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Header 1

List View

General Information | Contact | Default Values | Discount | Document Information | Clarification Request

Procurement Folder: 1834025
Procurement Type: Central Contract - Fixed Amt
Vendor ID: 000000185474
Legal Name: TERRACON CONSULTANTS INC
Alias/DBA:
Total Bid: $0.00
Response Date: 12/03/2025
Response Time: 13:11
Responded By User ID: vmervin
First Name: Vanessa
Last Name: Ervin
Email: vanessa.ervin@terracon.co
Phone: 3043440821

SO Doc Code: CEOI
SO Dept: 0310
SO Doc ID: DNR2600000003
Published Date: 11/10/25
Close Date: 12/3/25
Close Time: 13:30
Status: Closed
Solicitation Description: A&E - Meadow River WMA Wetlands Project
Total of Header Attachments: 1
Total of All Attachments: 1

Department of Administration
Purchasing Division
2019 Washington Street East
Post Office Box 50130
Charleston, WV 25305-0130

State of West Virginia
Solicitation Response

Proc Folder:	1834025
Solicitation Description:	A&E - Meadow River WMA Wetlands Project
Proc Type:	Central Contract - Fixed Amt

Solicitation Closes	Solicitation Response	Version
2025-12-03 13:30	SR 0310 ESR12032500000003386	1

VENDOR

000000185474
TERRACON CONSULTANTS INC

Solicitation Number: CEOI 0310 DNR2600000003

Total Bid: 0 **Response Date:** 2025-12-03 **Response Time:** 13:11:39

Comments:

FOR INFORMATION CONTACT THE BUYER
Joseph (Josh) E Hager III
(304) 558-2306
joseph.e.hageriii@wv.gov

Vendor
Signature X **FEIN#** **DATE**

All offers subject to all terms and conditions contained in this solicitation

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
1	Civil engineering				

Comm Code	Manufacturer	Specification	Model #
81101500			

Commodity Line Comments: Attachments are included as a response to the Expression of Interest. No cost involved.

Extended Description:

Design and Contract Administration of a new wetlands area at Meadow River Wildlife Management Area.

West Virginia Division of Natural Resources

Expression of Interest

A&E – Meadow River WMA Wetlands Project

CEOI DNR2600000003

December 3, 2025

112 California Avenue, Building 4
Charleston, WV 25305
P (304) 558-2306

Nationwide
Terracon.com

- Facilities
- Environmental
- Geotechnical
- Materials

Expression of Interest Response

PROJECT UNDERSTANDING

Terracon Consultants, Inc. (Terracon) appreciates the opportunity to respond to the West Virginia Division of Natural Resources' (WVDNR) Expression of Interest (EOI) for the A&E Meadow River Wildlife Management Area (WMA) Wetlands Project. Terracon understands that the WVDNR is seeking an EOI from qualified firms to provide necessary engineering to evaluate, design, specify and provide construction administration for the establishment of a natural wetland area located on the Meadow River WMA located in Greenbrier County, West Virginia.

Wetlands play a vital role in showcasing nature's beauty, improving water quality in the watershed, and ensuring adequate stormwater management, all which uphold a high quality of life that define Greenbrier County. At Terracon, we understand that a project located within the Meadow River Wetlands Wildlife Management Area (WMA) is a long-term investment in the health, resilience, and vitality of the region.

The Meadow River Wildlife Management Area is located in the upper vale of the Meadow River, Greenbrier County, West Virginia. The 2,385-acre WMA ranges across wetlands, bottom-lands along the Meadow River and its tributaries, and into the surrounding gently sloping Allegheny foothills. Game traditionally hunted in the management area includes deer, grouse, squirrel, raccoon, turkey, woodcock, and waterfowl. Creating local networks of connected habitat cores and corridors will enhance resilience and connectivity and the ability of wildlife species to adapt to changing conditions within the MWA. Connected local networks of headwater streams and larger rivers, their riparian corridors, floodplains, and wetlands enhance the stability of these habitats and enables fish, reptiles, birds and other priority wildlife species that depend on those habitats to move across the landscape as conditions change.

Local stressors identified within Meadow River Wetlands Conservation Focus Area Management Plan (WVDNR, 2021) consist of water quality impairments, including excess iron and increased sedimentation. Distinctive stressors identified include wetland habitat degradation from livestock grazing, along with historical anthropogenic impacts from the draining and filling of wetland areas. Terracon understands the unique challenges posed by sedimentation, water quality degradation, and ecological balance, and we are committed to delivering innovative, cost-effective, and environmentally responsible solutions tailored to the needs of this project

The Meadow River WMA's boundaries are shown in Figure 1 on the following page.

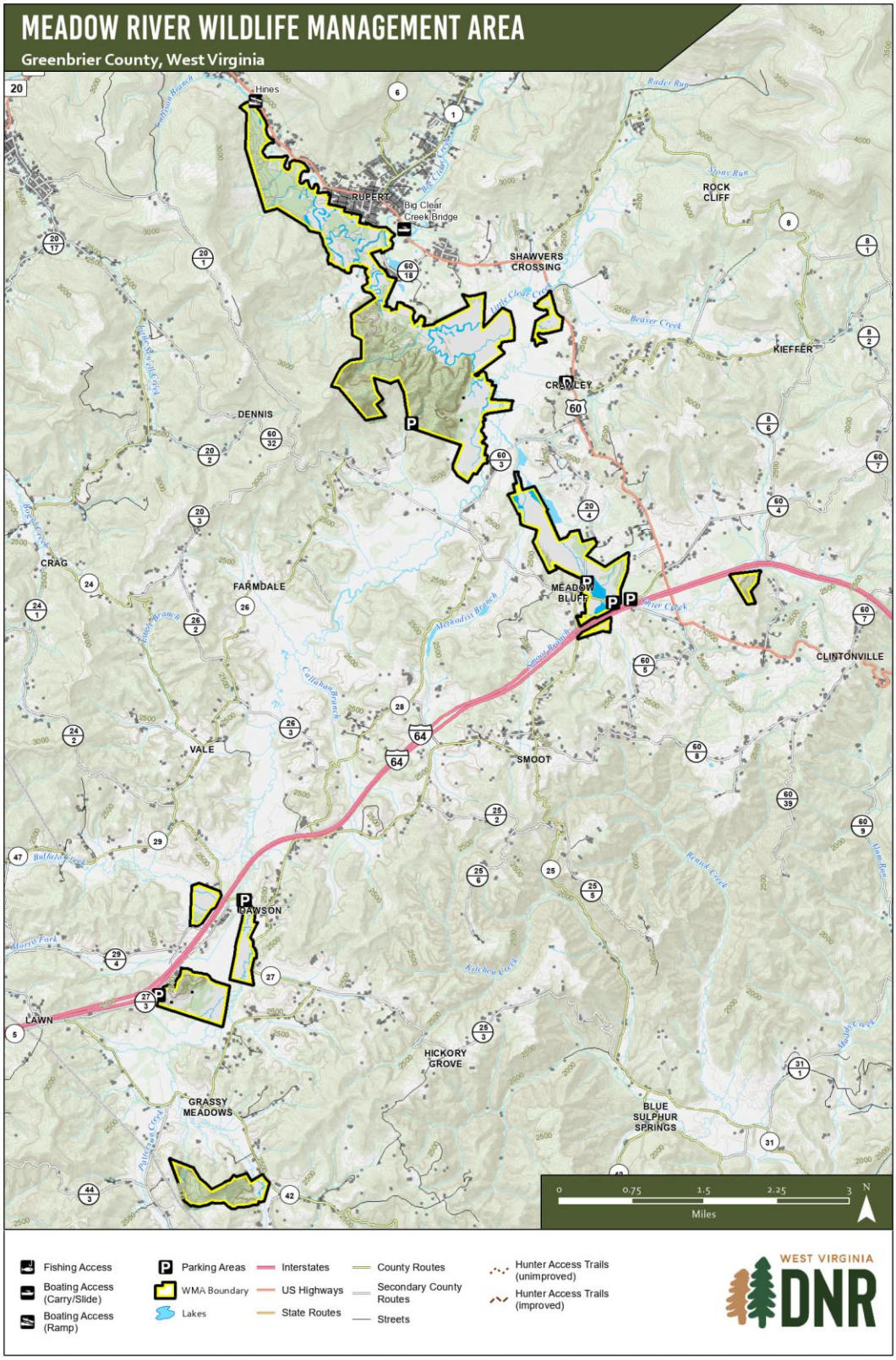

Figure 1. Meadow River WMA Boundary.

Expression of Interest Response

PROJECT APPROACH

Terracon's approach includes preliminary site identification, inventory, assessment, evaluation/ranking, reporting (conceptual and final design plan) and ultimately, concurrence on the use of and creation or enhancement options at a recommended site(s).

Siting is a systematic process with general areas screened in relation to established goals and objectives. Data is collected and evaluated; sites are ranked and narrowed to preference, best fit (commensurate) and greatest opportunity for success.

The benefits of a thorough and methodical site selection process include:

- Assuring that all available sites within a defined geographic region or watershed are reviewed, increasing the likelihood that a suitable site(s) will be chosen and site success.
- Eliminating problem sites, allowing financial and personnel resources to be focused on sites with greatest probability of success.
- A process or method to document compliance with federal and state guidelines
- Expeditious agency review and concurrence
- Greater level of confidence
- Reduction in risk or fatal flaw during construction phase

Pursuing enhancement, restoration and preservation over creation will result in increased success and will significantly reduce overall costs.

Goal/Objective 1:

Site Assessment and Data Collection

Terracon brings a diverse range of expertise and a comprehensive suite of assessment tools that can be scaled to projects of any size or complexity. Recognizing that ecological challenges are rarely solved with a one-size-fits-all approach, we prioritize site-specific solutions. Once project initiation has occurred, we will utilize our team's broad range of skills to assess the site to determine design and permitting needs. Terracon's comprehensive design and permitting services for wetland creation or enhancement projects are grounded in detailed site assessments.

The entire design process will begin with high quality data collection, by thoroughly analyzing the site's existing hydrology, soil, vegetative, and ecological conditions to understand how water moves through and impacts the area. Based on that data, we will collaborate with WVDNR to design a project that enhances wetland habitats for waterfowl, using native vegetation and mimicking natural flow patterns. Throughout the process, we will ensure compliance with regulatory requirements, prioritize minimal long-term maintenance, and opportunities to increase biodiversity, resilience, and community engagement.

A detailed understanding of baseline site conditions and project planning is paramount to the approach. Defined goals and objectives and quantifiable measures of success must be established. Improper site selection, a limited understanding of ecological requirements and a lack of identifiable performance standards are the most common reasons for failure. Information as garnered through detailed project review at the onset of the project will include:

- General site location data – surrounding land uses (historic and present day), impairment issues, critical use issues, watershed area and uses, wildlife uses, landscape connectivity, aquatic resources and uses, etc.
- Wetland/stream classifications – stream type/designation, wetland habitat, and hydro-geomorphic classification, etc.
- Functional/physical habitat characterizations
- Hydrology – drainage areas, hydroperiod, sources, etc.
- Vegetative characteristics and composition of wetland and riparian and buffer areas – stratification, density, abundance, frequency, health of communities, etc.

- Stream morphological characteristics - substrates, flow/depth diversity, bank conditions, function of waterway (transport, accumulation, etc.), biological community structure, etc.
- Review and evaluation of exhibited functions. Dependent upon methodology employed and functions/values evaluated (inherently subjective and not quantifiable).

Wetland Site Selection

Although the EOI specifically entails wetland creation, opportunities for enhancement and/or restoration should not be discounted and will be evaluated as well.

The approach to wetland site selection will consider the existing regional and local watershed characteristics and historic/current continuity/ fragmentation and development within terrestrial and aquatic habitats.

Consideration of economic, societal, and biotic values of the resource including water quality improvements, floodflow alteration, habitats for trout, waterfowl, songbirds, reptiles, and amphibians, visual and aesthetics, pollution prevention, and system continuity will be undertaken.

Review of multiple secondary data sources will be undertaken to assist in the sighting, inventory (reconnaissance surveys), preliminary ranking, and eventual selection, and will include review of:

- Topographical mapping, aerial photography, U.S. Department of Agriculture Natural Resources Conservation Service soil maps, Federal Emergency Management Agency (FEMA) floodplain maps, National Wetland Inventory.
- Review of Biological Stream Surveys
- Threatened and Endangered Species (USFWS Information for Planning and Consultation (IPaC) and WVDNR)
- Greenways (habitat connectivity)
- Important Bird Areas and Important Mammal Areas
- Regional Land Use Planning Documents
- Natural Heritage County Assessments

Coordination with multiple stakeholders will be undertaken, including:

- Conservation groups (such as Ducks Unlimited and Trout Unlimited)
- Private landowners
- Local sportsmen's organizations
- Local watershed organizations
- West Virginia Department of Environmental Protection (WVDEP)
- WVDNR
- U.S. Fish and Wildlife Service (USFWS)

Sites resistant to disturbance and ones which will utilize natural processes rather than relying on engineered control structures are preferred. Wetland site evaluation and selection will consider the following criteria:

- Restoration/enhancement potential
- Presence of upland buffers
- Availability and reliability of hydrologic sources
- Topographic constraints
- Current and potential site/watershed disturbance
- Existing land use features
- Functional characteristics

- Hydro-geomorphic setting
- Availability of acreage
- Constructability, practicality, and feasibility of the site
- Site management and protection
- Normal flow depth and width
- Bank full depth and width
- Bank cross sections
- Stream riffle/run/pool ratios
- Stream gradient
- Stream sinuosity
- Stream channel substrate composition and location
- Macro-invertebrate and fish habitat structure and cover
- Macro-invertebrate composition
- Visual fish survey
- Banks conditions, slopes, and heights
- Floodplain identification
- Riparian corridor conditions and vegetation

Wetland Delineation

Accurately defining existing wetland boundaries and jurisdictional authority will be key to commencing construction as quickly as possible. A rapid desktop review of readily available data sources identified that wetland habitats cover much of the WMA, especially along the Meadow River valley.

As a company with a nationwide footprint, Terracon leverages our environmental professionals to stay up-to-date and informed on the constantly changing waters of the United States (WOTUS) regulations and operative definitions. Using this to our advantage, we are detail oriented in our assessments and take care to consider ways to alleviate burdensome regulatory requirements.

Existing Conditions Assessment (Vegetation, Soils and Hydrology)

The existing conditions assessment will provide the baseline data upon which the entire project is built, therefore this initial assessment is vital for overall project success. Evaluating the existing conditions of the Meadow River Wetland MWA will be vital to successfully create a wetland with ecological conditions to support waterfowl populations and resolve existing and potential ecological stressors.

Although the U.S. Army Corps of Engineers (USACE) Huntington District dictates the methodology to evaluate wetlands for use in USACE permitting and their compensatory mitigation program, there are numerous other methodologies that may be better suited for the wetland project. Terracon's experienced team would consider multiple methods, including the hydrogeomorphic method (HGM), which first classifies wetlands based on three (3) fundamental parameters (geomorphic setting/landscape position, water source, and direction/movement of water within the system). Terracon has extensive experience in the application of the West Virginia Wetland Rapid Assessment Method (WVWRAM). Understanding these parameters first, before in-situ vegetation, soil, and hydrology samples are taken, will help to understand the hydrologic regime and ensuring the proposed enhancements implemented within the wetland system will function as intended. For example, a rapid desktop review identified that wetland habitats cover much of the WMA, especially along the Meadow River valley.

Terracon proposes to collect existing conditions data on current vegetative and soil conditions, using plots and soil samples, respectively. Terracon's expertise in geotechnical engineering will be used at this stage, to first use Terracon's proprietary Stage 1 platform to conduct a preliminary prediction of

expected sub-surface conditions and then assess whether more detailed geotechnical data is needed. In particular, representative soil samples from transects across the wetland, including accumulated sediment from the ponded area, will be collected to help inform design decisions.

It is well cited in scientific literature that hydrologic regime (seasonality, depth, and duration) is the most important factor to evaluate when creating or restoring wetlands, as it serves as the primary driver of wetland structure and function. The Guidelines for Conducting and Reporting Hydrologic Assessments of Potential Wetland Sites (ERDC TN-WRAP-00-01, June 2000), is often referenced for such studies, and indicates that “hydrologic assessments run the gamut from (1) simple observations of indicators, to (2) direct measurements of groundwater or surface water, to (3) indirect methods of estimations such as scope and-effect equations of hydrologic models.”

Our team knows the importance of evaluating water quality for the wetland design. We also propose to document how parameters will improve over time. Water quality sampling may also include nitrate/nitrite, pH, turbidity, dissolved oxygen (DO), and salinity, which are all important for wetland creation. Water quality parameters will be collected using grab samples for lab analysis or instrumentation such as a YSI Multi-Probe for in-situ measurements. Sampling will abide by hold times (particularly important for nitrogen and bacteria samples) and include both impounded water during dry weather conditions and stormwater inflows and outflows during wet weather conditions. The results of this sampling will help inform design attributes of wetland creation.

The Terracon team will collaborate with WVDNR to decide on which type of existing conditions assessment would ensure sufficient data is collected, while also balancing any seasonal or schedule constraints.

Goal/Objective 2:

Terracon can provide all necessary services to design and permit the facilities described in this EOI in a manner that is consistent with the WVDNR needs, objectives, current law, and current code; while following the plan to design and execute the project within budget.

Evaluate Feasibility

The primary objective is to develop a feasible wetland design plan to create a wetland environment suitable for waterfowl and other wetland species, while minimizing cost and ecological disturbance. This includes identifying and mitigating sources of pollution, enhancing wetland function, and designing features that integrate with the surrounding landscape to create a resilient wetland ecosystem, enhancing landscape resilience and connectivity to other wetland and riparian areas.

Understanding the specific needs of the WVDNR will be essential to providing cost-effective services and deliverables to meet expectations. The Terracon Team is committed to promoting effective communication with the WVDNR’s Project Manager for successful completion of the project objectives.

Conceptual and Final Design Plan

The project objective is the establishment of a seasonal wetland natural wetland area located on the existing Meadow River WMA by installing various features to control and direct water to create a wetland environment suitable for waterfowl and other wetland species. Managed seasonal wetlands areas are natural wetlands with a wide variety of plant species but are usually dominated by grasses and sedges that produce lots of seeds and tubers and harbor diverse aquatic invertebrate communities, with good foraging potential for ducks. Managed moist-soil areas can provide rich and complete foraging habitats and cover for waterfowl. Moist-soil wetlands are fairly economical to establish and manage because plant communities emerge from natural seed banks. Wetlands with a 50:50 interspersion of vegetation to water are attractive to waterfowl and other birds on both breeding and wintering grounds. Native, hardy vegetation species will be selected with favorable characteristics for survivability in this setting.

Our team will develop a conceptual design using existing condition data gathered and using judgement based on our collective professional experience designing wetlands and wetland restoration projects. The conceptual plan reiterates the processes, procedures, methodologies, rationales, criteria, etc. employed to preliminarily identify, evaluate, assess, rank, and select a suitable site(s). The conceptual plan serves as a record of analysis which provides documentation and justification relative to the evaluation of reasonable and practicable options/alternatives. Through review and approval, it provides a record of agency coordination and concurrence. Ultimately, the conceptual plan serves as

required supporting documentation to the project permit application (subject to public review and comment).

The conceptual plan also serves as the basis for and provides direction relative to specific site design needs and future actions.

Final Site Design

- Overall Goals and Objectives
- Baseline Description of the Proposed Site
- Description of the Resource within the Local Watershed
- A Description of the Physical Attributes of the Site
- Site Section Methodology
- A Description of the Future Sustainability of the Site
- Work Plans
- Wetland Design Specifications and Characteristics
- Vegetation Landscape Plan
- Design and Construction Plans
- Water Budget
- Identification and Description of Buffers
- Identification of Performance Standards
- Documentation of Site Protection and Maintenance Issues
- Adaptive Management Plans

Throughout the planning and design phases of Wetland Creation project, several key issues must be proactively addressed to ensure the project's success and alignment with expectations:

- Regulatory Coordination and Compliance: The project must comply with all applicable local, state, and federal regulations. Early and ongoing coordination with permitting agencies will be essential to avoid delays and ensure that all design elements meet regulatory standards.
- Adaptive Management: The project will be designed with flexibility to respond to site-specific data collected during assessment, as well as future environmental changes or stakeholder input.
- Long-Term Maintenance Planning: To be successful, the wetland project will be designed with sustainable and low-maintenance design attributes. The design process will include the development of a maintenance plan that outlines responsibilities, timelines, and adaptive strategies to ensure the created wetland continues to function as intended over time.
- Hydrologic and Ecological Integration: Understanding the site's historic and current conditions, especially in regard to hydrology, and its interaction with surrounding land uses is critical. The design process will consider how stormwater flows into, through, and out of the site, and how the wetland enhancements will function within the broader watershed.
- Stakeholder Engagement and Communication: If public meetings are required, clear and accessible communication will be necessary to build support and understanding. Our team is prepared to assist in presenting technical information in a way that is meaningful to the public and stakeholders.
- Data-Driven Decision Making: All planning and design decisions will be informed by the results of site assessments, including topographic and hydrologic surveys, vegetation and soil analysis, and water quality testing. This ensures that the final design is grounded in real-world conditions.

Once the conceptual (30% submittal) plans have been approved, detailed design will commence. Detailed design typically proceeds through 60%, 90% and 100% milestones, however this is flexible depending upon the WVDNR's needs. Detailed design drawings (plans, profiles, cross-sections, details, and notes) and corresponding specifications will be developed and refined as the project progresses. A workshop will be held at each design milestone during which the design will be presented, and feedback and questions will be received. Each deliverable will undergo an extensive internal quality control review prior to delivery to the WVDNR. Permit packages will be developed following the 60% milestone and submitted at the 90% milestone, to ensure a timely review and approval by the time the final design is completed.

Supplemental Plans (Grading, Planting Plans, Erosion and Sedimentation (E&S) Control)

Our engineering design team will work collaboratively with our landscape architect to develop a grading plan and planting plan. Wetland plant selection will be based on recommendations for constructed wetlands and guidance from West Virginia University Extension. Plant selection for the wetland will favor native species. Landscape design will consider aesthetics, maintainability, as well as consideration of how people will interact with the site, providing pedestrian routes to minimize damage to the plants.

The team will prioritize identifying appropriate vegetative stock (species and composition), as it is extremely important to both the long-term ecological and aesthetic attributes of the wetland. Wetland systems with a similar hydrologic regime and which are similarly situated on the landscape will be used as a reference to confirm use of plant species which will support a fully functional and thriving wetland.

Erosion and sediment controls will be designed as part of the construction SWPPP. Careful construction phasing is critical to prevent damage, compaction, or contamination to wetland substrate soils. Any supplemental fill soil brought on site will meet strict engineering standards for the project's design.

Permitting

Terracon offers expert environmental permit preparation services to support a wide range of ecological restoration, development, and infrastructure projects. Our team navigates complex regulatory frameworks to ensure timely and compliant permitting, minimizing delays and facilitating project success. Our Services Include:

- Wetland and Waterway Permits: Preparation of General Permits, Joint Permit Applications.
- WVDEP Section 404/401 Clean Water Act documentation.
- Erosion and Sediment Pollution Control Plans: Development of plans and supporting documentation for Erosion and Sediment Pollution Control Plan approvals, and National Pollutant Discharge Elimination System (NPDES) permits for larger projects where the Chapter 102 limit of disturbance exceeds one-acre.
- Floodplain Permitting: Coordination with local floodplain administrators and preparation of required modeling and documentation.
- Endangered Species Coordination: Preparation of habitat assessments and consultation documents for compliance with federal and state rare, threatened, and endangered species regulations through IPaC, USFWS-WVFO, and WVDNR.
- Historic and Cultural Resource Documentation: Coordination with the State Historic Preservation Office (SHPO) and preparation of required forms and reports.
- Environmental Assessments: Support for Joint Permit Application documentation, including environmental impact resources assessments and alternatives analysis.

Regulatory Pre-Application Meetings

Pre-application meetings may be conducted with federal, state and/or local agencies as needed to facilitate submittal and approval of permits. If the project receives federal funding or a USACE Clean Water Act (CWA) permit is required, the project will have a federal nexus, and therefore early coordination with federal agencies will set the project up for success. Terracon routinely leads these pre-application meetings to introduce the concept plan to the resource agencies, gauge their

receptiveness, identify any significant obstacles, and determine what, if any, additional studies may be required by the agencies to make a complete application.

Permit Applications

Permitting specialists from our team will coordinate and assist WVDNR in obtaining all required permits and regulatory approvals necessary for project construction.

As introduced above, a federal nexus will require a much more involved analysis, which may include a full Environmental Assessment (EA) according to National Environmental Policy Act (NEPA). The existing Preliminary Investigation Feasibility Report (PIFR) document will serve as a foundation for further detailed examination of environmental impacts and alternatives for the project site. If an EA is required, Terracon has a robust staff of NEPA practitioners who are intimately familiar with the nuances of this complex process and can help guide our team to success.

Terracon also has the internal staff availability to complete analysis of federal environmental acts which are often triggered as part of the NEPA process, including Endangered Species Act (ESA), CWA, and National Historic Preservation Act (NHPA). Particularly, Terracon's team of archaeologists and historic preservationists can complete any necessary NHPA triggered survey (cultural, historic, or archaeological), while our team of biologists are well versed in protected species habitat assessments and will quickly navigate USFWS requirements if any impacts to protected species habitat is anticipated.

Terracon brings extensive experience navigating this complex regulatory landscape, coordinating with the USACE, and delivering successful permitting outcomes. The Terracon team will demonstrate how the proposed wetland creation or enhancement produces a net improvement on the wetland function.

Cultural Resources

Cultural (historic and archaeological) resource investigations may be required if the proposed project involves a federal undertaking (in most cases, this means a federal permit or funding). Permitting under federal regulations such as Section 404 of the Clean Water Act, would require compliance with Section 106 of the National Historic Preservation Act of 1966 as amended, and the regulations of the Advisory Council on Historic Preservation (codified as 36 CFR 800).

The project would be reviewed by the West Virginia State Historic Preservation Office (WVSHPO), which acts as the federally designated State Historic Preservation Office (SHPO). The WVSHPO would render an opinion regarding project effects to cultural resources and the need for studies to determine whether significant cultural resources are present in the project's area of potential effects. Detailed archaeological and historic structures surveys would be conducted by the applicant to comply with the relevant laws and regulations. Permits that would trigger these studies include, but are not limited to, USACOE Section 404 Individual Permits, USACOE NWPs and Individual Section 401 Water Quality Certifications or NPDES permits.

The scope of work to resolve cultural resource issues includes:

- The WVSHPO should be consulted on specific archaeological, prehistorical, or historical sites or structures which might be affected by the proposed project. The consultation process is initiated with a simple letter request to the WVSHPO requesting project consultation or on-line data submission. The need for and scope of future required cultural resource surveys will be determined based on the results of coordination with WVSHPO.
- Required supporting studies could include: Historic Structures Surveys; Archaeological Surveys; Effects Determinations; Mitigation/Recordation Efforts

Scoping considerations include:

- Early coordination with WVSHPO allows consulting parties, stakeholders and public to be involved in early project planning
- Enabling development of project schedules that recognize need and time frame for appropriate review and approval
- Terracon is a qualified Cultural Resource Consultant that can facilitate cultural resource compliance.

Public Meetings

Community involvement and public input for the proposed project are vital for successful implementation and perception of the proposed project. Terracon would lead this effort, with input from the WVDNR.

Goal/Objective 3:

Construction Drawings

Construction drawings are the cornerstone of successful project execution, serving as the detailed visual and technical blueprint for translating design concepts into built reality. At Terracon, we prepare precise construction drawings that guide contractors, engineers, and stakeholders through every phase of development. The aim is a successful project that is constructed and functions as designed.

What We Provide:

- Engineered Plans: Fully detailed drawings including site layout, grading, utilities, erosion and sediment control, stormwater management, and construction details.
- Sealed Documents: All drawings are prepared under the direction of and sealed by a licensed professional engineer and meet regulatory and permitting requirements.
- Multidisciplinary Integration: Our drawings incorporate input from civil, environmental, and geotechnical disciplines, when applicable, to ensure cohesive and constructible designs.
- Computer-Aided Design (CAD) and Geographic Information Systems (GIS) Compatibility: We utilize industry-standard software platforms to produce drawings that are accurate, scalable, and easily integrated with other project data and modern construction processes

Project Specification Services

Terracon offers comprehensive project specification services that provide contractors with clear, detailed guidance on proposed treatments, materials, and construction methods. Specifications serve as a critical companion to construction drawings, ensuring consistency, quality, and compliance throughout project execution. Our capabilities include:

- Customized Specifications: We tailor specifications to the unique needs of each project, addressing site conditions, material requirements, and client preferences.
- Extensive Specification Library: Our diverse repository of “off-the-shelf” templates allows for efficient development, which we refine and adapt to suit individual project goals. Technical Accuracy: Specifications are prepared by experienced professionals with deep knowledge of engineering standards, environmental practices, and construction protocols.
- Integration with Drawings: Specifications are coordinated with construction drawings to eliminate ambiguity and support seamless implementation.

Construction Contract Documents and Administration Services with Competent Professionals

At Terracon, we believe that effective construction management and oversight is as critical as sound design. Even the most well-engineered plans can falter without proper execution and oversight in the field. Our team brings extensive experience in construction oversight, including collaboration with contractors and you, the client, to ensure that every project is delivered with precision, safety, and integrity.

Our oversight capabilities include:

- Facilitation of pre-construction meetings
- Coordination with regulatory agencies overseeing permit authorizations
- Review of shop drawings and materials prior to mobilization
- Active field construction oversight and reporting
- On-site monitoring of construction activities to ensure compliance with design intent

- Early identification of unforeseen issues and collaborative evaluation of solutions
- Verification of materials and methods used during construction
- Site-safety inspection and monitoring
- Threatened and endangered species monitoring during construction
- Documentation of field conditions, changes, and resolutions
- Invoice review and approval recommendations
- Grant reimbursement requests and milestone reporting
- Support for close-out reporting and post-construction evaluations

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- Integration with Drawings: Specifications are coordinated with construction drawings to eliminate ambiguity and support seamless implementation.

Post-Construction Monitoring

Terracon routinely performs post-construction monitoring for wetland creation, enhancement, and restoration projects to monitor post-construction success and compliance with project goals and permit requirements. These monitoring periods provide valuable information to evaluate project success metrics and establish “lessons learned” that can be carried to future projects.

COMPANY HISTORY

Skelly and Loy, Inc. was established in 1969 as a full-service environmental and engineering consulting firm. In 2020, Skelly and Loy joined the national consulting firm Terracon Consultants, Inc. Skelly and Loy's offices joined Terracon's existing offices in the Northeast to serve clients throughout the region. Terracon has more than 180 offices and 8,000 employees across the U.S. providing environmental, geotechnical engineering, materials testing, and facilities management services.

Terracon’s Pittsburgh office has built a reputation for excellence in delivering professional services, including environmental, civil, and mining engineering; abandoned mine drainage (AMD) and abandoned mine land (AML) treatment; mine reclamation; stormwater design; floodplain management; construction management; National Environmental Policy Act (NEPA) compliance; natural resource management; wastewater permitting; noise and air quality investigations; hazardous waste management investigations and remedial design; industrial hygiene studies; archaeology and cultural resources; Geographic Information Systems (GIS); stream, floodplain, and wetland restorations; and water, wastewater, and remediation treatment systems.

QUALIFICATIONS

KEY PERSONNEL QUALIFICATIONS

The diverse background of our team provides the comprehensive expertise required to meet this project’s needs. Combining disciplines to develop the best possible project outcome is our specialty.

Expression of Interest Response

For environmental service projects, the integrated team approach restores the ecosystem holistically. Engineers design each project with care to minimize temporary and permanent impacts to sensitive resources. Scientists evaluate the necessary needs and/or geomorphic features needed to restore the appropriate feature whether it is a wetland, forest, stream, and/or habitat. Hydrologists calculate the flood response to proposed improvements and predict potential impacts within the design. The team collaborates on each project to provide a stable, sustainable system whether it is green infrastructure or replanting a forest and requiring minimal maintenance following re-establishment of vegetation.

The successful completion of work order assignments under this contract will require effective communication and coordination with CGE staff members, local stakeholders, regulatory agencies, and the future contractor.

Based on the information provided in the Request for Qualification (RFQ), the qualified team should be adept at performing the following required tasks:

- River/stream channel restoration design
- Legacy and accumulated sediments
- Hydrology and Hydraulics Analysis
- Permitting
- Site assessments presence-absence determinations and impacts to wetlands, watercourses
- Rare, threatened, and endangered species survey and coordination and/or culturally significant features (structures and archaeology).
- Wetland mitigation
- Stormwater BMP and Green Stormwater Infrastructure (GSI) design
- Feasibility studies: Project constraints and opportunities evaluation
- Conceptual through construction-ready design
- Construction oversight and cost opinions
- Operations and maintenance strategies
- Grant assistance
- Understanding and restoring habitat
- Forest stand delineations and conservation plans
- Regulatory understanding and project advocacy
- Landscaping design
- Public meetings, coordination, and education
- Geotechnical borings and analysis
- Lab testing of boring materials
- Trail design
- Dam design

A summary of the key personnel who will work under this contract is provided below.

Trent Sustich, Project Manager for this contract, is the NEPA/Natural Resources Group Manager in the Terracon Pittsburgh office, as well as a seasoned biologist. Mr. Sustich has 15 years of experience (14 with Terracon) working on a variety of projects ranging from wetland delineations to Environmental Assessments and is the primary project manager for natural resource projects in the Pittsburgh office. He will manage the contract and coordinate the completion of the plan development.

Morna Pollock is a Senior Staff Scientist in the Pittsburgh office. Ms. Pollock has 18 years of experience, including 13 years conducting bat surveys in the U.K. with five of those years as a permitted surveyor for listed bat species. She has vast experience conducting emergence surveys, habitat assessments, and potential roost tree surveys. She also has undertaken raptor and eagle surveys. Ms. Pollock has contributed to more than 50 strategic Habitat Management Plans, Habitat Restoration Plans, Biodiversity Action Plans and Sustainability Plans relating to biodiversity and sustainability issues. In 2024, Ms. Pollock completed a watershed conservation plan in a U.K. state forest (3,200 acres), mapping existing negative factors affecting biodiversity (such as watercourse shading/temperature changes, invasive species and perched culverts/fish migration barriers), identifying negative water quality point and non-point sources, and conflicts between current land

management with development of remedial actions to improve ecosystem function and biodiversity within riparian corridors.

Stephen Toki, Jr., is a Senior Scientist and Project Manager in the Pittsburgh office. Mr. Toki has 31 years of experience (15 at Terracon), including three years at the PA Fish and Boat Commission (PFBC). He has worked on dozens of projects throughout the Southwestern Pennsylvania region in his career as a stream and wetland delineation specialist and has extensive experience in aquatic resources assessments/characterizations, mitigation siting and design, construction inspection and monitoring, and NEPA documentation supporting dozens of Environmental Assessments and Environmental Impact Statements in multiple states.

Kaitlin Bomboy is a Staff Scientist in the Pittsburgh office. Ms. Bomboy has over five years of resource management experience (two with Terracon) working with both public and private sector clients. She has a strong background in stormwater regulation, erosion and sedimentation control, permitting, and NEPA documentation. She is a strong technical writer and has prepared dozens of documents, including reports and regulatory agency correspondence, and has been involved in public involvement activities throughout her career.

Matthew Leisses is a Senior Environmental Scientist who has over 22 years of experience with managing stream, wetland, and natural landscape restoration projects. He possesses the technical and personal skills needed to lead a successful team under this contract. Mr. Leisses has managed numerous stream, wetland, meadow and natural landscape restoration projects across the nation from Philadelphia to California; overseen construction of stream and wetland restoration projects; and supervised an advanced hydrology team. His expertise is restoring ecological systems and providing fish passage and habitat. Mr. Leisses' background prior to joining Terracon includes years of directing stream design/build projects. The design-build experience gives him great insights for discerning the critical information to include on design plans that will communicate how to construct the project and provide flexibility for field changes common to the design-build approach. It also makes him the perfect interpreter between designers and construction personnel, and he is a skilled advisor for the on-the-fly adjustments that need to be made in the field. Prior to joining Terracon, Matt acquired extensive experience working on ecological restoration projects and permitting in Maryland.

Michael Lower, P.E., Terracon Department Manager for the Engineering Division, will provide subject matter expertise and QA/QC overview for the project. Mr. Lower has nearly 30 years of engineering and project management experience with specific expertise in stream restoration and relocation design and implementation; green stormwater infrastructure design and life-cycle functionality, dam removal and rehabilitation; hydrologic and hydraulic (H&H) studies; and floodplain analysis and modeling. His in-depth knowledge of permitting includes United States Army Corps of Engineers' permitting, and Federal Emergency Management Agency (FEMA) Conditional Letters of Map Revision (CLOMR), and Letters of Map Revision (LOMR). The breadth of Mr. Lower's experience provides a foundation for high-quality projects from inception to completion for those under his guidance.

Jared Mummert, P.E., a Professional Engineer licensed in PA will serve as lead design engineer. His eight years of experience in the environmental engineering and water resources engineering field includes technical leadership in a broad range of projects including stream restoration design, wetland restoration design, dam removal design, green stormwater infrastructure design, H&H modeling, environmental permitting, Unmanned Aircraft System (UAS)/drone mapping, topographic land surveying, construction management, construction oversight, and erosion and sediment pollution control design. Jared provides a practical understanding and approach to the project.

Justin Matincheck, P.E., is a West Virginia licensed Professional Engineer with 18 years of experience. His experience in environmental, civil, and construction-related projects has been gained through involvement in the planning, evaluation, process design, preliminary design, and detailed design for numerous engineering projects. Mr. Matincheck has provided technical input on domestic wastewater systems, potable water systems, surface water quality, stormwater management, rainwater harvesting and reuse, industrial wastewater, and acid rock drainage (ARD) projects.

Samantha Hockenberry plays a pivotal role in natural resource studies, offering expertise in preparing reports, technical documents, and permit applications for project support from inception to construction. Her responsibilities encompass diverse ecological assessments, including wetland and waterway identification, stream evaluation, botanical surveys, and wildlife habitat assessments. With proficiency in GIS, she conducts geospatial analysis and ecosystem modeling. Ms. Hockenberry

manages permitting tasks, collaborating with state and federal agencies to prepare various permit applications, ensuring regulatory compliance and project advancement. Her broad skill set and comprehensive approach to environmental studies make her a valuable asset in project development involving compliance with federal, state, and local laws and regulations.

Key staff resumes are included in Attachment 1.

EXPERIENCE

Terracon has a proven record of supplying private and public clients across the country with quality environmental planning services. As illustrated by the qualified staff highlighted in the Key Personnel section, our team leadership excels in tasks relating to planning documentation, including NEPA document preparation, farmland assessments, aquatic resource assessments, cultural resource assessments, and watershed plans. The key personnel are supported by a team that includes hydrologists, ecologists, GIS specialists, and environmental engineers with a deep understanding of watershed dynamics, nonpoint source pollution control, habitat restoration, and stakeholder engagements.

The Terracon team is adept with and able to provide the services listed below.

Stormwater

- Green Stormwater Infrastructure (GSI)
- Storage calculations
- Post Construction Monitoring
- Stormwater facility sizing
- Stormwater Conveyance Design
- Native Plant Landscape Design
- Hydrology and Hydraulics Analysis
- Stormwater Basin Design
- Regulatory Compliance

Streams

- Natural Channel Design
- Erosion and Sediment Control Design
- Benthic Survey
- Fluvial Geomorphology (FGM)
- FEMA FIRM Revisions
- Construction Contract Documents
- Mecklenburg Analysis
- Environmental Assessments and Permitting
- Post-Construction Monitoring
- Conceptual through Detailed Design
- Hydrology and Hydraulics
- Construction Phase Support

Wetlands

- Rare Threatened, and Endangered Species Coordination
- Environmental Assessments and Permitting
- Construction Contract Documents
- Design
- Post-Construction Monitoring

Environmental Services

- Wetland and Waterways Identification and Delineation
- Environmental Assessments and Permitting
- Habitat Assessments
- Rare Threatened and Endangered Species Surveys
- Forest Stand Delineations and

- Conservation Plans
- NEPA coordination
- Botanical Surveys
- Geospatial Analysis and Ecosystem Modeling

Dams

- Dam condition and safety inspections
- Geotechnical evaluations for structural integrity
- Construction Contract Documents
- Dam breach analysis and design
- Probable Maximum Flood (PMF) Analysis
- Construction Phase Support
- Dam Removal Design
- Environmental Assessments and Permitting
- Post-Construction Monitoring
- Dam Rehabilitation Design
- Hydrology and Hydraulics

Other

- Field Surveys and Base Plans
- Aerial photogrammetry and Light Detection and Ranging (LiDAR) topography
- Bathymetric Surveys
- Volumetrics (of removed sediment)
- Ground Penetrating Radar
- Construction Contract Documents
- Geographic Information Systems (GIS)

PAST PERFORMANCE

Nixon Park Stream Restoration and Wetland Mitigation Project, Jacobus Borough, York County, PA – Pennsylvania, Department of Conservation and Natural Resources

Terracon, operating as Skelly and Loy, Inc. (Skelly and Loy), designed a large wetland and stream complex within an undeveloped portion of an existing county-owned nature park sited within an abandoned hay meadow dominated by non-native grasses. The restored site included the creation of 2.1 acres of wetland and relocation and enhancement of 1,200 linear feet of heavily degraded stream. The Nixon Park Stream Restoration and Wetland Mitigation Project was selected to receive the 2018 ACEC/PA Diamond Award within the Environmental category.

Due to its location with a county-owned nature park, the project includes a strong design emphasis on nature-based recreation and maximized opportunities for environmental education. The landscaping included a strong concentration of native wetland plants that are located in a variety of hydrologic wetland zones ranging from permanently inundated to ephemerally saturated. The riparian zone along the relocated and restored stream likewise incorporated a diverse microtopography to support a variety of riparian plants. Employing natural stream channel design protocols, the 18-foot-wide relocated stream was meandered through the site with an average meander length of 145 feet. Rock and log bank revetments at channel bends were designed to both improve aquatic habitat and encourage the natural development of minor irregularities in the channel planform over time. Banks were stabilized with a dense planting of lower riparian shrubs such as willow and dogwood.

Following receipt of the required permits and approvals, Skelly and Loy prepared construction specifications and bid documents. Construction began in the Summer of 2015. Skelly and Loy provided

engineering oversight during the construction of the stream and wetland restoration features, and construction of this project was completed in Summer 2016. Following the completion of construction, Skelly and Loy was contracted by Loganville Borough and Springfield Township to perform annual post-construction monitoring of the stream restoration for five years as required by the USACE permit.

Positive outcomes included a vast increase in biodiversity within the project area through creation of new aquatic and wetland environments, thereby expanding the park's education opportunities and advancing the park's mission.

Yam Grandy Mitigation Bank – Emanual County, Georgia

Yam Grandy Mitigation Bank (YGMB) is a wetland and stream mitigation bank located in Emanuel County, GA that serves the Ogeechee River Basin. YGMB seeks to offset wetland impacts incurred to Jurisdictional wetland impacts through the sale of bank credits. Terracon was contracted to perform the initial site investigations in 2009, inclusive of the wetland mitigation restoration design. Terracon has overseen site prep and construction, site clearing, planting and installation of bare root upland and wetland species over +/- 1,361.7 acres.

Terracon conducted the annual success monitoring including data associated with shallow groundwater, vegetation, macro-invertebrate species richness/diversity, and annual report submittals to regulatory agencies. Terracon coordinates with the Interagency Review Team, on an annual basis to facilitate the release of both State and Federal agency credits. Terracon has been involved with management activities at YGMB since 2009.

The goal of the mitigation bank is to re-establish historic hydrologic flows along Yam Grandy and Crooked Creeks and restore floodplain hydrologic activity to the adjacent floodplain wetlands. All wetland enhancement and restoration efforts have been deemed successful so far.

CSX Marsh Restoration – Chatham County, Georgia

Terracon obtained the appropriate permits through the USACE and the Georgia Coastal Resource Division (CRD) so that CSX Transportation was allowed to permanently impact 0.63-acres of salt marsh for construction of a permanent access road, and to temporarily impact 0.85-acres of salt marsh for the construction access. As part of the permit conditions, the 0.85 acres of salt marsh used for temporary construction access had to be restored following commencement of construction activities.

Terracon designed a site-specific salt marsh restoration plan, working with the resource agencies (USACE and CRD) to gain approval. Once approved by the agencies, Terracon organized research and ordered of nursery stock vegetation, and planted 17,300 two-inch plugs of black needle rush and 3,050 two-inch plugs of big cordgrass, for a total of 20,350 plugs, planted on 1-2’ centers. Terracon utilized their Adaptive Management Plan to identify a potential issue where cattails were the dominate species beginning to colonize in the first few months following construction. To prevent this opportunistic species from outcompeting the more desirable marsh species, Terracon coordinated with the client to devise an herbicide treatment to discourage its continued growth, in order to give the more desired marsh species a chance to re-establish.

Terracon also created the monitoring plan, which was approved by the resource agencies, to include four 100’ x 10’ belt transects and four 1-meter squared quad, monitored on a quarterly basis. To date, Terracon has monitored these transects for 3 years (12 monitoring sessions) and all plantings and restoration areas have been deemed successful. The cattail herbicide treatment was also deemed a success.

AA Shaw Mitigation Bank – Effingham County, Georgia.

AA Shaw Mitigation Bank is a wetland mitigation bank located in Effingham County, GA that serves the Savannah River Basin. AA Shaw seeks to offset wetland impacts incurred to Jurisdictional wetland impacts through the sale of bank credits. Terracon was contracted to perform the initial site investigations in 2010, inclusive of the wetland mitigation restoration design. Terracon has overseen

site prep and construction, site clearing, planting and installation of bare root upland and wetland species over +/- 600-acres.

Terracon conducted the annual success monitoring including data associated with shallow groundwater, wetland and upland vegetation, amphibian species richness/diversity, and annual report submittals to regulatory agencies. Terracon coordinates with the Interagency Review Team, on an annual basis to facilitate the release of both State and Federal agency credits. Terracon has been involved with management activities at AA Shaw since 2010.

The goal of the mitigation bank was to convert previously existing high density silviculture land/agricultural land into its historic wetland land type. This is done by a combination of forestry and habitat improvements, as well as hydrologic improvements and restoration through a combination of preliminary habitat and wetland analysis. Aspects of this include hydrologic improvements to wetlands via a series of low water crossings and ditch plugs. All enhancement and restoration efforts were successful, and the bank was closed out in 2022.

Longleaf Mitigation Bank – Nassau County, Florida

Longleaf Mitigation Bank (LLMB) is a wetland mitigation bank located in Nassau County, FL that serves the northeast Florida area. LLMB seeks to offset wetland impacts incurred to Jurisdictional wetland impacts through the sale of bank credits. Terracon was contracted to perform overall management activities at Longleaf Mitigation Bank including management and oversight of a 25-man planting crew responsible for the installation of approximately 150,000 bare root upland and wetland species over +/-3,400 acres. Terracon also coordinated all land management activities, including prescribed burns and other on-going land management as required by the Forestry Stewardship Plan. Terracon conducted the annual vegetation monitoring and report submittal, as well as coordinates with the Interagency Review Team to facilitate the release of both State and Federal agency credits.

Terracon has been involved with management activities at LLMB since 2007. The goal of the mitigation bank is to re-establish native longleaf savannah habitat throughout the upland portions of the bank. This is achieved by a combination of prescribed fire and planting of longleaf seedlings. An additional goal is to hydrologically improve the wetlands via a series of low water crossings and ditch plugs. All enhancement and restoration efforts were successful.

References

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We believe that Terracon's distinctive attributes differentiate our firm from the competition and look forward to this opportunity to work with WVDNR.

ATTACHMENT 1: KEY PERSONNEL RESUMES

Trent A. Sustich

Group Manager, Natural Resources/NEPA

Mr. Sustich is the Group Manager, Natural Resources/NEPA, in Terracon's Pittsburgh office. During his 15-year consulting career, he has completed environmental studies and managed open-end contracts for various clients and contracts for PennDOT, the Pennsylvania Turnpike Commission, the U.S. Army Corps of Engineers, the Southwestern Pennsylvania Commission, and Allegheny County. He has experience performing NEPA documentation, project management, project scoping, wetland identification and delineation, benthic macroinvertebrate collection and stream function evaluations, threatened and endangered species investigations including the Indiana Bat, Long Eared Owl, and Northern Goshawk, water quality investigations, permit preparation, asbestos inspections, Phase I Environmental Site Assessments, and groundwater and soil sampling.

PROFESSIONAL EXPERIENCE

National Environmental Policy Act (NEPA) Documentation – Mr. Sustich has experience completing NEPA documentation in both Pennsylvania and West Virginia. He has led and assisted in the completion of Environmental Assessments (EAs), Categorical Exclusion Evaluations (CEEs), and Pennsylvania's Bridge and Roadway Programmatic Agreements (BRPAs). Mr. Sustich is also involved in Environmental Justice assessments and Section 4(f)Evaluations.

Project Management – Mr. Sustich has experience managing several bridge and roadway projects, as well as Phase I ESA projects. His duties include proposal and budget preparation and management.

Project Scoping – Mr. Sustich has experience compiling statements of interests for a variety of transportation related projects. His duties include field scoping, organizing environmental write-ups across all services groups, and responses to selection criteria for PennDOT proposals.

Wetland Identification/Delineation – Mr. Sustich has experience leading and assisting many wetland identification/delineation and permitting projects for transportation, mining, and energy projects in Pennsylvania and West Virginia. He has experience in wetland function evaluation using the USACE Wetland Evaluation Technique II, Hydrogeomorphic Classification, and New England USACE Descriptive Method.

Benthic Macroinvertebrate Collection/Stream Function Evaluations – Mr. Sustich is a permitted benthic macroinvertebrate sampler in West Virginia. He has assisted in macroinvertebrate sampling for several jobs in Pennsylvania and West Virginia, including the I-70 Widening Project in Pennsylvania, and the Chief Logan Connector and Corridor H Projects in West Virginia. He has also been involved in sampling for numerous private client projects located in Pennsylvania and West Virginia. He also has experience evaluating streams using the West Virginia and Kentucky HGM Steam Assessment, EPA Rapid Bioassessment Protocols for Streams and Rivers, and the West Virginia Stream Condition Index (WVSCI).

Biological Evaluations – Mr. Sustich has performed several indoor air quality investigations for mold/mildew for private clients at residential and commercial properties, as well as schools. He has evaluated indoor versus outdoor conditions, and collected both air and swab samples to determine quality of potentially hazardous air quality.

Threatened/Endangered Species Evaluations – Mr. Sustich has assisted in several threatened/endangered species evaluations for transportation projects in both Pennsylvania and West Virginia. He worked as an assistant in a Long Eared Owl and Northern Goshawk survey for Corridor H, as well as evaluated potential habitat within the project area for Timber Rattlesnake, Green Salamander, and Southern Rock Vole. Mr. Sustich has been involved in Indiana Bat

EDUCATION

Bachelor of Science, B.S., Physical/Environmental Geography, The Pennsylvania State University, 2011

REGISTRATIONS/ CERTIFICATIONS

U.S. EPA Certified Asbestos Contractor/Supervisor, PA

U.S. EPA Certified Asbestos Inspector, PA, WV, OH

U.S. EPA Certified Asbestos Management Planner, PA

OSHA HAZWOPER/40HR/

8HR Refresher

YEARS OF EXPERIENCE

15 Years

evaluations performing portal sweeps, potential roost tree identification, and assisting in mist netting and harp trapping on projects for the Pennsylvania Department of Transportation (PennDOT) and the West Virginia Division of Highways (WV DOH).

Groundwater and Soil Sampling – Mr. Sustich has been involved in projects requiring groundwater well purging and sampling. He has performed pre-drill water sampling at residential properties prior to producers drilling Marcellus Shale wells. He has performed work for the Pennsylvania Department of Transportation and private clients.

Asbestos Inspections – Mr. Sustich is certified in Pennsylvania for asbestos inspections and supervisor oversight during abatement activities. He has performed several asbestos inspections for both the public sector and private clients in the Western Pennsylvania and West Virginia area.

Indoor Air Quality Investigations – Mr. Sustich has performed several indoor air quality investigations for mold/ mildew for private clients at both residential and commercial properties.

Hazardous Materials Investigations – Mr. Sustich was involved in the pre-demolition hazardous materials investigation of all of the buildings on the campus of the Department of Veteran Affairs Highland Park Hospital in Pittsburgh.

Environmental Site Assessments – Mr. Sustich has been involved with several Phase I ESAs for private clients. He has completed assessments at sites ranging from small commercial properties to medical office buildings.

PROJECT EXPERIENCE

Berkeley Springs Asbestos Inspections, Morgan County, West Virginia – Mr. Sustich served as environmental specialist for the asbestos inspection of several buildings on a property bought by the state. The project was part of an open-end asbestos survey contract providing inspection services for transportation projects throughout the state.

I**nterstate 79 Improvements, Monongalia County, West Virginia** – Mr. Sustich is serving as environmental specialist for improvements at I-79 Exits 152, 153, and 155. His role has included natural resource identification for Exits 153 and 155 and the coordination and completion of the CEE document for Exit 153.

West Run Road Preliminary Investigation and Engineering (PIE) Study, Monongalia County, West Virginia – Mr. Sustich served as environmental specialist for the West Run Road widening project. His duties included steam and wetland identification and delineation and the coordination and completion of the CEE document.

Chief Logan State Park Road Project EA and Finding of No Significant Impact, Logan County, West Virginia – Mr. Sustich served as environmental specialist for the development of a new roadway in Chief Logan State Park. With the Chief Logan Lodge, Hotel, and Convention Center outside the boundaries of the Chief Logan State Park, a need was created to connect the activity areas of the park with the Convention Center. The environmental documentation included an aquatic resources report, Section 4(f) and Section 6 (f) evaluations, and an environmental assessment. The project was a finalist for the WVDOH 2013 Engineering Excellence Award in the planning, traffic, and environmental category. Mr. Sustich was involved in conducting stream, wetland, and waste investigations along the proposed route.

Buffalo Creek Connector CE, Boone and Logan Counties, West Virginia – Mr. Sustich served as environmental specialist for preparation of a CE for construction of an upgraded roadway from WV 85 to CR 16. He conducted stream and wetland surveys and was involved in Indiana Bat roost tree identification.

Coalfields Expressway Project, Raleigh and Wyoming Counties, West Virginia – Mr. Sustich served as environmental specialist for the Public-Private Partnership (P3) project constructing a new section of 4 lane highway that will connect Beckley to Mullens. His duties included steam and wetland identification and delineation, mine portal identification and assessment, and harp trapping for Indiana and Northern Long Eared Bats.

Corridor H Project, Grant, Hardy, Randolph and Tucker Counties, West Virginia – Mr. Sustich is serving as environmental specialist for post-ROD environmental and natural resources

studies and an EIS re-evaluation for the Corridor H Project. Functional areas include rare, threatened, and endangered species; wetlands and streams; archaeology and historic resources; traffic and noise; and agency coordination, public involvement, and mitigation. Specifically, Mr. Sustich's duties included leading and assisting in the Long Eared Owl survey, Goshawk survey, Indiana Bat and Northern Long-Eared Bat surveys, stream and wetland investigations, and macroinvertebrate sampling.

Glenville Roundabout, Gilmer County, West Virginia – Mr. Sustich served as environmental specialist for natural resource and socioeconomic studies involved in the construction of a roundabout. His duties included stream and wetland identification and delineation, benthic macroinvertebrate collection, and socioeconomic mapping. Danville Industrial Park Access Road Project, Boone County, West Virginia - Mr. Sustich served as lead environmental specialist for the construction of a new access road to a proposed industrial park. He lead several field crews conducting stream and wetland identification and delineation, benthic macroinvertebrate collection, and he assisted in mist netting for Indiana and Northern Long Eared bats.

Wellsburg Bridge Project, Brooke County, West Virginia, Jefferson County, Ohio – Mr. Sustich served as environmental specialist for natural resources studies and 401/404 permit preparation for the construction of a new bridge over the Ohio River connecting Wellsburg, WV to Brilliant, OH. His duties included stream and wetland identification and delineation, benthic macroinvertebrate collection, and the preparation of 404, OH 401, and WV 401 permit applications.

West Virginia Route 2 Project, Hancock and Marshall Counties, West Virginia – Mr. Sustich is serving as environmental specialist for natural resource and socioeconomic studies involved in separate roadway upgrades to WV-2. His duties included stream and wetland identification and delineation, Categorical Exclusion updates, and socioeconomic mapping.

Tygart Valley Pipeline Project, Randolph and Barbour Counties, West Virginia – Mr. Sustich provided permit preparation for the construction of a 32-mile natural gas transmission line. He assisted in site reconnaissance and wetland and stream delineation to secure Stream Activity Permits.

White Oaks Phase II Development, Harrison County, West Virginia – Mr. Sustich assisted in permitting for the development of a business park. He assisted in wetland and stream delineation and macroinvertebrate sampling.

City of Pittsburgh Building Inspections, Allegheny County, Pennsylvania – Mr. Sustich served as an Environmental Scientist assisting in the inspections of dozens of buildings in the North Side, West End, Homewood, and Hill District sections of Pittsburgh. Suspected asbestos-containing materials were sampled and sent to a lab for analysis. He developed final reports that detailed asbestos quantities to be used for abatement.

Veterans Administration (VA) Pittsburgh Healthcare System, Highland Drive Campus, Allegheny County, Pennsylvania – Mr. Sustich was involved in the pre-demolition hazardous materials investigation of all of the buildings on the campus of the Highland Drive Hospital. Materials assessed were asbestos-containing materials, lead-based paint (LBP), underground storage tanks, stored chemicals, and other potential waste materials.

Canandaigua VA Medical Center Renovation, Ontario County, New York – Mr. Sustich provided the technical and field inspection for the asbestos materials survey and preparation of asbestos abatement plans. Terracon provided licensed New York Asbestos Handling Inspectors to collect samples of materials suspected of containing asbestos in compliance with 12NYCRR56 Subpart 56-5. Terracon coordinated with all applicable persons to develop the abatement specifications, drawings, and phasing for the renovation project. Terracon developed the technical specifications, for the purpose of managing the removal and disposal of ACM from the building.

Bath VA Medical Center Renovation, Steuben County, New York – Mr. Sustich provided the technical and field inspection for the asbestos materials survey of the dining hall area planned for renovations at Building 24. The objective of this inspection was to document the presence and condition of ACM that will be encountered during renovation activities. The sampling was conducted by a licensed New York Asbestos Handling Inspector. Asbestos bulk samples were analyzed using

Polarized Light Microscopy (PLM) and the Stratified Point-Counting Method. Non-friable, organically bound (NOB) materials such as floor tile, ceiling tile, and roofing materials were analyzed by quantitative Transmission Electron Microscopy (TEM) and PLM-NOB.

PennDOT District 12-0, E03810, Fayette and Westmoreland Counties, Pennsylvania – Mr. Sustich is serving as Project Manager for the replacement of the bridges carrying SR 1037 over Trump Run in Fayette County and SR3103 over Jacks Run in Westmoreland County. He has completed the BRPAs for each of the bridges and is managing the project through final design.

PennDOT District 12-0, E03883, Westmoreland County, Pennsylvania – Mr. Sustich is serving as Project Manager for the replacement of the bridge carrying US 0119 over a branch of Crabtree Creek. He led a field crew in the delineation of aquatic resources, and will be responsible for the completing of the CEE during preliminary design.

PennDOT District 1-0, E03829, Crawford County, Pennsylvania – Mr. Sustich is serving as Project Manager for the replacement of the bridge carrying SR 0006 over French Creek. He led a field crew in the delineation of aquatic resources and is supporting the project team through the preliminary design process.

PennDOT District 10-0, E04615, Clarion County, Pennsylvania – Mr. Sustich is serving as Project Manager for the widening of approximately 0.7 miles of SR 0068. His duties are to lead the field crew in the delineation of aquatic resources, completion of the CEE document, and serve as the main Terracon contact with the project team and the District.

PennDOT District 12-0, E02315, Washington County, Pennsylvania – Mr. Sustich is serving as Environmental Specialist for the reconstruction of approximately 3 miles of Interstate 70. He led and assisted in the delineation of aquatic resources, preparation of the waterways permits, scope development for post-construction monitoring, and is currently leading the effort to monitor relocated/impacted streams, wetlands, and sediment basins.

Beckley Z-Way, Shady Spring to Beaver, Raleigh County, West Virginia – Mr. Sustich is serving as Environmental Specialist for the widening of US 0019. He served as a field crew leader responsible for the delineation of aquatic resources within the project study area. He was also responsible for the submission of the Aquatic Resources Report. Mr. Sustich also assisted in the preparation of the EA, and was tasked with completing socioeconomic studies within the project area. He served as one of Terracon's representatives at the public meeting held in preparation of the NEPA document.

Beckley Z-Way, Beaver to South Eisenhower Drive, Raleigh County, West Virginia – Mr. Sustich is serving as Environmental Specialist for the construction of a new section of road connecting US 0019 to Interstate 64. He served as a field crew leader responsible for the delineation of aquatic resources within the project study area. He was also responsible for the submission of the Aquatic Resources Report.

Stephen G. Toki, Jr.

Senior Scientist, Natural Resources

EDUCATION
Bachelor of Science, Environmental Health / Biology Minor, 1995, Indiana University of Pennsylvania

REGISTRATIONS/ CERTIFICATIONS
FAA Qualified Wildlife Hazard Biologist

YEARS OF EXPERIENCE
31 Years

Mr. Toki has over 31 years of natural resources-related experience including three years as a Fisheries Biologist with the Pennsylvania Fish and Boat Commission. His responsibilities primarily include natural resources/ecological evaluations, NEPA documentation and state/federal water obstruction and encroachment permitting. In his role, Mr. Toki serves as a lead investigator, field coordinator, and overall project coordinator.

Mr. Toki directs and leads a variety of primary research studies and facilitates agency coordination for our clients. He has a broad experience base in conducting routine wildlife and habitat surveys for a variety of birds, mammals, fishes, reptiles, amphibians, and plants including those designated as species of special concern. He has extensive experience in aquatic resources assessments/characterizations as well as wetland and stream mitigation site selection, site design, construction inspection, and post-construction monitoring. Additionally, Mr. Toki has extensive practical experience as a senior field delineator and is skilled in the use and application of the federal delineation manuals and various individual state wetland finding procedures and regional delineation supplements as well as multiple functional habitat assessment methodologies. His stream experience includes stream ecology and habitat assessment (including United States Environmental Protection Agency [U.S. EPA] Rapid Bio-Assessment and WVSWVM), macroinvertebrate and fish sampling (including electro-shocking), impact assessment, mitigation site suitability and design (natural stream channel design, and fluvial geomorphic techniques), and construction inspection of mitigated resources. Mr. Toki also has extensive experience in evaluating terrestrial ecosystems including application of various wildlife habitat assessment models, development of habitat conservation/protection and enhancement plans, and implementation of breeding bird and raptor survey protocols. Ultimately, he is responsible for securing state and federal environmental permitting for our clients. Mr. Toki has applied his expertise and has helped to facilitate and successfully manage natural resource related issues on hundreds of federal/state and private projects throughout West Virginia, Pennsylvania, Virginia, New York, New Jersey, and Maryland.

PROJECT EXPERIENCE

Corridor H Project, Randolph, Tucker, Grant, Hardy and Hampshire Counties, West Virginia – Mr. Toki serves as Project Manager and Senior Resource Technical Lead for this project. In addition to his management role, Mr. Toki is responsible for a variety of ecological evaluations (i.e., wetland delineations, stream habitat assessments, threatened and endangered species surveys, etc.) and reporting in support and preparation of required NEPA Reevaluations as well as federal and state permit applications for Sections 01- 03 (approximately 30 miles of "new" roadway) of the proposed highway system. Mr. Toki identified, evaluated, and documented several mitigation actions relative to brook trout habitat enhancement/restoration within the Monongahela National Forest for the U.S. Forest Service including elimination of aquatic passage impediments. Additionally, Mr. Toki developed an ecological-based restoration project which incorporated stream, wetland, and riparian restoration and creation along a previously undocumented naturally reproducing trout stream within the project area. Mr. Toki also conducted various species habitat and presence/absence species surveys (timber rattlesnake, green salamander, woodrat, goshawk, etc.) for the project as required by the U.S. Forest Service. Mr. Toki supervised the basin inventory and assessment findings per USACE 404 permit stipulations along the Davis to Bismarck section of Corridor H. Most recently, Mr. Toki, oversaw, directed and assisted with RT&E species surveys on both the Parsons to Davis and

Wardensville projects. As part of this effort, Mr. Toki facilitated teaming arrangements with three different subconsultants in order to meet WVDOH project schedules as well as the individual species survey windows.

Beckley Z-Way, Beaver to South Eisenhower Boulevard, Raleigh County, West Virginia – Mr. Toki served as a senior field crew leader responsible for the inventory, classification, and characterization of aquatic resources within the project study area. As part of this effort, Mr. Toki conducted, documented, and oversaw Waters of the United States determinations and WV SWVM analyses in support of NEPA reporting requirements. Mr. Toki also assisted in the preparation and review of the Preliminary Aquatic Resource Report.

Coalfields Expressway Mullens Connector Design Build Public/Private Partnership, Wyoming County, West Virginia – Mr. Toki served as a senior field crew leader responsible for the inventory, classification, and characterization of aquatic resources within the project study area. As part of this effort, Mr. Toki conducted, documented, and oversaw Waters of the United States determinations and WV SWVM analyses in support of United States Army Corps of Engineers (USACE) Section 404 and Section 401 State Water Quality permitting requirements. Mr. Toki also assisted in the preparation and review of the Preliminary Waters of the U.S. Jurisdictional Delineation Report and facilitated agency field views in order to obtain concurrence on delineated features and functional parameters.

Danville Industrial Park Access Road (Hobet Mine), Wyoming County, West Virginia – Mr. Toki served as a senior field crew leader responsible for the inventory, classification, and characterization of aquatic resources within the project study area. As part of this effort, Mr. Toki conducted, documented, and oversaw Waters of the United States determinations and WV SWVM analyses in support of design build scoping efforts. Mr. Toki also assisted in the preparation and review of the Preliminary Aquatic Resource Report.

I-79, Exit 155 Business Park Development, Monongalia County, West Virginia – Mr. Toki provided technical guidance/oversight and served as senior field liaison to the prime consultant relative to stream inventories, classification, and assessment (WVSWVM evaluations) as well as completion of the required USACE Section 404 permit applications. In addition, Mr. Toki facilitated a preliminary Jurisdictional Determination meeting with the USACE, West Virginia Department of Environmental Protection, and U.S. EPA and gained concurrence relative the analyses and determinations.

White Oaks Business Park Phase II Site Development, Harrison County, Bridgeport, West Virginia – Mr. Toki provided technical guidance/oversight and served as senior field liaison to the prime consultant relative to stream inventories, classification, and assessment (WVSWVM evaluations). In addition, Mr. Toki is currently assisting the prime consultant in the development and implementation of a resource mitigation monitoring plan and evaluation of performance standards per stipulations within the issued Section 404 permit for the project.

WV Route 2, New Cumberland Improvements, Hancock County West Virginia – Mr. Toki served as a senior field crew leader responsible for the inventory, classification, and characterization of aquatic resources within the project study area. As part of this effort, Mr. Toki conducted, documented, and oversaw Waters of the United States determinations and WV SWVM analyses in support of NEPA reporting requirements.

Yeager Airport Wildlife Hazard Assessment and Wildlife Management Plan, Charleston, West Virginia – As a Qualified Wildlife Hazard Biologist, Mr. Toki oversaw survey efforts through the year-long assessment period. Following the assessment, he prepared the Wildlife Hazard Assessment findings for submission to the Federal Aviation Administration (FAA). He also provided technical oversight and management direction for airport operations staff and prepared and implemented a

comprehensive Wildlife Hazard Management Plan to address hazard risks. Both the Wildlife Hazard Assessment and Wildlife Management Plan were approved for implementation by the FAA.

Wellsburg Bridge over the Ohio River Design Build Public/Private Partnership, Brooke County, West Virginia – Mr. Toki served as a senior field crew leader responsible for the inventory, classification, and characterization of aquatic resources within the project study area (both Ohio and WV). As part of this effort, Mr. Toki conducted, documented, and oversaw Waters of the United States determinations and completion of respective state resource analyses in support of United States Army Corps of Engineers (USACE) Section 404 and two Individual Section 401 State Water Quality permitting requirements. Mr. Toki also prepared the Waters of the U.S. Jurisdictional Delineation Report and facilitated a successful agency field view in order to obtain state and federal concurrence on delineated features and functional parameters. Mr. Toki successfully coordinated and obtained Waters of the United States related permitting approvals, including facilitation of proactive compensatory resource mitigation within both Ohio and WV for this new bridge project over the Ohio River.

I-79, Exit 153 Interchange Improvement Project, Monongalia County, West Virginia – Mr. Toki served as Terracon's project manager and senior technical lead for this project. Mr. Toki was responsible for the completion of WVSWVM on project area watercourses, as well as review and oversight of aquatic resource findings completed by the prime consultant. Mr. Toki oversaw cultural resource investigations and air and noise analyses, as well as completion of the NEPA (CE) document for this project.

I-79, Exit 155 Interchange Improvement Project, Monongalia County, West Virginia – Mr. Toki served as Terracon's project manager and senior technical lead for this project. Mr. Toki was responsible for the completion of WVSWVM on project area watercourses, as well as review and oversight of aquatic resource findings completed by the prime consultant. Mr. Toki oversaw cultural resource investigations and air and noise analyses, as well as completion of the NEPA (CE) document for this project.

Wildlife Specialists, LLC, Mist Net Surveys for Federally Endangered Indiana Bat – Various Marcellus Shale Natural Gas Pipeline Projects located in North central and Northeastern Pennsylvania – Steve assisted with mist net surveys for the federally endangered Indiana bat on multiple natural gas pipeline projects located in Tioga, Potter, Sullivan and Montgomery Counties, Pennsylvania. Surveys were conducted for a 3-month period during the summer of 2010. Surveys were conducted in accordance with Pennsylvania game Commission and United States Fish and Wildlife Service established protocols. Survey efforts included site and net set selection (GPS survey), species identification and specimen data collection, transmitter and radio-telemetry, documentation of summer range/site habitat features, data compilation and adherence to specific disinfectant protocols.

PennDOT District 8-0 Design Build Project Bridge Rehabilitation along I-81 over LeTort Spring Run and Conodoquinet Creek – Steve was responsible for wetland identification and delineation, Phase 1 bog turtle habitat assessment, agency coordination, preparation of state/federal Joint Permit Application via JPA2 on-line Expert System and PennDOT Maintenance 9999 Permit.

Jennings Environmental Education Center-Pennsylvania Department of Conservation and Natural Resources (DCNR) Bureau of State Parks, August 12, 2009 – Provided mist net demonstration and capture workshop for "Bats: Natural History in the Classroom", a curriculum developed for the Midwestern Intermediate Unit IV in accordance with Pennsylvania Act 48 of 1999 to maintain public school teaching status in Pennsylvania through required continuing education credits.

Chief Gathering, LLC, Fayette South TETCO Compressor Station & Pipeline Project, Pennsylvania – Steve performed field investigations and wetland / surface water delineations for

the purpose of minimization or avoidance of aquatic habitats. Prepared and submitted a Species Presence/Absence and Habitat Findings Report for state-listed threatened plant species. I also prepared, submitted and secured PA DEP General Permit applications for this project.

Eastern Red Bat Migration Telemetry Study – The purpose of this study was to develop, implement and assess protocols for capturing, radio-tagging, and tracking migratory eastern red bats (*Lasiurus borealis*); to assess the viability of using an airplane and ground crew to radio-track long distance bat migration; and to determine the movements and distribution patterns of the red bat within Pennsylvania during the species fall migration and use of mountain ridges and other landscape features. Ultimately this information is to be utilized as a management tool governing the sighting and evaluation of wind turbine facilities in order to reduce the potential for future species mortality. The study is a part of a continued effort initially undertaken in the fall of 2007 to collect comprehensive data which will assist in the future development of a migratory predictive model. As part of this effort, Steve assisted in capture site selection, mist netting, species ID, transmitter attachment, telemetry tracking via vehicle.

Chestnut Flats Wind Project, Blair and Cambria Counties, Pennsylvania for Chestnut Flats Wind, LLC – Mr. Toki prepared a Critical Issues Analysis Report containing a preliminary inventory of potential resource constraints as they relate to project planning, land development and permitting for a 14,000-acre study area. This information allowed the developer to make proactive, informed decisions relative to preliminary sighting with the intent to avoid and/or minimize resource impacts to a practicable extent. This document also provided the foundation for future proposed due-diligence studies. Mr. Toki conducted detailed wetland and surface water identification and delineation studies, and threatened and endangered species habitat/presence/absence surveys for pre-determined wind turbine locations. Mr. Toki conducted surveys for the timber rattlesnake, Allegheny woodrat, Northeastern bulrush, Torrey's rush, Margurite's clubmoss, Appalachian blue violet and bushy beardgrass, with occurrences of the timber rattlesnake and suitable habitat for the woodrat (no active populations) identified and documented. A GIS database containing historically known and recently identified resource features was made available to the client throughout the duration of the project. Through proactive identification and avoidance of resource features, this project utilized permitting under the Pennsylvania Department of Environmental Protection General Permit criteria. As a part of this project, Mr. Toki also prepared a formal Wetland Restoration Plan for the client to facilitate the sale of land for a proposed substation and rectify a violation incurred by the previous owner. Mr. Toki's efforts, specifically his ability to present accurate and comprehensive findings have allowed for the successful avoidance of important resources, limited the scope of state permit applicability and eliminated the necessity for federal action on said permit.

PennDOT District 9-0 US 6219, Section 019 Meyersdale to I-68 Transportation Improvement Project – Mr. Toki was responsible for the inventory and identification/classification of natural resource features (wetlands, surface waters, threatened and endangered species, terrestrial habitats, etc.) located within an 11,000 acre project study area. Mr. Toki assisted the prime consultant in the development of preliminary alternatives (Environmental Overview) and selection of alternatives retained for detailed study, and was responsible for completing individual sections of the Draft Environmental Impact Statement. Mr. Toki conducted detailed field reconnaissance investigations related to vegetation and wildlife, threatened and endangered species, wetlands and surface waters and provided an analysis/coordination of findings and presentation to resource agencies. Mr. Toki was also responsible for direct coordination with federal and state regulatory agencies including coordination and presentation at Special Agency Coordination Meetings (SACM); and ecosystem-based mitigation sighting activities. Mr. Toki conducted wetland mitigation sighting, selection of preferred site and secured agency concurrence. Additionally, Mr. Toki coordinated with state and federal regulatory agencies regarding habitat suitability and/or

presence/absence for over 25 threatened, endangered or rare species within Pennsylvania and Maryland.

SR 6219, Section 020, Somerset County, Pennsylvania for PennDOT District 9-0 – Construction of a new 11- mile, four-lane, limited access roadway extending from the northern end of the Meyersdale Bypass to the southern end of the existing four-lane limited access US 219, south of Somerset. As the Environmental Monitor on record Mr. Toki was responsible for the re-evaluation of the Final Environmental Impact Statement during final design of this highway improvement project. Associated studies completed included: wetland and surface water identification and delineation; wetland functional assessments; stream assessments; threatened and endangered species surveys (timber rattlesnake, Fraser's sedge, upland sandpiper, dickcissel and the Indiana bat); agricultural lands reevaluation (Farmland Assessment Report) and ALCAB Adjudication. Mr. Toki was also responsible for the preparation and submission of a state/federal Water obstruction and Encroachment Joint Permit Application for the project as well as the design of on-site palustrine wetland replacement areas and stream restoration plans.

Allegheny Tunnel Transportation Improvement Project for the Pennsylvania Turnpike Commission (PTC), Somerset County, Pennsylvania – Assisted the PTC in the re-evaluation of the previous Alternatives Analysis. Supporting studies for which Mr. Toki was charged to complete include: wetland identification and delineation; wetland functional assessments; surface water inventory, classification and habitat assessment; presence/absence and habitat surveys for the Allegheny woodrat, timber rattlesnake, Appalachian blue violet, mountain bugbane, and mountain goldenrod; a formal wildlife habitat evaluation and; breeding bird/raptor surveys. This information will be evaluated as part of the alternatives analysis and ultimately used to select a recommended alternative.

Indiana University of Pennsylvania (IUP) Convocation Center for Pennsylvania Department of General Services – This project involves the construction of a multi-use 143,500 square foot Convocation Center with associated parking facilities on a 33-acre salvage yard. Mr. Toki was responsible for wetland identification and delineation, agency coordination, stream restoration design of 506 feet of Marsh Run and of a state/federal Water Obstruction and Encroachment Joint Permit Application. The proposed stream restoration design incorporated bioengineering techniques rather than standardized engineering practices. Wattles and a riparian buffer seed mix were placed along the stream banks to assist with erosion prevention and to provide habitat. The restored section of stream was designed and constructed with two gentle meanders along its length to provide a measure of sinuosity to the stream, mimicking natural stream course. In-stream habitat improvements included the use of large rock aggregates to replicate natural flow diversity.

Virginia Aviation Associates, LLC, Hampton Roads Executive Airport, York County Chesapeake, Virginia – Mr. Toki researched EIS documentation, identify mitigation opportunities, and prepared a formal Conceptual Wetland and Wildlife Mitigation Plan for review and concurrence by state and federal regulatory and resource agencies (DEQ, USACOE, USFWS, EPA, VA DGIF, FAA, VA BOAV). The plan consisted of nearly 500 acres of wetland and threatened species habitat mitigation with $4 million in federal, state, and local funding. Mr. Toki conducted agency coordination and oversaw the successful completion of client mitigation requirements. Additionally, Steve also prepared a Supplemental Environmental Assessment for the removal of off-site obstructions associated with a runway replacement project.

John Murtha - Johnstown Cambria County Airport Wildlife Hazard Assessment and Wildlife Management Plan – Mr. Toki conducted on and offsite avian time counts, runway crossing surveys, perimeter surveys, small- mammal trapping, habitat analysis, and other wildlife surveys to determine long-term mitigation of airport wildlife hazards. Mr. Toki coordinated all client and agency meetings, prepared meeting minutes, and survey updates. Mr. Toki obtained wildlife take permits, provided interim habitat and species control recommendations and documented survey results

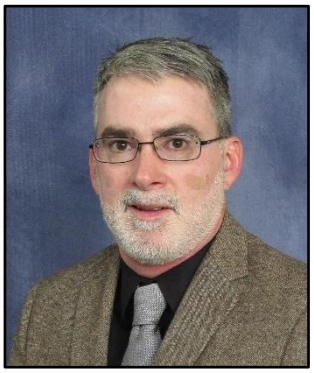
during completion of the Wildlife Hazard Assessment. As part of the assessment effort, Mr. Toki provided technical oversight and management direction for airport operations staff prepared and implemented a comprehensive Wildlife Hazard Management Plan to address hazard risks. Both the Wildlife Hazard Assessment and Wildlife Management Plan were approved for implementation by the FAA. Mr. Toki remained engaged with the airport after completion of the WHMP and continued to provide insight relative to new ACM updates, removal of obstructions, water resources and permitting, control of high-risk species and proper safety protocols for firearms use and storage.

PennDOT Central Office P3 Bridge Replacement Projects – SR3017, Section P50 (Armstrong County), SR0160 (Cambria County), SR 1007 (Somerset County) & SR 2046 Section P30 (Allegheny County) – Mr. Toki's services were requested by the P3 design team (Plenary/Walsh Keystone Partners) to conduct wetland and stream resource re-evaluations as well as facilitate agency coordination and assist with permit issuance on four proposed design build bridge projects located in Armstrong, Allegheny, Cambria and Somerset Counties, Pennsylvania. In several instances, Mr. Toki was successful in reducing resource impacts through the re-evaluation effort which resulted in streamlining and expediting permit approvals.

PennDOT Engineering District 12-0, SR 0031, Section X10, Westmoreland County, Pennsylvania – Mr. Toki was responsible for the successful completion of required natural resources evaluations/assessments in support and preparation of a state/federal water obstruction and encroachment permit application for the reconstruction of approximately 4 miles of SR 0031 (SR0031 Section X10**)**. As part of this effort, Mr. Toki successfully sighted and designed a 2 plus acre wetland site as compensatory mitigation for impacts associated with loss of acreage and functional. Mr. Toki worked through the Westmoreland County Bureau of Parks and Restoration to develop a viable site within publicly owned land while incorporating the county's specific requests relative to recreational use and access. Mr. Toki also secured prior approval from multiple state agencies regarding site evaluation/selection, preliminary design and ultimately a commensurate determination through final design plan submission. Mr. Toki will continue to assist PennDOT through facilitation of resource restoration monitoring following completion of construction.

Michael E. Lower, P.E.

Principal, Department Manager, Engineering



As a Principal and Department Manager for the Engineering Division in Terracon's Harrisburg office (formerly Skelly and Loy, Inc.), Mr. Lower is directly responsible for a staff of 30 professionals. In his position as the Department Manager, Mr. Lower holds the ultimate responsibility for project budgets, job performance, and client satisfaction.

EDUCATION
Bachelor of Science, Chemical Engineering, The Pennsylvania State University, 1996

REGISTRATIONS/ CERTIFICATIONS
Professional Engineer: PA, MD, TX, VA

Rosgen Levels I - IV

YEARS OF EXPERIENCE
29 Years

PROFESSIONAL EXPERIENCE

Natural Stream Channel Design – For natural stream channel design projects, Mr. Lower completes the required design calculations, contributes to the engineering design report, and develops construction drawings and specifications. In accordance with the 40-step design methodology as presented in "Applied River Morphology" by David Rosgen (1996), Mr. Lower routinely applies natural channel formation principles to provide a stable stream channel, adequate stormwater routing, and improved aquatic habitat. Mr. Lower's designs focus on the restoration of competent stream channels that are able to safely transport naturally occurring sediment loads while minimizing local in-stream bank and channel erosion. Mr. Lower is adept with the most up-to-date engineering and hydrology/hydraulics software programs such as AutoCAD, HEC-RAS, HEC-HMS, WinTR-55, SSA, HY-8, Ohio DNR STREAM Modules (Mecklenburg spreadsheets), and Microsoft Office products. Mr. Lower also has extensive experience in construction inspection and has provided construction oversight on most of the projects he has designed.

Stormwater Planning and Retrofit Projects – Mr. Lower has been actively involved in numerous stormwater planning and retrofit projects to improve water quality, manage rates of stormwater runoff, sequester sediment, treat pollutant loads, and meet MS4 and TMDL requirements. He participates in all levels of the projects, from initial site assessment into concept design and coordination with approving agencies through final design and construction. Mr. Lower is adept with the most up-to-date engineering and hydrology/hydraulics software programs such as AutoCAD, HEC-RAS, HEC-HMS, WinTR-55, SSA, HY-8, and Microsoft Office. His scale of project experience also ranges from tight, confined, small-scale projects to county-wide stormwater management planning studies.

PROJECT EXPERIENCE

Valley Green Road Stream Channel Stabilization, Philadelphia, Pennsylvania – Over a half century of piped stormwater discharge exacted its toll on a small unnamed tributary to the Wissahickon Creek. Located within the picturesque Wissahickon Valley Park (part of the celebrated and world renowned Fairmount Park system), extreme erosion was threatening to undermine a heavily used parking area auxiliary to the Valley Green Inn. Mr. Lower and the Skelly and Loy team designed and constructed a step-pool stream channel that stabilized the creek and allowed for

restoration of the parking lot. Teaming efforts with Philadelphia Water Department and Friends of the Wissahickon were instrumental to the success of the project.

Wissahickon High Level Sewer Crossing Stabilization at Old Hartwell Lane, Philadelphia, Pennsylvania – As lead design engineer, Mr. Lower employed a streamlined and expedited design process predicated on construction by PWD's in-house Waterways Restoration Team. An emergency permit was provided by the Pennsylvania Department of Environmental Protection, and Skelly and Loy conducted a simple dimensional survey of the site in order to develop basic stabilization prescriptions and rock quantity estimates. Skelly and Loy then provided direct and continuous field supervision during construction.

Slaughterhouse Creek Restoration Project, Carbon County, Pennsylvania – For this severely eroded section of Slaughterhouse Creek in Jim Thorpe Borough, Mr. Lower and the design team prepared a stream restoration design based upon natural channel design principles. Nearly 550 LF of high-gradient channel was actively and continually eroding following each new storm runoff event. To stave off further erosion and sediment supply to downstream waters, a step-pool stream channel with 25 rock weir structures was designed and built to create a naturalistic series of steps, pools, and riffles. Mr. Lower and the Skelly and Loy team provided engineering and environmental consulting services from concept design through final design, bidding, and construction management.

First Hollow Run Stream Restoration Design and Construction Oversight, Carbon County, Pennsylvania – To design the restoration and stabilization of this very high-gradient Exceptional Value stream channel confined within a 25-foot deep ravine, Mr. Lower and the design team used an innovative step-pool approach that incorporates keystone step structures. This project design led to Mr. Lower being a co-author of a paper entitled Natural Channel Design of Step-Pool Watercourses Using the "Keystone" Concept.

Neill Drive Pumping Station Stream Restoration and Infrastructure Protection, Philadelphia, Pennsylvania –Mr. Lower serves as the engineer of record for this stream restoration and sewer/water protection project along 2,000+ feet of a severely impacted and eroded Schuylkill River tributary. Stream gradients range from a moderate 3% to a severe 11%, requiring specialized step-pool channel architecture. Fluvial geomorphic survey and measurements, hydrologic (HEC-HMS) and hydraulic (HEC-RAS) analyses, geotechnical investigations, wetland delineations, landowner/stakeholder (PPR) meetings, concept and final design, and permitting are within the scope.

Ellen Run Stream Restoration, Mansfield, Pennsylvania – Skelly and Loy developed a natural stream channel design, based on geomorphic principles, for this 1,000 foot section of a tributary to the Tioga River. This project is located within the glaciated regions of the Northern Tier and incorporated a combination of in-stream cross rock vanes, reconstruction of channel geometry and bank stabilization using stacked boulder bank revetment. Mr. Lower served as project engineer for this design.

North Branch Mehoopany Creek Stream Restoration, Wyoming County, Pennsylvania – This project entailed completing detailed HEC-RAS modeling analysis of a bridge opening to confirm hydraulic capacity and flood elevations and solve a sediment transport problem. In serving as project engineer for this project, the design for the project include a retrofitted "W" weir rock

structure upstream of the bridge which serves to split higher velocity flows around the existing center bridge pier and evenly between the two openings.

Sheraden Run Aquatic Ecosystem Restoration Section 206 Project, Pittsburgh, Pennsylvania – Mr. Lower provided stream restoration expertise for this stream removal project in Sheraden Park. Varying stream gradients necessitated the evaluation of several stream types within open park, steep confining valley, and flat delta settings through the reach. Step-pool streams, meandering floodplain channels, and riparian vegetation planning were separate aspects of the study project.

Nixon Park Stream Restoration and Wetland Mitigation, Jacobus Borough, York County, Pennsylvania –Designed 1,190 linear feet (LF) of stream restoration to complement the creation of 2.1 acres of wetland (for which he also provided engineering oversight and support) within Richard M. Nixon County Park to satisfy permit requirements due to watercourse impacts incurred by the Loganville Bypass project. The wetland mitigation portion of the project offsets wetland impacts resulting from the I-83 Exit 18 project.

Catfish Creek, Washington County, Pennsylvania – Landowners along Catfish Creek, a tributary of Chartiers Creek in Washington County, Pennsylvania, have been experiencing major impacts from flooding with increasing frequency and growing severity in recent years. Problems with flooding along this stream corridor have a long history; however, recent hydrologic changes, which have been occurring within the watershed, have resulted in the further aggravation of these damaging events. This project produced a watershed management plan which inventoried the root causes for the flooding conditions and developed recommendations and specific BMP opportunities that would begin to mitigate these negative flooding impacts. These BMPs included stormwater management system retrofits, regional management facilities, and other structural and nonstructural solutions and incorporated geomorphic principles relative to restoring stream channel stability and reconnecting the stream channels to floodplains and/or flood storage areas. The effectiveness of these BMP measures was also modeled using the HEC HMS hydrologic computer model to demonstrate the level of benefit which could be achieved if these efforts were to be implemented.

Hartwood Acres Park Wetland Mitigation, Pennsylvania Turnpike Commission, Allegheny County, Pennsylvania – Serves as the engineer of record for this wetland mitigation site being constructed on Allegheny County park land to satisfy wetland replacement criteria for the Milepost 39.62 to 44.04 Turnpike expansion project. Two individual wetland cells were designed along with an improved access drive and associated culvert upgrade. The project required a NPDES Post-Construction Stormwater Management permit, an Erosion and Sediment Control Plan review by Allegheny County Conservation District, and a Highway Occupancy Permit from PennDOT.

Carpenter's Woods Channel Stabilization Design, Philadelphia, Pennsylvania – Skelly and Loy provided design and permitting services for this headwater stabilization project within Philadelphia's scenic Wissahickon Valley Park. The project has two components: 1) the stabilization of more than 500 feet of stormwater-fed gully channel and 2) stabilization of 100 feet of streambank just downstream from the gullied area. Stabilization designs were made to be aesthetically compatible with the location within a heavily used part of the park. Gully channels immediately downstream of stormwater outfalls were converted to "stepped infiltration swales," providing flow attenuation to relieve erosive pressure on the receiving stream. Trail stabilization

and obliteration, soil renovation, and extensive replanting with natives are additional project elements. Construction was completed in 2009.

SR 2001 Wetland Mitigation, PennDOT District 4-0, Pike County, Pennsylvania – Mr. Lower served as the professional design engineer in the preparation of the wetland mitigation plans to offset unavoidable impacts from the SR 2001 Improvements project in Pike County. Three separate basins were designed at varying elevations on National Park Service managed property within the Delaware Water Gap National Recreation Area. A staged erosion and sediment pollution control plan was prepared to confine all disturbances within the footprint of the wetland mitigation basin and a small soil disposal area.

I-83 Exit 18, Mill Creek Stream Mitigation, PennDOT District 8-0, York County, Pennsylvania – Mr. Lower designed the stream mitigation plan for the I-83 Exit 18 project to meet dual purposes: to mitigate for impacts to Mill Creek (a wild trout stream) and its tributaries within the project limits, and; to relocate segments of Mill Creek to accommodate the construction of new and widened bridge structures. In-stream habitat and stream stabilization features included mud sills, cross rock vanes, boulder bank revetments, a boulder lined plunge pool for box culvert energy dissipation, coir-wrapped soil lifts, habitat logs, and an extensive riparian revegetation plan.

Wooded Run Stream Relocation, SR 15 Section 88B, PennDOT District 3-0, Northumberland County, Pennsylvania – Construction of a two-span overpass over the project reach valley will require the relocation of Wooded Run (an informally named tributary to a wild trout stream) commensurate with the realignment of Hollow Road and construction of a new culvert. Without the relocation of Wooded Run, PennDOT was facing the construction of a third span of 4-lane highway. Mr. Lower and the design team prepared the stream relocation plans which included such features as: habitat log revetment structures, coir-wrapped soil lifts, re-use of streambed substrate from the abandoned channel, floodplain depressions, and a riparian planting plan. Design considerations included varying bedrock elevations, selection of riparian vegetation within the shadow of the overpass, and replication of riffle/pool habitat.

Central Susquehanna Valley Transportation (CSVT) Project: Stream and Wetland Mitigation- PennDOT, Snyder County, Pennsylvania – Mr. Lower was the engineer-of-record for this stream restoration and wetland creation project to mitigate for open water and wetland impacts associated with the Central Susquehanna Valley Transportation project. Thirteen wetland basins were designed along with stabilizing improvements to 646 linear feet of stream. Design efforts were especially challenging due to the presence of cultural resources which had to be avoided.

Bennett Creek Watershed, Frederick County, Maryland – To provide technical assistance to Frederick County, Mr. Lower visited and evaluated approximately fifteen sites with the project team. He prepared the conceptual layouts of six BMP sites, focusing on the sizing and placement of stream restoration activities and stormwater management BMPs.

Abers Creek Stream and Wetland Mitigation, SR 286, PennDOT District 11-0, Allegheny County, Pennsylvania – To accommodate planned widening of SR 286, Mr. Lower and the design team relocated Abers Creek within its floodplain. Design considerations included existing and proposed sewers, existing mature trees to be avoided on the wooded floodplain, anticipated bedrock surfaces, and an accompanying wetland mitigation feature. The relocation design

employed boulder bank revetments, cross rock vanes, coir-wrapped soil lifts, streambed substrate replacement, and a riparian planting plan.

West Virginia Department of Highways – For this state transportation agency, Mr. Lower performed the engineering design for three stream restoration projects. In completing the required design calculations, he used field data to determine the physical properties for the restored stream reaches including meander wavelength, bankfull width, and pool slope. One of the projects involved the design of three high gradient step-pool stream reaches using keystone step structures.

McLaughlin Run Watershed Assessment and Stream Stabilization, Allegheny County, Pennsylvania –Incorporating fluvial geomorphology principles, Mr. Lower was a member of the design team for this natural stream channel stabilization project. This restoration project serves as a model to demonstrate the effectiveness of new and innovative BMPs for streambank stabilization and channel restoration.

RELEVANT TRAINING

- Rosgen Level I, "Applied Fluvial Geomorphology" short course, Wildland Hydrology, Pagosa Springs, Colorado, February 2003
- Rosgen Level II, "River Morphology and Applications" short course, Wildland Hydrology, Pagosa Springs, Colorado, August 2003
- Rosgen Level III, "River Assessment and Monitoring", Lubrecht Forest, August 2004
- Rosgen Level IV, "River Restoration and Natural Channel Design", Elkin, North Carolina, April 2005
- "Design and Construction of Coastal Plains Outfalls" Workshop, Millersville, Maryland, Sponsored by Anne Arundel County Department of Public Works, February, 2007
- Municipal Separate Storm Sewer System (MS4) Workshop, PA DEP, February, 2015
- MS4 Total Maximum Daily Load and Chesapeake Bay Plan Workshop, PA DEP, Spring 2015
- Preparing for Your Next Permit NOI or Apllication, MS4 Workshop, PA DEP, Summer 2016
- PRP/TMDL Plans, MS4 Workshop, PA DEP, Fall 2016
- MD SHA, Erosion and Sediment Control Designers Certification, 2008
- MD SHA, Erosion and Sediment Control Certification ("Yellow Card"), 2008
- MDE, Erosion and Sediment Control Certification ("Green Card"), 2007

Matthew Leisses

Senior Scientist

Mr. Leisses is experienced in every level of environmental and construction-related projects from planning and field assessment, through preliminary and detailed design, to construction observation. Mr. Leisses provides technical expertise for permit coordination, geomorphic assessments, conceptual design plans, construction drawings, overseeing construction of designs, forest stand delineations, wetland delineations, fish shocking, and post project monitoring efforts.

PROFESSIONAL EXPERIENCE

Project Manager/ Environmental Scientist – Mr. Leisses career as a scientist and manager is diverse. He managed numerous dam removal projects across the nation from Philadelphia to California; oversaw stream and wetland restoration projects; and supervised an advanced hydrology team. Mr. Leisses performed water resource mapping of jurisdictional waters of the U.S. (streams and wetlands), obtained an abundance of permits for water impacts. He also performed stormwater monitoring and environmental sampling and testing. Mr. Leisses routinely addressed environmental impacts and concerns for Mid-Atlantic transportation departments including MD SHA, PennDOT, and the NJ DOT. And his management experience includes some significantly large environmental contracts. For example, he oversaw a statewide NJ DEP contract for stabilization of bridge scour and NEPA permitting for a large airport expansion in Louisiana.

EDUCATION

Biology Courses, The Pennsylvania State University, Millersville University

REGISTRATIONS/ CERTIFICATIONS

Rosgen Levels I-IV Natural Channel Design

Master Naturalist, PA

YEARS OF EXPERIENCE

22 Years

Executive Director – Mr. Leisses was an Executive Director for a non-profit watershed group in York County, PA. He was a founding member of the Watershed Alliance of York and worked cooperatively with other non-profits and regulatory agencies such as the U.S. Army Corps of Engineers, PA DEP, EPA, schools, governments, and private landowners. As the Executive Director, Mr. Leisses was responsible for working with municipalities on MS4 and water quality issues, providing quality education programs, and funding acquisition including successful awards from PA DEP's Growing Greener Grants for environmental projects.

PROJECT EXPERIENCE

SR 119 PennDOT Stream Relocation and Wetland Design - Mr. Leisses serves as the lead designer for this stream relocation project along 1,600+ feet of an impacted and eroded unnamed tributary. The stream was a high gradient (6%+) reach requiring specialized step-pool channel architecture. Fluvial geomorphic survey and measurements, hydrologic (HEC-HMS) and hydraulic (HEC-RAS) analyses, geotechnical investigations, wetland delineations, landowner/stakeholder meetings, concept and final design and permitting are within the scope. Additionally, the project required onsite mitigation for a 1-acre wetland creation. Mr. Leisses designed a multi-tiered habitat wetland solution to a groundwater fed system.

Mill Creek PennDOT North York Widening – Mr. Leisses served at the project lead for the crediting of the restoration for 4,600+ feet of Mill Creek in York, Pennsylvania for a stream mitigation project for a segment of relocation for the North York Widening project of Interstate 83. The project included estimating values for protocols for nutrient and sediment reduction for the proposed stream restoration and relocation. This involved conducting BANCS analysis and truthing the assessment by comparing three-dimensional surface modeled surfaces to estimate erosion rates. Using the guidelines within the Recommendations of the Chesapeake Bay Expert Panel to Define Removal Rates for Individual Stream Restoration Projects, an estimate was made for nutrient removal that was confirmed by the surface comparison.

PennDOT CSVT Southern Section Construction Stream Relocation - The project involved construction observation for the restoration of multiple channels during the Central Susquehanna Valley Transportation Project, Southern Section construction. Duties included construction oversight for the relocation and/or restoration of 10 stream channels as part of mitigation for the project.

I-80 Stream Relocations - Mr. Leisses provided design assistance, constructability reviews, and support for construction documents for the stream relocation design plans. Efforts on this project included reviewing plans for accuracy, constructability, and clarity. Special provisions were written to provide contractors with an understanding on how to construct atypical structures. Design assistance was provided when complicated design approaches were necessary.

Kehm Run - Mr. Leisses was the task manager and designer of the stream restoration. Two restoration reaches of destabilized stream resulted from a previous impoundment removal project. The project included over 600 linear feet of stream restoration design in stream reaches ranging from 2-4% slope. Design included grade control including step pools and cascades to stabilize two large headcuts that developed post dam removal. He also designed the erosion and sediment pollution control plan for the project.

PSU Harrisburg Stream Assessment - This project involved performing stream assessment services on a project that involved nearly one mile of impacted stream. Mr. Leisses inspected numerous outfalls, exposed utilities, identifying priorities, and potential restoration opportunities. Impediments and constraints were identified and prioritized. Potential solutions with estimates for construction were provided.

Horn Farm Ecological Restoration Project - Mr. Leisses was the project manager for the Horn Farm project. The project included numerous site investigations to identify ecological uplift opportunities for multiple stream channels, stormwater runoff, and 40 acres of agriculture and forested areas for stabilization, wetland creation, and stream and forest restoration. Mr. Leisses wrote a successful grant application for creating detailed plans and construction costs for implementing the project.

Leg Up Farm - Mr. Leisses was the project manager for the Leg Up Farm project. The project included site investigations to identify ecological uplift opportunities and flooding reduction opportunities for 1.5 acres of floodplain and stream restoration. This involved the management of multiple grants to implement design and construction of the project. Mr. Leisses successfully applied for 3 separate grants.

Lucasville Library Stream Stabilization - Mr. Leisses was the task manager for the stream restoration design for this project that included a 200 linear foot reach stream realignment that was eroding towards the library building. This project required unique solutions for a small section of realignment that implemented a combination of natural channel design, hard armoring, and bioengineering to stabilize a channel, the banks, and confine grading and improvements within the allotted properties while protecting the library.

Parkway Creek Stream Restoration – Mr. Leisses' contribution to this project involved introducing a new restoration approach to soften the design for the project. Due to the proximity of the streambank to a recreation trail, the stream restoration design originally included hard armoring solution to protect deteriorating and eroding banks. Mr. Leisses employed his knowledge of stabilization solutions that include strategically place boulders, logs, and native vegetation and provided unique details that allowed for protection of the trail while providing in-channel habitat using mostly onsite materials.

PA Turnpike Mile Marker 57-62 Improvements - Mr. Leisses was the project manager for stream work related to the over 5 miles of Turnpike improvements near Pittsburgh, PA. Efforts included numerous stream surveys to stabilize and/or realign multiple stream channels. The design often required creative solutions in bedrock and narrow valleys.

SR 4032 Pondtown Stream Mitigation - This project included the emergency mitigation repair of a wetland and stream along Pondtown Road near Dillsburg, Pennsylvania. Mr. Leisses was the lead designer.

Bennett Road Stream Restoration - The project involved construction observation for the restoration of Walton Run near Philadelphia Pennsylvania. Duties included construction oversight for the relocation and restoration of the stream and associated floodplain wetland storage area.

Confidential Client - This project involved required hydrology restoration on two streams impacted from numerous sinkholes causing a loss in stream flow. This involved repairing of the sinkholes and the lining of the channel using creative and cost-effective methods. Mr. Leisses was tasked with designing a nested "natural channel" with bioengineering methods for stabilizing the banks.

Washington Legion Stream Restoration - Mr. Leisses serves as the lead designer for this stream relocation project along 1,650+ feet of an impacted reach of an Unnamed tributary to Catfish Creek and one of its tributaries. This project involved over 14 exposed or at-risk utility crossings. The channel design involved relocating the channel and stabilizing the banks while reconnecting with the floodplain. The project was funded through a PA DEP Growing Greener Grant to provide the City of Washington with the needed MS4 credits while providing infrastructure protection, flood abatement, and ecological uplift. The main channel consisted of a typical riffle-pool sequence using a combination of natural channel design techniques. The relic channel was utilized for vernal pool habitat. The steep tributary was realigned and stabilized using a step-pool sequence. Fluvial geomorphic survey and measurements, hydrologic (HEC-HMS) and hydraulic (HEC-RAS) analyses, geotechnical investigations, wetland delineations, landowner/stakeholder meetings, concept and final design and permitting are within the scope and performed by Mr. Leisses.

Downingtown Stream Mitigation Monitoring - This project involves the qualitative and biological monitoring of Brandywine Creek north of Downingtown, Pennsylvania. A historic dam was removed due to disrepair of the structure and the blockage to fish passage it presented. Mr. completed the visual monitoring of the evolution of the creek post-construction. An annual report was provided describing existing conditions and providing recommendations.

I-83 Mount Rose Avenue Stream Monitoring - This project involves the qualitative monitoring of Mill Creek in York County, Pennsylvania. PennDOT's construction of Exit-18 resulted in the relocation and restoration of over 2,000 linear feet of Mill Creek and a tributary. Mr. Leisses performed the visual monitoring of the post-construction stream channel and evaluating the resulting functional uplift. An annual report was provided describing existing conditions and providing recommendations.

Daniel J. Johnston

Senior GIS Analyst

Mr. Johnston is a Senior GIS Analyst with 30 years of experience at Skelly and Loy. His exceptional computer aptitude allows Skelly and Loy to diversify his knowledge among all types of computer applications. He is experienced in all CAD platforms as well as in most graphic software applications. He is proficient with Civil 3D, Carlson Civil and Mining, InRoad Design, AutoCAD, and MicroStation. Mr. Johnston is accustomed to applying his knowledge to overcome challenges presented by client demands. He is experienced in compiling and updating Planimetric and Topographic databases from orthophotography and LIDAR. In addition to his CAD technical skills, Mr. Johnston is extremely knowledgeable in many of the ESRI GIS products.

EDUCATION
Continuing Graphic Design Degree

YEARS OF EXPERIENCE
32 Years

PROFESSIONAL EXPERIENCE

Viewshed Analysis and Computer Rendering - Mr. Johnston is responsible for collecting and organizing project data and building the computer model for viewshed analysis for major infrastructure and development projects. He uses the latest software and technology in the industry.

Photographic Computer Renderings - Project photographs of very important viewsheds can be modified to incorporate the proposed design. These illustrations are valuable for communicating the true impact of a proposed design to a viewshed. Mr. Johnston can also develop illustrations that require complete background reconstruction of the viewshed, which usually requires several photographs from different angle and positions. The photographs are then pulled apart and repositioned to proper angle and perspective for the final illustrations.

3D Computer Model Renderings - For some projects, a 3D computer model is required for the viewshed analysis. This type of model allows a complete 360° view of the project area plus the proposed project design. Mr. Johnston incorporates the CAD data from the design team and supplements the surrounding areas by incorporating GIS data (including DEM data). Once the model is built, still images can be generated for any view for paper production and a computer animation file can be generated for replay on computer, web, or DVD. The animation may be a flyover of the site or follow a certain corridor path like a road, transmission line, or trail.

Project Mapping Coordinator - Mr. Johnston is responsible for organizing and cataloging various layers of project information. His coordination of projects allows seamless development of work between GIS Specialists and CAD Operators. This ensures quality control of data that are being developed in an organized and speedy process.

- **Mining Permits - Mining Client in Central United States** - The client has several mining operations which require permitting for either new development or expansion of current operations. Mr. Johnston was directed to acquire, develop, and organize mapping from various available public or private sources. He uses the raw

information and develops a uniform mapping appearance that met governmental permit requirements.

- **Central Susquehanna Valley Transportation (CSVT) Project - Pennsylvania Department of Transportation (PennDOT)** – The proposed highway was developed to cross Snyder, Union, and Northumberland Counties. Mr. Johnston was in charge of all CAD file development and GIS integration. The project required development of approximately 60 different environmental constraint features, which were incorporated into GIS layers for impact analysis. Due to the large size of the study area, there were several different base mapping structures developed to present information at public events and in the project NEPA documents as clearly and accurately as possible.
- **Complete Design Packages - Various Clients** - Mr. Johnston's experience with CAD and various engineering software allows Skelly and Loy to develop complete sets of engineering packages, ranging from 15 to 60 different plan sheets per package.

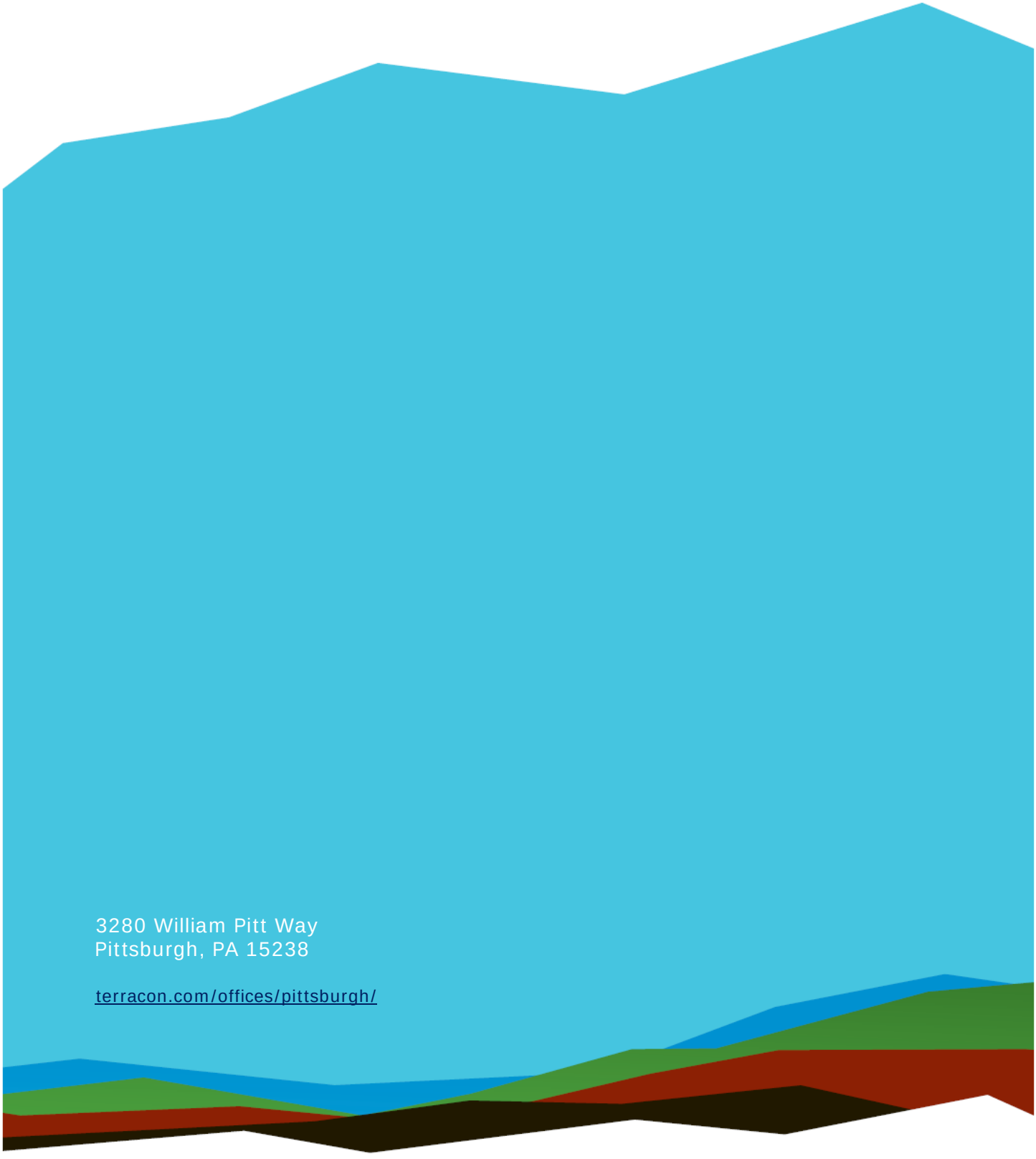
Data Analyst - Mr. Johnston is a key person in developing different methods of data analysis for our engineering and environmental staff. His ability to integrate multiple computer applications allows him to develop new methods for old problems.

- **Valley Subsidence - Mining Client in Virginia** - Our client requested that we prepare subsidence mapping for an old gypsum mine. This mine consisted of 14 main levels with several offshoot sub-levels. Mr. Johnston, in coordination with other in-house GIS specialists, developed a model that accounts for existing terrain, sloping angle of existing subsidence, and elevations of individual levels. This model is capable of predicting future subsidence with a reasonably accurate location. Our GIS model was used to calculate and catalog all the affected items in the study area, which allowed our engineers to determine a cost of potential liability for our clients.
- **Coal Refuse Analyst - Coal Processor in Australia** - Our client requested Skelly and Loy to evaluate and determine if a coal refuse pile was suitable for power generation. Mr. Johnston was responsible for collating drill holes and surface sampling information. The uniqueness of the problem was that the hole depths varied depending on the locations of the hole on the pile. He developed a 3D model that illustrated the location of quality coal deposits and was able to generate volumes of these deposits.
- **Corridor O Project Potential Subsidence - PennDOT** - The proposed highway would connect State College with Interstate 80. Our engineering staff collected large amounts of mining data from various sources. Mr. Johnston, along with our GIS Specialist and our engineering staff, developed a method that accounted for all of the information collected. Mr. Johnston's role in the process was to develop a methodology to identify potential subsidence zones that were acceptable to our engineers and GIS Specialist.
- **Volumetric Analyst - Various Clients** - Mr. Johnston is capable of calculating volumes of materials of all types. His ability to apply software applications beyond

their original designated use allows Skelly and Loy to determine numerous types of material volumes.

Graphics Coordinator - Mr. Johnston is responsible for coordinating all graphics for agency and public involvement activities. Graphics range from designing meeting displays to managing a dual-screen computer projection for meeting presentations.

- **CSVT Project - PennDOT** - Mr. Johnston was responsible for developing a digital version of both the draft and final Environmental Impact Statements. These digital versions were constructed using a web-based format that allowed distribution of the document on a compact diskette. These versions also enabled the Environmental Impact Statements to function as searchable documents. As part of the project, Mr. Johnston also developed a 3D Animation of a proposed bridge overpass near a group of concerned citizens and developed several before and- after photographs of impacted viewsheds in the study area.
- **Long-Term Acid Mine Drainage (AMD) Treatment - Mining Client in Tennessee** - Mr. Johnston developed a valley dam to hold water for a low maintenance AMD treatment system. As part of the design process, earthwork volumes and incremental water volumes were calculated at different elevations. The client then directed us to produce a five-minute 3D animation showing what the potential lake would look like after completion. This animation was used to explain the idea to the client and other environmental state and federal agencies for approval.



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