

CONTRACT NO. \_\_\_\_\_

DEPARTMENT: Public Works-Sewer

FEDERAL TAXPAYER I.D. 91-0890718

CONSULTANT: Gray & Osborne, Inc.

SERVICES PROVIDED: **Outfall Evaluation and Mixing Zone Study**

AMOUNT: \$53,350.00

FUND SOURCE: Sewer

DURATION: FROM: June 25, 2020

TO: November 30, 2020

## **AGREEMENT**

THIS AGREEMENT made and entered into on this 25<sup>th</sup> day of June, 2020, by and between the *CITY OF BURLINGTON*, (hereafter referred to as the "City"), and **Gray & Osborne, Inc.**, (hereafter referred to as "Provider").

### **WITNESSETH:**

WHEREAS, the City desires to contract with the Provider for providing of services; and

WHEREAS, the Provider is licensed and/or duly qualified to provide such services; and

WHEREAS, the City has an interest in promoting the health, safety and welfare of the citizens of the City of Burlington; and

WHEREAS, the Scope of Work included in this Agreement is consistent with promoting the interests of the City; and

WHEREAS, the City and the Provider are desirous of entering into an agreement to formalize their relationship.

**NOW, THEREFORE, in consideration of the terms and conditions set forth herein, the City and Provider do mutually agree as follows:**

1. WORK AND/OR SERVICES TO BE PROVIDED BY THE PARTIES:

- a. The Provider shall complete an outfall and mixing zone study for the sewer plant to fulfill the requirements of the City's NPDES permit and submit the study to the Department of Ecology by October 1, 2020. The work shall be performed in a satisfactory and proper manner, as determined by the City, and as further described in "**Exhibit A, A-1 and B**, Scope of Work and/or Services of Provider, which is attached hereto and incorporated herein by reference.
  
- b. The City will provide such assistance and guidance to the Provider as may be required to support the objectives of this Agreement and additional duties as outlined in "**Exhibit A, A-1 and B**, Scope of Work and/or Services of City, which is attached hereto and incorporated herein by reference.

2. TIME OF PERFORMANCE:

All services described under Scope of Work and/or Services shall be conducted on or before **November 30, 2020**.

3. CONSIDERATION:

The City shall pay to the Provider for work and/or services as follows: The sums billed to the City shall not exceed the total sum of **\$53,350.00**. Provider shall bill the City of Burlington monthly by way of itemized invoices for the services rendered under this Agreement. Any deposits paid by the City in advance shall be offset against amounts billed, and shall be reflected in the Provider's invoice.

4. RELATIONSHIP:

The City and Provider intend that an independent contractual relationship be created by this Agreement. Provider is not considered to be an employee of the City for any purpose, and neither the Provider nor any employee of the Provider shall be entitled to any of the benefits the City provides for the City's employees, including but not limited to health insurance, sick or annual leave, or worker's compensation. Provider specifically represents and stipulates that the Provider is engaged in the business of providing the services set forth in this Agreement, whether or not for profit, and that provider is fully registered and legally authorized to conduct such business, and pays all necessary taxes and assessments levied against such business.

5. SUSPENSION, TERMINATION, AND CLOSE OUT:

If the Provider fails to comply with the terms and conditions of this Agreement, the City may pursue such remedies as are legally available, including but not limited to, the suspension or termination of this Agreement.

Further, in the event the Provider has failed to perform any substantial obligation to be performed by the Provider under this Agreement, then the City may, upon written notice to the Provider, withhold all monies due and payable to Provider, without penalty, until such failure to perform is cured or otherwise adjudicated.

6. CHANGES, AMENDMENTS, MODIFICATIONS:

Either party may request changes to the Agreement. Any and all agreed modifications shall be in writing and signed by each of the parties.

7. REPORTS AND INFORMATION:

The Provider, in such form as the City may require, shall provide reports as to the status of the work or services undertaken pursuant to this Agreement, including the costs and obligations incurred or to be incurred in connection therewith, and any other matters covered by this Agreement.

8. AUDITS AND INSPECTIONS:

The City or its delegates shall have the right to review and monitor the financial and other components of the work and services provided and undertaken as a part of the Agreement by whatever legal and reasonable means are deemed by the City.

9. DEFENSE & INDEMNITY AGREEMENT:

Provider agrees to defend, indemnify and save harmless the City, their appointed and elective officers, subcontractors, agents and/or employees, from and against all loss or expense, including but not limited to judgments, settlements, attorney's fees and costs by reason of any and all claims and demands upon the City, their appointed or elected officials, subcontractors, agents and/or employees for damages because of personal or bodily injury, including death at any time resulting therefrom, sustained by any person or persons and on account of damage to property including loss of use thereof, whether such injury to persons or damage to property is due to the negligence of Provider, its subcontractors, agents and/or employees, except only such injury or damage as shall have been occasioned by the sole negligence of the City, or their appointed or elected officials, subcontractors, agents and/or employees. It is further provided that no liability shall attach to the City by reason of entering into this Agreement, except as expressly provided herein.

10. NO THIRD-PARTY BENEFICIARIES:

Except as specifically provided herein, this Agreement is for the parties hereto only, and is not intended to benefit any other person or entity, and no person or entity not a party to this Agreement shall have any third-party beneficiary or other rights whatsoever hereunder.

11. PROOF OF INSURANCE:

The Provider shall provide proof of insurance for general comprehensive liability in the amount of \$1,000,000 per occurrence to cover activities during the

term of this Agreement. Proof of insurance shall be in a form acceptable and approved by the City. A certificate of insurance naming the City of Burlington at 833 S. Spruce Street, Burlington, WA 98233, its elected and/or appointed officials and/or officers, subcontractors, agents and/or employees as additional insureds shall accompany this Agreement for signing.

12. EQUAL OPPORTUNITY EMPLOYER:

The Provider shall comply with Federal, State and local laws as to the requirements of an Equal Opportunity Employer.

13. GOVERNING LAW:

This Agreement shall be governed by and construed in accordance with the laws of the State of Washington, including any regulation, ordinance or other requirement of any governmental agency having or asserting jurisdiction over the services provided hereunder.

14. VENUE AND JURISDICTION:

All parties shall submit and not object to jurisdiction and venue being that of Skagit County, Washington, in connection with any claims arising out of this Agreement.

15. SEVERABILITY:

If any term or condition of this Agreement is held invalid, such invalidity shall not affect other terms, conditions or application which can be given effect without the invalid term, condition or application. To this end, the terms and conditions of this Agreement are declared severable.

16. WAIVER:

Waiver of any breach or condition of this Agreement shall not be deemed a waiver of any prior or subsequent breach. No terms or conditions of this Agreement shall be held to be waived, modified or deleted except by an instrument in writing, signed by the parties hereto.

17. ENTIRE AGREEMENT:

This written Agreement represents the entire agreement between the parties and supersedes any prior oral statements, discussions or understandings between the parties.

18. COUNTERPARTS:

This Agreement may be executed in any number of identical counterparts, notwithstanding that all parties have not signed the same counterpart, with the same effect as if all parties had signed the same document. All counterparts shall be construed as and shall constitute one and the same agreement.

19. SUCCESSORS AND ASSIGNS:

This Agreement shall be binding upon and inure to the benefit of the successors and assigns of the parties hereto; provided that no party hereto may assign this Agreement without the prior consent of the other party, which consent shall not be unreasonably delayed or withheld.

20. HEADINGS:

The headings to the paragraphs of this Agreement are solely for the convenience of the parties, and are not an aid in the interpretation of the instrument.

21. NOTICES:

Any notices to be sent to the City shall be sent to the City at the following address:

City of Burlington  
ATTN: City Clerk  
833 S. Spruce Street  
Burlington, WA 98233

With additional copies to:

Burlington Public Works Department and  
Burlington City Attorney

Any notices to be sent to Provider shall be sent to the following address:

Gray & Osborne, Inc.  
1130 Rainier Ave. S. Suite 300  
Seattle, WA 98144

AUTHORITY

Each individual executing this Agreement on behalf of the City and the Provider represents and warrants that such individual(s) are duly authorized to execute and deliver this Agreement on behalf of the City or the Providers.

IN WITNESS WHEREOF, the City and the Provider have executed this Agreement as of the date and year last written below.

**CITY OF BURLINGTON**

**PROVIDER:**

\_\_\_\_\_  
Steve Sexton  
Mayor

By: \_\_\_\_\_

Gray & Osborne, Inc  
Tax ID Number: 91-0890718  
UBI Number: 600 087 923

\_\_\_\_\_  
Marv Pulst, P.E.  
Public Works Director

\_\_\_\_\_  
Joe Stewart  
Finance Director

Approved As To Form

\_\_\_\_\_  
Leif Johnson  
City Attorney

# EXHIBIT A

## SCOPE OF SERVICES

### CITY OF BURLINGTON OUTFALL EVALUATION AND MIXING ZONE STUDY

The City of Burlington (City) owns, operates, and maintains an activated sludge wastewater treatment plant (WWTP). The treated and disinfected effluent flows into the Skagit River from the diversion vault through four separate ductile iron outfall pipes. (Three are 10 inches in diameter and one is 20 inches in diameter.) Each outfall pipe is equipped with a diffuser. The Washington State Department of Ecology (Ecology) issued to the City a National Pollutant Discharge Elimination System (NPDES) Waste Discharge Permit WA0020150 on January 12, 2018. This permit expires on January 31, 2023. All discharges and activities authorized by this permit must comply with the terms and conditions of the permit. Per Special Condition S9, the permit stipulates that the City must update the Outfall Evaluation and Mixing Zone Study (Beak, 1998). Ecology required a Plan of Study be submitted for review by February 1, 2020, prior to initiating the update to the Outfall Evaluation and Mixing Zone Study. A Plan of Study was prepared by Gray & Osborne (G&O) with the assistance of Cosmopolitan Marine Engineering (CME) and submitted to Ecology in January 2020. Ecology issued review comments regarding the Plan of Study on April 23, 2020. The comments are repeated below:

1. Page 3, Table 1 footnotes: “Due to the complex diffuser geometry, the outfall will be modeled both as a 19-port diffuser, with each port having an effective port diameter of 5 inches, and a single-port diffuser, with an effective port diameter of 21 inches....Actual spacing between ports is 5 feet; however, due to the complex configuration of the diffusers, the outfall will be modeled as a single port with an effective port diameter of 22 inches.”

*Given the high degree of simplification of diffuser geometry that will be carried forward into the new model, a dye study should be done to calibrate the model and ensure its accuracy.*

2. Page 3, Table 1 footnotes: “Port depth and Distance from shore taken from page 10 of 70 of the Fact Sheet for NPDES Permit WA0020150...”

*Be cautious about carrying forward old assumptions including about what data set to use when determining river flow statistics via online USGS tools. Upriver hydroelectric projects such as have occurred within the past 10 years or so at the Baker Dam may have measurably impacted base flows near the Burlington outfall. Baker River base flows went from 80 cfs to 1000 cfs near Concrete as a result of changes in operations at the*

*Baker Dam, and subsequent evaluations of available dilution on the Skagit River near Mt. Vernon showed a related, measureable increase in available dilution. Flows prior to the hydroelectric project might no longer be representative.*

3. Page 10: The proposal is to model available dilution at current 2020 and at projected 2030 flows.

*Please also evaluate available dilution at the hydraulic capacity as an end point. This could enable modeled dilution factors to be useful for the duration of the design life of the plant.*

As noted in Comment 1, Ecology is requiring a field dye study be completed for the Mixing Zone Study. Per the terms of the NPDES permit, the Mixing Zone Study is due to Ecology by October 1, 2020. The information in the Mixing Zone Study is used by Ecology to determine if additional effluent limitations will be added to the City's NPDES permit.

## **SCOPE OF WORK**

The following is a scope of work for completion of an Outfall Evaluation and Mixing Zone Study needed to fulfill the requirements of the City's NPDES permit Special Conditions S9 – Mixing Study, and S10 – Outfall Evaluation. Per the requirements of Section S9.A, the Mixing Zone Study will follow the *Guidance for Conducting Mixing Zone Analyses* (Appendix C of Ecology's *Permit Writer's Manual*, 2015) and the protocols identified in Section S9.C.

The scope of work is described below. The estimated not-to-exceed budget is included in Exhibit B. We have included efforts from Bill Fox of CME, whom we have worked with on multiple mixing zone studies and the Plan of Study for Burlington, in the scope and budget for the outfall evaluation, field work, and dilution modeling. CME's scope of work is attached to this scope of work and is incorporated by reference. G&O will provide project management, establish 1Q10, 7Q10 and harmonic mean river flow rates for the Skagit River, establish design flows, temperature, maps/drawings, AKART analysis, and "reasonable potential" evaluation of compliance with water quality standards, assistance with the field work, and report preparation. The Mixing Zone Study will address each reporting requirement as described in Section S9.B in the NPDES permit.

### **A. Project Management and Coordination**

1. Provide project management and coordination necessary to complete the project.



**B. Mixing Zone Plan of Study Addendum**

1. A mixing zone plan of study addendum memorandum will be prepared for submittal to Ecology to address Ecology's review comments, finalize quantification of key (1Q10, 7Q10 and harmonic mean) river flow rates for the Skagit River from USGS data, provide maps/drawings, establish the schedule and methods for conducting the dye tracer study, and the procedure for using the study results to establish or validate a mixing zone model for the Mixing Zone Study.

**C. Outfall Evaluation**

1. Conduct an inspection dive at the start of the dye injection to document the diffuser and effluent flow conditions. Photographs will be taken of the diffuser during the dye injection period.
2. Prepare narrative with photographs and submit to City and Ecology which will satisfy NPDES Permit Condition S10 – Outfall Evaluation.

**D. Dye Tracer Study**

1. Conduct a dye tracer study during the season of the lowest flow in the Skagit River, which generally occurs in late August and early September. The target date for the dye tracer study will be during the first 2 weeks of September 2020. The tracer study will include dye injection at the WWTP, plume sampling, and ancillary measurements from a boat in the Skagit River.

**E. Data Assessment**

1. Calculate the dilution factors at the acute and chronic mixing zone boundaries based on the field and laboratory fluorometry data measurements on the day(s) of the study.
2. Run the UM3 and RIVPLUM models using the ancillary measurements to support the ambient and effluent conditions present during the dye tracer studies. The model runs will be compared to the measured dilution values. An assessment and recommendation for the most appropriate model construct will be provided, based on comparison of observed to modeled dilutions.

3. Run the recommended mixing zone model at critical effluent flow rates and 7Q10 river discharge to establish acute, chronic, and human health dilution values for the NPDES permit.
4. Calculate the reasonable potential to exceed water quality standards using effluent concentrations, receiving water concentrations, Ecology's updated water quality standards in WAC Chapter 173-201A, and new dilution factors using the latest version of Ecology's PermitCalc spreadsheet.
5. Provide assessment of the potential for permit limits for ammonia and priority pollutant metals and organic compounds based on the reasonable potential analysis.

**F. Outfall Evaluation and Mixing Zone Study Report**

1. Prepare an Outfall Evaluation and Mixing Zone Study Report that documents the outfall inspection, tracer study field methods and results, model selection/development, AKART analysis, recommended NPDES dilution values, reasonable potential analysis, and permit limit analysis.
2. Prepare copies of the draft final Outfall Evaluation and Mixing Zone Study Report for review by the City. Provide electronic copy in PDF format.
3. Incorporate City comments and submit the final Outfall Evaluation and Mixing Zone Study Report to Ecology.

**G. Incorporate Ecology Revisions and Finalize Outfall Evaluation and Mixing Zone Study Report**

1. Respond to review comments and incorporate revisions in the final version of the Outfall Evaluation and Mixing Zone Study Report for submittal to Ecology.
2. Provide final Outfall Evaluation and Mixing Zone Study Report incorporating Ecology comments to the City and Ecology.

# Memorandum



PO Box 623 • Gig Harbor, WA 98335  
(253) 265-2958 • Fax (253) 272-7250  
BFox@cosmopolitaneng.com

**DATE:** May 16, 2020  
**TO:** Jay Swift, G&O  
**FROM:** Bill Fox, CME  
**RE:** City of Burlington Outfall Dye Study

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Following is the approach, scope of work and fee proposal recommended to satisfy Ecology's request for a dye tracer study at the City of Burlington WWTP.

## BACKGROUND

The City of Burlington NPDES Permit Section S9 requires the City to conduct a mixing zone study of their wastewater treatment plant discharge to the Skagit River. G&O submitted a mixing zone plan of study to Ecology in January 2020. The plan of study proposed to establish the acute, chronic and human health dilution factors using models, without any field tracer study confirmation of the models. Ecology responded on April 23:

*Given the high degree of simplification of diffuser geometry that will be carried forward into the new model, a dye study should be done to calibrate the model and ensure its accuracy.*

This scope of work establishes the scope of work and fee proposal for a dye tracer study as required by the Ecology response.

## S10 OUTFALL EVALUATION

This study will include injection of a fluorescent tracer into the effluent of the Burlington WWTP. Because the results will be used to calibrate a dilution model, it is necessary to confirm if the diffuser ports are open and flowing during the field study. An inspection dive will be conducted of the existing diffuser at the start of the dye injection to document the diffuser and effluent flow conditions. Photographs will be taken of the diffuser during the dye injection period. The photographs and accompanying narrative will be submitted to Ecology, which will satisfy NPDES Permit Condition S10 – Outfall Evaluation.

## PLAN OF STUDY ADDENDUM

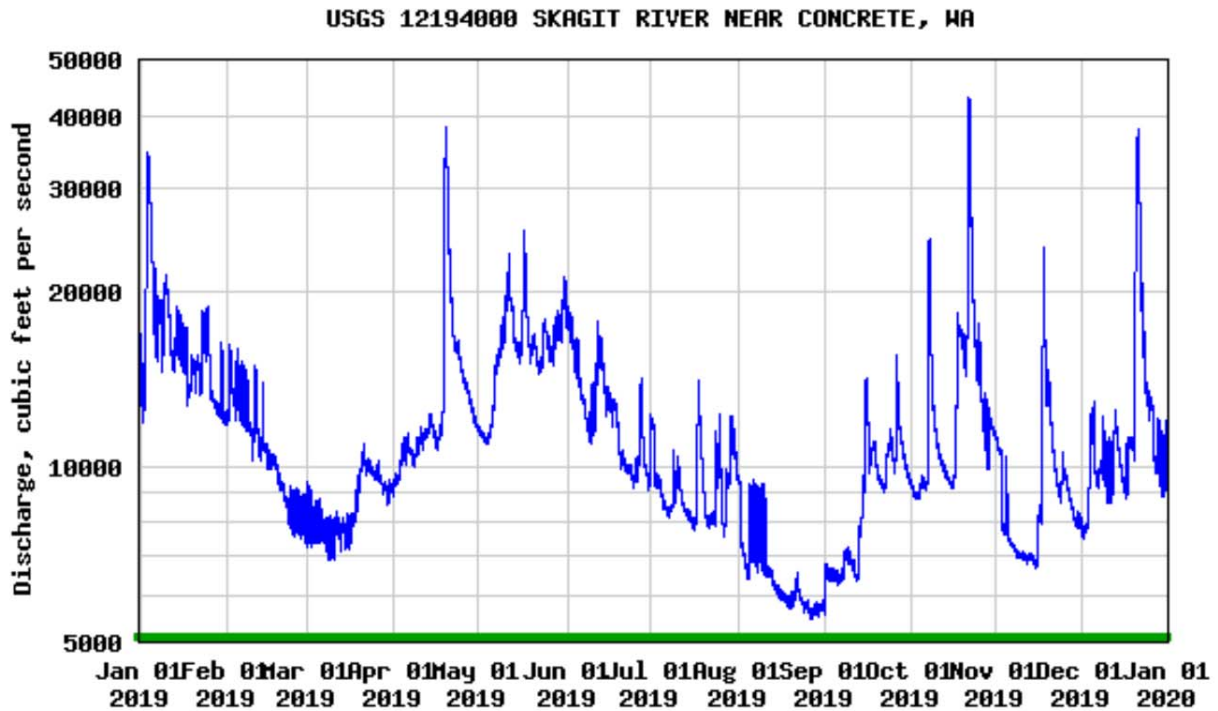
A mixing zone plan of study addendum memorandum will be prepared for submittal to Ecology in advance of the field study. The study plan will establish the schedule and methods for conducting the dye tracer study, and the procedure for using the study results to establish or validate a mixing zone model for the S9 Mixing Zone Study.

# EXHIBIT A-1

## DYE TRACER FIELD STUDY

### Schedule

The dye tracer study should be conducted during the season of the lowest flow in the Skagit River, which generally occurs in late August and early September. The following chart shows the daily flows in 2019. The target date for the dye tracer study will be during the first two weeks of September 2020.



### Equipment

Field work will be conducted from the river bank next to the outfall and from a small boat in the river. Principal equipment and materials include:

- Inflatable drift boat with outboard engine
- Rhodamine WT dye and pump
- Turner Designs SCUFA field fluorometer
- Garmin GPS
- Swoffer current meter and/or current drifters
- Dive equipment including underwater camera

### Dye Injection

Liquid Rhodamine WT dye (6.5% percent solution) will be injected into the effluent stream using a Watson-Marlow Model 504U peristaltic pump. The dye will be injected directly into the overflow from the UV channel at a target concentration of 500 to 1000 ppb (TBD). Mixed effluent samples will be collected at the outfall distribution chamber along the Skagit River Levee, approximately 40 yards downstream of the UV overflow chamber. WWTP personnel will assist by collecting effluent samples at the distribution chamber, and endeavoring to hold effluent flow as high and steady as possible during the field measurements.

# EXHIBIT A-1

## Plume Sampling

Field crew will collect dye concentration measurements at the acute and chronic mixing zone boundaries using a fluorometer suspended from the sampling vessel. Dye concentration will be measured with a Self-Contained Underwater Fluorescence Apparatus (SCUFA) by Turner Designs. The SCUFA will be positioned within the visible effluent plume, with data logged internally and uploaded later.

Bottle samples will also be collected through the plume and the mixing zone boundaries for subsequent laboratory testing. Upstream samples will be collected to quantify background fluorescence. The effluent, background and plume samples analyzed in the laboratory will provide the direct measurements of dilution at the mixing zone boundaries.

## Ancillary Measurements

A handheld current meter will be used to measure current speeds from the sampling vessel. Current speed will be measured upstream of the diffuser and at the apparent plume centerline at the mixing zone boundary. Current speed measurements will be collected at several locations within the water column and will be calculated as the average of three consecutive measurements. Current drifters plotted by GPS will be used as backup.

Effluent flow rate and temperature will be recorded by WWTP staff during the dye injection period. River flow rate will be obtained from USGS during the same period. River temperature will be recorded by the SCUFA.

## **ASSESSMENT**

The results of the dye tracer study will be assessed and used as follows:

1. The field and laboratory fluorometry data will provide direct measurement of dilution factors at the acute and chronic mixing zone boundaries on the day of the study.
2. The ancillary measurements will be used to run the UM3 and RIVPLUM models for the ambient and effluent conditions present during the dye tracer studies. The model runs will be compared to the measured dilution values. An assessment and recommendation for the most appropriate model construct will be provided, based on comparison of observed to modeled dilutions.
3. The recommended mixing zone model will then be run at critical effluent flow rates and 7Q10 river discharge to establish acute, chronic and human health dilution values for the NPDES permit.

## **REPORT**

A report will be prepared that documents the outfall inspection, tracer study field methods and results, model selection/development, and recommended NPDES dilution values.

A draft copy will be submitted to G&O and the City for review, followed by a final report for Ecology. A presentation to Ecology is included, if requested.

An allowance of 8 hours is included in this proposal for follow-up responses and report revisions resulting from comments by Ecology.

# EXHIBIT A-1

## STIPULATIONS

G&O and/or the City shall conduct the following:

- Establish 1Q10, 7Q10 and harmonic mean river flow rates for the Skagit River from USGS data.
- Establish (as necessary) design flows, temperature, maps/drawings, AKART analysis, and “reasonable potential” evaluation of compliance with water quality standards.

## SCHEDULE

Target due dates are as follows:

Study plan addendum	June 15
Field study	September 11
Draft report	September 24
Report to Ecology	October 1

## FEE

Fee for the services described herein shall be as follows, payable as lump sum upon completion of each task:

Task	Fee
Preliminary (review docs, study plan, mobilize equipment)	\$5,900
Field Study (dye injection, inspection, field data, laboratory tests)	\$13,700
Assessment (data analysis, model development, critical dilution values)	\$5,000
Draft and Final Report	\$4,800
Allowance for response to Ecology comments	\$1,500
Total	\$30,900

## EXHIBIT B

### ENGINEERING SERVICES SCOPE AND ESTIMATED COST

*City of Burlington - Outfall Evaluation and Mixing Zone Study*

Tasks	Principal Hours	Project Manager Hours	Project Engineer Hours	AutoCAD/ GIS Tech./ Eng. Intern Hours
A Project Management and Coordination	4	4		
B Mixing Zone Plan of Study Addendum	2	4	8	4
C Outfall Evaluation	1	2		
D Dye Tracer Study	2	8	20	
E Data Assessment	2	8	12	
F Outfall Evaluation and Mixing Zone Study Report	4	12	16	8
G Incorporate Ecology Revisions and Finalize Outfall Evaluation and Mixing Zone Study Report	2	4	4	2
Hour Estimate:	17	42	60	14
Fully Burdened Billing Rate Range:*	\$135 to \$200	\$119 to \$200	\$119 to \$148	\$50 to \$132
Estimated Fully Burdened Billing Rate:*	\$175	\$165	\$130	\$100
Fully Burdened Labor Cost:	\$2,975	\$6,930	\$7,800	\$1,400

Total Fully Burdened Labor Cost:	\$ 19,105
Direct Non-Salary Cost:	\$ 255
Subconsultant:	
Cosmopolitan Marine Engineering	\$ 30,900
Subconsultant Overhead (10%)	\$ 3,090
<b>TOTAL ESTIMATED COST:</b>	<b>\$ 53,350</b>

\* Actual labor cost will be based on each employee's actual rate. Estimated rates are for determining total estimated cost only. Fully burdened billing rates include direct salary cost, overhead, and profit.