. Plant Assemblage C (Riparian Areas)

Scientific Name	Common Name	Nat'l Wetland Indicator Status	Preferred Stock	Microsite Preferences	Quantity/Density
TREES		Primary assemblage component with minimum density of 400 trees per acre			
Abies grandis	Grand fir	FACU	2/0 or jumbo bare root from northern Puget Sound lowlands Provenance	Moist microsites not subject to regular flooding and above elevation 76 ft	Potential tree for added diversity. Small quantity/density.
Acer macrophyllum	Big Leaf Maple	FACU	1 gallon pots from northern Puget Sound lowlands Provenance	Moist microsites throughout the site not subject to regular flooding and above elevation 76 ft	Potential tree for added diversity. Small quantity/density. Likely natural recruitment.
Alnus rubra	Red alder	FAC	Seed collected on the Klock Property or from other local sources or 1 gallon pots	Anywhere on site above elevation 76 ft	Potential tree for added diversity. Small quantity/density. Likely natural recruitment.

Table 9. Plant Assemblage C (Riparian Areas)

Fraxinus latifolia	Oregon Ash	FACW	Live cuttings from local sources	Anywhere on site elevation 76 ft or above	Potential tree for added diversity. Small quantity/density.
Picea sitchensis	Sitka Spruce	FAC	2/0 or jumbo bare root from northern Puget Sound lowlands Provenance	Moist microsites not subject to regular overbank flooding and above elevation 76 ft	Primary tree with large quantities and densities in moist microsites.
Populus trichocarpa	Black Cottonwood	FAC	Live cuttings from the Klock property or from other local sources	Anywhere on site elevation 76 ft or above	Primary tree with large quantities and densities in moist microsites.
Pseudotsuga menziesii	Douglas-fir	FACU	2/0 or jumbo bare root from northern Puget Sound lowlands Provenance	Mounds or microsites Elevation 77 or above	Primary tree with large quantities and densities in dry microsites.
Salix scouleriana	Willow	FAC	Live cuttings from the Klock property or from other local sources	Mounds or nearly level microsites not subject to long term flooding or soil saturation. Favors wet microsites and can withstand some flooding or long duration ponding	Broad Leaf Deciduous; Generally shade intolerant

Table 9. Plant Assemblage C (Riparian Areas)

Salix sitchensis	Stika Willow	FACW	Live cuttings from the Klock property or from other local sources	Mounds or nearly level microsites not subject to long term flooding or soil saturation Favors wet microsites and can withstand some flooding or long duration ponding	Broad Leaf Deciduous; Generally shade intolerant
Salix lucida ssp. lasiandra	Pacific Willow	FACW	Live cuttings from the Klock property or from other local sources	Mounds or nearly level microsites not subject to long term flooding or soil saturation. Favors wet microsites and can withstand some flooding or long duration ponding	Broad Leaf Deciduous; Generally shade intolerant
Thuja plicata	Western Red Cedar	FAC	2/0 or jumbo bare root from northern Puget Sound lowlands Provenance	Moist microsites and mounds not subject to regular flooding and above elevation 76 ft	Primary tree with large quantities and densities in moist microsites.

Table 9. Plant Assemblage C (Riparian Areas)

SHRUBS		Moderate assemblage component with minimum density of 100 shrubs per acre			
Acer circinatum	Vine maple	FAC	1 gallon pots from northern Puget Sound lowlands Provenance	Moist microsites above elevation 76 ft	Potential for added diversity. Small quantity/density.
Cornus stolonifera	Red Osier Dogwood	FACW	Cuttings from local sources	Anywhere on site and can withstand some flooding but not long duration ponding/strongly anoxic conditions	Primary shrub with large quantities and densities in moist/wet sites.
Lonicera involucrata	Twinberry	FAC	1 gallon pots from northern Puget Sound lowlands Provenance	Favors wet microsites and can withstand some flooding or long duration ponding	Potential for added diversity. Small quantity/density.
Physocarpus capitatus	Ninebark	FACW	One gallon pots	Anywhere on site not subject to regular flooding and above elevation 76 ft	Primary shrub with large quantities and densities in moist/wet sites.
Ribes sanguineum	Goose Berry	FACU	1 gallon pots from northern Puget Sound lowlands Provenance	Anywhere on site above elevation 76 ft	Potential for added diversity. Small quantity/density.
Rosa nutkana	Nootka Rose	FAC	1 gallon pots from northern Puget Sound lowlands Provenance	Anywhere on site above elevation 76 ft	Moderate quantity/density.

Table 9. Plant Assemblage C (Riparian Areas)

Rubus parviflorus	Thimbleberry	FACU	1 gallon pots from northern Puget Sound lowlands Provenance	Anywhere on site above elevation 76 ft	Potential for added diversity. Small quantity/density.
Rubus spectabilis	Salmonberry	FAC	1 gallon pots from northern Puget Sound lowlands Provenance	Anywhere on site above elevation 76 ft	Potential for added diversity. Small quantity/density.
Sambucus racemosa	Elderberry	FACU	Cuttings from local sources or 1 gallon pots from northern Puget Sound lowlands Provenance	Anywhere on site above elevation 76 ft	Potential for added diversity. Small quantity/density.
Spiraea douglasii	Hardhack	FACW	1 gallon pots from northern Puget Sound lowlands Provenance	Favors wet microsites and can withstand some flooding or long duration ponding	Primary shrub with large quantities and densities in moist/wet sites.
Symphoricarpos albus	Snowberry	FACU	1 gallon pots from northern Puget Sound lowlands Provenance	Above elevation 77 – drier microsites	Potential for added diversity. Small quantity/density.

Table 9. Plant Assemblage C (Riparian Areas)

Native Hydroseed Mix		Native Hydroseed mix to be applied following grading/ground disturbance activities for erosion control and invasive species suppression.			
Agrostis alba	Red top	FAC	Hand seed or incorporate into native seed mix for hydroseeding		Shade tolerant
Elymus glaucus	Blue wildrye	FACU	Hand seed or incorporate into native seed mix for hydroseeding		
Festuca rubra	Red fescue	FAC	Hand seed or incorporate into native seed mix for hydroseeding	Bare mineral soil areas where turf forming grasses are prescribed	Somewhat shade tolerant; Can withstand full sun and seasonal (early) saturation of soils
Hordeum brachyantherum	Meadow Barley	FACW	Hand seed or incorporate into native seed mix for hydroseeding		
Poa secunda	Bluegrass	FACU	Hand seed or incorporate into native seed mix for hydroseeding		

Table 10. Plant Assemblage D (Low Growing Riparian Areas)

Scientific Name	Common Name	Nat'l Wetland Indicator Status	Preferred Stock	Microsite Preferences	Quantity/Density
TREES	Primary assemblage component with minimum density of 400 trees per acre				
Salix scouleriana	Scouler Willow	FAC	Live cuttings from the Klock property or from other local sources	Mounds or nearly level microsites not subject to long term flooding or soil saturation. Favors wet microsites and can withstand some flooding or long duration ponding	Broad Leaf Deciduous; Generally shade intolerant
Salix sitchensis	Stika Willow	FACW	Live cuttings from the Klock property or from other local sources	Mounds or nearly level microsites not subject to long term flooding or soil saturation. Favors wet microsites and can withstand some flooding or long duration ponding	Broad Leaf Deciduous; Generally shade intolerant

Table 10. Plant Assemblage D (Low Growing Riparian Areas)

Salix lucida ssp. lasiandra	Pacific Willow	FACW	Live cuttings from the Klock property or from other local sources	Mounds or nearly level microsites not subject to long term flooding or soil saturation. Favors wet microsites and can withstand some flooding or long duration ponding	Broad Leaf Deciduous; Generally shade intolerant
SHRUBS			Moderate assemblage component with minimum density of 100 shrubs per acre		
Acer circinatum	Vine maple	FAC	1 gallon pots from northern Puget Sound lowlands Provenance	Moist microsites above elevation 76 ft	Potential for added diversity. Small quantity/density.
Cornus stolonifera	Red Osier Dogwood	FACW	Cuttings from local sources	Anywhere on site and can withstand some flooding but not long duration ponding/strongly anoxic conditions	Primary shrub with large quantities and densities in moist/wet sites.
Lonicera involucrata	Twinberry	FAC	1 gallon pots from northern Puget Sound lowlands Provenance	Favors wet microsites and can withstand some flooding or long duration ponding	Potential for added diversity. Small quantity/density.

Table 10. Plant Assemblage D (Low Growing Riparian Areas)

Physocarpus capitatus	Ninebark	FACW	One gallon pots	Anywhere on site not subject to regular flooding and above elevation 76 ft	Primary shrub with large quantities and densities in moist/wet sites.
Ribes sanguineum	Goose Berry	FACW	1 gallon pots from northern Puget Sound lowlands Provenance	Anywhere on site above elevation 76 ft	Potential for added diversity. Small quantity/density.
Rosa nutkana	Nootka Rose	FAC	1 gallon pots from northern Puget Sound lowlands Provenance	Anywhere on site above elevation 76 ft	Moderate quantity/density.
Rubus parviflorus	Thimbleberry	FACU	1 gallon pots from northern Puget Sound lowlands Provenance	Anywhere on site above elevation 76 ft	Potential for added diversity. Small quantity/density.
Rubus spectabilis	Salmonberry	FAC	1 gallon pots from northern Puget Sound lowlands Provenance	Anywhere on site above elevation 76 ft	Potential for added diversity. Small quantity/density.

Table 10. Plant Assemblage D (Low Growing Riparian Areas)

Sambucus racemosa	Elderberry	FACU	Cuttings from local sources or 1 gallon pots from northern Puget Sound lowlands Provenance	Anywhere on site above elevation 76 ft	Potential for added diversity. Small quantity/density.
Spiraea douglasii	Hardhack	FACW	1 gallon pots from northern Puget Sound lowlands Provenance	Favors wet microsites and can withstand some flooding or long duration ponding	Primary shrub with large quantities and densities in moist/wet sites.
Symphoricarpos albus	Snowberry	FACU	1 gallon pots from northern Puget Sound lowlands Provenance	Above elevation 77 ft – drier microsites	Potential for added diversity. Small quantity/density.
Native Hydroseed Mix			Native Hydroseed mix to be applied following grading/ground disturbance activities for erosion control and invasive species suppression.		
Agrostis alba	Red top	FAC	Hand seed or incorporate into native seed mix for hydroseeding	Shade tolerant	Shade tolerant
Elymus glaucus	Blue wildrye	FACU			
Juncus effusus	Slough sedge	FACW	Propagate in flats then section into plugs or squares	Moist microdepressions and the margins of the Main Oxbow	Shade tolerant

Table 10. Plant Assemblage D (Low Growing Riparian Areas)

Festuca rubra	Red fescue	FAC	Bare mineral soil areas where turf forming grasses are prescribed	Somewhat shade tolerant; Can withstand full sun and seasonal (early) saturation of soils	
Hordeum brachyantherum	Meadow Barley	FACW			
Poa secunda	Bluegrass	FACU			

Table 11. Plant Assemblage E (Native Emergent Plants and Erosion Control)

Scientific Name	Common Name	Nat'l Wetland Indicator Status	Preferred Stock	Microsite Preferences	Quantity/ Density
Native Hydroseed Mix	(Upland)	Native Hydroseed mix to be applied following grading/ground disturbance activities for erosion control and invasive species suppression.			
Agrostis alba	Red top	FAC	Hand seed or incorporate into native seed mix for hydroseeding		
Elymus glaucus	Blue wildrye	FACU	Hand seed or incorporate into native seed mix for hydroseeding		
Festuca rubra	Red fescue	FAC	Hand seed or incorporate into native seed mix for hydroseeding	Bare mineral soil areas where turf forming grasses are prescribed	Somewhat shade tolerant; Can withstand full sun and seasonal (early) saturation of soils
Hordeum brachyantherum	Meadow Barley	FACW	Hand seed or incorporate into native seed mix for hydroseeding		
Poa secunda	Bluegrass	FACU	Hand seed or incorporate into native seed mix for hydroseeding		

Table 11. Plant Assemblage E (Native Emergent Plants and Erosion Control)

Scirpus microcarpus	Panicled bulrush	OBL	Hand seed or incorporate into native seed mix for hydroseeding		
Native Hydroseed Mix	(Wetland)	Native Hydroseed mix to be applied following grading/ground disturbance activities for erosion control and invasive species suppression.			
Agrostis alba	Red top	FAC	Hand seed or incorporate into native seed mix for hydroseeding		
Festuca rubra	Red fescue	FAC	Hand seed or incorporate into native seed mix for hydroseeding	Bare mineral soil areas where turf forming grasses are prescribed	Somewhat shade tolerant; Can withstand full sun and seasonal (early) saturation of soils
Glyceria elata	Tall Managrass	FACW	Hand seed or incorporate into native seed mix for hydroseeding		
Hordeum brachyantherum	Meadow Barley	FACW	Hand seed or incorporate into native seed mix for hydroseeding		
Scirpus microcarpus	Panicled bulrush	OBL	Hand seed or incorporate into native seed mix for hydroseeding		

Table 11. Plant Assemblage E (Native Emergent Plants and Erosion Control)

Native Hydroseed Mix	(Riparian)		Native Hydroseed mix to be applied following grading/ground disturbance activities for erosion control and invasive species suppression.		
Agrostis alba	Red top	FAC	Hand seed or incorporate into native seed mix for hydroseeding		
Elymus glaucus	Blue wildrye	FACU	Hand seed or incorporate into native seed mix for hydroseeding		
Festuca rubra	Red fescue	FAC	Hand seed or incorporate into native seed mix for hydroseeding	Bare mineral soil areas where turf forming grasses are prescribed	Somewhat shade tolerant; Can withstand full sun and seasonal (early) saturation of soils
Hordeum brachyantherum	Meadow Barley	FACW	Hand seed or incorporate into native seed mix for hydroseeding		
Poa secunda	Bluegrass	FACU	Hand seed or incorporate into native seed mix for hydroseeding		

Table 12. Planting Phases for the Klock Property Ecosystem Restoration

Phase 1	Planted within 1 year post-grading
Phase 2	Planted within 2 years post-grading

Grading Area	Acres	Non Emergent Acres	Phase
1	0.04	0.04	1
2	0.03	0.03	1
3	0.06	0.06	1
4	0.21	0.00	1
5	0.21	0.21	1
6	0.24	0.24	1
7	0.21	0.00	1
8	0.63	0.63	1
9	2.60	2.60	1
10	5.17	2.71	2
11	0.17	0.17	1
12	5.78	0.00	1
13	1.48	0.00	1
14	2.58	2.58	2
Totals	**19.40**	**9.26**	

Total Non-Emergent Phase	**3.98**
Total Non-Emergent Phase	**5.29**

Table 13: Planting Area 1, Takeoff 1C

Planting Area 1; Sheet C-3				
Planting Assemblage				C - Riparian Sites
Acres				0.04
Plants/Acre				1500
Total Plants				67
Conifer Pots/Acre				300
BR Conifer/Acre				500
Stakes/Acre				600
Other Pots/Acre				100
Lbs Seed/Acre				25
Total Lbs of Seed				1.1
Latin Name	**Common Name**	**Nat'l Wetland Indicator Status**	**Stock**	**Quantity**
Abies grandis	Grand fir	FACU	1 gal	0
Acer macrophyllum	Big Leaf Maple	FACU	1 gal	0
Alnus rubra	Red alder	FAC	1 gal	0
Fraxinus latifolia	Oregon Ash	FACW	1 gal	0
Picea sitchensis	Sitka Spruce	FAC	1 gal	4
Picea sitchensis	Sitka Spruce	FAC	Bare Root	9
Populus trichocarpa	Black Cottonwood	FACW	Stakes	9
Pseudotsuga menziesii	Douglas-fir	FACU	1 gal	4
Pseudotsuga menziesii	Douglas-fir	FACU	Bare Root	9
Rhamnus purshiana	Cascara	UPL	1 gal	0
Salix scouleriana	Scouler Willow	FAC	Live Cuttings	4
Salix sitchensis	Sitka Willow	FACW	Live Cuttings	4
Salix hookeriana	Hooker Willow	FACW	Live Cuttings	0
Salix lucida ssp. lasiandra	Pacific Willow	FACW	Live Cuttings	4
Salix prolixa (S. rigida mackenzieana)	MacKenzie Willow	OBL	Live Cuttings	0
Thuja plicata	Western Red Cedar	FAC	1 gal	4
Thuja plicata	Western Red Cedar	FAC	Bare Root	4
Acer circinatum	Vine maple	FAC	1 gal	0
Cornus stolonifera	Red Osier Dogwood	FACW	Stakes	4
Lonicera involucrata	Twinberry	FAC	1 gal	0
Oemleria ceraciformis	Indian Plum	FACU	1 gal	0
Physocarpus capitatus	Ninebark	FACW	1 gal	1
Ribes sanguineum	Goose Berry	FACU	1 gal	0
Rosa nutkana	Nootka Rose	FAC	1 gal	0
Rubus parviflorus	Thimbleberry	FACU	1 gal	0
Rubus spectabilis	Salmonberry	FAC	1 gal	0
Sambucus racemosa	Elderberry	FACU	1 gal	0
Spiraea douglasii	Hardhack	FACW	1 gal	0
Symphoricarpos albus	Snowberry	FACU	1 gal	0
Agrostis alba	Red top (lbs)	FAC	Seed	0.2
Elymus glaucus	Blue wildrye (lbs)	FACU	Seed	0.2
Festuca rubra	Red fescue (lbs)	FAC	Seed	0.2
Glyceria elata	Tall mannagrass (lbs)	FACW	Seed	0
Hordeum brachyantherum	Meadow barley (lbs)	FACW	Seed	0.2
Poa secunda	Bluegrass (lbs)	FACU	Seed	0.2
Scirpus microcarpus	Panicled bulrush (lbs)	OBL	Seed	0

Table 14: Planting Area 2, Takeoff 2C

Planting Area 2; Sheet C-4			
Planting Assemblage			C - Riparian Sites
Acres			0.03
Plants/Acre			1500
Total Plants			40
Conifer Pots/Acre			300
BR Conifer/Acre			500
Stakes/Acre			600
Other Pots/Acre			100
Lbs Seed/Acre			25
Total Lbs of Seed			0.7

Latin Name	**Common Name**	**Nat'l Wetland Indicator Status**	**Stock**	**Quantity**
Abies grandis	Grand fir	FACU	1 gal	0
Acer macrophyllum	Big Leaf Maple	FACU	1 gal	0
Alnus rubra	Red alder	FAC	1 gal	0
Fraxinus latifolia	Oregon Ash	FACW	1 gal	0
Picea sitchensis	Sitka Spruce	FAC	1 gal	3
Picea sitchensis	Sitka Spruce	FAC	Bare Root	5
Populus trichocarpa	Black Cottonwood	FACW	Stakes	5
Pseudotsuga menziesii	Douglas-fir	FACU	1 gal	3
Pseudotsuga menziesii	Douglas-fir	FACU	Bare Root	5
Rhamnus purshiana	Cascara	UPL	1 gal	0
Salix scouleriana	Scouler Willow	FAC	Live Cuttings	3
Salix sitchensis	Sitka Willow	FACW	Live Cuttings	3
Salix hookeriana	Hooker Willow	FACW	Live Cuttings	0
Salix lucida ssp. lasiandra	Pacific Willow	FACW	Live Cuttings	3
Salix prolixa (S. rigida mackenzieana)	MacKenzie Willow	OBL	Live Cuttings	0
Thuja plicata	Western Red Cedar	FAC	1 gal	2
Thuja plicata	Western Red Cedar	FAC	Bare Root	3
Acer circinatum	Vine maple	FAC	1 gal	0
Cornus stolonifera	Red Osier Dogwood	FACW	Stakes	3
Lonicera involucrata	Twinberry	FAC	1 gal	0
Oemleria ceraciformis	Indian Plum	FACU	1 gal	0
Physocarpus capitatus	Ninebark	FACW	1 gal	1
Ribes sanguineum	Goose Berry	FACU	1 gal	0
Rosa nutkana	Nootka Rose	FAC	1 gal	0
Rubus parviflorus	Thimbleberry	FACU	1 gal	0
Rubus spectabilis	Salmonberry	FAC	1 gal	0
Sambucus racemosa	Elderberry	FACU	1 gal	0
Spiraea douglasii	Hardhack	FACW	1 gal	0
Symphoricarpos albus	Snowberry	FACU	1 gal	0
Agrostis alba	Red top (lbs)	FAC	Seed	0.1
Elymus glaucus	Blue wildrye (lbs)	FACU	Seed	0.1
Festuca rubra	Red fescue (lbs)	FAC	Seed	0.1
Glyceria elata	Tall mannagrass (lbs)	FACW	Seed	0
Hordeum brachyantherum	Meadow barley (lbs)	FACW	Seed	0.1
Poa secunda	Bluegrass (lbs)	FACU	Seed	0.1
Scirpus microcarpus	Panicled bulrush (lbs)	OBL	Seed	0

Table 15: Planting Area 3, Takeoff 3C

Planting Area 3; Sheet C-5			
Planting Assemblage			C - Riparian Sites
Acres			0.06
Plants/Acre			1500
Total Plants			85
Conifer Pots/Acre			300
BR Conifer/Acre			500
Stakes/Acre			600
Other Pots/Acre			100
Lbs Seed/Acre			25
Total Lbs of Seed			1.4

Latin Name	**Common Name**	**Nat'l Wetland Indicator Status**	**Stock**	**Quantity**
Abies grandis	Grand fir	FACU	1 gal	1
Acer macrophyllum	Big Leaf Maple	FACU	1 gal	1
Alnus rubra	Red alder	FAC	1 gal	0
Fraxinus latifolia	Oregon Ash	FACW	1 gal	1
Picea sitchensis	Sitka Spruce	FAC	1 gal	6
Picea sitchensis	Sitka Spruce	FAC	Bare Root	11
Populus trichocarpa	Black Cottonwood	FACW	Stakes	11
Pseudotsuga menziesii	Douglas-fir	FACU	1 gal	6
Pseudotsuga menziesii	Douglas-fir	FACU	Bare Root	11
Rhamnus purshiana	Cascara	UPL	1 gal	0
Salix scouleriana	Scouler Willow	FAC	Live Cuttings	6
Salix sitchensis	Sitka Willow	FACW	Live Cuttings	6
Salix hookeriana	Hooker Willow	FACW	Live Cuttings	0
Salix lucida ssp. lasiandra	Pacific Willow	FACW	Live Cuttings	6
Salix prolixa (S. rigida mackenzieana)	MacKenzie Willow	OBL	Live Cuttings	0
Thuja plicata	Western Red Cedar	FAC	1 gal	5
Thuja plicata	Western Red Cedar	FAC	Bare Root	6
Acer circinatum	Vine maple	FAC	1 gal	0
Cornus stolonifera	Red Osier Dogwood	FACW	Stakes	6
Lonicera involucrata	Twinberry	FAC	1 gal	1
Oemleria ceraciformis	Indian Plum	FACU	1 gal	0
Physocarpus capitatus	Ninebark	FACW	1 gal	1
Ribes sanguineum	Goose Berry	FACU	1 gal	0
Rosa nutkana	Nootka Rose	FAC	1 gal	1
Rubus parviflorus	Thimbleberry	FACU	1 gal	0
Rubus spectabilis	Salmonberry	FAC	1 gal	0
Sambucus racemosa	Elderberry	FACU	1 gal	0
Spiraea douglasii	Hardhack	FACW	1 gal	0
Symphoricarpos albus	Snowberry	FACU	1 gal	0
Agrostis alba	Red top (lbs)	FAC	Seed	0.3
Elymus glaucus	Blue wildrye (lbs)	FACU	Seed	0.3
Festuca rubra	Red fescue (lbs)	FAC	Seed	0.3
Glyceria elata	Tall mannagrass (lbs)	FACW	Seed	0
Hordeum brachyantherum	Meadow barley (lbs)	FACW	Seed	0.3
Poa secunda	Bluegrass (lbs)	FACU	Seed	0.3
Scirpus microcarpus	Panicled bulrush (lbs)	OBL	Seed	0

Table 16: Planting Area 4, Takeoff 4E

Planting Area 4; Sheet C-6			
Planting Assemblage		E - Native Emergent Plants and Erosion Control	
Acres			0.21
Plants/Acre			N/A; Seed
Total Plants			N/A; Seed
Conifer Pots/Acre			0
BR Conifer/Acre			0
Stakes/Acre			0
Other Pots/Acre			0
Lbs Seed/Acre			35
Total Lbs of Seed			7.2

Latin Name	**Common Name**	**Nat'l Wetland Indicator Status**	**Stock**	**Quantity**
Abies grandis	Grand fir	FACU	1 gal	0
Acer macrophyllum	Big Leaf Maple	FACU	1 gal	0
Alnus rubra	Red alder	FAC	1 gal	0
Fraxinus latifolia	Oregon Ash	FACW	1 gal	0
Picea sitchensis	Sitka Spruce	FAC	1 gal	0
Picea sitchensis	Sitka Spruce	FAC	Bare Root	0
Populus trichocarpa	Black Cottonwood	FACW	Stakes	0
Pseudotsuga menziesii	Douglas-fir	FACU	1 gal	0
Pseudotsuga menziesii	Douglas-fir	FACU	Bare Root	0
Rhamnus purshiana	Cascara	UPL	1 gal	0
Salix scouleriana	Scouler Willow	FAC	Live Cuttings	0
Salix sitchensis	Sitka Willow	FACW	Live Cuttings	0
Salix hookeriana	Hooker Willow	FACW	Live Cuttings	0
Salix lucida ssp. lasiandra	Pacific Willow	FACW	Live Cuttings	0
Salix prolixa (S. rigida mackenzieana)	MacKenzie Willow	OBL	Live Cuttings	0
Thuja plicata	Western Red Cedar	FAC	1 gal	0
Thuja plicata	Western Red Cedar	FAC	Bare Root	0
Acer circinatum	Vine maple	FAC	1 gal	0
Cornus stolonifera	Red Osier Dogwood	FACW	Stakes	0
Lonicera involucrata	Twinberry	FAC	1 gal	0
Oemleria ceraciformis	Indian Plum	FACU	1 gal	0
Physocarpus capitatus	Ninebark	FACW	1 gal	0
Ribes sanguineum	Goose Berry	FACU	1 gal	0
Rosa nutkana	Nootka Rose	FAC	1 gal	0
Rubus parviflorus	Thimbleberry	FACU	1 gal	0
Rubus spectabilis	Salmonberry	FAC	1 gal	0
Sambucus racemosa	Elderberry	FACU	1 gal	0
Spiraea douglasii	Hardhack	FACW	1 gal	0
Symphoricarpos albus	Snowberry	FACU	1 gal	0
Agrostis alba	Red top (lbs)	FAC	Seed	1
Elymus glaucus	Blue wildrye (lbs)	FACU	Seed	2.1
Festuca rubra	Red fescue (lbs)	FAC	Seed	1
Glyceria elata	Tall mannagrass (lbs)	FACW	Seed	0
Hordeum brachyantherum	Meadow barley (lbs)	FACW	Seed	1
Poa secunda	Bluegrass (lbs)	FACU	Seed	2.1
Scirpus microcarpus	Panicled bulrush (lbs)	OBL	Seed	0

Table 17: Planting Area 5, Takeoff 5C

Planting Area 5; Sheet C-7			5
Planting Assemblage			C - Riparian Sites
Acres			0.21
Plants/Acre			1500
Total Plants			308
Conifer Pots/Acre			300
BR Conifer/Acre			500
Stakes/Acre			600
Other Pots/Acre			100
Lbs Seed/Acre			25
Total Lbs of Seed			5.1

Latin Name	**Common Name**	**Nat'l Wetland Indicator Status**	**Stock**	**Quantity**
Abies grandis	Grand fir	FACU	1 gal	2
Acer macrophyllum	Big Leaf Maple	FACU	1 gal	2
Alnus rubra	Red alder	FAC	1 gal	0
Fraxinus latifolia	Oregon Ash	FACW	1 gal	2
Picea sitchensis	Sitka Spruce	FAC	1 gal	21
Picea sitchensis	Sitka Spruce	FAC	Bare Root	41
Populus trichocarpa	Black Cottonwood	FACW	Stakes	41
Pseudotsuga menziesii	Douglas-fir	FACU	1 gal	21
Pseudotsuga menziesii	Douglas-fir	FACU	Bare Root	41
Rhamnus purshiana	Cascara	UPL	1 gal	1
Salix scouleriana	Scouler Willow	FAC	Live Cuttings	21
Salix sitchensis	Sitka Willow	FACW	Live Cuttings	21
Salix hookeriana	Hooker Willow	FACW	Live Cuttings	0
Salix lucida ssp. lasiandra	Pacific Willow	FACW	Live Cuttings	21
Salix prolixa (S. rigida mackenzieana)	MacKenzie Willow	OBL	Live Cuttings	0
Thuja plicata	Western Red Cedar	FAC	1 gal	18
Thuja plicata	Western Red Cedar	FAC	Bare Root	21
Acer circinatum	Vine maple	FAC	1 gal	1
Cornus stolonifera	Red Osier Dogwood	FACW	Stakes	21
Lonicera involucrata	Twinberry	FAC	1 gal	2
Oemleria ceraciformis	Indian Plum	FACU	1 gal	1
Physocarpus capitatus	Ninebark	FACW	1 gal	4
Ribes sanguineum	Goose Berry	FACU	1 gal	1
Rosa nutkana	Nootka Rose	FAC	1 gal	2
Rubus parviflorus	Thimbleberry	FACU	1 gal	1
Rubus spectabilis	Salmonberry	FAC	1 gal	1
Sambucus racemosa	Elderberry	FACU	1 gal	1
Spiraea douglasii	Hardhack	FACW	1 gal	0
Symphoricarpos albus	Snowberry	FACU	1 gal	1
Agrostis alba	Red top (lbs)	FAC	Seed	1
Elymus glaucus	Blue wildrye (lbs)	FACU	Seed	1
Festuca rubra	Red fescue (lbs)	FAC	Seed	1
Glyceria elata	Tall mannagrass (lbs)	FACW	Seed	0
Hordeum brachyantherum	Meadow barley (lbs)	FACW	Seed	1
Poa secunda	Bluegrass (lbs)	FACU	Seed	1
Scirpus microcarpus	Panicled bulrush (lbs)	OBL	Seed	0

Table 18: Planting Area 6, Takeoff 6C

Planting Area 6; Sheet C-8			
Planting Assemblage			C - Riparian Sites
Acres			0.24
Plants/Acre			1500
Total Plants			361
Conifer Pots/Acre			300
BR Conifer/Acre			500
Stakes/Acre			600
Other Pots/Acre			100
Lbs Seed/Acre			25
Total Lbs of Seed			6

Latin Name	**Common Name**	**Nat'l Wetland Indicator Status**	**Stock**	**Quantity**
Abies grandis	Grand fir	FACU	1 gal	2
Acer macrophyllum	Big Leaf Maple	FACU	1 gal	2
Alnus rubra	Red alder	FAC	1 gal	0
Fraxinus latifolia	Oregon Ash	FACW	1 gal	2
Picea sitchensis	Sitka Spruce	FAC	1 gal	24
Picea sitchensis	Sitka Spruce	FAC	Bare Root	48
Populus trichocarpa	Black Cottonwood	FACW	Stakes	48
Pseudotsuga menziesii	Douglas-fir	FACU	1 gal	24
Pseudotsuga menziesii	Douglas-fir	FACU	Bare Root	48
Rhamnus purshiana	Cascara	UPL	1 gal	1
Salix scouleriana	Scouler Willow	FAC	Live Cuttings	24
Salix sitchensis	Sitka Willow	FACW	Live Cuttings	24
Salix hookeriana	Hooker Willow	FACW	Live Cuttings	0
Salix lucida ssp. lasiandra	Pacific Willow	FACW	Live Cuttings	24
Salix prolixa (S. rigida mackenzieana)	MacKenzie Willow	OBL	Live Cuttings	0
Thuja plicata	Western Red Cedar	FAC	1 gal	22
Thuja plicata	Western Red Cedar	FAC	Bare Root	24
Acer circinatum	Vine maple	FAC	1 gal	1
Cornus stolonifera	Red Osier Dogwood	FACW	Stakes	24
Lonicera involucrata	Twinberry	FAC	1 gal	2
Oemleria ceraciformis	Indian Plum	FACU	1 gal	1
Physocarpus capitatus	Ninebark	FACW	1 gal	5
Ribes sanguineum	Goose Berry	FACU	1 gal	1
Rosa nutkana	Nootka Rose	FAC	1 gal	2
Rubus parviflorus	Thimbleberry	FACU	1 gal	1
Rubus spectabilis	Salmonberry	FAC	1 gal	1
Sambucus racemosa	Elderberry	FACU	1 gal	1
Spiraea douglasii	Hardhack	FACW	1 gal	0
Symphoricarpos albus	Snowberry	FACU	1 gal	1
Agrostis alba	Red top (lbs)	FAC	Seed	1.2
Elymus glaucus	Blue wildrye (lbs)	FACU	Seed	1.2
Festuca rubra	Red fescue (lbs)	FAC	Seed	1.2
Glyceria elata	Tall mannagrass (lbs)	FACW	Seed	0
Hordeum brachyantherum	Meadow barley (lbs)	FACW	Seed	1.2
Poa secunda	Bluegrass (lbs)	FACU	Seed	1.2
Scirpus microcarpus	Panicled bulrush (lbs)	OBL	Seed	0

Table 19: Planting Area 7, Takeoff 7E

Planting Area 7; Sheet C-9			
Planting Assemblage		E - Native Emergent Plants and Erosion Control	
Acres			0.21
Plants/Acre			N/A; Seed
Total Plants			N/A; Seed
Conifer Pots/Acre			0
BR Conifer/Acre			0
Stakes/Acre			0
Other Pots/Acre			0
Lbs Seed/Acre			35.0
Total Lbs of Seed			7.2

Latin Name	**Common Name**	**Nat'l Wetland Indicator Status**	**Stock**	**Quantity**
Abies grandis	Grand fir	FACU	1 gal	0
Acer macrophyllum	Big Leaf Maple	FACU	1 gal	0
Alnus rubra	Red alder	FAC	1 gal	0
Fraxinus latifolia	Oregon Ash	FACW	1 gal	0
Picea sitchensis	Sitka Spruce	FAC	1 gal	0
Picea sitchensis	Sitka Spruce	FAC	Bare Root	0
Populus trichocarpa	Black Cottonwood	FACW	Stakes	0
Pseudotsuga menziesii	Douglas-fir	FACU	1 gal	0
Pseudotsuga menziesii	Douglas-fir	FACU	Bare Root	0
Rhamnus purshiana	Cascara	UPL	1 gal	0
Salix scouleriana	Scouler Willow	FAC	Live Cuttings	0
Salix sitchensis	Sitka Willow	FACW	Live Cuttings	0
Salix hookeriana	Hooker Willow	FACW	Live Cuttings	0
Salix lucida ssp. lasiandra	Pacific Willow	FACW	Live Cuttings	0
Salix prolixa (S. rigida mackenzieana)	MacKenzie Willow	OBL	Live Cuttings	0
Thuja plicata	Western Red Cedar	FAC	1 gal	0
Thuja plicata	Western Red Cedar	FAC	Bare Root	0
Acer circinatum	Vine maple	FAC	1 gal	0
Cornus stolonifera	Red Osier Dogwood	FACW	Stakes	0
Lonicera involucrata	Twinberry	FAC	1 gal	0
Oemleria ceraciformis	Indian Plum	FACU	1 gal	0
Physocarpus capitatus	Ninebark	FACW	1 gal	0
Ribes sanguineum	Goose Berry	FACU	1 gal	0
Rosa nutkana	Nootka Rose	FAC	1 gal	0
Rubus parviflorus	Thimbleberry	FACU	1 gal	0
Rubus spectabilis	Salmonberry	FAC	1 gal	0
Sambucus racemosa	Elderberry	FACU	1 gal	0
Spiraea douglasii	Hardhack	FACW	1 gal	0
Symphoricarpos albus	Snowberry	FACU	1 gal	0
Agrostis alba	Red top (lbs)	FAC	Seed	1
Elymus glaucus	Blue wildrye (lbs)	FACU	Seed	2.1
Festuca rubra	Red fescue (lbs)	FAC	Seed	1
Glyceria elata	Tall mannagrass (lbs)	FACW	Seed	0
Hordeum brachyantherum	Meadow barley (lbs)	FACW	Seed	1
Poa secunda	Bluegrass (lbs)	FACU	Seed	2.1
Scirpus microcarpus	Panicled bulrush (lbs)	OBL	Seed	0

Table 20: Planting Area 8, Takeoff 8C

Planting Area 8; Sheet C-10			
Planting Assemblage			C - Riparian Sites
Acres			0.27
Plants/Acre			1500
Total Plants			408
Conifer Pots/Acre			300
BR Conifer/Acre			500
Stakes/Acre			600
Other Pots/Acre			100
Lbs Seed/Acre			25
Total Lbs of Seed			6.8

Latin Name	**Common Name**	**Nat'l Wetland Indicator Status**	**Stock**	**Quantity**
Abies grandis	Grand fir	FACU	1 gal	3
Acer macrophyllum	Big Leaf Maple	FACU	1 gal	3
Alnus rubra	Red alder	FAC	1 gal	0
Fraxinus latifolia	Oregon Ash	FACW	1 gal	3
Picea sitchensis	Sitka Spruce	FAC	1 gal	27
Picea sitchensis	Sitka Spruce	FAC	Bare Root	54
Populus trichocarpa	Black Cottonwood	FACW	Stakes	54
Pseudotsuga menziesii	Douglas-fir	FACU	1 gal	27
Pseudotsuga menziesii	Douglas-fir	FACU	Bare Root	54
Rhamnus purshiana	Cascara	UPL	1 gal	1
Salix scouleriana	Scouler Willow	FAC	Live Cuttings	27
Salix sitchensis	Sitka Willow	FACW	Live Cuttings	27
Salix hookeriana	Hooker Willow	FACW	Live Cuttings	0
Salix lucida ssp. lasiandra	Pacific Willow	FACW	Live Cuttings	27
Salix prolixa (S. rigida mackenzieana)	MacKenzie Willow	OBL	Live Cuttings	0
Thuja plicata	Western Red Cedar	FAC	1 gal	24
Thuja plicata	Western Red Cedar	FAC	Bare Root	27
Acer circinatum	Vine maple	FAC	1 gal	1
Cornus stolonifera	Red Osier Dogwood	FACW	Stakes	27
Lonicera involucrata	Twinberry	FAC	1 gal	3
Oemleria ceraciformis	Indian Plum	FACU	1 gal	1
Physocarpus capitatus	Ninebark	FACW	1 gal	5
Ribes sanguineum	Goose Berry	FACU	1 gal	1
Rosa nutkana	Nootka Rose	FAC	1 gal	3
Rubus parviflorus	Thimbleberry	FACU	1 gal	1
Rubus spectabilis	Salmonberry	FAC	1 gal	1
Sambucus racemosa	Elderberry	FACU	1 gal	1
Spiraea douglasii	Hardhack	FACW	1 gal	0
Symphoricarpos albus	Snowberry	FACU	1 gal	1
Agrostis alba	Red top (lbs)	FAC	Seed	1.4
Elymus glaucus	Blue wildrye (lbs)	FACU	Seed	1.4
Festuca rubra	Red fescue (lbs)	FAC	Seed	1.4
Glyceria elata	Tall mannagrass (lbs)	FACW	Seed	0
Hordeum brachyantherum	Meadow barley (lbs)	FACW	Seed	1.4
Poa secunda	Bluegrass (lbs)	FACU	Seed	1.4
Scirpus microcarpus	Panicled bulrush (lbs)	OBL	Seed	0

Table 21: Planting Area 8, Takeoff 8D

Planting Area 8; Sheet C-10			
Planting Assemblage			D - Low Growing Riparian Sites
Acres			0.36
Plants/Acre			1500
Total Plants			539
Conifer Pots/Acre			0
BR Conifer/Acre			0
Stakes/Acre			1200
Other Pots/Acre			300
Lbs Seed/Acre			25
Total Lbs of Seed			9

Latin Name	**Common Name**	**Nat'l Wetland Indicator Status**	**Stock**	**Quantity**
Abies grandis	Grand fir	FACU	1 gal	0
Acer macrophyllum	Big Leaf Maple	FACU	1 gal	0
Alnus rubra	Red alder	FAC	1 gal	0
Fraxinus latifolia	Oregon Ash	FACW	1 gal	0
Picea sitchensis	Sitka Spruce	FAC	1 gal	0
Picea sitchensis	Sitka Spruce	FAC	Bare Root	0
Populus trichocarpa	Black Cottonwood	FACW	Stakes	0
Pseudotsuga menziesii	Douglas-fir	FACU	1 gal	0
Pseudotsuga menziesii	Douglas-fir	FACU	Bare Root	0
Rhamnus purshiana	Cascara	UPL	1 gal	0
Salix scouleriana	Scouler Willow	FAC	Live Cuttings	108
Salix sitchensis	Sitka Willow	FACW	Live Cuttings	108
Salix hookeriana	Hooker Willow	FACW	Live Cuttings	0
Salix lucida ssp. lasiandra	Pacific Willow	FACW	Live Cuttings	108
Salix prolixa (S. rigida mackenzieana)	MacKenzie Willow	OBL	Live Cuttings	0
Thuja plicata	Western Red Cedar	FAC	1 gal	0
Thuja plicata	Western Red Cedar	FAC	Bare Root	0
Acer circinatum	Vine maple	FAC	1 gal	2
Cornus stolonifera	Red Osier Dogwood	FACW	Stakes	108
Lonicera involucrata	Twinberry	FAC	1 gal	18
Oemleria ceraciformis	Indian Plum	FACU	1 gal	4
Physocarpus capitatus	Ninebark	FACW	1 gal	22
Ribes sanguineum	Goose Berry	FACU	1 gal	2
Rosa nutkana	Nootka Rose	FAC	1 gal	18
Rubus parviflorus	Thimbleberry	FACU	1 gal	2
Rubus spectabilis	Salmonberry	FAC	1 gal	4
Sambucus racemosa	Elderberry	FACU	1 gal	22
Spiraea douglasii	Hardhack	FACW	1 gal	0
Symphoricarpos albus	Snowberry	FACU	1 gal	16
Agrostis alba	Red top (lbs)	FAC	Seed	1.8
Elymus glaucus	Blue wildrye (lbs)	FACU	Seed	1.8
Festuca rubra	Red fescue (lbs)	FAC	Seed	1.8
Glyceria elata	Tall mannagrass (lbs)	FACW	Seed	0
Hordeum brachyantherum	Meadow barley (lbs)	FACW	Seed	1.8
Poa secunda	Bluegrass (lbs)	FACU	Seed	1.8
Scirpus microcarpus	Panicled bulrush (lbs)	OBL	Seed	0

Table 22: Planting Area 9, Takeoff 9B

Planting Area 9; Sheet C-11				
Planting Assemblage		B - Primarily Wet, Seasonally Wet, or Wetland Sites		
Acres				2.10
Plants/Acre				1500
Total Plants				3145
Conifer Pots/Acre				300
BR Conifer/Acre				500
Stakes/Acre				600
Other Pots/Acre				100
Lbs Seed/Acre				25
Total Lbs of Seed				52.4
Latin Name	**Common Name**	**Nat'l Wetland Indicator Status**	**Stock**	**Quantity**
Abies grandis	Grand fir	FACU	1 gal	0
Acer macrophyllum	Big Leaf Maple	FACU	1 gal	0
Alnus rubra	Red alder	FAC	1 gal	0
Fraxinus latifolia	Oregon Ash	FACW	1 gal	0
Picea sitchensis	Sitka Spruce	FAC	1 gal	419
Picea sitchensis	Sitka Spruce	FAC	Bare Root	629
Populus trichocarpa	Black Cottonwood	FACW	Stakes	419
Pseudotsuga menziesii	Douglas-fir	FACU	1 gal	0
Pseudotsuga menziesii	Douglas-fir	FACU	Bare Root	0
Rhamnus purshiana	Cascara	UPL	1 gal	0
Salix scouleriana	Scouler Willow	FAC	Live Cuttings	0
Salix sitchensis	Sitka Willow	FACW	Live Cuttings	419
Salix hookeriana	Hooker Willow	FACW	Live Cuttings	0
Salix lucida ssp. lasiandra	Pacific Willow	FACW	Live Cuttings	210
Salix prolixa (S. rigida mackenzieana)	MacKenzie Willow	OBL	Live Cuttings	0
Thuja plicata	Western Red Cedar	FAC	1 gal	210
Thuja plicata	Western Red Cedar	FAC	Bare Root	419
Acer circinatum	Vine maple	FAC	1 gal	0
Cornus stolonifera	Red Osier Dogwood	FACW	Stakes	210
Lonicera involucrata	Twinberry	FAC	1 gal	42
Oemleria ceraciformis	Indian Plum	FACU	1 gal	0
Physocarpus capitatus	Ninebark	FACW	1 gal	52
Ribes sanguineum	Goose Berry	FACU	1 gal	0
Rosa nutkana	Nootka Rose	FAC	1 gal	21
Rubus parviflorus	Thimbleberry	FACU	1 gal	0
Rubus spectabilis	Salmonberry	FAC	1 gal	10
Sambucus racemosa	Elderberry	FACU	1 gal	0
Spiraea douglasii	Hardhack	FACW	1 gal	84
Symphoricarpos albus	Snowberry	FACU	1 gal	0
Agrostis alba	Red top (lbs)	FAC	Seed	10.5
Elymus glaucus	Blue wildrye (lbs)	FACU	Seed	0
Festuca rubra	Red fescue (lbs)	FAC	Seed	10.5
Glyceria elata	Tall mannagrass (lbs)	FACW	Seed	10.5
Hordeum brachyantherum	Meadow barley (lbs)	FACW	Seed	10.5
Poa secunda	Bluegrass (lbs)	FACU	Seed	0
Scirpus microcarpus	Panicled bulrush (lbs)	OBL	Seed	10.5

Table 23: Planting Area 9, Takeoff 9C

Planting Area 9; Sheet C-11			
Planting Assemblage			C - Riparian Sites
Acres			0.50
Plants/Acre			1500
Total Plants			755
Conifer Pots/Acre			300
BR Conifer/Acre			500
Stakes/Acre			600
Other Pots/Acre			100
Lbs Seed/Acre			25
Total Lbs of Seed			12.6

Latin Name	**Common Name**	**Nat'l Wetland Indicator Status**	**Stock**	**Quantity**
Abies grandis	Grand fir	FACU	1 gal	5
Acer macrophyllum	Big Leaf Maple	FACU	1 gal	5
Alnus rubra	Red alder	FAC	1 gal	0
Fraxinus latifolia	Oregon Ash	FACW	1 gal	5
Picea sitchensis	Sitka Spruce	FAC	1 gal	50
Picea sitchensis	Sitka Spruce	FAC	Bare Root	101
Populus trichocarpa	Black Cottonwood	FACW	Stakes	101
Pseudotsuga menziesii	Douglas-fir	FACU	1 gal	50
Pseudotsuga menziesii	Douglas-fir	FACU	Bare Root	101
Rhamnus purshiana	Cascara	UPL	1 gal	3
Salix scouleriana	Scouler Willow	FAC	Live Cuttings	50
Salix sitchensis	Sitka Willow	FACW	Live Cuttings	50
Salix hookeriana	Hooker Willow	FACW	Live Cuttings	0
Salix lucida ssp. lasiandra	Pacific Willow	FACW	Live Cuttings	50
Salix prolixa (S. rigida mackenzieana)	MacKenzie Willow	OBL	Live Cuttings	0
Thuja plicata	Western Red Cedar	FAC	1 gal	45
Thuja plicata	Western Red Cedar	FAC	Bare Root	50
Acer circinatum	Vine maple	FAC	1 gal	3
Cornus stolonifera	Red Osier Dogwood	FACW	Stakes	50
Lonicera involucrata	Twinberry	FAC	1 gal	5
Oemleria ceraciformis	Indian Plum	FACU	1 gal	3
Physocarpus capitatus	Ninebark	FACW	1 gal	10
Ribes sanguineum	Goose Berry	FACU	1 gal	3
Rosa nutkana	Nootka Rose	FAC	1 gal	5
Rubus parviflorus	Thimbleberry	FACU	1 gal	3
Rubus spectabilis	Salmonberry	FAC	1 gal	3
Sambucus racemosa	Elderberry	FACU	1 gal	3
Spiraea douglasii	Hardhack	FACW	1 gal	0
Symphoricarpos albus	Snowberry	FACU	1 gal	3
Agrostis alba	Red top (lbs)	FAC	Seed	2.5
Elymus glaucus	Blue wildrye (lbs)	FACU	Seed	2.5
Festuca rubra	Red fescue (lbs)	FAC	Seed	2.5
Glyceria elata	Tall mannagrass (lbs)	FACW	Seed	0
Hordeum brachyantherum	Meadow barley (lbs)	FACW	Seed	2.5
Poa secunda	Bluegrass (lbs)	FACU	Seed	2.5
Scirpus microcarpus	Panicled bulrush (lbs)	OBL	Seed	0

Table 24: Planting Area 10, Takeoff 10C

Planting Area 10; Sheet C-12				
Planting Assemblage				C - Riparian Sites
Acres				2.71
Plants/Acre				1500
Total Plants				4062
Conifer Pots/Acre				300
BR Conifer/Acre				500
Stakes/Acre				600
Other Pots/Acre				100
Lbs Seed/Acre				25
Total Lbs of Seed				67.7

Latin Name	**Common Name**	**Nat'l Wetland Indicator Status**	**Stock**	**Quantity**
Abies grandis	Grand fir	FACU	1 gal	27
Acer macrophyllum	Big Leaf Maple	FACU	1 gal	27
Alnus rubra	Red alder	FAC	1 gal	0
Fraxinus latifolia	Oregon Ash	FACW	1 gal	27
Picea sitchensis	Sitka Spruce	FAC	1 gal	271
Picea sitchensis	Sitka Spruce	FAC	Bare Root	542
Populus trichocarpa	Black Cottonwood	FACW	Stakes	542
Pseudotsuga menziesii	Douglas-fir	FACU	1 gal	271
Pseudotsuga menziesii	Douglas-fir	FACU	Bare Root	542
Rhamnus purshiana	Cascara	UPL	1 gal	14
Salix scouleriana	Scouler Willow	FAC	Live Cuttings	271
Salix sitchensis	Sitka Willow	FACW	Live Cuttings	271
Salix hookeriana	Hooker Willow	FACW	Live Cuttings	0
Salix lucida ssp. lasiandra	Pacific Willow	FACW	Live Cuttings	271
Salix prolixa (S. rigida mackenzieana)	MacKenzie Willow	OBL	Live Cuttings	0
Thuja plicata	Western Red Cedar	FAC	1 gal	244
Thuja plicata	Western Red Cedar	FAC	Bare Root	271
Acer circinatum	Vine maple	FAC	1 gal	14
Cornus stolonifera	Red Osier Dogwood	FACW	Stakes	271
Lonicera involucrata	Twinberry	FAC	1 gal	27
Oemleria ceraciformis	Indian Plum	FACU	1 gal	14
Physocarpus capitatus	Ninebark	FACW	1 gal	54
Ribes sanguineum	Goose Berry	FACU	1 gal	14
Rosa nutkana	Nootka Rose	FAC	1 gal	27
Rubus parviflorus	Thimbleberry	FACU	1 gal	14
Rubus spectabilis	Salmonberry	FAC	1 gal	14
Sambucus racemosa	Elderberry	FACU	1 gal	14
Spiraea douglasii	Hardhack	FACW	1 gal	0
Symphoricarpos albus	Snowberry	FACU	1 gal	14
Agrostis alba	Red top (lbs)	FAC	Seed	13.5
Elymus glaucus	Blue wildrye (lbs)	FACU	Seed	13.5
Festuca rubra	Red fescue (lbs)	FAC	Seed	13.5
Glyceria elata	Tall mannagrass (lbs)	FACW	Seed	0
Hordeum brachyantherum	Meadow barley (lbs)	FACW	Seed	13.5
Poa secunda	Bluegrass (lbs)	FACU	Seed	13.5
Scirpus microcarpus	Panicled bulrush (lbs)	OBL	Seed	0

Table 25 : Planting Area 10, Takeoff 10E

Planting Area 10; Sheet C-12			
Planting Assemblage		E - Native Emergent Plants and Erosion Control	
Acres			2.47
Plants/Acre			N/A; Seed
Total Plants			N/A; Seed
Conifer Pots/Acre			0
BR Conifer/Acre			0
Stakes/Acre			0
Other Pots/Acre			0
Lbs Seed/Acre			35
Total Lbs of Seed			86.3

Latin Name	Common Name	Nat'l Wetland Indicator Status	Stock	Quantity
Abies grandis	Grand fir	FACU	1 gal	0
Acer macrophyllum	Big Leaf Maple	FACU	1 gal	0
Alnus rubra	Red alder	FAC	1 gal	0
Fraxinus latifolia	Oregon Ash	FACW	1 gal	0
Picea sitchensis	Sitka Spruce	FAC	1 gal	0
Picea sitchensis	Sitka Spruce	FAC	Bare Root	0
Populus trichocarpa	Black Cottonwood	FACW	Stakes	0
Pseudotsuga menziesii	Douglas-fir	FACU	1 gal	0
Pseudotsuga menziesii	Douglas-fir	FACU	Bare Root	0
Rhamnus purshiana	Cascara	UPL	1 gal	0
Salix scouleriana	Scouler Willow	FAC	Live Cuttings	0
Salix sitchensis	Sitka Willow	FACW	Live Cuttings	0
Salix hookeriana	Hooker Willow	FACW	Live Cuttings	0
Salix lucida ssp. lasiandra	Pacific Willow	FACW	Live Cuttings	0
Salix prolixa (S. rigida mackenzieana)	MacKenzie Willow	OBL	Live Cuttings	0
Thuja plicata	Western Red Cedar	FAC	1 gal	0
Thuja plicata	Western Red Cedar	FAC	Bare Root	0
Acer circinatum	Vine maple	FAC	1 gal	0
Cornus stolonifera	Red Osier Dogwood	FACW	Stakes	0
Lonicera involucrata	Twinberry	FAC	1 gal	0
Oemleria ceraciformis	Indian Plum	FACU	1 gal	0
Physocarpus capitatus	Ninebark	FACW	1 gal	0
Ribes sanguineum	Goose Berry	FACU	1 gal	0
Rosa nutkana	Nootka Rose	FAC	1 gal	0
Rubus parviflorus	Thimbleberry	FACU	1 gal	0
Rubus spectabilis	Salmonberry	FAC	1 gal	0
Sambucus racemosa	Elderberry	FACU	1 gal	0
Spiraea douglasii	Hardhack	FACW	1 gal	0
Symphoricarpos albus	Snowberry	FACU	1 gal	0
Agrostis alba	Red top (lbs)	FAC	Seed	12.3
Elymus glaucus	Blue wildrye (lbs)	FACU	Seed	24.7
Festuca rubra	Red fescue (lbs)	FAC	Seed	12.3
Glyceria elata	Tall mannagrass (lbs)	FACW	Seed	0
Hordeum brachyantherum	Meadow barley (lbs)	FACW	Seed	12.3
Poa secunda	Bluegrass (lbs)	FACU	Seed	24.7
Scirpus microcarpus	Panicled bulrush (lbs)	OBL	Seed	0

Table 26: Planting Area 11, Takeoff 11C

Planting Area 11; Sheet C-13				
Planting Assemblage				C - Riparian Sites
Acres				0.11
Plants/Acre				1500
Total Plants				166
Conifer Pots/Acre				300
BR Conifer/Acre				500
Stakes/Acre				600
Other Pots/Acre				100
Lbs Seed/Acre				25
Total Lbs of Seed				2.8
Latin Name	**Common Name**	**Nat'l Wetland Indicator Status**	**Stock**	**Quantity**
Abies grandis	Grand fir	FACU	1 gal	1
Acer macrophyllum	Big Leaf Maple	FACU	1 gal	1
Alnus rubra	Red alder	FAC	1 gal	0
Fraxinus latifolia	Oregon Ash	FACW	1 gal	1
Picea sitchensis	Sitka Spruce	FAC	1 gal	11
Picea sitchensis	Sitka Spruce	FAC	Bare Root	22
Populus trichocarpa	Black Cottonwood	FACW	Stakes	22
Pseudotsuga menziesii	Douglas-fir	FACU	1 gal	11
Pseudotsuga menziesii	Douglas-fir	FACU	Bare Root	22
Rhamnus purshiana	Cascara	UPL	1 gal	1
Salix scouleriana	Scouler Willow	FAC	Live Cuttings	11
Salix sitchensis	Sitka Willow	FACW	Live Cuttings	11
Salix hookeriana	Hooker Willow	FACW	Live Cuttings	0
Salix lucida ssp. lasiandra	Pacific Willow	FACW	Live Cuttings	11
Salix prolixa (S. rigida mackenzieana)	MacKenzie Willow	OBL	Live Cuttings	0
Thuja plicata	Western Red Cedar	FAC	1 gal	10
Thuja plicata	Western Red Cedar	FAC	Bare Root	11
Acer circinatum	Vine maple	FAC	1 gal	1
Cornus stolonifera	Red Osier Dogwood	FACW	Stakes	11
Lonicera involucrata	Twinberry	FAC	1 gal	1
Oemleria ceraciformis	Indian Plum	FACU	1 gal	1
Physocarpus capitatus	Ninebark	FACW	1 gal	2
Ribes sanguineum	Goose Berry	FACU	1 gal	1
Rosa nutkana	Nootka Rose	FAC	1 gal	1
Rubus parviflorus	Thimbleberry	FACU	1 gal	1
Rubus spectabilis	Salmonberry	FAC	1 gal	1
Sambucus racemosa	Elderberry	FACU	1 gal	1
Spiraea douglasii	Hardhack	FACW	1 gal	0
Symphoricarpos albus	Snowberry	FACU	1 gal	1
Agrostis alba	Red top (lbs)	FAC	Seed	0.55
Elymus glaucus	Blue wildrye (lbs)	FACU	Seed	0.55
Festuca rubra	Red fescue (lbs)	FAC	Seed	0.55
Glyceria elata	Tall mannagrass (lbs)	FACW	Seed	0
Hordeum brachyantherum	Meadow barley (lbs)	FACW	Seed	0.55
Poa secunda	Bluegrass (lbs)	FACU	Seed	0.55
Scirpus microcarpus	Panicled bulrush (lbs)	OBL	Seed	0

Table 27: Planting Area 11, Takeoff 11D

Planting Area 11; Sheet C-13				
Planting Assemblage				D - Low Growing Riparian Sites
Acres				
Plants/Acre				
Total Plants				
Conifer Pots/Acre				
BR Conifer/Acre				
Stakes/Acre				
Other Pots/Acre				
Lbs Seed/Acre				
Total Lbs of Seed				

Latin Name	**Common Name**	**Nat'l Wetland Indicator Status**	**Stock**	**Quantity**
Abies grandis	Grand fir	FACU	1 gal	0
Acer macrophyllum	Big Leaf Maple	FACU	1 gal	0
Alnus rubra	Red alder	FAC	1 gal	0
Fraxinus latifolia	Oregon Ash	FACW	1 gal	0
Picea sitchensis	Sitka Spruce	FAC	1 gal	0
Picea sitchensis	Sitka Spruce	FAC	Bare Root	0
Populus trichocarpa	Black Cottonwood	FACW	Stakes	0
Pseudotsuga menziesii	Douglas-fir	FACU	1 gal	0
Pseudotsuga menziesii	Douglas-fir	FACU	Bare Root	0
Rhamnus purshiana	Cascara	UPL	1 gal	0
Salix scouleriana	Scouler Willow	FAC	Live Cuttings	18
Salix sitchensis	Sitka Willow	FACW	Live Cuttings	18
Salix hookeriana	Hooker Willow	FACW	Live Cuttings	0
Salix lucida ssp. lasiandra	Pacific Willow	FACW	Live Cuttings	18
Salix prolixa (S. rigida mackenzieana)	MacKenzie Willow	OBL	Live Cuttings	0
Thuja plicata	Western Red Cedar	FAC	1 gal	0
Thuja plicata	Western Red Cedar	FAC	Bare Root	0
Acer circinatum	Vine maple	FAC	1 gal	0
Cornus stolonifera	Red Osier Dogwood	FACW	Stakes	18
Lonicera involucrata	Twinberry	FAC	1 gal	3
Oemleria ceraciformis	Indian Plum	FACU	1 gal	1
Physocarpus capitatus	Ninebark	FACW	1 gal	4
Ribes sanguineum	Goose Berry	FACU	1 gal	0
Rosa nutkana	Nootka Rose	FAC	1 gal	3
Rubus parviflorus	Thimbleberry	FACU	1 gal	0
Rubus spectabilis	Salmonberry	FAC	1 gal	1
Sambucus racemosa	Elderberry	FACU	1 gal	4
Spiraea douglasii	Hardhack	FACW	1 gal	0
Symphoricarpos albus	Snowberry	FACU	1 gal	3
Agrostis alba	Red top (lbs)	FAC	Seed	0.31
Elymus glaucus	Blue wildrye (lbs)	FACU	Seed	0.31
Festuca rubra	Red fescue (lbs)	FAC	Seed	0.31
Glyceria elata	Tall mannagrass (lbs)	FACW	Seed	0
Hordeum brachyantherum	Meadow barley (lbs)	FACW	Seed	0.31
Poa secunda	Bluegrass (lbs)	FACU	Seed	0.31
Scirpus microcarpus	Panicled bulrush (lbs)	OBL	Seed	0

Table 28: Planting Area 12, Takeoff 12E

Planting Area 12; Sheet C-14			
Planting Assemblage		E - Native Emergent Plants and Erosion Control	
Acres			1.48
Plants/Acre			N/A; Seed
Total Plants			N/A; Seed
Conifer Pots/Acre			0
BR Conifer/Acre			0
Stakes/Acre			0
Other Pots/Acre			0
Lbs Seed/Acre			35
Total Lbs of Seed			51.8

Latin Name	Common Name	Nat'l Wetland Indicator Status	Stock	Quantity
Abies grandis	Grand fir	FACU	1 gal	0
Acer macrophyllum	Big Leaf Maple	FACU	1 gal	0
Alnus rubra	Red alder	FAC	1 gal	0
Fraxinus latifolia	Oregon Ash	FACW	1 gal	0
Picea sitchensis	Sitka Spruce	FAC	1 gal	0
Picea sitchensis	Sitka Spruce	FAC	Bare Root	0
Populus trichocarpa	Black Cottonwood	FACW	Stakes	0
Pseudotsuga menziesii	Douglas-fir	FACU	1 gal	0
Pseudotsuga menziesii	Douglas-fir	FACU	Bare Root	0
Rhamnus purshiana	Cascara	UPL	1 gal	0
Salix scouleriana	Scouler Willow	FAC	Live Cuttings	0
Salix sitchensis	Sitka Willow	FACW	Live Cuttings	0
Salix hookeriana	Hooker Willow	FACW	Live Cuttings	0
Salix lucida ssp. lasiandra	Pacific Willow	FACW	Live Cuttings	0
Salix prolixa (S. rigida mackenzieana)	MacKenzie Willow	OBL	Live Cuttings	0
Thuja plicata	Western Red Cedar	FAC	1 gal	0
Thuja plicata	Western Red Cedar	FAC	Bare Root	0
Acer circinatum	Vine maple	FAC	1 gal	0
Cornus stolonifera	Red Osier Dogwood	FACW	Stakes	0
Lonicera involucrata	Twinberry	FAC	1 gal	0
Oemleria ceraciformis	Indian Plum	FACU	1 gal	0
Physocarpus capitatus	Ninebark	FACW	1 gal	0
Ribes sanguineum	Goose Berry	FACU	1 gal	0
Rosa nutkana	Nootka Rose	FAC	1 gal	0
Rubus parviflorus	Thimbleberry	FACU	1 gal	0
Rubus spectabilis	Salmonberry	FAC	1 gal	0
Sambucus racemosa	Elderberry	FACU	1 gal	0
Spiraea douglasii	Hardhack	FACW	1 gal	0
Symphoricarpos albus	Snowberry	FACU	1 gal	0
Agrostis alba	Red top (lbs)	FAC	Seed	7.4
Elymus glaucus	Blue wildrye (lbs)	FACU	Seed	14.8
Festuca rubra	Red fescue (lbs)	FAC	Seed	7.4
Glyceria elata	Tall mannagrass (lbs)	FACW	Seed	0
Hordeum brachyantherum	Meadow barley (lbs)	FACW	Seed	7.4
Poa secunda	Bluegrass (lbs)	FACU	Seed	14.8
Scirpus microcarpus	Panicled bulrush (lbs)	OBL	Seed	0

Table 29: Planting Area 13, Takeoff 13C

Planting Area 13; Sheet C-15			
Planting Assemblage			C - Riparian Sites
Acres			0.11
Plants/Acre			1500
Total Plants			166
Conifer Pots/Acre			300
BR Conifer/Acre			500
Stakes/Acre			600
Other Pots/Acre			100
Lbs Seed/Acre			25
Total Lbs of Seed			2.8

Latin Name	**Common Name**	**Nat'l Wetland Indicator Status**	**Stock**	**Quantity**
Abies grandis	Grand fir	FACU	1 gal	1
Acer macrophyllum	Big Leaf Maple	FACU	1 gal	1
Alnus rubra	Red alder	FAC	1 gal	0
Fraxinus latifolia	Oregon Ash	FACW	1 gal	1
Picea sitchensis	Sitka Spruce	FAC	1 gal	11
Picea sitchensis	Sitka Spruce	FAC	Bare Root	22
Populus trichocarpa	Black Cottonwood	FACW	Stakes	22
Pseudotsuga menziesii	Douglas-fir	FACU	1 gal	11
Pseudotsuga menziesii	Douglas-fir	FACU	Bare Root	22
Rhamnus purshiana	Cascara	UPL	1 gal	1
Salix scouleriana	Scouler Willow	FAC	Live Cuttings	11
Salix sitchensis	Sitka Willow	FACW	Live Cuttings	11
Salix hookeriana	Hooker Willow	FACW	Live Cuttings	0
Salix lucida ssp. lasiandra	Pacific Willow	FACW	Live Cuttings	11
Salix prolixa (S. rigida mackenzieana)	MacKenzie Willow	OBL	Live Cuttings	0
Thuja plicata	Western Red Cedar	FAC	1 gal	10
Thuja plicata	Western Red Cedar	FAC	Bare Root	11
Acer circinatum	Vine maple	FAC	1 gal	1
Cornus stolonifera	Red Osier Dogwood	FACW	Stakes	11
Lonicera involucrata	Twinberry	FAC	1 gal	1
Oemleria ceraciformis	Indian Plum	FACU	1 gal	1
Physocarpus capitatus	Ninebark	FACW	1 gal	2
Ribes sanguineum	Goose Berry	FACU	1 gal	1
Rosa nutkana	Nootka Rose	FAC	1 gal	1
Rubus parviflorus	Thimbleberry	FACU	1 gal	1
Rubus spectabilis	Salmonberry	FAC	1 gal	1
Sambucus racemosa	Elderberry	FACU	1 gal	1
Spiraea douglasii	Hardhack	FACW	1 gal	0
Symphoricarpos albus	Snowberry	FACU	1 gal	1
Agrostis alba	Red top (lbs)	FAC	Seed	0.6
Elymus glaucus	Blue wildrye (lbs)	FACU	Seed	0.6
Festuca rubra	Red fescue (lbs)	FAC	Seed	0.6
Glyceria elata	Tall mannagrass (lbs)	FACW	Seed	0
Hordeum brachyantherum	Meadow barley (lbs)	FACW	Seed	0.6
Poa secunda	Bluegrass (lbs)	FACU	Seed	0.6
Scirpus microcarpus	Panicled bulrush (lbs)	OBL	Seed	0

Table 30: Planting Area 13, Takeoff 13D

Planting Area 13; Sheet C-15				
Planting Assemblage				D - Low Growing Riparian Sites
Acres				0.06
Plants/Acre				1500
Total Plants				92
Conifer Pots/Acre				0
BR Conifer/Acre				0
Stakes/Acre				1200
Other Pots/Acre				300
Lbs Seed/Acre				25
Total Lbs of Seed				1.5
Latin Name	**Common Name**	**Nat'l Wetland Indicator Status**	**Stock**	**Quantity**
Abies grandis	Grand fir	FACU	1 gal	0
Acer macrophyllum	Big Leaf Maple	FACU	1 gal	0
Alnus rubra	Red alder	FAC	1 gal	0
Fraxinus latifolia	Oregon Ash	FACW	1 gal	0
Picea sitchensis	Sitka Spruce	FAC	1 gal	0
Picea sitchensis	Sitka Spruce	FAC	Bare Root	0
Populus trichocarpa	Black Cottonwood	FACW	Stakes	0
Pseudotsuga menziesii	Douglas-fir	FACU	1 gal	0
Pseudotsuga menziesii	Douglas-fir	FACU	Bare Root	0
Rhamnus purshiana	Cascara	UPL	1 gal	0
Salix scouleriana	Scouler Willow	FAC	Live Cuttings	18
Salix sitchensis	Sitka Willow	FACW	Live Cuttings	18
Salix hookeriana	Hooker Willow	FACW	Live Cuttings	0
Salix lucida ssp. lasiandra	Pacific Willow	FACW	Live Cuttings	18
Salix prolixa (S. rigida mackenzieana)	MacKenzie Willow	OBL	Live Cuttings	0
Thuja plicata	Western Red Cedar	FAC	1 gal	0
Thuja plicata	Western Red Cedar	FAC	Bare Root	0
Acer circinatum	Vine maple	FAC	1 gal	0
Cornus stolonifera	Red Osier Dogwood	FACW	Stakes	18
Lonicera involucrata	Twinberry	FAC	1 gal	3
Oemleria ceraciformis	Indian Plum	FACU	1 gal	1
Physocarpus capitatus	Ninebark	FACW	1 gal	4
Ribes sanguineum	Goose Berry	FACU	1 gal	0
Rosa nutkana	Nootka Rose	FAC	1 gal	3
Rubus parviflorus	Thimbleberry	FACU	1 gal	0
Rubus spectabilis	Salmonberry	FAC	1 gal	1
Sambucus racemosa	Elderberry	FACU	1 gal	4
Spiraea douglasii	Hardhack	FACW	1 gal	0
Symphoricarpos albus	Snowberry	FACU	1 gal	3
Agrostis alba	Red top (lbs)	FAC	Seed	0.3
Elymus glaucus	Blue wildrye (lbs)	FACU	Seed	0.3
Festuca rubra	Red fescue (lbs)	FAC	Seed	0.3
Glyceria elata	Tall mannagrass (lbs)	FACW	Seed	0
Hordeum brachyantherum	Meadow barley (lbs)	FACW	Seed	0.3
Poa secunda	Bluegrass (lbs)	FACU	Seed	0.3
Scirpus microcarpus	Panicled bulrush (lbs)	OBL	Seed	0

Table 31: Planting Area 14, Takeoff 14A

Planting Area 14; Sheet C-16			
Planting Assemblage			A - Upland and Dry Sites
Acres			2.72
Plants/Acre			1500
Total Plants			4080
Conifer Pots/Acre			300
BR Conifer/Acre			600
Stakes/Acre			500
Other Pots/Acre			100
Lbs Seed/Acre			35.0
Total Lbs of Seed			95.2

Latin Name	**Common Name**	**Nat'l Wetland Indicator Status**	**Stock**	**Quantity**
Abies grandis	Grand fir	FACU	1 gal	26
Acer macrophyllum	Big Leaf Maple	FACU	1 gal	26
Alnus rubra	Red alder	FAC	1 gal	0
Fraxinus latifolia	Oregon Ash	FACW	1 gal	26
Picea sitchensis	Sitka Spruce	FAC	1 gal	103
Picea sitchensis	Sitka Spruce	FAC	Bare Root	129
Populus trichocarpa	Black Cottonwood	FACW	Stakes	258
Pseudotsuga menziesii	Douglas-fir	FACU	1 gal	516
Pseudotsuga menziesii	Douglas-fir	FACU	Bare Root	1289
Rhamnus purshiana	Cascara	UPL	1 gal	13
Salix scouleriana	Scouler Willow	FAC	Live Cuttings	387
Salix sitchensis	Sitka Willow	FACW	Live Cuttings	258
Salix hookeriana	Hooker Willow	FACW	Live Cuttings	129
Salix lucida ssp. lasiandra	Pacific Willow	FACW	Live Cuttings	0
Salix prolixa (S. rigida mackenzieana)	MacKenzie Willow	OBL	Live Cuttings	0
Thuja plicata	Western Red Cedar	FAC	1 gal	129
Thuja plicata	Western Red Cedar	FAC	Bare Root	129
Acer circinatum	Vine maple	FAC	1 gal	13
Cornus stolonifera	Red Osier Dogwood	FACW	Stakes	258
Lonicera involucrata	Twinberry	FAC	1 gal	0
Oemleria ceraciformis	Indian Plum	FACU	1 gal	13
Physocarpus capitatus	Ninebark	FACW	1 gal	0
Ribes sanguineum	Goose Berry	FACU	1 gal	0
Rosa nutkana	Nootka Rose	FAC	1 gal	52
Rubus parviflorus	Thimbleberry	FACU	1 gal	13
Rubus spectabilis	Salmonberry	FAC	1 gal	0
Sambucus racemosa	Elderberry	FACU	1 gal	52
Spiraea douglasii	Hardhack	FACW	1 gal	0
Symphoricarpos albus	Snowberry	FACU	1 gal	52
Agrostis alba	Red top (lbs)	FAC	Seed	12.9
Elymus glaucus	Blue wildrye (lbs)	FACU	Seed	25.8
Festuca rubra	Red fescue (lbs)	FAC	Seed	12.9
Glyceria elata	Tall mannagrass (lbs)	FACW	Seed	0
Hordeum brachyantherum	Meadow barley (lbs)	FACW	Seed	12.9
Poa secunda	Bluegrass (lbs)	FACU	Seed	25.8
Scirpus microcarpus	Panicled bulrush (lbs)	OBL	Seed	0

Appendix 1 - List of Abbreviations Used in This Basis of Design Report

BMPs – Best Management Practices

BPA – Bonneville Power Administration

BOD – Basis of Design Report

BWT – Bobby Wolford Trucking and Salvage, Inc.

CFS – Cubic feet per second

CID – Criminal Investigation Division (of the EPA)

COT – Construction Oversight Team

CWA – Clean Water Act

EPA – Environmental Protection Agency

HPA – Hydraulic Projects Approval

LIDAR – Light detection and ranging

SWPPP – Stormwater Pollution and Prevention Plan

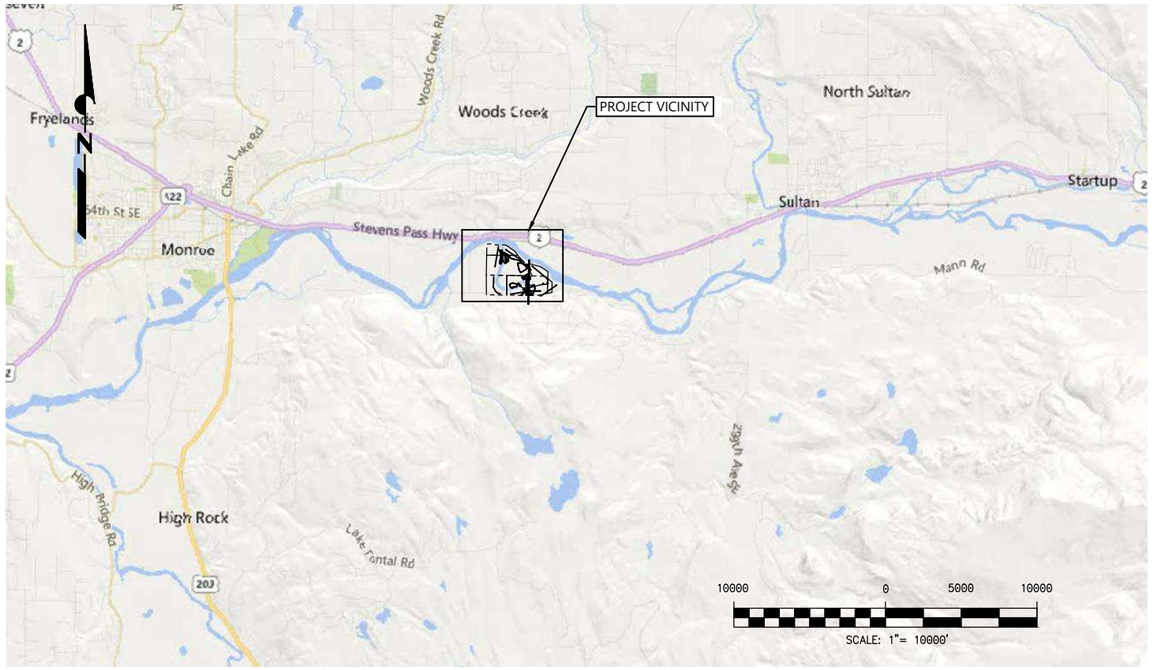
USGS – U.S. Geological Survey

KLOCK PROPERTY, RESTORATION, SKYKOMISH RIVER

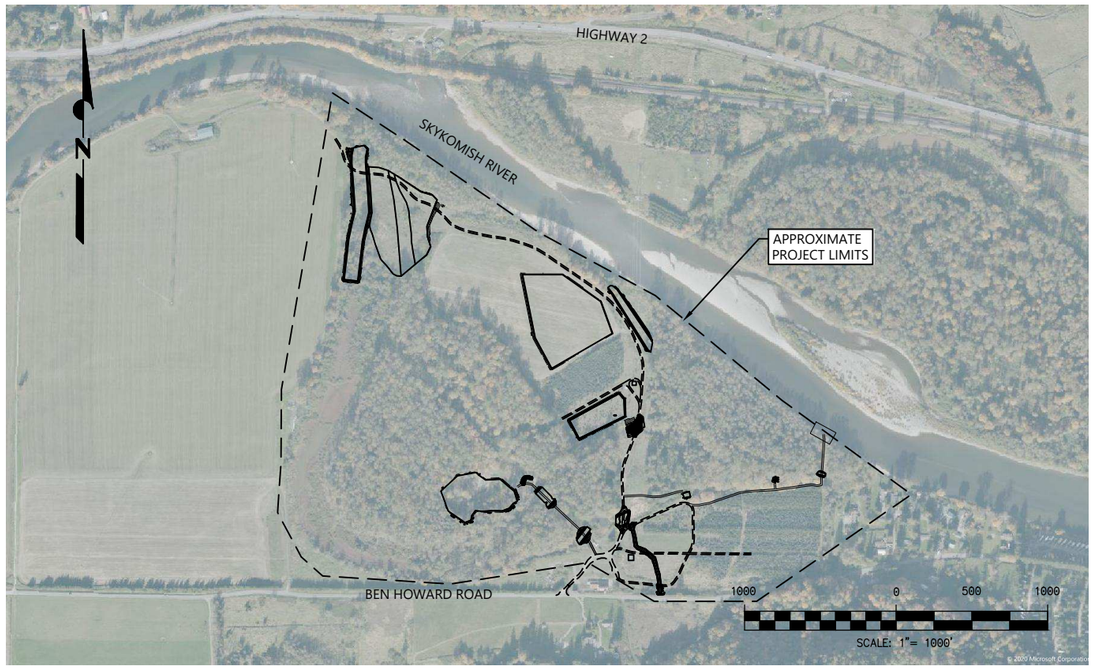
SKYKOMISH COUNTY, WA

FLOODPLAIN RESTORATION GRADING PLAN

90% DESIGN



LOCATION MAP



VICINITY MAP

PROJECT INFORMATION:

PROJECT LOCATION: KLOCK PROPERTY RESTORATION SITE
EAST OF MONROE, WA IN SNOHOMISH COUNTY
T27N, R7E, SEC 10

OWNER: PHONE: (425) 760-4444
CONTACT: DEREK KLOCK

ENGINEER: R2 RESOURCES, INC.
15250 NE 95TH ST
REDMOND, WA 98052
PHONE: (425) 556-1288
CONTACT: PAUL DeVRIES, P.E.

NOTES:

1. HORIZONTAL DATUM: WASHINGTON STATE PLANE NORTH ZONE, NAD 83, U.S. FEET.
2. VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).

0 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

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13	C-11	PLAN - CUT AREA - 9			

REV	DATE	DESCRIPTION	DRN	APP

PAUL EDWARD DEVRIES — STATE OF WASHINGTON — 37861 — REGISTERED PROFESSIONAL ENGINEER

LYNDON C. LEE, Ph.D. — 000365 — PROFESSIONAL WETLAND SCIENTIST

KLOCK PROPERTY, RESTORATION, SKYKOMISH RIVER

DESIGNED BY: P DeVRIES
DRAWN BY: J SCHULZ
CHECKED BY: L LEE
PROJECT MGR: X XXXXX
FILENAME: 2079-SHEET G-01.dwg

LC LEE & ASSOCIATES, INC.
BELLINGHAM, WA

Resource Consultants, Inc.
REDMOND, WA.

KLOCK PROPERTY RESTORATION
SKYKOMISH RIVER, WA

COVER SHEET

DATE: MONTH XX, XXXX
SHEET: G-1
REV: X

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LEGEND

- KEY PLAN BORDER
- PROPERTY LINE
- 2230 CONTOUR (EXISTING MAJOR)
- 2233 CONTOUR (EXISTING MINOR)
- 2230 CONTOUR (PROPOSED MAJOR)
- 2233 CONTOUR (PROPOSED MINOR)
- PROFILE (EXIST)
- PROFILE (PROPOSED)
- W RIVER WETTED MARGIN
- OHW ORDINARY HIGH WATER LEVEL
- 100 100-YR FLOOD EXTENT
- ROAD
- ACCESS

- ROCK
- UNDISTURBED EARTH / RIVERBED
- CUT
- FILL
- WOOD
- STAGING AREA

DRAWING REFERENCES

THE DRAWINGS ARE REFERENCED IN THE FOLLOWING MANNER

SECTION CUT ON SHEET 5, SHOWN ON SHEET 7:

A / C-7 — A: SECTION ID; C-7: SHEET ON WHICH SECTION IS SHOWN

ON SHEET 7 THIS SECTION IS DEFINED AS:

SECTION — A / C-5 — A: SECTION ID; C-5: SHEET FROM WHICH SECTION WAS CUT

PLAN AREA OUTLINED ON SHEET 5, SHOWN ON SHEET 7:

1 / C-7 — 1: PLAN NUMBER; C-7: SHEET ON WHICH PLAN AREA IS SHOWN

ON SHEET 7 THIS AREA IS DEFINED AS:

PLAN — 1 / C-5 — 1: PLAN NUMBER; C-5: SHEET ON WHICH PLAN AREA IS DEFINED

DETAILS ARE CROSS-REFERENCED IN A SIMILAR MANNER TO PLAN, USING LOWERCASE LETTERS FOR DETAIL NUMBER.

RESTORATION DESIGN LIMITATIONS

THE DESIGNS ON THESE PLANS ARE BASED ON CUT AND FILL AREA LOCATIONS AND A TOTAL TARGET CUT VOLUME OF 32,000 CY AS PRESCRIBED BY US DEPARTMENT OF JUSTICE AND TULALIP TRIBE REPRESENTATIVES. THE GOAL OF THE EARTHWORK LAID OUT IN THESE PLANS IS TO RESTORE NATURAL RIVERINE FLOODING PROCESSES OVER A TOPOGRAPHY RESEMBLING PRE-VIOLATION CONDITIONS. THERE IS INHERENT UNCERTAINTY IN THIS GOAL THAT PRECLUDES ASSURING ABSOLUTELY THAT THE PROJECT AS DESIGNED WILL NOT BE ASSOCIATED WITH UNANTICIPATED/UNDESIRED CHANNEL CHANGES. CHANNEL ADJUSTMENT OF BED AND BANKS IS THE USUAL RESPONSE TO SPATIAL AND TEMPORAL CHANGES IN FLOW AND SEDIMENT TRANSPORT PATTERNS, IRRESPECTIVE OF WHETHER THE PROJECT IS CONSTRUCTED. THE DESIGN ACCORDINGLY CANNOT ELIMINATE RISKS ASSSOCIATED WITH THESE CHANGES COMPLETELY IN BOTH SPACE AND TIME. THE EXISTENCE OF THESE RISKS INCLUDES, BUT IS NOT LIMITED TO, CASES WHERE: (I) SOME DEGREE OF BANK EROSION AND/OR TREE FALL OCCURS AT LOCATIONS WITHIN THE PROJECT REACH WHERE RIGID BANK PROTECTION IS NOT DESIGNED SPECIFICALLY; OR (II) THE RIVER REOCCUPIES ITS FORMER MAIN CHANNEL LOCATION THROUGH THE OXBOW THROUGH CHANNEL MIGRATION OR AN AVULSION ASSOCIATED WITH AN EXTREME FLOOD EVENT. INCREASED BANK EROSION, AVULSION, AND FLOODING RISKS MAY RESULT IN DIRECT RESPONSE TO THE PROJECT, IN WAYS THAT CANNOT BE PREDICTED WITH ABSOLUTE CERTAINTY.

ESTIMATED VOLUMES	
AREA	VOLUME (CY)
CUT	
1	178
2	30
3	43
4	141
5	630
6	1037
7	169
8	2750
9	8958
10	16470
11	1596
TOTAL	**32000**
FILL	
12	16684
13	6652
14	8664
TOTAL	**32000**

NOTES:

1. VOLUMES ARE ESTIMATED.
2. EXCAVATE CUT AREA 9 AND PLACE SPOILS AT FILL AREA SITE 12 LAST, TO BALANCE NET CUT AND FILL REQUIREMENT.

ABBREVIATIONS

BM	BENCH MARK
CG	CENTER OF GRAVITY
CL, ℄	CENTERLINE
CP	CONTROL POINT
CY	CUBIC YARD
DBH	DIA AT BREAST HEIGHT
DIA	DIAMETER
DS, D/S	DOWNSTREAM
DSEL	DOWNSTREAM ELEVATION
DWG	DRAWING
E	EAST
EA	EACH
ELEV, EL	ELEVATION
ELJ	ENGINEERED LOG JAM
EXIST	EXISTING
FT	FOOT, FEET
H, HORZ	HORIZONTAL
HPA	HYDRAULIC PROJECT APPROVAL
ID	IDENTIFICATION, INNER DIA
IN	INCH, INCHES
L	LENGTH
LB	POUNDS
LT	LEFT
LF	LINEAR FOOT
LWD	LARGE WOODY DEBRIS
MAX	MAXIMUM
MIN	MINIMUM
MISC	MISCELLANEOUS
MON	MONUMENT
N	NORTH
NO	NUMBER
NTS	NOT TO SCALE
OC	ON CENTER
OHWL	ORDINARY HIGH WATER LEVEL
OHWM	ORDINARY HIGH WATER MARK
PSI	POUNDS PER SQUARE INCH
RT	RIGHT
S	SLOPE, SOUTH
SHT	SHEET
SP	STATE PLANE COORDINATES
SPEC	SPECIFICATION
STA	STATION
STD	STANDARD
SF	SQUARE FOOT
SY	SQUARE YARD
TESC	TEMPORARY EROSION AND SEDIMENT CONTROL
TYP	TYPICAL
USEL	UPSTREAM ELEVATION
VAR	VARIES
V, VERT	VERTICAL
W	WEST, WIDE
W/	WITH
WM	WATER MARK
W/O	WITHOUT
WSDOT	WA DEPT OF TRANSPORTATION
WSEL	WATER SURFACE ELEVATION
WT	WEIGHT
YR	YEAR

SURVEY DATUM

SURVEY HORIZONTAL DATUM FOR THIS PROJECT IS WASHINGTON STATE PLANE NORTH ZONE COORDINATES, NORTH AMERICAN DATUM NAD83/07; VERTICAL DATUM IS NAVD88.
CONTROL POINT LOCATIONS SHOWN ON THIS SHEET

SURVEY CONTROL POINT DATA

PROJECT CONTROL POINTS: #1 #2 #3

SP — NAVD88

POINT ID#
NORTHING (FT)
EASTING (FT)
ELEVATION (FT; NAVD88)

"CONTRACTOR TO ESTABLISH SURVEY CONTROL AND SUBMIT SUPPORTING DOCUMENTATION"

0 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

REV	DATE	DESCRIPTION	DRN	APP

DANIEL EDWARD DEVRIES — STATE OF WASHINGTON — 37861 — REGISTERED PROFESSIONAL ENGINEER

D. LYNDON C. LEE, Ph.D. — 000385 — PROFESSIONAL WETLAND SCIENTIST

KLOCK PROPERTY, RESTORATION, SKYKOMISH RIVER

DESIGNED BY: P DeVRIES
DRAWN BY: J SCHULZ
CHECKED BY: L LEE
PROJECT MGR: X XXXXX
FILENAME: 2079-SHEET G-02.dwg

LC LEE & ASSOCIATES, INC. BELLINGHAM, WA

Resource Consultants, Inc. REDMOND, WA.

KLOCK PROPERTY RESTORATION
SKYKOMISH RIVER, WA

GENERAL NOTES, LEGEND, ABBREVIATIONS AND ESTIMATED QUANTITIES

DATE: MONTH XX, XXXX
SHEET: G-2
REV: X

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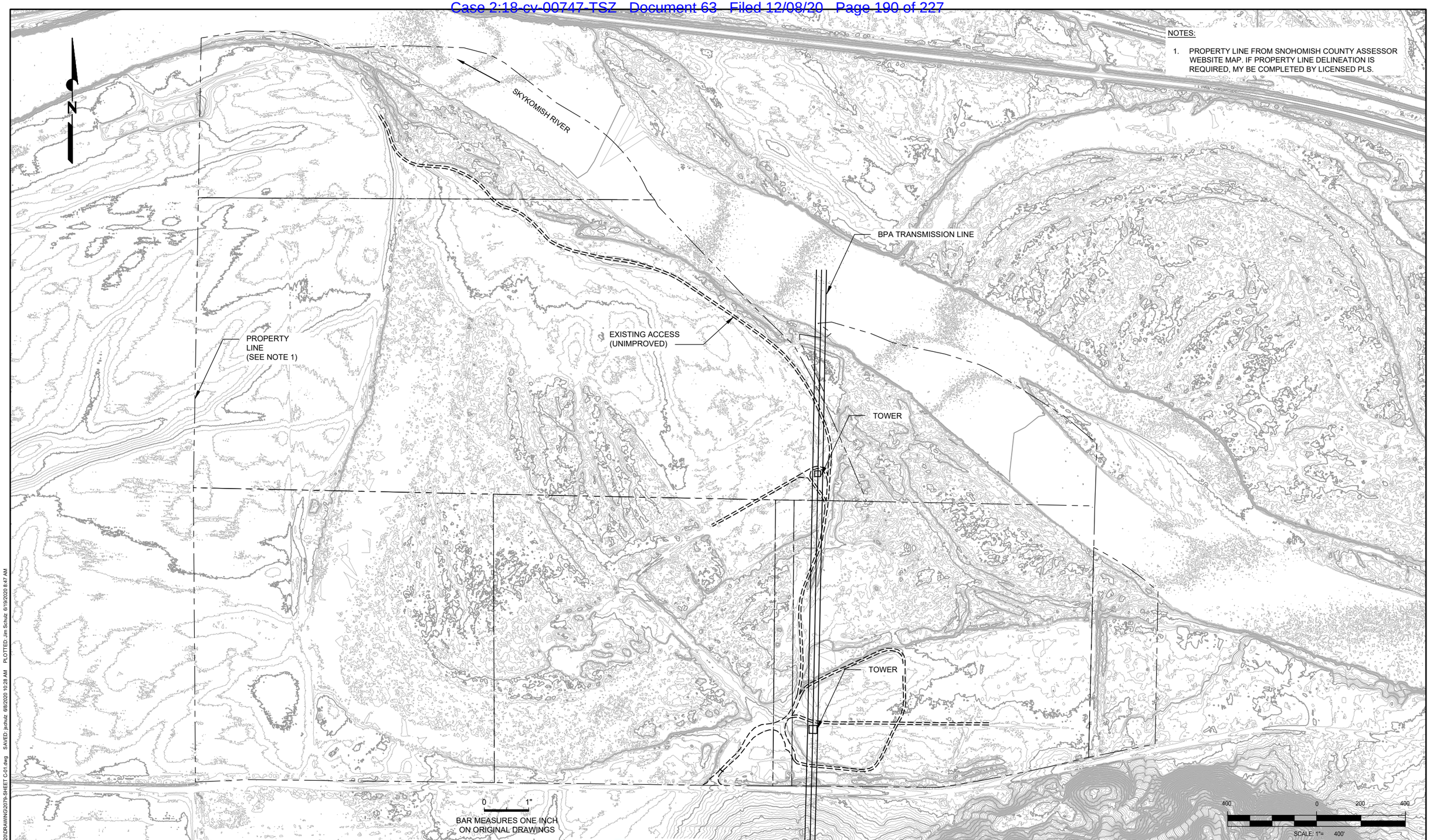

NOTES:

1. PROPERTY LINE FROM SNOHOMISH COUNTY ASSESSOR WEBSITE MAP. IF PROPERTY LINE DELINEATION IS REQUIRED, MY BE COMPLETED BY LICENSED PLS.

REV	DATE	DESCRIPTION	DRN	APP

PAUL EDWARD DEVRIES — STATE OF WASHINGTON — 37861 — REGISTERED PROFESSIONAL ENGINEER

LYNDON C. LEE, Ph.D. — 000365 — PROFESSIONAL WETLAND SCIENTIST

KLOCK PROPERTY, RESTORATION, SKYKOMISH RIVER

DESIGNED BY: P DeVRIES
DRAWN BY: J SCHULZ
CHECKED BY: L LEE
PROJECT MGR: X XXXXX
FILENAME: 2079-SHEET C-01.dwg

LC LEE & ASSOCIATES, INC.
BELLINGHAM, WA

Resource Consultants, Inc.
REDMOND, WA.

KLOCK PROPERTY RESTORATION
SKYKOMISH RIVER, WA

EXISTING SITE PLAN

DATE: MONTH XX, XXXX

SHEET: C-1

REV: X

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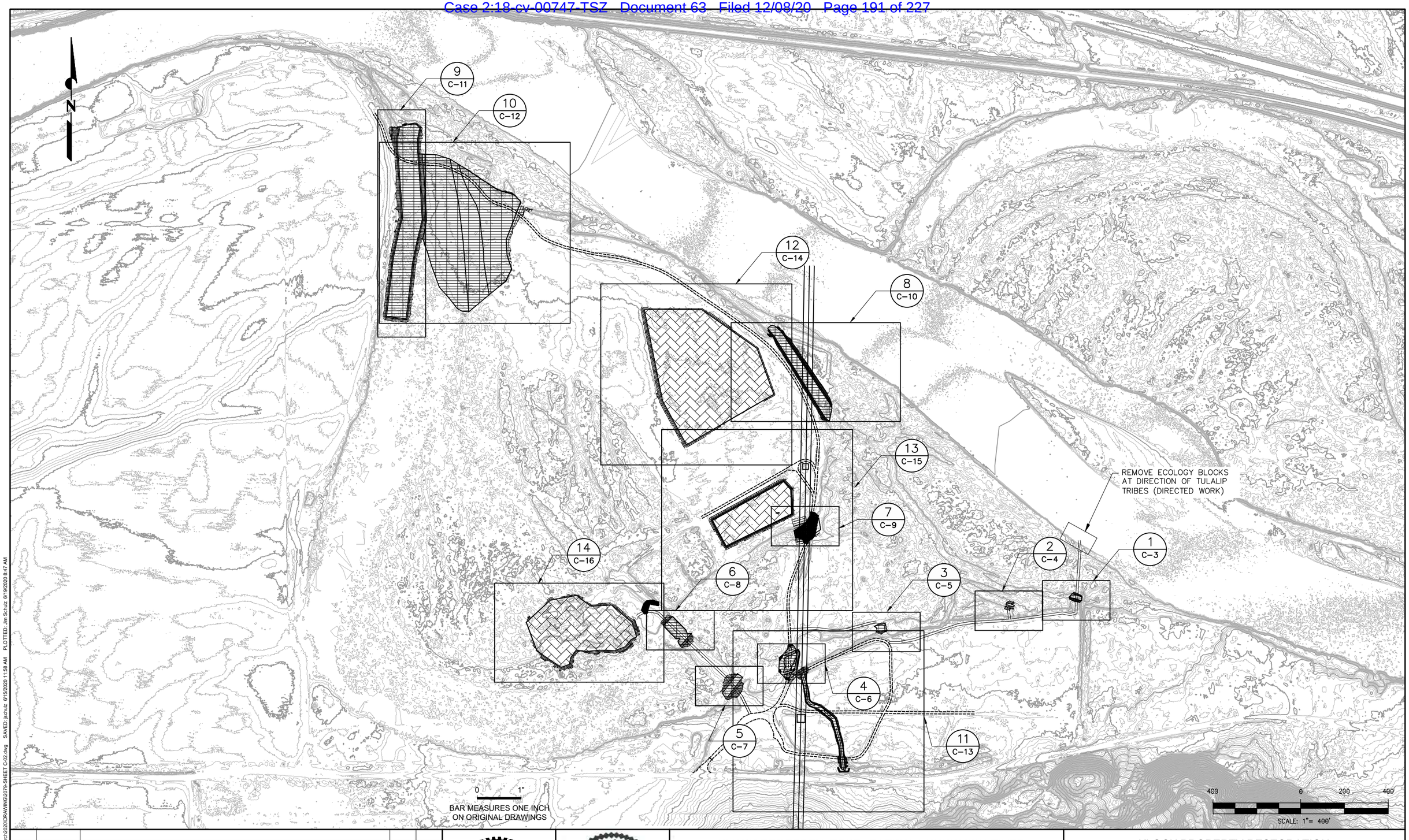

REV	DATE	DESCRIPTION	DRN	APP

PAUL EDWARD DEVRIES — STATE OF WASHINGTON — 37861 — REGISTERED PROFESSIONAL ENGINEER

LYNDON C. LEE, Ph.D. — 000385 — CERTIFIED PROFESSIONAL WETLAND SCIENTIST

KLOCK PROPERTY, RESTORATION, SKYKOMISH RIVER

DESIGNED BY: P DeVRIES
DRAWN BY: J SCHULZ
CHECKED BY: L LEE
PROJECT MGR: X XXXXX
FILENAME: 2079-SHEET C-02.dwg

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REDMOND, WA.

KLOCK PROPERTY RESTORATION
SKYKOMISH RIVER, WA

ACCESS PLAN

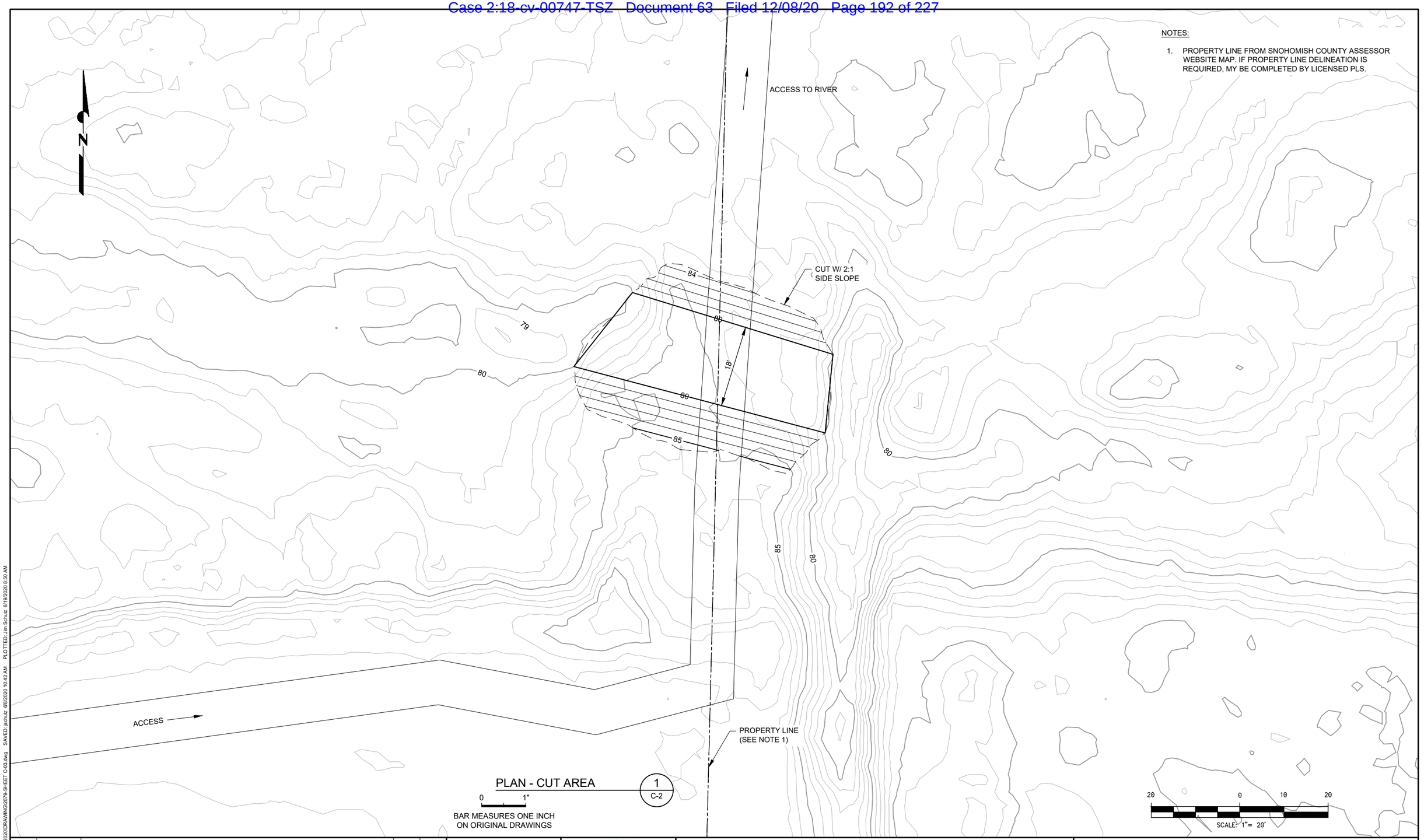
DATE: MONTH XX, XXXX

SHEET: C-2

REV: X

NOTES:

1. PROPERTY LINE FROM SNOHOMISH COUNTY ASSESSOR WEBSITE MAP. IF PROPERTY LINE DELINEATION IS REQUIRED, MY BE COMPLETED BY LICENSED PLS.



PLAN - CUT AREA 1 / C-2

0 1"

BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

REV	DATE	DESCRIPTION	DRN	APP

KLOCK PROPERTY, RESTORATION, SKYKOMISH RIVER

DESIGNED BY: P DeVRIES
DRAWN BY: J SCHULZ
CHECKED BY: L LEE
PROJECT MGR: X XXXXX
FILENAME: 2079-SHEET C-03.dwg

LC LEE & ASSOCIATES, INC.
BELLINGHAM, WA

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REDMOND, WA.

KLOCK PROPERTY RESTORATION
SKYKOMISH RIVER, WA

PLAN - CUT AREA - 1

DATE: MONTH XX, XXXX
SHEET: C-3
REV: X

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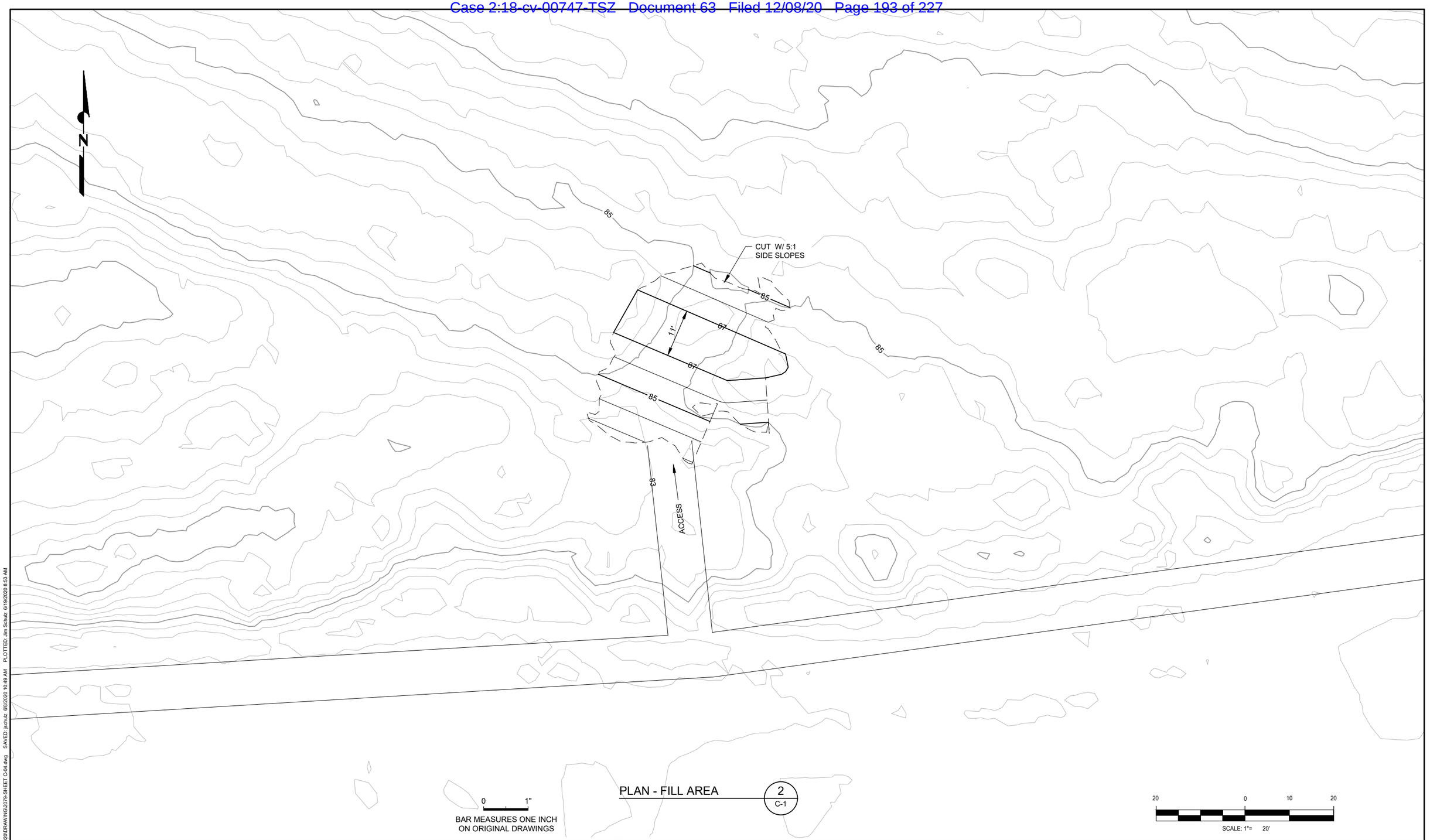

PLAN - FILL AREA 2 / C-1

0 1"
BAR MEASURES ONE INCH
ON ORIGINAL DRAWINGS

20 0 10 20
SCALE: 1"= 20'

REV	DATE	DESCRIPTION	DRN	APP

RAUL EDWARD DEVRIES STATE OF WASHINGTON 37861 REGISTERED PROFESSIONAL ENGINEER

LYNDON C. LEE, Ph.D 000365 CERTIFIED PROFESSIONAL WETLAND SCIENTIST

KLOCK PROPERTY, RESTORATION, SKYKOMISH RIVER

DESIGNED BY: P DeVRIES
DRAWN BY: J SCHULZ
CHECKED BY: L LEE
PROJECT MGR: X XXXXX
FILENAME: 2079-SHEET C-04.dwg

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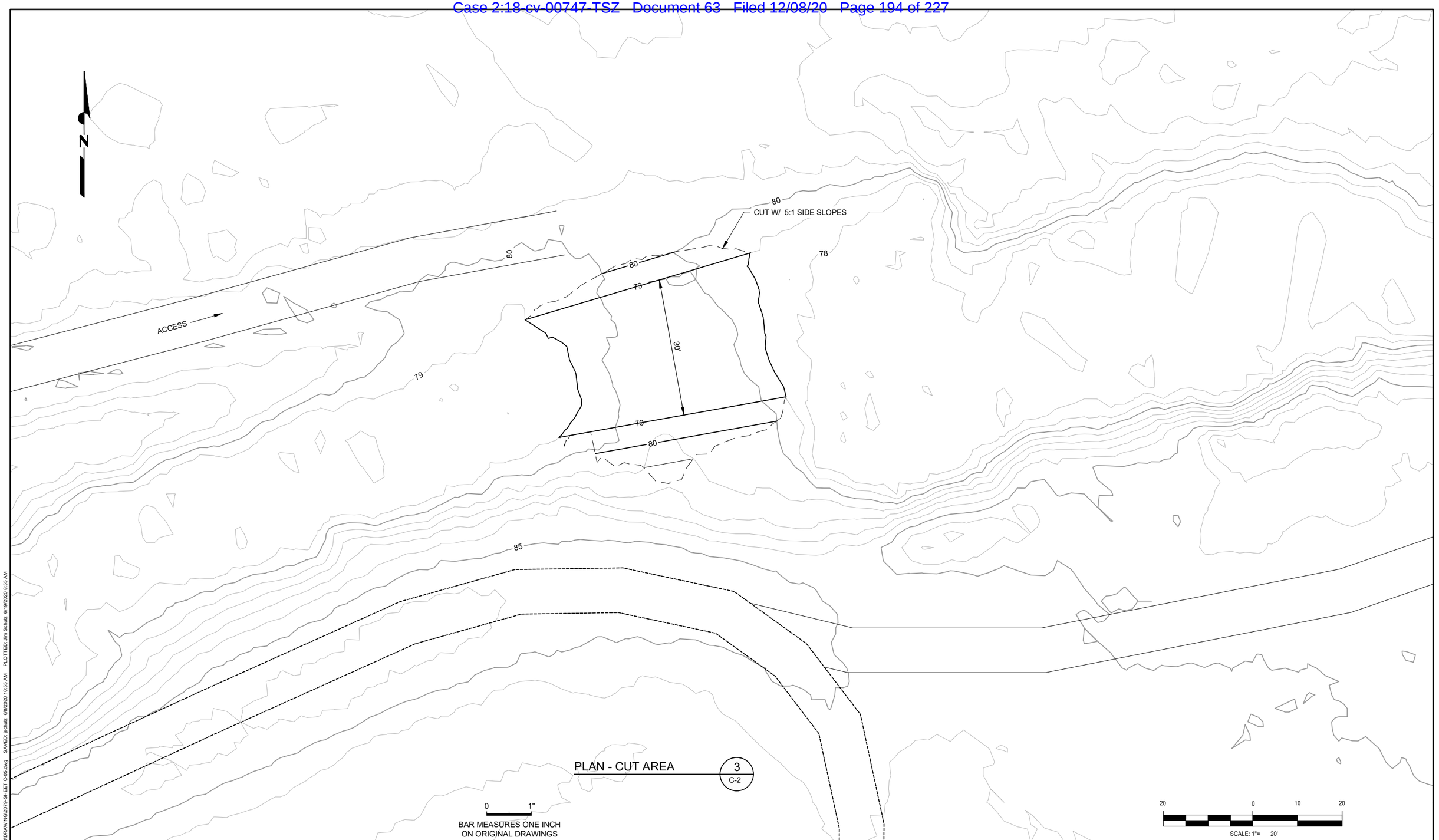
Resource Consultants, Inc.
REDMOND, WA.

KLOCK PROPERTY RESTORATION
SKYKOMISH RIVER, WA

PLAN - CUT AREA - -2

DATE: MONTH XX, XXXX
SHEET: C-4
REV: X

FILED IN: K:\2079 LCLA-DOJ\KlockMarch2020\DRAWING\2079-SHEET C-04.dwg SAVED: jschulz 6/8/2020 10:49 AM PLOTTED: Jim Schulz 6/19/2020 8:53 AM



REV	DATE	DESCRIPTION	DRN	APP

PAUL EDWARD DEVRIES — STATE OF WASHINGTON — 37861 — REGISTERED PROFESSIONAL ENGINEER

C. LYNDON C. LEE, Ph.D. — 000385 — PROFESSIONAL WETLAND SCIENTIST

KLOCK PROPERTY, RESTORATION, SKYKOMISH RIVER

DESIGNED BY: P DeVRIES
DRAWN BY: J SCHULZ
CHECKED BY: C LEE
PROJECT MGR: X XXXXX
FILENAME: 2079-SHEET C-05.dwg

LC LEE & ASSOCIATES, INC.
BELLINGHAM, WA

Resource Consultants, Inc.
REDMOND, WA.

KLOCK PROPERTY RESTORATION
SKYKOMISH RIVER, WA

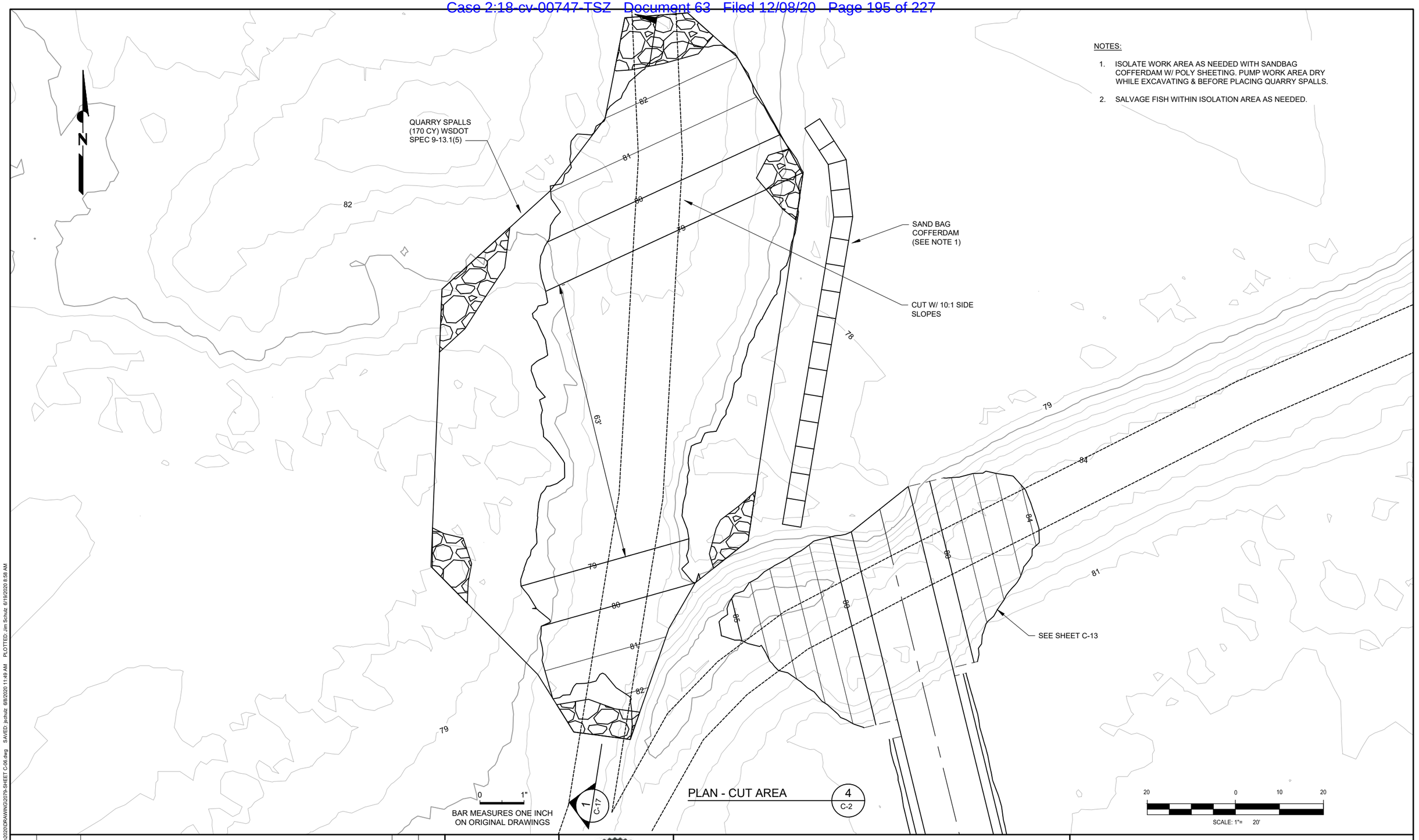
PLAN - CUT AREA - 3

DATE: MONTH XX, XXXX

SHEET: C-5

REV: X

FILED IN: K:\2079 LCLA-DOJ\Klock\March2020\DRAWING\2079-SHEET C-05.dwg SAVED: jschulz 6/8/2020 10:55 AM PLOTTED: Jim Schulz 6/19/2020 8:55 AM



NOTES:

1. ISOLATE WORK AREA AS NEEDED WITH SANDBAG COFFERDAM W/ POLY SHEETING. PUMP WORK AREA DRY WHILE EXCAVATING & BEFORE PLACING QUARRY SPALLS.
2. SALVAGE FISH WITHIN ISOLATION AREA AS NEEDED.

REV	DATE	DESCRIPTION	DRN	APP

KLOCK PROPERTY, RESTORATION, SKYKOMISH RIVER

DESIGNED BY: P DeVRIES
DRAWN BY: J SCHULZ
CHECKED BY: L LEE
PROJECT MGR: X XXXXX
FILENAME: 2079-SHEET C-06.dwg

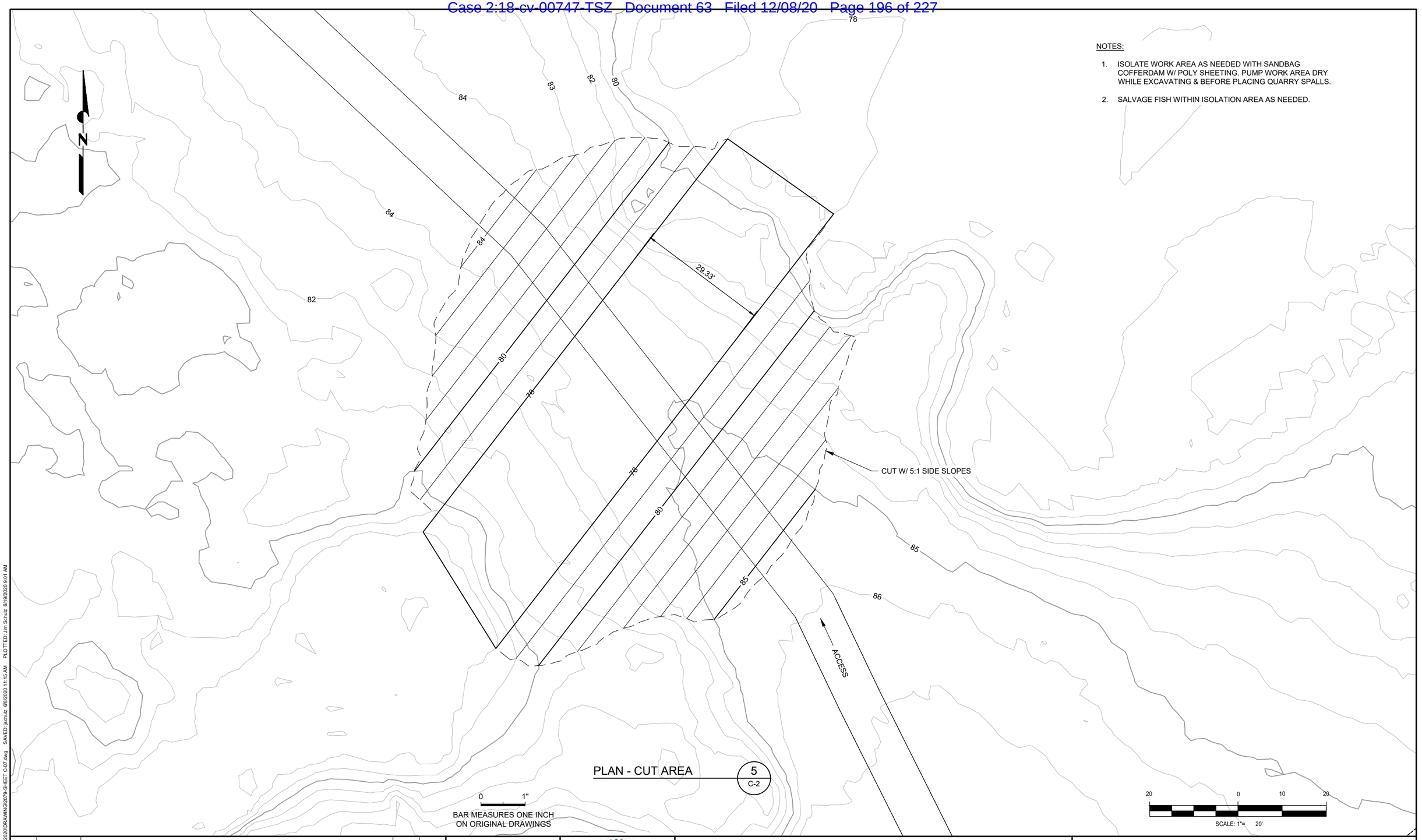
LC LEE & ASSOCIATES, INC.
BELLINGHAM, WA

Resource Consultants, Inc.
REDMOND, WA.

KLOCK PROPERTY RESTORATION
SKYKOMISH RIVER, WA

PLAN - CUT AREA - 4

DATE: MONTH XX, XXXX
SHEET: C-6
REV: X



NOTES:

1. ISOLATE WORK AREA AS NEEDED WITH SANDBAG COFFERDAM W/ POLY SHEETING. PUMP WORK AREA DRY WHILE EXCAVATING & BEFORE PLACING QUARRY SPALLS.
2. SALVAGE FISH WITHIN ISOLATION AREA AS NEEDED.

PLAN - CUT AREA 5 / C-2

0 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

20 0 10 20
SCALE: 1"= 20'

REV	DATE	DESCRIPTION	DRN	APP

PAUL EDWARD DEVRIES — STATE OF WASHINGTON — 37861 — REGISTERED PROFESSIONAL ENGINEER

LYNDON C. LEE, Ph.D. — 000385 — CERTIFIED PROFESSIONAL WETLAND SCIENTIST

KLOCK PROPERTY, RESTORATION, SKYKOMISH RIVER

DESIGNED BY: P DeVRIES
DRAWN BY: J SCHULZ
CHECKED BY: L LEE
PROJECT MGR: X XXXXX
FILENAME: 2079-SHEET C-07

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BELLINGHAM, WA

Resource Consultants, Inc.
REDMOND, WA.

KLOCK PROPERTY RESTORATION
SKYKOMISH RIVER, WA

PLAN - CUT AREA - 5

DATE: MONTH XX, XXXX
SHEET: C-7
REV: X

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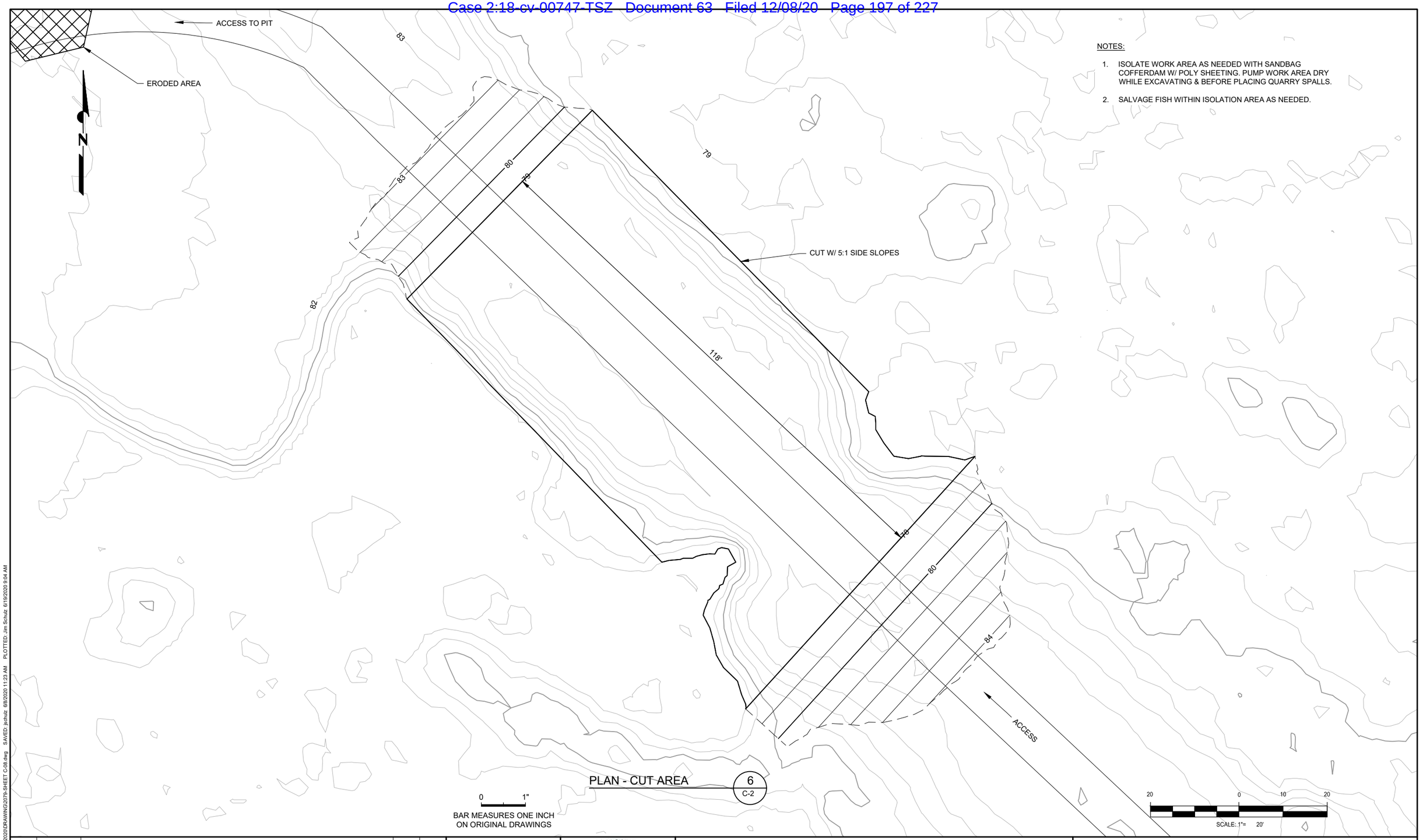


NOTES:

1. ISOLATE WORK AREA AS NEEDED WITH SANDBAG COFFERDAM W/ POLY SHEETING. PUMP WORK AREA DRY WHILE EXCAVATING & BEFORE PLACING QUARRY SPALLS.
2. SALVAGE FISH WITHIN ISOLATION AREA AS NEEDED.

PLAN - CUT AREA 6 (C-2)

0 1"

BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

REV	DATE	DESCRIPTION	DRN	APP

RAIL EDWARD DEVRIES — STATE OF WASHINGTON — 37861 — REGISTERED PROFESSIONAL ENGINEER

LYNDON C. LEE, Ph.D. — 000365 — PROFESSIONAL WETLAND SCIENTIST

KLOCK PROPERTY, RESTORATION, SKYKOMISH RIVER

DESIGNED BY: P DeVRIES
DRAWN BY: J SCHULZ
CHECKED BY: L LEE
PROJECT MGR: X XXXXX
FILENAME: 2079-SHEET-C-08.dwg

LC LEE & ASSOCIATES, INC.
BELLINGHAM, WA

Resource Consultants, Inc.
REDMOND, WA.

KLOCK PROPERTY RESTORATION
SKYKOMISH RIVER, WA

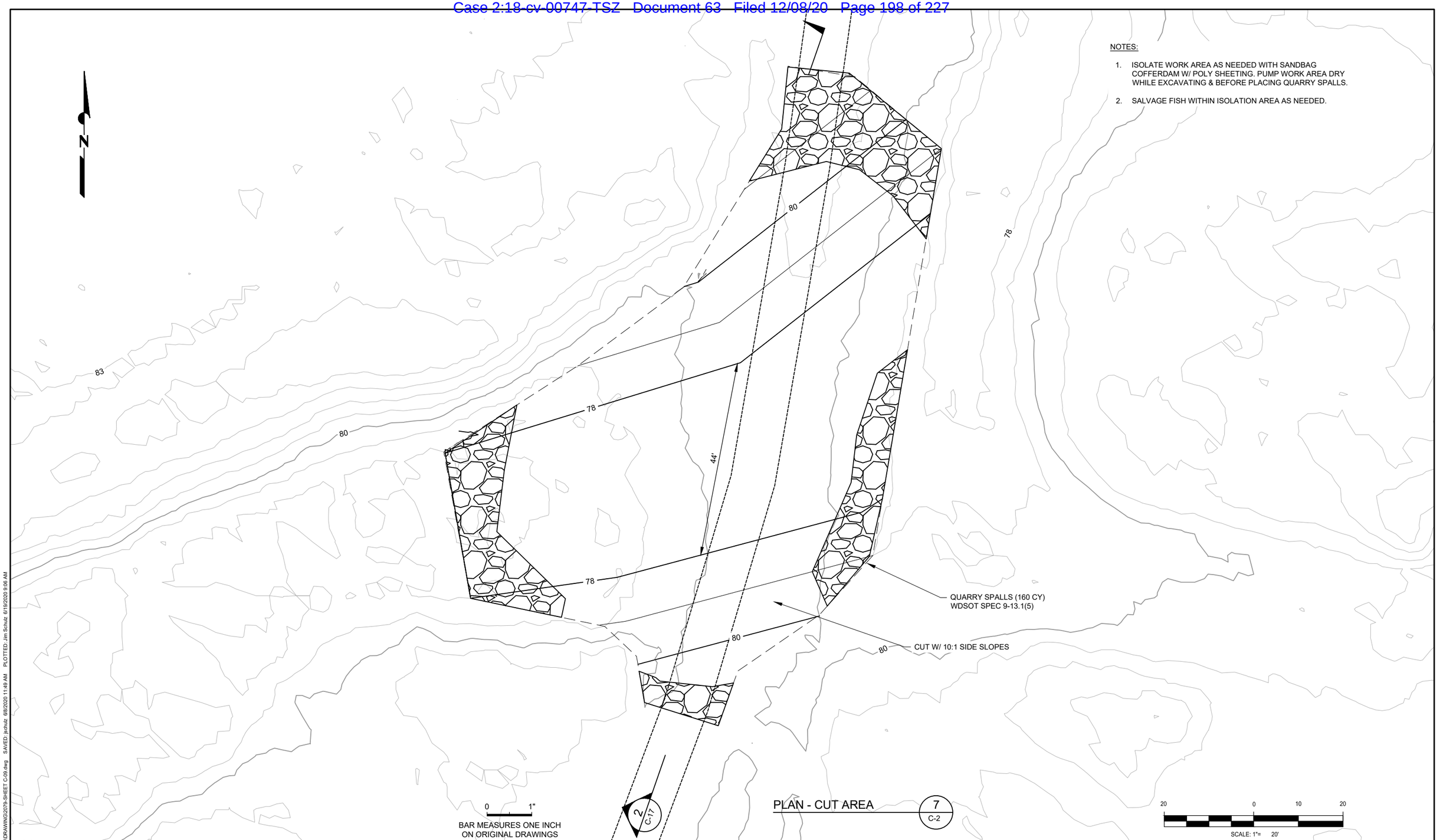
PLAN - CUT AREA - 6

DATE: MONTH XX, XXXX

SHEET: C-8

REV: X

FILED IN: K:\2079 LCLA-DOJ\Klock\March2020\DRAWING\2079-SHEET C-08.dwg SAVED: jschultz 6/8/2020 11:23 AM PLOTTED: Jim Schultz 6/19/2020 9:04 AM



NOTES:

1. ISOLATE WORK AREA AS NEEDED WITH SANDBAG COFFERDAM W/ POLY SHEETING. PUMP WORK AREA DRY WHILE EXCAVATING & BEFORE PLACING QUARRY SPALLS.
2. SALVAGE FISH WITHIN ISOLATION AREA AS NEEDED.

REV	DATE	DESCRIPTION	DRN	APP

RAIL EDWARD DEVRIES — STATE OF WASHINGTON — 37861 — REGISTERED PROFESSIONAL ENGINEER

LYNDON C. LEE, Ph.D. — 000385 — PROFESSIONAL WETLAND SCIENTIST

KLOCK PROPERTY, RESTORATION, SKYKOMISH RIVER

DESIGNED BY: P DeVRIES
DRAWN BY: J SCHULZ
CHECKED BY: L LEE
PROJECT MGR: X XXXXX
FILENAME: 2079-SHEET C-09.dwg

LC LEE & ASSOCIATES, INC.
BELLINGHAM, WA

Resource Consultants, Inc.
REDMOND, WA.

KLOCK PROPERTY RESTORATION
SKYKOMISH RIVER, WA

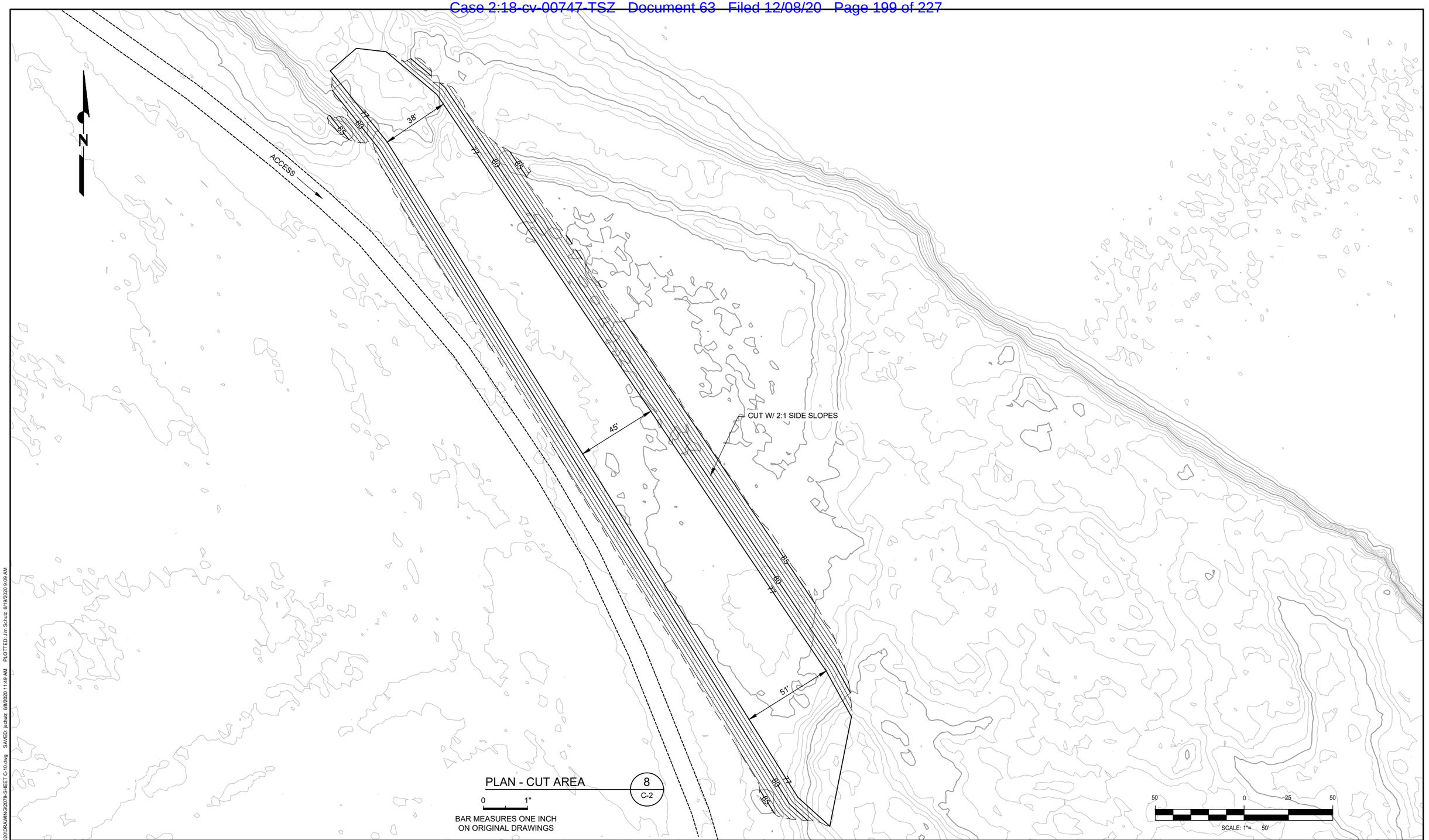
PLAN - CUT AREA - 7

DATE: MONTH XX, XXXX

SHEET: C-9

REV: X

FILED IN: K:\2079 LCLA,DOJ\Klock\March2020\DRAWING\2079-SHEET C-09.dwg SAVED: jschulz 6/8/2020 11:49 AM PLOTTED: Jim Schulz 6/19/2020 9:06 AM



PLAN - CUT AREA 8 C-2

0 1"

BAR MEASURES ONE INCH
ON ORIGINAL DRAWINGS

REV	DATE	DESCRIPTION	DRN	APP

RAIL EDWARD DEVRIES
STATE OF WASHINGTON
37861
REGISTERED
PROFESSIONAL ENGINEER

LYNDON C. LEE, Ph.D.
000385
PROFESSIONAL WETLAND SCIENTIST

KLOCK PROPERTY, RESTORATION, SKYKOMISH RIVER

DESIGNED BY: P DeVRIES
DRAWN BY: J SCHULZ
CHECKED BY: L LEE
PROJECT MGR: X XXXXX
FILENAME: 2079-SHEET C-10.dwg

LC LEE & ASSOCIATES, INC.
BELLINGHAM, WA

Resource Consultants, Inc.
REDMOND, WA.

KLOCK PROPERTY RESTORATION
SKYKOMISH RIVER, WA

PLAN - CUT AREA - 8

DATE: MONTH XX, XXXX
SHEET: C-10
REV: X

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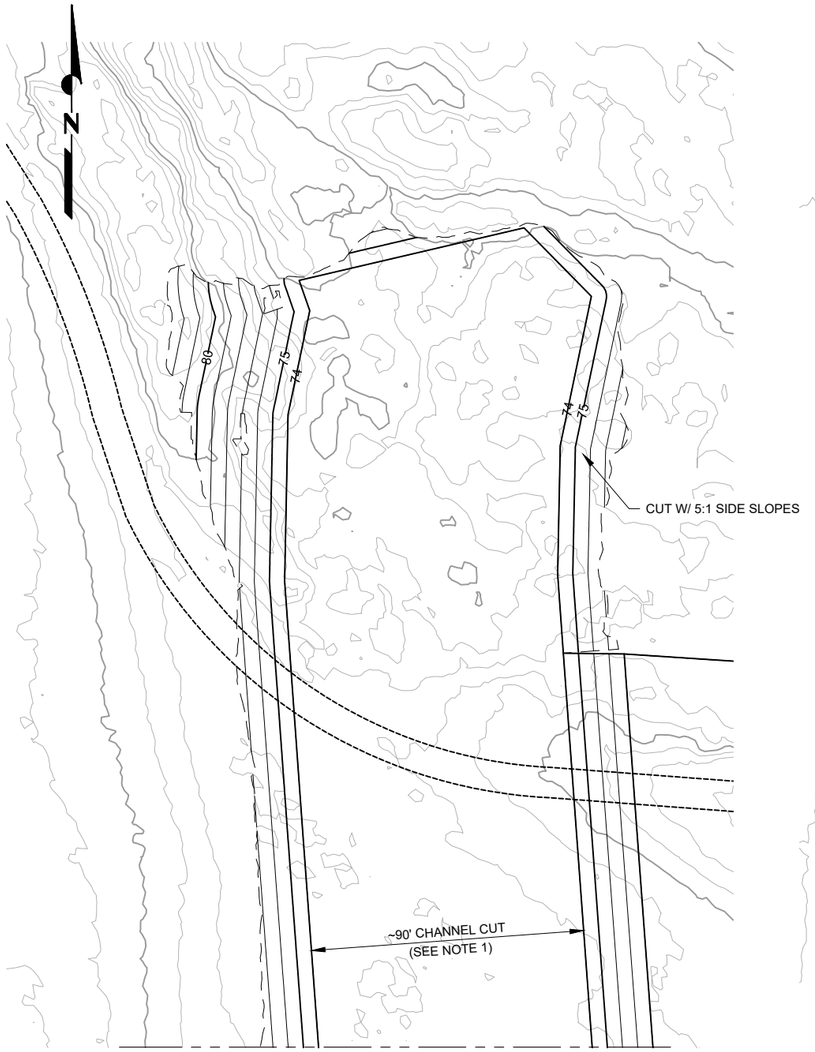
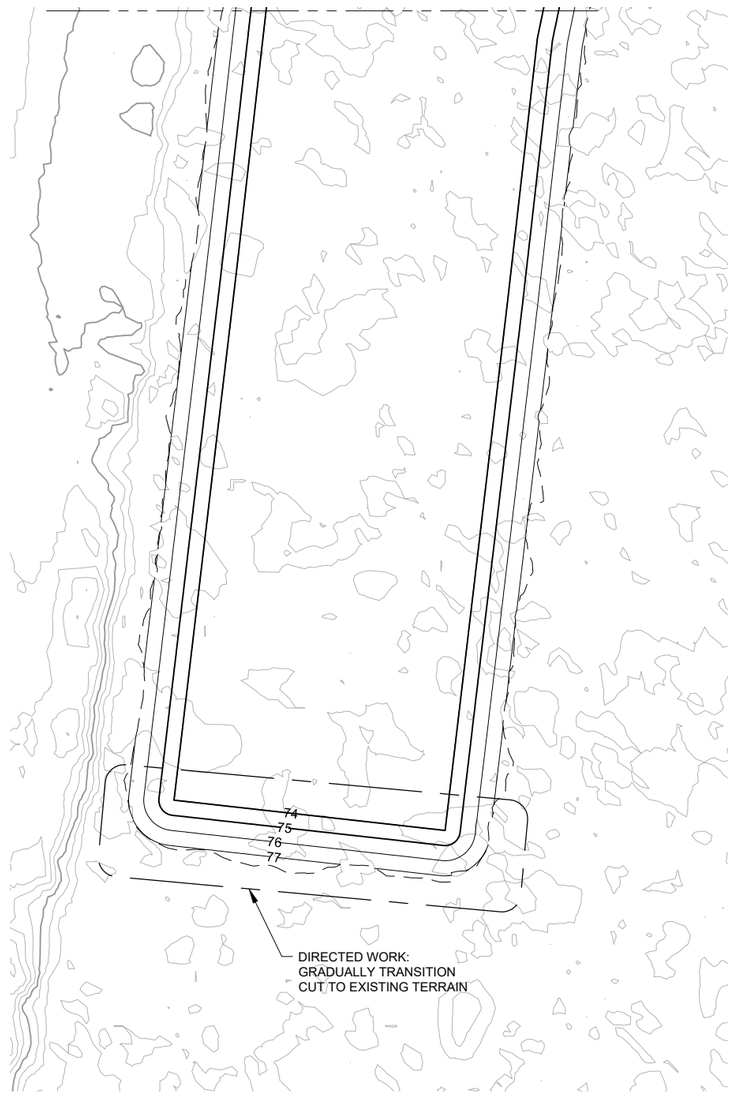
NOTES:

1. CUT CHANNEL SUFFICIENTLY WIDE TO FULFILL 32,000 CY TOTAL FOR PROJECT AFTER ALL OTHER EXCAVATION HAS BEEN COMPLETED. LEAVE IN PLACE MATURE TREES W/ DBH > 6".





0 1"
BAR MEASURES ONE INCH
ON ORIGINAL DRAWINGS

PLAN - CUT AREA 9 (C-2)

50 0 25 50
SCALE: 1"= 50'

REV	DATE	DESCRIPTION	DRN	APP

PAUL EDWARD DEVRIES — STATE OF WASHINGTON — 37861 — REGISTERED PROFESSIONAL ENGINEER

LYNDON C. LEE, Ph.D. — 000365 — PROFESSIONAL WETLAND SCIENTIST

KLOCK PROPERTY, RESTORATION, SKYKOMISH RIVER

DESIGNED BY: P DeVRIES
DRAWN BY: J SCHULZ
CHECKED BY: L LEE
PROJECT MGR: X XXXXX
FILENAME: 2079-SHEET-C-11.dwg

LC LEE & ASSOCIATES, INC.
BELLINGHAM, WA

Resource Consultants, Inc.
REDMOND, WA.

KLOCK PROPERTY RESTORATION
SKYKOMISH RIVER, WA

PLAN - CUT AREA - 9

DATE: MONTH XX, XXXX
SHEET: C-11
REV: X

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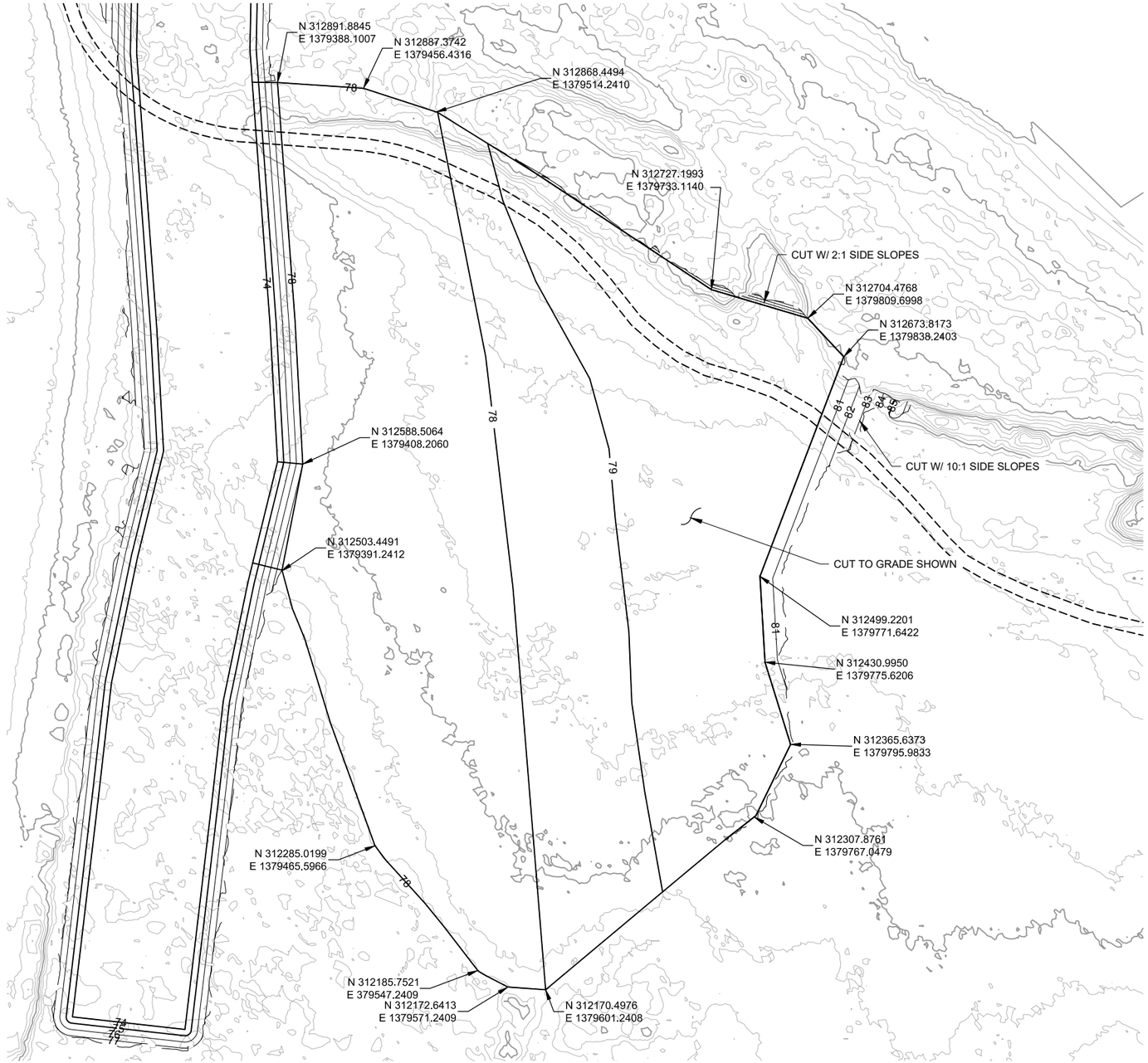

0 1"
BAR MEASURES ONE INCH
ON ORIGINAL DRAWINGS

PLAN - CUT AREA 10 / C-2

100 0 50 100
SCALE: 1"= 100'

REV	DATE	DESCRIPTION	DRN	APP

PAUL EDWARD DEVRIES — STATE OF WASHINGTON — 37861 — REGISTERED PROFESSIONAL ENGINEER

LYNDON C. LEE, Ph.D. — 000365 — PROFESSIONAL WETLAND SCIENTIST

KLOCK PROPERTY, RESTORATION, SKYKOMISH RIVER

DESIGNED BY: P DeVRIES
DRAWN BY: J SCHULZ
CHECKED BY: L LEE
PROJECT MGR: X XXXXX
FILENAME: 2079-SHEET C-12.dwg

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REDMOND, WA.

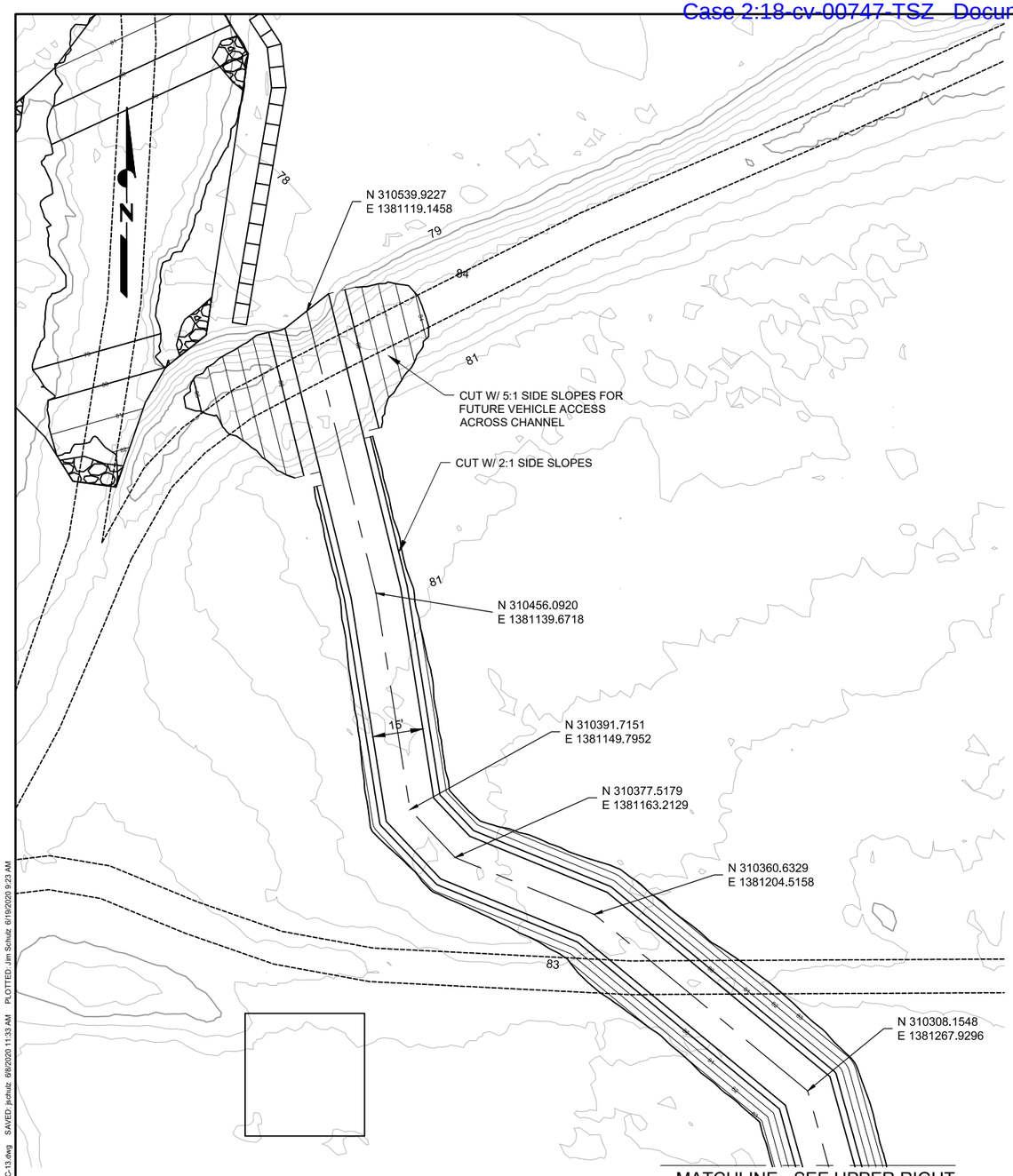
KLOCK PROPERTY RESTORATION
SKYKOMISH RIVER, WA

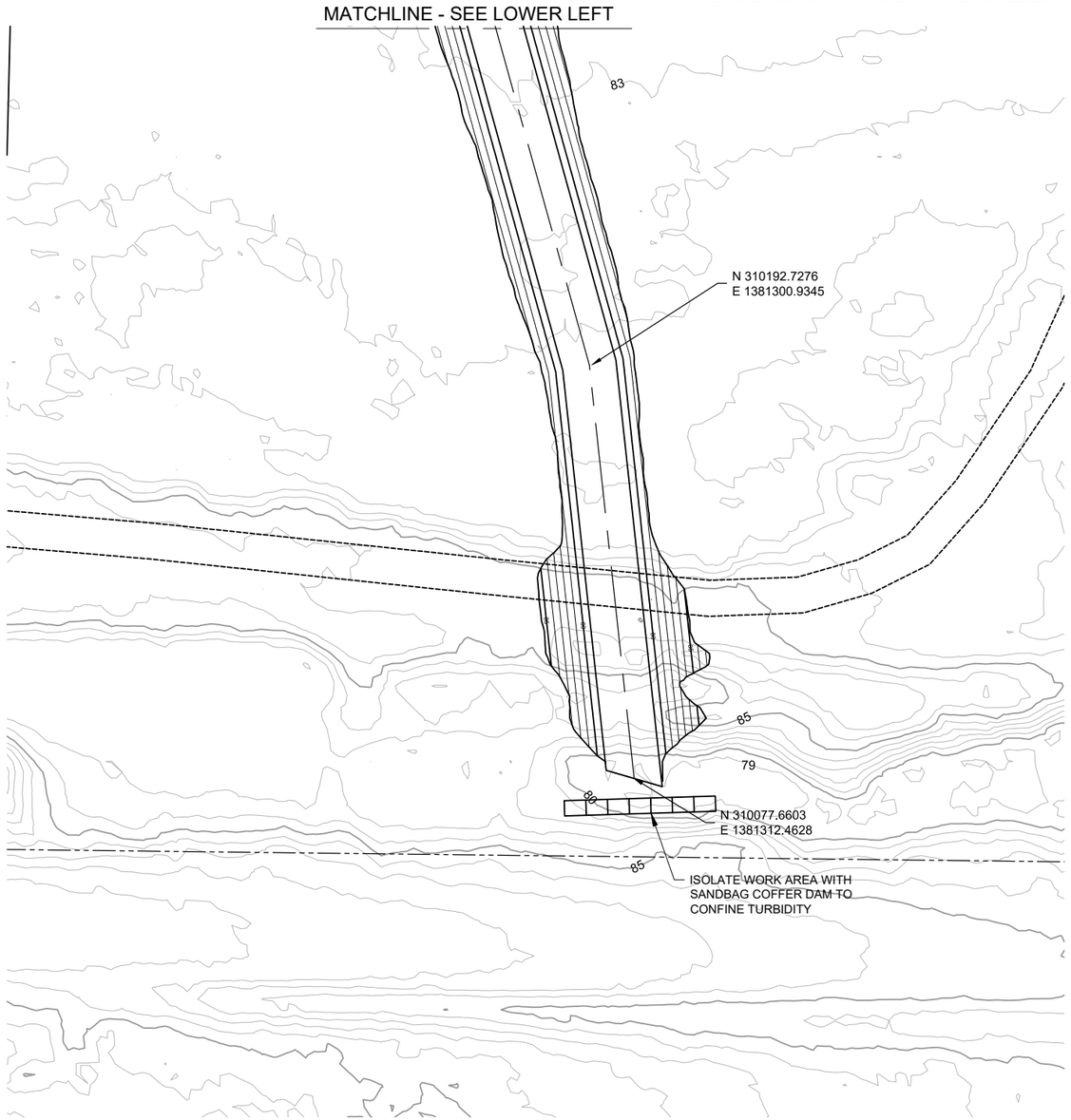
PLAN - CUT AREA - 10

DATE: MONTH XX, XXXX
SHEET: C-12
REV: X

NOTES:

1. ISOLATE WORK AREA AS NEEDED WITH SANDBAG COFFERDAM W/ POLY SHEETING. PUMP WORK AREA DRY WHILE EXCAVATING & BEFORE PLACING QUARRY SPALLS.
2. SALVAGE FISH WITHIN ISOLATION AREA AS NEEDED.





PLAN - CUT AREA 11 / C-2

0 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

40 0 20 40
SCALE: 1"= 40'

REV	DATE	DESCRIPTION	DRN	APP

PAUL EDWARD DEVRIES — STATE OF WASHINGTON — 37861 — REGISTERED PROFESSIONAL ENGINEER

LYNDON C. LEE, Ph.D. — 000385 — PROFESSIONAL WETLAND SCIENTIST

KLOCK PROPERTY, RESTORATION, SKYKOMISH RIVER

DESIGNED BY: P DeVRIES
DRAWN BY: J SCHULZ
CHECKED BY: L LEE
PROJECT MGR: X XXXXX
FILENAME: 2079-SHEET C-13.dwg

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REDMOND, WA.

KLOCK PROPERTY RESTORATION
SKYKOMISH RIVER, WA

PLAN - CUT AREA - 11

DATE: MONTH XX, XXXX
SHEET: C-13
REV: X

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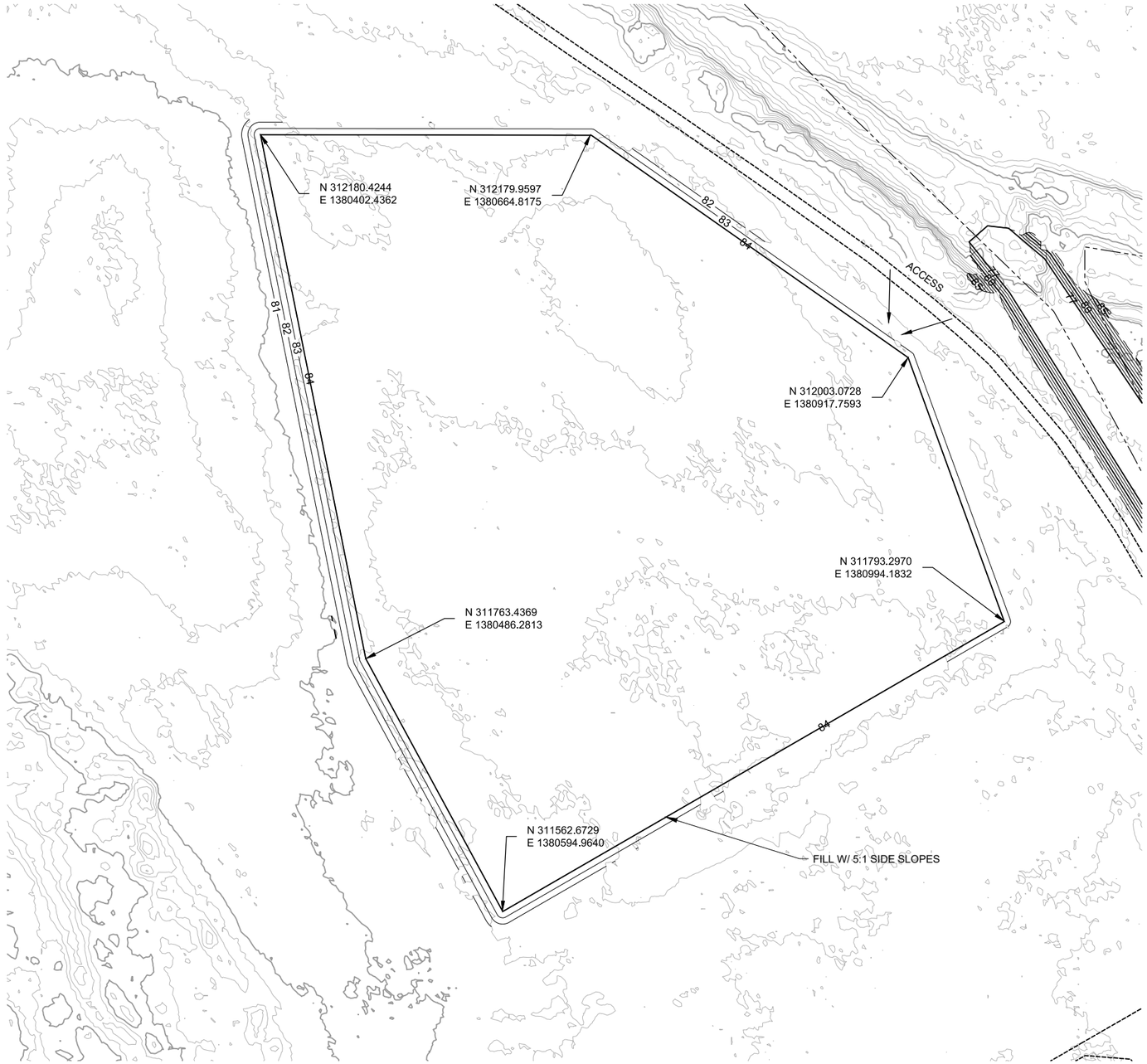

0 1"
BAR MEASURES ONE INCH
ON ORIGINAL DRAWINGS

PLAN - FILL AREA 12 (C-2)

100 0 50 100
SCALE: 1"= 100'

REV	DATE	DESCRIPTION	DRN	APP

RAIL EDWARD DEVRIES — STATE OF WASHINGTON — 37861 — REGISTERED PROFESSIONAL ENGINEER

LYNDON C. LEE, Ph.D. — 000385 — PROFESSIONAL WETLAND SCIENTIST

KLOCK PROPERTY, RESTORATION, SKYKOMISH RIVER

DESIGNED BY: P DeVRIES
DRAWN BY: J SCHULZ
CHECKED BY: L LEE
PROJECT MGR: X XXXXX
FILENAME: 2079-SHEET C-14.dwg

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KLOCK PROPERTY RESTORATION
SKYKOMISH RIVER, WA

PLAN - FILL AREA - 12

DATE: MONTH XX, XXXX
SHEET: C-14
REV: X

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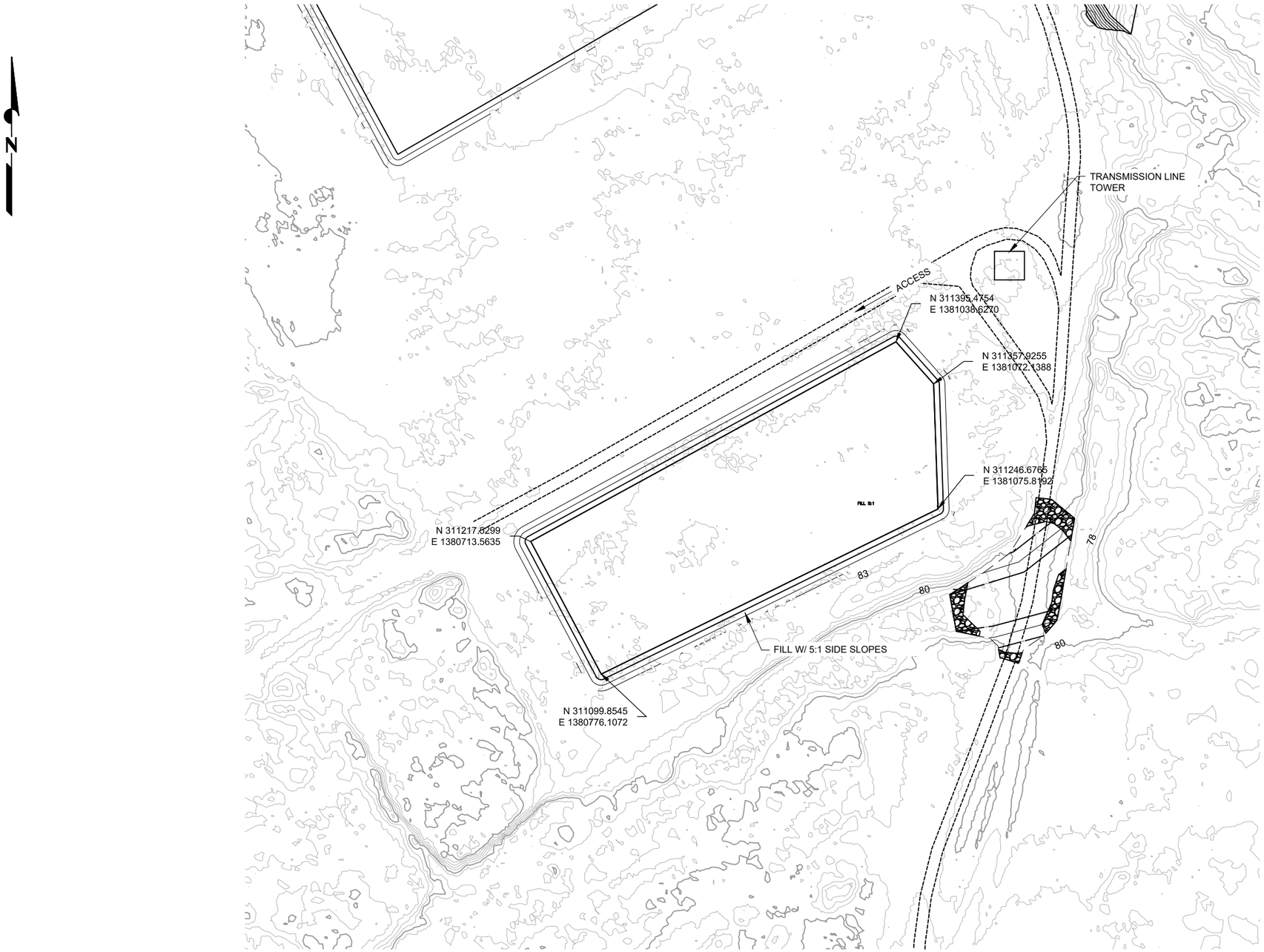

0 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

PLAN - FILL AREA 13 C-1

100 0 50 100
SCALE: 1"= 100'

REV	DATE	DESCRIPTION	DRN	APP

PAUL EDWARD DEVRIES STATE OF WASHINGTON 37861 REGISTERED PROFESSIONAL ENGINEER

LYNDON C. LEE, Ph.D. 000385 PROFESSIONAL WETLAND SCIENTIST

KLOCK PROPERTY, RESTORATION, SKYKOMISH RIVER

DESIGNED BY: P DeVRIES
DRAWN BY: J SCHULZ
CHECKED BY: L LEE
PROJECT MGR: X XXXXX
FILENAME: 2079-SHEET C-15.dwg

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REDMOND, WA.

KLOCK PROPERTY RESTORATION
SKYKOMISH RIVER, WA

PLAN - FILL AREA - 13

DATE: MONTH XX, XXXX
SHEET: C-15
REV: X

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NOTES:

1. PIT AREA TO BE CLEANED UP UNDER DIRECTION OF TULALIP TRIBE REPRESENTATIVE. WASTE AND CONTAMINATED MATERIAL TO BE HAULED OFFSITE AND DISPOED OF AT APPROVED LOCATION. AREA TO BE FILLED WILL BE STAKED IN FIELD BY TRIBE, FILL TO ELEVATION 83'.

N

N 310875.3068
E 1380095.5262

N 310852.9780
E 1379973.1890

N 310825.3049
E 1380158.8595

N 310830.5660
E 1380254.7518

ERODED AREA
(APPROX)

81
82
83

ACCESS

83
82
81
80
79

N 310751.4229
E 1379863.5075

N 310751.8732
E 1380346.6675

N 310685.1789
E 1380367.5174

N 310671.9655
E 1380342.1929

N 310639.7421
E 1380314.4151

83
82
81
80

FILL W/ 5:1 SIDE SLOPES

N 310620.8524
E 1379912.1929

N 310621.9636
E 1380268.8596

N 310624.1859
E 1380091.0818

N 310624.1859
E 1380201.0818

N 310590.8513
E 1380066.6373

N 310559.7389
E 1380061.0818

N 310545.2939
E 1380022.1929

0 1"

BAR MEASURES ONE INCH
ON ORIGINAL DRAWINGS

PLAN - FILL AREA 14 C-2

50 0 25 50

SCALE: 1"= 50'

REV	DATE	DESCRIPTION	DRN	APP

PAUL EDWARD DEVRIES
STATE OF WASHINGTON
37861
REGISTERED
PROFESSIONAL ENGINEER

LYNDON C. LEE, Ph.D.
000385
PROFESSIONAL WETLAND SCIENTIST

KLOCK PROPERTY, RESTORATION, SKYKOMISH RIVER

DESIGNED BY: P DeVRIES
DRAWN BY: J SCHULZ
CHECKED BY: L LEE
PROJECT MGR: X XXXXX
FILENAME: 2079-SHEET C-16.dwg

LC LEE & ASSOCIATES, INC.
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REDMOND, WA.

KLOCK PROPERTY RESTORATION
SKYKOMISH RIVER, WA

PLAN - FILL AREA - 14

DATE: MONTH XX, XXXX
SHEET: C-16
REV: X

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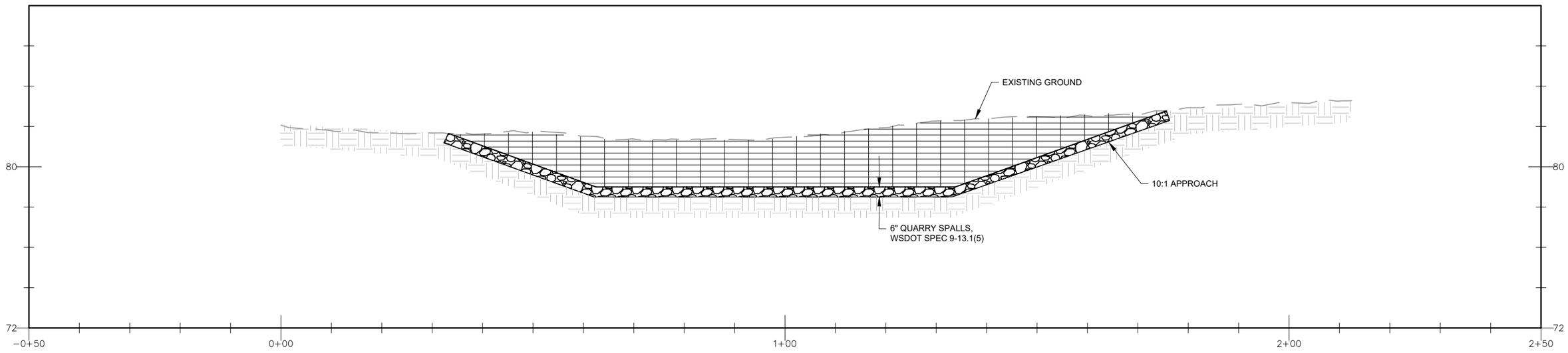
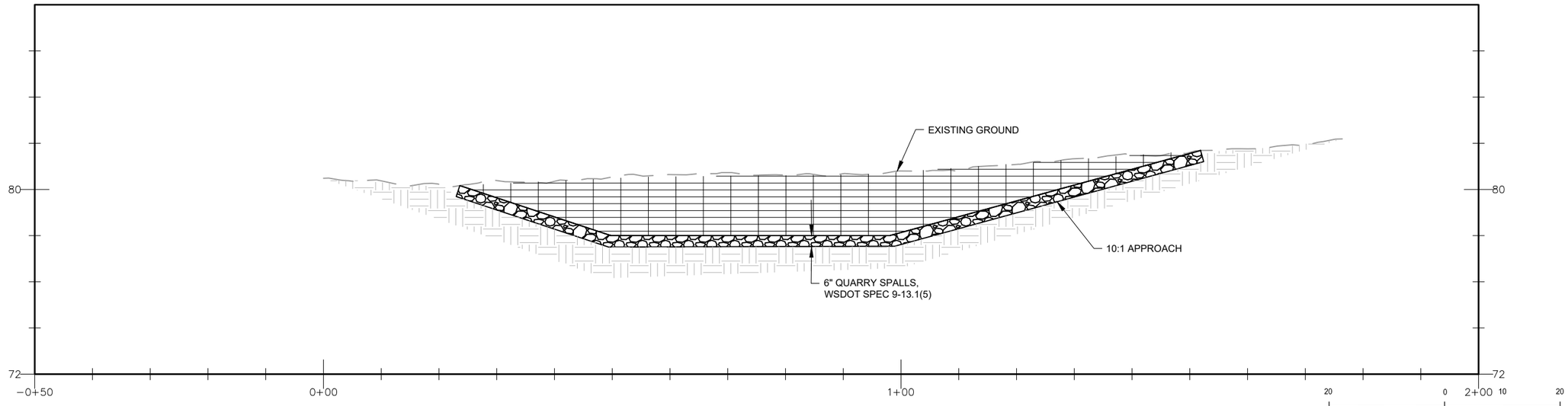


PROFILE 1 C-6



0 1"
BAR MEASURES ONE INCH
ON ORIGINAL DRAWINGS

PROFILE 2 C-9

REV	DATE	DESCRIPTION	DRN	APP

PAUL EDWARD DEVRIES, STATE OF WASHINGTON, 37861, REGISTERED PROFESSIONAL ENGINEER

LYNDON C. LEE, Ph.D, 000365, PROFESSIONAL WETLAND SCIENTIST

KLOCK PROPERTY, RESTORATION, SKYKOMISH RIVER

DESIGNED BY: P DeVRIES
DRAWN BY: J SCHULZ
CHECKED BY: L LEE
PROJECT MGR: X XXXXX
FILENAME: 2079-SHEET C-17.dwg

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BELLINGHAM, WA

Resource Consultants, Inc.
REDMOND, WA.

KLOCK PROPERTY RESTORATION
SKYKOMISH RIVER, WA

PROFILES

DATE: MONTH XX, XXXX
SHEET: C-17
REV: X

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NOTES:

1. PLANTING AREA NUMBERS AND LETTERS CORRESPOND TO TABLES ON SHEET C-19.

N

9B 9C 10C 10E 12E 13E 7E 14A 6C 5C 4E 3C 11D 11C 8C 8D 8C 2C 1C

150' EASEMENT

PLANT ASSEMBLAGES

- A UPLAND, DRY
- B PRIMARILY WET, SEASONALLY WET, WETLANDS
- C RIPARIAN
- D LOW GROWING RIPARIAN
- E NATIVE EMERGENT, EROSION CONTROL

0 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

400 0 200 400
SCALE: 1"= 400'

REV	DATE	DESCRIPTION	DRN	APP

RAIL EDWARD DEVRIES — STATE OF WASHINGTON — 37861 — REGISTERED PROFESSIONAL ENGINEER

WETLAND SCIENTIST — LYNDON C. LEE, Ph.D. — 000385

KLOCK PROPERTY, RESTORATION, SKYKOMISH RIVER

DESIGNED BY: P DeVRIES
DRAWN BY: J SCHULZ
CHECKED BY: L LEE
PROJECT MGR: X XXXXX
FILENAME: 2079-SHEET C-18.dwg

LC LEE & ASSOCIATES, INC.
BELLINGHAM, WA

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REDMOND, WA.

KLOCK PROPERTY RESTORATION
SKYKOMISH RIVER, WA

PLANTING PLAN

DATE: MONTH XX, XXXX
SHEET: C-18
REV: X

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NOTES:

1. SEE SHEETS C–20, AND C21 FOR PLANTING DETAILS.
2. PLANTING AREA NUMBERS AND LETTERS IN TABLES CORRESPOND TO PREVIOUS SHEET.

Phase 1	Planted within 1 year post-grading
Phase 2	Planted within 2 years post-grading

Grading Area	Acres	Non Emergent Acres	Phase
1	0.04	0.04	1
2	0.03	0.03	1
3	0.06	0.06	1
4	0.21	0.00	1
5	0.21	0.21	1
6	0.24	0.24	1
7	0.21	0.00	1
8	0.63	0.63	1
9	2.60	2.60	1
10	5.17	2.71	2
11	0.17	0.17	1
12	5.78	0.00	1
13	1.48	0.00	1
14	2.58	2.58	2
Totals	**19.40**	**9.26**	

	Planting Area & Planting Assemblage																		Totals
	1C	2C	3C	4E	5C	6C	7E	8C	8D	9B	9C	10C	10E	11C	11D	12E	13E	14A	
Acres	0.044	0.026	0.057	0.206	0.205	0.241	0.207	0.272	0.360	2.097	0.503	2.708	2.467	0.111	0.062	5.779	1.481	2.579	**19.403**
Plants/Acre	1500	1500	1500	0	1500	1500	0	1500	1500	1500	1500	1500	0	1500	1500	0	0	1500	-
Total Plants	67	40	85	0	308	361	0	408	539	3145	755	4062	0	166	92	0	0	3868	**13897**
Conifer Pots/Acre	300	300	300	0	300	300	0	300	0	300	300	300	0	300	0	0	0	300	-
BR Conifer/Acre	500	500	500	0	500	500	0	500	0	500	500	500	0	500	0	0	0	600	-
Stakes/Acre	600	600	600	0	600	600	0	600	1200	600	600	600	0	600	1200	0	0	500	-
Other Pots/Acre	100	100	100	0	100	100	0	100	300	100	100	100	0	100	300	0	0	100	-
Lbs Seed/Acre	25	25	25	35	25	25	35	25	25	25	25	25	35	25	25	35	35	35	-
Total Lbs Seed	1.11	0.66	1.42	7.21	5.13	6.02	7.23	6.79	8.99	52.42	12.58	67.71	86.33	2.77	1.54	202.25	51.83	90.26	**612.26**

			Planting Area & Planting Assemblage																	Totals
Scientific Name	**Common Name**	**Stock**	1C	2C	3C	4E	5C	6C	7E	8C	8D	9B	9C	10C	10E	11C	11D	12E	13E	14A	
Abies grandis	Grand fir	1 Gallon Pot	0	0	1	0	2	2	0	3	0	0	5	27	0	1	0	0	0	26	**67**
Acer macrophyllum	Big Leaf Maple	1 Gallon Pot	0	0	1	0	2	2	0	3	0	0	5	27	0	1	0	0	0	26	**67**
Alnus rubra	Red alder	1 Gallon Pot	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Fraxinus latifolia	Oregon Ash	1 Gallon Pot	0	0	1	0	2	2	0	3	0	0	5	27	0	1	0	0	0	26	**67**
Picea sitchensis	Sitka Spruce	1 Gallon Pot	4	3	6	0	21	24	0	27	0	419	50	271	0	11	0	0	0	103	**939**
Picea sitchensis	Sitka Spruce	Bare Root (BR)	9	5	11	0	41	48	0	54	0	629	101	542	0	22	0	0	0	129	**1592**
Populus trichocarpa	Black Cottonwood	Stakes	9	5	11	0	41	48	0	54	0	419	101	542	0	22	0	0	0	258	**1511**
Pseudotsuga menziesii	Douglas-fir	1 Gallon Pot	4	3	6	0	21	24	0	27	0	0	50	271	0	11	0	0	0	516	**933**
Pseudotsuga menziesii	Douglas-fir	Bare Root (BR)	9	5	11	0	41	48	0	54	0	0	101	542	0	22	0	0	0	1289	**2123**
Rhamnus purshiana	Cascara	1 Gallon Pot	0	0	0	0	1	1	0	1	0	0	3	14	0	1	0	0	0	13	**34**
Salix scouleriana	Scouler Willow	Stakes	4	3	6	0	21	24	0	27	108	0	50	271	0	11	18	0	0	387	**930**
Salix sitchensis	Sitka Willow	Stakes	4	3	6	0	21	24	0	27	108	419	50	271	0	11	18	0	0	258	**1220**
Salix hookeriana	Hooker Willow	Stakes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	129	**129**
Salix lucida ssp. lasiandra	Pacific Willow	Stakes	4	3	6	0	21	24	0	27	108	210	50	271	0	11	18	0	0	0	**753**
Salix prolixa, S rigida mackenzieana	MacKenzie Willow	Stakes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Thuja plicata	Western Red Cedar	1 Gallon Pot	4	2	5	0	18	22	0	24	0	210	45	244	0	10	0	0	0	129	**714**
Thuja plicata	Western Red Cedar	Bare Root (BR)	4	3	6	0	21	24	0	27	0	419	50	271	0	11	0	0	0	129	**965**
Acer circinatum	Vine maple	1 Gallon Pot	0	0	0	0	1	1	0	1	2	0	3	14	0	1	0	0	0	13	**36**
Cornus stolonifera	Red Osier Dogwood	Stakes	4	3	6	0	21	24	0	27	108	210	50	271	0	11	18	0	0	258	**1011**
Lonicera involucrata	Twinberry	1 Gallon Pot	0	0	1	0	2	2	0	3	18	42	5	27	0	1	3	0	0	0	**105**
Oemleria ceraciformis	Indian Plum	1 Gallon Pot	0	0	0	0	1	1	0	1	4	0	3	14	0	1	1	0	0	13	**38**
Physocarpus capitatus	Ninebark	1 Gallon Pot	1	1	1	0	4	5	0	5	22	52	10	54	0	2	4	0	0	0	**161**
Ribes sanguineum	Goose Berry	1 Gallon Pot	0	0	0	0	1	1	0	1	2	0	3	14	0	1	0	0	0	0	**23**
Rosa nutkana	Nootka Rose	1 Gallon Pot	0	0	1	0	2	2	0	3	18	21	5	27	0	1	3	0	0	52	**135**
Rubus parviflorus	Thimbleberry	1 Gallon Pot	0	0	0	0	1	1	0	1	2	0	3	14	0	1	0	0	0	13	**36**
Rubus spectabilis	Salmonberry	1 Gallon Pot	0	0	0	0	1	1	0	1	4	10	3	14	0	1	1	0	0	0	**36**
Sambucus racemosa	Elderberry	1 Gallon Pot	0	0	0	0	1	1	0	1	22	0	3	14	0	1	4	0	0	52	**98**
Spiraea douglasii	Hardhack	1 Gallon Pot	0	0	0	0	0	0	0	0	0	84	0	0	0	0	0	0	0	0	**84**
Symphoricarpos albus	Snowberry	1 Gallon Pot	0	0	0	0	1	1	0	1	16	0	3	14	0	1	3	0	0	52	**91**
Agrostis alba	Red top	Seed, Lbs	0.22	0.13	0.28	1.03	1.03	1.20	1.03	1.36	1.80	10.48	2.52	13.54	12.33	0.55	0.31	28.89	7.40	12.89	**97.02**
Elymus glaucus	Blue wildrye	Seed, Lbs	0.22	0.13	0.28	2.06	1.03	1.20	2.07	1.36	1.80	0.00	2.52	13.54	24.67	0.55	0.31	57.79	14.81	25.79	**150.12**
Festuca rubra	Red fescue	Seed, Lbs	0.22	0.13	0.28	1.03	1.03	1.20	1.03	1.36	1.80	10.48	2.52	13.54	12.33	0.55	0.31	28.89	7.40	12.89	**97.02**
Glyceria elata	Tall mannagrass	Seed, Lbs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**10.48**
Hordeum brachyantherum	Meadow barley	Seed, Lbs	0.22	0.13	0.28	1.03	1.03	1.20	1.03	1.36	1.80	10.48	2.52	13.54	12.33	0.55	0.31	28.89	7.40	12.89	**97.02**
Poa secunda	Bluegrass	Seed, Lbs	0.22	0.13	0.28	2.06	1.03	1.20	2.07	1.36	1.80	0.00	2.52	13.54	24.67	0.55	0.31	57.79	14.81	25.79	**150.12**
Scirpus microcarpus	Panicled bulrush	Seed, Lbs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**10.48**

0 1"

BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

REV	DATE	DESCRIPTION	DRN	APP

PAUL EDWARD DEVRIES — STATE OF WASHINGTON — 37861 — REGISTERED PROFESSIONAL ENGINEER

LYNDON C. LEE, Ph.D. — 000385 — PROFESSIONAL WETLAND SCIENTIST

KLOCK PROPERTY, RESTORATION, SKYKOMISH RIVER

DESIGNED BY: P DeVRIES
DRAWN BY: J SCHULZ
CHECKED BY: L LEE
PROJECT MGR: X XXXXX
FILENAME: 2079-SHEET C-19.dwg

LC LEE & ASSOCIATES, INC.
BELLINGHAM, WA

Resource Consultants, Inc.
REDMOND, WA.

KLOCK PROPERTY RESTORATION
SKYKOMISH RIVER, WA

PLANT TAKEOFF TABLES

DATE: MONTH XX, XXXX
SHEET: C-19
REV: X

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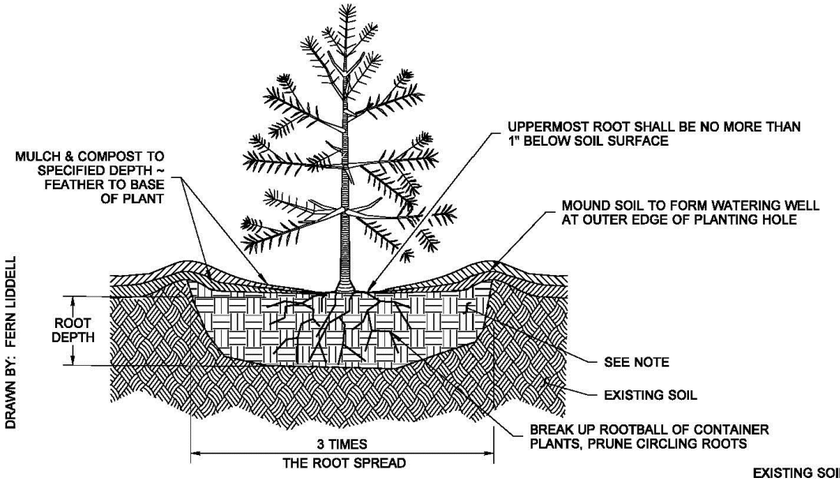
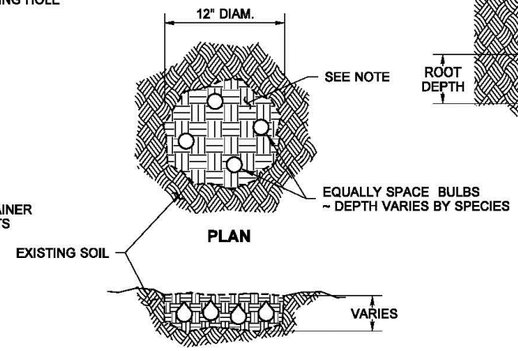


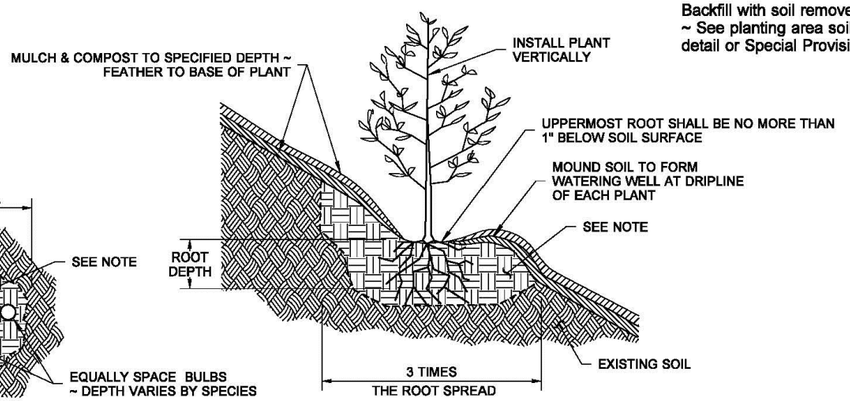
SHRUB, TREE AND GROUND COVER PLANTING DETAIL



BULB PLANTING DETAIL

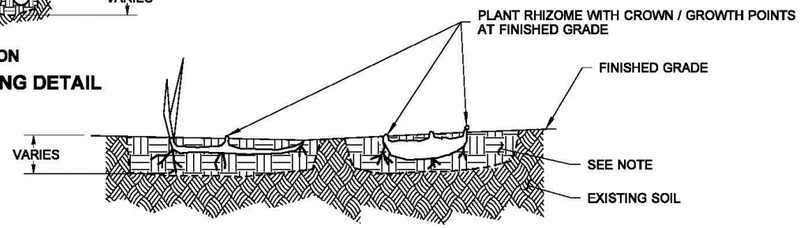
NOTE

Backfill with soil removed from hole ~ See planting area soil preparation detail or Special Provisions.

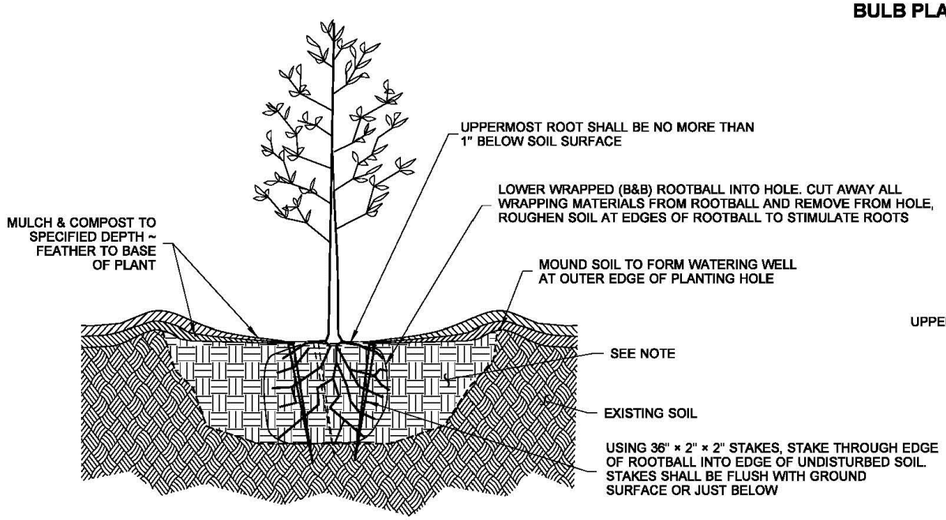


SLOPE PLANTING DETAIL

(INCLUDES ALL PLANTS ON SLOPES)

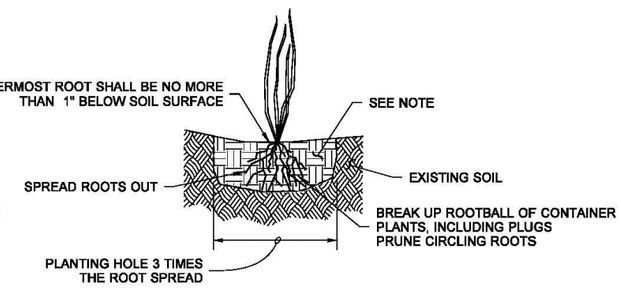


TUBER OR RHIZOME PLANTING DETAIL



STREET TREE PLANTING AND STAKING DETAIL

(APPLIES TO CONTAINER, BALL AND BURLAPPED, (B&B) DECIDUOUS AND CONIFERS)



EMERGENT PLANTING DETAIL

STATE OF WASHINGTON
REGISTERED
LANDSCAPE ARCHITECT

SALLY A. ANDERSON
CERTIFICATE NO. 000372

NOTE: THIS PLAN IS NOT A LEGAL ENGINEERING DOCUMENT BUT AN ELECTRONIC DUPLICATE. THE ORIGINAL, SIGNED BY THE ENGINEER AND APPROVED FOR PUBLICATION, IS KEPT ON FILE AT THE WASHINGTON STATE DEPARTMENT OF TRANSPORTATION. A COPY MAY BE OBTAINED UPON REQUEST.

TREE AND SHRUB PLANTING DETAILS

STANDARD PLAN H-10.10-00

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

Pasco Bakotich III — STATE DESIGN ENGINEER — *07-03-08* — DATE

Washington State Department of Transportation

0 1"

BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

REV	DATE	DESCRIPTION	DRN	APP

RALL EDWARD DEVRIES — STATE OF WASHINGTON — 37861 — REGISTERED PROFESSIONAL ENGINEER

LYNDON C. LEE, Ph.D. — 000365 — PROFESSIONAL WETLAND SCIENTIST

KLOCK PROPERTY, RESTORATION, SKYKOMISH RIVER

DESIGNED BY: P DeVRIES
DRAWN BY: J SCHULZ
CHECKED BY: L LEE
PROJECT MGR: X XXXXX
FILENAME: 2079-SHEET C-20.dwg

LC LEE & ASSOCIATES, INC.
BELLINGHAM, WA

Resource Consultants, Inc.
REDMOND, WA.

KLOCK PROPERTY RESTORATION
SKYKOMISH RIVER, WA

PLANTING DETAILS - I

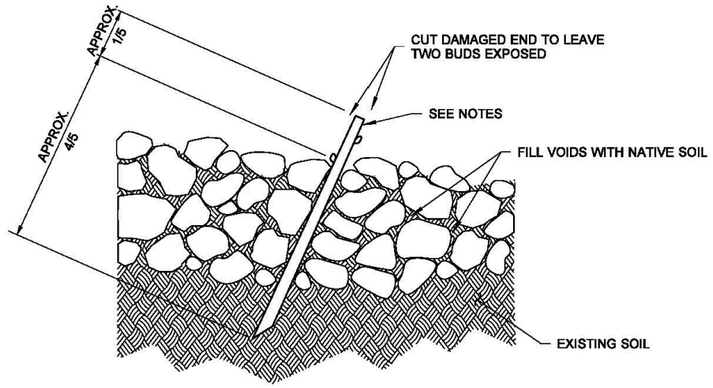
DATE: MONTH XX, XXXX

SHEET: C-20

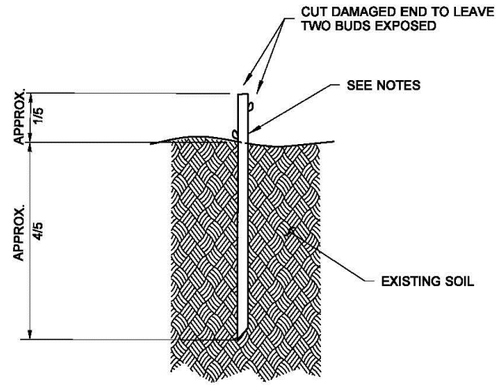
REV: X

FILED IN: K:\2079 LCLA-DOJ\Klock\Maech2020\DRAWING\2079-SHEET C-20.dwg SAVED: jschultz 6/15/2020 12:45 PM PLOTTED: Jim Schultz 6/19/2020 9:32 AM

DRAWN BY: FERN LIDDELL



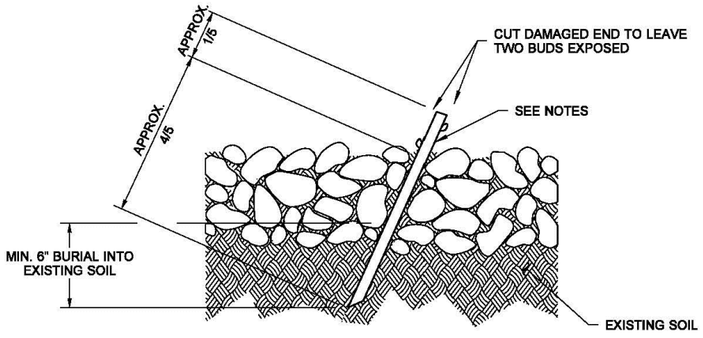
LIVE STAKE INSTALLATION IN RIPRAP



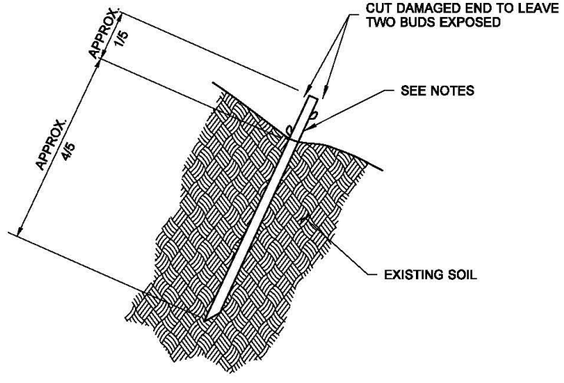
TYPICAL LIVE STAKE INSTALLATION

NOTES

1. See Plant Material List for size and type of live stake.
2. Do not use axe or sledge for driving stakes.
3. In hard ground use an iron bar or star drill to prepare the holes for the stake.
4. Avoid stripping bark or bruising stakes during installation.
5. Fill void around cutting with soil.



LIVE STAKE INSTALLATION IN QUARRY SPALLS



LIVE STAKE INSTALLATION ON SLOPES

STATE OF WASHINGTON
REGISTERED
LANDSCAPE ARCHITECT
SALLY A. ANDERSON
CERTIFICATE NO. 000372

NOTE: THIS PLAN IS NOT A LEGAL ENGINEERING DOCUMENT BUT AN ELECTRONIC DUPLICATE. THE ORIGINAL, SIGNED BY THE ENGINEER AND APPROVED FOR PUBLICATION, IS KEPT ON FILE AT THE WASHINGTON STATE DEPARTMENT OF TRANSPORTATION. A COPY MAY BE OBTAINED UPON REQUEST.

LIVE STAKE INSTALLATIONS

STANDARD PLAN H-10.15-00

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

Pasco Bakotich III — STATE DESIGN ENGINEER
07-03-08 — DATE

Washington State Department of Transportation

0 1"

BAR MEASURES ONE INCH
ON ORIGINAL DRAWINGS

REV	DATE	DESCRIPTION	DRN	APP

PAUL EDWARD DEVRIES — STATE OF WASHINGTON — 37861 — REGISTERED PROFESSIONAL ENGINEER

LYNDON C. LEE, Ph.D. — 000385 — CERTIFIED PROFESSIONAL WETLAND SCIENTIST

KLOCK PROPERTY, RESTORATION, SKYKOMISH RIVER

DESIGNED BY: P DeVRIES
DRAWN BY: J SCHULZ
CHECKED BY: L LEE
PROJECT MGR: X XXXXX
FILENAME: 2079-SHEET C-21.dwg

LC LEE & ASSOCIATES, INC.
BELLINGHAM, WA

Resource Consultants, Inc.
REDMOND, WA.

KLOCK PROPERTY RESTORATION
SKYKOMISH RIVER, WA

PLANTING DETAILS - II

DATE: MONTH XX, XXXX
SHEET: C-21
REV: X

Appendix 3. Flood Modeling for the Klock Property Restoration Basis of Design

I. Methods

We used a two-dimensional (2-D) hydrodynamic model developed previously for Snohomish County (WSE, 2018) to evaluate flooding patterns in the vicinity of the Klock property with and without restoration earthwork. The model domain extends along the Skykomish River from just above the Sultan River to its confluence with the Snoqualmie River and a portion of the Snoqualmie and Snohomish Rivers upstream of the SR 522 bridge. The model terrain was developed from a combination of LiDAR and bathymetry data collected variously over the 2014-2016 period (Figure 1; WSE 2018). Because the WSE (2018) model had been calibrated to simulate high flow events, the surface roughness properties were kept the same in our simulations.

The magnitude of the 100-year flood was estimated for the reach using flows established by Snohomish County Surface Water Management (SWM) as part of the FEMA Flood Insurance Study hydrology, effective September 16, 2005 (Figure 2). The flows were provided by SWM engineer David Lucas through email correspondence on February 21, 2019. The corresponding magnitude used in the analyses is Q_{100} = 168,200 cfs. This was derived from the flows in Figure 2, adding an estimated 900 cfs for small inflows, and accounting for downstream attenuation.

In earlier runs where the 2D model terrain was modified to represent topography associated with different scenarios, it was determined that a proposed total cut of 32,000 CY would result in minor changes to the 100 year flood (Q_{100}) water surface elevation, whereas an alternative, smaller proposed cut volume of 20,240 CY would not (R2 2019). This information guided layout of the proposed earthwork design in the current preliminary design plan set prepared by R2.

The WSE (2018) model terrain was subsequently modified to represent the preliminary design plan actions and run again to compare against the existing conditions for an evaluation of changes in the 100-year flood levels with the proposed project (Figure 3). In addition, the model output was used to evaluate substrate mobility in the vicinity of the two fords proposed for the BPA transmission line access road.

The 2-D model mesh network from the WSE (2018) model was further modified in the vicinity of proposed project actions to more accurately simulate hydraulics in the vicinity of each location (Figure 4). Specifically, the original WSE (2018) model mesh size of 100 ft was reduced to approximately 20 ft, as illustrated in Figure 5. To conserve budget, the original WSE/SWM mesh was used for simulating existing conditions and the modified mesh network was used for simulating project actions.

II. Results

The model results were used to specify a stable rock mix for the two proposed ford locations for the BPA transmission line access road, and to characterize the resulting changes in 100-year flood water surface elevations. The ford rock placement extended upstream and downstream of the ford to accommodate local adjustments associated with adjacent future erosion.

Ford Rock Sizing: The modeling predicted that maximum velocity at the two proposed ford locations for the BPA transmission line access road was approximately 4.1 ft/s during the 100-year flood peak flow, with a flow depth of approximately 4.0 ft. This value was evaluated for incipient motion conditions using two independent equations. In the first approach, Shields' equation (e.g., Raudkivi 1990) was used to evaluate shear stress τ and corresponding critical median grain size D_{50cr}:

$$\tau^*_{cr} = \frac{\tau}{(S_s - 1)\rho g D_{50cr}}$$

where the submerged specific gravity (S_s-1) = 1.5 (typical lower range for commercially available aggregates; larger values preferred for additional stability) and the dimensionless critical shear stress τ^*_{cr} = 0.03, which is a characteristic lower bound value for initiation of motion (Buffington and Montgomery 1997; Recking and Pitlick 2013). Shear stress was estimated from shear velocity (u_*) as:

$$\tau = \rho u_*^2$$

where shear velocity was estimated using the integrated form of logarithmic law of the wall equation was used to estimate shear velocity respectively (Richards 1982):

$$\frac{V}{u_*} = 5.75 log\left(\frac{d}{D_{65}}\right) + 6.00$$

where V = mean column velocity, d = depth, and y = height above the bed. The characteristic substrate size D_{65} was set to an initial estimate of 4" corresponding to quarry spalls. The mean column velocity and depth values were extracted from the 2D model results.

The second approach was based on empirical relations established between velocity and stable stone size, using the Isbash relation (USACE 1994):

$$U_{cr} = C[2gD_{50cr}(S_s - 1)]^{1/2}$$

where U_{cr} = characteristic velocity mobilizing the stone and the factor C =0.86 (Recking and Pitlick 2013).

The critical D_{50cr} was estimated using each method, and the larger of the two selected. A side slope correction was then applied to estimate the stable D_{50cr} on a 10H:1V side slope (specified for the slopes on both sides of the ford for easy vehicle access), using an estimated stream-wise slope = 0.005 and the equations of Simons and Senturk (1992; in Mooney et al. 2007). The resulting D_{50} values were then compared with mixes in WSDOT's 2020 standard specifications, from which it was confirmed that quarry spalls (specification 9-13.1(5)) resulted in a stability

safety factor in excess of 3.0. Quarry spalls are a standard substrate for vehicle access during construction, and can be expected to remain stable in place for many years after placement (barring more extensive erosion originating away from the ford location).

Changes in 100 Year Flood Water Levels: The simulations indicate that the proposed grading will increase flows in the oxbow and excavated channels during the 100-year flood peak flow (Figure 5). Peak water levels will be elevated in the vicinity of fill areas, and lowered over the floodplain where most of the previous fill occurred. Changes within the river main stem channel are predicted to be within +/- 0.1 ft depending on location. We expect the river to adjust its boundary over time in response.

III. References

Buffington, J.M. and D.R. Montgomery. 1997. A systematic analysis of eight decades of incipient motion studies, with special reference to gravel-bedded rivers. Water Resources Research, 33(8), pp. 1993-2029.

Mooney, D.M., C.L. Holmquist-Johnson, and S. Broderick. 2007. Rock ramp design guidelines. U.S. Department of the Interior, Bureau of Reclamation.

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Richards, K. 1982. Rivers: Form and process in alluvial channels. Methuen. New York NY.361p.

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Simons, D.B., and F. Sentürk. 1992. Sediment Transport Technology Water and Sediment Dynamics. Water Resources Publication, Littleton, Colorado.

U.S. Army Corps of Engineers (USACE). 1994. Hydraulic Design of Flood Control Channels. Engineering Manual EM 1110-2-1601.

Watershed Science & Engineering. 2018. Ben Howard Road flooding analysis: Lower Skykomish River Hydraulic Modeling. Report prepared for Snohomish County Public Works. August.

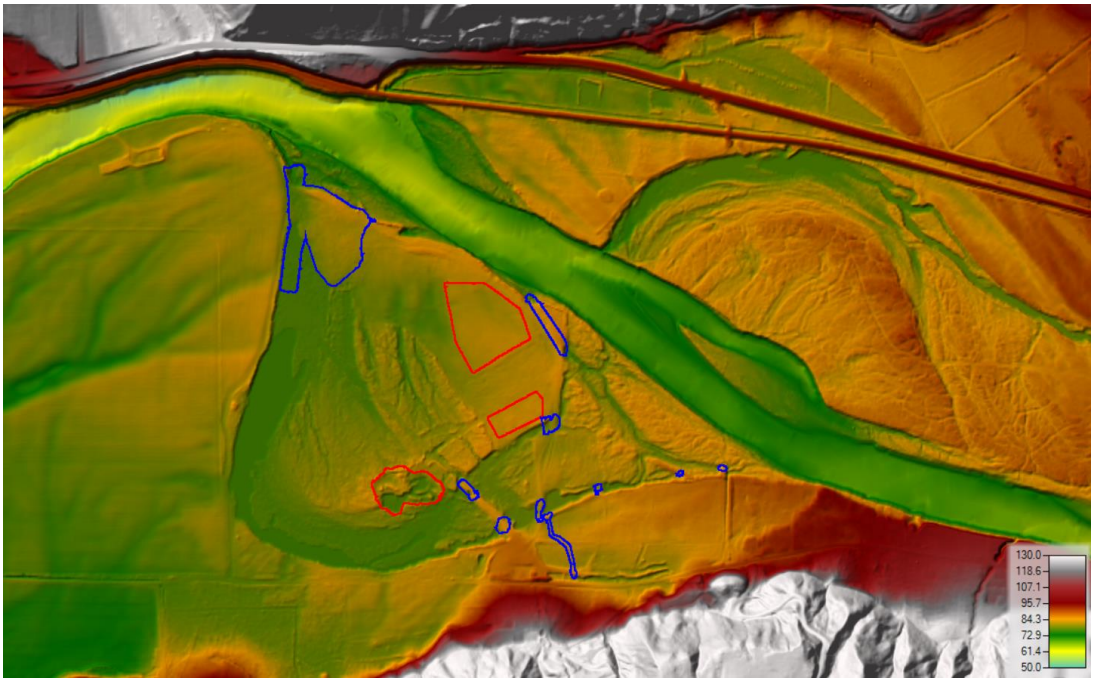

Figure 1. Existing terrain in the vicinity of the Klock Property simulated using the 2D HEC-RAS model. Blue polygons denote the areas that will be excavated, red polygons areas where fill will be placed.

FEMA Flood Insurance Study for Snohomish County, WA #53061CV001A - Vol. 1 - Effective September 16, 2005

Table 6. Summary of Discharges (Cont'd)

Flooding Source and Location	Drainage Area (Square Miles)	Peak Discharges (Cubic Feet per Second) 10-Year	50-Year	100-Year	500-Year
Sammamish River					
At mouth	240.0	2,300	3,300	4,300	5,600
Sauk River					
Near community of Sauk	714	52,500	81,000	94,000	129,000
At Town of Darrington	--[1]	--[1]	--[1]	70,000	--[1]
Scriber Creek					
At 196th Street Southwest	1.8	139	171	184	212
At outlet from Scriber Lake	2.4	175	206	216	233
At Interstate Highway 5	3.0	168	190	197	212
Below 44th Avenue West	3.5	222	258	270	292
Skykomish River					
At mouth	844	98,000[2]	140,600[2]	160,800[2]	208,500[2]
Below Woods Creek	834	101,000[2]	145,000[2]	165,900[2]	215,100[2]
Below Sultan River	724	102,900	147,900	169,500	220,000
Below Wallace River	618	76,600	112,200	129,500	170,200
At gage near Town of Gold Bar	535	72,000	107,000	124,000	164,000
At confluence with North and South Fork Skykomish Rivers	509	64,900	95,500	109,800	142,300
At North Fork Skykomish River at mouth	147	20,900	34,500	39,500	51,500
At North Fork Skykomish River at RM 4.00	--[1]	20,900	34,500	39,500	51,500
Snohomish River					
At City of Snohomish	1,729	125,000	141,000[2]	174,000[2]	243,000[2]
Near City of Monroe	1,537	114,000	173,000	204,000	293,000
At City of Everett	--[1]	--[1]	--[1]	170,000	--[1]

[1]Data not available
[2]Decrease in discharge due to overbank storage

49

Figure 2: FEMA Flood Insurance Study hydrology, provided by Snohomish County Surface Water Management, Department of Public Works.

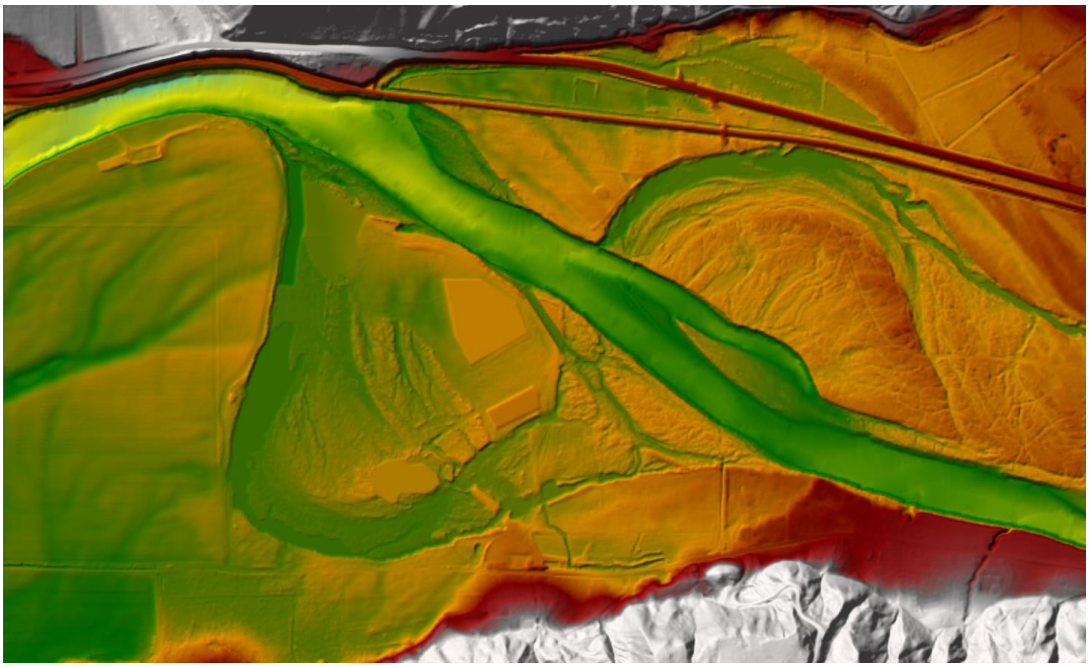

Figure 3. Proposed terrain in the vicinity of the Klock Property simulated using the 2D HEC-RAS model.

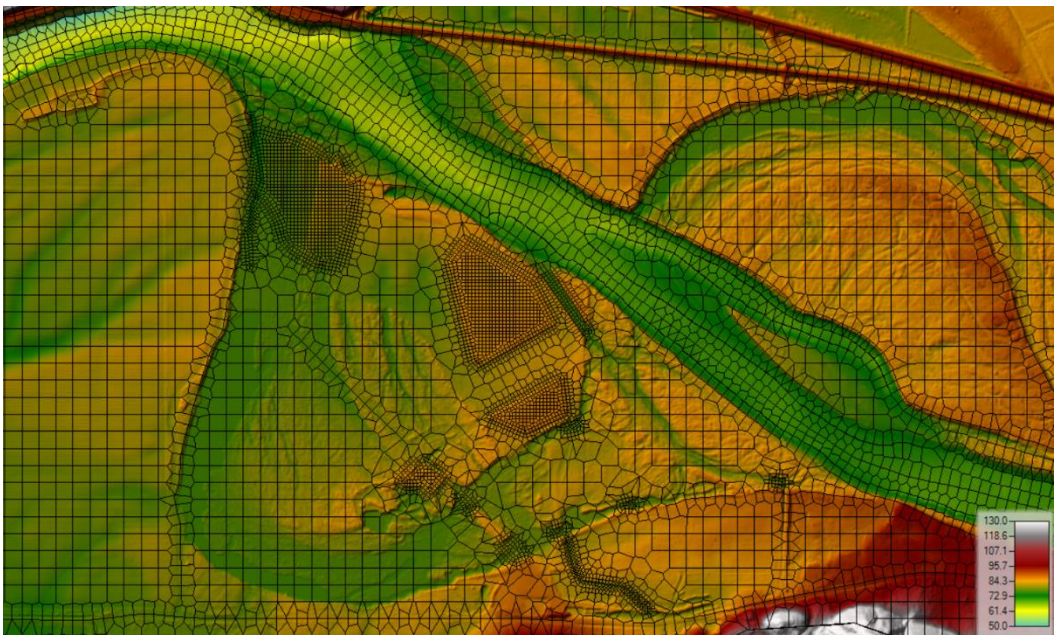

Figure 4. HEC-RAS 2-D hydraulic model mesh network in the vicinity of the Klock Property. Areas proposed for cut and fill were simulated using a finer mesh than elsewhere within the 100-year flood zone.

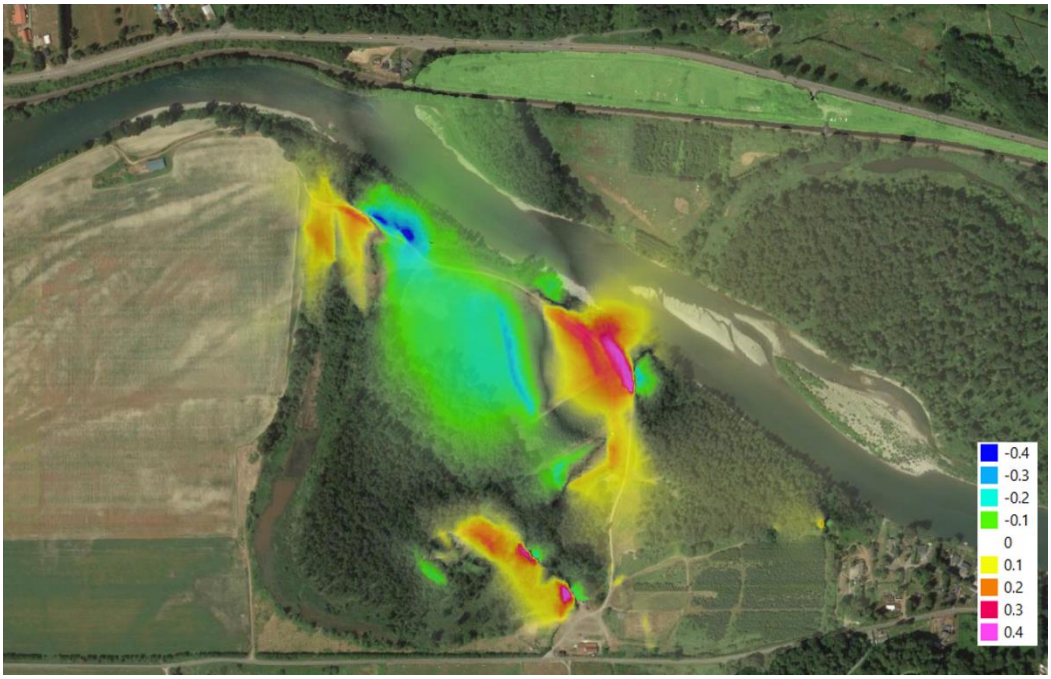

Figure 5. Predicted changes (units=ft) in 100-year flood water surface elevations associated with the proposed Klock Property restoration design compared with existing conditions.

RESOURCE CONSULTANTS INC.

15250 NE 95TH STREET
REDMOND, WA 98052
425.556.1288
r2usa.com

Appendix 4
Technical Memorandum – Draft

Date: June 11, 2020 Project Number: 2079.01/TM102

To: File

From: Paul DeVries, Ph.D., P.E., C.F.P. (R2); Chiming Huang, Ph.D., P.E. (R2); Lyndon Lee (LCLA)

Project: Klock Property Restoration

Subject: Evaluation of Effects of Proposed Floodplain Restoration Activities on 100 year Flood Peak Water Surface Elevation

---

1. Background

The proposed activities that are the subject of this memorandum involve restoring the structure and functioning of waters of the United States, including wetland ecosystems (waters/wetlands) on floodplain areas of the Klock Property. This property consists of an approximately 187.9-acre area within the overall Klock holdings. It is located east of the City of Monroe along the south bank (river left) of the Skykomish River in unincorporated Snohomish County, Washington (Figure 1). The latitude/longitude coordinates for the approximate centroid of the Klock Property are 47° 50' 54.86" N/121° 53' 37.22" W. Ben Howard Road forms the south boundary of the Klock Property. The property is located within Section 10, Township 27 North, Range, 7 East. It is comprised of Snohomish County Tax Parcel Nos. 27071000100100, 27071000100300, and 27071000100200 and parts of 27070300300300, 27070300300500, 27071000200100. These latter three tax parcels will be the subject of a lot line adjustment.

The Klock Property is owned by Karl Frederick Klock Pacific Bison, LLC. The restoration measures that are the focus of this evaluation are part of a negotiated settlement of Clean Water Act non-compliance issues among Karl Frederick Klock Pacific Bison, LLC, Bobby Wolford

Trucking & Salvage, Inc. (BWT), and the U.S. Environmental Protection Agency Region 10 (EPA). The key goal of the settlement is to restore the property from impacts associated with stream rerouting, mechanical clearing, filling, and earthwork activities that were undertaken by the Klocks and BWT.

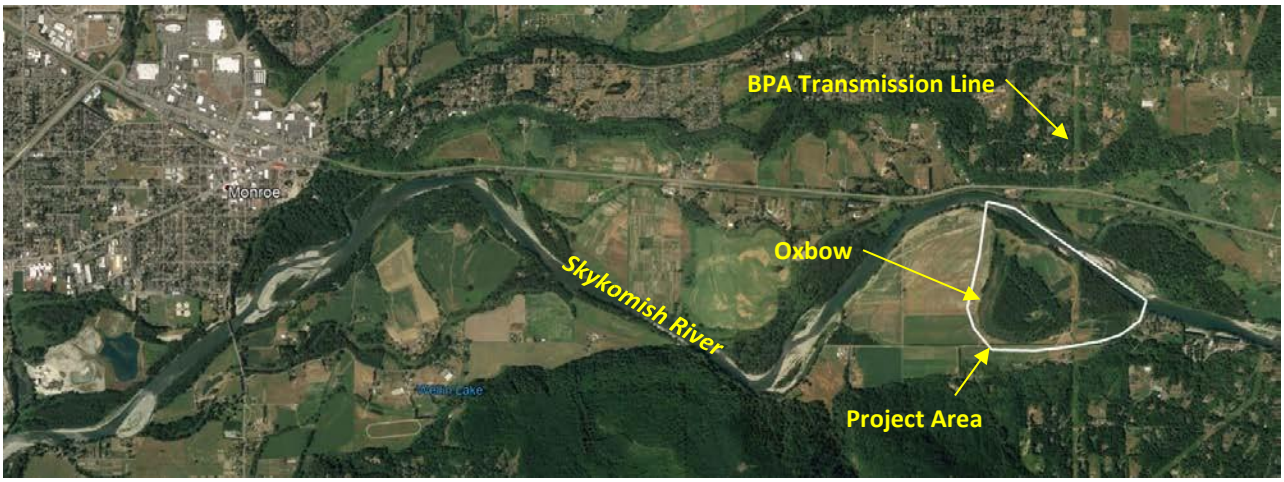

Figure 1. Location of project area targeted for floodplain restoration earthwork activities, and selected landmarks.

The project area encompasses a large, generally "U" shaped secondary river channel or "oxbow" system that has been part of the active floodplain and channel system of the Skykomish River since at least 1938. During moderate to high water events in the main channel of the Skykomish River and depending on the elevation or "stage" of frequently occurring flood events or floodwaters (2-5 year recurrence interval), this oxbow system can be directly and regularly connected to the Skykomish River at both its upstream and downstream ends. The oxbow system includes a complex network of small secondary and tertiary channels that are embedded within it and which are regularly inundated by and connected to flood flows from the main channel of the Skykomish River. The area that includes the oxbow system is dominated by a mosaic of third or fourth growth forested, scrub/shrub, and emergent waters/wetlands plant communities. This mosaic also includes seasonal open water features that flow when they are connected to the main channel of the Skykomish River or alternatively, they exist as residual ponded features when water levels recede. Some agricultural and Christmas tree production areas are also included in the property.

Proposed earthwork activities consist of the following actions to restore floodplain connectivity Figure 2):

- Removal of fill placed in and around the downstream end of the oxbow and adjoining floodplain (indicated by #9 & #10 in Figure 2).
- Removal of fill placed in a former high flow channel (#8).
- Removal of culverts and fill at two locations along BPA's transmission line access road that currently restrict flows through two floodplain high flow channels that are part of the oxbow flow path network, and creating rock fords in their place (#4 & #7).
- Removal of fill at five other locations in floodplain high flow channels that are part of the oxbow flow path network (#1, #2, #3, #5, and #6).
- Daylighting and additional excavation of a channel to connect an upland tributary draining under Ben Howard Road with the oxbow flow path network (#11).
- Removing concrete ecology blocks from the river's edge.
- Cleaning out contaminated soils and debris disposed of in a central floodplain pit area surrounded by the oxbow flow path network, and hauling the material offsite, followed by placing some of the spoils from the above excavations within the pit area and refilling to approximate local floodplain elevations (#14).
- Placing the remainder of spoils from the above excavations at two higher ground areas on the floodplain near the BPA transmission line corridor to keep the excavated native materials on site (#12 and #13).

This technical memorandum documents the flood modeling analysis that was performed to evaluate effects of these proposed restoration earthwork activities on the 100 year flood peak water surface elevation (WSE).

2. Hydrology

The magnitude of the 100-year flood (Q_{100}) was estimated for the reach using flows established by Snohomish County Surface Water Management (SWM) as part of the FEMA Flood Insurance Study hydrology, effective September 16, 2005 (Figure 3). The flows were provided by SWM engineer David Lucas through email correspondence on February 21, 2019. The corresponding magnitude used in the analyses is Q_{100} = 168,200 cfs. This was derived from the flows in Figure 3, adding an estimated 900 cfs for small inflows, and accounting for downstream attenuation.

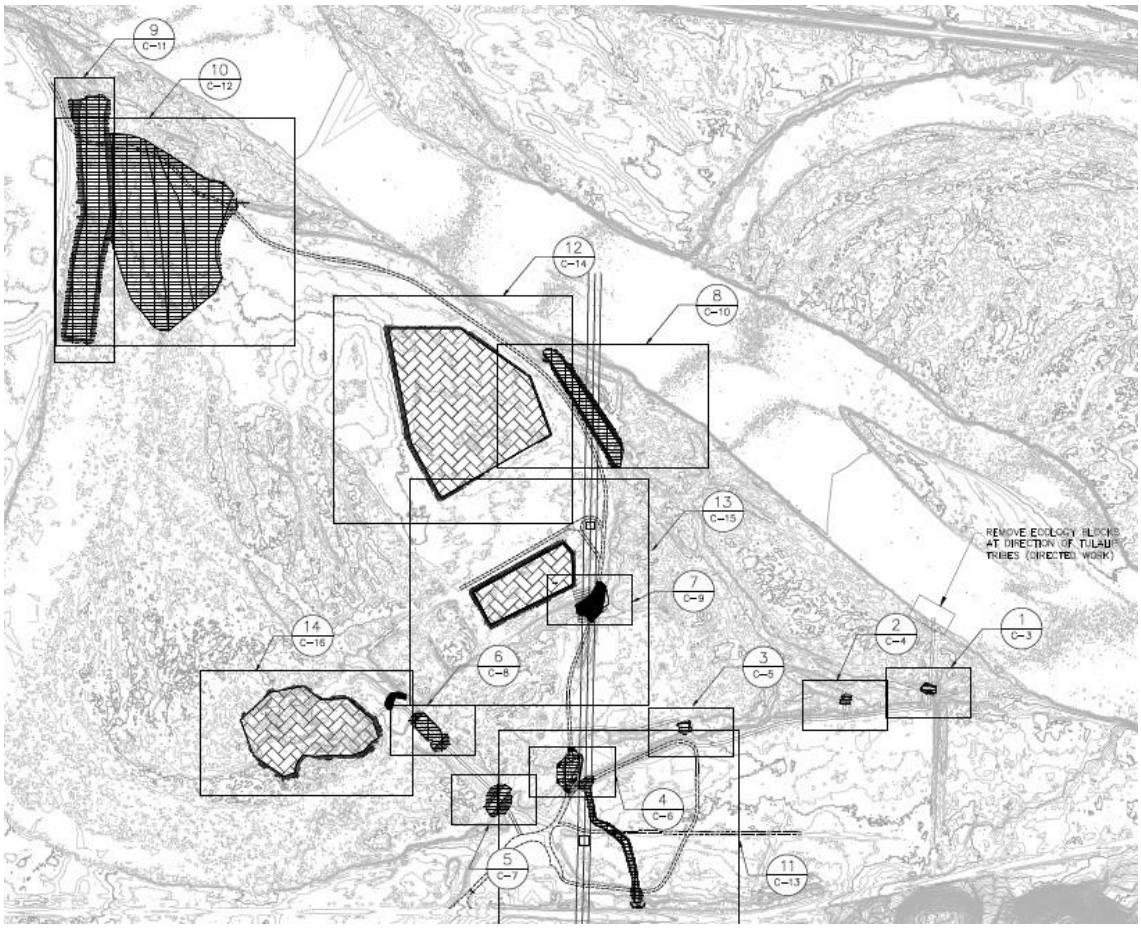

Figure 2. Map of proposed floodplain restoration earthwork activities.

FEMA Flood Insurance Study for Snohomish County, WA #53061CV001A - Vol. 1 - Effective September 16, 2005

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[1]Data not available
[2]Decrease in discharge due to overbank storage

Figure 3. FEMA Flood Insurance Study hydrology, provided by Snohomish County Surface Water Management, Department of Public Works.

3. Hydraulic Modeling Methods

We used a two-dimensional (2-D) HEC-RAS hydraulic model developed previously for Snohomish County (WS&E 2018) to evaluate flooding patterns in the vicinity of the Klock property with and without corrective earthwork. The model domain extends along the Skykomish River from just above the Sultan River to its confluence with the Snoqualmie River and a portion of the Snoqualmie and Snohomish Rivers upstream of the SR 522 bridge. The model terrain was developed from a combination of LiDAR and bathymetry data collected variously over the 2014-2016 period (Figure 4; WS&E 2018). Because the model had been calibrated to simulate high flow events, the surface roughness properties were kept the same in our simulations.

During project scoping, the 2-D model terrain was modified to represent topography associated with different net excavation volumes under negotiation. The modeling guided layout of the proposed earthwork design for the volume agreed to as part of the settlement. The WS&E (2018) model terrain was subsequently modified to represent the preliminary design plan actions, and run to compare against existing conditions for an evaluation of changes in the 100year flood levels with the proposed project (Figure 5). The 2-D model mesh network was also further modified in the vicinity of proposed project actions to more accurately simulate hydraulics in the vicinity of each location, where the original WS&E (2018) model mesh size of 100 ft was reduced to approximately 20 ft at locations where earthwork is proposed (Figure 6).

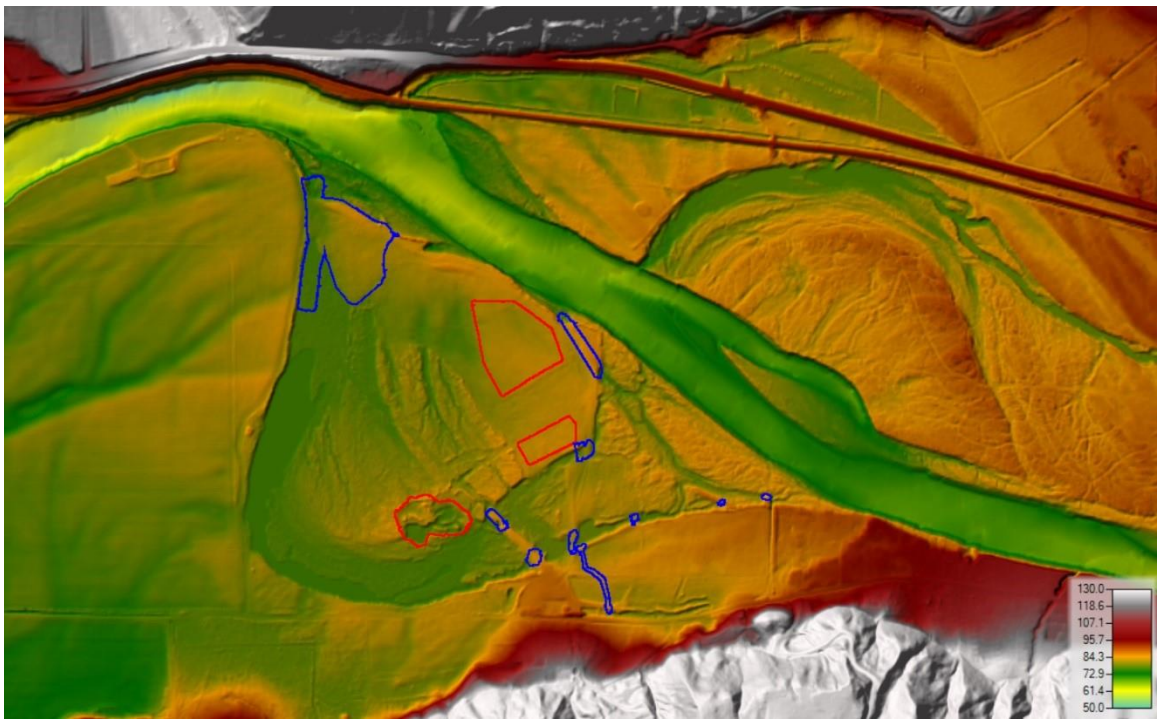

Figure 4. Existing HEC-RAS 2-D model terrain in the vicinity of the Klock Property. Blue polygons denote the areas that will be excavated, red polygons areas where fill will be placed.

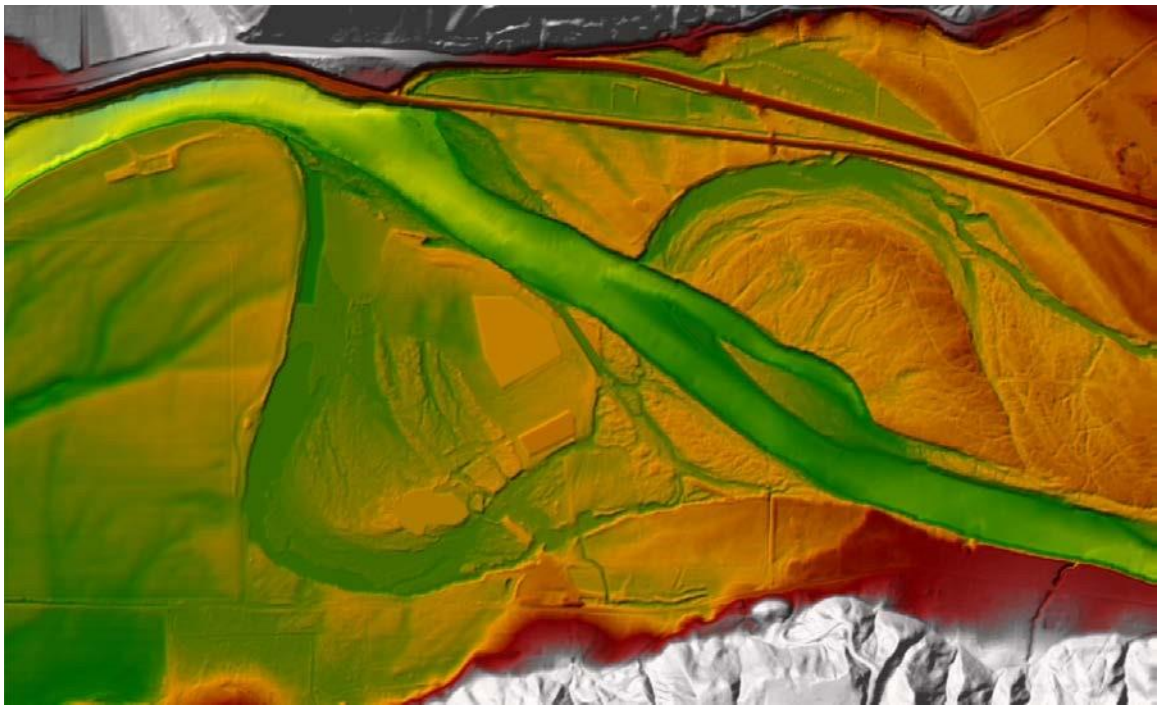

Figure 5. HEC-RAS 2-D model terrain in the vicinity of the Klock Property, modified to reflect proposed earthwork.

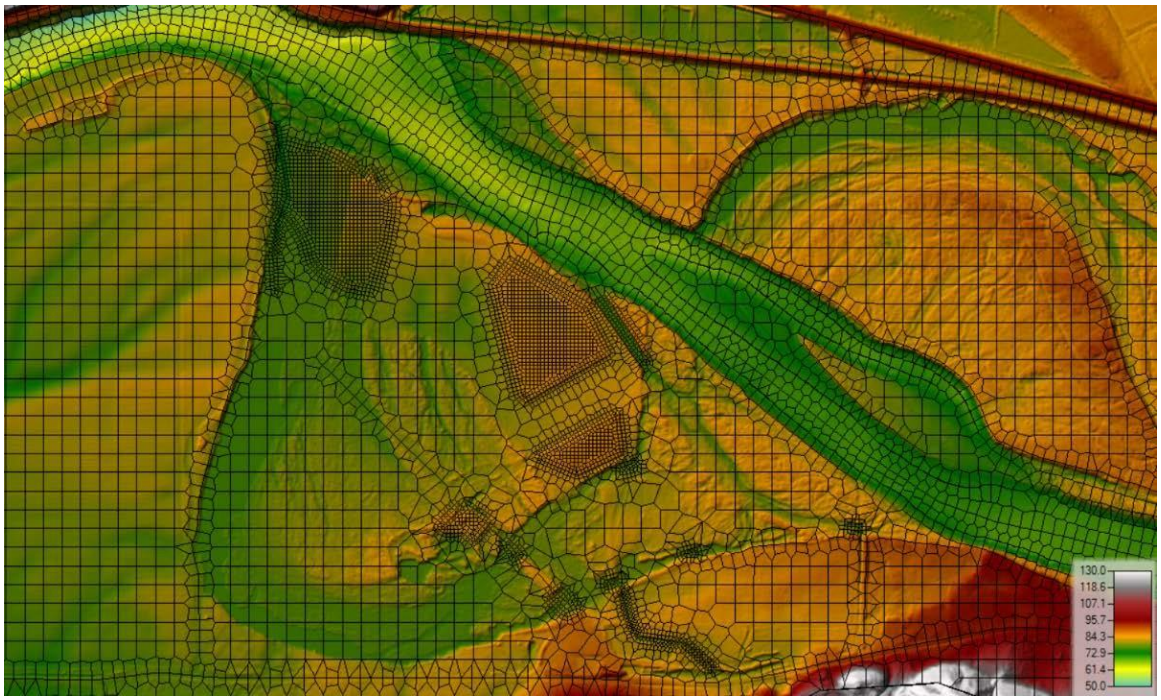

Figure 6. HEC-RAS 2-D hydraulic model mesh network in the vicinity of the Klock Property.

4. Modeling Predictions and Interpretation

The simulations indicate that the proposed grading will increase flows in the oxbow and excavated channels during the 100 year flood peak flow, thereby increasing local WSEs compared with existing conditions due to the enhanced floodplain connectivity (Figure 7). Peak water levels will be elevated in the vicinity of the upstream side of the fill areas, and lowered over the floodplain in response to fill removal.

Changes within the river mainstem channel are predicted to be mostly within +/- 0.02 ft depending on location (Figure 7), which corresponds to well within modeling accuracy and measurement error. Greatest changes are in the vicinity where floodplain channel excavation is proposed, followed by the fill areas. Within the mainstem channel proper, the central area near the excavated channel (#8 in Figure 2) is predicted to have the greatest local rise, generally less than 0.10 ft. We expect the river to adjust its morphology locally in this area over time as a compensatory response, where the WSEs should decrease again.

The proposed restoration earthwork activities are not predicted to result in a floodplain-wide increase in WSEs. Consistent with FEMA (2009) Appendix E guidelines, no structures are predicted to be affected by increased WSEs associated with the proposed earthwork.

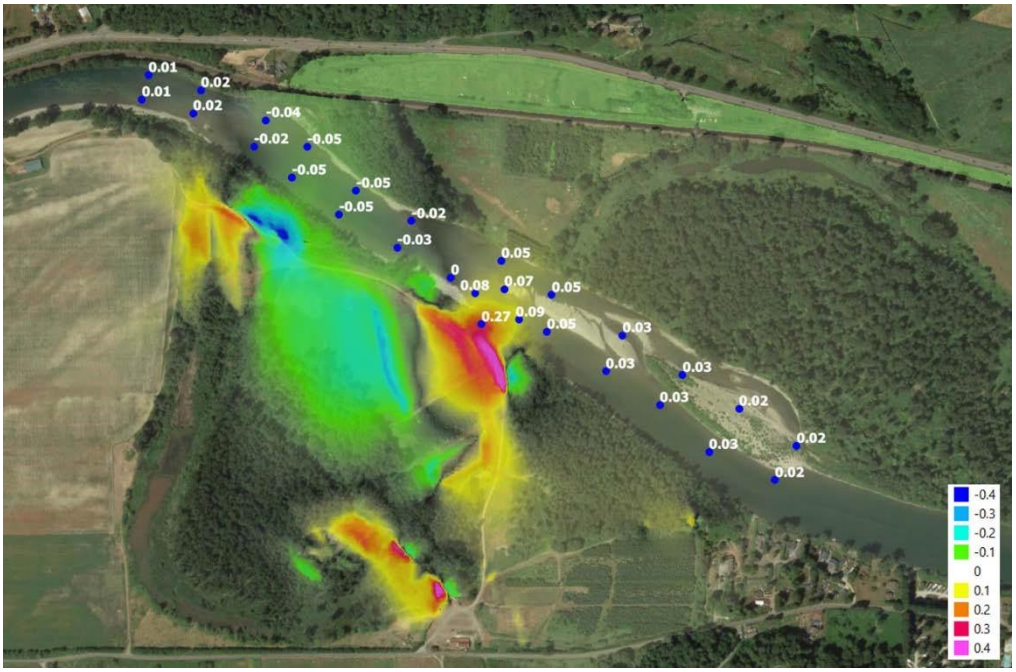

Figure 7. Predicted changes (units=ft) in 100-year flood water surface elevations associated with the proposed design relative to existing conditions.

5. References

Federal Emergency Management Agency (FEMA). 2009. National Flood Insurance Program Floodplain Management Guidebook. Region 10, 5th Edition, March. Bothell, WA.

Watershed Science & Engineering (WS&E). 2018. Ben Howard Road flooding analysis: Lower Skykomish River Hydraulic Modeling. Report prepared for Snohomish County Public Works. August.

After Recording, Return to:

James A. Tupper, Jr.
Tupper Mack Wells, PLLC
2025 First Avenue, Suite 1100
Seattle, WA 98121

QUIT CLAIM DEED

GRANTOR:	**Karl Frederick Klock Pacific Bison LLC**
GRANTEE:	**Tulalip Tribes of Washington**
ABBREVIATED LEGAL DESCRIPTION:	**TBD** **Complete legal description on Page 2.**
TAX PARCEL NO.:	**TBD**
REFERENCE NO.:	**N/A**

Quit Claim

Grantor (as defined above) for itself, its heirs and assigns, hereby grants and conveys as a gift, without warranties, to Grantee (as defined above) the following described real estate situated in the County of Snohomish, State of Washington, together with all after acquired title of the Grantor therein:

[property description to be provided]

EXCEPTING any interest or right in the G. L. Willner Certificate of Water Right S1-*06508CWRIS, Certificate No. 6, Page 2999, dated March 24, 1948, which has never

been exercised or applied for the beneficial use of water on the above-described property. Grantor reserves all right and interest in the certificate of water right for its exclusive use on Grantor's separate and retained real property.

IN WITNESS WHEREOF, the Grantor hereto executed this Quit Claim Deed as of the _____ of _____ 2021.

GRANTOR:

KARL FREDERICK KLOCK PACIFIC BISON LLC

_____
By Derek Klock
Its Managing Member

STATE OF WASHINGTON)
) ss.
COUNTY OF KING_)

On this day personally appeared before me Derek Klock, Managing Member of Karl Frederick Klock Pacific Bison LLC, to me known to be the individual described in and who executed the within and foregoing Quit Claim Deed and acknowledged that she signed the same as the free and voluntary.

GIVEN under my hand and official seal this ____ day of _____, 2021.

_____
Printed Name: _____
NOTARY PUBLIC in and for the State of
_____, residing at _____
My Commission Expires: _____

4823-5807-1498, v. 1