



COUNTY OF PLACER
Community Development/Resource Agency

**PLANNING
SERVICES DIVISION**

Michael J. Johnson, AICP
Agency Director

E.J. Ivaldi, Deputy Director

MEMORANDUM

TO: Honorable Board of Supervisors

FROM: Michael J. Johnson, AICP
Agency Director
By Jennifer Byous, Senior Planner

DATE: October 7, 2014

**SUBJECT: PLACER COUNTY CONSERVATION PLAN COON CREEK
WATERSHED ASSESSMENT CONSULTING SERVICES CONTRACT**

ACTIONS REQUESTED

1. Authorize the Chairman to sign a Budget Revision increasing Planning's budget revenues and expenditures in the amount of \$399,712 to develop a comprehensive watershed assessment of the Coon Creek Watershed for western Placer County, and
2. Authorize the Community Development/Resource Agency Director to sign a contract with CBEC ECO Engineering in the amount of \$399,712 for the development of a comprehensive watershed assessment of the Coon Creek Watershed.

There are no net County costs associated with these actions.

BACKGROUND

In 2013, the Placer County Conservation Plan (PCCP) program was awarded \$400,000 from the Cooperative Endangered Species Conservation Fund Non-traditional Habitat Conservation Planning Assistance Program to develop a comprehensive watershed assessment of the Coon Creek Watershed in western Placer County and conduct surveys for special status species. The Coon Creek watershed encompasses approximately 112 square miles (Exhibit A) and originates east of Auburn near Meadow Vista, flowing westward. The watershed is intercepted by the East Side Canal downstream of Highway 65 and outside of the Plan Area in Sutter County. The East Side Canal then flows into the Cross Canal. The Cross Canal joins the Sacramento River immediately downstream of the confluence of the Feather and Sacramento Rivers near Verona. Coon Creek historically flowed into the American River basin.

This watershed assessment is being created as part of the Placer County Conservation Plan (PCCP) which is currently being developed. The PCCP has identified the presence of rare, threatened, or endangered species that are known to occur or could occur within the Coon Creek Watershed, as well as contiguous oak woodland complexes, high quality wetlands, and potential threats and impacts to these species and habitats. The Coon Creek Watershed assessment will build upon the Auburn Ravine/Coon Creek Ecosystem Restoration Plan which was completed in 2002. The Assessment will cover the entire watershed, including portions that flow in Sutter County East Side and Cross Canals, and will provide an opportunity to inform the PCCP

conservation strategy about protection and preservation opportunities within the Coon Creek watershed. The results of this watershed assessment will provide the link for the PCCP's watershed approach that will provide the relationship between lost function in other watersheds – with enhanced or preserved functions in Coon Creek.

In May 2014, a Request for Proposals (RFP No. 10371) for development of the Coon Creek Watershed Assessment was released. Seven proposals were received and reviewed in accordance with the County's public purchasing policy. After evaluating the proposals and interviewing the three top-rated proposals, staff concluded that CBEC ECO Engineering, who teamed with HT Harvey and Associates, was the highest ranked firm. The proposal includes assessing existing hydrologic conditions, defining geomorphic sub-reaches and characterizing geomorphic processes, water quality monitoring, hydrogeomorphic surveys, implementation of a California Rapid Assessment Method (CRAM) program, conducting salmonid surveys, and identifying general restoration goals and opportunities.

ENVIRONMENTAL CLEARANCE

Implementation of this contract is categorically exempt from the California Environmental Quality Act (CEQA) in accordance with Placer County Code Section 18.36.080 Class 6, Information Collection (CEQA Guidelines Section 153061 (b)(3)]. The Coon Creek Watershed Assessment will only consist of data collection with identification of future restoration opportunities.

FISCAL IMPACT

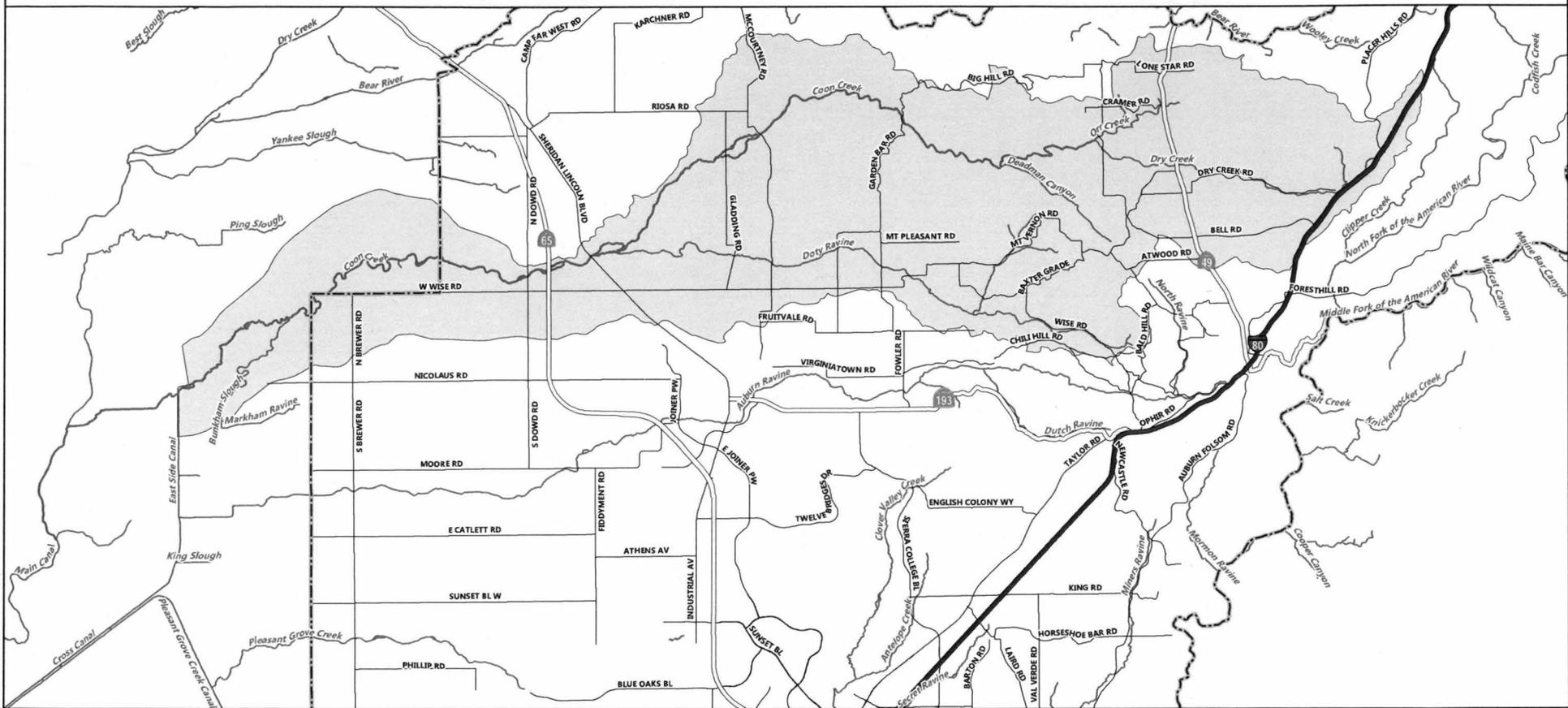
The subject contract is \$399,712. Funding for this contract will come from the Planning Services Division's Federal Cooperative Endangered Species Conservation Fund contract. There is no net County cost associated with this action.

ATTACHMENTS

- Exhibit A: Coon Creek Watershed Assessment Area
- Exhibit B: Budget Revision
- Exhibit C: Consultant Services Agreement with CBEC ECO Engineering

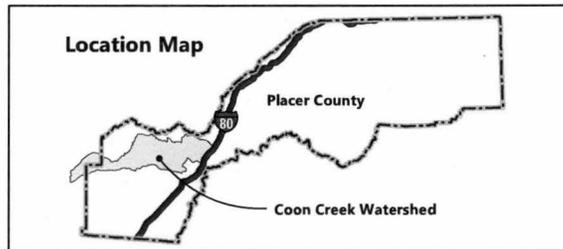
cc: Desiree Belding, Placer County Purchasing
Chris Bowles, CBEC ECO Engineering
Loren Clark, CDRA Assistant Director

Figure1: Coon Creek



DATA DISCLAIMER:
 The features on this map were prepared for geographic purposes only and are not intended to illustrate legal boundaries or supercede local ordinances. Official information concerning the features depicted on this map should be obtained from recorded documents and local governing agencies

Path: L:\REQUESTS\PLN_JByou\CoonCreek_140521\ARCMAP\CoonCreek_140521.mxd



LEGEND

- Coon Creek Watershed
- Interstate
- Highway
- Major Roads
- Perennial Stream

EXHIBIT A

127

FOR CASH TRANSFERS & RESERVE CANCELLATIONS PLEASE PROVIDE THE FOLLOWING
Fund/subFund, OCA - PCA - G/L - Sub G/L

PLACER COUNTY

BUDGET REVISION

PAS DOCUMENT NO.

POST DATE:

DEPT NO.	DOC TYPE	Total \$ Amount	TOTAL LINES
6	BR	799,424.00	2

- Cash Transfer Required
- Reserve Cancellation Required
- Establish Reserve Required

- 4116 Auditor-Controller
- County Executive
- Board of Supervisors

ESTIMATED REVENUE ADJUSTMENT										APPROPRIATION ADJUSTMENT											
DEPT NO.	T/C	Rev	Fund	Sub Fund	OCA	PCA	OBJ 3	PROJ.	PROJ. DTL	AMOUNT	DEPT NO.	T/C	Rev	Fund	Sub Fund	OCA	PCA	OBJ 3	PROJ.	PROJ. DTL	AMOUNT
06	006		100		992233	92233	7326			399,712.00	06	014		100		992233	92233	2555			399,712.00
TOTAL										399,712.00	TOTAL										399,712.00

REASON FOR REVISION: TO APPROPRIATE FUNDING TO DEVELOP A COMPREHENSIVE WATERSHED ASSESSMENT OF THE COON CREEK WATERSHED
FOR WESTERN PLACER COUNTY (CONTRACT WITH cbec eco engineering).

Prepared by Donna Kirkpatrick Ext 3038

Department Head [Signature]

Board of Supervisors _____

Date: 9/12/14

Page: _____

Budget Revision # _____ FOR INDIVIDUAL DEPT USE

Distribution: ORIGINAL ONLY to Auditor

Rev 11/16/2004

EXHIBIT B

128

Contract No.: _____

Administering Agency: County of Placer/ Community Development Resource Agency

Contract Description: CONSULTING SERVICES – COON CREEK WATERSHED ASSESSMENT

CONSULTANT SERVICES AGREEMENT

THIS AGREEMENT is made at Auburn, California, as of _____, 2014, by and between the County of Placer, ("County"), and cbec eco engineering, ("Consultant"), who agree as follows:

1. **Services.** Subject to the terms and conditions set forth in this Agreement, Consultant shall provide the services described in Exhibit A. Consultant shall provide said services at the time, place, and in the manner specified in Exhibit A.
2. **Payment.** County shall pay Consultant **\$399,712** for services rendered pursuant to this Agreement at the time and in the amount set forth in Exhibit A. The payment specified in Exhibit A shall be the only payment made to Consultant for services rendered pursuant to this Agreement. Consultant shall submit all billings for said services to the Placer County Planning Department.
3. **Facilities, Equipment and Other Materials, and Obligations of County.** Consultant shall, at its sole cost and expense, furnish all facilities, equipment, and other materials which may be required for furnishing services pursuant to this Agreement.
4. **Exhibits.** All exhibits referred to herein will be attached hereto and by this reference incorporated herein.
5. **Time for Performance.** Time is of the essence. Failure of Consultant to perform any services within the time limits set forth in Exhibit A shall constitute material breach of this contract.
6. **Independent Consultant.** At all times during the term of this Agreement, Consultant shall be an independent Consultant and shall not be an employee of the County. County shall have the right to control Consultant only insofar as the results of Consultant's services rendered pursuant to this Agreement. County shall not have the right to control the means by which Consultant accomplishes services rendered pursuant to this Agreement.
7. **Licenses, Permits, Etc.** Consultant represents and warrants to County that it has all licenses, permits, qualifications, and approvals of whatsoever nature, which are legally required for Consultant to practice its profession. Consultant represents and warrants to County that Consultant shall, at its sole cost and expense, keep in effect or obtain at all times during the term of this Agreement, any licenses, permits, and approvals which are legally required for Consultant to practice its profession at the time the services are performed.
8. **Time.** Consultant shall devote such time to the performance of services pursuant to this Agreement as may be reasonably necessary for the satisfactory performance of Consultant's obligations pursuant to this Agreement. Neither party shall be considered in default of this Agreement to the extent performance is prevented or delayed by any cause, present or future, which is beyond the reasonable control of the party.

9. HOLD HARMLESS AND INDEMNIFICATION AGREEMENT

The CONSULTANT hereby agrees to protect, defend, indemnify, and hold PLACER COUNTY free and harmless from any and all losses, claims, liens, demands and causes of action of every kind and character including, but not limited to, the amounts of judgments, penalties, interest, court costs, legal fees, and all other expenses incurred by PLACER COUNTY arising in favor of any party, including claims, liens, debts, personal injuries, death, or damages to property (including employees or property of PLACER COUNTY) and without limitation by enumeration, all other claims or demands of every character occurring or in any way incident to, in connection with or arising directly or indirectly out of this contract or agreement to the extent that the above arise out of, pertain to, or relate to the negligence, recklessness, or willful misconduct (all whether by act, error and/or omission) of the CONSULTANT. CONSULTANT'S obligation shall include the duty to defend PLACER COUNTY as set forth in California Civil Code Sections 2778 and 2782.8. This provision is not intended to create any cause of action in favor of any third party against CONSULTANT or PLACER COUNTY or to enlarge in any way the CONSULTANT'S liability but is intended solely to provide for indemnification of PLACER COUNTY from liability for damages or injuries to third persons or property arising from CONSULTANT'S performance pursuant to this contract or agreement.

As used above, the term PLACER COUNTY means the County of Placer, its officers, agents, employees, and volunteers.

A. INSURANCE:

CONSULTANT shall file with COUNTY concurrently herewith a Certificate of Insurance, in companies acceptable to COUNTY, with a Best's Rating of no less than A-:VII showing.

B. WORKER'S COMPENSATION AND EMPLOYERS LIABILITY INSURANCE:

Worker's Compensation Insurance shall be provided as required by any applicable law or regulation. Employer's liability insurance shall be provided in amounts not less than one million dollars (\$1,000,000) each accident for bodily injury by accident, one million dollars (\$1,000,000) policy limit for bodily injury by disease, and one million dollars (\$1,000,000) each employee for bodily injury by disease.

If there is an exposure of injury to CONSULTANT'S employees under the U.S. Longshoremen's and Harbor Worker's Compensation Act, the Jones Act, or under laws, regulations, or statutes applicable to maritime employees, coverage shall be included for such injuries or claims.

Each Worker's Compensation policy shall be endorsed with the following specific language:

Cancellation Notice - "This policy shall not be changed without first giving thirty (30) days prior written notice and ten (10) days prior written notice of cancellation for non-payment of premium to the County of Placer."

Waiver of Subrogation - The workers' compensation policy shall be endorsed to state that the workers' compensation carrier waives its right of subrogation against the County, its officers, directors, officials, employees, agents or volunteers, which might arise by reason of payment under such policy in connection with performance under this agreement by the CONSULTANT.

CONSULTANT shall require all SUBCONTRACTORS to maintain adequate Workers' Compensation insurance. Certificates of Workers' Compensation shall be filed forthwith with the County upon demand.

C. GENERAL LIABILITY INSURANCE:

1. Comprehensive General Liability or Commercial General Liability insurance covering all operations by or on behalf of CONSULTANT, providing insurance for bodily injury liability and property damage liability for the limits of liability indicated below and including coverage for:
 - (a) Contractual liability insuring the obligations assumed by CONSULTANT in this Agreement.
2. One of the following forms is required:
 - (a) Comprehensive General Liability;
 - (b) Commercial General Liability (Occurrence); or
 - (c) Commercial General Liability (Claims Made).
3. If CONSULTANT carries a Comprehensive General Liability policy, the limits of liability shall not be less than a Combined Single Limit for bodily injury, property damage, and Personal Injury Liability of:
 - One million dollars (\$1,000,000) each occurrence
 - Two million dollars (\$2,000,000) aggregate
4. If CONSULTANT carries a Commercial General Liability (Occurrence) policy:
 - (a) The limits of liability shall not be less than:
 - One million dollars (\$1,000,000) each occurrence (combined single limit for bodily injury and property damage)
 - One million dollars (\$1,000,000) for Products-Completed Operations
 - Two million dollars (\$2,000,000) General Aggregate
 - (b) If the policy does not have an endorsement providing that the General Aggregate Limit applies separately, or if defense costs are included in the aggregate limits, then the required aggregate limits shall be two million dollars (\$2,000,000).
5. Special Claims Made Policy Form Provisions:

CONSULTANT shall not provide a Commercial General Liability (Claims Made) policy without the express prior written consent of COUNTY, which consent, if given, shall be subject to the following conditions:

 - (a) The limits of liability shall not be less than:
 - One million dollars (\$1,000,000) each occurrence (combined single limit for bodily injury and property damage)
 - One million dollars (\$1,000,000) aggregate for Products Completed Operations
 - Two million dollars (\$2,000,000) General Aggregate
 - (b) The insurance coverage provided by CONSULTANT shall contain language providing coverage up to one (1) year following the completion of the contract in order to provide insurance coverage for the hold harmless provisions herein if the policy is a claims-made policy.

Conformity of Coverages - If more than one policy is used to meet the required coverages, such as a separate umbrella policy, such policies shall be consistent with all other applicable policies used to meet these minimum requirements. For example, all policies shall be Occurrence Liability policies or all shall be Claims Made Liability policies, if approved by the County as noted above. In no cases shall the types of policies be different.

D. ENDORSEMENTS:

Each Comprehensive or Commercial General Liability policy shall be endorsed with the following specific language:

1. "The County of Placer, its officers, agents, employees, and volunteers are to be covered as insured for all liability arising out of the operations by or on behalf of the named insured in the performance of this Agreement."
2. "The insurance provided by the Consultant, including any excess liability or umbrella form coverage, is primary coverage to the County of Placer with respect to any insurance or self-insurance programs maintained by the County of Placer and no insurance held or owned by the County of Placer shall be called upon to contribute to a loss."
3. "This policy shall not be changed without first giving thirty (30) days prior written notice and ten (10) days prior written notice of cancellation for non-payment of premium to the County of Placer."

E. AUTOMOBILE LIABILITY INSURANCE:

Automobile Liability insurance covering bodily injury and property damage in an amount no less than one million dollars (\$1,000,000) combined single limit for each occurrence.

Covered vehicles shall include owned, non-owned, and hired automobiles/trucks.

F. PROFESSIONAL LIABILITY INSURANCE (ERRORS & OMISSIONS):

Professional Liability Insurance for Errors and Omissions coverage in the amount of not less than one million dollars (\$1,000,000) combined single limit for each occurrence and two million dollars (\$2,000,000) aggregate.

If Consultant sub-contracts in support of Consultants work provided for in the agreement, Professional Liability Insurance for Errors shall be provided by the sub contractor in an amount not less than one million dollars (\$1,000,000) in aggregate.

The insurance coverage provided by the consultant shall contain language providing coverage up to one (1) year following completion of the contract in order to provide insurance coverage for the hold harmless provisions herein if the policy is a claims made policy.

G. Additional Requirements:

Premium Payments - The insurance companies shall have no recourse against the COUNTY and funding agencies, its officers and employees or any of them for payment of any premiums or assessments under any policy issued by a mutual insurance company.

Policy Deductibles - The CONSULTANT shall be responsible for all deductibles in all of the CONSULTANT's insurance policies. The maximum amount of allowable deductible for insurance coverage required herein shall be \$25,000.

CONSULTANT's Obligations - CONSULTANT's indemnity and other obligations shall not be limited by the foregoing insurance requirements and shall survive the expiration of this agreement.

Verification of Coverage - CONSULTANT shall furnish the County with original certificates and amendatory endorsements or copies of the applicable policy language effecting coverage required by this clause. All certificates and endorsements are to be received and approved by the County before work commences. However, failure to obtain the required documents prior to the work beginning shall not waive the CONSULTANT's obligation to provide them. The County reserves the right to require complete, certified copies of all required insurance policies, including endorsements required by these specifications, at any time.

Material Breach - Failure of the CONSULTANT to maintain the insurance required by this agreement, or to comply with any of the requirements of this section, shall constitute a material breach of the entire agreement.

***SOLE PROPRIETER LANGUAGE:

Workers' Compensation

CONSULTANT represents they have no employees and, therefore, not required to have Workers Compensation coverage.

CONSULTANT agrees they have no rights, entitlements or claim against COUNTY for any type of employment benefits or workers' compensation or other programs afforded to COUNTY employees.

10. **Consultant Not Agent.** Except as County may specify in writing Consultant shall have no authority, express or implied, to act on behalf of County in any capacity whatsoever as an agent. Consultant shall have no authority, express or implied pursuant to this Agreement to Bind County to any obligation whatsoever.
11. **Assignment Prohibited.** Consultant may assign its rights and obligations under this Agreement only upon the prior written approval of County, said approval to be in the sole discretion of County.
12. **Personnel.**
 - A. Consultant shall assign only competent personnel to perform services pursuant to this Agreement. In the event that County, in its sole discretion, at any time during the term of this Agreement, desires the removal of any person or persons assigned by Consultant to perform services pursuant to this Agreement, including those members of the Project Team as explained below, Consultant shall remove any such person immediately upon receiving notice from County of the desire of County for removal of such person or persons.
 - B. Notwithstanding the foregoing, if specific persons are designated as the "Project Team" in Exhibit A, Consultant agrees to perform the work under this agreement with those individuals identified. Reassignment or substitution of individuals or subcontractors named in the Project Team by Consultant without the prior written consent of County shall be grounds for cancellation of the agreement by County, and payment shall be made pursuant to Section 15 (Termination) of this Agreement only for that work performed by Project Team members.

13. **Standard of Performance.** Consultant shall perform all services required pursuant to this Agreement in the manner and according to the standards observed by a competent practitioner of the profession in which Consultant is engaged in the geographical area in which Consultant practices its profession. All products of whatsoever nature which Consultant delivers to County pursuant to this Agreement shall be prepared in a substantial first class and workmanlike manner and conform to the standards or quality normally observed by a person practicing in Consultant's profession.
14. **Termination.**
- A. County shall have the right to terminate this Agreement at any time by giving notice in writing of such termination to Consultant. In the event County shall give notice of termination, Consultant shall immediately cease rendering service upon receipt of such written notice, pursuant to this Agreement. In the event County shall terminate this Agreement:
- 1) Consultant shall deliver copies of all writings prepared by it pursuant to this Agreement. The term "writings" shall be construed to mean and include: handwriting, typewriting, printing, Photostating, photographing, and every other means of recording upon any tangible thing any form of communication or representation, including letters, words, pictures, sounds, or symbols, or combinations thereof.
 - 2) County shall have full ownership and control of all such writings delivered by Consultant pursuant to this Agreement.
 - 3) County shall pay Consultant the reasonable value of services rendered by Consultant to the date of termination pursuant to this Agreement not to exceed the amount documented by Consultant and approved by County as work accomplished to date; provided, however, that in no event shall any payment hereunder exceed the amount of the agreement specified in Exhibit A, and further provided, however, County shall not in any manner be liable for lost profits which might have been made by Consultant had Consultant completed the services required by this Agreement. In this regard, Consultant shall furnish to County such financial information as in the judgment of the County is necessary to determine the reasonable value of the services rendered by Consultant. The foregoing is cumulative and does not affect any right or remedy, which County may have in law or equity.
- B. Consultant may terminate its services under this Agreement upon thirty- (30) working days' advance written notice to the County.
15. **Non-Discrimination.** Consultant shall not discriminate in its employment practices because of race, religious creed, color, national origin, ancestry, physical handicap, medical condition, marital status, or sex in contravention of the California Fair Employment and Housing Act, Government Code section 12900 et seq.
16. **Records.** Consultant shall maintain, at all times, complete detailed records with regard to work performed under this agreement in a form acceptable to County, and County shall have the right to inspect such records at any reasonable time. Notwithstanding any other terms of this agreement, no payments shall be made to Consultant until County is satisfied that work of such value has been rendered pursuant to this agreement. However, County shall not unreasonably withhold payment and, if a dispute exists, the withheld payment shall be proportional only to the item in dispute.
17. **Ownership of Information.** All professional and technical information developed under this Agreement and all work sheets, reports, and related data shall become the property of County, and

Consultant agrees to deliver reproducible copies of such documents to County on completion of the services hereunder. The County agrees to indemnify and hold Consultant harmless from any claim arising out of reuse of the information for other than this project.

18. **Waiver.** One or more waivers by one party of any major or minor breach or default of any provision, term, condition, or covenant of this Agreement shall not operate as a waiver of any subsequent breach or default by the other party.
19. **Conflict of Interest.** Consultant certifies that no official or employee of the County, nor any business entity in which an official of the County has an interest, has been employed or retained to solicit or aid in the procuring of this agreement. In addition, Consultant agrees that no such person will be employed in the performance of this agreement without immediately notifying the County.
20. **Entirety of Agreement.** This Agreement contains the entire agreement of County and Consultant with respect to the subject matter hereof, and no other agreement, statement, or promise made by any party, or to any employee, officer or agent of any party, which is not contained in this Agreement, shall be binding or valid.
21. **Alteration.** No waiver, alteration, modification, or termination of this Agreement shall be valid unless made in writing and signed by all parties, except as expressly provided in Section 15, Termination.
22. **Governing Law.** This Agreement is executed and intended to be performed in the State of California, and the laws of that State shall govern its interpretation and effect. Any legal proceedings on this agreement shall be brought under the jurisdiction of the Superior Court of the County of Placer, State of California, and Consultant hereby expressly waives those provisions in California Code of Civil Procedure §394 that may have allowed it to transfer venue to another jurisdiction.
23. **Notification.** Any notice or demand desired or required to be given hereunder shall be in writing and deemed given when personally delivered or deposited in the mail, postage prepaid, and addressed to the parties as follows:

COUNTY OF PLACER
Planning Department
3091 County Center Dr.
Auburn, CA 95603

CONSULTANT
cbec eco engineering
2544 Industrial Blvd
West Sacramento, CA 95691

Any notice so delivered personally shall be deemed to be received on the date of delivery, and any notice mailed shall be deemed to be received five (5) days after the date on which it was mailed.

Executed as of the day first above stated:

COUNTY OF PLACER

By: _____ Date: _____
David Boesch, County Executive Officer

Approved as to Form – County Counsel:

By: _____ Date: _____

Approved as to Content:

By: _____ Date: _____
Michael Johnson, Director, Community Development Resource Agency

CONSULTANT – cbec eco engineering*

By: _____	By: _____
Name: _____	Name: _____
Title: _____	Title: _____
Date: _____	Date: _____

**If a corporation, agreement must be signed by two corporate officers; one must be the secretary of the corporation, and the other may be either the President or Vice President, unless an authenticated corporate resolution is attached delegating authority to a single officer to bind the corporation.*

Exhibits

A. Scope of Work

COON CREEK WATERSHED ASSESSMENT - SCOPE OF SERVICES

Table of Contents

1	Perform Desk-Based Watershed-Scale Assessment	1
1.1	Collate and Analyze Existing Data	1
1.2	Assess Watershed Hydrology	2
1.3	Characterize Existing Channel Dynamics	3
1.4	Develop Water Quality Monitoring Plan.....	4
2	Perform Field-Based Assessments	5
2.1	Geomorphic Assessment (Fluvial Audit)	5
2.2	California Rapid Assessment Method (CRAM).....	7
2.3	Fish Surveys.....	7
2.4	Water Quality Monitoring - Phase 1	9
2.5	Water Quality and BMI Monitoring - Phase 2.....	11
3	Develop Appraisal System.....	12
3.1	Watershed Disturbance Assessment	12
3.2	Opportunities and Constraints Analysis.....	14
4	Reporting	16
4.1	Technical Memoranda	16
4.2	Final GIS Integration and Preparation.....	18
4.3	Draft Report	19
4.4	Final Report.....	19
5	Project Management	20
5.1	Direction and Coordination.....	20
5.2	Meetings	20

This work is being completed under Federal Section 6 Grant Agreement Number P1382019 and will comply with all provisions of the grant agreement.

1 PERFORM DESK-BASED WATERSHED-SCALE ASSESSMENT

1.1 COLLATE AND ANALYZE EXISTING DATA

The cbec and HTH team will compile existing information and data on geologic, geomorphic, hydrologic, water quality, and riparian and aquatic habitat conditions of the Coon Creek watershed. As part of this effort, the team will generate extensive spatial datasets to facilitate analysis and present findings. These GIS-based datasets will be included as part of the deliverables for Task 4. The cbec team will identify existing data gaps and report these to Placer County (County) after collating the existing data provided by the County and obtained from other sources. The team will address these data gaps through subsequent analyses and field assessments, and will provide Placer County with advanced notice if there is concern regarding filling any of the gaps in data for the Coon Creek watershed. The following list summarizes the specific environmental setting components that will be assessed as part of Task 1.1:

- Geology and Soils
- LiDAR Data
- Geomorphic Data
- Historical Aerial Photo Record
- Watershed Hydrology
- Water Quality
- Riparian and Riverine Aquatic Habitat
- Anadromous Fish

LiDAR data for the watershed consists of two data sets provided to the County, one from CVFED and another from USGS/FEMA. From initial data samples provided by Placer County, it appears the County already possesses bare earth data in a DEM format. As part of this task, cbec will perform basic processing of the LiDAR data which will consist of generating a mosaic/composite DEM for the watershed from the existing tiles, potentially resampling the composite DEM to a different resolution, and performing a hydrologic analysis (using ArcHydro), if needed.

Assumptions:

1. No field data will be collected as part of this task.
2. Existing data that is of poor or inconsistent quality will not be developed into spatial datasets.
3. Level of effort on this task will be commensurate with allocated hours and associated budget from fee estimate.

Meetings:

1. Results from this task will be discussed with Placer County via a conference call or go-to-meeting (see Task 5.2).

Deliverables:

1. Electronic copies of all spatial datasets and GIS files will be provided as part of Task 4.
2. Existing ecological conditions TM as described below in Task 4.

1.2 ASSESS WATERSHED HYDROLOGY

In order to assess existing hydrologic conditions, particularly peak flows, cbec will leverage the existing HEC-1 model developed by CESI for the Coon Creek watershed. First, cbec will review the existing HEC-1 model in detail after importing it into the HEC-HMS platform. Second, cbec will make minor modifications to model parameters or subshed resolution to meet the needs of the project. Third, if flow data are available from the Teichert gage (or a stage discharge curve is provided for the Dowd Road gage) and accompanying rainfall data is available, cbec will further refine the model's rainfall-runoff and routing parameters by performing limited model calibration and validation for up to 2 events (one for calibration, one for validation). Otherwise, cbec will perform a comparison of model outputs with a regional regression analysis to verify that model results are reasonable.

Following model review, refinement, and calibration/validation or checking, the model will be modified to reflect 'reference state' conditions allowing for the approximate determination of a pre-disturbance hydrologic regime. This evaluation would largely be achieved by modifying land use cover types and conditions and surface storage characteristics within the rainfall-runoff approach (i.e., Initial and Constant) and removing flow impediments and reversing channel incision within the selected runoff routing method (i.e., Muskingum-Cunge). Finally, cbec will use the model to characterize peak flow magnitude, duration and timing for a suite of events, likely the 2 (bankfull), 5, 10, 25, 50 and 100 year events, at key index points within the watershed (to be informed by Task 1.3) for existing and 'reference state' conditions. This process would facilitate an analysis of anthropogenic impacts on the Coon Creek watershed winter hydrologic regime.

To characterize base flow conditions, cbec will develop a spreadsheet-based accounting tool heavily supported by the functionality and statistical functions provided by HEC-DSSVue and HEC-SSP. This analysis will rely on the Dowd Road flow data and, if provided, the Teichert flow data. It will also draw on information and records of agricultural diversions, wastewater discharges and other influences on the base flow hydrologic regime. Time series data will be integrated into the accounting tool to characterize typical flows across seasons in the major stems of the Coon Creek watershed (e.g., Coon Creek and Doty Ravine) as well as the influences of diversions, discharges and other manipulations on the system. This accounting tool can then be leveraged to assess impacts resulting from changes to water management and discharge practices in the watershed (e.g., discontinuation of discharges from SMD-1).

Assumptions:

1. cbec will communicate with relevant water management agencies (e.g., PCWA, NID, etc.) to obtain necessary information on diversions, discharges and other water management practices in the watershed, particularly those impacting base flow patterns. This effort will include up to 10 brief phone calls with relevant agencies.
2. No field data will be collected as part of this task.
3. HTH will not contribute to this task.

4. Level of effort on this task will be commensurate with allocated hours and associated budget from fee estimate.

Deliverables:

1. A technical memorandum will be prepared as part of Task 4 that describes:
 - a. HEC-1 model condition, any refinements made, and results regarding peak flows (see Task 4).
 - b. The spreadsheet-based accounting analysis of base flow conditions.
2. If changes are made to the existing conditions HEC-1 model developed by CESI, cbec will submit the revised existing conditions and pre-disturbance models (and all supporting files) to the County on DVD. If no changes are made to the existing conditions model, cbec will provide the pre-disturbance conditions model to the County on a DVD.
3. The spreadsheet-based accounting tool and supporting data used in the base flow analysis..

1.3 CHARACTERIZE EXISTING CHANNEL DYNAMICS

cbec will initially assess existing channel dynamics by defining geomorphic sub-reaches and characterizing geomorphic processes through a desktop-based approach. The channel length of the relevant watercourses will be divided into sub-reaches at significant geomorphic boundaries using relevant information including available maps, aerial photographs, LiDAR data and the 2002 ecosystem restoration plan for Coon Creek. These sub-reaches may be further modified subsequent to information gained through field surveys. cbec will develop a model of geomorphic process within the watershed (which we term the Geomorphic Process Model, or GPM) to describe conditions and processes present within the above sub-reaches. The GPM will integrate factors controlling current channel form and process and will be based upon the following components:

1. **Specific stream power analysis:** a quantitative characterization of the geomorphic energy regime (i.e. sediment transport capacity) of the stream system.
2. **Sediment storage index:** available remotely sensed data (e.g., LiDAR and aerial photos) will be used to quantify, where possible, the areas of exposed sediment to generate an index of sediment storage area relative to sub-reach length.
3. **Sediment input index:** for each sub-reach, potential sediment input from tributaries, bank erosion and in-channel storage sources will be assessed from available channel morphology data and aerial imagery.
4. **Historical channel assessment:** an assessment of an historical aerial photo time-series to characterize dynamic channel behavior on a sub-reach level. This assessment may be mostly qualitative (or at best semi-quantitative) if resolution of aerial photography is too coarse to discern channel margins.

The length of channel for which the GPM will be developed will depend on the resolution of the aerial photos and LiDAR data. Based on the clarity of the channel edges and in-channel features, the above

components may be augmented with field data collected during the fluvial audit. The GPM could include all perennial channels, but will likely be comprised of a much smaller subset (length) of that system. Our initial estimate is that the GPM could be developed for up to 20 miles of the perennial stream network. The above components will be integrated to produce the overarching Geomorphic Process Model (GPM).

Assumptions:

1. No field data will be collected as part of this task, but the data used in this task may be augmented with field data collected as part of Task 2.1.
2. HTH will not contribute to this task.
3. Level of effort on this task will be commensurate with allocated hours and associated budget from fee estimate.

Deliverables:

1. Results and understandings generated as part of this task will be included in a geomorphic conditions technical memorandum covering desktop and field-based assessments (see Task 4). This technical memorandum will be submitted following the completion of the Task 2.1.
2. ArcGIS files with various calculations (e.g., specific stream power) fitted to the stream centerline, which would be provided as part of Task 4.3.

1.4 DEVELOP WATER QUALITY MONITORING PLAN

The cbec team will perform a two-phase water quality monitoring effort in the Coon Creek watershed. Initially, cbec will develop a water quality monitoring plan and Quality Assurance Project Plan (QAPP) for Phase 1 monitoring which will be performed over the first year of the project. While preliminary details are provided below in Task 2.4, cbec will work with the County to determine the most appropriate monitoring plan to accomplish project objectives within the available budget. The Phase 1 effort will provide data collection for a large range of water quality parameters at key locations in the watershed, which will facilitate more location and constituent-specific water quality or BMI monitoring performed as part of Phase 2. As water quality data becomes available from the Phase 1 monitoring effort, cbec will communicate with the County to discuss key water quality stressors and priorities for a Phase 2 water quality and BMI monitoring effort. Development of the Phase 2 water quality and BMI monitoring plan will be performed as part of Task 2.5.

It should be noted that the proposed water quality monitoring plan that is being developed represents a minimal-level approach to sampling. While the results of our analyses will determine whether or not specific constituents of concern are present during the sampling period, care should be taken in extrapolating these results to the watershed level or determining seasonal variation. Our proposed efforts represent a reasonable level of effort in developing the water quality signature for this watershed, but are not exhaustive in nature.

Assumptions:

1. No field data will be collected as part of this task.
2. HTH will not contribute to this task.
3. Level of effort on this task will be commensurate with allocated hours and associated budget from fee estimate.

Meetings:

1. cbec will discuss the Phase 1 water quality monitoring plan with the County (and stakeholders invited by the County) at up to 2 conference calls.

Deliverables:

1. An electronic draft Phase 1 WQ monitoring plan will be developed and circulated for review and edits.
2. A finalized Phase 1 monitoring plan will be submitted to the County.

2 PERFORM FIELD-BASED ASSESSMENTS

2.1 GEOMORPHIC ASSESSMENT (FLUVIAL AUDIT)

Depending on land access and field conditions, cbec's field hydrogeomorphic survey crew will survey a portion of the entire Coon Creek perennial stream network (up to 50 miles), if accessible with landowner permission (arranged by Placer County), using a combination of the fluvial audit methodology (higher resolution) and field reconnaissance walk (lower resolution). A spatially-nested approach will be used to select representative, higher-relevance reaches that will be surveyed with the fluvial audit methodology. The fluvial audit component of the field assessment will characterize some or most of the following features in the reaches surveyed (which will consist of up to 20 miles of channel length):

1. **Reach scale channel morphology.** We use a classification scheme that is the combination of recognized procedures (Montgomery and Buffington 1997, Brierley and Fryirs, 2000).
2. **Morphological units** (i.e., specific channel units such as runs, pools, riffles, etc.).
3. **Sediment sources** (e.g., tributaries, bank erosion). The sources are recorded in terms of severity and spatial extent in order that an index of sediment supply can be applied to sediment budget calculations.
4. **Within channel sediment storage** (i.e., the areal extent of alluvial bar features). This data also provides input to the sediment budget in terms of in-channel supply to downstream areas.
5. **Indicators of the sediment transport regime** (e.g., the form, texture and vegetation cover of bar features and bed forms).
6. **Large woody debris** – The incidence, location (e.g., mid-channel, bank-side etc.), character (e.g. size of wood pieces, species of tree) and extents of large wood within the active channel, including the geomorphic influence it is having.

7. **Vegetation** – Both in-channel vegetation (e.g., macrophytes) and riparian/bankside cover (including age structure, density and species).
8. **River engineering pressures** (e.g., bank protection, canalization, embankments, hydraulic structures, bridge crossings, etc.) - categorized in terms of their extents and severity of impact(s) to river process.
9. **Fish passage barriers.** Both anthropogenic (e.g., dams, large weirs, etc.) and naturally occurring (e.g., waterfalls) barriers to upstream fish passage.
10. **Water management** (e.g., locations of abstraction, flow diversion/ augmentation etc).
11. **Other land use pressures** (e.g., grazing encroachment, field cultivation close to channel margins, etc.).

Other lesser priority reaches (up to 30 miles) will be surveyed with a lower-resolution field reconnaissance walk that will capture key features including reach scale channel morphology, grade control structures and other significant river engineering pressures, fish passage barriers, general characterization of sediment storage and input, and other key features. The types of data detailed above will be recorded and geo-referenced using a survey grade, Real Time Kinematic (RTK) Global Positioning System (GPS) that has a sub-inch vertical and horizontal accuracy under optimal operating conditions.

Assumptions:

1. Placer County will be responsible for securing permission from land owners to access stream reaches targeted for the field-based geomorphic assessment. However, cbec recognizes that it may need to provide supporting information or communicate with interested landowners regarding details of the field assessments.
2. cbec's hydrogeomorphic survey crew will spend up to 12 days in the field as part of this assessment, and will survey a portion of the entire perennial stream length. Assuming landowner permissions are obtained by Placer County, we estimate that we will be able to cover 30 to 50 miles of stream corridor using these methodologies. This linear extent may be limited if landowner permission is not obtained or if terrain or field conditions make in-channel or stream-side passage difficult. In this latter case, surplus budget may be redirected to other tasks or into a contingency fund.
3. HTH will not contribute to this task.
4. Level of effort on this task will be commensurate with allocated hours and associated budget from fee estimate.

Deliverables:

1. Results and understandings generated as part of this task will be included in a geomorphic conditions technical memorandum covering desktop and field-based assessments (see Task 4).
2. As part of Task 4, cbec will provide ArcGIS files demonstrating location, type and extent/severity (where applicable) of relevant geomorphic features from the field assessment.

2.2 CALIFORNIA RAPID ASSESSMENT METHOD (CRAM)

HTH will implement a California Rapid Assessment Method (CRAM) program for the Coon Creek watershed to elaborate on and build from background data review and baseline dataset creation conducted under Task 1. The assessment will document baseline conditions in the Coon Creek watershed, and it will create a framework for future CRAM surveys to assess watershed changes through time. It will be designed specifically to assess the possible ecological lift that could occur throughout the watershed as a result of PCCP implementation.

CRAM sites will be chosen specifically to represent reaches of Coon Creek and other streams within the Coon Creek watershed (e.g., Doty Ravine) that are representative of general watershed conditions. Data from field assessments conducted by cbec (e.g. in Task 1) as well as a review of biological resources data completed by HTH in Task 1 will be used to inform the selection appropriate CRAM sites. Our budget estimate assumes that up to 20 CRAM sites will be selected in 2015; however, HTH may sample fewer or additional sites subject to the County's available budget, and in coordination with the County and cbec, with the understanding that additional CRAM sites may be recommended for assessment during 2016. The San Francisco Estuary Institute recommends a minimum of 25 to 30 CRAM sites for watershed-scale CRAM assessments.

Assumptions:

1. The CRAM Riverine Module will be completed at up to 20 field sites.
2. Placer County will secure permission from land owners to access the CRAM sites selected.
3. If Placer County chooses to conduct CRAM surveys at additional sites, a budget amendment will be required.
4. cbec will not contribute to this task.
5. Level of effort on this task will be commensurate with allocated hours and associated budget from fee estimate.

Deliverables:

1. Survey methods and results will be described in a draft and final TM as described below in Task 4.

2.3 FISH SURVEYS

Two types of salmonid surveys will be completed in the Coon Creek watershed: a detailed habitat assessment (access permitting), including a reconnaissance-level assessment of fish passage barriers and diversions (which will build from previously completed work and be completed by cbec in Task 1) and field surveys of fish distribution and abundance.

To the extent feasible, salmonid habitat assessments will be performed within the same survey reaches selected by cbec for geomorphic surveys. Combining survey locations will result in cost efficiencies for field surveys and will allow the results of geomorphic and stream channel surveys to be correlated and

compared with the results of surveys of salmon habitat suitability. HTH assumes that a total of not more than 10 survey reaches consisting of pool-run-riffle complexes will be selected and that each surveyed reach will be approximately 100 - 200 meters long. Survey reaches will be selected to represent those reaches that appear to have the greatest potential to support salmonid spawning and rearing. The selection of specific survey reaches will be informed by data collected in Task 1, including: field data collected by cbec during its geomorphic assessment, review of aerial photography completed by HTH, and HTH's review of prior reports prepared by others.

At each selected survey reach, HTH will complete a standardized salmonid habitat assessment following the methods described in the California Salmonid Stream Habitat Restoration Manual (Flosi et al. 2010), or a similar method of salmonid habitat assessment identified in conjunction with County and other appropriate parties (e.g., CDFW). The assessment will consider and incorporate the results of prior salmonid habitat investigations (e.g., Jones & Stokes 2004, 2005). Field data forms, representative photographs, and geospatial data, as appropriate, will be collected or completed for each survey area. Habitat mapping will not be completed because it is assumed that geomorphic data collected by cbec will be sufficient for characterizing in-stream fish habitat (e.g., the presence, length, and depth of pools, riffles, runs, and other in-stream habitat features).

Additionally, fish surveys will be completed within each of the 10 selected survey reaches to provide information on the occurrence of adult and juvenile salmonids. Surveys will be timed to increase the probability of fish detection (i.e., they will occur during periods of peak migration based on information obtained from CDFW and from other sources regarding salmonid migration patterns throughout the Sacramento Valley). In general, surveys will occur in the early fall and late fall/early winter with a third survey planned in the spring. To increase efficiency, the salmonid habitat assessment described above will be completed concurrently with one of the three planned fish surveys. HTH will record contextual information (i.e. water temperature, clarity, weather conditions) and will follow basic snorkel survey procedures as described in O'Neal 2007. Results of the fish surveys will be incorporated into a draft and final species survey report as described above.

These data will be supplemented by an investigation of additional factors that are likely to substantially affect salmonid habitat quality in the Coon Creek watershed and for which adequate data do not currently exist: summer and early fall water temperatures and fish passage barriers or water diversions.

Because summer and early fall water temperatures may be a key limiting factor for steelhead habitat quality in upper reaches of Coon Creek, water quality data collected during Sub-tasks 2.4 and 2.5 will include water temperature data collected continuously throughout summer and fall using automated data loggers. Subject to the available budget, water temperature data loggers may be installed above identified fish passage barriers on the assumption that targeted habitat enhancement actions (e.g., installation of fish ladders) could be completed to make these areas accessible if these areas otherwise provided suitable salmonid habitat.

In addition to obtaining water temperature data, cbec will complete a reconnaissance-level assessment of fish passage barriers as part of its fieldwork in Task 2.1. This assessment will build from prior surveys

completed by Bailey and Buell (2005) and others (e.g., California Department of Water Resources). It will focus on verifying the current condition of these previously-identified passage barriers and noting (e.g., mapping and photographing) other potential passage barriers that are incidentally observed by cbec during field investigations completed as part of Task 2.1.

Assumptions:

1. HTH assumes that fish habitat assessments and fish surveys will be completed within a maximum of ten (10) survey areas approximately 100 - 200 meters long.
2. Placer County will be responsible for securing access to field survey sites.
3. cbec will not contribute directly to this task but will be responsible for the field assessment of fish passage barriers and for the purchase, deployment, and maintenance of automated data loggers.
4. HTH will provide limited technical input related to the completion of water temperature monitoring and fish passage barrier assessment as directed by cbec.
5. Level of effort on this task will be commensurate with allocated hours and associated budget from fee estimate.

Deliverables:

1. Survey methods and results will be described in a draft and final TM as described below in Task 4.

2.4 WATER QUALITY MONITORING - PHASE 1

cbec proposes to perform water quality monitoring in a two-phase approach. Phase 1 would characterize existing water quality conditions at strategic locations in the watershed during the first year of the project. This phase would consist of three types of data collection:

- Long-term continuous data collection
- Short-term continuous water quality sonde data collection
- Discrete sampling for laboratory analysis

Proposed water quality parameters, number of sites, duration of data collection (i.e., deployment length) and other pertinent information are summarized below in Table 1. Information provided below is preliminary and subject to change.

Table 1: Proposed Phase 1 water quality monitoring

Data Collection Category	Parameters	proposed # of sites	Instrument	Deployment Length	Deployment or Sampling Frequency	# Deployments or Sampling Events	Total # of Samples per Consuitent
Long-Term Continuous Data	Temperature & Depth	16	Rugged TROLL 100 (or equivalent)	2+ years (continuous)	Continuous	N/A	N/A
Water Quality Sonde Data	T, SC, pH, DO and Turbidity	3	YSI 6920 (or equivalent)	2 weeks	1 wet (winter) and 1 dry (summer)	3	N/A
Analytical Lab Samples	Hardness, Nutrients, TSS, Coliform	5	Grab Samples for Lab Analysis	N/A	2 wet and 1 dry conditions	3	15
	Metals, Pesticides	3	Grab Samples for Lab Analysis	N/A	2 wet and 1 dry conditions	3	9

Long-term continuous temperature and depth data would be collected at up to 16 locations within the Coon Creek Watershed. Initial proposed locations are provided in Figure 1 and are indicated by red triangles. In general these locations will be approximately 100 feet upstream and 500 feet downstream of the confluence of each of the tributaries in the Coon Creek watershed. Additionally, several points will be monitored along the main stem of Coon Creek and Doty Ravine.

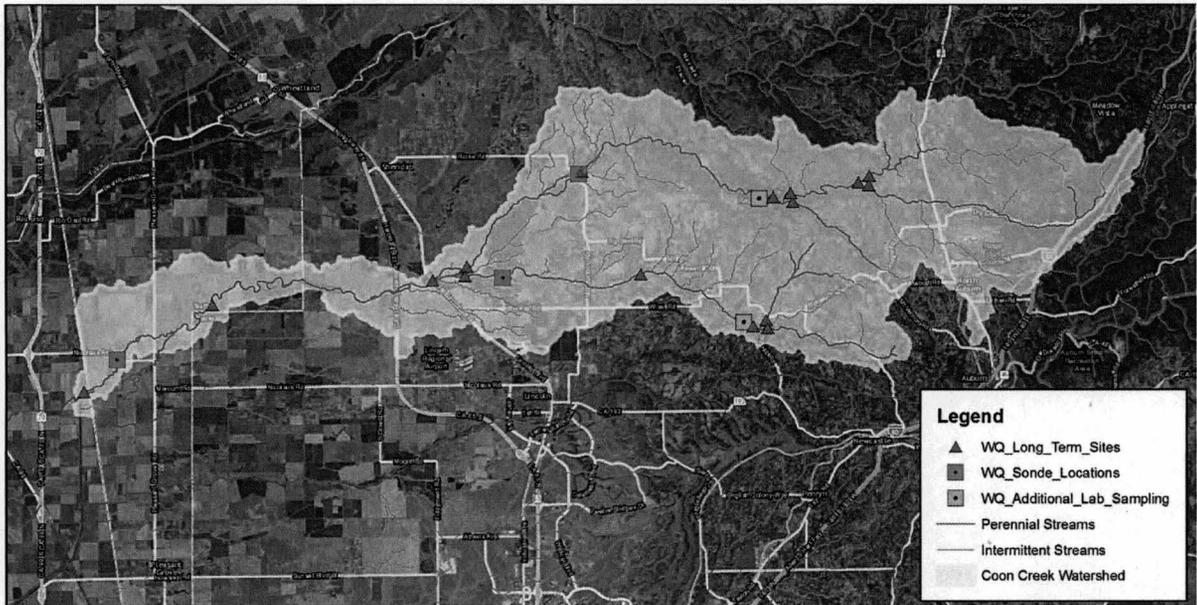


Figure 1. Proposed water quality monitoring locations

Water quality sondes would be deployed at up to three (3) locations (proposed locations are represented by green squares in Figure 1). As part of Phase 1 monitoring, these sondes would be deployed on two occasions (once during dry/summer conditions and once during wet/winter conditions) for a deployment duration of up to 2 weeks in length. Temperature, specific conductance, pH, dissolved oxygen, and turbidity would be measured during these deployments.

The third element of the Phase 1 water quality monitoring would consist of discrete sampling (i.e. grab samples) for laboratory analysis to characterize a variety of constituents of concern (see Table 1 for proposed list). The constituents requiring less costly analyses (hardness, nutrients, coliform and Total Suspended Solids (TSS)) would be sampled at up to five (5) sites indicated by both the three green and two orange squares in Figure 1. The constituents requiring more expensive analyses (metals and pesticides) would be sampled at up to the 3 water quality sonde locations.

This data collection effort would be supplemented with discrete water quality sampling performed during the fluvial audit stage (Task 2.1) of the project. A hand-held water quality meter would be used to capture temperature, conductivity, pH, DO and turbidity along the stream network in reaches surveyed as part of the fluvial audit. These water quality parameters would be collected at up to 16 sites as appropriate during the fluvial audit. The water quality data would be collected as a spot check at each of

the proposed monitoring locations, unless deemed infeasible during the fluvial audit or due to land access constraints. It is likely that these measurements could vary significantly in their number of locations.

Assumptions:

1. Placer County will secure access to the assessment sites.
2. HTH will not contribute to this task.
3. Level of effort on this task will be commensurate with allocated hours and associated budget from fee estimate.

Deliverables:

1. Information and results generated as part of this Phase 1 effort will be presented in a technical memorandum (see Task 4).

2.5 WATER QUALITY AND BMI MONITORING - PHASE 2

Following the completion of the Phase 1 water quality monitoring and review of results, a second phase of more location and constituent-focused monitoring could be conducted. An analysis of the Phase 1 results (which will be performed on an ongoing basis rather than waiting until the end of Year 1) as well as findings from other field efforts (e.g., fluvial audit, CRAM, and fish surveys), will guide the development of a Phase 2 monitoring plan. Depending on the findings in Phase 1 and the interests of the County, this second phase will likely consist of a combination of water quality and benthic macroinvertebrate (BMI) monitoring, though the County may elect to pursue only one type of monitoring. The specific constituents and organisms targeted and the sites selected for this Phase 2 effort will be driven in part by results from Phase 1 and by past BMI monitoring conducted along Coon Creek in 2005.

The number and extent of water quality monitoring locations for Phase 2 monitoring could vary significantly. This range might include in-depth (many constituent) sampling at a limited number of locations, or sampling for only a few constituents at a greater number of locations, or a combination of both types of effort. Similarly, there is considerable variation possible in the number and timing of sampling events or instrument deployments that the County may elect to pursue.

Water quality data collected by cbec will be supplemented by data characterizing benthic macroinvertebrate (BMI) communities collected by HTH. Locations selected for BMI surveys will be the same locations selected for water quality sampling, subject to available budget. At each survey reach, HTH will collect BMI samples using standard BMI protocols such as the Surface Water Ambient Monitoring Program protocol (California Regional Water Quality Control Board 2007), CDFW (1999), or another appropriate protocol. Because the County may desire to continue BMI monitoring long-term, possibly using volunteers, HTH will consult with the County and other appropriate entities (e.g., U.S. Environmental Protection Agency) prior to initiation of BMI surveys to ensure that the BMI protocol selected meets the County's long-term goals for BMI monitoring, meets any regulatory agency

requirements related to PCCP implementation, and is consistent with other BMI data collection efforts for similar watersheds within the Central Valley, including known "reference" stream reaches or watersheds, so that data collected from the Coon Creek watershed can be compared and contrasted with BMI data from other locales. Standard field data forms and QA/QC procedures and protocols will be completed for all BMI surveys.

Note: This task is not authorized by Placer County at this time. The cost estimate provided in the budget summary is preliminary, and provides for both water quality and BMI monitoring. A finalized scope and budget for this task would be developed following the collection of at least some Phase 1 water quality data and prioritization with the County in regard to the best approach for a more detailed Phase 2 monitoring effort.

Assumptions:

1. The combined labor and direct expenses budget for Phase 2 will not exceed the amount specified in the fee estimate.
2. HTH assumes that BMI assessments will be completed within a maximum of ten (10) survey areas.
3. The County may elect to initiate Phase 2 monitoring before the end of Phase 1 monitoring.
4. The County will provide guidance on the constituents, organisms and sites selected for the Phase 2 analysis.
5. Placer County will secure access to assessment sites.
6. Completion of the College of Bioassessment Training will not be required.
7. Level of effort on this task will be commensurate with allocated hours and associated budget from fee estimate.

Deliverables:

1. An electronic draft Phase 2 monitoring plan will be developed and circulated for review and edits.
2. A finalized Phase 2 monitoring plan will be submitted to the County.
3. Results and interpretation generated as part of this Phase 2 effort will be presented in the final report (Task 4).

3 DEVELOP APPRAISAL SYSTEM

3.1 WATERSHED DISTURBANCE ASSESSMENT

The cbec team will assess alterations to the watershed and stream network's hydrology, physical processes and water quality. As part of this process, the existing restoration plan will be analyzed in regard to previously identified stressors and their causal mechanisms. Stressors identified in the 2002 Restoration Report include:

- Alteration of flows and other effects of water management
- Floodplain and seasonal wetland changes
- Channel forms changes
- Water quality
- Water temperature
- Land use

The watershed disturbance assessment will include an evaluation of the changes in the watershed within the following approach:

1. Develop Engineering and Land Use Pressure Index

The cbec team will develop a cumulative index representative of engineering features present in the river corridor and land use pressures. Data generated from the desk-based analyses and field assessments will be categorized and then weighted based on relative severity and expert judgment. A composite score will be assigned to each reach reflecting the cumulative impacts of engineering measures and land use pressures on physical processes and conditions in the reach. These scores will then be categorized into 5 overall impact severity categories ranging from very low to very high. We estimate that this index will be developed for up to 30 to 50 miles of perennial channel length, but this number may be reduced if land access, field conditions or terrain, or remote sensing data restrict the length of channel characterized during the previous desk and field-based assessments.

2. Assess Hydrologic Regime Alterations

Drawing on the hydrologic analysis performed in Task 1.2, the cbec team will assess impacts to the hydrologic regime on a sub-catchment scale, to the extent practicable. This assessment will result in two spatial datasets, where the first will consist of scoring of impacts to peak flows (from event-based simulation) and the second will assign scores based on impacts to flow duration and base flow patterns (from long-term simulation). A composite score will then be assigned to each sub-catchment to reflect the degree of hydromodification.

3. Assess Water Quality Impacts

Impacts of specific constituents will be mapped as practicable. At a minimum, temperature data will be developed in map format. For each water quality constituent, scores will be assigned to reaches based on severity of impact. The division of sub-reaches for water quality impacts will be different than sub-reaches identified for geomorphic and hydrologic impacts, and will depend largely on the spatial density of sampling locations. Based on water quality criteria, impaired reaches and water bodies will be identified in a separate spatial dataset to provide an indication of impairment to the system.

It is also important to note that given the relatively sparse sampling density, both geographically and temporally, that the mapping generated by this effort may not be representative of all conditions, and may ignore local water quality impacts that are muted by dilution effects between impact and sampling locations.

Assumptions:

1. Level of effort on this task will be commensurate with allocated hours and associated budget from fee estimate.

Deliverables:

1. ArcGIS files representing physical, hydrologic and water quality impacts to reaches will be provided as part of the final watershed base map (Task 4).
2. Methodology, analysis and findings from this task will be summarized in the final report generated as part of Task 4.

3.2 OPPORTUNITIES AND CONSTRAINTS ANALYSIS

The cbec team will identify general restoration goals and opportunities, assess restorability on a reach-by-reach basis and prioritize restoration options. The analysis includes the following components:

1. Establish Restoration Goals and Identify General Opportunities and Constraints

The initial phase of restoration opportunity assessment includes the identification of potential restoration goals for the overall watershed and for specific reaches. General opportunities will then be identified for the Coon Creek basin which are divided into three general categories: (1) in-channel projects (to include actions in the immediate river corridor), (2) point-source pollution prevention and attenuation, and (3) land use management and behavioral changes. Included in these potential opportunities will be flood and conservation easements on privately held land that could provide floodplain habitat and peak flow attenuation benefits.

Following this broad goal and restoration opportunities identification process, reaches will be assessed/prioritized for the need and suitability of various projects. This assessment will result in the preliminary production of restoration opportunity maps (and accompanying spatial datasets) for the general sub-reaches of the system. This preliminary information will be presented to the County (and relevant stakeholders) before a more comprehensive assessment of restoration feasibility and project prioritization.

2. Develop a Reach Restorability Index

After receiving feedback from the County and relevant stakeholders, the cbec team will conduct a more detailed assessment of reach-scale restoration potential. Drawing on the hydrology, geomorphic process and water quality impacts assessment, ecological findings, and the identification of key stressors, cbec will develop a reach restorability index throughout the relevant sections of the Coon Creek stream network. We estimate that this index will be developed for up to 30 to 50 miles of perennial channel length, but this number may be reduced if land access, field conditions or terrain, or remote sensing data restrict the length of channel characterized during the previous desk and field-based assessments.. Reaches would be scored in terms of degree of impact and on the basis of feasibility of achieving

physical and ecologic function uplift, while also considering relative cost-effectiveness. Various constraints (e.g., existing infrastructure, downstream channel connectivity barriers, nonnegotiable pollution sources) will be considered as well as the conditionality of restoration success on other projects and actions.

3. Identify and Prioritize Restoration Measures

Following the ranking of sub-reaches on the basis of restoration potential, cbec will identify a number of restoration and management options to be developed for reaches showing meaningful promise of physical and ecological uplift. For in-channel and river corridor restoration measures, potential options will form a continuum of degrees of intervention (ranging from 'do nothing' to 'major physical modifications'), with associated variations in cost and benefit.

cbec will develop a thorough 'options appraisal matrix' that presents restoration options, together with their approximate cost, limitations (e.g., potential impacts to important infrastructure, other socio-economic considerations) and benefits to physical and ecological process and water quality. Afterwards, cbec will perform a Multi Criteria Assessment (MCA) to identify optimum restoration strategies at individual sites and appropriate groupings of projects to achieve enhanced longitudinal connectivity and significant, cumulative functional uplift of geomorphic processes and ecology. Consultation with the County will be used to select the final restoration and management strategy for the watershed and specific projects to be implemented.

Assumptions:

1. Within one month of the first meeting with the County to discuss the preliminary restoration goal and project assessment, the County will provide comprehensive information to cbec regarding their knowledge of existing constraints that may inhibit certain restoration actions in various reaches or other parts of the watershed. This would include infrastructure constraints (e.g., sewer line), incompatibility with the County master plan (e.g., potential restoration project co-location with a future bridge), land owner unwillingness, easement constraints, and other limitations.
2. Level of effort on this task will be commensurate with allocated hours and associated budget from fee estimate.

Deliverables:

1. A set of maps showing the preliminary restoration opportunity and constraint identification and an accompanying written summary of restoration goals and constraints.
2. The reach restorability index provided as a spatial dataset in the final watershed base map (Task 4).
3. A more comprehensive set of maps showing finalized restoration opportunities.
4. The Multi Criteria Assessment and proposed restoration strategy will be summarized in the final report (Task 4).

4 REPORTING

4.1 TECHNICAL MEMORANDA

Technical memoranda will be drafted for key assessment components of the watershed assessment, thus facilitating interim documentation and reporting to the County during the project. The TMs will cover key assessment information including methodology, sampling locations, photos, maps and results, as relevant. Table 2 below summarizes the six (6) TMs that will be developed, while the text below the table summarizes specific content to be covered in each TM. For all TMs, a draft version will be submitted to the County for comments and review. Following receipt of comments, a final TM will be provided to the County. These TMs will be integrated into the overall assessment Draft and Final Reports as part of sub-tasks 4.3 and 4.4.

Table 2: Summary of technical memoranda

Technical Memorandum Content	Relevant Sub-Tasks	Contributor(s)
Ecological Desktop Assessment	1.1 (ecological component)	HTH
Hydrologic Assessment	1.2	cbec
Geomorphic Assessment	1.3 and 2.1	cbec
CRAM	2.2	HTH
Fish Surveys	2.3	HTH
Water Quality Monitoring - Phase 1	2.4	cbec

1. Ecological Desktop Assessment TM, sub-task 1.1

Based on the review of existing data described above in Sub-task 1.1, HTH will produce a draft and final technical memorandum (TM) describing existing ecological conditions within the Coon Creek Watershed. The TM will include a description of existing ecological conditions within the watershed, emphasizing riparian and riverine aquatic habitats along with anadromous fish. Other biological resources (e.g., plant communities, vernal pools, distribution and abundance of wildlife species, including special-status species) will be described by summarizing readily available data (e.g., CNDDDB or data provided by the County), but these resources will not be emphasized in the TM. (., The TM will include appropriate maps identified from readily-available sources.

2. Hydrologic Assessment TM, sub-task 1.2

cbec will generate a Hydrologic Assessment TM describing the HEC-1 modeling and spreadsheet-based accounting analysis of Coon Creek's watershed hydrology. The TM will summarize the existing state of the HEC-1 model, describe refinements made to model parameters and resolution, and present results generated for the existing conditions analysis. It will also describe modifications made to the model for the pre-disturbance conditions assessment and present associated results. Finally, the TM will describe

the data and assumptions utilized by the spreadsheet-based accounting tool for the base flow analysis, and will present relevant results from that effort.

3. Geomorphic Assessment TM, sub-tasks 1.3 and 2.1

A geomorphic assessment TM will be drafted following the completion of sub-tasks 1.3 and 2.1 This TM will present methodology, maps, select photos and results from both the desktop and field-based geomorphic assessments. Results and discussion will be included for the specific stream power analysis, sediment storage and input indices, historical channel assessment, fluvial audit and reconnaissance level survey. The geomorphic regime and channel dynamism will be discussed on a sub-reach level, along with their relevance to management actions and restoration opportunities.

4. CRAM TM, sub-task 2.2

A CRAM TM will be prepared following the surveys described in Sub-task 2.2. The TM will include maps of sampling locations, representative photographs, copies of field data forms, and CRAM results. This task includes uploading the CRAM scores to the eCRAM database. The uploaded CRAM data would remain private.

5. Fish Surveys TM, sub-task 2.3

Results of the field habitat assessment, fish surveys, water temperature investigation, and fish passage barrier investigation will be incorporated into a draft and final TM. The TM will include maps of all survey locations, methods and results for all surveys, a discussion of survey results, and identification of limiting factors for salmonids to prioritize potential habitat improvement and restoration actions. Representative photographs, field data forms, and geospatial datasets will be included as appendices to the draft TM and within other tasks described above as appropriate (e.g., GIS data will be included with Task 1 submittals). If target species are observed during surveys, California Natural Diversity Database forms will be completed and submitted to the California Department of Fish and Wildlife (CDFW) as appropriate.

6. Water Quality Monitoring - Phase 1 TM, sub-task 2.4

The cbec team will draft a TM to describe the sampling locations and methods, results and relevant results interpretation from the Phase 1 water quality monitoring effort. The TM will provide maps of the sampling locations along with results for the three types of data collected: long-term continuous data, short-term continuous WQ sonde data, and discrete sampling for analytical laboratory analysis. Suggestions will also be provided regarding the potential constituents targeted and sampling protocol utilized in the Phase 2 monitoring effort.

Assumptions:

1. Methods, results and recommendations not included specifically in a TM will be incorporated in the Draft and Final Reports developed in sub-tasks 4.3 and 4.4.
2. The team will respond to one set of collated comments provided for each draft TM in developing the final TM.

Deliverables:

1. The above six (6) technical memoranda submitted in electronic form for draft and both electronic and hard copies for final delivery.

4.2 FINAL GIS INTEGRATION AND PREPARATION

Over the course of the project, cbec will develop a spatial dataset library and a watershed base map using a GIS platform (ESRI ArcGIS) to facilitate data organization, layered viewing, multi-component analyses, and identification/ prioritization of restoration/ management opportunities in the Coon Creek watershed. Initial inputs will include data provided by the County, findings from the 2002 Restoration Plan, and data obtained from other sources (e.g., regulatory agencies, monitoring programs, non-profit organizations, libraries, etc). Data not already in a suitable format (e.g., geomorphic reach characterization in Chapter 5 of the 2002 Restoration Plan) will be digitized or georeferenced by the cbec team to allow inclusion in the GIS database to the extent practicable. This base map will include pertinent data collected during the field assessments performed by cbec and HTH. Subsequent analyses and restoration opportunity identification will be performed using the GIS, and relevant outputs and findings will be included in the final watershed base map provided to the County.

Data that will be included as part of this effort includes:

- Geology and Soils Data
- LiDAR
- Historical Aerial Photos and Associated Analyses
- Hydrologic Data
- Geomorphic Data
- Biological Resources Data
- Water Quality Data
- Appraisal System Metrics
- Restoration Opportunities

Assumptions:

1. Existing data that is of poor or inconsistent quality will not be developed into spatial datasets.

Deliverables:

1. Electronic copies of all spatial datasets and GIS files generated by the study. This submittal would include appropriately organized ArcGIS MXD files to facilitate pre-formatted viewing.

4.3 DRAFT REPORT

The methods employed and results obtained through the assessment will be described, in addition to the results and recommendations obtained through the *Appraisal System* and the *Multi-Criteria Assessment*, in a Draft Report that will be submitted to the County electronically for comment and review. Directly included within the report will be the six technical memoranda developed as part of sub-task 4.1 for the various components of the overall ecological assessment.

We anticipate that the Final Report will broadly contain the following elements:

- Section 1 - Watershed analysis including:
 - Summary and analysis of existing data sets, such as soils, geology, historic aerial photos, hydrology, geomorphology, LiDAR, and other ecological data sets
 - Ecological Desktop Assessment
 - Hydrologic Assessment
 - Geomorphic Assessment
 - CRAM
 - Fish Surveys
 - Water Quality Monitoring - Phase 1
 - Water Quality and BMI Monitoring - Phase 2
 - High quality maps, figures and select field photos
- Section 2 – Development of the appraisal system
 - Watershed Disturbance Assessment
 - Identification and prioritization of restoration and management opportunities, resulting in a series of recommended actions

Assumptions:

1. cbec will respond to one set of collated comments provided by the County.

Deliverables:

1. The draft report will be submitted in electronic format to the County.

4.4 FINAL REPORT

Based on one set of collated comments, cbec will respond and modify the Draft Report as appropriate, to produce a Final Report within four (4) weeks of receipt of comments.

Results from the Coon Creek watershed assessment can be leveraged by Placer County for the PCCP/CARP watershed approach to assess potential improvements to or preservation of physical and ecological functions in the Coon Creek watershed resulting from proposed rehabilitation and management actions, and their value in offsetting impacts to other watersheds.

Assumptions:

1. cbec will respond to one set of collated comments provided by the County.

Deliverables:

1. Three (3) hard copies and one digital copy of the final report will be provided to the City, including electronic data files on DVD.

5 PROJECT MANAGEMENT

5.1 DIRECTION AND COORDINATION

This task covers day-to-day management of the project, including regular internal coordination among cbec and HTH team members (e.g., project manager and key technical staff) to ensure adherence to the project scope of work, schedule, and budget; monthly project invoicing; internal project management (e.g., budgeting, tracking labor and direct expenses); and coordination (in the form of email correspondence or telephone conversations) between HTH and cbec regarding project execution.

Assumptions:

None

Deliverables:

1. Invoices
2. Progress reports

5.2 MEETINGS

cbec will participate in up to five (5) meetings and fourteen (14) conference calls with County staff and stakeholders. An initial kick-off meeting will be held in October 2014, which will be followed by monthly conference calls with the exception of a second in-person meeting in December 2014. Conference calls will transition to bi-monthly after a June 2015 meeting as the majority of the field assessments will be complete. Meetings are indicated in the proposed project schedule below in Table 3 as an "M" in sub-task 5.2, while conference calls are indicated with a "C" in the same row. cbec will also participate in several short phone calls with pertinent agencies, County staff and stakeholders to obtain data and understandings necessary for the watershed assessment.

In person meetings are proposed as follows, with dates subject to change given project timeline and progress:

1. Oct 2014: A kick-off meeting
2. Dec 2014: Secondary meeting to discuss preliminary field assessment results
3. June 2015: Meeting to discuss field assessment results from all field efforts completed to date (likely everything except WQ and BMI monitoring) and preliminary restoration goals and opportunities

4. Nov 2015: Meeting to discuss additional WQ monitoring results and opportunities and constraints analysis findings
5. September 2016: Meeting to present completed opportunities and constraints analysis and draft report

HTH will participate in-person or remotely (e.g., conference call) in the following meetings

- One (1) kick-off meeting with cbec and County staff attended by up to two (2) HTH staff
- To support Sub-task 1.1, one (1) HTH biologist will participate in up to 5 to 10 brief phone calls or conference calls with pertinent agencies and stakeholders to discuss relevant data for the Coon Creek watershed and to request those datasets.
- To support Sub-task 2.2, one (1) HTH biologist will attend one meeting and up to three (3) brief calls to discuss the approach to completion of CRAM surveys.
- To support Sub-task 2.5, up to two (2) HTH biologists will attend meetings with County and other parties (e.g, CDFW, EPA, CVRWQCB) to discuss BMI protocols
- To support Sub-task 3.2, HTH will attend up to two (2) meetings with cbec and the County. At the first meeting, cbec and HTH will present the preliminary restoration goals and opportunities identified for the watershed. The second meeting will be used to present the reach restorability assessment and the prioritized restoration opportunities for the stream network, and to receive the County's feedback on finalizing a restoration and management strategy and specific projects

Assumptions:

1. In-person meetings will occur in western Placer County or the Sacramento Metropolitan area

Deliverables:

1. Meeting notes
2. Presentation slides

PROJECT SCHEDULE

Table 3: Proposed project schedule

Task	Description	2014												2015												2016											
		S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N									
1	Perform Desk-Based Watershed-Scale Assessment																																				
1.1	Collate and Analyze Existing Data																																				
1.2	Assess Watershed Hydrology																																				
1.3	Characterize Existing Channel Dynamics																																				
1.4	Develop Water Quality Monitoring Plan																																				
2	Perform Field-Based Assessments																																				
2.1	Geomorphic Assessment (Fluvial Audit)																																				
2.2	CRAM																																				
2.3	Fish Surveys																																				
2.4	Water Quality Monitoring - Phase 1																																				
2.5	Water Quality and BMI Monitoring - Phase 2																																				
3	Develop Appraisal System																																				
3.1	Watershed Disturbance Assessment																																				
3.2	Opportunities and Constraints Analysis																																				
4	Reporting																																				
4.1	Technical Memoranda																																				
4.2	Final GIS Integration and Prep																																				
4.3	Draft Report																																				
4.4	Final Report																																				
5	Project Management																																				
5.1	Direction and Coordination																																				
5.2	Meetings	M	C	M	C	C	C	C	C	M	C	C	M	C	C	M	C	C	C	C	C	C	C	M	C	C											

Note: In the last row of the table, 'M' indicates a meeting and 'C' indicates a conference call.

All work on this project will be completed by November 30, 2016.

ESTIMATED PROJECT BUDGET SUMMARY

Coon Creek Watershed Assessment
cbec Project #14-1039



H.T. HARVEY & ASSOCIATES
Ecological Consultants

Task #	Task Description	Watershed Assessment (Excludes Phase 2 WQ and BMI Monitoring)				Fish Surveys	Phase 2 WQ and BMI Monitoring		Comments
		cbec	HT Harvey	CESI	Base Total	HT Harvey	cbec	HT Harvey	
1	Perform Desk-Based Watershed-Scale Assessment								
1.1	Collate and Analyze Existing Data	\$ 18,785	\$ 7,761		\$ 26,546				
1.2	Assess Watershed Hydrology	\$ 19,740		\$ 3,000	\$ 22,740				CESI budget for clarification and support in HEC-1 model usage
1.3	Characterize Existing Channel Dynamics	\$ 18,225			\$ 18,225				
1.4	Develop Water Quality Monitoring Plan	\$ 4,510			\$ 4,510				
2	Perform Field-Based Assessments								
2.1	Geomorphic Assessment (Fluvial Audit)	\$ 45,460			\$ 45,460				
2.2	CRAM		\$ 34,018		\$ 34,018				
2.3	Fish Surveys				\$ -	\$ 30,686			
2.4	Water Quality Monitoring - Phase 1	\$ 29,950			\$ 29,950				
2.5	Water Quality and BMI Monitoring - Phase 2				\$ -		\$ 20,820	\$ 24,001	
3	Develop Appraisal System								
3.1	Watershed Disturbance Assessment	\$ 16,730	\$ 4,365		\$ 21,095				
3.2	Opportunities and Constraints Analysis	\$ 27,370	\$ 7,178		\$ 34,548				
4	Reporting								
4.1	Technical Memoranda	\$ 18,960	\$ 12,148		\$ 31,108	\$ 6,250			
4.2	Final GIS Integration and Prep	\$ 3,775			\$ 3,775				
4.3	Draft Report	\$ 11,220	\$ 5,834		\$ 17,054		\$ 3,840	\$ 6,880	If funded, Phase 2 monitoring would be presented in final report
4.4	Final Report	\$ 5,400			\$ 5,400				
5	Project Management								
5.1	Direction and Coordination	\$ 14,240	\$ 6,368		\$ 20,608				
5.2	Meetings	\$ 9,440	\$ 5,866		\$ 15,306				
	cbec Labor Fee	\$ 243,805					\$ 24,660		
	cbec Direct Expenses	\$ 32,434					\$ 20,785		
	Subconsultants		\$ 83,538	\$ 3,000		\$ 36,936	\$ -	\$ 30,881	Includes 8% administrative fee
	Total Project Budget	\$ 276,239	\$ 83,538	\$ 3,000	\$ 362,777	\$ 36,936	\$ 45,445	\$ 30,881	

Notes: The watershed assessment (excluding Phase 2 water quality and BMI monitoring) and fish surveys (\$362,777 and \$36,936, respectively) would be included in the contract with a total project budget of \$399,712. The Phase 2 WQ and BMI monitoring will not be included in the \$399,712 project budget and would require separate funding or a budget amendment for implementation

160

ESTIMATED LABOR FEES

Coon Creek Watershed Assessment
cbec Project #14-1039



Task #	Description	President	Senior Associate	Senior Ecolhydrologist	Associate Eoengineer	Associate Ecolhydrologist	Technician	Field Assistant	Desktop Publishing	Subtotal Labor Hours Per Task	Subtotal Labor Fee Per Task - Watershed Assessment	Subtotal Labor Fee Per Task - Phase 2 WQ Monitoring	Notes
		\$170	\$145	\$145	\$125	\$125	\$100	\$40	\$70				
1	Perform Desk-Based Watershed-Scale Assessment												
1.1	Collate and Analyze Existing Data	9	9		102		32			152	\$ 18,785		
1.2	Assess Watershed Hydrology	22			128					150	\$ 19,740		
1.3	Characterize Existing Channel Dynamics	4	21		92		30			147	\$ 18,225		
1.4	Develop Water Quality Monitoring Plan	3			32					35	\$ 4,510		
2	Perform Field-Based Assessments												
2.1	Geomorphic Assessment (Fluvial Audit)	12	56		228		40	70		406	\$ 45,460		
2.4	Water Quality Monitoring - Phase 1				166		92			258	\$ 29,950		
2.5	Water Quality and BMI Monitoring - Phase 2	1			122		54			177		\$ 20,820	
3	Develop Appraisal System												
3.1	Watershed Disturbance Assessment	10	14		104					128	\$ 16,730		
3.2	Opportunities and Constraints Analysis	17	32		152				12	213	\$ 27,370		
4	Reporting												
4.1	Hydrologic Assessment TM	6			28					34	\$ 4,520		
4.1	Geomorphic Assessment TM	6	12		48					66	\$ 8,760		
4.1	WQ Monitoring TM - Phase 1	4			40					44	\$ 5,680		
4.2	Final GIS Integration and Prep	2	3		24					29	\$ 3,775		
4.3	Draft Report	8	12		56				16	92	\$ 11,220		
4.3 optional	WQ and BMI Monitoring - Phase 2	2			28					30		\$ 3,840	If funded, Phase 2 monitoring to be described in draft report
4.4	Final Report	4	8		24				8	44	\$ 5,400		
5	Project Management												
5.1	Direction and Coordination	22			84					106	\$ 14,240		
5.2	Meetings	32			32					64	\$ 9,440		
										0	\$ -		
	Project Total Hours and Labor Costs	164	167	0	1490	0	248		36	2175	\$ 243,805	\$ 24,660	

191



H.T. HARVEY & ASSOCIATES

Ecological Consultants

Project Name: Coon Creek Watershed Assessment
 Proposal Number: 7438
 Project Number:
 Date: September 5, 2014

Staff Time Estimates

Task	Sharon Kramer	Debra Bishop	Pat Reynolds	John Hunter	Matt Wacker	Ecologist 2	Ecologist 1	Graphic/GIS	Support	HTH Cost by Task	HTH Direct Expenses	HTH Total Project Cost	cbec overhead (8%)	Total Cost
	Principal Fish Ecology	Principal Restoration Ecology	Associate Restoration Ecologist	Associate Plant Ecologist	Senior Restoration Ecologist	Staff Restoration Ecologist	Staff Fish Biologist							
1. Perform Desk-based Watershed Assessment										\$ -	-	\$ -	\$ -	\$ -
1.1 Collate and Analyze Existing Data	2		4	2	6	8	16	12	4	\$ 6,966	\$ 220	\$ 7,186	\$ 575	\$ 7,761
2. Perform Field-based Assessments										\$ -	\$ -	\$ -	\$ -	\$ -
2.2 CRAM		2	20		4	180		20	4	\$ 30,662	\$ 836	\$ 31,498	\$ 2,520	\$ 34,018
2.3 Fish Surveys	2	2	4		4		180	8	4	\$ 24,268	\$ 4,145	\$ 28,413	\$ 2,273	\$ 30,686
2.5 Water Quality and BMI Monitoring	2		4		4		70	8	4	\$ 11,078	\$ 11,145	\$ 22,223	\$ 1,778	\$ 24,001
3. Develop Appraisal System										\$ -	\$ -	\$ -	\$ -	\$ -
3.1 Watershed Disturbance Assessment		2	8	4	8				2	\$ 4,042	\$ -	\$ 4,042	\$ 323	\$ 4,365
3.2 Opportunities and Constraints Analysis	2	4	8	4	8	8		6	2	\$ 6,580	\$ 66	\$ 6,646	\$ 532	\$ 7,178
4. Reporting										\$ -	\$ -	\$ -	\$ -	\$ -
TM)		1	2		4	8	16	6	2	\$ 4,919	\$ 88	\$ 5,007	\$ 401	\$ 5,408
4.1 (Sub-task 2.2: CRAM TM)		1	4			34		6	2	\$ 6,175	\$ 66	\$ 6,241	\$ 499	\$ 6,740
4.1 (Sub-task 2.3: Fish Surveys TM)	2	1	1		1		34	6	2	\$ 5,721	\$ 66	\$ 5,787	\$ 463	\$ 6,250
4.3 (Sub-task 2.5: Phase 2 WQ and BMI reporting)	2	1	1		6		34	4	2	\$ 6,326	\$ 44	\$ 6,370	\$ 510	\$ 6,880
reporting)		2	10	4	10	4		2	1	\$ 5,380	\$ 22	\$ 5,402	\$ 432	\$ 5,834
5. Project Management										\$ -	\$ -	\$ -	\$ -	\$ -
5.1 Coordination		2	6		24				6	\$ 5,896	\$ -	\$ 5,896	\$ 472	\$ 6,368
5.2 Meetings	2	2	10		10	5	2		1	\$ 5,247	\$ 185	\$ 5,432	\$ 435	\$ 5,866
Total Labor Hours	14	20	82	14	89	247	352	78	36	Total Costs	\$16,883	Total Cost		Total Cost
TOTAL COST	\$ 3,010	\$ 4,300	\$ 14,678	\$ 2,506	\$ 14,507	\$ 32,357	\$ 40,832	\$ 8,190	\$ 2,880	\$123,260	\$16,883	\$140,143	\$ 11,211	\$ 151,354

162

CBEC ESTIMATED REIMBURSABLE EXPENSES



Coon Creek Watershed Assessment
cbec Project #14-1039

Item Description	Watershed Assessment		Unit Cost	Watershed	
	Base Quantity	Phase 2 WQ Monitoring		Assessment Base Costs	Phase 2 WQ Monitoring Costs
Mileage	848 miles		0.56 /mile	\$ 474.88	\$ -
Car Rental	30 day(s)	12 day(s)	100.00 /day	\$ 3,000.00	\$ 1,200.00
RTK GPS	12 day(s)		350.00 /day	\$ 4,200.00	\$ -
Multi-meter	8 day(s)		150.00 /day	\$ 1,200.00	\$ -
Levelloggers/temp probes	16 unit		595.00 /unit	\$ 9,520.00	\$ -
Barometric probe	1 unit		495.00 /unit	\$ 495.00	\$ -
Pressure transducer data shuttle	1 unit		199.00 /unit	\$ 199.00	\$ -
WQ Sondes (3 units, two 2-wk deployments)	12 week(s)	16 week(s)	420.00 /week	\$ 5,040.00	\$ 6,720.00
YSI 650 Handheld	4 week(s)	6 week(s)	40.00 /week	\$ 160.00	\$ 240.00
Equipment for installing HOBOS, sondes				\$ 200.00	
Analytical Laboratory Costs					
Hardness	15 samples	30 samples	25.00 /sample	\$ 375.00	\$ 750.00
pH	15 samples	30 samples	20.00 /sample	\$ 300.00	\$ 600.00
Nutrients	15 samples	30 samples	60.00 /sample	\$ 900.00	\$ 1,800.00
TSS	15 samples	30 samples	20.00 /sample	\$ 300.00	\$ 600.00
Metals	9 samples	18 samples	115.00 /sample	\$ 1,035.00	\$ 2,070.00
Pesticides	9 samples	18 samples	185.00 /sample	\$ 1,665.00	\$ 3,330.00
Coliform	15 samples	30 samples	35.00 /sample	\$ 525.00	\$ 1,050.00
Quality Control (QAPP) (10%)				\$ 442.50	\$ 885.00
			Subtotal Reimbursables	\$ 30,031.38	\$ 19,245.00
			Administrative Charge (8%)	\$ 2,402.51	\$ 1,539.60
			Total Reimbursables	\$ 32,433.89	\$ 20,784.60

163

