



City of Tacoma, WA

**TACOMA WATER
REQUEST FOR QUALIFICATIONS
FISH HABITAT MITIGATION AND RESTORATION PROJECTS
SPECIFICATION NO. TW24-0128F**



City of Tacoma
Tacoma Water

**REQUEST FOR QUALIFICATIONS TW24-0128F
Fish Habitat Mitigation and Restoration Projects**

Submittal Deadline: 11:00 a.m., Pacific Time, Tuesday, July 16, 2024

Submittals must be received by the City's Procurement and Payables Division prior to 11:00 a.m. Pacific Time.

For electronic submittals, the City of Tacoma will designate the time of receipt recorded by our email, sendbid@cityoftacoma.org, as the official time of receipt. This clock will be used as the official time of receipt of all parts of electronic bid submittals. For in person submittals, the City of Tacoma will designate the time of receipt recorded by the timestamp located at the lobby security desk, as the official time of receipt. Late submittals will be returned unopened and rejected as non-responsive.

Submittal Delivery: Sealed submittals will be received as follows:

By Email:

sendbid@cityoftacoma.org

Maximum file size: 35 MB. Multiple emails may be sent for each submittal

Bid Opening: Submittals must be received by the City's Procurement and Payables Division prior to 11:00 a.m. Pacific Time. Sealed submittals in response to a RFB will be opened Tuesday's at 11:15 a.m. by a purchasing representative and read aloud during a public bid opening held at the Tacoma Public Utilities Administrative Building North, 3628 S. 35th Street, Tacoma, WA 98409, conference room M-1, located on the main floor. They will also be held virtually Tuesday's at 11:15 a.m. Attend [via this link](#) or call 1 (253) 215 8782. Submittals in response to an RFP, RFQ or RFI will be recorded as received. As soon as possible, after 1:00 PM, on the day of submittal deadline, preliminary results will be posted to www.TacomaPurchasing.org.

Solicitation Documents: An electronic copy of the complete solicitation documents may be viewed and obtained by accessing the City of Tacoma Purchasing website at www.TacomaPurchasing.org.

- [Register for the Bid Holders List](#) to receive notices of addenda, questions and answers and related updates.
- Click here to see a [list of vendors registered for this solicitation](#).

Pre-Proposal Meeting: A pre-proposal meeting will not be held.

Project Scope: Tacoma Water intends to award a consultant contract based on qualifications and abilities with direct experience in stream habitat analysis and fluvial geomorphology, extensive knowledge of anadromous salmonids and their habitat requirements, demonstrated ability in technical facilitation and stakeholder collaboration, and qualified river restoration design engineers.

Estimate: \$750,000.00 (For budgetary purposes only)

Paid Sick Leave: The City of Tacoma requires all employers to provide paid sick leave in accordance with State of Washington law.

Americans with Disabilities Act (ADA Information): The City of Tacoma, in accordance with Section 504 of the Rehabilitation Act (Section 504) and the Americans with Disabilities Act (ADA), commits to nondiscrimination on the basis of disability, in all of its programs and activities. Specification materials can be made available in an alternate format by emailing the contact listed below in the *Additional Information* section.

Title VI Information:

"The City of Tacoma" in accordance with provisions of Title VI of the Civil Rights Act of 1964, (78 Stat. 252, 42 U.S.C. sections 2000d to 2000d-4) and the Regulations, hereby notifies all bidders that it will affirmatively ensure that in any contract entered into pursuant to this advertisement, disadvantaged business enterprises will be afforded full and fair opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, national origin in consideration of award.

Additional Information: Requests for information regarding the specifications may be obtained by contacting Brandon Snow, Senior Buyer, by email to bsnow@cityoftacoma.org.

Protest Policy: City of Tacoma protest policy, located at www.tacomapurchasing.org, specifies procedures for protests submitted prior to and after submittal deadline.



Meeting sites are accessible to persons with disabilities. Reasonable accommodations for persons with disabilities can be arranged with 48 hours advance notice by calling 253-502-8468.

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REQUEST FOR QUALIFICATIONS

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SUBMITTAL CHECK LIST

This checklist identifies items to be included with your submittal. Any submittal received without these required items may be deemed non-responsive and not be considered for award.

Submittals must be received by the City of Tacoma Purchasing Division by the date and time specified in the Request for Qualifications page.

The following items make up your complete electronic submittal package (include all the items below):	
Signature Page (Appendix B)	
Statement of Qualifications (Section 10)	
After award, the following documents will be executed:	
City of Tacoma Contract (See sample in Appendix C)	
Certificate of Insurance and related endorsements (Appendix D)	

1. BACKGROUND

Tacoma Water, (the terms City, City of Tacoma, and Tacoma Water are synonymous and interchangeable in respect to this RFQ), and the U.S. Army Corps of Engineers (USACE) developed the Additional Water Storage Project (AWSP) to provide storage for Tacoma's municipal and industrial water supply. The AWSP was authorized in 1999, the same year Chinook salmon (*Oncorhynchus tshawytscha*) were listed as threatened under the Endangered Species Act (ESA). In response to the listing, Tacoma Water developed the Green River Habitat Conservation Plan¹ (HCP) in 2001 to continue exercising its water diversion rights and to secure ESA incidental take permits. While the AWSP incorporated several measures to protect ESA listed species, the details of these components are described in the AWSP Draft Feasibility Report and Environmental Impact Statement² (DFR/EIS). The most substantial measure was the downstream fish passage facility at Howard Hanson Dam (HHD) but also included fish habitat mitigation and ecosystem restoration projects.

Objectives for the fish habitat mitigation and ecosystem restoration projects were also developed as part of the DFR/EIS, detailed most comprehensively in Appendix F³. The objective of the fish habitat mitigation measures was to compensate for the area inundated by the AWSP. The objective of the fish habitat ecosystem restoration measures was to restore portions of habitat impacted during the original construction of HHD. These measures provided the basis to accomplish both fish habitat mitigation and ecosystem restoration, hereby referred to as fish habitat projects. By constructing these projects mitigation and ecosystem restoration objectives for the AWSP are met if the projects remain functional and meet project goals.

Tacoma Water and the USACE then signed the Project Cooperation Agreement (PCA) in 2003, which detailed responsibilities for the AWSP. Tacoma will ultimately be responsible for all costs associated with operating, maintaining, and monitoring the fish habitat projects under the direction of an Operation, Maintenance, Repair, Replacement, and Rehabilitation Manual (OMRR&R Manual).

The AWSP was thus implemented in a two-phased approach. In the first phase, baseline habitat surveys were conducted in 2005/2006, fish habitat projects were constructed between 2003 and 2010 (Figure 1), and the reservoir was raised in 2007. Baseline habitat surveys were intended to compare pre-AWSP conditions to specific fish habitat project objectives. However, the most substantial component, construction of the downstream fish passage facility at HHD, was suspended in 2011. Hence, the first phase was not completed, and Tacoma did not receive its full water allotment from the AWSP.

¹ [Habitat Conservation Plan](#)

² [AWSP Draft Feasibility Report and Environmental Impact Statement](#)

³ [AWSP Draft Feasibility Report and Environmental Impact Statement, Appendix F](#)

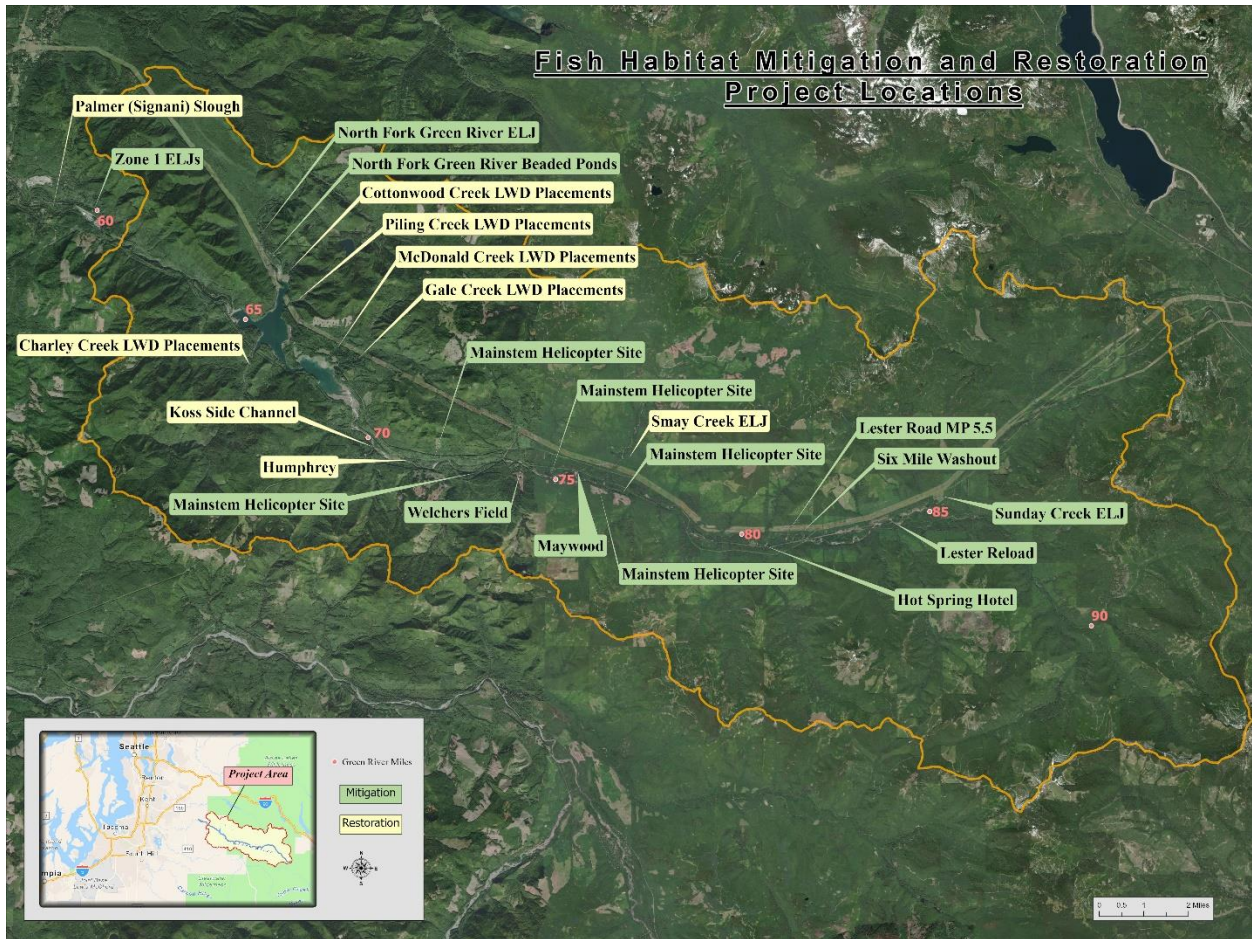


Figure 1. Upper Green River watershed and a sample of AWSP fish habitat mitigation and ecosystem restoration project locations (15 of 30 total projects). Fish habitat projects span approximately 25 miles of the mainstem Green River and 11 miles of its tributaries.

Without downstream fish passage at HHD the fish habitat projects do not benefit the intended species. Therefore, Tacoma Water sought to delay maintenance of the fish habitat projects until salmon are scheduled for reintroduction. Tacoma is required to monitor and maintain these projects to meet the goals and objectives described in an OMRR&R Manual; which remains in draft and the remaining projects are aging and beginning to decay beyond the simple repairs that were anticipated (Figure 2). However, due to the incomplete nature of the draft OMRR&R Manual (Appendix A) and the many changes made to the projects since the AWSP⁴ was implemented and HCP was published, details are lacking, and requirements may still be subject to change.

⁴ [AWSP Final Integrated Validation Report and Supplemental Environmental Impact Statement](#)



Figure 2. Fish habitat project known as an engineered log jam, located near river mile 85. Left picture taken soon after construction in 2005 (looking downstream), right picture after 10+ years of decay in 2017 (looking upstream).

Because the superseding 2019 Biological Opinion⁵ states HHD must have a permanent downstream fish passage facility built by 2030, Tacoma must begin considering how to meet fish habitat obligations under the AWSP by adaptively managing these projects before the OMRR&R Manual is finalized; using the present flexibility to determine how projects are maintained and how objectives are met. The overall goal is to meet Tacoma’s fish habitat obligations, but also to be good environmental and financial stewards of the upper Green River watershed. Information also needs to be collected in the right way to inform fish habitat project goal attainment using S.M.A.R.T. goals (Specific, Measurable, Achievable, Realistic, Time-bound). This may require reestablishing baseline conditions, but by precisely defining mitigation targets and ecosystem restoration goals, Tacoma’s measure of success will be clear. Tacoma recommends targets that are more holistic and independent of seasonal and annual variability while still being clearly defined, measurable, realistic, and beneficial, with a clear project ending. To meet Tacoma’s fish habitat obligations under the AWSP and maintain compliance with their incidental take permits, Tacoma must initiate the long-delayed maintenance of the fish habitat projects to complete the first phase of the AWSP and receive their full water allotment.

To learn more about the City of Tacoma, visit www.cityoftacoma.org. To learn more about Tacoma Water, visit www.mytpu.org.

2. PROJECT OBJECTIVES

To meet Tacoma’s fish habitat obligations an OMRR&R Manual, hereby referred to as O&M Manual, is necessary to detail how Tacoma will monitor and maintain these projects.

⁵ [NMFS Biological Opinion on HHD](#)

Tacoma Water intends to award a contract for fish habitat consulting and engineering services to develop an initial project-by-project mitigation and restoration plan consistent with the best available science, current conditions, and applicable regulating documents (i.e., PCA, 2001 Record of Decision⁶, DRF/EIS, and OMRR&R Policy Manual⁷). This preliminary plan will then be reviewed by the USACE, among other stakeholders, to provide guidance and modifications as necessary. Then a final draft of the O&M Manual will be written by the selected firm for the stakeholders to review and the USACE to ultimately approve for implementation.

Project success will be measured by the establishment and acceptance of an O&M Manual during the pre-design phase, as detailed in this solicitation. Followed by a secondary phase(s) with the execution of said manual including designing, permitting, constructing, and commissioning the projects. The secondary phase will be executed later with a separate or amended contract.

3. SUMMARY OF SCOPE OF SERVICES AND DELIVERABLES

Tacoma Water intends to select a consultant based on qualifications and abilities of the firm and key project individuals. Tacoma Water requires a firm with direct experience in stream habitat analysis and fluvial geomorphology, extensive knowledge of anadromous salmonids and their habitat requirements, demonstrated ability in technical facilitation and stakeholder collaboration, and qualified river restoration design engineers licensed in Washington State.

The contract will be limited to the pre-design phase but may be amended, as described below. The selected consultant will perform the following primary services:

- 1) Consultant will perform a document review and develop a conceptual framework to meet pre-design project objectives.
- 2) Support Tacoma Water staff during initial stakeholder engagement meeting(s) for introductions, consultations, and decision prompts.
- 3) Consultant will analyze existing information, survey present-day habitat conditions, assess the existing or remaining projects, and write a current conditions report.
- 4) With a detailed understanding of current conditions, consultant will develop an initial project-by-project mitigation and restoration plan, which will serve as consultant developed recommendations.
- 5) Consultant will develop conceptual designs based on selected recommendations and stakeholder input.

⁶ [AWSP Record of Decision](#)

⁷ [OMRR&R Policy Manual](#)

- 6) Consultant will draft a preliminary project-by-project O&M Manual consistent with the applicable regulating documents, stakeholder input, and current conditions which will serve as a habitat restoration strategy to meet mitigation and ecosystem restoration goals.
- 7) Support Tacoma Water staff during stakeholder consultation meeting(s).
- 8) Consultant will write a final O&M Manual.

Consultant deliverables include conceptual framework, proposal presentations, meeting minutes, current conditions or assessment reports, recommendations report, conceptual design drawings, prioritization/implementation strategy/schedule, cost estimates, alternatives analyses, preliminary O&M Manual, and final O&M Manual. These services are budgeted at approximately \$750,000. However, the final scope, deliverables, budget, and schedule will be negotiated with the selected consultant.

Additional services include engineering designs, construction permitting, and construction/commissioning support services. As well as providing training to Tacoma Water staff sufficient to implement the final O&M Manual. Construction is anticipated to start December 2026 but will be procured using a traditional design-bid-build approach. These additional services will be in an amended or separate contract and occur concurrently with downstream passage construction at HHD.

4. ANTICIPATED CONTRACT TERM

The contract is anticipated to have a three-year duration to carry the project to the design and permitting phase, with the intent to execute an amendment. The amendment will extend the contract for the additional services cited above prior to bidding for construction.

5. CALENDAR OF EVENTS

The following schedule has been established for the submission and evaluation of the Statement of Qualifications (SOQ) and selection of the Consultant. These are tentative dates only and the City reserves the right to adjust these dates at its sole discretion.

Contract may be issued after Public Utility Board and/or City Council approval.

The anticipated schedule of events concerning this Solicitation is as follows:

Publish and issue Solicitation:	6/20/2024
Pre-Submittal Questions:	7/1/2024
Response to Questions:	7/8/2024
Submittal Due Date:	7/16/2024
Submittal Evaluated, on or about:	7/30/2024
Interviews/presentations, on or about:	8/6/2024
Award Recommendation, on or about:	8/2024
Public Utility Board approval on or about:	9/2024

6. INQUIRIES

- 6.1 Questions should be submitted to Brandon Snow, Senior Buyer, via email to bsnow@cityoftacoma.org. Subject line to read:
TW24-0128F – Fish Habitat Mitigation and Restoration Projects – *VENDOR NAME*
- 6.2 Questions are due by 3 pm on the date included in the Calendar of Events section.
- 6.3 Questions marked confidential will not be answered or included.
- 6.4 The City reserves the discretion to group similar questions to provide a single answer or not to respond when the requested information is confidential.
- 6.5 The answers are not typically considered an addendum.
- 6.6 The City will not be responsible for unsuccessful submittal of questions.
- 6.7 Written answers to questions will be posted alongside the specifications at www.tacomapurchasing.org

7. DISCLAIMER

The City is not liable for any costs incurred by the Respondent for the preparation of materials, or a submittal submitted in response to this Solicitation, for conducting any presentations to the City, or any other activities related to responding to this Solicitation or related to the contract negotiation process.

8. EVALUATION CRITERIA

A Selection Advisory Committee (SAC) consisting of City staff and other stakeholders, as appropriate, shall independently evaluate the SOQ. The relative weight of each scoring criteria is indicated in the table below.

Criteria	Max Score
Firm Qualifications & Team Technical Knowledge (Section 10.1)	30
Project Approach & Understanding (Section 10.2)	25
Experience in Related Projects (Section 10.3)	35
Client References (Section 10.4)	5
Equity in Contracting (Section 10.5)	5
Total	100

After the evaluation, the SAC may conduct interviews of the most qualified Respondents before final selection.

- 8.1 The SAC will select one respondent to provide the services required.

- 8.2** The SAC may use references to clarify information in the submittals and/or interviews, if conducted, which may affect the final scoring. The City reserves the right to contact references other than those included in the submittal.
- 8.3** Part 1 of the evaluation process shall consist of the evaluation of the written SOQ package submitted by each Proposer and as a result, a short list of Proposers may be invited to interview with the SAC.
- 8.4** Part 2 of the evaluation process will evaluate the interviews, if conducted, to produce a final rating. The City reserves the right to select a consultant directly from the SOQs (Part 1 evaluation) without conducting an interview.

9. SOQ SUBMITTAL AND GENERAL GUIDELINES

The SOQ should be submitted in PDF format. The City recommends that the Proposer's SOQ submittals be limited to no more than 16 double-sided pages or 32 pages total (not including City of Tacoma required forms, front and back covers, and appendices specifically referenced).

10. CONTENT TO BE SUBMITTED

A full and complete response to each of the "CONTENT TO BE SUBMITTED" items is expected in a single location; do not cross reference to another section in your submittal.

Information that is confidential must be clearly marked and provide an index identifying the affected page number(s) and locations(s) of such identified materials. See Section 1 of the Standard Terms and Conditions – Solicitation 1.06 for Public Disclosure: Proprietary or Confidential Information.

Respondents are to provide complete and detailed responses to all items below. Submittals that are incomplete or conditioned in any way that contain alternatives or items not called for in this RFQ, or not in conformity with law, may be rejected as being non-responsive. The City will not accept any submittal containing a substantial deviation from the requirements outlined in this RFQ.

Submittals should present information in a straightforward and concise manner, while ensuring complete and detailed descriptions of the respondent's/team's abilities to meet the requirement of this RFQ. Emphasis will be on completeness of content.

The City reserves the right to request clarification of any aspect of a firm's submittal or request additional information that might be required to properly evaluate the submittal. A firm's failure to respond to such a request may result in rejection of the firm's submittal. Firms are required to provide responses to any request clarification within three business days.

Requests for clarification or additional information shall be made at the sole discretion of the City. The City's retention of this right shall no way diminish a Proposer's responsibility to submit a submittal that is current, clear, complete, and accurate.

10.1 Firm Qualifications & Team Technical Knowledge – 30 points

Please describe the consulting team to be assigned to this project, including names with titles, technical qualifications, and general project responsibilities. Include the following:

- Project manager background and experience related to this project
- Key team members expected to make contributions to this project
- Provide an organization chart for the team including any subconsultants
- Identify which office(s) the project will be delivered from and its location
- Provide a statement that conveys the firm's commitment to actively perform the proposed work (additional services included) and the ability of all project personnel for completing the project in view of the firm's current and projected workload
- Individual resumes for all team members as an appendix

10.2 Project Approach & Understanding – 25 points

Please summarize the firm's understanding of the project, including primary and additional services that will need to be completed to meet Tacoma Water's objectives and fish habitat requirements. Describe the following:

- Respondent's understanding of the key issues to be addressed in this project and potential approaches to address them including any proposed activities, methodologies, tools, or tasks the Respondent would like Tacoma to be aware of
- Availability of the firm and sufficient resources to perform all the services
- Availability of the project manager and key team members

10.3 Experience in Related Projects – 35 points

Please provide five examples of related projects the firm has successfully completed. At least three of the examples should involve assessments of riverine habitat conditions specific to anadromous salmonids, fish habitat restoration planning and conceptual design with a primary focus on large wood projects, development of fish habitat project maintenance and monitoring methodology, and/or stakeholder engagement/collaboration. At least two of the examples should involve fish habitat project design, permitting, and/or construction/commissioning support services. For each example, include the following:

- General description
- Name and contact information of the client
- Project location
- Start and completion dates
- Services provided
- Any key similarities to Tacoma Water's Fish Habitat Mitigation and Restoration Projects
- Involvement of the individuals proposed for this project team and their roles on the example project

10.4 Client References – 5 points

References shall be used to verify the accuracy of the information provided by the Respondent in project experience, which may affect the rating of the Respondent. The City reserves the right to contact references other than those submitted by the Proposer.

10.5 Equity in Contracting – 5 points

Proposed teams with certified [Washington State Office of Minority & Women's Business Enterprises](#) will receive five points, these include the following categories:

- Disadvantaged Business Enterprise (DBE)
- Minority Business Enterprise (MBE)
- Minority/Women Business Enterprise (MWBE)
- Small Business Enterprise (SBE)
- Women Business Enterprise (WBE)

11. INTERVIEWS / ORAL PRESENTATIONS

An invitation to interview may be extended to Respondents based on SAC review of the written submittals. The SAC reserves the right to adjust scoring based on additional information and/or clarifications provided during interviews. The SAC may determine additional scoring criteria for the interviews following evaluation of written submittals.

The City reserves all rights to begin contract negotiations without conducting interviews.

Respondents must be available to interview within five business days' notice.

If interviews are conducted, the SAC will schedule the interviews using the email address for communications provided on the signature page. Additional interview information will be provided at the time of invitation. At this time, it is anticipated that the main objective of the interview will be for the SAC to meet the project manager and key personnel that will have direct involvement with the project and hear about their relevant experience and expertise. The City does not intend to meet with firm officials unless they are to be directly involved with the project.

12. RESPONSIVENESS

12.1 Respondents agree their submittal is valid until a contract(s) has been executed.

12.2 All submittals will be reviewed by the City to determine compliance with the requirements and instructions specified in this Solicitation. The Respondent is specifically notified that failure to comply with any part of this Solicitation may result in rejection of the submittal as non-responsive. The City reserves the right, in its sole discretion, to waive irregularities deemed immaterial.

12.3 The final selection, if any, will be that submittal which, after review of submissions and potential interviews, in the sole judgement of the City, best meets the requirements set forth in this Solicitation.

13. CONTRACT OBLIGATION

The selected Respondent(s) will be expected to execute a Contract with the City. At a minimum, any contract will incorporate the contents of this specification, including all stated services or deliverables and other requirements and the City of Tacoma Standard Terms and Conditions, together with the contents of Respondent's submittal. The submittal contents of the successful Respondent will become contractual obligations.

14. FORM OF CONTRACT

In event the City's Services Contract or other City Contract template is attached to this RFQ as a sample form of Contract, the City expects to utilize the Terms and Conditions contained in the sample form of Contract. Respondents may also propose to utilize their own form of Contract. Post award negotiation may occur at the discretion of the City.

City, at its sole option, will decide whether to engage in negotiation on any or all proposed exceptions. City reserves sole discretion to determine the final form of Contract that will be used.

15. STANDARD TERMS AND CONDITIONS

City of Tacoma [Standard Terms and Conditions](#) apply.

16. INSURANCE REQUIREMENTS

Successful Respondent will provide proof of and maintain the insurance coverage in the amounts and in the manner specified in the City of Tacoma Insurance Requirements contained in this solicitation – Appendix D.

17. PARTNERSHIPS

The City will allow Respondents to partner in order to respond to this Solicitation. Respondents may team under a Prime Respondent's submittal in order to provide responses to all sections in a single submission; however, each Respondent's participation must be clearly delineated by section. The Prime Respondent will be considered the responding vendor and the responsible party at contract award. Any contract negotiations will be conducted only with the Prime Respondent. All contract payments will be made only to the Prime Respondent.

Any agreements between the Prime Respondent and other companies will not be a part of the agreement between the City and the Prime Respondent.

18. COMMITMENT OF FIRM KEY PERSONNEL

The Respondent agrees that key personnel identified in its submittal or during contract negotiations as committed to this project will, in fact, be the key personnel to perform during the life of this contract. Should key personnel become unavailable for any reason, the selected Respondent shall provide suitable replacement personnel, subject to the approval of the City. Substantial organizational or personnel changes within the agency are expected to be communicated immediately. Failure to do so could result in cancellation of the Contract.

19. AWARD

Awardee shall be required to comply with [2 CFR Part 25](#) and obtain a unique entity identifier and/or be registered in the System for Award Management as appropriate.

After the Respondent is selected by the SAC and prior to award, all other Respondents will be notified via email by the Purchasing Division.

Once a finalist has been selected by the SAC, contract negotiations with that finalist will begin, and if a contract is successfully negotiated, it will, if required, be submitted for final approval by the Public Utility Board and/or City Council.

20. SCOPE, BUDGET, AND SCHEDULE

The selected Proposer will meet with the City to review the project scope and timeline. Based on the meeting, the selected Proposer shall submit a draft scope, budget, and project schedule to the City within five (5) business days or as directed by the City's Project Manager. The scope and budget shall include an itemized list of tasks and include estimated hours for the proposed work. The budget shall be supported by a list of hourly rates for personnel to be utilized under this contract.

21. ENVIRONMENTALLY PREFERABLE PROCUREMENT

In accordance with the [City's Sustainable Procurement Policy](#) and [Climate Action Plan](#), it is the policy of the City of Tacoma to encourage the use of products or services that help to minimize the environmental and human health impacts of City Operations. Respondents are encouraged to incorporate environmentally preferable products or services that have a lesser or reduced effect on human health and the environment when compared with competing products or services that serve the same purpose. This comparison may consider raw materials acquisition, products, manufacturing, packaging, distribution reuse, operation, maintenance or disposal of the product or service.

The City of Tacoma encourages the use of sustainability practices and desires any awarded contractor(s) to assist in efforts to address such factors when feasible for the following:

- Durability, reusability, or refillable
- Pollutant releases, especially persistent bioaccumulative toxins (PBTs), low volatile organic compounds (VOCs), and air quality and stormwater impacts

- Toxicity of products used
- Greenhouse gas emissions, including transportation of products and services, and embodied carbon
- Recycled content
- Energy and water resource efficiency

22. PROPRIETARY OR CONFIDENTIAL INFORMATION

The Washington State Public Disclosure Act ([RCW 42.56 et seq.](#)) requires public agencies in Washington make public records available for inspection and copying unless they fall within the specified exemptions contained in the Act, or are otherwise privileged. Documents submitted under this RFP shall be considered public records and, with limited exceptions, will be made available for inspection and copying by the public.

Information that is confidential or proprietary must be clearly marked. Further, an index must be provided indicating the affected page number(s) and location(s) of all such identified material. Information not included in said index will not be reviewed for confidentiality or as proprietary before release.

23. ADDENDUMS

In the event it becomes necessary to revise any part of this RFQ, an addendum will be posted alongside specifications at www.tacomapurchasing.org.

Failure to acknowledge addendum(s) on the required Signature Page may result in a submittal being deemed non-responsive by the City.

APPENDIX A

Draft OMRR&R Manual

DRAFT

**Operation, Maintenance, Repair,
Replacement, and Rehabilitation Manual**

Howard Hanson Dam Additional Water Storage Project
Habitat Restoration and Mitigation Projects
King County, Washington

December 2012



**US Army Corps
of Engineers®**
Seattle District

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Executive Summary



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Appendices

Appendix A. As-Built Information

Wildlife?

Zone 1 Engineered log jams

2005 Stream habitat mitigation and Humphrey restoration projects

2005 Reservoir tributary restoration

2006 Stream habitat mitigation projects

2009-10 Stream habitat restoration projects

Appendix B. Project Cooperation Agreement

Appendix C. Design Documentation Report 2005

Appendix D. Design Documentation Report 2006

Include contract plans and specs?

2006 Flood Report

1. GENERAL

The Howard Hanson Dam (HHD) Additional Water Storage Project (AWSP) is a dual-purpose water supply and ecosystem restoration project that is being implemented in two phases. The local sponsor for the project is the city of Tacoma. Phase I includes 20,000 acre-ft of new water storage behind HHD for Tacoma up to a reservoir elevation of 1167 ft, associated habitat mitigation, and a suite of habitat restoration projects. Phase II includes additional water storage of 12,000 acre-ft and associated habitat mitigation. Phase II, if executed, will occur sometime in the future and is not addressed in this manual. AWSP project commitments are governed by the Record of Decision signed July 25, 2001 (Appendix A).

AWSP habitat related projects include 1) fish passage facility, 2) flow adjustments 3) habitat mitigation measures, 4) and environmental restoration features. The focus of this manual is the habitat mitigation measures and environmental restoration features. The habitat mitigation measures are further subdivided into phase one and phase two mitigation. This manual only addresses the phase one mitigation which is tied to water storage from 1147 to 1167 feet. Phase two water storage from 1167 to 1177 feet includes additional habitat mitigation that would be developed if the phase two project were implemented.

The purpose of this manual is to address Operation, Maintenance, Repair, Replacement, and Rehabilitation (OMRR&R) requirements for fish and wildlife habitat mitigation and restoration projects constructed under Phase I of the AWSP that are to be turned over to the local sponsor for O&M. Three of the original AWSP restoration projects including a downstream fish passage facility, annual gravel nourishment, and annual large wood supplementation were separated from the broader AWSP after Chinook salmon were listed under the Endangered Species Act in 1999. These projects are now considered 100% federal projects that are operated and maintained by the Corps. They are therefore not addressed in this manual.

The purpose of the mitigation projects is to offset impacts to habitat lost by flooding streams and wildlife areas around the reservoir as a result of storing the additional water. The purpose of the habitat restoration projects is to improve habitat conditions initially impacted by the original construction of the dam (USACE 1998). Specific project purposes and objectives are detailed more fully in the sections below.

In 2000, the Corps and Tacoma signed a PCA for the Howard Hanson Dam Section 1135 Fish and Wildlife Restoration Project. The OMRR&R manual for that project discusses the AWSP and the relationship between the two projects. The manual states:

It is anticipated that beginning in 2006, the Howard Hanson Dam (HHD) reservoir will be raised an additional 20 feet under the Corps/City of Tacoma's Additional Water Storage Project (AWSP). This action will effectively negate or significantly alter all of the efforts undertaken for

the HHD 1135. Because of this change in operation, the City of Tacoma will only be responsible for the O&M of the HHD 1135 project until the AWSP becomes fully operational. At that time, all O&M requirements for the HHD 1135 will either be nullified or included into the AWSP's Restoration O&M plan based on negotiations between the Corps and the City of Tacoma at that time. If the AWSP does not become fully operational, then the City of Tacoma will be responsible for continuing O&M as specified in this document.

This AWSP OMRR&R manual absorbs the section 1135 projects and details future maintenance requirements.

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2. AUTHORIZATION

The AWSP was authorized in the Water Resources Development Act of 1999 as a dual purpose water supply and ecosystem restoration project. A Record of Decision for the project was signed by the Corps in 2001. Funds were first appropriated for construction in 2002. A Project Cooperation Agreement (PCA) was signed with the local project sponsor, the city of Tacoma, in 2003. The project life is 50 years.

The first habitat project was constructed in 2003. Mitigation projects were largely completed by 2007. Habitat restoration projects were completed by 2010. Water was first stored at HHD for water supply in 2007.

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3. LOCATION

HHD is located in southeast King County on the Green River near Ravensdale, Washington. The dam is located at river mile (RM) 64.5 in Section 28, Township 21 North, Range 8 East, Willamette Meridian. The dam lies within the city of Tacoma municipal watershed and access to much of the over 220 square miles of watershed above HHD is closed to the public. From RM 64.5, the Green River flows west and north from the Cascade Mountains to join with the Black River to form the Duwamish River at RM 12. The Duwamish River then empties into Puget Sound 12 miles downstream at Elliott Bay. The Tacoma Headworks Dam is located at RM 61.

Fish habitat projects (also referred to as stream habitat projects) were constructed throughout the Tacoma municipal watershed both around Eagle Gorge Reservoir and further upstream. One project extends beyond the watershed boundary gate to Tacoma lands along Sunday Creek and upper sections of the Green River. Two projects occur downstream of the Tacoma watershed gate. Table 3-1 and Figure 3-1 provide a summary of individual projects and their location.

Wildlife mitigation projects were constructed within the vicinity of Eagle Gorge Reservoir.
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Note that both stream and wildlife mitigation projects have riparian habitat components. Section 6. describes individual project objectives and more detailed descriptions.

Table 3-1. Summary of stream habitat projects and general location

Site name	FR/EIS project #	Location	Year completed
<u>Stream Mitigation Projects</u>			
Zone 1 log jams	TR-01	Green RM 60	2003
Reservoir fish islands	MS-02	Reservoir	2008
Reservoir riparian vegetation	MS-02	Reservoir	2007
North Fork Ponds	VF-05	North Fork RM 1.7	2005
Upper North Fork	TR-09	North Fork RM 2.5	2005
Reservoir railroad breaches	TR-05	Eagle Gorge Reservoir	2006
Lower McDonald Creek	TR-05	McDonald Cr RM 0 - 0.2	2006
McDonald Creek culvert	TR-10	McDonald Cr RM 0.4	2005
McDonald Creek bridge	TR-10	McDonald Cr RM 0.6	2005
Gale Creek bridge	TR-05	Gale Ck RM 0.8	2005
Sweeney Creek	MS-08	Green RM 72.8	2005
Welchers Field	MS-08	Green RM 74.4	2005
Maywood	MS-08	Green RM 75.9 - 76.1	2005
Nagrom	MS-08	Green RM 77.8	2005
Hot Springs	MS-08	Green RM 80.9 - 81.2	2005
MP 5.5	MS-08	Green RM 81.6 - 81.8	2005
Six mile washout	MS-08	Green RM 82.3 - 82.4	2005
Reload	MS-08	Green RM 84.7 - 85.1	2005
Mainstem helicopter	MS-04	Green RM 71.4 - 77.2	2006
Green R. riparian buffer	MS-08	Green RM 71.3 - 87	2005
Green R. riparian thinning	MS-08		2005
Green R. riparian planting	MS-08	Green RM 74.4, 80.9	2005
East Maywood Cr bridge	TR-10	East Maywood Cr RM 0.4	2005
Sunday Creek sites 1-8	MS-04	Sunday Cr RM 0.1 - 2.1, Green RM 86.4 - 87.2	2006
<u>Stream Restoration Projects</u>			
Palmer (Signani) Slough	VF-04	Green RM 59	2009
Cottonwood Creek LWD	TR-07	Cottonwood Cr 0.5 - 0.7	2005
Piling Creek LWD	TR-07	Piling Cr RM 0.4 - 0.5	2005
Charley Creek LWD	TR-07	Charley Cr RM 0.7 - 1.0	2005
McDonald Creek LWD	TR-07	McDonald Cr RM 0.3 - 0.7	2005
Gale Creek LWD	TR-07	Gale Cr RM 0.5 - 0.9	2005
Koss side channel	MS-03	Green RM 70.0 - 70.5	2010
Humphrey	MS-03	Green RM 71.0 - 71.6	2005
Smay Creek	TR-06	Smay Cr RM 0.5 - 1.5	2010

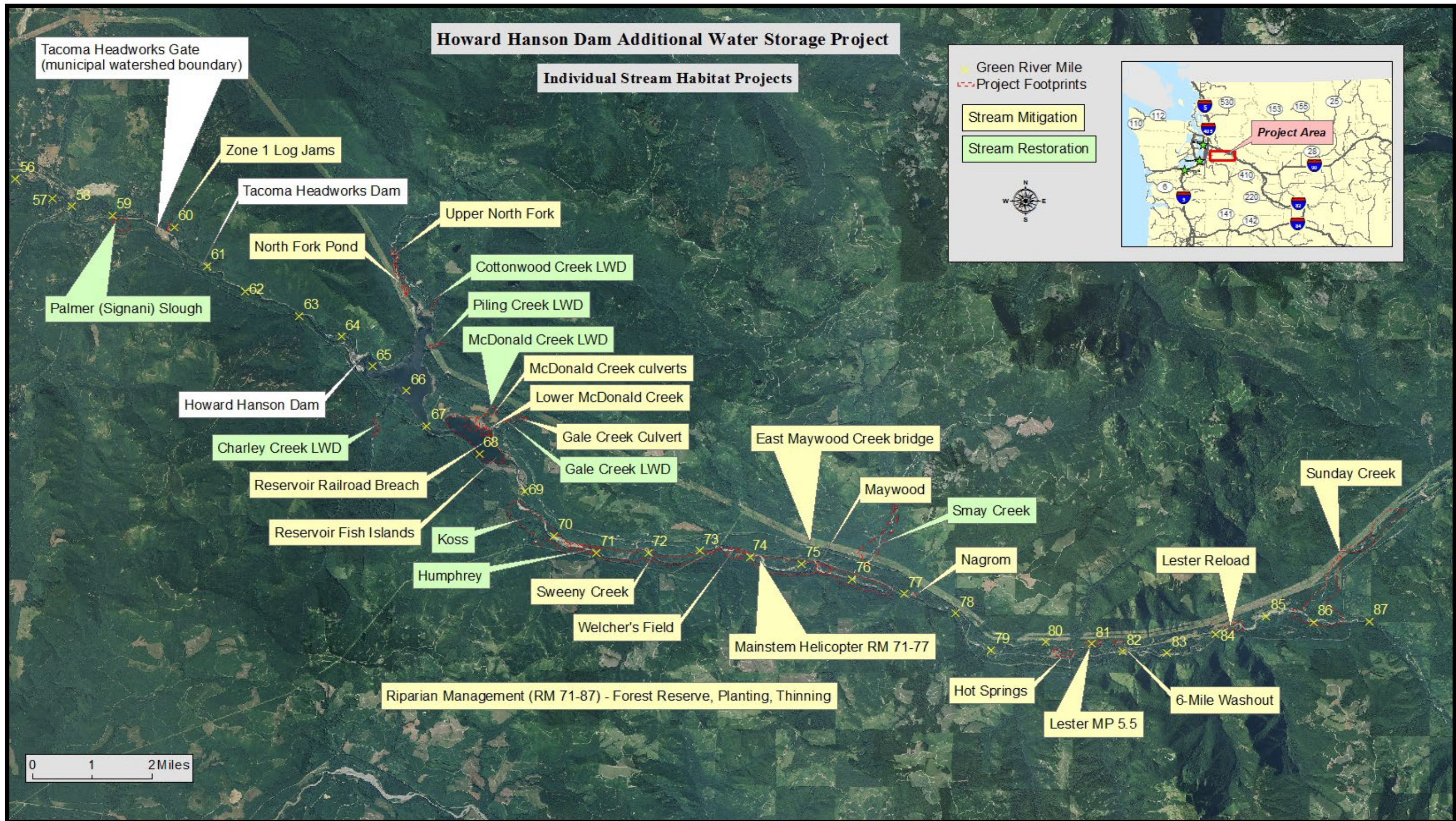


Figure 3-1. Location of stream habitat projects

Table 3-2. Summary of wildlife habitat projects and general location

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Figure 3-2. Location of wildlife habitat projects

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4. PERTINENT INFORMATION

4.1. Historical Data

Detailed historical information about the area including historical activity and hydrologic data is contained in various designs reports that are attached as appendices. [archaeologist?]

Detailed information regarding the hydrological characteristics of the project area can be found in the project design memoranda (appendix B). The following summary is excerpted from the HHD water control manual.

4.2. Watershed Characteristics

The Green River basin has a total drainage area of 483 square miles. The river flows westward about 60 miles from its headwaters south of Stampede Pass to the City of Auburn, then turns and flows northwestward 20 miles to the confluence of the Black River where it becomes known as the Duwamish River. The Duwamish continues northwestward about 11 miles and enters Elliott Bay. The drainage basin above HHD is about 221 square miles. From its headwaters to the project, the Green River flows through steep mountain valleys with forested slopes.

4.2.1. Topography

Elevations along the eastern boundary of the basin range from 3,500 feet to 5,750 feet. Along the northern and southern boundaries of the basin, altitudes range from over 5,000 feet at the eastern end to about 3,000 feet at a north-and-south line in the vicinity of Palmer. This upper portion of the basin is characterized by sharply incised valleys and prominent ridges. To the west, the boundaries are at a much lower elevation, seldom exceeding 1,000 feet and generally below 500 feet.

4.2.2. Climate

a. General. The Green River basin lies on the west side of the Cascade Range approximately 100 miles east of the Pacific Ocean. Westerly air currents from the ocean prevail in these latitudes, bringing the region considerable moisture, cool summers, and comparatively mild winters. Climate throughout the basin varies markedly due to topography. Major storm activity occurs during the fall and winter when the basin is subject to rather frequent, heavy frontal rains associated with cyclonic disturbances from the Pacific Ocean. During the summer months, weather is relatively warm and dry due to decreased activity of the semi-permanent Aleutian low

and increased moisture-bearing capacity of incoming marine air as it is warmed by passage over land.

b. Temperature. Normal annual temperatures for stations in or near the basin range from 4.3°Celsius (°C) (39.8°Fahrenheit (°F)) at Stampede Pass to 11.0°C (51.8°F) at Seattle Tacoma WSCMO AP. Normal monthly temperatures for four representative stations are presented in Table 4-2.2.

Table 4-1. Normal monthly temperature (°F) (1971-2000)

Month	STATIONS			
	Stampede Pass WSCMO Elevation 3,958 Feet	Palmer 3ESE Elevation 920 Feet	Seattle Tacoma WSCMO AP Elevation 450 Feet	Howard A. Hanson Dam ^{1/} Elevation 1,206 Feet
Jan	25.9	37.6	40.9	35.6
Feb	28.2	40.1	43.3	37.5
Mar	32.3	42.9	46.2	40.2
Apr	36.9	46.9	50.2	44.4
May	43.1	52.4	55.8	50.3
Jun	49.4	57.1	60.7	55.1
Jul	56.1	62.0	65.3	60.6
Aug	57.0	62.7	65.6	60.3
Sep	51.7	58.4	61.1	56.2
Oct	42.6	50.5	52.7	48.0
Nov	30.7	42.1	45.2	39.6

Dec	25.8	37.6	40.7	35.0
Annual	40.0	49.2	52.3	46.9

^{1/} Temperature recorded at Howard A. Hanson Dam for period 1982 to 2000.

c. Precipitation. In the Green River basin, precipitation is a function of location and elevation and varies greatly over the basin. Normal annual precipitation ranges from less than 36 inches near the mouth of the river to more than 124 inches along the highest elevations of the basin divide. Normal annual basin precipitation above Auburn and at Howard A. Hanson Dam is 76 and 86 inches respectively. Approximately 75% of the annual amount falls during the 6-month period October through March. Mean monthly precipitation for stations in the basin varies from 0.75 inches) for July at Seattle Tacoma WSCMO AP to 13.79 inches for December at Stampede Pass WSCMO. The maximum precipitation recorded for one month is 33.96 inches at Palmer 3ESE in December 1933. A maximum of 8.34 inches in 24 hours has been recorded at Stampede Pass WSCMO in November 2006. Normal monthly precipitation for four representative stations in the basin is presented in Table 4-2.

Table 4-2. Normal monthly precipitation in inches (1971-2000)

Month	Stations			
	Stampede Pass WSCMO Elevation 3,958 feet	Palmer 3ESE Elevation 920 feet	Seattle Tacoma WSCMO AP Elevation 450 feet	Howard A. Hanson Dam Elevation 1,206 feet
Jan	12.47	10.86	5.13	12.20
Feb	8.95	9.01	4.18	9.39
Mar	7.35	8.69	3.75	8.32

Apr	5.69	7.41	2.59	6.87
May	4.32	6.03	1.78	5.33
Jun	3.98	5.12	1.49	4.55
Jul	1.86	2.96	0.79	2.20
Aug	2.20	2.69	1.02	2.33
Sep	4.16	4.28	1.63	4.14
Oct	6.45	6.76	3.19	7.56
Nov	12.84	12.01	5.90	12.90
Dec	13.88	10.99	5.62	12.12
Annual	84.15	86.81	37.07	87.90

d. Snowfall. Snowfall amounts in the Green River basin are dependent upon elevation and distance from the modifying influence of Puget Sound. Mean annual snowfall varies from 4.7 inches at Kent to 439.3 inches at Stampede Pass WSCMO, which recorded a maximum amount of 704.5 inches during the winter of 1971-1972. Snow surveys have been made in the basin since 1940. There are four active snow pillows in the basin.

4.2.3. Storms and Floods

Flood producing storms occur chiefly from late fall through winter and occasionally in early spring. The sharp increase in frequency, duration, and severity of storms in late fall is a result of a southward displacement and renewed activity of the semi-permanent Aleutian low-pressure system. Frequently, a series of waves develops along the polar front. As the waves move landward, the unstable, moist air masses are orographically lifted by the mountains. This results in general, often heavy, precipitation that increases with elevation. All general winter storms of the Northwest are of this one basic type, having similar origins, air mass trajectories, and a moisture source in the Pacific Ocean.

All events that had, or would have had under natural conditions, flows in excess of the bank-full capacity of 12,000 cfs are considered to be floods. A flow in excess of 12,000 cfs has occurred in each of the months from October through April. The largest floods have occurred only in the period November through February. In less than 18 hours, the main river can rise from base flow stage to flood stage with very little advance warning aside from weather forecast information. The maximum instantaneous flow is generally 20-30% greater than the maximum daily flow. The largest recorded flood peaks in the Green River basin occurred in December 1933, December 1946, and November 1959 before regulation began at the dam (Table 4-3). Upper Green River flood frequencies are illustrated in Table 4-4.

Table 4-3. Peak discharges in the Green River (ft³/sec)

Station	1933	1946	1959	1975	1977	1996	2009
Green River near Palmer	21,700	23,300	27,800	24,200 ^{1/}	36,200 ^{1/}	29,300 ^{1/}	30,780 ^{1/}
Green River near Auburn	24,000	21,900	28,100	26,200 ^{1/}	37,800 ^{1/}	33,800 ^{1/}	37,010 ^{1/}

^{1/} Estimated natural flood peak

Table 4-4. Upper Green River Flood Frequencies (from 2006 DDR Appendix B1)

RECURRENCE INTERVAL	EXCEEDENCE FREQUENCY	HAH DAM INFLOW FFQ 1932-1998 (RM 65/220 mi2) ¹	NR LESTER #12104500 FFQ 1946-1990 (RM 80/96 mi2) ²	NORTH FORK GREEN R NR LEMOLO #121010570 FFQ 1957-1987 (16.7 mi2) ³
1-YR	99%	2800	1200	237
2-YR	50%	12000	4700	1090
5-YR	20%	17200	8600	1710
10-YR	10%	22000	11600	2140
25-YR	4%	27000	16800	2560
50-YR	2%	33000	21000	3130
100-YR	1%	39000	26000	3570

4.2.4. Runoff Characteristics

The heaviest rainfall and, consequently, the highest runoff generally occurs during the winter storm season from November through March. Runoff during this period is characterized by frequent sharp peaks of short duration. However, peaks may be separated by periods of relatively low flow when temperatures drop and precipitation falls as snow. Intense winter rainstorms with warm winds and occasional accompanying snowmelt cause the river to swell from relatively low flow to flood levels within 24 to 36 hours. After a storm has passed, flows generally recede relatively rapidly. In April, heavy winter rains begin to abate, temperatures rise, and runoff is generally due to a combination of rainfall and snowmelt. Spring runoff is characterized by peaks that are generally smaller in magnitude than rainflood peaks, but can be of much longer duration. Generally by late May or June the snowpack is depleted and flows recede rapidly, reaching minimum flow during August or September. The unusually low minimum flow of the Green River upstream of Howard A. Hanson Dam reflects the absence of storage in glacial ice and the meager contribution from ground water. The locations of streamgaging stations in the basin, together with their periods of record, are shown on Table 4-5.

Although the drainage area increases from 230 square miles for the streamgaging station Green River near Palmer (near Palmer) to 399 square miles for the station Green River near Auburn (near Auburn), an increase of 73%, the average annual runoff volume increases only 20%. The lower incremental runoff downstream of Palmer is reflective of the lower precipitation in the lower basin. Mean annual flow near Palmer varied from 511 cfs to 1,504 cfs during the period of record from 1913 to 1962. Extremes of discharge recorded were a maximum of 27,800 cfs in November 1959 and a minimum of 81 cfs in September 1934. A summary of streamflow data is presented in Table 4-5 for the gages on the Green River near Lester, below Howard A. Hanson Reservoir, and near Auburn. Table 4-6 lists mean monthly flows for these same stations.

Table 4-5. Summary of streamflow data (ft³/sec)

Stream	Station Location	Drainage Area	Period of Record	Annual Runoff			Extreme Discharge		
		Mi ²		Mean	Max	Min	Max Inst.	Max Daily	Min Daily
Green River	near Lester	96.2	1946 - 1993	381	588	219	22,000	15,000	20
Green River	near Palmer	230	1931 - 1961 ^{1/}	1,100	1,504	511	27,800	19,100	81
Green River	at purification plant near Palmer	231	1964 - 2009 ^{2/}	946	1,562	573	12,500	10,900	20
Newaukum Creek	near Black Diamond	27.4	1944 - 1949, 1952 - 2009	58.6	85.9	33.7	2,640	1,670	8.3
Big Soos Creek	above Hatchery near Auburn	66.7	1960 - 2009	123	195	63.5	4,200	3,580	18
Green River	near Auburn	399	1936 - 1961 ^{1/}	1,346	1,783	662	28,100	21,400	81
Green River	near Auburn	399	1962 - 2009 ^{2/}	1,331	2,071	785	12,400	11,600	152

^{1/} Natural flows

^{2/} Regulated Flows

Table 4-6. Mean monthly streamflow data (ft³/sec)

Stream	Station Location	Period	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Green River	near Lester	1946 – 1993	153	421	532	480	449	393	623	771	471	155	65	70
Green River	near Palmer	1931 - 1961 ^{1/}	624	1,454	1,793	1,476	1,291	1,270	1,659	1,682	1,869	419	199	247
Green River	at purification plant near Palmer	1964 - 2009 ^{2/}	473	1,280	1,480	1,620	1,400	1,140	1,290	1,270	716	314	161	238
Newaukum Creek	near Black Diamond	1944 - 1949, 1952 – 2009	24	65	95	115	101	87	68	48	39	26	20	19
Big Soos Creek	above Hatchery near Auburn	1960 – 2009	41	113	204	256	233	199	151	97	69	43	32	32
Green River	near Auburn	1936 - 1961 ^{1/}	646	1,621	2,185	1,832	1,936	1,640	2,039	1,950	1,280	533	252	288
Green River	near Auburn	1962 - 2009 ^{2/}	638	1,640	2,080	2,350	2,050	1,690	1,780	1,610	1,000	520	308	376

^{1/} Natural flows

^{2/} Regulated Flows

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5. CONSTRUCTION HISTORY

Fish and wildlife projects were constructed over a period of seven years extending from 2003 to 2010. Table 5-1 and Table 3-2 indicate the year individual projects were constructed. The Corps and Tacoma shared responsibility for project design. Initial designs were developed and presented in a Conceptual Design Report (CDR) (HDR 2000). In some cases, particularly for the stream habitat projects, substantial design modification from the CDR occurred due to concerns about feasibility and cost.

The Corps and Tacoma shared the construction responsibility for the stream habitat projects while Tacoma was responsible for constructing the wildlife projects. Stream habitat projects constructed by Tacoma included the replacement of three culverts with bridges (McDonald, Gale, and East Maywood Creeks), removal of a second culvert along McDonald Creek, and the reservoir fish islands. Tacoma was also responsible for implementing the riparian buffer along the Green River. The Corps constructed the remaining stream habitat projects through contracts summarized in Table 5-1.

[Insert table with contract names, contract no, dates of work, contractor, CO, RE, and total cost]

Table 5-1. Stream habitat construction contracts administered by the Corps

Contract Title	Contract #	Construction period	Type of solicitation	Contractor	Corps Contracting officer	Contract cost	Notes
Green River Fish Habitat Restoration Pilot Project Zone 1	rental equipment, DACA67-02-D-2009 delivery order 7	August 2003	rental equipment, AE task order	Corps rental equipment Tetra Tech, Inc. & GeoEngineers		\$385,654	Zone 1 ELJs constructed by combination of Corps rental equipment contract and A-E contract for construction oversight. Work included ELJs and gravel nourishment. Costs represent ELJs only.
Green River Fish Habitat Restoration Pilot Project Zone 1	W912DW-04-C-0013	August - September 2004	Invitation for bid (IFB)	CDM Constructors Inc.	Sharon Gonzalez	\$407,923	Contract included ELJ retrofit, Maywood test pile project, and gravel nourishment. Costs reflected in table are for the ELJ retrofit and test pile project only.
2005 Howard Hanson Dam AWSP Fish Habitat Rehabilitation Project	W912DW-05-C-0015	July - October 2005	IFB	CDM Constructors Inc.	Sharon Gonzalez	\$1,172,344	
2005 Howard Hanson Dam AWSP Fish Habitat Rehabilitation - Helicopter LWD Project	W912DW-06-P-0008	October 2005		Columbia Helicopters, Inc.		\$55,700	
2006 Howard Hanson Dam AWSP Habitat Rehabilitation Project	W912DW-06-C-0021	September - November 2006	IFB?	CDM Constructors Inc.	Kevin Mulvihill	\$863,994	
Howard Hanson Dam Additional Water Storage Project 2009 Fish Habitat Restoration	W912DW-09-C-0014		IFB	BCI Contracting, Inc.	Sharon Gonzalez	\$1,553,761	

Construction of wildlife mitigation projects

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6. PROJECT PERFORMANCE

This section provides a summary of each individual project, project goals, and pertinent design and construction information. This data is summarized in several tables xx-xx. All project numbers are referenced to the project Feasibility Report and EIS (Corps 1998).

6.1. Objectives

The purpose of all mitigation projects is to offset habitat impacts associated with 20,000 acre-feet of water storage for Phase I of the AWSP. These impacts, the justification for mitigation, and the scope of the mitigation are detailed in the draft AWSP Feasibility Report and EIS (DFR) (Corps 1998). This document should be referenced for more detail. In summary, the FR required xx wildlife habitat units, 11.5 stream habitat units, and 78.2 riparian habitat units of mitigation for Phase I of the AWSP. A habitat unit is uniquely defined for individual projects or project types in the Feasibility Report.

6.1.1. Wildlife mitigation

[Rhonda]

6.1.2. Riparian and Stream mitigation

Objectives and conceptual designs for the riparian stream habitat mitigation were developed as part of the DFR in 1998. Section 4.7.3 (pages 137 to 142) of the DFR describes the mitigation projects. More detailed project objectives and can be found in Appendix F1 of the DFR on pages F1-536 and F1-537 of Appendix F1. This information is summarized in Table 6-1 below. For each project, there was generally both a riparian and stream habitat component. This is why they are presented together. The mitigation was further subdivided between in-reservoir projects and above-reservoir projects. The projects were also subdivided into Phase I and Phase II mitigation. In most cases, the DFR assumed that 67% of each individual mitigation project would be constructed during Phase I water storage and the remaining 33% constructed during Phase II. During project implementation this approach proved unworkable for some projects. For example, it is not practical to construct 67% of a culvert replacement project. For this reason, the various stream projects were prioritized based on habitat benefits, constructability concerns and other factors which resulted in a project implementation strategy different from the 67% percent goal presented in the DFR for each of the mitigation projects.

During the project design phase, the CDR abandoned the project numbering system developed in the DFR in favor of an alternate system. The alternate CDR numbering itself was later abandoned. The project numbering system in this manual is referenced to the DFR. **The CDR numbering system is included in Table 6-1 (column 3) for reference.** During construction each individual project was assigned a unique name that differed slightly from the way the project was organized in the DFR. The discussion below and in Table 6-1 is organized in a manner consistent with the organization of the DFR because these two documents work together to explain the rationale and implementation behind the work. Project construction names are referenced to the DFR titles in Table 6-1.

Riparian Habitat – In Reservoir

Page Mill Pond and Creek VF-05

This project as it was conceived in the DFR was not pursued for several reasons. The riparian component focused on planting sedges within the new inundation zone in the vicinity of the Page Mill Pond area which is in the drainage of the North Fork Green River. For numerous reasons this proved impractical (see Table 6-1). It was further assumed that sedges would naturally colonize those new areas suitable for their establishment as the new reservoir height was implemented. This latter assumption will be verified through monitoring as discussed in section 6.1.1. No riparian habitat mitigation credit was realized for this project.

Green River MS-02

The MS-02 project is focused along the mainstem of the Green River within the reservoir inundation zone. The riparian component involved planting sedges. This was not pursued for the same reasons identified above. Sedge colonization around the reservoir was instead monitored to determine effects of the new reservoir on this habitat.

North Fork Green River TR-04

The TR-04 project is focused along the North Fork of the Green River within the reservoir inundation zone. Similar to the riparian projects described above, the riparian objective was to plant inundation tolerant species (i.e. sedges) within this elevation zone. For the reasons described above, this planting project was not pursued.

Riparian Habitat – Above Reservoir

MS-08 (Mainstem Green River above elevation 1240 ft)

The objectives of this mitigation project consist of 1) protecting riparian lands from timber harvest, 2) thinning riparian lands to improve growth of individual trees, and 3) planting vegetation. The geographical focus is the riparian area within 200 feet of the Green River from RM 71.3-80.1. Tacoma has indicated that they have created a Natural Forest Management Zone along the Green River from RM 69 to 84 that achieves the objective of protecting 200 ft riparian buffers from future harvest (Tacoma Water 2005). This is a component of the Tacoma Water HCP as well as mitigation for AWSP water storage (Tacoma Water 2001). Following investigation of the project area for potential thinning opportunities, it was concluded that minimal opportunities exist for thinning with negligible benefits. Therefore no thinning was conducted. Two locations were identified within the project area where planting was feasible. The planting areas included one acre near RM 80 (Hot Springs site) and one acre near RM 73.5 (Welchers Field). Both of these sites were formerly cleared of vegetation by previous landowners and consisted of grass fields. The fields were planted with a mix of conifers and deciduous trees from the river extending landward 200 feet. Additional planting opportunities along this riparian zone did not exist with the exception of planting frequently inundated gravel bars. Planting such gravel bars was considered to have a low probability of success due to the

seasonal inundation that would likely kill or wash away planted vegetation. Furthermore, given the numerous seed sources, gravel bars with a higher likelihood of being colonized by vegetation would readily be colonized and did not require artificial assistance.

As described above, most of the other DFR proposed riparian habitat projects (thinning, planting, reservoir sedges) were not feasible for various reasons. Therefore in order to ensure sufficient riparian mitigation was implemented for the phase 1 of the AWSP, the objectives of the MS-08 project were expanded to include additional sections of the Green River. Protection of 200 foot buffers was achieved along both banks of the river for a total of xx acres from RM 71.3 to 88. This resulted in a total of xx HU. Since a total of 79.2 HU were necessary to achieve the phase 1 riparian mitigation objective, there is a surplus of riparian mitigation that can be applied to phase 2 water storage if necessary.

TR-09 (Gale Creek and North Fork Green River elevation 1240-1320 ft)

The objectives for this project are similar to those of MS-08 except for the location which is 150 feet on either side of Gale Creek and the North Fork Green River. The focus is on thinning and planting. There is no set aside objective for this project. Upon investigation of potential thinning opportunities, it was concluded that minimal opportunities exist for thinning with negligible benefits. Therefore no thinning was conducted. A total of 17 acres of North Fork riparian habitat was planted with conifers at a rate of 50 per acre (location???). Additional planting opportunities did not exist within the project area other than underneath existing power lines. Plantings under power lines would likely be cut by the power line owners so this was not pursued.

Stream Habitat – In Reservoir

Page Mill Pond and Creek VF-05

Similar to the discussion under riparian habitat, the stream habitat component of the Page Mill Pond project was not constructed. This was due to the high quality wetland habitat that existed at the project site already, constructability concerns related to the construction access, and resource agency resistance to disturbing the existing high quality habitat (Corps 2005-ESA meeting minutes). An alternate project titled the North Fork Ponds was constructed on the south bank of the North Fork Green River just upstream of the reservoir inundation zone. The new location is in the same general vicinity of the proposed Page Mill project but on the opposite side of the North Fork Green River. The general project objectives for the North Fork Ponds were similar to that for the Page Mill Pond project which included creation of off-channel, pond type habitat containing LWD. A total of 0.3 acres of backwater habitat was constructed and connected to the North Fork. Based on Table 8 on page F1-537 of the DFR, this is assumed to represent 0.3 HU. A total of 26 large logs were transported to the site and placed within the ponds. An additional number of on-site trees that were cleared during the construction were also placed within the ponds. This was estimated to be 35-40 trees primarily alder. Application of the Table 8 ratio (150 logs = 0.75 HU) results in an additional 0.3 HU applied to this project site for a total HU of 0.6.

Green River MS-02

The geographic focus of this project is the Green River within the new inundation zone (elevation 1147 – 1177 feet). The stream habitat components listed in the DFR F1 appendix include floating debris islands and the retention of trees around the reservoir. Additional project objectives/concepts including adding logs and boulders to maintain stream integrity and habitat within the new inundation zone were identified in the main body of the DFR (see Table 6-1).

While it was recognized that the integrity of the stream may deteriorate within the reservoir inundation zone thus justifying artificial measures to maintain that integrity and habitat, it became apparent that ‘attracting’ fish species to this location during periods when the stream was not inundated may not be beneficial to the species. This was particularly evident when understanding that spawning fish attracted to this zone for spawning risked flooding and siltation of redds when flood storage occurred later in the year. Furthermore, the lack of future riparian vegetation in this zone would be the habitat less attractive/beneficial for fish species. A decision was made among the project team to forgo implementation of this project at the present time in favor of constructing projects that were more clearly beneficial and with less potential for adverse consequences. As a result of the HHD section 1135 project, logs and boulders had been recently (2001) installed along the North Fork and Gale Creek downstream of elevation 1147 feet for the purpose of maintaining stream habitat along these stretches of inundated stream. Delaying construction of a similar project further upstream (to Phase 2 water storage) would allow more time for the section 1135 project to evolve which could then be studied and used to determine the effectiveness of these habitat measures and whether they are appropriate projects for this location.

Five floating debris islands were constructed in 2008. They were subsequently destroyed by flood in 2009. Due to the ever present flood concerns and the limited fish benefit these structures were found to provide (ref-monitoring data), they were not reconstructed. **An alternate project**

Trees were retained around the reservoir prior to the reservoir inundation. This project element was thus successfully implemented. However, there are safety concerns associated with leaving these trees in place. After 1-2 years of inundation most of the trees have died and periodically fall into the reservoir. This is of particular concern when work on the reservoir is occurring. Debris management during floods when the winds are typically higher has become more hazardous with the dead standing trees around the rim of the reservoir. If phase 2 is implemented, the retention of standing trees within the new inundation zone should be re-evaluated due to the associated safety issues.

North Fork Green River TR-04

The geographic focus of this project is the North Fork Green River within the new inundation zone (elevation 1147 – 1177 feet). This project consisted of several design concepts within the new reservoir inundation zone (elevation 1147-1177 feet) similar to those described above under MS-02 with the goal maintaining or creating stream habitat within this zone. As discussed above under MS-02, these concepts were not implemented due to concerns about attracting fish to

habitat in the inundation zone which might ultimately result in net adverse effects. This project will be revisited during phase 2 if the section 1135 projects prove successful.

Lower Bear Creek TR-01 (Zone one log jams)

The project objective in the DFR was to restore habitat at the mouth of Bear Creek which enters the Green River upstream of the Tacoma Headworks Dam and downstream of HHD. After the DFR as completed, it was recognized by the project team that the proposed location for this project would not benefit salmonids because these species were planned to be transported from the Tacoma Headworks Dam to a location upstream of HHD thus bypassing Bear Creek. The project was thus abandoned in favor of constructing two to three engineered log jams near RM 60 downstream of the Tacoma Headworks Dam (Corps 2000).

The implemented project consisted of two engineered log jams constructed near RM 60 of the Green River. This was the first habitat project constructed under the AWSP in 2003. Construction was done in concert with the first year of the gravel nourishment project which was constructed at the same location. The projects were collectively called the zone 1 pilot project which was considered a 100% Corps funded ESA regulatory driven project at the time of construction. Design of both projects was described in a design report (Corps 2003a) and construction report (Corps 2003b). Additional design and construction occurred in 2004 for one of the log jams to ensure stability during high flows (Corps 2004a, Corps 2004b). The financial and O&M responsibility for the two log jams was later changed to the stream mitigation category to ensure consistency with the DFR, PCA, and ESA consultation documents.

TR-05 (Reservoir tributaries elevation 1147-1177 ft)

Project objectives for TR-05 are similar to those described above under MS-02 and TR-04 but with a different geographic location. The geographic focuses of this project are the smaller tributaries that exist around the reservoir. Similar to the rationale described for MS-02 and TR-04, stream maintenance of these tributaries was not pursued. However, specific projects identified in the DFR involving culverts and stranding were identified as current problems that could be remedied. These included removing culverts along the former railroad grade near Gale Creek to prevent fish stranding during reservoir drawdown and replacing the road 5530 perched culvert at Gale Creek, an existing fish passage barrier, with a bridge. A third element to this project, removing a fish passage barrier along McDonald Creek within the reservoir inundation zone, was also implemented. This latter project consisted of regrading approximately 1000 feet of stream channel to remove a 5 foot waterfall. Large logs and boulders were placed at the downstream end of the channel at its confluence with Gale Creek.

Stream Habitat – Above Reservoir

MS-08 (Mainstem Green River above elevation 1240 ft)

The objective of this project was to create riverine pool area using large wood. According to Table 8 on page F1-537 of the DFR, 18 structures each creating 6,000 ft² of pool area is equivalent to 4.0 HU. This translates to 0.1 HU for every 2,700 ft² of pool area created. The DFR assumed that placing a single log structure consisting of 2-3 keystone logs would create

6,000 ft² of pool area. During project design it was recognized this was not realistic assumption. A toolbox of design approaches was thus developed with the objective to determine the most cost effective methods for creating pool area using wood. An array of project types would be constructed with the expectation that some would be more successful than others. Since O&M of these structures was anticipated, it was assumed that the project team would determine which methods proved successful through monitoring. The O&M would thus focus on replicating those successful approaches.

During project design, the geographic area for the project was expanded upstream to about RM 84. This was due to practical considerations tied to equipment access to the river for construction. The specific construction objective was to create 78,000 ft² of new pool area (2.9 HU). A total of eight individual project sites were constructed under MS-08. Based on monitoring conducted in spring 2007 by the Corps in response to a large flood in November 2006, it was estimated that 74,000 ft² (2.74 HU) of new pool area existed at the time of the monitoring (see Table 6-3).

TR-09 (North Fork Green River elevation 1240-1320 ft)

The objective of TR-09 was to create riverine pool area in the North Fork Green River similar to that described under MS-08 for the mainstem. Since the North Fork Green River is smaller in size, the specific goal was two structures each creating 4,000 ft² of pool area for a total of 8,000 ft² (0.2 HU). As with the mainstem, the project team realized that creating 8,000 ft² of pool area with two 2-3 large log clusters was unlikely. The toolbox developed for MS-08 was therefore applied to TR-09. Several log structures were ultimately constructed at one project site along the North Fork.

Headwaters Culvert Replacement TR-10

The project described in the DFR was replacement of three culverts that were existing fish passage barriers. One culvert replacement had an objective of reconnecting fish access to at least 3,000 linear feet of habitat. This project was implemented by replacing the 5530 road culvert at East Maywood Creek with a bridge. This restored access to 4,540 linear feet of stream habitat (Tacoma xx). The two remaining projects had a specific objective of reconnecting fish access to a total of 4,000 linear feet of stream habitat. These were implemented 1) by removing one culvert along the former access road to McDonald Field and rerouting the road to bypass the stream, and 2) by replacing the 5530 road culvert at McDonald Creek with a bridge. These two projects restored access to 5,682 linear feet of stream habitat (Tacoma xx).

Mainstem Channel Replacement MS-04 (Sunday Creek and Mainstem helicopter)

The MS-04 project was located near RM 85 of the Green River on property owned by the Washington Department of Transportation. The property was formerly used as an emergency airstrip which had been partially eroded by the Green River making its function as an airstrip unusable for anything except helicopters. Since the river was now running through the airstrip, it was assumed at the time of the DFR that WSDOT would readily sell the property to Tacoma. During the project design phase, discussions with WSDOT proved unsuccessful due to the

WSDOT need for a replacement property that could function as an airstrip. Tacoma could not locate a sufficiently suitable property and as a result the project was not constructed.

Two replacement projects were designed based on the habitat ratios for MS-08 (0.1 HU for each 2,700 ft² of riverine pool area). The design target was 1.5 HU or 40,500 ft² of pool area. The projects were titled Sunday Creek and the Mainstem Helicopter project. Sunday Creek is a large tributary to the Green River immediately upstream from the WSDOT airstrip location. Its confluence with the Green River is at approximately RM 85.5. The project area include the Green River from RM 85.5 to 86.5 and Sunday Creek from its mouth upstream approximately two miles. It included seven discreet construction project sites and helicopter placed wood placement across an additional 0.5 miles of Sunday Creek and across the entire 1.0 mile of the Green River. The specific project objective was 27,000 ft² of pool area.

The Mainstem Helicopter project extended from about RM 71 to 77. This consisted of large wood placement by helicopter in the mainstem Green River in clusters, individually and in clusters along the bank wedged between existing trees, or in side channels of the river. In some cases for both the Sunday Creek and Mainstem Helicopter projects, the large wood clusters were chained together after placement. The specific project objective was 13,500 ft² of pool area.

Shortly after construction, a large flood occurred on the Green River which affected both projects. The vast majority of work in Sunday Creek remained functioning after the flood although some specific log jams were washed out. The majority of the Mainstem Helicopter projects were washed out and ended up in HHD reservoir and thus were not effective. Monitoring conducted by the Corps after the flood indicated that the Sunday Creek proved more effective at creating pool area than the design targets while the Mainstem Helicopter project proved ineffective. Together they resulted in over 41,000 ft² of pool area or 1.53 HU created which achieved the habitat goal for the combined project (Table 6-3).

Table 6-1. AWSP riparian and stream mitigation projects

Project Name (DFR)	DFR/ EIS #	General Project Objectives (Phase 1 & 2) (DFR p.137-142)	Detailed Project Elements Phase 1 & 2 (DFR p. F1-536, F1-537)	Total HU Phase 1 & 2 (DFR p. F1-540, F1-542)	HU (Phase 1) (DFR p. F1-540, F1-542)	General Implementation Plan	Phase 1 HU constructed	Constructed Project(s): Date Implemented
Riparian Habitat - In Reservoir								
Page Mill Pond and Page Creek	VF-05	The project site is the floodplain of the North Fork Green River (1147 to 1185 foot elevation) and includes a pond (Page Mill) and creek. This project would maintain and improve an existing wetland pond complex that lies within and above the enlarged storage pool. A series of smaller ponds would be developed within the floodplain of the existing wetland/pond complex. Native wetland plants would be planted above the new storage pool and inundation tolerant plants would be planted within the new pool.	Wetland Planting, 5 acres, 1.0 HSI/acre, areas within and above 5 ft. max inundation	5.0	3.3	The Corps and Tacoma determined that planting wetland plants (i.e. sedges) along this riparian area is probably not feasible nor sensible from a habitat perspective at this time. This is due to 1) lack of appropriate soil and light conditions for sedges until many years after the AWSP pool raise, 2) likelihood that given the history of sedge growth in the reservoir that these species are likely to colonize newly inundated areas anyway and in a manner not likely to be expedited by the Corps, and 3) all work done for the phase 1 pool raise will be lost when phase 2 occurs. Sedges would instead be monitored over time to ensure they colonized new areas around the reservoir rim. Monitoring is further detailed in the wildlife section of this report (xx).	0	NA
Green River	MS-02	Project location is RM. 69-70, upper Green River from full pool (elev. 1146 feet) to full additional pool elevation (1167 foot Phase I and 1177 foot Phase II). This project would provide partial maintenance of up to 7,000 lineal feet of mainstem river riparian habitat. Partial mitigation for riparian areas would be accomplished by 1) retention of existing trees along the riparian zones; and 2) plantings in bare areas in/and along stream channels with inundation tolerant grasses, forbs, trees and aquatic plants.	Planting, 10 acres, 0.375 HSI/acre, 3.75 HU, HSI from HHD Section 1135 PMR	3.8	2.5		0	NA
North Fork Green River	TR-04	Project location is North Fork Green from full pool (elev. 1146 feet to additional pool elevation (1177 feet). This project would provide partial maintenance of up to 3,000 lineal feet of large tributary riparian habitat using similar features described in MS-02.	Planting, 15 acres, 0.3 HSI/acre, 4.5 HU, HSI from HHD Section 1135 PMR	4.5	2.9		0	NA

Project Name (DFR)	DFR/EIS #	General Project Objectives (Phase 1 & 2) (DFR p.137-142)	Detailed Project Elements Phase 1 & 2 (DFR p. F1-536, F1-537)	Total HU Phase 1 & 2 (DFR p. F1-540, F1-542)	HU (Phase 1) (DFR p. F1-540, F1-542)	General Implementation Plan	Phase 1 HU constructed	Constructed Project(s): Date Implemented
Riparian Habitat - Above Reservoir								
---	MS-08	The project location is the mainstem Green River valley floor RM 71.3-80.1, beginning at elevation 1240 feet (at the upper edge of restoration project MS-03). This partial mitigation feature (and including TR-09, a linked project) is a set-aside of riparian forest reserve (managed solely for fish and wildlife habitat) on lands owned and managed by Tacoma Water Department in the Upper Green. The mitigation area on the mainstem Green includes stream buffers of 200 feet and protects a total riparian area of 400 acres. Within the set-aside areas are two hot-spots of biodiversity, the only remaining old-growth area along the mainstem Green, approximately 20 acres of Sitka spruce, and a large unsurveyed wetland area (recently identified, US Forest Service 1996). This forest reserve area would have 210 acres as natural forest (no management) and would include prescriptions to improve riparian habitat including 1) selective thinning (90 total acres) of riparian zones to open forest canopy, improve tree growth, and to drop habitat logs for aquatic and terrestrial habitat; and 2) planting of evergreen species, cedar, hemlock and spruce (50/acre for 100 total acres).	Set-aside 210 acres at 5 acres reserved per 1 acre affected. 42 HU, 0.2 HSI/acre	42.0	27.3	Implemented with Tacoma Natural Zone no harvest buffer of 200ft (5:1 ratio of acres protected : acres impacted). Total of 727 acres protected from Elder Cr to Friday Cr). Total of 727 acres protected = 145.4 HU.;	145.4	Mainstem riparian buffer: 2005
			Thinning, 90 acres, equivalent of 27 HU, 0.3 HSI/acre, 50% greater than HSI for reserve	27.0	17.6	Few potential thinning areas identified within the riparian zone. Project not pursued due to likelihood of only limited habitat benefit.	0	NA
			Planting, 100 acres, equivalent to 30 HU, 0.3 HSI/acre, 50% greater than HSI for reserve	30.0	19.5	Plant conifers (50/acre - 30ft centers) within 200 ft of mainstem in currently unvegetated areas: Hot Springs (1 acre), Welchers Field (1 acre). Remainder of project area is already vegetated.	0.6	Mainstem plantings at Hot Springs and Welchers Field: 2005
---	TR-09	This is a continuation of the riparian forest reservoir (MS-08) for two tributaries of HHD reservoir. The project location is on Tacoma Forest Lands along Gale Creek (8.3 acres) from elevation 1240 to 1280 feet and the North Fork Green (31.7 acres) from elevation 1240 to 1320 foot elevation. Riparian buffers of 150 feet would be managed solely for fish and wildlife with prescriptions described in MS-08.	Thinning, 5 acres, equivalent to 1.5 HU, 0.3 HSI/acre, 50% greater than HSI for reserve	1.5	1.0	Few potential thinning areas identified within the riparian zone. Project not pursued due to likelihood of only limited habitat benefit.	0	NA
			Planting, 26 acres, equivalent to 7.8 HU, 0.3 HSI/acre, 50% greater than HSI for reserve	7.8	5.1	17 acres planted with conifer at 50 per acre.	5.2	North Fork planting: 2001
			Riparian subtotal:	121.6	79.2		151.2	

Project Name (DFR)	DFR/EIS #	General Project Objectives (Phase 1 & 2) (DFR p.137-142)	Detailed Project Elements Phase 1 & 2 (DFR p. F1-536, F1-537)	Total HU Phase 1 & 2 (DFR p. F1-540, F1-542)	HU (Phase 1) (DFR p. F1-540, F1-542)	General Implementation Plan	Phase 1 HU constructed	Constructed Project(s): Date Implemented	
Stream Habitat - In Reservoir									
Page Mill Pond and Page Creek	VF-05	The project site is the same as described under riparian habitat. A series of new, smaller ponds would be created and large woody debris would be added to the ponds and existing stream channel.	Create 2 ponds, HU 1 acre, reconnect 1/2 acre pond, add 150 logs, 0.75 HU.	2.0	1.3	Page Mill Pond and Creek site were dropped due to the existing high quality habitat in this area already and resistance from resource agencies about disturbing the existing high quality habitat. Alternate project located along right bank of North Fork near elevation 1180 ft). Excavate 0.3 acres of pond/edge habitat along North Fork floodplain (0.3 HU) and connect to North Fork. Place LWD in excavated habitat (0.3 HU).	0.6	North Fork Ponds: 2005	
Green River	MS-02	Project location same as described above in MS-02- riparian habitat project. This project seeks to maintain in stream and bank habitat along the mainstem Green River in the new inundation pool. Project features include 1) placement of large structural elements to contain the existing channel (boulders); 2) addition of large woody debris (anchored to the structures or embedded into the riverbank) to create limited cover for fish; 3) excavation of sub-impoundments/ponds, side-channel habitat and dendrites; 4) placement of floating islands in selected areas around reservoir; and 5) barrier removal with culvert replacement (in railroad berm) and grade realignment where necessary.	10 Floating Debris Islands, 1.0 HU, 10 islands already planned for Section 1135	1.0	0.7	Constructed five wood debris islands and placed within the reservoir, 0.5 HU;	0.5	Reservoir fish islands: 2008	
			---	---	---	---	Remove culverts (5 total) in old railroad grade along mainstem RM 68-69; HU = 0.3 consistent with TR-05 culvert removal project.	0.3	Troutdale culverts
			Retain trees around the reservoir, 0.5 HU (p. F1-541)	0.5	0.5	Retain trees around reservoir, 0.5 HU.	0.5	Retain reservoir trees: 2007	
North Fork Green River	TR-04	The project site is the same as described above in TR-04 riparian habitat project. The project has the same features as MS-02- stream habitat project but does not include culvert replacement.	Place 5 culverts in railroad grade, decreasing stranding, 0.05 HSI/HU; Place 300 boulders, 260 logs, instream and in ponds, 2.4 HU; Reconnect relic side-channels, reshape areas in ponds, divert Elder Crk for water source.	2.2	1.4	Allocated to Phase 2 mitigation.	0	NA	
Lower Bear Creek	TR-01	The project site is the lower 3,000 feet of Bear Creek, a large tributary that enters the Green River just below HHD, at RM 63. This project would improve the stream channel by adding boulder or logs and includes limited excavation to recreate meanders or backwater habitats.	Improve 1.4 acres, 60 boulders, 150 logs, HSI of 0.45/acre	0.6	0.4	Project objectives were changed during ESA consultation after DFR completed because original project site was between HHD and Headworks where salmon would not be transported. Benefits could therefore not be realized. New plan outlined in BA and BO is construction of 2-3 engineered log jams in Green River RM 60.	0.6	zone 1 log jams: 2003	
---	TR-05	The project sites are tributaries of the reservoir including Charley, Gale, Cottonwood and McDonald Creeks. This project would provide partial maintenance of large and small tributary habitat. Habitat maintenance features include those listed in MS- 02 but do not include floodplain excavation.	Place 5 culverts in railroad grade, decreasing stranding, 0.05 HSI/HU	0.3	0.2	Breach railroad grade and regrade existing low points for drainage in vicinity of Gale Creek confluence with mainstem.	0.3	Reservoir railroad breaches: 2006	
			Replace 1 large trib culvert, 2500 x 20 ft, 1.2 HU	1.2	0.8	Replace Gale Creek culvert with bridge.	1.2	Gale Cr bridge: 2005	
			Add 130 LOD, 165 boulders, 2500 ft, 0.8 HU	0.8	0.5	Regrade lower McDonald Creek to eliminate fish passage barriers.	0.3	Lower McDonald Cr: 2006	

Project Name (DFR)	DFR/EIS #	General Project Objectives (Phase 1 & 2) (DFR p.137-142)	Detailed Project Elements Phase 1 & 2 (DFR p. F1-536, F1-537)	Total HU Phase 1 & 2 (DFR p. F1-540, F1-542)	HU (Phase 1) (DFR p. F1-540, F1-542)	General Implementation Plan	Phase 1 HU constructed	Constructed Project(s): Date Implemented
Stream Habitat - Above Reservoir								
---	MS-08	The project site is the mainstem Green River valley floor RM 71.3- 80.1, beginning at elevation 1240 feet. Management prescriptions within the protected area to improve fish and wildlife habitat include: 1) riparian improvements discussed above; and 2) addition of large keystone trees (60 feet or greater, 4-foot-diameter rootwad attached) at one 2-3 trees cluster/half-mile of mainstem to act as collection points for additional debris and to improve channel diversity -- pools, gravel collection, side channels.	Place 18 2-3 keystone log clusters, create 6,000 ft2 pool by year 5, 2.35 HU; Cover-Backwater HSI is 0.3, dropping 270 logs from thinning, increases HSI to 0.32	4.0	2.7	Construct LWD projects in mainstem Green River. Goal is to create at least 72,000 ft2 of new pool area. Each 2,700 ft2 of pool area created results in 0.1 HU of mitigation. Reference Table xx for totals as of 2006.	2.74	Sweeney Cr, Welchers Field, Maywood, Nagrom, Hot Springs, Lester Rd MP 5.5, Six mile washout, Reload: all constructed in 2005
---	TR-09	The project site is on Gale Creek from elevation 1240 to 1280 feet and the North Fork Green from elevation 1240 to 1320 feet. Management prescriptions include 1) riparian improvements discussed above; and 2) placement of one cluster of keystone logs in the North Fork channel.	Place 2 2-3 keystone log, creating 4,000 ft2 pool by year 5, 0.2 HU	0.2	0.1	Construct LWD structures in North Fork creating total of 8000 ft2 of pool area just above el. 1240 off rd #5512 (4,000 ft2 pool area = 0.1 HU).	0.26	Upper North Fork: 2005
Headwaters Culvert Replacement	TR-10	Three tributaries of the Upper Green River would have existing culverts replaced to provide passage for juvenile and adult salmon and steelhead. A culvert inventory has been proposed for the Upper Green River (either MIT or WDFW) and will identify locations on two small tributaries and one large tributary for culvert replacement.	Replace 2 small culverts and reconnect up to 4,000 linear ft;	1.2	0.8	Upper McDonald Cr culvert replaced with bridge, lower McDonald Cr culvert removed and road rerouted to avoid stream.	1.2	McDonald Cr culvert, McDonald Cr bridge: 2005
			Replace 1 large culvert, large tributary reconn. of up to 3,000 linear ft.	1.7	1.1	East Maywood Cr culvert replaced with bridge.	1.7	East May wood Cr bridge : 2005
Mainstem Channel Replacement	MS-04	The project site is the mainstem river near the Lester Airport between RM 83 and 84. This project would return the river to its historic channel by diverting the river with a one or more series of debris jams/flow deflectors and by excavating excess sediments. Currently, the river has abandoned its historical channel and begun eroding the old Lester airstrip and the mainline road adjacent to the river. This land is owned by Washington State Department of Transportation. During summer low flow period the new exposed, braided channel has high stream temperatures with no pool volume and low width/depth ratio presenting a potential barrier to introduction of adult anadromous salmonids.	Place mainstem back into 4,000 ft historic channel, excavate and divert, HSI increase from 0.5 to 0.8	1.7	1.1	Airstrip diversion project dropped due to inability to obtain real estate. Two replacement projects were constructed modeled on MS-08 objective of 2700 ft2 of pool area per 0.1 HU. Projects were located in the mainstem Green River RM 71-71 (mainstem helicopter project) and Sunday Creek. Sunday Creek objective was 27,000 ft2 of new pool area using LWD (1.0 HU) in Sunday Cr and mainstem Green River between Sunday Ck confluence upstream to high trestle bridge. Mainstem helicopter project objective was 13,500 ft2 of new pool area using LWD (0.5 HU).	1.53	Sunday Creek, Mainstem Helicopter: 2006
			Stream subtotal:	17.4	11.6		11.7	

6.1.3. Stream Restoration

Stream restoration projects were created according to elevation zones around the reservoir. In general, the elevation zone immediately upstream from the reservoir, defined as 1177 – 1240 ft, was considered the restoration zone. This included projects in all reservoir tributaries and the mainstem Green River in this elevation zone. The one exception to this is Palmer or Signani Slough which is located downstream of HHD. During the implementation phase it was necessary to change the location of the North Fork project for reasons detailed below.

VF-04 Palmer (Signani) Slough

MS-03 Mainstem Green River elevation 1177-1240 ft (Koss and Humphrey)

TR-06 Smay Creek

This project was originally planned for the North Fork Green River from elevation 1177-1240 ft. After review of the North Fork project site with the sponsor and stakeholders, it was decided to move the project to Smay Creek. The primary reason was that this section of the North Fork often runs dry in the late summer and early fall. Stakeholders did not want to create habitat that would potentially attract fish species to a river section that might dry up and consequently strand or kill fish. Smay creek is a similar sized tributary to the Green River that is about 10 miles upstream of the North Fork site. The North Fork project goals were generally retained for Smay Creek.

Reservoir tributaries elevation 1177-1240 ft

Table 6-2. AWSP habitat restoration projects

Project Location	FR/EIS #	CDR #	Project Objectives (draft EIS)	Project Elements (mitigation: p. F1-537; restoration: section 8D.3, p. F1-523)	General Implementation Plan	Date Constructed
Habitat Restoration						
Palmer (Signani) Slough	VF-04	MSI-01	Restore up to 3.4 acres of former side-channel to quality fish habitat which was lost due to Corps realignment of BNR railroad during construction of HHD. Excavate fill material, replace 48 inch culvert with one or two 16 foot culverts, add LWD, excavate in the floodplain to restore habitat complexity, divert 35 cfs from the Green River to provide additional water for the entire channel length.	Headworks road will be breached at two points to provide flow diversion at the upstream end (2-4 ft culvert, none existing) and replacement of an existing 4 ft culvert with either one or two 16ft culverts. Flow diversion to the upstream end will require starting 600-1000ft upstream of the breach near RM 59.6. The diversion pipe will probably have to follow pipeline 1 or 5 to protect against flood damage. The outlet channel may require re-alignment and may extend further downstream than the current channel.	Replace downstream culvert at Signani slough. Install/construct fish ladder at high beaver dam forming pond. Annually breach smaller downstream dams. Construct spawning channel upstream of pond. Add LWD.	Culvert replaced 2004. Fish ladder and habitat work completed in 2009.
Mainstem Green River, el. 1177 to 1240 Humphrey & Koss projects	MS-03	MSI-05	Restore and improve 8000 lineal ft of mainstem and valley floor habitat of the Green River from 1177 to 1240. Includes 1) addition of LWD or boulders to increase pool depth, sediment routing, and instream cover, bank stability and channel confinement, 2) restoration or creation of off-channel habitat (side channels or meanders), and 3) implementation of 200 ft riparian buffers (Tacoma forest plan).	Restore and improve 8000 lineal ft of mainstem and valley floor habitat of the Green River from 1177 to 1240. Includes 1) addition of LWD or boulders to increase pool depth, sediment routing, and instream cover, bank stability and channel confinement, 2) restoration or creation of off-channel habitat (side channels or meanders), and 3) protection and expansion of riparian zone buffer strips.	Add 'loose' LWD to mainstem Green, add LWD and create pool habitat at the Humphrey project site (road 5027 terminus). Add LWD via helicopter at additional locations to encourage channel migration and increase habitat diversity (former side channel downstream of meander). Create side channel, back water habitat, construct log jams at RM 71 (Koss project site).	Humphrey site completed 2005; Koss site completed 2010.
Smay Creek [former North Fork Green River, el. 1177 to 1240]	TR-06	TRI-01.2	Restore and improve 4000 lineal ft of main channel and valley floor habitat of the North Fork Green River from 1177 to 1240 similar to MSI-05.	Restore and improve 4000 lineal ft of mainstem and valley floor habitat of North Fork Green from 1177 to 1240 ft. Includes 1) addition of LWD or boulders to increase pool depth, sediment routing, and instream cover, bank stability and channel confinement, 2) restoration or creation of off-channel habitat (side channels or meanders), and 3) protection and expansion of riparian zone buffer strips.	Project site dropped due to concerns about creating habitat in section of the North Fork that is occasionally dry during the summer. Investigated possibility of regrading North Fork to eliminate this problem - concluded infeasible. Replacement project location is Smay Creek, a tributary of similar size to the North Fork. Scope includes creating pool habitat, adding LWD, increasing channel diversity, and creating off channel habitat.	Smay Creek restoration completed in 2010.
Reservoir tribs including Charley, Gale, McDonald, Cottonwood, Piling, and 3 unnamed tribs, el. 1177- 1240ft.	TR-07	TRI-02.2	Restore tributaries to reservoir including Charley, Gale, McDonald, Cottonwood, Piling, and 3 unnamed tribs similar to MSI-05	Restore and improve 1000 lineal ft of channel habitat in large and small tributaries from 1177 to 1240 ft. Includes 1) addition of LWD or boulders to increase pool depth, sediment routing, and instream cover, bank stability and channel confinement, and 2) protection and expansion of riparian zone buffer strips.	Increase pool area, gravel storage, and habitat complexity by adding LWD to all tributaries. Primary method will be placement by helicopter.	constructed 2005

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6.1.4. Section 1135

[Scott, Rhonda, Dan]

6.2. Design goal and construction standard

[Scott, Zac, Rhonda]

There are several categories of projects with each having various levels of design standards depending on the project location and other factors.

In stream log projects

Culvert/bridge projects

Project status after November 2006 flood

Many of the log jam projects in the Green River and tributaries were completed in 2005 and 2006. A large flood occurred in November 2006. The flood created concern that many of these projects were destroyed and as a result mitigation needed to immediately replaced prior to storing water in spring 2007. The Corps conducted an analysis of the potentially affected projects and summarized the data in a report titled 'Post Flood (November 2006) Analysis of Constructed Habitat Projects in the Upper Green River'. The critical data was the pool area created by the relevant projects. This data is summarized in Table 6-3 [Table xx](#).

As stated above, the strategy for LWD/log jam project was to develop and construct several different types of structures using various techniques that ranged across the cost and construction effort spectrum. This included relatively large log jams with 19 wooden piles stabilizing over 60

large logs to simply placing unanchored logs in the river with the expectation that they will be transported downstream to a location where they will create pool habitat. The purpose of this was to learn what the most cost effective approach is so that this can be applied to the O&M stage of the project. The flood report details the results of this analysis and should be used as a guide for O&M construction.

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Table 6-3. Created pool area and associated habitat units for log jam mitigation projects in the upper Green River watershed after the November 2006 flood.

Mitigation	direct pool area		net pool area		mean calibrated pool area	pool area design target	Habitat Units (HU)			
	raw	calibrated	raw	calibrated			design target	mean created	range created	
Upper Green log jams (MS-08)	98,967	72,244	104,019	75,933	74,089	78,421	2.90	2.74	2.53	2.96
Welchers	9,442	6,892	12,787	9,334	8,113	14,788	0.55	0.30	0.26	0.35
Maywood	20,701	15,112	22,542	16,456	15,784	12,132	0.45	0.58	0.56	0.61
Hot Springs	18,492	13,499	20,788	15,175	14,337	11,708	0.43	0.53	0.50	0.56
MP 5.5	11,858	8,656	14,731	10,753	9,705	9,431	0.35	0.36	0.32	0.40
6 mile washout	19,108	13,948	15,341	11,199	12,574	13,351	0.49	0.47	0.41	0.52
Reload	19,366	14,137	17,830	13,016	13,577	17,011	0.63	0.50	0.48	0.52
Airstrip replacement (MS-04)	48,087	35,102	65,071	47,502	41,302	40,500	1.50	1.53	1.30	1.76
Sunday Creek / Green River RM 86	42,527	31,044	54,556	39,826	35,435	27,000	1.00	1.31	1.15	1.48
Mainstem helicopter	5,560	4,058	10,515	7,676	5,867	13,500	0.50	0.22	0.15	0.28
North Fork (TR-09)	7,025	5,938	16,801	15,069	10,504	8,000	0.20	0.26	0.15	0.38
Restoration										
Humphrey (MS-03)	26,023	18,996	84,186	61,455	40,226	15,683	na			

1. All pool area is in square feet.
2. Direct and net pool area represents the mean of two separate aerial photo delineations of pool area (see table 1 average).
3. Calibrated pool areas include a scaling factor based on field measurements of a subset of pools delineated on aerial photos.
4. In the Green River mainstem and Sunday Creek, 2700 ft² of pool area = 0.1 HU. In the North Fork, 4000 ft² of pool area = 0.1 HU. Ratios are from FR/EIS.
5. MSI-06 phase 1 target HU was actually 2.7. Table value of 2.9 HU represents maximizing opportunity for pool area creation during the design and construction phase.

6.3. Other project functions

??

Cultural resources? [Danielle]

6.4. Relationship to HHD operating project

LWD from upstream habitat projects will occasionally arrive in the reservoir particularly during floods. This LWD is corralled by the Corps HHD project staff and delivered to McDonald Field. Once at McDonald Field all wood is inventoried by the Corps and Tacoma. Tacoma is then responsible for removing logs from the reservoir. Typically this involves creating log decks at McDonald Field in an area above the inundation zone. Natural or non-tagged logs that are received at the reservoir are set-aside for other uses. Any tagged logs are to be set aside by Tacoma for future redistribution to the upper watershed as replacement for logs or jams eroded by river flows.

7. PROJECT COOPERATION AGREEMENT

The City of Tacoma and the U.S. Army Corps of Engineers entered into a PCA for the AWSP on 17 July 2003 as required by Public Law 106-53. A copy of the duly executed PCA is included as Appendix B of this manual.

Article IX of the PCA addresses the OMRR&R that is the subject of this document. Section A of Article IX is reproduced below:

A. Upon notification in accordance with Article ILE of this Agreement and for so long as the Project Modification remains authorized, the Non-Federal Sponsor shall operate, maintain, repair, replace, and rehabilitate the entire Fish Habitat component of the Project Modification for Ecosystem Restoration or the functional portion of the Fish Habitat component of the Project Modification for Ecosystem Restoration, at no cost to the Government, in a manner compatible with the Project Modification's authorized purposes and in accordance with applicable Federal and State laws as provided in Article XII of this Agreement and specific directions prescribed by the Government in the OMRR&R Manual and any subsequent amendments thereto.

This document should be considered the OMRR&R Manual referenced in the PCA.

8. OPERATION

[Who, what, where, when, and how of the various project operations]

With few exceptions, the projects don't require any action to operate. They generally function and operate independently. Projects do require periodic inspection, monitoring, and maintenance which are detailed in later sections.

8.1. Wildlife habitat mitigation

[Rhonda]

Mowing elk fields -

8.2. Stream habitat mitigation

All stream mitigation projects operate independently and don't require any human intervention. Periodic monitoring, inspection, and repair is required.

8.3. Stream habitat restoration

The only restoration project that contains an operational component is the fish ladder at Palmer Slough. The other restoration projects operate independently and don't require any human intervention.

Palmer (Signani) Slough

The fish ladder is designed so that flow can be bypassed directly downstream avoiding the ladder weirs. This bypass was designed for two purposes. The primary purpose is to create downstream flood conditions to allow scour, sediment sorting, and erosion of fine sediment that may have accumulated in the downstream channel. This allows for periodic cleaning of downstream spawning gravels. The secondary purpose is to functionally remove the dam and fish ladder allowing a 'natural' river channel. This would also require removing fill material upstream of the fish ladder.

A simulated flood is considered part of the operation of the project. The simulated flood is created by removing the stop logs between the furthest upstream and furthest downstream weir chambers. Care must be taken when removing stop logs (detail process – design gate?).

The precise timing and frequency of these floods should be determined based on need and experience. The likely timing is the late summer (?) period before adult salmon return for spawning. This timing would avoid sensitive time periods when eggs may be in the gravel (September-March) and when larger densities of juvenile fish are present (thru July). Resident trout may also spawn during the spring and have eggs in gravel into August (?). There will likely always be fish present in the pond and downstream channel including resident trout and coho salmon. Care must therefore be taken to ensure that the pond is not dewatered to a level stranding and killing fish. The pond should be monitored to collect fish that may be stranded as the water retreats.

Annually breach beaver dams downstream of fish ladder.

8.4. Section 1135

9. EMERGENCY OPERATIONS

No specific emergency operations have been identified for the habitat projects.

During high flow events, it is possible that some of the habitat projects may become damaged or may wash out completely. Periodic monitoring and subsequent replacement may be necessary when this occurs. This will in part be determined by the aggregate habitat units that remain functional at the time of monitoring.

It is possible that the Palmer slough fish ladder may periodically become plugged with debris during a high flow event. Regular inspection and debris clearing as described in section 10 should be adequate to maintain functionality of the fish ladder.

10. MAINTENANCE AND INSPECTION

Maintenance and inspection include those activities necessary for the proper care and efficient operation of the various project elements. These are activities that are expected to occur on a regular basis (ie monthly, annually). For most of the habitat projects addressed in this manual, no maintenance and inspection is required due to the nature of the projects. There a few exceptions to this that are detailed below.

10.1. Wildlife habitat mitigation

[Rhonda]

10.2. Stream habitat mitigation

Maintenance and inspection is required only for the projects detailed below.

TR-05 McDonald Creek

- dig out channel after floods to ensure fish passage – depths? Construction standard?

MS-02 Troutdale road culverts

- culverts under road. (Is this mitigation? Credit?) Annual inspection to ensure culverts are allowing injury free fish passage.

TR-05 Gale Cr Bridge

- periodic inspection after floods to ensure integrity of the structure and ensure safe fish passage.

TR-10 McDonald Cr and East Maywood Cr bridges

- periodic inspection after floods to ensure integrity of the structure and ensure safe fish passage.

10.3. Stream habitat restoration

Palmer (Signani) Slough

The fish ladder constructed to allow fish passage into the beaver pond located at the site requires periodic inspection to ensure debris is not plugging the inlet/outlet to the pond. The project is designed to prevent beavers from plugging the facility. However, debris may naturally accumulate at the pond outlet, and should be removed periodically to ensure fish passage is continuing. The fish ladder itself should also be checked (annually) for debris to ensure conditions don't develop that may injure fish in the ladder. Debris within the weirs of the fish ladder itself may be left in place as this may provide habitat benefits in the form cover and structure within the fish ladder weirs.

10.4. Section 1135?

11. SURVEILLANCE

11.1. Wildlife habitat mitigation

[Rhonda]

11.2. Stream habitat mitigation

Monitoring of stream mitigation projects will occur on an approximate every five year cycle for the life of the project. It may desirable to adjust this schedule in response to large flood events. Since most damage is expected to occur during large floods, monitoring that occurs after these events should capture the status of the various projects. For certain projects, such as those that have fish passage as a goal, post flood monitoring is more important and should be conducted to ensure safe fish passage is continuing after the flood. A template for this monitoring was conducted in 2005 and 2006 in a report titled 'Upper Green River Baseline Habitat Monitoring'.

11.3. Stream habitat restoration

11.4. Section 1135?

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12. REPAIR, REPLACEMENT, AND REHABILITATION

Repair is considered to entail those activities of a routine nature that maintain the project in a well kept condition. Replacement covers those activities taken when a worn-out element or portion thereof is replaced. Rehabilitation refers to a set of activities as necessary to bring a deteriorated project back to its original condition. RR&R actions are to conform to the project as-built plans and specifications unless other arrangements are made with the district commander.

These activities are the responsibility of the project sponsor.

A project replacement period was developed for all mitigation and restoration projects during the Feasibility phase of the project. This is detailed in the FR and summarized in table xx. The strategy was to repair a certain percentage of the project (10-40%) every 5 or 10 years. This varied depending on the type of project. For the purposes of this manual and future RR&R, these numbers should be considered guides that could be used for budgeting purposes. Actual project repair will be driven by need as determined by monitoring. For mitigation projects, the objective is to ensure that sufficient mitigation is in place to offset impacts from the AWSP water storage. Repair of restoration projects will also be determined by monitoring data. If monitoring indicates project goals are no longer being met, project repair should occur to return the project to a functioning condition. For stream projects, flood frequency may in the end be the determining factor for the timing of repairs.

Regulatory (Craig FR/EIS is the only requirement?)

12.1. Wildlife habitat mitigation

[Rhonda]

12.2. Stream habitat mitigation

TR-01 Zone one log jams

MS-02 Troutdale road culverts

MS-02 Reservoir trees

MS-08 Green River riparian management

MS-08 Green River log structures

MS-04 Sunday Creek

MS-04 Mainstem helicopter log jams (MS-08?)

TR-09 Upper North Fork Green River log jams

TR-05 Reservoir railroad breaches

TR-05 Gale Creek bridge

TR-05 McDonald Creek

VF-05 North Fork Ponds

TR-04 North Fork Green River elevation 1147-1177 ft

TR-10 McDonald Creek culvert removal and bridge

TR-10 East Maywood Creek bridge

12.3. Stream habitat restoration

VF-04 Palmer (Signani) Slough

MS-03 Mainstem Green River (Koss and Humphrey)
elevation 1177-1240 ft

TR-06 Smay Creek

Reservoir tributaries

elevation 1177-1240 ft

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Table 12-1. Summary of monitoring, operation, and maintenance requirements for stream mitigation projects.

Project Name	FR/EIS #	Project constructed	Monitoring	FR/EIS Stream Replacement Period (yrs)	FR/EIS % of stream project maintained	O&M
Combined Phase 1 & 2 Stream Habitat Mitigation						
Zone 1 log jams	TR-01	two log jams on mainstem Green River Mile 60	Annual monitoring to ensure project stability. 5 year plan?	10	40%	Maintain or rebuild log jams if/when needed.
Troutdale road culverts	MS-02	Place 5 culverts in RR grade to decrease fish stranding	Annual monitoring of culverts along road to ensure safe fish passage.	5	20%	Repair culverts as needed to eliminate blockages and ensure safe fish passage.
Reservoir trees		Retain trees around reservoir project not listed on F1-537 as this project requires no action. HU on page F1-541.	?			?
Reservoir Fish Islands		nothing constructed - is there any mitigation credit here?	Monitor debris storage areas to ensure sufficient wood (define) is present. Conduct snorkel surveys to verify juvenile fish use and evaluate predation.			Islands destroyed in Jan 2009 flood. Concept is not viable. New concept (debris storage area?) necessary. Will be constructed as part of O&M - schedule?
Green River Riparian Management RM 71.3-87	MS-08	Forest reserve establishing 200 ft stream buffers along Green River - 210 acres with no active management	?	5	10%	Maintain buffer - no tree cutting within 200 ft of Green River
		Forest reserve establishing 200 ft stream buffers along Green River - 90 acres of selective thinning to open forest canopy, improve tree growth, and provide habitat logs				Maintain buffer
		Forest reserve establishing 200 ft stream buffers along Green River - 100 acres planted	Periodic monitoring of plants first few years to ensure survival. Replant as necessary to achieve desired density of 50 conifers per acre. (current status? - do we need to replant?)			Maintain buffer. Monitor plantings to ensure survival. Replant if necessary to ensure 50/acre goal.
Green River log structures: Sweeny, Welchers, Maywood, Nagrom, Hot Springs, MP 5.5, 6 Mile Washout, Lester Reload.		Log jams, various log structures constructed in mainstem Green River from RM 72.8 - 85.1.	Monitor habitat conditions in Green River project area every five years to verify pool area habitat goals are being achieved. Objective is 72,000 ft ² of riverine pool area created relative to baseline conditions.	10	40%	Rebuild structures/add additional logs to ensure pool area targets are achieved. Monitoring results should determine need for O&M.

Project Name	FR/EIS #	Project constructed	Monitoring	FR/EIS Stream Replacement Period (yrs)	FR/EIS % of stream project maintained	O&M
Sunday Creek	MS-04	Log jams, various log structures constructed in mainstem Green River from RM 86.4-87.2 and in Sunday Cr RM 0.1-2.1.	Monitor habitat conditions in project area every five years to verify pool area habitat goals are being achieved. Objective is 27,000 ft2 of riverine pool area created relative to baseline conditions. (set higher goal based on constructed habitat?)	5	25%	Rebuild structures/add additional logs to ensure pool area targets are achieved. Monitoring results should determine need for O&M.
Mainstem helicopter project, Green RM 71-77		Log jams, various log structures constructed in mainstem Green River from RM 71-77.	Monitor habitat conditions in Green River project area every five years to verify pool area habitat goals are being achieved. Objective is 13,500 ft2 of riverine pool area created relative to baseline conditions. (set lower goal based on constructed habitat?)			Rebuild structures/add additional logs to ensure pool area targets are achieved. Monitoring results should determine need for O&M.
Upper North Fork Green River	TR-09	Forest reserve establishing 150 ft stream buffers along North Fork Green River - 5 acres of selective thinning to open forest canopy, improve tree growth, and provide habitat logs	?	5	10%	?
		Forest reserve establishing 150 ft stream buffers along North Fork Green River - 26 acres planted	?			?
Upper North Fork log jams		Place 2 2-3 keystone log clusters creating 4000 ft2 pool by year 5	Monitor habitat conditions in Green River project area every five years to verify pool area habitat goals are being achieved. Objective is 8,000 ft2 of riverine pool area created relative to baseline conditions. (set lower goal based on constructed habitat?)	10	40%	Rebuild structures/add additional logs to ensure pool area targets are achieved. Monitoring results should determine need for O&M.
Reservoir railroad breaches	TR-05	Breach railroad grade in 4 location and regrade certain areas to ensure water does not pool during a reservoir drawdown.	Monitor every five years or after large floods to ensure the project area continues to drain so as to avoid fish stranding in isolated pools.	5	20%	Regrade as necessary to eliminate formation of isolated pools during reservoir drawdown.
Gale Cr. Bridge		Replaced Gale Cr culvert with bridge.	Monitor every five years or after large floods to ensure safe fish passage is maintained.			Repair as necessary to ensure safe fish passage.

Project Name	FR/EIS #	Project constructed	Monitoring	FR/EIS Stream Replacement Period (yrs)	FR/EIS % of stream project maintained	O&M
McDonald Creek		Regrade lower McDonald Creek to eliminate fish passage barriers.	Monitor every five years or after large floods to ensure safe fish passage is maintained.			Re-establish pilot channel as necessary following floods to re-create single thread channel through reservoir zone.
North Fork Ponds	VF-05	Create pond complex along North Fork Green River creating total of x acres of habitat. Add (150?) logs to the pond complex.	Monitor habitat conditions in project area every five years to verify pool area habitat goals are being achieved. Objective is 27,000 ft2 of riverine pool area created relative to baseline conditions. (set higher goal based on constructed habitat?)	10	20%	Rebuild structures/add additional logs to ensure pool area targets are achieved. Monitoring results should determine need for O&M. (New design criteria based on flood results.)
McDonald Cr bridge and culvert removal	TR-10	Remove culvert/move road and replace 2nd culvert with bridge along McDonald Cr.	Monitor every five years or after large floods to ensure safe fish passage is maintained.	15	30%	Repair as necessary to ensure safe fish passage.
East Maywood Cr bridge		Replace culvert along East Maywood Cr with bridge.				

Table 12-2. Summary of monitoring, operation, and maintenance requirements for stream restoration projects.

Project Name	FR/EIS #	General Implementation Plan	Monitoring	FR/EIS Stream Replacement Period (yrs)	FR/EIS % of stream project maintained	O&M
Stream Habitat Restoration						
Palmer (Signani) Slough	VF-04	Replace small broken culvert with 8 ft (?) box culvert at downstream end of project site. Construct fish ladder at high beaver dam to allow juvenile fish passage into pond. Construct spawning channel upstream of pond. Add LWD.	Monitor culvert and fish ladder to ensure safe fish passage is achieved.	10*	40%*	Annually breach beaver dams downstream of fish ladder. Clear debris from trashrack in pond. Monitor fish passage at ladder. Monitor spawning. Conduct periodic simulated floods (or maybe just one) by lowering pond level to flush out accumulated sediment downstream of fish ladder.
Humphrey and Koss	MS-03	Add large wood and log jams at the Humphrey and Koss projects sites. Construct side channel/pond complex at Koss site on left bank. Construct pilot channel entrance/exit to promote side channel construction on right bank.	Monitor habitat conditions in project area every five years to verify habitat goals are being achieved (define more clearly).	10*	40%*	Replace 40% of project every 10 years depending on project status.
Smay Creek	TR-06	Log jams, various log structures constructed in lower reaches of Smay Creek.	Monitor habitat conditions in project area every five years to verify habitat goals are being achieved (define more clearly).	10*	40%*	Replace 40% of project every 10 years depending on project status.
Charley, Gale, McDonald, Cottonwood, and Piling Creeks	TR-07	Add large wood to Charley, Gale, McDonald, Piling, and Cottonwood Creeks. Goal is to achieve xx large wood /RM (?)	Monitor habitat conditions in project area every five years to verify habitat goals are being achieved (define more clearly).	10*	40%*	Replace 40% of project every 10 years depending on project status. Charlie Creek?

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Flood report

12.4. Section 1135?

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13. NOTIFICATION OF DISTRESS

Relevant? Delete?

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14. REFERENCES

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HHD AWSP Stream Mitigation and Restoration

Project Location	CDR #	FR/EIS #	Project Objectives (draft EIS)	Project Elements (mitigation: p. F1-537; restoration: section 8D.3, p. F1-523)	FR/EIS Stream Habitat Units (p. F1-537,542)	FR/EIS Riparian Habitat Units	FR/EIS Stream Replacement Period (yrs)	FR/EIS % of stream project maintained	General Implementation Plan	Timeframe for Implementation	Phase 1 stream HU planned	Phase 1 stream HU constructed to date	Phase 1 riparian HU planned	Phase 1 riparian HU constructed to date	O&M	
Combined Phase 1 & 2 Stream Habitat Mitigation																
Mainstem Green River below HHD	MSI-03	TR-01	Improve lower 3000ft of Bear Creek (enters Green at RM 63) by adding boulders or logs and includes limited excavation to recreate meanders or backwater habitats.	Improve 1.4 acres, add 60 boulders and 150 logs.	0.60		10	40%	Project objectives were changed during ESA consultation after EIS completed because original project site was between HHD and Headworks where salmon will not be transported. Benefits could therefore not be realized. New plan outlined in BA and BO is construction of 2-3 engineered log jams at approximately RM 60.	constructed 2003	0.60	0.60			Annually photograph structures from established photo points. Use photos to evaluate stability. Maintain if needed. Rebuild after 25 years or when needed (wood decay, etc). Project life is 50 years.	
Mainstem Green River, RM 69-70 elevation 1147-1177 ft	MSI-04	MS-02	Retain existing trees along riparian zones around reservoir, plantings in bare areas in/and along stream channels with inundation tolerant grasses, forbs, trees, and aquatic plants. Construct features to maintain stream channel in section of reservoir that is alternately flooded and 'dry'. Excavate subimpoundments/ponds and side-channel habitat. Construct floating islands. Place 5 culverts in RR grade. Divert Elder Cr for water source in ponds/side-channels.	Plant 10 acres of riparian/wetland species (7 acres during P1 and 3 acres during P2)		3.75	5	10%	Original plan was sedge plantings in reservoir. Sedges are not practical for phase 1, but may make sense for phase 2.	phase 2					Monitor natural recolonization of sedges.	
				Place 5 culverts in RR grade to decrease fish stranding	0.30				Area between bridge 71 and flaggate project investigated. All problem areas appear to have drainage through culverts. Monitor to ensure no problems develop (flaggate removed by Ops in 2005). Can breach road at culvert locations during phase 2 if determined necessary.	phase 1					Ensure no ponding behind former RR grade during reservoir drawdown.	
				Reconnect relic side channels, reshape ponds, divert Elder Cr for water source.	1.10		5	20%	Construct wall based channel at project site near Elder Creek.	phase 2						
				10 floating debris islands	0.80				Add boulders/LWD to provide pool habitat and maintain river structure.	phase 2						
Mainstem Green River, RM 71.3-80.1 beginning at elevation 1240 ft	MSI-06	MS-08	Set aside of riparian forest reserve for fish and wildlife habitat on lands owned by Tacoma Water. Includes stream buffers of 200 ft and protects a total riparian area of 400 acres that includes 20 acres of old growth Sitka Spruce and a large unsurveyed wetland. Forest reserve includes 1) 210 acres as natural forest with no management, 2) 90 acres selective thinning to open forest canopy, improve tree growth, and to drop habitat logs for aquatic and terrestrial habitat, and 3) 100 acres planted with cedar, hemlock, and spruce (50/acre). Addition of 2-3 keystone log clusters (60 ft or greater, 4ft dbh rootwad attached) every half mile to act as collection points for additional debris and to improve channel diversity - pools, gravel collection, side channels.	Forest reserve establishing 200 ft stream buffers along Green River - 210 acres with no active management		42.00			Implemented with Tacoma Natural Zone no harvest buffer of 200ft (776 acres protected). Dick Ryan's letter to Scott Pozarycki dated 12/12/2005 indicates 1,113 Acres protected	implemented 2004			42.00		Maintain buffer	
				Forest reserve establishing 200 ft stream buffers along Green River - 90 acres of selective thinning to open forest canopy, improve tree growth, and provide habitat logs		27.00	5	10%	Thinning areas: near Lester, others? 90 acres unlikely. Replace with additional acres of protected 200 ft stream buffer along mainstem (1:5 mitigation ratio). Replaced by 135 Acres of No Harvest 200 ft buffer along mainstem Green River as per Dick Ryan's letter to Scott Pozarycki dated 12/12/2005.	2007 & phase 2			17.00		Maintain buffer	
				Forest reserve establishing 200 ft stream buffers along Green River - 100 acres planted		30.00			Plant conifers (50/acre - 30ft centers) within 200 ft of mainstem in currently unvegetated areas: Hot Springs (7.5), Welchers Field (4), Koss orchard (7), Humphrey meander (1) Sunday Cr. 100 acres unlikely. Replace with additional acres of protected 200 ft stream buffer along mainstem (1:5 mitigation ratio).	2007 & phase 2.			20.00		Maintain buffer. Monitor plantings to ensure survival. Replant if necessary to ensure 50/acre goal.	
				Place 18 2-3 keystone log clusters that each create 6000 ft2 pool by year 5. Add 270 logs from thinning.	4.00		10	40%	Construct LWD projects in mainstem Green River at Reload, Lester Rd MP 6, MP 5.5, Hot Springs, Maywood, Welchers, Sweeney Cr. Goal is to create at least 72,000 ft2 of new pool area. Additional pool area created can be used for additional mitigation credit. Each 2,700 ft2 of pool area created results in 0.1 HU of mitigation.	constructed 2004, 2005 & phase 2	2.70	2.74			Additional loose wood and/or log structures constructed every 5-10 yrs sufficient to ensure pool area targets maintained. Monitoring will measure river pool area every 5 yrs.	
Sunday Creek	MSI-07	MS-04	At WSDOT airstrip RM 83-84, return river to its historic channel by diverting the river with one or more series of debris jams/flow deflectors and by excavating excess sediments. Currently, river has begun eroding the old Lester airstrip and the mainline road adjacent to the river. Land owned by WSDOT. During summer low flow, new exposed, braided channel has high stream temps with no pool volume and low width/depth ratio presenting a potential barrier to adult salmon.	Place mainstem back into 4000 ft historic channel, excavate and divert Airstrip diversion dropped due to inability to obtain real estate. Replacement projects are listed in General Implementation Plan column.	1.70	5	25%	Create 27,000 ft2 pool area using LWD or by creating off channel habitat (0.1 HU = 2700 ft2 pool area) in Sunday Cr and mainstem Green between high trestle and Sunday Ck.	constructed 2006	1.00	1.31			Maintain pool area and off channel targets similar to schedule for MSI-6.		
Create new pools or off channel habitat in mainstem Green between RM 71-77. Goal is 13,500 ft2 pool area (0.1 HU = 2700 ft2 pool area). This can become part of MSI-06.								constructed 2006	0.50	0.22			Maintain pool area and off channel targets similar to schedule for MSI-6.			
???									0.20							

HHD AWSP Stream Mitigation and Restoration

Project Location	CDR #	FR/EIS #	Project Objectives (draft EIS)	Project Elements (mitigation: p. F1-537; restoration: section 8D.3, p. F1-523)	FR/EIS Stream Habitat Units (p. F1-537,542)	FR/EIS Riparian Habitat Units	FR/EIS Stream Replacement Period (yrs)	FR/EIS % of stream project maintained	General Implementation Plan	Timeframe for Implementation	Phase 1 stream HU planned	Phase 1 stream HU constructed to date	Phase 1 riparian HU planned	Phase 1 riparian HU constructed to date	O&M
North Fork of Green River elevation 1147-1177 ft.	TRI-01.1	TR-04	Retain existing trees along riparian zones around reservoir, plantings in bare areas in/and along stream channels with inundation tolerant grasses, forbs, trees, and aquatic plants. Construct features to maintain stream channel in section of reservoir that is alternately flooded and 'dry'. Excavate subimpoundments/ponds and side-channel habitat. Construct floating islands.	Plant 15 acres of riparian habitat		4.50	5	10%	Uncertain success of sedges. Will monitor existing reservoir sedges and attempt to implement during phase 2 or find alternate at that time.	phase 2					
				Included among the 300 boulders and 260 logs identified in MSI-04.	Included in MSI-04		5	-4%	Add boulders/LWD to provide pool habitat and maintain river structure. Add log booms along river banks to retain debris from pool raise?	phase 2	Included in MSI-04 total	Included in MSI-04 total			
North Fork Green River, 1240-1320ft.	TRI-01.3, TRI-02.3	TR-09	Project site is on Gale Creek from 1240-1280ft and the North Fork from 1240-1320ft. Management prescriptions include 1) continuation of the riparian forest reserve along Gale Cr (8.3 acres) and the North Fork (31.7 acres, 1240-1320). Riparian buffers of 150 ft managed solely for fish and wildlife with prescriptions as described in MS-08; and 2) placement of one cluster of keystone logs in the North Fork channel.	Forest reserve establishing 150 ft stream buffers along North Fork Green River - 5 acres of selective thinning to open forest canopy, improve tree growth, and provide habitat logs		1.50	5	10%	Unlikely sufficient planting areas exist. May replace this element with acres of protected 150 ft stream buffer along North Fork (1:5 mitigation ratio = 7.5 acres). Alternatively, can do some hardwood to conifer conversion type projects. This will be left for phase 2. Implemented by replacing with 7.5 Acres of No Harvest 200 ft buffer along the North Fork as per Dick Ryan's letter dated 12/12/2005 to Scott Pozarycki.	phase 2					
				Forest reserve establishing 150 ft stream buffers along North Fork Green River - 26 acres planted		7.80			Likely replace this element with acres of protected 150 ft stream buffer along mainstem.	phase 2					
				Place 2 2-3 keystone log clusters creating 4000 ft2 pool by year 5	0.20		10	40%	Construct log structures producing 8000ft2 of pool habitat just above el. 1240 off rd #5512 where old road goes down to river.	constructed 2005	0.20	0.26			same as MSI-06
Reservoir tribs including Charley, Gale, Cottonwood, and McDonald Creeks 1147-1177 ft.	TRI-02.1, TRI-03	TR-05	Partial maintenance of tributary habitat in Charley, Gale, Cottonwood, and McDonald Creeks. Includes features listed in MSI-04 except floodplain excavation.	Place 5 culverts in RR grade	0.30		5	20%	Breach RR berm in 5 locations that are existing low points determined by H&H LIDAR evaluation. COE determine precise breach locations/design. General location is near and downstream of Gale Cr confluence with Green River. Tacoma implement.	constructed 2006	0.30	0.30			
				Replace 1 large tributary culvert (2500 x 20ft)	1.20				Tacoma replace Gale Creek culvert with bridge.	constructed 2005	1.20	1.20			
				Add 130 LWD, 165 boulders over 2500ft	0.80				Recreate lower McDonald Creek to eliminate fish passage barriers.	constructed 2006	0.30	0.30			
North Fork of Green River floodplain including Page Mill Pond and Creek, elevation 1147-1185ft.	TRI-04	VF-05	Maintain and improve existing wetland pond complex that lies within and above new pool on floodplain of North Fork Green River (1147-1185) and includes Page Mill pond and creek. Series of smaller ponds developed within floodplain and existing complex. LWD added to ponds and existing stream channel. Native wetland plantings above new reservoir, and inundation tolerant plantings within new pool. 5 acres of wetland planting within and above 5 ft max inundation	Plant 5 acres of native wetland species (3.3 acres during phase 1 and 1.7 acres during phase 2)		5.00	5	10%	Uncertain success of sedges. Will monitor existing reservoir sedges and attempt to implement during phase 2 or find alternate at that time	phase 2					
				Create 2 ponds totaling 1 acre of habitat.	1.00		10	20%	Excavate 0.5-1 acres of pond/edge habitat along North Fork floodplain. Place LWD in ponds.	constructed 2005	0.50	0.30			
				Reconnect 1/2 acre pond.	0.25					phase 2					
				Add 150 logs to the pond complex.	0.75					constructed 2005	0.30	0.30			
Three TBD tributaries on the upper Green River.	TRI-05 / -06 / -07	TR-10	Three tributaries (2 small and 1 large) on upper Green would have existing culverts replaced to provide fish passage. Culvert inventory will identify locations.	Replace 2 small culverts reconnecting up to 4000 linear ft	1.20		15	30%	Tacoma replace 2 impassable culverts: upper McDonald Cr culvert replaced with bridge, lower McDonald Cr culvert removed - road rerouted to avoid stream.	constructed 2005	1.20	1.20			
				Replace 1 large culvert reconnecting up to 3000 linear ft	1.70				Tacoma replace 1 large tributary impassable culvert - East Maywood Cr culvert replaced with	constructed 2005	1.70	1.70			
Eagle Gorge Reservoir	no number	no number	Retain existing trees around reservoir and/or restoration projects below and above dam: 1) 3.2 acres of side channel habitat below HHD; or 2) stream habitat improvements above HHD, 8000 lineal ft mainstem and 4000 lineal ft North Fork. (p. F-541)		0.50				Trees have been retained around reservoir. Complete restoration projects in 2007-8.	implemented 2006	0.50	0.50			
Totals:					17.40	121.55									
Phase 1 Targets:					11.50	78.20					11.80	10.93	79.00	0.00	
Phase 2 Targets:					5.90	42.40									
Additional Phase 2 Stream Habitat Mitigation															

Project Location	CDR #	FR/EIS #	Project Objectives (draft EIS)	Project Elements (mitigation: p. F1-537; restoration: section 8D.3, p. F1-523)	FR/EIS Stream Habitat Units (p. F1-537,542)	FR/EIS Riparian Habitat Units	FR/EIS Stream Replacement Period (yrs)	FR/EIS % of stream project maintained	General Implementation Plan	Timeframe for Implementation	Phase 1 stream HU planned	Phase 1 stream HU constructed to date	Phase 1 riparian HU planned	Phase 1 riparian HU constructed to date	O&M
Green River RM 38 & Lower Burns Creek		LVF-03	Reconnect and improve up to 2.8 acres of side-channel habitat. An isolated levee at RM 37.9-38.2 would be replaced with a set back levee allowing the river to reclaim the historic floodplain. The relic side-channel would be improved and a nearby tributary, Burns Creek, would be re-aligned to follow its historic connection with the floodplain.	Reconnect and improve up to 2.8 acres of side-channel habitat. Remove isolated levee at RM 37.9-38.2 allowing river to reclaim historic floodplain. Realignment of Burns Creek to its historic connection with the floodplain. Build setback levee to provide protection at edge of 100 year floodplain. Rehabilitate an existing, abandoned 2500 ft long side-channel through excavation, placement of woody debris, and plantings. Divert Burns Cr to connect with the new side-channel by excavating new channel and filling old channel.		none	none	same as column D, but 2.01 additional acres.	Phase 2	Phase 2	NA	NA	NA	NA	
O-Grady and Metzler Parks		LVF-04	Reconnect and improve 2.1 acres of Middle Green River side-channel habitat, 4.81 acres baseline, 2.1 additional acres with mitigation, by increasing the complexity and connectivity of two major side channels located on the right bank (Metzler Park) and left bank (O'Grady Park). The existing channel would be improved by addition of LWD, debris jams to raise mainstem water surface to create a more permanent side channel/river connection and by improving a groundwater tributary channel (in O'Grady Park).	Side channel RM 40.21R(Metzler Park): improve connectivity of side channel at flows 800-2000 cfs. Place debris jam at secondary inlet at RM 40.2 to raise water elevation and partially block this inlet. Add LWD through channel. Side channel RM 40.63L: place debris jam at RM 40.2 inlet to trap gravel and divert more flow into side channel. Side channel RM 40.01R: excavate upper 250-300 ft to improve connectivity, add debris jam just below inlet, add LWD throughout channel. Side channel RM 39.45L (O'Grady Park): place debris jam near inlet, excavate 300 ft of the channel to improve connectivity at low to moderate flows, add LWD to all channels and slough.		none	none	same as column D.	Phase 2	Phase 2	NA	NA	NA	NA	
Flaming Geyser Park		LVF-06	Reconnect and improve up to 3.75 acres of side-channel habitat: 2.4 acres baseline and 2.35 additional acres with mitigation. Under the concept plan for GDERP, an existing side and an existing spring fed stream would be reconnected through excavation of an old cutoff channel. The existing and new channels would be enhanced through addition of LWD and providing stable water source (spring fed stream).	Divert the downstream end of the side channel to join the stream through the relic, perched side channel. This will create 1500 ft of new channel and improve flows through the lower portion of the side channel. Excavate 150 ft of inlet 1-2 ft deeper, RM 45.1, and place a debris jam just downstream of inlet to improve connection of side channel at lower flows. Install LWD in all channels.		none	none	same as column D, but 1.31 additional acres.	Phase 2	Phase 2	NA	NA	NA	NA	
Brunner Slough (Kanaskat Slough)		VF-03	Reconnect and improve up to 2.8 acres of side-channel habitat to quality fish habitat. Excavate old channel, divert flow from the mainstem Green to allow natural scour and excavation of the old channel; addition of LWD for habitat complexity, and redirect a small tributary that formerly flowed into this channel.	Reconnect and improve up to 2.8 acres of side-channel habitat. In the inner threaded channel 1) excavate upper channel to the existing level of the Green River, 2) divert flow from mainstem Green to allow natural scour and excavation of the old channel, and 3) add LWD. In outer threaded channel 1) deepen lower channel, 2) excavate upper channel and breach private road crossings, 3) redirect small tributary that formerly flowed into this channel but now enters mainstem Green below this side channel, and 4) add LWD. Also divert flow (30-40 cfs) from river into overflow channel and existing beaver pond, create ponds, install 500-700 ft culvert to transit gravel company land.		none	none	same as column D, but 2.4 additional acres.	Phase 2	Phase 2	NA	NA	NA	NA	
Stream Habitat Restoration															
RM 60 gravel nourishment (zone 1)	GN-KP	LMS-01-04	Add 3900 yd3 of screened gravel to the Green River near RM 40-46. Four conceptual sites identified. Potential site also identified below Tacoma Diversion Dam.	Add 3900 yd3 of screened gravel to the Green River near RM 40-46. Four conceptual sites identified. Potential site also identified below Tacoma Diversion Dam. Gravel to be placed just within active channel, to be moved by high flows. Replacement value is 50% of the median estimated loss of sediment.	NA	NA	1	100%	Place 3900 yd3 of spawning sized gravel annually at RM 60 (zone 1 - Tacoma Watershed Office).	implemented 2003 O&M 2004 - 2052	NA	NA	NA	NA	Place 3900 yd3 of spawning sized gravel annually at RM 60. Size gradation and quantities may be modified based on annual monitoring data.

HHD AWSP Stream Mitigation and Restoration

Project Location	CDR #	FR/EIS #	Project Objectives (draft EIS)	Project Elements (mitigation: p. F1-537; restoration: section 8D.3, p. F1-523)	FR/EIS Stream Habitat Units (p. F1-537,542)	FR/EIS Riparian Habitat Units	FR/EIS Stream Replacement Period (yrs)	FR/EIS % of stream project maintained	General Implementation Plan	Timeframe for Implementation	Phase 1 stream HU planned	Phase 1 stream HU constructed to date	Phase 1 riparian HU planned	Phase 1 riparian HU constructed to date	O&M
loose wood debris transport	MSI-02	MS-09	LWD would be stockpiled for the purpose of placement in habitats at a later date.	Haul a portion of the LWD collected annually in the reservoir to locations below Tacoma Diversion Dam and place within the active channel of the Green River. Generic volume of wood: 100-150 pieces, minimum size 1ft x 20ft to max 4ft x 40ft, or an average size of 2.5 - 3ft diameter, 300ft length with rootwad attached. Actual annual volume will vary.	NA	NA	1	100%	Haul a percent (approx 50%) of LWD collected in the reservoir each year to zone 1 gravel loading berms and place on the gravel berms. Exact amount to be determined by annual ESA consultation. Additional placement locations are possible in the future dependent on results at zone 1. Biop expanded this to include an additional 5 truckloads (total 50-75 tons) of small wood debris per year.	implemented 2004 O&M 2005 - 2053	NA	NA	NA	NA	Annual wood loading at RM 60. Quantities based on amount of wood that enters the reservoir each year. LWD and habitat monitoring every 5 years to track effectiveness (baseline 2001, start 2006).
Signani Slough (Palmer Slough)	MSI-01	VF-04	Restore up to 3.4 acres of former side-channel to quality fish habitat which was lost due to Corps realignment of BNR railroad during construction of HHD. Excavate fill material, replace 48 inch culvert with one or two 16 foot culverts, add LWD, excavate in the floodplain to restore habitat complexity, divert 35 cfs from the Green River to provide additional water for the entire channel length.	Headworks road will be breached at two points to provide flow diversion at the upstream end (2-4 ft culvert, none existing) and replacement of an existing 4 ft culvert with either one or two 16ft culverts. Flow diversion to the upstream end will require starting 600-1000ft upstream of the breach near RM 59.6. The diversion pipe will probably have to follow pipeline 1 or 5 to protect against flood damage. The outlet channel may require re-alignment and may extend further downstream than the current channel.	NA	NA	10*	40%*	Replace downstream culvert at Signani slough. Install/construct fish ladder at high beaver dam forming pond. Annually breach smaller downstream dams. Construct spawning channel upstream of pond. Add LWD.	Culvert replaced 2004. Habitat construction in 2007-8.	NA	NA	NA	NA	Annually breach beaver dams downstream of high dam forming pond. Annually monitor fish passage and spawning at ladder and spawning channel. Ensure fish ladder functioning throughout year to facilitate adult and juvenile fish passage both upstream and downstream through ladder.
Mainstem Green River, el. 1177 to 1240	MSI-05	MS-03	Restore and improve 8000 lineal ft of mainstem and valley floor habitat of the Green River from 1177 to 1240. Includes 1) addition of LWD or boulders to increase pool depth, sediment routing, and instream cover, bank stability and channel confinement, 2) restoration or creation of off-channel habitat (side channels or meanders), and 3) implementation of 200 ft riparian buffers (Tacoma forest plan).	Restore and improve 8000 lineal ft of mainstem and valley floor habitat of the Green River from 1177 to 1240. Includes 1) addition of LWD or boulders to increase pool depth, sediment routing, and instream cover, bank stability and channel confinement, 2) restoration or creation of off-channel habitat (side channels or meanders), and 3) protection and expansion of riparian zone buffer strips.	NA	NA	10*	40%*	Add 'loose' LWD to mainstem Green, add LWD and create pool habitat at the Humphrey project site (road 5027 terminus). Add LWD via helicopter at additional locations to encourage channel migration and increase habitat diversity (former side channel downstream of meander), Koss backwater excavation.	constructed humphrey site 2005, Koss site 2007-8	NA	NA	NA	NA	Replace maximum of 40% of LWD every 10 years.
Smay Creek [former North Fork Green River, el. 1177 to 1240]	TRI-01.2	TR-06	Restore and improve 4000 lineal ft of main channel and valley floor habitat of the North Fork Green River from 1177 to 1240 similar to MSI-05.	Restore and improve 4000 lineal ft of mainstem and valley floor habitat of North Fork Green from 1177 to 1240 ft. Includes 1) addition of LWD or boulders to increase pool depth, sediment routing, and instream cover, bank stability and channel confinement, 2) restoration or creation of off-channel habitat (side channels or meanders), and 3) protection and expansion of riparian zone buffer strips.	NA	NA	10*	40%*	Project site dropped due to concerns about creating habitat in section of the North Fork that is occasionally dry during the summer. Investigated possibility of regrading North Fork to eliminate this problem - concluded infeasible. Replacement project is Smay Creek habitat restoration. Includes creating pool habitat, adding LWD, increasing channel diversity, and creating off channel habitat.	2007-8	NA	NA	NA	NA	Replace maximum of 40% of LWD every 10 years.
Reservoir tribs including Charley, Gale, McDonald, Cottonwood, Piling, and 3 unnamed tribs, el. 1177-1240ft.	TRI-02.2	TR-07	Restore tributaries to reservoir including Charley, Gale, McDonald, Cottonwood, Piling, and 3 unnamed tribs similar to MSI-05	Restore and improve 1000 lineal ft of channel habitat in large and small tributaries from 1177 to 1240 ft. Includes 1) addition of LWD or boulders to increase pool depth, sediment routing, and instream cover, bank stability and channel confinement, and 2) protection and expansion of riparian zone buffer strips.	NA	NA	10*	40%*	Increase pool area, gravel storage, and habitat complexity by adding LWD to all tributaries. Primary method will be placement by helicopter.	constructed 2005	NA	NA	NA	NA	Replace maximum of 40% of LWD every 10 years.

APPENDIX B

Signature Page

SIGNATURE PAGE

**CITY OF TACOMA
TACOMA WATER**

All submittals must be in ink or typewritten, executed by a duly authorized officer or representative of the bidding/proposing entity, and received and time stamped as directed in the **Request for Qualifications page near the beginning of the specification**. If the bidder/proposer is a subsidiary or doing business on behalf of another entity, so state, and provide the firm name under which business is hereby transacted.

**REQUEST FOR QUALIFICATIONS SPECIFICATION NO. TW24-0128F
Fish Habitat Mitigation and Restoration Projects**

The undersigned bidder/proposer hereby agrees to execute the proposed contract and furnish all materials, labor, tools, equipment and all other facilities and services in accordance with these specifications.

The bidder/proposer agrees, by submitting a bid/proposal under these specifications, that in the event any litigation should arise concerning the submission of bids/proposals or the award of contract under this specification, Request for Bids, Request for Proposals or Request for Qualifications, the venue of such action or litigation shall be in the Superior Court of the State of Washington, in and for the County of Pierce.

Non-Collusion Declaration

The undersigned bidder/proposer hereby certifies under penalty of perjury that this bid/proposal is genuine and not a sham or collusive bid/proposal, or made in the interests or on behalf of any person or entity not herein named; and that said bidder/proposer has not directly or indirectly induced or solicited any contractor or supplier on the above work to put in a sham bid/proposal or any person or entity to refrain from submitting a bid/proposal; and that said bidder/proposer has not, in any manner, sought by collusion to secure to itself an advantage over any other contractor(s) or person(s).

Bidder/Proposer's Registered Name

Signature of Person Authorized to Enter Date
into Contracts for Bidder/Proposer

Address

Printed Name and Title

City, State, Zip

(Area Code) Telephone Number / Fax Number

Authorized Signatory E-Mail Address

State Business License Number
in WA, also known as UBI (Unified Business Identifier) Number

E.I.No. / Federal Social Security Number Used on Quarterly
Federal Tax Return, U.S. Treasury Dept. Form 941

State Contractor's License Number
(See Ch. 18.27, R.C.W.)

E-Mail Address for Communications

Addendum acknowledgement #1 _____ #2 _____ #3 _____ #4 _____ #5 _____

THIS PAGE MUST BE SIGNED AND RETURNED WITH SUBMITTAL.

APPENDIX C

Sample Contract

SERVICES CONTRACT

Click here for the [Contract Questionnaire Popup Quick Reference](#)

Start Questionnaire

Finalize Document

THIS CONTRACT, made and entered into effective as of [Month] [Day], [Year] (“EFFECTIVE DATE”), by and between the CITY OF TACOMA, a municipal corporation of the State of Washington (hereinafter referred to as the “CITY”), and [INSERT legal name of Supplier exactly as it appears in Ariba including any dbas or trade names], (hereinafter may be referred to as “CONTRACTOR” or “SUPPLIER”);

In consideration of the mutual promises and obligations hereinafter set forth, the Parties hereto agree as follows:

1. Scope of Services

The CONTRACTOR agrees to diligently and completely perform the services or deliverables consisting of [INSERT A BRIEF DESCRIPTION OF THE WORK TO BE PERFORMED] as is described in [Exhibit A, B, ETC., if needed] attached hereto and incorporated herein.

2.

3. Changes to Scope of Work

The CITY shall have the right to make changes within the general scope of services or deliverables upon execution in writing of a change order or amendment hereto. If the changes will result in additional work effort by CONTRACTOR, the CITY will agree to reasonably compensate the CONTRACTOR for such additional effort up to the maximum amount specified herein or as otherwise provided by City Code.

4.

5. Term

All services shall be satisfactorily completed on or before [INSERT CONTRACT TERMINATION DATE] and this Contract shall expire on said date unless mutually extended by a written and executed Amendment to this Contract.

6.

7. Delay

Neither party shall be considered to be in default in the performance of this Contract to the extent such performance is prevented or delayed by any cause which is beyond the reasonable control of the affected party and, in such event, the time for performance shall be extended for a period equal to any time lost as a result thereof. In the event CONTRACTOR is unable to proceed due to a delay solely attributable to CITY, CONTRACTOR shall advise CITY of such delay in writing as soon as is practicable.

8. Compensation

The CITY shall compensate the CONTRACTOR for the services and deliverables performed under this Contract [on the basis of] [EXHIBIT XXXX and/or a DESCRIPTION OF COMPENSATION ARRANGEMENTS –MILESTONES, TIME AND MATERIALS, LUMP SUM ETC.]

9. Prevailing Wages

- A. If federal, state, local, or any applicable law requires CONTRACTOR to pay prevailing wages in connection with this Contract, and CONTRACTOR is so notified by the CITY, then CONTRACTOR shall pay applicable prevailing wages and otherwise comply with the Washington State Prevailing Wage Act (RCW 39.12) in the performance of this Contract.
- B. If applicable, a Schedule of Prevailing Wage Rates and/or the current prevailing wage determination made by the Secretary of Labor for the locality or localities where the Contract will be performed is made of part of the Contract by this reference. If prevailing wages apply to the Contract, CONTRACTOR and its subcontractors shall:
 1. Be bound by and perform all transactions regarding the Contract relating to prevailing wages and the usual fringe benefits in compliance with the provisions of Chapter 39.12 RCW, as amended, the Washington State Prevailing Wage Act and/or the Davis-Bacon Act (40 U.S.C. 3141- 3144, and 3146-3148) and the requirements of 29 C.F.R. pt. 5 as may be applicable, including the federal requirement to pay wages not less than once a week.
 2. Ensure that no worker, laborer or mechanic employed in the performance of any part of the Contract shall be paid less than the prevailing rate of wage specified on that Schedule and/or specified in a wage determination made by the Secretary of Labor (unless specifically preempted by federal law, the higher of the Washington state prevailing wage or federal Davis-Bacon rate of wage must be paid.
 3. Immediately upon award of the Contract, contact the Department of Labor and Industries, Prevailing Wages section, Olympia, Washington and/or the federal Department of Labor, to obtain full information, forms and procedures relating to these matters. Per such procedures, a Statement of Intent to Pay Prevailing Wages and/or other or additional documentation required by applicable federal law, must be submitted by CONTRACTOR and its subcontractors to the CITY, in the manner requested by the CITY, prior to

any payment by the CITY hereunder, and an Affidavit of Wages Paid and/or other or additional documentation required by federal law must be received or verified by the CITY prior to final Contract payment.

10. Not to Exceed Amount

The total price to be paid by CITY for CONTRACTOR'S full and complete performance of the Scope of Work hereunder shall not exceed \$ [INSERT TOTAL AMOUNT OF CONTRACT] plus applicable taxes without a written and executed Amendment to this Contract. Said price shall be the total compensation for CONTRACTOR'S performance hereunder including, but not limited to, all work, deliverables, materials, supplies, equipment, subcontractor's fees, and all reimbursable travel and miscellaneous or incidental expenses to be incurred by CONTRACTOR.

In the event the CONTRACTOR incurs cost in excess of the sum authorized for service under this Contract, the CONTRACTOR shall pay such excess from its own funds, and the CITY shall not be required to pay any part of such excess, and the CONTRACTOR shall have no claim against the CITY on account thereof.

11. Payment

CONTRACTOR shall submit [Pick one of the following monthly, weekly, annual, Contract milestone, other (describe in detail)] invoices for services completed and/or deliverables furnished during the invoice period. Upon CITY'S request, CONTRACTOR shall submit necessary and appropriate documentation, as determined by the CITY, for all invoiced services and deliverables. For transactions conducted in SAP Ariba, invoices shall be submitted directly through Ariba. For invoices paid by ACH or by check, unless stated otherwise, invoices shall be electronically submitted by email with corresponding PO number or other identifying number listed in the subject line to accountspayable@cityoftacoma.org.

Payment shall be made through the CITY'S ordinary payment process, and shall be considered timely if made within 30 days of receipt of a properly completed invoice. All payments shall be subject to adjustment for any amounts, upon audit or otherwise, determined to have been improperly invoiced. The CITY may withhold payment to the CONTRACTOR for any services or deliverables not performed as required hereunder until such time as the CONTRACTOR modifies such services or deliverables to the satisfaction of the CITY.

12. Payment Method

The City's preferred method of payment is by ePayables (Payment Plus), followed by credit card (aka procurement card), then Electronic Funds Transfer (EFT) by Automated Clearing House (ACH), then check or other cash equivalent. CONTRACTOR may be required to have the capability of accepting the City's ePayables or credit card methods of payment. The City, in its sole discretion, will determine the method of payment for this Contract.

13. Independent Contractor Status

The services and deliverables shall be furnished by the CONTRACTOR as an independent Contractor, and nothing herein contained shall be construed to create an employer and employee relationship. The CONTRACTOR shall provide at its sole expense all materials, office space, and other necessities to perform its duties under this Contract, unless stated otherwise in this Contract. No payroll or employment taxes of any kind shall be withheld or paid by the CITY with respect to payments to CONTRACTOR. The payroll or employment taxes that are the subject of this paragraph include, but are not limited to, FICA, FUTA, federal income tax, state personal income tax, state disability insurance tax and state unemployment insurance tax. By reason of CONTRACTOR's status as an independent Contractor hereunder, no workers' compensation insurance has been or will be obtained by the CITY on account of CONTRACTOR. CONTRACTOR may be required to provide the CITY proof of payment of these said taxes and benefits. If the CITY is assessed or deemed liable in any manner for those charges or taxes, the CONTRACTOR agrees to hold the CITY harmless from those costs, including attorney's fees.

14. Services Warranty

The CONTRACTOR warrants that all services performed pursuant to this Contract shall be generally suitable for the use to which CITY intends to use said services and deliverables as expressed in the Scope of Work. In the performance of services under this Contract, the CONTRACTOR and its employees further agree to exercise the degree of skill and care required by customarily accepted good practices and procedures followed by professionals or service providers rendering the same or similar type of service. All obligations and services of the CONTRACTOR hereunder shall be performed diligently and completely according to such professional standards.

15.

16. Contract Administration

[INSERT NAME TITLE AND DEPARTMENT OF CONTRACT ADMINISTRATOR] for the CITY shall have primary responsibility for contract administration and approval of services to be performed by the CONTRACTOR, and shall coordinate all communications between the CONTRACTOR and the CITY.

17. Specific Personnel

If before, during, or after the execution of this Contract, CONTRACTOR represents to the CITY that certain personnel would or will be responsible for performing services and deliverables under this Contract, then the CONTRACTOR is obligated to ensure that said personnel perform said Contract services to the maximum extent permitted by law. This Contract provision shall only be waived by written authorization by the CITY, and on a case-by-case basis.

18.

19.

The CONTRACTOR shall establish and maintain records in accordance with requirements prescribed by the CITY, with respect to all matters related to the performance of this Contract. Except as otherwise authorized by the CITY, the CONTRACTOR shall retain such records for a period of _____ [INSERT THE TIME THE RECORDS SHOULD BE KEPT. MOST COMMON IS 6 YEARS] years after receipt of the final payment under this Contract or termination of this Contract.

20. Notices

Except for routine operational communications, which may be delivered personally or transmitted by electronic mail all notices required hereunder shall be in writing and shall be deemed to have been duly given if delivered personally or mailed first-class mail, postage prepaid, to the parties at the following addresses:

CITY:	CONTRACTOR:
Name:	Name:
Title:	Title:
Address:	Address:
Telephone No.:	Telephone No.:
E-mail:	E-mail:

21. Termination

- A. Except as otherwise provided herein, the CITY may terminate this Contract at any time, for CITY’s own reasons and without cause, by giving ten (10) business days written notice to CONTRACTOR. In the event of termination, all finished and unfinished work prepared by the CONTRACTOR pursuant to this Contract shall be provided to the CITY. CITY may terminate this Contract in the event of any material breach of any of the terms and conditions of this Contract if CONTRACTOR’s breach continues in effect after written notice of breach and 30 days to cure such breach and fails to cure such breach.

- B. In the event CITY terminates this Contract due to the CITY’s own reasons and without cause due to the CONTRACTOR’s actions or omissions, the CITY shall pay the CONTRACTOR the amount due for actual work and services necessarily performed under this Contract up to the effective date of termination, not to exceed the total compensation set forth herein.

- C. In the event of material default or breach by CONTRACTOR of any of the terms or conditions of the Contract, CITY may, at its election, procure services and deliverables under this CONTRACT from other sources, and may deduct from the unpaid balance due CONTRACTOR, or collect against the bond or security (if any), or may invoice and recover from CONTRACTOR all costs paid in excess of the price(s) set forth in the Contract.
- D. Termination of this Contract by CITY shall not constitute a waiver of any claims or remaining rights the CITY may have against CONTRACTOR relative to performance hereunder.

22. Suspension

The CITY may suspend this Contract, at its sole discretion, upon seven (7) business days' written notice to the CONTRACTOR. Such notice shall indicate the anticipated period of suspension. Any reimbursement for expenses incurred due to the suspension shall be limited to the CONTRACTOR'S reasonable expenses and shall be subject to verification. The CONTRACTOR shall resume performance of services under this Contract without delay when the suspension period ends. Suspension of this Contract by CITY shall not constitute a waiver of any claims or remaining rights the CITY may have against CONTRACTOR relative to performance hereunder.

23. Federal Funds

If federal funds will be used to fund, pay or reimburse all or a portion of the services or deliverables provided under the Contract, the terms and conditions set forth at Appendix A to this Contract are incorporated into and made part of this Contract and CONTRACTOR will comply with all applicable provisions of Appendix A and with all applicable federal laws, regulations, executive orders, policies, procedures, and directives in the performance of this Contract. If CONTRACTOR's receipt of federal funds under this Contract is as a sub-recipient, Appendix B, "Sub-recipient Information and Requirements" must be completed and incorporated into and made part of this Contract.

24. Taxes

Unless stated otherwise herein, CONTRACTOR is responsible for the payment of all charges and taxes applicable to the services performed under this Contract, and CONTRACTOR agrees to comply with all applicable laws regarding the reporting of income, maintenance of records, and all other requirements and obligations imposed pursuant to applicable law. If the CITY is assessed, made liable, or responsible in any manner for such charges or taxes, the CONTRACTOR holds CITY harmless from such costs, including attorney's fees.

If CONTRACTOR fails to pay any taxes, assessments, penalties, or fees imposed by any governmental body, including by Tacoma City ordinance, and including by a court of law, CITY will deduct and withhold or pay over to the appropriate governmental body those unpaid amounts upon demand by the governmental body. Any such payments shall be deducted from the CONTRACTOR's total compensation.

25. Licenses and Permits

The CONTRACTOR, at its expense, shall obtain and keep in force any and all necessary licenses and permits. The CONTRACTOR shall obtain a business license as required by Tacoma Municipal Code Subtitle 6B.20 and shall pay business and occupation taxes as required by Tacoma Municipal Code Subtitle 6A.30. If applicable, CONTRACTOR must have a Washington state business license.

26. Indemnification

CONTRACTOR shall indemnify, defend, and hold harmless the CITY, its officials, officers, agents, employees, and volunteers, from any and all claims, demands, damages, lawsuits, liabilities, losses, liens, expenses and costs arising out of the subject matter of this Contract; provided that this provision shall not apply to the extent that damage or injury results from the sole negligence of the CITY, or its officers, agents, or employees. This indemnification shall extend to and include attorneys' fees and the cost of establishing the right of indemnification hereunder in favor of the CITY. This indemnification shall survive the termination of this Contract.

It is expressly agreed that with respect to design professional services performed by CONTRACTOR herein, CONTRACTOR's duty of indemnification, including the duty and cost to defend, against liability for damages arising out of such services or out of bodily injury to persons or damage to property shall, as provided in RCW 4.24.115 apply only to the extent of CONTRACTOR's negligence.

27. Title 51 Waiver

CONTRACTOR specifically assumes potential liability for actions brought by the CONTRACTOR'S own employees against the CITY and, solely for the purpose of this indemnification and defense, the CONTRACTOR specifically waives any immunity under the state industrial insurance law, Title 51 RCW. THE CONTRACTOR RECOGNIZES THAT THIS WAIVER WAS THE SUBJECT OF MUTUAL NEGOTIATION.

28. Insurance

During the course and performance of the services herein specified, CONTRACTOR will maintain the insurance coverage in the amounts and in the manner specified in the City of Tacoma Insurance Requirements as is applicable to the services and deliverables provided under this Contract. The City of Tacoma Insurance Requirements documents are fully incorporated herein by reference.

Failure by CITY to identify a deficiency in the insurance documentation provided by CONTRACTOR or failure of CITY to demand verification of coverage or compliance by CONTRACTOR with these insurance requirements shall not be construed as a waiver of CONTRACTOR'S obligation to maintain such insurance.

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29. Nondiscrimination

The CONTRACTOR agrees to take all steps necessary to comply with all federal, state, and City laws and policies regarding non-discrimination and equal employment opportunities. The CONTRACTOR shall not discriminate in any employment action because of race, religion, creed, color, national origin or ancestry, sex, gender identity, sexual orientation, age, marital status, familial status, veteran or military status, the presence of any sensory, mental or physical disability or the use of a trained dog guide or service animal by a disabled person. In the event of non-compliance by the CONTRACTOR with any of the non-discrimination provisions of this Contract, the CITY shall be deemed to have cause to terminate this Contract, in whole or in part.

30. Conflict of Interest

No officer, employee, or agent of the CITY, nor any member of the immediate family of any such officer, employee, or agent as defined by City ordinance, shall have any personal financial interest, direct or indirect, in this Contract, either in fact or in appearance. The CONTRACTOR shall comply with all federal, state, and City conflict of interest laws, statutes, and regulations. The CONTRACTOR represents that the CONTRACTOR presently has no interest and shall not acquire any interest, direct or indirect, in the program to which this Contract pertains which would conflict in any manner or degree with the performance of the CONTRACTOR'S services and obligations hereunder. The CONTRACTOR further covenants that, in performance of this Contract, no person having any such interest shall be employed. The CONTRACTOR also agrees that its violation of the CITY'S Code of Ethics contained in Chapter 1.46 of the Tacoma Municipal Code shall constitute a breach of this Contract subjecting the Contract to termination.

31.

32. Public Disclosure

This Contract and documents provided to the CITY by CONTRACTOR hereunder are deemed public records subject to disclosure under the Washington State Public Records Act, Chapter 42.56 RCW (Public Records Act). Thus, the CITY may be required, upon request, to disclose this Contract and documents related to it unless an exemption under the Public Records Act or other laws applies. In the event CITY receives a request for such disclosure, determines in its legal judgment that no applicable exemption to disclosure applies, and CONTRACTOR has complied with the requirements herein to mark all content considered to be confidential or proprietary, CITY agrees to provide CONTRACTOR ten (10) days written notice of impending release. Should legal action thereafter be initiated by CONTRACTOR to enjoin or otherwise prevent such release, all expense of any such litigation shall be borne by CONTRACTOR, including any damages, attorneys fees or costs awarded by reason of having opposed disclosure. CITY shall not be liable for any release where notice was provided and CONTRACTOR took no action to oppose the release of information. Notice of any proposed release of information pursuant to Chapter 42.56 RCW, shall be provided to CONTRACTOR according to the "Notices" provision herein.

33. Confidential or Proprietary Records Must be Marked

If CONTRACTOR provides the CITY with records that CONTRACTOR considers confidential or proprietary, CONTRACTOR must mark all applicable pages of said record(s) as "Confidential" or "Proprietary." If CONTRACTOR fails to so mark record(s), then (1) the CITY, upon request, may release said record(s) without the need to satisfy the notice requirements above; and (2) the CONTRACTOR expressly waives its right to allege any kind of civil action or claim against the CITY pertaining to the release of said record(s).

34.

35. Approval for Release of Information Related to Contract

If requested by CITY, CONTRACTOR shall not release any information or documentation concerning the work under this Contract or any part thereof for marketing, advertising, or other commercial activities or publication including, but not limited to, news releases or professional articles without CITY's prior written approval. CONTRACTOR may submit at any time for review and approval a generic abstract describing the component parts of the completed Scope of Services ("Project Abstract"). After receiving written approval of the Project Abstract from the CITY, the CONTRACTOR may make minor insignificant changes to the Project Abstract and use all or parts of the Project Abstract in proposals.

This Section shall survive for six (6) years after the termination or expiration of this Contract.

36. Dispute Resolution

In the event of a dispute pertaining to this Contract, the parties agree to attempt to negotiate in good faith an acceptable resolution. If a resolution cannot be negotiated, then the parties agree to submit the dispute to voluntary non-binding mediation before pursuing other remedies. This provision does not limit the CITY'S right to terminate authorized by this Contract.

37. Miscellaneous Provisions

Governing Law and Venue

Washington law shall govern the interpretation of this Contract. Pierce County shall be the venue of any mediation, arbitration, or litigation arising out of this Contract.

Assignment

The CONTRACTOR shall not assign, subcontract, delegate, or transfer any obligation, interest or claim to or under this Contract or for any of the compensation due hereunder without the prior written consent of the CITY.

No Third Party Beneficiaries

This Contract shall be for the sole benefit of the parties hereto, and nothing contained herein shall create a contractual relationship with, or create a cause of action in favor of, a third party against either party hereto.

Waiver

A waiver or failure by either party to enforce any provision of this Contract shall not be construed as a continuing waiver of such provisions, nor shall the same constitute a waiver of any other provision of this Contract.

Severability and Survival

If any term, condition or provision of this Contract is declared void or unenforceable or limited in its application or effect, such event shall not affect any other provisions hereof and all other provisions shall remain fully enforceable. The provisions of this Contract, which by their sense and context are reasonably intended to survive the completion, expiration or cancellation of this Contract, shall survive termination of this Contract.

Entire Agreement

This Contract and the attached Exhibits and Appendices, as modified herein, contain the entire agreement between the parties as to the services to be rendered hereunder. All previous and contemporaneous agreements, representations or promises and conditions relating to the subject matter of this Contract are superseded hereby. The Parties hereto mutually acknowledge, understand and agree that the terms and conditions set forth herein shall control and prevail over any conflicting terms and conditions stated in any attachments hereto.

Modification

No modification or amendment of this Contract shall be effective unless set forth in a written and executed Amendment to this Contract.

IN WITNESS WHEREOF, the Parties hereto have accepted and executed this Contract, as of the Effective Date stated above, which shall be Effective Date for bonding purposes as applicable. The undersigned Contractor representative, by signature below, represents and warrants they are duly authorized to execute this legally binding Contract for and on behalf of Contractor and further represents and warrants that Contractor is not suspended, debarred, or otherwise disqualified under federal, state, or local law from participating in this Contract.

CITY OF TACOMA:

CONTRACTOR:

Signature:

Signature:

Name:

Name:

Title:

Title:

(City of Tacoma use only - blank lines are intentional)

Director of Finance: _____

Deputy/City Attorney (approved as to form): _____

Approved By: _____

Approved By: _____

Approved By: _____

Approved By: _____

Approved By: _____

Approved By: _____

Approved By: _____

Approved By: _____

APPENDIX A
FEDERAL FUNDING

1. COPELAND ANTI-KICKBACK ACT

For Contracts subject to Davis Bacon Act the following clauses will be incorporated into the Contract:

- A. CONTRACTOR shall comply with 18 U.S.C. § 874, 40 U.S.C. § 3145, and the requirements of 29 C.F.R. pt. 3 as may be applicable, which are incorporated by reference into this Contract.
- B. CONTRACTOR or subcontractor shall insert in any subcontracts the clause above and such other clauses federal agencies may by appropriate instructions require, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all of these Contract clauses.
- C. Breach. A breach of the contract clauses above may be grounds for termination of the contract, and for debarment as a contractor and subcontractor as provided in 29 C.F.R. § 5.12.

2. EQUAL EMPLOYMENT OPPORTUNITY

During the performance of this Contract, CONTRACTOR will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, or national origin. If the CONTRACTOR does over \$10,000 in business a year that is funded, paid or reimbursed with federal funds, CONTRACTOR will take specific and affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, sexual orientation, gender identity, or national origin. Such action shall include, but not be limited to the following:

- A. Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. CONTRACTOR agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.
- B. CONTRACTOR will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, or national origin.
- C. CONTRACTOR will not discharge or in any other manner discriminate against any employee or applicant for employment because such employee or applicant has inquired about, discussed, or disclosed the compensation of the employee or applicant or another employee or applicant. This provision shall not apply to

instances in which an employee who has access to the compensation information of other employees or applicants as a part of such employee's essential job functions discloses the compensation of such other employees or applicants to individuals who do not otherwise have access to such information, unless such disclosure is in response to a formal complaint or charge, in furtherance of an investigation, proceeding, hearing, or action, including an investigation conducted by the employer, or is consistent with the Contractor's legal duty to furnish information.

- D. CONTRACTOR will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of the contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
- E. CONTRACTOR will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.
- G. In the event of CONTRACTOR's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this Contract may be canceled, terminated, or suspended in whole or in part and the CONTRACTOR may be declared ineligible for further federally funded contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.
- H. CONTRACTOR will include the portion of the sentence immediately preceding paragraph (A) and the provisions of paragraphs (A) through (G) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. CONTRACTOR will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance:

Provided, however, that in the event CONTRACTOR becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the administering agency, the CONTRACTOR may request the United States to enter into such litigation to protect the interests of the United States.

3. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

- A. Overtime requirements. Neither CONTRACTOR or subcontractor contracting for any part of the Contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay

for all hours worked in excess of forty hours in such workweek.

- B. Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (3)(A) of this section the CONTRACTOR and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such CONTRACTOR and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (3)(A) of this section, in the sum of \$27 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (3)(A) of this section.
- C. Withholding for unpaid wages and liquidated damages. The CITY shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the CONTRACTOR or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such CONTRACTOR or sub-contractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (3)(B) of this section.
- D. Subcontracts. The Contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (3)(A) through (D) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime CONTRACTOR shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (3)(A) through (D) of this section.

4. CLEAN AIR ACT

- A. CONTRACTOR agrees to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act, as amended, 42 U.S.C. § 7401 et seq.
- B. CONTRACTOR agrees to report each violation to the CITY and understands and agrees that the CITY will, in turn, report each violation as required to assure notification to the Federal Emergency Management Agency, and the appropriate Environmental Protection Agency Regional Office.

CONTRACTOR agrees to include these requirements in each subcontract exceeding \$150,000 financed in whole or in part with federal funds.

5. FEDERAL WATER POLLUTION CONTROL ACT

- A. CONTRACTOR agrees to comply with all applicable standards, orders, or

regulations issued pursuant to the Federal Water Pollution Control Act, as amended, 33 U.S.C. 1251 et seq.

- B. CONTRACTOR agrees to report each violation to the CITY and understands and agrees that the CITY will, in turn, report each violation as required to assure notification to the appropriate federal agency.
- C. CONTRACTOR agrees to include these requirements in each subcontract exceeding \$150,000 financed in whole or in part with federal funding.

6. DEBARMENT AND SUSPENSION

- A. This Contract is a Covered Transaction for purposes of 2 C.F.R. pt. 180 and 2 C.F.R. pt. 3000. As such, the CONTRACTOR is required to verify that none of the contractor's principals (defined at 2 C.F.R. § 180.995) or its affiliates (defined at 2 C.F.R. § 180.905) are excluded (defined at 2 C.F.R. § 180.940) or disqualified (defined at 2 C.F.R. § 180.935).
- B. CONTRACTOR must comply with 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C, and must include a requirement to comply with these regulations in any lower tier Covered Transaction it enters into.
- C. This certification is a material representation of fact relied upon by the CITY. If it is later determined that the CONTRACTOR did not comply with 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C, in addition to remedies available to CITY, the Federal Government may pursue available remedies, including but not limited to suspension and/or debarment.
- D. CONTRACTOR agrees to comply with the requirements of 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C throughout the period of this Contract and to include a provision requiring such compliance in its lower tier covered transactions.

7. BYRD ANTI-LOBBYING AMENDMENT

- A. Contractors who apply or bid for an award of \$100,000 or more shall file the required certification with CITY. Each tier certifies to the tier above that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, officer or employee of Congress, or an employee of a Member of Congress in connection with obtaining any Federal contract, grant, or any other award covered by 31 U.S.C. § 1352. Each tier shall also disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award. Such disclosures are forwarded from tier to tier up to the recipient who in turn will forward the certification(s) to the CITY.
- B. If applicable, CONTRACTOR certification required by Appendix A to 44 CFR Part 18 contained at Appendix A-1 to this Contract is incorporated into this Contract.

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8. PROCUREMENT OF RECOVERED MATERIALS

A. In the performance of this Contract, CONTRACTOR shall make maximum use of products containing recovered materials that are EPA-designated items unless the product cannot be acquired:

1. Competitively within a timeframe providing for compliance with the contract performance schedule;
2. Meeting contract performance requirements; or
3. At a reasonable price.

B. Information about this requirement, along with the list of EPA- designated items, is available at EPA's Comprehensive Procurement Guidelines web site, <https://www.epa.gov/smm/comprehensive-procurement-guideline-cpg-program>.

C. CONTRACTOR also agrees to comply with all other applicable requirements of Section 6002 of the Solid Waste Disposal Act.

9. **CONTRACTOR** shall be required to comply with 2 CFR part 25, and obtain a unique entity identifier and/or be registered in the federal System for Award Management as appropriate.

APPENDIX A-1

**APPENDIX A to 44 C.F.R. PART 18 – CERTIFICATION REGARDING LOBBYING
Certification for Contracts, Grants, Loans, and Cooperative Agreements**

Supplier certifies, to the best of his or her knowledge and belief, that:

1. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
2. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.
3. The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

Supplier, by Contract signature, certifies or affirms the truthfulness and accuracy of each statement of its certification and disclosure, if any. In addition, the Contractor understands and agrees that the provisions of 31 U.S.C. Chap.38, Administrative Remedies for False Claims and Statements, apply to this certification and disclosure, if any.

APPENDIX D

City of Tacoma Insurance Requirements



CITY OF TACOMA INSURANCE REQUIREMENTS FOR CONTRACTS

This Insurance Requirements shall serve as an attachment and/or exhibit form to the Contract. The Agency entering a Contract with City of Tacoma, whether designated as a Supplier, Contractor, Vendor, Proposer, Bidder, Respondent, Seller, Merchant, Service Provider, or otherwise referred to as "Contractor".

1. GENERAL REQUIREMENTS

The following General Requirements apply to Contractor and to Subcontractor(s) performing services and/or activities pursuant to the terms of this Contract. Contractor acknowledges and agrees to the following insurance requirements:

- 1.1. Contractor shall not begin work under the Contract until the required insurance has been obtained and approved by the City of Tacoma.
- 1.2. Contractor shall keep in force during the entire term of the Contract, at no expense to the City of Tacoma, the insurance coverage and limits of liability listed below and for Thirty (30) calendar days after completion of all work required by the Contract, unless otherwise provided herein.
- 1.3. Liability insurance policies, except for Professional Liability and Workers' Compensation, shall:
 - 1.3.1. Name the City of Tacoma and its officers, elected officials, employees, and agents as **additional insured**
 - 1.3.2. Be considered primary and non-contributory for all claims with any insurance or self-insurance or limits of liability maintained by the City of Tacoma
 - 1.3.3. Contain a "Waiver of Subrogation" clause in favor of City of Tacoma
 - 1.3.4. Include a "Separation of Insureds" clause that applies coverage separately to each insured and additional insured
 - 1.3.5. Name the "City of Tacoma" on certificates of insurance and endorsements and not a specific person or department
 - 1.3.6. Be for both ongoing and completed operations using Insurance Services Office (ISO) form CG 20 10 04 13 and CG 20 37 04 13 or the equivalent
 - 1.3.7. Be satisfied by a single primary limit or by a combination of a primary policy and a separate excess umbrella
- 1.4. A notation of coverage enhancements on the Certificate of Insurance shall not satisfy these requirements below. Verification of coverage shall include:
 - 1.4.1. An ACORD certificate or equivalent
 - 1.4.2. Copies of requested endorsements
- 1.5. Contractor shall provide to City of Tacoma Procurement & Payable Division, prior to the execution of the Contract, Certificate(s) of Insurance and endorsements from the insurer certifying the coverage of all insurance required herein. Contract or Permit number and the City of Tacoma Department must be shown on the Certificate of Insurance.



CITY OF TACOMA INSURANCE REQUIREMENTS FOR CONTRACTS

- 1.6. A renewal Certificate of Insurance shall be provided electronically prior to coverage expiration via email sent annually to coi@cityoftacoma.org.
- 1.7. Contractor shall send a notice of cancellation or non-renewal of this required insurance within Thirty (30) calendar days to coi@cityoftacoma.org.
- 1.8. "Claims-Made" coverages, except for pollution coverage, shall be maintained for a minimum of three years following the expiration or earlier termination of the Contract. Pollution coverage shall be maintained for six years following the expiration of the Contract. The retroactive date shall be prior to or coincident with the effective date of the Contract.
- 1.9. Each insurance policy must be written by companies licensed or authorized (or issued as surplus line by Washington surplus line broker) in the State of Washington pursuant to RCW 48 with an (A-) VII or higher in the A.M. Best key rating guide.
- 1.10. Contractor shall not allow any insurance to be cancelled, voided, suspended, or reduced in coverage/limits, or lapse during any term of this Contract. Otherwise, it shall constitute a material breach of the Contract.
- 1.11. Contractor shall be responsible for the payment of all premiums, deductibles and self-insured retentions, and shall indemnify and hold the City of Tacoma harmless to the extent such a deductible or self-insured retained limit may apply to the City of Tacoma as an additional insured. Any deductible or self-insured retained limits in excess of Twenty Five Thousand Dollars (\$25,000) must be disclosed and approved by City of Tacoma Risk Manager and shown on the Certificate of Insurance.
- 1.12. City of Tacoma reserves the right to review insurance requirements during any term of the Contract and to require that Contractor make reasonable adjustments when the scope of services changes.
- 1.13. All costs for insurance are included in the initial Contract and no additional payment will be made by City of Tacoma to Contractor.
- 1.14. Insurance coverages specified in this Contract are not intended and will not be interpreted to limit the responsibility or liability of Contractor or Subcontractor(s).
- 1.15. Failure by City of Tacoma to identify a deficiency in the insurance documentation or to verify coverage or compliance by Contractor with these insurance requirements shall not be construed as a waiver of Contractor's obligation to maintain such insurance.
- 1.16. If Contractor is a government agency or self-insured for any of the above insurance requirements, Contractor shall be liable for any self-insured retention or deductible portion of any claim for which insurance is required. A certification of self-insurance shall be attached and incorporated by reference and shall constitute compliance with this Section.



CITY OF TACOMA

INSURANCE REQUIREMENTS FOR CONTRACTS

2. SUBCONTRACTORS

It is Contractor's responsibility to ensure that each subcontractor obtain and maintain adequate liability insurance coverage that applies to the service provided. Contractor shall provide evidence of such insurance upon City of Tacoma's request. Failure of any subcontractor to comply with insurance requirements does not limit Contractor's liability or responsibility.

3. REQUIRED INSURANCE AND LIMITS

The insurance policies shall provide the minimum coverages and limits set forth below. Providing coverage in these stated minimum limits shall not be construed to relieve Contractor from liability in excess of such limits.

3.1 Commercial General Liability Insurance

Contractor shall maintain Commercial General Liability Insurance policy with limits not less than One Million Dollars (\$1,000,000) each occurrence and Two Million Dollars (\$2,000,000) annual aggregate. This policy shall be written on ISO form CG 00 01 04 13 or its equivalent and shall include product liability especially when a Contract is solely for purchasing supplies. It includes Products and Completed Operations for three years following the completion of work related to performing construction services. It shall be endorsed to include: A per project aggregate policy limit (using ISO form CG 25 03 05 09 or equivalent endorsement)

3.2 Commercial (Business) Automobile Liability Insurance

Contractor shall maintain Commercial Automobile Liability policy with limits not less than One Million Dollars (\$1,000,000) each accident for bodily injury and property damage and bodily injury and property damage coverage for owned (if any), non-owned, hired, or leased vehicles. Commercial Automobile Liability Insurance shall be written using ISO form CA 00 01 or equivalent. Contractor must also maintain MCS 90 and CA 99 48 endorsements or equivalent if "Pollutants" are to be transported unless in-transit Pollution coverage is covered under required Contractor's Pollution Liability Insurance.

3.3 Workers' Compensation

Contractor shall comply with Workers' Compensation coverage as required by the Industrial Insurance laws of the State of Washington, as well as any other similar coverage required for this work by applicable federal laws of other states. Contractor must comply with their domicile State Industrial Insurance laws if it is outside the State of Washington.

3.4 Employers' Liability Insurance

Contractor shall maintain Employers' Liability coverage with limits not less than One Million Dollars (\$1,000,000) each employee, One Million Dollars (\$1,000,000) each accident, and One Million Dollars (\$1,000,000) policy limit.

3.5 Professional Liability Insurance or Errors and Omissions

For contracts with professional licensing, design, or engineering services. Contractor and/or its subcontractor shall maintain Professional Liability or Errors and Omissions with limits of One Million Dollars (\$1,000,000) per claim and Two Million Dollars (\$2,000,000) in the aggregate covering acts, errors and omissions arising out of the professional services under this Contract. Contractor shall maintain this coverage for Two Million Dollars (\$2,000,000) if the policy limit includes the payment of claims or defense costs, from the policy limit. If the scope of such design-related professional services includes work related to pollution conditions, the Professional Liability policy shall include Pollution Liability coverage.



CITY OF TACOMA INSURANCE REQUIREMENTS FOR CONTRACTS

3.6 Excess or Umbrella Liability Insurance

Contractor shall provide Excess or Umbrella Liability Insurance with limits not less than Three Million Dollars (\$3,000,000) per occurrence and in the aggregate. This coverage shall apply, at a minimum, in excess of primary underlying Commercial General Liability, Employer's Liability, Pollution Liability, Marine General Liability, Protection and Indemnity, and Automobile Liability if required herein.

3.7 Other Insurance

Other insurance may be deemed appropriate to cover risks and exposures related to the scope of work or changes to the scope of work required by City of Tacoma. The costs of such necessary and appropriate Insurance coverage shall be borne by Contractor.