



The following documentation is an electronically-submitted vendor response to an advertised solicitation from the *West Virginia Purchasing Bulletin* within the Vendor Self-Service portal at ***wvOASIS.gov***. As part of the State of West Virginia's procurement process, and to maintain the transparency of the bid-opening process, this documentation submitted online is publicly posted by the West Virginia Purchasing Division at ***WVPurchasing.gov*** with any other vendor responses to this solicitation submitted to the Purchasing Division in hard copy format.

## Header

[List View](#)

### General Information [Contact](#) [Default Values](#) [Discount](#) [Document Information](#)

Procurement Folder: 159029

SO Doc Code: CEOI

Procurement Type: Central Contract - Fixed Amt

SO Dept: 0310

Vendor ID: 000000206513 

SO Doc ID: DNR1600000011

Legal Name: TERRADON CORPORATION

Published Date: 11/20/15

Alias/DBA:

Close Date: 12/2/15



Total Bid: \$0.00

Close Time: 13:30

Response Date: 12/02/2015 

Status: Closed

Response Time: 10:27

Solicitation Description: Addendum, repairs/compliance with DEP Dam Safety Requirement  

Total of Header Attachments: 0

Total of All Attachments: 0



Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
1	Architectural/Engineering Services				

Comm Code	Manufacturer	Specification	Model #
81101508			

Extended Description :	A/E services to design repairs necessary to bring Cacapon Resort State Park's upper and lower dams and the Conaway Wildlife Management Area's dam into compliance with DEP's Dam Safety Requirements.
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terraddon.com

P.O. Box 519  
Nitro, WV 25143  
Tel: 304-755-8291

P.O. Box 1635  
Lewisburg, WV 24901  
Tel: 304-645-4636

P.O. Box 307  
Charlton Hts, WV 25040  
Tel: 304-541-7655

101 North Court Street  
Ripley WV, 25271  
Tel: 304-532-4909

December 2, 2015

West Virginia Division of Natural Resources  
324 Fourth Ave  
South Charleston, WV 25303

To Whom It May Concern,

TERRADON Corporation is pleased to submit an Expression of Interest to the West Virginia Division of Natural Resources for the Cacapon Resort State Park and Conaway Wildlife Management Area earthen dam rehabilitation.

TERRADON Corporation offers a multi-faceted approach to design engineering and consulting services. For the past 25 years TERRADON staff has provided a wealth of engineering solutions blanketing the Appalachian and Mid-Atlantic region with successful projects. The company built its reputation on expert personnel and quality, time-sensitive service. Those same founding principles hold true today. TERRADON is the largest woman-owned engineering firm in West Virginia. TERRADON is a certified Women's Business Enterprise as defined by the Women's Business Enterprise National Council and the National Women Business Owners Corporation.

The second-generation, family-owned business has built a strong reputation by providing flexible, cost effective design solutions and maintaining the highest level of customer service. TERRADON will manage the contract from our Poca office in Putnam County, WV with support from our teaming partner O'Brien & Gere.

The TERRADON project team's experience includes inspecting dams, evaluating hazards of earthen dam structures and designing hazard mitigation plans to alleviate deficiencies. Members of the TERRADON team have also permitting experience, designed stream stabilization and wetland enhancement projects to minimize damage from flooding. TERRADON is currently providing engineering services for the Bluestone Dam in Hinton, WV, including inspection services.

We look forward to furthering our relationship with the West Virginia Division of Natural Resources and assisting you with completing your projects in a timely and economical fashion. Please feel free to contact us at any time at 304-755-8291 or [bill.hunt@terraddon.com](mailto:bill.hunt@terraddon.com) concerning this project.

Sincerely,  
TERRADON Corporation

A handwritten signature in black ink, appearing to read "Bill Hunt", is written over a horizontal line.

Bill Hunt, PG, LRS  
VP, Geo-Environmental Department



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

State of West Virginia  
Centralized Expression of Interest  
02 — Architect/Engr

Proc Folder: 159029

Doc Description: Addendum, repairs/compliance with DEP Dam Safety Requirement

Proc Type: Central Contract - Fixed Amt

Date Issued	Solicitation Closes	Solicitation No	Version
2015-11-20	2015-12-02 13:30:00	CEOI 0310 DNR1600000011	2

#### BID RECEIVING LOCATION

BID CLERK

DEPARTMENT OF ADMINISTRATION

PURCHASING DIVISION

2019 WASHINGTON ST E

CHARLESTON

WV 25305

US

#### VENDOR

Vendor Name, Address and Telephone Number:

TERRADON Corporation, Inc.

409 Jacobson Drive

Poca, WV 25159

#### FOR INFORMATION CONTACT THE BUYER

Guy Nisbet

(304) 558-2596

guy.l.nisbet@wv.gov

Signature X *Virginia R. Kio* CEO

FEIN #

55-0687626

DATE 11/24/15

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

**ADDITIONAL INFORMATION:****Addendum**

Addendum No. 1 Issued to publish and distribute the attached information to the vendor community.

\*\*\*\*\*

**Expression of Interest**

The West Virginia Purchasing Division for the Agency, The West Virginia Division of Natural Resources (WVDNR) is soliciting CEOI responses from qualified firms to provide a contract to provide necessary engineering and other related professional services to design and provide construction contract administration services for the repairs necessary to bring Cacapon Resort State Park Upper and Lower Dams and well as Conaway Wildlife Management Area Dam in to compliance with DEP Dam Safety Requirements per the specifications and terms and conditions as attached.

INVOICE TO	SHIP TO
DIVISION OF NATURAL RESOURCES PARKS & RECREATION-PEM SECTION 324 4TH AVE  SOUTH CHARLESTON WV25305  US	STATE OF WEST VIRGINIA JOBSITE - SEE SPECIFICATIONS  No City WV 99999  US

Line	Comm Ln Desc	Qty	Unit Issue
1	Architectural/Engineering Services		

Comm Code	Manufacturer	Specification	Model #
81101508			

**Extended Description :**

A/E services to design repairs necessary to bring Cacapon Resort State Park's upper and lower dams and the Conaway Wildlife Management Area's dam into compliance with DEP's Dam Safety Requirements.



DNR1600000011	<b>Document Phase</b> <b>Final</b>	<b>Document Description</b> Addendum, repairs/compliance w ith DEP Dam Safety Requirement	<b>Page 3</b> <b>of 3</b>
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#### ADDITIONAL TERMS AND CONDITIONS

See attached document(s) for additional Terms and Conditions



**ADDENDUM ACKNOWLEDGEMENT FORM**  
**SOLICITATION NO.:** \_\_\_\_\_

**Instructions:** Please acknowledge receipt of all addenda issued with this solicitation by completing this addendum acknowledgment form. Check the box next to each addendum received and sign below. Failure to acknowledge addenda may result in bid disqualification.

**Acknowledgment:** I hereby acknowledge receipt of the following addenda and have made the necessary revisions to my proposal, plans and/or specification, etc.

**Addendum Numbers Received:**

(Check the box next to each addendum received)

<input checked="" type="checkbox"/> Addendum No. 1	<input type="checkbox"/> Addendum No. 6
<input type="checkbox"/> Addendum No. 2	<input type="checkbox"/> Addendum No. 7
<input type="checkbox"/> Addendum No. 3	<input type="checkbox"/> Addendum No. 8
<input type="checkbox"/> Addendum No. 4	<input type="checkbox"/> Addendum No. 9
<input type="checkbox"/> Addendum No. 5	<input type="checkbox"/> Addendum No. 10

I understand that failure to confirm the receipt of addenda may be cause for rejection of this bid. I further understand that any verbal representation made or assumed to be made during any oral discussion held between Vendor's representatives and any state personnel is not binding. Only the information issued in writing and added to the specifications by an official addendum is binding.

TERRADON Corporation, Inc.

\_\_\_\_\_  
Company

*Virginia R. King, CEO*

\_\_\_\_\_  
Authorized Signature

11/24/15

\_\_\_\_\_  
Date

**NOTE:** This addendum acknowledgement should be submitted with the bid to expedite document processing.  
 Revised 6/8/2012

STATE OF WEST VIRGINIA  
Purchasing Division

## PURCHASING AFFIDAVIT

**MANDATE:** Under W. Va. Code §5A-3-10a, no contract or renewal of any contract may be awarded by the state or any of its political subdivisions to any vendor or prospective vendor when the vendor or prospective vendor or a related party to the vendor or prospective vendor is a debtor and: (1) the debt owed is an amount greater than one thousand dollars in the aggregate; or (2) the debtor is in employer default.

**EXCEPTION:** The prohibition listed above does not apply where a vendor has contested any tax administered pursuant to chapter eleven of the W. Va. Code, workers' compensation premium, permit fee or environmental fee or assessment and the matter has not become final or where the vendor has entered into a payment plan or agreement and the vendor is not in default of any of the provisions of such plan or agreement.

**DEFINITIONS:**

**"Debt"** means any assessment, premium, penalty, fine, tax or other amount of money owed to the state or any of its political subdivisions because of a judgment, fine, permit violation, license assessment, defaulted workers' compensation premium, penalty or other assessment presently delinquent or due and required to be paid to the state or any of its political subdivisions, including any interest or additional penalties accrued thereon.

**"Employer default"** means having an outstanding balance or liability to the old fund or to the uninsured employers' fund or being in policy default, as defined in W. Va. Code § 23-2c-2, failure to maintain mandatory workers' compensation coverage, or failure to fully meet its obligations as a workers' compensation self-insured employer. An employer is not in employer default if it has entered into a repayment agreement with the Insurance Commissioner and remains in compliance with the obligations under the repayment agreement.

**"Related party"** means a party, whether an individual, corporation, partnership, association, limited liability company or any other form or business association or other entity whatsoever, related to any vendor by blood, marriage, ownership or contract through which the party has a relationship of ownership or other interest with the vendor so that the party will actually or by effect receive or control a portion of the benefit, profit or other consideration from performance of a vendor contract with the party receiving an amount that meets or exceeds five percent of the total contract amount.

**AFFIRMATION:** By signing this form, the vendor's authorized signer affirms and acknowledges under penalty of law for false swearing (W. Va. Code §61-5-3) that neither vendor nor any related party owe a debt as defined above and that neither vendor nor any related party are in employer default as defined above, unless the debt or employer default is permitted under the exception above.

**WITNESS THE FOLLOWING SIGNATURE:**

Vendor's Name: TERRADON Corporation, Inc.

Authorized Signature: Thomas G. Kitzredge Date: 10/22/15

State of West Virginia  
Putnam

County of \_\_\_\_\_, to-wit:

Taken, subscribed, and sworn to before me this 22nd day of October, 2015.

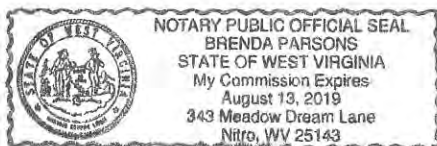
My Commission expires August 13, 2019.

**AFFIX SEAL HERE**

**NOTARY PUBLIC**

Brenda Parsons

*Purchasing Affidavit (Revised 08/01/2015)*

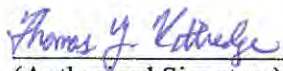


### CERTIFICATION AND SIGNATURE PAGE

By signing below, or submitting documentation through wvOASIS, I certify that I have reviewed this Solicitation in its entirety; understand the requirements, terms and conditions, and other information contained herein; that I am submitting this bid, offer or proposal for review and consideration; that I am authorized by the vendor to execute and submit this bid, offer, or proposal, or any documents related thereto on vendor's behalf; that I am authorized to bind the vendor in a contractual relationship; and that to the best of my knowledge, the vendor has properly registered with any State agency that may require registration.

TERRADON Corporation, Inc.

\_\_\_\_\_  
(Company)

 Thomas Y. Kittredge, President  
\_\_\_\_\_  
(Authorized Signature) (Representative Name, Title)

304-755-8291 304-755-2636 10/22/15  
\_\_\_\_\_  
(Phone Number) (Fax Number) (Date)



# State of West Virginia

## VENDOR PREFERENCE CERTIFICATE

Certification and application\* is hereby made for Preference in accordance with **West Virginia Code**, §5A-3-37. (Does not apply to construction contracts). **West Virginia Code**, §5A-3-37, provides an opportunity for qualifying vendors to request (at the time of bid) preference for their residency status. Such preference is an evaluation method only and will be applied only to the cost bid in accordance with the **West Virginia Code**. This certificate for application is to be used to request such preference. The Purchasing Division will make the determination of the Vendor Preference, if applicable.

**1. Application is made for 2.5% vendor preference for the reason checked:**

- \_\_\_\_ Bidder is an individual resident vendor and has resided continuously in West Virginia for four (4) years immediately preceding the date of this certification; **or**,  
 \_\_\_\_ Bidder is a partnership, association or corporation resident vendor and has maintained its headquarters or principal place of business continuously in West Virginia for four (4) years immediately preceding the date of this certification; or 80% of the ownership interest of Bidder is held by another individual, partnership, association or corporation resident vendor who has maintained its headquarters or principal place of business continuously in West Virginia for four (4) years immediately preceding the date of this certification; **or**,  
 \_\_\_\_ Bidder is a nonresident vendor which has an affiliate or subsidiary which employs a minimum of one hundred state residents and which has maintained its headquarters or principal place of business within West Virginia continuously for the four (4) years immediately preceding the date of this certification; **or**,

**2. Application is made for 2.5% vendor preference for the reason checked:**

- \_\_\_\_ Bidder is a resident vendor who certifies that, during the life of the contract, on average at least 75% of the employees working on the project being bid are residents of West Virginia who have resided in the state continuously for the two years immediately preceding submission of this bid; **or**,

**3. Application is made for 2.5% vendor preference for the reason checked:**

- \_\_\_\_ Bidder is a nonresident vendor employing a minimum of one hundred state residents or is a nonresident vendor with an affiliate or subsidiary which maintains its headquarters or principal place of business within West Virginia employing a minimum of one hundred state residents who certifies that, during the life of the contract, on average at least 75% of the employees or Bidder's affiliate's or subsidiary's employees are residents of West Virginia who have resided in the state continuously for the two years immediately preceding submission of this bid; **or**,

**4. Application is made for 5% vendor preference for the reason checked:**

- ☒ Bidder meets either the requirement of both subdivisions (1) and (2) or subdivision (1) and (3) as stated above; **or**,

**5. Application is made for 3.5% vendor preference who is a veteran for the reason checked:**

- \_\_\_\_ Bidder is an individual resident vendor who is a veteran of the United States armed forces, the reserves or the National Guard and has resided in West Virginia continuously for the four years immediately preceding the date on which the bid is submitted; **or**,

**6. Application is made for 3.5% vendor preference who is a veteran for the reason checked:**

- \_\_\_\_ Bidder is a resident vendor who is a veteran of the United States armed forces, the reserves or the National Guard, if, for purposes of producing or distributing the commodities or completing the project which is the subject of the vendor's bid and continuously over the entire term of the project, on average at least seventy-five percent of the vendor's employees are residents of West Virginia who have resided in the state continuously for the two immediately preceding years.

**7. Application is made for preference as a non-resident small, women- and minority-owned business, in accordance with West Virginia Code §5A-3-59 and West Virginia Code of State Rules.**

- \_\_\_\_ Bidder has been or expects to be approved prior to contract award by the Purchasing Division as a certified small, women- and minority-owned business.

Bidder understands if the Secretary of Revenue determines that a Bidder receiving preference has failed to continue to meet the requirements for such preference, the Secretary may order the Director of Purchasing to: (a) reject the bid; or (b) assess a penalty against such Bidder in an amount not to exceed 5% of the bid amount and that such penalty will be paid to the contracting agency or deducted from any unpaid balance on the contract or purchase order.

By submission of this certificate, Bidder agrees to disclose any reasonably requested information to the Purchasing Division and authorizes the Department of Revenue to disclose to the Director of Purchasing appropriate information verifying that Bidder has paid the required business taxes, provided that such information does not contain the amounts of taxes paid nor any other information deemed by the Tax Commissioner to be confidential.

**Under penalty of law for false swearing (West Virginia Code, §61-5-3), Bidder hereby certifies that this certificate is true and accurate in all respects; and that if a contract is issued to Bidder and if anything contained within this certificate changes during the term of the contract, Bidder will notify the Purchasing Division in writing immediately.**

Bidder: TERRADON

Signed: Thomas J. Kithridge

Date: 10/22/15

Title: President



Engineering . Land Planning . Surveying . Testing & Inspection

## STATEMENT OF QUALIFICATIONS FOR

### *Engineering and Professional Services for Repairs/Compliance with DEP Dam Safety Requirements for Cacapon Resort State Park Upper and Lower Dams/Conaway Wildlife Management Area Dam*

Division of Natural Resources, Parks & Recreation - PEM Section  
324 4th Ave  
South Charleston, WV 25305  
December 2, 2015



Corporate Office  
409 Jacobson Dr.  
Poca, WV 25159  
304-755-8291

Greenbrier Valley  
425 North Jefferson St.  
Lewisburg, WV 24901  
304-645-4636

Jackson County  
101 North Court Street  
Ripley WV, 25271  
304-532-4909

Fayette County  
P.O. Box 307  
Charlton Heights, WV 25040  
304-541-7655

ALL LOCATIONS Phone: 304.755.8291 Fax: 304.755.2636

[www.terraddon.com](http://www.terraddon.com)

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## Corporate Overview



TERRADON Corporation offers a multi-faceted approach to design engineering and consulting services. For more than 25 years TERRADON staff has provided a wealth of engineering solutions blanketing the Appalachian Region with successful projects. The company built its reputation on expert personnel and quality, time-sensitive service. Those same founding principles hold true today. Staff includes engineers, landscape architects, surveyors, planners, environmental scientists, designers, technicians and LEED Accredited Professionals. The company maintains approximately 50 leading-edge staff in four locations: Nitro/Poca, WV; Lewisburg, WV; Charlton Heights, WV; and Ripley, WV. TERRADON'S departments work cohesively to provide turn-key solutions that strive to exceed client expectations.

The family-owned business has built a strong reputation by providing flexible, cost effective design solutions and maintaining the highest level of customer service. TERRADON is particularly suited to design engineering within the mountainous areas of the Ohio Valley and Appalachian Regions. The firm has been recognized through numerous awards from professional organizations and agencies including: WV State Division of Highways, WV Department of Environmental Protection and the American Institute of Architects.

TERRADON's experience includes inspecting dams, evaluating hazards of earthen dam structures and designing hazard mitigation plans to alleviate deficiencies. Members of the TERRADON team have also designed stream stabilization and wetland enhancement projects to minimize damage from flooding. TERRADON is currently providing engineering services for the Bluestone Dam in Hinton, WV, including inspection services.

TERRADON is the largest woman-owned engineering firm in West Virginia. TERRADON is a registered Small Woman Owned Business through the WV Purchasing Division and a certified Women's Business Enterprise as defined by the Women's Business Enterprise National Council and the National Women Business Owners Corporation.



The TERRADON staff will be supported by our teaming partner, O'Brien & Gere. O'Brien & Gere is a well-respected engineering and consulting firm that has been providing dam engineering services for more than 70 years. Our project team consists of staff that possess extensive experience in dam safety evaluation and design, including:

- Planning and development of dam safety programs for compliance with federal and state agencies
- Dam inspection and investigation, including a number of NRCS dams
- Hydrologic/hydraulic analyses, including use of the SITES program
- Investigation and design of NRCS-type drop inlet spillway and outlet conduit systems
- Concrete repair technology and rehabilitation of spillway structures
- Rehabilitation of earth embankments and earth-lined spillways
- Environmental assessment, including wetlands delineation and NEPA documentation



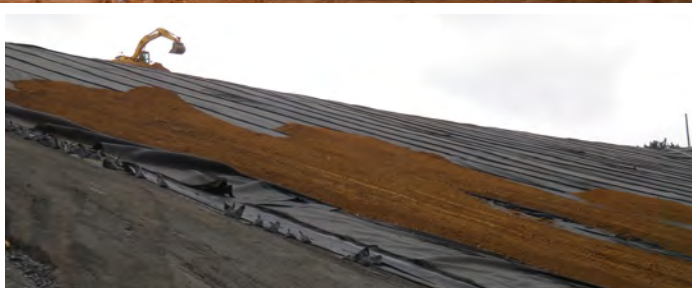
## SECTION 1: QUALIFICATIONS AND EXPERIENCE

### Section 1.1: Company Description and Experience in Similar Projects

#### Geotechnical Services

TERRADON offers some of the most experienced staff in the region for local geotechnical expertise. This team of experts brings a distinctive, specialized understanding of the difficult soil and groundwater conditions found in the Ohio Valley and Appalachian Regions of the United States.

The Geotechnical group has provided investigations associated with earthen dams, mining, waste disposal, new building construction, landslides analysis and remedial design, cell and high mast towers, landfill permitting and cap design, flexible/rigid pavement design, and environmental remediation.



#### SERVICES INCLUDE

- Dam Design (Earth, Rock Concrete)
- Dam Studies (Cost, Volume, Area, Water Balance)
- Retaining Structure Analysis and Design
- Stability Analysis
- Landslide Analysis and Remedial Design
- Foundation Design
- Municipal and Industrial Landfills
- Flexible and Rigid Pavement Design
- Test Borings
- Monitoring Well and Piezometer Installation
- Test Pit Excavations
- Soil and Rock Logging, Sampling and Testing
- Permitting
- Construction Inspection/Administration

#### GEOTECHNICAL DESIGNS INCLUDE

- Dams
- Roadway Cuts, Fills and Bridge Foundations
- Site Development
- Landslide Remediation
- Subsurface and Surface Drainage
- Structural Corrections
- Structural Retaining Walls
- MSE Walls and Other Gravity Walls
- H-Piles and Lagging
- Anchors (Rock or Soil) In Combination with Above if Applicable
- Building Foundations
- Asphalt and Concrete Pavements

## Environmental Services



Constantly changing federal and state environmental requirements are difficult to track and can have a serious impact on businesses and other organizations. TERRADON offers a strong environmental services team to manage issues in a complex environment. Staff is well-versed on environmental permitting processes and regulations as well as site assessment and reporting.

TERRADON closely follows environmental activities on the local, state and federal levels. TERRADON has a thorough understanding of state and federal environmental permitting processes and regulations. This expertise applies to both the initial permit preparations, as well as subsequent negotiations affecting the permit. The firm's strength in addressing environmental issues is built on the diversity of its staff with credentials in chemistry, civil engineering, geotechnical engineering and geology.

## SERVICES INCLUDE

- Environmental Site Assessments
  - Phase I ESA
  - Phase II ESA
- Hazardous Waste
- Process Water
- Wastewater
- Storm Water
- Groundwater
- Air Permitting
- Risk Management Plans
- Wetland Delineation
- Tier II Reporting
- Emergency Response Plans
- Environmental Audits
- Environmental Remediation
- NEPA Compliance
- Asbestos and Lead Inspection
- Underground Storage Tanks
- Impoundment Stabilization and Closure
- SPCC Planning
- BMP Planning





## Water

Since 1989, TERRADON has provided planning, design and construction administration for millions of dollars worth of civil engineering projects including water improvement projects. Project experience is varied in both size and scope, ranging from small on-site systems to meet the requirements of schools and single-user site office buildings, to upgrades of major municipal facilities involving both new construction and the renovation of existing facilities. Key staff have more than 100 years of combined experience and have designed water systems for both private clients and municipalities.



### Water

- Utility Planning and Layout
- Water Treatment, Storage and Distribution
- System Modeling
- Drinking Water Backflow Prevention and Testing Programs
- Operation and Maintenance Manuals
- Source Water Protection Plans
- Asset Management Planning
- Permitting

### Stormwater

- Planning and Layout
- Stormwater Management Design
- Erosion and Sediment Control Plans
- MS4 Plans
- Stormwater Protection Plans
- Best Management Practices Design
- Permitting



### Wastewater

- Utility Planning and Layout
- Wastewater Treatment, Flow Equalization, Collection and Pumping
- Decentralized Sewer System Planning and Design/On-Site Wastewater System Design
- Sewer System Infiltration and Inflow (I/I) and Sewer System Evaluation Surveys (SSES)
- Sewer System Rehab Design
- Operation and Maintenance Manuals
- Industrial Waste Treatment
- Sanitary Sewer Overflow (SSO) Abatement
- Asset Management Planning
- Combined Sewer Overflow (CSO) Compliance
- Hydraulic Modeling
- Mixing Zone Studies
- Permitting



## Materials Testing and Construction Monitoring



TERRADON offers materials testing and construction monitoring services to document compliance with project design specifications and regulatory requirements. The firm provides construction monitoring for utility, highway, and commercial construction projects. TERRADON also provides laboratory and field testing of construction materials. Engineers and technicians at TERRADON are West Virginia Department of Highways certified in Portland Cement Concrete, Hot-mixed Asphalt, Compaction and Aggregates.

### SERVICES INCLUDE

#### Materials Testing & Inspection

- Slump of Portland Cement Concrete (AASHTO-T119)
- Air Content of Freshly Mixed Concrete (AASHTO-T196 and T152)
- Unit Weight and Yield (AASHTO-T121)
- Making and Curing of Concrete Test Specimens (AASHTO-T23)
- Compressive Strength of Concrete Specimens (AASHTO-T22)
- Fine and Course Aggregate Gradations (AASHTO-T11 and T27)
- Specific Gravity of Aggregates (AASHTO-T84 and T85)
- Atterberg Limits (AASHTO-T89 and T90)
- Moisture Content of Soil (ASTM-D2216)
- Nuclear Compaction Testing of Soil, Stone, and Hot Mixed Asphalt
- Preparation of Certification Forms and Construction Reports
- Welder Certification

#### Specialty Testing and Inspection

- Floor Flatness Testing
- Fireproofing
- Masonary Testing
- Structural Steel Inspection
  - Certified Welding Inspection
  - Dye Penetrant Testing
  - Bolt Testing
- Project Safety Monitoring
- FAA Eastern Regional Laboratories List

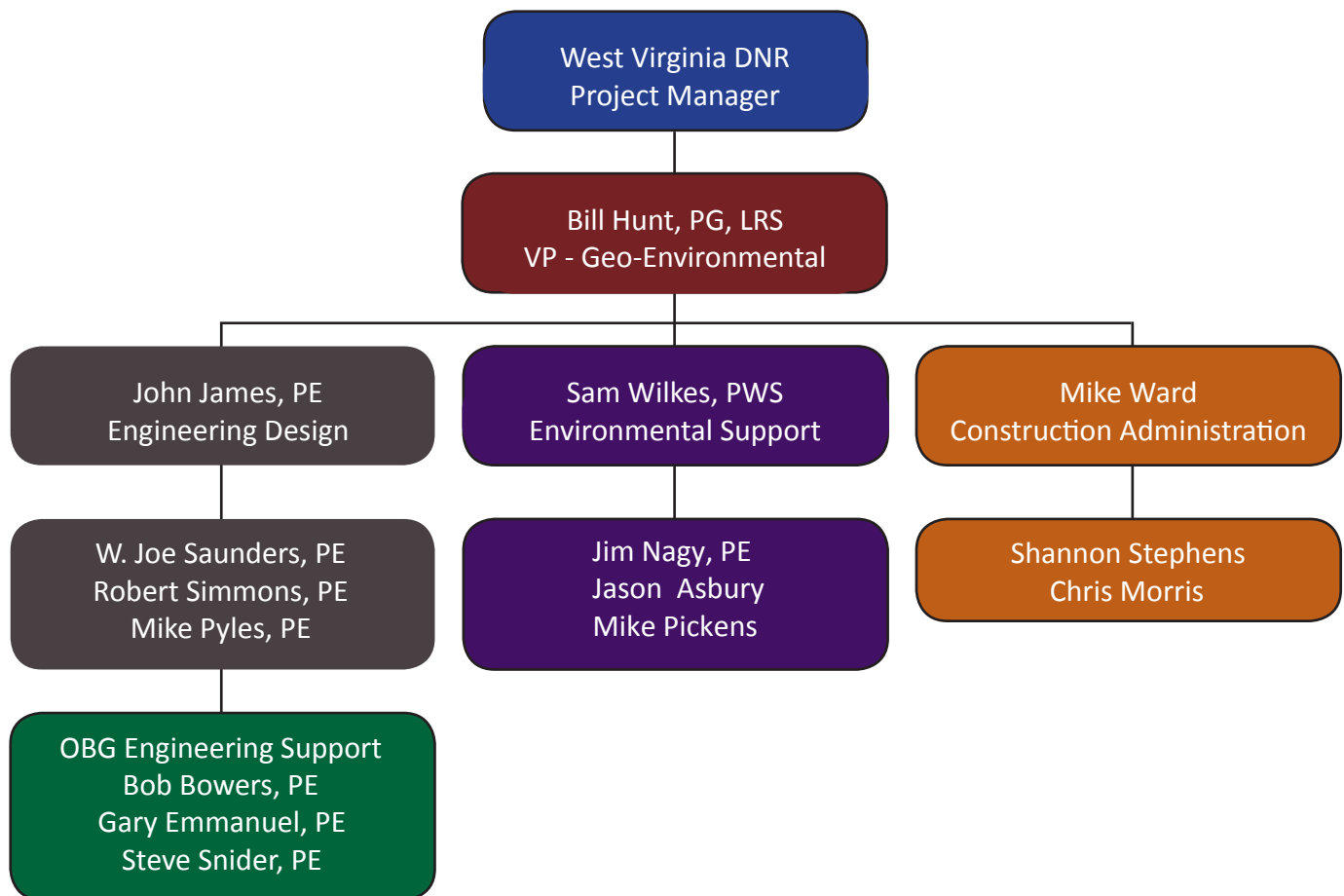
#### Construction Monitoring

- Document compliance with project design specifications
- Ensures compliance with regulatory requirements
- OSHA 10-Hour and 30-Hour Construction Safety & Health Certified



## Section 1.2: Proposed Staffing Plan

The following organization chart of the proposed team shows TERRADON's commitment to selecting an experienced team. This team will provide the necessary resources to complete the individual design, permitting, and construction inspection elements of the project. TERRADON's proposed team will also focus on accomplishing the project goals of maintaining accessibility of the resources with minimal disruption the public, be responsive to WVDNR needs and objectives, and provide technical and fiscal responsible construction administration throughout the project. The project will be under the direction of Bill Hunt, TERRADON's Vice President of the Geo-Environmental Department. Mr. Hunt is the department head overseeing the geotechnical engineering, environmental, and construction administration/inspection areas within TERRADON. John James is TERRADON's lead geotechnical and dam design engineer. Mr. James will be leading the engineering design team for this project. The TERRADON project team's resumes are included as Appendix A.





### Section 1.3: Past Projects

TERRADON offers some of the most experienced staff in the region for local geotechnical expertise. This team of experts brings a distinctive, specialized understanding of the difficult soil and groundwater conditions found in the Ohio Valley and Appalachian Regions of the United States. The Geotechnical group has provided investigations associated with earthen dams, mining, waste disposal, new building construction, landslides analysis and remedial design, cell and high mast towers, landfill permitting and cap design, flexible/rigid pavement design, and environmental remediation. An example of the project teams past projects are presented in Appendix B.

The projects presented in Appendix B include:

1. Mallard Lake Dam, Glade Springs, WV, Upgrade, Presently under review
2. Beckley Upper Glade Water Supply Dam; Beckley, WV, Upgrade
3. Bluestone Dam Phase IV Dam Stability; Hinton, WV, Construction Design
4. Lake Chaweva Dam; Cross Lanes, WV, Rehab
5. Meadowood Dam, Big Bend Park, Tornado, WV, Rehab
6. Dawson Lake Dam; Dawson, WV, New Dam
7. Chatham Lake Dam; Glade Springs, Daniels, WV, New Dam
8. The Summit Bechtel Family National Scouting Reserve; Mt. Hope, WV
9. Matewan Municipal Swimming Pool Environmental Assessment; Matewan, WV
10. Ada Dam Rehabilitation; Bluefield, WV
11. Potomac Creek Dams 1 and 2; Stafford County, VA
12. Upgrade and Repair of Picatinny Lake and Lake Denmark Dams; Dover, NJ



## Section 2: PROJECT DETAILS AND GOALS

TERRADON will provide a turnkey project management team with the experience and expertise to complete the re-evaluation analysis of the Cacapon Resort State Park Dams and the safety analysis and design of the Conaway Run Wildlife Management Area Dam rehabilitation projects. Our proposed dam evaluation and design team, environmental permitting personnel, and the construction administration manager and construction inspection staff are qualified to provide exemplary service and communication throughout this WVDNR project.

TERRADON has conducted a preliminary review of the Dam Safety Inspections and the previously prepared Engineering Plans and design report for the Upper and Lower Dams at Cacapon State Park. Based on our preliminary review of the available documents, it is our opinion that the Cacapon dam renovation design is basically sound, but that tweaking the design could result in a savings in the \$50,000-to 100,000 range, and a redesign of the Park dam utilizing an alternate overflow design system along with rerouting the downstream channel alignment could result in an additional savings of \$150,000 to \$250,000.

### Section 2.1: Communications Plan

TERRADON will have an open line of communication with WVDNR's Parks and Recreation Section in South Charleston, local facilities managers at Cacapon Resort State Park and Conaway Run Wildlife Management Area throughout all aspects of this project. We propose conducting a project kick off meeting with the WVDNR's appropriate staff and our project management team to ensure that all parties have a clear understanding of the project goals and a clear path to accomplish those goals. Throughout the project, our team will be available to discuss the project with WVDNR staff and we will have ongoing project summary reports and meetings to present our progress and discuss the design options. Each of the design options will be discussed and presented in a manner to fully describe the impact to the resources and the general public during construction activities.

Our project team will also apply for and obtain all required permitting from state and federal agencies. We anticipate that at a minimum, federal and state permits will require agency coordination between the Army Corps of Engineers and WVDEP. A nationwide or individual 404 permit as well as a construction storm water permits will be necessary and should be submitted on the behalf of WVDNR for these projects. The permitting process can be lengthy and will directly impact the construction schedule. Therefore, communication between the agencies and internal permitting staff and the design staff will be critical for composing a realistic construction schedule.

Once all environmental permitting is in place, the construction activities can commence. The construction schedule will be planned so that there will be a minimal impact to the general public and the water resources. This will be balanced by determining the lowest usage of the resource and the ideal time of year to complete the project based on the environmental permits.

TERRADON proposes having senior construction inspectors on site during all phases of construction and conducting weekly meetings with construction supervisors and WVDNR managers. Our construction inspection team is well seasoned and has performed detailed site activities logs for documenting construction progress on a daily basis. These daily logs can be submitted electronically via email to the construction supervisors and WVDNR on a weekly basis. This process accomplishes proper documentation of progress, accountability, and resolution of issues that arise on the construction site. It also ensures that all parties are continually informed of progress, issues, and resolution on a weekly basis.

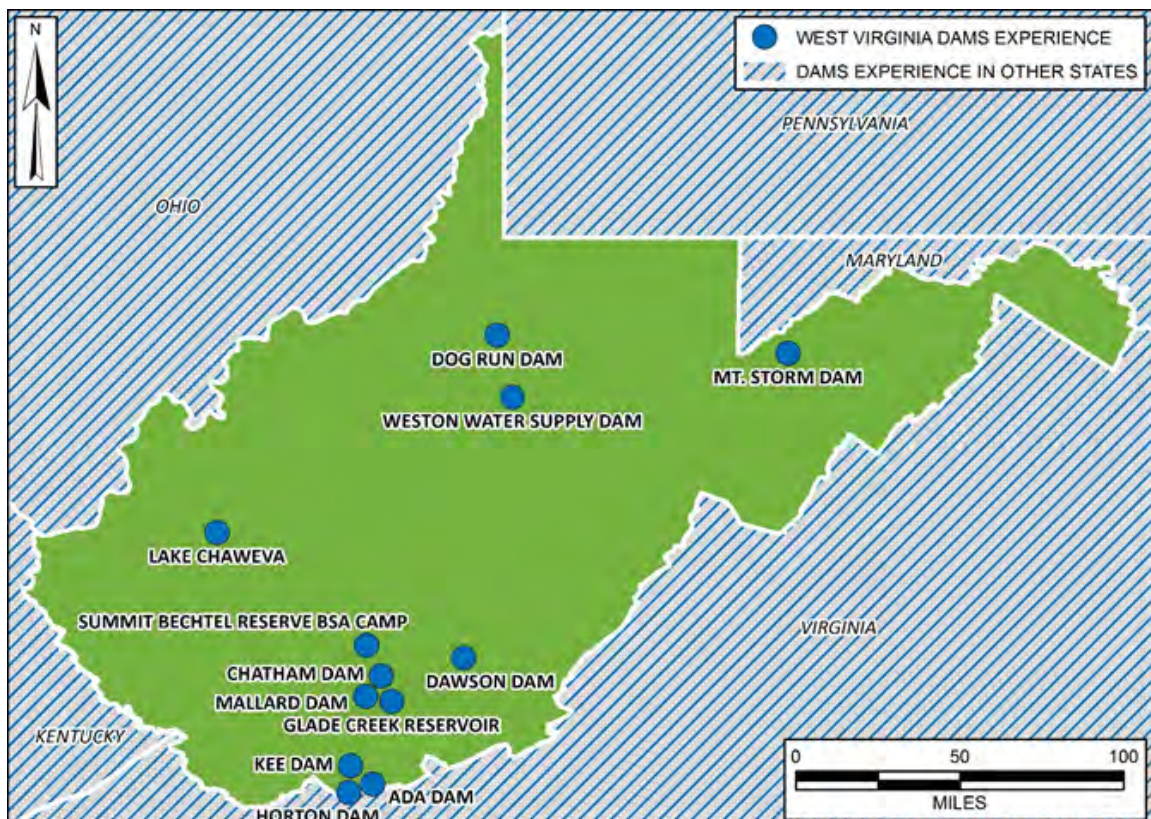


Month 13	Month 14	Month 15	Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24
										Project Finalization and Closeout	
Monthly Progress Reports During Entire Project Duration											
Environmental Permitting, Continual Agency Coordination, and Agency Approvals for Environmental Clearance			Construction Administration and Construction Inspection Services								
Compose Construction Specifications, Competitively Bid Construction Phase, and Award Construction Contract		Award Construction Contract, Construction Kick Off Meeting		Begin Construction, based on Construction Company availability and WVDNR's disruption minimization to general public plan.							

## Section 2.4: Competent and Professional Experience

The TERRADON and O'Brien & Gere team has the professional staff has significant West Virginia dam experience to accomplish all the required disciplines to accomplish this project. Our proposal documents both our project experience and the staffing plan shows the breadth and depth of our staff bolstered by the staff of O'Brien & Gere. TERRADON is confident that we can perform all the engineering, environmental planning/permitting and construction administration tasks required to make this project successful while minimizing the impact to the WVDNR Facilities and general public.

The map below includes the various locations in which our team has successfully completed dam projects within the state. In addition to West Virginia, the team has extensive experience in all of the neighboring states as well – a list of those projects can be provided upon request.



## Appendix A: Resumes

12. NAME <b>Bill Hunt, PG, LRS</b>		13. ROLE IN THIS CONTRACT <b>Environmental Manager</b>		14. YEARS EXPERIENCE	
				a. TOTAL <b>30</b>	b. WITH CURRENT FIRM <b>5</b>
15. FIRM NAME AND LOCATION (City and State) <b>TERRADON Corporation Pocahontas, West Virginia</b>					
16. EDUCATION (DEGREE AND SPECIALIZATION) Bachelor of Science, Environmental Science Master of Arts, Geography			17. CURRENT PROFESSIONAL REGISTRATION (STATE AND DISCIPLINE) Professional Geologist-IN Licensed Remediation Specialist-WV		
18. OTHER PROFESSIONAL QUALIFICATIONS (Publications, Organizations, Training, Awards, etc.) Bill Hunt serves as TERRADON's VP over the Geo-Environmental Division. Hunt offers 30 years of environmental management expertise during the completion of more than 1000 environmental projects. Hunt is a Licensed Remediation Specialist and a Professional Geologist. His background includes NEPA Compliance – EAs and FONSI's, Phase I and II ESAs, Section 404/401 permitting, soil and groundwater remediation, RCRA Closures, SPCC, BMP, SWPP and GPP plan preparation and testing and analysis. Hunt has provided environmental management services on a wide variety of projects ranging from large industrial properties to undeveloped raw land.					
<b>19. RELEVANT PROJECTS</b>					
a.	(1) TITLE AND LOCATION (City and State) <b>NEPA Environmental Assessment (EA) Matewan, WV</b>		(2) YEAR COMPLETED		
			PROFESSIONAL SERVICES <b>2015</b>	CONSTRUCTION (If Applicable)	
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE			<input checked="" type="checkbox"/> Check if project performed with current firm		
EA conducted for the Mingo County Board of Education for a property transfer. This work was done as a Section 6(f) Conversion Land project pursuant to the requirements of the Land and Water Conservation Act (LAWCON) of 1965. Three replacement parcels of land were evaluated for conversion of the existing Matewan Swimming Pool. The project evaluated the alternative properties for potential impact to cultural resources, hazardous materials/wastes, geologic resources, noise and energy resources, surface water resources, floodplains, wetlands, threatened and endangered species, recreation, aesthetics, socio-economic conditions and environmental justice.					
b.	(1) TITLE AND LOCATION (City and State) <b>NEPA Environmental Assessment (EA) Charleston, WV</b>		(2) YEAR COMPLETED		
			PROFESSIONAL SERVICES <b>2012</b>	CONSTRUCTION (If Applicable)	
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE			<input checked="" type="checkbox"/> Check if project performed with current firm		
EA conducted for the Kanawha County Board of Education for a property transfer. This work was done as a Section 6(f) Conversion Land project pursuant to the requirements of the Land and Water Conservation Act (LAWCON) of 1965. Three replacement parcels of land were evaluated for conversion of an existing park. The project evaluated the alternative properties for potential impact to cultural resources, hazardous materials/wastes, geologic resources, noise and energy resources, surface water resources, floodplains, wetlands, threatened and endangered species, recreation, aesthetics, socio-economic conditions and environmental justice.					
c.	(1) TITLE AND LOCATION (City and State) <b>Cell Tower NEPA Categorical Exclusion Study Multiple Locations, WV</b>		(2) YEAR COMPLETED		
			PROFESSIONAL SERVICES <b>2010 - 2015</b>	CONSTRUCTION (If Applicable)	
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE			<input checked="" type="checkbox"/> Check if project performed with current firm		
Conducted numerous NEPA Compliance Assessments for cell tower locations throughout the state of West Virginia. The work followed NEPA Section 107 guidelines assessing the properties for potential impact to cultural resources, hazardous materials/wastes, geologic resources, noise and energy resources, surface water resources, floodplains, wetlands, threatened and endangered species, recreation, aesthetics, socio-economic conditions and environmental justice.					
d.	(1) TITLE AND LOCATION (City and State) <b>Wetland Mitigation Re-Design/Implementation Fraziers Bottom, WV</b>		(2) YEAR COMPLETED		
			PROFESSIONAL SERVICES <b>2012</b>	CONSTRUCTION (If Applicable)	
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE			<input checked="" type="checkbox"/> Check if project performed with current firm		
Conducted hydrological assessment of an existing wetland mitigation project. Assessment conducted to determine short-comings of previous design by another firm. Identified topographic and hydrologic barriers within the mitigation cells. Redesigned mitigation cells to enhance surface water movement and infiltration within the mitigation cells to allow greater development of hydrophytic vegetation.					
e.	(1) TITLE AND LOCATION (City and State) <b>Groundwater Data Statistical Analysis Tucker County, WV</b>		(2) YEAR COMPLETED		
			PROFESSIONAL SERVICES <b>On-going</b>	CONSTRUCTION (If Applicable)	
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE			<input checked="" type="checkbox"/> Check if project performed with current firm		
Conduct statistical analysis of groundwater quality data, current and historical, to assess integrity of landfill cells. The groundwater data were evaluated for impacts related to the landfill. West Virginia regulations (§33-4.11.a.6) provide for a variety of statistical evaluation techniques for the evaluation of groundwater data. Intra-well statistical calculations are the statistical method implemented at TCL. The statistical analysis program used to analyze inorganic parameters is DUMPStat (Downgradient Upgradient Monitoring Program Statistics). The Shewhart-CUSUM control charts were used for intra- and inter-well analyses.					



12. NAME <b>John James, PE</b>	13. ROLE IN THIS CONTRACT <b>Senior Geotechnical and Structural Engineer</b>	14. YEARS EXPERIENCE	
		a. TOTAL <b>47</b>	b. WITH CURRENT FIRM <b>11</b>
15. FIRM NAME AND LOCATION (City and State) <b>TERRADON Corporation      Poca, WV</b>			
16. EDUCATION (DEGREE AND SPECIALIZATION) <b>BS, Civil Engineering</b>		17. CURRENT PROFESSIONAL REGISTRATION (STATE AND DISCIPLINE) <b>Professional Engineer, WV, NC</b>	

18. OTHER PROFESSIONAL QUALIFICATIONS (Publications, Organizations, Training, Awards, etc.)  
 John James is a Senior Geotechnical Engineer for: various earth and rock fill dams, numerous foundation investigations, studies and designs for landfills and environmental facilities, surface and ground water studies, remediation studies, foundation investigations and designs ranging in size from houses to major industrial complexes, storm drainage facilities, airport facilities, landslide analysis and correction, and forensic engineering. James specializes in innovative and cost-saving concepts for client projects.

**19. RELEVANT PROJECTS**

a.	(1) TITLE AND LOCATION (City and State) <b>Upper Glade Creek Water Supply Dam Beckley, WV</b>	(2) YEAR COMPLETED	
		PROFESSIONAL SERVICES <b>2011</b>	CONSTRUCTION (If Applicable) <b>2014</b>
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE		<input checked="" type="checkbox"/> Check if project performed with current firm	
<b>Geotechnical Engineer.</b> The \$205K project included providing an additional 15 days of storage for drought conditions for Beckley Water Company. The selected water storage facilities included the Lower and Upper Glade Creek Dams. The study/design was complicated by the necessity to route design floods through the upstream Flattop Lake. The Lower Dam is a concrete weir type dam, and the impoundment is bisected by WV Route 3. The upper dam is a 76 foot high earth and rock fill dam built circa 1977. The study phase included: 1) evaluating the installation of automatic gates on the lower water supply dam, which would be operated during "normal" flood events to prevent overtopping of WV Route 3 during flood events less than 100 years, 2) provide storage during drought conditions, 3) increasing the pool volume by dredging and excavating below the pool level, 4) constructing another dam on water company property, and 5) using an innovative method of raising of the lake level in the upper impoundment. Cost analysis indicated that raising the lake level in the upper reservoir would be the least expensive.			
b.	(1) TITLE AND LOCATION (City and State) <b>Chatham Lake Dam Glade Springs, WV</b>	(2) YEAR COMPLETED	
		PROFESSIONAL SERVICES <b>2003-2004</b>	CONSTRUCTION (If Applicable) <b>2004</b>
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE		<input checked="" type="checkbox"/> Check if project performed with current firm	
The \$1.3 million dam project was complicated by the development of residential properties around an upscale golf resort in southern West Virginia. Initial involvement included planning, which evolved to combine three smaller dams and lakes to one large dam and lake. The chosen design resulted in a 70' high dam with one 70 acre lake. Studies included water balance studies including low flow augmentation requirements and golf course irrigation requirements. It was determined that low flow augmentation requirements, irrigation needs and peak summer evaporation rates were each about equal. After selecting appropriate lake and dam sizing, the dam was designed with safety and cost effectiveness paramount.			
c.	(1) TITLE AND LOCATION (City and State) <b>Dawson Dam Dawson, WV</b>	(2) YEAR COMPLETED	
		PROFESSIONAL SERVICES <b>2009</b>	CONSTRUCTION (If Applicable) <b>2009</b>
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE		<input checked="" type="checkbox"/> Check if project performed with current firm	
The developer desired a lake as a design feature for a residential development in Dawson, Greenbrier County, WV. The initial scope included a study of dam height/cost/lake area and included some non-engineering aspects as aesthetic details. As a residential feature, the developer was interested in the lake area as opposed to water volume. After the lake area was chosen, TERRADON designed the dam to be as economical as possible and included such innovative concepts as making a portion of the emergency spillway a wetland as part of necessary mitigation. TERRADON also provided QC and construction certification for the Dawson Dam and provided the required dam safety inspections since the completion of construction. Services included the development of an Emergency Action Plan and an Operation and Maintenance Plan for the Dawson Dam. Total construction costs totaled \$350K.			
d.	(1) TITLE AND LOCATION (City and State) <b>Water Supply Dams, Design and Upgrade West Virginia</b>	(2) YEAR COMPLETED	
		PROFESSIONAL SERVICES <b>Various</b>	CONSTRUCTION (If Applicable) <b>Various</b>
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE		<input checked="" type="checkbox"/> Check if project performed with current firm	
Provided upgrade and design services for various water supply dams throughout West Virginia. Projects include: Upper & Lower Dog Run Dams, Salem, West Virginia; Key Dam, Bluefield, West Virginia; and Weston Water Supply Dam, Weston, West Virginia. Geotechnical analysis and studies included: seismic analysis and monitoring; seepage analysis and corrective design; and reconstruction and structural design components.			

12. NAME <b>W. Joe Saunders</b>		13. ROLE IN THIS CONTRACT <b>Senior Structural and Transportation Engineer</b>		14. YEARS EXPERIENCE a. TOTAL <b>22</b>		b. WITH CURRENT FIRM <b>4</b>	
15. FIRM NAME AND LOCATION (City and State) <b>TERRADON Corporation Nitro, WV</b>							
16. EDUCATION (DEGREE AND SPECIALIZATION) <b>B.S., Civil Engineering, West Virginia Technical Institute</b>				17. CURRENT PROFESSIONAL REGISTRATION (STATE AND DISCIPLINE) <b>Professional Engineer – WV, OH, VA, NC</b>			
18. OTHER PROFESSIONAL QUALIFICATIONS (Publications, Organizations, Training, Awards, etc.) Joe Saunders is a Professional Engineer with 17 years of project management and design experience. He is licensed in West Virginia, Ohio, Virginia and North Carolina, and offers a wealth of experience related to engineering design and plan development for structures and roadways. Saunders is responsible for engineering studies, analysis, and design for the development of construction plans including: structural retaining walls, foundations, bridge replacements and rehabilitations, roadway and highway design, right-of-way plans, and ancillary design. Additional responsibilities include preliminary design and reports, construction plans and specifications, construction estimates, contracts and bidding review, and construction engineering. Saunders directs design teams at TERRADON by performing design tasks, QA/QC checking and reviewing, and hydrology and hydraulic calculations. Saunders also works with the design teams to schedule manpower and capacity for projects and provides daily coordination of project tasks with clients/owners.							
<b>19. RELEVANT PROJECTS</b>							
a.	(1) TITLE AND LOCATION (City and State) <b>Bluestone Dam Structural Design and Inspection Summers County, WV</b>			(2) YEAR COMPLETED			
				PROFESSIONAL SERVICES <b>On-going</b>		CONSTRUCTION (If Applicable)	
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE				<input checked="" type="checkbox"/> Check if project performed with current firm			
Senior Design Engineer for the Bluestone Dam Phase IV Construction team. Designs included structural cantilevered steel framing anchored to the sloped downstream face of the dam that supports drilling operations for anchor installation and a 150 ton crane. The cantilevered platform extends 32' from the face of the dam, with supports spaced up to as much as 15'. This spacing provides main support members to accommodate the full weight of the 150 ton crane and support vehicles, and requires a detailed examination of fatigue prone members for the design service life of the project. All members below high water level were designed to support full loadings and force effects from water and debris collisions.							
b.	(1) TITLE AND LOCATION (City and State) <b>Design of US-35 in Mason County, WV</b>			(2) YEAR COMPLETED			
				PROFESSIONAL SERVICES <b>2008</b>		CONSTRUCTION (If Applicable) <b>2010</b>	
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE				<input type="checkbox"/> Check if project performed with current firm			
Served as Principal Designer on the design of this 3.5 mile section of divided four lane highway on a new alignment with up to 4 million yards of excavation, several bridges and culverts, and a half mile of stream relocation. The design was completed on a fast track schedule within 6 months (instead of normal 18 month). Saunders coordinated this effort and provided quality control on this \$48M project by directing as many as 45 professionals at any time. The project won the engineering excellence award, the bids were under budget and was constructed with no change orders.							
c.	(1) TITLE AND LOCATION (City and State) <b>Corridor H, Grant County, WV</b>			(2) YEAR COMPLETED			
				PROFESSIONAL SERVICES <b>2006</b>		CONSTRUCTION (If Applicable) <b>2008</b>	
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE				<input type="checkbox"/> Check if project performed with current firm			
Served as Principal Designer on the design of this 2.5 mile section of divided four lane highway on a new alignment with several million yards of excavation, culverts, access roads and complete right of way plans. Saunders coordinated this effort by partnering with WVDOH and various environmental permitting agencies in the early stages of the design to meet the schedule. The project won the engineering excellence award, the bids were under budget and was constructed with no change orders.							
d.	(1) TITLE AND LOCATION (City and State) <b>Corridor H, Tucker County, WV</b>			(2) YEAR COMPLETED			
				PROFESSIONAL SERVICES <b>2011</b>		CONSTRUCTION (If Applicable) <b>Under Construction</b>	
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE				<input type="checkbox"/> Check if project performed with current firm			
Served as Principal Designer on the design of this 2 mile section of divided four lane highway on a new alignment. Impressed with the quality of design on this project, the client, WVDOH, asked to take the designs of adjacent 4 other similar sections of this highway completed by other consultants and combine all 5 sections, approximately 10 miles total, into one construction contract. The project won the engineering excellence award, the bids were under budget and was constructed with no change orders. The quality control implemented by Saunders makes all these projects candidates for awards. The bids come under budget because the plans are clear and concise. The high quality set of plans eliminates the need for change orders.							

12. NAME <b>Robert F. Simmons III, PE</b>		13. ROLE IN THIS CONTRACT <b>Senior Design Engineer</b>		14. YEARS EXPERIENCE	
				a. TOTAL <b>8</b>	b. WITH CURRENT FIRM <b>4</b>
15. FIRM NAME AND LOCATION (City and State) <b>TERRADON Corporation Nitro, West Virginia</b>					
16. EDUCATION (DEGREE AND SPECIALIZATION) Bachelor of Science, Civil Engineering			17. CURRENT PROFESSIONAL REGISTRATION (STATE AND DISCIPLINE) WV Professional Engineer; Level V Inspector		
18. OTHER PROFESSIONAL QUALIFICATIONS (Publications, Organizations, Training, Awards, etc.) Robert Simmons serves as a Senior Design Engineer at TERRADON Corporation. Simmons offers a background in structural design, geotechnical investigation and design, material testing and onsite inspection, including the inspection of large soil embankments, gabion basket installations, mass and lightweight concrete pours. Additionally, Simmons has served as the Quality Control Manager on multiple large projects and provided report review and technical guidance for field staff, which also included the inspection of structural steel welding and shear stud installation. Simmons has provided services on a number of projects throughout West Virginia, Kentucky, Virginia and southern Ohio.					
<b>19. RELEVANT PROJECTS</b>					
a.	(1) TITLE AND LOCATION (City and State) <b>Bluestone Dam Phase IV Construction Engineering</b> Hinton, WV		(2) YEAR COMPLETED		
			PROFESSIONAL SERVICES <b>Ongoing</b>	CONSTRUCTION (If Applicable) <b>N/A</b>	
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE			<input checked="" type="checkbox"/> Check if project performed with current firm		
Senior design engineer for the contractor for all work regarding the platform. Designs have included forces and buckling effects on pier columns installed on an incline under various loading conditions. These conditions include both axial, coming from the platform above, as well as lateral collision forces from debris striking the structure during high water events.					
b.	(1) TITLE AND LOCATION (City and State) <b>Hammerstrait Bridge Replacement</b> Mason County, WV		(2) YEAR COMPLETED		
			PROFESSIONAL SERVICES <b>2015</b>	CONSTRUCTION (If Applicable) <b>N/A</b>	
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE			<input checked="" type="checkbox"/> Check if project performed with current firm		
Senior design engineer for the project. This included the design of concrete abutments supported on piling driven to rock, steel plate girders, and concrete deck.					
c.	(1) TITLE AND LOCATION (City and State) <b>Catfish Man of the Woods Bridge Replacement</b> Cabell County, WV		(2) YEAR COMPLETED		
			PROFESSIONAL SERVICES <b>2013</b>	CONSTRUCTION (If Applicable) <b>N/A</b>	
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE			<input checked="" type="checkbox"/> Check if project performed with current firm		
Senior design engineer for the project. This included the design of concrete abutments supported on drilled shaft foundations to rock, concrete prestressed box girders, and concrete deck.					
d.	(1) TITLE AND LOCATION (City and State) <b>Elkins-Randolph County Regional Airport (EKN)</b> Elkins, WV		(2) YEAR COMPLETED		
			PROFESSIONAL SERVICES <b>2011</b>	CONSTRUCTION (If Applicable) <b>N/A</b>	
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE			<input checked="" type="checkbox"/> Check if project performed with current firm		
Provided design assistance, as well as onsite construction observation, for the rehabilitation and narrowing of Runway 5-23. The runway was narrowed from 150' to 75' during rehabilitation in order to conform to current FAA guidelines for a B-II airport. The narrowing caused all Airfield lighting associated with the runway and associated taxiway to be replaced. The replacement lighting was upgraded such that the wiring was installed in conduit to facilitate easier future repairs. Provided design assistance, as well as onsite construction observations for a stream bank stabilization project. A small stream located on the airport property was rapidly eroding its banks, and destroying developable property for the project. Loose material was excavated, and gabion baskets were installed in the area of erosion. Provided design assistance, as well as onsite construction observation for Runway 5 that penetrated the Runway approach surface. Obstructions included multiple trees and one house that was purchased by the airport and then demolished.					



12. NAME <b>E. Michael Pyles, PE</b>		13. ROLE IN THIS CONTRACT <b>Senior Civil and Hydraulic Engineer</b>		14. YEARS EXPERIENCE	
				a. TOTAL <b>40</b>	b. WITH CURRENT FIRM <b>5</b>
15. FIRM NAME AND LOCATION (City and State) <b>TERRADON Corporation Nitro, West Virginia</b>					
16. EDUCATION (DEGREE AND SPECIALIZATION) B.S. Civil Engineering M.S. Engineering			17. CURRENT PROFESSIONAL REGISTRATION (STATE AND DISCIPLINE) Professional Engineer – WV		
18. OTHER PROFESSIONAL QUALIFICATIONS (Publications, Organizations, Training, Awards, etc.) Pyles has served as Project Engineer on civil/environmental projects for State, County and City government clients since 1972. His key areas of expertise include bridge scour analysis, hydraulic stream modeling, stormwater system design, construction plan/specifications preparation, and state/federal permitting. In addition, he is proficient with the utilization of computer aided drafting (CADD) for construction plans preparation on civil/environmental design projects. He also has experience providing post design services including bid documents, construction oversight, and record plan preparation.					
<b>19. RELEVANT PROJECTS</b>					
a.	(1) TITLE AND LOCATION (City and State) <b>Forks of Cacapon Bridge</b> Forks of Cacapon, WV		(2) YEAR COMPLETED		
			PROFESSIONAL SERVICES <b>2007</b>	CONSTRUCTION (If Applicable) <b>2008</b>	
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE			<input type="checkbox"/> Check if project performed with current firm		
Senior Design Engineer for a project that consisted of the preparation of a hydraulic analysis of the piers and abutments and the deck drainage design on a new bridge for a West Virginia Department of Highways project to replace the existing bridge over the Cacapon River. The hydraulic analysis indicated that footer design for all three bridges was adequate to resist the predicted scour and the bridge replacement did not increase the 100-year flood elevation.					
b.	(1) TITLE AND LOCATION (City and State) <b>US Route 35 Relocation</b> Buffalo, WV		(2) YEAR COMPLETED		
			PROFESSIONAL SERVICES <b>2002</b>	CONSTRUCTION (If Applicable) <b>2007</b>	
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE			<input type="checkbox"/> Check if project performed with current firm		
Senior Design Engineer for a project that consisted of the design on three new bridges over Five and Twenty Mile Creek for a WVDOT project to relocate US Route 35 and WV 869. Since the proposed WV 869 bridge could sometimes in the backwater from the Kanawha River, the scour analysis was prepared for the Kanawha River normal pool and backwater conditions. The scour analysis indicated that footer design for all three bridges was adequate to resist the predicted scour and the bridge replacements did not increase the 100-year flood elevation.					
c.	(1) TITLE AND LOCATION (City and State) <b>The Summit Bechtel Family National Scouting Reserve</b> Mt. Hope, WV		(2) YEAR COMPLETED		
			PROFESSIONAL SERVICES <b>2012</b>	CONSTRUCTION (If Applicable) <b>N/A</b>	
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE			<input type="checkbox"/> Check if project performed with current firm		
Senior Design Engineer for a project that consisted of 60+miles of underground utilities for the 10,600+ acre site of the National Boy Scout Camp. From the initial site selection to surveying, planning, infrastructure design and inspection, TERRADON was a key player in creating one of the highest-profile design and construction endeavors in West Virginia. Working under tight specifications and time restrictions, TERRADON spearheaded the delivery of quality results.					
d.	(1) TITLE AND LOCATION (City and State) <b>Greenbrier River Bridge</b> Hinton, WV		(2) YEAR COMPLETED		
			PROFESSIONAL SERVICES <b>2000</b>	CONSTRUCTION (If Applicable) <b>N/A</b>	
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE			<input type="checkbox"/> Check if project performed with current firm		
Senior Design Engineer for a project for the WVDOT bridge over the Greenbrier River at the confluence of the Greenbrier River and the New River downstream of the Bluestone Dam. The hydraulic analysis was performed to determine the proper bridge waterway opening.					

12. NAME Samuel P. Wilkes, MS, PWS		13. ROLE IN THIS CONTRACT Environmental Project Manager		14. YEARS EXPERIENCE	
				a. TOTAL 20	b. WITH CURRENT FIRM 2
15. FIRM NAME AND LOCATION (City and State) TERRADON Corporation Pocahontas, West Virginia					
16. EDUCATION (DEGREE AND SPECIALIZATION) Master of Science; Environmental Science & Policy Bachelor of Science, Earth & Environmental Science			17. CURRENT PROFESSIONAL REGISTRATION (STATE AND DISCIPLINE) Professional Wetland Scientist – Nationwide OSHA 1910.120/1926.65 HAZWOPER		

**18. OTHER PROFESSIONAL QUALIFICATIONS (Publications, Organizations, Training, Awards, etc.)**

Sam Wilkes serves as TERRADON's Environmental Project Manager. Wilkes offers more than 20 years consulting experience as a project manager and senior environmental scientist providing technical support to watershed management, restoration, natural resource conservation, and hazardous materials programs. He has experience providing oversight and management of field teams and contractors collecting wetland, stream quality, environmental media data, and general site condition data for site characterization and environmental permitting purposes. As a project manager, he regularly interact with clients, manages budgets, personnel staffing, prepares quality project deliverables, meets project deadlines, and presents scientific information to clients and the general public. Publications include:

**Cormier, S. M., Wilkes, S. P. and Zheng, L. (2013).** Relationship of land use and elevated ionic strength in Appalachian watersheds. *Environmental Toxicology and Chemistry*, 32: 296–303. doi: 10.1002/etc.2055

**U.S. EPA (Environmental Protection Agency). 2011.** A Field-Based Aquatic Life Benchmark for Conductivity in Central Appalachian Streams. Office of Research and Development, National Center for Environmental Assessment, Washington, DC. EPA/600/R-10/023F. ([http://cfpub.epa.gov/si/si\\_public\\_record\\_report.cfm?dirEntryId=233809](http://cfpub.epa.gov/si/si_public_record_report.cfm?dirEntryId=233809))

**19. RELEVANT PROJECTS**

a.	(1) TITLE AND LOCATION <i>(City and State)</i> <b>Pine Creek Watershed Implementation Plan, Beckley, WV</b>	(2) YEAR COMPLETED	
		PROFESSIONAL SERVICES <b>2011</b>	CONSTRUCTION (If Applicable)
	(3) BRIEF DESCRIPTION <i>(Brief scope, size, cost, etc.) AND SPECIFIC ROLE</i>	<input type="checkbox"/> Check if project performed with current firm	
Project Manager to support the WVDEP and Piney Creek Watershed Association to create a watershed management plan within 80K budget. The implementation plan integrated strategies for both nonpoint and point sources throughout the watershed to meet the pollutant reductions required by the TMDLs. The watershed contains many contributing sources, such as abandoned mine lands, runoff from urban and non-vegetated areas, failing septic systems, and stream bank erosion. The plan is a tool to help determine and prioritize green infrastructure projects locations throughout the watershed, especially within the City of Beckley, MS4 area.			
b.	(1) TITLE AND LOCATION <i>(City and State)</i> <b>WV Total Maximum Daily Load Development, Statewide, WV</b>	(2) YEAR COMPLETED	
		PROFESSIONAL SERVICES <b>2003-2013</b>	CONSTRUCTION (If Applicable)
	(3) BRIEF DESCRIPTION <i>(Brief scope, size, cost, etc.) AND SPECIFIC ROLE</i>	<input type="checkbox"/> Check if project performed with current firm	
Under the Clean Water Act, provided support of technical tasks for over 2,500 TMDLs developed for the WVDEP/DWWM since 2003 with a cumulative project budget of over \$7M. Responsibilities included assessing watershed data for metals, pH, fecal coliform and biological impairment representation in the water quality modeling. TMDLs were developed by integrating all available data; chemical, biological, permit and landuse information, into the watershed modeling and permit allocation processes. Managed the team of biologists using the USEPA stressor identification methodology to identify pollutant stressors to the biological community to ensure all significant pollutant sources are captured in the TMDL process. This stressor identification process has become a collaborative effort directed by Mr. Wilkes that brings together a wide array of ecologists and biologists to arrive at causative stressor decisions to address biologically impaired streams.			
c.	(1) TITLE AND LOCATION <i>(City and State)</i> <b>Waters of the U.S. Assessment and Delineation statewide, WV</b>	(2) YEAR COMPLETED	
		PROFESSIONAL SERVICES <b>2014-2015</b>	CONSTRUCTION (If Applicable)
	(3) BRIEF DESCRIPTION <i>(Brief scope, size, cost, etc.) AND SPECIFIC ROLE</i>	<input checked="" type="checkbox"/> Check if project performed with current firm	
Managed and conducted Waters of the US assessment and delineation on over 300 individual oil/gas well pads, site access roads, and over 1,800 field inspections of aboveground storage tanks. All work was done in accordance with US Army Corps of Engineers (USACE) 1987 Manual, the Eastern Mountains and Piedmont Regional Supplement and WVDEP Guidance. Individual or nationwide permits have been obtained through the USACE Huntington District.			

12. NAME <b>James Nagy</b>		13. ROLE IN THIS CONTRACT <b>Project Engineer</b>		10. YEARS EXPERIENCE	
				a. TOTAL <b>40</b>	b. WITH CURRENT FIRM <b>8</b>
15. FIRM NAME AND LOCATION (City and State) <b>TERRADON Corporation Nitro, West Virginia</b>					
16. EDUCATION (DEGREE AND SPECIALIZATION) <b>Bachelor of Science, Civil Engineering</b>			17. CURRENT PROFESSIONAL REGISTRATION (STATE AND DISCIPLINE) <b>WV</b>		
18. OTHER PROFESSIONAL QUALIFICATIONS (Publications, Organizations, Training, Awards, etc.) James Nagy serves as a Project Engineer/Manager in the Geo-Environmental Group for TERRADON. Acting as a project engineer he provides engineering services for other groups within TERRADON, i.e., Land Development, Civil and Survey. As a project manager he works to maintain relations with existing Environmental Department clients by providing permitting and reporting services that are required by the DEP and other regulatory agencies, as well as other miscellaneous needs the client may have. Nagy has a great deal of experience dealing with utility companies and provides assistance to all departments within TERRADON when dealing with utilities on various projects. He is also the primary person responsible for preparing permit applications for the WV Bureau of Public Health for water and sewer projects.					
<b>19. RELEVANT PROJECTS</b>					
a.	(1) TITLE AND LOCATION (City and State) <b>The Bechtel Summit National Scouting Reserve</b>		(2) YEAR COMPLETED		
			PROFESSIONAL SERVICES <b>2012 - 2013</b>	CONSTRUCTION (If Applicable) <b>2012 - 2013</b>	
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE			<input checked="" type="checkbox"/> Check if project performed with current firm		
Performed preliminary design and layout of water facilities, including meter vault, booster station, chlorination station, and water storage tanks. Prepared plans and specifications for construction of a 2.0 MG and a 6.0 MG concrete water storage tank and related appurtenances. Conducted periodic construction monitoring of sewage treatment facilities, including waste water equalization pond, treatment plant, and land irrigation system. Prepared permit applications for submittal to the WV BPH for water and waste water systems, water storage tanks, and temporary swimming pools.					
b.	(1) TITLE AND LOCATION (City and State) <b>School Projects</b>		(2) YEAR COMPLETED		
			PROFESSIONAL SERVICES <b>On-going</b>	CONSTRUCTION (If Applicable)	
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE			<input checked="" type="checkbox"/> Check if project performed with current firm		
Responsible for layout, design and permitting of water and sewer lines for numerous school projects in WV. Projects entailed coordination with PSDs, municipal water and sewer departments, and State and Federal regulatory agencies for design of facilities.					
c.	(1) TITLE AND LOCATION (City and State) <b>Commercial Developments</b>		(2) YEAR COMPLETED		
			PROFESSIONAL SERVICES <b>On-going</b>	CONSTRUCTION (If Applicable)	
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE			<input checked="" type="checkbox"/> Check if project performed with current firm		
Responsible for layout, design and permitting of water and sewer lines for numerous commercial development projects in WV. Projects entailed coordination with PSDs, municipal water and sewer departments, and State and Federal regulatory agencies for design of facilities.					
d.	(1) TITLE AND LOCATION (City and State) <b>Charleston Replacement Housing</b>		(2) YEAR COMPLETED		
			PROFESSIONAL SERVICES <b>On-going</b>	CONSTRUCTION (If Applicable)	
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE			<input checked="" type="checkbox"/> Check if project performed with current firm		
Utility design, primarily water, sewer and stormwater, and coordination of overall site activities with the project developer for multi-unit housing development. Each phase entailed the design and layout of several hundred feet of water, sewer and stormwater lines, including multiple connections with the utility providers, i.e., the Charleston Sanitary Board and West Virginia American Water, and applicable permit applications. Also responsible for construction monitoring and provision of as-built drawings as required by the respective utility providers.					
e.	(1) TITLE AND LOCATION (City and State) <b>Manila Ridge Water Main Extension Project</b>		(2) YEAR COMPLETED		
			PROFESSIONAL SERVICES <b>2014</b>	CONSTRUCTION (If Applicable)	
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE			<input checked="" type="checkbox"/> Check if project performed with current firm		
Performed layout and design of approximately 37,000 feet of 6" & 2" water line and all necessary appurtenances to serve about 56 customers in the Manila Ridge area of Putnam County. Also responsible for all permit applications/clearances required by state and federal regulatory agencies, as well as coordination with West Virginia American Water.					

12. NAME <b>Jason Asbury</b>		13. ROLE IN THIS CONTRACT <b>Environmental/Permitting</b>		10. YEARS EXPERIENCE	
				a. TOTAL <b>10</b>	b. WITH CURRENT FIRM <b>5</b>
15. FIRM NAME AND LOCATION (City and State) <b>TERRADON Corporation Poca, West Virginia</b>					
16. EDUCATION (DEGREE AND SPECIALIZATION) <b>Bachelor of Science, Landscape Architecture</b>			17. CURRENT PROFESSIONAL REGISTRATION (STATE AND DISCIPLINE)		
18. OTHER PROFESSIONAL QUALIFICATIONS (Publications, Organizations, Training, Awards, etc.) Jason Asbury serves as a Geo-Environmental Project Manager and Environmental Agency Coordinator for TERRADON. Acting as regulatory liaison/coordinator, Asbury provides critical project support for specialized permitting and erosion and sediment control planning, as well as conducting field work for wetland assessment/delineation projects and Section 404/401 permitting. Asbury is also responsible for developing site, grading, landscape and utility plans, site detailing and erosion sediment control plans and permitting.					
<b>19. RELEVANT PROJECTS</b>					
a.	(1) TITLE AND LOCATION (City and State) <b>The Bechtel Summit National Scouting Reserve</b>		(2) YEAR COMPLETED		
			PROFESSIONAL SERVICES <b>2010</b>	CONSTRUCTION (If Applicable) <b>2013</b>	
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE		<input checked="" type="checkbox"/> Check if project performed with current firm			
Served as Regulatory Coordinator for a 10,600+/- acres recreational development in Fayette County, WV, acting as the primary contact with the WVDEP on behalf of all contractors and consultants, for more than 50 site permits. Responsible for NPDES design and permitting, including erosion and sediment control, for multiple contractors/consultants with the WVDEP. The project included 550,000 tons of aggregate, 600 acres of grading activities, 28 miles of drainage swales, 14 miles of new road construction, 4 earthen dams, and more than 60 miles of new utility installation.					
b.	(1) TITLE AND LOCATION (City and State) <b>Chesapeake Energy – Trace Fork Slip</b>		(2) YEAR COMPLETED		
			PROFESSIONAL SERVICES <b>2012</b>	CONSTRUCTION (If Applicable)	
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE		<input checked="" type="checkbox"/> Check if project performed with current firm			
Served as Regulatory Coordinator for erosion repair design for 175'x40' wide slip for Chesapeake Energy. Redesigned a stormwater channel and filed a notice of termination with WVDEP. Managed permit closure for the site.					
c.	(1) TITLE AND LOCATION (City and State) <b>Columbia Pipeline Group</b>		(2) YEAR COMPLETED		
			PROFESSIONAL SERVICES <b>2012</b>	CONSTRUCTION (If Applicable)	
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE		<input checked="" type="checkbox"/> Check if project performed with current firm			
Served as Regulatory Coordinator and Site Designer for a compressor station site that routinely flooded. Project included hydraulic analysis on existing drainage structures. Designed approximately 500-foot of pipe replacement to alleviate runoff. Tasks included stormwater calculations, grading plan, and stormwater design and handled all agency contact for the submittal and approval of the project permits.					
d.	(1) TITLE AND LOCATION (City and State) <b>Chesapeake Energy Aquatic Resource Assessment/Wetland Delineations</b>		(2) YEAR COMPLETED		
			PROFESSIONAL SERVICES <b>On-going</b>	CONSTRUCTION (If Applicable)	
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE		<input checked="" type="checkbox"/> Check if project performed with current firm			
Currently serving as Qualified Individual and Regulatory Coordinator to asses existing and future oil and gas locations. Currently assessed approximately 380 well pad sites to date. Task include conducting field survey for wetland indicators (soil, vegetation, hydrology) in accordance with US Army Corps of Engineers methodology, flagging wetland boundaries for survey and preparation of reports with detailed field activities and findings for USACE. Also responsible for determining and obtaining appropriate Nationwide, Office of Land and Stream and WV DOH permits when project conditions warranted permitting.					
e.	(1) TITLE AND LOCATION (City and State) <b>Wetland Assessment Delineation for Superior Marine</b>		(2) YEAR COMPLETED		
			PROFESSIONAL SERVICES <b>2014</b>	CONSTRUCTION (If Applicable)	
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE		<input checked="" type="checkbox"/> Check if project performed with current firm			
Served as Qualified Individual and assessed a 2.5 acre site located along the Ohio River. Task included conducting field survey for wetland indicators (soil, vegetation, hydrology) in accordance with US Army Corps of Engineers methodology, flagging wetland boundaries for survey and preparation of reports with detailed field activities and findings for USACE.					

12. NAME <b>Michael Pickens</b>		13. ROLE IN THIS CONTRACT <b>Project Geologist</b>		10. YEARS EXPERIENCE	
				a. TOTAL <b>1</b>	b. WITH CURRENT FIRM <b>1</b>
15. FIRM NAME AND LOCATION (City and State) <b>TERRADON Corporation Nitro, West Virginia</b>					
16. EDUCATION (DEGREE AND SPECIALIZATION) <b>Bachelor of Science, Geology</b>			17. CURRENT PROFESSIONAL REGISTRATION (STATE AND DISCIPLINE)		
18. OTHER PROFESSIONAL QUALIFICATIONS (Publications, Organizations, Training, Awards, etc.) Michael Pickens serves as a Geo-Environmental Project Geologist for TERRADON. Through training and course curriculum, Pickens provides permitting, geotechnical, geological and environmental support for different projects, as well as conducting field inspections and sampling both soil and water for potential contaminants. Utilizing course curriculum Pickens has experience with interpretation and investigation of the subsurface and applying geologic information to engineering and environmental applications.					
<b>19. RELEVANT PROJECTS</b>					
a.	(1) TITLE AND LOCATION (City and State) <b>Geotechnical Drilling Inspections</b>		(2) YEAR COMPLETED		
			PROFESSIONAL SERVICES <b>On-going</b>	CONSTRUCTION (If Applicable)	
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE		<input checked="" type="checkbox"/> Check if project performed with current firm			
Currently used as a Qualified Individual on different projects for subsurface investigation utilizing information from borehole drilling or excavating trenches. With a Geology background the tasks during inspection include material descriptions of both soil and rock, data and sample collection, creating and interpreting borehole logs to depict an accurate representation of the subsurface to be utilized for different engineering or environmental applications.					
b.	(1) TITLE AND LOCATION (City and State) <b>Environmental Permitting</b>		(2) YEAR COMPLETED		
			PROFESSIONAL SERVICES <b>On-going</b>	CONSTRUCTION (If Applicable)	
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE		<input checked="" type="checkbox"/> Check if project performed with current firm			
Currently used as a Qualified Individual to assist with environmental permitting of streams, wetland, air, etc. to ensure environmental compliance and safety on project sites.					
c.	(1) TITLE AND LOCATION (City and State) <b>Field Services / Inspection</b>		(2) YEAR COMPLETED		
			PROFESSIONAL SERVICES <b>On-going</b>	CONSTRUCTION (If Applicable)	
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE		<input checked="" type="checkbox"/> Check if project performed with current firm			
Currently used as a Qualified Individual to assist with construction inspections. Experience with performing soil compaction testing, percolation testing, and taking site notes and photos to document progression of project through the different phases of construction.					
d.	(1) TITLE AND LOCATION (City and State)		(2) YEAR COMPLETED		
			PROFESSIONAL SERVICES	CONSTRUCTION (If Applicable)	
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE		<input type="checkbox"/> Check if project performed with current firm			
e.	(1) TITLE AND LOCATION (City and State)		(2) YEAR COMPLETED		
			PROFESSIONAL SERVICES	CONSTRUCTION (If Applicable)	
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE		<input type="checkbox"/> Check if project performed with current firm			



12. NAME <b>Mike Ward</b>		13. ROLE IN THIS CONTRACT <b>Engineering Technician</b>		14. YEARS EXPERIENCE	
				a. TOTAL <b>30</b>	b. WITH CURRENT FIRM <b>5</b>
15. FIRM NAME AND LOCATION (City and State) <b>TERRADON Corporation Nitro, West Virginia</b>					
16. EDUCATION (DEGREE AND SPECIALIZATION) B.A. Accounting, Marshall University Engineering and Construction Management Courses, West Virginia State University			17. CURRENT PROFESSIONAL REGISTRATION (STATE AND DISCIPLINE) Bridgemont Engineering Technician Level III WVDOH Certifications for concrete, soil compaction, aggregate technician Level II post tension steel Inspector		
18. OTHER PROFESSIONAL QUALIFICATIONS (Publications, Organizations, Training, Awards, etc.) Michael Ward serves as a Senior Field Technician for TERRADON Corporation. He has provided construction management, construction observation, testing, and inspection services in the engineering industry for 30 years. Ward serves as a third-party independent inspector, or the owner's representative for municipal, commercial and industrial projects. He has extensive experience in heavy highway construction, underground utilities, soils, asphalt, concrete, grout, auger cast piles, and anchor testing.					
<b>19. RELEVANT PROJECTS</b>					
a.	(1) TITLE AND LOCATION (City and State) The Summit Bechtel Family National Scouting Reserve Mt. Hope, WV		(2) YEAR COMPLETED		
			PROFESSIONAL SERVICES <b>2009 - 2013</b>	CONSTRUCTION (If Applicable) <b>2009 - 2013</b>	
	(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE		<input checked="" type="checkbox"/> Check if project performed with current firm		
As the Senior Inspector, provided QA/QC inspection services during the construction of four (4) earthen dams. Inspection consisted of the observation of fill placement, soil compaction testing of fill, observation of concrete placement for spillways and strength testing of concrete. In addition, Mr. Ward performed evaluations of soil borrow areas used as fill material for the construction of these four (4) dams. Daily and weekly inspection logs were completed and turned into the client for documentation of construction activities and progress. In addition, the Senior Inspector led the construction inspection team which oversaw QA/QC on 14 miles of new road construction built to WVDOH specifications; installation of 64 miles of underground utilities, including 21 miles of waterline, 24 miles of sewer line, 17 miles of electric conduit, and 2 miles of gas lines; installation of the largest grey/ Blackwater sewage system east of the Mississippi. The camp also had 600 acres cleared, grubbed and graded with 28 miles of drainage swales, including erosion and sediment control best management practices. The work also included the testing of over 7,000 CY of structural concrete and over 5 Million CY of mass excavation and compaction. In addition 4 earthen dams were built with over 800,000 CY of embankment.					
b.	(1) TITLE AND LOCATION (City and State) Above Ground Storage Tank Inspections (Senate Bill 373 Compliance)		(2) YEAR COMPLETED		
			PROFESSIONAL SERVICES <b>2014</b>	CONSTRUCTION (If Applicable)	
	(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE		<input checked="" type="checkbox"/> Check if project performed with current firm		
Senior Inspector for approximately 1,800 Aboveground Storage Tank (AST) inspections. Task included navigation to and conducting field inspections of AST's according to the specifications of WVDEP. Tanks were certified as Fit for Service, Fit for Service but Repairs Required, or Not Fit for Service. The field inspections also included marking each AST with the company emergency contact number, WVDEP's emergency spill number, and the WVDEP tank identification number.					
c.	(1) TITLE AND LOCATION (City and State) City of Dunbar Wastewater Treatment Plant		(2) YEAR COMPLETED		
			PROFESSIONAL SERVICES <b>1999 - 2001</b>	CONSTRUCTION (If Applicable)	
	(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE		<input type="checkbox"/> Check if project performed with current firm		
Construction Manager and Field Inspector 10M Wastewater treatment plant and storm and sanitary line upgrades for the City of Dunbar, WV and the West Virginia Department of Environmental Protection. Contracts 2&3 installation of storm conduit and wastewater piping Inspection of 50,000 ft. of waste water and sanitary piping. 48" to 6". Excavation depths 6' to 28' monitoring excavation, backfill and compaction procedures and road repairs to ensure compliance with approved plans and specifications, inspection for alignment, grade and leakage. Extensive documentation and resolve of any complaints concerning construction activities.					

12. NAME <b>Shannon P. Stephens</b>	13. ROLE IN THIS CONTRACT <b>Senior Construction Inspector</b>	14. YEARS EXPERIENCE a. TOTAL <b>12</b> b. WITH CURRENT FIRM <b>1</b>	
15. FIRM NAME AND LOCATION (City and State) <b>TERRADON Corporation Nitro, West Virginia</b>			
16. EDUCATION (DEGREE AND SPECIALIZATION)		17. CURRENT PROFESSIONAL REGISTRATION (STATE AND DISCIPLINE) AWS Certified Welding Inspector, OSHA 30-Hour Training FAA Eastern Regional Laboratory Technician Bridgemont Engineering Technician Level III WVDOH Certifications for concrete, soil and asphalt compaction, aggregate technician	
18. OTHER PROFESSIONAL QUALIFICATIONS (Publications, Organizations, Training, Awards, etc.) Shannon Stephens joined TERRADON in early 2014 as a Senior Inspector. Stephens has performed a wide variety of construction materials testing and inspection, as well as all related analysis and reporting, for private, State and Federal clients. He previously established the in-house testing and quality control department and laboratory, creating a Quality Control unit for a heavy-highway division. Stephens has been responsible for staffing, report preparation related to materials testing, laboratory testing and reporting, staff training, and policy and procedure development.			

**19. RELEVANT PROJECTS**

(1) TITLE AND LOCATION (City and State)	(2) YEAR COMPLETED	
<b>a. Smith Fastener</b> South Charleston, WV	PROFESSIONAL SERVICES <b>2014</b>	CONSTRUCTION (If Applicable) N/A
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE <input checked="" type="checkbox"/> Check if project performed with current firm Served as Senior Inspector for the construction of an light industrial site in South Charleston, WV. On-site testing included observation of soil cuts and fill placement, observation of concrete placement, fabrication of concrete and grout compressive strength test specimens and inspection of structural steel and bolting for tilt-up concrete wall panels.		
<b>b. King's Daughters Medical Center</b> Ashland, KY	PROFESSIONAL SERVICES <b>2011</b>	CONSTRUCTION (If Applicable) N/A
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE <input type="checkbox"/> Check if project performed with current firm Served as Senior Inspector for the Heart and Vascular building renovation in Ashland, WV. Onsite testing included inspection for auger cast piles, structural steel, normal and lightweight concrete and fireproofing. Was responsible for oversight of all on-site testing and inspection as well as interfacing with client representatives and Project Engineer.		
<b>c. WACO Oil and Gas</b> Pennsboro, WV	PROFESSIONAL SERVICES <b>2015</b>	CONSTRUCTION (If Applicable) N/A
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE <input checked="" type="checkbox"/> Check if project performed with current firm Served as an Inspector for the construction of an oil/gas well pad and access road for a new gas well location. Inspection involved observation or proof rolling, conducting in field one-point proctors and compaction testing. Project also involved observation of remediation of on slide that impinged on the proposed access road route.		
<b>d. Pioneer WV FCU</b> Charleston, WV	PROFESSIONAL SERVICES <b>2014</b>	CONSTRUCTION (If Applicable) N/A
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE <input checked="" type="checkbox"/> Check if project performed with current firm Served as Senior Inspector for the new Credit Union facility in Charleston, WV. Project involvement ranged from observation of geotechnical soil borings and soil logging to on-site QA/QC testing of soil cut and fill, concrete and grout placement and fabrication of concrete and grout compressive strength test specimens.		
<b>e. West Virginia State University – New Athletic Complex</b> Institute, WV	PROFESSIONAL SERVICES <b>2014</b>	CONSTRUCTION (If Applicable) N/A
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE <input checked="" type="checkbox"/> Check if project performed with current firm Served as Senior Inspector for the QA/QC testing of the construction of a new athletic complex. Onsite testing included inspection for undercutting of poor soil, soil fill placement and compaction testing, structural steel, placement of concrete and grout, and fabrication of concrete and grout compressive strength test specimens. Was responsible for oversight of all on-site testing and inspection as well as interfacing with client representatives and Project Engineer.		



12. NAME <b>Chris Morris</b>	13. ROLE IN THIS CONTRACT <b>Engineering Technician</b>	14. YEARS EXPERIENCE	
		a. TOTAL <b>21</b>	b. WITH CURRENT FIRM <b>3</b>
15. FIRM NAME AND LOCATION (City and State) <b>TERRADON Corporation Nitro, West Virginia</b>			
16. EDUCATION (DEGREE AND SPECIALIZATION)		17. CURRENT PROFESSIONAL REGISTRATION (STATE AND DISCIPLINE) FAA Eastern Regional Laboratory Technician Bridgemont Engineering Technician Level III WVDOH Certifications for concrete, soil and asphalt compaction, aggregate technician, Level II post tension steel Inspector	

**18. OTHER PROFESSIONAL QUALIFICATIONS (Publications, Organizations, Training, Awards, etc.)**

Chris Morris serves as a Senior Inspector for TERRADON and brings more than 20 years of experience in inspection and materials testing. Morris has extensive experience in geotechnical and environmental soil and groundwater sampling and asphalt, concrete, auger cast piles, soils and laboratory testing. He is responsible for quality control testing and inspection for WVDOT and commercial and residential construction projects throughout West Virginia. He interfaces with site owners (public and private) and contractors to complete testing and inspection projects. Morris is responsible for monitoring contractor's work for conformance to the design plans, specifications and general permit requirements; experience tracking daily quantities, completing daily inspection reports, reviewing payment requisitions and maintaining field sketchbooks and as-built drawings.

**19. RELEVANT PROJECTS**

a.	(1) TITLE AND LOCATION (City and State) Above Ground Storage Tank Inspections (WV SB 37 Compliance)	(2) YEAR COMPLETED	
		PROFESSIONAL SERVICES <b>2014</b>	CONSTRUCTION (If Applicable)
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE		<input checked="" type="checkbox"/> Check if project performed with current firm	
Served as Senior Inspector for approximately 1,800 Above Ground Storage Tank inspections. Task included field inspection of AST's and certification of tanks for WVDEP compliance.			
b.	(1) TITLE AND LOCATION (City and State) Huntington VA Medical Center Slide Huntington, WV	(2) YEAR COMPLETED	
		PROFESSIONAL SERVICES <b>2013</b>	CONSTRUCTION (If Applicable)
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE		<input checked="" type="checkbox"/> Check if project performed with current firm	
Served as Engineering Technician during geotechnical investigation to determine cause of slide and slope failure. Duties included drilling coordination and inspection including observation and logging of soil sampling. Coordinated with Senior Engineer and Project Manager to relate field information and make alterations to field scope as needed.			
c.	(1) TITLE AND LOCATION (City and State) Glenville College Pioneer Center Glenville, WV	(2) YEAR COMPLETED	
		PROFESSIONAL SERVICES <b>2012-2013</b>	CONSTRUCTION (If Applicable)
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE		<input checked="" type="checkbox"/> Check if project performed with current firm	
Served as Senior Engineering Technician responsible for footing inspection, concrete testing, rebar inspection, soil placement and compaction testing, and aggregate placement and compaction testing for utility trenches. Coordinated with Project Engineer to report field conditions and make any scope changes as deemed necessary by Project Engineer.			
d.	(1) TITLE AND LOCATION (City and State) Courtyard Marriott Hotel Charleston, WV	(2) YEAR COMPLETED	
		PROFESSIONAL SERVICES <b>2013-2014</b>	CONSTRUCTION (If Applicable)
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE		<input checked="" type="checkbox"/> Check if project performed with current firm	
Served as Senior Engineering Technician to perform QA/QC testing and observation for construction of new five-story hotel. Responsible for auger cast piling testing, rebar inspection soil and concrete placement observation, masonry inspection, soil compaction testing, fabrication of concrete, mortar and grout specimens for compressive strength testing.			
e.	(1) TITLE AND LOCATION (City and State) Fairmont State Office Building Fairmont, WV	(2) YEAR COMPLETED	
		PROFESSIONAL SERVICES <b>2013-2014</b>	CONSTRUCTION (If Applicable)
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE		<input checked="" type="checkbox"/> Check if project performed with current firm	
Served as Senior Engineering Technician to perform QA/QC testing and observation for construction of new five-story office building. Responsible for caisson inspection, rebar inspection, soil and concrete placement observation, masonry inspection, soil compaction testing, fabrication of concrete, mortar and grout specimens for compressive strength testing, and steel inspection.			

**E. RESUMES OF KEY PERSONNEL PROPOSED FOR THIS CONTRACT**  
(Complete one section E for each key person.)

<b>12. NAME</b> <b>Robert R. Bowers, PE</b>		<b>13. ROLE IN THIS CONTRACT</b> Project Officer		<b>14. YEARS EXPERIENCE</b>	
				A. TOTAL 36	B. WITH CURRENT FIRM 36
<b>15. FIRM NAME AND LOCATION (city and state)</b> O'Brien & Gere (East Norriton, PA)					
<b>16. EDUCATION (degree and specialization)</b> ME/1978/Geotechnical Engineering; Cornell University BS/1977/Civil Engineering; Cornell University			<b>17. CURRENT PROFESSIONAL REGISTRATION (state and discipline)</b> Professional Engineer: DE, CT, GA, MI, NJ, NY, OH, PA Pending: WV, LA, RI, TN, VA		
<b>18. OTHER PROFESSIONAL QUALIFICATIONS (publications, organizations, training, awards, etc.)</b> Sustaining Member of Association of State Dam Safety Officials (ASDSO – Board Advisory and Training Committees) and United States Society on Dams (USSD); member of American Society of Civil Engineers.					
<b>19. RELEVANT PROJECTS</b>					
<b>a.</b>	<b>(1) TITLE AND LOCATION (city and state)</b> <b>County-Wide Dam Safety Program (Broome County, NY)</b>			<b>(2) YEAR COMPLETED</b>	
				PROFESSIONAL SERVICES 2014	CONSTRUCTION (IF APPLICABLE)
	<b>(3) BRIEF DESCRIPTION (brief scope, size, cost, etc.) AND SPECIFIC ROLE</b>			<input checked="" type="checkbox"/> check if project performed with current firm	
Project Officer – Project included developing a program to bring 20 NRCS dams into compliance with the revised NYSDEC Dam Safety regulations. The resulting phased program allowed for development of EAPs (including dam breach analyses and inundation mapping) in the first year, O&M Manuals in the second year, and Engineering Assessments (EA's) over the next three years. Subsequent task orders included ROV inspections of the outlet conduits, SITES analyses of emergency spillway erosion potential with recommended improvements for certain vulnerable spillways, and a long-term dam upgrade program to address deficiencies identified by the EA's.					
<b>b.</b>	<b>(1) TITLE AND LOCATION (city and state)</b> <b>Stafford County Dams (Stafford County, VA)</b>			<b>(2) YEAR COMPLETED</b>	
				PROFESSIONAL SERVICES	CONSTRUCTION (IF APPLICABLE)
	<b>(3) BRIEF DESCRIPTION (brief scope, size, cost, etc.) AND SPECIFIC ROLE</b>			<input checked="" type="checkbox"/> check if project performed with current firm	
Project Officer – Performed dam inspections, investigations, engineering analyses, preliminary design, value engineering, and construction administration for three water supply dams owned and operated by the County, including one NRCS dam. Services included conducting visual inspections, hydrologic, hydraulic, and dam failure assessments, dam breach analyses and inundation mapping to confirm hazard classifications, and preparation of summary reports in accordance with Virginia dam safety regulations. Permit applications were prepared for the structural modifications associated with raising of the Aquia Dam. Current work includes SITES analysis of erosion potential for the Potomac Creek Dam #1 emergency spillway.					
<b>c.</b>	<b>(1) TITLE AND LOCATION (city and state)</b> <b>DNREC Dams Improvement Program (Kent &amp; Sussex Counties, DE)</b>			<b>(2) YEAR COMPLETED</b>	
				PROFESSIONAL SERVICES Ongoing	CONSTRUCTION (IF APPLICABLE) 2 dams scheduled in 2015, the other 6 scheduled for 2016/17
	<b>(3) BRIEF DESCRIPTION (brief scope, size, cost, etc.) AND SPECIFIC ROLE</b>			<input checked="" type="checkbox"/> check if project performed with current firm	
Project Officer – Site investigations, field surveys, and preliminary and final designs for 8 dams, including installation of operable gates at existing or new outlets, repair/replacement of concrete structures/ spillways, shoreline protection, including subsurface investigations, hydrologic/hydraulic analyses, and updating EAPs.					
<b>d.</b>	<b>(1) TITLE AND LOCATION (city and state)</b> <b>(1) TITLE AND LOCATION (city and state)</b> <b>Philadelphia Water Dept. Engineering Services for Dams &amp; Reservoirs (Philadelphia, PA)</b>			<b>(2) YEAR COMPLETED</b>	
				PROFESSIONAL SERVICES Ongoing	CONSTRUCTION (IF APPLICABLE) Various
	<b>(3) BRIEF DESCRIPTION (brief scope, size, cost, etc.) AND SPECIFIC ROLE</b>			<input checked="" type="checkbox"/> check if project performed with current firm	
Project Officer – O'Brien & Gere has been providing dam safety services for 8 reservoirs in the PWD water supply system for over 25 years. Projects have included subsurface investigations for slope stability and seepage analyses, underwater inspections, annual dam safety inspections, preparation of EAPs and Operation, Maintenance & Inspection Manuals, and design and construction administration for modifications to the dams.					

**E. RESUMES OF KEY PERSONNEL PROPOSED FOR THIS CONTRACT**  
(Complete one section E for each key person.)

<b>12. NAME</b> Gary B. Emmanuel		<b>13. ROLE IN THIS CONTRACT</b> Project Manager		<b>14. YEARS EXPERIENCE</b>	
				A. TOTAL 35	B. WITH CURRENT FIRM 7
<b>15. FIRM NAME AND LOCATION (city and state)</b> O'Brien & Gere (East Norriton, PA)					
<b>16. EDUCATION (degree and specialization)</b> BS/1976/Civil Engineering; Lafayette College MS/1982/Civil Engineering; The Pennsylvania State University			<b>17. CURRENT PROFESSIONAL REGISTRATION (state and discipline)</b> Professional Engineer: WV, AR, DE, MD, NJ, PA, WV		
<b>18. OTHER PROFESSIONAL QUALIFICATIONS (publications, organizations, training, awards, etc.)</b> Member of American Society of Civil Engineers and Association of State Dam Safety Officials.					
<b>19. RELEVANT PROJECTS</b>					
a.	<b>(1) TITLE AND LOCATION (city and state)</b> County-Wide Dam Safety Program (Broome County, NY)		<b>(2) YEAR COMPLETED</b>		
			PROFESSIONAL SERVICES 2014	CONSTRUCTION (IF APPLICABLE)	
	<b>(3) BRIEF DESCRIPTION (brief scope, size, cost, etc.) AND SPECIFIC ROLE</b>		<input checked="" type="checkbox"/> check if project performed with current firm		
Project Manager – Project included developing a program to bring 20 NRCS dams into compliance with the revised NYSDEC Dam Safety regulations. The resulting phased program allowed for development of EAPs (including dam breach analyses and inundation mapping) in the first year, O&M Manuals in the second year, and Engineering Assessments (EA's) over the next 3 years. Subsequent task orders included ROV inspections of the outlet conduits, SITES analyses of emergency spillway erosion potential with recommended improvements for certain vulnerable spillways, and a long-term dam upgrade program to address deficiencies identified by EA's.					
b.	<b>(1) TITLE AND LOCATION (city and state)</b> NCCD Delaware Bay Dikes Repair and Prevention Project (New Castle County, Delaware)		<b>(2) YEAR COMPLETED</b>		
			PROFESSIONAL SERVICES Ongoing	CONSTRUCTION (IF APPLICABLE) 2014	
	<b>(3) BRIEF DESCRIPTION (brief scope, size, cost, etc.) AND SPECIFIC ROLE</b>		<input checked="" type="checkbox"/> check if project performed with current firm		
Project Manager – Prepared designs for the upgrade and repair of five flood protection dikes bordering the Delaware River to qualify the structures for inclusion in the USACE Levee Rehabilitation and Inspection Program. Performed topographic surveys, engineering inspections, geotechnical investigations and prepared designs for raising and reinforcement of the dikes. Providing construction phase services including on-site inspection.					
c.	<b>(1) TITLE AND LOCATION (city and state)</b> Philadelphia Water Dept. Engineering Services for Dams & Reservoirs (Philadelphia, PA)		<b>(2) YEAR COMPLETED</b>		
			PROFESSIONAL SERVICES Ongoing	CONSTRUCTION (IF APPLICABLE) Various	
	<b>(3) BRIEF DESCRIPTION (brief scope, size, cost, etc.) AND SPECIFIC ROLE</b>		<input checked="" type="checkbox"/> check if project performed with current firm		
Project Manager – O'Brien & Gere has been providing dam safety services for 8 reservoirs in the PWD water supply system for over 25 years. Projects have included subsurface investigations for slope stability and seepage analyses, underwater inspections, annual dam safety inspections, preparation of EAPs and Operation, Maintenance & Inspection Manuals, and design and construction administration for modifications to the dams.					
d.	<b>(1) TITLE AND LOCATION (city and state)</b> DASNY State-Wide Dam Safety Program (Multiple Locations, Central and Adirondack Regions of New York)		<b>(2) YEAR COMPLETED</b>		
			PROFESSIONAL SERVICES Ongoing	CONSTRUCTION (IF APPLICABLE) Papish Pond – 2014; Oneida Dam – 2015; Lows Lake - 2016	
	<b>(3) BRIEF DESCRIPTION (brief scope, size, cost, etc.) AND SPECIFIC ROLE</b>		<input checked="" type="checkbox"/> check if project performed with current firm		
Technical Associate - Developed documents for compliance with NYSDEC dam safety regulations for five dams owned and operated by the State, through a contract with the DASNY. Hydrologic and hydraulic models were used to evaluate the Spillway Design Flood (SDF) for each dam; perform dam breach analyses; and to generate inundation mapping. The project scope also includes performing dam safety inspections, conducting engineering assessments, developing EAPs and Operation, Maintenance & Inspection Manuals, evaluation of alternatives, development of cost estimates, and design and construction administration of the proposed improvements.					
e.	<b>(1) TITLE AND LOCATION (city and state)</b> USACE Phila. District, Upgrade/Repair of Lake Denmark Dam & Picatinny Lake Dam (Picatinny Arsenal, NJ)		<b>(2) YEAR COMPLETED</b>		
			PROFESSIONAL SERVICES 2013	CONSTRUCTION (IF APPLICABLE) 2013	
	<b>(3) BRIEF DESCRIPTION (brief scope, size, cost, etc.) AND SPECIFIC ROLE</b>		<input checked="" type="checkbox"/> check if project performed with current firm		
Project Manager - Prepared designs for upgrades and repairs of two high hazard dams. Performed geotechnical and forensic concrete investigations for structural stability analyses. Prepared Incremental Hazard Evaluations to select Spillway Design Floods as the basis for design of improvements. Also updated the EAPs following construction					


# E. RESUMES OF KEY PERSONNEL PROPOSED FOR THIS CONTRACT



(Complete one section E for each key person.)

<b>12. NAME</b> Steven H. Snider, PE		<b>13. ROLE IN THIS CONTRACT</b> Technical Director		<b>14. YEARS EXPERIENCE</b>	
				A. TOTAL 40	B. WITH CURRENT FIRM 24
<b>15. FIRM NAME AND LOCATION (city and state)</b> O'Brien & Gere (Hawthorne, NY)					
<b>16. EDUCATION (degree and specialization)</b> BS/1974/Civil & Env. Engineering; Clarkson University AS/1972/Engineering Science; SUNY Canton			<b>17. CURRENT PROFESSIONAL REGISTRATION (state and discipline)</b> Professional Engineer: NJ, NY, PA Federal Energy Regulatory Commission (FERC) Independent Consultant		
<b>18. OTHER PROFESSIONAL QUALIFICATIONS (publications, organizations, training, awards, etc.)</b> Sustaining Member of Association of State Dam Safety Officials (ASDSO – Advisory Committee) and United States Society on Dams (USSD); member of American Society of Civil Engineers.					
<b>19. RELEVANT PROJECTS</b>					
a.	<b>(1) TITLE AND LOCATION (city and state)</b> County-Wide Dam Safety Program (Broome County, NY)			<b>(2) YEAR COMPLETED</b>	
				PROFESSIONAL SERVICES 2014	CONSTRUCTION (IF APPLICABLE)
	<b>(3) BRIEF DESCRIPTION (brief scope, size, cost, etc.) AND SPECIFIC ROLE</b>			<input checked="" type="checkbox"/> check if project performed with current firm	
Technical Director – Engineering Assessments, Emergency Action Plans and O&M Manuals for 21 'Class B & C' NRCS flood control embankments according to NYSDEC Part 673 regulations. The Assessments included visual inspections; review of historical archives; evaluation of hydraulic capacity and embankment stability; and recommendations for repairs, improvements, further study and regulatory compliance. The EAP's included design flood and dam break inundation mapping.					
b.	<b>(1) TITLE AND LOCATION (city and state)</b> Evaluation of Emergency Spillway Erosion Potential (Broome County, NY)			<b>(2) YEAR COMPLETED</b>	
				PROFESSIONAL SERVICES 2014	CONSTRUCTION (IF APPLICABLE)
	<b>(3) BRIEF DESCRIPTION (brief scope, size, cost, etc.) AND SPECIFIC ROLE</b>			<input checked="" type="checkbox"/> check if project performed with current firm	
Project Manager – Evaluation of emergency spillway erosion potential for 21 flood control dams using the NRCS SITES computer software. Project included in-situ density testing and laboratory analyses to estimate erosive characteristics of the earth-lined channels. Evaluation and televised inspection of principal spillway conduits through 21 earth embankments.					
c.	<b>(1) TITLE AND LOCATION (city and state)</b> Virginia Power, Mt. Storm Lake Dam Remediation (Mt. Storm, WV)			<b>(2) YEAR COMPLETED</b>	
				PROFESSIONAL SERVICES 1995	CONSTRUCTION (IF APPLICABLE)
	<b>(3) BRIEF DESCRIPTION (brief scope, size, cost, etc.) AND SPECIFIC ROLE</b>			<input checked="" type="checkbox"/> check if project performed with current firm	
Senior Manager – Detailed conceptual evaluation of alternatives to remediate insufficient spillway capacity. The studies included consideration of a wide variety of options including dam raising; existing spillway expansion; new emergency spillways; and combinations thereof. Construction cost matrices were developed to assist in selecting a cost effective solution for the 200-foot high rockfill dam.					
d.	<b>(1) TITLE AND LOCATION (city and state)</b> West Virginia-American Water Company, Ada Dam Improvements (Bluefield, WV)			<b>(2) YEAR COMPLETED</b>	
				PROFESSIONAL SERVICES 1983	CONSTRUCTION (IF APPLICABLE) \$1.68 million
	<b>(3) BRIEF DESCRIPTION (brief scope, size, cost, etc.) AND SPECIFIC ROLE</b>			<input checked="" type="checkbox"/> check if project performed with current firm	
Resident Engineer – Designed major improvements to a 60-foot-high earth embankment including a new ogee side-channel spillway, chute and energy dissipator; 60-foot high intake tower; outlet works; rockfill stabilizing berm; and foundation grouting. Resident engineer for construction.					
e.	<b>(1) TITLE AND LOCATION (city and state)</b> North Jersey District Water Supply Commission, Multiple Services Contract (Wanaque, NJ)			<b>(2) YEAR COMPLETED</b>	
				PROFESSIONAL SERVICES 2015	CONSTRUCTION (IF APPLICABLE)
	<b>(3) BRIEF DESCRIPTION (brief scope, size, cost, etc.) AND SPECIFIC ROLE</b>			<input checked="" type="checkbox"/> check if project performed with current firm	
Project Manager – Multiple services contract including design of a reinforced concrete overlay for Green Swamp Dam Nos. 2 & 4; remediation design of Post Brook Dam; seismic stability analyses of Monksville and Pompton Lakes Dam; ROV diving inspection of the Raymond Dam intake tower; hydraulic modeling of the Raymond Dam intake; corrosion inspection of the twin 60-inch intake conduits; stability analyses of the residual storage lagoon embankments.					



## Appendix B: Past Projects Experience

EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT		20. Example Project Key Number
		1
21. Title and Location (City and State)	22. Year Completed	
Mallard Dam, Glade Springs, WV	Professional Services Ongoing	Construction (if applicable)
23. Project Owner's Information		
a. Project Owner	b. Point of Contact Name	c. Point of Contact Telephone Number
Glade Springs Resort	Mr. JW Hamm	
24. Brief Description of Project and Relevance to This Contract (include scope, size, and cost)		
<p>Construction Cost: \$150,000 est</p> <p>Project Scope: Mallard Dam presents a difficult situation relative to the Dam Safety Rule (47CSR34) requirements. The hazard potential is represented solely by the heavily traveled roadway on the crest of the dam. The dam has overtopped at least twice previously and has a relatively large watershed which will result in future overtopping of the embankment due to inadequate spillway capacity combined with insufficient reservoir storm water storage. While the Rule has provisions to determine hazard potential classifications in scenarios where houses and roadways exist downstream, it contains no specific guidance regarding hazards on the crests of dams. The lack of Rule guidance requires DEP to make design approval conditions and set precedent for this situation based upon its core dam safety mission – the protection of lives and property.</p> <p>The hydraulic and hydrological studies and designs were performed using Soil Conservation Service (SCS) methods and computer program (SITES) to estimate potential runoffs and route resulting runoffs through the principal spillway pipes and dam overtopping. The dam was analyzed for a 100 year storm and the design storm (1/4PMP storm). It was found that the existing dam would overtop during a 100 year storm event by about 1 inch, thus the dam's principal spillway was upgraded. Additionally, the dam upgrade was designed to be overtopped by generally flattening the downstream slope to 5:1 (also providing an internal chimney drain) which also improves the stability of the dam. It was found that grassed permanent Erosion Control Matting (ECM) would provide the necessary shear resistance with a (considerable) Safety Factor of 2.</p> <p>The proposed internal chimney drain resulted in an upgraded Static Safety Factor of 1.85 and Seismic Safety Factor of 1.3. The Sudden Drawdown condition is not applicable because there is no drain provided (grandfather provision). This is further justified due to the relatively shallow (&lt;5 feet) depth of the pool.</p>		
		
5. Firms from Section C Involved with This Project		
a.	(1) Firm Name	(2) Firm Location (City and State)
	TERRADON Corporation	Nitro, WV
		(3) Role
		Engineer


EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT		20. Example Project Key Number	
		2	
21. Title and Location (City and State)		22. Year Completed	
Beckley Upper Glade Water Supply Dam, Beckley, WV		Professional Services 2014 Construction (if applicable) 2014	
23. Project Owner's Information			
a. Project Owner	b. Point of Contact Name	c. Point of Contact Telephone Number	
Beckley Water Company	Matthew Stanley, President & CEO	(304) 255-5121 x 115	
24. Brief Description of Project and Relevance to This Contract (include scope, size, and cost)			
<p>Construction Cost: \$206,000</p> <p>Project Scope: The general project included providing an additional 15 days of storage for drought conditions for Beckley Water Company. The selected water storage facilities included the Lower and Upper Glade Creek Dams. The study/design was complicated by the necessity to route design floods through the upstream Flattop Lake. The Lower Dam is a concrete Weir type dam, and the impoundment is dissected by WV Route 3. The upper dam is a 76 ft high Earth and Rock Fill dam built circa 1977. The study phase included evaluating the installation of automatic gates on the lower water supply dam which would be operated during "normal" flood events to prevent overtopping of WV Route 3 during flood events less than 100 years, yet provide storage during drought conditions, increasing the pool volume by dredging and excavating below the pool level, constructing another dam on water company property, and an innovative method of raising of the lake level in the upper impoundment. Cost analysis indicated that raising the lake level in the upper reservoir would be the least expensive.</p> <p>The design for raising the upper lake normal pool level included evaluation of flood events including 100 year and Probably Maximum Precipitation floods and providing designs to safely handle each. This included modifications to the principal intake riser to raise the level while improving its hydraulic efficiency at a reasonable cost and raising the initial operating level of the emergency spillway. The modifications to the principal spillway riser included filling the existing intake weir openings, cutting the top off the riser to provide a new weir 2.5 times as long (ergo 2.5 times hydraulically more efficient at low heads), and constructing a new cover/trash rack. The emergency spillway operating frequency was maintained by designing a new higher concrete control weir to replace the existing; studies indicated this did not significantly affect the flow capacity at high flow rates. During the design, it was found that the Riser could be modified to gain essentially 27 complete days storage, pending weather, at about the same cost. Modifications resulted in 175 million gallons at the construction cost of \$206,000 or about \$0.0012/per gallons additional storage. Design included the addition of monitoring wells to monitor the phreatic surface within the dam.</p>			
<div></div>			
5. Firms from Section C Involved with This Project			
a	(1) Firm Name	(2) Firm Location (City and State)	(3) Role
	TERRADON Corporation	Nitro, WV	Environmental Consultant


EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT		20. Example Project Key Number
		3
21. Title and Location (City and State)	22. Year Completed	
Bluestone Dam Phase IV Dam Stability, Hinton, WV	Professional Services Ongoing	Construction (if applicable) Ongoing
23. Project Owner's Information		
a. Project Owner	b. Point of Contact Name	c. Point of Contact
United States Army Corp. of Eng.	Aaron Reel, Coastal Drilling Inc. Project Manager	Telephone Number
		(304) 376-8140 (cell)
24. Brief Description of Project and Relevance to This Contract (include scope, size, and cost)		
<p>Construction Cost: \$94,788,808</p> <p>Project Scope: TERRADON has performed the construction engineering and structural inspection during the Phase 4 Dam Safety project at the Bluestone Dam. The project is currently in its third year, and is expected to be completed in 2019. TERRADON performs routine inspections on all elements of the drilling platform. The steel decking is checked for deformation, section loss, confirmation that no gaps between adjacent panels exist, that all welds are performed, and that no panels are placed in such a manner that undue stresses will be introduced. We check the stringers for deformation, section loss, and that all bolts are properly installed. All connections at the dam face are checked for proper bearing onto the concrete, and the soundness of the concrete is confirmed.</p> <p>TERRADON worked closely with the contractor and various fabricators to develop and approve welding procedures in accordance with AWS D1.5 for these critical items. TERRADON was intimately involved in verifying the setting of welding equipment, the travel speed, welding materials, preheat application, interpass temperatures and proper position. TERRADON also reviewed all ultrasonic and radiographic testing performed during the development of the welding procedure and welder qualification.</p> <p>TERRADON performed a detailed analysis of the existing stringer-on-pier system that was in place when the current contractor was awarded the project. The platform system originally consisted of nine (9) HP-14x89 stringers spaced at 3'-0-3/8". There have been a maximum of 107 pier systems installed at any given time, and the platform has been lowered 8'-0" in elevation twice, for a total of 16'-0".</p> <p>The analysis of this platform included placing multiple pieces of equipment that included, but is not limited to a 150 ton crane, a 20 ton carrydeck, and a 22.5 ton drill rig at various locations on the platform in order to determine the governing load condition for the various structural steel elements. Because of the angle of the pier column, tension forces are induced into the pier cap. These forces are transferred to the dam by way of two (2) 2" diameter Williams Forms Spin Lock anchors.</p> <p>It was later required for the spans in key locations to be doubled to 15.2', while maintaining access for all equipment. In order to do this, deeper stringers (W24x84) were required. Because of this increased depth, as well as the fact that the HP14x89 stringers were still in use in adjacent locations, it was required that the new W24x84 stringers have the bottom flange and portions of the web coped at the ends. A new bottom flange, as well as bearing stiffeners was designed, and a complete fatigue analysis was performed to confirm that this was an acceptable design approach. Modifications to the column base plates were also required, adding an additional 2' to the overall length, and performing a full penetration groove weld on the 2-7/8" thick plate. Finally, a "fender" system was developed in order to protect portions of the column that have the potential to be submerged during high water events from woody debris collisions.</p>		







5. Firms from Section C Involved with This Project			
a	(1) Firm Name	(2) Firm Location (City and State)	(3) Role
	TERRADON Corporation	Nitro, WV	Structural Construction Consultant and Inspection


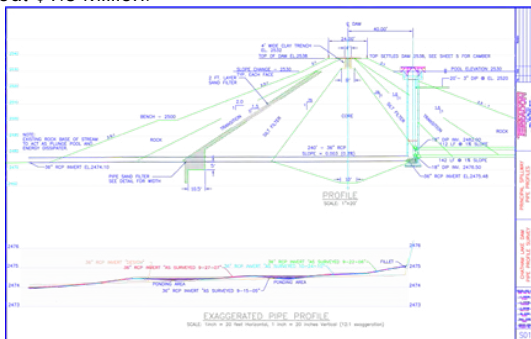
EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT		20. Example Project Key Number
		4
21. Title and Location (City and State)	22. Year Completed	
Lake Chaweva, Cross Lanes, WV	Professional Services	Construction (if applicable)
	Design build	
23. Project Owner's Information		
a. Project Owner	b. Point of Contact Name	c. Point of Contact Telephone Number
Cross Lanes Land Owner's Association		
24. Brief Description of Project and Relevance to This Contract (include scope, size, and cost)		
<p>TERRADON Corporation was retained for planning, design, construction (design-build) and Certificate of Compliance for an earthen and rock fill dam originally constructed in 1930 and taken out of service in 1998. Services included investigation and repair of several landslides caused by dewatering the lake when it was taken out of service. Extensive restoration analyses and studies were required to bring the impoundment structure up to current safety codes.</p> <p>Hydraulic modeling, analyses and evaluations were performed to determine the correct spillway dimensions to allow for upgrade to the current standards for 100 year storm events. The dam break analysis evaluated the hazard classification of the dam and the potential flood wave downstream. The WINSTABL computer model was used to conduct a stability analysis of the up and downstream faces of the dam.</p> <p>A limited subsurface investigation was valuable in defining the engineering characteristics at the abutments and within foundation soils. The borrow study reviewed the available earthen materials to rehabilitate the dam. While a sedimentation study and mitigation design was completed for the impoundment. The results and evaluations of the studies and modeling culminated in detailed rehabilitation designs of the embankments, the downstream face of the dam, and the principal and emergency spillways.</p> <p>Construction plans and technical specifications were prepared by TERRADON in order to bid and construct the needed improvements. Construction inspection and ongoing engineering oversight was provided throughout the construction process on behalf of the client.</p> 		
5. Firms from Section C Involved with This Project		
a	(1) Firm Name	(2) Firm Location (City and State)
	TERRADON Corporation	Nitro, WV
		(3) Role
		Engineer


EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT		20. Example Project Key Number
		5
21. Title and Location (City and State)	22. Year Completed	
Pettigrew Lake, Tornado, WV	Professional Services 2011	Construction (if applicable) 2011
23. Project Owner's Information		
a. Project Owner	b. Point of Contact Name	c. Point of Contact Telephone Number
Kanawha County Parks & Recreation Commission		
24. Brief Description of Project and Relevance to This Contract (include scope, size, and cost)		
<p>Construction Cost: Volunteer Community Service (Estimated \$100,000)</p> <p>Project Scope: Pettigrew Lake is located in the Meadowood Park in Tornado, WV. The recreational lake is approximately eight acres with an average depth of 10 feet. Over the course of several years, the dam had been significantly weakened by burrowing animals, which resulted in a near breach of the dam, plus the cmp outlet structure had mostly deteriorated. The dam had been damaged for approximately 10 years and the public facility was in disrepair. The Kanawha County Parks &amp; Recreation Commission did not have adequate budget to make the repairs, as there were higher priorities for allocated funds.</p> <p>Through the cooperative efforts of volunteers organized by the Coal River Group (a nonprofit community organization), the Kanawha County Parks and Recreation Commission and WVDEP granted permission to proceed with the project. TERRADON Corporation volunteered its engineering services to design plans for the repair of the dam structure. The design for the repair of the dam consisted of establishing an access road and compacted fill material to seal a 15 foot breach in the existing dam plus the installation of a new HDPE outlet structure. Massey Coal Services brought in a five man crew and bulldozers to carry out the construction of the design plans.</p> <p><a href="http://www.wvgazettemail.com/News/201106091320">http://www.wvgazettemail.com/News/201106091320</a></p>		
		
Photo by Brad Davis		
5. Firms from Section C Involved with This Project		
a.	(1) Firm Name TERRADON Corporation	(2) Firm Location (City and State) Nitro, WV
		(3) Role Engineer

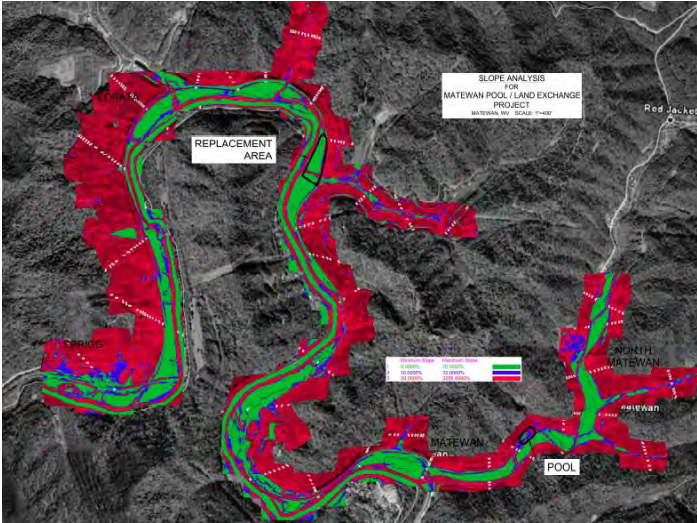



EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT		20. Example Project Key Number
		7
21. Title and Location (City and State)	22. Year Completed	
Dawson Lake Dam	Professional Services 2009	Construction (if applicable)
23. Project Owner's Information		
a. Project Owner	b. Point of Contact Name	c. Point of Contact Telephone Number
ARK Group, Dawson Lake, LLC		
24. Brief Description of Project and Relevance to This Contract (include scope, size, and cost)		
<p>Construction Cost: \$350,000</p> <p>Project Scope: The developer desired a recreational lake as a design feature for an upscale residential development in Dawson, Greenbrier County, WV. The initial scope included a study of dam height/cost/lake area and included some non-engineering aspects such as aesthetic details as a residential feature, the developer was interested in the lake area as opposed to water volume. A challenging requirement imposed by the developer was that the difference in normal pool and 100 year pool be less than one foot. This requirement, combined with the WV dam safety requirements, necessitated a dam design configuration was actually less expensive than smaller dam designs that were studied. These smaller dams could not meet both project requirements, simultaneously.</p> <p>Pertinent design analyses included hydrology/hydraulic analysis including flood routing for 100 year and PMP storms, and dam break analysis for both sunny day and overtopping events. The SITES computer model was used for flood routing and the NRCS's DAMBRK model for dam break analysis. Stability analysis was analyzed for the end of construction, sudden draw down, long term, and seismic conditions using the WINSTABL computer model. The dam design included a filter design using Part 628, National Engineering Handbook, Chapter 45.</p> <p>TERRADON designed the dam to be as economical as possible, which included an innovative concept for making a portion of the emergency spillway a constructed wetland as part of necessary on site wetland mitigation required by the Army Corps of Engineers. TERRADON also provided quality control (QC) and construction certification for the Dawson Dam and has provided the WVDEP required dam safety inspections since the completion of construction. Services also included the development of an Emergency Action Plan and an Operation and Maintenance Plan for the Dawson Dam.</p>		
 		
5. Firms from Section C Involved with This Project		
a.	(1) Firm Name TERRADON Corporation	(2) Firm Location (City and State) Nitro, WV
		(3) Role Engineer



EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT			20. Example Project Key Number
			7
21. Title and Location (City and State)		22. Year Completed	
Chatham Lake Dam, Glade Springs, WV		Professional Services 2003-present	Construction (if applicable)
23. Project Owner's Information			
a. Project Owner	b. Point of Contact Name		c. Point of Contact Telephone Number
Glade Springs Homeowners Association			
24. Brief Description of Project and Relevance to This Contract (include scope, size, and cost)			
Construction Cost: \$1.3 Million			
Project Scope: The general project included development of residential properties around an upscale golf resort in southern West Virginia. Initial involvement included planning, which evolved from three smaller dams and lakes to one large dam and lake. The chosen design resulted in a 70' high dam with one 70 acre lake. Studies included water balance studies including low flow augmentation requirements and golf course irrigation requirements. Of interest: it was found that low flow augmentation requirements, irrigation needs and peak summer evaporation rates were each about equal. After selecting appropriate lake and dam sizing, the dam was designed with safety and cost effectiveness paramount.			
Several cost-saving innovations/items were incorporated into the design, including optimizing the use of available materials in a zoned earth and rock fill embankment, the use of a manhole riser as opposed to standard lake riser, (this was permitted as innovative/experimental by West Virginia Dam Safety), and the use of rigid/flexible principal spillway outlet pipe. (Designer John James partnered with WVDEP Dam Safety Engineer on a Paper presented at the ASDSO Southeast Regional Conference, Charleston, WV, May 4, 2010). This procedure provided for the use of high strength concrete pipe with limited flexibility joints to be installed in a flexible configuration within the dam as opposed to conventional concrete cradle on bedrock. This procedure included filling the dam to the half diameter elevation of the outlet pipe, cutting a "cradle" the size for the pipe for it to rest in Dusting the cradle and top of pipe with dry bentonite (key for seepage control) and continue filling of the dam. While both these procedures were considered somewhat controversial by some peers, monitoring has indicated very successful performance to date. While such "new" or "experimental" practices may not be appropriate for USACE dam projects, it demonstrates TERRADON's willingness and ability to develop, consider and design cutting-edge and innovative solutions. It is estimated that these innovations saved up to 50% on the cost of the dam.			
Other design procedures included hydraulic design to provide a nearly constant lake level (the difference in lake level between normal pool and 100 year pool is only one foot, as requested by developer). The design also included dambreak modeling (using both the National Weather Service Dambreak and HEC-RAS programs) and development of downstream inundation maps and resultant emergency action plan. The cost of the dam project was about \$1.3 Million.			
			
5. Firms from Section C Involved with This Project			
a	(1) Firm Name	(2) Firm Location (City and State)	(3) Role
	TERRADON Corporation	Nitro, WV	Environmental Consultant

EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT		20. Example Project Key Number	
		8	
21. Title and Location (City and State)	22. Year Completed		
The Summit Bechtel Family National Scouting Reserve (National Boy Scout Camp), Mt. Hope, WV	Professional Services 2008-2013	Construction (if applicable) 2013	
23. Project Owner's Information			
a. Project Owner	b. Point of Contact Name	c. Point of Contact Telephone Number	
Trinity Works	Rob Ridgeway	(304) 469-1089	
24. Brief Description of Project and Relevance to This Contract (include scope, size, and cost)			
<p>Construction Cost: \$350 Million</p> <p>Project Scope: TERRADON Corporation was heavily involved in the development of the Summit Bechtel National Scout Reserve as a consultant to Trinity Works. The Summit is a 10,600+ acre outdoor adventure center owned by the Boy Scouts of America and located near Mt. Hope, WV. From the initial site selection to surveying, planning, infrastructure design and inspection, TERRADON was a key player in creating one of the highest-profile design and construction endeavors in West Virginia. Working under tight specifications and time restrictions. TERRADON was responsible for agency coordination for all permitting activities for the project, acting as the primary contact with the WVDEP on behalf of all contractors and consultants working on the 10,600+-acre site. This coordination effort dealt with more than 50 permits for various developments within the project, TERRADON also spearheaded the delivery of quality results,</p> <div style="display: flex; justify-content: space-between;"> <ul style="list-style-type: none"> <li>Initial Site Selection/Conceptual Designs</li> <li>Erosion and Sediment Control</li> <li>Survey/Mapping</li> <li>Geotechnical Engineering</li> <li>Materials Testing and Construction Monitoring</li> <li>550,000 tons of aggregate produced by on-site rock crushing</li> <li>600 acres of clearing, grubbing and rough grade operations</li> <li>28 miles of drainage swales, including erosion and sediment control</li> <li>Construction Inspection of 4 earthen dams</li> </ul> <ul style="list-style-type: none"> <li>Site Planning/Grading</li> <li>Abandoned Mine Lands (AML) Mitigation</li> <li>All Environmental Permitting</li> <li>Utility Design</li> <li>60+ miles of underground utilities</li> <li>3 million cubic yards of excavation</li> <li>14 miles of new roads (grade and drain)</li> <li>600 acres of fine grading and re-vegetation</li> <li>80,000 seat lawn amphitheater</li> </ul> </div>			
			
5. Firms from Section C Involved with This Project			
a	(1) Firm Name	(2) Firm Location (City and State)	(3) Role
	TERRADON Corporation	Nitro, WV	Engineer

EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT		20. Example Project Key Number
		9
21. Title and Location (City and State)	22. Year Completed	
Environmental Assessment – Section 6(f) Conversion Land – Matewan Municipal Swimming Pool, Matewan, WV	Professional Services 2011-2015	Construction (if applicable)
23. Project Owner's Information		
a. Project Owner	b. Point of Contact Name	c. Point of Contact Telephone Number
Mingo County Board of Education	Randy Keathley and James Farley	(304) 235-3333
24. Brief Description of Project and Relevance to This Contract (include scope, size, and cost)		
<p>Construction Cost:</p> <p>Project Scope: TERRADON Corporation was contracted by the Mingo County Board of Education to conduct an Environmental Assessment for a 6(f) Land Conversion. This project involved identifying and assessing three replacement property options for the transfer of the Matewan Municipal Pool property to the Mingo County Board of Education. The work was done as a Section 6(f) Conversion Land project pursuant to the requirements of the Land and Water Conservation Act (LAWCON) of 1965. Under this project three replacement parcels were assessed under six alternatives for the project. Each alternative was assessed for potential impacts to cultural resources, hazardous materials/wastes, geologic resources, noise and energy resources, surface water resources, floodplains, wetlands, threatened and endangered species, recreation, aesthetics, socio-economic conditions and environmental justice. In addition, a slope analysis was conducted on the land within the Matewan municipal area to assess the availability of buildable land in the proposed project area.</p> <p>Coordination and consultation for this project was conducted with the following entities: Town of Matewan, Mingo County Board of Education, WV SHPO, WV DNR, WV Geological and Economic Survey, US FWS, USDA – Soil Conservation Service, US Department of Homeland Security -- FEMA and US Department of Commerce -- Census Bureau.</p>		
 		
5. Firms from Section C Involved with This Project		
a	(1) Firm Name	(2) Firm Location (City and State)
	TERRADON Corporation	Nitro, WV
		(3) Role
		Environmental Consultant



EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAMS QUALIFICATIONS FOR THIS CONTRACT		20. EXAMPLE PROJECT KEY NUMBER <b>10</b>	
21. TITLE AND LOCATION (CITY AND STATE) <b>Rehabilitation of Ada Dam (Bluefield, WV)</b>		22. YEAR COMPLETED	
		PROFESSIONAL SERVICES 1984	CONSTRUCTION (IF APPLICABLE)
23. PROJECT OWNER'S INFORMATION			
PROJECT OWNER West Virginia American Water Company	POINT OF CONTACT NAME Brian Long	POINT OF CONTACT TELEPHONE NUMBER (304) 926- 0499	

24. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT (include scope, size, and cost)

Ada Dam, which impounds a water supply reservoir for the City of Bluefield, West Virginia, was cited as one of twenty-six unsafe dams after a Phase I inspection by the West Virginia Department of Natural Resources. Phase II studies and a \$2 million rehabilitation program brought the dam into compliance with state and federal safety requirements. O'Brien & Gere designed the rehabilitation measures and provided resident engineering services during construction of the necessary improvements.

O'Brien & Gere undertook subsurface investigations, design and resident engineering services for remediation of dam safety deficiencies at the 65-ft high dam.

A hydraulic earth fill dam built in the 1920s, Ada Dam had been plagued with four major problems:

- Inadequate spillway
- Lack of upstream control on the reservoir blowoff line
- Heavy vegetation growth on the downstream slope
- Persistent seepage despite an extensive bedrock grouting program in 1946.

The spillway design flood exceeded the existing spillway capacity. To eliminate this inadequacy, O'Brien & Gere designed a new, ogee-shaped overflow section, side-channel spillway, spillway chute and stilling basin. The computer programs HEC 1 and HEC 2 were used to size the overflow and spillway chute sections. The stilling basin geometry and sizing were selected using criteria established by the U.S. Bureau of Reclamation.

A 60-ft high reinforced concrete intake tower, providing upstream control for the water supply conduit, was designed with two gates; one for full drawdown and one for improved water quality.

Rock excavated for spillway expansion was placed as a rockfill berm on the downstream embankment slope to improve stability to current safety standards.

## RESERVOIR PIPING

During construction of the dam improvements, the reservoir blow-off pipe was televised. The televising revealed numerous joint offsets and structural pipe failures that may have been significant contributors to embankment seepage and possible piping. The pipeline was sliplined with polyethylene pipe and the resulting annulus grouted to guard against fine grained soil migration.

Engineering fees are estimated at \$120,000.



25. FIRMS FROM SECTION C INVOLVED WITH THIS PROJECT			
a.	(1) FIRM NAME O'Brien & Gere	(2) FIRM LOCATION (city and state) E. Norriton PA	(3) ROLE Engineering Services



EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAMS QUALIFICATIONS FOR THIS CONTRACT		20. EXAMPLE PROJECT KEY NUMBER <b>11</b>	
21. TITLE AND LOCATION (CITY AND STATE) <b>Potomac Creek Dam Nos. 1 and 2 (Stafford County, VA)</b>		22. YEAR COMPLETED	
		PROFESSIONAL SERVICES Ongoing	CONSTRUCTION (IF APPLICABLE) n/a
23. PROJECT OWNER'S INFORMATION			
PROJECT OWNER Stafford County	POINT OF CONTACT NAME Janet L. Spencer, PE	POINT OF CONTACT TELEPHONE NUMBER (540) 658-8620	

**24. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT (include scope, size, and cost)**

The County of Stafford retained O'Brien & Gere for renewal of the Operation & Maintenance (O&M) Certificates for Potomac Creek Dams #1 (NRCS structure) and #2. The project included visual inspection and preparation of annual inspection reports for both dams in accordance with DCR's Virginia Impounding Structure Regulations (Dam Safety), performing Spillway Design Flood (SDF) analyses, developing inundation mapping, preparation of updated Emergency Action Plans (EAPs) and completion of the O&M Certificate applications. Following completion of the SDF analyses, the need/benefit of conducting Incremental Damage Analyses (IDA) for the dams was also assessed.

O'Brien & Gere is currently investigating the performance of the two emergency spillways for Potomac Creek Dam No. 1 during its SDF, using the NRCS SITES computer program to estimate the extent of erosion that would occur during a storm of this magnitude. O'Brien & Gere used the SDF hydrograph developed in the previous phase of work, as-built drawings of the geometry of the emergency spillways and soil parameters obtained through a drilling and laboratory testing program to develop the input parameters for the SITES model.

Under an earlier project for Stafford County, OBG was involved in various stages of the upgrades and raising of the Aquia Dam (Smith Lake). Our services included planning studies, visual inspection and hydrologic, hydraulic and dam failure assessment of this originally 60-foot high, 1600-foot long water supply earth dam. A safe yield analysis and a feasibility study were performed to evaluate the technical and economic factors associated with the proposed 20-foot raising of the reservoir. Preliminary design documents were developed and permit applications were submitted for the dam raising project. Subsequent to final design, OBG provided value engineering and construction administration/inspection for the project, which ultimately included a new intake structure, conversion of the principal spillway to a low-level outlet system and the emergency spillway to the new principal spillway, placement of an RCC overlay on a portion of the earth embankment to create a new emergency spillway, and raising of the remainder of the earth embankment section.

Estimated engineering fees for the current Potomac Creek Dams project are about \$85,000.



25. FIRMS FROM SECTION C INVOLVED WITH THIS PROJECT			
a.	(1) FIRM NAME O'Brien & Gere	(2) FIRM LOCATION (city and state) East Norriton, PA	(3) ROLE Consulting Engineer
b.	(1) FIRM NAME	(2) FIRM LOCATION (city and state)	(3) ROLE

EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAMS QUALIFICATIONS FOR THIS CONTRACT		20. EXAMPLE PROJECT KEY NUMBER <b>12</b>	
21. TITLE AND LOCATION (CITY AND STATE) <b>Upgrade and Repair of Picatinny Lake and Lake Denmark Dams (Dover, NJ)</b>		22. YEAR COMPLETED	
		PROFESSIONAL SERVICES 2013	CONSTRUCTION (IF APPLICABLE) 2013
23. PROJECT OWNER'S INFORMATION			
PROJECT OWNER United States Army Corps of Engineers (USACE) Philadelphia & New York Districts		POINT OF CONTACT NAME Matthew Emigholz	POINT OF CONTACT TELEPHONE NUMBER 917-790-8248

**24. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT (include scope, size, and cost)**

O'Brien & Gere provided engineering services for the upgrade and repair of Picatinny Lake Dam and Lake Denmark Dam in NJ. O'Brien & Gere was retained for the preparation of construction contract plans and specifications for the upgrades and repairs and to assist in obtaining required Dam Safety and Freshwater Wetlands permits. This included review of existing studies and designs, site investigation, and design in support of meeting code compliance.

**Phase I – Site Investigation and Preliminary Design and Report:** Services included field and engineering investigations to develop a basis of design. Topographic surveys were performed at both dam sites providing mapping for use in detailed design. Complete hydrologic and hydraulic analyses were performed to assess the current spillway capacity of both dams and evaluate alternatives for increasing spillway capacity. Incremental Hazard Evaluations were performed to develop recommendation for an appropriate Spillway Design Flood (SDF) for each dam. With NJDEP approval, O'Brien & Gere evaluated alternates for raising the Lake Denmark Dam to confine the 100-Year Flood in the existing spillway and alternatives for safely passing approved SDF (30% PMF) at the Picatinny Lake Dam. Concrete and subsurface investigations were performed at both dams (with UXO) to provide the required data for the Slope Stability Analysis of each dam's earth embankment and Structural Stability Analyses of the spillway of the Picatinny Lake Dam, and inform the evaluation of alternatives for repairs to address structural deficiencies. Additionally, recommendations were made for a new low-level outlet system for Picatinny Lake Dam and repair of the low-level outlet system for Lake Denmark Dam. Recommendations were also made for repair of the existing sluice gates at the Picatinny Lake Dam. Estimates of the Probable Construction cost were made using MCASES (MII) to assist in selection of alternatives for detailed design.

**Phase II – 90% Design Submission and Phase III – 100% Contract Documents:**

- A Roller Compacted Concrete overlay for the crest and downstream face of Picatinny Lake Dam
- Spillway training walls to protect an occupied building on the dam embankment from the SDF
- Concrete repairs and upgrades to the upstream crest wall and exposed spillway surfaces
- A new siphon-operated low-level outlet for Picatinny Lake Dam
- New sluice gates at Picatinny Lake Dam
- Relocation of existing utilities and security fencing at Picatinny Lake Dam
- A stabilized toe block/dam section for the Lake Denmark Dam spillway consisting of reinforced concrete, pre-stressed rock anchors and pressure relief
- Upgrades and repairs to existing low-level outlets at Lake Denmark Dam
- Rip rap slope protection on the upstream face of the Lake Denmark Dam embankment
- Re-grading and general site improvements at both Picatinny Lake Dam and Lake Denmark Dam
- Technical Specifications were prepared using the Specs-Intact system. Final construction cost estimates were prepared using MCASES (MII). Combined costs for upgrades and repairs at the 2 dams were an estimated \$2.45M.

The Final Design was used to obtain required permits and approvals, including NJDEP Dam Safety permit, NJDEP Freshwater Wetlands permit, and Soil Erosion and Sediment Control Plan Certification by the Morris County Soil Conservation District. O'Brien & Gere assisted with the negotiation of a contract to construct the improvements awarded in 2010. During construction, O'Brien & Gere provided Archaeological monitoring of excavations due to the historical significance of the dam site in addition to supporting USACE with periodic inspections, review of submittals and response to requests for information. O'Brien & Gere updated EAPs for the dams utilizing inundation mapping prepared during design. The engineering fee through all phases of design and construction totaled \$923,000.

25. FIRMS FROM SECTION C INVOLVED WITH THIS PROJECT			
a.	(1) FIRM NAME O'Brien & Gere	(2) FIRM LOCATION (city and state) East Norriton, PA	(3) ROLE Engineering Services