



SAND SPRING RUN, STREAM
BANK RESTORATION PROJECT PA

GAME LANDS 38

SEPTEMBER 20, 2019

SUBMITTED TO
MONROE COUNTY
CONSERVATION DISTRICT
8050 Running Valley Road
Stroudsburg, PA 18360



ENVIRONMENTAL CONSULTANTS

Sound Science. Creative Solutions.®

80 Emerson Lane, Suite 1306
Bridgeville, Pennsylvania 15017
Tel 412.839.1001 Fax 412.839.1005
www.swca.com

September 20, 2019

Lori Kerrigan
Monroe County Conservation District
8050 Running Valley Road
Stroudsburg, Pennsylvania 18360

Re: Sand Spring Run, Stream Bank Restoration Project, PA Game Lands 38

Dear Ms. Kerrigan:

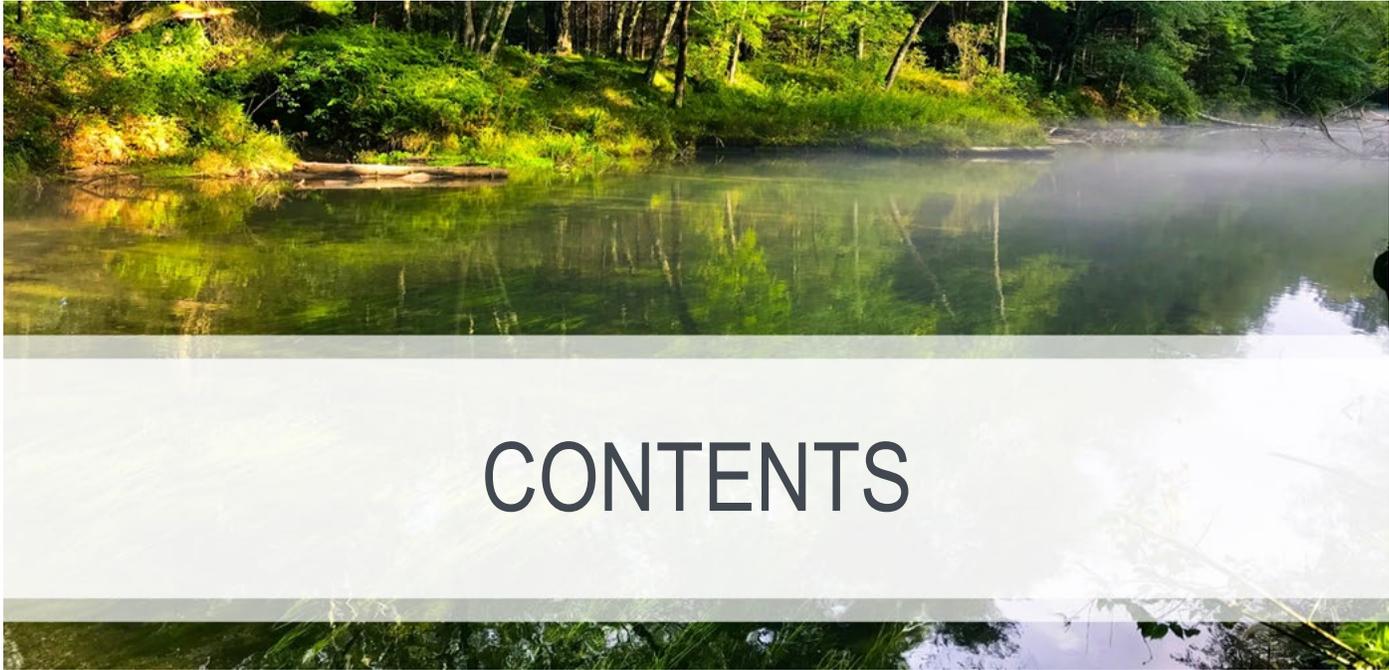
SWCA Environmental Consultants (SWCA) is pleased to present the attached proposal to improve water quality, restore the natural stream functions, minimize bank erosion, and restore habitat in the headwater reach of Sand Spring Run and the larger Pocono and Brodhead Creek Watershed. Stream restoration, as well as other types of ecosystem restoration, is a key market for SWCA Pittsburgh. Our extensive expertise in aquatic and riparian ecology, habitat, water quality, and flora and fauna has allowed us to bring a unique perspective to the ecosystem restoration process, compared with traditional engineering firms. Working alongside our ecologists and natural resource biologists, our stream restoration engineers are focused only on "green" design projects, allowing them to maintain a unique perspective of the design process while still understanding the necessity to accommodate surrounding infrastructure and floodplain management.

To provide the Monroe County Conservation District (District) and the Pennsylvania Game Commission (PAGC) with the most effective and efficient design, SWCA is teaming with GEI Consulting Engineers and Encompass Energy Services. Together, our Team provides the District and PAGC with leaders in ecological restoration and environmental permitting, geotechnical and streambank stabilization, and civil survey. If you have questions regarding our proposal, please feel free to contact me at (412) 839-1001 or via email at SMitchell@swca.com. Thank you for considering SWCA for this important work.

Sincerely,

A handwritten signature in black ink, appearing to read "S. Mitchell".

Seth Mitchell
Director – Pittsburgh Office



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STATEMENT OF INTEREST

SWCA Environmental Consultants (SWCA) has teamed with GEI Consultants, Inc. (GEI), and Encompass Energy Services (Encompass), collectively referred to as the SWCA Team, to provide our combined qualifications to support the Monroe County Conservation District (District) and Pennsylvania Game Commission (PAGC) with the proposed Sand Spring Run, Stream Bank Restoration Project (herein called the project). The District and PAGC have stated that the overall goal of the project will be to improve water quality, restore natural stream functions, minimize bank erosion, and restore habitat in this reach of Sand Spring Run and the larger Pocono and Broadhead Creek Watershed. The SWCA Team has been assembled to provide the District and PAGC with the most qualified team to meet the stated goals of the project. The following response to the Request for Qualifications (RFQ) is based on the SWCA Team's understanding of the project information included in the original RFQ and in Addenda #1, #2 and #3.

QUALIFICATIONS

SWCA ENVIRONMENTAL CONSULTANTS

SWCA is one of the largest professional consulting firms dedicated solely to natural and cultural resources and environmental planning. Environmental consulting is all we do, and we have a 38-year track record of providing these services. Our success is most evident in our growth over this time frame; we presently employ more than 1,100 professionals across 32 offices in 18 states and the Pacific Islands. SWCA provides a full spectrum of environmental services focused on planning, natural and cultural resource management, air quality, permitting, regulatory compliance, and water resources and climate change consulting. We are an employee-owned firm of scientists, planners, and technical specialists who combine scientific expertise with in-depth knowledge of permitting and compliance protocols to achieve technically sound, cost-effective solutions for our clients. Specific natural resources experience includes stream and wetland restoration, ecologically enhanced stormwater channel design, wetland delineations, protected species surveys, wetland and stream mitigation banks, and environmental monitoring. Our staff has expertise with federal, state, and local government regulations and has demonstrated success in assisting our clients with developing creative solutions to environmental issues affecting project outcomes.

Our extensive expertise in aquatic and riparian ecology, habitat, water quality, and flora and fauna has allowed us to bring a unique perspective to the ecosystem restoration process, compared with traditional engineering firms. Working alongside our ecologists and natural resource biologists, our stream restoration engineers are focused only on “green” design projects, allowing them to maintain a unique perspective of the design process while still understanding the necessity to accommodate surrounding infrastructure and floodplain management.

GEI CONSULTANTS, INC.

Since 1970, GEI has provided geotechnical engineering consulting for countless landmark construction projects, including commercial, institutional, and industrial buildings and structures; dams, levees, and pipelines; and tunnels, highways, and bridges; along with construction-related structures such as slurry walls and excavation support systems. Many of these projects draw on GEI’s environmental, water resources, and ecological expertise, fields that are highly synergistic with our comprehensive knowledge of soil behavior, groundwater flow, and earth science.

The underground is often thought of as a “black box,” full of risk and uncertainty. Through expert analysis, design, and discussion with our clients, we reduce the unknowns and get projects out of the ground on time and on budget. Every site poses a unique mix of challenges, such as tight space, neighboring buildings, contamination, complex regulations, community concerns, and more. GEI designs solutions that address those unique challenges.

We work in a variety of construction scenarios. We help plan, estimate, and schedule the underground elements of a project, a piece that is often “fast tracked” to get construction started and out of the ground. We provide a host of expert services to owners, architects, contractors, and construction companies, offering creative, practical, and cost-effective solutions to the challenges that so often arise during construction.

Embankment dam engineering has been a niche specialty for GEI since its inception. The firm has been engaged by the U.S. Army Corps of Engineers (USACE), U.S. Bureau of Reclamation, numerous utility companies, and others to evaluate the conditions of existing dams and to design new embankments. This experience includes embankments under the auspices of the Nuclear Regulatory Commission, for which GEI developed quality assurance/quality control (QA/QC) procedures for the design and construction monitoring of embankments. Our embankment design capabilities are an important part of our total water resources engineering capability.

ENCOMPASS ENERGY SERVICES

Our company has a well-rounded dedicated team of professionals who have the experience required to appreciate the challenges and opportunities presented by each of our projects. Our safety plan and training is second to none, with client-specific requirements incorporated into all of our project orientation meetings and reinforced during the life of the project. This employee experience and company support allow for a safe, cost-effective solution to any project, large or small. Extensive manpower resources, multiple office locations, and our strategic partners allow us to service all your project-based needs throughout the lower 48 states, Alaska, and Canada.

It is our primary goal to offer the highest level of service through the incorporation of new technology. This will not only provide for better products to end users but will allow us to do so more quickly and more cost effectively than ever before. Each day on your projects, you will see how this customized approach allows us to focus on being as effective and efficient as possible. This forward-thinking approach allows our clients to exceed the expectations they have set not only for us, but also for themselves, putting their project ahead on both time and schedule.

KEY TEAM MEMBER EXPERIENCE

The SWCA Team has been assembled to provide the District and the PAGC with experienced personnel who will contribute to the successful completion of the project. The following personnel are experts in their field of study and have the capacity to dedicate the necessary time to this project. In addition, the key project personnel will be

supported by a larger group of staff that includes natural and cultural resources specialists, threatened and endangered species experts, permitting specialists, geotechnical staff, and civil surveyors. With this broad reach of experts, the SWCA Team will be able to adapt to project needs as they arise during the life cycle of the project. Detailed resumes of key personnel are provided in Appendix C, and a summary matrix of the SWCA Team is provided in Table 1, below.

SWCA ENVIRONMENTAL CONSULTING KEY STAFF

Tony Somers, RLA, PP, ASLA, Project Manager / Landscape Architect

As both a Landscape Architect and Licensed Planner, Mr. Somers offers a broad range of professional expertise complemented by his seasoned business acumen. Mr. Somers's Landscape Architecture background includes the design and implementation of a diverse range of projects, including stream corridor and wetland restorations, LID implementation, municipal green infrastructure guidelines, urban pocket parks, commercial campus development, public charrettes, visual impact assessments, 3-D visualizations, and photorealistic rendering.

As a Professional Planner, his expertise in areas such as land use development, environmental analysis, urban planning, community redevelopment, and municipal bylaw improvements complements his design proficiency. Mr. Somers blends innovative design techniques with a strong analytical and regulatory acuity to create and manage ecologically conscientious and socially engaging design projects that exceed client expectations. Mr. Somers has served as the project manager for several dozen public and private client projects ranging from large-scale solar developments to wetland restorations and bank stabilization work. Working closely with clients to fully understand their needs and timelines, and diligently managing staff and subconsultants accordingly, is a hallmark of his successful project optimization and ongoing client satisfaction.

Daren Pait, P.E., CFM, Stream Restoration/Natural Channel Design Lead

Mr. Pait has 19 years of experience in surface water and environmental engineering. His experience includes natural channel design, wetland design, living shoreline design, hydraulic flood modeling/floodplain mapping, watershed management planning and modeling, flood mitigation design, water quality best management practice (BMP) design, and stream/shoreline stability assessments. He has been the design engineer for more than 135,000 linear feet of stream channel stabilization and restoration projects, 33 acres of riparian wetland mitigation projects, and more than 30 acres of lake and pond retrofit projects for Chesapeake total maximum daily limit (TMDL) compliance.

David Bidelspach, M.S., P.E., Senior Design QA/QC Manager

Mr. Bidelspach has a broad range of experience restoring damaged ecosystems and is a river restoration specialist with national recognition. Mr. Bidelspach's academic and research background includes 5 years with the Stream Restoration Program at North Carolina State University and 9 years as the river restoration technical leader for a large engineering consulting firm. During his 17 years in the industry, he has provided assessment, design, and construction oversight services on many restoration projects and taught courses related to river assessment, restoration design, and construction administration. He has completed more than 100 river restoration/stabilization projects in North and Central America. Mr. Bidelspach specializes in coupling natural channel design (NCD) with a traditional engineering framework for river restoration designs to achieve the optimal combination of project goals and objectives. The multi-criteria decision analysis (MCDA) framework, used and taught by Mr. Bidelspach, incorporates NCD, 3-D stream design, limiting factors analysis, and stakeholder participation.

Kevin A. McCaffery, P.E., Hydrologic & Hydraulic Engineering Lead

Mr. McCaffery is a civil engineer and permitting specialist with more than 15 years of experience on sites throughout New England and the United States. His primary role is to provide internal engineering support for restoration and development projects. His project experience spans the entire life cycle from initial planning and conception through the construction phase. Mr. McCaffery has extensive experience preparing hydrologic and hydraulic models and

site/civil design plans suitable for permit submissions and eventual construction. He has been working on stream restoration, wetland mitigation, and natural systems stormwater design throughout his career and has degrees in both Environmental Science and Civil Engineering. He is a licensed civil engineer in the Commonwealth of Pennsylvania. Particularly relevant to this project, Mr. McCaffery was a part of the Fort Sheridan Ravine Restoration project on the shores of Lake Michigan and multiple bank stabilization projects on the Connecticut River. Both locations have tall, steep bluffs with non-cohesive soils that required significant bank stabilization and establishment of vegetation for long-term stability. For both, natural approaches were used to the extent possible, with soil lifts/mattresses, log crib walls, and woody vegetation all being employed where suitable.

Natalie Shearer, M.S., Permitting Lead

Ms. Shearer has a broad range of experience throughout Pennsylvania. She maintains a valid Pennsylvania Wild Plant Management Permit; conducts rare, threatened, and endangered plant surveys and wetland and stream delineations; prepares Pennsylvania (PA) Chapter 105 Water Obstruction and Encroachment Permits; and coordinates with several state and federal agencies. Of particular relevance to this project, Ms. Shearer has written and received approval for several Joint Chapter 105/Section 404 Water Quality and Obstruction Permits throughout the Commonwealth. She has coordinated pre-application meetings and agency site visits. She has also used the Pennsylvania Rapid Protocol in the field and during the permitting process.

GEI KEY STAFF

Jesús E. Gómez, Ph.D., P.E., DGEP, Geotechnical Engineering Lead

Dr. Gómez has more than 30 years of design and construction experience in geotechnical projects in the United States, South America, and the Caribbean. Dr. Gómez has an extensive geotechnical construction background and has led the design and construction supervision of numerous slope and waterfront stabilization and rehabilitation projects, where he has conceived and developed cost-effective, constructible solutions. Some of the notable projects where Dr. Gómez has participated as a lead designer or as reviewer include the Jefferson Memorial North Plaza Stabilization and Seawall Reconstruction in Washington, D.C., for the National Park Service (NPS); the Ellis Island Seawall Rehabilitation in the New York City Harbor, also for NPS, Reconstruction of Amtrak Roadbed in Maryland; and Bluff Stabilization for Anderson's Residence in Maryland, all of which were conceived to preserve either the historic appearance of the seawalls or the natural appearance of the existing landscape while introducing substantial, and invisible, structural or earth-engineered stabilization measures.

Helen Robinson, P.E., Senior Geotechnical Engineer

Ms. Robinson has more than 16 years of design and construction experience across the United States providing engineering services and project and construction management for geotechnical designs. Her experience includes design of micropiles, tiebacks, soil nails, drilled shafts, driven piles, sheet pile cofferdams, retaining walls, braced excavation support, ground improvement methods, and shallow foundations. Ms. Robinson's professional experience also includes site investigations (boreholes, test pits), soil classification, laboratory testing, load testing, field support and interpretation, and instrumentation. Under Top Secret security clearance, she conducted an extensive study on chemical grouts used for soil stabilization and permeation, including polyurethanes, cementitious grouts with additives, sodium silicate, and colloidal silica.

ENCOMPASS KEY STAFF

Jeff Conaway, M.S., P.E., P.L.S., Surveying Lead

As the Regional Director of Operations, Mr. Conaway is responsible for overseeing the daily business operations for the Northeast region. He is a Professional Land Surveyor in three states, as well as a Certified Federal Land Surveyor. He has over 20 years of experience in field survey services, including boundary surveys, section

breakdowns, preliminary surveys, section breakdowns, construction staking, and as-built surveys. Mr. Conaway also has extensive experience in project management, where he excels in communications, progress reporting, and project quality control. Mr. Conaway demonstrates strong leadership and mentoring skills, which allows him to develop strong project teams both in the office and field.

Table 1. SWCA Team Matrix

STAFF NAME	EXPERTISE	RELEVANT PROJECTS
<p>Tony Somers RLA, PP, ASLA Project Manager / Landscape Architect 9 years</p>	<ul style="list-style-type: none"> Licensed Landscape Architect Licensed Professional Planner Project Management Green infrastructure design and Stormwater BMP guideline development Stormwater design and BMP design standards Ecological design and planning Wetland restoration assessment, design, and monitoring 	<ul style="list-style-type: none"> Lower Bois D'Arc Reservoir Stream Mitigation Design Services Final Design; Resource Environmental Solutions, LLC; Harris County, TX Connecticut River Erosion Control Work for 2017; FirstLight Power Resources Services, LLC; Northfield, Franklin County, MA K140 (Pilot Gully) Channel Stabilization Final Design; RPS Klotz Associates; Harris County, TX
<p>Daren Pait., P.E., CFM Stream Restoration/Natural Channel Design Lead 19 years</p>	<ul style="list-style-type: none"> Water Quality BMP design Natural channel design Wetland and living shoreline design Stream/shoreline stability assessments Watershed management planning and modeling 	<ul style="list-style-type: none"> Annual Stream Mitigation Monitoring; North Carolina Department of Transportation; Greensboro, Statesville, and Cary, NC Greensboro Northern Loop On-Site Stream Design, R-2413; North Carolina DOT Natural Environment Unit; Greensboro, NC Streambank Stabilization and Infrastructure Protection; Charlotte Water (Water and Wastewater Utility); Charlotte, NC
<p>David Bidelspach, M.S., P.E. Senior QA/QC Manager 21 years</p>	<ul style="list-style-type: none"> Stream restoration and design Geomorphic assessment Design alternatives 	<ul style="list-style-type: none"> Tioga River Tributary Stream Restoration; Confidential Energy Company Client; Bradford County, PA Morgan Creek Tributary to Tioga River Stream Restoration; New York Department of Transportation; Tioga County, PA Quaker Run Stream Restoration; U.S. Fish and Wildlife Service; Shamokin, PA
<p>Kevin A. McCaffery, P.E. Hydrologic & Hydraulic Engineering Lead 17 years</p>	<ul style="list-style-type: none"> Stormwater management design and permitting Hydrologic, hydraulic, and water quality modeling Stream and wetland restoration design Watershed planning and modeling Environmental permitting: federal, state, and local Construction drawings and contract documents 	<ul style="list-style-type: none"> FirstLight Hydro Camp 2W Environmental Services; FirstLight Power Resources Services, LLC; Gill, Franklin County, MA Gin City Mitigation Bank Development - Phase I; Gin City Land Company, Inc.; Harris County, TX Lower Bois D'Arc Reservoir Stream Mitigation Design Services; Resource Environmental Solutions, LLC; Harris County, TX
<p>Natalie Shearer, M.S. Permitting Lead 14 years</p>	<ul style="list-style-type: none"> Rare, threatened, and endangered plant surveys Wetland and stream delineations Wetland ecology Ecology Land development Critical Issues Analysis Clean Water Act (CWA) Section 404 compliance CWA jurisdictional waters determinations (Waters of the U.S.) 	<ul style="list-style-type: none"> Sleighter Chrysler Dealership Site Development & Mitigation; Confidential Client; Westmoreland County, PA Robertsville Solar Critical Issues Analysis; Confidential Client; Robertsville, Stark County, OH Sellers Road Upgrade Delineation and Permitting; Confidential Client; Tyler County, WV

STAFF NAME	EXPERTISE	RELEVANT PROJECTS
Jesús E. Gómez, Ph.D., P.E., DGEP Geotechnical Engineering Lead 34 years	<ul style="list-style-type: none"> • Extensive geotechnical construction background • Design and construction supervision of numerous slope and waterfront stabilization and rehabilitation projects 	<ul style="list-style-type: none"> • Invisible Bluff Stabilization for Anderson Residence; Annapolis, MD • Jefferson Memorial North Plaza Stabilization and Seawall Replacement; Washington, D.C. • Swinging Bridge Dam; NY
Helen Robinson, P.E. Senior Geotechnical Engineer 16 years	<ul style="list-style-type: none"> • Engineering services and project and construction management for geostructural designs • Site investigations (boreholes, test pits) 	<ul style="list-style-type: none"> • Soil Nail Wall, Private Residence; Annapolis, MD • USACE Adelphi Pond Laboratory Center Building 203 Pond Retrofit; Adelphi, MD • North Fork Dam – MSE Wall; Asheville, NC
Jeff Conaway, M.S., P.E. Surveying Lead 20 years	<ul style="list-style-type: none"> • Professional Land Surveyor 	<ul style="list-style-type: none"> • Mariner East II Project – 350 Miles; Energy Transfer Partners; OH, WV, PA • NY Harbor Upgrade Project – 6 Miles; Buckeye Partners; NJ • Northeast Upgrade Project – 40 Miles; El Paso, PA, NJ



PROJECT UNDERSTANDING

SWCA understands that the primary objective of the proposed project is to stop the erosion and excessive sediment loading that is currently occurring within the project reach of Sand Spring Run and along the adjacent, abandoned railroad embankment, while at the same time restoring the natural and stable stream functions to achieve water quality improvements and ecological uplift to the project stream reach in this critical headwater (designated Exceptional Value (EV) under Title 25 PA Code Chapter 93) of the Upper Pocono Creek, a Class-A Trout Fishery. Site access issues (the site is more than 1 mile from the nearest paved road) and the need to develop an adequate bankfull floodplain for the stream between the very high and steep embankments of the abandoned railroad are the primary challenges to the successful implementation of the project, as they will present obstacles to the site logistics involved with moving equipment and materials in and out of the site. SWCA has extensive experience working on remote projects where site access is challenging and where access roads may require improvements, shoring, or logging mats for access. Also, we will strive to use on-site materials in the stream restoration design to minimize trucking and materials cost, which can greatly reduce the overall cost of the project.

SCOPE OF WORK

SWCA'S STREAM RESTORATION AND NATURAL CHANNEL DESIGN PROCESS

SWCA's stream restoration design team is led by Mr. David Bidelspach, P.E., a native of Pennsylvania and a graduate of Pennsylvania State University's Agricultural and Biological Engineering Program. Mr. Bidelspach's graduate academic and research background include 5 years with the Stream Restoration Program at North Carolina State University under Dr. Greg Jennings, during which he was a primary contributor in the development of a 3-D NCD process in the Autodesk Civil 3-D CADD software platform using a "Breaklines" program, which he coauthored with others at the university (Figure 1). This "Breaklines" 3-D NCD process allows designers to rapidly go through numerous, highly accurate channel form iterations to achieve an optimized design that minimizes cut-and-fill volumes and maximizes structural integrity and geomorphic stability. The simple generation of precise cross-sections from the 3-D CADD surface also allows for the rapid development of highly accurate hydraulic models for design analysis. Finally, the 3-D CADD surface can be loaded into GPS-guided construction equipment, allowing for seamless creation

of the final design, expedited construction times, and a reduction of necessary construction manpower. The overall design, analysis, and construction process using these 3-D methodologies results in shorter, more accurate, and less expensive finished projects than are obtainable by traditional design methods. Mr. Bidelspach has also worked directly with Dr. David Rosgen on numerous NCD projects across the country and internationally and assisted Dr. Rosgen in the application of the “Breaklines” 3-D design process to Dr. Rosgen’s design process.

All of SWCA’s stream restoration NCD projects are designed using the “Breaklines” 3-D CADD process, and every member of SWCA’s stream restoration design team has not only been extensively trained in the “Breaklines” 3-D CADD process, but has also completed, or is in the process of completing, all four levels of Dr. Rosgen’s training in fluvial geomorphology, river assessment and monitoring, and NCD through Wildland Hydrology.

TASK 1. DATA COLLECTION

WATERSHED ASSESSMENT

SWCA will conduct a watershed assessment and analysis of the areas upstream of the reach and within the project reach vicinity to better understand existing watershed conditions and historic watershed alterations that have contributed to instability in the project reach. The watershed assessment and analysis will utilize methodology from Rosgen’s Watershed Assessment of River Stability and Sediment Supply (WARSSS) process to develop hypotheses for disturbance and departure from a reference condition (Rosgen 2006). WARSSS is a three-phase, hierarchal approach that assesses watersheds with a practical, rapid initial screening component and the integration of hillslope, hydrologic, and channel processes. It is designed to identify the location, nature, extent, and consequences of various past, existing, and proposed, land use impacts. The detailed evaluation criteria involved in the WARSSS process will be tailored individually to Sand Spring Run watershed and the project site.

This task will be primarily an office-based task with only a few days of field work necessary for calibration of assumptions and boundary conditions compared to regional data sets and collection of soil samples. This field effort will include field sediment sampling and characterization in support of developing a geomorphic channel evolution model (CEM) or equivalent for use in the “Geomorphic Stream Conditions Assessment” and “Sediment Transport Analysis” components of the work (Tasks 2 and 4, respectively). It is assumed that a minimum of four bed and bank samples and gradation evaluations will be collected and analyzed for these purposes.

SITE SURVEY CONTROL AND TOPOGRAPHIC SURVEY

As described above, surveying services will be provided by SWCA Team member Encompass. Encompass will establish survey control at the project area and collect sufficient topographic information and infrastructure locations to design and construct the stream restoration project and bank repairs. The following surveying scope of work will be implemented toward this end:

- Establish survey control at the project area and collect topographic information and infrastructure locations to design and construct the bank repairs. This will include installation of and survey of three temporary benchmarks (rebar with plastic safety caps) near the proposed work area.
- Collect sufficient topographic survey data to produce a 1-foot contour map of the project area. Within the same area, pertinent planimetric and a tree survey (trees greater than 6-inch diameter at breast height) will be captured and noted.
- Survey data will be assembled and presented in an AutoCAD Civil 3D file (.dwg) file as well as a .pdf. This deliverable will include survey shot data, TINs, and breaklines.

SITE AND REFERENCE REACH GEOMORPHIC ASSESSMENT

SWCA will conduct field investigations of the project area to determine the current channel stability conditions and processes as well as to interpret of the potential upstream and downstream channel instability processes that have resulted in stream bed and bank erosion in the project reach. SWCA will also identify an appropriate nearby reference reach for the restoration design and perform a geomorphic reference reach survey. The assessment information will be used to recommend appropriate stable channel design techniques to provide for the likelihood of long-term stability in the reach in the Natural Channel Design component of the work. This work will include walking the project reach and reference reach and documenting the condition of the stream and valley with photographs, and locating these features using total station and/or optical level surveying equipment. Although not likely to be used extensively due to the heavy tree canopy in the project area, survey-grade GPS will be used wherever possible for surveying. The current conditions of the project stream and reference reach and stream types will be assessed using the methodologies developed and described by Dave Rosgen (Rosgen 2006, 1996).

A geomorphic survey will be acquired for each stream type along the project reach and reference reach and at locations of significant changes in drainage area (if any); and will include cross sections of at least one riffle and one pool, a representative longitudinal profile through approximately two meander wavelengths (or a distance of approximately 20 bankfull widths) and at least one Wolman pebble count or sieve grain size analysis where only sands/silts/clays exist or are the dominant channel material. The substrate samples obtained will be representative of the overall reach and bed material present at a riffle. Grab samples from depositional bars will also be obtained, if present, for sediment transport analysis during future tasks. Measurements of stream sinuosity, slope, velocity and discharge, and sediment transport competency calculations will also be performed. Geomorphic dimensional properties of the project reach will be recorded and calculated using RIVERMorph stream restoration software or equivalent methods/software.

SITE GEOTECHNICAL INVESTIGATION, ANALYSIS, AND REPORTING

As described above, geotechnical investigation, analysis, and design services will be provided by SWCA Team member GEI Consultants, Inc. Conducting the slope stability analysis and design will require the collection of geotechnical field data and laboratory analysis of soil. The geotechnical exploration and analysis are intended to

- characterize the surface and subsurface soil/fill materials in the area of the proposed stream and slope restoration,
- determine the depth to bedrock in the area of the proposed stream and slope restoration,
- determine the engineering characteristics of the soil/fill material,
- determine the volumes and types of soil/fill material available for reconstruction of the slopes, and
- provide the data required for slope stability analysis of the proposed design.

Subsurface conditions are anticipated to change from the western portion of the restoration area near the pond, where fills in excess of 50 feet were placed for the former railroad embankment, to the eastern portion, where naturally occurring soils are present. Based on our experience in the area, we expect that soil conditions are likely variable throughout the site. Also, bedrock will contain weathered shale layers and seams, which may be a factor in short- and long-term slope stability.

GEI anticipates that 12 soil borings will be necessary to adequately characterize the site. Five soil borings would be completed on the slope of north side, and five borings would be completed on the slope of the south side of Sand Spring Run along the 250 feet of proposed restoration (approximately one soil boring every 50 linear feet). Two soil borings would be performed along portions of the former railroad embankment that have fill in excess of 40 feet to verify its stability for use as a construction access road.

The target depth of the borings is approximately 10 feet below the base of the stream or the toe of the embankment. The pond elevation, as determined using Google Earth Pro, is 1,547 feet above mean sea level (amsl). The railroad bed elevation is approximately 1,600 feet amsl. The borings on the western portion are anticipated to be approximately 70 feet deep. The borings on the eastern portion of the restoration area are anticipated to be approximately 40 feet deep. The borings in the railroad embankment are anticipated to be approximately 50 feet deep. An estimate of the total drilling is approximately 600 linear feet.

An all-terrain vehicle (ATV)-mounted drill rig will be required to access the exploration area. The drill rig will be on a track-mounted platform capable of ascending 1:1 slopes. In addition, a backhoe will be required for clearing of vegetation for access, and as-needed minor grading of the right-of-way and former railbed to allow access for support vehicles. The drill rig will be equipped with hollow-stem augers and split spoon samplers.

To assess subsurface conditions, standard penetration tests will be conducted using 2-foot split spoon samplers continuously in the upper 10 feet and every 5 feet thereafter of soil until auger refusal is encountered. The standard penetration tests record the number 30-inch drops required to advance a 140-pound hammer 6 inches. The number is recorded for each 6-inch penetration over the 2-foot interval of the split spoon sampler.

GEI field personnel will log the soils in the field using the Unified Soil Classification System. Soil boring logs will be prepared for each soil boring. Soil samples collected from the split spoons will be placed in jars for additional review. Thirty soil samples will be collected for laboratory analysis from the soil boring for Atterberg Limits per American Society for Testing and Materials (ASTM) Test Method ASTM D4318, grain size analysis in accordance with ASTM D422, natural moisture content in accordance with ASTM D2216, and One-Dimensional Consolidation Properties of Soils Using Incremental Loading in accordance with ASTM-D2435.

GEI will prepare a Geotechnical Exploration Report, signed and sealed by a Professional Engineer licensed in Pennsylvania, that will include the following:

- A text narrative of the field investigation methods;
- A site location plan on U.S. Geological Survey topographic quadrangle;
- A soil boring location plan on an aerial photograph;
- Soil boring logs;
- A geological cross-section to scale for the north and south slopes of Sand Run;
- Laboratory analytical data;
- Recommendation for earthwork activities, fill placement, and compaction; and
- Slope stability analyses of up to three critical sections to assess stability of the existing slope and of the proposed grading.

Assumptions

- Access to the site will be approved by the property owners and arranged by the District.
- If unanticipated drilling conditions or adverse weather conditions impact the proposed duration of drilling (5 days), GEI will provide a revised cost for the completion of the work.
- Rock coring is not included in the scope of work. If rock coring is determined to be required, GEI will provide a revised cost for the completion of the work.
- Grouting of soil borings is not included in the drilling cost. If grouting is required, additional charges will be invoiced.
- Soil cuttings can be spread on the property.

- Costs for classification and disposal of Investigation Derived Waste (IDW) are not included in this proposal. GEI will provide costs for classification and disposal of IDW if requested.
- Permitting will not be required to conduct the geotechnical exploration or minor clearing and grading.
- Reporting and slope stability analysis fees do not include development of structural stabilization measures for the slopes such as soil nails, retaining or training walls, or A-Walls. Stability analyses of the proposed grading include up to two iterations on proposed grading.

Task 1 Deliverables:

- Survey Control and Site Topographic Base Map
- Initial Condition Plan and Report (including reference reach geomorphic summary)

TASK 2. PRELIMINARY DESIGN

The SWCA Team has prepared detailed engineered design plans, technical specifications, and design reports for many NCD projects in the past and can bring a great deal of experience to this process. SWCA will develop NCD recommendations for geomorphic design alternatives utilizing the information and recommendations in Task 1. The design alternatives will incorporate elements to promote long-term stability, as described below.

The new NCD channel will be designed based on dimensionless ratios collected from the reference reach, as described above, and available regional fluvial geomorphology dataset, such that the channel will have sufficient shear stress to transport sediment delivered to the system, as described further below.

SWCA will also develop a Design Summary Report documenting existing conditions (including the deliverables described above for Tasks 1 and 2), the basis of design, and preliminary design concepts and components for each project reach. The Design Summary Report will be critical to USACE permitting and will include the following sections:

- Introduction and Project Purpose
 - Site Description
 - Ecoregion and Physiographic Provenance
 - Soils
 - Watershed Assessment and Characterization
- Regional And Local Relationships
 - Regional Curves
 - Reference Reaches
- Stream Assessments and Field Reconnaissance
 - Reach-Specific Summary of Findings
 - Geomorphic Data Tables
 - SWG Level 1 Stream Conditional Assessment Findings
- Design Summary
 - Natural Stable Channel Design Approach
 - Restoration Goals and Objectives
 - Restoration Goals
 - Design Objectives
 - Design Variables and Dimensionless Ratios
 - Reach Specific Restoration Design Approach

- Stabilization and Habitat Enhancement Structures
 - Structures
 - Structure Placement Approach
- Sediment Transport Analysis Methods Results
- Conclusions and Recommendations
 - Passive Restoration
 - Implementation and Construction Considerations
- References

SWCA will prepare and submit a preliminary design submittal to the District and PAGC for review and comment. The preliminary design submittal will include a draft of the Basis of Design Report, as described above, and a preliminary design of the NCD stream. The preliminary design submittal will include the deliverables described below as well as a preliminary Engineers Opinion of Probable Cost (EOPC).

Task 2 Deliverables:

- Draft Basis of Design Report (including preliminary EOPC)
- Construction Plan Set (Partial)
 - Cover Sheet,
 - General Notes
 - Survey Control Map
 - Overview Sheet with Buffers/Easements
 - Existing Conditions Plan with Ordinary High Water Mark Delineation
 - NCD Plan and Profile Sheets
 - Typical Sections
 - In-Stream Structure Details
 - Riparian Corridor and Channel Planting Plan and Planting Palette

TASK 3. FINAL DESIGN

SWCA will revise and finalize the Basis of Design Report and construction documents upon receipt of comments for the preliminary design submittal by the District and PAGC. The final design submittal will be developed as a complete document set and will be submitted to the District and PAGC for final review and comment. A “Plans in Hand” site review with the 90% Construction Plan Set will be conducted with SWCA and the District and PAGC to field verify the final site design. The 100% Construction Plans will address any District and PAGC comments to the 90% plans and will be used for construction bidding purposes. The 100% Construction Plans will be sealed by a Professional Engineer licensed in the State of Pennsylvania. SWCA will also prepare Draft Construction Specifications and a final EOPC (cost estimate) for the project.

Task 3 Deliverables:

- Final Basis of Design Report, including
 - Hydrology and Hydraulic Design
 - Geotechnical and Slope Stability Design
- Final Construction Plan Set
 - Cover Sheet
 - General Notes
 - Overview Sheet with Buffers/Easements

- Survey Controls
- Existing Topographic Conditions and Ordinary High Water Mark Delineation
- Morphological Tables
- NCD Plan and Profile Sheets
- Typical Cross Sections
- Stream Geometry Sheets and Tables
- Riparian Corridor and Channel Planting Plan and Planting Palette
- Construction Quantities
- In-Stream Structure Design Tables
- In-Stream Structure Details
- Erosion and Sediment Control Plan
- Draft Construction Specifications

TASK 4. CONSTRUCTION DOCUMENTS

The SWCA Team will assist the District and PAGC in the development of construction bid package through the development of the following documents.

Task 4 Deliverables:

- Final Technical Specification
- Final Construction Plan Set
- Long-Term Monitoring/Operation & Maintenance Plan

PERMITTING SUPPORT

The project is located within an EV watershed. As a result, general permits are not permissible and a Joint Pennsylvania Water Obstruction and Encroachment/USACE Section 404 Permit Application (JPA) will be required for any work within a stream, wetland, or floodway, which the Pennsylvania Department of Environmental Protection (PADEP) defines in the absence of a Federal Emergency Management Agency (FEMA)-mapped floodplain as extending 50 feet landward from the stream top of bank.

The JPA review will consist of an application completeness review, followed by a technical review. While the established review time frame for a JPA is 180 business days (approximately 6 months), it is important to note that review time frames can often extend to as long as 18 to 24 months, depending on the complexity of the overall project and the agency workload. SWCA recommends that a pre-application meeting be scheduled with the PADEP, District, and the PAGC to ensure unanticipated delays are minimized.

The JPA in Pennsylvania requires the following components, which the SWCA Team will prepare: the Project Description Narrative, General Information Form, Floodplain Management (stream is located in FEMA-mapped floodplain), Municipality and County Notifications, Impact Fee Calculations, Location and Photograph Maps, and thorough Alternatives Analysis. As part of this permitting process, coordination with additional agencies will likely be required and is detailed below.

Rare, Threatened, and Endangered Species Consultation

SWCA will conduct a desktop review for rare, threatened, and endangered species potentially present within the project site and proposed mitigation site using the Pennsylvania Natural Heritage Program's Conservation Explorer review system. SWCA will contact regulatory agencies identified through the database to determine whether any additional species-specific surveys are required to address any potential adverse effects the project may have on

rare, threatened, and endangered species or habitats. A detailed description of the existing habitat of the project site and mitigation site will be included in the Environmental Assessment (EA) (see below). Bog turtles are known to occur in Monroe County. As a result, further coordination, including a bog turtle survey, may be required. Any required species-specific surveys will be addressed under a separate proposal, if necessary.

Cultural Resources Consultation

Given that the project will require a JPA issued by a federal and state agency, the project is subject to cultural resources compliance laws, including Section 106 of the National Historic Preservation Act and the Pennsylvania State History Code. SWCA's cultural resource experts based out of the Pittsburgh, Pennsylvania, office have extensive experience working closely with the Pennsylvania State Historic Preservation Office (SHPO) on similar sized projects within the Commonwealth.

Environmental Assessment

SWCA biologists will prepare an EA of the project site. The EA will include a field component to collect detailed information pertaining to the on-site biological conditions, as well as a detailed EA report summarizing the findings of the site visit and proposed impacts. The on-site analysis will also include a more detailed study of the streams and wetlands that are proposed to be impacted on the project site and will follow all protocol listed in the Pennsylvania Wetland Condition Level 2 Rapid Assessment for wetlands and the Pennsylvania Riverine Condition Level 2 Rapid Assessment for streams and rivers issued by the PADEP. These protocols were developed to allow a more qualitative analysis of streams and wetland systems, leading to a more well-suited development of replacement habitat during mitigation.

Permitting Deliverables:

Task 1

- Wetland Delineation Report

Task 3

- Pre-application Meetings for Permitting
- Prepare and submit NPDES Permit Application
- Section 404 / Chapter 105 Joint Permit Application

PROVEN PROJECT IMPLEMENTATION SYSTEMS

COMMUNICATION

Prior to commencement of the project, SWCA's Project Manager (PM), Mr. Somers, will work with the District and the PAGC to develop a Communication Plan that is suitable for the project. The Communication Plan will address varying communication approaches based on the critical components of the project.

Communication Control

Regular communication is essential to ensure that all parties involved are working with the most up-to-date and accurate information. The SWCA Team understands that reliability, strong relationships, and trust are essential to good communication. To help build our relationship with District and the PAGC, we will use management tools to maintain clear project communications, such as conducting regular team calls, using our secure electronic file transfer protocol (FTP) system, and providing diagrams of the "chain of command" within our team (including our teaming

partners). Rapid and direct communication regarding safety, public interaction, field logistics, and schedule issues will flow directly from SWCA to the District and PAGC. These actions will prevent rework, as all involved parties will constantly be informed of the various aspects of the project.

QUALITY ASSURANCE/QUALITY CONTROL

SWCA has a robust audit system in place to assess project performance and identify areas of improvement. This system consists of both internal audits and client feedback. We use the system to resolve project-level issues identified both internally and by our clients and to uncover trends that may point to company-wide issues in our service delivery. Using this information, we can modify methods or processes in our service delivery and develop new methods or processes to improve the client experience.

Internal Audits

Our PMs and Senior Leadership conduct monthly project audits to ensure that schedule, budget, and quality objectives are being met. These consist of an in-person meeting where the PM and Senior Leadership review key performance indicators together.

Client Feedback Program

SWCA strives to meet or exceed expectations set at the beginning of a project, and we strive to continuously improve our service delivery. To this end, SWCA has a system in place to track and respond to client feedback on our performance. At the close of every project, we ask our clients to what degree SWCA and our staff are meeting expectations in key areas such as helpfulness, responsiveness, communication, value for fees paid, and quality of deliverables. Our clients rate their experiences with SWCA on a scale of 1.0 (Unacceptable) to 10.0 (Exceptional).

Cost Control and Cost Accounting System

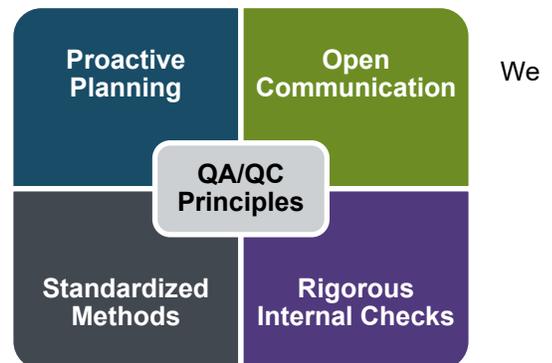
Establishing realistic budget parameters with the client at the start of the project sets the foundation from which project costs are monitored and controlled. SWCA Team members will be familiar with the estimated costs for their aspects of the project. Mr. Somers will regularly monitor the budget throughout the life of the project. He will provide the District and PAGC with detailed, up-to-date project costs on a monthly basis.

SWCA uses *Delttek Vision*, a fully integrated software a flexible work-breakdown structure, which allows project costs to be tracked by phase and/or task; it can incorporate multiple billing arrangements in a single project. This provides concise and easy-to-understand invoices and gives us the option to provide billing information in a detailed or simple format. Our PMs can track project activities and costs with real-time information, allowing us to monitor and manage costs effectively.

PROJECT MANAGEMENT

SWCA's strategic and technical services will be provided in accordance with industry best practices. We implement a comprehensive range of QA/QC measures in all aspects of project execution to ensure an outstanding level of quality. An internal quality review process is applied to each project task undertaken by SWCA. staff each project with the right mix of professionals with appropriate levels of knowledge, skill, and experience to ensure we deliver quality performance. SWCA takes a team-based approach to QA/QC that rests on four key principles.

1. Proactive planning to ensure quality performance
2. Open communication
3. Use of standardized methods



4. Rigorous internal checks to guarantee that project progress stays on schedule

From the outset of project planning, SWCA works to proactively provide excellence through the use of work plans that revolve around QA/QC. By communicating directly and openly with the District and PAGC from project kick-off through the final deliverable, SWCA creates seamless and real-time feedback between the District and PAGC's needs and SWCA's responsibilities, eliminating the need for rework.

SWCA's strong QA/QC program has been designed to achieve our company vision of Sound Science, Creative Solutions and is intentionally designed to establish across-the-board standards for excellence in SWCA work products. Our team believes in continuous and consistent project quality rather than an "end of the line" QA/QC approach. Continuous QA/QC means that steps to ensure quality are implemented during all stages of the project.

1. We select experienced, dependable people for the team because this is the most important step toward ensuring a high-quality result in the execution of the project.
2. We establish clear expectations and guidelines regarding how tasks will be performed and deliverables prepared.
3. We implement a rigorous process of checks and milestones for all written deliverables, technical reports, field study execution, and data collection.

Scope of Services Section 3.1 of the RFQ provides information regarding the expected deliverables for the project. The SWCA Team has been assembled to ensure that experts in given fields are working on tasks that provide the most benefit to the District and PAGC. Specifically, SWCA will lead the overall design and permitting of the project, with data input from GEI on geotechnical and slope analysis and bank stabilization engineering, and from Encompass, which will be providing the topographic and civil survey data needed to complete a comprehensive design that meets the stated goals of the project. Specific understanding of key project components are detailed below.

SAFETY

SWCA tracks and reports all safety and compliance incidents that occur on all of our projects. Because safety is a core component of our work culture, we emphasize safety to our crews, and we provide several types of communication devices suitable for working in remote areas. Based on the terrain, location, and type of work, our crews will use a combination of cell phones, walkie-talkies, and SPOT devices or Delorme In-Reach devices. SWCA's newest safety app, SIREN (Safety Incident Reporting and Emergency Notification), is designed to streamline the incident reporting process and ensure that all incidents are reported within 24 hours so the situation can be managed to achieve the best possible outcome. By submitting an incident notification through SIREN, the local office safety representative, local office management, and our corporate safety team are alerted so that all appropriate responses can be taken. Other features available through SIREN include SWCA's Safety Manual and a means to request emergency assistance via SMS text message. Our staff consists of skilled and experienced off-road drivers. The remote nature of this project will likely entail the use of ATVs. SWCA requires that all staff complete an online ATV safety course prior to operating an ATV. SWCA will work closely the District and PAGC to meet fire protection equipment requirements for crews, including fire tools (e.g., pulaskis, shovels, adze hoes), fire extinguishers, and other essential items.



RELEVANT PROJECT EXPERIENCE AND REFERENCES

Provided below is a selection of project summaries of SWCA’s representative, recent projects highlighting our experience in stream restoration and design elements. References for each project are provided. Table 2 below provides a matrix of these and several other relevant SWCA projects and the relevant project components included in each. Additional project examples from our team members/subconsultants are provided in Appendix E.

SAN FRANCISQUITO CANYON AQUATIC BARRIERS RESTORATION PROGRAM, LOS ANGELES COUNTY, CA | U.S. FOREST SERVICE AND NATIONAL FISH AND WILDLIFE FOUNDATION

SWCA, in partnership with The Resource Institute, was awarded a National Fish and Wildlife Foundation (NFWF) grant to develop design plans and supporting resource studies to complete stream restoration at two sites along San Francisquito Creek, an arid perennial stream located in Angeles National Forest in southern California. Phase 1 of the project involves baseline conditions analyses, natural channel design/engineering, developing all required permitting documents, including National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA), stakeholder and community outreach, and biological and cultural resources support. This first project phase is focused on developing engineering designs for aquatic organism passage within two stream segments, where a demolished dam, sediment accumulation (after erosion from a devastating wildfire), and a damaged road culvert are blocking water flow and movement of the state-listed and federally listed California red-legged frog (*Rana draytonii*) and unarmored threespine stickleback (*Gasterosteus aculeatus*). Site-specific designs will be developed through the implementation of natural channel design methodologies at four high-priority passage barriers along the creek. The project will also include a detailed planting plan (for riparian and arid upland areas) and habitat design that take into consideration the special needs of all aquatic species (particularly



special status species) and will account for changes in sedimentation and flooding associated with post-fire recovery within Angeles National Forest. The project design is also accounting for resource constraints, including the cultural significance of the St. Francis dam failure site, potential road and utility conflicts, and competing habitat needs of wildlife. Future project phases (subject to grant funding) will focus on construction and implementation of the stream restoration design.

SWCA Staff Involvement: David Bidelspach

Reference Contact: Alan Walker, Project Manager, The Resource Institute, (336) 750-0522, awalker@resourceinstituteinc.org

Budget and Schedule Performance: The schedule for this complex, grant-funded project is aggressive. Work is ongoing, but SWCA has remained on schedule and within budget throughout all steps of Phase 1. The U.S. Forest Service, NFWF, and The Resource Institute have all expressed positive responses regarding the ongoing resource studies, stakeholder engagement, and the design process.

Beginning price \$440,000, ending price \$440,000.

PILLOT GULLY CHANNEL STABILIZATION, HARRIS COUNTY, TEXAS | HARRIS COUNTY FLOOD CONTROL DISTRICT

SWCA completed the design for a channel stabilization project for a 2,200-foot reach of Pilot Gully, a tributary to Cypress Creek and part of a linear greenway park system. SWCA developed both preliminary design alternatives and the final design for the project. The channel has undergone extensive downcutting and lateral erosion in response to straightening and over-excavation as part of flood control improvements and extensive watershed modification from urban/suburban development. A large concrete grade control structure was installed in the 1950s and had failed within the last 10 years, resulting in exaggerated downcutting and several active headcuts moving upstream. SWCA was retained to develop a channel stabilization and restoration solution using Natural Channel Design (NCD) methodologies.



The final design focused on a Rosgen Priority 2 restoration, where the incised and entrenched stream is fully restored using NCD methods at its existing elevation with a nominal geomorphic (bankfull) floodplain bench and the original gully walls are over-excavated and laid back to a stabilized form to convey a larger, design flood event (e.g., 100-year event). The NCD stream restoration included constructed boulder riffles and log and boulder cross vanes, NCD grade control structures, and the use of toe wood for meander bend bank stabilization. HEC-RAS models were developed and used to both confirm “no-rise” conditions as a result of the project relative to regulatory flood elevations, as well as to evaluate both in-stream power and shear stress to confirm the validity of the design relative to sediment transport and erosion prevention. SWCA also provided permitting support for the project, including Clean Water Act Section 404/401 permitting through the USACE Galveston District, and will be providing bid phase support and engineering construction oversight.

SWCA Staff Involvement: David Bidelspach

Reference Contact: Jonathan St. Romain, PE, Project Manager, Harris County Flood Control District, (713) 684-4000, Jonathan.St.Romain@hcfcd.hctx.net

Budget and Schedule Performance: The stream design and plan set had to adhere to the Harris County Flood Control District (HCFCD) standards. Through multiple reviews of the plan set and Project Manual, SWCA has adhered to the project schedule, which has been extended due to a bond referendum passing in August 2018 resulting in a requirement for the HCFCD to present the project at a public meeting and additional effort from the SWCA Team. SWCA coordinated with the HCFCD to move budget allocations from some tasks, which were completed, to other tasks to cover the most of the additional effort, but one change order was required to cover the public meeting costs.

Beginning price \$317,039, ending price \$333,167.

LOWER BOIS D’ARC RESERVOIR MITIGATION PROJECT, HARRIS COUNTY, TEXAS | RESOURCE ENVIRONMENTAL SOLUTIONS, LLC

SWCA is on a team providing the mitigation plan and design for the proposed Bois d’Arc Lake Reservoir in northeast Texas. The mitigation plan includes the enhancement, restoration, and creation of approximately 60 miles of streams and 8000 acres of wetlands. Through a watershed approach to mitigation, on-site mitigation would be provided at the proposed reservoir site and near site mitigation would be provided on the nearly 15,000-acre Riverby Ranch and the 1,900-acre Upper Bois d’Arc Creek Mitigation Site. The project includes a geomorphic investigation of reference reach systems, as well as the existing conditions and degree of impairment for ephemeral, intermittent and perennial streams within the project area. Design elements include re-meandering the channel, defining a low-flow channel, and bankfull bench, and bank grading. Design of in-channel structures include augmented riffles and pools, large-wood toe stabilization, boulder and log grade control structures, rootwads, j-hooks, and point bars. SWCA is also providing the construction oversight.



SWCA Staff Involvement: David Bidelspach

Contact: Matt Stahman, Project Manager, Resource Environmental Solutions, (281) 734-7787, mstahman@res.us

Budget and Schedule Performance: The schedule for this complex, public works project for the North Texas Municipal Water District is aggressive. Work is ongoing, but SWCA has remained on schedule and within budget throughout all Phases of work.

Beginning costs \$2,063,800, ending costs \$2,063.800.

GREEN RIVER RIVERBANK RESTORATION, GREENFIELD, MA | PRIVATE RESIDENCE



SWCA’s Amherst office designed and permitted a riverbank restoration and reconstruction project on the Green River at a private residence in Greenfield, Massachusetts. We proposed the removal of foreign material from the riverbank and within the river, and reconstruction and restoration of a failing and eroding riverbank. The design objective was to stabilize the bank, improve the natural capacity of the resource areas, and provide wildlife habitat. We designed the construction plans and acted as the construction monitor for the duration of site work. Following construction, our staff installed native plant material including red dogwood, speckled alder, and willow. SWCA’s strategies included utilizing natural material such as root wads and boulders to stabilize the toe of slope, enhanced wildlife habitat, installed log vanes to deflect water from the bank, installed native plants to stabilize the slope and minimize future erosion, and controlled invasive plants throughout 2-year post-construction monitoring period.

The restoration survived 2011 Tropical Storm Irene intact. We removed a significant amount of historic construction debris from within the bank and the river. The homeowner has stabilized and protected their property while improving the overall habitat and aesthetics of the property.

Confidential client, contact information available upon request

BANK RESTORATION & BIOENGINEERING, OSAGE RIVER, ELDON, MISSOURI

SWCA’s Amherst office designed and implemented a bank stabilization and bioengineering plan for a 900–linear foot section of bank on the Osage River, in Eldon, Missouri. The site, located below the Bagnell Dam, consisted of a 25- to 30-foot bank, steep slopes with sparse vegetation. A primary sewer pipeline of the Town of Eldon was located at the top of the riverbank and portions of the sewer pipe could be seen along the eroding bank. To address the severe bank erosion and significant amount of sediment loading occurring to the river, and to protect and maintain the location of the sewer pipe, SWCA implemented regrading of the bank to a stable gradient, working from the top of slope. We secured the toe of slope with stone and incorporated a biodegradable erosion control fabric and an erosion control seed mix to stabilize the bank. The bank was revegetated with riverfront plant species native to the Osage River. SWCA provided successful demonstration of bioengineering bank restoration on the Osage River and restoration of sewer line infrastructure.



Confidential client, contact information available upon request

FLUVIAL GEOMORPHOLOGIC ASSESSMENTS POST TROPICAL STORM IRENE, FOUR RIVERS IN FRANKLIN COUNTY, MA



In cooperation with FEMA, UMASS-Amherst and the MA Geological Survey, SWCA’s Amherst office completed geomorphologic assessments of four rivers located within the Deerfield River watershed after significant flooding related to Tropical Storm Irene. Our team assessed stream corridors within priority subwatersheds using multiple methods and developed fluvial erosion hazard maps. SWCA’s strategies included completed rapid fluvial geomorphological assessments along priority stream corridors, inventoried erosion prone areas using GPS, photolog, and field data forms, collected cross section and longitudinal profile data at various sites along all assessed streams, both pre- and post-Irene floods, developed fluvial erosion hazard maps for stream corridors using GIS data and field collected GPS data, compiled year-end reports for the U.S. Army Corps of Engineers for compliance with the Section 404 Permit, and published documents in partnership with USGS. Staff utilized the

fluvial geomorphologic techniques to assess erosion hazard and flood prone areas for stream corridor management. We provided local municipalities with detailed erosion hazard index figures for use in evaluation of high hazard location within towns.

Confidential client, contact information available upon request

Table 2. Relevant SWCA Projects with Relevant Project Components

	Stream Restoration	Planning	Natural Channel Design	Stream Channel Modifications	Stream Stabilization Improvements	Stream / Floodplain Restoration	Stream Hydraulics	Floodplain Modeling and Mapping	Stream Ecology / Biological Assessments	Fluvial Geomorphology	Public Involvement
RELEVANT PROJECT EXPERIENCE											
San Francisquito Canyon Aquatic Barriers Restoration Program	●	●	●	●	●	●	●	●	●	●	●
Lower Bois D'Arc Reservoir Stream Mitigation	●	●	●	●	●	●	●	●	●	●	●
K140 (Pilot Gully) Channel Stabilization	●		●	●	●	●	●	●	●	●	●
Connecticut River Erosion Monitoring		●			●	●		●	●	●	
Connecticut River Wetland and Rare Mussel Survey									●		
Barrett Street Brook Urban Stream Restoration	●			●	●				●		●
Cold River and Warren Brook Restoration	●					●			●		
Connecticut River Soil Bioengineering and Riverbank Stabilization	●				●	●			●		
Sidney Floodplain Restoration	●	●				●		●	●		●
Long-Term Community Recovery Strategy		●							●		
Hurricane Irene Recovery										●	●



Table 3. SWCA's Estimated Fees

TASK DESCRIPTION	EST. FEE
Data Collection	\$ 59,772
Preliminary Design	\$ 30,053
Final Design and Permitting	\$111,127
Construction Documents	<u>\$ 41,851</u>
TOTAL:	\$242,803

* Actual scope fee to be negotiated upon bidder selection and contract execution.

SWCA

APPENDIX A:
Respondent Information Form

RESPONDENT INFORMATION FORM
STATEMENT OF BIDDER QUALIFICATIONS

1. Company name, bidder email, mail address and all branch office address.

SWCA Environmental Consultants
SMitchell@swca.com
80 Emerson Lane, Suite 1306, Bridgeville, Pennsylvania 15017

SWCA Office Locations

Phoenix, Arizona (Corporate / Consulting)
20 E Thomas Road, Suite 1700
Phoenix, AZ 85012
(602) 274-3831

Flagstaff, Arizona
30IL114 N. San Francisco Street,
Suite 100
Flagstaff, AZ 86001
(800) 224-4234

Tucson, Arizona
343 W. Franklin Street
Tucson, AZ 85701
(800) 320-7835

Half Moon Bay, California
60 Stone Pine Road, Suite 100
Half Moon Bay, CA 94019
(866) 625-9876

Pasadena, California
51 W. Dayton Street
Pasadena, CA 91105
(866) 841-2672

San Francisco, California
330 Townsend St., Suite 216
San Francisco, CA 94107
(415) 536-2883

San Luis Obispo, California
1422 Monterey Street, Suite C200
San Luis Obispo, CA 93401
(805) 543-7095

Denver, Colorado
295 Interlocken Boulevard, Suite
300
Broomfield, CO 80021
(800) 272-0683

Durango, Colorado
130 Rock Point Drive, Suite A
Durango, CO 81301
(970) 385-8566

Fort Collins, Colorado
2120 S. College Ave., Suite 2
Fort Collins, Colorado 80525
(970) 237-4096

Honolulu, Hawaii
1001 Bishop Street, Bishop
Square: ASB Tower, Suite 2800

Honolulu, HI 96813
(808) 548-7922

Chicago, Illinois
200 West 22nd Street, Suite 200
Lombard, IL 60148
(630) 836-8717

Baton Rouge, Louisiana
5745 Essen Lane, Suite 105
Baton Rouge, LA 70810
(713) 934-9900

Amherst, Massachusetts
15 Research Drive
Amherst, MA 01002
(413) 256-0202

Boston, Massachusetts
1900 West Park Drive, Suite 280
Westborough, MA 01581
(413) 256-0202

Las Vegas, Nevada
7210 Placid Street
Las Vegas, NV 89119
(866) 262-5921

Reno, Nevada
675 Sierra Rose Dr., Suite 104
Reno, NV 89511
(866) 262-5921

Albuquerque, New Mexico
5647 Jefferson Street NE
Albuquerque, NM 87109
(800) 828-8499

Carlsbad, New Mexico
101 W. Church St.
Carlsbad, NM 88220
(800) 828-8499

Raleigh-Sanford, North Carolina
201 Chatham Street, Suite 3
Sanford, NC 27330
(919) 292-2200

Bismarck, North Dakota
116 N. 4th Street, Suite 200
Bismarck, ND 58501
(701) 258-6622

Tulsa, Oklahoma
233 S. Detroit Ave., Suite 301

Tulsa, OK 74120
(918) 770-7983

Portland, Oregon
1220 SW Morrison, Suite 700
Portland, OR 97205
(503) 224-0333

Pittsburgh, Pennsylvania
80 Emerson Lane, Suite 1306
Bridgeville, PA 15017

Arlington, Texas
2201 Brookhollow Plaza Drive,
Suite 400
Arlington, TX 76006
(817) 394-6506

Austin, Texas
4407 Monterey Oaks Blvd, Building
1, Suite 110
Austin, TX 78749
(800) 272-0649

Houston, Texas
10245 W. Little York Road, Suite
600
Houston, TX 77040
(888) 605-4214

San Antonio, Texas
6200 UTSA Blvd, Suite 102
San Antonio, TX 78249
(866) 841-2554

Salt Lake City, Utah
257 E. 200 South, Suite 200
Salt Lake City, UT 84111
(800) 828-7991

Vernal, Utah
2332 W. 600 North
Vernal, UT 84078
(435) 789-9388

Seattle, Washington
221 First Avenue West, Suite 205
Seattle, WA 98119
(206) 781-1909

Sheridan, Wyoming
1892 S. Sheridan Avenue
Sheridan, WY 82801
(307) 673-4303

2. Type of business entity (corporation, non-for-profit, proprietorship, etc.) and Federal Tax Identification Number.

S Corporation
Federal EIN: 86-0483317

3. If company is a corporation, state the date and place of incorporation and give a brief history of company's operations. Please include if your firm is affiliated with Minority, Women, Small or Disadvantaged Business Enterprises.

SWCA was incorporated April 13, 1984 in the state of Arizona.

SWCA is committed to partnering with diverse suppliers. We formalized that commitment by developing a Supplier Diversity Program, which establishes and maintains mutually beneficial contracting relationships with small and disadvantaged businesses. Specifically, the program is charged with accomplishing the following:

- Meeting small businesses through attendance at events and through networking
- Developing relationships with small businesses with the goal of subcontracting project work
- Identifying opportunities to purchase products and services from small business vendors
- Establishing small business goals and reporting toward those goals

4. List directors, officers, owners, managerial employees or partners, and identify the ownership interest of each.

Principal Shareholders: SWCA ESOP Plan and Trust, established in 1998

Executive Leadership Team: Joseph J. Fluder III, CEO; Rich Young, President, COO; Denis Henry, CFO, Executive VP; Scott Slessman, Sr. VP of Business Development Resources

Officers: Joseph J. Fluder III, CEO; Rich Young, President, COO; Denis Henry, CFO, Executive VP;

Board Members: John R. Thomas, Chairman, External Director; Steven W. Carothers, Ph.D., Founder, Internal Director; Robert K. Wilson, External Director; Joseph J. Fluder III, Internal Director; Denis Henry, Rotating Internal Director; Rick Adam, External Director; Laura Huenneke, Ph.D., External Director

5. Total number of employees and total number of licensed professionals (include an organizational chart, if available).

Total Employee Count: 1,100

Licensed Professionals: 315

6. Identify locations from which services will be performed.

Pennsylvania Office, 80 Emerson Lane, Suite 1306, Bridgeville, Pennsylvania 15017
Raleigh-Sanford Office, 201 Chatham Street, Suite 3, Sanford, North Carolina 27330
Massachusetts Office, 15 Research Drive, Amherst, Massachusetts 01002
Fort Collins Office, 2120 S. College Ave., Suite 2, Fort Collins, Colorado 80525

7. Identify or attach license or certificates to perform the work in each jurisdiction where the work will take place.

See Appendix C for licenses and certificates

8. Has any director, officer, owner or managerial employee had any professional license suspended or revoked? If yes, list the name of the individual, license held and disposition of the issue.

No

9. Has any director, officer, owner or managerial employee been convicted or the subject of criminal indictment during the past five (5) years? If yes, summarize the matter and its disposition.

No

10. Is the company currently involved in bankruptcy or similar proceedings? If yes, explain.

No

11. During the past three (3) years, has company been found guilty of any OSHA, EPA or State environmental or safety violation? If yes, describe the nature of the violation and steps taken to remediate the condition(s).

No

12. During the past five (5) years, has company been charged with retaliation or discrimination against any employee on the basis of race, ethnicity, national origin, disability, gender or other violation of equal employment opportunities? If yes, summarize each claim and its disposition.

No

13. During the past five (5) years, has company been named as a party in any action involving a claim for personal injury or wrongful death arising from performance of work on any project? If yes, summarize the claim and its disposition.

No

14. During the past five (5) years, has company been the subject of an investigation or proceedings before the city, state or federal Departments of Labor for any alleged violation of any wage or labor law? If yes, summarize each such instance and its disposition.

No

15. Has the company ever been terminated from a project by the Owner? If yes, list the projects on which the bidder was terminated, the nature of the termination (e.g., convenience, suspension, for cause), and the date of said termination.

No

16. List the technical and professional staff to be employed on this project; describe general and specific specialties/expertise and overall resources; provide title, role and work resume of each team member, including principals.

All of this information is provided in the Statement of Interest (SOI) for this Request for Qualifications (RFQ). Corporate summaries for SWCA and our subconsultant team members, as well as our firm qualifications specific to the RFQ are presented in the "Qualifications" section of the SOI. The "Key Team Member Experience" section of the SOI presents the key team members, their project roles, and a brief summary of their expertise related to this project, both in brief bios as well as a Team Matrix Table (Table 1). Relevant project experience for each key team member is summarized in Table 1. The resumes included in Appendix C and include more detailed information on the qualifications of each of these key team members.

17. Indicate your understanding of the scope of work involved in the project and potential problems to be addressed. Summarize how you will respond to specific phases of the work, identifying any innovative or creative design approaches or strategies that the company proposes.

Our understanding of the scope of work and the potential problems to be addressed are presented in in the “Communication” subsection of “Project Understanding” section of the Statement of Interest (SOI), but are summarized here also.

Understanding of the scope of work:

SWCA understands that the primary objective of the proposed project is to stop the erosion and excessive sediment loading that is currently occurring within the project reach of Sand Spring Run and along the adjacent, abandoned railroad embankment while at the same time restoring the natural and stable stream functions to achieve water quality improvements and ecological uplift to the project stream reach in this critical headwater (designated Exceptional Value (EV) under Title 25 PA Code Chapter 93) of the Upper Pocono Creek, a Class-A Trout Fishery.

Potential problems to be addressed:

Site access issues (the site is more than one mile from the nearest paved road) and the need to develop an adequate bankfull floodplain for the stream between the very high and steep embankments of the abandoned railroad are the primary challenges to the successful implementation of the project, as they will present obstacles to the site logistics involved with moving equipment and materials in and out of the site. SWCA has extensive experience working on remote projects where site access is challenging and where access roads may require improvements, shoring, or logging mats for access. Also, we will strive to use onsite materials in the stream restoration design to minimize trucking and materials cost, which can greatly reduce the overall cost of the project.

Phases of work:

We anticipate the following phases of work will be implemented to successfully complete the project:

1. Site access, installation of erosion and sediment control measures,
2. Site clearing as necessary,
3. Earthwork for floodplain and disposal of the material will occur next, including grading back of the abandoned railroad embankment to a stable slope and appropriately-wide floodplain adjacent to the stream,
4. Earthwork for the stream channel and installation of in-stream structures,
5. Application of topsoil, seed, matting, live stakes (for stream banks), and planting woody vegetation along floodplain and tie-in slopes,
6. Demobilization and site clean-up

Innovative or creative design approaches/strategies:

We utilize a 3-D natural channel design (NCD) process to develop stream restoration designs that results in faster and more efficient design, analysis, and construction of these projects. This unique design process is explained further in the “Scope of Work” section of the SOI. Further, based on our experience, we anticipate the utilization of wood structures for in-stream stabilization and habitat, bio-engineered vegetated soil lifts for bank stability, and installation of toe wood along stream banks will be much more feasible for constructing a stable, sustainable, and cost effective project as opposed to trucking in extensive quantities of boulders. This is an approach we commonly take with projects that may require a mile or more of off-road access, such as this project.

18. Describe the nature and level of communications company will maintain with MCCD staff during the various project phases.

We describe our proposed communication plan in the “Communication” subsection of “Proven Project Implementation Systems” section of the SOI.

19. Discuss any special or specific qualifications company has for this project.

We utilize a 3-D natural channel design (NCD) process to develop stream restoration designs that results in faster and more efficient design, analysis, and construction of these projects. This unique design process is explained further in the “SWCA’s Stream Restoration and Natural Channel Design Process” subsection of the “Scope of Work” section of the SOI.

20. Describe how company will ensure Project performance, quality and consistency through adequate management, supervision and control techniques.

We describe our proposed plan to ensure project performance, quality and consistency in the “Quality Assurance/Quality Control” and “Project Management” subsections of the “Proven Project Implementation Systems” section of the SOI.

21. Describe company’s system of monitoring and oversight to ensure maintenance of complete and accurate work, payroll and invoicing records

We describe our proposed system of project monitoring and oversight in the “Quality Assurance/Quality Control” subsection of the “Proven Project Implementation Systems” section of the SOI.

22. Does company have any projects ongoing at the time of the submission of this bid? If yes, list the projects on which the bidder is currently working, the percentage now complete, and the expected dates of completion.

PROJECT NAME	KEY TEAM MEMBERS	% COMPLETED	ESTIMATED COMPLETION
SWCA ENVIRONMENTAL CONSULTANTS			
Gregorys Creek Stream & Wetland Mitigation Bank	Daren Pait, David Bidelspach	5%	12/31/2019
San Francisquito Creek AOP Restoration	David Bidelspach	60%	6/30/2020
LID #7 External Channel NCD Stabilization	Daren Pait, David Bidelspach	95%	9/31/2019
Westhampton Solar Construction Drawings And SWPPP	Kevin Mccaffery	10%	11/1/2019
Hillcrest Solar Hydrology Analysis	Kevin Mccaffery	0%	11/1/2019
Trona Mine Drainage Analysis and Mapping	Kevin Mccaffery	75%	10/15/2019
Russell Enforcement Order Mitigation Plans	Tony Somers, Kevin Mccaffery	50%	10/15/2019
Line 111 Extension Mitigation Design	Tony Somers	80%	10/11/2019
Valley Street Solar Development	Tony Somers	90%	10/01/2019
Middletown Municipal Trail Design	Tony Somers	10%	12/31/2019
Alamo Restoration Design	Tony Somers	80%	10/01/2019
Capon Bridge Solar Development Via	Tony Somers	0%	02/01/2020
Gill Farm Water Design and Permitting	Tony Somers	0%	12/01/2019
GEI CONSULTANTS			
Racine Hydro Cell Remediation	Helen Robinson, Andy Baxter	82%	2020-Q2
E.W. Brown Ash Pond	Helen D Robinson	51%	2020-Q3
Olefins Test Load	Jesús Gómez, Helen Robinson	73%	2019-Q3
Southern Beltway	Helen D Robinson	0%	2020-Q1
ALC Pond Retrofit	Helen D Robinson	38%	2020-Q3
Back River WWTP - SOE Design	Jesús Gómez, Helen Robinson	57%	2020-Q1
Russo Engineering Consulting Services	Jesús Gómez, Helen Robinson	66%	2019-Q4
Venture Global - Calcasieu Pass LNG	Helen D Robinson	41%	2019-Q4
DFI- Micropile Connection Research	Helen D Robinson	88%	2019-Q4
GCGV Olefins	Helen D Robinson	5%	2019-Q4
Houston Lake Dam	Helen D Robinson	68%	2020-Q1
SR 252 Instrumentation	Jesús Gómez, Helen Robinson	22%	2020-Q4
Scudder Falls Bridge Replacement Project	Jesús Gómez, Helen Robinson	36%	2020-Q3
LiDL Grocery Displacement Pile Testing	Jesús Gómez, Helen Robinson	54%	2019-Q3
Building 324 Technical Peer Review	Helen D Robinson	88%	2019-Q3
Jobs Creek	Jesús Gómez, Helen Robinson	93%	2019-Q4
Lake White Reservoir Water Transfer	Jesús Gómez, Helen Robinson	69%	2020-Q1
USACE-IEPR for E.Branch Dam Cutoff	Jesús Gómez, Helen Robinson	84%	2019-Q4
Beaver Dam Creek Dam	Andy Baxter	84%	2020-Q1
AlexRenew Wet Weather Program	Helen Robinson	36%	2023-Q4
ENCOMPASS			
Equitrans Mountain Valley Pipeline Project	Jeff Conaway, Tim Newmyer	75%	2021
Williams Maddie Project	Jeff Conaway	20%	2020
National Grid - Mohawk Valley Pipeline	Jeff Conaway	40%	2021
Kinder Morgan - TGP 200 Project	Jeff Conaway	76%	2020
Williams Harrison Hub Project	Jeff Conaway, BJ Parkin	88%	2019
Kinder Morgan - TGP 261B Project	BJ Parkin	65%	2020
AEP - Cabin Creek Project	Kevin Schafer	75%	2019
DTE - TCAR Project	Jeff Conaway, BJ Parkin	85%	2020
Williams Clearfork Phase 2 Project	Vance Hefley, BJ Parkin	40%	2020
UGI Keystone Cement Project	Jeff Conaway, BJ Parkin	80%	2020

23. Attach company's most current certified financial statement or, if a certified statement has not been issued within the past 12 months, the company's latest internal financial statement.

See proposal document for SWCA's Financial Stability Letter (Appendix D)

By: 
(Signature)

Tony Somers, Landscape Architect, SWCA, Incorporated
(Print Name, Title and Company)

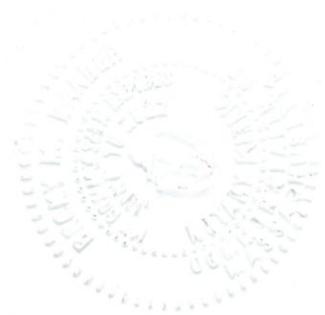
Dated: September 20, 2019

Sworn to before me this 20 day of Sept, 2019


Notary Public



BECKY M. BARBER
Notary Public
Commonwealth of Massachusetts
My Commission Expires
June 10, 2022



SWCA

APPENDIX B:
Non-Collusion Affidavit

NONCOLLUSION AFFIDAVIT

MCCD Project Name: Sand Spring Run Spring Bank Restoration

State of Pennsylvania

County of Monroe County

I state that I am the EVP-CFO (Title) of SWCA, Incorporated (Name of Firm) and that I am authorized to make this affidavit on behalf of my firm, and its owners, directors, and officers. I am the person responsible in my firm for the prices(s) and the amount of this proposal.

I state that:

- 1. The price(s) and amount of this proposal have been arrived at independently and without consultation, communication or agreement with any other contractor, proposer, or potential proposer.
2. Neither the price(s) nor the amount of this proposal, and neither the approximate price(s) nor approximate amount of this proposal, have been disclosed to any other firm or person who is a proposer or potential proposer, and they will not be disclosed before the proposal submission date.
3. No attempt has been made or will be made to induce any firm or person to refrain from proposing on this contract, or to submit a proposal higher than this proposal, or to submit any intentionally high or noncompetitive proposal or other form of complementary proposal.
4. The proposal of my firm is made in good faith and not pursuant to any agreement or discussion with, or inducement from, any firm or person to submit a complementary or other noncompetitive proposal.
5. SWCA, Incorporated (Name of Firm) its affiliates, subsidiaries, officers, directors, and employees are not currently under investigation by any governmental agency and have not in the last three years been convicted or found liable for any act prohibited by state or federal law in any jurisdiction, involving conspiracy or collusion with respect to proposing and/or bidding on any public contract, except as follows:

I state that SWCA, Incorporated (Name of Firm) understands and acknowledges that the above representations are material and important, and will be relied upon by the Monroe County Conservation District (MCCD) in awarding the contract(s) for which this proposal is submitted. I understand and my firm understands that any misstatement in this affidavit is and shall be treated as fraudulent concealment from the MCCD of the true facts relating to the submission of this proposal.

(Signature) [Handwritten Signature]

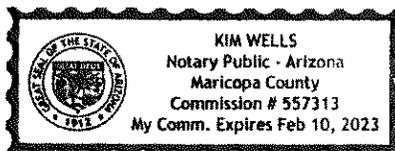
Denis Henry (Signatory's Printed Name)

EVP-CFO (Signatory's Title)

SWORN TO AND SUBSCRIBED BEFORE ME THIS 17th DAY OF SEPTEMBER, 2019.

[Handwritten Signature] Notary Public

My Commission Expires



2-10-23

NONCOLLUSION AFFIDAVIT

State of New Jersey
County of Burlington

MCCD Project Name: Sund Spring Run
0990000726

I state that I am the Vice President (Title) of GEI Consultants, Inc. (Name of Firm) and that I am authorized to make this affidavit on behalf of my firm, and its owners, directors, and officers. I am the person responsible in my firm for the prices(s) and the amount of this proposal.

I state that:

1. The price(s) and amount of this proposal have been arrived at independently and without consultation, communication or agreement with any other contractor, proposer, or potential proposer.
2. Neither the price(s) nor the amount of this proposal, and neither the approximate price(s) nor approximate amount of this proposal, have been disclosed to any other firm or person who is a proposer or potential proposer, and they will not be disclosed before the proposal submission date.
3. No attempt has been made or will be made to induce any firm or person to refrain from proposing on this contract, or to submit a proposal higher than this proposal, or to submit any intentionally high or noncompetitive proposal or other form of complementary proposal.
4. The proposal of my firm is made in good faith and not pursuant to any agreement or discussion with, or inducement from, any firm or person to submit a complementary or other noncompetitive proposal.
5. GEI Consultants, Inc. (Name of Firm) its affiliates, subsidiaries, officers, directors, and employees are not currently under investigation by any governmental agency and have not in the last three years been convicted or found liable for any act prohibited by state or federal law in any jurisdiction, involving conspiracy or collusion with respect to proposing and/or bidding on any public contract, except as follows:

I state that GEI Consultants, Inc. (Name of Firm) understands and acknowledges that the above representations are material and important, and will be relied upon by the Monroe County Conservation District (MCCD) in awarding the contract(s) for which this proposal is submitted. I understand and my firm understands that any misstatement in this affidavit is and shall be treated as fraudulent concealment from the MCCD of the true facts relating to the submission of this proposal.

[Signature]
(Signature)

BARRY J RAUS
(Signatory's Printed Name)

Vice President
(Signatory's Title)

SWORN TO AND SUBSCRIBED
BEFORE ME THIS 18 DAY OF
September, 2019.

[Signature]
Notary Public # 50049209

My Commission Expires
11/7/2021

NONCOLLUSION AFFIDAVIT

MCCD Project Name: Sand Spring Run Sream Bank Restoration

State of Pennsylvania :

County of Allegheny County :

I state that I am the VP of Eastern Ops (Title) of ENCOMPASS SERVICES, LLC (Name of Firm) and that I am authorized to make this affidavit on behalf of my firm, and its owners, directors, and officers. I am the person responsible in my firm for the prices(s) and the amount of this proposal.

I state that:

1. The price(s) and amount of this proposal have been arrived at independently and without consultation, communication or agreement with any other contractor, proposer, or potential proposer.
2. Neither the price(s) nor the amount of this proposal, and neither the approximate price(s) nor approximate amount of this proposal, have been disclosed to any other firm or person who is a proposer or potential proposer, and they will not be disclosed before the proposal submission date.
3. No attempt has been made or will be made to induce any firm or person to refrain from proposing on this contract, or to submit a proposal higher than this proposal, or to submit any intentionally high or noncompetitive proposal or other form of complementary proposal.
4. The proposal of my firm is made in good faith and not pursuant to any agreement or discussion with, or inducement from, any firm or person to submit a complementary or other noncompetitive proposal.
5. ENCOMPASS SERVICES, LLC (Name of Firm) its affiliates, subsidiaries, officers, directors, and employees are not currently under investigation by any governmental agency and have not in the last three years been convicted or found liable for any act prohibited by state or federal law in any jurisdiction, involving conspiracy or collusion with respect to proposing and/or bidding on any public contract, except as follows:

I state that ENCOMPASS SERVICES, LLC (Name of Firm) understands and acknowledges that the above representations are material and important, and will be relied upon by the Monroe County Conservation District (MCCD) in awarding the contract(s) for which this proposal is submitted. I understand and my firm understands that any misstatement in this affidavit is and shall be treated as fraudulent concealment from the MCCD of the true facts relating to the submission of this proposal.

[Signature]
(Signature)

William J Whitman II, PLS
(Signatory's Printed Name)

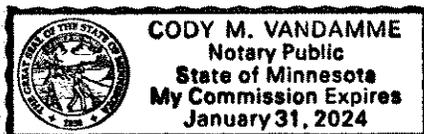
VP of Eastern Operations
(Signatory's Title)

SWORN TO AND SUBSCRIBED
BEFORE ME THIS 19th DAY OF
September, 2019.

[Signature]
Notary Public

My Commission Expires

1-31-24



SWCA

APPENDIX C:

Key Staff Resumes
Registrations and Certifications

DAVID BIDELSPACH, M.S., PE, SENIOR DESIGN QA/QC MANAGER

Mr. Bidelspach has a broad range of experience restoring damaged ecosystems and is a river restoration design specialist with national recognition. He is a native of Pennsylvania and a graduate of the Pennsylvania State University's Agricultural and Biological Engineering Program. Mr. Bidelspach's graduate academic and research background includes 5 years with the Stream Restoration Program at North Carolina State University (NCSU) under Dr. Greg Jennings, during which he was a primary contributor in the development of a 3-D natural channel design (NCD) process in the Autodesk Civil 3D CADD software platform utilizing an "Breaklines" program, which he co-authored with others at NCSU. This open-source "Breaklines" 3-D NCD process allows designers to rapidly go through numerous, highly accurate channel form iterations to achieve an optimized design with minimized cut-and-fill volumes and maximized structural integrity and geomorphic stability. Mr. Bidelspach has trained NCD designers in this innovative NCD design process across the country since its development. Mr. Bidelspach has also worked directly with Dr. David Rosgen on numerous NCD projects across the country and internationally and assisted Dr. Rosgen in the application of the "Breaklines" 3-D design process to Dr. Rosgen's design process. He has completed more than 100 river restoration/stabilization projects in 29 states, six Canadian Provinces/Territories and Costa Rica. Of particular relevance to the Sand Spring Run Stream Bank Restoration Project, he has completed over 20 stream and wetland restoration projects in Pennsylvania and more than 20 stream restoration projects in the neighboring states of New York, Maryland, Ohio, Delaware, and New Jersey over the last 21 years. Mr. Bidelspach is one of the few NCD designers that has actually operated heavy earthwork equipment and constructed stream restoration projects, greatly enhancing his ability to develop accurate engineer's estimates and constructible designs.

YEARS OF EXPERIENCE

21

EXPERTISE

Stream restoration and design

Geomorphic assessment

Design alternatives

EDUCATION

M.S., Agricultural and Biological Engineering; Pennsylvania State University, State College, Pennsylvania; 2002

B.S., Agricultural and Biological Engineering; Pennsylvania State University, State College, Pennsylvania; 1999

M.Eng, Civil and Environmental Engineering; Pennsylvania State University, State College, Pennsylvania; 2002

REGISTRATIONS / CERTIFICATIONS

Professional Engineer, Oklahoma No. 25374; 2011

Professional Engineer, North Carolina No. 30920; 2005

Professional Engineer, Montana No. 18895; 2008

Professional Engineer, Colorado No. 43974; 2010

Professional Engineer, Wyoming No. 12757; 2010

TRAINING

NCD and River Restoration Level IV, Wildland Hydrology; 2005

Geomorphology and Sediment Transport in Channel Design, Utah State University; 2009

MEMBERSHIPS

Member,
American Society of Civil Engineers

SELECTED PROJECT EXPERIENCE (* denotes project experience prior to SWCA)

***Tioga River Tributary Stream Restoration; Confidential Energy Company Client; Bradford County, Pennsylvania.** Mr. Bidelspach served as the NCD stream restoration designer for approximately 4,000 linear feet (lf) of an unnamed tributary to the Tioga River to provide Permittee Responsible Mitigation for Clean Water Act (CWA) Section 404 impacts to Waters of the U.S. (WOTUS). The design was completed in 2012 and constructed in 2013.

***Morgan Creek Tributary to Tioga River Stream Restoration; New York Department of Transportation; Tioga County, Pennsylvania.** Mr. Bidelspach served as the NCD stream restoration designer for approximately 2,600 lf of Morgan Creek Tributary to Tioga River to provide Permittee Responsible Mitigation for CWA Section 404 impacts to WOTUS as part of the U.S. Highway 15 expansion at the Pennsylvania/New York State Line. The project was designed 2006 and constructed in 2012.

***Quaker Run Stream Restoration; U.S. Fish and Wildlife Service; Shamokin, Pennsylvania.** Mr. Bidelspach served as the NCD stream restoration designer for approximately 2,500 lf of Quaker Run on a former strip-mining site, which was designed and constructed in 2006. The restoration design and construction balanced grading every 300 lf to optimize the construction effort and cost on the project, which was limited by equipment access issues.

K140 (Pilot Gulley) Natural Channel Design Stream Stabilization; Harris County Flood Control District; Harris County, Texas.

Mr. Bidelspach served as the Lead NCD Stream Restoration Designer for the design for a channel stabilization project for a 2,200-foot reach of Pilot Gulley, a tributary to Cypress Creek and part of a linear greenway park system. SWCA developed both preliminary design alternatives and the final design for the project. The project design was completed in the spring of 2019, and is scheduled to begin construction in the fall of 2019.

Lower Bois D'Arc Reservoir Stream Mitigation Design Services; Resource Environmental Solutions, LLC; Fannin, Texas.

Mr. Bidelspach served as the Lead NCD Stream Restoration Designer for the design of over 40 miles of NCD stream restoration on a 17,000-acre ranch to provide Permittee Responsible Mitigation for CWA Section 404 impacts to WOTUS as part of the construction of the Lower Bois d'Arc reservoir for the North Texas Municipal Water District. The stream restoration designs were completed in less than 12 months in 2018 and 2019, and construction is expected to be completed in 2021.

Little Cypress Creek Watershed Plan Fluvial Geomorphology Study; Lockwood, Andrews & Newnam, Inc.; Harris County, Texas.

Mr. Bidelspach served as the senior QA/QC fluvial geomorphologist for this watershed assessment and planning project that resulted in recommendations for NCD of channel stabilization improvements as part of larger watershed master drainage plan for a 52-square mile watershed in northwest Harris County. SWCA developed conceptual NCD prescriptions and details for the Draft Little Cypress Creek Master Drainage Plan as a means to provide a self-mitigating project with regard to the CWA Section 404 requirements for "no net loss" of wetlands and WOTUS, as well as to maximize the potential for the proposed flood control improvements to benefit the social, recreational, economic, and environmental attributes provided by the flood control improvements.

San Francisquito Canyon Aquatic Barriers Restoration Program; Resource Institute, Inc.; Los Angeles County, California.

Mr. Bidelspach served as the lead fluvial geomorphologist and stream restoration designer on this multiple-site stream and fish passage restoration project on San Francisquito Creek in the Angeles National Forest (ANF). SWCA, in partnership with The Resource Institute, is working with the U.S. Forest Service on a National Fish and Wildlife Foundation grant to conduct river restoration at four distinct sites along San Francisquito Creek in the ANF. The work is part of a programmatic, watershed approach to restoring aquatic organism passage (AOP), for the California red-legged frog and unarmored threespine stickleback, both of which are federal and state-listed species. Design and implementation of NCD methodologies is underway at four high-priority passage barriers along the creek; three AOP barriers are undersized culverts clogged with sediment and debris after fire activity, and the fourth is located at the site of the failed St. Francis Dam, where dam foundation remnants have blocked natural stream flows. Phase 1 of the Program involves baseline conditions analyses, natural channel design/engineering, road crossing design/engineering, developing all required permitting documents (including NEPA and CEQA), stakeholder and community outreach, and biological and cultural resource support (surveys, documents, and permits). Preliminary and 60% designs were completed under Phase 1 in 2018 and early 2019. Final designs are expected to be completed in 2020, with construction following soon thereafter.

Yellowstone River Diversion Dam Removal and Stream Restoration; Moon Lake Electric Association; Altamont, Duchesne County, Utah.

Mr. Bidelspach served as the lead fluvial geomorphologist and stream restoration designer on this dam removal and stream restoration project. SWCA is supporting Moon Lake Electric Association through the decommissioning process of a small hydroelectric facility in the Ashley National Forest of Utah. The project centers on the removal of a 15-foot-high, 313-foot-long rock-and-crib diversion dam and an associated 2-mile penstock. SWCA has guided Moon Lake Electric Association through the Federal Energy Regulatory Commission (FERC) surrender of license application, has performed all of the surveys, and has prepared all of the documents included in the application. This included biological and cultural resources field surveys, wetland delineation, NEPA analysis, a historic properties treatment plan, a dam removal and restoration plan, and a restoration design for the stream area inundated by the dam. SWCA facilitated meetings between Moon Lake Electric Association, FERC, and the U.S. Forest Service to set expectations regarding the level of NEPA analysis and engagement with other federal and state agencies. SWCA also outlined a conceptual restoration plan for the Yellowstone River and associated riparian area and uplands. Primary resource issues of concern included recreation, fisheries, and historic structures.

KEVIN A. MCCAFFERY, PE, HYDROLOGIC & HYDRAULIC ENGINEERING LEAD

Mr. McCaffery is a civil engineer and permitting specialist with more than 15 years of experience on sites throughout New England and the United States. His primary role is to provide internal engineering support for restoration and development projects. His project experience spans the entire life cycle from initial planning and conception through the construction phase. Mr. McCaffery has extensive experience preparing hydrologic and hydraulic models and site/civil design plans suitable for permit submissions and eventual construction. He has been working on stream restoration, wetland mitigation, and natural systems stormwater design throughout his career and has degrees in both Environmental Science and Civil Engineering. He is a licensed civil engineer in the Commonwealth of Pennsylvania.

YEARS OF EXPERIENCE

17

EXPERTISE

Stormwater management design and permitting

Hydrologic, hydraulic, and water quality modeling

Stream and wetland restoration design

Watershed planning and modeling

Environmental permitting: federal, state, and local

Construction drawings and contract documents

EDUCATION

M.S., Civil Engineering; University of Maine, Orono; 2002

B.S. cum laude, Environmental Science; State University of New York, Plattsburgh; 2000

A.S. with honors, Engineering Science; Jefferson Community College, Watertown, New York; 1997

REGISTRATIONS / CERTIFICATIONS

Pennsylvania Professional Engineer, Civil, Pennsylvania No. PE085502; 2016

New York Professional Engineer, Civil, New York No. 88713; 2010

Massachusetts Professional Engineer, Civil, Massachusetts No. 46778; 2006

New Hampshire Professional Engineer, Civil, New Hampshire No. 11994; 2006

Maine Professional Engineer, Civil, Maine No. 11038; 2006

SELECTED PROJECT EXPERIENCE (* denotes project experience prior to SWCA)

FirstLight Hydro Camp 2W Environmental Services; FirstLight Power Resources Services, LLC; Gill, Franklin County, Massachusetts. SWCA performed bank stabilization and restoration for an eroding bank along the Connecticut River. The bank is located adjacent to a private residence and was not a suitable site for a constructed bank repair. SWCA designed, permitted, and implemented a “soft” bioengineering solution for stabilizing a 100-foot section of Connecticut River bank. The design and restoration included the creation of vegetated geo-lifts (coir fabric with soil and seed mixes), seeding, planting, and the use and placement of dead or dying trees (located on-site) as toe of slope protection. *Role: Civil Engineer.*

Gin City Mitigation Bank Development, Phase I; Gin City Land Company, Inc.; Harris County, Texas. SWCA assisted in the development of a mitigation plan for an approximately 400-acre property in eastern Harris County formerly used for rice production. The plan included restoration of a native forested wetland flatwoods community along Cedar Bayou. SWCA specialists assisted with management of an on-site nursery. In support of U.S. Army Corps of Engineer (USACE) permitting efforts, SWCA conducted an intensive archaeological survey of the proposed bank footprint. The plan is currently under USACE review for final approval. *Role: Hydrologist and Civil Engineer.*

Lower Bois D'Arc Reservoir Stream Mitigation Design Services; Resource Environmental Solutions, LLC; Harris County, Texas. SWCA conducted ecological restoration of an approximately 17,000-acre portion of a watershed as part of the Bois d'Arc Lake Project, which consists of an approximate 16,000-acre reservoir being built in north Texas (Fannin County) to provide critical new water services to 80 communities in the district. Services provided include wetland and stream design and implementation, monitoring, and maintenance and planting. *Role: Wetland Modeling and Grading Plan preparation.*

Tranquility Ranch Permittee Responsible Mitigation Design and Permitting Services; Carollo Engineers; Montgomery County, Texas. Developed continuous simulation hydrology model for 51-acre wetland mitigation bank based on actual precipitation records. Prepared grading plans and outlet control structure details for USACE approval. *Role: Wetland Modeling and Grading Plan preparation.*

Bayou Bend Mitigation Bank; Alsace, LLC; Harris County, Texas. SWCA developed a mitigation plan for a property in eastern Harris County formerly used for rice production.

The plan included restoration of a native forested wetland flatwoods community along Cedar Bayou. Provided wetland design and modeling to support USACE application.

Gooseberry Creek Revitalization Planning and Design Services; PLACE Alliance New York, LLC; Tannersville, Greene County, New York. To assist the village of Tannersville with the design and development of a storm recovery plan, SWCA provided a variety of services, including watershed characterization and a water quality assessment. Provided conceptual design of floodplain storage facility adjacent to Susquehanna River. Modified Federal Emergency Management Agency (FEMA) hydraulic model to determine reduction in peak stage for cost-benefit analysis. Assisted with site design and layout of project elements. *Role: Hydraulic Modeler.*

***East Burke Dam Removal; Passumpsic Valley Land Trust; East Burke, Vermont.** Developed deconstruction plans and permit applications for an approximately 125-foot-long dam removal on the East Branch of the Passumpsic River. Sediment management and bank stabilization aspects were a major component of the USACE and Vermont-Department of Environmental Conservation permitting effort, combined with a cost-effective practical removal strategy. *Role: Civil Engineer.*

***Gonic and Gonic Sawmill Dam Removals; City of Rochester; Rochester, New Hampshire.** Responsible for developing construction drawings for proposed removal of two dams in series on the Cocheco River. Contaminated sediment removal was a significant aspect of the project approach. *Role: Project Civil Engineer.*

***Fifteen Mile Falls Fisheries Enhancement; TransCanada Hydro NE; Monroe, New Hampshire/Barnet, Vermont.** Project manager for hydroelectric client mandated to improve fish passage as an operating license condition. Engaged stakeholders to gain consensus on projects required, prepared design and permit documents for individual projects, then coordinated with contractor during construction. *Role: Project Manager.*

***Johnson Creek Realignment; Steiner and Associates; Arlington, Texas.** Prepared preliminary engineering plans for destabilized creek to submit Individual Permit to USACE, which included sections of stream restoration, stabilization, realignment, and creation. *Role: Project Manager.*

***Ravinia and Indian Creek Stream Enhancement; Fremont Township; Fremont, Illinois.** Preparation of construction plans, specifications, and design calculations for stream and lakeside wetland enhancement.

***Ft. Sheridan Ravine Restoration; Ft. Sheridan Homeowner's Association; Highland Park, Illinois.** Performed hydrologic and hydraulic modeling and preparation of construction plans and specifications for 1,000 feet of destabilized ravine in Lake County, Illinois.

***West Shoreland Stream Restoration; Fremont Township; Mundelein, Illinois.** Performed hydrologic and hydraulic modeling and preparation of construction plans and specifications for destabilized stream in Lake County, Illinois.

***Seneca Meadows Wetland Mitigation Project; Seneca Meadows Landfill; Waterloo, New York.** Prepared preliminary grading plan and design calculations for wetland creation project in anticipation of landfill expansion.

***Countryside Lake Shoreline Stabilization; Countryside Lake Homeowner's Association; Mundelein, Illinois.** Prepared conceptual plan for stabilization of lake shoreline using native vegetation.

***Stevens Branch Bank Stabilization; Montpelier, Vermont.** Developed design to stabilize eroding river bank and stormwater outfall. Prepared USACE General Permit and Vermont Agency of Natural Resources Stream Alteration Permit applications.

***Mascoma Lake Bank Stabilization; Enfield, New Hampshire.** Prepared plan and permit application for New Hampshire Department of Environmental Services wetlands impact. Project consisted of stabilization of 2,000 square feet of bank along Mascoma Lake, underlain by an existing sewer line also requiring repair.

***Mission, Kansas Redevelopment Plan; Mission, Kansas.** Prepared conceptual natural channel design plans through downtown redevelopment zone. Assisted in locating and designing naturalized regional stormwater management basins to alleviate flooding issues.

***Flint Creek Stream Restoration; Barrington, Illinois.** Performed hydrologic and hydraulic modeling and prepared construction plans and specifications for destabilized stream in Lake County, Illinois.

DAREN PAIT, PE, CFM, STREAM RESTORATION/NATURAL CHANNEL DESIGN LEAD

Mr. Pait has 19 years of experience in surface water and environmental engineering. His experience includes natural channel design, wetland design, living shoreline design, hydraulic flood modeling/floodplain mapping, watershed management planning and modeling, flood mitigation design, water quality best management practice (BMP) design, and stream/shoreline stability assessments. He has been the design engineer for more than 135,000 linear feet of stream channel stabilization and restoration projects, 33 acres of riparian wetland mitigation projects, and more than 30 acres of lake and pond retrofit projects for TMDL Compliance.

YEARS OF EXPERIENCE

19

EXPERTISE

Water Quality Best Management Practice (BMP) design

Natural channel design

Wetland and living shoreline design

Stream/shoreline stability assessments

Watershed management planning and modeling

EDUCATION

B.S., Environmental Engineering; North Carolina State University, Raleigh; 2000

REGISTRATIONS / CERTIFICATIONS

Certified Floodplain Manager

Professional Engineer, South Carolina

Professional Engineer, Virginia

Professional Engineer, North Carolina

MEMBERSHIPS

Member, North Carolina Association of Environmental Professionals (NCAEP)

Member, Virginia Lakes and Watersheds Association

Member, South Carolina Mitigation Association

Member, Association of State Floodplain Managers

SELECTED PROJECT EXPERIENCE (* denotes project experience prior to SWCA)

LID #7 External Channel Stabilization Final Design; LJA Engineering, Inc.; Fort Bend County, Texas.

***Annual Stream Mitigation Monitoring; North Carolina Department of Transportation (NCDOT); Greensboro, Statesville, and Cary, North Carolina.**

Provided annual stream monitoring services for the NCDOT as part of an annual services on-call contract. Monitored 10 separate stream mitigation sites located in Statesville, Greensboro, and Cary, North Carolina. Conducted full stream channel profile surveys, permanent cross-section surveys, photodocumented channel conditions at permanent photo points, and prepared a separate annual monitoring report for each site. Review of as-built surveys after construction of the sites and establish Year 0 monitoring set-up.

Role: Project Manager.

***I-540 On-Site Mitigation, Site Identification and Feasibility Assessment, R-2721, R-2828, and R-2829; NCDOT; Raleigh, North Carolina.**

Completed site identification assessment for the entire 21-mile proposed highway corridor in 2016. Sixteen sites were identified as having potential for on-site mitigation during this assessment phase. A feasibility assessment was completed for one of the sites in 2018. *Role: Project Manager and Project Engineer.*

***Greensboro Northern Loop On-Site Stream Design, R-2413; NCDOT Natural Environment Unit; Greensboro, North Carolina.**

Through a NCDOT Natural Environment Unit on-call contract, provided stream design services for 3,170 linear feet of stream restoration, relocation, or enhancement associated with the NC-68 Connector from Edgefield Road to the Haw River. The project included five separate sites ranging in size from 250 to 900 linear feet. These projects were implemented to offset stream impacts resulting from construction of the northwestern portion of the Greensboro Urban Loop in Guilford County. Each separate stream reach crosses the proposed roadway at some location. The proposed channels were designed to handle the increased flashy stormwater runoff from the additional impervious area of the new location road. In some cases, the radius of curvature ratio was increased to allow for stream bends that could handle the additional shear stress from the developing watershed. Kimley-Horn worked in close coordination with the NCDOT Natural Environment Unit, Right-of-Way Unit, and Hydraulics Unit to prepare the construction drawings. Construction was completed in 2015. *Role: Project Manager.*

***Greensboro Eastern Loop Onsite Stream Design, U-2525B; NCDOT Natural Environment Unit; Greensboro, North Carolina.** Stream design services for 2,720 linear feet of stream restoration, relocation, or enhancement associated with the Greensboro Eastern

Loop under an NCDOT Natural Environment Unit on-call contract. The project consisted of five separate sites ranging in size from 1,300 linear feet to 360 linear feet. These projects were implemented to offset stream impacts resulting from construction of the Greensboro Eastern Loop in Guilford County. The designer worked in close coordination with the NCDOT Natural Environment Unit, Right-of-Way Unit, and Hydraulics Unit to prepare the construction drawings. *Role: Project Manager.*

***US-311 Bypass On-Site Stream Mitigation, Site CF-16; NCDOT; High Point, North Carolina.** Provided mitigation plan preparation and design for 1,000 linear feet of an unnamed tributary to Muddy Creek located near High Point, North Carolina. The scope of work included production of a Mitigation Plan document, production of an Agency Packet, attending agency meetings, attending internal NCDOT Hydraulics Unit meetings, producing construction drawings, and preparing project special provisions. *Role: Project Manager and Project Engineer.*

***Indirect and Cumulative Impacts Analysis, Goldsboro US-70 Bypass; NCDOT; Wayne County, North Carolina.** Performed stormwater technical assistance for water quality impact analysis for a 60–square mile watershed associated with the construction of approximately 21 miles of US-70 Bypass (R-2554). Assessed the anticipated nutrient, sediment, and runoff volume changes that could result from induced development that could result from the roadway's existence. A land use impact analysis was completed for the existing conditions, future build scenario conditions, and future no-build scenario in 2008. Using the predicted land use changes, models were completed for the water quality and quantity impacts that would result from induced development. In 2010, BasinSim 1.0 (GWLF) was utilized to model nitrogen, phosphorus, sediment loading, and peak flow changes. The watershed contains three 303d-listed streams and five 14-digit HUC watersheds of concern.

***Maxton US 74 Bypass, On-Site Stream Restoration; NCDOT; Maxton, North Carolina.** As part of an on-call environmental services contract with the NCDOT, provided geomorphic assessment, stream restoration design, and construction observation services for this 3,720-linear foot project associated with the relocation of US 74 (R-0513) from Maxton, North Carolina to NC 41. The project stream is a tributary to the Lumber River located in Robeson County, North Carolina. This project was performed as an on-site stream mitigation project because it is within the easement of the US 74 Bypass. A Priority 2 stream restoration approach was used to restore this entrenched stream channel to a natural floodplain. The floodplain for the stream channel was excavated down 2.5 feet to the proper elevation of the channels stable bankfull bench. The channel was meandered through this floodplain and the corrected floodplain/bankfull bench elevation has since resulted in riparian wetlands forming within the restored channel's floodplain. Construction Drawings were prepared in MicroStation and a licensed Professional Engineer designed the stream and signed and sealed the plans. Construction inspection services were also provided as part of the construction phase. *Role: Project Manager and Project Engineer.*

***Little Jacob Swamp On-Site Stream Mitigation; NCDOT; Lumberton, North Carolina.** As part of an on-call environmental services contract with the NCDOT, provided stream restoration design and construction observation services for this 3,340-linear-foot project within the easement of the US 74 Bypass. The project stream is a tributary to the Little Jacob Swamp in Robeson County. Also provided 10.5 acres of riparian buffer preservation and 8.8 acres of riparian buffer restoration at two sites. The project is located in the coastal plain of North Carolina and has a sandy floodplain and watershed with high infiltration rates. A Priority 2 stream restoration approach was used. The floodplain for the stream channel was excavated down 4 feet to lower the floodplain to the elevation of the dredged/channelized stream. A Priority 1 approach was not feasible since this would result in hydraulic trespass of the properties upstream of the site. *Role: Project Manager and Project Engineer.*

***Stoney Creek Stream and Wetland Restoration; NCDOT; Goldsboro, North Carolina.** A Clean Water Management Trust Fund application was submitted and awarded to restore approximately 18,000 feet of Stoney Creek and provide integrated stormwater management practices. The project included the design of a wetland slough system to mimic relic ox-bow channels that provide floodplain storage during large storm events. This resulted in lowering floodplain elevations and improving water quality. The City of Goldsboro was awarded a \$2 million grant to design and construct the project. Professional services also included construction observation assistance services during construction. *Role: Project Engineer.*

NATALIE SHEARER, M.S., QEP, NATURAL RESOURCES PROJECT MANAGER, FEDERAL AND STATE PERMITTING LEAD

Ms. Shearer is a Natural Resources Project Manager. She has a diverse background including conducting rare, threatened, and endangered plant surveys and wetland and stream delineations. She is a Qualified Environmental Professional (QEP) and maintains a valid Pennsylvania wild plant management permit.

Ms. Shearer also prepares Pennsylvania general and joint permit applications as well as Nationwide Permit applications. She coordinates with state and federal agencies on projects and facilitates meetings between agencies and clients. Ms. Shearer is safety-orientated and ensures her team follows all safety procedures, including client-specific requirements.

YEARS OF EXPERIENCE

14

EXPERTISE

Wetland ecology

Critical Issues Analysis

CWA Section 404 compliance and jurisdictional waters determinations (Waters of the U.S.)

Safety and regulatory agency coordination

Endangered Species Act compliance

Botany and vegetation assessments

Threatened and endangered species surveys; noxious weed surveys

Land development; oil and gas

EDUCATION

M.S., Environmental Science and Management; Duquesne University of the Holy Spirit, Pittsburgh, PA; 2010

B.A., Environmental Studies; University of Pittsburgh, Pittsburgh, PA; 2003

B.A., Mathematics, m: Biology; Saint Vincent College, Latrobe, PA; 2000

REGISTRATIONS / CERTIFICATIONS

Red Cross CPR/AED Certification; American Red Cross

Qualified Environmental Professional; Institute of Professional Environmental Practice; 2010

Running Buffalo Clover Surveyor, Ohio; U.S. Fish and Wildlife Service; 2019

SELECTED PROJECT EXPERIENCE (* denotes project experience prior to SWCA)

Universal to Plum Transmission Line; Confidential Client; Allegheny County, Pennsylvania. CONFIDENTIAL Role: Project Manager. Reviewed field data, wrote wetland delineation report, and coordinated on Chapter 105 permitting needs with the client.

Centre Hall Solar Critical Issues Analysis (CIA); Confidential Client; Centre County, Pennsylvania. CONFIDENTIAL Role: Project Manager; wrote the Critical Issues Analysis.

Mingoville Solar CIA; Confidential Client; Centre County, Pennsylvania. CONFIDENTIAL Role: Project Manager; wrote the Critical Issues Analysis.

Equitrans Spartan Interconnect Environmental Services; Confidential Client; Coraopolis, Allegheny County, Pennsylvania. CONFIDENTIAL Role: Assistant Project Manager, Chapter 105 permitting.

Sleighter Chrysler Dealership Site Development and Mitigation; Confidential Client; Westmoreland County, Pennsylvania. CONFIDENTIAL Role: Assistant Project Manager. Assisted in finalizing the response to comment package and coordinating with the client, Pennsylvania Department of Environmental Protection (PADEP), and mitigation bank.

Summit Solar; Confidential Client; Somerset, Somerset County, Pennsylvania. CONFIDENTIAL Role: Project Manager; wrote the Critical Issues Analysis and coordinated fieldwork efforts.

Brookview Solar Site; Confidential Client; Adams County, Pennsylvania. CONFIDENTIAL. Role: Wetland Delineation Lead.

Robertsville Solar Critical Issues Analysis; Confidential Client; Robertsville, Stark County, Ohio. CONFIDENTIAL Role: Project Manager. Responsible for overseeing research involved with the Critical Issues Analysis, finalizing the CIA, and coordinating with the client.

Bolivar CIA; Confidential Client; Bolivar, Stark County, Ohio. CONFIDENTIAL Role: Project Manager. Responsible for overseeing research involved with the Critical Issues Analysis, finalizing the CIA, and coordinating with the client.

Equitrans H509 Weston Maintenance Project; Confidential Client; Lewis County, West Virginia. CONFIDENTIAL Role: Lead Wetland Delineator.

PERMITS

Pennsylvania Department of Conservation and Natural Resources Endangered and Threatened Plant Species (19-023); PA

TRAINING

Environmental Review and Compliance for Natural Gas Facilities, Federal Energy Regulatory Commission; 2016

40-Hour Wetland Training, Wetland Training Institute, Inc.; 2006

Planning Hydrology, Vegetation, and Soils for Constructed Wetlands, Wetland Training Institute, Inc.; 2011

Federal Wetlands/Waters Regulatory Policy eSession, Wetland Training Institute, Inc.; 2014

10-Hour OSHA Construction Safety and Health; 2013

Safeland Training

MEMBERSHIPS

Member, Women's Energy Network

Member, Society of Women Environmental Professionals

Member, Association of State Wetland Managers

Member, Institute of Professional Environmental Practice

Member, Society of Wetland Scientists

Capon Bridge Natural Resources Permitting; Confidential Client; Hampshire County, West Virginia. CONFIDENTIAL *Role: Project Manager. Coordinated wetland delineation fieldwork, led threatened and endangered species consultations, discussed permitting options with client.*

H527 Pipeline Maintenance Project; Confidential Client; Doddridge County, West Virginia. CONFIDENTIAL *Role: Project Manager. Led wetland delineation fieldwork, wrote the delineation report, threatened and endangered species consultation letters, floodplain permit, and non-reporting Nationwide Permit 3.*

Sellers Road Upgrade Delineation and Permitting; Confidential Client; Tyler County, West Virginia. CONFIDENTIAL *Role: Project Manager. Coordinated fieldwork, agency consultations, and wrote the stormwater pollution prevention plan (SWPPP).*

Walden Solar Critical Issues Analysis; Confidential Client; Walden, Orange County, New York. CONFIDENTIAL *Role: Project Manager. Responsible for overseeing research involved with the Critical Issues Analysis, finalizing the CIA, and coordinating with the client.*

Falcon Ethane Pipeline System; Shell Pipeline Company LP; Pennsylvania, West Virginia, and Ohio. The Falcon Ethane Pipeline System Project is an approximate 98-mile common carrier ethane supply pipeline to be located in southwestern Pennsylvania, Ohio, and West Virginia. It will connect three major ethane sources in Houston, Pennsylvania, Scio, Ohio, and Cadiz, Ohio to Shell Chemical's planned Pennsylvania Petrochemical Plant located in Monaca, Pennsylvania. *Role: Environmental Lead. Coordinated the environmental surveys including stream and wetland delineations, bat surveys, northern harrier/short-eared owl surveys, and rapid assessment protocol method fieldwork. Conducted wetland delineations and rare, threatened, and endangered plant surveys. Compiled three Chapter 105/Section 404 Joint Permit application packages and coordinated with two U.S. Army Corps of Engineers districts on the Nationwide Permit 12 applications and with the Ohio EPA on the 401 Water Quality Certification. Facilitated pre- and post-application meetings with the agencies and participated in public outreach.*

Multiple Gathering Line Projects; Appalachia Midstream Services, LLC; Pennsylvania. This project included several gathering lines located in Sullivan and

Susquehanna Counties, Pennsylvania. *Role: Permitter and Botanist. Conducted preliminary reconnaissance of proposed pipeline routes and assisted the route development coordinator with routing the proposed pipeline around wetlands and forested perennial stream crossings whenever possible. Once a route was established, led wetland delineation crews and prepared Chapter 105 Water Encroachment and Obstruction permits and Joint Chapter 105/Section 404 permits. Conducted several botanical surveys on these gathering lines and prepared reports to send to the Department of Conservation and Natural Resources to obtain clearance.*

Multiple Waterline and Gathering Line Permitting Projects; Hilcorp Energy; Pennsylvania. Multiple gathering line and water line projects located in Greene, Lawrence, and Mercer Counties, Pennsylvania. *Role: Permitting Supervisor. Conducted wetland delineations and prepared Chapter 105 Water Obstruction and Encroachment Permits for several water line and gathering line projects for Hilcorp's Pennsylvania oil and gas operations.*

Imperial Landfill Expansion; Republic Services; Pennsylvania. This project entailed expanding the current landfill space at the Imperial Landfill located in Imperial, Pennsylvania. *Role: Project Manager. Led the wetland and stream delineation work for the expansion area, which consisted of delineating 2.6 acres of wetland that were proposed for impact. Submitted a wetland delineation report to the PADEP and U.S. Army Corps of Engineers (USACE) and participated in a Jurisdictional Determination field meeting with the USACE. Determined a suitable wetland mitigation area, submitted a Chapter 105 Water Obstruction and Encroachment permit and final mitigation plan to the PADEP, and received permit authorization for the wetland impacts and mitigation plan.*

TONY SOMERS, RLA, PP, ASLA, LANDSCAPE ARCHITECT / PLANNER / PROJECT MANAGER

As both a Landscape Architect and Licensed Planner, Mr. Somers offers a broad range of professional expertise complemented by a seasoned business acumen. His Landscape Architecture background includes the design and implementation of a diverse range of projects that include stream corridor and wetland restorations, LID implementation, municipal green infrastructure guidelines, urban pocket parks, commercial campus development, public charrettes, visual impact assessments, 3D visualizations, and photorealistic rendering.

As a Professional Planner, his expertise in areas such as land use development, environmental analysis, urban planning, community redevelopment, and municipal bylaw improvements complements his design proficiency. Mr. Somers blends innovative design techniques with a strong analytical and regulatory acuity to create and manage ecologically conscientious and socially engaging design projects that exceed client expectations.

YEARS OF EXPERIENCE

9

EXPERTISE

- Licensed Landscape Architect
- Licensed Professional Planner
- Project Management
- Green infrastructure design
- Stormwater design and BMP design standards and guidelines
- Ecological design and planning
- Wetland restoration assessment, design and monitoring
- Sustainable / low-impact development design
- GIS/CAD/GPS planning and mapping
- Feasibility assessments and buildout analysis
- Landscape design charrettes and public presentations
- Stream and river assessment and natural channel design
- Site plan development and construction detailing
- 3D, photorealistic, perspective and conceptual visualizations

SELECTED PROJECT EXPERIENCE (* denotes project experience prior to SWCA)

Lower Bois D'Arc Reservoir Stream Mitigation Design Services Final Design; Resource Environmental Solutions, LLC; Harris County, Texas. SWCA conducted ecological restoration of an approximately 17,000-acre portion of a watershed as part of the Bois d'Arc Lake Project, consisting of an approximate 16,000-acre reservoir being built in north Texas (Fannin County) to provide critical new water services to 80 communities in the district. Services provided include wetland and stream design and implementation, monitoring, and maintenance and planting. *Role: Landscape Architect. Wetland and stream restoration design.*

Connecticut River Erosion Control Work for 2017; FirstLight Power Resources Services, LLC; Northfield, Franklin County, Massachusetts. Provide permitting, design, and restoration services in compliance with FERC licensing requirements at hydro-electric facility on the Connecticut River. *Role: Landscape Architect. Riverbank restoration design.*

Bondi Island Landfill Wetland Restoration; David G. Roach & Sons, Inc.; Springfield, Hampden County, Massachusetts. This project included developing a wetland remediation/corrective action plan to address sediment in the wetlands from a winter storm events. SWCA provided design wetland mitigation and slope stabilization plan at the Bondi Island Landfill. SWCA provided design wetland mitigation and slope stabilization plan at the Bondi Island Landfill. *Role: Landscape Architect and Project Manager. Wetland mitigation design.*

Cabot Station Ecological Restoration & Maintenance; FirstLight Power Resources Services, LLC; Turners Falls, Franklin County, Massachusetts. SWCA is currently providing construction monitoring, wetland restoration, and long-term biological monitoring in compliance with WQC and 404 permits. *Role: Landscape Architect. Wetland mitigation design development.*

Mount Auburn Cemetery Lake and Water Assessment; Mount Auburn Cemetery; Cambridge, Middlesex County, Massachusetts. SWCA completed pond assessment, wildlife habitat improvement investigations, recommendations and the design/installation of floating islands for a cemetery in Cambridge, Massachusetts. These activities are a collaborative effort involving both SWCA and Grassroots Wildlife Conservation, Inc.

EDUCATION

M.L.A., Landscape Architecture; Virginia Polytechnic Institute & State University, Alexandria; 2012

Natural Resources Graduate Certificate; Virginia Polytechnic Institute & State University, Alexandria; 2011

B.B.A., Marketing; Radford University, Radford, Virginia; 1998

International Business Study Abroad Program; Vienna, Austria; Radford University, Radford, Virginia; 1998

REGISTRATIONS / CERTIFICATIONS

First Aid/CPR/AED; American Red Cross; 2017

Rhode Island Registered Landscape Architect, Rhode Island No. LA.0000676; State of Rhode Island and Providence Plantations; 2019

Connecticut Landscape Architect, Connecticut No. LAR.0001491; State of Connecticut; 2018

New Jersey Registered Professional Planner, New Jersey No. 33LI00634100; 2017

Massachusetts Registered Landscape Architect, Massachusetts No. 4220; Commonwealth of Massachusetts; 2017

New Jersey Registered Landscape Architect, New Jersey No. 21AS00122600; 2016

AWARDS / HONORS

Edward B. Ballard Scholarship

Outreach Award

MEMBERSHIPS

Member, Ecological Landscape Alliance

Member, American Society of Landscape Architects

Member, Society for Ecological Restoration

Role: Landscape Architect and Project Manager. Pond fringe and aquatic bench planting design.

K140 (Pilot Gully) Channel Stabilization Final Design; RPS Klotz Associates; Harris County, Texas. SWCA completed the design for a channel stabilization project for a 2,200-foot reach of Pilot Gully, a tributary to Cypress Creek and part of a linear greenway park system. SWCA developed both preliminary design alternatives and the final design for the project. *Role: Landscape Architect and Graphics Specialist. Presentation visualizations developments.*

DCR Fearing Pond Stormwater Erosion Mitigation Plan and Permitting; Massachusetts Department of Conservation and Recreation (DCR) Lakes and Ponds Program; Plymouth, Plymouth County, Massachusetts. Green stormwater infrastructure design to restore a degraded campground. *Role: Landscape Architect and Project Manager.*

Horseshoe Solar Visual Studies to support Article 10 Permitting; Invenergy Solar Development LLC; Caledonia, Livingston County, New York. *Role: Project Manager. Visual impact assessment, 3D modeling and photorealistic simulations.*

University of Massachusetts Amherst Pond Dredging Design and Permitting; University of Massachusetts at Amherst; Amherst, Hampshire County, Massachusetts. SWCA provided plans and permits for the dredging and restoration of a 4-acre pond on the UMASS Amherst Campus. *Role: Landscape Architect. Aquatic and riparian design development.*

DCR Multi-use Trail Repair and Maintenance Project; Massachusetts Department of Conservation and Recreation; Multiple Counties, Massachusetts. SWCA provided DCR with a range of services including trail design, repair, and maintenance. SWCA assisted in the development of the trail system at Greylock Glen in Adams, Massachusetts. A component of trail design was botanical surveys of proposed trail development and repair locations to determine locations of any nearby rare plant species to be protected during construction activities. *Role: Landscape Architect and Project Manager. Trail restorations and improvements. Development of new trail systems to bypass sensitive areas.*

Camino Solar Environmental Support; Aurora Solar, LLC; Kern County, California. This proposed 44-MW solar PV project sited on a combination of Bureau of Land Management (BLM) and private lands is expected to be one of the first approved under the streamlined permitting of the Desert Renewable Energy Conservation Plan (DRECP). SWCA is providing comprehensive environmental permitting support for the project, including preparation of the Plan of Development for the BLM, Conditional Use Permit Application for Kern County, and the environmental technical studies for the project, including natural, cultural, and paleontological resources; noise; greenhouse gases; air quality; and traffic. *Role: Environmental Specialist. Solar site design and development.*

***Heck's Ditch Stream Restoration; Bergen SWAN; Emerson, Bergen County, New Jersey.** Restoration of a tributary of the Oradell Reservoir within the Emerson Woods Preserve. Developed plans and recommendations for the improvement of the stream corridor. Restoration measures included bank stabilization, the rerouting of walking trails away from sensitive slopes, development of a suitable native plant palette, stream measures to dissipate peak discharge flows and reduce scouring, and ongoing

management and invasive control plans. *Role: Landscape Architect and Project Manager.*

Jesús E. Gómez, Ph.D., P.E., DGEP

Vice President



Dr. Jesús Gómez has over 30 years of design and construction experience in geotechnical projects in the United States, South America, and the Caribbean. Dr. Gómez has an extensive geotechnical construction background. While as Chief Engineer for Franki Pile Foundations in Caracas, Venezuela, he performed complete design, supervision, and monitoring of geotechnical solutions for large industrial and residential projects.

Dr. Gómez has lead the design and construction supervision of numerous slope and waterfront stabilization and rehabilitation projects where he has conceived and developed cost-effective, constructible solutions. Some of the notable projects where Dr. Gómez has participated as a lead designer or as reviewer include the Jefgerson Memorial Nosth Plaza Stabilization and Seawall Reconstruction in Washington, DC, for the National Park Service (NPS); the Ellis Island Seawall Rehabilitation in the New York City Harbor, also for NPS, Reconstruction of Amtrak Roadbed in Maryland; and Bluff Stabilization for Anderson's Residence in Maryland; all of which were conceived to preserve either the historic appearance of the seawalls, or the natural appearance of the existing landscape while introducing substantial, and invisible, structural or earth-engineered stabilization measures.

Dr. Gómez was one of the authors of the FHWA/ADSC grouted Hollow Bar Soil Nail (HBSN) Test Program field research effort and report, and of the FHWA 2015 GEC-7 grouted Soil Nail Walls Reference Manual. He has also authored numerous research efforts on various topics such as buckling of micropiles, micropile-footing connections, single bore multiple anchors (SBMA), compressive anchors, removable anchors, grouting, and soil-structure interface behavior, among others. Dr. Gómez has authored or co-authored over 50 publications on practical technological applications and design in geotechnical engineering. He was recipient of the 2004 Shamsher Prakash Award for Excellence in the Practice of Geotechnical Engineering, and in 2010 he was inducted into the Academy of Geo-Professionals as an Eminent Geotechnical Engineer. In April 2011, he was honored by CE News Magazine as one of seven individuals on the "Power List of People Advancing the Civil Engineering Profession." He is the recipient of the 2014 President's Award by the International Association of Foundation Drilling (ADSC) for his contributions to the Geo-Industry.

Dr. Gómez has always been active in teaching of foundation engineering courses at graduate level and is currently and adjunct professor at Villanova University. He frequently teaches in seminars and is a regular speaker at conferences of professional organizations. He is an approved NHI instructor.

PROJECT EXPERIENCE

High Street Stabilization, Port Deposit, MD. Existing retaining walls and slopes along High Street had undergone significant displacement or collapse causing total shut down to vehicular traffic. Developed a variety of invisible stabilization solutions to suit varying conditions along the street, and to preserve the historic look of the existing retaining structures and the natural appearance of the slopes. Conceived the use of a Micropile A-Wall to stabilize the existing slope, and of a combination of, temporary micropiles and tiebacks to permit removal of existing, collapsed wall and construction of a similar new wall on micropiles. This project was featured in a variety of publications and received a special recognition award by the Deep Foundations Institute in 2005. Design procedures for micropile A-Walls developed during this project are being taught in seminars and conferences.

EDUCATION

Ph.D., Civil Engineering, Virginia Polytechnic Institute and State University

M. S., Civil Engineering, Virginia Polytechnic Institute and State University

B. S., Civil Engineering, Universidad Católica Andrés Bello (Caracas, Venezuela)

EXPERIENCE IN THE INDUSTRY
34 years

EXPERIENCE WITH GEI
2 years

REGISTRATION AND LICENSES
Professional Engineer, DE No. 12344
Professional Engineer, Spain
Professional Engineer, Venezuela

Invisible Bluff Stabilization for Anderson Residence, Annapolis, Maryland: A high-end residential property suffered the effects of adverse weather in the aftermath of one of the worst hurricanes in record. The property sits atop a 65-ft tall bluff on the Severn River in Maryland. A significant slide occurred that caused the collapsed of the stair and trolley structures that provided access to the river, and endangered the house structure. Dr. Gómez was retained by the owner to investigate possible remediation options, and to design and supervise the construction of a final remediation solution. Dr. Gómez devised a system to stabilize the slope and remain invisible from view under vegetative cover, which consisted of micropiles, hollow core bar anchors, soil nails, and special meshing working together to provide global and local stability to 10,000 sf of slope, and permit vegetative growth. This project was featured in the International Society for Micropiles meeting in Washington, DC, in 2010, and has been used as case history in several slope stabilization seminars throughout the US.

Jefferson Memorial North Plaza Stabilization and Seawall Replacement, Washington, DC: Chief Engineer to remediate movements of the Seawall and North Plaza of this landmark in the nation's capital. He outlined a geotechnical exploration and instrumentation program that revealed that the movements were due to recent drop in the piezometric level at the rock interface, about 90 ft from the surface. This drop caused compression of the existing soft soils at the site and lateral movement due to embankment edge effects. He supervised the development of Finite Element and Finite Difference modeling to assess various remediation scenarios. As the Chief Engineer of the remediation design, which consisted of demolition of the existing seawall and construction of a new seawall on vertical caissons and battered pipe piles. The new foundations are designed to resist both vertical and lateral movement of the seawall and plaza, while maintaining the historic integrity of each of the elements of the project and remaining invisible from view. This project was recipient of the 2012 Project of the Year award by the ASCE National Capital Region. Dr. Gómez was invited by various ASCE sections to present technical details of the project to engineers and contractors.

Ellis Island Seawall Rehabilitation, New York City Harbor, New York: Lead Designer for the remediation of the seawalls around Ellis Island in the New York City Harbor. The historic seawalls were subject to various degrees of deterioration and became a priority for repair by National Park Service. Dr. Gómez devised a variety of underpinning and retaining solutions for the walls that included the use of micropiles, tiebacks, and grouting to hinder the deterioration and deformation process, while maintaining the historic fabric of the seawalls and remaining entirely hidden from view.

Liberty Island Seawall Remediation, New York City Harbor, New York: Project Manager for the study of the seawall and remediation. The Liberty Island seawalls have been subject to significant deterioration since its construction. The study of the seawalls included stability analysis of the wall and development of alternatives for hidden stabilization measures.

Foundation Rehabilitation of Four Bridges along the Southern End of the New Jersey Turnpike, New Jersey: As Project Manager, developed a detailed design for construction of micropiles for the retrofit of existing bridges. The design included geotechnical exploration, testing, and development of construction details for over 400 micropiles for foundation retrofit of four bridges and connection to the superstructure, development of load testing and QC procedures. Directed construction engineers for QC support during construction of the micropiles consisting of full-time observation of the micropile installation, testing of grout properties, support during load testing of micropiles, assistance during technical meetings with the project team, and also assisted the contractor in developing preloading procedures for the micropiles to transfer loads from the existing piles to the new micropiles. This project has been featured in several seminars and publications and aided in increasing the database of bond values from US projects available to designers of hollow core bar micropiles and soil nails, which was limited before this project was completed.

Commodore Barry Bridge, Gloucester, New Jersey: Senior Reviewer for the installation monitoring of rock fill islands, and instrumentation installation and monitoring of the subsurface conditions. Over 200,000-cys of stone was placed over alluvial sediments adjacent to existing piers. Monitoring of pore water pressures, and settlement rates and totals were critical.

Helen D. Robinson, PE

Senior Engineer



Helen Robinson has over 16 years of design and construction experience across the U.S. and provide engineering services and project and construction management for geotechnical designs. Her experience includes design of micropiles, tiebacks, soil nails, drilled shafts, driven piles, sheet pile cofferdams, retaining walls, braced excavation support, ground improvement methods, and shallow foundations. Ms.

Robinson's professional experience also includes site investigations (boreholes, test pits), soil classification, laboratory testing, load testing field support and interpretation, and instrumentation. Under TS security clearance she conducted an extensive study on chemical grouts used for soil stabilization and permeation including polyurethanes, cementitious grouts with additives, sodium silicate, and colloidal silica.

She has significant expertise in writing technical and non-technical papers and articles for conference proceedings and industry publications. She has been the presenting author at seminars and conferences throughout the country and serve as an instructor for internal project management training at Schnabel Engineering. She is also proficient with computer programs for design analysis including LPILE, GROUP (Ensoft), CTShoring (CivilTech), SLOPE/W, PYWall, Framework, SNAP2, SNAILZ and AutoCAD for design drawing.

PROJECT EXPERIENCE

Soil Nail Wall, Private Residence, Annapolis, Maryland. A significant slide of a 60-ft high bluff occurred after a major coastal storm. The configuration of the site prevented large construction equipment from accessing the slope. After consideration of various alternatives and numerous slope stability analyses, the selected stabilization solution consisted of a soil reinforcement scheme utilizing vertical and sub-horizontal hollow core bar soil nails and a flexible facing system. The system was designed to address global stability, as well as local stability concerns. Ms. Robinson performed design of all structural elements and oversaw construction monitoring for this project, including quarterly monitoring of inclinometers, data processing, and reporting to confirm the design assumptions.

USACE Adelphi Pond Laboratory Center Building 203 Pond Retrofit, Adelphi, Maryland. Currently serving as the Project Manager for the retrofit and modification of a large storm water retention pond on a secure DOD facility. We are a subconsultant to the prime contractor HSU Builders, and GEI is serving as the Engineer of Record for geotechnical and dam engineering design. Following award of the contract, GEI determined that the bid design utilizing a Submerged Gravel Wetland Best Management Practice (BMP) was not feasible based on conditions discovered during our site survey and geotechnical exploration. GEI performed an alternatives analysis where we evaluated a variety of BMPs and various sizing configurations to most efficiently capture full water quality volume (WQv) for the site drainage area. Working closely with Maryland Department of the Environment (MDE), GEI engineered a new concept design consisting of a Modified Wet Pond BMP. Work included the oversight of a detailed geotechnical exploration program and laboratory testing. Design work included slope stability analyses, hydrology and hydraulics analyses, dam break analyses, civil design, grading, retaining wall design, and ecological assessments, design, and permitting.

North Fork Dam - MSE Wall, Asheville, North Carolina. Project Manager and designer for a 23 ft high, 275 ft long Mechanically Stabilized Earth (MSE) retaining wall on the site of the North Fork Dam in Black Mountain, North Carolina. The North Fork Dam and Burnett Reservoir are the primary water supply for the City of Asheville and surrounding communities. The MSE wall will be installed at the toe of the Main Dam and retain a proposed seismic stability berm. Prepared a design package for bidding including drawings, calculations,

EDUCATION

B.S., Civil Engineering, The Pennsylvania State University

M.S., Civil Engineering, The Pennsylvania State University

EXPERIENCE IN THE INDUSTRY

16 years

EXPERIENCE WITH GEI

2 years

REGISTRATION AND LICENSES

Professional Engineer, Pennsylvania

Professional Engineer, Arkansas

quantities, and specifications. Design considerations included drainage, selection of backfill material, accommodations for various site features, and a cantilevered parapet at the top of the wall.

North Fork Dam- Soil Nail and Tieback Retaining Wall, Asheville, North Carolina. Performed design calculations and analysis as a Senior Engineer for a soil nail and tieback retaining wall on the site of North Fork Dam for the City of Asheville. The retaining wall will be installed near the Auxiliary Spillway adjacent to an access road. The wall is two-tiered and has a maximum height of 30 ft and a length of 300 ft. Along the top of the wall, 6 strand tiebacks bear on concrete pads above the bottom tier of the wall which contains up to 5 rows of soil nails. I prepared specifications for the soil nail wall, tiebacks and bearing pads. Aside from structural considerations, aesthetics was a primary concern to the owner, and prepared design calculations and a specification for a sculpted shotcrete architectural finish for the wall.

Yeager Airport Runway 5 Slope Mitigation, Charleston, West Virginia. Served as Assistant Project Manager for the forensic investigation of Yeager Airport's Runway 5 EMAS fill slope failure which swallowed buildings and blocked Elk Two Mile Creek in July 2015. Failure of this 240-foot 1H:1V reinforced embankment, the largest in the U.S., also resulted in major flood damage to upstream structures. Assisted with development of mitigation plans to stabilize the resulting 160-foot vertical head scarp and the massive debris field. The mitigation plans included temporary surface drainage, erosion protection, staging and access requirements, design of waste fills, emergency contingencies and development of an instrumentation and monitoring program. Also participated in identifying and evaluating the wide range of issues that could affect project safety, constructability, operations, cost, and schedule. This included a risk evaluation of eight remedial alternatives including various fill slope configurations and structural retaining wall solutions.

Piedmont Driving Club Retaining Walls, Atlanta, Georgia. Project Manager for the design and construction of anchored MSE walls along Greens 16 and 18 of the Piedmont Driving Club. The design consisted of repairs to failing timber retaining walls and the removal and reconstruction of reinforced soil behind the wall. Passive tiered anchors were connected to timber deadmen to limit deflections of the timber soldier piles. Led the design development, prepared the design package, and oversaw field personnel during construction.

VCUHS Children's Hospital of Richmond Pavilion, Richmond, Virginia. Served as Project Manager and designer for a complex micropile underpinning system to transfer lateral earth loads from the portion of the existing building to be demolished. Worked in close partnership with the structural engineer and architect on the project to develop structural spring constants for the micropiles and tiebacks. Developed the tensioning sequence to transfer the load from the frame of the building to the foundation elements. In 2017, this project was awarded the Pinnacle Award—the highest honor given by the American Council of Engineering Companies (ACEC) of Virginia.

Jefferson Memorial Settlement Study and Seawall Design, Washington, DC. Project Manager for the settlement study. Oversaw field investigation and survey operations; conducted an extensive review of historical documentation; and performed analysis and design for three alternative remediation approaches. These designs involved complex soil-structure interaction analysis as well as lateral loading and coupling of forces. The selected design was a seawall supported on drilled shafts and driven pipe piles. Regularly visited the site to read instruments, meet with the surveyors, and to assure that field representatives were following proper instrumentation procedures. Processed the data and produced quarterly monitoring reports, which helped determine the rate and causes of settlement of the historic seawall. During the seawall design phase, performed lateral analyses of the drilled shaft/pipe pile system.

Ellis Island Historic Seawall Rehabilitation, New York, New York. Ellis Island seawalls showed accelerated deterioration and erosion from behind the wall compromising the seawall stability at some locations. Deterioration of these walls has resulted in aesthetical and public safety concerns. Project Manager for the installation of micropiles to provide structural underpinning and lateral support of the seawall.



Jeff Conaway, PLS

Project Director

Years of Experience: 20

Professional Summary

As the Regional Director of Operations, Jeff is responsible for overseeing the daily business operations for the Northeast region. He is a Professional Land Surveyor in three states as well as a Certified Federal Land Surveyor. He has over 20 years of experience in field survey services including; boundary surveys, section breakdowns, preliminary surveys, section breakdowns, construction staking and as-built surveys. Mr. Conaway also has extensive experience in project management where he excels in communications, progress reporting, project and quality control. Jeff demonstrates strong leadership & mentoring skills which allow him to develop strong project teams both in the office and field.

Professional Licenses

- ✦ Minnesota, West Virginia, Wisconsin, Maine, CFeds

Education & Certifications

- ✦ University of MN Duluth – Bachelor of Arts – Communications
- ✦ St. Cloud State University – Land Surveying
- ✦ Dunwoody Institute of Technology – Boundary Law and Legal Descriptions

Relevant Professional Experience

Client	Project	Location	Position
Energy Transfer Partners	Mariner East II Project – 350 Miles	OH/WV/PA	Project Director
Enbridge	Superior Terminal Enhancement Project I & II – Facility Upgrade Project	WI	Project Manager
Buckeye Partners	Broadway Pipeline Project – 5 Miles	OH	Project Manager
Buckeye Partners	NY Harbor Upgrade Project – 6 Miles	NJ	Project Manager
El Paso	Northeast Upgrade Project – 40 Miles	PA/NJ	Project Manager
El Paso	TP 300 Line Project – 150 Miles	PA/NJ	Project Manager
Columbia Pipeline Group	SM – 080 Project – 9 Miles	WV	Project Manager
EQT	H-312 Project – 10 Miles	WV	Project Manager

Commonwealth of Pennsylvania Department of State
Bureau of Professional and Occupational Affairs
Professional Engineer

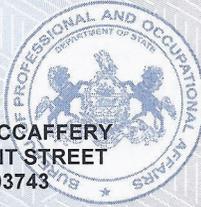
License Number
PE085502

Expiration Date
09/30/2017

Registration Code
5jhjkJdi

License Status
Active

KEVIN ANDREW MCCAFFERY
83 WEST PLEASANT STREET
CLAREMONT NH 03743



OFFICIAL DOCUMENT

READ THE FOLLOWING INFORMATION CAREFULLY CONCERNING YOUR LICENSE:

1. SIGN THE WALLET CARD AND CERTIFICATE WHERE INDICATED.
2. DETACH THE WALLET CARD AND CERTIFICATE AT PERFORATION.

KEVIN ANDREW MCCAFFERY
83 WEST PLEASANT STREET
CLAREMONT NH 03743

Registration Code

Your **registration code** is found on the attached wallet card.

Use this **registration code** online to: renew your license, change your personal or license address, or order duplicate licenses.

Visit our website at: www.mylicense.pa.gov

First time users will be required to use this **registration code** to create a user ID and password.

DISPLAY THIS CERTIFICATE PROMINENTLY • NOTIFY AGENCY WITHIN 10 DAYS OF ANY CHANGE

Commonwealth of Pennsylvania
Department of State
Bureau of Professional and Occupational Affairs
PO Box 2649 Harrisburg PA 17105-2649

17 0070358

License Type

Professional Engineer

License Status

Active

KEVIN ANDREW MCCAFFERY
83 WEST PLEASANT STREET
CLAREMONT NH 03743

License Number

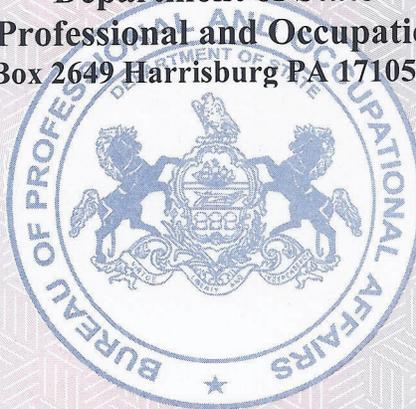
PE085502

Initial License Date

12/01/2016

Expiration Date

09/30/2017





Commissioner of Professional and Occupational Affairs



Signature



***Society of Wetland Scientists
Professional Certification Program, Inc***

grants the designation

Professional Wetland Scientist

For

Natalie L. Shearer, MS, QEP

In recognition of all the professional requirements approved by the Society of Wetland Scientists Certification Program, Inc. and verified by the Society's Certification Review Panel on 6/13/2019.
Professional Wetland Scientist number 3127. Due to recertify by 6/13/2024.



Matthew Simpson, PWS
President

Robert D. Shannon, Ph.D., PWS
Review Panel Chair

SWCA

APPENDIX D:
Financial Stability Letter



ENVIRONMENTAL CONSULTANTS

Sound Science. Creative Solutions.®

20 East Thomas Road, Suite 1700
Phoenix, Arizona 85012
Tel 602.274.3831 Fax 602.274.3958
www.swca.com

Financial Stability Letter

3/13/19

To Whom It May Concern:

As a private company, SWCA does not disclose its financial statements. However, we recognize that some clients may require evidence of SWCA's financial stability. As such, we offer the following information that we hope illustrates the strength of our company:

1. SWCA has remained financially stable since our founding in 1981 and we have steadily grown our revenues in all but three plateau years during economic slow-downs.
2. SWCA's revenues have more than doubled in the ten-year period between 2009 and 2018.
3. Our banking relationship with First American Bank is excellent, and we have maintained this relationship since 1998 when we became an employee-owned Employee Stock Ownership Plan (ESOP) company. We have zero debt, maintain deposit balances in excess of \$10M, and have a \$6M line of credit with a zero balance. Our banking representative is James Walrack and he can be reached at 847.586.2285.

Please feel free to contact me if you have any questions.

Regards,

A handwritten signature in black ink, appearing to read "Michael Lanin".

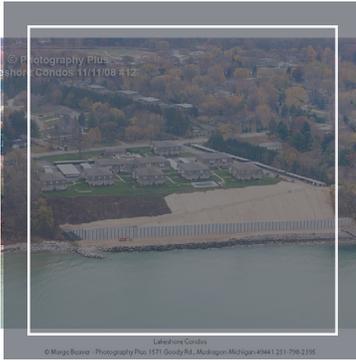
Michael Lanin

Vice President of Accounting, Finance & Risk Management

P 602.274.3831 | F 602.274.3958

SWCA

APPENDIX E:
Subconsultants Previous Experience



PROJECT

Bluff Stabilization

Location: St. Joseph, Michigan

Client: Lakeshore Condominiums, Home Owner's Association

Service Dates

Start: July 2007

Completion: November 2008

Fees

- Final Fee: \$160,000
- Construction Fee: \$1.8 million

This project required stabilization of an 80-foot tall bluff adjacent to Lake Michigan. The project was over 600 feet in length and protects over 100 residences and facilities. Access to the beach by the residents was a requirement of each alternative evaluated.

Freeze/thaw cycles caused repeating infinite slope failures when water seeping through the alternating clay/granular layers with a perched water table, froze along the bluff face during winter months and increased the groundwater load behind the frozen bluff face. Groundwater was not able to drain; therefore the buildup of water occurred until the frozen bluff face failed. These cyclical failures exposed the slough material to erosion by Lake Michigan. The bluff eroded over time and eventually compromised the safety of existing condo structures atop the bluff.

GEI staff provided services for all phases of the project beginning with evaluation of the bluff stability, continuing through gathering engineering properties of the bluff, oversight of the subsurface exploration, development of soil boring logs, interpretation of the engineering/design soil profile, development of stabilization alternatives, preparation of contract documents, and construction oversight. Numerous meetings were conducted with the home owners to convey the nature of the problems, potential repair alternatives, cost of alternatives, and recommendations for stabilization of the bluff slope.

After evaluation of numerous alternatives and their associated costs, an anchored H-pile concrete panel wall with dewatering drains was designed and constructed to stop movement on the 80-foot-high bluff. The wall was designed in two segments, with a sloping asphalt ramp between the segments to allow access to the beach area by the residents.

To reduce the effects of groundwater on the in wall, two types of drains were installed. 1) Attached to the back side of each concrete panel was a vertical wick drain to prevent water buildup along the back side of the wall. 2) Approximately 25 feet in front of the condo buildings, 30 four-inch diameter and continuously screened wells were installed. The wells were drilled 90 feet deep. The wells serve two purposes - to intercept and lower the water table behind the wall and as observation wells for periodically measuring the elevation of the ground water.



Innovations and Notable Outcomes

Understanding the factors affecting the stability of the bluff and their relationship is always a challenge. Access to a bluff face and gathering representative samples that show the properties of the materials in the bluff can be difficult. Determining the effect of groundwater on slope stability requires the installation of monitoring wells or piezometers, and time to measure the seasonal fluctuation of ground water may not be available. Analysis of the data gathered from the soil investigation to determine the least costly stabilization method requires experience in slope stabilization and knowledge of repair methods.

Working with a Home Owner's Association (HOA) was challenging as many of its members do not have an engineering background and needed to be educated about the investigation and design process. Numerous meetings and presentations kept the HOA informed about project progress and cost.



Key Elements

- Bluff stabilization along eastern shoreline of Lake Michigan
- The soils glacially deposited
- The bluff instability is likely caused by more than erosion of the toe
- Previous attempts to stabilize the bluff have not been effective
- Groundwater likely contributes to bluff instability
- Surface materials exposed on the bluff face are likely slump material that may not be representative of the underlying bluff material
- The freezing of the bluff face likely causes a buildup of groundwater in the face during the winter months
- Soil stratigraphy likely changes along the face of the bluff
- Access to the bluff face and shoreline is difficult
- Buildings located near the crest of the bluff must be protected
- Access to the beach area by visitors must be maintained



PROJECT

Coastal Bluff Stabilization

Location: Suffolk County, New York

Client: Residential Property

GEI designed and permitted a bluff stabilization project located at a residential home on the North Shore of Long Island.

GEI prepared a slope stabilization and bulkhead repair plan, plus permit application packages to secure permits from the U.S. Army Corps of Engineers, New York State Department of Environmental Conservation, and local municipalities. The scope of work included the repair of approximately 140 feet of bulkhead, creation of a live (vegetated) crib wall, and stabilization of the bluff face with native vegetation

Key Elements

- Bluff Stabilization Plan
- Permit Applications
- Live Crib Wall
- Construction Oversight





PROJECT

Former City Landfill Slope Stabilization Feasibility Study and Permitting

Location: Eastport, Maine

Client: City of Eastport, Maine

Service Dates

Completion: 2014

Key Elements

- State-level permitting
- Slope stabilization
- Coastal erosion control methods
- Alternatives analysis
- Former landfill
- NRPA permit

Currently on the Maine Department of Environmental Protection's (ME DEP) Landfill Closure Program, the former City of Eastport (the City) municipal landfill has been out of commission since the late 1970s. A majority of the landfill is presently graded and covered with vegetation, but metal and other debris is visible along the shoreline portion of the site, where landfill waste is being moved into the bay by repeated tidal cycles and erosion. GEI conducted a feasibility to identify and evaluate options for stabilizing this slope to prevent solid waste discharge onto the shore. Additionally, GEI aided in ME DEP permitting for the project.

ME DEP testing in September and October 2013 adjacent to the site revealed concentrations of metals and organic compounds significantly above those detected in the background sample. GEI staff characterized the geometry and conditions of the failing slope at the landfill using field measurements and photography. We also evaluated coastal erosion dynamics at the landfill site and researched and ranked coastal erosion remediation control methodologies to use on the site. The most effective remediation alternative, after review with ME DEP and the City, was chosen to be rip rap. Following the evaluation, permitting actions for a Natural Resource Protection Act permit for the project were completed by GEI to submit to ME DEP and U.S. Army Corps of Engineers. This permitting process involved assessment of the coastal wetlands in project area to determine their extent and location. Furthermore, we contacted all potential stakeholders to reach out about the project and see if it had any implications on them. The project also dealt with City of Eastport ordinances and ME DEP Solid Waste Regulations.





PROJECT

Geotechnical Services for Route 2 Slope Failure Assessment and Remediation

Location: Charlemont and Savoy, Massachusetts

Client: Massachusetts Department of Transportation, Highway Division

Service Dates

Start: September 1, 2011

Completion: Ongoing

Fees

- Final Fee: \$94,000

Key Elements

- Failure evaluation
- Subsurface explorations
- Instrumentation monitoring
- Repairs design

GEI provided geotechnical assessment and design services for the slope failures along Route 2 in western Massachusetts. The project involved two sites including a slope east of Trout Brook in Charlemont, Massachusetts and three significant translational slides east of Black Brook Road in Savoy, Massachusetts.

GEI performed the following scope of work:

- GEI performed site visits to observe conditions and investigated the causes of failure. We observed three borings performed at the Trout Brook site to investigate soil conditions and installed an inclinometer.
- Provided recommendations for temporary repairs to stabilize the roadways and allowed MassDOT to re-open the roadway. Recommendations included temporary repairs, monitoring requirements, and temporary rock fall protection design.
- Observed construction of temporary repairs to confirm site conditions were consistent with our design assumptions.
- Performed stability analyses for existing and repaired conditions
- Provided recommendations for permanent repairs and monitoring.
- Collecting periodic inclinometer readings at the site and providing reports of the ongoing slope movement, pending permanent repairs.





PROJECT

Green Shoreline Stabilization at Aunt Amy's Creek

Location: Stony Brook, New York

Client: Private Residence

Service Dates

Start: 2013

Completion: Ongoing

Fees

- Final Fee: \$22,000

Key Elements

- Bioengineered Slope Stabilization
- Living Shoreline
- Wetland Permitting
- Green Infrastructure

GEI designed and oversaw restoration plans and submitted permit applications for a bio-engineered shoreline restoration at Aunt Amy's Creek in Stony Brook

At times when the natural slope of a shoreline exceeds the natural angle of repose of the soils, and where brushmattress and live stakes are not enough to restore the shoreline, additional structural support may be required. Installation of a live cribwall at Aunt Amy's Creek was critical in order to stop the continuous degradation of the slope and prevent future collapse of the natural wooded vegetation into the tidal creek.

The wooden cribwall structure was built into the ground in sections and then filled with stone and soil. For extra support, additional layers of stone and geogrid were integrated into the structure. A variety of specially selected plant species, chosen for their ability to withstand the salinity and shade in the creek, were inserted into the open weave of the wooden structure.





PROJECT

Orchard Beach State Park Erosion Control and Geotechnical Study

Location: Lake Michigan, Michigan

Client: Michigan Department of Technology, Management & Budget

The national historic Orchard Beach State Park is located on the East shore of Lake Michigan, north of Manistee, Michigan.

The park encompasses 211 acres and has 3,000 feet of shoreline with a steep bluff and includes historical limestone structures constructed in the 1930s and 1940s as well as various other buildings and amenities that were added throughout the years, including restrooms and showers, contact station, administrative and maintenance building, manager's residence, and garage. There is also a campground and day area.

Due to continuing erosion at the toe of the bluff by wave action on Lake Michigan waves and sloughing of the high, steep slope, caused by seepage, the bluff has receded over the years, increasing the vulnerability of several structures. Of particular concern are the pavilion, which is used for community and social gathering events on a regular basis and several bunk houses and a bathroom located within 50 feet of the bluff face.

The Michigan Department of Natural Resources (MDNR) and MDTMB selected GEI to study the bluff and better understand the risks posed to these structures and develop conceptual level mitigation alternatives to be considered for implementation in 2018, or sooner.

GEI's scope of work for this project included the following tasks:

- Review available site data related to site soil and groundwater conditions, air photos, property boundaries and site topography.
- Review Lake Michigan induced wave erosion along the beach and bluff to quantify bluff and toe erosion rates.
- Complete a geotechnical subsurface exploration program including three (3) soil borings along the top of the slope.
- Complete a topographic survey of the bluff from the southern boundary of the campgrounds to the northern boundary of the site.
- Use the subsurface exploration data to develop soil profiles from north to south along the shoreline at three (3) critical cross sections used in the slope stability analyses.
- Perform geotechnical laboratory testing on soil samples obtained from the borings to determine the physical and strength parameters of the soils for use in static stability analyses.
- Complete a static slope stability analysis to establish an existing slope model and potential failure modes with associated Factors of Safety.
- Estimate the design storm and water levels using existing data for design of

Service Dates

Start: February 2017

Completion: Ongoing

Fees

- Final Fee: \$55,000



shoreline protection to prevent long term erosion at the toe of the existing bluff.

- Develop dewatering design to mitigate seepage and subsequent erosion.
- Prepare conceptual design drawings and budget-level construction cost estimates of the selected methods for shoreline protection.
- Provide preliminary recommendations for stabilization of the existing shoreline and bluff to meet required factors of safety for global slope stability.



The areas of erosion and repair



Key Elements

- Geotechnical Field Explorations
- Laboratory Testing and Analysis
- Alternatives Analysis for Slope Stability Improvements
- Conceptual Level Remedial Recommendation Measures to Reduce Slope Erosion





PROJECT

Slope Stabilization through Living Shoreline

Location: Nantucket, Massachusetts

Client: Private Owner

Service Dates

Start: November 2, 2014

Completion: April 15, 2016

Key Elements

- Feasibility evaluation
- Geotechnical investigations
- Slope Stabilization Design
- Construction management
- Coastal bank stabilization
- Environmental permitting

GEI was retained by the property owner to remedy the severe erosion of a coastal bank on the island of Nantucket. The coastal bank of this property has been eroding at the rate of 18 inches per year.

GEI conducted the necessary hydrodynamic study and determined that the site is at moderate level of coastal erosion risk and in need of protection to prevent further loss to the property.

Field survey was performed, soil samples were collected and tested to characterize the coastal bank and embankment stability analyses were performed. We then developed embankment stabilization recommendations to convert the existing area to a “Living Shoreline,” which will meet the requirements of Massachusetts Department of Protection (MassDEP) and the local Conservation Commission.

Permit documents were prepared and final approvals were secured to execute the project.

Project construction was completed at the 90% level in 5 weeks. Additional embankment stabilization planting was performed in early spring of 2016. The project performance will be monitored for 3 years to assure full compliance with the regulatory requirements.





CONTACT

SETH MITCHELL
Director, Pittsburgh Office
T: 412.839.1001
E: SMitchell@swca.com
www.swca.com

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