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July 24, 2015

Proposal No. OPP201108

U.S. Environmental Protection Agency
Office of Research and Development
National Risk Management Research Laboratory
26 W. Martin Luther King Drive
Mail Code: MS489
Cincinnati, OH 45268

Attention: Dr. John McKernan
Alternate Task Order Manager

Dear Dr. McKernan:

Contract No. EP-C-11-038
Task Order No. 31, Assistance to the Engineering Technical Support Center
Technical Directive B3-17 – GCL Tie and Treating Superfund Site – Supplemental Site Characterization

Battelle Memorial Institute, through its corporate operations (Battelle), is pleased to submit the attached work plan for Technical Directive (TD) B3-17, GCL Tie and Treating Superfund Site – Supplemental Site Characterization. This TD proposal has been prepared in response to your direction to provide a proposal for the continuation of the TD under Task Order (TO) 31. Also included is Attachment 1 to the work plan, which consists of response to comments received from EPA Region 2 regarding the work plan for TD B2-17 initiated under TO 24.

Based on the information provided by the U.S. EPA and the Organizational Conflict of Interest (OCI) review that Battelle performed for this work order, Battelle does not believe that an OCI exists at this time. Battelle found no OCI between the work being performed under these projects and any of the STREAMS II work authorizations we are currently performing. Battelle's estimated total cost, including Task 1a (Optional): QAPP Format Update, for TD B3-17 is $276,046, including a fee of $15,604, for the period of July 14, 2015 through August 31, 2016.

Please feel free to contact Stephen Rosansky at (813) 474-2943 or by e-mail rosansky@battelle.org if you have any technical questions or comments regarding this work plan or LaDonna James at (614) 424- 5543 or by e-mail jamesl@battelle.org for any contractual questions.

Sincerely,
LaDonna F. James
Digitally signed by LaDonna F. James
DN: cn=LaDonna F. James, o=Government Contracts, ou=545, email=jamesl@battelle.org, c=US
Date: 2015.07.24 16:44:56 -04'00'
LaDonna James
Sr. Contracts Officer

LJ:hg
Enclosure
cc: Mr. Stephen Wright
Mr. Jorge Rangel
Ms. Ruth Corn, EPA
Ms. Camille Davis

TECHNICAL WORK PLAN

for

GCL TIE AND TREATING SUPERFUND SITE – SUPPLEMENTAL SITE CHARACTERIZATION

on

CONTRACT NO. EP-C-11-038
TASK ORDER 31, TECHNICAL DIRECTIVE B3-17

July 24, 2015

1.0: INTRODUCTION

The GCL Tie and Treatment property, located along the Susquehanna River in southwestern Delaware County, New York, occupies approximately 30 acres in an industrial area. A remedy consisting of excavation and treatment of contaminated soils was completed in 2000 and a groundwater extraction treatment system (GWETS) was installed and began operating on August 2004. The GWETS system has remained in operation to the present. Although effective at containing and removing a portion of the contaminants of concern (COCs), removal appears to be approaching an asymptotic level. It is suspected that the persistence of source material is preventing groundwater in the vicinity of MW-3B from being cleaned up within the expected timeframe of the remedy.

At the request of the U.S. Environmental Protection Agency (EPA), Battelle performed a detailed review and evaluation of all existing relevant site information including past optimization efforts, evaluating the Region's assessment of the existing groundwater pump and treat capture zone, revising the treatment capture zone analysis, and recommending a path forward for additional characterization at the site. Conclusions and recommendations were summarized in the document titled *GCL Tie and Treating Superfund Site Characterization and Remedial Options Evaluation* (Battelle, 2014).

On April 22, 2015, Battelle received Technical Directive B2-17 (TD B2-17), requesting that Battelle implement a number of the recommendations presented in the remedial options evaluation report, including performing a field investigation to better characterize lithology, groundwater hydraulics, and the nature and extent of nonaqueous phase liquid (NAPL) in the vicinity of MW-3B. This proposal is a request to restart this TD under Task Order 31 as TD B3-17.

2.0: OBJECTIVE

The primary objective of this TD is to conduct field activities to provide supplemental characterization at

the GCL site including subsurface and residual source material characterization in the vicinity of monitoring well MW-3B. Specifically, the objectives of this TD are to conduct the following activities at four proposed locations as outlined in the *GCL Tie and Treating Superfund Site Characterization and Remedial Options Evaluation* (Battelle, 2014):

- Determine the horizontal and vertical extent of NAPL in the source area
- Determine the vertical distribution of dissolved phase constituents and (if possible) correlate the concentrations with the presence of NAPL
- Identify transmissive zones, confining units, and preferential pathways within this source zone.

Battelle will utilize the information collected during this investigation to update the conceptual site model (CSM) and to evaluate the possibility of implementing alternative remedial options at the site. In addition, results will be used to evaluate if challenges at the site would make it technically impractical to achieve remedial goals within the source area that still contains NAPL, necessitating application for a technical impracticability (TI) waiver for that portion of the site.

3.0: ORGANIZATIONAL CONFLICT OF INTEREST

Battelle has performed an organizational conflict of interest (OCI) search for this TD and determined that there is no apparent OCI associated with this work.

4.0: SITE BACKGROUND

The GCL Tie and Treatment property occupies approximately 30 acres in an industrial area and consists of a sawmill and wood treating facility, and a former light manufacturing company. According to an analysis of historical photographs conducted by the EPA and accounts by local residents, wood-preserving activities at the site date as far back as the 1940s when the Delaware and Hudson Railway Company owned the property.

EPA initiated a removal action at the site in March 1991. Activities conducted as part of the removal action included: delineation of surface contamination, installation of a chain link fence, site stabilization, identification and disposal of containerized (e.g., tanks, drums) and non-containerized hazardous wastes (e.g., liquids in sumps), staging of contaminated soil and wood debris for disposal, and a pilot study to determine the effectiveness of composting to bioremediate creosote-containing soils.

The long-term response work being conducted at this site is divided into two operable units (OUs). OU1 deals with the contaminated soils on the portion of the site where GCL operated its facility. This area was the focus of historical removal activities. A remedy for this portion of the site was selected in a September 1994 Record of Decision (ROD), which called for the excavation and on-site treatment of contaminated soil via low temperature thermal desorption. The remedial design (RD) for OU1 was completed in September 1997, and on-site construction activities for OU1 began in August 1998 and were completed in June 2000.

OU2 deals with the soils/sediments on the remainder of the site (referred to as the non-GCL property), and also includes surface water, groundwater, and other components not covered under OU1. In March 1995, EPA selected a remedy in the OU2 ROD, calling for the extraction and on-site treatment of groundwater contaminated with organic compounds, discharge of treated groundwater to surface water, and the excavation and treatment of contaminated sediments via the thermal desorption system to be used for the GCL-property soils. Pools of dense NAPL-contaminated groundwater, encountered during the OU1 soil excavation, were pumped and treated as part of the OU1 remedial action. Pre-design groundwater

sampling conducted in November 1997 indicated that contamination had migrated offsite. Further sampling conducted in March 2000 defined the extent of the downgradient plume of contamination. The RD for OU2 was completed in the fall of 2001. The groundwater treatment system began operation on August 30, 2004. A Remediation System Evaluation (RSE) was conducted by EPA to optimize the management and operation of the treatment system. The RSE report was finalized by the end of December 2006 (EPA, 2006) and the recommendations of the RSE report have been implemented.

5.0: PROJECT ACTIVITIES

In accordance with the TD, Battelle will focus on the portion of the site where the GCL facility carried out its creosote operations, including the area where soil excavation (past removal action) was conducted. The earlier excavation work only involved unsaturated soils, so any polycyclic aromatic hydrocarbons (PAHs), which may have migrated into the saturated zone, were not considered in this remedy. Historical site evidence indicates that the source area may extend to where the MW-3B cluster is located or even further downgradient of this area. The depth of PAH migration also may extend into the shallow fractured bedrock.

Battelle will conduct supplemental site characterization activities including characterizing subsurface geologic conditions and evaluating the presence of NAPL and associated COCs (i.e., PAHs, volatile organic compounds [VOCs], and semivolatile organic compounds [SVOCs]) in four proposed locations as shown in Figure 1. An additional 1-inch-diameter monitoring well may be installed in the intermediate zone in an interval where NAPL is encountered, if NAPL is encountered during the investigation. Activities also will include collecting continuous soil cores to log geologic conditions and to identify intervals exhibiting NAPL. Locations of water-bearing zones will be identified using a heat pulse flowmeter (HPFM) and geophysical imaging, and groundwater samples will be collected at these zones and analyzed for COCs.

The scope of this project is divided into three tasks, including:

Task 1 – Finalize Quality Assurance Project Plan

Task 2 – Field Investigation

Task 3 – Reporting

Each of these tasks is described in detail in the remainder of this section.

5.1 Task 1: Finalize Quality Assurance Project Plan

A QAPP for the field investigation was drafted as part of TD B2-17. The draft QAPP was prepared in accordance with the Guidance for Quality Assurance Project Plans (EPA QA/G-5; EPA, 2002). It contains the organizational structure for the project, data quality objectives, a description of activities that will be performed, sampling procedures and analytical methods, quality assurance and quality control procedures, data management procedures, project schedule, and health and safety documentation, which is included as an attachment. Health and safety documentation comply with Occupational Safety and Health Administration (OSHA) requirements as specified in Code of Federal Regulations (CFR) 1910.120.

The draft QAPP has been developed to serve as a guidance document for groundwater, soil, and NAPL sampling conducted during field activities. The document will be finalized as part of this task. Comments received from the EPA will be addressed and incorporated into the final version of the document. The final version will be approved by the EPA prior to beginning field activities (Task 2).

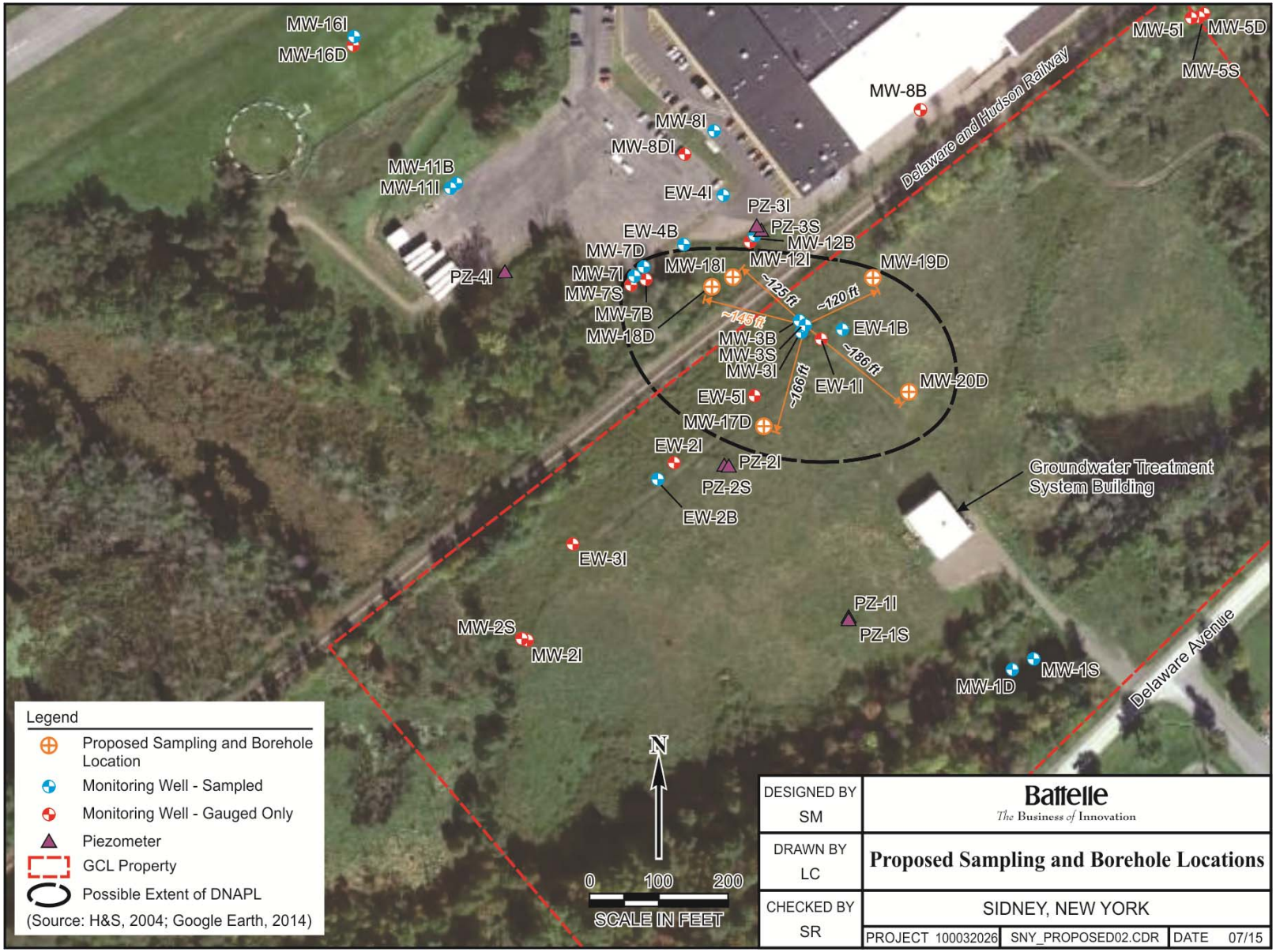

Figure 1. Proposed Borehole Locations

5.2 Task 1a (Optional): QAPP Format Update

Battelle developed the draft version of the QAPP following the Guidance for Quality Assurance Project Plans (EPA QA/G-5, EPA, 2002). Based on earlier discussions with the EPA, the draft document was prepared with the understanding that the Uniform Federal Policy (UFP) for Quality Assurance Project Plans, the format of which consists of 37 Worksheets, is not required for this project. However, preliminary comments received from the EPA on the draft QAPP indicate that the UFP format may be required. This optional task includes scope and associated cost to update the QAPP document to comply with the UFP format should the EPA confirm that the UFP format is required.

5.3 Task 2: Field Investigation

For the purpose of the activities outlined in this work plan, site lithology is broadly defined as two units: 1) the glaciolacustrine and glacial till deposits in the shallow and intermediate groundwater zones, and 2) fractured bedrock interbedded with clays in the deeper zone. Because of the very different physical properties of each of these zones and known limits associated with various drilling technologies, the proposed technical approach to characterize each of these lithologic units is different. Hence, a two-phase approach will be conducted to characterize the geology and nature and extent of contamination. The first phase will consist of characterizing the shallow and upper intermediate zones, and the second phase will involve characterizing the underlying intermediate and deep zones. The technical approach for characterizing each zone is outlined in detail in Sections 5.3.1 and 5.3.2 below.

In preparation of the field effort, Battelle will arrange for subcontractors to perform the following services:

- Utility locating using geophysical methods
- Drilling
- HPFM testing and geophysical imaging
- Investigation derived waste (IDW) disposal
- Analytical services.

Prior to the mobilization of the drilling rigs, Battelle staff will hold discussions with the EPA and other site stakeholders, which may include the railroad company, the Army Corps of Engineers and their on-site contractor to identify the ownership of the property onto which each borehole will be advanced to ensure appropriate permissions are obtained to perform the proposed work. Dig Safely New York will be notified and a private utility clearance contractor will be used to clear each proposed borehole location of any underground utilities.

It is estimated that the field investigation will require 16 days to complete. Battelle assumes that one staff member (geologist) will be on site for the duration of the investigation to oversee subcontractors, log cores, and collect soil, groundwater, and NAPL samples. A second staff member will provide field support for approximately one week during the period when two drill rigs will be operational. The proposed field investigation will consist of the proposed activities:

- Temporarily shut down operation of the groundwater treatment system for the duration of the field investigation.
- Use pressure transducers installed in existing monitoring wells adjacent to the proposed boreholes to monitor ambient water levels in different groundwater zones during drilling and groundwater sampling activities. Times of observed formation changes in the subsurface during drilling and groundwater purging and sample collection will be documented. The times at which formation changes occur and groundwater samples are collected will be evaluated and compared against any changes recorded in the pressure transducers to potentially correlate hydraulic transmissivity between shallow, intermediate, and deep zones.

- Measure groundwater elevations and NAPL thickness (if any) in all site wells.
- If NAPL is detected, collect NAPL samples and analyze for VOCs, SVOCs, viscosity, specific gravity, and hydrocarbon fraction. Up to three NAPL samples will be collected from either existing wells or new boreholes.
- Advance four boreholes and characterize the resulting aquifer material using a variety of drilling and characterization techniques (see Sections 5.3.1 and 5.3.2). The proposed locations of these boreholes are depicted in Figure 1.
- Collect groundwater and soil samples from proposed boreholes at discrete intervals. The proposed number of samples, analyses, and analytical methods are provided in Table 1.
- Perform HPFM testing and geophysical imaging (see Section 5.3.2).
- Complete the new borings into permanent 4-inch-diameter monitoring wells for future groundwater level elevation and chemical concentration monitoring.
- Complete one boring as a permanent 1-inch-diameter well in the intermediate zone for future groundwater monitoring.
- Survey each boring and/or monitoring well location.
- Containerize, characterize, and dispose of IDW generated during the investigation. All solid IDW will be containerized in 55-gallon steel drums, analyzed, and disposed in accordance with applicable regulations. Liquid IDW will be transferred and treated at the GWETS.

Table 1. Groundwater and Soil Sample Collection Plan

Sample Type	Number of Samples	Analytical Group	Analytical Method
Groundwater	52[(a)]	VOCs	U.S. EPA SW8260B
		SVOCs	U.S. EPA Method SW8260D
Soil	24	VOCs	U.S. EPA SW8260B
		SVOCs	U.S. EPA Method SW8260D
NAPL	3	Hydrocarbon Fraction	ASTM D7169
		Kinematic Viscosity	ASTM D7042/D445
		API Gravity	ASTM D4052
QC Samples			
Field Duplicates		10%	
MS/MSD		5%	
Equipment Rinsates		1 per sampling day	
Trip Blanks		1 per cooler of groundwater samples	
Field Blanks		1 per source of decontaminations water	
Temperature Blank		1 per cooler	

(a) 13 samples per each borehole location, assuming samples will be at 10-ft intervals, beginning approximately 20 ft below ground surface (bgs) to about 150 ft bgs.
(b) Samples will be collected at locations within the core where NAPL and/or lenses of more permeable aquifer material are observed

5.3.1 Shallow and Upper Intermediate Zone Characterization. Soils, groundwater, and NAPL in the shallow and upper intermediate zones will be characterized at the four proposed locations utilizing direct

push drilling techniques. Specifically, a Geoprobe® drill rig will be used to advance boreholes down to refusal depths (anticipated to be approximately 75 to 90 ft bgs) to collect continuous cores (via macro cores), which will be visually inspected and logged by a geologist. The Geoprobe® offers advantages of being faster, and overall, is less costly than other drilling technologies, such as sonic (which is the proposed method to characterize the bedrock zone).

Soil core logging activities will include visually identifying and documenting lithology and water-bearing zones, and inspecting the cores for visual staining indicative of the presence of NAPL. A hand-held photoionization detector (PID) will be used to identify portions of the core that have high concentrations of VOCs. The PID will be calibrated to detect VOCs using a calibration standard that most closely represents the nature of the COCs at the site. Portions of each core identified as being water-bearing zones and those portions of the core that are identified to contain NAPL and/or elevated concentrations of VOCs as measured by the PID will be subsampled. Core samples will be sent to a laboratory accredited in the State of New York for analysis of VOCs and SVOCs. A Hydropunch™ or comparable tool will be used to collect groundwater samples at the approximate intervals corresponding to where water-bearing zones, NAPL, and/or elevated levels of VOCs are observed to be present.

In addition to sampling contaminated intervals, groundwater samples will be collected at suspected "clean" intervals to confirm conditions at those intervals are free of contamination. In general, one groundwater sample per 10 ft of depth will be collected, including "clean" samples to verify presence/absence of VOCs. Sampling frequency may change due to site-specific conditions encountered while in the field. Once the desired information and samples are collected, the direct push investigation boreholes will be abandoned, backfilled, and sealed via tremie grouting methods to approximately 1 ft bgs. The remaining 1 ft of borehole space will be backfilled to the surface with soil.

If NAPL is detected in the shallow or intermediate zone, it would be beneficial to install a permanent monitoring well at the approximate depth interval where NAPL is encountered, which could be used to monitor the progress of any remedy used to treat that interval. Hence, costs have been included to complete one of the borings as a 1-inch-diamter permanent monitoring well screened across a 5-ft-long interval as opposed to abandoning it as described above.

5.3.2 Lower Intermediate and Deep Zone Characterization. Soils, groundwater and NAPL in the lower intermediate and deep zones (anticipated to be approximately 75 to 150 ft bgs) will be characterized using sonic drilling and HQ[1] coring. Sampling will be performed at the same four general locations where the shallow zone boreholes will be advanced. A sonic drill rig will be utilized to quickly drill through the overburden down to the depth of refusal encountered by the Geoprobe® drill rig. Continuous sonic cores will be collected across the entire borehole. The cores will be extruded into FLUTe® liners to characterize the presence/absence of NAPL in these zones. The cores in intermediate and deep zones, beginning approximately at the depth of refusal encountered by the Geoprobe®, will be logged by a geologist. Core logging activities will include visually identifying and documenting the lithology and water-bearing zones (if possible), and identifying the intervals in which NAPL is present. A hand-held PID will be used to identify portions of the core that have high concentrations of VOCs. Information from core logging activities will be used to inform decisions as to where to collect discrete groundwater samples in the lower intermediate and weathered bedrock zones. Groundwater samples will be collected using the push-ahead method associated with sonic drilling. The push-ahead sampler is advanced beyond the zone of influence

[1] The designation HQ refers to the size of the drill bit, typically 64 mm inside diameter (ID) and 96 mm outside diameter (OD).

of the drilling bit into the native undisturbed formation. Upon opening the sampling ports, an unadulterated representative groundwater sample is collected directly from the zone of interest without purging requirements.

Upon encountering bedrock within the deep zone, HQ coring will be implemented to ensure whole competent bedrock cores are retrieved. HQ coring also will eliminate any concerns using sonic drilling in the bedrock layer, which could (under the right conditions) create some fractures in the bedrock. As with continuous sonic coring, cores collected using the HQ method will be extruded into FLUTe® liners to characterize NAPL in the bedrock zone. In addition, they will be logged by a geologist with the objective of visually identifying and documenting fractures, fracture fill, and the water-bearing zones. Every attempt will be made to extract the cores as they are oriented at depth so that geologic strike/dip and fracture orientation can be evaluated.

Upon completion of HQ coring in the bedrock, conductor casing will be set through the shallow and intermediate zones as well as weathered portions of the bedrock to isolate these zones from the competent bedrock zone to prepare for HPFM testing and geophysical logging in the bedrock zone. In order to conduct HPFM testing in the bedrock zone, the bedrock zone must be isolated from overburden and weathered bedrock. At each of the proposed investigation locations, casing will be set down to competent bedrock to isolate the bedrock zone from the overburden and weathered bedrock, which will effectively convert the borehole into the monitoring well with an open borehole into competent bedrock. The depth at which the bedrock wells are set will be determined in the field based on information collected from the HQ coring activities.

HPFM testing will be conducted in the competent bedrock zone to identify water-producing intervals in the bedrock unit under ambient conditions. If no groundwater flow is measured under ambient conditions, HPFM testing under stressed conditions may be required. Stressed conditions will be implemented by turning on existing nearby extraction wells set in the bedrock formation to influence groundwater flow in the bedrock. In addition, geophysical logging of the bedrock boreholes will be conducted. Proposed techniques include measuring fluid temperature and fluid resistivity, and using natural gamma ray, caliper, optical televiewer, and acoustic televiewer logging tools. A description of what each of these tests provide is provided below:

- **Fluid temperature** – Fluid-temperature logs provide a continuous record of vertical variations in the water temperature in a well. Temperature logs are used to identify water-producing and water-receiving zones and to determine zones of vertical borehole flow.

- **Fluid resistivity** – Fluid-resistivity logs are used to identify water-producing and water-receiving zones and to determine intervals of vertical borehole flow. Water-producing and water-receiving zones are usually identified by distinct changes in resistivity.

- **Natural gamma ray** – Fine-grained sediments such as shale or siltstone usually emit more gamma radiation than sandstone, limestone, or dolomite. This presents the potential to identify fracture zones (known to be filled with mud at depth).

- **Caliper** – The caliper log is used to identify possible water-bearing fractures and to adjust responses of other logs to changes in well diameter.

- **Optical televiewer** – This tool generates a continuous oriented 360° image of the borehole wall using an optical imaging system which can be used to identify fracture zones and fracture orientation (dip) in the bedrock.

- **Acoustic televiewer** – This tool utilizes multi-eco acoustic properties to construct a detailed image of the borehole. In certain geologic settings (darker lithology's and iron staining) the acoustic televiewer will render a cleaner borehole image than optical televiewer imaging would in the same setting.

The results of the HPFM and geophysical testing will be available in near real time and will be used to inform decisions as to where to collect discrete groundwater samples. Groundwater samples collected in bedrock will be collected via low-flow methods using a bladder pump.

5.4 Task 3: Reporting

Following the field investigation and laboratory analysis of soil and groundwater samples collected during field activities, a technical memorandum summarizing field activities will be prepared by Battelle. The technical memorandum will include all soil and groundwater analytical results, HPFM results, and borehole geophysical logging results. The data will be used to update the CSM, including a text description of field observations, data interpretation, and possibly modifying existing figures from previous reports. No computer modeling will be conducted as part of the CSM update. Considerations and recommendations for an appropriate path forward for the site will be provided. In addition, the technical memorandum will include the evaluation of potential alternative remediation technologies that can significantly reduce or eliminate the source. Draft and final versions of the document will be prepared.

5.5 Expected Conditions

The following assumptions were made to develop the cost proposal for the proposed technical effort:

- One Battelle staff member will be onsite, responsible for overseeing field activities. A second staff member will be on site for one week while the two drilling contractors are onsite simultaneously.
- Field activities will take 16 days.
- Field work will not be performed on weekends.
- The project plan will be documented in the form of a QAPP as outlined in the Guidance for Quality Assurance Project Plans (EPA QA/G-5, EPA, 2002) unless the EPA elects to fund optional Task 4.
- One draft and one final version of the QAPP will be prepared.
- It is assumed that no permits of any type will be required and therefore costs to apply for permits are not included.
- Boreholes will be advanced to a maximum depth of 150 ft bgs.
- Pressure transducers are already installed in various monitoring wells at the site. Battelle will have access to data generated during proposed sampling activities.
- Well completion reports will be prepared by the drilling subcontractor. Costs for this effort are included.
- No overhead obstructions were observed during a site visit, which would prevent drill rig setup.
- The EPA (or its contractors) will arrange access to the private property north of the site, at which one boring location is proposed.
- Conversations will be held with the EPA and property owners (MeadWestvaco and the Railroad Company) in order to determine approved access for the location of the proposed borehole north of

the railroad.

- EPA will ensure that access to the site pump-and-treat operations and the pressure transducers is secured.
- Electric power is available on the Mead Westvaco property.
- Pricing assumes all four boreholes will be completed as permanent 4-inch-diameter monitoring wells in the bedrock and the installation of one 1-inch-diameter monitoring well in the intermediate zone.
- Personal protective equipment (PPE) required onsite will be Level D.
- HPFM testing and geophysical logging will be conducted at the conclusion of drilling once drill rigs have mobilized offsite.
- A clean water source and electric power are available onsite to use in support of drilling and field activities. Costs for utility usage are not included.
- Extraction system controls are accessible. The on-site contractor, H&S Environmental, will be available to assist Battelle staff to temporarily turn off the extraction system during the majority of the field event (the system may need to be turned on during portions of the HPFM testing in order to induce groundwater flow).
- H&S will provide site access during field activities.
- H&S will provide access to existing pressure transducers on site in support of this field event.
- Liquid IDW generated during drilling activities will be combined with the groundwater treatment plant process water influent.
- One draft and one final version of the technical memorandum will be prepared.

6.0: PROJECT MANAGEMENT AND STAFFING

Battelle's Task Order Leader is Ms. Amy Dindal, who will be responsible for overall project management and technical oversight. Ms. Dindal is Battelle's STREAMS II Contract Manager and successfully managed the EPA Environmental Technology Verification (ETV) Advanced Monitoring Systens Center and ETV Materials Management and Research Center, with similar responsibilities, for several years. Mr. Stephen Rosansky will serve as Battelle's Technical Directive Manager. Mr. Rosansky holds a B.S. in chemical engineering from The Ohio State University, Professional Engineer licenses in Ohio, Florida, and South Carolina and is a certified Project Management Professional. Mr. Rosansky has more than 20 years of consulting experience implementing a wide range of remedial technologies to treat sites contaminated with NAPLs consisting of petroleum hydrocarbons and chlorinated solvents. Mr. Andrew Barton will serve as the technical lead for the project. Mr. Barton holds a M.S. in hydrogeology from The Ohio State University, and has over 18 years of consulting experience in designing and optimizing soil and groundwater remedial systems. He currently serves as the lead of Battelle's Site Characterization Practice Area. Ms. Dindal, Mr. Rosansky, and Mr. Barton will rely on additional Battelle staff for various technical expertise pertaining to hydrogeology as well as other administrative support.

7.0: SCHEDULE AND COST

Battelle's proposed cost with and without Optional Task 1a is shown in Table 2. The proposed schedule for TD B3-17 is provided in Figures 2 and 3. Figure 2 is the proposed schedule should the EPA elect not to

award optional Task 1a, whereas Figure 3 represents the proposed schedule should the optional task be awarded. The period of performance for this effort is July 14, 2015 through August 31, 2016 for a proposed cost of $276,046 with a fixed fee of $15,604 assuming the optional task is awarded.

Table 2. Task Descriptions and Cost

Task	*Task Description*	*Cost*	*Fee*	*Total*
Task 1	Finalize Quality Assurance Project Plan	$ 5,706	$ 340	$ 6,046
Task 2a	Field Invest - Prep	$ 4,124	$ 247	$ 4,371
Task 2b	Field Invest	$ 216,302	$ 12,976	$ 229,278
Task 3	Reporting	$ 26,747	$ 1,595	$ 28,342
Total Costs Excluding Option		**$ 252,880**	**$ 15,158**	**$ 268,038**
Task 1a	Task 1a (Optional): QAPP Format Update	$ 7,562	$ 446	$ 8,008
Total Optional Costs		**$ 7,562**	**$ 446**	**$ 8,008**
Total Proposed Costs		**$ 260,442**	**$ 15,604**	**$ 276,046**

9.0: REFERENCES

Battelle. 2012. GCL Tie and Treating Superfund Site Characterization and Remedial Options Evaluation. July 8.

EPA. 2006. Remediation System Evaluation (RSE) GCL Tie and Treating superfund Site, Sidney, New York. EPA 542-R-06-016. EPA 542-R-06-016. December.

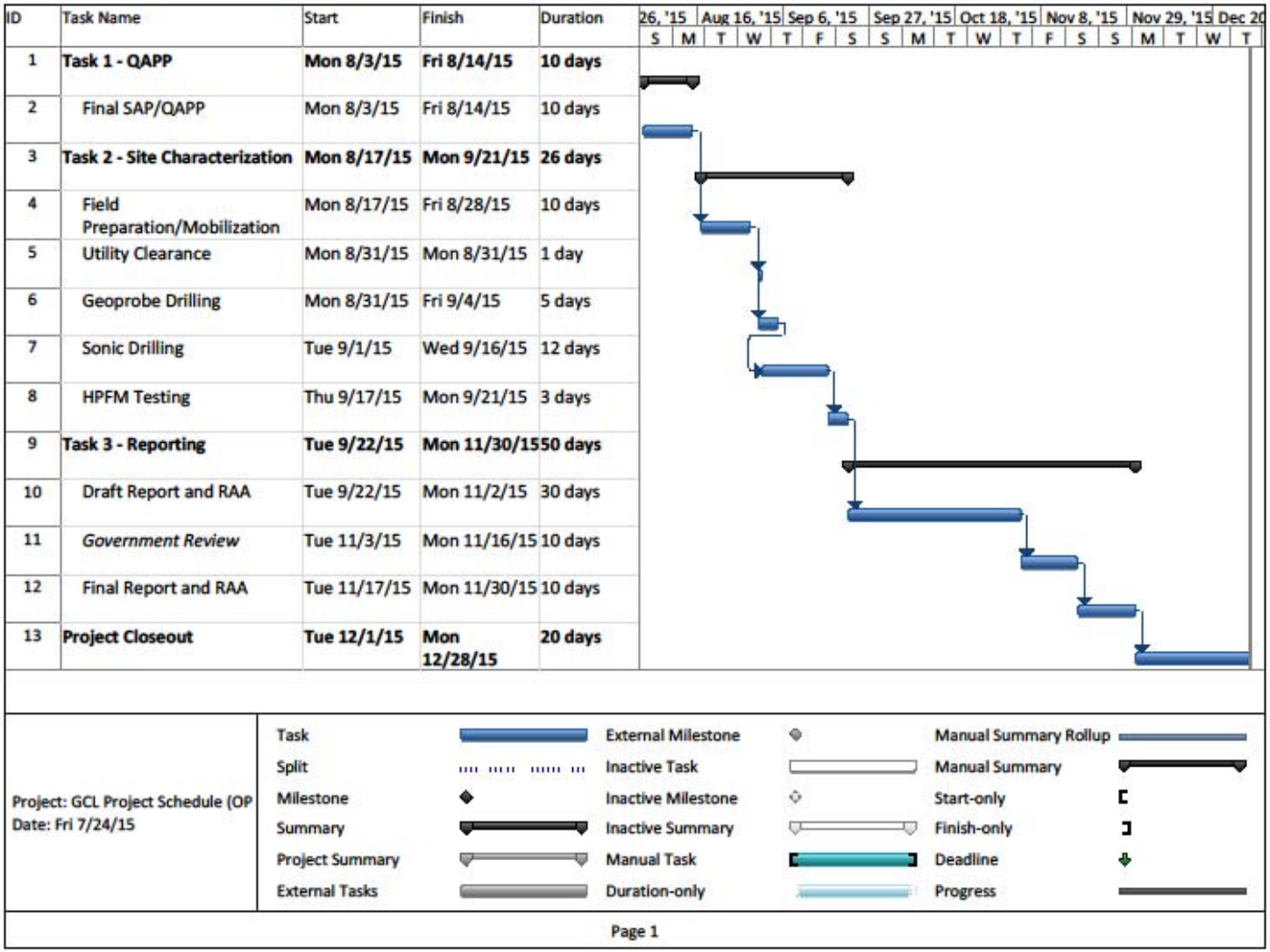

Figure 2. Project Schedule without Optional Task

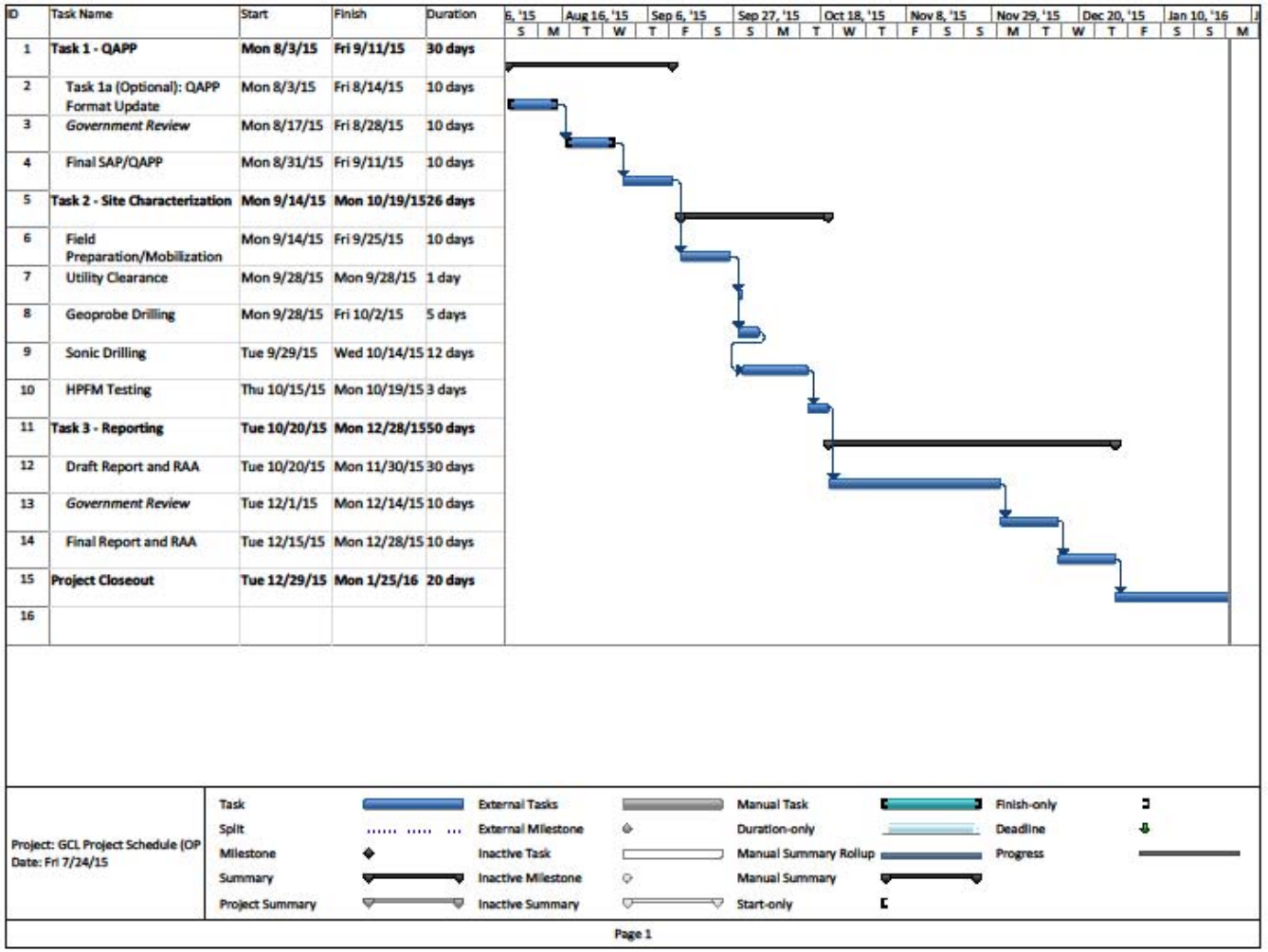

Figure 3. Project Schedule Including Optional Task

PRICE PROPOSAL

Task Order No. 31, Assistance to the Engineering Technical Support Center

Technical Directive B3-17 – GCL Tie and Treating Superfund Site Supplemental Site Characterization

Contract No. EP-C-11-038

Proposal No. OPP201108

Submitted to

U.S. Environmental Protection Agency
Cincinnati Procurement Operations Division
26 W. Martin Luther King Drive, NWD
Cincinnati, OH 45268-7001

by

Battelle
505 King Avenue
Columbus, OH 43201

July 24, 2015

NOTICE

Battelle Memorial Institute
Detail Cost Breakdown Report
Lbr Cat Burden Thru Esc

Proposal Summary

Resource-Description	Dept	2015 Hrs/Base	2015 Rate	2015 Cost	2016 Hrs/Base	2016 Rate	2016 Cost	Total Hrs/Base	Total Rate	Total Cost
Salary Labor										
ADMIN		5.00		125	36.00		844	41.00		969
EDITOR		4.00		130	16.00		525	20.00		656
GRDES		4.00		121	24.00		728	28.00		849
P2SCI		16.00		624	244.00		9,542	260.00		10,167
P4ENG		22.00		1,420	64.00		4,147	86.00		5,568
P4SCI		38.00		1,545	120.00		5,959	158.00		7,504
PADMIN		3.00		91	12.00		367	15.00		458
TECH		0.00		0	56.00		1,448	56.00		1,448
Total Regular Labor		**92.00**		**4,057**	**572.00**		**23,560**	**664.00**		**27,617**
Total Labor				**4,057**			**23,560**			**27,617**
Fringe Base (LABOR+ESC)										
Salary Fringe Group A		4,057.01		1,704	23,560.05		10,296	27,617.06		12,000
Total Fringe		**4,057.01**		**1,704**	**23,560.05**		**10,296**	**27,617.06**		**12,000**
Division OH Base (LBR+FRG)										
BCO Division Overhead		2,547.21		1,607	6,632.88		4,185	9,180.09		5,793
BTSO Division Overhead		3,213.75		839	27,222.91		7,105	30,436.66		7,944
Total Division Overhead		**5,760.96**		**2,446**	**33,855.79**		**11,291**	**39,616.74**		**13,737**
Other Direct Cost										
ERI BCO Special Facilities-31870834		534.08		27	3,014.37		151	3,548.45		177
ERI BCO Special Facilities-31880924		0.00		0	1,178.23		59	1,178.23		59
Procurement Admin (Purch)	31870834	0.00		0	32,813.50		574	32,813.50		574
Procurement Admin (Sub)	31870834	0.00		0	152,748.48		2,673	152,748.48		2,673
Special Facilities-35850071		0.00		0	597.11		18	597.11		18
Special Facilities-35851046		2,016.86		61	5,959.72		179	7,976.57		239
Special Facilities-35870834		1,196.89		36	20,666.08		620	21,862.97		656
Travel	35851046	0.00		0	3.00		6,924	3.00		6,924
Oakland, CA (Clay St)-35870834		886.76		80	0.00		0	886.76		80
Pittsburgh, PA (Springho-35870834		310.13		2	0.00		0	310.13		2
Tampa, FL (LeClare Shore-35851046		2,016.86		12	0.00		0	2,016.86		12
Total Other Direct Costs				**217**			**11,198**			**11,415**
G&A Base (LBR+FRG+DOH+ODC)										
G&A		8,423.92		1,405	56,343.97		8,333	64,767.89		9,738
Total G&A		**8,423.92**		**1,405**	**56,343.97**		**8,333**	**64,767.89**		**9,738**
Purchases										
Purchased Materials	31870834	0.00		0	5,830.00		5,851	5,830.00		5,851
Purchased Services	31870834	0.00		0	25,993.00		26,161	25,993.00		26,161
Purchased Equipment	31870834	0.00		0	800.00		802	800.00		802
Total Purchases		**0.00**		**0**	**32,623.00**		**32,813**	**32,623.00**		**32,813**
Subcontractor										
Cascade Drilling-Subcontractor	31870834	0.00		0	2.00		114,772	2.00		114,772
Hager-Richter (HPFM)-Subcontractor	31870834	0.00		0	1.00		13,400	1.00		13,400
Zebra Drilling-Subcontractor	31870834	0.00		0	1.00		24,576	1.00		24,576
Total Subcontractors		**0.00**		**0**	**4.00**		**152,748**	**4.00**		**152,748**

Proposal Summary

Resource-Description	Dept	2015 Hrs/Base	2015 Rate	2015 Cost	2016 Hrs/Base	2016 Rate	2016 Cost	Total Hrs/Base	Total Rate	Total Cost
Fee										
Fee		9,828.92		590	250,239.01		15,014	260,067.93		15,604
Total Fee		**9,828.92**		**590**	**250,239.01**		**15,014**	**260,067.93**		**15,604**
COFC DOH Base (LBR+FRG)										
CoFC DOH		2,547.21		81	6,632.88		221	9,180.09		302
COFC GA Base (LBR+FRG+DOH+ODC)										
CoFC G&A		8,423.92		33	14,275.19		39	22,699.10		72
Total of CoFC		**10,971.13**		**114**	**20,908.06**		**260**	**31,879.19**		**374**
Total Estimated Cost				**9,943**			**250,499**			**260,442**
Total Estimated Cost and Fee				**10,533**			**265,513**			**276,046**
GRAND TOTAL ESTIMATED COST AND FEE				**10,533**			**265,513**			**276,046**

Proposal Project: TO31 TD B3-17
Activity ID: 01 - Task 1

Resource-Description	Dept	2015 Hrs/Base	2015 Rate	2015 Cost	Total Hrs/Base	Total Rate	Total Cost
Salary Labor							
ADMIN		5.00		125	5.00		125
EDITOR		4.00		130	4.00		130
GRDES		4.00		121	4.00		121
P2SCI		16.00		624	16.00		624
P4ENG		18.00		1,162	18.00		1,162
P4SCI		6.00		296	6.00		296
PADMIN		3.00		91	3.00		91
Total Regular Labor		**56.00**		**2,550**	**56.00**		**2,550**
Total Labor				**2,550**			**2,550**
Fringe Base (LABOR+ESC)							
Salary Fringe Group A		2,550.13		1,071	2,550.13		1,071
Total Fringe		**2,550.13**		**1,071**	**2,550.13**		**1,071**
Division OH Base (LBR+FRG)							
BCO Division Overhead		774.14		488	774.14		488
BTSO Division Overhead		2,847.04		743	2,847.04		743
Total Division Overhead		**3,621.19**		**1,232**	**3,621.19**		**1,232**
Other Direct Cost							
ERI BCO Special Facilities-31870834		534.08		27	534.08		27
Special Facilities-35851046		1,650.15		50	1,650.15		50
Special Facilities-35870834		1,196.89		36	1,196.89		36
Oakland, CA (Clay St)-35870834		886.76		80	886.76		80
Pittsburgh, PA (Springho-35870834		310.13		2	310.13		2
Tampa, FL (LeClare Shore-35851046		1,650.15		10	1,650.15		10
Total Other Direct Costs				**204**			**204**
G&A Base (LBR+FRG+DOH+ODC)							
G&A		5,056.43		605	5,056.43		605
Total G&A		**5,056.43**		**605**	**5,056.43**		**605**
Fee							
Fee		5,661.80		340	5,661.80		340
Total Fee		**5,661.80**		**340**	**5,661.80**		**340**
COFC DOH Base (LBR+FRG)							
CoFC DOH		774.14		25	774.14		25
COFC GA Base (LBR+FRG+DOH+ODC)							
CoFC G&A		5,056.43		20	5,056.43		20
Total of CoFC		**5,830.57**		**45**	**5,830.57**		**45**
Total Estimated Cost				**5,706**			**5,706**
Total Estimated Cost and Fee				**6,046**			**6,046**

Proposal Project: TO31 TD B3-17
Activity ID: 01 - Task 1

		2015			Total		
Resource-Description	**Dept**	**Hrs/Base**	**Rate**	**Cost**	**Hrs/Base**	**Rate**	**Cost**
Total for Activity ID, 01 - Task 1				**6,046**			**6,046**

Proposal Project: TO31 TD B3-17
Activity ID: 02 - Task 2a

		2016			Total		
Resource-Description	**Dept**	**Hrs/Base**	**Rate**	**Cost**	**Hrs/Base**	**Rate**	**Cost**
Salary Labor							
ADMIN		4.00		78	4.00		78
P2SCI		12.00		468	12.00		468
P4ENG		2.00		129	2.00		129
P4SCI		5.00		287	5.00		287
Total Regular Labor		**23.00**		**963**	**23.00**		**963**
Total Labor				**963**			**963**
Fringe Base (LABOR+ESC)							
Salary Fringe Group A		963.15		421	963.15		421
Total Fringe		**963.15**		**421**	**963.15**		**421**
Division OH Base (LBR+FRG)							
BCO Division Overhead		112.60		71	112.60		71
BTSO Division Overhead		1,271.44		332	1,271.44		332
Total Division Overhead		**1,384.05**		**403**	**1,384.05**		**403**
Other Direct Cost							
ERI BCO Special Facilities-31870834		112.60		6	112.60		6
Procurement Admin (Purch)	31870834	2,007.06		35	2,007.06		35
Special Facilities-35850071		99.02		3	99.02		3
Special Facilities-35851046		185.55		6	185.55		6
Special Facilities-35870834		986.87		30	986.87		30
Total Other Direct Costs				**79**			**79**
G&A Base (LBR+FRG+DOH+ODC)							
G&A		1,865.84		247	1,865.84		247
Total G&A		**1,865.84**		**247**	**1,865.84**		**247**
Purchases							
Purchased Materials	31870834	2,000.00		2,007	2,000.00		2,007
Total Purchases		**2,000.00**		**2,007**	**2,000.00**		**2,007**
Fee							
Fee		4,119.55		247	4,119.55		247
Total Fee		**4,119.55**		**247**	**4,119.55**		**247**
COFC DOH Base (LBR+FRG)							
CoFC DOH		112.60		4	112.60		4
COFC GA Base (LBR+FRG+DOH+ODC)							
CoFC G&A		224.41		1	224.41		1
Total of CoFC		**337.01**		**4**	**337.01**		**4**
Total Estimated Cost				**4,124**			**4,124**
Total Estimated Cost and Fee				**4,371**			**4,371**

Proposal Project: TO31 TD B3-17
Activity ID: 02 - Task 2a

		2016			Total		
Resource-Description	**Dept**	**Hrs/Base**	**Rate**	**Cost**	**Hrs/Base**	**Rate**	**Cost**
Total for Activity ID, 02 - Task 2a				**4,371**			**4,371**

Proposal Project: TO31 TD B3-17
Activity ID: 03 - Task 2b

		2016			Total		
Resource-Description	**Dept**	**Hrs/Base**	**Rate**	**Cost**	**Hrs/Base**	**Rate**	**Cost**
Salary Labor							
ADMIN		11.00		215	11.00		215
P2SCI		152.00		5,933	152.00		5,933
P4ENG		10.00		646	10.00		646
P4SCI		25.00		1,408	25.00		1,408
PADMIN		9.00		273	9.00		273
TECH		56.00		1,448	56.00		1,448
Total Regular Labor		**263.00**		**9,922**	**263.00**		**9,922**
Total Labor				**9,922**			**9,922**
Fringe Base (LABOR+ESC)							
Salary Fringe Group A		9,922.24		4,336	9,922.24		4,336
Total Fringe		**9,922.24**		**4,336**	**9,922.24**		**4,336**
Division OH Base (LBR+FRG)							
BCO Division Overhead		702.05		443	702.05		443
BTSO Division Overhead		13,556.21		3,538	13,556.21		3,538
Total Division Overhead		**14,258.26**		**3,981**	**14,258.26**		**3,981**
Other Direct Cost							
ERI BCO Special Facilities-31870834		309.66		15	309.66		15
Procurement Admin (Purch)	31870834	30,806.44		539	30,806.44		539
Procurement Admin (Sub)	31870834	152,748.48		2,673	152,748.48		2,673
Special Facilities-35850071		297.07		9	297.07		9
Special Facilities-35851046		927.73		28	927.73		28
Special Facilities-35870834		12,331.41		370	12,331.41		370
Travel	35851046	3.00		6,924	3.00		6,924
Total Other Direct Costs				**10,558**			**10,558**
G&A Base (LBR+FRG+DOH+ODC)							
G&A		28,797.81		3,914	28,797.81		3,914
Total G&A		**28,797.81**		**3,914**	**28,797.81**		**3,914**
Purchases							
Purchased Materials	31870834	3,830.00		3,844	3,830.00		3,844
Purchased Services	31870834	25,993.00		26,161	25,993.00		26,161
Purchased Equipment	31870834	800.00		802	800.00		802
Total Purchases		**30,623.00**		**30,806**	**30,623.00**		**30,806**
Subcontractor							
Cascade Drilling-Subcontractor	31870834	2.00		114,772	2.00		114,772
Hager-Richter (HPFM)-Subcontractor	31870834	1.00		13,400	1.00		13,400
Zebra Drilling-Subcontractor	31870834	1.00		24,576	1.00		24,576
Total Subcontractors		**4.00**		**152,748**	**4.00**		**152,748**
Fee							
Fee		216,266.84		12,976	216,266.84		12,976

Proposal Project: TO31 TD B3-17
Activity ID: 03 - Task 2b

Resource-Description	Dept	2016 Hrs/Base	2016 Rate	2016 Cost	Total Hrs/Base	Total Rate	Total Cost
Total Fee		**216,266.84**		**12,976**	**216,266.84**		**12,976**
COFC DOH Base (LBR+FRG)							
CoFC DOH		702.05		23	702.05		23
COFC GA Base (LBR+FRG+DOH+ODC)							
CoFC G&A		4,372.73		12	4,372.73		12
Total of CoFC		**5,074.78**		**35**	**5,074.78**		**35**
Total Estimated Cost				**216,302**			**216,302**
Total Estimated Cost and Fee				**229,278**			**229,278**
Total for Activity ID, 03 - Task 2b				**229,278**			**229,278**

Proposal Project: TO31 TD B3-17
Activity ID: 04 - Task 3

Resource-Description	Dept	2016 Hrs/Base	2016 Rate	2016 Cost	Total Hrs/Base	Total Rate	Total Cost
Salary Labor							
ADMIN		17.00		445	17.00		445
EDITOR		12.00		395	12.00		395
GRDES		24.00		728	24.00		728
P2SCI		80.00		3,141	80.00		3,141
P4ENG		48.00		3,114	48.00		3,114
P4SCI		72.00		3,561	72.00		3,561
PADMIN		3.00		94	3.00		94
Total Regular Labor		**256.00**		**11,478**	**256.00**		**11,478**
Total Labor				**11,478**			**11,478**
Fringe Base (LABOR+ESC)							
Salary Fringe Group A		11,478.26		5,016	11,478.26		5,016
Total Fringe		**11,478.26**		**5,016**	**11,478.26**		**5,016**
Division OH Base (LBR+FRG)							
BCO Division Overhead		4,470.09		2,821	4,470.09		2,821
BTSO Division Overhead		12,024.17		3,138	12,024.17		3,138
Total Division Overhead		**16,494.26**		**5,959**	**16,494.26**		**5,959**
Other Direct Cost							
ERI BCO Special Facilities-31870834		2,253.27		113	2,253.27		113
ERI BCO Special Facilities-31880924		1,178.23		59	1,178.23		59
Special Facilities-35850071		201.02		6	201.02		6
Special Facilities-35851046		4,475.35		134	4,475.35		134
Special Facilities-35870834		7,347.79		220	7,347.79		220
Total Other Direct Costs				**532**			**532**
G&A Base (LBR+FRG+DOH+ODC)							
G&A		22,985.49		3,593	22,985.49		3,593
Total G&A		**22,985.49**		**3,593**	**22,985.49**		**3,593**
Fee							
Fee		26,578.33		1,595	26,578.33		1,595
Total Fee		**26,578.33**		**1,595**	**26,578.33**		**1,595**
COFC DOH Base (LBR+FRG)							
CoFC DOH		4,470.09		149	4,470.09		149
COFC GA Base (LBR+FRG+DOH+ODC)							
CoFC G&A		7,462.29		20	7,462.29		20
Total of CoFC		**11,932.39**		**169**	**11,932.39**		**169**
Total Estimated Cost				**26,747**			**26,747**
Total Estimated Cost and Fee				**28,342**			**28,342**

Proposal Project: TO31 TD B3-17
Activity ID: 04 - Task 3

		2016			Total		
Resource-Description	**Dept**	**Hrs/Base**	**Rate**	**Cost**	**Hrs/Base**	**Rate**	**Cost**
Total for Activity ID, 04 - Task 3				**28,342**			**28,342**

Proposal Project: TO31 TD B3-17
Activity ID: 05 - Task 1A (Optional)

Resource-Description	Dept	2015 Hrs/Base	2015 Rate	2015 Cost	2016 Hrs/Base	2016 Rate	2016 Cost	Total Hrs/Base	Total Rate	Total Cost
Salary Labor										
ADMIN		0.00		0	4.00		105	4.00		105
EDITOR		0.00		0	4.00		130	4.00		130
P4ENG		4.00		258	4.00		258	8.00		516
P4SCI		32.00		1,249	18.00		702	50.00		1,951
Total Regular Labor		**36.00**		**1,507**	**30.00**		**1,196**	**66.00**		**2,703**
Total Labor				**1,507**			**1,196**			**2,703**
Fringe Base (LABOR+ESC)										
Salary Fringe Group A		1,506.88		633	1,196.40		523	2,703.28		1,156
Total Fringe		**1,506.88**		**633**	**1,196.40**		**523**	**2,703.28**		**1,156**
Division OH Base (LBR+FRG)										
BCO Division Overhead		1,773.07		1,119	1,348.14		851	3,121.20		1,969
BTSO Division Overhead		366.70		96	371.09		97	737.79		193
Total Division Overhead		**2,139.77**		**1,215**	**1,719.23**		**948**	**3,859.00**		**2,162**
Other Direct Cost										
ERI BCO Special Facilities-31870834		0.00		0	338.84		17	338.84		17
Special Facilities-35851046		366.70		11	371.09		11	737.79		22
Tampa, FL (LeClare Shore-35851046		366.70		2	0.00		0	366.70		2
Total Other Direct Costs				**13**			**28**			**41**
G&A Base (LBR+FRG+DOH+ODC)										
G&A		3,367.49		800	2,694.83		579	6,062.32		1,379
Total G&A		**3,367.49**		**800**	**2,694.83**		**579**	**6,062.32**		**1,379**
Fee										
Fee		4,167.13		250	3,274.28		196	7,441.41		446
Total Fee		**4,167.13**		**250**	**3,274.28**		**196**	**7,441.41**		**446**
COFC DOH Base (LBR+FRG)										
CoFC DOH		1,773.07		57	1,348.14		45	3,121.20		102
COFC GA Base (LBR+FRG+DOH+ODC)										
CoFC G&A		3,367.49		13	2,215.75		6	5,583.24		19
Total of CoFC		**5,140.56**		**70**	**3,563.89**		**51**	**8,704.44**		**121**
Total Estimated Cost				**4,237**			**3,325**			**7,562**
Total Estimated Cost and Fee				**4,487**			**3,522**			**8,008**
Total for Activity ID, 05 - Task 1A (Optional)				**4,487**			**3,522**			**8,008**

Attachment 1:
Response to Comments on GCL TWP

Attachment 1: Response to Comments on GCL TWP

Comment No.	Comment	Response
EPA Comments (July 7, 2015)		
1.	2.0 Objective, 1st sentence: Please insert the following after residual source characterization: "in the vicinity of monitoring well MW-3B."	The additional text was added as requested.
2.	4.0, Site Background, 1st ¶, 2nd sentence: Please insert the following after 1the 1940s: "when the Delaware and Hudson Railway Company."	The additional text was added as requested.
3.	4th ¶: The recommendations of the RSE report have been implemented.	The sentence was changed to "The RSE report was finalized by the end of December 2006 (EPA, 2006) and the recommendations of the RSE report have been implemented."
4.	5.0, Project Activities, 2nd ¶, last sentence: Please insert the following after geophysical imaging: "and groundwater samples will be collected."	The sentence was changed to "Locations of water-bearing zones will be identified using a heat pulse flowmeter (HPFM) and geophysical imaging, and groundwater samples will be collected at these zones and analyzed for COCs."
5.	5,2, Task 2: Field Investigation, 3rd ¶: Please ensure that access has been secured for each of the drilling locations. (See Comment #16 below.)	Battelle will ensure that appropriate permissions are obtained to install the boreholes in their proposed locations. It is desirable to advance the northernmost borehole on MeadWestvaco property away from any railroad easements that may exist. The following text has been added to the third paragraph of Section 5.2: "Prior to the mobilization of the drilling rigs, Battelle staff will hold discussions with the EPA and other site stakeholders, which may include the railroad company, the Army Corps of Engineers and their on-site contractor to identify the ownership of the property onto which each borehole will be advanced to ensure appropriate permissions are obtained to perform the proposed work."
6.	4th ¶, bullet #1: Please ensure that consideration is given to the ongoing operation of groundwater pump and treat system with respect to determining water level impacts during the borehole activities. Does this mean that the groundwater pump and treat operations will be temporarily shut down during the field work?	It is desirable to turn off the recovery system during the field activities to eliminate potential impact to the groundwater table while identifying groundwater elevations, transmissive zones, and collecting groundwater samples. The system may be turned on during HPFM testing to induce groundwater flow in the bedrock wells if groundwater flow is not observed under normal flow (non-operating) conditions. An additional bullet was added to state the following: "Temporarily shut down operation of the groundwater treatment system for the duration of the field investigation."
7.	4th ¶, bullet #7: Please explain the "temporary"	The intent is to finish the wells as permanent wells including using

Attachment 1: Response to Comments on GCL TWP

Comment No.	Comment	Response
EPA Comments (July 7, 2015)		
	connotation of the monitoring wells at these boring locations. How will they be finished? Open boreholes, assuming they will not be fully cased and screened? Can they be made permanent? (Please see Comment #13d below.)	bentonite and grout to seal the annular spacing, with open boreholes extending into competent bedrock. Future sampling and analysis of groundwater and any NAPL in the well will be useful to gauge the progress of any applied remedy. The word "temporary" was placed with "permanent" in the work plan.
8.	5.2.1, Shallow and Upper…, 3rd ¶: As related to Comment #7, is the temporary 1-inch diameter well in addition to the four 4-inch temporary wells? The 1-inch diameter does appear to be restrictive. Please clarify the Task 2 discussion.	The 1-inch-diameter well is in addition to the 4-inch-diameter wells. The purpose of the 1-inch-diameter well is to monitor a discrete interval if/where NAPL is detected during advancement of the borehole in the shallow/intermediate interval. A paragraph was added at the end of Section 5.2.1 to provide additional clarification.
9.	5.2.2., Lower Intermediate…, 1st ¶, last sentence: Please clarify what "iso-flow methods" are associated with sonic drilling.	"Iso-flow" was changed to "push-ahead". The following text was added to the end of Section 5.2.2 to describe the push-ahead method: "The push-ahead sampler is advanced beyond the zone of influence of the drilling bit into the native undisturbed formation. Upon opening the sampling ports, an unadulterated representative groundwater sample is collected directly from the zone of interest without purging requirements."
10.	4th ¶: See Comment #6.	As stated in the response to Comment #6, the intent is to shut down the system during the investigation. The system may be restarted if necessary to facilitate the HPFM tests.
11.	Task 3, Reporting: The primary thrust of this investigation is, ultimately, to evaluate potential remedial alternatives for addressing the residual NAPL material. The determination of the "practicality" of these alternatives as they relate to technical impracticability is somewhat premature.	The following text was deleted "or, if not practical, a path forward for developing a TI waiver for the source area"
12.	5.4, Assumptions: With respect to the title of this section, please consider replacing it with the following: Expected Conditions. This more definitive title is clearer when discussing the development of the cost proposal.	The change was made as requested.
13.	Will field activities be performed on the weekends? Does this include Sunday?	Fieldwork will not be conducted on weekends. A bullet was added to reflect this.
14.	During the field reconnaissance trip, were any overhead	Based on the site visit, it is not believed that there are any potential

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	obstructions observed that could interfere with a drill rig placement?	overhead utilities that will interfere or present a hazard during drilling activities. A bullet was added to reflect this assumption.
15.	Please see Comment #16 below on access issues.	Please refer to response to Comment #5.
16.	Please clarify temporary versus permanent. Would the installation of permanent wells at these locations benefit the project?	Please refer to response to Comment #7. These wells will be finished as permanent wells. References to temporary wells were deleted.
17.	EPA will ensure that access to the Site pump and treat operations and the pressure transducers is secured.	The requested statement was added to the list of bulleted assumptions.
18.	Will the clean water source and electric power be available to the proposed location on the non-GCL property? There may be a need to contact MeadWestvaco if we want to use their power and water from their building.	An assumption has been added stating that electrical power will be available on MeadWestvaco property. Battelle has been in contact with H&S Environmental, the company contracted by USACE to operate the treatment plant. H&S has indicated that if it is not possible to use a receptacle at the MeadWestvaco facility, utility boxes are installed to operate pumps in wells located on the north side of the tracks. Power can be obtained from these boxes. Furthermore, H&S has a generator that can be used if necessary. At present, it is not anticipated that water will be required on the MeadWestvaco property. Decontamination activities can be performed on GCL property.
19.	<u>Comments on Figure 1.</u> 1. Please replace the word "Explanation" to "Legend". 2. Please replace the identification of the red dashed line to the "GCL Property" not the GCL Tie and Treating Site. 3. Please provide identifying numbers/letters on the four proposed boring locations/wells.	The requested revisions were made to the figure. Keeping consistent with current well identification nomenclature, the wells will be labelled MW-17D through MW-20D. If a well is installed in the shallow/intermediate interval, it will be identified as MW-xxS, with xx being the number of the deep well (17D through 20D) next to which it is installed. Its location and corresponding identifying number will be determined based on field observations made during field activities.
20.	Access issues: We understand that the one boring is proposed to be located on the northwest side of the railroad tracks. Even though this location is proposed and has not been surveyed, it would be beneficial if there was, at least, some estimate made as to the distance from the tracks. Also, it may be necessary to perform a survey in order to determine on which property this boring would be	The approximate distance from the railroad tracks is 40 ft. However, there is some flexibility regarding the exact location where this well can be installed. As stated in response to Comment #5, Battelle will communicate with project and site stakeholders to ensure that proper permissions are obtained prior to advancing the boreholes.

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	located and, also, is there enough access to secure a drill rig.	
21.	We need to make a determination as to whether or not the proposed locations is on either MeadWestvaco property or the railroad's property.	Please refer to response to Comment #5.
22.	Securing property access from the railroad will be very difficult and could result in a major delay.	Noted. Please refer to response to Comments #5 and #20.
23.	In order to determine approved access for this location, there will be a need to contact both property owners. Access to this area is crucial in order to complete the proposed work.	Agreed. Please refer to response to Comment #5.
24.	After the analysis was performed to locate these proposed borings as shown on Figure 1, was any consideration made of potentially locating the northernmost boring on the GCL property rather than on the north side of the tracks? If the hydrogeologic conditions mandate that this location be used then the above access discussion is warranted.	Locating the northernmost boring on the GCL property was considered. However, locating it on the GCL property places the well 1) too close to existing monitoring locations and 2) potentially cross gradient (not downgradient) from MW-3B. The best location is the proposed location on the northern side of the railroad tracks; however, there is some flexibility regarding its exact locations. Further discussions with project and site stakeholders will resolve this issue.