



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 1

[List View](#)
[General Information](#) | [Contact](#) | [Default Values](#) | [Discount](#) | [Document Information](#) | [Clarification Request](#)
Procurement Folder: 933150

SO Doc Code: CEOI

Procurement Type: Central Purchase Order

SO Dept: 0313

Vendor ID: 000000160331

SO Doc ID: DEP2200000005

Legal Name: MICHAEL BAKER INTERNATIONAL INC

Published Date: 10/13/21

Alias/DBA:
Close Date: 10/19/21

Total Bid: \$0.00

Close Time: 13:30

Response Date: 10/18/2021

Status: Closed

Response Time: 14:38

Solicitation Description: EOI - Belle (Sneed) Drainage

Responded By User ID: michaelbaker

Total of Header Attachments: 1

First Name: Leigh

Total of All Attachments: 1

Last Name: TeWinkle

Email: dmprocurement@datamz

Phone: 9499736615



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

State of West Virginia
Solicitation Response

Proc Folder: 933150
Solicitation Description: EOI - Belle (Sneed) Drainage
Proc Type: Central Purchase Order

Solicitation Closes	Solicitation Response	Version
2021-10-19 13:30	SR 0313 ESR10182100000002468	1

VENDOR
000000160331
MICHAEL BAKER INTERNATIONAL INC

Solicitation Number: CEOI 0313 DEP2200000005
Total Bid: 0
Response Date: 2021-10-18
Response Time: 14:38:43
Comments:

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

Vendor		
Signature X	FEIN#	DATE

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

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
1	EOI Engineering Design Services				0.00

Comm Code	Manufacturer	Specification	Model #
81100000			

Commodity Line Comments: EOI Response attached.

Extended Description:

*Dates of Service are estimated for bidding purposes only.



EXPRESSION OF INTEREST (EOI)
FOR PROFESSIONAL ENGINEERING DESIGN SERVICES
AND CONSTRUCTION MONITORING SERVICES FOR THE

BELLE (SNEED) DRAINAGE PROJECT KANAWHA COUNTY, WV CEOI 0313 DEP2200000005

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
ABANDONED MINE LANDS AND RECLAMATION

OCTOBER 19, 2021

October 19, 2021

Department of Administration
Purchasing Division
State of West Virginia Department of Administration
2019 Washington Street, East
Charleston, West Virginia 25305-0103

**Re: Expression of Interest (EOI) for Professional Engineering
Design Services and Construction Monitoring Services for the
EOI - Belle (Snead) Drainage Projects (CEOI 0313 DEP2200000005)**

Dear Mr. Joseph Hager:

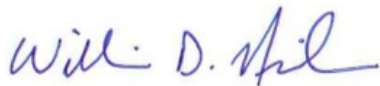
Michael Baker International (Michael Baker) is pleased to present our response to your EOI related to the mapping and design services for the above referenced project in Harrison County. Michael Baker is honored to have built a 30-year relationship with the West Virginia Department of Environmental Protection (WVDEP), helping to solve complex mining and environmental challenges. Since 1983, we have worked together on more than 40 projects, and **have successfully received local and national recognition for our efforts**. At Michael Baker, we do not take the past for granted, but rather, look forward to opportunities to enhance the services we offer to the WVDEP. To meet your design requirements and respond to the EOI, Michael Baker has assembled a team of experienced personnel who have performed on previous similar assignments for WVDEP. Our proposed team members have also provided similar services for numerous mine reclamation and related projects over the years for a variety of clients as reflected in the enclosed documentation.

Michael Baker's staff is experienced with all aspects of mine reclamation projects. We have provided similar services to the WVDEP, as well as the Pennsylvania DEP, the Ohio DNR, and the U.S. Office of Surface Mining to name a few. We feel that our combination of regional experience, familiarity with the site, proximity, and reclamation specific knowledge and expertise is unique to Michael Baker, and we are confident we can provide efficient, timely, personal, cost effective, and quality solutions for the WVDEP on this assignment.

We look forward to a favorable review of our qualifications and the opportunity to personally present our proposed project approach. Should you have any questions or require additional information, please feel free to contact me at (724) 495-4225 wneider@mbakerintl.com.

Very truly yours,

Michael Baker Jr., Inc.



William D. Neider, P.E.
Project Manager



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

State of West Virginia
Centralized Expression of Interest
Architect/Engr

Proc Folder: 933150			Reason for Modification:
Doc Description: EOI - Belle (Sneed) Drainage			
Proc Type: Central Purchase Order			
Date Issued	Solicitation Closes	Solicitation No	Version
2021-09-21	2021-10-19 13:30	CEOI 0313 DEP2200000005	1

BID RECEIVING LOCATION

BID CLERK
DEPARTMENT OF ADMINISTRATION
PURCHASING DIVISION
2019 WASHINGTON ST E
CHARLESTON WV 25305
US

VENDOR

Vendor Customer Code: 000000160331

Vendor Name : Michael Baker International, Inc.

Address : 100

Street : Airside Drive

City : Moon Township

State : Pennsylvania **Country :** United States **Zip :** 15108

Principal Contact : William D. Neider, P.E.

Vendor Contact Phone: (724) 495-4225 **Extension:**

FOR INFORMATION CONTACT THE BUYER

Joseph E Hager III
(304) 558-2306
joseph.e.hageriii@wv.gov

Vendor Signature X *Will D. Neider* **FEIN#** 25-1228638 **DATE** 10/18/2021

ADDITIONAL INFORMATION

The Acquisitions and Contract Administration Section of the Purchasing Division is soliciting an Expression of Interest for the West Virginia Department of Environmental Protection, Division of Land Restoration, Office of Abandoned Mine Lands and Reclamation (WVDEP-DLR-AML), from qualified firms to provide architectural/engineering services as defined herein.

2.PROJECT: The mission or purpose of the project for which bids are being solicited is to provide the following design services for the Belle (Sneed) Drainage project.

.Perform site investigation.

.Design access for construction and future maintenance access.

.Design of drainage conveyances, including drainage channels, underdrains, and/or other controls to safely convey water off site.

.Condition and revegetate all disturbed areas.

Per the attached specifications and terms and conditions.

INVOICE TO	SHIP TO
ENVIRONMENTAL PROTECTION OFFICE OF AML&R 601 57TH ST SE CHARLESTON WV 25304 US	ENVIRONMENTAL PROTECTION OFFICE OF AML&R 601 57TH ST SE CHARLESTON WV 25304 US

Line	Comm Ln Desc	Qty	Unit Issue
1	EOI Engineering Design Services		

Comm Code	Manufacturer	Specification	Model #
81100000			

Extended Description:

*Dates of Service are estimated for bidding purposes only.

SCHEDULE OF EVENTS

<u>Line</u>	<u>Event</u>	<u>Event Date</u>
-------------	--------------	-------------------

	Document Phase	Document Description	Page 3
DEP2200000005	Final	EOI - Belle (Sneed) Drainage	

ADDITIONAL TERMS AND CONDITIONS

See attached document(s) for additional Terms and Conditions



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

State of West Virginia
Centralized Expression of Interest
Architect/Engr

Proc Folder: 933150

Doc Description: EOI - Belle (Sneed) Drainage

Reason for Modification:

Addendum #1 issued to publish agency responses to all vendor submitted questions.

Proc Type: Central Purchase Order

Date Issued	Solicitation Closes	Solicitation No	Version
2021-10-13	2021-10-19 13:30	CEOI 0313 DEP2200000005	2

BID RECEIVING LOCATION

BID CLERK
DEPARTMENT OF ADMINISTRATION
PURCHASING DIVISION
2019 WASHINGTON ST E
CHARLESTON WV 25305
US

VENDOR

Vendor Customer Code: 000000160331

Vendor Name : Michael Baker International, Inc.

Address : 100

Street : Airside Drive

City : Moon Township

State : Pennsylvania

Country : United States

Zip : 15108

Principal Contact : William D. Neider, P.E.

Vendor Contact Phone: (724) 495-4225

Extension:

FOR INFORMATION CONTACT THE BUYER

Joseph E Hager III
(304) 558-2306
joseph.e.hageriii@wv.gov

Vendor
Signature X

FEIN# 25-1228638

DATE 10/18/2021

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

ADDITIONAL INFORMATION

The Acquisitions and Contract Administration Section of the Purchasing Division is soliciting an Expression of Interest for the West Virginia Department of Environmental Protection, Division of Land Restoration, Office of Abandoned Mine Lands and Reclamation (WVDEP-DLR-AML), from qualified firms to provide architectural/engineering services as defined herein.

2.PROJECT: The mission or purpose of the project for which bids are being solicited is to provide the following design services for the Belle (Sneed) Drainage project.

.Perform site investigation.

.Design access for construction and future maintenance access.

.Design of drainage conveyances, including drainage channels, underdrains, and/or other controls to safely convey water off site.

.Condition and revegetate all disturbed areas.

Per the attached specifications and terms and conditions.

INVOICE TO	SHIP TO
ENVIRONMENTAL PROTECTION OFFICE OF AML&R 601 57TH ST SE CHARLESTON WV 25304 US	ENVIRONMENTAL PROTECTION OFFICE OF AML&R 601 57TH ST SE CHARLESTON WV 25304 US

Line	Comm Ln Desc	Qty	Unit Issue
1	EOI Engineering Design Services		

Comm Code	Manufacturer	Specification	Model #
81100000			

Extended Description:

*Dates of Service are estimated for bidding purposes only.

SCHEDULE OF EVENTS

<u>Line</u>	<u>Event</u>	<u>Event Date</u>
-------------	--------------	-------------------

	Document Phase	Document Description	Page 3
DEP2200000005	Final	EOI - Belle (Sneed) Drainage	

ADDITIONAL TERMS AND CONDITIONS

See attached document(s) for additional Terms and Conditions

STATE OF WEST VIRGINIA
Purchasing Division

PURCHASING AFFIDAVIT

CONSTRUCTION CONTRACTS: Under W. Va. Code § 5-22-1(i), the contracting public entity shall not award a construction contract to any bidder that is known to be in default on any monetary obligation owed to the state or a political subdivision of the state, including, but not limited to, obligations related to payroll taxes, property taxes, sales and use taxes, fire service fees, or other fines or fees.

ALL CONTRACTS: 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: (1) for construction contracts, the vendor is not in default on any monetary obligation owed to the state or a political subdivision of the state, and (2) for all other contracts, 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: Michael Baker International, Inc.

Authorized Signature: Will D. Hill Date: 10/18/2021

State of Pennsylvania

County of Beaver, to-wit:

Taken, subscribed, and sworn to before me this 18 day of October, 2021.

My Commission expires September 18, 2024.

AFFIX SEAL HERE

Commonwealth of Pennsylvania - Notary Seal
Cheryl L. Noss, Notary Public
Allegheny County
My commission expires September 18, 2024
Commission number 1377231
Member, Pennsylvania Association of Notaries

NOTARY PUBLIC

Cheryl L. Noss

Purchasing Affidavit (Revised 01/19/2018)

West Virginia Ethics Commission
Disclosure of Interested Parties to Contracts

(Required by W. Va. Code § 6D-1-2)

Name of Contracting Business Entity: Michael Baker International Address: 100 Airside Drive
Moon Township, PA 15108

Name of Authorized Agent: William D. Neider, P.E. Address: 100 Airside Drive, Moon Township, PA 15108

Contract Number: CEOI 0313 DEP2200000005 Contract Description: EOI

Governmental agency awarding contract: WVDEP

☐ Check here if this is a Supplemental Disclosure

List the Names of Interested Parties to the contract which are known or reasonably anticipated by the contracting business entity for each category below (attach additional pages if necessary):

1. Subcontractors or other entities performing work or service under the Contract

☒ Check here if none, otherwise list entity/individual names below.

2. Any person or entity who owns 25% or more of contracting entity (not applicable to publicly traded entities)

☒ Check here if none, otherwise list entity/individual names below.

3. Any person or entity that facilitated, or negotiated the terms of, the applicable contract (excluding legal services related to the negotiation or drafting of the applicable contract)

☒ Check here if none, otherwise list entity/individual names below.

Signature: William D. Neider Date Signed: 10/18/2021

Notary Verification

State of Pennsylvania, County of Beaver:

I, William Neider, the authorized agent of the contracting business entity listed above, being duly sworn, acknowledge that the Disclosure herein is being made under oath and under the penalty of perjury.

Taken, sworn to and subscribed before me this 18 day of October, 2021.

Cheryl L. Noss

Notary Public's Signature

To be completed by State Agency:

Date Received by State Agency: _____
Date submitted to Ethics Commission: _____
Governmental agency submitting Disclosure: _____

Commonwealth of Pennsylvania - Notary Seal
Cheryl L. Noss, Notary Public
Allegheny County
My commission expires September 18, 2024
Commission number 1377231

Member, Pennsylvania Association of Notaries Revised Form 8, 2018

DESIGNATED CONTACT: Vendor appoints the individual identified in this Section as the Contract Administrator and the initial point of contact for matters relating to this Contract.

Will D. Phil

(Name, Title)

(Printed Name and Title)

(Address)

(Phone Number) / (Fax Number)

(email address)

CERTIFICATION AND SIGNATURE: By signing below, or submitting documentation through wvOASIS, I certify that: I have reviewed this Solicitation in its entirety; that I understand the requirements, terms and conditions, and other information contained herein; that this bid, offer or proposal constitutes an offer to the State that cannot be unilaterally withdrawn; that the product or service proposed meets the mandatory requirements contained in the Solicitation for that product or service, unless otherwise stated herein; that the Vendor accepts the terms and conditions contained in the Solicitation, unless otherwise stated 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.

By signing below, I further certify that I understand this Contract is subject to the provisions of West Virginia Code § 5A-3-62, which automatically voids certain contract clauses that violate State law.

(Company)

Will D. Phil

Senior Associate

(Authorized Signature) (Representative Name, Title)

(Printed Name and Title of Authorized Representative)

(Date)

(Phone Number) (Fax Number)

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.

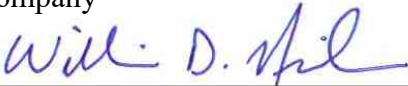
Addendum Numbers Received:

(Check the box next to each addendum received)

- | | |
|---|--|
| <input 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.

Company



Authorized Signature

Date

NOTE: This addendum acknowledgment should be submitted with the bid to expedite document processing.

SOLICITATION NUMBER: Addendum Number:

The purpose of this addendum is to modify the solicitation identified as (“Solicitation”) to reflect the change(s) identified and described below.

Applicable Addendum Category:

- ☐ Modify bid opening date and time
- ☐ Modify specifications of product or service being sought
- ☐ Attachment of vendor questions and responses
- ☐ Attachment of pre-bid sign-in sheet
- ☐ Correction of error
- ☐ Other

Description of Modification to Solicitation:

Additional Documentation: Documentation related to this Addendum (if any) has been included herewith as Attachment A and is specifically incorporated herein by reference.

Terms and Conditions:

1. All provisions of the Solicitation and other addenda not modified herein shall remain in full force and effect.
2. Vendor should acknowledge receipt of all addenda issued for this Solicitation by completing an Addendum Acknowledgment, a copy of which is included herewith. Failure to acknowledge addenda may result in bid disqualification. The addendum acknowledgement should be submitted with the bid to expedite document processing.

ATTACHMENT A

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:

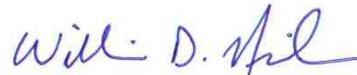
(Check the box next to each addendum received)

<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.

Michael Baker International, Inc.

Company



Authorized Signature

10/19/2021

Date

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

**WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION
AML CONSULTANT QUALIFICATION QUESTIONNAIRE**

Attachment "A"

PROJECT NAME EOI – Belle (Sneed) Drainage Kanawha County, WV CEOI 0313 DEP2200000005		DATE (DAY, MONTH, YEAR) <p style="text-align: center;">October 19, 2021</p>		FEIN <p style="text-align: center;">25-1228638</p>	
1. FIRM NAME Michael Baker International, Inc.		2. HOME OFFICE BUSINESS ADDRESS 100 Airside Drive Moon Township, Pennsylvania 15108		3. FORMER FIRM NAME Michael Baker Jr., Inc.	
4. HOME OFFICE TELEPHONE <p style="text-align: center;">412.269.6300</p>	5. ESTABLISHED (YEAR) <p style="text-align: center;">1940</p>	6. TYPE OWNERSHIP Individual <u>Corporation</u> Partnership Joint-Venture		6a. WV REGISTERED DBE (Disadvantaged Business Enterprise) <p style="text-align: right;">YES <u>NO</u></p>	
7. PRIMARY AML DESIGN OFFICE: ADDRESS / TELEPHONE / PERSON IN CHARGE / NO. AML DESIGN PERSONNEL EACH OFFICE Michael Baker International / 100 Airside Drive, Moon Township, PA 15108 / 724.495.4225 / William D. Neider, PE / 25 Russell E. (Rusty) Hall, PE, PS / 7 (Charleston, WV)					
8. NAMES OF PRINCIPAL OFFICERS OR MEMBERS OF FIRM William D. Neider, PE, Senior Associate – 724.495.4225			8a. NAME, TITLE, & TELEPHONE NUMBER - OTHER PRINCIPALS Russell E. (Rusty) Hall, PE, PS, Assistant Vice President – 304.769.0821		
9. PERSONNEL BY DISCIPLINE (Bold Lettering Indicates Minimum Design Team Members)					
<u>195</u> ADMINISTRATIVE <u>13</u> ARCHITECTS <u>2</u> BIOLOGISTS <u>21</u> CADD OPERATORS/DESIGNERS <u>1</u> CHEMICAL ENGINEERS <u>57</u> CIVIL ENGINEERS <u>81</u> CONSTRUCTION INSPECTORS / Mgrs. <u>71</u> DESIGNERS <u>3</u> DRAFTSMEN	<u>1</u> ECOLOGISTS <u>0</u> ECONOMISTS <u>6</u> ELECTRICAL ENGINEERS <u>15</u> ENVIRONMENTALISTS <u>12</u> ESTIMATORS <u>15</u> GEOLOGISTS <u>16</u> HISTORIANS <u>4</u> HYDROLOGISTS	<u>2</u> LANDSCAPE ARCHITECTS <u>10</u> MECHANICAL ENGINEERS <u>4</u> MINING ENGINEERS <u>1</u> PHOTOGRAMMETRISTS <u>25</u> PLANNERS: URBAN/REGIONAL <u>2</u> SANITARY ENGINEERS <u>2</u> SOILS ENGINEERS <u>7</u> SPECIFICATION WRITERS	<u>26</u> STRUCTURAL ENGINEERS <u>16</u> SURVEYORS/Technicians <u>16</u> TRAFFIC ENGINEERS <u>77</u> ENGINEERING TECHNICIANS <u>73</u> PROJECT MANAGERS <u>37</u> GIS SPECIALISTS <u>35</u> OTHER <u>728</u> TOTAL PERSONNEL (Moon Township, PA and Charleston, WV Offices)		
TOTAL NUMBER OF WV REGISTERED PROFESSIONAL ENGINEERS IN PRIMARY OFFICE: <u>22</u> * RPEs other than Civil and Mining must provide supporting documentation that qualifies them to supervise and perform this type of work.					
10. HAS THIS JOINT-VENTURE WORKED TOGETHER BEFORE?			_YES _NO N/A		

**WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION
AML CONSULTANT QUALIFICATION QUESTIONNAIRE**

Attachment "A"

11. OUTSIDE KEY CONSULTANTS / SUB-CONSULTANTS ANTICIPATED TO BE USED. Attach "AML Consultant Confidential Qualification

NAME AND ADDRESS: NGE Consulting 650 MacCorkle Avenue West St. Albans, WV 25177	SPECIALTY: Drilling, Geotechnical Exploration, and Monitoring	WORKED WITH BEFORE <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
NAME AND ADDRESS: Bio-Chem Testing, Inc. 5 Weatherridge Drive Hurricane, WV 25526	SPECIALTY: Water Testing	WORKED WITH BEFORE <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
NAME AND ADDRESS: Sturm Environmental Services Brushy Fork Road Bridgeport, WV 26330	SPECIALTY: Soil Testing	WORKED WITH BEFORE <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
NAME AND ADDRESS:	SPECIALTY:	WORKED WITH BEFORE <input type="checkbox"/> Yes <input type="checkbox"/> No
NAME AND ADDRESS:	SPECIALTY:	WORKED WITH BEFORE <input type="checkbox"/> Yes <input type="checkbox"/> No
NAME AND ADDRESS:	SPECIALTY:	WORKED WITH BEFORE <input type="checkbox"/> Yes <input type="checkbox"/> No
NAME AND ADDRESS:	SPECIALTY:	WORKED WITH BEFORE <input type="checkbox"/> Yes <input type="checkbox"/> No
NAME AND ADDRESS:	SPECIALTY:	WORKED WITH BEFORE <input type="checkbox"/> Yes <input type="checkbox"/> No
NAME AND ADDRESS:	SPECIALTY:	WORKED WITH BEFORE <input type="checkbox"/> Yes <input type="checkbox"/> No

12. RELEVANT EXPERIENCE.

A. Is your firm's personnel experienced in Abandoned Mine Lands Remediation / Mine Reclamation Engineering?

YES Description and Number of Projects:

Michael Baker has been assisting state and federal agencies with abandoned mine land (AML) restoration and acid mine drainage (AMD) remediation since 1977. Michael Baker's experience began with Operation Scarlift and now includes well over 200 AML/AMD remediation projects ranging from strip pit and highwall regrading subsidence control, mine sealing, reclamation of mine refuse piles,; drainage improvements, revegetation, stream relocation, restoration of streams and wetlands, natural streambed design, landslide correction, and replacement of water supplies affected by abandoned mine lands to abatement of AMD problems. These services are accomplished by providing a "one-stop-shop" of professionals including engineers, geologists, surveyors, and environmental scientists to address essentially any issue that may be encountered on an AML project. These professionals combine diverse experience in:

- | | | | |
|--------------------------|------------------------------|-------------------------------|------------------------|
| • Mining | • Water Treatment | • Stormwater Management | • Surveying |
| • Geotechnical | • Water Line Design & Supply | • E&S Control | • Mapping |
| • Geology | • Grading | • Sustainable Design | • Field Reconnaissance |
| • Hydraulics & Hydrology | • Earthwork Balance | • Hazardous Waste Remediation | • Project Management |
| • Groundwater | • Highwall Elimination | • Material Handling Plans | • Quality Control |

Michael Baker has been assisting West Virginia Department of Environmental Protection with Abandoned Mine Lands Remediation/Mine Reclamation Engineering design services ever since WVDEP initiated its AML Reclamation Program in 1983. In addition to WVDEP, we have also assisted PADEP with AML reclamation and AMD remediation designs. The "AML and related Project Experience Matrix" table provided at the end of this Consultant Qualification Questionnaire (CQQ) shows our experience on AML related projects for different state agencies, and for private clients.

NO

B. Is your firm experienced in soil analysis?

YES Description and Number of Projects:

Michael Baker has conducted in-house soil analysis for over 60 years. We take pride in our work that starts with a geologic literature review to identify and review available references that characterize the site soils and other factors influencing the development and condition of the soils. The task is followed by a geotechnical reconnaissance that is essentially a site view by a Michael Baker geologist or geotechnical engineer to characterize the site soil conditions. Lastly and as appropriate, a subsurface investigation is conducted to collect and identify site soils and assign appropriate engineering descriptions that, in turn, are utilized for soil analysis.

In designing AML reclamation projects, generally three types of soil analysis are needed. These analyses may include: a) geotechnical analysis/soil classification, b) soil analysis for revegetation potential (pH, Acid Base Accounting, Nutrients) and c) soil analysis for hazardous materials. Michael Baker is involved in selecting and collecting the soil samples and analyzing the results of laboratory testing as required for design. Laboratory testing is performed by a subcontractor. Of the 30 most recent AML projects, Michael Baker was involved in soil analysis for 23 projects. Michael Baker has also prepared reprocessing potential evaluations of coal refuse sites (10 projects),

12. RELEVANT EXPERIENCE.

which required evaluation of mine refuse based on laboratory test results. Refuse testing for these projects included refuse float/sink and proximate analysis, with results evaluated by Michael Baker to determine BTU content and reprocessing potential.

In addition to evaluating coal refuse for reprocessing, Michael Baker has experience in the design of coal refuse facilities through our work in supporting active mining. Michael Baker has conducted the geotechnical analysis related to slope stability and liner/cover soils permeability, as well as the analysis to support the staging required to construct the refuse area. Our experience includes coarse refuse piles, fine refuse (slurry) impoundments, and combined refuse areas. Michael Baker currently is involved with the final permitting of a refuse facility for which we have conducted all the geotechnical, civil, and hydraulic analysis for an approximate 300-acre refuse facility.

NO

C. Is your firm experienced in hydrology and hydraulics?

YES Description and Number of Projects:

Michael Baker's hydrology and hydraulic staff for AML remediation design are experts in the application of hydraulic models that include HEC-1, HEC-2, HEC-RAS, HY8, TR20, TR55, HAESTADS PONDS 2, FLOWMASTER, HYDROFLOW, KYPIPE 2, CYBERNET, SEDCAD 4, UNET, and DAMBRK. Michael Baker applies this experience to services such as stormwater management; culvert analysis; hydrologic and hydraulic studies; storm sewer design; floodplain modeling; channel design; watershed planning; energy dissipation; and waterline extension and distribution.

Expertise in hydrology and hydraulics is essential in any AML reclamation/remediation design. Of the 30 most recent AML projects, 28 projects needed hydrology/hydraulics expertise of the AML/AMD design group, and 100% of this work was conducted in-house.

NO

12. RELEVANT EXPERIENCE.

D. Does your firm produce its own aerial photography and Develop Contour Mapping?

YES Description and Number of Projects:

Since 1983, Michael Baker has been designing AML/AMD remediation projects for WVDEP. For all the AML projects to date, WVDEP provided Michael Baker with contour maps developed from aerial photography of the project site. Michael Baker's responsibility was to verify the topographic map by check field surveying.

Michael Baker has a survey and photogrammetric department with a staff of 96. Michael Baker routinely performs aerial photography and contour mapping for federal and several state agencies, as well as for private clients. This includes mapping for special reclamation projects for WVDEP. Michael Baker's Survey and Photogrammetric Department is as old as the company itself is; however, Michael Baker always brings the latest technology to the table. Fixed, mobile, and aerial LiDAR equipment are "state-of-the-art" tools that Michael Baker can offer to add efficiencies to the field mapping process and enhance quality. **Michael Baker is a national leader in the development and application of aerial LiDAR.** During the last five years, Michael Baker has completed more than 50 mapping projects. Some examples are listed as follows:

Professional Mapping and Design Services at the Bond Forfeited Permits of the Maurice Jennings Coal Company S-61-83 and S-53-78, WVDEP (Photogrammetric Mapping, Surveying Services, Bathymetric Surveying, and 4 Band Imagery).

Professional Mapping and Design Services at the Bond Forfeited Permits of the Masteller Coal Company S-125-82 and S-10-85-78, WVDEP (Photogrammetric Mapping, Surveying Services, Bathymetric Surveying, and 4 Band Imagery).

Professional Mapping and Design Services at the Bond Forfeited Permits of the F&M Coal Company S-1044-87 and S-57-84, WVDEP (Photogrammetric Mapping, Surveying Services, Bathymetric Surveying, and 4 Band Imagery).

Updating Boundary/Site Improvements and Utility Survey – 23 LPOEs, North and South U.S. Borders, US-VISIT (Photogrammetric Mapping and Surveying Services).

Rio Grande Valley Border Fence Boundary Surveys, Cameron and Hidalgo Counties, TX. U.S. Army Corps of Engineers, Fort Worth District (Metes and Bounds Surveys and Legal Deed Descriptions)

Land Ports of Entry (LPOEs) Aerial Mapping Refresh, North and South U.S. Borders. Department of Homeland Security, US-VISIT (Mapping)

Sewer Infrastructure Location/Verification, Allegheny County, PA. 3 Rivers Wet Weather, Inc. (GPS or Conventional Survey Data by Others)

Open-End Contract for Surveying and Photogrammetric Mapping Services, Statewide, Pennsylvania. Pennsylvania Department of Transportation (Through a series of nine open-end contracts, Michael Baker has been providing surveying and mapping services to PennDOT continuously since 1986.

Indefinite Delivery Contract A/E for Multidiscipline & Related Services for the Department of Homeland Security and Other Civil/Military Projects. U.S. Army Corps of Engineers, Fort Worth District (Surveying and Mapping)

Border Fence Project – PF225, Various Locations in TX, AZ, NM, CA. U.S. Army Corps of Engineers, Fort Worth District. (Aerial Photography, Analytical Aerotriangulation, Stereo Mapping Compilation, Digital Orthophotography, Horizontal and Vertical Control Surveys, Geodetic Surveys)

Land Ports of Entry (LPOEs) Aerial Mapping Refresh, North and South U.S. Borders. Department of Homeland Security, US-VISIT (Aerial Photography Stereo Mapping Compilation/Topographic Mapping, Horizontal and Vertical Control Surveys, Geodetic Surveys)

Aerial Photography, Contour Mapping, and Field Surveys are at the core of Michael Baker's business and expertise.

NO

12. RELEVANT EXPERIENCE.

E. Is your firm experienced in domestic waterline design? (Include any experience your firm has in evaluation of aquifer degradation as a result of mining.)

YES Description and Number of Projects:

Michael Baker, to date, has designed eight (8) domestic waterlines for WVDEP and countless others for clients in West Virginia, Pennsylvania, Ohio, and elsewhere. In general, for each of these projects, Michael Baker performed field surveying of proposed routes, subsurface investigation for storage tank site foundations, water distribution system hydraulic modeling and analyses, pipeline design, storage tank sizing, sizing and designing booster pumping station, and electric and telemetric system. For the McDowell County Public Water Supply System, Michael Baker also designed a water treatment and filtration plant. Construction plans, specifications, cost estimate and bid schedules were prepared for each project.

Michael Baker has performed numerous waterline extension feasibility studies to determine if the pre-law mining had impacted area aquifers from which local residents obtained drinking water. The studies also involved evaluation of mining activities in the project area with regard to date and time of mining, and the effect of mining on the local aquifers and groundwater quality based on hydrogeological data, resident interview, water sampling and testing, and historic background water quality information. To date, Michael Baker has performed more than 16 water line feasibility studies.

NO

12. RELEVANT EXPERIENCE.

F. Is your firm experienced in Acid Mine Drainage Evaluation and Abatement Design?

YES

Description and Number of Projects:

Michael Baker's design experience includes both active and passive treatment systems, which is based on the characterization of the AMD site as well as the flows and chemistry of the AMD. To this end, Michael Baker provides AMD sampling to determine chemical parameters as well as the flow measurements covering high- and low-flow periods that are most important in developing AMD abatement system. To date, Michael Baker has evaluated and designed 17 AMD abatement systems, four of which are passive treatment systems while the other 13 are active treatment facilities that have been constructed and are currently in service. A few examples are listed as follows:

Professional Mapping and Design Services at the Bond Forfeited Permits of the Maurice Jennings Coal Company S-61-83 and S-53-78, West Virginia Department of Environmental Protection, Office of Special Reclamation, Michael Baker designed seep collectors, conveyance pipes, pump stations, force mains, and limestone lined conveyance channels to transfer AMD to a high density lime slurry treatment system consisting of a surge pond, equalization pond, clarification ponds and a terminal aerobic wetland.

Professional Mapping and Design Services at the Bond Forfeited Permits of the Masteller Coal Company S-125-82 and S-10-85-78, West Virginia Department of Environmental Protection, Office of Special Reclamation, Michael Baker designed seep collectors, conveyance pipes, and limestone lined conveyance channels to transfer AMD to a treatment system consisting of ponds for aeration, clarification, and sludge retention, a solar powered caustic soda feed pumps, and wholly passive treatment systems that do not include and water wheel lime feeders.

Professional Mapping and Design Services at the Bond Forfeited Permits of the F&M Coal Company S-1044-87 and S-57-84, West Virginia Department of Environmental Protection, Office of Special Reclamation, Michael Baker designed seep collectors, conveyance pipes, pump stations, force mains, and limestone lined conveyance channels to transfer AMD to a high density lime slurry treatment system consisting of solar powered caustic soda feed pumps, surge ponds, equalization ponds, clarification ponds, and a terminal aerobic wetland.

Kempton Refuse and Acid Mine Drainage/Abandoned Mine Lands, Tucker County, West Virginia, West Virginia Department of Environmental Protection, Office of Abandoned Mine Lands, Michael Baker designed conveyance pipes and limestone lined conveyance channels to transfer AMD to a treatment system consisting of an equalization pond, successive alkalinity producing system (SAPS pond), and aerobic wetland. The project was constructed in 2009.

Lancashire Acid Mine Drainage Treatment Plant Design, Permitting, and Construction Phase Services, Ebensburg, PA, Pennsylvania Department of Environmental Protection, Michael Baker directed a multi-disciplinary team of engineers in the design and permitting of an 11 MGD acid mine drainage treatment plant; and subsequently provided construction phase services through commissioning. The treatment plant was successfully commissioned in 2011.

Condition Assessment and Operational Audit – Dumans Mine Water Treatment Plant, Barr Township, PA, Pennsylvania Department of Environmental Protection, Michael Baker directed activities of a multi-disciplinary engineering team investigating avenues to reduce acid mine water treatment costs and improve operations at the pumping station, treatment plant, and sludge lagoons (9.4 MGD). Work involved review of records; numerous field measurements, bench-scale treatability studies; consultation with the electric company, cost estimating; and preparation of a report summarizing findings and recommendations. The team was charged with finding avenues to reduce the annual operation and maintenance cost of this facility materially while maintaining compliance with applicable effluent limitations.

Additionally, Michael Baker has designed ten AMD remediation projects for the WVDEP alone that included open limestone channel (OLC), anaerobic and aerobic wetlands and settling ponds, limestone sand dumping in the stream, and alkaline leach bed/anoxic limestone drains. Other Michael Baker AMD abatement designs have been designed for USACE's Baltimore and Nashville Districts, as well as the Pennsylvania Department of Environmental Protection.

NO

13. PERSONAL HISTORY STATEMENT OF PRINCIPALS AND ASSOCIATES RESPONSIBLE FOR AML PROJECT DESIGN. (Furnish complete data but keep to essentials)

As depicted in Attachments B and C of this AML Consultant Questionnaire Form, Michael Baker can support this project with a variety and depth of technical resources as needed to deliver this project successfully. **However, the organization chart depicted on the following page identifies our core AML team that Michael Baker will dedicate to our WVDEP AML work.** This team will be led by Mr. Bill Neider, serving as Michael Baker's AML & Reclamation Coordinator. Mr. Neider is a registered West Virginia Professional Engineer and will also be acting as Project Manager.

The balance of our committed team includes personnel with the type of capabilities required for a typical AML project, including a senior field investigator to help assess the site and understand the mining conditions, a geologist or civil associate to conduct subsurface investigations, a designer for grading and earthwork balance, a civil associate for stormwater/erosion & sedimentation control, and an engineer to assist with the design, plans and specifications.

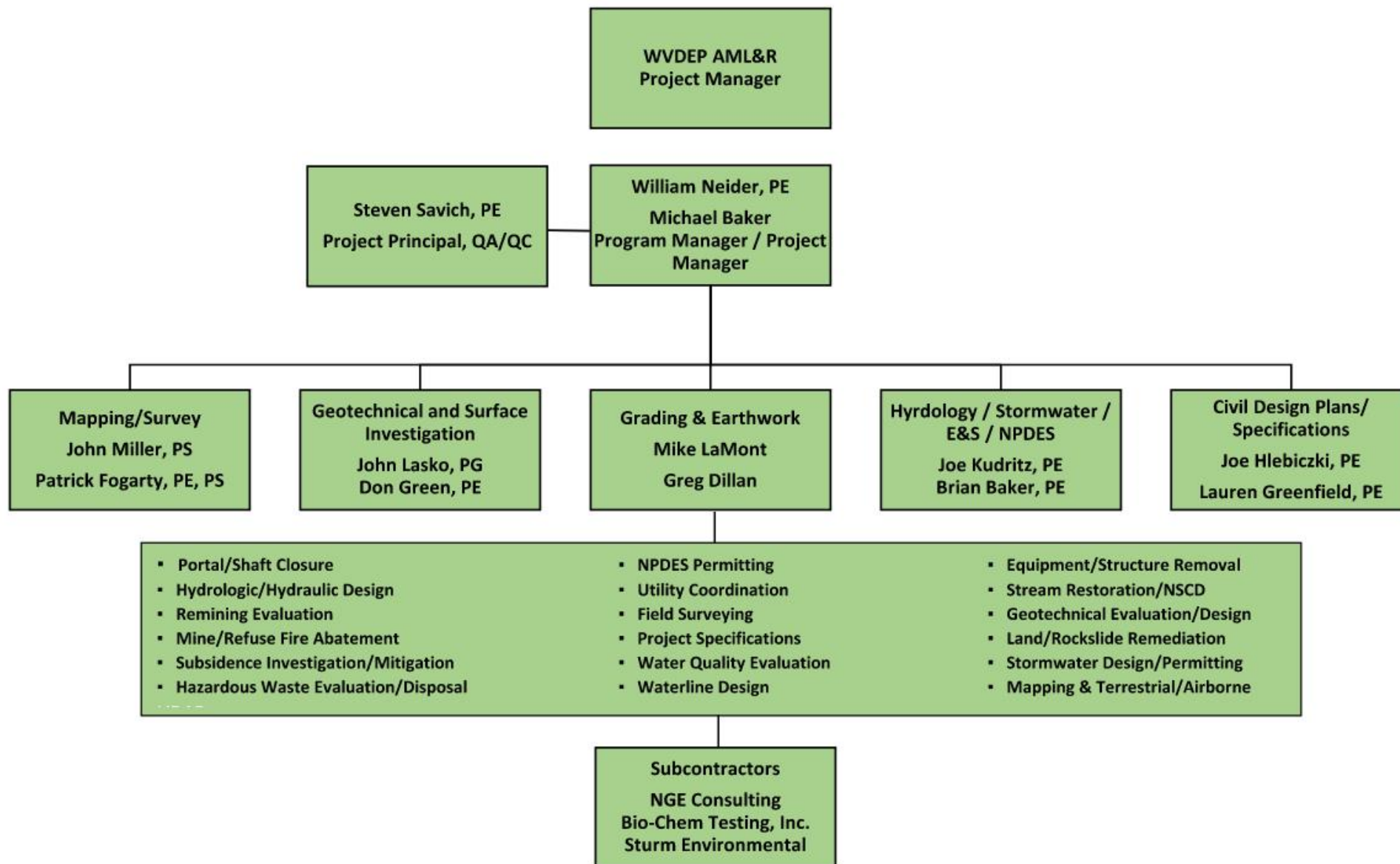
Other technical disciplines are available to assess items like surface water quality, hazardous materials (past AMD treatment chemicals), cover soils, refuse stability, site access, bridges, etc.

This team will work together closely for design efficiency and can handle multiple concurrent projects, tapping other Michael Baker technical resources, as needed, to ensure project success.

**WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION
AML CONSULTANT QUALIFICATION QUESTIONNAIRE**

Attachment "A"

13. PERSONAL HISTORY STATEMENT OF PRINCIPALS AND ASSOCIATES RESPONSIBLE FOR AML PROJECT DESIGN. (Furnish complete data but keep to essentials)



**WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION
AML CONSULTANT QUALIFICATION QUESTIONNAIRE**

Attachment "A"

13. PERSONAL HISTORY STATEMENT OF PRINCIPALS AND ASSOCIATES RESPONSIBLE FOR AML PROJECT DESIGN. (Furnish complete data but keep to essentials)

NAME & TITLE (Last, First, Middle Int.)	YEARS OF EXPERIENCE		
	YEARS OF AML DESIGN EXPERIENCE:	YEARS OF AML RELATED DESIGN EXPERIENCE:	YEARS OF DOMESTIC WATERLINE DESIGN EXPERIENCE:
Savich, Steven, M., P.E. Practice Executive, Land Dev. & Infrastructure	4	26	24

Brief Explanation of Responsibilities

Mr. Savich is committed to client satisfaction and proactive coordination and communication with WVDEP. Based on the long running relationship between WVDEP and Michael Baker, Mr. Savich conveys this approach through Michael Baker's AML&R Team.

Crabtree Creek AMD Restoration Project, Westmoreland County, Pennsylvania. *PA Department of Environmental Protection.* QA/QC. Responsible for QA/QC of the project. Michael Baker is providing permitting, survey, geotechnical, and design services for the Crabtree Creek AMD Restoration Project in Westmoreland County, Pennsylvania. Work includes the design of the collection system of the mine pool AMD discharge and the design of approximately 18,300 feet of pipeline for gravity conveyance of the AMD discharge from the collection point to the passive treatment system site.

Mountain View Portals Mine Reclamation, Preston County, West Virginia. *West Virginia Department of Environmental Protection.* QA/QC. Responsible for QA/QC of the project. Michael Baker provided engineering services for the reclamation of the Mountain View Portals abandoned coal mine site. Michael Baker's services included site investigation; field survey; subsurface investigation; water quality and soil sampling and analysis; conceptual, preliminary, and final design; stream restoration; permitting; environmental investigations; bidding-phase support; and construction monitoring.

Service Center Replacement Design and Construction Management, McKeesport, Pennsylvania. *Duquesne Light Company.* Technical Manager. Served as the civil engineering lead for the project. Coordinated all civil engineering efforts on the project, provided technical oversight of staff, and provided quality control and project compliance reviews. Michael Baker served as architect/engineer of record and owner's representative for all phases of work in connection with design and construction management for a 27,000-square-foot service center to be used for equipment servicing, truck servicing and repairs, and other vehicle deployment needs. The site is an "improved brownfield site, ready for development." Michael Baker prepared complete and comprehensive design documents and supported all site requirements, including agency permitting, due diligence, and other administrative services, to secure the site location. Michael Baker also provided procurement services, negotiation support, bid support, and construction management and inspection.

Addison Terrace Redevelopment Master Planning and Engineering Services, Pittsburgh, Pennsylvania. *Housing Authority of the City of Pittsburgh.* Project Manager. Participated in the Master Planning process with third party Architecture and Landscape design teams. Responsible for all design and permitting documentation as well as coordination with all relevant agencies. The resulting plan and cost estimate will be used as the guidance for final design of the resulting development. As part of a multidisciplinary consulting team, Baker provided planning, civil engineering, and construction phase services for the Addison Terrace housing complex into a new, mixed-income, mixed-use community. Michael Baker's services included master planning, civil engineering for site design and utilities, construction-phase services, community outreach, and stakeholder coordination.

Garfield Commons Redevelopment, Pittsburgh, Pennsylvania. *Urban Redevelopment Authority of Pittsburgh.* Project Manager. Provided technical oversight of the design team preparing the plan and specification documents. He was responsible for all design and permitting documentation as well as coordination with all relevant agencies. Michael Baker provided engineering services for the redevelopment of the Garfield Heights public housing development to Garfield Commons, a mixed-income residential neighborhood. Michael Baker's services included planning, site design, utility coordination and design, grading and drainage design, the preparation of erosion and sediment control plans, the design of sidewalks and parking facilities, landscape architecture, and construction management and construction inspection.

Public Improvements for Public Housing in the City of Pittsburgh. *LaQuatra Bonci Associates.* Project Manager. Managed the design of public infrastructure for the redevelopment of portions of the Larimer neighborhood. The work included new sewers, waterlines and public streets and sidewalks.

Freeport Mine - PH I - Preparation of 6 Design Build RFP Packages and 1 Site Design -Bid Build Bid Package. *Freeport Mining.* Technical Lead. Provided technical oversight of the design team preparing the surface facilities plan and specification documents. He was responsible for design and permitting documentation as well as coordination with all relevant agencies.

EDUCATION (Degree, Year, Specialization)

Master's Certificate, 2003, Civil Engineering | B.S., 1995, Civil Engineering

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS

Society of American Military Engineers (SAME) | Urban Land Institute (ULI)

REGISTRATION (Type, Year, State)

Professional Engineer, 2005, PA | Professional Engineer, 2000, OH | Professional Engineer, 2006, VA | Professional Engineer, New Jersey, 2017

**WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION
AML CONSULTANT QUALIFICATION QUESTIONNAIRE**

Attachment "A"

13. PERSONAL HISTORY STATEMENT OF PRINCIPALS AND ASSOCIATES RESPONSIBLE FOR AML PROJECT DESIGN. (Furnish complete data but keep to essentials)

NAME & TITLE (Last, First, Middle Int.)	YEARS OF EXPERIENCE		
	YEARS OF AML DESIGN EXPERIENCE:	YEARS OF AML RELATED DESIGN EXPERIENCE:	YEARS OF DOMESTIC WATERLINE DESIGN EXPERIENCE:
Neider, William, D., P.E. Project Manager	10	23	15

Brief Explanation of Responsibilities

Mr. Neider will oversee all aspects of the design, construction document preparation and permitting for site civil engineering projects. He has worked in various areas of the civil engineering practice with his primary area of experience being focused in mining permitting and reclamation projects, oil and gas permitting, land development, local transportation projects, and municipal services. He has managed projects and designed the improvements and infrastructure for commercial development, military/U.S. Government, residential subdivisions, industrial parks and sites, educational facilities, and local streets. In addition to land development experience, he has designed and directed a number of mining facilities infrastructure permitting and reclamation projects including refuse impoundments, coarse refuse piles, erosion and sedimentation control plans, and site reclamation. He also performed municipal engineering designs that included water distribution extensions, sewer modeling/design, drainage studies, and flood abatement designs. In all areas of his experience, he has been involved in every aspect of the design and construction document preparation, as well as management of design teams and project management. Mr. Neider has also been involved in oversight of the construction phase of projects. His experience has been with coordinating the review of project submittals, answering requests for information, and resolving construction related issues to ensure proper conformance to the design intent.

Mountain View Portals Mine Reclamation, Preston County, West Virginia. *West Virginia Division of Environmental Protection.* Project Manager. Responsibilities include project manager duties, quality control/quality assurance reviews of the project, and project design. Also, responsible for construction cost estimate, stormwater pollution prevention plan, technical specifications, and NPDES permitting. The purpose of the project was to remediate subsidence areas, reestablish mine captured stream, provide drainage conveyances, install mine seals and bat gate mine seals, and perform refuse reclamation and revegetation of disturbed areas. Michael Baker prepared construction plans, specifications, stormwater pollution prevention plan services, and check survey.

Ebenezer Run Highwall #9, Brooke County, West Virginia. *West Virginia Division of Environmental Protection.* Project Manager. Responsibilities include project manager duties, quality control/quality assurance reviews of the project, and project design. Also responsible for construction cost estimate, stormwater pollution prevention plan, technical specifications, and NPDES permitting. The project consists of reclamation of two sites with approximately 3,660 linear feet of an abandoned strip mine highwall ranging in height from 30 to 40 feet and areas of mine spoil. Michael Baker prepared construction plans, specifications, stormwater pollution prevention plan services, and check survey.

Waitman Barbe Highwall #1, Monongalia County, West Virginia. *West Virginia Division of Environmental Protection.* Project Manager. Responsibilities include project manager duties, quality control/quality assurance reviews of the project, and design of channels and channel linings at the toe of the backfilled highwall. Also responsible for construction cost estimate, stormwater pollution prevention plan, and technical specifications. The project consists of reclamation of approximately 4,600 linear feet of an abandoned strip mine highwall ranging in height from 30 to 45 feet. This includes areas of mine spoil, three areas of exposed coal refuse, an illegal dumpsite containing non-hazardous construction debris and a suspected 11 mine openings. Michael Baker prepared construction plans, specifications, and a stormwater pollution prevention plan services.

Collier Sportsman's Club Highwalls, Brooke County, West Virginia. *West Virginia Division of Environmental Protection.* Project Manager. Responsibilities include project manager duties, quality control/quality assurance reviews, and design of channels and channel linings at the toe of the backfilled highwall. Also responsible for construction cost estimate, stormwater pollution prevention plan, and technical specifications. Involved with proposed gas line crossing with resolution and coordination between the gas line company and the WVDEP. The project consists of reclamation of an abandoned strip mine highwall and includes mine spoil, review of water quality data, design of wet and buried mine seals with bat gates at suspected mine entries, removal of non-hazardous trash and waste from the site, and revegetation of all disturbed areas.

Professional Mapping and Design Services at the Bond Forfeited Permits of the Masteller Coal Company S-10-85 & S-125-82, Mineral County, West Virginia. *West Virginia Division of Environmental Protection.* Project Manager. Responsibilities include project manager duties, quality control/quality assurance reviews of the project, and project design. Also responsible for construction cost estimate, stormwater pollution prevention plan, and technical specifications. The project consist of mapping, reclamation, and treatment for previously reclaimed highwalls, treatment ponds, and several acid mine drainage (AMD) seeps at the site of an abandoned strip mine.

Professional Mapping and Design Services at the Bond Forfeited Permits of the F&M Coal Company S-1044-87 & S-57-84, Preston County, West Virginia. *West Virginia Division of Environmental Protection.* Project Manager. Responsibilities include project manager duties, quality control/quality assurance reviews of the project, and project design. Also responsible for construction cost estimate, stormwater pollution prevention plan, and technical specifications. The project consist of mapping, reclamation, and treatment for previously reclaimed highwalls, treatment ponds, and several acid mine drainage (AMD) seeps at the site of an abandoned strip mine.

EDUCATION (Degree, Year, Specialization)

B.S.A.S., 2001, Civil Engineering Technology

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS

N/A

REGISTRATION (Type, Year, State)

Professional Engineer, 2013, WV | Professional Engineer, 2007, PA

**WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION
AML CONSULTANT QUALIFICATION QUESTIONNAIRE**

Attachment "A"

13. PERSONAL HISTORY STATEMENT OF PRINCIPALS AND ASSOCIATES RESPONSIBLE FOR AML PROJECT DESIGN. (Furnish complete data but keep to essentials)

NAME & TITLE (Last, First, Middle Int.)	YEARS OF EXPERIENCE		
	YEARS OF AML DESIGN EXPERIENCE:	YEARS OF AML RELATED DESIGN EXPERIENCE:	YEARS OF DOMESTIC WATERLINE DESIGN EXPERIENCE:
John Miller, P.S. Senior Surveyor	7	49	0

Brief Explanation of Responsibilities

Mr. Miller is a seasoned Licensed Surveyor with over 45 years of experience. He has managed and directed crews for various survey projects including control surveys for aerial mapping, as-built surveys, property surveys, subdivision and land development surveys, topographic surveys for sewer and water projects, and construction stakeouts. Mr. Miller has managed projects from initial client contact to completion, prepared cost estimates for projects, performed court house research, deed plotting, boundary line resolution, plotted and reduced field data, managed subdivision layout and erosion sedimentation plans, prepared Highway Occupancy Permits and DEP planning modules, prepared agency applications and obtained approvals, attended municipal meetings, prepared legal descriptions, created plans using computer aided drafting, and volume calculations for landfill air space.

Mapping and Design Services for Special Mine Reclamation Permits, Preston County, West Virginia. West Virginia Department of Environmental Protection. Surveyor. Directed survey crew in the location of mine openings, seeps, monitoring wells and test borings. Verified mapping contours by surveying cross-sections. This survey will be used for engineering design to treat the water from mine drainage. Michael Baker is providing engineering and mapping services to meet the requirements of special mine reclamation permits. Michael Baker's services include data collection and analysis, aerial mapping verification, supplemental field and bathymetric pond surveying, bench-scale treatability testing, acid-base accounting testing, engineering design and analysis, preparation of construction plans and specifications and stormwater pollution prevention plans; cost estimates, bidding-phase support; and construction services.

Maurice Jennings Coal Company Site, Preston, West Virginia. West Virginia Department of Environmental Protection. Surveyor. Directed survey crew in the location of mine openings, seeps, monitoring wells, treatment facilities and treatment ponds. Verified mapping contours by surveying cross-sections. This survey will be used for engineering design to treat the water from mine drainage. Michael Baker is providing engineering services for the special reclamation of Maurice Jennings Coal Company mining permits; S-61-83 and S-53-78. The project area consists of previously reclaimed highwalls, treatment ponds, and several acid mine drainage (AMD) seeps at the site of an abandoned strip mine. Michael Baker's services include aerial mapping, site reconnaissance, permit research and review, surveying, bench-scale treatability studies, AMD conveyance, AMD treatment, preparation of reclamation and treatment plans, stormwater pollution prevention plans, field water quality sampling, technical specifications, bidding-phase support, construction services, and right-of-way support.

Masteller Coal Company Site, Mineral, West Virginia. West Virginia Department of Environmental Protection. Surveyor. Directed survey crew in the location of mine openings, seeps, monitoring wells, treatment facilities and treatment ponds. Verified mapping contours by surveying cross-sections. This survey will be used for engineering design to treat the water from mine drainage. Michael Baker is providing engineering services for special reclamation of Masteller Coal Company mining permits; S-10-85 and S-125-82. The project area consists of previously reclaimed highwalls, treatment ponds, and several acid mine drainage (AMD) seeps. Michael Baker's services include site reconnaissance, permit research and review, aerial mapping, surveying, bench-scale treatability studies, AMD conveyance, AMD treatment, preparation of reclamation and treatment plans, stormwater pollution prevention plans, field water quality sampling, technical specifications, bidding-phase support, and construction services.

Surveying Services for Natural Gas Lines, Washington County and Green County, Pennsylvania. Vista Gathering, LLC. Surveyor. Directed survey crew, stakeout pipeline centerline, stakeout limit of disturbance, survey road crossings, stream crossings and utility locations for permitting and construction. Michael Baker provided surveying services for new natural gas pipelines ranging in length from one mile to nine miles throughout Southwestern Pennsylvania. Services included routing; re-routing; preliminary topographic surveys locating obstructions, property evidence, proposed route as indicated by land agents, woodland, utility, road, stream, and railroad crossings; and tying of the resultant mapping into the state plane coordinate system and vertical datum by the use of OPUS to generate the alignment sheets. Michael Baker also provided construction stake-out surveys, including preliminary centerline for property owner review and constructability walk; final stakeout for construction, including right-of-way and LOD; development of as-builts; and downloading and processing of data for submittal to and upload to client-specific geo-referenced GIS software.

EDUCATION (Degree, Year, Specialization)

A.S., 1972, Civil Engineering Technology

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS

Pennsylvania Society of Land Surveyors (PSLS), Allegheny

REGISTRATION (Type, Year, State)

Professional Land Surveyor, 1984, PA

**WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION
AML CONSULTANT QUALIFICATION QUESTIONNAIRE**

Attachment "A"

13. PERSONAL HISTORY STATEMENT OF PRINCIPALS AND ASSOCIATES RESPONSIBLE FOR AML PROJECT DESIGN. (Furnish complete data but keep to essentials)

NAME & TITLE (Last, First, Middle Init.)	YEARS OF EXPERIENCE		
	YEARS OF AML DESIGN EXPERIENCE:	YEARS OF AML RELATED DESIGN EXPERIENCE:	YEARS OF DOMESTIC WATERLINE DESIGN EXPERIENCE:
Fogarty, Patrick W., P.E., P.S. Survey Engineer	25	35	26

Brief Explanation of Responsibilities

Mr. Fogarty is responsible for technical and management aspects of civil design and surveying projects within the Charleston, WV, office. Mr. Fogarty has designed and managed projects in numerous disciplines including civil, structural and transportation engineering, site development, ecosystem restoration, planning and surveying. These projects have included stream restoration as well as boundary and topographic and photogrammetric surveys. Duties include field surveying, drawings and specification preparation, design, design drafting, construction inspection, quality control testing, shop drawing review, project management, contract administration, and report preparation. Management duties include financial planning, management and staff utilization, human resource planning, marketing, and strategic planning.

Engineering Design for Remediation of Crooked Run #5, Harrison County, West Virginia. WVDEP - Office of AML&R. Project Manager. Responsible for the management and coordination of all activities. Michael Baker provided engineering services to remediate seven abandoned mine sites along Crooked Run Stream near Clarksburg, West Virginia. Services included field investigation and surveys; core boring and water sampling; conceptual, preliminary, and final design of remediation measures; and bid phase and construction phase support.

Mine Subsidence Remediation Design, Marion County, West Virginia. WVDEP - Office of AML&R. Project Manager. Engineer-of-Record responsible for the coordination of all activities. Michael Baker provided engineering services to mitigate the effects of mine subsidence at four residential sites. Michael Baker's services included surveying and mapping; field investigation; conceptual, preliminary, and final design of subsidence remediation measures; and bid-phase and construction-phase support.

Engineering Services to Remediate Landslide Caused by Abandoned Mine Activity, McDowell County, West Virginia. WVDEP - Office of AML&R. Project Manager. Responsible for the management and coordination of all activities. Michael Baker provided field investigation, engineering services, and construction support to remediate a landslide on private property caused by drainage from abandoned mine portals. Michael Baker provided conceptual, preliminary, and final design documents for remedial drainage measures and provided support during construction.

Engineering Design for Remediation of Crooked Run #5, Harrison County, West Virginia. WVDEP - Office of AML&R. Project Manager. Responsible for the management and coordination of all activities. Michael Baker provided engineering services to remediate seven abandoned mine sites along Crooked Run Stream near Clarksburg, West Virginia. Services included field investigation and surveys; core boring and water sampling; conceptual, preliminary, and final design of remediation measures; and bid phase and construction phase support.

Drainage Improvements and Reclamation Measure Design for Four Abandoned Mine Sites, Kanawha County, West Virginia. WVDEP - Office of AML&R. Project Manager. Responsible for the management and coordination of all activities. Michael Baker is providing surveying and mapping, field investigation, subsurface investigation, water testing and sampling, and conceptual, preliminary and final design for the reclamation of four abandoned mine sites that are affected by uncontrolled drainage, debris, and hazards from open portals. Michael Baker is also providing bid phase and construction phase support for the remedial measures.

Engineering MSA (West Virginia, Kentucky, Pennsylvania). NiSource Corporation. Surveyor of Record. Responsible for quality assurance of field and office activities. Michael Baker has provided NiSource with surveying services for many years. Under our existing MSA, surveying services have been provided for various locations throughout West Virginia, Kentucky, and Pennsylvania.

EDUCATION (Degree, Year, Specialization)

B.S., 1985, Civil Engineering | Diploma, 1993, Surveying and Mapping | Coursework, Business Administration

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS

Association of State Floodplain Managers (ASFPM)

REGISTRATION (Type, Year, State)

Professional Engineer: 1990, West Virginia | Professional Surveyor: 1993, West Virginia
LEED Green Associate: 2012, West Virginia
Professional Engineer, 2000, Kentucky | Professional Engineer, 2002, Virginia | Professional Engineer, 2003, Pennsylvania | Professional Engineer, 1996, Ohio | Professional Surveyor, 2001, Kentucky | Professional Surveyor, Ohio, 1996

**WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION
AML CONSULTANT QUALIFICATION QUESTIONNAIRE**

Attachment "A"

13. PERSONAL HISTORY STATEMENT OF PRINCIPALS AND ASSOCIATES RESPONSIBLE FOR AML PROJECT DESIGN. (Furnish complete data but keep to essentials)

NAME & TITLE (Last, First, Middle Init.)	YEARS OF EXPERIENCE		
	YEARS OF AML DESIGN EXPERIENCE:	YEARS OF AML RELATED DESIGN EXPERIENCE:	YEARS OF DOMESTIC WATERLINE DESIGN EXPERIENCE:
Lasko, John D., P.G. Senior Geologist	14	34	0

Brief Explanation of Responsibilities

Mr. Lasko's background encompasses a variety of geotechnical projects. His experience includes project task management, test boring layout, drilling inspection, geotechnical interpretation of subsurface geology, construction inspection, and related project fieldwork.

Waitman Barbe Highwall #1, Monongalia County, West Virginia. *West Virginia Division of Environmental Protection.* Geologist. Assisted in the field view and determination of mining conditions. The project consists of reclamation of approximately 4,600 linear feet of an abandoned strip mine highwall ranging in height from 30 to 45 feet. This includes areas of mine spoil, three areas of exposed coal refuse, an illegal dumpsite containing non-hazardous construction debris and a suspected 11 mine openings. Michael Baker prepared construction plans, specifications, and stormwater pollution prevention plan services.

Collier Sportsman's Club Highwalls, Brooke County, West Virginia. *West Virginia Division of Environmental Protection.* Geologist. Assisted in the subsurface investigation. Michael Baker's responsibilities included research of existing geological data and mining maps, review of water quality data, erosion and sedimentation controls, design of wet and buried mine seals with bat gates at suspected mine entries, backfilling of existing highwalls to stable configurations, site grading, upgrade of existing access roads, reclamation of onsite spoil and coal refuse, culverts and channel design, removal of non-hazardous trash and waste from the site, and revegetation of all disturbed areas. Additional responsibilities were for coordination of the check survey and drilling by sub-consultants, and the preparation of the WV NPDES Stormwater Permit.

Site Design and Permitting for Cumberland Mine Air Shaft Number 10, Greene County, Pennsylvania. *Alpha Natural Resources, Inc.* Senior Staff Consultant. Responsible for site reconnaissance to evaluate landslide susceptibility for the project site. Evaluated overall site for landslide potential, groundwater conditions, bedrock, and structural geology. Evaluated proposed test boring program and recommended modifications to accommodate investigation of site conditions. Evaluated and modified testing program to accommodate site conditions. Prepared site reconnaissance plan, and provided recommendations for final subsurface investigation and testing and site design. Michael Baker developed site design and construction documents and cost estimates, and provided permitting services for the Number 10 air intake shaft and associated site infrastructure, including a one-mile-long access road at the Cumberland Mine.

Landslide Induced Pipeline Failure, Armstrong County, Pennsylvania. *Buckeye Pipeline Company.* Geologist. Responsible for inspection of remediation construction activities after a pipeline break including landslide stabilization, site grading, erosion and sedimentation control, and installation of spring collection and treatment facilities. Work also included preparation of record drawings and construction quality control reports. Construction involved several contractors and required close liaison with state agencies. Michael Baker conducted a detailed landslide investigation after a 10-inch diameter petroleum pipeline break and resulting spill which was induced by a landslide.

Geotechnical Investigation of the Wheeling Army Reserve Center, Wheeling, West Virginia. *Mellon Stuart Construction, Inc.* Senior Geologist. Responsible for providing supervision of subsurface investigation and interpretation of subsurface conditions. Construction inspector during landslide remediation. In February 1998, a 300'-long landslide occurred along the access road embankment for the Wheeling Army Reserve Center in Wheeling, West Virginia. Michael Baker was retained to conduct a geotechnical investigation, prepare a remediation design and provide construction management for the emergency repair of the landslide. The geologic site conditions proved to be difficult due to previous strip mining activities at the site.

On-Call Multidiscipline Services, Pittsburgh International Airport (PIT) and, Allegheny County Airport (AGC), Pittsburgh, Pennsylvania. *Allegheny County Airport Authority.* Senior Geologist. Provided construction support for landslide repair. Performed landslide susceptibility survey for timber harvest report and permit. Since 1989, Michael Baker has provided multidiscipline, on-call engineering services to the airport authority, which owns and operates Pittsburgh International Airport and Allegheny County Airport. Michael Baker has acted as an extension of the airport authority's staff, providing the depth of resources and experience of the entire company when called upon. Michael Baker delivered a full range of services on an on-call, as-needed basis, including architecture, civil, structural, mechanical, electrical, plumbing, fire protection, and environmental services. Knowledge of the airports' current and historical conditions enables Michael Baker to coordinate very effectively with the airport authority.

EDUCATION (Degree, Year, Specialization)

M.S., 1989, Earth Science and Geology; B.S., 1985, Geology

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS - N/A

REGISTRATION (Type, Year, State)

Professional Geologist: 1995, PA

**WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION
AML CONSULTANT QUALIFICATION QUESTIONNAIRE**

Attachment "A"

13. PERSONAL HISTORY STATEMENT OF PRINCIPALS AND ASSOCIATES RESPONSIBLE FOR AML PROJECT DESIGN. (Furnish complete data but keep to essentials)

NAME & TITLE (Last, First, Middle Init.)	YEARS OF EXPERIENCE		
	YEARS OF AML DESIGN EXPERIENCE:	YEARS OF AML RELATED DESIGN EXPERIENCE:	YEARS OF DOMESTIC WATERLINE DESIGN EXPERIENCE:
Green, Donald, P.E. Geotechnical Technical Consultant	10	43	0

Brief Explanation of Responsibilities

Mr. Green's responsibilities include geotechnical engineering, foundation and retaining wall design, planning, laboratory and field investigations, preparation of plans and specifications, and project supervision and management. He has spent the majority of this career performing foundation engineering for structures both on land and water.

Rural Abandoned Mine Reclamation (RAMP) Program (6 sites), Multiple-Counties, West Virginia. Project Engineer. Responsible for engineering services required to reclaim abandoned mine areas, including site investigations, hydrologic/hydraulic studies, topographic surveys and geotechnical investigations. Used data obtained to prepare PS&E to solicit bids to reclaim abandoned mine areas. Mine reclamation included waste disposal, closure of abandoned mine entries, mine seals, storm water management, AMD abatement, slope stabilization, and revegetation.

Mine Subsidence Abatement, Beaford Residence, Fairmont, West Virginia. U.S. Department of the Interior, Office of Surface Mining (OSM). Project Manager. Responsible for subsurface investigation and preparation of PS&E to abate subsidence-induced lateral displacement of a private residence while under contract for OSM.

Mine Subsidence, Open-End Engineering Services Agreement. Pennsylvania Department of Environmental Protection, Bureau of Abandoned Mine Reclamation. Project Manager. Responsible for investigation of reported mine subsidence events, determination of potential causes, and developing plans to mitigate subsidence damage on over two dozen projects. Drilled test borings, installed instrumentation to monitor movement, performed laboratory tests, completed analyses, and prepared summary reports to document findings and make recommendations.

Freedom Road Improvement Project, Butler and Beaver Counties, Pennsylvania. Pennsylvania Department of Transportation, District 11-0. Geotechnical Project Manager. Responsible for preliminary design for safety improvements over about 10 miles of two-lane roadway. The subsurface investigation included over 100 test borings to support roadway and structure design. Investigated construction alternatives to reduce impacts of exposing seven coal beds, abatement of AMD, mitigation of subsidence activity at abandoned clay mines, landslide stabilization, and stream relocation.

Ryan Homes On-Call Geotechnical and Engineering Services, Various Locations in Pennsylvania, Buffalo, New York, and Nashville, Tennessee. NVR, Inc. Task Manager. Responsible for being the client's point-of-contact to provide on-call engineering services ranging from foundation stabilization, landslide investigation and stabilization, mitigation of groundwater intrusion, and wall movement. Michael Baker was responsible for providing professional geotechnical engineering services, on an on-call basis, to assist Ryan Homes when problems were encountered during the development of residential lots. Michael Baker was responsible for investigating the cause and extent of the problem and recommending methods for remediation and stabilization.

Cuyahoga Valley Railway-Slope Stabilization Project, Summit County, Ohio. National Park Service and the Ohio Department of Transportation. Project Manager. Responsible for design of rock anchors for construction of a two-tiered wall system to stabilize a landslide below an existing bridge abutment.

Open-End Construction Management and Construction Inspection Services, Various Counties, Pennsylvania. Pennsylvania Department of Transportation, Central Office. Technical Specialist. Provided QA oversight for a forensic investigation to determine the cause of excessive deformation of new abutment foundations for dual multispan bridge structures in the north-central region of Pennsylvania. Michael Baker is one of the Pennsylvania Department of Transportation's (PennDOT) preferred construction management and construction inspection providers on roadway and bridge projects through the state, including specialty railroad-railroad crossing projects administered through the PennDOT Bureau of Public Transportation. Under numerous open-end contracts, Michael Baker is providing construction management and construction inspection services for highway, roadway, and bridge projects; small and mid-sized projects for erosion and sedimentation control; and environmental projects, on an as-needed basis. Michael Baker's services include administering the construction contract, performing claims avoidance evaluations, preparing documents and presentations for claims review committee meetings, and preparing correspondence. Services also include overseeing the documentation control system, preparing supplements for specialty subconsultants or additional work orders or change orders, and coordinating the work of all subconsultants. On-site services include providing full construction inspection, documenting construction progress, and coordinating the construction schedule among stakeholders.

EDUCATION (Degree, Year, Specialization)

M.S., 2004, Civil Engineering | B.S., 1978, Civil Engineering

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS

Association of State Dam Safety Officials (ASDSO) | Chi Epsilon, The National Engineering Honor Society

REGISTRATION (Type, Year, State)

Professional Engineer, 1985, PA

**WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION
AML CONSULTANT QUALIFICATION QUESTIONNAIRE**

Attachment "A"

13. PERSONAL HISTORY STATEMENT OF PRINCIPALS AND ASSOCIATES RESPONSIBLE FOR AML PROJECT DESIGN. (Furnish complete data but keep to essentials)

NAME & TITLE (Last, First, Middle Init.)	YEARS OF EXPERIENCE		
	YEARS OF AML DESIGN EXPERIENCE:	YEARS OF AML RELATED DESIGN EXPERIENCE:	YEARS OF DOMESTIC WATERLINE DESIGN EXPERIENCE:
LaMont, Michael, J. Technical Specialist	24	36	26

Brief Explanation of Responsibilities

Mr. LaMont is a designer with a background in pipelines, telecommunications, reclamation of abandoned mine lands including acid mine drainage abatement, earthwork, grading plans, stream channel restoration, sealing of mine portals and reclamation of coal refuse piles. While at Michael Baker he has worked on many abandoned mine land reclamation and mine shaft site design and permitting projects. His site / civil qualifications also consist of parking lot layout and design, roadway geometry, right-of-way acquisition, drainage, storm sewer and sanitary sewer design. Additional telecommunications experience include fiber optic cable construction and installation drawings along highways, railroads and cross country routes, as well as stream and road crossing drawings and cross sections, and state, local, and environmental permit drawings.

Waitman Barbe Highwall #1, Monongalia County, West Virginia. *West Virginia Division of Environmental Protection.* Technical Specialist. Prepared construction plans, details, and cross-section sheets and earthwork balancing for the project, and highwall backfilling grading. Provided erosion and sedimentation control measures, site regrading, mine seals, and collection and diversion ditch alignments and profiles. Michael Baker's responsibilities included research of existing geological data and mining maps, review of water quality data, erosion and sedimentation controls, design of wet and buried mine seals with bat gates at suspected mine entries, backfilling of existing highwalls to stable configurations, site grading, upgrade of existing access roads, reclamation of onsite spoil and coal, culverts and channel, removal of non-hazardous trash and waste from the site, and revegetation of all disturbed areas. Additional responsibilities were for coordination of the check survey and drilling by sub-consultants and the preparation of the WV NPDES Stormwater Permit.

Collier Sportsman's Club Highwalls, Brooke County, West Virginia. *West Virginia Division of Environmental Protection.* Technical Specialist. Prepared construction plans, details, and cross-section sheets and earthwork balancing for the project, and highwall backfilling grading. Provided erosion and sedimentation control measures, site regrading, mine seals, and collection and diversion ditch alignments and profiles. Michael Baker's responsibilities included research of existing geological data and mining maps, review of water quality data, erosion and sedimentation controls, design of wet and buried mine seals with bat gates at suspected mine entries, backfilling of existing highwalls to stable configurations, site grading, upgrade of existing access roads, reclamation of onsite spoil and coal refuse, culverts and channel design, removal of non-hazardous trash and waste from the site, and revegetation of all disturbed areas. Additional responsibilities were for coordination of the check survey and drilling by sub-consultants and the preparation of the WV NPDES Stormwater Permit.

Professional Mapping and Design Services at the Bond Forfeited Permits of the Maurice Jennings Coal Company S-61-83 & S-53-78, Preston County, West Virginia. *West Virginia Division of Environmental Protection.* Technical Specialist. Responsibilities include Prepared construction plans and profiles, details, erosion and sediment control measures, collection and diversion channels, and revegetation.

Professional Mapping and Design Services at the Bond Forfeited Permits of the Masteller Coal Company S-10-85 & S-125-82, Mineral County, West Virginia. *West Virginia Division of Environmental Protection.* Technical Specialist. Responsibilities include Prepared construction plans and profiles, details, erosion and sediment control measures, collection and diversion channels, and revegetation.

Professional Mapping and Design Services at the Bond Forfeited Permits of the F&M Coal Company S-1044-87 & S-57-84, Preston County, West Virginia. *West Virginia Division of Environmental Protection.* Technical Specialist. Responsibilities include Prepared construction plans and profiles, details, erosion and sediment control measures, collection and diversion channels, mine seals and revegetation.

Maple Run Portals and Tipple, West Virginia. *West Virginia Division of Environmental Protection.* Prepared construction plan, profile, detail, and cross section sheets and earthwork balancing for the project, which included, site grading, mine seals, collection and diversion ditches, placement of soil cover, and revegetation.

Emoryville Mine Complex, West Virginia. *West Virginia Division of Environmental Protection.* Prepared construction plan, profile, detail, and cross section sheets and earthwork balancing for the project which included erosion and sedimentation control measures, site regrading, mine seals, collection and diversion ditches, removal of abandoned barges and coal refuse from the North Branch of the Monongahela River, placement of soil cover, and revegetation.

Watson Portal and Refuse Reclamation, West Virginia. *West Virginia Division of Environmental Protection.* Prepared construction plan, profile, detail, and cross section sheets and earthwork balancing for the project which included erosion and sedimentation control measures, site regrading, mine seals, collection and diversion ditches, removal of abandoned barges and coal refuse from the North Branch of the Monongahela River, placement of soil cover, and revegetation.

Mountain View Portals Mine Reclamation, Preston County, West Virginia. *West Virginia Division of Environmental Protection.* Prepared construction plan, profile, detail, and cross section sheets and earthwork balancing for the project which included erosion and sedimentation control measures, site regrading, mine seals, collection and diversion ditches, stream re-channelization, placement of soil cover on exposed refuse, and revegetation.

EDUCATION (Degree, Year, Specialization)

Certificate, 1986, Computer Aided Drafting and Design

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS - N/A

REGISTRATION (Type, Year, State) – N/A

**WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION
AML CONSULTANT QUALIFICATION QUESTIONNAIRE**

Attachment "A"

13. PERSONAL HISTORY STATEMENT OF PRINCIPALS AND ASSOCIATES RESPONSIBLE FOR AML PROJECT DESIGN. (Furnish complete data but keep to essentials)

NAME & TITLE (Last, First, Middle Init.)	YEARS OF EXPERIENCE		
	YEARS OF AML DESIGN EXPERIENCE:	YEARS OF AML RELATED DESIGN EXPERIENCE:	YEARS OF DOMESTIC WATERLINE DESIGN EXPERIENCE:
Dillan, Gregory, B. Technical Specialist	8	40	32

Brief Explanation of Responsibilities

Mr. Dillan is an experienced designer with a broad background in the preliminary and final design of various commercial and private site developments. His experience in the engineering field has encompassed numerous conceptual site studies, site layouts, final site designs, roadway designs, utility routing and design, grading, and mass earthwork analysis. He possesses advanced expertise with the latest computer design software which permits fast and efficient site analysis and conceptual layout. His expertise with this technology permits more time for preliminary design refinement, which ultimately provides a more comprehensive final design for the client. Mr. Dillan has performed site design grading and earthwork balancing on numerous large land development projects. Mr. Dillan's professional experience also includes developing and producing high quality graphical exhibits for meetings and public presentations, and performing geotechnical lab testing for various roadway and site projects.

Professional Mapping and Design Services at the Bond Forfeited Permits of the Maurice Jennings Coal Company S-61-83 & S-53-78, Preston County, West Virginia. *West Virginia Division of Environmental Protection.* Technical Specialist. Responsibilities include Prepared construction plans and profiles, details, erosion and sediment control measures, collection and diversion channels, and revegetation.

Professional Mapping and Design Services at the Bond Forfeited Permits of the Masteller Coal Company S-10-85 & S-125-82, Mineral County, West Virginia. *West Virginia Division of Environmental Protection.* Technical Specialist. Responsibilities include Prepared construction plans and profiles, details, erosion and sediment control measures, collection and diversion channels, and revegetation.

Professional Mapping and Design Services at the Bond Forfeited Permits of the F&M Coal Company S-1044-87 & S-57-84, Preston County, West Virginia. *West Virginia Division of Environmental Protection.* Technical Specialist. Responsibilities include Prepared construction plans and profiles, details, erosion and sediment control measures, collection and diversion channels, mine seals and revegetation.

Summersville Five Block Mine Reclamation, Nicholas County, West Virginia. *West Virginia Division of Environmental Protection.* Technical Specialist. Responsibilities include Prepared construction plans and profiles, details, erosion and sediment control measures, collection and diversion channels, mine seals and revegetation.

Kempton Refuse and Acid Mine Drainage, Tucker County, West Virginia. *West Virginia Department of Environmental Protection.* Designer. Performed site analysis, site design and site grading. Michael Baker prepared detailed design plans and technical specifications for the Kempton Refuse and Acid Mine Drainage (AMD) project. The primary purpose of the project was to reclaim the remains of pre-law underground and surface mines in the project area and divert AMD through a passive treatment system before discharging it to existing streams in order to rehabilitate the watershed, and in turn the North Branch of the Potomac River. Michael Baker performed site reconnaissance and office research, field surveying, and test drilling; provided analysis and design of reclamation measures; prepared construction plans and specifications; and developed a quantity estimate and construction cost estimate.

U.S. Army Reserve Complex, Wheeling, West Virginia. *U.S. Army Corps of Engineers, Baltimore District.* Designer. Responsible for design of site access road. Michael Baker provided a complete design-build package for a new U.S. Army Reserve Center located on a 25-acre site in Wheeling, West Virginia. The \$15.5 million project involved design of an 18,000-square-foot OMS/AMSA building and a 24,000-square-foot training center. Both buildings were constructed of steel frames on spread-footing foundations. Facades feature a combination of split-faced block with brick. The roofs are constructed of standing-seam metal, with certain roofs vaulted. Associated site infrastructure work included the removal of a hilltop and construction of parking facilities and a one-half mile access road, as well as landscaping. Due to water pressure issues for fire protection, an on-site 60,000-gallon water storage tank was constructed. This project shared property with a regional general airport authority.

2017 West Virginia MAOP M&R Station Upgrades. *Dominion Resources Services, Inc.* Technical Specialist. Responsible for site grading and drainage plan, as well as earthwork volume calculations for new M&R station.

Cumberland Mine No. 7 Shaft Design and Permitting, Pennsylvania. *Pennsylvania Services Corporation.* Designer. Performed site design and site grading. Michael Baker prepared the Cumberland Mine No. 7 Shaft site design and secured the PADEP Coal Mining Activity Revision Permit and PennDOT Highway Occupancy Permit needed for development of the 43-acre site. The facility was permitted for mine dewatering and included a lined treatment pond. The Coal Mining Activity Permit application addressed stream variances, wetland encroachments, stream relocation, and stream crossings.

EDUCATION (Degree, Year, Specialization)
Certificate, 1978, Drafting and Design Technology

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS - N/A

REGISTRATION (Type, Year, State) – N/A

**WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION
AML CONSULTANT QUALIFICATION QUESTIONNAIRE**

Attachment "A"

13. PERSONAL HISTORY STATEMENT OF PRINCIPALS AND ASSOCIATES RESPONSIBLE FOR AML PROJECT DESIGN. (Furnish complete data but keep to essentials)

NAME & TITLE (Last, First, Middle Int.)	YEARS OF EXPERIENCE		
Brian Baker, P.E. Civil Engineer	YEARS OF AML DESIGN EXPERIENCE: 3	YEARS OF AML RELATED DESIGN EXPERIENCE: 12	YEARS OF DOMESTIC WATERLINE DESIGN EXPERIENCE: 7

Brief Explanation of Responsibilities

Mr. Baker has been working in the site/civil group as an engineering associate and civil engineer since the Fall of 2009. He has worked on several housing development projects in the Pittsburgh area where he assisted in the grading, drainage, erosion and sedimentation control, and stormwater management features of the site.

He started working on facility projects in 2011, designing Erosion and Sedimentation Control Plans, Post-Construction Stormwater Management Plans, and Stormwater Pollution Prevention Plans for various ARCs. He has also helped obtain various permits from the EPA and several different State Departments of Environmental Protection.

Master Services Agreement - Surveying Services for Gathering Lines, Northern, Western, and Central Pennsylvania; and, Ohio. Confidential Client. Civil Engineer. Responsibilities included developing a watershed model to determine the effects of gas industry developments within a watershed. This included using the ArcGIS, HECRAS, and HECHMS programs to assist in making maps and performing calculations. This included dividing the watershed into smaller watersheds and finding a land use and soil condition for the entire area. This was completed for both a "past" condition, which basically modeled the system before any developments took place, and a "present" condition which included future industry developments within the watershed. This also included modeling the effects of existing stormwater facilities at specific well pads within the watershed and taking into account the designed ponds outflows. Multiple maps were created and highlighted specific areas of concentrated development and the effects these areas had on areas directly downstream, as well as a whole for the watershed. A summary report was written as well to describe and explain all of the findings of the modeling and calculations. Michael Baker has been performing preconstruction surveys, preparing alignment sheets, performing construction staking, and conducting as-built surveys of over 100 miles of midstream pipelines. Michael Baker initially performs route staking and concentrates on property evidence, environmentally sensitive areas, tree clearing, stream crossings, and other design impacts to support permitting and constructibility issues. Upon routing stakeout and constructibility walk, final preconstruction surveys are performed and alignment sheets displaying a plan and profile of the pipeline are prepared. Michael Baker provides staking of proposed pipeline, limits of disturbance (LOD), and additional temporary work spaces (ATWS) prior to construction and performs in-ditch as-built surveys during construction. Final as-built alignment sheets are prepared and delivered base upon in-ditch as-builts, post-construction survey, inspector weld maps and pipe tallies, and other information.

Design and Construction Management Master Services Contract, Southwestern Pennsylvania. Duquesne Light Company. Civil Engineer. Responsibilities included going on site because of Stormwater Drainage and Erosion Control Issues. Developed a plan to prevent further erosion from occurring by directing water around the site to an existing drainage ditch. Tasks included mapping of drainage area, calculating stormwater draining towards site, and developing a grading and stormwater management plan to better control stormwater on site. Michael Baker is providing architectural and engineering services under a three-year master services agreement for design, preconstruction, bid phase, construction management, and other services for the renovation or improvements to the company's facilities and for major capital projects and programs. Michael Baker's services include project management, architectural and engineering design, design management and design reviews, cost estimates, construction sequencing, bidding-phase support, and construction management and inspection.

Runway Extension and Environmental Assessment, Morgantown Municipal Airport (MGW), Morgantown, West Virginia. Morgantown Municipal Airport. Civil Engineer. Responsible for stormwater management and erosion and sedimentation control design. This included stormwater detention basin design, stormwater pipe system design, and swales and channel design for stormwater conveyance. Steep slopes are a limiting factor and multiple ponds will be necessary to control and safely route the large amount of runoff the runway extension will produce. This also included modeling the affects the proposed flows will have on areas downstream of the airport runway extension and limiting the disturbances surrounding residents will notice. An existing stream will be relocated and routed through a large diameter pipe as part of the project. Michael Baker is developing an environmental assessment and runway extension design for the Morgantown Municipal Airport. Michael Baker also performed a benefit-cost analysis, which included a runway justification study for the runway extension. The environmental assessment is being developed in accordance with the National Environmental Policy Act of 1969 (NEPA); Federal Aviation Administration (FAA) Order 1050.F; Environmental Impacts: Policies and Procedures; and FAA Order 5050.4b, NEPA Implementing Instructions for Airport Actions. The runway extension design is being developed in accordance with all applicable FAA advisory circulars.

Apache Civil Infrastructure. Baker AECOM JV. Civil Engineer. Responsibilities included developing a stormwater management plan for an airfield in Qatar. This included the design of a dozen evaporation ponds on site because conveyance of stormwater was a not a viable solution due to site restrictions. Tasks included stormwater calculations of rate and runoff, designing stormwater pipe conveyance systems, and helping with grading and drainage on site, utility layouts, and detail sheets. Responsibilities also included attending project design meetings.

EDUCATION (Degree, Year, Specialization)	
B.C.E., 2009, Civil and Environmental	
MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS	REGISTRATION (Type, Year, State)
American Society of Civil Engineers (ASCE) Chi Epsilon, The National Civil Engineering Honor Society	Professional Engineer, 2014, PA

**WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION
AML CONSULTANT QUALIFICATION QUESTIONNAIRE**

Attachment "A"

13. PERSONAL HISTORY STATEMENT OF PRINCIPALS AND ASSOCIATES RESPONSIBLE FOR AML PROJECT DESIGN. (Furnish complete data but keep to essentials)

NAME & TITLE (Last, First, Middle Int.)	YEARS OF EXPERIENCE		
	YEARS OF AML DESIGN EXPERIENCE:	YEARS OF AML RELATED DESIGN EXPERIENCE:	YEARS OF DOMESTIC WATERLINE DESIGN EXPERIENCE:
Kudritz, Joseph Lee, P.E. Civil Engineer	4	13	0

Brief Explanation of Responsibilities

Mr. Kudritz is a Civil Engineer with experience involving water and wastewater collection including water and wastewater hydraulic studies, sewer and force main alignments, constructing pump station operation and maintenance manuals, and cost estimation. Much of his background involves hydraulic and hydrologic studies and models, creating water elevation profiles, and working with topographic maps.

Simpson Creek Highwall, Tipple, and Portals Reclamation, Barbour County, West Virginia. *West Virginia Department of Environmental Protection.* Civil Associate. Performed hydrologic and hydraulic analysis for several unnamed streams. Tasks on the projects included: sizing the channels, sizing the grouted rock protection, and developing peak flow rates based on the contributing drainage area. Michael Baker provided engineering services for the mine reclamation of the Simpson Creek Highwall, Tipple, and Portals. Michael Baker's services included site reconnaissance; records review; surveying; subsurface investigation; water sampling and laboratory testing; engineering analysis and design; preparation of construction plans, specifications, and cost estimate; permitting; bidding-phase support; and construction monitoring.

Freeport Mine - PH I - Preparation of 6 Design Build RFP Packages and 1 Site Design -Bid Build Bid Package. *Freeport Mining.* Civil Associate. Responsibilities included overseeing the drainage aspects on the entire site. Specific duties included, sizing the collection channels and the required erosion protection lining, sizing the necessary sediment traps, and coordinating the channel designs with those responsible for grading the proposed channels.

E02313 - WO 2 SR 519-138 FD. *Pennsylvania Department of Transportation, Central Office.* Civil Associate. Responsible for preparing the post construction stormwater management report and plans to be submitted with the NPDES Permit. Also responsible for specifying the required BMP stormwater controls and designing the stormwater detention basins at the site. j

Open End Agreement, District 12 - General Design Open End. *Pennsylvania Department of Transportation, Central Office.* Civil Associate. Responsible for preparing the post construction stormwater management report and plans to be submitted with the NPDES Permit. Also responsible for specifying the required BMP stormwater controls and designing the stormwater detention basins at the site.

FEMA WR 44 KDKA PGH SWMP. *Kellogg Brown & Root.* Civil Associate. Performed all necessary calculations for the stormwater management controls used for the site. Prepared the stormwater management report for the project.

Engineering Services for Enhancement of the Presidential Emergency Radio Transmission Facilities, Nationwide. *U.S. Army Corps of Engineers, Omaha District.* Civil Associate. Performed all necessary calculations for the stormwater management controls used for the site. Prepared the stormwater management report for the project. Under a design-build relationship with a constructor, Michael Baker conducted site evaluations, designed prototype structures for transmitters and generators, and prepared site designs at 35 locations to upgrade the presidential radio broadcast system. The modular facilities were designed to backup AM and FM transmissions during emergencies and withstand electromagnetic pulses, high winds, and other disasters. Michael Baker's services included mechanical and electrical system design, generator and fuel storage system specifications, preparation of environmental surveys, adapting the prototype designs to individual site conditions, and construction management services during installation.

1971- 2013, Municipal Engineering Services, Koppel, Pennsylvania. *Koppel, Borough of.* Civil Associate. Responsible for determining the size and location of storm drains. From 1971 through 2013, Michael Baker served as the municipal engineer for the borough, providing annual on-call engineering services. Michael Baker's tasks ranged from planning and design through construction inspection to support the daily operations of the borough.

EDUCATION (Degree, Year, Specialization)

Graduate Studies, Water Resources & Environmental Engineering | B.S., 2007, Civil Engineering

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS

Engineers Without Borders (EWB), Pittsburgh Professional Chapter

REGISTRATION (Type, Year, State)

Professional Engineer: 2013, PA | ESRI Certification in ArcGIS 9.2, 2009, PA | AutoCAD Certification, 2008, PA

**WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION
AML CONSULTANT QUALIFICATION QUESTIONNAIRE**

Attachment "A"

13. PERSONAL HISTORY STATEMENT OF PRINCIPALS AND ASSOCIATES RESPONSIBLE FOR AML PROJECT DESIGN. (Furnish complete data but keep to essentials)

NAME & TITLE (Last, First, Middle Init.)	YEARS OF EXPERIENCE		
	YEARS OF AML DESIGN EXPERIENCE:	YEARS OF AML RELATED DESIGN EXPERIENCE:	YEARS OF DOMESTIC WATERLINE DESIGN EXPERIENCE:
Hlebiczki, William, J., P.E. Civil Engineer	6	6	0
<p>Brief Explanation of Responsibilities Mr. Hlebiczki is a Civil Engineer with a background in water resources engineering and site development. His experience includes stormwater management design, environmental permitting, site development plans, erosion and sediment control plans, and Dam Construction Inspection.</p> <p>Mountain View Portals Mine Reclamation, Preston County, West Virginia. West Virginia Department of Environmental Protection. Civil Associate. Responsibilities include sampling water and acid-base accounting soil sampling, setting up drawings for drawing package, and designing toe of slope channels and collection channels. My experience using AutoCAD Civil 3D were helpful in designing the channels and setting up the plans. Michael Baker provided engineering services for the reclamation of the Mountain View Portals abandoned coal mine site. Michael Baker's services included site investigation; field survey; subsurface investigation; water quality and soil sampling and analysis; conceptual, preliminary, and final design; stream restoration; permitting; environmental investigations; bidding-phase support; and construction monitoring.</p> <p>Mapping and Design Services for Special Mine Reclamation Permits, Preston County, West Virginia. West Virginia Department of Environmental Protection. Civil Associate. Responsible for drainage calculations for the channels, sampling acid mine drainage, doing a bathymetric test of the ponds onsite, and making some of the sheets for the drawing package. Some of these sheets included building floor plans, site plans, and profiles/cross sections of the site and the ponds. The tools that were used included Hydraflow Hydrographs and AutoCAD Civil 3D, Boat with Sonar, and mapping. Michael Baker is providing engineering and mapping services to meet the requirements of special mine reclamation permits. Michael Baker's services include data collection and analysis, aerial mapping verification, supplemental field and bathymetric pond surveying, bench-scale treatability testing, acid-base accounting testing, engineering design and analysis, preparation of construction plans and specifications and stormwater pollution prevention plans; cost estimates, bidding-phase support; and construction services.</p> <p>Summersville Five Block Mine Reclamation, Nicholas County, West Virginia. WVDEP - Office of AML&R. Civil Associate. Responsibilities included setting up sheets for drawing package, making cross sections and profiles of the site and ponds, revising the site as conceptual changes were made, and storm water calculations, which included setting up drainage areas and designing diversion channels. I was able to stay with the project and quickly carry through the many aspects of the project that were affected by the changes that were made throughout the project. Tools used for this job included AutoCAD Civil 3D and its extension Hydraflow Hydrographs.</p> <p>Maurice Jennings Coal Company Site, Preston, West Virginia. West Virginia Department of Environmental Protection. Civil Associate. Responsible for creating and revising drawing for submission to the WVDEP, as well as sampling the acid mine discharge water on the site. The tools used included mapping and AutoCAD Civil 3D. Michael Baker is providing engineering services for the special reclamation of Maurice Jennings Coal Company mining permits; S-61-83 and S-53-78. The project area consists of previously reclaimed highwalls, treatment ponds, and several acid mine drainage (AMD) seeps at the site of an abandoned strip mine. Michael Baker's services include aerial mapping, site reconnaissance, permit research and review, surveying, bench-scale treatability studies, AMD conveyance, AMD treatment, preparation of reclamation and treatment plans, stormwater pollution prevention plans, field water quality sampling, technical specifications, bidding-phase support, construction services, and right-of-way support.</p> <p>Masteller Coal Company Site, Mineral, West Virginia. West Virginia Department of Environmental Protection. Civil Associate. Responsible for delineating drainage areas, channel design, culvert design, sampling acid mine drainage, specification modifications, and mapping. The tools used for this project included AutoCAD Civil 3D, Hydraflow Hydrographs, and Hydraflow Express. Michael Baker is providing engineering services for special reclamation of Masteller Coal Company mining permits; S-10-85 and S-125-82. The project area consists of previously reclaimed highwalls, treatment ponds, and several acid mine drainage (AMD) seeps. Michael Baker's services include site reconnaissance, permit research and review, aerial mapping, surveying, bench-scale treatability studies, AMD conveyance, AMD treatment, preparation of reclamation and treatment plans, stormwater pollution prevention plans, field water quality sampling, technical specifications, bidding-phase support, and construction services.</p>			
EDUCATION (Degree, Year, Specialization) B.S.E., 2015, Civil Engineering			
MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS N/A		REGISTRATION (Type, Year, State) Professional Engineer, 2019, OH	

**WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION
AML CONSULTANT QUALIFICATION QUESTIONNAIRE**

Attachment "A"

13. PERSONAL HISTORY STATEMENT OF PRINCIPALS AND ASSOCIATES RESPONSIBLE FOR AML PROJECT DESIGN. (Furnish complete data but keep to essentials)

NAME & TITLE (Last, First, Middle Init.)	YEARS OF EXPERIENCE		
	YEARS OF AML DESIGN EXPERIENCE:	YEARS OF AML RELATED DESIGN EXPERIENCE:	YEARS OF DOMESTIC WATERLINE DESIGN EXPERIENCE:
Greenfield, Lauren, E., P.E. Civil Engineer	1	11	0

Brief Explanation of Responsibilities

Ms. Greenfield is a Civil/Environmental Project Manager for Michael Baker International, working out of the Moon Township, Pennsylvania office. She provides geotechnical, water resources, civil, and environmental design, engineering, permitting, project management, and construction oversight for projects throughout the Mid-Atlantic region. Ms. Greenfield specializes in water resources design and environmental remediation for detention/retention ponds, bioretention facilities, culverts, hydrologic and hydraulic modeling, water and wastewater treatment, acid mine drainage, and underground storage tank projects. She also has geotechnical engineering experience with subsurface utility exploration, pavements, and retaining wall design as well as civil-site experience with land development projects, municipal plan reviews, and public outreach.

Morgantown Airport Runway Extension Project, City of Morgantown, West Virginia. *Michael Baker International.* Project Manager and Project Engineer for the 1,000LF runway extension at the Morgantown Municipal Airport, located in the City of Morgantown, West Virginia. Her role for this project includes full design and permitting for the stormwater, erosion/sediment, coal seam removal, and acid mine drainage remediation for both the runway and borrow sites for the project. Her stormwater design includes three linked detention ponds, phased implementation of the erosion/sediment controls, and remediation of the coal seam acid mine drainage with staged limestone treatment wetlands. She also has completed hydrologic and hydraulic analyses for the two, 500LF embedded culverts within the runway embankment and drainage around the runway and taxiway. Also completed the full NPDES permit package for the project with WVDEP and coordinated with the USACE for the Chapter 401/404 Joint Permit, providing technical assistance with the Environmental Assessment documents. She also participated in public meetings, prepared engineering cost estimates and quantities, and coordinated with multiple state and federal agencies for this project.

2019 to 2020 - Environmental Assessment for the Morgantown Municipal Airport, City of Morgantown, West Virginia. Ms. Greenfield was the Project Manager for the FAA Short-Form Environmental Assessment as part of the 1,600LF runway extension at the Morgantown Municipal Airport, located in the City of Morgantown, West Virginia. Lauren oversaw the field team and field work efforts, conducted QA/QC of the reporting, prepared a final, PE-sealed report to the FAA, and prepared project invoicing.

Hurricane Florence Recovery MILCON Package 7, Marine Corps Air Station New River, Jacksonville, North Carolina. *NAVFAC Mid-Atlantic.* Project Engineer. Responsibilities included technical design, report/permit preparation, and management of the P378 Infiltration Basin basis of design package and NCDEQ E&S and SWM permitting packages. Michael Baker is leading the multi-discipline architectural and engineering team for design-build delivery of the C-12W hangar and associated site development. Michael Baker is serving as the primary liaison between design, design-build, and NAVFAC project management teams. The design was delivered in two packages, including a fast-track site and structural package.

McCandless Acid Mine Drainage Remediation and Reclamation Project, Madison Township, Pennsylvania. Ms. Greenfield was the Design Engineer for the McCandless Property Acid Mine Drainage Project, located in Madison Township, Clarion County, PA. The McCandless property was previously a large strip and subsurface mine that had significant acid mine drainage contaminating two existing ponds and three streams on site. Coal waste and landslides were also prevalent. Ms. Greenfield's responsibilities included planning, design, agency coordination, bid package and specification preparation, and site inspection for the entire project. Her design of a five-stage wetland treatment system and two neutralizing ponds to capture leachate of heavy metals used native plant species, hay baffles, and limestone to naturally treat the acid mine drainage water before discharge into the Allegheny River. The property is now used by local conservation districts as an educational field site.

EDUCATION (Degree, Year, Specialization)

M.B.A., 2013, Business Administration | B.S., 2010, Civil Engineering | B.S., 2010, Environmental Engineering

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS

American Society of Civil Engineers (ASCE) | National Honorary Civil Engineering Fraternity of Chi Epsilon | Pennsylvania Society of Professional Engineers (PSPE) | Women in Transportation Society (WTS)

REGISTRATION (Type, Year, State)

Professional Engineer, 2018, West Virginia | Professional Engineer, 2017, PA | Professional Engineer, 2017, VA | Professional Engineer, 2017, NC | Professional Engineer, 2018, MD | Professional Engineer, Washington DC

14. PROVIDE A LIST OF SOFTWARE AND EQUIPMENT AVAILABLE IN THE PRIMARY OFFICE WHICH WILL BE USED TO COMPLETE AML DESIGN SERVICES

HYDROLOGY

SEDCAD4 – Storm Routing through Detention Structures, Channel Design and Riprap Sizing.
TR20 – Project Formulation – Hydrology by SCS
TR55 – Urban Hydrology for Small Watersheds by SCS
HAESTADS POND2 – Storm Routing through Detention Structures
HEC1 – Flood Hydrograph Package by U.S.A.C.O.E.
HAESTADS QTRSS – Urban Hydrology for Watersheds
Hydroflow Hydrographs – Storm Routing Model

HYDRAULICS – OPEN CHANNEL AND CULVERT

HEC RAS/ - river Analysis System/Flood Plain Analysis/Water Surface Profile
HEC2 – Water Surface Profiles by U.S.A.C.O.E.
HY8 – Culvert Analysis by FHWA
FLOWMASTER – Channel and Pipeline Hydraulics by HAESTAD, Inc.
Hydroflow Express – Culverts, Channels, Inlets, and Weir Hydraulics

PIPELINE HYDRAULICS

WATERCAD – Water Distribution System Modeling
KYPipe2 – Water Distribution System Modeling
CYBERNET – Water Distribution System Modeling
Hydroflow Storm Sewer – Stormwater Conveyance System Modeling

GEOTECHNICAL

Log Draft 5
gINT V8.3
FB-Multi-Pier Version 4.16
Slope/W 2007
Seep/W 2007
UTexas 4
GRL WEAP
L-Pile Versions 4, 5 or 6
COM 624P Version 2
GSTABL7 and STEDwin

GEOTECHNICAL (continued)

FIT Version 8.2
UniSettle, Version 3
DARwin 3.1
Midas GTS
GROUP Version 6
FE Flow 5.3
EMBANK
SPW 911
ProSheet
CRSP
DRIVEN
PASTABL6
RSS
HELP
SURFER
SlopeInc
PCASE 2.09.01
CPET-IT
FOSSA
MSEW

STRUCTURAL – BRIDGE DESIGN

MIDAS 2018 v2.3
STAAD.PRO V8.1
PCA COLUMN 3.60
ABUTWALL
LRFD SIMON – Steel Design and Optimization Program
NSBA SPLICE – LRFD Design of Field Splices for Steel Girders
MICROSTATION V8i SELECT Series 3
ASHTOWare BrR 6.8
COM 624P Version 2
L-Pile Versions 4,5, or 6
FP-Multi-Pier Version 4.16
Vbent 3.5

14. PROVIDE A LIST OF SOFTWARE AND EQUIPMENT AVAILABLE IN THE PRIMARY OFFICE WHICH WILL BE USED TO COMPLETE AML DESIGN SERVICES

DRAFTING AND SITE DESIGN

AutoCAD – Civil 3D for Earthwork, Survey, Quantity, Calculations,
Terrain Modeling, Coordinate Geometry, Site Grading, etc.

SURVEY EQUIPMENT

Survey/Global Positioning System (GPS)

- 12 – Leica System 500 - SR 530 RTK - GPS Receiver
- 2 – Leica RS500 Geodetic Reference Station (RTK – COR Station)
- 16 – Pacific Crest ADL Vantage Pro 2-35 Watt UHF – GPS-RTK Trans/Receiver
- 2 – Airlink Raven CDMA C3210 Wireless Modems – Sprint Service, Public Random IP
- 6 – Airlink Raven CDMA C3210 Wireless Modems – Verizon Service, Static IP
- 1 – Leica Disto – Pro (Handheld EDM)
- 32 – Leica Viva GNSS dual frequency receivers
- 3 – Leica 1230 GNSS dual frequency receivers
- 5 – Trimble R8 Model 3 GNSS dual frequency receivers

Pipe/Cable Locators

- 3 – Radio Detection RD4000 with 3 watt transmitters
- 5 – Radio Detection RD8000 with 10 watt transmitters
- 1 – Radio Detection RD7000 with 3 watt transmitter
- 5 – Optical Ranging Inc. Spar 300 locating system integrated with the Trimble R8 receivers

Total Stations

- 1 – Wild TC 2000

Tripods

- 64

Total Stations with Onboard Data Collection

- 1 – Leica TCRP 1200 total station, fully robotic
- 15 – Leica TS 15P total station, fully robotic
- Optical Plummet
- 1 – Wild ZNL-16 (11164)

Magnetic Locators

- 2 – Chicago Steel Tape - FT - 60
- 1 – Schoenstedt
- 6 – Subsurface Instrument – ML-1

Hydrographic Survey Equipment

- 1 - HyDrone Bathymetric System

Unmanned Survey Equipment

- 1 – Fixed-wing Precision Hawk Lancaster
- 1 – Phantom 3
- 1 – Phantom 2 Vision
- 1 – Phantom Inspire

Levels (Engineering)

- 9 – Zeiss Ni 2 automatic level with Nedo folding rod
- 1 – Wild N-3 with Nedo folding rod
- 2 – Topcon Dini digital levels with bar code rods
- 6 – Leica NA2 automatic level with 16 ft rod

GPS Antennas

- 12 – Leica AT502
- 1 – Leica AT503 w/Chokering and Ray-Dome
- 1 – Leica AT504 w/Chokering and Ray-Dome
- 32 – Leica GS 15
- 5 – Trimble R8 GNSS

Vehicle / Boats

- 12 – 4 Wheel Drive Suburbans
- 2 – 4 Wheel Drive Jeep
- 1 – 4 Wheel Drive Pickup
- 1 – 8 Wheel Argo – Amphibious ATV
- 3 – Utility Trailers (10' and 14')
- 2 – Yamaha- Quad ATV

Fathometer

- 1 – Innerspace Tech Model 455 – 200 KHz 8° Transducer

Survey Software

- 2 – Leica GIS Data Pro Version 3.0
- 1 – Innerspace Technology Version 6.0 Data Logging with Guidance
- 17 – Leica GeoOffice Version 7.5 and 8.3
- 2 – Trimble Pathfinder Office Version 4.0
- 22 – Listech – Liscad 10.0 (COGO)
- 5 – MicroStation Version V8i and XM
- 2 – Leica SPIDER CORS Controlling Software Version 2.0
- 10 – AutoCAD Civil 3D 2011 and 2014

Field Laptops PCs

- 30 – HP Elite laptop PCs
- 1 Panasonic Model CF19 Tough Book

14. PROVIDE A LIST OF SOFTWARE AND EQUIPMENT AVAILABLE IN THE PRIMARY OFFICE WHICH WILL BE USED TO COMPLETE AML DESIGN SERVICES

GIS SOFTWARE

ESRI: 4 – ARC/Info, Version 10.X
9 – ArcView, Version 10.X
10 – ArcEditor, Version 10.X
1 – Spatial Analyst
1 – 3D Analyst
1 – ArcCOGO

AutoCAD, Version 2014 and prior versions

1 – Visual Basic, Version 6
1 – Visual Studio 2013 Architects w/MSDN Premium
1 – Visual Studio 2013 Developers w/MSDN Premium
1 – Visual Studio 2013 Pro w/MSDN Premium

ARCInfo and ARCEditor are concurrent licenses
ARCView concurrent licenses

MOBILE LIDAR

Sensor

1 – LYNX Mobile Mapper System with 2 Sensors.

LiDAR Processing WorkStations

3 – HP E5540 2.53 GHz, 18 GB RAM, 1.4 TB of disc space

Servers

1 – HP DL380, 2.1 TB of disc space,
1 – ATMOS R610 DP Server GBE HA TITAN, 120 TB of disc space

Software

1 – Optech ALTM Navigation-Planner
1 – Applanix POS PAC
1 – Optech Dashmap
6 – TerraSolid TerraScan
5 – TerraSolid TerraMatch
6 – TerraSolid TerraModeler
1 – TerraSolid Terraphoto
1 – TerraSolid Terraslave
1 – GeoCue Enterprise Server

5 – GeoCue Client
5- Geocue LiDAR CuePac
1-Geocue LYNX MMS CuePac

PHOTOGRAMMETRIC EQUIPMENT

Softcopy Stereoplotters

1 – HP X5670 @ 2.93 GHz Processor X2 (Xeon), 18 GB RAM, 64 BIT Operating System
1 – HP E5645 @ 2.40 GHz Processor X2 (Xeon), 24 GB RAM, 64 BIT Operating System

Digital Orthophoto

2 – HP Z600 E5640 @ 2.67 GHz Processor X2, 120 GB RAM, 232 GB Disc Space

Scanner

1 – Z/I PhotoScan – Variable Resolution Settings from 7 to 256 microns.

Server

1 – Compaq Proliant DL380
Xeon 3 GHz Processor
5.1 GB Memory
1 Terrabyte Disc Storage

1.2 Terrabyte Network Attached Storage

Software

1 – MrSID, Geo Express 8.5
1 – ImageStation Automatic Triangulation (ISAT) 6.2
7 – IRAS – C, Version 10.1
1 – Adobe Photo Shop 5, Version 10.0
1 – ERDAS Imagine, Version 2010
2 – ImageStation Base Rectifier-ISBR, Version 6.2
3 – ImageStation DTM Collection-ISDC, Version 6.2
3 – ImageStation Feature Collection (ISFC) 5.3
3 – ImageStation Model Setup (SMS) 5.3
2 – ZI Ortho Pro/Geo Media, Version 6.2
34 – MicroStation – J & 8, Versions V8 and V8i
1 – MRF Mapping Tool Kit for GIS Linework Processing, Version 8.1
1 – Corporate licensed Axiom Productivity Kit including File Fixer and English to Metric Conversion packages

**WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION
AML CONSULTANT QUALIFICATION QUESTIONNAIRE**

Attachment "A"

15. CURRENT ACTIVITIES ON WHICH YOUR FIRM IS THE DESIGNATED ENGINEER OF RECORD

PROJECT NAME, TYPE AND LOCATION	NAME AND ADDRESS OF OWNER	NATURE OF YOUR FIRM'S RESPONSIBILITY	ESTIMATED CONSTRUCTION COST	PERCENT COMPLETE
Mountain View Portals Mine Reclamation Preston County, West Virginia	West Virginia Department of Environmental Protection (WVDEP) Office of Abandoned Mine Lands & Reclamation 601 57th Street, SE Charleston, WV 25304	Michael Baker responsibilities includes providing engineering services for the reclamation of the Mountain View Portals abandoned coal mine site. Michael Baker's services included site investigation; field survey; subsurface investigation; water quality and soil sampling and analysis; conceptual, preliminary, and final design; stream restoration; permitting; environmental investigations; bidding-phase support; and construction monitoring.	\$ 169,267 (Michael Baker Fee)	90%
Crabtree Creek AMD Restoration Project Westmoreland County, Pennsylvania	Loyalhanna Watershed Association 6 Old Lincoln Highway West Ligonier, PA, 15658	Michael Baker is providing permitting, survey, geotechnical, and design services for the Crabtree Creek AMD Restoration Project in Westmoreland County, Pennsylvania. Work includes the design of the collection system of the mine pool AMD discharge and the design of approximately 18,300 feet of pipeline for gravity conveyance of the AMD discharge from the collection point to the passive treatment system site.	\$ 278,674 (Michael Baker Fee)	60%
Multi-Purpose Machine Gun Range Reconstitution Camp Ravenna Joint Military Training Center, Ohio	USPFO-OH 2811 W. Dublin-Granville Road Columbus, OH 43235-2788	Michael Baker responsibilities include architectural, engineering, and environmental services for reconstitution of the Automated Multi-Purpose Machine Gun (MPMG) Range at Camp Ravenna Joint Military Training Center. Michael Baker provided topographic mapping and surveying, reviewed design documents against current codes, performed a new wetlands delineation, supporting facility design, stormwater collection and conveyance, site layout and development, targetry layout and associated automation, utilities, construction documents and cost estimate, updated and prepared required permits, and provided construction phase support.	\$612,079 (Michael Baker Fee)	90%

**WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION
AML CONSULTANT QUALIFICATION QUESTIONNAIRE**

Attachment "A"

15. CURRENT ACTIVITIES ON WHICH YOUR FIRM IS THE DESIGNATED ENGINEER OF RECORD

PROJECT NAME, TYPE AND LOCATION	NAME AND ADDRESS OF OWNER	NATURE OF YOUR FIRM'S RESPONSIBILITY	ESTIMATED CONSTRUCTION COST	PERCENT COMPLETE
Allegheny River Blvd. Landslide Remediation, Transmission Line Landslide Remediation Allegheny County, Pennsylvania	Duquesne Light Company 2841 New Beaver Avenue Pittsburgh, PA 15233	Geotechnical evaluation and remediation of landslides along transmission lines remediation. Michael Baker performed an initial site inspection, site characterization and development of remediation alternatives. The site characterization included a subsurface investigation and laboratory testing. Remediation alternatives included an anchored retaining wall, rock buttress or lime or cement stabilization of materials. The rock buttress alternative was selected. Michael Baker then prepared a bid package that included construction plans, specifications, details and cost estimate. During construction, Michael Baker provided construction oversight to make sure the landslide remediation was performed in accordance with the construction plans.	\$1,300,000	95%
Corridor H Quality Assurance Management (QAM) Services Randolph and Tucker Counties, West Virginia.	West Virginia Department of Transportation Division of Highways Building 5 Charleston, WV 25305	Michael Baker provided quality assurance management (QAM) for construction of Sections 1, 2, and 3 of the Corridor H highway from Kerens to Parsons. During a long-term relationship with the client, Michael Baker served as the owner's representative to provide all the services needed from pre-award phase, through post-award and construction stages of their largest ever construction project being executed as design-build.	\$19,266,623 (Michael Baker Fee)	80%
Buckeye Line 700 Slide Area Alternatives Analysis and Construction Oversight of Landslide Repair Allegheny County, Pennsylvania	Buckeye Partners, L.P. 993 Broadhead Road, Suite 100 Moon Township, PA 15108	Provided a alternatives analysis with recommendations to repair a landslide along Line 700. Michael Baker performed an initial site review and developed a condition report and two alternatives to mitigate the land movement. Michael Baker conducted survey work to establish the limits of the slide area and provided engineering design services to develop construction plans, specifications, details and a cost estimate to remedy the site. After contract award, Michael Baker provided oversight to ensure the contractor performed the landslide repair in accordance with the construction plans	\$1,100,000	95%

**WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION
AML CONSULTANT QUALIFICATION QUESTIONNAIRE**

Attachment "A"

15. CURRENT ACTIVITIES ON WHICH YOUR FIRM IS THE DESIGNATED ENGINEER OF RECORD

PROJECT NAME, TYPE AND LOCATION	NAME AND ADDRESS OF OWNER	NATURE OF YOUR FIRM'S RESPONSIBILITY	ESTIMATED CONSTRUCTION COST	PERCENT COMPLETE
TL-590 Construction Services Two Landslips Marshall County, West Virginia	Dominion Energy Transmission, Inc. 925 White Oaks Boulevard Bridgeport, WV 26330	On-site inspection of land slips along transmission line TL-590. Michael Baker performed onsite inspection to ensure compliance to the project specifications including verification of equipment and materials to maintain erosion and sedimentation plan, soil sample collection analysis and evaluation for enable proper soil densification, performed Troxler nuclear moisture density measurements to determine soil compaction was within the project specifications. Provided oversight of final grading and seeding of the landslide area.	\$800,000	75%
Bergey 812 Well Pad Landslide Remediation Gaines Tioga County, Pennsylvania	Tilden Marcellus, LLC 4600 J Barry Court, Suite 120 Canonsburg, PA 15317	Geotechnical design of landslide remediation. Michael Baker performed a detailed geotechnical site reconnaissance of the landslide and developed remediations alternatives as possible solutions to the landslide issue. A remediation alternative was selected by the client. Michael Baker then prepared a bid package that included construction plans, specifications, details and quantity worksheets. After the client selected the contractor, Michael Baker provided construction oversight to make sure the landslide remediation was performed according to the construction plans.	\$165,000	75%
TOTAL NUMBER OF PROJECTS:		TOTAL ESTIMATED CONSTRUCTION COSTS:		
8		\$23,691,643		

WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION
AML CONSULTANT QUALIFICATION QUESTIONNAIRE

Attachment "A"

16. CURRENT ACTIVITIES ON WHICH YOUR FIRM IS SERVING AS A SUB-CONSULTANT TO OTHERS

PROJECT NAME, TYPE AND LOCATION	NATURE OF FIRMS RESPONSIBILITY	NAME AND ADDRESS OF OWNER	ESTIMATED COMPLETION DATE	ESTIMATED CONSTRUCTION COST	
				ENTIRE PROJECT	YOUR FIRM'S RESPONSIBILITY
None					

**WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION
AML CONSULTANT QUALIFICATION QUESTIONNAIRE**

Attachment "A"

17. COMPLETED WORK WITHIN LAST 5 YEARS ON WHICH YOUR FIRM WAS THE DESIGNATED ENGINEER OF RECORD

PROJECT NAME, TYPE AND LOCATION	NAME AND ADDRESS OF OWNER	ESTIMATED CONSTRUCTION COST	YEAR	CONSTRUCTED (YES OR NO)
F&M Coal Company, S-1044-87 & S-57-84 Mapping and Design Services Preston County, West Virginia	West Virginia Department of Environmental Protection (WVDEP) Office of Special Reclamation 47 School Street, Suite 301 Philippi, WV 26416	\$243,752 (Michael Baker Fee)	2017	Yes
Masteller Coal Company, S-10-85 & S-125-82 Mapping and Design Services Mineral County, West Virginia	West Virginia Department of Environmental Protection (WVDEP) Office of Special Reclamation 47 School Street, Suite 301 Philippi, WV 26416	\$168,937 (Michael Baker Fee)	2017	Yes
Maurice Jennings Coal Company, S-53-78 & S-61-83 Mapping and Design Services Preston County, West Virginia	West Virginia Department of Environmental Protection (WVDEP) Office of Special Reclamation 47 School Street, Suite 301 Philippi, WV 26416	\$217,982 (Michael Baker Fee)	2017	No
Training Area and Maneuver Trails Camp Ravenna Joint Military Training Center, Portage and Trumbull Counties, Ohio	121 OH Air National Guard 1438 S.R. 534 SW Newton Falls, Ohio 43217-1161	\$292,131 (Michael Baker Fee)	2018	Yes
Ebenezer Run Highwall #9 Brooke County, West Virginia	West Virginia Department of Environmental Protection (WVDEP) Office of Abandoned Mine Lands & Reclamation 601 57th Street, SE Charleston, WV 25304	\$101,413 (Michael Baker Fee)	2016	Yes
Small Arms Range Repair Evaluation Mansfield, Ohio	OH Air National Guard 1947 Harrington Memorial Road Mansfield, OH 44903-0179	\$124,834 (Michael Baker Fee)	2017	No

**WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION
AML CONSULTANT QUALIFICATION QUESTIONNAIRE**

Attachment "A"

17. COMPLETED WORK WITHIN LAST 5 YEARS ON WHICH YOUR FIRM WAS THE DESIGNATED ENGINEER OF RECORD

PROJECT NAME, TYPE AND LOCATION	NAME AND ADDRESS OF OWNER	ESTIMATED CONSTRUCTION COST	YEAR	CONSTRUCTED (YES OR NO)
F&M Coal Company, S-1044-87 & S-57-84 Mapping and Design Services Preston County, West Virginia	West Virginia Department of Environmental Protection (WVDEP) Office of Special Reclamation 47 School Street, Suite 301 Philippi, WV 26416	\$243,752 (Michael Baker Fee)	2017	Yes
Masteller Coal Company, S-10-85 & S-125-82 Mapping and Design Services Mineral County, West Virginia	West Virginia Department of Environmental Protection (WVDEP) Office of Special Reclamation 47 School Street, Suite 301 Philippi, WV 26416	\$168,937 (Michael Baker Fee)	2017	Yes
Maurice Jennings Coal Company, S-53-78 & S-61-83 Mapping and Design Services Preston County, West Virginia	West Virginia Department of Environmental Protection (WVDEP) Office of Special Reclamation 47 School Street, Suite 301 Philippi, WV 26416	\$217,982 (Michael Baker Fee)	2017	No
Training Area and Maneuver Trails Camp Ravenna Joint Military Training Center, Portage and Trumbull Counties, Ohio	121 OH Air National Guard 1438 S.R. 534 SW Newton Falls, Ohio 43217-1161	\$292,131 (Michael Baker Fee)	2018	Yes
Ebenezer Run Highwall #9 Brooke County, West Virginia	West Virginia Department of Environmental Protection (WVDEP) Office of Abandoned Mine Lands & Reclamation 601 57th Street, SE Charleston, WV 25304	\$101,413 (Michael Baker Fee)	2016	Yes
PFC Abraham G. Sams Memorial Bridge Replacement Clay County, West Virginia	West Virginia Department of Transportation, Division of Highways 1900 Kanawha Boulevard, East Charleston, West Virginia 25305-0430	\$998,196 (Michael Baker Fee)	2018	Yes
Design-Build Coonskin Park Access Road Bridge Charleston, West Virginia	West Virginia Department of Transportation, Division of Highways 1900 Kanawha Boulevard, East Charleston, West Virginia 25305-0430	\$6,200,000 (Construction)	2016	Yes

**WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION
AML CONSULTANT QUALIFICATION QUESTIONNAIRE**

Attachment "A"

18. COMPLETED WORK WITHIN LAST 5 YEARS ON WHICH YOUR FIRM HAS BEEN A SUB-CONSULTANT TO OTHER FIRMS (INDICATE PHASE OF WORK FOR WHICH YOUR FIRM WAS RESPONSIBLE)

PROJECT NAME, TYPE AND LOCATION	NAME AND ADDRESS OF OWNER	ESTIMATED CONSTRUCTION COST OF YOUR FIRM'S PORTION	YEAR	CONSTRUCTED (YES OR NO)	FIRM ASSOCIATED WITH
None					

19. Use this space to provide any additional information or description of resources supporting your firm's qualifications to perform work for the West Virginia Abandoned Mine Lands Program.

Michael Baker International, Inc. (Michael Baker) has been providing abandoned mine lands (AML) reclamation and acid mine drainage (AMD) remediation since the federal government first enacted legislation. Our work experience in AML/AMD started with Operation Scarlift in the 1970's, and we have been providing our engineering services in these areas to the West Virginia Department of Environmental Protection (WVDEP) since they initiated its AML Reclamation Program in 1983. Michael Baker's AML/AMD experience has developed the full skill set for reclamation projects. We also provide services in this area to the WVDEP OSR, Pennsylvania Department of Environmental Protection (PADEP), the Ohio Department of Natural Resources (ODNR), and the U.S. Office of Surface Mining (OSM), to name a few. Our recent experience on numerous AML reclamation and AMD remediation projects for the WVDEP, ODNR, PADEP and the U.S. Army Corps of Engineers, Nashville District, illustrates our track record for the completion of assignments on time and within budget. Through these experiences, Michael Baker has garnered AML/AMD-specific recognition and developed long-standing business relationships through successful endeavors based on our ability to provide the following services at a level that meets environmental standards while exceeding client expectations:

- ◆ Reclamation of mine refuse piles
- ◆ Mine Sealing
- ◆ Subsidence Control
- ◆ Balanced earthwork and grading
- ◆ Strip pit and high wall reclamation
- ◆ Drainage conveyance and improvements
- ◆ Revegetation of acid bearing ground
- ◆ Stream relocation and natural stream channel design
- ◆ Wetland assessments and inventory
- ◆ Restoration of streams and wetlands
- ◆ Landslide identification, investigation and remediation
- ◆ Replacement of water supplies affected by mining
- ◆ Efficient Passive and active AMD treatment systems



Although the projects presented in the Project Experience Matrix of Attachment "C" of the CQQ clearly show Michael Baker's AML design, water system design, and related experience, they only hint at the extensive human and material resources that especially qualify our firm for this project. Additionally, some projects may require some unique technical skills beyond a typical AML project, and as you may observe on our Organization chart included in Section 13 of this Expression of Interest, we can bring the full depth of in-house technical services to the project, as needed. Based on our initial investigations of the project, this includes items like inventorying and characterizing surface water seeps and mine discharge; completing a test boring program aimed at determining spoil, and evaluating any highwall or mine pool conditions to assist with reclamation; designing and maintaining a

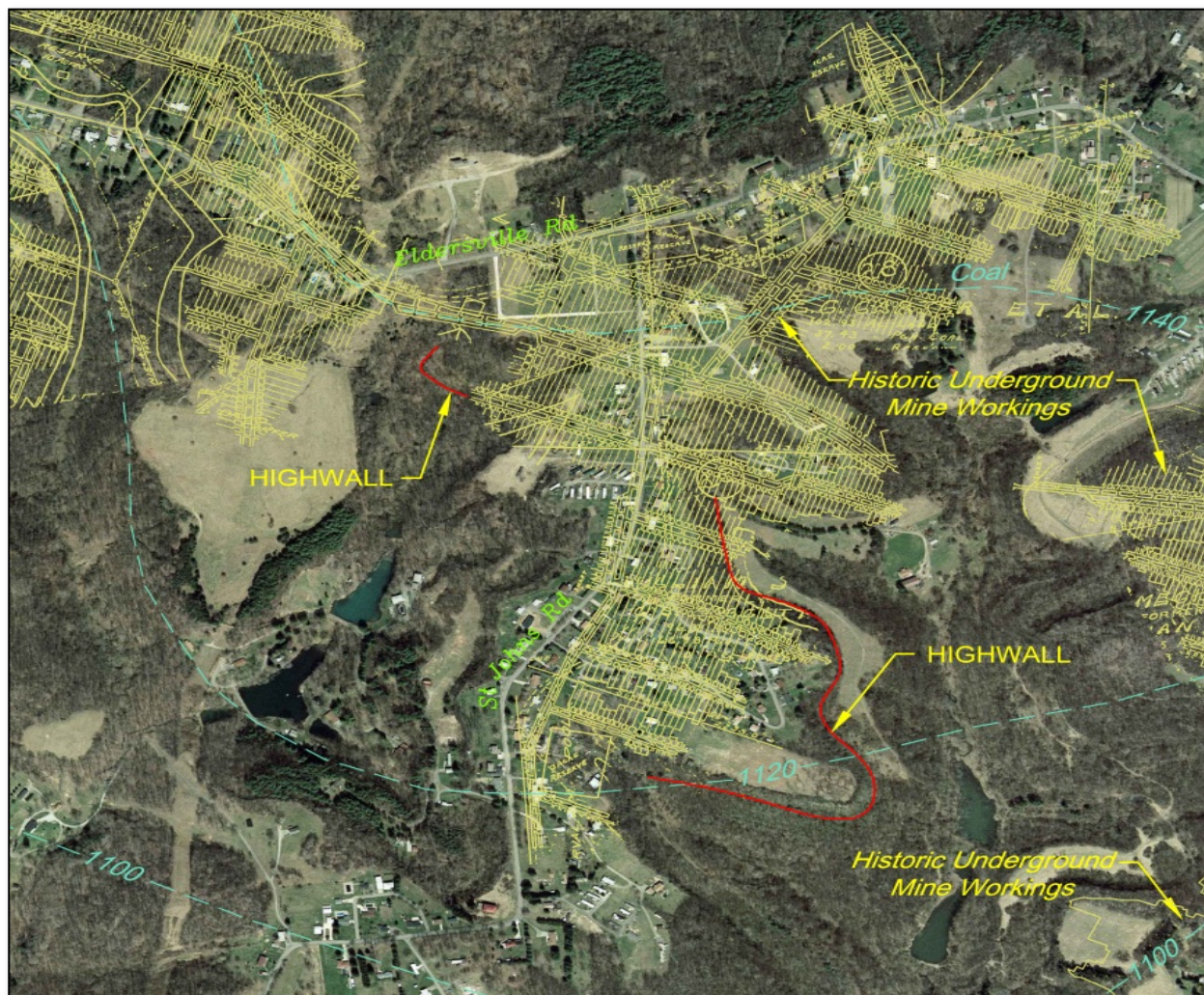
19. Use this space to provide any additional information or description of resources supporting your firm's qualifications to perform work for the West Virginia Abandoned Mine Lands Program.

treatment system for treating mine water and seepage; and LiDAR experts for securing mapping of large and altered sites, to name a few. The following narrative further describes our experience and provides insight into the special capabilities of Michael Baker.

The civil, mining, surveying, mapping, environmental, and geotechnical services of Michael Baker are available to respond to the needs of WVDEP immediately. Working from our Moon Township, Pennsylvania office and supported by our Charleston, West Virginia office, Michael Baker can expeditiously provide the full spectrum of services needed in water distribution system design as well as mine reclamation and mine drainage abatement operations. Some of the more important services our firm can provide to WVDEP include:

Field Investigation and Design Solutions

Sometimes it is about not reinventing the wheel. Our field investigations start with a literature review of any available mapping, historic mine maps, old aerial photographs, mined out area maps, landslide susceptibility maps, geologic maps, soil conservation service reports, etc. After compiling and review of available existing resources, we perform a field view of the project. Our specialized experience and technical ability has taught us that a typical AML project is a puzzle with many pieces. Because of the history of the site, often pieces of the puzzle no longer exist. Michael Baker's responsibility is to uncover and connect the various puzzle pieces and utilize this information to develop an efficient, constructible, cost-effective design. We take this responsibility very seriously. The adjacent image is an example of present day aerial photography, historical mine maps, structure contours and field collected data. This becomes a valuable design tool.



19. Use this space to provide any additional information or description of resources supporting your firm's qualifications to perform work for the West Virginia Abandoned Mine Lands Program.

Design Systems – Active and Passive

Michael Baker's design experience includes both active and passive treatment systems, which are based on the characterization of the AMD site as well as the flows and chemistry of the AMD. To this end, Michael Baker provides AMD sampling to determine chemical parameters, as well as the flow measurements covering high- and low-flow periods that are most important in developing AMD abatement system. To date, Michael Baker has evaluated and designed 17 AMD abatement systems, four of which are passive treatment systems that have been recently constructed and are currently in service.

Additionally, Michael Baker has designed ten AMD remediation projects for WVDEP alone that included open limestone channel (OLC), anaerobic and aerobic wetlands and settling ponds, limestone sand dumping in the stream, and alkaline leach bed/anoxic limestone drains. Other Michael Baker AMD abatement designs have been designed for USACE's Baltimore and Nashville Districts.



Geotechnical Investigation and Analysis

In designing AML reclamation and landslide remediation projects, generally three types of soil analysis are needed. These analyses may include:

- ◆ Geotechnical analysis (bearing capacity, friction angle, etc.)
- ◆ Soil analysis for revegetation potential (pH, Acid Base Accounting, Nutrients)
- ◆ Soil analysis for hazardous materials where past dumping may have occurred.

Michael Baker is involved in selecting and collecting the soil samples and analyzing the results of laboratory testing as required for design. Of the 30 most recent AML projects, Michael Baker was involved in soil analysis for 23 projects.



Hydrology and Hydraulic Analysis

Michael Baker has used specialized regional and local hydrologic methods in our 50+ years of combined experience in the program and during our work on local and federal contracts. The team has experts in hydrologic analyses who have experience using a variety of current hydrologic methods, including HEC-1, HEC-2, HEC-RAS, HY8, TR20, TR55, HAESTADS PONDS 2, FLOWMASTER, HDYRDOFLOW, KYPIPE 2, CYBERNET, SEDCAD 4, UNET, and

19. Use this space to provide any additional information or description of resources supporting your firm's qualifications to perform work for the West Virginia Abandoned Mine Lands Program.



DAMBRK. Michael Baker applies these models to services such as stormwater management, culvert analysis, hydrologic and hydraulic studies, storm sewer design, floodplain modeling, channel design, watershed planning, energy dissipation, and waterline extension and distribution. The team is also skilled in calibrating the rainfall runoff models in to historical data to justify results. We realize that each watershed is different from the next and that knowledge of local characteristics can be important.

Expertise in hydrology and hydraulics is essential in any AML/AMD remediation design. **Of the 30 most recent AML/AMD projects, 28 projects needed hydrology/hydraulics expertise of the AML/AMD design group.**

Stormwater Management

Michael Baker applies advancements in sediment control devices to provide an environmentally low impact, cost-effective design for reclamation projects. This approach uses sediment tube traps and wattles in lieu of the conventional sedimentation ponds. These devices filter sediment laden runoff through them while also reducing hydraulic energy. They also provide a higher efficiency of pollutant removal then

conventional methods and reduce the project's total disturbed area typically needed when conventional sedimentation basins are utilized.

Michael Baker grades the site such that all stormwater runoff is directed towards a channel at the toe of the backfilled highwall which doesn't allow any runoff exiting the site without the benefit of treatment. This keeps all runoff within the limits of disturbance and allows for the erosion control devices to be placed incrementally as construction progresses.

Once the site is vegetated, the controls are removed without any further reclamation that typically occurs with traps and ponds. The application of these new technologies also results in lower construction cost and project duration while providing a high efficiency of pollutant removal.



19. Use this space to provide any additional information or description of resources supporting your firm's qualifications to perform work for the West Virginia Abandoned Mine Lands Program.

Development of Balanced Earthwork and Grading

Michael Baker typically employs AutoCAD Civil 3D for production of grading plans, profiles, details, cross sections, and balancing cut and fill volumes on AML projects. We have presented a team that includes experts in utilizing this tool for grading and evaluating excavation and fill quantities to produce a balanced AML site. AutoCAD Civil 3D is a powerful tool for abandoned mine land projects allowing the rapid evaluation of grading plan alternatives and calculation of bid item quantities. It is especially useful for projects requiring extensive backfilling and grading, such as required for projects with large refuse and gob piles, highwalls, and other abandoned surface disturbances. If required, Michael Baker is also capable of utilizing Bentley MicroStation for development of plans and earthwork balancing.

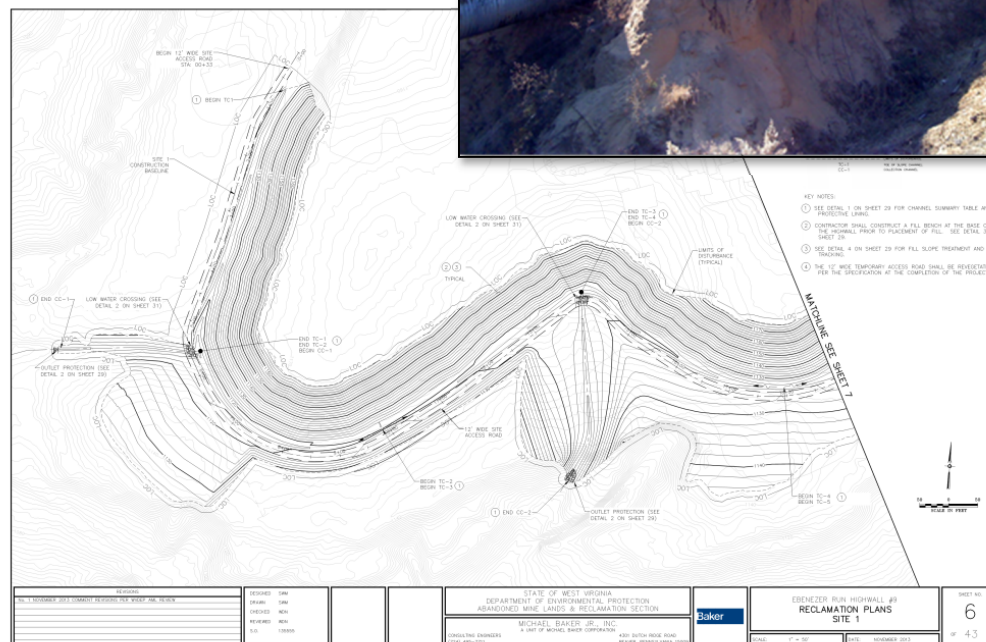
Preliminary Design, Final Design, and Construction Documents

Michael Baker's expert team of licensed professional engineers are experienced in preparing preliminary design reports, construction plans, specifications, bid tabs, and cost estimates for projects including mine subsidence and grouting, portal sealing, highwall backfilling, AMD Treatment and landslide stabilization.

Michael Baker was relied upon to write the manual for PADEP for the Permitting for Surface Facilities related to Coal Mining. A manual in which the guidelines are set for all mine permitting to be used by the Operators. This provides for a consistent and methodical process to permit the facilities and ensures the protection of the environment. This trust in Michael Baker by PADEP to take responsibility for this important document is just a sampling of the trust our clients have always placed in Michael Baker. It also demonstrates our knowledge of the mining processes and procedure. That understanding of how mining occurs today and historically yields valuable insight into developing solutions to deal with the resulting special reclamation projects.

Permitting

Every design project must be permitted; however the role of permitting is often overlooked. Michael Baker can prepare the required permitting documentation for AML designs to obtain required permits and authorizations. Michael Baker has an



the

19. Use this space to provide any additional information or description of resources supporting your firm's qualifications to perform work for the West Virginia Abandoned Mine Lands Program.

experienced team of professionals that have a diverse background in environmental and regulatory permitting. Permits are prepared in-house by a team that is intimately involved with the design of the project and has working relationships with regulatory agencies. In many instances, our working relationships with the regulatory community have allowed us to fast-track permits or permit revisions due to unforeseen conditions. This has saved our client valuable time and funding during design and construction. Beyond the application, Michael Baker provides technical representation to support our client's position during the permit negotiations.

Mobile and Aerial LiDAR Capabilities

Michael Baker's aerial light detection and ranging (LiDAR) service provides an efficient and affordable high-definition solution to digital terrain model surface creation and planimetric feature collection. Michael Baker owns and operates the latest in aerial LiDAR and positioning technology for outstanding productivity and survey efficiency. From a single aerial collection session, our aerial LiDAR system offers the ability to accurately capture and classify features that are important to you and the requirements of your project. With up to four range measurements, including first, second, third, and last return-point capture, you can be assured that all project data is accurately captured and available for classification

Michael Baker LiDAR provides the ability to accurately and effectively capture point-cloud terrain data for orthophoto rectification and planimetric or topographic map compilation. Products can be delivered as bare-earth DEM files, with the option of upgrading to digital terrain models for contour generation.



Michael Baker owns fixed-wing and octocopter drones.

Some of the functions applicable to design projects for which Michael Baker routinely employs the LiDAR System:

- ◆ Aerial imagery (vertical) acquisition using digital/film based cameras.
- ◆ Aerial Light Detection and Ranging (LiDAR) collection
- ◆ Field survey, including photogrammetry control, densification, and accuracy testing
- ◆ Unmanned Aerial Surveys (UAS)
- ◆ LiDAR data processing
- ◆ Map reproduction
- ◆ Earthwork Volume Computations and Cost Estimates
- ◆ Aerial imagery (oblique photographs)
- ◆ Contour Mapping of the Surface and Subsurface
- ◆ Perform Fully Analytical Aerial Triangulation (FAAT)
- ◆ Stereo compilation of data
- ◆ Aerial Mosaic, including Ortho Imagery
- ◆ Facilities Layout and Site Design
- ◆ Drafting of Plans Profiles and Cross Sections

The LiDAR System and AutoCAD Civil 3D Design software are powerful cost saving tools for abandoned mine land projects since they can evaluate numerous configurations rapidly. They are especially useful for projects requiring extensive waterline plan and profile drawings and can interface with hydraulic models such as WaterCAD for analysis and design. They are also useful for projects requiring extensive backfilling and grading, such as may be required for water tank and pump station sites, and for the grading of refuse banks and gob piles, elimination of highwalls, and reclamation of other abandoned surface disturbances.

19. Use this space to provide any additional information or description of resources supporting your firm's qualifications to perform work for the West Virginia Abandoned Mine Lands Program.

Additional Services

Michael Baker also provides the following services for abandoned mine lands reclamation and water system design projects:

- ◆ Field Surveying
- ◆ Mapping Verification Surveying
- ◆ Bathymetric Surveying
- ◆ Environmental Evaluations and Assessments
- ◆ Data Acquisition and Interpretation
- ◆ Construction Management

Since we can furnish all of the engineering related services required for abandoned mine lands reclamation projects "in-house", we can work very efficiently and meet the strictest of schedules. Our efficiency is further heightened by the use of mapping systems and AutoCAD compatible design software to perform computer-assisted mapping, design and drafting.



Michael Baker owns a HyDrone bathymetric system and has used it on numerous mine ponds.

The experience of the key project personnel includes abandoned and active mine operations. Since we continually serve many of the Country's largest coal and mineral producers as well as industrial clients and state environmental agencies, several personnel listed under Item 13 of the CQQ also have experience in all phases of mining services, from survey, mapping, exploration and reserve analysis through mine planning, permitting, design, construction management, and final closure and reclamation. Since mining and reclamation projects (and WVDEP assignments in particular) comprise a large segment of our business, we work to assure that the mining services provided meet the needs and expectations of our clients and any regulatory agencies involved. Some of the many coal producers we have served are listed below:

- | | |
|-------------------------------|--|
| ◆ Consolidation Coal Company | ◆ Emerald Coal Resources LP |
| ◆ Alpha Natural Resources | ◆ Cumberland Coal Resources LP |
| ◆ Westmoreland Coal Company | ◆ Exxon Research and Engineering Company |
| ◆ U.S. Steel Mining Co., Inc. | |

19. Use this space to provide any additional information or description of resources supporting your firm's qualifications to perform work for the West Virginia Abandoned Mine Lands Program.

Summary

As a large, diverse engineering firm, Michael Baker has facilities available to properly conduct water distribution extension, abandoned mine land reclamation, and AMD remediation projects. The use of in-house capabilities facilities can speed project completion and facilitate tracking of progress. The in-house capabilities include:

- ◆ Data Processing
- ◆ Interactive Graphics and AutoCAD
- ◆ Word Processing
- ◆ Printing and Reproduction

Michael Baker's qualifications to provide engineering services for waterline and abandoned mine land projects, we offer the following response to the evaluation factors:

1. Bidder Experience

- ◆ Extensive experience in each area. Items 17 and 18 of the CQQ describe various projects for which we provided these services during the last five years. Projects and technical services listed under item 12 of the CQQ describe competencies typical of various projects for which we provided our services to WVDEP.
- ◆ Strong capabilities in each area. Item 13 of the CQQ lists our personnel by discipline. Our large multi-disciplinary staff is experienced in all aspects of Special Reclamation and AML reclamation; civil, environmental, mining, geotechnical and reclamation engineering applied to surface and underground coal mining; land restoration; stream and water restoration; and land use and natural resources planning. The attached "Project Experience Matrix" show various projects performed for various clients and also show primary participants responsible for these projects.

2. Qualification of Personnel with respect to background, general experience, and experience relative to the requirements of the project.

- ◆ Michael Baker's key personnel are registered professional engineers experienced in a broad variety of water distribution and similar projects, as indicated item 13 of the CQQ.
- ◆ Our Project Professionals are veterans of many similar projects including past WVDEP projects.
- ◆ Our Mining Services Manager, Mr. Christopher Ruppen and our proposed Project Manager for this assignment, Mr. Bill Neider, both demonstrate the desire and commitment that WVDEP deserves and expects for this assignment.
- ◆ Our commitment is demonstrated by the fact that Michael Baker has conducted a comprehensive investigation of the project site and has been involved with the interpretation of the mining history leading to the current day site conditions.

19. Use this space to provide any additional information or description of resources supporting your firm's qualifications to perform work for the West Virginia Abandoned Mine Lands Program.

3. Corporate Specialized Experience and Demonstrated Abilities

- ◆ Michael Baker's specialized experience with AML related problems is summarized in the abandoned mine lands reclamation and Related Projects Matrix in Attachment B. Our work has addressed the full spectrum of reclamation projects.
- ◆ The firm has a wealth of experience on similar projects, as evidenced by projects performed for mining and mineral companies. Moreover, Michael Baker's transportation, site development, and water resource projects in the tri-state area often address special reclamation problems.
- ◆ Michael Baker applies advancements in sediment control devices to provide an environmentally low impact, cost-effective design for reclamation projects. This approach uses sediment tube traps and wattles in lieu of the conventional sedimentation ponds. These devices filter sediment laden runoff through them while also reducing hydraulic energy. They also provide a higher efficiency of pollutant removal than conventional methods and reduce the project's total disturbed area typically needed when conventional sedimentation basins are utilized. Michael Baker grades the site such that all stormwater runoff is directed towards a channel at the toe of the backfilled highwall which doesn't allow any runoff exiting the site without the benefit of treatment. This keeps all runoff within the limits of disturbance and allows for the erosion control devices to be placed incrementally as construction progresses. Once the site is vegetated, the controls are removed without any further reclamation that typically occurs with traps and ponds. The application of these new technologies also results in lower construction cost and project duration while providing a high efficiency of pollutant removal.
- ◆ Our specialized experience and technical ability has taught us that a typical AML project is a puzzle with many pieces. Because of the past history of the site, often pieces of the puzzle no longer exist. Michael Baker's responsibility is to uncover and connect the various puzzle pieces and utilize this information to develop an efficient, constructible, and cost-effective design. We take this responsibility very seriously.

20. THE FOREGOING IS A STATEMENT OF FACTS

Signature: William D. Neider Title: Senior Associate Date: October 18, 2021
Printed Name: William D. Neider, P.E.

Projects		* Exp. Basis C = Corp P = Personal	** Additional Info provided In Sections (s)	Project Experience Requirements																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
				Abandoned Surface Mine Reclamation	Abandoned Deep Mine Reclamation	Portal / Shaft Closure	Hydrologic / Hydraulic Design /Eval.	Remaining Evaluation	Mine / Refuse Fire Abatement	Subsidence Investigation Mitigation	Hazardous Waste Disposal	Project Specifications	Water Quality Eval. Mitigation / Replacement	Construction Inspection / Management	Water Treatment	Equipment / Structure Removal	Stream Restoration	Geotechnical / Stability	NPDES/Stormwater Preparation	Steven M. Savich, Pe – Project Principal, QAQC		William D. Neider, PE – Program & Project Manager		John D. Lasko, PG – Geotechnical & Surface Investigations		Don Green, PE – Geotechnical & Surface Investigation		Greg Dillan – Grading & Earthwork		Michael J. LaMont – Grading & Earthwork		Joe Hlebiczkzi, PE. – Civil Design Plans Specs		Lauren Greenfield, PE – Civil Design Plans Specs		Jeff Weiss - Demolition		Carl Jeffreys, PE, PG – Liners and Cap Cover		Greg Heilman, PE – Mining Engineer		Joseph Kudritz, PE – Hydrology Stormwater		Brian Baker, PE – E&S NPDES		Gary Case – Hazardous Material Management		Carl E. Sarver, Jr. – Geology / Mining		Mark Anderson – Mapping & LiDAR		John Miller, PLS - Surveying		Jeffrey Frye, PE – Waterline Engineer		Ralph Gromley, PLS - Surveying		Scott Zang, PE – Refuse Disposal		Patrick Fogarty, PE – Surveying		Russell E. (Rusty) Hall, PE, PS – Principal																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
																				M P	P	M P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P

[illegible]

