Council Meeting Date: September 12, 2016 **Agenda Item:** 7(c)

CITY COUNCIL AGENDA ITEM

CITY OF SHORELINE, WASHINGTON

AGENDA TITLE:	Motion to Authorize the City Manager to Execute an Amendment to the Agreement with Herrera Environmental Consultants for Continued Pre-design Activities in Support of the Hidden Lake Dam Removal and Boeing Creek Restoration Projects
DEPARTMENT:	Public Works
PRESENTED BY:	Tricia Juhnke, City Engineer
ACTION:	____ Ordinance ____ Resolution __X__ Motion ____ Discussion ____ Public Hearing

PROBLEM/ISSUE STATEMENT:

On May 23, 2016, the City Council discussed the results of the Hidden Lake Dam Removal alternatives analysis and authorized staff to pursue Alternative 4, which represents an expanded scope to pursue restoration efforts downstream along Boeing Creek in addition to the Hidden Lake area. An amendment to the existing contract with Herrera Environmental Consultants is needed to proceed with additional pre-design activities primarily associated with downstream restoration elements.

RESOURCE/FINANCIAL IMPACT:

Funding for this contract amendment is from the Surface Water Management Capital Project budget, as programmed in the draft 2017-2022 CIP:

Project	Original Contract Amount	Original Contract - Spent	Original Contract - Unspent	Current Amend-ment	Contract Net Increase	Contract New Amount
Hidden Lake Dam Removal	$150,722	$130,000	($20,722)	$39,810	$19,088	$169,810
Boeing Creek Restoration	$0	$0	($0)	$81,677	$81,677	$81,677
Combined	***$150,722***	***$130,000***	***($20,722)***	***$121,487***	***$100,765***	***$251,487***

RECOMMENDATION

Staff recommends that Council authorize the City Manager to execute an amendment to the agreement with Herrera Environmental Consultants to add scope and increase the total contract amount from $150,722 to a total contract amount of $251,487 for continued pre-design activities in support of the Hidden Lake Dam Removal and Boeing Creek Restoration Projects.

Approved By: City Manager ***DT*** City Attorney ***MK***

BACKGROUND

Hidden Lake is a man-made pond located east of the intersection of NW Innis Arden Way and 10th Avenue NW, partially within Shoreview Park. The current dam and lake was constructed in 1995 by King County. Sediment deposition within the lake occurs at a high rate and as a result the City's Surface Water Utility had been required to remove large volumes of sediment to maintain the lake as an open water feature.

On September 8, 2014, the City Council discussed this issue as presented in the Hidden Lake Management Plan Feasibility Study and authorized staff to cease dredging the lake and begin a phased approach to remove Hidden Lake Dam and re-establish Boeing Creek at Hidden Lake. The staff report for this discussion can be found at the following link:
http://cosweb.ci.shoreline.wa.us/uploads/attachments/cck/council/staffreports/2014/staffreport090814-8a.pdf.

On June 3, 2015, the City entered into an agreement with Herrera Environmental Consultants for Hidden Lake Dam Removal Phase 1. The original contract scope included alternatives analysis, outreach assistance, grant funding opportunity evaluation, permitting assistance, and development of preliminary design plans for a preferred alternative. Design alternatives were developed to modify the existing lake and its associated outflow configuration to safely convey flood flows and manage sediments that will continue to be transported into the existing lake area in Boeing Creek during storm events in the basin.

On May 23, 2016, City Council discussed the results of the alternatives analysis and authorized staff to pursue Alternative 4, which represents an expansion of the original project scope concept. The staff report for this discussion can be found at the following link:
http://cosweb.ci.shoreline.wa.us/uploads/attachments/cck/council/staffreports/2016/staffreport052316-8a.pdf

The expanded project scope adds removal of the Seattle Golf Club diversion dam located approximately 800 feet downstream of NW Innis Arden Way to the overall project concept in order to remove all major fish passage barriers along Boeing Creek downstream of Hidden Lake. Additionally, Alternative 4 tentatively separates the overall concept into two complementary projects: the Hidden Lake Dam Removal Project (HLDRP) for improvements upstream of NW Innis Arden Way; and the Boeing Creek Restoration Project (BCRP) for improvements downstream of Hidden Lake Dam, including NW Innis Arden Way culvert replacement, Seattle Golf Club Dam removal, and other channel restoration improvements. The Hidden Lake Dam Removal Project and Boeing Creek Restoration Project were previously identified as Alternative 4 Phases 1 and 2, respectively.

DISCUSSION

The scope of work for Alternative 4 selected as the preferred alternative is beyond what was described in the original scope of work for the Herrera team's support for the City on this project. The current amendment is necessary in order to continue developing

project elements to a refined concept level in order to: 1) provide the City with better accuracy in construction cost estimates, 2) expand on analysis and documentation of potential aquatic habitat benefits near the mouth of Boeing Creek, which are understood to be a critical issue affecting viability for grant funding, and 3) create greater project definition to support discussions with various stakeholders.

COUNCIL GOAL ADDRESSED

This project addresses Council Goal #2, Improve Shoreline's utility, transportation, and environmental infrastructure.

RESOURCE/FINANCIAL IMPACT

Budget for this contract amendment is available from the Surface Water Utility Fund:

Project	Original Contract Amount	Original Contract - Spent	Original Contract - Unspent	Current Amend-ment	Contract Net Increase	Contract New Amount
Hidden Lake Dam Removal	$150,722	$130,000	($20,722)	$39,810	$19,088	$169,810
Boeing Creek Restoration	$0	$0	($0)	$81,677	$81,677	$81,677
Combined	***$150,722***	***$130,000***	***($20,722)***	***$121,487***	***$100,765***	***$251,487***

The currently estimated project budgets are as follows:

HIDDEN LAKE DAM REMOVAL PROJECT

Project Expenditures:	
Pre-Design (through end of 2017):	
Staff and other Direct Expenses	$30,000
Engineering Consultant	***$169,810[1]***
Design and Permitting (2018-2019):	
Staff and other Direct Expenses	$30,000
Engineering Consultant[2]	$200,000
Project Expenditures (Pre-Design/Design)	**$429,810**
Project Revenue:	
Surface Water Capital Fund	$429,810
Project Revenue	**$429,810**

Construction costs are not fully funded at this time; additional grant funding is being targeted.

[1] Current amendment covers $19,088 of this amount.
[2] Not included in current consulting contract.

BOEING CREEK RESTORATION PROJECT

Project Expenditures:	
Pre-Design (through end of 2017):	
Staff and other Direct Expenses	$40,323
Engineering Consultant	*$81,677*[3]
Project Expenditures (Pre-Design)	**$122,000**
Project Revenue:	
Surface Water Capital Fund	$122,000
Project Revenue	**$122,000**

Design/permitting and construction costs are not fully funded at this time; additional grant funding is being targeted.

ALTERNATIVES ANALYSIS

The alternative approaches are possible:

1. Amend the Herrera contract for additional pre-design work – ***recommended***
2. Start a new selection process for hiring a consultant for additional pre-design

The second alternative to start a new selection process to hire a consultant for additional pre-design is not being recommended because compared to the recommended approach it would delay the project schedule and require additional City staff resources to undergo the hiring process. Hiring a new consultant would also be less efficient than the recommended alternative as it would require re-starting the process of educating and coordinating with the consultant regarding project-specific information.

The recommended alternative, to amend the Herrera contract, is the most efficient and effective approach to continuing the development of the Hidden Lake Dam Removal and Boeing Creek Restoration pre-design. This additional scope is allowable under the scope of the original Request for Qualifications (RFQ) for the Herrera contract.

RECOMMENDATION

Staff recommends that Council authorize the City Manager to execute an amendment to the agreement with Herrera Environmental Consultants to add scope and increase the total contract amount from $150,722 to a total contract amount of $251,487 for continued pre-design activities in support of the Hidden Lake Dam Removal and Boeing Creek Restoration Projects.

ATTACHMENTS

Attachment A - Herrera Environmental Consultants - Hidden Lake Dam Removal and Boeing Creek Restoration Projects Scope of Work

[3] Current amendment covers this full amount.

Hidden Lake Dam Removal and Boeing Creek Restoration Design Development, Monitoring, Funding Support, and Outreach Support

Amendment to Pre-Design (Phase 1) Scope of Work

The City of Shoreline (City) seeks ongoing assistance from Herrera Environmental Consultants (Herrera) and its subconsultants working on the Hidden Lake Dam Removal project in monitoring data collection, stakeholder outreach, grant funding support, and developing concept design information for potential Boeing Creek fish passage and stream restoration improvements that are collectively described as Alternative 4 in the project's alternatives analysis report (Herrera 2016).

On May 23, 2016, Shoreline City Council authorized staff to pursue Alternative 4, which represents an expansion of the original Hidden Lake Dam Removal project scope concept. The expanded scope adds removal of the Seattle Golf Club diversion dam located approximately 800 feet downstream of NW Innis Arden Way to the overall project concept in order to remove all major fish passage barriers along Boeing Creek downstream of Hidden Lake. Additionally, Alternative 4 tentatively separates the overall concept into two complementary projects: the Hidden Lake Dam Removal Project (HLDRP) for improvements upstream of NW Innis Arden Way; and the Boeing Creek Restoration Project (BCRP) for improvements downstream of Hidden Lake Dam including NW Innis Arden Way culvert replacement, Seattle Golf Club Dam removal, and other channel restoration improvements. (The Hidden Lake Dam Removal Project and Boeing Creek Restoration Project were previously identified as Alternative 4 Phases 1 and 2, respectively, but moving forward will be identified only by project names/acronyms.)

Much of this pending work is beyond what was described in the original scope of work for the Herrera team's support for the City on this project. The purposes of developing project elements to a refined concept level are to: 1) provide the City with better accuracy in construction cost estimates, 2) expand on analysis and documentation of potential aquatic habitat benefits near the mouth of Boeing Creek, which are understood to be a critical issue affecting viability for grant funding, and 3) create greater project definition to support discussions with various stakeholders. This work will involve several tasks described below, adhering to the project Pre-Design (Phase 1) task numbering scheme where the task work is a continuation of work conducted to date as of July 2016. These new and redefined tasks will be wholly associated with either HLDRP or BCRP (as indicated in the task titles in the remainder of this scope of work), since the City is budgeting those projects separately.

Herrera's subconsultants in this project include Carlstad Consulting for public and stakeholder outreach and grant funding guidance, Perrone Consulting for geotechnical engineering, Pacific Geomatic Services for survey and base mapping, and Cultural Resource Consultants for archaeological and historical resources research and documentation.

Task 2 – Stakeholder Outreach and Coordination (BCRP)

Herrera and Carlstad Consulting will support the City in outreach and communications with various stakeholders (including individuals and organizations owning private property downstream of NW Innis Arden Way and other potentially affected or interested parties) in relation to conceptual design of stream restoration for fish passage downstream of Hidden Lake, and corresponding effects on private landowners. This may take the form of one-on-one conversations with landowners, planning and facilitating a community meeting(s), and/or writing project newsletter updates to be distributed to residents. A brief outreach plan will be prepared to guide the City's efforts to reach stakeholders and obtain their feedback.

Assumptions:

- Up to two community and/or small stakeholder group meetings will occur to discuss the City's vision for fish passage restoration in Boeing Creek, and potential effects on the creek and adjacent land owners.
- Herrera and Carlstad will meet with City staff to plan the community meeting(s), and will then assist in drafting the agenda and meeting announcement(s).
- Cynthia Carlstad will facilitate the meeting(s) at the City's request.
- The City will make logistical arrangements, publish announcements, and host the community meeting(s).
- Herrera's project manager and/or lead designer will assist the City in up to two meetings with the Seattle Golf Club to discuss conceptual design plans for removing the irrigation water diversion dam owned by Seattle Golf Club and associated creek channel restoration.

Deliverables:

- Concise (1-2 page) stakeholder outreach and coordination plan
- Draft meeting announcement(s) and agenda(s) for up to two community meetings
- Draft agendas and notes from up to two meetings with Seattle Golf Club
- Summary notes from community meeting(s)

Task 5 – Cultural Resources Assessment (BCRP)

Cultural Resource Consultants (CRC) will expand on the cultural resources assessment documentation previously prepared for the Hidden Lake area for the HLDRP, focusing on identification of any historical or archaeological resources that may be present in and near Boeing Creek downstream of NW Innis Arden Way. This assessment will extend from the downstream limits of the "Project Area" defined in the draft cultural resources assessment prepared previously by CRC (dated July 2015), and extend to the mouth of the creek at Puget Sound.

Assumptions:

- CRC will do no fieldwork for the updated and expanded assessment
- Mitigation for potential project impacts to archaeological or historic sites is not included in this scope of work.
- CRC will contact area tribes for information relevant for the expanded project area

Deliverable:

- Revised and expanded Cultural Resources Assessment Memorandum – electronic file in Adobe PDF format

Task 6 – Survey and Base Mapping (BCRP)

Remaining unfinished work in this task per the original scope of work is voided and replaced with the following.

Pacific Geomatic Services (PGS) will review available topographic mapping furnished by the City for the vicinity of the Seattle Golf Club dam, and determine how it can be tied into supplemental survey work performed by PGS. PGS will then survey the Boeing Creek thalweg profile and survey channel/bank cross-sections at approximately 100 feet intervals from the limits of its previous survey work conducted just downstream of NW Innis Arden Way to 400 feet downstream of the Seattle Golf Club diversion dam, a total length of approximately 1,200 lineal feet. Additionally, PGS will survey three channel/bank cross-sections farther downstream near the mouth of the creek, in the vicinity of a potentially problematic bank erosion area and as requested by the City and/or Herrera for other specific features of interest. Cross-sections will extend approximately 25 feet beyond the top of bank of the active creek channel along both sides of the creek, subject to safe accessibility for survey crew members. Site reconnaissance by Herrera's lead engineer and lead geomorphologist will be done through the creek from NW Innis Arden Way to the Seattle Golf Club diversion dam and farther downstream near the creek mouth in advance of the survey field work to inform whether any other key features should be captured in the survey.

PGS will establish a primary control network utilizing the Washington State Reference Network and tied into a local public horizontal and vertical control network. From this network they will establish a localized project control network on the datum as specified by the City.

PGS will process the collected data into an AutoCAD drawing that includes topographic survey completed previously for the Hidden Lake project and survey furnished by the City for the diversion dam vicinity (done by others).

Assumptions:

- PGS will have reasonable access to all areas requiring mapping.

- The City will acquire right of entry onto private properties requiring any mapping.
- All survey and mapping work will be performed in a single, coordinated field effort.
- PGS field crews may need to perform minor brushing with machetes to conduct this survey, outside of landscaped areas. The City will coordinate with private property owners to obtain the necessary permissions to do so.
- For safety reasons PGS personnel are not permitted to enter enclosed utility structures. These structures will be detailed and inventoried only to the extent feasible from the surface.
- All electronic mapping standards will be based on APWA drafting standards unless specified otherwise and provided to PGS prior to commencement of work.
- Herrera will prepare a list of survey data to be collected for brief review and comment by the City in advance of the field survey effort commencing in this task.
- A Record of Survey will not be created for this phase of the project.
- AutoCAD base map file will be in AutoCAD 14 Civil 3D format. Base map drawing objects shall include an existing ground surface and stream centerline alignment. Objects (such as trees) denoted by symbols within the survey shall be AutoCAD blocks and not only COGO points.

Deliverables:

- List of survey data to be collected
- AutoCAD base map file

Task 8 – Grant Funding Assessment and Application Support (BCRP)

Herrera and Carlstad Consulting will assist the City in researching potential grant programs that should be considered for funding of HLDRP and BCRP improvements, and in discussing the project(s) with funding agencies. Herrera will maintain and periodically update a list of potential grant sources and information on their application processes and timelines. This list will be refined as project design development advances, enabling the City to decide which grant program(s) to formally pursue with an application. Herrera will assist the City in drafting up to two grant applications for City review and embellishment (beyond the Washington State RCO Land and Water Conservation Fund grant application that is being completed in August 2016), and support the application submittal and review process.

Assumptions:

- Two Herrera team members will meet with City staff once during the course of completing work on this task, at City offices.
- The City will have primary responsibility for drafting the grant application(s), with Herrera providing technical support in the form of design descriptions,

cost estimates, expected project outcomes, and potential project impacts and related mitigation measures.
- The City will provide information needed for grant applications not readily accessible to the Herrera team, such as organizational data, performance on previous grants, and match and partnership arrangements.
- The City will be involved in any in-person meetings with grant funding organizations.

Deliverables:

- List of potential grant sources, updated periodically between August 2016 and December 2017.
- Notes from communications with grant funding organizations.
- Content input for draft application(s) for up to two grant programs.

Task 11 – Preliminary Design of Preferred Alternative (HLDRP)

The remaining unfinished work of this task will be completed. Specifically, Herrera will prepare preliminary design drawings to approximately a 20% to 30% level of completion for the HLDRP elements, which include removal of Hidden Lake Dam and stream restoration work extending upstream of the existing culverts beneath NW Innis Arden Way. For HLDRP elements that are important from a regulatory or funding agency perspective, the drawing detail will be prepared to a 30% level of completion. For other project elements the design detail will be developed to a lesser level of completion. Herrera will refine a construction cost estimate to accompany the preliminary design submittal for City review.

Assumptions:

- Herrera will produce the project design drawings using AutoCAD 2014 Civil 3D format.
- The City will review and comment on a draft set of preliminary design drawings and a preliminary itemized construction cost estimate, and provide consolidated comments to Herrera.
- No meetings will be necessary in this task.
- Herrera will prepare a final set of preliminary design drawings addressing City comments, and refine the construction cost estimate as needed accordingly.
- The preliminary design plans will not include traffic control or temporary erosion and sediment control information, but the cost estimate developed in coordination with the preliminary design will capture those project elements.

Deliverables:

- Preliminary design drawings in Adobe PDF and AutoCAD electronic file format – draft and final.

- Preliminary construction cost estimate in Microsoft Excel electronic file format – draft and final.

Task 12 – Hidden Lake Dam Removal Project Management (HLDRP)

This task covers project management activities associated with the work of Tasks 11, 13 and 14 that is linked to HLDRP elements. Herrera will provide the following management measures, with support from subconsultant partners as applicable to their involvement in the project:

- Monthly telephone conversations with the City's Project Manager regarding task progress, upcoming project activities, and budget usage.
- Monthly progress reports to accompany invoices, including a brief description of the work completed by task, and schedule updates.
- Maintenance of project files.

Assumptions

- Routine project progress communications with the City's project manager will be accomplished via telephone calls and email so that no in-person meetings will be necessary in this task. Monthly project management check-in calls will require no more than 30 minutes per meeting/call.

Deliverables

- Monthly invoices and progress reports.
- Communication via telephone and email with the City's project manager regarding project progress and issues potentially affecting scope, schedule and/or budget.

Task 13 – Hidden Lake Sediment Monitoring Plan (HLDRP)

Herrera will prepare a plan for monitoring sediment deposition in Hidden Lake, to be implemented by the City and/or their designees, which may or may not include Herrera. The purpose of the monitoring plan is to 1) inform the City on an ongoing basis regarding how much time it may have to move forward with removal or modification of the existing dam that impounds Hidden Lake, 2) guide Hidden Lake dam removal/modification design strategies, 3) allow for adaptive management of sedimentation issues in the lake, if necessary, and 4) mitigate for changing site conditions if necessary. The monitoring plan will focus on recommendations for topographic/bathymetric survey for sediment deposition volume and lake water storage capacity estimates.

Assumptions

- The City and/or its designee will implement physical monitoring after an initial joint site visit with Herrera staff who prepare the plan.

- Herrera will prepare a monitoring plan outline for City review and approval before proceeding with preparation of the final monitoring plan.
- The principal portion of the monitoring will be staking select locations throughout the lake to be sampled with handheld, easy-to-use depth sounders and measuring tape, for those locations that are no longer submerged.
- Sediment characterization will not be necessary for the monitoring itself, but may be needed for mitigation actions. The trigger for these observations and analysis will be described in the plan.
- The plan will be subject to one round of review by the City, and the City will provide consolidated comments to Herrera.

Deliverables

- Outline of Hidden Lake sediment deposition monitoring plan in Microsoft Word electronic file format
- Monitoring plan in Microsoft Word and Adobe pdf electronic file formats – draft and final.
- Monitoring stakes installed in the lake bed.

Task 14 – Boeing Creek Flow Gaging (HLDRP)

Herrera will assist the City with installation and initial data gathering for a streamflow gage located upstream of Hidden Lake. The gage will monitor water levels in the creek, from which flow estimates will be calculated based on a "rating curve" developed from measured flow rates at varying water levels. This work will involve the subtasks described below.

Task 14A - Site Assessment

Some key considerations for accurate streamflow data collection are to select a gaging location that 1) has a cross-section that captures the range of flows to be monitored, and 2) is not subject to backwater influences under existing or future conditions (in the event that the gage is used long-term).

A streamflow monitoring expert from Herrera will visit the creek corridor upstream of Hidden Lake to confirm feasibility for accurate gaging and associated rating curve development and to select a specific location for gage equipment installation in the channel and on the bank. The gage location needs to have stable stream banks and a stable bed that is not subject to substrate incision or aggradation so that the flow cross-section is consistent over time, and should exhibit laminar flow to insure accuracy of manual discharge measurements to support rating curve development. In conjunction with gage installation at the selected location, additional visual survey will be performed in the gage area to document the integrity of the channel and hence the reliability of the subsequent data to be collected.

Assumptions

- A Herrera staff member will conduct one, half-day site visit.

Task 14B – Monitoring Equipment Purchase and Calibration

After the preferred gaging location is selected (and approved by the City or a private property owner) and the desired configuration of the gage is confirmed, Herrera will develop an equipment list for gage installation. This includes the gage hardware and the materials needed for installation.

The equipment will include a non-vented pressure transducer to measure water depth, a barometric sensor to collect ambient air pressure data, and a staff gage to track vertical instrument drift. The transducer will be contained within PVC, steel, or other durable piping that is anchored to prevent becoming dislodged in a flood event. An In-Situ Rugged TROLL 100 Non-Vented Level Logger will be used, and will likely be housed in a well-point standpipe, affixed with hose clamps to an angle iron driven into the stream bed, and protected by a PVC or steel conduit, locking well cap and lock. A Rugged BaroTROLL Data Logger will be deployed in a nearby location on the bank. All of this equipment will be durable enough such that the gage can be operated for years into the future without need for replacement, while being discreet and durable as relates to vandalism concerns.

Assumptions

- Herrera will purchase the equipment on behalf of the City of Shoreline.
- Herrera will conduct testing of the pressure transducer for accuracy and bias prior to deployment.

Deliverables

- Flow gaging equipment that will become property of the City of Shoreline.

Task 14C – Gage Installation

Installation of the recommended gage equipment will be accomplished by a team of two Herrera staff in one day. This includes programming the transducer data logger, documenting the installation in a standardized format with photos, and an initial stage-discharge measurement at a few locations to confirm creek flow on the day of installation, and a channel cross-section topographic survey.

Deliverables

- Flow gaging equipment installed and operating.

Task 14D – Rating Curve Development, Field Calibration, Maintenance, and Training Visits

A Herrera scientist with experience measuring streamflow with a current meter will visit the site on up to ten occasions to develop a rating curve. On two of these occasions, two Herrera employees will visit (for safety measuring high flows in larger storm events). On some of these occasions, a City employee will attend to be trained to download water depth measurements from the data logger, and perform required maintenance on the monitoring equipment. Taking manual discharge measurements will require use of a portable flow meter such as a Hach FH950 Portable Velocity Meter.

Deliverables

- Rating curve for converting water depths to flow rates, in electronic file format for the City's records.
- Sufficient training for City staff to perform future monitoring data collection and equipment maintenance.
- Electronic file with measured flow data – template in which the City can continue to add data over time.

Task 15 – Conceptual Design of Culvert Replacements Beneath NW Innis Arden Way (BCRP)

Herrera will prepare a conceptual design for replacing the culverts beneath NW Innis Arden Way with a new box culvert or small bridge structure, to enable a refined cost estimate for this component of larger-scale stream restoration and fish passage improvements in Boeing Creek. In the alternatives analysis report prepared in Task 10 in the original scope of work, the cost estimate for this part of the work was very rough. Herrera will also prepare conceptual design information for restoring fish passage and natural channel characteristics through the "rock cascade" section of the creek just downstream of the NW Innis Arden Way culverts. The design development undertaken in this task will be to a lesser level of detail than will be produced for the HLDRP elements upstream of NW Innis Arden Way as described in Task 11. It is assumed that the level of effort for the design in this task will be progressed to a conceptual "Type, Size, and Location" (TSL) level to support more accurate planning level costs so that a preferred approach to eventual culvert replacement can be developed by the City.

The cost to maintain or replace existing utilities in the road right of way during culvert replacement is potentially significant. A key focus of this task will on determining how culvert replacement could be accomplished with the least extent of alterations to existing utilities as possible, and whether any utility replacements would be desirable for the City as part of culvert replacement construction. Herrera will prepare a brief technical memorandum documenting utility issues and recommendations, and describing an assessment of options for culvert replacement.

Geotechnical considerations for design and construction are also important given the deep fill over the existing culverts. Perrone Consulting (Perrone) will assist Herrera in evaluating options for a new culvert or small bridge structure, appropriate foundation design for the new structure, and in determining appropriate means of shoring or laying back the excavation side slopes during removal and replacement of the culverts. Two new geotechnical borings will be drilled to a depth of approximately 40 feet in the roadway embankment fill near the existing culverts. Perrone will log the geotechnical borings.

Assumptions

- The City will confirm the alignment and depth of all utilities overlying the existing culverts.
- Perrone will arrange for a drilling subcontractor.
- The City will determine if complete closure of the road is feasible during culvert replacement construction, or if traffic control would be necessary to maintain one open roadway lane at all times during construction.
- Up to three alternative replacement crossing structures will be considered. These alternatives will likely include a bridge, precast concrete culvert, and/or a prefabricated structural arch culvert.
- Herrera will submit draft conceptual design drawings and a supporting technical memorandum (less than 10 pages in length) for City review and comment. The City will provide consolidated comments to Herrera.
- No meetings will be needed with City staff during the course of the work on this task.

Deliverables

- Geotechnical boring logs.
- Conceptual design drawings (plan view and typical cross sections) – draft and final in Adobe PDF electronic file format
- A brief technical memorandum describing the basis for recommendation of a new culvert/bridge structure, necessary utility modifications (if any), backfill, and associated roadway modifications.
- Refined cost estimate for design, permitting, and construction of the culvert replacements – Microsoft Excel electronic file format.

Task 16 – Conceptual Design of Seattle Golf Club Diversion Dam Reach (BCRP)

Herrera will prepare a conceptual design for removing the Seattle Golf Club diversion dam and restoring a stable, fish-passable stream channel through the dam area. The length of stream channel encompassed in this design effort will extend from approximately 200 feet upstream of the dam to 200 feet downstream of the dam. The design development undertaken in this task will be to a lesser level of detail than will be produced for the HLDRP elements upstream of NW Innis Arden Way as described in Task 11. The conceptual design plans will address construction

site access and staging, viable means of streamflow diversion, a proposed channel elevation profile, typical channel sections, grade controls, and riparian vegetation plantings.

Herrera will prepare a brief technical memorandum documenting issues associated with dam removal and stream channel re-grading, and design recommendations. Herrera will prepare a cost estimate for design, permitting and construction that refines cost information included in the alternatives analysis report prepared under Task 10 in the original scope of work.

Assumptions

- The City and/or Seattle Golf Club will determine potential contamination concerns associated with the existing pumphouse near the dam, assuming it would be demolished, and determine utility modifications that may be needed with a re-graded stream channel at the dam site.
- No geotechnical information will be prepared under this task.
- The City will provide all existing drawings and existing utility information for the site.
- The City will coordinate with representatives of the Highlands community for drive-in site access and for obtaining all existing pumphouse and dam design and maintenance information.
- Herrera will submit draft conceptual design drawings and a supporting technical memorandum (less than 10 pages in length) for City review and comment. The City will provide consolidated comments to Herrera.
- One meeting with City staff will occur during the course of the work on this task.

Deliverables

- Conceptual design drawings (plan view, stream profile, and typical cross sections) – draft and final in Adobe PDF electronic file format
- A brief technical memorandum describing the basis for recommendation of how the existing dam should be demolished, utility modifications (if any), and extent of stream channel modifications and channel bed grade control needed for long-term, stable channel conditions in this reach of the creek. This memorandum will briefly describe permitting requirements that apply to dam removal and channel modifications in this reach.
- Refined cost estimate for design, permitting, and construction of the dam removal and associated channel modifications – Microsoft Excel electronic file format.

Task 17 – Nearshore Habitat Gains Analysis (HLDRP)

The purpose of this task is to expand on cursory information presented in the alternatives analysis report (Herrera 2016) regarding benefits of sediment loading increases to nearshore areas of Puget Sound. Herrera will evaluate LIDAR, the Washington Coastal Atlas, and a previous beach restoration opportunities assessment done by King County and Sound Transit in

this area to inform existing habitat character and deficiencies of existing habitat. The analysis will also use a potential reference site at the mouth of Pipers Creek to estimate the size of a future delta that could form, corresponding habitat it would provide for Chinook salmon and forage fish, and time it may take for that to occur based upon sediment delivery rates established in earlier phases of the project.

Assumptions

- The City will coordinate with private property owners to provide access to the mouth of Boeing Creek to document the differences between the beach at the mouth of Boeing Creek and the beach at the mouth of Piper's Creek in Carkeek Park.
- The habitat analysis will be primarily qualitative in terms of the habitat transformation, but a quantitative estimate of the length of shoreline improved will be made.
- Site visits to Carkeek Park and the mouth of Boeing Creek will occur on the same day.
- No new topographic survey will be required.
- No meetings will be needed with City staff during the course of the work on this task.

Deliverables

- A brief technical memorandum describing the methods and results of estimating increased habitat quality and quantity at the mouth of Boeing Creek and the time that it will likely take to reform.

Task 18 – Boeing Creek Restoration Project Management (BCRP)

This task covers project management activities associated with the work of Tasks 2, 5, 6, 8, 15, 16 and 17 that are linked to BCRP elements. Herrera will provide the following management measures, with support from subconsultant partners as applicable to their involvement in the project:

- Monthly telephone conversations with the City's Project Manager regarding task progress, upcoming project activities, and budget usage.
- Monthly progress reports to accompany invoices, including a brief description of the work completed by task, and schedule updates.
- Maintenance of project files.

Assumptions

- While routine project progress communications will occur with the City's project manager, they will be accomplished via telephone calls and email so that no in-person meetings will be necessary in this task. Monthly project management check-in calls will require no more than 30 minutes per meeting/call.

Deliverables

- Monthly invoices and progress reports.

- Communication via telephone and email with the City's project manager regarding project progress and issues potentially affecting scope, schedule and/or budget.

HERRERA ENVIRONMENTAL CONSULTANTS

Cost Estimate for Hidden Lake Dam Removal and Boeing Creek Restoration Design Development, Monitoring, Funding Support, and Outreach Support
Herrera Project No. 15-05984-001

Hidden Lake Dam Removal and Boeing Creek Restoration Design Development, Monitoring, Funding Support, and Outreach Support			Task 2 *Stakeholder Outreach and Coordination*		Task 5 *Cultural Resources Assessment*		Task 6 *Survey and Base Mapping*		Task 8 *Grant Funding Assessment and Application Support*		Task 11 *Preliminary Design of Preferred Alternative*		Task 12 *Hidden Lake Dam Removal Project Management*		Task 13 *Hidden Lake Sediment Monitoring Plan*		Task 14 *Boeing Creek Flow Gaging*		Task 15 *Conceptual Design of Culvert Replacements Beneath NW Innis Arden Way*		Task 16 *Conceptual Design of Seattle Golf Club Diversion Dam Reach*		Task 17 *Nearshore Habitat Gains Analysis*		Task 18 *Boeing Creek Restoration Project Management*		TOTAL	
COST SUMMARY																												
Labor				$5,424		$404		$2,464		$10,968		$14,765		$2,527		$6,510		$7,138		$11,361		$13,358		$6,929		$4,898		$86,747
Escalation factor on labor @ 3% (for some tasks)				$0		$0		$0		$329		$0		$0		$0		$71		$341		$401		$0		$147		$1,289
Travel and per diem				$0		$0		$0		$16		$0		$0		$16		$162		$0		$0		$16		$0		$211
Other direct costs (ODCs)				$0		$0		$0		$0		$0		$0		$110		$1,565		$0		$0		$0		$0		$1,675
Subconsultants				$6,240		$1,274		$12,196		$2,496		$0		$0		$0		$0		$9,360		$0		$0		$0		$31,566
GRAND TOTAL				**$11,664**		**$1,678**		**$14,660**		**$13,809**		**$14,765**		**$2,527**		**$6,636**		**$8,937**		**$21,062**		**$13,759**		**$6,945**		**$5,045**		**$121,487**
COST ITEMIZATION																												
Labor		(2016 rates)																										
Personnel		Rate/Hour	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost
P7 Ewbank, Mark	Vice President	$65.29	16	$1,045	1	$65	0	$0	24	$1,567	2	$131	10	$653	1	$65	1	$65	3	$196	5	$326	2	$131	20	$1,306	85	$5,550
P7 Carrasquero, Jose	Vice President	$65.26	0	$0	0	$0	0	$0	2	$131	0	$0	0	$0	0	$0	0	$0	0	$0	2	$131	4	$261	0	$0	8	$522
P5 Mostrenko, Ian	Engineer V	$55.03	4	$220	0	$0	6	$330	0	$0	24	$1,321	0	$0	1	$55	1	$55	16	$880	20	$1,101	0	$0	0	$0	72	$3,962
P5 Lepine, Kris	Scientist V	$53.75	0	$0	0	$0	0	$0	0	$0	8	$430	0	$0	0	$0	0	$0	2	$108	2	$108	0	$0	0	$0	12	$645
P5 Parsons, Jeffrey	Engineer V	$53.67	4	$215	1	$54	6	$322	0	$0	4	$215	0	$0	24	$1,288	0	$0	4	$215	6	$322	28	$1,503	0	$0	77	$4,133
P4 Gifford, Kristina	Planner IV	$40.58	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	4	$162	4	$162	0	$0	0	$0	8	$325
P3 Turnidge, Laura	CAD Technician III	$37.09	0	$0	0	$0	2	$74	0	$0	40	$1,484	0	$0	0	$0	0	$0	24	$890	24	$890	0	$0	0	$0	90	$3,338
P3 Petro, Shelby	Scientist III	$33.34	0	$0	0	$0	0	$0	24	$800	0	$0	0	$0	0	$0	0	$0	2	$67	2	$67	0	$0	0	$0	28	$934
P3 Svendsen, Alexander	Scientist III	$32.70	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	12	$392	16	$523	0	$0	0	$0	0	$0	0	$0	28	$916
P3 Beggs, Mark	Engineer III	$32.20	0	$0	0	$0	0	$0	8	$258	24	$773	0	$0	0	$0	0	$0	24	$773	24	$773	0	$0	0	$0	80	$2,576
P2 Bennett, Dan	Scientist II	$30.43	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	48	$1,461	0	$0	0	$0	0	$0	0	$0	48	$1,461
P2 Lau, Olivia	GIS Analyst II	$29.86	4	$119	0	$0	0	$0	16	$478	0	$0	0	$0	2	$60	0	$0	0	$0	0	$0	3	$90	0	$0	25	$747
F2 Tonkikh, Natalya	Accounting Administrator II	$23.00	0	$0	0	$0	0	$0	0	$0	0	$0	4	$92	0	$0	0	$0	0	$0	0	$0	0	$0	6	$138	10	$230
A4 Jackowich, Pamela	Administrative Coordinator IV	$29.21	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	2	$58	0	$0	2	$58	2	$58	0	$0	0	$0	8	$234
Subtotal Direct Labor			28	$1,599	2	$119	14	$726	74	$3,233	102	$4,352	14	$745	42	$1,919	66	$2,104	81	$3,349	91	$3,937	39	$2,042	26	$1,444	579	$25,570
Labor Overhead (OH) @		195.00%		$3,118		$232		$1,416		$6,304		$8,487		$1,453		$3,742		$4,103		$6,530		$7,678		$3,983		$2,815		$49,862
Fee on Burdened Labor @		15%		$708		$53		$321		$1,431		$1,926		$330		$849		$931		$1,482		$1,742		$904		$639		$11,315
SUBTOTAL LABOR (Direct Labor+OH+Fee)				**$5,424**		**$404**		**$2,464**		**$10,968**		**$14,765**		**$2,527**		**$6,510**		**$7,138**		**$11,361**		**$13,358**		**$6,929**		**$4,898**		**$86,747**
TRAVEL AND PER DIEM COSTS	Unit	Cost	Units	Cost	Units	Cost	Units	Cost	Units	Cost	Units	Cost	Units	Cost	Units	Cost	Units	Cost	Units	Cost	Units	Cost	Units	Cost	Units	Cost	Units	Cost
Auto Use	Mile	$0.54	0	$0.00	0	$0.00	0	$0.00	30	$16.20	0	$0.00	0	$0.00	30	$16.20	300	$162.00	0	$0.00	0	$0.00	30	$16.20	0	$0.00	390	$211
SUBTOTAL TRAVEL AND PER DIEM				**$0**		**$0**		**$0**		**$16**		**$0**		**$0**		**$16**		**$162**		**$0**		**$0**		**$16**		**$0**		**$211**
OTHER DIRECT COSTS (ODCs)	Unit	Cost	Units	Cost	Units	Cost	Units	Cost	Units	Cost	Units	Cost	Units	Cost	Units	Cost	Units	Cost	Units	Cost	Units	Cost	Units	Cost	Units	Cost	Units	Cost
Photocopying, CAD Plots, and Printing																												
Photocopying (color)	Page	$0.75	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0
CAD Plots	Page	$1.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0
Printing/Graphics (vendor)	Cost			$0.00		$0.00		$0.00		$0.00		$0.00		$0.00		$0.00		$0.00		$0.00		$0.00		$0.00		$0.00		$0
Delivery Services																												
Courier	Cost			$0.00		$0.00		$0.00		$0.00		$0.00		$0.00		$0.00		$0.00		$0.00		$0.00		$0.00		$0.00		$0
Field Equipment and Supplies																												
Camera, digital	Day	$10	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	1	$10.00	2	$20.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	3	$30
Current meter (Marsh McBirney)	Day	$60	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	5	$300.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	5	$300
Monitoring Stakes with Grade Markings				$0.00		$0.00		$0.00		$0.00		$0.00		$0.00		$100.00		$0.00		$0.00		$0.00		$0.00		$0.00		$100
Miscellaneous Hardware (lump sum)		$200	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	1	$200.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	1	$200
Rugged TROLL 100	Device	$420	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	1	$420.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	1	$420
BaroTROLL	Device	$420	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	1	$420.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	1	$420
TROLL Communication Cable/Station	Device	$205	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	1	$205.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	1	$205
SUBTOTAL ODCs				**$0**		**$0**		**$0**		**$0**		**$0**		**$0**		**$110**		**$1,565**		**$0**		**$0**		**$0**		**$0**		**$1,675**
SUBCONSULTANT COSTS	Unit	Cost	Units	Cost	Units	Cost	Units	Cost	Units	Cost	Units	Cost	Units	Cost	Units	Cost	Units	Cost	Units	Cost	Units	Cost	Units	Cost	Units	Cost	Units	Cost
Carlstad Consulting				$6,000.00		$0.00		$0.00		$2,400.00		$0.00		$0.00		$0.00		$0.00		$0.00		$0.00		$0.00		$0.00	0	$8,400
Cultural Resource Consultants				$0.00		$1,225.00		$0.00		$0.00		$0.00		$0.00		$0.00		$0.00		$0.00		$0.00		$0.00		$0.00	0	$1,225
Pacific Geomatic Services				$0.00		$0.00		$11,727.00		$0.00		$0.00		$0.00		$0.00		$0.00		$0.00		$0.00		$0.00		$0.00	0	$11,727
Perrone Consulting (incl. drilling subcontractor)				$0.00		$0.00		$0.00		$0.00		$0.00		$0.00		$0.00		$0.00		$9,000.00		$0.00		$0.00		$0.00	0	$9,000
Fee on Subconsultants @ 4%		4%		$240		$49		$469		$96		$0		$0		$0		$0		$360		$0		$0		$0		$1,214
SUBTOTAL SUBCONSULTANT				**$6,240**		**$1,274**		**$12,196**		**$2,496**		**$0**		**$0**		**$0**		**$0**		**$9,360**		**$0**		**$0**		**$0**		**$31,566**