



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

Solicitation

NUMBER
DEP16555

PAGE
1

ADDRESS CORRESPONDENCE TO ATTENTION OF:
FRANK WHITTAKER 304-558-2316

RFQ COPY

TYPE NAME/ADDRESS HERE

Tetra Tech, Inc.
1000 Green River Drive
Fairmont, WV 26554

ENVIRONMENTAL PROTECTION
DEPT. OF
OFFICE OF SPECIAL RECLAMATION
105 S. RAILROAD STREET
PHILIPPI, WV
26416-9998 304-457-3219

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DATE PRINTED

06/24/2014

BID OPENING DATE:

07/22/2014

BID OPENING TIME 1:30PM

LINE	QUANTITY	UOP	CAT NO.	ITEM NUMBER	UNIT PRICE	AMOUNT
0001	1	JB		906-29		
MASTELLER DESIGN						
EXPRESSION OF INTEREST						
THE WEST VIRGINIA PURCHASING DIVISION, FOR THE AGENCY, THE WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION, IS SOLICITING EXPRESSIONS OF INTEREST FOR PROFESSIONAL MAPPING AND DESIGN SERVICES AT THE BOND FORFEITED PERMITS OF THE MASTELLER COAL COMPANY S-125-82 AND S-10-85 IN MINERAL COUNTY, WV PER THE FOLLOWING BID REQUIREMENTS AND ATTACHED SPECIFICATIONS.						
***** THIS IS THE END OF RFQ DEP16555 ***** TOTAL:						
07/22/14 10:03:40AM West Virginia Purchasing Division						

SIGNATURE <i>Mark Speranza</i>	TELEPHONE 412-921-8916	DATE 7-18-2014
TITLE Operations Manager	FEIN 95-4148514	ADDRESS CHANGES TO BE NOTED ABOVE

WHEN RESPONDING TO SOLICITATION, INSERT NAME AND ADDRESS IN SPACE ABOVE LABELED 'VENDOR'



**WVDEP Office of Special Reclamation
Request for Qualifications: DEP16555
Mapping and Engineering Design Services –
The Masteller Coal Company S-125-82 and
S-10-85**

STATE OF WEST VIRGINIA
Purchasing Division

PURCHASING AFFIDAVIT

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

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

DEFINITIONS:

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

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

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

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

WITNESS THE FOLLOWING SIGNATURE:

Vendor's Name: Tetra Tech, Inc.

Authorized Signature: Mark Sp Date: July 17, 2014

State of Pennsylvania

County of Allegheny, to-wit:

Taken, subscribed, and sworn to before me this 17 day of July, 2014.

My Commission expires August 8, 2017, 2017.

AFFIX SEAL HERE

NOTARY PUBLIC Cynthia K. Haluszczak
COMMONWEALTH OF PENNSYLVANIA
Notarial Seal
Cynthia K. Haluszczak, Notary Public
Green Tree Boro, Allegheny County
My Commission Expires Aug. 8, 2017
MEMBER, PENNSYLVANIA ASSOCIATION OF NOTARIES
Purchasing Affidavit (Revised 07/01/2012)

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.

Tetra Tech, Inc.
 Company

Mike Sperry
 Authorized Signature

July 17, 2014
 Date

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



CERTIFICATE OF LIABILITY INSURANCE

DATE(MM/DD/YYYY)
09/24/2013

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER Aon Risk Insurance Services West, Inc. Los Angeles CA Office 707 Wilshire Boulevard Suite 2600 Los Angeles CA 90017-0460 USA	CONTACT NAME:	
	PHONE (A/C. No. Ext): (866) 283-7122 FAX (A/C. No.): (800) 363-0105	
INSURED Tetra Tech, Inc. 661 Andersen Drive Pittsburgh PA 15220 USA	E-MAIL ADDRESS:	
	INSURER(S) AFFORDING COVERAGE	
	NAIC #	
	INSURER A: National Union Fire Ins Co of Pittsburgh	19445
	INSURER B: Insurance Co of the State of PA	19429
	INSURER C: Lexington Insurance Company	19437
INSURER D: AIG Europe Limited	AA1120841	
INSURER E:		
INSURER F:		

COVERAGES

CERTIFICATE NUMBER: 570051365549

REVISION NUMBER:

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

Limits shown are as requested

INSR LTR	TYPE OF INSURANCE	ADDL INSR	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	GENERAL LIABILITY			GL5142623	10/01/2013	10/01/2014	EACH OCCURRENCE	\$1,000,000
	<input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY						DAMAGE TO RENTED PREMISES (Ea occurrence)	\$1,000,000
	<input type="checkbox"/> CLAIMS-MADE <input checked="" type="checkbox"/> OCCUR						MED EXP (Any one person)	\$10,000
	<input checked="" type="checkbox"/> X,C,U Coverage						PERSONAL & ADV INJURY	\$1,000,000
	GEN'L AGGREGATE LIMIT APPLIES PER:						GENERAL AGGREGATE	\$2,000,000
	<input type="checkbox"/> POLICY <input checked="" type="checkbox"/> PRO-JECT <input checked="" type="checkbox"/> LOC						PRODUCTS - COMP/OP AGG	\$2,000,000
A	AUTOMOBILE LIABILITY			CA 327 52 65	10/01/2013	10/01/2014	COMBINED SINGLE LIMIT (Ea accident)	\$2,000,000
	<input checked="" type="checkbox"/> ANY AUTO						BODILY INJURY (Per person)	
	<input type="checkbox"/> ALL OWNED AUTOS						BODILY INJURY (Per accident)	
	<input checked="" type="checkbox"/> HIRED AUTOS						PROPERTY DAMAGE (Per accident)	
	<input type="checkbox"/> SCHEDULED AUTOS							
	<input checked="" type="checkbox"/> NON-OWNED AUTOS							
D	<input checked="" type="checkbox"/> UMBRELLA LIAB			TH1300027	10/01/2013	10/01/2014	EACH OCCURRENCE	\$5,000,000
	<input type="checkbox"/> EXCESS LIAB						AGGREGATE	\$5,000,000
	<input checked="" type="checkbox"/> RETENTION \$100,000							
B	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY			WC15656017	10/01/2013	10/01/2014	<input checked="" type="checkbox"/> WC STATUTORY LIMITS	
B	ANY PROPRIETOR / PARTNER / EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH)			AOS	10/01/2013	10/01/2014	E.L. EACH ACCIDENT	\$1,000,000
	If yes, describe under DESCRIPTION OF OPERATIONS below			WC15656011			E.L. DISEASE-EA EMPLOYEE	\$1,000,000
				CA			E.L. DISEASE-POLICY LIMIT	\$1,000,000
C	Contractor Prof			028182375	10/01/2013	10/01/2014	Each Claim	\$5,000,000
				Prof/Poll Liab			Aggregate	\$5,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (Attach ACORD 101, Additional Remarks Schedule, if more space is required)
Evidence of Insurance. Stop Gap Coverage for the following states: OH, ND, WA, WY.

CERTIFICATE HOLDER**CANCELLATION**

Tetra Tech, Inc. 661 Andersen Drive Pittsburgh PA 15220 USA	SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.
	AUTHORIZED REPRESENTATIVE <i>Aon Risk Insurance Services West, Inc.</i>

Holder Identifier : A

Certificate No : 570051365549



ENDORSEMENT

This endorsement, effective 12:01 A.M. 10/01/2013

forms a part of

policy No. GL 5142623

by NATIONAL UNION FIRE INSURANCE COMPANY OF PITTSBURGH, PA

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

CONTRACTOR'S COMMERCIAL PRIME ENDORSEMENT

This endorsement modifies insurance provided under the following:

COMMERCIAL GENERAL LIABILITY COVERAGE FORM

Coverage afforded under this endorsement does not apply to any person or organization covered as an additional insured on any other endorsement now or hereafter attached to this Coverage Part.

I. ADDITIONAL INSURED

Section II - WHO IS AN INSURED, 1. is amended to include as an insured any person or organization described in paragraphs A through I below, whom you are required to add as an additional insured under a written contract or agreement. The written contract or agreement must be:

1. Currently in effect or becoming effective during the term of this policy; and
2. Executed prior to "bodily injury", "property damage," or "personal injury and advertising injury".

A. BY CONTRACT

Any person or organization to whom you become obligated to include as an additional insured under this policy, as a result of any contract or agreement you enter into which requires you to furnish insurance to that person or organization of the type provided by this policy, but only with respect to liability arising out of your operations or premises owned by or rented to you. However, the insurance provided will not exceed the lesser of:

1. The coverage and/or limits of this policy, or
2. The coverage and/or limits required by said contract or agreement.

B. CONTROLLING INTEREST

1. Any person or organization having a greater than a 50% interest in you, but only with respect to their liability arising out of:
 - a. Their financial control of you; or
 - b. Premises they own, maintain or control while you lease these premises.
2. The insurance afforded to these additional insureds under Paragraph I.B.1 does not apply to structural alterations, new construction or demolition operations performed by or for that person or organization.

C. CO-OWNER OR INSURED PREMISES

A Co-owner of insured premises co-owned by you and covered by this insurance but only with respect to their liability as co-owner of the premises.

D. LESSOR OF LEASED EQUIPMENT

1. Any person or organization from whom you lease equipment, but only with respect to liability for "bodily injury", "property damage" or "personal and advertising injury" caused, in whole or in part, by your maintenance, operation or use of such equipment leased to you by such person(s) or organization(s).
2. With respect to the insurance afforded to these additional insureds under Paragraph I.D.1, this insurance does not apply to any "occurrence" which takes place:
 - a) after the equipment lease expires, or
 - b) after the equipment is returned or no longer in your possession,whichever takes place later.

E. MANAGERS OR LESSORS OF PREMISES

Managers or Lessors of premises but only with respect to liability arising out of the ownership, maintenance or use of that part of the premises leased to you and subject to the following additional exclusions:

This insurance under this paragraph does not apply to:

1. Any "occurrence" which takes place after you cease to be a tenant in that premises.
2. Structural alterations, new construction or demolition operations performed by or on behalf of such Managers or Lessors.

F. MORTGAGEE, ASSIGNEE, OR RECEIVER

1. A mortgagee, assignee, or receiver but only with respect to their liability as mortgagee, assignee, or receiver and arising out of the ownership, maintenance, or use of the premises by you.
2. The insurance afforded to the additional insureds under Paragraph I.F.1 does not apply to structural alterations, new construction or demolition operations performed by or for that mortgagee, assignee, or receiver.

G. OWNERS, LESSEES, OR CONTRACTORS - COMPLETED OPERATIONS

- (1) Any Owner, Lessee or Contractor, but only with respect to liability arising out of "your work" performed for that additional insured and included in the "products-completed operations hazard".

H. OWNERS, LESSEES, OR CONTRACTORS - ONGOING OPERATIONS

Any Owners, Lessees, or Contractors, but only with respect to liability arising out of your ongoing operations performed for that additional insured.

This insurance does not apply to "bodily injury" or "property damage" occurring after:

- (1) all work, including materials, parts or equipment furnished in connection with such work, on the project (other than service, maintenance or repairs) to be performed by or on behalf of the additional insured(s) has been completed; or,
- (2) that portion of "your work" out of which the injury or damage arises has been put to its intended use by any person or organization other than another contractor or subcontractor engaged in performing operations for a principal as a part of the same project.

I. STATE OR POLITICAL SUBDIVISION - PERMITS

Any State or Political Subdivision, subject to the following provisions:

1. This insurance applies only with respect to operations performed by you or on your behalf for which the state or political subdivision has issued a permit.
2. This insurance does not apply to:
 - a. "Bodily injury," "property damage" or "personal and advertising injury" arising out of operations performed for the state or municipality; or
 - b. "Bodily injury" or "property damage" included within the "products-completed operations hazard".

II. PRIMARY INSURANCE - ADDITIONAL INSURED

Where persons or organizations have been added to your policy as additional insureds to comply with insurance requirements of written contracts mandating primary coverage for such additional insureds relative to:

- a) the performance of your ongoing operations for the additional insureds; or
- b) "your work" performed for the additional insureds and included in the "products-completed operations hazard,"

then with respect to these additional insureds as defined above in this Section only,
SECTION IV - COMMERCIAL GENERAL LIABILITY CONDITIONS, Paragraph 4. - Other Insurance, a. - Primary Insurance, is deleted in its entirety and replaced with the following:

This insurance is primary over any similar insurance available to any person or organization we have added to this policy as an additional insured to comply with insurance requirements of written contracts mandating primary coverage for such additional insureds relative to (a) the performance of your ongoing operations for the additional insureds, or (b) "your work" performed for the additional insureds and included in the "products-completed operations hazard. However, this insurance is primary over any other similar insurance only if the additional insured is designated as a named insured of the other similar insurance. We will not require contribution of limits from the other similar insurance if the insurance afforded is primary.

III. INCIDENTAL MEDICAL MALPRACTICE LIABILITY COVERAGE

SECTION II - WHO IS AN INSURED, 2. a. (1) (d) is deleted in its entirety and replaced with the following:

- (d) Arising out of his or her providing or failing to provide professional health care services, except for "bodily injury" arising out of "Incidental Medical Malpractice Injury" by any physician, dentist, nurse or other medical practitioner employed or retained by you unless such "bodily injury" is covered by another primary policy. However, the insurance provided hereunder to such persons will not apply to liability arising out of services performed outside of the scope of their duties as your "employees." Any series of continuous, repeated or related acts will be treated as the occurrence of a single negligent professional healthcare service, which will be assignable to the same policy and policy year in which the originating act occurred.

SECTION V - DEFINITIONS - is amended to add:

"Incidental Medical Malpractice Injury" means "Bodily Injury" arising out of the rendering of or failure to render the following services:

- a. medical, surgical, dental, x-ray or nursing service or treatment or the furnishing of food or beverages in connection therewith; or
- b. the furnishing or dispensing of drugs or medical, dental or surgical supplies or appliances.

The Coverage provided by this endorsement does not apply to you or any insured if you are engaged in the business or occupation of providing any of the services described in the definition of "Incidental Medical Malpractice Injury".

IV. JOINT VENTURES / PARTNERSHIPS / LIMITED LIABILITY COMPANIES

The paragraph under **SECTION II - WHO IS AN INSURED** which states:

No person or organization is an insured with respect to the conduct of any current or past partnership, joint venture or limited liability company that is not shown as a Named Insured in the Declarations.

is hereby deleted and replaced with the following:

No person or organization, other than you, is an insured with respect to the conduct of any current or past partnership, joint venture or limited liability company that is not shown as a Named Insured in the Declarations.

Coverage under this policy, however, will not apply:

- a. Prior to the termination date of any joint venture, partnership or limited liability company; or
- b. If there is valid and collectible insurance purchased specifically to insure the partnership, joint venture or limited liability company.

V. SUPPLEMENTARY PAYMENTS

Under **SECTION I - SUPPLEMENTARY PAYMENTS - COVERAGES A AND B**, Paragraph 1.b., is deleted in its entirety and replaced with the following:

- b. Up to \$2,500 for cost of bail bonds required because of accidents or traffic law violations arising out of the use of any vehicle to which the Bodily Injury Liability Coverage applies. We do not have to furnish these bonds.

VI. LIBERALIZATION CLAUSE

If we revise or replace our standard policy form to provide more coverage, your policy will automatically provide the additional coverage as of the day the revision is effective in your state.

VII. UNINTENTIONAL ERRORS AND OMISSIONS

SECTION IV - COMMERCIAL GENERAL LIABILITY CONDITIONS, 6. - Representations is amended by adding:

- d. The unintentional failure by you or any insured to provide accurate and complete nonmaterial representations as of the inception of the policy will not prejudice the coverages afforded by this policy.

VIII. AMENDMENT OF DUTIES IN THE EVENT OF OCCURRENCE, OFFENSE, CLAIM OR SUIT

SECTION IV - COMMERCIAL GENERAL LIABILITY CONDITIONS, 2. - Duties in the Event of Occurrence, Offense, Claim or Suit, a. is hereby deleted and replaced with the following:

- a. You must see to it that we are notified as soon as practicable of any "occurrence" or an offense, which may result in a claim. Knowledge of an "occurrence" or an offense by your agent, your servant, or your employee will not in itself constitute knowledge to you unless the Director of Risk Management (or one with similar or equivalent title) or his/her designee will have received such notice. To the extent possible notice should include:

- (1) How, when and where the "occurrence" or offense took place;
- (2) The names and addresses of any injured persons and witnesses; and
- (3) The nature and location of any injury or damage arising out of the "occurrence" or offense.

IX. AMENDMENT OF EXPECTED OR INTENDED INJURY EXCLUSION

SECTION I - COVERAGES, COVERAGE A - BODILY INJURY AND PROPERTY DAMAGE LIABILITY, 2. - Exclusions, a. - Expected or Intended Injury, is deleted and replaced by the following:

- a. "Bodily injury" or "property damage" expected or intended from the standpoint of the insured. This exclusion does not apply to "bodily injury" or "property damage" resulting from the use of reasonable force to protect persons or property.

X. CONTRACTUAL LIABILITY - RAILROADS

Only with respect to (i) operations performed within 50 feet of railroad property and (ii) for which a Railroad Protective Liability Policy in the name of the railroad has been provided, then

A. SECTION V - DEFINITIONS, Paragraph 9, is deleted in its entirety and replaced with the following:

9. "Insured Contract" means:

- a. A contract for a lease of premises. However, that portion of the contract for a lease of premises that indemnifies any person or organization for damage by fire to premises while rented to you or temporarily occupied by you with permission of the owner is not an "insured contract";
- b. A sidetrack agreement;
- c. Any easement or license agreement;
- d. An obligation, as required by ordinance, to indemnify a municipality, except in connection with work for a municipality;
- e. An elevator maintenance agreement;
- f. That part of any other contract or agreement pertaining to your business (including an indemnification of a municipality in connection with work performed for a municipality) under which you assume the tort liability of another party to pay for "bodily injury" or "property damage" to a third person or organization. Tort liability means a liability that would be imposed by law in the absence of any contract or agreement.

Paragraph f. does not include that part of any contract or agreement:

(1) That indemnifies an architect, engineer or surveyor for injury or damage arising out of:

- (a) Preparing, approving or failing to prepare or approve maps, shop drawings, opinions, reports, surveys, field orders, change orders or drawings and specifications; or

(b) Giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage; or

(2) Under which the insured, if an architect, engineer or surveyor, assumes liability for an injury or damage arising out of the insured's rendering or failure to render professional services, including those listed in Paragraph (1) above and supervisory, inspection, architectural or engineering activities; and

B. SECTION IV - COMMERCIAL GENERAL LIABILITY CONDITIONS, 4. - Other Insurance, b. Excess Insurance, (1) (a), is amended to include the following:

(v) That is a Railroad Protective Insurance Policy or similar coverage.

XI. COVERAGE FOR YOUR SUPERVISORY OR MANAGERIAL EMPLOYEES RELATING TO CO-EMPLOYEE INJURIES

SECTION II - WHO IS AN INSURED, 2.a. (1), (a) and (b) are clarified to hold that:

Your supervisory or managerial "employees" are insureds for "bodily injury" to "co-employees" while in the course of their employment or performing duties related to the conduct of your business if claims or suits arise out of liability assumed by an insured under an "insured contract" as provided by **SECTION I - COVERAGES, COVERAGE A BODILY INJURY AND PROPERTY DAMAGE LIABILITY, 2. Exclusions, e. Employer's Liability.**

XII. WAIVER OF TRANSFER OF RIGHTS OR RECOVERY AGAINST OTHERS TO US

SECTION IV - COMMERCIAL GENERAL LIABILITY CONDITIONS, 8. - Transfer of Rights of Recovery Against Others To Us, is amended by the addition of the following:

We waive any right of recovery we may have against any person or organization pursuant to applicable written contract or agreement you enter into because of payments we make for injury or damage arising out of your ongoing operations or "your work" done under a contract with that person or organization and included in the "products-completed operations hazard".

XIII. AMENDMENT OF OTHER INSURANCE

A. SECTION IV - COMMERCIAL GENERAL LIABILITY CONDITIONS, 4.- Other Insurance, b. - Excess Insurance, (1), is amended to include the following:

This insurance shall not be excess where (i) such other insurance is specifically purchased to apply as excess of this policy, or (ii) where you are obligated by contract to provide primary insurance to an additional insured, unless there is other additional insurance coverage available to that additional insured.

B. SECTION IV - COMMERCIAL GENERAL LIABILITY CONDITIONS, 4.- Other Insurance, b. - Excess Insurance, (2), is deleted in its entirety and replaced with the following:

When this insurance is excess, we will have no duty under Coverages A or B to defend any claim or "suit" that any other insurer has a duty to defend. If no other insurer defends, we will undertake to do so, but we will be entitled to the insured's rights against all those other insurers.

XIV. AMENDMENT AGGREGATE LIMITS PER PROJECT

A. For all sums which the insured becomes legally obligated to pay as damages caused by "occurrences" under COVERAGE A (SECTION I), offense under COVERAGE B (SECTION 1) and for all medical expenses caused by accidents under COVERAGE C (SECTION I), which can be attributed only to ongoing operations at a single designated construction project:

1. A separate Per Construction Project General Aggregate Limit applies to each construction project, and that limit is equal to the amount of the General Aggregate Limit shown in the Declarations.
 2. The Per Construction Project General Aggregate Limit is the most we will pay for the sum of (i) all damages under COVERAGE A, except damages because of "bodily injury" or "property damage" included in the "products-completed operations hazard", (ii) all damages under COVERAGE B and (iii) all medical expenses under COVERAGE C regardless of the number of:
 - a. Insureds;
 - b. Claims made or "suits" brought; or
 - c. Persons or organizations making claims or bringing "suits".
 3. Any payments made under COVERAGE A or B for damages or under COVERAGE C for medical expenses shall reduce the Per Construction Project General Aggregate Limit for that construction project. Such payments shall not reduce the General Aggregate Limit shown in the Declarations nor shall they reduce any other Per Construction Project General Aggregate Limit for any other construction project covered under this policy.
 4. The limits shown in the Declarations for Each Occurrence, Fire Damage and Medical Expense continue to apply. However, instead of being subject to the General Aggregate Limit shown in the Declarations, such limits will be subject to the applicable Per Construction Project General Aggregate Limit.
- B. For all sums which the insured becomes legally obligated to pay as damages caused by "occurrences" under COVERAGE A (SECTION I), offenses under COVERAGE B (SECTION 1) and for all medical expenses caused by accidents under COVERAGE C (SECTION I), which cannot be attributed only to ongoing operations at a single construction project:
1. Any payments made under COVERAGE A or B for damages or under COVERAGE C for medical expenses shall reduce the amount available under the General Aggregate Limit or the Products-Completed Operations Aggregate Limit, whichever is applicable; and
 2. Such payments shall not reduce any Construction Project General Aggregate Limit.
- C. When coverage for liability arising out of the "products-completed operations hazard" is provided, any payments for damages because of "bodily injury" or "property damage" included in the "products-completed operations hazard" will reduce the Products-Completed Operations Aggregate Limit, and not reduce the General Aggregate Limit nor the Construction Project General Aggregate Limit.
- D. If the applicable construction project has been abandoned, delayed, or abandoned and then restarted, or if the authorized contracting parties deviate from plans, blueprints, designs, specifications or timetables, the project will still be deemed to be the same construction project.
- E. The provisions of Limits of Insurance (SECTION III) not otherwise modified by this endorsement shall continue to apply as stipulated.

CERTIFICATION AND SIGNATURE PAGE

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

Tetra Tech, Inc.
(Company)

Mark Speranza
(Authorized Signature)

Mark P. Speranza, Operations Manager
(Representative Name, Title)

412-921-8916 412-921-4040
(Phone Number) (Fax Number)

July 18, 2014
(Date)

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July 18, 2014

Mr. Frank Whittaker

Department of Administration, Purchasing Division

2019 Washington Street East, Charleston, West Virginia 25305-0130

Dear Mr. Whittaker:

Tetra Tech is pleased to submit our qualifications to perform design services in reply to RFQ #DEP16555 for the State of West Virginia. As outlined in our proposal, Tetra Tech and its personnel have completed work on **thousands of similar projects**. These projects have included items in the Scope of Work such as drainage control, mine seals, blasting designs, highwall elimination, and water treatment design.

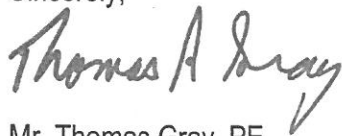
This project will be managed out of Tetra Tech's Pittsburgh, Pennsylvania area offices, with assistance from our Fairmont, WV office. Tetra Tech has a total of **six design teams** (a team consisting of one West Virginia registered engineer and one CAD professional) in these offices as well as a West Virginia registered surveyor and two West Virginia Licensed Remediation Specialists. Tetra Tech also has more than 650 mining and civil engineers, and 170 CAD professionals companywide that are available to support this work if needed.

Our experienced team is led by Mr. Thomas Gray, PE. Mr. Gray has more than 40 years of mining experience and has managed or supported numerous projects for the WVDEP. Mr. Gray is a registered Professional Engineer in the State of West Virginia. He will be joined by Mr. Gregory Hynes, PE, also a West-Virginia registered Professional Engineer. Mr. Hynes will serve as a project advisor and has managed and supported more than 40 projects for the WVDEP.

As a firm, Tetra Tech also has significant experience working for the WVDEP. Mr. Gray recently managed three projects for the WVDEP – the Fisher Run, Tunnelton, and the Paint Branch Mine Portal Closure Design projects. Tetra Tech is also currently managing the AML&R's Parker Run Design Project and the OSR's Energy Marketing Slurry Impoundment Project. In addition, our Charleston office is currently managing TMDL projects for the WVDEP.

We have provided one original submittal, and three copies. We appreciate this opportunity to provide this proposal, and look forward to answering any questions you may have. If you should require any additional information, please contact Mr. Gray at (304) 534-4021.

Sincerely,



Mr. Thomas Gray, PE
Project Manager

Tetra Tech Approach

Tetra Tech's approach is to develop a site plan that will:

- 1) comply with the requirements of the applicable rules and regulations
- 2) be easily constructed and economical
- 3) use the best available technology
- 4) maintain sustainable re-vegetation and
- 5) if needed, treat any discharge water with minimal costs.

Our plan is to design the site so that it can be constructed at the least possible cost to the State of West Virginia. Our initial step would be to review available site maps, permit plans, water quality information, and reclamation plans and conduct a one-day on site reconnaissance meeting with WVDEP Office of Special Reclamation (OSR) representatives to investigate site conditions in detail and discuss potential mitigation options. A detailed scope of work and engineering cost estimate are expected to be prepared after this field meeting. It is our understanding that the site is generally devoid of operating mine systems, although existing ponds still exist. Our plan is to develop the information needed to prepare and implement a strategy to restore the site including acid mine drainage (AMD) treatment systems. While specific information regarding this site and discharges from it, are not in the public domain, in the past Tetra Tech has been involved in the development of Total Maximum Daily Loads (TMDLs) for the area in which the site is located. From the aerial photographs available for these locations, it appears the sites have been reclaimed. It is assumed that acid mine drainage (AMD) is present and therefore that the waters in this area are impacted by metals and low pH. An active, passive, or combined system approach may be warranted.

Our initial step would be one of reconnaissance to review available mine maps, permit plans, and reclamation plans, site data, and conduct a one-day on site reconnaissance meeting with WVDEP Office of Special Reclamation (OSR) representatives to investigate site conditions in detail and discuss potential mitigation options. A detailed scope of work and engineering cost estimate are expected to be prepared after this field meeting. This scope of work would include the logical phases of a project. These phases include:

- Investigation Phase,
- Planning Phase, and
- Design Phase.

It is expected that the plan will involve both field and document investigations. These will likely involve characterization studies of water sources emanating from the Masteller sites as well as characterization of subsurface materials. The need for geotechnical/environmental investigations and supplementary site surveying would also be assessed at this field meeting. The site mapping along with a hand held GPS device would be very useful during site visits to validate and document key site elements. Other items which may need to be considered during site investigation include limits of backfilling and grading, earthwork balancing, site access for construction, surface and groundwater water control, E&S plan strategies (preferred BMP's, potential usage of existing ponds etc.), sources of topsoil for covering regraded refuse, disposal requirements and potential scrap value of any existing structures to be demolished. If coal refuse is found on site the potential for coal reprocessing for use as the fuel source or a blending product for an electric generating power facility will be reviewed.

Following site reconnaissance, Tetra Tech will meet internally with in-house mining reclamation experts and solicit additional input from OSR where appropriate to develop the detailed scope of work and engineering cost estimate for the design. Tetra Tech has experience with many alternative reclamation techniques, and therefore will be able to evaluate the current site reclamation design and identify alternatives.

Members of the design review team will independently review the design report, plans, and specifications provided to Tetra Tech. They will meet to discuss the project and then travel to the site to conduct a site visit to personally view the project. The site visit will be used to verify seep location and rates of flow. Water samples will also be attained for laboratory analysis. A preliminary analysis will be reported verbally to WV DEP at the conclusion of the site visit.

The following work will be required to determine if the existing treatment system is effective, or if the design of an alternative passive or active treatment system is required to meet the original water quality objectives:

1. Investigation of the present system to evaluate the existing system will involve:
 - a. Detailed review of current design report, plans, specifications, and previous water sample data and reports.
 - b. Additional water sampling and testing at the collection wells, seeps and outfalls.
2. Evaluate the quality of the water of the existing treatment system by:
 - a. Water sampling and testing at the outfall to determine the present water chemistry.
 - b. Analysis of water samples taken at the collection wells to determine appropriateness for treatment prior to discharging.
 - c. Thorough review of the as-builts, specifications, and water chemistry to evaluate existing passive system.
3. Assessment to determine if the existing system can be repaired to meet the desired water treatment goals involves the following:
 - a. Verify seep locations, rate of flow into the collection wells and ALD, quality and seasonal variation of flow rates and water chemistry.
 - b. Review water quantity and quality data for the seeps, in the mine pool, and the receiving streams. This is necessary to determine treatment alternatives and treatment levels to meet stream quality goals. Determine seasonal variations in quality and flow rate from seeps and in the stream.
4. If the existing system can be repaired to meet the original water quality objectives and is cost effective, corrective measures for repairing the system in addition to maintenance of the system will be prepared.
5. If it is determined that the existing system will not meet the required water treatment objectives, an alternative design solution will be developed. The design of the alternative system will include the following:
 - a. Recommend alternative treatment plan if the existing system cannot be repaired or the required repairs are not cost effective.

- b. Determine level of treatment needed to meet stream quality goals. The design basis for any passive treatment system is critical to the design's success.
- c. If additional treatment area is required, the utilization of the area that is adjacent to the receiving tributary will be addressed. The property boundaries will be surveyed to determine their exact location.

6. Design modifications or a new treatment system.

Addressing the Scope of Work

Below is a brief outline of some of Tetra Tech's experience with the scope of work under this contract. Tetra Tech has a strong technical knowledge of the services required to complete mine reclamation projects including:

Prepare work areas by clearing and grubbing – Tetra Tech's engineering and support personnel have prepared hundreds of plans, drawings and specifications to be used for construction bids and for on-site support during construction activity. We have prepared many similar plans for the WVDEP AML section and these will be the general template for reclamation drawings. Construction sequence and E&S narratives included with these plans describe the sequence from initial clearing and grubbing and installing erosion and sediment controls to the final site clean-up and vegetation and mulching.

Install new and refurbish existing drainage controls and erosion protection (sediment ponds, sediment ditches, and diversions) – In 2012, Tetra Tech was named as the #1 engineering firm by the *Engineering News-Record* for water related services for the ninth consecutive year. Many members of our team have significant experience with design of open channels, culverts, and mine water collection and conveyance systems, as well as erosion protection systems.

Tetra Tech understands the challenge of preparing mine reclamation plans on time and within available budgets. Our numerous civil and mining engineers are well experienced with preparing erosion and sediment control plans and specifying appropriate Best Management Practices (BMP's). Tetra tech personnel have specific experience preparing and submitting WV stormwater plans. Our engineers will work closely with WVDEP OSR to incorporate proper and economical erosion and sediment control BMP's into the reclamation construction drawings. The anticipated erosion and sediment controls will consider the requirements of the current mine permit and utilize existing structures (ditches, ponds, etc.) where possible.

Locate, protect and/or avoid existing utility lines, poles, gas lines, etc. – Tetra Tech has in-house West Virginia certified land surveyors to complete base mapping of project sites. Topography, utility lines, poles, noted gas lines and other surface features can be surveyed for each project. If needed, Tetra Tech would subcontract aerial photography for the development of more detailed contour maps of larger sites. In addition, our firm has surveyors with experience in working on a variety of abandoned mine land projects.

Construct new and upgrade existing access roads, and install culverts – Tetra Tech has significant experience in the construction and upgrading of access roads and the installation of culverts for abandoned mine land projects. Recently, Tetra Tech completed an access road required for the Gladden Mine Discharge Passive Treatment System project in association with PADEP.

In addition, our firm is currently performing this type of work for projects for E&P clients operating in the Marcellus Shale on an as needed basis. Tetra Tech coordinates with local government and state entities such as the Department of Transportation for the development of access roads/culverts for project sites. Following the completion of a project, Tetra Tech also can restore the area to its prior condition.

Install mine seals and subsurface drains - Tetra Tech recently completed several projects requiring the closure of abandoned mine openings. For the West Virginia Department of Environmental Protection, Tetra Tech completed designs to install wet mine seals and drainage improvements for the closure of nine portals on private properties in Weston and Tunnelton, West Virginia. Tetra Tech also recently prepared mine seal designs for three shafts for use at an active coal mine during closure for a coal company in Aledonia, Ohio and completed the design of four internal mine bulkheads at the same Ohio coal mine.

Perform blasting designs and pre-blast surveys, if needed for reclamation of site – If required, Tetra Tech conducts these surveys by first attempting to contact each home owner to make an appointment to meet with them and inspect their dwelling. Typically a two-person team will perform these tasks. They will view the inside and outside of each room for existing damage and inspect, photograph, and videotape to document the dwelling's condition prior to any blasting. A report is then assembled and provided to the WVDEP Division of Mining & Reclamation for review and approval.

Tetra Tech staff includes mining engineers with experience in blasting. Blasting plans can be reviewed and prepared if needed. If special conditions exist, such as blasting in an isolation trench near a mine fire, Tetra Tech may use a blasting expert as a consultant.

Eliminate existing highwalls by backfilling and regrading with materials available onsite, or designate borrow area sites nearby – Tetra Tech is very experienced in preparing design plans for highwall elimination, borrow areas, treatment ponds, and the necessary grading for final reclamation. Tetra Tech primarily uses AutoCAD Version 2013 and AutoDesk Civil 3D for state-of-the-art site design to prepare a plan based on current site conditions to meet permit specifications and approximate original contour. Tetra Tech reclamation grading plans include balanced earthwork including anticipated shrinkage of engineered and compacted fills. Grading plans also minimize required hauling and re-handling of materials by balancing individual work areas and considering construction sequencing and available work areas.

Repair or eliminate any slip areas on partially backfilled highwalls – Tetra Tech's geotechnical engineers and soil scientists have conducted slope stability analyses for a variety of projects, inspecting the site for slip areas on partially backfilled highwalls. Mr. Gray has performed slope stability analysis in support of restoration plan development numerous times for the Office of Surface Mining and also prepares restoration plans. Tetra Tech's highly experienced geotechnical staff works in close conjunction with hydrogeologists to integrate groundwater control with slope stability. Our reclamation plans generally include compacted fill slopes of 2H:1V or shallower as allowable by site conditions, and other stability measures such as rock toes, key benching, and fill benches where applicable.

Reshape and add lime amendments to any potentially toxic coal refuse piles – Tetra Tech has experience evaluating the requirement for lime amendments for refuse materials and acid-producing overburden. Alternative alkaline products such as steel slag leach beds and fluidized bed combustion (FBC) ash have been evaluated for reclamation projects.

Condition, stabilize, and revegetate disturbed land by the plan view acre, based on post-mine land use from permit files from landowners – Tetra Tech is experienced in developing reclamation plans aimed at meeting specific land use and vegetation conditions. Tetra Tech's professionals understand the ecology of reclaimed areas as well as understanding permit requirements. Reclamation plans are based on experience gained implementing plans at mine sites and monitoring reclamation success.



If long term water treatment is anticipated on the site, prepare and regrade areas to accommodate space for future structures or facilities – Tetra Tech has experience with the preparation of areas to accommodate for the need of water treatment structures or facilities.

Design efficient passive and active water treatment and pumping systems which minimize maintenance and meet NPDES water quality standards – Tetra Tech is experienced in designing passive and active treatment systems. Tetra Tech's professionals understand WV DEP's objectives and will strive to exceed expectations.

Design appropriate sludge handling facilities onsite – Tetra Tech recently selected underground sludge injection boreholes into underground coal mines on the Cresson project for PADEP. We are currently performing a similar task at the Bird Mine Site in PA for Miller Springs, Inc. and at Belt, MT for MT DEQ.

Final site cleanup – Tetra Tech will work with contractors for the final cleanup and restoration of sites, including the removal and hauling of all debris, and restoration of sites to prior conditions.

To further demonstrate our experience, we have provided full-page resumes in Section D and project descriptions in Section E.

Attachment B: Consultant Questionnaire

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

Attachment "B"

PROJECT NAME Multiple Permits Design	DATE (DAY, MONTH, YEAR) 11, June, 2014	FEIN 95-4148514
1. FIRM NAME Tetra Tech, Inc.	2. HOME OFFICE BUSINESS ADDRESS 661 Andersen Drive Pittsburgh, PA 15220	3. FORMER FIRM NAME Tetra Tech NUS, Inc. NUS Corporation NUS Environmental Corporation
4. HOME OFFICE TELEPHONE (304) 534-4021	5. ESTABLISHED (YEAR) 1966	6. TYPE OWNERSHIP Corporation
6a. WV REGISTERED DBE (Disadvantaged Business Enterprise) No		

7. PRIMARY OSR DESIGN OFFICE: ADDRESS/TELEPHONE/PERSON IN CHARGE/ NO. OSR DESIGN PERSONNEL EACH OFFICE

Foster Plaza 7, 661 Andersen Drive, Pittsburgh, PA 15220 / (412) 921-7090 / Mark Speranza, PE / (16 AML design personnel - 6 Design Engineers and 10 CADD Professionals)

8. PRINCIPAL OFFICERS OR MEMBERS OF FIRM Mr. Mark Perry, PE – Unit President Mr. Thomas Gray, PE – Project Manager	8a. NAME, TITLE, & TELEPHONE NUMBER - OTHER PRINCIPALS Ms. Stephanie Warino, PG – Fairmont Operations Manager
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9. PERSONNEL BY DISCIPLINE

2012 ADMINISTRATIVE	152 ECOLOGISTS	19 LANDSCAPE ARCHITECTS	98 STRUCTURAL ENGINEERS
130 ARCHITECTS	138 ECONOMISTS	54 MECHANICAL ENGINEERS	60 SURVEYORS
300 BIOLOGIST	60 ELECTRICAL ENGINEERS	70 MINING ENGINEERS	75 TRAFFIC ENGINEERS
170 CADD OPERATORS	746 ENVIRONMENTALISTS	12 PHOTOGRAMMETRISTS	7855 OTHER
304 CHEMICAL ENGINEERS	271 ESTIMATORS	96 PLANNERS: URBAN/REGIONAL	
588 CIVIL ENGINEERS	367 GEOLOGISTS	70 SANITARY ENGINEERS	
61 CONSTRUCTION INSPECTORS	3 HISTORIANS	34 SOILS ENGINEERS	239 TOTAL PERSONNEL (IN PRIMARY OFFICE)
- DESIGNERS (counted in CADD)	115 HYDROLOGISTS	140 SPECIFICATION WRITERS	
- DRAFTSMEN (counted in CADD)			14,000+ Personnel company-wide

TOTAL NUMBER OF WV REGISTERED PROFESSIONAL ENGINEERS IN PRIMARY OFFICE: 6
***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

Below is a list of subcontractors we would likely use, if required

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

NAME AND ADDRESS: Test Boring Services, Inc. 140 Mong Road Scenery Hill, PA 15360	SPECIALTY: Drilling	WORKED WITH BEFORE <u> X </u> Yes (with individual staff) <u> </u> No
NAME AND ADDRESS: Sturm Environmental Services P.O. Box 650 Bridgeport, WV 26330	SPECIALTY: Laboratory analysis (coal, soil, water)	WORKED WITH BEFORE <u> X </u> Yes (with individual staff) <u> </u> No
NAME AND ADDRESS: Double J Drilling 1207 Williamstown Pike Williamstown, WV 26187	SPECIALTY: Drilling	WORKED WITH BEFORE <u> X </u> Yes <u> </u> No
NAME AND ADDRESS: Blue Mountain Aerial Mapping 11023 Mason-Dixon Highway Burton, WV 26562	SPECIALTY: Aerial mapping	WORKED WITH BEFORE <u> X </u> Yes <u> </u> No
NAME AND ADDRESS: Industrial Lab Analysis 65 36 th Street Wheeling, WV 26003	SPECIALTY: Laboratory Analysis (water)	WORKED WITH BEFORE <u> X </u> Yes (with individual staff) <u> </u> No
NAME AND ADDRESS: Test Boring Services, Inc. 140 Mong Road Scenery Hill, PA 15360	SPECIALTY: Drilling	WORKED WITH BEFORE <u> X </u> Yes (with individual staff) <u> </u> No
NAME AND ADDRESS: Terra Testing, Inc. 260 Meadowlands Blvd. Washington, PA 15301	SPECIALTY: Geotechnical drilling	WORKED WITH BEFORE <u> X </u> Yes <u> </u> No
NAME AND ADDRESS: TRIAD Engineering 219 Hartman Run Road Morgantown, WV 26505	SPECIALTY: Surveying, Drilling	WORKED WITH BEFORE <u> X </u> Yes <u> </u> No

12. A. **Is your firm experienced in Special Reclamation Remediation/ Mine Reclamation Engineering?**

YES Description and Number of Projects: Tetra Tech has completed dozens of projects involving special reclamation and mine reclamation engineering. Our Project Manager has been working on reclamation projects for the past 30 years, with some of his WVDEP projects involving AMD. Tetra Tech is also the No. 1 engineering firm in the U.S. based on the prestigious 2014 Engineering News-Record rankings, which was the ninth year in a row we have received that distinction. Many members of our team have significant experience with the special reclamation and mine reclamation engineering, including our mining engineers and hydrologists.

B. **Is your firm experienced in soil analysis and coal refuse analyses?**

YES Description and Number of Projects: Tetra Tech has conducted **thousands of soil investigations, including coal refuses analyses** worldwide that included sampling and analysis. Along with this site work, we have provided thousands of reports presenting the results of the investigations. We have extensive specialized experience and technical competence in providing soil sampling and analysis services, including **more than 6,000 environmental site characterizations (including at mining sites) and more than 1,000 geotechnical investigations**. We have trained and experienced field sampling crews available to support this project.

C. **Is your firm experienced in hydrology and hydraulics for handling mine water discharges on mining sites?**

YES Description and Number of Projects: Tetra Tech has over **three decades of experience** in hydrology and hydraulics having completed **hundreds of projects, including those on mining sites**. Our expertise and knowledge in evaluating hydrologic systems is applied to specific water resource project types including water resource and flood damage assessment, flood control designs (including channels, levees, detention basins and bank protection, hydraulic structure design, erosion and sedimentation studies, stream restoration and wetland design, dam and levee safety evaluations, reservoir operation/optimization studies, flood-control and flood management studies and mapping, development of flood warning systems, dam break flood studies and contingency planning, stormwater drainage design, surface and groundwater supply analysis. The basis of these hydrologic studies is the application of HEC software such as HEC-HMS, GeoHMS, HECFFA, HEC-SSP, HEC-DSSVue, HEC-ResSim, CWMS and legacy software such as HEC-1, HEC-5, HEC-DSS, and COED.

D. **Does your firm produce its own Aerial Photography and Develop Contour Mapping?**

YES Description and Number of Projects: Tetra Tech employs 15 GIS and CADD personnel in its Pittsburgh and Fairmont offices and has all necessary software for map development. Our firm hires subcontractors when necessary for aerial photography to develop contour maps. Tetra Tech has completed aerial photography and/or contour mapping for **over 100 projects**.

E. **Is your firm experienced in design of highwall elimination, grading and material handling plans for land reclamation?**

YES Description and Number of Projects:

Tetra Tech has experience in highwall-related projects. Our firm has performed several analyses of highwalls in Pennsylvania and for the Wyoming Department of Environmental Quality, our firm has managed highwall grading and monitoring projects under a statewide contract. Through our five-year contracts with the PADEP Bureau of Abandoned Mine Reclamation and Bureau of Mining Projects, Tetra Tech will manage additional highwall reclamation projects. Our project manager, Gregory Hynes, PE, also has a significant amount of highwall experience having completed **numerous highwall reclamation projects for the WVDEP**. Most recently he managed three highwall projects for the agency in 2012 – **the Waitman-Barbe Highwall, the Colliers Sportsman's Club Highwall, and the Simpson Creek Highwall**. In addition, our project advisor, Thomas Gray, PE, also has significant experience in the elimination and reclamation of highwalls.

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

NAME & TITLE (Last, First, MI) Gray, Thomas, A., PE Project Manager / Mining Engineer	YEARS OF EXPERIENCE	
	YEARS OF OSR DESIGN EXPERIENCE 0	YEARS OF OSR RELATED DESIGN EXPERIENCE 40
Brief explanation of responsibilities		
<p>Mr. Gray has more than 39 years of mining engineering experience and has managed numerous AML projects for the West Virginia Department of Environmental Protection. His experience for the agency includes the Paint Branch mine portals design, Tunnelton mine portals design, Fisher Run mine portals design, Omega mine grouting project, Owings Mine reclamation, Majesty Mine reclamation, Godby Branch water supply extension, and Left Hand Fork Refuse fire control. Since 2000, Mr. Gray has participated in more than 50 AMR projects and has managed 30 projects for the OSM. Currently, Mr. Gray oversees two statewide open-end contracts with the Pennsylvania Department of Environmental Protection. He also currently manages projects involving mineral rights for the West Virginia Division of Highways. Mr. Gray co-authored the chapter entitled, 'Mine Closure, Sealing, and Abandonment' in SME's Mining Engineering Handbook.</p>		
EDUCATION (Degree, year, specialization) BS, 1973, Mining Engineering / MBA, 1977, Business Administration		
MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS		REGISTRATION (Type, year, state)
Society of Mining Engineers - Distinguished Member Society of American Military Engineers Engineering Society of Western Pennsylvania		Professional Engineer, 1988, West Virginia Professional Engineer, 1978, Pennsylvania Professional Engineer, 1980, Virginia Professional Engineer, 2009, Ohio Professional Engineer, 1989, Maryland

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

NAME & TITLE (Last, First, MI) Hynes, Gregory, P., PE Project Advisor	YEARS OF EXPERIENCE	
	YEARS OF OSR DESIGN EXPERIENCE 0	YEARS OF OSR RELATED DESIGN EXPERIENCE 27
Brief explanation of responsibilities		
<p>Mr. Hynes has more than 27 years of experience in abandoned mine land reclamation, land restoration, mining permits, and environmental and water resources engineering. He has managed or supported more than 30 AML projects for the WVDEP. Most recently, Mr. Hynes managed the Energy Marketing Slurry Impoundment project for the Office of Special Reclamation, and four highwall projects for the Office of Abandoned Mine Lands in 2012 – 2014 including the Parker Run Refuse, the Waitman-Barbe Highwall, the Colliers Sportsman's Club Highwall, and the Simpson Creek Highwall. He has also managed several projects for other state agencies including PADEP and the Ohio Department of Natural Resources, preparing design calculations, cost estimates, plans, and technical specifications for abandoned mine land reclamation. Mr. Hynes has also prepared permit applications and construction level drawings and specifications for proposed surface mine facilities in West Virginia and Pennsylvania. Projects included permitting and reclamation of various mining related surface facilities.</p>		
EDUCATION (Degree, year, specialization) MS, 1997, Civil Engineering / BE, 1987, Civil Engineering		
MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS		REGISTRATION (Type, year, state)
N/A		Professional Engineer, 1998, West Virginia Professional Engineer, 1993, Pennsylvania Professional Engineer, 1998, Ohio

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

NAME & TITLE (Last, First, MI) Giovannetti, Ernest	YEARS OF EXPERIENCE	
	YEARS OF OSR DESIGN EXPERIENCE 0	YEARS OF OSR RELATED DESIGN EXPERIENCE 41

Brief explanation of responsibilities

Mr. Ernest Giovannitti, PE has more than 41 years of engineering. He previously served as Director of the Bureau of Mining and Reclamation for the Pennsylvania Department of Environmental Resources (1970-1995) and the Chief of the Division of Permits and Compliance in the Bureau of Water Quality Management and the. From 1995-2000, Mr. Giovannitti served as the Director of Abandoned Mine Reclamation for the Pennsylvania Department of Environmental Protection.

EDUCATION (Degree, year, specialization)

MS, Sanitary Engineering / BS, Civil Engineering

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS

REGISTRATION (Type, year, state)

Professional Engineer, Pennsylvania

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

NAME & TITLE (Last, First, MI) Smith, Terence, PE Mining Engineer	YEARS OF EXPERIENCE	
	YEARS OF OSR DESIGN EXPERIENCE 0	YEARS OF OSR RELATED DESIGN EXPERIENCE 24

Brief explanation of responsibilities

Mr. Smith has more than 36 years of experience in mining engineering and management, and water and wastewater design engineering and project management. Mr. Smith previously served as a longwall maintenance supervisor and currently serves as a project manager for two statewide mining engineering abandoned mine land reclamation design contracts with PADEP. He recently provided design services for a mine discharge reclamation project for the South Fayette Conservation Group. His mining expertise also includes longwall mining, coal preparation plant and coal refuse disposal supervision, surface mine permitting, mine operations evaluations, compliance evaluations, economic feasibility analysis, cost estimating and project management in the coal mining industry.

EDUCATION (Degree, year, specialization)

BS, 1978, Mining Engineering

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS

REGISTRATION (Type, year, state)

Society of Mining, Metallurgy, and Exploration

American Society of Civil Engineers

Water Environment Federation

Professional Geologist, 1992, Pennsylvania

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

NAME & TITLE (Last, First, MI) Connolly, Timothy, PE Civil Engineer	YEARS OF EXPERIENCE	
	YEARS OF OSR DESIGN EXPERIENCE 0	YEARS OF OSR RELATED DESIGN EXPERIENCE 30
Brief explanation of responsibilities Mr. Connolly has more than 30 years of civil engineering experience. His experience includes work on abandoned mine land reclamation projects and he is currently serving as a project manager on Tetra Tech's abandoned mine land contracts through the Pennsylvania Department of Environmental Protection. He is a registered Professional Engineer in West Virginia and specializes in mine drainage projects, managing several such projects in Pennsylvania over the past two years. Mr. Connolly has also served as a heavy equipment operator performing construction services on various mine-related projects in the Commonwealth of Pennsylvania and is a Certified Construction Instructor certified by the Office of Surface Mining. Mr. Connolly is also familiar with AutoCad and Haestad Methods Hydrology software.		
EDUCATION (Degree, year, specialization) BS, 1983, Transportation Technology AD, 1980, Highway Engineering		
MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS N/A	REGISTRATION (Type, year, state) Professional Engineer, 2013, West Virginia Professional Engineer, 1989, Pennsylvania	

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

NAME & TITLE (Last, First, MI) Mertz, Robert, C., PE Civil Engineer	YEARS OF EXPERIENCE	
	YEARS OF OSR DESIGN EXPERIENCE 0	YEARS OF OSR RELATED DESIGN EXPERIENCE 30
Brief explanation of responsibilities Mr. Mertz is a civil engineer with more than 30 years of professional experience in project management, engineering, construction management, and quality assurance/quality control. He is a West Virginia registered Professional Engineer and has supported numerous civil engineering projects throughout his career. He has provided geotechnical and sedimentation and erosion control analyses, provided engineering design, developed sedimentation and erosion control plans, provided specifications, and QA/QC support for numerous projects and has also had coordination with state DEP agencies.		
EDUCATION (Degree, year, specialization) ME, 1991, Civil Engineering BS, 1983, Civil Engineering		
MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS N/A	REGISTRATION (Type, year, state) Professional Engineer, 1997, West Virginia Professional Engineer, 1997, Ohio Professional, Engineer, 1990, Pennsylvania	

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

NAME & TITLE (Last, First, MI) Wilkes, Samuel, P., PWS Wetland Scientist	YEARS OF EXPERIENCE	
	YEARS OF OSR DESIGN EXPERIENCE	YEARS OF OSR RELATED DESIGN EXPERIENCE
	0	11

Brief explanation of responsibilities

Mr. Wilkes is an environmental scientist providing technical support to clients, such as the WVDEP and the WVDHHR, US Forest Service, Bureau of Land Management, and the EPA. He also provides technical support to clients pertaining to abandoned mine site investigations, abandoned mine land inventories, contaminant transport in surface waters, environmental contamination, and potentially responsible party searches. Mr. Wilkes has experience in investigating hard rock mines and mill sites for contaminants such as arsenic, copper, cyanide, lead, mercury, uranium, zinc, and organic compounds. He is proficient in contaminant source identification and characterization, site assessments contaminant migration pathways, and customized surface water modeling for abandoned mine sites.

EDUCATION (Degree, year, specialization)

MS, 2003, Environmental Science and Policy / BS, 1996, Earth and Environmental Science

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS

Society of Wetland Scientists

REGISTRATION (Type, year, state)

Professional Wetland Scientist, 2003, US
Certified Forest Stand Delineator and Conservation Planner, 2003, MD

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

NAME & TITLE (Last, First, MI) Coffman, James, D. Geophysicist	YEARS OF EXPERIENCE	
	YEARS OF OSR DESIGN EXPERIENCE	YEARS OF OSR RELATED DESIGN EXPERIENCE
	0	17

Brief explanation of responsibilities

Mr. Coffman has more than 17 years of experience leading, performing, and interpreting results for hundreds of surface and borehole geophysical surveys. His experience in environmental geophysics is comprehensive and he has also performed this work for abandoned mine land projects, targeting mine voids, including work for the Virginia Department of Mines, Minerals, and Energy (DMME). He currently serves as the primary geophysicist on two statewide abandoned mine land reclamation contracts with PADEP. His concentration has been in surveys using electromagnetics (EM), ground penetrating radar (GPR), magnetics, seismic refraction, electrical resistivity, borehole geophysics, and utility location equipment.

EDUCATION (Degree, year, specialization)

MS, Geophysics, 1997 / BS, Geology, 1995

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS

N/A

REGISTRATION (Type, year, state)

N/A

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

NAME & TITLE (Last, First, MI) Hoppe, Ben CAD Designer	YEARS OF EXPERIENCE	
	YEARS OF OSR DESIGN EXPERIENCE	YEARS OF OSR RELATED DESIGN EXPERIENCE
	0	10

Brief explanation of responsibilities

Mr. Hoppe is a CAD Designer with over 11 years of relevant experience and is Tetra Tech's Pittsburgh office CAD manager. He has significant experience in providing CAD support for abandoned mine land reclamation projects and has supported three such efforts for the West Virginia Department of Environmental Protection and other projects in Pennsylvania. Mr. Hoppe currently serves as a CAD designer on two statewide abandoned mine land reclamation contracts with PADEP. His expertise includes all phases of civil design work including but not limited to, site grading, proposed roadway geometry layout, utility layout and Erosion & Sediment Control BMP Design. Mr. Hoppe is capable of providing accurate earthwork volumes for designs, layout of sewer and storm sewer systems (gravity and low pressure) using 3D models and complex grading designs using 3D civil software ensuring accuracy. Also capable of providing 3D models of piping systems for water and wastewater facilities utilizing a variety of different types of pipes, valves and mechanical equipment.

EDUCATION (Degree, year, specialization)

AAS, 2004, Drafting

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS	REGISTRATION (Type, year, state)
N/A	N/A

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

NAME & TITLE (Last, First, MI) Najeski, Nichole CAD Designer	YEARS OF EXPERIENCE	
	YEARS OF OSR DESIGN EXPERIENCE	YEARS OF OSR RELATED DESIGN EXPERIENCE
	0	4

Brief explanation of responsibilities

Ms. Najeski has more than four years of experience in Computer Aided Drafting and Design. She has supported numerous abandoned mine land projects and her responsibilities have included creating and modifying elevations, level drawings, base levels, and site plans for wireless infrastructure; performing quality assurance tasks; maintaining cycle times for normal course of business during integration; communicating with area representatives and field technicians to resolve conflicting data; reviewing site data for accuracy; and preparing cross sections, site location maps, surface soil and groundwater sampling maps, and conceptual site model figures.

EDUCATION (Degree, year, specialization)

AS, 2010, Drafting

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS	REGISTRATION (Type, year, state)
N/A	N/A

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

NAME & TITLE (Last, First, MI) Moore, Zachary CAD Designer	YEARS OF EXPERIENCE	
	YEARS OF OSR DESIGN EXPERIENCE	YEARS OF OSR RELATED DESIGN EXPERIENCE
	0	8

Brief explanation of responsibilities

Mr. Moore is a CAD Designer with more than eight years of relevant experience. He has supported numerous abandoned mine land reclamation projects throughout his career. His expertise also includes different phases of civil design work including but not limited to, site grading, proposed roadway geometry layout, bridge design and rehabilitation, maintenance of traffic plans. He has experience with programs such as AutoCAD 2000/2004/2007, AutoCAD Civil 3D, Autodesk Architectural Desktop, Microstation V8, Microstation XM, Microsoft Word, Excel, PowerPoint, Outlook, Adobe Photoshop, and 3D Studio Max.

EDUCATION (Degree, year, specialization)

AAS, 2006, Drafting

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS

N/A

REGISTRATION (Type, year, state)

N/A

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

NAME & TITLE (Last, First, MI) Kimmel, Thomas, PS/PLS Surveyor	YEARS OF EXPERIENCE	
	YEARS OF OSR DESIGN EXPERIENCE	YEARS OF OSR RELATED DESIGN EXPERIENCE
	0	41

Brief explanation of responsibilities

Mr. Kimmel has more than 41 years of surveying experience in various sectors for private and public government. He is a registered surveyor in nine states, including West Virginia. Mr. Kimmel has supported numerous projects involving boundary and topographic surveying, borehole stakeouts, cross sections, mapping using aerial photogrammetric methods, and ALTA land title surveys. He also has experience teaching community college surveying courses.

EDUCATION (Degree, year, specialization)

BS, 1995, Applied Science and Technology with Surveying Specialization

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS

N/A

REGISTRATION (Type, year, state)

Professional Surveyor, 1994, WV
Professional Land Surveyor, 1975, PA
Professional Land Surveyor, 1990, MD
Professional Land Surveyor, 1993, DE
Licensed Surveyor, 1993, VA
Professional Surveyor, 2003, OH
Professional Land Surveyor, 1994, NC
Licensed Surveyor, 1996, NY
Professional Land Surveyor, 1996, NJ

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

TR-55, STABL5, HEC-HMS, GeoHMS, HECFFA, HEC-SSP, HEC-DSSVue, HEC-ResSim, CWMS and legacy software such as HEC-1, HEC-5, HEC-DSS and COED

Microsoft Office Professional and Microsoft Project

Adobe Photoshop

Adobe Acrobat Version 9.0

AutoCAD Map 3D 2008 / AutoCAD 2008

AutoDesk Civil 3D 2007

ESRI ArcGIS 9.2

ESRI ArcView 3.3

Bentley PondPack (Haestad Methods) Version 9.0

Bentley Flow Master (Haestad Methods)

Bentley HEC-Pack

STABL5M

Hydrologic Evaluation of Landfill Performance (HELP)

Groundwater Vistas Version 3.5 (MODFLOW based 3D finite difference model, including MT3D, RT3D, MODPATH, MODFLOWT, and SWIFT Components

GMS (MODFLOW based 3D finite difference model, including MT3D, RT3D, MODPATH, and 3-D spatial analysis components)

Visual MODFLOW (MODFLOW based 3D finite difference model, including MODPATH)

SWANFLOW (3D finite difference model specializing in 3-phase fluid flow in porous media – water, NAPL, air)

Several analytical-based software packages including BIOCHLOR, BIOSCREEN, and SESOIL

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

PROJECT NAME, TYPE & LOCATION	NAME & ADDRESS OF OWNER	NATURE OF YOUR FIRM'S RESPONSIBILITY	ESTIMATED CONSTRUCTION COST	PERCENT COMPLETE
WVDEP OSR Coal Slurry Impoundment, Barbour County, WV	WVDEP OSR	Prime Contractor	\$116,310	95%
WVDEP AMLR Parker Run Design (WV)	WVDEP Office of Abandoned Mine Lands and Reclamation 105 S. Railroad Street Philippi, WV 26416	Prime Contractor	Unknown	80%
TMDL Development for WV Group E2 Watershed (West Fork River Watershed)	WVDEP DWWM 601-57th Street Charleston, WV 25304-2345	Prime Contractor - TMDL Development Lead	N/A	30%
TMDL Development for WV Group D2 Watersheds (Monongahela River Watershed)	WVDEP DWWM 601-57th Street Charleston, WV 25304-2345	Prime Contractor - TMDL Development Lead	N/A	60%
PADEP East Avoca-Grove Street Drainage Study, Pennsylvania	PADEP Bureau of Abandoned Mine Reclamation 400 Market Street Harrisburg, PA 17105	Management of mine drainage control project	Not yet known	10%
PADEP Palo Alto Drainage Control Project, Pennsylvania	PADEP Bureau of Abandoned Mine Reclamation 400 Market Street Harrisburg, PA 17105	Mine drainage control engineering design	Not yet known	80%
PADEP Statewide Mining Engineering Design Services Contract, Pennsylvania	PADEP Bureau of Abandoned Mine Reclamation 400 Market Street Harrisburg, PA 17105	Program management of five-year statewide mining engineering design contract	Not yet known	20%
TOTAL NUMBER OF PROJECTS: 10 (Tetra Tech is currently conducting thousands of projects nationwide – for the purpose of this EOI, only a sample of our most recent mining projects for state entities are shown)			TOTAL ESTIMATED CONSTRUCTION COSTS: \$0	

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

PROJECT NAME, TYPE & LOCATION	NAME & ADDRESS OF OWNER	NATURE OF YOUR FIRM'S RESPONSIBILITY	ESTIMATED CONSTRUCTION COST	PERCENT COMPLETE
PADEP Statewide Mining Engineering Design Services Contract, Pennsylvania	PADEP Bureau of Mining Programs 400 Market Street Harrisburg, PA 17105	Program management of five-year statewide mining engineering design contract	Not yet known	20%
Wyoming Abandoned Mine Lands Statewide Subsidence Hazards Mitigation Contract, Wyoming	Wyoming Department of Environmental Quality, AML Division 122 W. 25 th Street Cheyenne, WY 82002	Statewide program management of subsidence mitigation	Not yet known	40%
ODNR Statewide Coal Mining Permit Review Contract, Ohio	Ohio Dept. of Natural Resources 2045 Morse Road Columbus, OH 43229	Program management of two-year statewide coal mining permit reviews	N/A	80%
TOTAL NUMBER OF PROJECTS: 10 (Tetra Tech is currently conducting thousands of projects nationwide – for the purpose of this EOI, only a sample of our most recent mining projects for state entities are shown)			TOTAL ESTIMATED CONSTRUCTION COSTS: \$0	

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

17. COMPLETED WORK WITHIN LAST 5 YEARS ON WHICH YOUR FIRM WAS THE DESIGNATED ENGINEER OF RECORD				
PROJECT NAME, TYPE & LOCATION	NAME & ADDRESS OF OWNER	ESTIMATED CONSTRUCTION COST	YEAR	CONSTRUCTED (YES OR NO)
ODOT Mine Subsidence Mitigation, Ohio	Ohio Department of Transportation 338 Muskingum Drive Marietta, OH 45750	N/A	2010	N/A
Marjol Battery Plant RFI Oversight and Mine Subsidence Investigation, Pennsylvania	EPA Region III 1650 Arch Street Philadelphia, PA 19103	N/A	2009	N/A
Majorsville Mine Subsidence Investigation, Pennsylvania	MarkWest Energy 601 Technology Drive, Suite 130 Canonsburg, PA 15317	N/A	2011	N/A
ALCOSAN Grand View Golf Course Mine Drainage Treatment System, Pennsylvania	ALCOSAN 3300 Preble Avenue Pittsburgh, PA 15233	N/A	2011	N/A
Coal Mine Air Shaft Closure Design, Ohio	Ohio Valley Coal Company 34 Kelley Way, Suite 100 Brilliant, OH 43913	N/A	2009	Yes
Ohio Valley Coal Company Mine Seal Closure Designs, Ohio	Ohio Valley Coal Company 34 Kelley Way, Suite 100 Brilliant, OH 43913	N/A	2009	Yes
Forest City Mine Water Sourcing Study, Pennsylvania	Confidential oil and gas client	N/A	2011	N/A
South Fayette Mine Water Sourcing Study, Pennsylvania	Confidential oil and gas client	N/A	2011	N/A

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

PROJECT NAME, TYPE & LOCATION	NAME & ADDRESS OF OWNER	ESTIMATED CONSTRUCTION COST	YEAR	CONSTRUCTED (YES OR NO)
Bird Mine and Strayer Mine Refuse Permitting and Water Treatment Design, Pennsylvania	AMD Industries, Inc. P.O. Box 501 California, PA 15419	N/A	2012	N/A
Kiskiminetas River Watershed Mining- Related Metals TMDL Development and Abandoned Mine Land GIS Services, Pennsylvania	PADEP and EPA Region 3 1650 Arch Street Philadelphia, PA 19103	N/A	2012	N/A
Mine Pool Water Evaluation Management Plan, Pennsylvania	Confidential oil and gas client	N/A	2011	N/A
Inspections for Settling Ponds under Mining Activity Permits, Pennsylvania	AMD Industries, Inc. P.O. Box 501 California, PA 15419	N/A	2010	N/A
Mine Reserves Investigation and Due Diligence Study, Pennsylvania	PBS Coals, Inc. 1576 Stoystown Road Friedens, PA 15541	N/A	2011	N/A
Quecreek Deep Mine Expansion Permitting, Pennsylvania	PBS Coals, Inc. 1576 Stoystown Road Friedens, PA 15541	N/A	2012	N/A
Coal Property Due Diligence Evaluation, Pennsylvania	Confidential client	N/A	2011	N/A
Report on Current Mine Rescue Practices in China, China	Center for Disease Control, NIOSH 1600 Clifton Road Atlanta, GA 30333	N/A	2009	N/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 & LOCATION	NAME & ADDRESS OF OWNER	ESTIMATED CONSTRUCTION COST OF YOUR FIRM'S PORTION	YEAR	CONSTRUCTED (YES OR NO)	FIRM ASSOCIATED WITH
Jonathan Run Acid Mine Drainage Treatment Plant Design, Pennsylvania	PennDOT 500 North Street Harrisburg, PA 17120	N/A	2012	N/A	GAI
Cresson Acid Mine Drainage Evaluation Project, Pennsylvania	PADEP Bureau of Abandoned Mine Reclamation 400 Market Street Harrisburg, PA 17105	N/A	2012	N/A	GAI
IHI Mine Fire Investigation, Colorado	Colorado Division of Mining Reclamation and Safety 101 South Third, Suite 301 Grand Junction, CO 81501	N/A	2010	N/A	Zapata Engineering, Inc.
Tetra Tech has been a subcontractor on numerous projects over the past five years. These are our most recent mining-related projects.					

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 Office of Special Reclamation.

Due to the large number of mining projects recently completed by Tetra Tech, only a sample of some recent projects are shown in this attachment. Additional experience can be identified upon request.

20. The foregoing is a statement of facts.

Signature: Thomas A Gray Title: Unit Energy and Natural Resources Manager

Date: July 17, 2014

Printed Name: Thomas Gray, PE

Attachment C: Recent Mining Projects

ATTACHMENT C

Over the next several pages, we have included our Attachment C form that lists recent mining projects. This form has been broken down to include several parts including:

- Featured Projects (longer descriptions of each project has been provided in Section E)
- Project Manager's WVDEP projects
- Project Advisor's WVDEP projects
- Additional WVDEP and WVDOT projects completed by our firm
- Additional local projects completed by our firm (West Virginia and neighboring states)

Tetra Tech has additional local mining projects, but for the sake of brevity, we have included a sampling of recent work. Our firm has completed thousands of mining-related projects nationwide.

ATTACHMENT C

Over the next several pages, we have included our Attachment C form that lists recent mining projects. The form has been broken down to include several parts including:

- Featured Projects (longer descriptions of each project has been provided in Section E)
- Project Manager's WVDEP projects
- Project Advisor's WVDEP projects
- Additional WVDEP and WVDOT projects completed by our firm
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Tetra Tech has additional local mining projects, but for the sake of brevity, we have included only a sampling of recent work. Our firm has completed thousands of mining-related projects nationwide.

OSR and RELATED PROJECT EXPERIENCE MATRIX

PROJECT	Exp. Basis C-Corp. P-Personal *	Additional info provided in Section (s) **	PROJECT EXPERIENCE REQUIREMENTS																Primary staff participation/capacity *** M-Management P-Professional					
			Forfeited Surface Mine Reclamation	Forfeited Deep Mine Reclamation	Portal/Shaft Closure	Hydrologic/Hydraulic Design/ Eval.	Remining Evaluation	Mine/Refuse Fire Abatement	Subsidence Investigation Mitigation	Hazardous Waste Disposal	Project Specifications	Water Quality Evaluation /Mitigation/Replacement	Construction Inspection/Management	Water Treatment	Equipment/Structure Removal	Stream Restoration	Geotechnical/Stability	NPDES/Stormwater preparation	Thomas Gray, PE	Gregory Hynes, PE	Ben Hoppe	Heather Trexler, PG	Other Project Team Personnel	Other Tetra Tech Personnel
TETRA TECH FEATURED PROJECTS (INCLUDED IN SECTION E OF OUR PROPOSAL)																								
ALCOSAN AMD Treatment System and Pipeline	C & P					X						X		X					M		P		P	
Cresson Mine Pool Project	C & P	E										X		X										
Bear Run Alkaline Mine Drainage Passive Treatment	C & P					X					X	X	X	X	X				M		P		P	P
Gladden Acid Mine Drainage Mitigation and Stream Sealing	C & P	E											X		X									
Powderly Creek Mine Drainage Feasibility Study	C & P					X					X	X		X		X	X		P					M
Bird Mine and Strayer Refuse Permitting and Water Treatment System Design	C & P	E				X		X				X		X					M		P	P	P	P
WVDEP OSR Coal Slurry Impoundment	C & P	E	X			X										X			P	M			P	M
* List whether project experience is corporate or personnel based or both.																								
** Use this area to provide specific sections or pages if needed for reference.																								
*** List primary design personnel and their functional capacity for the projects listed.																								
Attachment "C"																								

OSR and RELATED PROJECT EXPERIENCE MATRIX

PROJECT	Exp. Basis C-Corp. P-Personal *	Additional info provided in Section (s) **	PROJECT EXPERIENCE REQUIREMENTS																Primary staff participation/capacity *** M-Management P-Professional					
			Forfeited Surface Mine Reclamation	Forfeited Deep Mine Reclamation	Portal/Shaft Closure	Hydrologic/Hydraulic Design/ Eval.	Remining Evaluation	Mine/Refuse Fire Abatement	Subsidence Investigation Mitigation	Hazardous Waste Disposal	Project Specifications	Water Quality Evaluation /Mitigation/Replacement	Construction Inspection/Management	Water Treatment	Equipment/Structure Removal	Stream Restoration	Geotechnical/Stability	NPDES/Stormwater preparation	Thomas Gray, PE					
PROJECT MANAGER'S (THOMAS GRAY, PE) ADDITIONAL WVDEP EXPERIENCE																								
WVDEP Grout Injection Research Project	P	D							X		X		X						M					
WVDEP Water Supply Extension Project	P	D										X							P					
WVDEP Godby Branch Water Supply Extension	P	D									X	X					X		M					
WVDEP Gauley River Heizer/Manila Water Line	P	D											X						P					
WVDEP Lefthand Fork Burning Refuse	P	D					X	X				X	X				X		M					
WVDEP Owings Mine Grouting Design	P	D			X	X	X					X	X	X	X	X	X		M					
WVDEP Majesty Mine Complex Restoration	P	D			X	X	X					X	X		X	X	X	X	M					
WVDEP Refuse Pile and Mine Portal Reclamation Design	P	D										X					X		P					
* List whether project experience is corporate or personnel based or both. ** Use this area to provide specific sections or pages if needed for reference. *** List primary design personnel and their functional capacity for the projects listed.																								

Attachment "C"

OSR and RELATED PROJECT EXPERIENCE MATRIX

PROJECT	Exp. Basis C-Corp. P-Personal *	Additional info provided in Section (s) **	PROJECT EXPERIENCE REQUIREMENTS																Primary staff participation/capacity *** M-Management P-Professional					
			Forfeited Surface Mine Reclamation	Forfeited Deep Mine Reclamation	Portal/Shaft Closure	Hydrologic/Hydraulic Design/ Eval.	Remining Evaluation	Mine/Refuse Fire Abatement	Subsidence Investigation Mitigation	Hazardous Waste Disposal	Project Specifications	Water Quality Evaluation /Mitigation/Replacement	Construction Inspection/Management	Water Treatment	Equipment/Structure Removal	Stream Restoration	Geotechnical/Stability	NPDES/Stormwater preparation	Gregory Hynes, PE					
PROJECT ADVISOR'S (GREGORY HYNES, PE) ADDITIONAL WVDEP EXPERIENCE																								
WVDEP Masontown No. 4 Reclamation	P	D			X	X					X	X		X	X	X	X		P					
WVDEP Odd-Moore Mine Reclamation	P	D									X			X			X		P					
WVDEP Watson Portal and Refuse Reclamation	P	D			X	X					X	X		X	X	X	X		P					
WVDEP Point Marion Maintenance	P	D				X					X	X		X					P					
WVDEP Kempton Refuse and AMD	P	D			X						X	X		X		X	X		P					
WVDEP Borgman Refuse & Portals	P	D			X	X					X	X		X					P					
WVDEP Flemington Portals & Drainage No. 2	P	D			X	X					X			X			X		P					
WVDEP Maple Run Portals & AMD	P	D			X	X					X	X		X		X			P					
WVDEP Emoryville Mine Complex AML/AMD	P	D			X	X					X	X		X			X		P					
WVDEP County Route 9 Waterline Extension	P	D				X					X	X					X		P					
WVDEP 9 Conty Roads Water Supply Study	P	D				X						X							P					
WVDEP Cheat Lake Highwall	P	D			X	X					X								P					
WVDEP Recommendations to Ameliorate Subsidence	P	D							X								X		P					
* List whether project experience is corporate or personnel based or both.																								
** Use this area to provide specific sections or pages if needed for reference.																								
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OSR and RELATED PROJECT EXPERIENCE MATRIX

PROJECT	Exp. Basis C-Corp. P-Personal *	Additional info provided in Section (s) **	PROJECT EXPERIENCE REQUIREMENTS																Primary staff participation/capacity *** M-Management P-Professional					
			Forfeited Surface Mine Reclamation	Forfeited Deep Mine Reclamation	Portal/Shaft Closure	Hydrologic/Hydraulic Design/ Eval.	Remining Evaluation	Mine/Refuse Fire Abatement	Subsidence Investigation Mitigation	Hazardous Waste Disposal	Project Specifications	Water Quality Evaluation /Mitigation/Replacement	Construction Inspection/Management	Water Treatment	Equipment/Structure Removal	Stream Restoration	Geotechnical/Stability	NPDES/Stormwater preparation	Thomas Gray, PE	Gregory Hynes, PE	Ben Hoppe	Heather Trexler, PG	Other Project Team Personnel	Other Tetra Tech Personnel
TETRA TECH'S ADDITIONAL WVDEP AND WEST VIRGINIA STATE AGENCY EXPERIENCE																								
WVDEP DWWM TMDL Development D2 Watersheds	C & P					X					X												M	
WVDEP TMDL Development Group B2 Watersheds	C & P					X					X												M	
WVDEP TMDL Development Cheat River Watershed	C & P					X					X												M	
WVDEP TMDL Development Group C2 Watersheds	C & P					X					X												M	
WVDEP DWWM TMDL Development E2 Watersheds	C & P					X					X												M	
WVDOH Rita to Dabney Specialty Coal Appraisal	C & P																M		P		P	P		
WVDOH Dabney to Stollings Specialty Coal Appraisal	C & P																M			M		M		
WVDOT Corridor H Davis-Bismark Coal Appraisal	C & P																M					P		
WVDOT/OH Valley Midstream Engineering	C & P																					M		
WVDOT Specialty Coal Valuation	C & P																M		P	P	P	P		
* List whether project experience is corporate or personnel based or both.																								
** Use this area to provide specific sections or pages if needed for reference.																								
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OSR and RELATED PROJECT EXPERIENCE MATRIX

PROJECT	Exp. Basis C-Corp. P-Personal *	Additional info provided in Section (s) **	PROJECT EXPERIENCE REQUIREMENTS																Primary staff participation/capacity *** M-Management P-Professional					
			Forfeited Surface Mine Reclamation	Forfeited Deep Mine Reclamation	Portal/Shaft Closure	Hydrologic/Hydraulic Design/ Eval.	Remining Evaluation	Mine/Refuse Fire Abatement	Subsidence Investigation Mitigation	Hazardous Waste Disposal	Project Specifications	Water Quality Evaluation /Mitigation/Replacement	Construction Inspection/Management	Water Treatment	Equipment/Structure Removal	Stream Restoration	Geotechnical/Stability	NPDES/Stormwater preparation	Thomas Gray, PE	Gregory Hynes, PE	Ben Hoppe	Heather Trexler, PG	Other Project Team Personnel	Other Tetra Tech Personnel
TETRA TECH'S ADDITIONAL RECENT LOCAL EXPERIENCE (WEST VIRGINIA AND BORDERING STATES)																								
Bandy and King Home Mine Subsidence Mitigation	C & P								X		X						X		M				P	P
Ohio DNR Mine Permit Review Contract	C & P																	P					M	P
Jonathan Run AMD Treatment Design	C & P					X					X			X				M					P	P
Quecreek Deep Mine Expansion	C & P					X			X			X		X			X	M		P	P	P	P	P
Forest City Mine Water Sourcing Study	C & P					X						X		X				M				P	P	P
Brookville Coal Seam 27A Highwall Mining Analysis	C & P															X		M			M	P	P	P
Mine Pool Water Evaluation Management Plan	C & P					X						X		X			X	M			P	P	P	P
Gladden AMD Mitigation/Stream Sealing	C & P				X	X					X	X	X		X	X	X	M		P	P	P	P	P
Casselman AMD Prevention and Response Plan	C & P						X					X		X				M				P	P	P
Casselman Biomonitoring Plan	C & P						X					X					X	M				P	P	P
Quecreek Deep Mine #1 Expansion	C & P	E				X						X					X							
Ohio Valley Coal Company Mine Seal and Bulkhead Design	C & P	E			X	X					X						X	M					P	P
Ohio Valley Coal Company Mine Air Shaft Closure Design	C & P	E			X	X					X							M						P
* List whether project experience is corporate or personnel based or both.																								
** Use this area to provide specific sections or pages if needed for reference.																								
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OSR and RELATED PROJECT EXPERIENCE MATRIX

PROJECT	Exp. Basis C-Corp. P-Personal *	Additional info provided in Section (s) **	PROJECT EXPERIENCE REQUIREMENTS																Primary staff participation/capacity *** M-Management P-Professional					
			Forfeited Surface Mine Reclamation	Forfeited Deep Mine Reclamation	Portal/Shaft Closure	Hydrologic/Hydraulic Design/ Eval.	Remining Evaluation	Mine/Refuse Fire Abatement	Subsidence Investigation Mitigation	Hazardous Waste Disposal	Project Specifications	Water Quality Evaluation /Mitigation/Replacement	Construction Inspection/Management	Water Treatment	Equipment/Structure Removal	Stream Restoration	Geotechnical/Stability	NPDES/Stormwater preparation	Thomas Gray, PE	Gregory Hynes, PE	Ben Hoppe	Heather Trexler, PG	Other Project Team Personnel	Other Tetra Tech Personnel
TETRA TECH'S ADDITIONAL RECENT LOCAL EXPERIENCE (WEST VIRGINIA AND BORDERING STATES)																								
South Fayette Mine Water Sourcing Study	C & P					X			X			X		X					M				P	
PA Abandoned Mine Fire Remediation/Investigation	C & P				X	X		X	X			X	X	X					M		P		P	
Beaver County YMCA Subsurface Investigation	C					X						X				X							M	
Kiskiminetas TMDL/AML GIS Support	C & P					X						X		X		X							M	
Settling Pond Inspections under Mining Activity Permits	C & P					X										X			M				P	
PBS Coals Mine Reserves Investigation	C & P										X								M			P	P	
MEPCO Mine Discharge Water Treatment Evaluation	C & P					X					X	X		X					M				P	
Casselman Mine Biomonitoring Plan	C & P					X						X							M			P	P	
Century Mine Water Balance Studies	C & P					X						X							M		P		P	
PA Coal Property Due Diligence Evaluation	C & P																		M				P	
Boone County Rural Water Line Expansion	C & P					X					X		X										M	
Canterbury Coal Floating Pump Station Design	C & P					X								X					M		P		P	
NEPCO CoGen Plant Fuel Supply and Ash Disposal	C & P									X		X							M		P		P	
MEPCO Zero Liquid Discharge System Technical and Cost Study	C & P	E												X										
* List whether project experience is corporate or personnel based or both. ** Use this area to provide specific sections or pages if needed for reference. *** List primary design personnel and their functional capacity for the projects listed.																								

OSR and RELATED PROJECT EXPERIENCE MATRIX

PROJECT	Exp. Basis C-Corp. P-Personal *	Additional info provided in Section (s) **	PROJECT EXPERIENCE REQUIREMENTS																Primary staff participation/capacity *** M-Management P-Professional					
			Forfeited Surface Mine Reclamation	Forfeited Deep Mine Reclamation	Portal/Shaft Closure	Hydrologic/Hydraulic Design/ Eval.	Remining Evaluation	Mine/Refuse Fire Abatement	Subsidence Investigation Mitigation	Hazardous Waste Disposal	Project Specifications	Water Quality Evaluation /Mitigation/Replacement	Construction Inspection/Management	Water Treatment	Equipment/Structure Removal	Stream Restoration	Geotechnical/Stability	NPDES/Stormwater preparation	Thomas Gray, PE	Gregory Hynes, PE	Ben Hoppe	Heather Trexler, PG	Other Project Team Personnel	Other Tetra Tech Personnel
TETRA TECH'S ADDITIONAL RECENT LOCAL EXPERIENCE (WEST VIRGINIA AND BORDERING STATES)																								
EPA Citizens Guide to Addressing AMD	C & P											X		X									M	
Nelsonville Bypass Mine Subsidence Mitigation	C & P								X												M	P		
Majorsville Pipeline & Mine Subsidence Investigation	C & P							X									P			P	P	M		
Marjol Battery Plant Mine Fire & Subsidence Evalaution	C & P					X		X	X								P					M		
CRA Riverside No. 3 Mine Seal	C & P				X												M					P		
AMD Industries Lancashire Treatment Facility O&M	C & P										X		X				M				P	P		
Mettiki Coal Refuse Disposal Support/Planning	C & P							X									M				P	P		
PA DCNR CCS Report/Study for Coal-Based Power	C & P										X						M				P	P		
Dirtcon Mining Reserve Estimates	C & P																P			M	P	P		
PBS Coals Corsa Capital Document Review	C & P																M					P		
Dirtcon Philippi Quarry Permitting	C & P																M					P		
Dirtcon Hoglick Hollow Permitting	C & P																M				P	P		
ODOT Highway 33 Subsidence Mitigation	C & P								X							X						M		
Belmont Mine Water Balance Studies	C & P	E			X	X					X					X		M				P	P	
* List whether project experience is corporate or personnel based or both.																								
** Use this area to provide specific sections or pages if needed for reference.																								
*** List primary design personnel and their functional capacity for the projects listed.																								
Attachment "C"																								

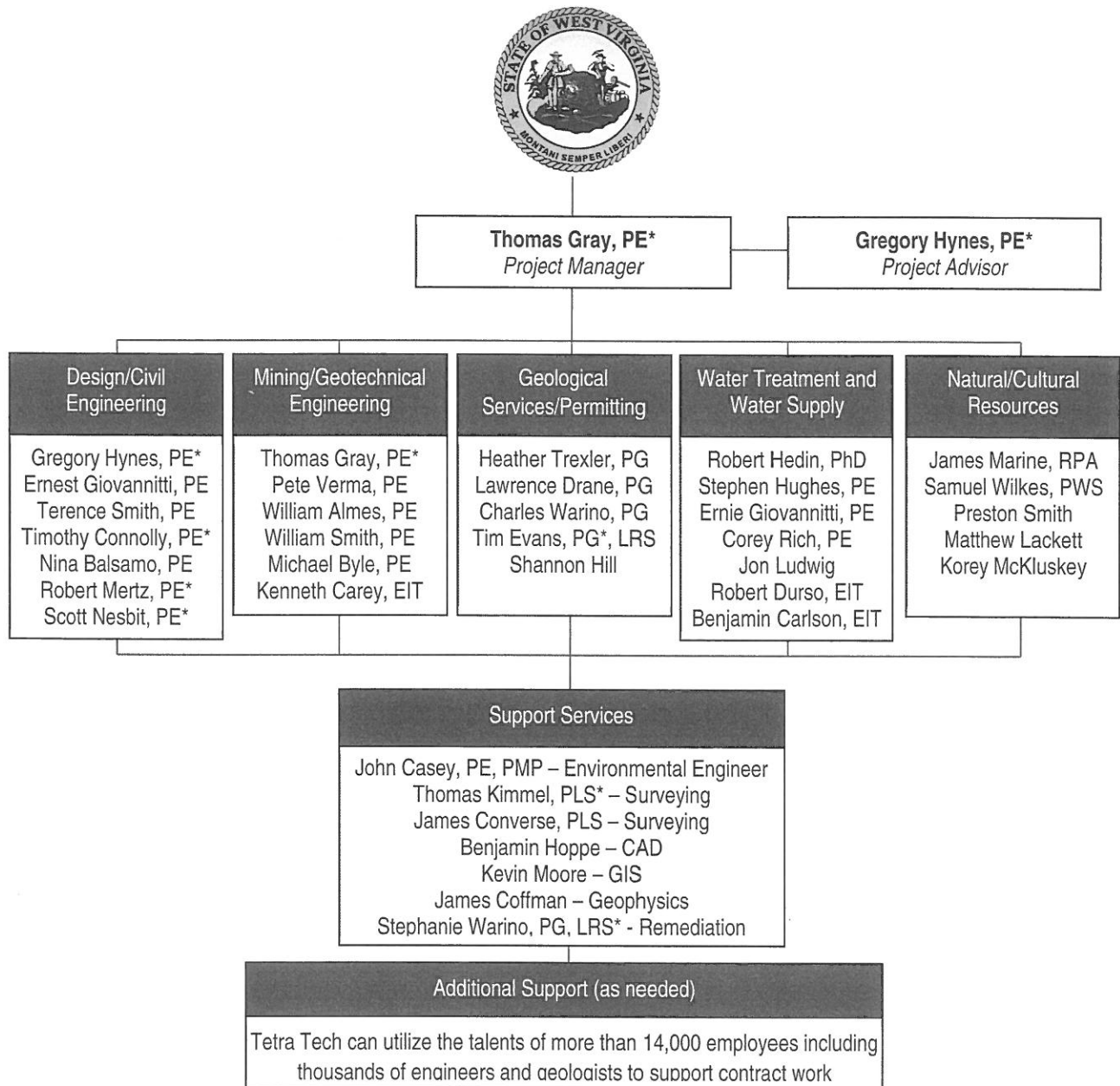
Attachment D: Resumes



Project Team Resumes

Over the next several pages, we have included full-page resumes of our project team's key personnel to supplement our proposal. Our project team is led by Mr. Thomas Gray, PE, a West Virginia-registered Professional Engineer. Mr. Gray has more than 40 years of mining experience and has supported more than 100 mining projects, including many for the WVDEP.

In addition, an organization chart of our mining team professionals has been provided below. All staff members are located in local West Virginia, Pennsylvania, and Ohio offices.



THOMAS GRAY, PE

PROJECT MANAGER

EXPERIENCE SUMMARY

Mr. Gray has more than 40 years of professional experience. He is a technical expert in mining engineering, mine reclamation, coal ash disposal and utilization, watershed and ecosystem restoration, mine subsidence, acid mine drainage remediation, mine stabilization via grouting and abandoned mine fire mitigation. Mr. Gray specializes in active and abandoned mining projects and with infrastructure projects that have mining related concerns. His project management responsibility has included construction, engineering, regulatory compliance, and research and development. He has been responsible for the successful completion of many unique projects.

RELEVANT EXPERIENCE

Project/Contract Manager; 2012 Professional Design Services Contract; Pennsylvania Department of Environmental Protection, Bureau of Abandoned Mine Reclamation and Bureau of Mining Programs; PA. Currently managing these open-end contracts to provide professional design services to remediate problems such as acid mine drainage, contamination of water supplies, degraded stream quality, subsidence, and abandoned refuse and waste piles, strip mines, highwalls, and landslide-prone areas.

Project Engineer; Parker Run Mine Drainage Design; West Virginia Department of Environmental Protection Office of AML&R; Marion County, WV. Supporting this contract, which includes design of drainage conveyances, design installation of mine seals, highwall reclamation, design of refuse reclamation, design of stream bank stabilization, design of structural and trash removal/disposal, and re-vegetation of disturbed areas.

Project Manager; Mine Seal Designs; Ohio Valley Coal Company; Aledonia, OH. Prepared mine seal designs for three shafts for use at an active coal mine during mine closure. The mine seals were designed to withstand the expected water pressure after the maximum mine pool has developed.

Project Manager; Fisher Run and Tunnelton Mine Portal Closures; WVDEP Office of AML and Reclamation; Lewis and Preston Counties, WV. Project Manager for the preparation of construction drawings to install wet mine seals and drainage improvements for the closure of abandoned mine portals

EDUCATION

BS, Mining Engineering,
Pennsylvania State University,
1973

MBA, University of Pittsburgh,
1977

AREA OF EXPERTISE

Mining Engineering

REGISTRATIONS/ AFFILIATIONS

Professional Engineer, WV,
1988, 10523

Professional Engineer, PA,
1978, 26978-E

Professional Engineer, MD,
1989, 17048

Professional Engineer, VA,
1980, 11628

Professional Engineer, OH,
2009, 73686

TRAINING/CERTIFICATIONS

N/A

YEARS OF EXPERIENCE

40

on private property in Weston and Tunnelton, WV. Prepared construction specifications and construction cost estimate for the closure of nine mine portals.

Senior Project Consultant; Mine Seal Research; NIOSH; Fayette County, PA. Research project to evaluate a potentially significant improvement to current state-of-the-art practice of constructing mine seals through vertical boreholes when direct access is prohibited. The new technology was tested and proved to be effective in providing barriers to airflow and to impound water and other inert materials.

Project Manager; Mine Seal Evaluation; Duquesne Light Company; Greensboro, PA. Evaluated suitability of a mine seal at the Gray's Landing Lock and Dam being constructed on the Monongahela River by the USACE.

Project Manager; OSM Little River Mining Reclamation Project; Cloudland, GA. This project near Cloudland, Georgia, required regrading an abandoned coal mine strip pit to eliminate a highwall, construction of drainage channels, and revegetation of disturbed areas. The survey was conducted to prepare site topography and cross sections at 50-foot intervals for reclamation and restoration of approximately 2,500 feet of abandoned highwall (as high as 100 feet) from surface mining. A grading plan was prepared that included site drainage features for two drainage channels.

Senior Project Manager; Chartiers Creek/Fishing Run Mine Discharge Investigation; South Fayette Conservation Group in Association with PADEP; South Fayette Township, PA. During an investigation of the deep mine discharges in Chartiers Creek it was found that Fishing Run was being diverted into a deep mine entrance and after becoming polluted coming out at the Gladden discharge, was the largest pollution source in the watershed. Through a grant from PADEP, a reclamation design was prepared and permitted. The design included sealing the mine entrance, reclaiming abandoned highwalls, removing dangerous mine structures and restoring 2,000 feet of stream channel.

Senior Project Manager; Chartiers Creek Mine Discharge Assessment; Chartiers Nature Conservancy in Association with PADEP; Crafton, PA. Assessed the characteristics of the large deep mine discharges in the Chartiers Creek main stem. Flow and chemical data was collected for nine mine discharges over a 12 month period. Mine maps were obtained and scanned into a GIS database. The conceptual hydrology of the mines was evaluated, including underground drainage basins and pooled conditions. This information was used to develop a restoration plan for the watershed.

Senior Engineer; Colorado Statewide Mine Fire Abatement Contract; Colorado Division of Reclamation, Mining and Safety; CO. The Colorado Inactive Mine Reclamation Program (CIMRP) is charged with abating, to the extent possible, hazards associated with mining activities resulting from mining which occurred prior to August, 1977. Six underground coal mine fires were identified for funding for reclamation design for their abatement and Tetra Tech was retained for this work. Mr. Gray is serving as a lead engineer supporting this work, which includes project development, design, procurement documents, and field management of fire abatement activities. Projects begin with the development of a mine fire abatement strategy and then the development of an abatement design. An Invitation for Bid is then created to find a suitable contractor and Tetra Tech provides construction management and inspection services.

Project Manager; Abandoned Coal Mine Fire Remediation Plan; Confidential Client; PA. During the development of a well pad, a natural gas drilling client operating in the Marcellus Shale experienced

elevated temperatures in excavated materials due to a burning abandoned coal mine. Tetra Tech investigated the subsurface conditions and Mr. Gray managed a Mine Fire Remediation Plan for the client.

Senior Project Manager; Dolph Mine Fire; Office of Surface Mining; Lackawanna County, PA. The Dolph mine fire was burning in coal refuse and two underground abandoned anthracite coal mines. A site investigation was completed to define the limits of fire and to recommend fire control methods. A cut-off trench was selected, plans and specifications were prepared and a contractor was selected. Construction was successfully completed and the fire is under control.

Project Consultant; Percy Mine Fire Control Project; PADER; Fayette County, PA. Provided consultation for this mine fire control project that involved mine grouting to contain an underground mine fire. The fire was successfully controlled.

Senior Project Manager; Cohen Mine Fire; Office of Surface Mining; OSM; Baldwin Borough, PA. Provided surveying and consultation for this small underground abandoned coal mine fire.

Senior Project Manager; Maiolie Mine Fire; Office of Surface Mining; Washington Township, PA. Provided surveying and consultation for this small underground abandoned coal mine fire.

Senior Project Manager; Coal Mine Fire Abatement; Office of Surface Mining; Elk County, PA. Managed the surveying during the abatement of a 1.5 acre coal mine fire. Quantity surveys were initiated within 24 hours of request by OSM.

Project Advisor; World Bank Mine Fire Appraisal; Dhanbad, State of Bihar, India. Assisted in the mine fire appraisal project to assess the fires in 17 coal seams of the 450 sq. km. coalfield for the world's largest complex of above-ground and underground mine fires.

Project Manager; Coal Refuse Pile Reclamation; Maple Coal Company; Colver, PA. Prepared technical specifications for reducing the potential for spontaneous heating at the Colver coal refuse pile.

Project Manager; Blacklick Creek Vinton/Wehrum Mine Drainage Treatment Facility Design; PADEP Bureau of Abandoned Mine Reclamation; Indiana County, PA. Tetra Tech was retained by PADEP for the design of a mine drainage treatment facility. Managing this large, multifaceted project included the design of a mine water conveyance system, design of relief boreholes, assessment of local mines for sludge disposal, coal refuse pile analysis, mine shaft and subsidence assessment, historical and museum commission documentation/clearance, conceptual treatment facility layout, public involvement through the development of a website, and the development of bid documents.

Project Manager; Palo Alto Mine Drainage Study and Design; PADEP Bureau of Abandoned Mine Reclamation; Borough of Palo Alto, PA. Managing this mine drainage study. Mine drainage is appearing at a residence in the Borough of Palo Alto during heavy precipitation events. Previous attempts at remediation by PADEP and the Office of Surface Mining were unsuccessful. Tetra Tech is studying the site and providing preliminary and final designs. The project also includes drilling, water testing, and surveying.

Project Advisor; East Avoca Mine Drainage Study; PADEP Bureau of Abandoned Mine Reclamation; Avoca Borough, PA. Providing oversight for this mine drainage study in Avoca, PA. Several residents

along Grove Street in Avoca have reported incidents of mine water in basements and in their yards during heavy precipitation events. Tetra Tech's investigation will determine the location and depth of abandoned mine workings that may be the source of mine water occasionally noted along Grove Street. Tetra Tech will then propose alternative solutions to abate the drainage problem.

Senior Project Manager; Alkaline Coal Ash Injection to Mitigate Acid Mine Drainage; CTC Foundation in conjunction with PADEP BAMR and Others; Washington, DC. Evaluated the injection of alkaline coal ash into the 537-acre Valley No. 2 mine to mitigate an AMD (500 gpm) pollution to the Conemaugh River and nearby Big Spring Run. Provided technical consultation for the investigation and authored a technical report. The project team included PADEP, Bureau of Abandoned Mine Reclamation, the Kiski-Conemaugh Coalition, Blacklick Creek Watershed Association, Reliant Energy, the Western PA Watershed Protection Project, St. Clair Township, and PA DCNR.

Senior Project Manager; Passive Treatment Techniques for Acid Mine Discharges; MAX Environmental Services; Yukon, PA. Developed plans to use passive treatment techniques to treat most of the effluent from a hazardous waste disposal facility. Water sources included near neutral surface water runoff, acidic mine discharges and alkaline underflows from disposal cells.

Senior Project Manager; South Branch Blacklick Creek Acid Mine Drainage Feasibility Study; USACE Pittsburgh District; Nanty Glo, PA. Completed a feasibility study to determine the most effective passive abatement method for treating acid mine drainage at the abandoned mine and restoring the aquatic environment of the South Branch Blacklick Creek. Project manager for the conceptual design and cost estimate. A general evaluation report for the restoration of the aquatic ecosystem was completed.

Senior Project Manager; Mine Pool Acid Discharge Investigation; LTV Corporation; Greene County, PA. Conducted an investigation of the potential to utilize biological remediation for a large mine pool acid discharge. Responsible for evaluating and developing a field test to utilize sulfate reduction bacteria to mitigate the large Clyde Mine Pool discharge.

Senior Project Manager; Thompson Run Watershed Acid Mine Drainage Assessment and Restoration; Municipality of Monroeville; Monroeville, PA. Prepared a watershed restoration project for Thompson Run, a tributary of Turtle Creek. Responsible for assessing the adverse impacts of acid mine drainage on the 16-square-mile watershed and developing a realistic restoration plan.

Project Manager; Acid Mine Drainage Identification / Mine Pool Water Sourcing Study; Confidential Client; Forest City, PA. Identified large acid mine drainage sources around Forest City to be used as potential sources of water for a Marcellus Shale client's fracing operations in northeast PA. Mr. Gray gathered the historic flow and chemistry data for the discharges. Two discharges were singled out for further consideration, Vandling and Grey Slope. The mine pools were georeferenced onto a map with these discharges. A conceptual passive treatment system was designed for the Vandling Discharge with an associated pipeline to transport the water to a truck loading area.

Project Manager; Casselman Mine Acid Mine Drainage Prevention and Response Plan; Maryland Energy Resources; Garrett County, MD. Prepared a plan for submittal to the state of Maryland which outlined the measures to be taken to prevent impacts to the Casselman River by mine water when an underground coal mine was closed. The plan needed to include provisions that explained the interaction of

the final mine pool with the Casselman River, what measures would be taken to avoid seeps, outflows, and other discharges resulting from the mine pool, how the mine pool would be controlled post-mining, a monitoring and detection plan for acid mine drainage seeps, and a response/mitigation plan should a seep or discharge occur.

Project Manager; Kempton Mine Acid Mine Drainage Study; Mettiki Coal Company; Western MD. Completed a mine drainage study to determine the feasibility of eliminating AMD flowing from the abandoned Kempton mine into the headwaters of the Potomac River by siphoning water from the pool into an adjacent active underground mine. The study evaluated the potential for lowering the mine pool to below the level of the discharge by siphoning water from the pool into Mettiki's active underground mine.

Project Engineer; AMD Treatment; PADEP; Cresson, PA. Supporting this preliminary design evaluation associated with the proposed Cresson AMD Treatment Plant. BAMR has entered into an agreement with the Susquehanna River Basin Commission to provide treated AMD to supplement flow during low flow periods. Project is currently in the field investigation phase to identify the location of the proposed facility and mine water extraction wells.

Project Manager: Bear Run Acid Mine Drainage Passive Treatment System; Indiana County Conservation District in Conjunction with PADEP; Indiana County, PA. Project Manager for the design of a passive AMD mine treatment system, site grading and PADEP / Indiana County Erosion and Sediment Control permit, stream restoration and preparation of a PADEP Government Financed Construction Contract for a third party contractor to remove coal refuse from the site. Prepared construction grading plans, permits and hydraulic analysis of the Bear Run stream for a stream culvert crossing.

Project Manager: Group Gladden Mine Acid Mine Drainage Treatment System; South Fayette Conservation; South Fayette Township, PA. Preparation of a site grading plan and passive AMD treatment system to treat a maximum flow rate of 1,500 gpm of AMD flow from the abandoned Gladden Mine into Millers Run and Chartiers Creek. Preparation of a grading plan, specifications and design calculations to create 3 acres of passive treatment ponds and design of a spray pumping system to deliver 1,000 gpm of AMD through a nozzle system for aeration and evaluation of stream flow losses in areas affected by past mining.

Senior Project Manager; Jandy Coal Refuse Acid Mine Drainage Investigation and Design; Paint Creek Watershed Association in Association with PADEP; Windber, PA. Investigated acid mine drainage on the Jandy coal refuse disposal site. It was determined that the source of the contamination was a reclaimed surface mine spoil and adjacent abandoned deep coal mine. The selected mitigation approach was to reduce the surface infiltration through drainage controls and to reduce the level of the mine pool so that the groundwater levels would be reduced and thus eliminate the discharge. Design plans were prepared as part of this project.

Project Consultant; Owings Mine Complex Site Reclamation Acid Mine Drainage Treatment System Design; WVDEP; Charleston, WV. Reclamation design of an abandoned mine site comprising old mine structures, open mine portals, refuse piles and numerous acid mine drainage producing discharges. Evaluated water quality and designed a passive AMD treatment system design at the Owings Mine Complex site. **Awarded: James E. "Pete" Pitsenbarger AML Award North, West Virginia Reclamation Awards.**

GREGORY HYNES, PE

PROJECT ADVISOR

EXPERIENCE SUMMARY

Mr. Hynes has more than 27 years of experience in abandoned mine land reclamation, land restoration, mining permits, and environmental and water resources engineering. He has managed or supported more than 25 AML projects for the WVDEP. Most recently, Mr. Hynes managed three highwall projects for the agency in 2012 – the Waitman-Barbe Highwall, the Colliers Sportsman's Club Highwall, and the Simpson Creek Highwall. He has also managed several projects for other state agencies including PADEP and the Ohio Department of Natural Resources, preparing design calculations, cost estimates, plans, and technical specifications for abandoned mine land reclamation. Mr. Hynes has also prepared permit applications and construction level drawings and specifications for proposed surface mine facilities in West Virginia and Pennsylvania. Projects included permitting and reclamation of various mining related surface facilities.

RELEVANT EXPERIENCE

Project Manager; Parker Run Mine Drainage Design; West Virginia Department of Environmental Protection Office of AML&R; Marion County, WV. Managing this contract, which includes design of drainage conveyances, design installation of mine seals, highwall reclamation, design of refuse reclamation, design of stream bank stabilization, design of structural and trash removal/disposal, and re-vegetation of disturbed areas.

Project Engineer; Energy Marketing Slurry Impoundment; West Virginia Department of Environmental Protection OSR; Barbour County, WV. Supporting this project that involves the certification of a coal slurry impoundment for a company (Energy Marketing Company) that had its mine permit revoked. Services included safety certification of the impoundment with MSHA 30 CFR 77.216-4, mapping of the permit area, a dewatering plan to minimize seepage through the existing embankment, and the development of an RFQ for the construction contract to clean the existing sediment control pond and replace the pond outlet drainage structure to control dewatering from the impoundment. The safety assessment includes a review of data and location of piezometers, underdrains, decant pipes, and discharges; a bathymetric survey to document depths, volumes and elevations of the impounded water, sediment, and slurry; and the identification of any deficiencies that may affect the short-term stability of the structure until dewatering and final reclamation are initiated.

Project Engineer; Hardy Coal Reclamation Bond Forfeiture; ODNR; Belmont County, OH. Responsible for reviewing geological data and mining maps, and providing design of reclamation measures required for the forfeiture site. Also provided environmental assessment documentation, and prepared

EDUCATION

MS, Civil Engineering,
Youngstown State University,
1997

BE, Civil Engineering,
Youngstown State University,
1987

AREA OF EXPERTISE

Mining Engineering

REGISTRATIONS/ AFFILIATIONS

Professional Engineer, WV,
1998, 013850

Professional Engineer, PA,
1993, PE044310E

Professional Engineer, OH,
1998, 62948

TRAINING/CERTIFICATIONS

N/A

YEARS OF EXPERIENCE

27

construction plans and specifications for the project, including erosion and sedimentation control measures, site regrading, collection ditches, stream relocation, soil cover placement, and revegetation. The project site is a partially reclaimed mine site. The project area included an old soil stockpile area and the remnants of a large sedimentation pond. The pond and its embankment have redirected the flow of water in a stream causing both soil erosion and impoundment of water. The reclamation plan developed provided for relocation and restoration of the stream channel, regrading revegetation of the project area to provide a freely draining surface, and diversion and collection of surface water as needed. Improvement of an existing access road with rock aggregate to allow for construction access was also planned.

Project Engineer; Vienna Mine Seals – Abandoned Mine Lands; ODNR; Vienna, OH. Provided plans, specifications, and cost estimates for sealing two 100-foot-deep mine shafts located at two different sites and determine the best design for sealing the shafts. Both sites are on wooded lots adjacent to occupied residences.

Project Manager; Simpson Creek Highwall, Tipple, and Portals; WVDEP; Barbour County, WV. Responsible for project management, engineering design, and development of construction plans, specifications, and cost estimates. The project included exploratory drilling, and preparation of reclamation plans and specifications for five sites containing numerous suspected mine entries to a large underground mine complex. Design measures included elimination of impounded mine water, installation of wet mine seals, access roads, collection channels, tipple demolition, minor site grading to provide positive drainage, and final revegetation.

Project Manager; Wymer Portals and Acid Mine Drainage; WVDEP; Monongalia County, WV. Responsible for project management, engineering design, and development of construction plans, specifications, and cost estimates. The project included development of site mapping, exploratory drilling, and preparation of reclamation plans and specifications for a large abandoned mine complex. Design measures included elimination of impounded mine water, installation of wet mine seals, bat gates, and access roads, elimination of highwalls by proposed earthwork and site grading with available on site refuse and spoil materials, and final revegetation. Numerous surface water and mine drainage structures including ditches, pipes, and underdrains were also required.

Project Manager; Davidson Highwall; WVDEP; Monongalia County, WV. Responsible for project management, engineering design, and development of construction plans, specifications, and cost estimates. The project included development of site mapping, exploratory drilling, and preparation of reclamation plans and specifications for a large abandoned mine complex. Design measures included elimination of impounded mine water, installation of wet mine seals, stream channel restoration, elimination of highwalls by proposed earthwork and site grading with available on site refuse and spoil materials, and final revegetation. Numerous surface water and mine drainage structures including ditches, pipes, and underdrains were also required.

Project Engineer; Elkins Coal Refuse Reclamation; WVDEP; Preston County, WV. Performed research of geological data and mining maps, designing reclamation measures, and preparing construction plans and specifications for the project which included erosion and sedimentation control measures, site earthwork and grading, slope stability analysis, mine seals, collection and diversion ditches, soil cover placement, and revegetation.

Project Engineer; Tibbs Run Portals & Tipple Reclamation; WVDEP; Monongalia County, WV. Performed design of reclamation measures, including mine seals, underdrains, and mine water collection channels. Prepared construction plans, specifications, and cost estimates for the project, which included erosion and sedimentation control measures, site regrading, collection and diversion ditches, soil cover placement, and revegetation.

Project Engineer; National Mine Complex Reclamation, WVDEP; Monongalia County, WV. Performed research of geological data and mining maps, designing reclamation measures, and preparing construction plans and specifications for the project which included erosion and sedimentation control measures, site earthwork and regrading, slope stability analysis, mine seals, collection and diversion ditches, soil cover placement, and revegetation.

Project Engineer; MacArthur Mine Subsidence; WVDEP; Raleigh County, WV. Performed drilling inspection, mine map research and interpretation, and parking lot and roadway restoration, and developing specifications, plans, and cost estimates. The project required test drilling in a residential neighborhood in order to estimate grouting requirements to abate its underground mine subsidence problems.

Project Engineer; Beech Bottom Refuse Reclamation Project; WVDEP; Ohio and Brooke Counties, Beech Bottom, WV. Responsibilities included site design and preparation of the project construction plans and specifications. The project included three sites located along the Ohio River containing barren refuse piles ranging in size from 15 to 60 acres. The reclamation plan that was developed provided for the refuse piles to be graded to stable slopes, covered, and vegetated to reduce AMD generation. Refuse piles encroaching on the Ohio River were graded and covered with a mat liner and vegetated for erosion control. Site drainage with collection ditches and storm water piping was also designed to provide positive drainage. A phase I archaeological investigation of a proposed borrow area located in the Ohio River Floodplain was performed as required by the WV SHPO.

Project Engineer; Big Hollow Mine Dump Reclamation; WVDEP; Mullins, WV. Performed research of geological data and mining maps. Prepared construction plans and specifications for the project which included erosion and sedimentation control measures, site regrading, collection and diversion ditches, soil cover placement, and revegetation.

Project Engineer; Twilight Burning Refuse Reclamation; WVDEP; Twilight, WV. Performed research of geological data and mining maps, designing reclamation measures, and preparing construction plans, specifications, and cost estimates for the project which included erosion and sedimentation control measures, site earthwork and grading, mine seals, methods of extinguishing/quenching actively burning refuse, collection and diversion ditches, soil cover placement, and revegetation.

Project Engineer; Piney Swamp Run Refuse No. 1 Reclamation; WVDEP; Keyser, WV. Performed research of geological data and mining maps, review of water quality data, and design of acid mine drainage abatement measures, including wetlands, successive alkalinity producing systems, anoxic limestone drains, metals settling ponds, and open limestone channels. Prepared construction plans, specifications, and cost estimates for the project, which included erosion and sedimentation control measures, site regrading, collection and diversion ditches, soil cover placement, and revegetation.

Project Engineer; Turnhole Branch Reclamation Project; WVDEP; McDowell County, WV. Performed research of geological data and mining maps, designing reclamation measures, and preparing construction plans, specifications, and cost estimates for the project which included erosion and sedimentation control measures, site earthwork and regrading, underdrain, slope stability analysis, mine seals, collection and diversion ditches, soil cover placement, and revegetation.

Project Engineer; Pageton Mine Refuse Reclamation; WVDEP; Pageton, WV. Performed research of geological data and mining maps, designing reclamation measures, and preparing construction plans and specifications for the project which included erosion and sedimentation control measures, site earthwork and regrading, slope stability analysis, mine seals, collection and diversion ditches, soil cover placement, and revegetation

Project Engineer; Masontown No. 4 Reclamation, AMD Abatement; WVDEP; Masontown, WV. Performed research of geological data and mining maps, review of water quality data, and preparation of construction plans, specifications, and cost estimates for the project which included erosion and sedimentation control measures, site earthwork and grading, mine seals (wet and dry), collection and diversion ditches, stream crossings, soil cover placement, and revegetation. The Masontown No. 4 project required the design of measures for the abatement of acid mine drainage (AMD) emanating from abandoned mine entries and refuse piles at four specific sites along two tributaries to the Cheat River.

Project Engineer; Odd-Moore Mine Reclamation; WVDEP; Raleigh County, Odd, WV. Performed research of geological data and mining maps, designing reclamation measures, and preparing construction plans, specifications, and cost estimates for the project which included erosion and sedimentation control measures, site earthwork and regrading, underdrains, limestone ditches, abandoned mining structure removal, soil cover placement, and revegetation. The Odd Moore Refuse Pile abandoned mine land site consisted of two refuse piles covering approximately 12 acres with steep unstable slopes, four abandoned mining impoundments, a concrete foundation and remains of an old tippie, and acid mine drainage (AMD) seepage, all in close proximity to an existing residence.

Project Engineer; Watson Portal and Refuse Reclamation; WVDEP; Fairmont, WV. Performed research of geological data and mining maps, review of water quality data, and design of acid mine drainage abatement measures, including anoxic limestone drains, metals settling ponds, and open limestone channels. Prepared construction plans and specifications for the project, which included erosion and sedimentation control measures, site regrading, mine seals, collection and diversion ditches, abandoned barge and coal refuse removal from the North Branch of the Monongahela River, soil cover placement, and revegetation.

Project Engineer; Cheat Lake Highwall; WVDEP; Monongalia County, WV. Performed research of geological data and mining maps and review of water quality data. Prepared construction plans, specifications, and cost estimates for the project which included erosion and sedimentation control measures, site earthwork and regrading, mine seals (wet and dry), collection and diversion ditches, stream crossings, soil cover placement, and revegetation. The Cheat Lake Highwall abandoned mine land site consisted of a 19-acre refuse pile, numerous abandoned mine openings discharging acid mine drainage (AMD), and a dangerous highwall in close proximity to a residential area.

Project Engineer; Emoryville Mine Complex Reclamation and AMD Remediation; WVDEP; Emoryville, WV. Performed research of geological data and mining maps, review of water quality data, and design of acid mine drainage abatement measures, including open limestone channels, Successive Alkalinity Producing Systems, and aerobic wetlands. Prepared construction plans and specifications for the project which included erosion and sedimentation control measures, site regrading, mine seals, collection and diversion ditches, abandoned barge and coal refuse removal from the North Branch of the Monongahela River, soil cover placement, and revegetation. The Emoryville Mine Complex project required the design of measures for the abatement of acid mine drainage (AMD) emanating from abandoned mine entries and piles at three sites. AMD discharges and coal refuse piles are located along both sides of Emory Creek, a tributary to the North Branch Potomac River.

Project Engineer; Flemington Portals and Drainage; WVDEP; Taylor County, WV. Provided review and oversight of all hydraulic and hydrologic calculating performed on the project, and developing conceptual plans for review with the client prior to finalization of the design. The design portion of the project included the following: design of reclamation measures for an abandoned highwall area, construction of diversion and collection ditches, replacement of an existing culvert, repair to existing mine seals and ditches, erosion and sedimentation control measures, and site grading to eliminate the existing ponded areas, and revegetation. The work also included preparation of construction plans and specifications including the cost estimate.

Project Engineer; Mine Reclamation for Borgman Refuse and Portals; WVDEP; Preston County, WV. Performed research of geological data and mining maps, designing reclamation measures, and preparing construction plans and specifications for the project which included erosion and sedimentation control measures, site earthwork and regrading, slope stability analysis, mine seals, collection and diversion ditches, soil cover placement, and revegetation. Project responsibilities included site reconnaissance, survey and mapping, subsurface investigation, designing grading, drainage control structures, ditches, passive treatment for AMD, earthwork, and preparation of plans, specifications and costs.

Project Engineer; Kempton Refuse and Acid Mine Drainage; WVDEP; Tucker County, WV. Performed research of geological data and mining maps, review of water quality data, and design of acid mine drainage abatement measures, including open limestone channels, SAPS cells, and aerobic wetlands. Prepared construction plans and specifications for the project, which included site grading, mine seals, collection and diversion ditches, soil cover placement, and revegetation. Work included performance of site reconnaissance and office research, field surveying, test drilling, analysis and design of reclamation measures, preparation of construction plans and specifications, and development of a quantity estimate and construction cost estimate.

Project Engineer; Jed-Havaco Refuse Reclamation; WVDEP; WV. Performed research of geological data and mining maps, designed reclamation measures, and prepared construction plans, specifications, and cost estimates for the project which included erosion and sedimentation control measures, site earthwork and regrading, slope stability analysis, mine seals, collection and diversion ditches, soil cover placement, and revegetation.

ROBERT HEDIN, PhD

Consultant

Dr. Hedin is one of the leading authorities on the treatment of mine drainage and the restoration of streams polluted by mine drainage. He began researching mine drainage issues in 1988 at the U.S. Bureau of Mines. His experience includes the design, permitting, and construction of passive treatment systems, mine drainage characterizations, watershed assessments, and stream restoration plans.

In 1994, Dr. Hedin formed Hedin Environmental in order to provide personalized consulting services for a wide range of clients interested in mine drainage treatment. Dr. Hedin is the author of numerous publications regarding passive treatment of mine drainage and related topics, such as resource recovery. Dr. Hedin oversees all Hedin Environmental projects and performs

data evaluation, treatment system conceptual design and sizing, and restoration plan formulation. He has also given numerous presentations at technical conferences and served as an expert witness in court proceedings. His clients have included state and federal agencies, watershed organizations, townships and municipalities, non-profit organizations, mining companies, insurance companies, law firms, and engineering firms. Dr. Hedin is also the president of Iron Oxide Recovery, Inc., a sister company that specializes in recovering a marketable iron product from passive treatment systems.

EDUCATION

PhD, Ecology

BA, Environmental Studies and Economics

REGISTRATIONS

N/A

YEARS EXPERIENCE

35

Project Manager; Babb Creek Watershed Association (in conjunction with the Pennsylvania Department of Environmental Protection (PADEP); Acid Mine Drainage Passive Treatment System Design; Morris Township, PA. The Anna S Mine Complex acid mine drainage treatment project is located in Morris Township, Tioga County in Pennsylvania. The Babb Creek Watershed Association (BCWA) received a grant for construction of two passive systems to treat three large underground mine discharges. The system consists of 8 large vertical flow ponds, two settling basins, and four polishing wetlands. Since that time, the system has been operating well and water quality improvements in Wilson Run and Babb Creek have been documented. BCWA is monitoring the system and will perform routine maintenance.

Project Manager; Sewickley Creek Watershed Association; Lowber Project / Marchand Mine Acid Mine Drainage Passive Treatment Design; Sewickley Township, PA. This project involved the design, permitting, and construction of a large system of ponds and wetlands that passively treats a large discharge from the Marchand Mine. A large discharge of acid mine drainage began flowing from the mine portal and polluted Sewickley Creek with more than one ton per day of iron contamination. The Sewickley Creek Watershed Association has received the 2008 Governor's Award for Environmental Excellence for this project, which was also featured in Earth Magazine.

Project Manager; LC20D Farmington Township Acid Mine Drainage Passive Treatment System and Hydrogeological Investigation; Farmington Township, PA. Hedin Environmental (HE) is the primary contractor to the Farmington Township Supervisors for this project that will result in the



TETRA TECH

plugging of several AMD-producing gas wells and the construction of a large passive treatment system. The projects, which are funded by PADEP BAMR, were identified in the restoration plan was completed by Hedin Environmental. The project will also investigate the local groundwater hydrology so that the relationship between artesian flows of acid mine drainage can be better understood and used to advantage in stream restoration planning.

Project Manager; Seaboard Insurance Company; Acid Mine Drainage Assessment and Passive Treatment System Design for Four Seeps at K&J Coal Site; Cambria County, PA. As part of the settlement between the Commonwealth and Seaboard Insurance regarding the bankruptcy of K&J Coal Company, four acid mine drainage seeps at a site in Cambria County will be treated with passive systems. Hedin Environmental led the technical team that assisted Seaboard Insurance in its negotiations, development of the treatment system designs, selection of a construction contractor, and is overseeing the construction process.

Project Manager; Robbins Hollow Headwaters Passive Design Treatment Systems; Kettle Creek Watershed in PA. Hedin Environmental was the primary contractor for this project for four small systems to treat seepage and discharges to the headwaters of Robbins Hollow, a tributary of Two Mile Run in the Kettle Creek Watershed. Two systems are vertical-flow type systems while two involve oxic limestone detention ponds for marginally-contaminated flows. These projects were funded by the Growing Greener Program and the Office of Surface Mining.

Project Manager; Allegheny Land Trust; Wingfield Pines Acid Mine Discharge Passive Treatment System Design. Hedin Environmental was the primary contractor to the Allegheny Land Trust for this treatment system design. The discharge is a large, alkaline flow from a deep mine. The system has been designed to provide educational opportunities and to produce a marketable iron product.

Project Manager; Young Township; Little Elk Run MD20 Passive Mine Drainage Treatment System; Young Township, PA. Hedin Environmental was the primary contractor designing, permitting, bidding and performing construction oversight for this passive treatment system. The system was identified as the top priority watershed project in the restoration plan developed by Hedin Environmental. The system has an innovative design that is modeled on vertical flow pond technologies. However, the compost and limestone are in separate units for easy access and maintenance.

Project Manager; Elk County Fishermen; Johnson Run Passive Treatment Complex; Elk County, PA. Hedin Environmental performed the design, permitting, bidding, and construction oversight of a passive treatment system. The project was identified in a restoration plan prepared by Hedin Environmental. The system contains several innovative features that are intended to prolong the lifetime of the system. The raw water is pretreated with a passive self-flushing limestone system that discharges into a conventional vertical flow system equipped with a manually-operated flushing system.

ERNEST GIOVANNITTI, PE

Civil Engineer

Mr. Ernest Giovannitti, PE has more than 41 years of engineering. He previously served as Director of the Bureau of Mining and Reclamation for the Pennsylvania Department of Environmental Resources (1970-1995) and the Chief of the Division of Permits and Compliance in the Bureau of Water Quality Management and the. From 1995-2000, Mr. Giovannitti served as the Director of Abandoned Mine Reclamation for the Pennsylvania Department of Environmental Protection.

EDUCATION

MS, Sanitary Engineering

BS, Civil Engineering

REGISTRATIONS

Professional Engineer: PA

YEARS EXPERIENCE

41

Mining Consultant; Indiana County Conservation District Bear Run Phase II, AMD Passive Treatment System; Indiana County, PA. Mr. Giovannitti assisted with the design of a passive AMD

treatment system consisting of a launder weir channel, two wetlands, and a pond. Appropriate site grading, a stream crossing, and stream restoration were also engineered. Construction drawings, specifications, and a cost estimate were prepared.

Mining Consultant; Water Sourcing / Acid Mine Drainage Conceptual Design of a Passive Treatment System; Confidential Client; Forest City, PA. Mr. Giovannitti provided consultation for two discharges were singled out for further consideration, Vandling and Grey Slope. The mine pools were georeferenced onto a map with these discharges. A conceptual passive treatment system was designed for the Vandling Discharge with an associated pipeline to transport the water to a truck loading area.

Director of Abandoned Mine Reclamation; Pennsylvania Comprehensive Plan for Abandoned Mine Reclamation; PADEP; PA. While at the Pennsylvania Department of Environmental Protection, Mr. Giovannitti created this comprehensive plan, which provides a framework for organization reclamation in the state. It provides for coordinating among those involved in reclamation activities, for prioritizing expenditures and for decision-making. It also includes a process for developing restoration plans on a watershed basis, method for selecting projects based on costs and benefits and recognizes that partnering is the only means for achieving comprehensive solutions to abandoned mine land problems.

Director; Model Plan for Watershed Restoration; PADEP; PA. While at PADEP, Mr. Giovannitti developed this model to define the common elements of a restoration plan which, if used by resource and funding agencies, will facilitate partnering and avoid reworking plans to suit individual agency processes. It was intended that the model could be used interchangeably among the agencies. Resource and funding agencies could modify their internal procedures and traditions to accommodate this model.

Mining Engineer; Mine Discharge Feasibility Study. Mr. Giovannitti performed an engineering evaluation of the feasibility of using mine discharges to generate electrical energy.

TERENCE SMITH, PE

MINING ENGINEER

EXPERIENCE SUMMARY

Mr. Smith has more than 36 years of experience in mining engineering and management, and water and wastewater design engineering and project management. Recently, he has supported Tetra Tech's project for mine seal and bulkhead design for a project at a mine in Ohio. Mr. Smith's other experience includes longwall mining, coal preparation plant and coal refuse disposal supervision, surface mine permitting, mine operations evaluations, compliance evaluations, economic feasibility analysis, cost estimating and project management in the coal mining industry.

RELEVANT EXPERIENCE

Project Manager; 2012 Professional Design Services Contract; Pennsylvania Department of Environmental Protection, Bureau of Abandoned Mine Reclamation and Bureau of Mining Programs; PA. Serving as a project manager for these two five-year \$5M mining engineering contracts to provide professional design services to remediate problems such as open mine portals, acid mine drainage, mine fires, highwalls, and subsidence projects.

Project Engineer; Mine Seal and Bulkhead Design; Ohio Valley

Coal Company; Alledonia, OH. Tetra Tech designed four hydraulic mine seals at the Ohio Valley #6 Mine near Alledonia, OH and Mr. Smith supported this project with design services. Tetra Tech also performed a detailed study of mine seal and bulkhead successes and failures to assist in the design. The research included an analysis of reasons for failures of mine bulkheads as well as an analysis of the number of approved versus unapproved designs. Individuals at both MSHA and NIOSH were contacted to provide insight into mine bulkhead design. A review of available literature on mine bulkhead design was also performed and summarized as part of the project.

Project Engineer; AMD Treatment; PADEP; Cresson, PA. Preliminary design evaluation associated with the proposed Cresson AMD Treatment Plant. BAMR has entered into an agreement with the Susquehanna River Basin Commission to provide treated AMD to supplement flow during low flow periods. Project is currently in the field investigation phase to identify the location of the proposed facility and mine water extraction wells.

Project Engineer; Mine Discharge Reclamation; South Fayette Conservation Group; PA. Design engineering, permitting and project management for a watershed conservation group. The project objective is to seal a stream bottom in order to prevent water from entering an abandoned underground coal mine.

EDUCATION

BS, Mining Engineering,
University of Pittsburgh, 1978

AREA OF EXPERTISE

Mining Engineering

REGISTRATIONS/ AFFILIATIONS

Professional Engineer, PA,
1992, PE070977

TRAINING/CERTIFICATIONS

N/A

YEARS OF EXPERIENCE

36

THOMAS KIMMEL, PS/PLS SURVEYOR

EXPERIENCE SUMMARY

Mr. Kimmel has more than 41 years of surveying experience in various sectors for private and public government. He is a registered surveyor in nine states, including West Virginia. Mr. Kimmel has supported numerous projects involving boundary and topographic surveying, borehole stakeouts, cross sections, mapping using aerial photogrammetric methods, and ALTA land title surveys. He also has experience teaching community college surveying courses.

RELEVANT EXPERIENCE

Surveyor; ALTA Land Title Surveys; WV and PA. Conducted ALTA land title survey for a horse racetrack located in Charlestown, West Virginia. The West Virginia site was nearly 300 acres, consisting of 31 separate parcels located in three municipalities with over 80 title exceptions. The base mapping for the planimetrics of the area was done using aerial photogrammetric mapping techniques. The control (horizontal & vertical) for the photo-identities was established using GPS from a number of NGS and USGS monuments surrounding the site, having moved the control onto the site first and utilizing those bases for subsequent work. After all the deeds and easements were plotted, a survey crew was sent to search for ground evidence.

Surveyor; Mapping using Aerial Photogrammetric Methods; Pennsylvania Turnpike Commission; PA. Managed mapping projects utilizing aerial photogrammetric methods for three ten-mile sections of the PA turnpike, two along the mainline and one in the northeast extension. Control monument pairs were set approximately every two miles with panel points for both low level helicopter and upper level airplane flights. A full report was written and submitted to NGS such that the data was to be accepted and included into NGS' national data base for horizontal and vertical control.

Surveyor; Various PennDOT Surveying Projects; PennDOT; PA. Responsible for the creation of a transportation survey section at a previous employer to better meet the client's needs and PennDOT's requirements on surveying projects.

Surveyor; Boundary and Topographic Surveys; Various Clients. Performed numerous individual property, topographic, aerial, hydrographic, and engineering surveys. Conducted area supervision of multi-crewed projects.

EDUCATION

BS, Applied Science and Technology with Surveying Specialization, Thomas Edison State College, 1995

AS, Engineering and Surveying, Pennsylvania State University, 1973

AREA OF EXPERTISE

Surveying

REGISTRATIONS/ AFFILIATIONS

Professional Surveyor, WV, PS #974, 1994

Professional Land Surveyor, PA, PLS #22855-E, 1975

Professional Land Surveyor, MD, PLS #10911, 1990

Professional Land Surveyor, DE, PLS #572, 1993

Licensed Surveyor, VA, LS #1961, 1993

Professional Land Surveyor, NC, PLS #L3674, 1994

Professional Land Surveyor, NJ, PLS #GS39650, 1996

Licensed Surveyor, NY, LS #50239, 1996

Professional Surveyor, OH, #8260, 2003

TRAINING/CERTIFICATIONS

N/A

YEARS OF EXPERIENCE

41

HEATHER TREXLER, PG

LEAD GEOLOGIST

EXPERIENCE SUMMARY

Ms. Trexler has more than nine years of experience as a project manager and geologist. Her project activities for mining development include the preparation of geologic and hydrologic sections of permits to state agencies in West Virginia for longwall expansions, new room and pillar mines, refuse expansions and associated surface activities. She also reviews current and potential impacts to water resources, managing mining compliance sampling programs and evaluating large-volume water quality analysis.

RELEVANT EXPERIENCE

Project Geologist; Blacklick Creek Vinton/Wehrum Mine Drainage Treatment Facility Design; PADEP Bureau of Abandoned Mine Reclamation; Indiana County, PA. Supporting this large, multifaceted project included the design of a mine water conveyance system, design of relief boreholes, assessment of local mines for sludge disposal, coal refuse pile analysis, mine shaft and subsidence assessment, conceptual treatment facility layout, public involvement, and the development of bid documents.

Project Geologist; Palo Alto Mine Drainage Study and Design; PADEP Bureau of Abandoned Mine Reclamation; Borough of Palo Alto, PA. Providing geological support for this mine drainage study. Mine drainage is appearing at a residence in the Borough of Palo Alto during heavy precipitation events. Previous attempts at remediation by PADEP and the OSM were unsuccessful. Tetra Tech will conduct study the site then provide preliminary and final designs. The project will also include drilling, water testing, and surveying.

Project Geologist; East Avoca Mine Drainage Study; PADEP Bureau of Abandoned Mine Reclamation; Avoca Borough, PA. Serving as the lead geologist on this mine drainage study in Avoca, PA. Several residents along Grove Street in Avoca have reported incidents of mine water in basements and in their yards during heavy precipitation events. Tetra Tech's investigation will determine the location and depth of abandoned mine workings that may be the source of mine water occasionally noted along Grove Street. Tetra Tech will then propose alternative solutions to abate the drainage problem.

Project Geologist; 2012 Professional Design Services Contract; Pennsylvania Department of Environmental Protection, Bureau of Abandoned Mine Reclamation; PA. Serving as a geologist for this five-year \$5M mining engineering contract to provide professional design services to remediate problems such as open mine portals, acid mine drainage, mine fires, highwalls, and subsidence projects.

Project Manager; Marion County Reclaimed Mine Site Investigation; American Bituminous Power Partners, LP; Marion County, WV. Managed this project, which included a site assessment, sampling, and general recommendations as to the possible sources of elevated levels of aluminum at the site.

EDUCATION

MS, Geology, West Virginia University, 2003

BS, Geology, University of Cincinnati, 2001

AREA OF EXPERTISE

Geology

REGISTRATIONS/ AFFILIATIONS

Professional Geologist, PA, 2007, PG-004787

TRAINING/CERTIFICATIONS

PADEP Environmental Permitting and Erosion and Sedimentation Control Training

YEARS OF EXPERIENCE

10

Attachment E: Project Descriptions

Relevant Project Experience

Over the next several pages, we have included full-page project descriptions to supplement our proposal. These project examples (all of which have been listed in Attachment C) provide detailed descriptions of some of our recent work performed.

ALCOSAN GRAND VIEW GOLF COURSE ABANDONED MINE DRAINAGE TREATMENT SYSTEM AND DISCHARGE PIPELINE



CLIENT

ALCOSAN

LOCATION

North Braddock, Pennsylvania

DURATION

2012

COST

\$70,000

FEATURES

- Grant application and treatment plan
- Conceptual design of active drainage treatment system

REFERENCES

Ms. Jan Oliver
3300 Preble Avenue
Pittsburgh, PA 15233
(412) 734-8351

PROJECT DESCRIPTION

Tetra Tech was contracted by the Allegheny County Sanitary Authority (ALCOSAN) to develop a plan and grant application for a treatment system for abandoned mine drainage on the Grandview Golf Course located in North Braddock, PA.

Water flow and quality data was taken and a hybrid active/passive conceptual treatment design was developed for treatment of the discharge. The goal of the project was to eliminate the mine discharge occurring on the course. The system would treat the discharge to neutralize its acidity and remove aluminum so that the treated water can be reused as irrigation water on the course or discharged into Turtle Creek. At 70 gpm, approximately 100,000 gallons of mine water per day would be treated and removed from the ALCOSAN treatment system.

Tetra Tech also prepared a conceptual plan and cost estimate for a ½ mile discharge pipeline. The grant application resulted in a successful award.

CRESSON MINE POOL PROJECT



FEATURES

- Treatment of mine pool water discharge
- Modeling

PROJECT DESCRIPTION

Tetra Tech was subcontracted by GAI to perform Abandoned Mine Land remediation for PADEP's Bureau of Abandoned Mine Reclamation project located in Cresson, PA. The project involves the treatment of mine pool water and subsequent discharge into Clearfield Creek for use in agricultural purposes within the watershed. The facility will provide 5.7 million gallons per day of water to users in this river basin to mitigate for agricultural consumptive use during low-flow conditions and to restore water quality in Clearfield Creek.

Our evaluation determined that the combining and treating the water from the Cresson 9, Gallitzin Shaft, and Argyle/Stone Bridge mines could produce slightly less than the needed 5.7 mgd and that additional flow could be obtained by managing the pools. These pools can be treated at one location by collecting and routing discharges to a single treatment plant from the multiple mine pools. Several locations for sludge injection boreholes (expected to be successful and work for a long time period) were found by our engineers that had previous experience in in-mine sludge disposal. The necessary ingredients for successful sludge disposal include available property rights, open mining voids to accommodate the volume of sludge generated, and locating each borehole a sufficient distance from the withdrawal location to limit recycling. Tetra Tech reviewed mine maps and selected three boreholes for sludge disposal.

Tetra Tech is also developing a load duration curve approach coupled with geochemical simulation using the MINTEQA2 model to evaluate the existing and expected water quality conditions of Clearfield Creek and Sugar Run. The load duration curve approach is a simplified statistical approach for determining pollutant loading capacity by analyzing water quality concentrations and stream flow regimes. It will be used to establish the in-stream and end-of-pipe loading capacities of the water quality components under various pollutant loading conditions.

CLIENT

PADEP, Bureau of Abandoned Mine Reclamation

LOCATION

Cresson, Pennsylvania

DURATION

2011 – Ongoing

COST

\$ 600,000.00

REFERENCES

Mr. Eric Cavazza
PADEP BAMR
Cambria District Office
286 Industrial Park Road
Ebensburg, PA 15931
(814) 472-1900

BEAR RUN ACID MINE DRAINAGE PASSIVE TREATMENT



FEATURES

- PADEP coordination
- Mine drainage treatment system design
- Stream hydraulics computation

PROJECT DESCRIPTION

Tetra Tech was retained by the Indiana County Conservation District for the preparation of a site grading plan to install a passive treatment system for mine drainage that was discharging onto private land and into Bear Run in Indiana County, Pennsylvania. The mine drainage is alkaline, therefore the passive treatment system is designed to aerate and hold the flow in two surface water ponds totaling three acres.

The flow discharges into an existing wetland for polishing and ultimately into Bear Run. The design was incorporated into a Government Financed Construction Contract through PADEP for the removal of coal refuse from the site. Stream hydraulics were computed to reshape an unnamed tributary to Bear Run and to reconstruct a private stream crossing.

The system is fully functional and was constructed in 2010.

CLIENT

Indiana County Conservation District

LOCATION

Indiana County, Pennsylvania

DURATION

2009 – 2010

COST

\$

REFERENCES

Mr. Tom Clark
625 Kolter Drive, Suite 8
Indiana, PA 15701
(724) 465-9319

GLADDEN ACID MINE DRAINAGE MITIGATION AND STREAM SEALING



FEATURES

- PADEP coordination
- AMD treatment design and stream sealing
- Unstable highwall

PROJECT DESCRIPTION

Tetra Tech was retained by the South Fayette Conservation Group (in coordination with the Pennsylvania Department of Environmental Protection's Bureau of Abandoned Mine Reclamation) to design a passive acid mine drainage treatment system for this project.

Millers Run, a warm water fishery, flows into Chartiers Creek, also a warm water fishery. The abandoned mine portal discharges approximately 1,000 gpm of AMD into Millers Run. With the aeration and mixing of the flow, the pH rises and the iron oxide is precipitated out of the flow, resulting in several miles of iron oxide precipitation and low oxygenated water. Tetra Tech surveyed the site and prepared a topographic map, installed monitoring wells to monitor the mine pool elevation, delineated wetlands, and evaluated several alternative site configurations.

One site evaluated had an unstable highwall. Tetra Tech conducted a geotechnical evaluation, performing a hydrologic evaluation of the floodplain, and prepared the site layout and grading plan design. Tetra Tech prepared construction drawings, specifications, construction cost estimates and PADEP permits.

The design consisted of the excavation of a 3-acre basin on private property adjacent to a four-lane highway, railroad right-of-way, and an adjacent property owner. Treatment will consist of a directional bore into the mine to allow gravity flow of the drainage into a limestone bed and into the basin. The basin area will be over-excavated to remove the underlying coal bed and will be constructed at a

CLIENT

S. Fayette Conservation Group

LOCATION

South Fayette, Pennsylvania

DURATION

2009 – Ongoing

COST

\$

REFERENCES

Ms. Amy Smith
515 Millers Run Road
Morgan, PA 15064
(412) 257-8126

horizontal distance far enough away from the existing mine to prevent a blowout. Existing discharge will remain behind a small check dam but will be used as an outlet control if the mine pool rises. The basin will consist of three cells to increase holding time and allow for each cell to be isolated for the removal of iron oxide for commercial use. The basin will discharge through a riser structure into man-made wetland areas for additional treatment prior to flowing into Millers Run and Chartiers Creek.

In 2009, the client applied for a PADEP Growing Greener Grant to fund the investigation, design, and construction of a stream flow loss mitigation project. In order to build the project, flow into the mine needed to be reduced because sufficient property could not be acquired. By reducing the flow into the mine the design size could be decreased in size and the acquired property would be enough to install a system to handle the mine discharge. Weirs and continuous water level monitors were installed at the top and bottom of the stream channels. Data collected from the monitors was used to determine stream flows and flow loss. A design is underway to use Fabriform liner and grouting techniques to reduce flow into the mine.

"I would recommend both Tom (Gray) and Tetra Tech to anyone considering undertaking an AMD project."

Amy Smith

POWDERLY CREEK ACID MINE DRAINAGE TREATMENT AND STREAM RESTORATION



CLIENT

U.S. Army Corps of Engineers,
Baltimore District

LOCATION

Lackawanna County,
Pennsylvania

DURATION

FEATURES

- Evaluation of passive acid mine drainage treatment alternatives
- Stream restoration and HEC-RAC hydraulic modeling
- Geomorphic modeling and sediment load analysis

COST

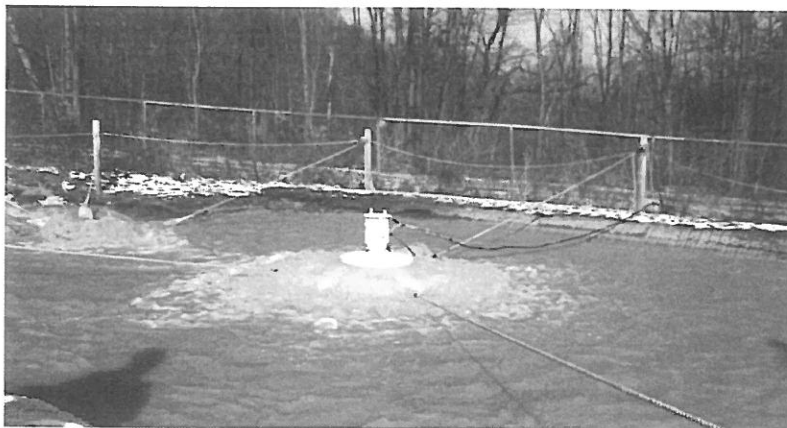
REFERENCES

PROJECT DESCRIPTION

Tetra Tech conducted an engineering evaluation of alternatives to restore reaches of Powderly Creek impacted by acid mine drainage (AMD). The creek was impounded, choked with fine sediments, and buried by mine tailings. Tetra Tech collected soil, water, and aquatic biology samples to assess the aquatic and riparian habitat, and prepared a detailed HEC-RAS hydraulic model to help evaluate stream restoration alternatives. Because impacts to stream flows, floodplains, bank and bed materials, and stream location had been severely impacted by coal mining activities, geomorphologic modeling was essential for the successful development of stable stream restoration designs. Overland and in-stream sediment loads, hydraulics, bed forms, stream profile, impoundment and wetland impacts, and potential management practices were evaluated to fully describe site geomorphology with and without the restoration projects. Geomorphic resources included USACE documents such as EM 1110-2-4000, EM 1110-2-1418, ERDC-CHL TR-01-28, and the "WES Stream Investigation and "Streambank Stabilization Handbook."

Tetra Tech prepared restoration options including wetland improvements, wetland creation, stream restoration, stream channel relocation, development of floodplains that appropriately link to the restored stream, low head floodwalls, potential breaching of other low head dams, and creation of stormwater BMPs. Passive systems for treating AMD were incorporated into the designs with treatment units located in the riparian corridor. The detailed designs of the selected alternative to restore the Powderly Creek watershed included a geomorphic evaluation, sediment load study, MCACES costs, construction documents, dam modifications, and passive AMD treatment systems. A comprehensive watershed plan, hydrologic and hydraulic models, geographic information system (GIS) data layers, and field data were created to support the development of the alternatives.

BIRD MINE AND STRAYER REFUSE PERMITTING AND WATER TREATMENT SYSTEM DESIGN



CLIENT

AMD Industries, Inc.

LOCATION

Tire Hill, Pennsylvania

DURATION

2012 – Ongoing

FEATURES

- Water treatment design
- PADEP permitting
- Refuse pile quantification and quality analysis

PROJECT DESCRIPTION

Tetra Tech was retained by AMD Industries to complete Pennsylvania Department of Environmental Protection (PADEP) permitting, water treatment design, and refuse pile quantification and quality analysis at the Bird Mine located in Tire Hill, PA. Tetra Tech was tasked with completing two different PADEP mining activity permit renewals – one for the Strayer Refuse Site and one for the Bird Mine Treatment Facility.

In addition, Tetra Tech planned for and conducted exploratory testing of the Strayer Refuse Site to determine the volume and quality of the refuse for possible removal. Our firm continues to provide mining-related support to this site.



WVDEP OSR COAL SLURRY IMPOUNDMENT



CLIENT

West Virginia Department of
Environmental Protection, OSR

LOCATION

Barbour County, West Virginia

DURATION

2013 – Ongoing

FEATURES

- Safety certification in accordance with MSHA regulations
- Dewatering plan
- Construction RFQ development

PROJECT DESCRIPTION

Tetra Tech was awarded this project from the West Virginia Department of Environmental Protection's OSR division in 2013. The project involves the certification of a coal slurry impoundment for a company (Energy Marketing Company) that had its mine permit revoked.

Tetra Tech's services include:

- Safety certification of the slurry impoundment in accordance with MSHA 30 CFR 77.216-4 (Water, sediment or slurry impoundments and impounding structures; reporting requirements; certification)
- Mapping of the entire permit area
- Development of an initial dewatering plan to minimize seepage through the existing embankment, and for preparation of the long-term reclamation of the impoundment
- Development of an RFQ for the construction contract to clean the existing sediment control pond and replace the pond outlet drainage structure to control dewatering from the impoundment

The safety assessment includes a review of data and location of piezometers, underdrains, decant pipes, and discharges; a bathymetric survey to document depths, volumes and elevations of the impounded water, sediment, and slurry; and the identification of any deficiencies that may affect the short-term stability of the structure until dewatering and final reclamation are initiated.