Fir Island Farm
Phase 2 Restoration – Engineering Design and Permitting
DRAFT Scope of Services

Revised – November 20, 2012

Overview

The Washington Department of Fish and Wildlife (WDFW) is sponsoring the Fir Island Farm habitat restoration project in Skagit County Washington, on Fir Island in the Skagit River Delta and Skagit Bay area. The project involves a 5,800 foot long coastal dike setback to restore 130 acres of tidal marsh. The restoration project will benefit multiple species, and in particular will restore coastal, estuarine tidal marsh habitat that are key habitats for migrating juvenile Chinook salmon. The estimated cost of the project is $12.5M, with contingencies of $3.5M (in 2011 dollars).

The next phases of studies (Phase 2) will involve completing engineering and environmental studies, permitting, final design, assembly of the construction contract documents, and the acquisition of construction funds. Phase 2 is a sizeable undertaking. An optimistic schedule to complete is two years, assuming sufficient funding is provided and without major project delays.

This document is a DRAFT scope of services, developed to support acquisition of grant funding for Phase 2 – Fir Island Farm Habitat Restoration, Design and Permitting phase of work. For the purposes of scoping and cost estimating, it is assumed that Phase 2 work will occur in two years.

Phase 2.1 – Final Engineering and Environmental Studies

Phase 2.1 will include conducting the remaining engineering and environmental studies necessary to complete final design and permitting. The following describes the eight tasks we have developed for Phase 2.1.

Task 2.1.1 – Project Management and Contract Administration

The Consultant and WDFW will provide project management and construction management administration services to complete Phase 2.1 work, including the following services and tasks:

- WDFW contract administration
- Subcontractor administration
- Invoicing and progress reporting
- Scheduling
- Change management
- Risk management

The Consultant will provide contract administration services to WDFW. This will include management of contract documents and coordinating with WDFW technical consultant contracting staff.

The Consultant will provide subcontract administration services to support the project. Subcontracted services include hydrodynamic modeling and cultural and archaeological studies.

The Consultant will provide monthly invoices and progress reports to WDFW.

The Consultant will keep a project schedule and provide monthly updates to WDFW, the Steering Committee and the project team.

The Consultant will keep a change management record, to be included with the monthly progress report, and provide administrative support for up to two change management conditions (amendments) for the Phase 2.1 studies.

The Consultant will provide risk management services for Phase 2.1. The Consultant will provide a risk management strategy specific to the Fir Island Farm Phase 2 engineering design and permitting project. The risk management strategy will be an open-file report, using a risk record (ledger), to be updated at specific intervals and milestones by the Consultant, WDFW, the Steering Committee and the project team. The Risk Management strategy submittals are as follows:

- DRAFT Risk Management Strategy to WDFW and Steering Committee for Review. WDFW and Steering Committee comments will be provided to the Consultant for inclusion in the REVISED Risk Management Strategy. The DRAFT Risk Management Strategy will include development of a risk management framework, initial identification of project risks and risk record (ledger), and recommended strategies for managing the risks.
- REVISED Risk Management Strategy to be provided to WDFW, the Steering Committee and the project team for use and updates throughout the project.
- Risk Record (Ledger) quarterly updates (or as needed as risks are identified) – The Consultant will provide and update the Risk Record at monthly WDFW and Steering Committee meetings.

- FUTURE REVISIONS (2) of the Risk Management Strategy – The Consultant will provide revisions and updates to the Risk Management Strategy at the outset of each following major design Phases 2.2 and 2.3.

Deliverables

- 12 invoices and progress reports provided monthly
- DRAFT and REVISED Risk Management Strategy Report

Assumptions

- The length of the contract for this phase is limited to one year
- No more than two contract changes (amendments) will occur during Phase 2.1.
- Project schedule will use either an Excel spreadsheet or Microsoft (MS) Project software

Task 2.1.2 – Project Coordination, Meeting Attendance and Calls

The Consultant will attend a number of meetings and conference calls in support of the project. This task is designed to be flexible and allow for attendance at scheduled meetings (such as the monthly steering committee meetings) plus attendance at other project coordination calls and meetings as will likely be needed for the project. All meetings and calls with WDFW and the Steering Committee will be tracked on this task, regardless of the specific project management, design, permitting task.

- Consultant will attend four quarterly, two hour project management meetings in La Conner WA. Consultant Project Manager will attend all four meetings. Consultant will provide attendance by supporting Principal in Charge at two meetings and the Civil Engineer, Geotech, Environmental Permit Specialist, Hydrogeologist at up to two additional meetings each. Consultant will provide two hours preparation, two hours attendance in La Conner, and one hour of debrief and meeting minute review. Meeting minutes to be provided by WDFW.
- Steering committee meeting updates will be held the second half of the quarterly meetings. The assumption for these meetings is that the quarterly updates will be held during the second hour of the project management meetings. The quarterly project management and combined steering committee meeting will remain at two hours.
- Consultant will attend up to four additional project outreach and coordination meetings with WDFW. This task is anticipated to support WDFW in coordinating with Skagit County Dike District No. 22, Private Landowners, Skagit River Systems Cooperative, the Skagit Watershed Council, and other stakeholders, as needed. Consultant will provide two hours preparation, two hours attendance in La Conner, and one hour debrief and meeting minute review to be provided by WDFW. Meeting minutes to be provided by WDFW.
- Consultant will attend one hour-long conference calls every week with WDFW and/or the Steering Committee. Consultant will provide time for Project Manager to attend each weekly call. Principal in charge will attend ½ of the calls. Civil Engineer, Geotech, Environmental Permit Specialist, Hydrogeologist will attend calls as needed, assumed to be ¼ of the total calls.
- Hydrodynamic Modeling subconsultant will attend two, two hour long combined project management and steering committee meetings in La Conner WA.

- Hydrodynamic Modeling subconsultant will attend four, one hour long conference calls with WDFW and/or the Steering Committee.
- Cultural and archaeological subconsultant will attend two, two hour long combined project management and steering committee meetings in La Conner WA.
- Cultural and archaeological subconsultant will attend four, one hour long conference calls with WDFW and/or the Steering Committee.

Deliverables

- (4) Monthly meeting minutes reviews
- (4) Project outreach meeting minutes reviews

Assumptions

- The number of meetings and calls and hours are limited to the amounts listed in the tasks above.
- Meeting minutes are to be provided by WDFW for review by Consultant.

Task 2.1.3 – Grant Funding and Construction Financing

The Fir Island Farm Restoration project has an estimated construction budget of $12.5M to $16M. Dedicated resources will be necessary to coordinate grant funding application and acquisition from a number of sources. Phase 2.1 grant funding and construction financing efforts will focus on developing a funding strategy utilizing a dedicated team comprised of key WDFW, Steering Committee and Consultant team members. Phase 2.1 work will focus on research and grant funding strategy, and follow on Phases 2.2 and 2.3 will focus on grant application and award. Phase 2.1 grant funding and construction financing tasks will include:

- Research and identify applicable grants, funds available, granting agency points of contact, grant submittal timelines and deadlines
- Coordinate with grant agencies through various phone calls, meetings and site visits

Deliverables

- DRAFT Construction Grant Funding and Financing Strategy

Assumptions

- WDFW will be lead and take a majority of responsibility for Task 2.1.3.
- Consultant will provide 40 hours for technical, on-call support.
- No construction funding grant applications will be submitted in Phase 2.1.
- Funding team members will include:
    - Brian Williams – WDFW
    - Shirley Solomon – Skagit Watershed Council
    - Mike Shelby – Western Washington Agriculture Association
    - Others – TBD

Task 2.1.4 – Geotechnical Engineering Final Field Explorations

The Consultant will perform the final geotechnical field studies that will provide data to support final engineering design. Field studies will involve characterizing the subsurface conditions by drilling a limited number of borings and collecting samples. Using the boring data, the Consultant will interpret the subsurface conditions and develop geotechnical baseline data reports for the preferred restoration plan project elements. The project elements will consist of:

- Preferred dike embankment alignment
- Dike pipe penetration areas
- Existing dike breach zones
- Existing drainage ditch fills
- New tidal channel excavations
- Stormwater pond
- Soil and rock material salvage materials, processing and mixing
    - Stormwater pond dike materials
    - Existing rock protection
    - Topsoil
    - New tidal channel excavations
- Temporary construction facilities
    - Site access roads, staging areas, haul routes and parking lot
    - Temporary irrigation structure
    - Construction dewatering locations
        - Pipe penetrations
        - Breach grading areas and tidal channels
        - Stormwater pond and drainage channels

The subsurface field explorations will include up to four mud-rotary borings, six cone penetrometer (CPTs) test, and two days of test pit explorations. Geotechnical laboratory analysis will include sieve grain size analyses, hydrometer tests, strength, density, water content and compaction tests to support geotechnical engineering design analyses. The subsurface explorations will be located using hand-held hand-held resource grade GPS mapping (horizontal accuracy ±1meter) equipment. Geotechnical field sampling and testing will include coordination and observation by the Cultural Resources Archaeologist.

The subsurface explorations and laboratory results will be compiled with geologic interpretation in support of geotechnical design. The geologic interpretations will include the following information:

- Borings, CPT and test pit vertical soil profiles for the exploration locations
- (1) Interpreted subsurface profile along the length of the proposed dike setback alignment
- (2) Interpreted subsurface profiles across the proposed dike setback and stormwater pond

Deliverables

- DRAFT & FINAL Task 2.1.4 Geotechnical Letter Report.

Assumptions

- The geotechnical letter report will be limited to field data collection, laboratory analysis, and geologic interpretations only. Geotechnical engineering design will be performed in the following Phase 2.2.
- Scope assumes that cultural and archaeological resources will not be encountered during field explorations. If cultural and archaeological resources are encountered, the Section 106 Mitigation Plan and Additional Consultation OPTION will be needed.
- DRAFT letter reports will be provided to WDFW, the Steering Committee and ITR team for review and comment. Schedule is to be determined. Comments will be addressed and included in FINAL letter reports.
- No hazardous waste and/or contamination studies have been included. If evidence of hazardous waste and/or contamination is observed during field investigations, a Phase II Contaminated Media study will be necessary.

Response Study (Higher Probability – Included in Cost Estimate)
Task 2.1.4a OPTION – Section 106 Mitigation Plan Additional Consultations*
The Consultant will perform additional consultations required if cultural and archaeological resources are found during final field explorations during engineering investigations and a separate Section 106 consultation and contingency mitigation plan is needed.

Response Study (Higher Probability – Included in Cost Estimate)

Task 2.1.4.b OPTION - Geotechnical log boom design

The Consultant design the log boom if hydrodynamic modeling results indicate boom is needed per Task 2.1.6.3 Spur Dike Modeling.

Response Study (Lower Probability – Not Included in Cost Estimate)*
Task 2.1.4b OPTION – Phase II Contaminated Media Study
The Consultant will perform as an OPTION a Phase II Environmental Site Assessment (field investigation) if contaminated media are discovered during Phase 2.1 geotechnical and hydrogeologic field explorations. Phase II site investigation scope and scale can vary depending upon the type and amount of contamination. Generally, a Phase II site investigation will include sampling and testing of soil, sediment, surface and groundwater media and contamination, and associated costs required to collect such samples (including drilling, geoprobes, test pits, laboratory fees). The Consultant will provide a written report documenting the Phase II contaminated media sampling results and findings, as well as provide recommendations on engineering mitigation and contamination avoidance/management options for construction. Estimated costs for a Phase 2 contaminated media study in 2013 are estimated at $34,000.

Task 2.1.5 – Groundwater and Interior Drainage Final Explorations, Monitoring and Modeling

The feasibility study documents that the dike setback can be designed to mitigate for changes to the interior drainage system based on surface water modeling studies. This proposed design involves building new interior storage ponds on the farm side of the dikes, and drainage structures through the dikes. To date, preliminary pond size estimates have been developed based on interior drainage surface water and groundwater baseflow from upstream drainages. A HEC-RAS unsteady flow model of surface water runoff was used to demonstrate the feasibility of the ponds to mitigate for losses to interior drainage storage. The interior drainage storage pond size and drainage structure designs also needs to accommodate tidal groundwater inflow and outflow conditions as part of final design. The following hydrogeologic studies will be performed in support of finalizing the interior drainage design.

- Install two new nested groundwater monitoring wells, and reinstall up to three existing groundwater wells, to provide long-term monitoring, document the existing conditions baseline, and document future project effects on groundwater seepage, mounding and salt-water intrusion.
- Download and analyze surface water and groundwater monitoring well data from the dedicated dataloggers.
- Evaluate the effects of groundwater elevation and salt-water intrusion using a conceptual hydrologic/hydrogeologic model of the existing drainage system and available data.
- If groundwater effects are determined to be significant and contribute to overly large storage pond and drainage infrastructure, the Consultant will develop a numerical groundwater flow/seepage model of the system based on the conceptual model as a contract OPTION. The model will be calibrated to existing (baseline) groundwater level, flow and salinity conditions, and analyze mounding effects, groundwater inflow, and the effects on dead and live storage in the interior drainage storage pond under future conditions.
- Reanalyze interior drainage flood runoff using additional inflows from the numerical groundwater model.

2.1.5.1 - Groundwater Monitoring

Groundwater monitoring will be established for the project. Original groundwater monitoring wells were established at GP-01, GP-02 and GP-03. GP-01 is located in the existing dike near Dry Slough, and is assumed that the groundwater well and logger remains intact. GP-02 is located in the Hayton Bay Field and GP-03 is located further interior (north) on the Hayton farm fields. GP-02 and GP-03 monitoring wells will be reinstalled (with the option to reinstall GP-01) at locations determined by the project hydrogeologist deemed appropriate for long term groundwater monitoring.

A second (nested) pair of groundwater monitoring wells will be installed at the northern edge of the dike setback alignment. The objective of this paired monitoring installation is to document effects on groundwater elevation and salinity along the margin of the dike setback and the interior drainage pond system. Two new groundwater monitoring wells holes will be installed

along the preferred dike alignment, along an east-west section at the northern end of the project. The first well will be constructed as a a "nested" set of three wells and will be located at a point that will ultimately be within the new dike setback. The second new well will be constructed as a "nested" set of three wells and will be installed approximately 250 feet north of the preferred dike alignment and stormwater pond. The nested well will have three separate groundwater well pipes with intake screens located at 5 feet, 10 feet and 20 foot depths. The nested wells will have groundwater monitoring equipment to automatically record parameters including groundwater level, temperature and salinity. This will allow for evaluation of groundwater mounding and salinity effects north of the dike setback and interior drainage ponds. A slug tests will be performed in estimate the hydraulic conductivity characteristics of the saturated soils.

When the new dike is constructed, the groundwater well installed in the dike location will need to be protected or reinstalled. The Claude O. Davis surface water well (SW-COD-2.0-LTC) will need to be re-installed as part of the construction project at the new mouth of Claude O. Davis Slough.

2.1.5.2 – Initial Groundwater Effects Analysis

The Consultant will perform an initial groundwater effects analysis, on the proposed construction conditions, to estimate likely changes in groundwater seepage conditions using SEEP/W or comparable modeling code. Salinity effects will be evaluated using an advection-dispersion equations. Input for the equations will use SEEP/W modeling output (head gradients and seepage rates). The following parameters will be evaluated:

- Likely changes of interior farm groundwater elevations in the spring and early summer growing season,
- Likely changes of salinity conditions in the spring and early summer growing season,
- Seepage estimates to the interior drainage stormwater ponds and channels for the spring and early summer growing seasons, and the fall/winter flood seasons.

If the analysis predicts that significant effects (changes in elevation affecting interior drainage storage capacity, salinity and seepage rates) occur, additional numerical groundwater modeling may be required to finalize the engineering design. This would beas Task 2.1.5.2.a Groundwater Effects Modeling.

Response Study (Higher Probability – Included in Cost Estimate)
2.1.5.2a – Groundwater Effects Modeling (OPTION)

The Consultant will develop a numerical groundwater model to demonstrate the groundwater effects on interior drainage storage and adjacent farm field crop subsurface drainage conditions. The model will evaluate groundwater elevations and groundwater discharge through the dike into the interior drainage storage pond and channels. The Consultant will reanalyze the HEC-

RAS model with the revised groundwater seepage conditions predicted by the groundwater model.

1) spring groundwater, tidal cycle condition, and

2) spring groundwater, tidal cycle and stormwater flood event condition.

3) project design flood conditions considering appropriate groundwater inflows

At this stage, it is anticipated that the Consultant will use the USGS' modeling code MODFLOW and MT3D to simulate groundwater flow and density/salinity conditions. However, depending on the level of complexity determined by the conceptual model and the final objectives, other software may be used to support the MODFLOW analysis.

The MODFLOW outputs will be incorporated into a revised analysis of interior drainage surface water storage modeling.

2.1.5.3 - Interior Drainage Surface Water HEC-RAS Modeling

Using the results of the groundwater effects analysis, the interior drainage surface water model, i.e. the HEC-RAS models, will be reevaluated to finalize the size, length, depth and width of the interior drainage storage pond facility, and to identify if additional interior drainage culverts and pipes will be necessary to provide adequate drainage. The HEC-RAS model will be evaluated for the following conditions:

1) spring groundwater, tidal cycle condition

2) spring groundwater, tidal cycle and stormwater flood event condition and

3) Project design flood conditions considering appropriate groundwater inflows

2.1.5.4 - Interior Drainage and Groundwater Effects Sensitivity Analysis

A sensitivity analysis will be performed to evaluate the effects of key factors on interior drainage surface water and groundwater conditions. There are a number of key factors that could potentially affect interior drainage and groundwater performance.

Tidal tailwater conditions affect upstream interior drainage storage capacity and conveyance. Several factors can affect tidal tailwater conditions including sea level rise (SLR),tidal marsh and tidal channel sedimentation, among others. As sea level rises, tailwater conditions will increase, thereby reducing interior drainage conveyance and storage capacity. Sedimentation and deposition in downstream tidal drainage channels and marsh areas can similarly reduce interior drainage conveyance and storage capacity.

Upstream (headwater) factors that can impact interior drainage conditions include the potential establishment and growth of freshwater wetland vegetation in the proposed interior drainage storage pond facility as well as sedimentation in the pond. These factors reduce storage, reduce flow conveyance, and have the potential to increase upstream water surface elevations.

Other factors that could impact drainage performance include climate changes that result in increased long-term precipitation and variability in soil permeability resulting in differing groundwater flow and elevation conditions. Increased precipitation may change sedimentation rates and soil permeability determines seepage rates through and underneath the dike structure.

The Consultant will perform a sensitivity analysis to estimate the relative influence of the key factors listed above on interior drainage storage capacity and conveyance. Probabilistic methods and Monte Carlo simulation will be used to develop five headwater and five tailwater scenarios that would represent a likely range of future upstream and downstream conditions. Based on the estimated probabilities associated with the headwater and tailwater scenarios, the Consultant will calculate the probability associated with interior drainage storage capacity and conveyance for each combination of headwater/tailwater scenario analyzed.

Sensitivity scenarios will be developed and sensitivity analyses will completed during the study Phase 2.1 work. The sensitivity analysis findings will be used to make recommendations for final design criteria and configurations to be carried forward into future design Phases 2.2 and 2.3.

2.1.5.5 - Interior Drainage and Groundwater Effects and Design Recommendations

Using the results of the groundwater analysis and interior drainage analysis, the Consultant will provide a summary of interior drainage and groundwater effects and recommendations for use in project design and permitting.

Deliverables

- DRAFT & FINAL Task 2.1.5.1 Groundwater Monitoring Letter Report.
- DRAFT & FINAL Task 2.1.5.2 Initial Groundwater Effects Letter Report.
- DRAFT & FINAL Task 2.1.5.2 Groundwater Modeling Letter Report (OPTION).
- DRAFT & FINAL Task 2.1.5.3 Interior Drainage Revised Surface Water HEC-RAS Modeling Letter Report.
- DRAFT & FINAL Task 2.1.5.4 Sensitivity Analysis Letter Report
- DRAFT & FINAL Task 2.1.5.4 Final Interior Drainage and Groundwater Effects Letter Report.

Assumptions

- Groundwater monitoring will be performed quarterly (4 times) during the study period. Groundwater monitoring will include the two new “nested” wells, as well as potential

relocation of GP-01 and replacement of GP-02 and GP-03 at locations to be determined. Data will be processed and reported in the Groundwater Monitoring Letter Report.

- The groundwater effects analysis will utilize engineering empirical relationships to evaluate potential for groundwater seepage and salt-water intrusion. If, in the opinion of the Consultant, and upon agreement with WDFW, the groundwater effects will be modeled using a numerical groundwater model as a contract Option summarized below.
- The scope of services assumes that surface water storage pond areas and tidegate designs will mitigate interior drainage, surface water and groundwater effects. If the Phase 2.1 groundwater studies show otherwise, contingency plan OPTIONS for sheetpile cutoff, relief wells and/or pump station design for additional interior drainage protection will be needed in Phase 2.2 60% design.
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- The scope of services assumes that the CD22 Consent Decree Dry Slough project will not be installed.
- A single slug test assumes that subsurface soil profiles have similar hydraulic properties along the extent of the dike setback.
- DRAFT letter reports will be provided to WDFW and ITR team for review and comment. Comments will be addressed and included in FINAL letter reports.
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Task 2.1.6 – Coastal Engineering

The final design will include detailed coastal engineering, hydrodynamic modeling and analyses of the dike, breach channels and spur dike as it relates to rock protection needs, sediment and erosion, need for log booms, and checks on extreme tide and storm overtopping. The following are the base coastal engineering design tasks.

2.1.6.1 - Significant wave height analysis and sea level rise review - to determine/confirm levee profile elevations

Significant water surface elevations will be determined based on the combination of three components: 1) extreme tides, 2) wave run-up, and 3) wind storm surge (local) using long-term historical data, empirical formulation and new Skagit Bay hydrodynamic model with Fir Island Farm restoration site and 4) dike elevation adjustments for long term sea level rise based on current Northwest Climate Impacts Group assessments and models. The extreme tidal elevation will be estimated using NOAA long-term predicted (and historical) tide data near the project site in Skagit Bay. The local wind storm surge will be calculated using the new Skagit Bay hydrodynamic model and the estimated 100-year peak wind forcing. Significant wave height will be calculated based on the 100-year wind data and the fetch of Skagit Bay. The significant wave height will be added to the maximum normal spring tides plus the storm surge elevation to determine the maximum water surface level. It is assumed that there is no significant effect on the water level in the bay front of the project site during high river flow event. A technical memo will be prepared to summary the analysis results upon the completion of this task.

2.1.6.2 - Breach opening erosion and stable channel modeling – to estimate a stable breach configuration

This task will be conducted using tidal inlet coastal engineering methods in lieu of the Skagit Bay hydrodynamic model. Stable tidal channel breach analysis is based on evaluation of equilibrium threshold criterion that may include maximum velocity, volume flux and shear stress. An iterative analysis will be performed to estimate threshold criterion for sediment transport, indicating that a stable channel. A technical memo summarizing the engineering analysis will be prepared and submitted upon the completion of this task.

2.1.6.3 - Spur dike modeling

This task is to evaluate the hydrodynamic effects on Brown Slough tidegates and the west dike rock protection with and without the spur dike using the new Skagit Bay hydrodynamic model. Model grid will be modified to represent the spur dike. It assumes two simulations will be conducted in this task. Model outputs of bed shear stress and velocity at selection locations will be provided to further analysis associated sediment transport conditions and the likelihood of erosion and deposition areas. A technical memo to summary the modeling analysis and GIS output of model results will be prepared and submitted upon the completion of this task.

2.1.6.4 - GIS data processing

A processing routine for a portable GIS data output will be needed for engineers to design the levee embankments and pilot channels. This is so the engineers can review hydrodynamic modeling output at a range of scales and locations along the marsh and dike, including images and animations on a model grid scale (i.e. looking at many points along the dike to evaluate scour and erosion protection needs). The portable GIS data output will be provided for the following anticipated modeling output data sets:

- Task 2.1.6.1 – Significant wave height analysis and sea level rise (or as an alternative an existing Alternative 2A run).
- Task 2.1.6.3 – Spur dike modeling.

2.1.6.5 - Reporting

The Consultant will compile reports documenting the findings and results and provide the letter reports listed as deliverables.

Deliverables

- DRAFT & FINAL 2.1.6.1 – Significant Wave Height Analysis and Sea Level Rise Review Letter Report.

- DRAFT & FINAL 2.1.6.2 and GIS Output – Breach Opening Erosion and Stable Channel Model Analysis Letter Report
- DRAFT & FINAL 2.1.6.3 and GIS Output – Spur Dike Analysis Letter Report
- DRAFT & FINAL 2.1.6.4 – GIS Processing Instructions Letter Report
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Assumptions

- All model runs in will be conducted using the same model boundary conditions and forcing as the existing condition conducted in the Phase I of the project Yang, Z. and T. Wang. 2011. Hydrodynamic Modeling Analysis of Fir Island Farm Restoration – Baseline Condition.
- Sea level rise predictions will use information available from the Northwest Region Climate Impacts Group assessments. The Consultant and their Subconsultant are not not responsible for climate change predictions made by others, and use them as the best available science.
- Drainage flow rates and stream discharges into the project site and configuration of the tidegates will be based on existing data to be provided by the Consultant.
- Technical memoranda will include a Draft for Prime Consultant review, Draft Final for WDFW review and Final. The Draft and Draft final will be subject to comments from the Prime Consultant, WDFW and their technical review team.
- Breach opening and spur dike alternatives GIS surface TIN files (in NAVD88 meter vertical datum) will be provided by the Prime Consultant. Breach opening sizing based shear stress equilibrium may have additional erosion and accretion. The breach analysis is being performed to limit adverse erosion and sedimentation that could impact the new and existing marsh. Breach modeling, analysis and design does not guarantee that adverse erosion or sedimentation will not occur.
- Analysis and design of bioengineering, vegetation and large wood debris features is proposed as an alternative with increased long term ecological benefits, and potential cost savings to the Owner. Design of these features proposes to use environmentally sound features as an alternative to rock protection design. The use of the environmentally sound bioengineering and wood alternatives will inherently have increased risks for dike performance with respect to erosion protection, which if recommended and approved by the study, will be an acceptable risk to the Owner.

Task 2.1.7 – Permit Pre-application Coordination

The Consultant will perform advance coordination and attend pre-application meetings with key regulatory agencies. The objective of these pre-application meetings is to accurately determine permitting (and design) requirements, prior to completion of the 60% design documents. Permits will then be submitted upon completion of the 60% design documents. Technical memoranda will be provided summarizing coordination and meeting feedback for each of the permits outlining the permit requirements for project design and permitting.

Pre-Application permits will be attended with the following agencies and organizations:

- U.S. Army Corps of Engineers (Section 404 Permit)
- NOAA (Limit 8 – Section 7 Consultation)
- USFWS (Biological Opinion for Bull Trout – Section 7 Consultation)
- FEMA (FEMA Bi-Op and floodplain fill permit confirmation)
- Washington Department of Fish and Wildlife (Hydraulic Project Approval (HPA) and State Environmental Policy Act (SEPA))
- Washington State Department of Ecology (Section 401 Water Quality Certification, NPDES Permit, Wetlands Mitigation)
- Washington State Department of Archaeological and Historic Preservation (Section 106)
- Swinomish, Skagit, Stillaguamish Tribe Consultation (Section 106)
- Skagit County (Shoreline, Lot Certifications, Special Use, Critical Areas, Fill/Grading, Temporary Access)

Given the project description and location, we anticipate additional effort will be required during the Pre-application phase for certain permits, namely the Section 106 consultation, the Skagit County Special Use and Temporary Access Permits, and the FEMA Floodplain permit.

In order for WDFW to complete permitting, a final cultural and archaeological investigation will be needed for the project's preferred dike realignment and removal plan. An archaeological consultant will perform the site studies, tribal and Department of Archaeological and Historic Preservation consultations to meet the requirements of Section 106 of the National Historic Preservation Act. An incidental discovery and recovery plan will likely be required as a contingency should the archaeologist or others find cultural or archaeological resources during final investigations or construction, which could trigger additional work for mitigation plans, design revisions and consultations.

Deliverables

- DRAFT and FINAL 2.1.7.1 – Permit Pre-Application Summary
- DRAFT and FINAL 2.1.7.2 – Section 106 Consultation Coordination Summary

Assumptions

- Pre-application meetings will be coordinated by the Consultant.
- Pre-application meetings will be held at the offices of each stated agency, or at the WDFW offices in La Conner.
- The Consultant and WDFW will attend the pre-application permit meetings.
- The Consultant, Archaeological Subconsultant and WDFW will attend Section 106 consultation coordination meetings scheduled by the Archaeological Subconsultant.

Task 2.1.8 – Monitoring and Adaptive Management Plan Phase 2.1

Investing in a large restoration project will likely have numerous long term ecosystem, vegetation and drainage performance monitoring requirements (and opportunities). The project will be a key opportunity to document the benefits for estuarine and fish habitat restoration. Monitoring include sampling of physical presence of fish, physical characteristics of the existing and interior areas (tidal channels, marsh areas), native and invasive vegetation composition. In addition to restoration monitoring, additional interior drainage monitoring will likely be necessary to document any changes to drainage or crops as a result of the project. The continuance of existing baseline data collection, and development of a focused baseline monitoring effort will provide needed documentation for long term effects studies surrounding the project.

Phase 2.1 work will be focused on developing monitoring criteria and parameters, development of a DRAFT monitoring plan, and identify additional baseline monitoring work to be completed in Phases 2.2 and 2.3 before construction.

Deliverables

- DRAFT 2.1.8 – Monitoring and Adaptive Management Plan
- DRAFT FINAL 2.1.8 – Monitoring and Adaptive Management Plan

Assumptions

- WDFW will be the lead agency on developing the Monitoring and Adaptive Management Plan. The consultant will provide technical support, review and assistance on vegetation and invasive species management and limit their involvement to the hours shown on in the proposal.
- The monitoring and adaptive management plan will utilize existing baseline monitoring studies to the extent feasible.
- The monitoring and adaptive management plan will require coordination, and possible work requests, with other agencies and resources. Coordination will be the responsibility and performed by WDFW.

Task 2.1.9 – Real Estate, Landowner and Partner Agreements

In Phase 2.1, WDFW will begin negotiating real estate, landowner and partner agreements, easements and rights of way. The Consultant will provide a pool of 42 hours to provide technical assistance to WDFW (such as CAD drawings, descriptions of work, schedule). WDFW will be primary party responsible for development of the agreements and easements.

Deliverables

- Data, files, CAD drawings, schedules and project descriptions as requested by WDFW.

Assumptions

- WDFW will be the prime on performing real estate and landowner agreements and the Consultant will provide support on an as-needed basis. Consultant hours and budget will

be limited to the amounts shown in the cost estimate. Any work beyond these budgets will be performed after receipt of a contract amendment to be provided by WDFW.

- Budgets were developed with the assumption that CD22 and Hayton property landowner agreements would be needed. Additional landowner agreements will likely require additional budget and resources.
- This scope and budget do not include resources to support CD22 Consent Decree negotiations that may occur with WDFW.

Task 2.1.10 – Independent Technical Review

A small team of qualified professionals, separate from the Consultant, WDFW and the Steering Committee, will perform an Independent Technical Review (ITR. The ITR team will review the Phase 2.1 DRAFT documents listed below. The ITR will review and provide comments, which the Consultant will respond to and/or address in the FINAL letter reports for each of the Phase 2.1 tasks. The ITR team will meet with WDFW and the Consultant team to discuss comments and questions before the Consultant revises the documents. The Consultant team will provide the FINAL letter reports with comment responses to WDFW and the ITR Team. The ITR Consultant will backcheck the revised FINAL letter reports and identify issues that have not been fully addressed or questions remain. Outstanding issues, if any, will be carried forward into the next Phase 2.2 of design.

Deliverables

- DRAFT 2.1.10.1 – Phase 2.1 ITR Review Comments
- FINAL 2.1.10.1 – Phase 2.1 ITR Review Comments & Backcheck

Assumptions

- Phase 2.1 ITR will involve review of technical documents that will be the basis subsequent engineering designs.
    - DRAFT Task 2.1.4 Geotechnical Exploration Report
    - DRAFT Task 2.1.5.2 Initial Groundwater Effects Letter Report.
    - DRAFT Task 2.1.5.3 Interior Drainage Revised Surface Water HEC-RAS Modeling Letter Report.
    - DRAFT Task 2.1.5.4 Interior Drainage and Groundwater Effects Letter Report.
    - DRAFT Task 2.1.6.1 – Significant Wave Height Analysis and Sea Level Rise Review Letter Report.
    - DRAFT Task 2.1.6.2 Breach Opening Erosion and Stable Channel Model Analysis Letter Report
    - DRAFT Task 2.1.6.3 and GIS Output – Spur Dike Analysis Letter Report
    -
- The Consultant will provide an electronic copy of documents to the ITR team for review.
- The ITR team will provide review and comments organized using a standard ITR comment form.

- WDFW, Consultant and ITR team will meet in La Conner WDFW offices to discuss review comments prior to Consultant revising documents.
- The ITR team will provide backcheck review comments and update the standard ITR comment form.

Phase 2.2 – 60% Engineering Design, Permits, Baseline Monitoring

Phase 2.2 will include 60% engineering design, development and submittal of project permits and continuance of construction funding grant application and acquisition as needed.

Task 2.2.1 – Project Management and Contract Administration

The Consultant and WDFW will provide project management and construction management administration services to complete Phase 2.2 work. Project management and administration services will be similar to those outlined in Phase 2.1, with the following exception. The Consultant will update the risk management strategy at the outset of Phase 2.2.

- Update to the REVISED Risk Management Strategy to be provided to WDFW, the Steering Committee and the project team for use and updates throughout the project.
- Risk Record (Ledger) quarterly (or as needed) updates – The Consultant will provide and update the Risk Record at monthly WDFW and Steering Committee meetings.

Task 2.2.2 – Project Coordination, Meeting Attendance and Calls

The Consultant will attend meetings and conference calls in support of the project in Phase 2.2. Project management and administration services will be similar to those outlined in Phase 2.1 for a maximum 1 year contracting period, with the following exceptions.

- N/A - Hydrodynamic Modeling subconsultant will attend two, two hour steering committee meetings in La Conner WA.
- N/A - Hydrodynamic Modeling subconsultant will attend four, one hour conference calls with WDFW and/or the Steering Committee.

Deliverables

- 12 invoices and progress reports provided monthly
- DRAFT and REVISED Risk Management Strategy Report

Assumptions

- The number of meetings and calls are limited to the amounts listed in the tasks above and in Task 2.1.1.

Task 2.2.3 – Grant Funding and Construction Financing

Phase 2.2 grant funding and construction financing will continue building upon Phase 2.1 work. The work will primarily focus on developing and submitting grant applications.

- REVISE Construction Grant Funding and Financing Strategy (as needed)
- Prepare up to three grant applications in Phase 2.2.

Deliverables

- REVISED Construction Grant Funding and Financing Strategy
- (3) Grant Application Submittals

Assumptions

- Funding team members will include:
  - Brian Williams – WDFW
  - Shirley Solomon – Skagit Watershed Council
  - Mike Shelby – Western Washington Agriculture Association
  - Others – TBD
- Grant application submittals will be prepared by WDFW, with assistance from the Consultant. The Consultant will provide a pool of 80 hours (48 hours Project Manager and 24 hours Principal Scientist or Principal Engineer and 8 hours Principal in Charge) to perform research, attend meetings and site visits, and assist with grant applications in support of the funding team in Phase 2.1.

Task 2.2.4 – 60% Design, Specifications, Schedule and Opinion of Probable Construction Cost

The Consultant will develop a 60% design package including plans, specifications outline, engineer cost and bid sheet, and construction schedule for review and comment by WDFW.

Task 2.2.4.1 – Site Survey

In order to complete engineering design of the site, WDFW will provide survey for the project. Survey work will include establishment of permanent control, ground topography and channel bathymetry, structure surveys (roads, fences, utilities, drainage, etc.), property lines, boundaries, legal descriptions, easements and information for updating the Washington Administrative Code (WAC) for the reserve status. There are contingency surveys that may be needed for the expanded interior drainage groundwater and surface water modeling effort, and other possible roadway contingency designs (both included in project contingencies below).

Deliverables

- Site survey basemap stamped by Professional Land Surveyor, registered in the State of Washington.
- File survey record with Skagit County assessor's office for all formal boundary determinations as required by County.

Assumptions

- WDFW will provide all site survey by a registered professional land surveyor.
- Consultant will develop a site survey plan, to be performed by WDFW surveyor.

2.2.4.2 – Geotechnical Engineering Design

The Consultant will provide geotechnical design for the 60% Design Plans. This will include design analysis for the design items listed above in Phase 2.1, including seepage, slope stability, reuse and phasing of on-site materials, haul route designs, pipe bedding design, ditch fill compaction, dewatering for pipe installations.

Deliverables

- DRAFT Geotechnical Design Letter Report
- FINAL Geotechnical Design Letter Report

Assumptions

- Contaminated soils, structural and foundation design of the floodgate, Fir Island Road design, among others.

Response Study (Higher Probability – Included in Cost Estimate)

2.2.4.2a – Geotechnical log boom design

The Consultant may be required to design the log boom if hydrodynamic modeling results indicate a log boom is needed per Task 2.1.6.3 Spur Dike Modeling.

2.2.4.3 – General Civil Design

The Consultant will provide civil design for the 60% Design Plans. This includes all access, utility locates, survey control, earthwork, fill, excavation grading, dewatering, TESC, landscaping and vegetation plans, details, sections, etc. General civil design also includes development of Engineer's opinion of probable construction cost, and construction schedule. 60% plan submittal will include specifications outline.

Deliverables

- 60% Design Plans
- Outline Specifications
- DRAFT engineer opinion of probable cost
- DRAFT engineer opinion of probable construction schedule

Assumptions

- Contaminated soils are not included in this scope of services.
- Structural and foundation design of the CD22 floodgate are not included in this scope of services.

Response Designs (Higher Probability – Included in Cost Estimate)

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Response Designs (Higher Probability – Included in Cost Estimate)

2.2.4.3b – 60% Design Interior Drainage Pump Station (OPTION)

The Consultant may be required to add an interior drainage pump station if it is demonstrated that interior drainage, surface water and groundwater inflows have

adverse effects and require mitigation beyond what can be obtained through tidegate and interior drainage design alone. This design would be triggered by the results and findings of Task 2.1.5.2b – Groundwater Effects Modeling (OPTION).

Response Designs (Higher Probability – Included in Cost Estimate)

2.2.4.3c – 60% Design Fir Island Roadway Siding (OPTION)

The Consultant may be required to design a roadway siding along the Fir Island Road construction access entrance. This will be triggered by the results of pre-application permit coordination with the county Task 2.1.7.

Response Design (Lower Probability – Not Included in Cost Estimate)*

2.2.4.3d – 60% Design Drain Tile Design (OPTION)

The Consultant may be required design drain tiles in WDFW and Hayton Farms that may be redundant and unnecessary with interior drainage pump station ($4,169 this Phase 2.2 work).

Task 2.2.5 – Independent Technical Review 60% Design Plans

The ITR team will be provided the Phase 2.2 DRAFT 60% Design documents for review. The ITR will include review and assembly of comments, to be responded to or addressed in the 90% design. The ITR team will meet with WDFW and the Consultant team to discuss comments and questions prior to the Consultant revising the documents. The Consultant team will provide the design revisions in the 90% design. The ITR will backcheck the revised FINAL letter reports and flag any issues that have not been fully addressed or questions remain, and will be carried forward into the next Phase 2.2 of design.

Deliverables

- Phase 2.2 ITR will involve review of 60% plans and supporting documents.
  - DRAFT 2.2.4.2 - DRAFT Geotechnical Design Letter Report
  - DRAFT 60% Design Plans, calculations checks, specifications outline, opinion of probable cost, and construction schedule
- The Consultant will provide an electronic copy of documents to the ITR team for review.
- The ITR team will provide review and comments organized using a standard ITR comment form.
- WDFW, Consultant and ITR team will meet in La Conner WDFW offices to discuss review comments prior to Consultant revising documents.
- The ITR team will provide backcheck review comments and update the standard ITR comment form.

Task 2.2.6 Permit Applications and Coordination

The Consultant will develop and submit the following permits and supporting documents in conjunction with the 60% design submittal: Joint Aquatic Resource Permit Application (JARPA) for the Section 404, Section 401, and HPA; Limit 8 checklist for salmon for Section 7 compliance; biological evaluation for Section 7 consultation; SEPA checklist (WDFW lead agency) and Skagit County permits including lot certification, critical areas review, fill/grade, shoreline substantial development and special use permit. Several of these permits require notifications, pre-application and permit meetings, as well as attendance at hearing examiner meetings. Contingencies have been included for permits including the potential need for an environmental impact statement.

Deliverables

- Permit Applications
- Attendance and hearing examiner meetings
- Ongoing coordination with permit agencies for approval

Assumptions

- Assumes the project can be permitted through a nationwide permit as impacts to estuarine wetlands will not be permanent or adverse.
- Recently, Snohomish County has performed an EIS for the Smith Island dike setback project. It is assumed that an environmental impact statement will not be required for Fir Island Farm by Skagit County.
- The wetland delineation can use an aerial delineation and will not require a full field survey, per the Consultant's previous communications on this topic with the Corps of Engineers.
- A FEMA CLOMR and Skagit County floodplain grading permit will not be required for the project.
- A temporary ROW and access permit will not be required for the Consultant to obtain and can be obtained by the Contractor as part of the construction contract.

Response Design/Permit (Higher Probability – Included in Cost Estimate)

Task 2.2.6a Permit Options*

The Consultant may be required, depending upon federal and local permit authority decision, be required to provide additional information and permit applications in addition to those anticipated. The potential permit options include:

- *404 Individual Permit (vs. a nationwide) – This is possible as the Corps of Engineers is reissuing the nationwide permits and could affect NWP27 – Habitat Restoration for this project.*

Response Design/Permit (Lower Probability – Not Included in Cost Estimate)*

Task 2.2.6a Permit Options*

The Consultant may be required, depending upon federal and local permit authority decision, be required to provide additional information and permit applications in addition to those anticipated. The following permit options are low probability options:

- *Field survey and delineation of wetlands and OHW. Consultant coordinated with Corps during feasibility study who indicated aerial mapping of wetlands was acceptable. Cost estimate for 2014 field wetland and OHW delineation and survey is estimated at $15,600.*
- *FEMA CLOMR. Previous experience on Skagit County tidal marsh dike setback restoration projects has been that a FEMA CLOMR and Skagit County floodplain permit was not required. Cost estimate for 2014 FEMA CLOMR submittal is $17,500.*
- *Skagit County Temporary ROW and Access Permit. Assumption that Contractor will obtain permit as part of construction contract. Cost estimate for 2014 permit is $1,200.*
- *Environmental Impact Statement (EIS). Previous Skagit County tidal marsh dike setback projects have not been required to submit and EIS. However, Snohomish County Smith Island dike setback was required. Cost estimate for 2014 EIS is $144,000.*

Task 2.2.7 – Monitoring and Adaptive Management Plan Phase 2.2

In Phase 2.2, baseline field monitoring will be performed during the spring juvenile Chinook migration period to capture baseline data prior to start of construction. The monitoring activities will be based on the requirements outlined in the Phase 2.1 Monitoring and Adaptive Management Plan.

Deliverables

- DRAFT 2.2.7 – Baseline Monitoring Data Report
- DRAFT FINAL 2.2.7 – Baseline Monitoring Data Report

Assumptions

- WDFW will be the lead agency on performing baseline monitoring field data collection efforts. It is anticipated that WDFW will be teaming with other project partners to collect the data.
- Field monitoring will be performed per the Phase 2.1 Monitoring and Adaptive Management Plan. Baseline field monitoring will likely include:
    - Existing marsh channels
    - Existing marsh vegetation
    - Existing fish use
    - Existing drainage flow and water quality
    - Existing dike structure conditions

Task 2.2.8 – Real Estate, Landowner and Partner Agreements

In Phase 2.2, WDFW will further negotiate real estate, landowner and partner agreements, easements and rights of way based on Phase 2.1 study findings and requirements of the Adaptive Management and Monitoring Report. The Consultant will provide a pool of 42 hours to provide technical assistance to

WDFW (such as CAD drawings, descriptions of work, schedule). WDFW will be primary party responsible for development of the agreements and easements.

Deliverables

- Data, files, CAD drawings, schedules and project descriptions as requested by WDFW.

Assumptions

- WDFW will be the prime on performing real estate and landowner agreements and the Consultant will provide support on an as-needed basis. Consultant hours and budget will be limited to the amounts shown in the cost estimate. Any work beyond these budgets will be performed after receipt of a contract amendment to be provided by WDFW.
- Budgets were developed with the assumption that CD22 and Hayton property landowner agreements would be needed. Additional landowner agreements will likely require additional budget and resources.
- This scope and budget do not include resources to support CD22 Consent Decree negotiations that may occur with WDFW.

Phase 2.3 – 90% Design, Final Design and Construction Contract Documents, Permit Award, Final Baseline Monitoring

Phase 3 will include final engineering design, award and tracking of permits, and development and assembly of construction contract bid documents. In addition, baseline monitoring efforts may continue to further develop baseline data prior to construction.

Task 2.3.1 – Project Management and Contract Administration

The Consultant and WDFW will provide project management and construction management administration services to complete Phase 3.1 work. Project management and administration services will be similar to those outlined in Phase 2.1, with the following exception. The Consultant will update the risk management strategy at the outset of Phase 2.2.

- Update to the REVISED Risk Management Strategy to be provided to WDFW, the Steering Committee and the project team for use and updates throughout the project.
- Risk Record (Ledger) quarterly (or as needed) updates – The Consultant will provide and update the Risk Record at monthly WDFW and Steering Committee meetings.

Task 2.3.2 – Project Coordination, Meeting Attendance and Calls

The Consultant will attend meetings and conference calls in support of the project in Phase 2.2. Project management and administration services will be similar to those outlined in Phase 2.1 for a maximum 1 year contracting period, with the following exceptions.

- N/A - Hydrodynamic Modeling subconsultant will attend two, two hour steering committee meetings in La Conner WA.
- N/A - Hydrodynamic Modeling subconsultant will attend four, one hour conference calls with WDFW and/or the Steering Committee.

Deliverables

- 12 invoices and progress reports provided monthly
- DRAFT and REVISED Risk Management Strategy Report

Assumptions

- The number of meetings and calls are limited to the amounts listed in the tasks above and in Task 2.1.1.

Task 2.3.3 – Grant Funding and Construction Financing

Phase 2.2 grant funding and construction financing will continue building upon Phase 2.1 work. The work will primarily focus on developing and submitting grant applications.

- REVISE Construction Grant Funding and Financing Strategy (as needed)
- Prepare up to three grant applications in Phase 2.3.

Deliverables

- REVISED Construction Grant Funding and Financing Strategy
- (3) Grant Application Submittals

Assumptions

- Funding team members will include:
  - Brian Williams – WDFW
  - Shirley Solomon – Skagit Watershed Council
  - Mike Shelby – Western Washington Agriculture Association
  - Others – TBD
- Grant application submittals will be prepared by WDFW, with assistance from the Consultant. The Consultant will provide a pool of 80 hours (48 hours Project Manager and 24 hours Principal Scientist or Principal Engineer and 8 hours Principal in Charge) to perform research, attend meetings and site visits, and assist with grant applications in support of the funding team in Phase 2.1.

Task 2.3.4 – 90% and Final Design, Specs, Schedule and Cost Estimate

The Consultant will develop a 90% design package including plans, DRAFT specifications, engineer cost and bid sheet, and construction schedule for review and comment by WDFW.

2.3.4.1 – Site Survey

WDFW will provide necessary survey revisions as a result of the 60% design review and permit requirements.

2.3.4.2 – Geotechnical Engineering Design

The Consultant will provide revised FINAL geotechnical design report for the 90% Design and Final Design Plans.

2.3.4.3 – General Civil Design

The Consultant will provide civil design for the 90% Design and Final Design Plans.

2.3.4.4 – Native Vegetation Plan Design

The Consultant will provide a 90% and revised FINAL native vegetation design report.

2.3.4.5 – Specifications

The Consultant will provide a DRAFT specifications for the 90% Design Plans.

2.3.4.6 – Engineer Estimate of Probable Cost

The Consultant will provide a revised DRAFT engineer estimate of probable cost for the 90% Design Plans.

2.3.4.7 – Construction Schedule

The Consultant will provide a revised DRAFT and FINAL construction schedule.

2.3.4.8 – Operation and Maintenance Plans

The Consultant will provide a revised DRAFT and FINAL operation and maintenance plans.

2.3.4.9 – Submittals and Reports

The Consultant will compile and provide the reports identified in the Deliverables.

Deliverables

- DRAFT-FINAL (and FINAL) Civil and Geotechnical Engineering Design Report, Plans, Specifications, Cost Estimate, Schedule and Native Vegetation Planting Plans and Specifications

Assumptions

- DRAFT-FINAL reports will be submitted to WDFW and ITR for final review. Upon completion and backcheck of comments, FINAL reports will be issued.

Response Designs (Higher Probability – Included in Cost Estimate)*

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Response Designs (Higher Probability – Included in Cost Estimate)*

2.3.4.3b – 60% Design Interior Drainage Pump Station (OPTION)

The Consultant may be required to add an interior drainage pump station if it is demonstrated that interior drainage, surface water and groundwater inflows have adverse effects and require mitigation beyond what can be obtained through tidegate and interior drainage design alone. This design would be triggered by the results and findings of Task 2.2.4.3b.

Response Designs (Higher Probability – Included in Cost Estimate)*

2.3.4.3c – 60% Design Fir Island Roadway Siding (OPTION)

The Consultant may be required to design a roadway siding along the Fir Island Road construction access entrance. This will be triggered by the results of pre-application permit coordination with the county Task 2.2.4.3c.

Response Design (Lower Probability – Not Included in Cost Estimate)*

2.3.4.3d – 60% Design Drain Tile Design (OPTION)

The Consultant may be required design drain tiles in WDFW and Hayton Farms that may be redundant and unnecessary with interior drainage pump station ($4,169 this Phase 2.2 work). This task may be triggered if drain tiles are included per Task 2.2.4.3d.

Task 2.3.5 – Independent Technical Review 90% Design Plans

The ITR team will be provided the Phase 2.3 DRAFT-FINAL 90% Design documents for review. The ITR will include review and assembly of comments, to be responded to or addressed in the FINAL design. The ITR team will meet with WDFW and the Consultant team to discuss comments and questions prior to the Consultant revising the FINAL design documents. The Consultant team will provide the design revisions in the FINAL design. The ITR will backcheck the revised FINAL letter reports and confirm all issues have been addressed and documented.

Deliverables

- Phase 2.3 ITR will involve review of 90% plans and supporting documents.
    - DRAFT-FINAL Engineering Design Report, Plans, Specifications, Cost, Schedule
- The Consultant will provide an electronic copy of documents to the ITR team for review.
- The ITR team will provide review and comments organized using a standard ITR comment form.
- WDFW, Consultant and ITR team will meet in La Conner WDFW offices to discuss review comments prior to Consultant revising documents.
- The ITR team will provide backcheck review comments and update the standard ITR comment form.
- ITR Consultant will provide a written letter report with professional engineering stamp documenting that they have performed and completed Independent Technical Review on the project.

Assumptions

- DRAFT-FINAL reports will be submitted to WDFW and ITR for final review. Upon completion and backcheck of comments, FINAL reports will be issued.
- All ITR comments will be resolved by the parties in a timely manner prior to submitting the FINAL design documents.

Task 2.3.6 Permit Coordination and Award

The Consultant will track and coordinate permits submitted for approval including: JARPA for the Section 404, Section 401, and HPA; Limit 8 checklist for salmon for Section 7 compliance; biological evaluation for Section 7 consultation; SEPA checklist and Skagit County permits including lot certification, critical areas review, fill/grade, shoreline substantial development and special use permit. Permit award, deadlines and compliance summaries will be provided to WDFW.

Deliverables

- Permit Awards, Points of Contact, and Compliance Requirement Summary

Assumptions

- Permit coordination and award budgets are limited to those hours shown in this proposal. If additional time is needed to respond to comments and coordinate with the agencies, a contract amendment will be necessary to complete permit award work.

Task 2.3.7 – Monitoring and Adaptive Management Plan Phase 2.3

In Phase 2.3, the final baseline field monitoring activities will be performed during the spring juvenile Chinook migration period to capture comprehensive data prior to construction. The monitoring activities will be based on the requirements outlined in the Phase 2.1 Monitoring and Adaptive Management Plan, and final field data collected to augment work performed in Task 2.2.7.

Deliverables

- DRAFT 2.3.7 – Baseline Monitoring Data Report
- DRAFT FINAL 2.3.7 – Baseline Monitoring Data Report

Assumptions

- WDFW will be the lead agency on performing baseline monitoring field data collection efforts. It is anticipated that WDFW will be teaming with other project partners to collect the data.
- Field monitoring will be performed per the Phase 2.1 Monitoring and Adaptive Management Plan. Baseline field monitoring will likely include:
    - Existing marsh channels
    - Existing marsh vegetation
    - Existing fish use
    - Existing drainage flow and water quality
    - Existing dike structure conditions

Task 2.3.8 – Real Estate, Landowner and Partner Agreements

In Phase 2.3, it is anticipated that WDFW will need to negotiate a number of real estate, landowner and partner agreements, easements and rights of way. The Consultant will provide a pool of 128 hours to

provide technical assistance (such as CAD drawings, descriptions of work, schedule). WDFW will be primary party responsible for development of the agreements and easements.

Deliverables

- Data, files, CAD drawings, schedules and project descriptions as requested by WDFW.

Assumptions

- WDFW will be the prime on performing real estate and landowner agreements and the Consultant will provide support on an as-needed basis. Consultant hours and budget will be limited to the amounts shown in the cost estimate. Any work beyond these budgets will be performed after receipt of a contract amendment to be provided by WDFW.
- Budgets were developed with the assumption that CD22 and Hayton property landowner agreements would be needed. Additional landowner agreements will likely require additional budget and resources.
- This scope and budget do not include resources to support CD22 Consent Decree negotiations that may occur with WDFW.

Response Design (Lower Probability – Not Included in Cost Estimate)*

Task 2.3.8a CD22 Landowner Agreement Consent Decree Support*
WDFW and the Consultant may be required to perform additional work related to the CD22 Consent Decree. The Decree may overlap WDFW property and the proposed project, and be part of a legal determination. A pool of hours has been identified as a possible cost to the project if additional negotiations, preparations of plans, project descriptions, easements and other associated agreement elements are needed for the project. The cost estimate of Consent Decree landowner agreement negotiations technical support in 2015 is estimated at $16,172. This task would be triggered if additional negotiations were needed resulting from the CD22 Consent Decree. WDFW would indicate if and when this were the case.

* Denotes response study or design may be necessary if findings from design studies are different than base contract assumptions.

** Yellow highlight indicates that response study or response design has a higher probability of occurring based on best professional judgment and review at the time of developing the scope of work. Higher probability response studies and design cost estimates are included in proposal.*

** Gray highlight indicates that response study or response design has a lower probability of occurring based on best professional judgment and review at the time of developing the scope of work. Lower probability response studies and design cost estimates are not included in proposal.*