

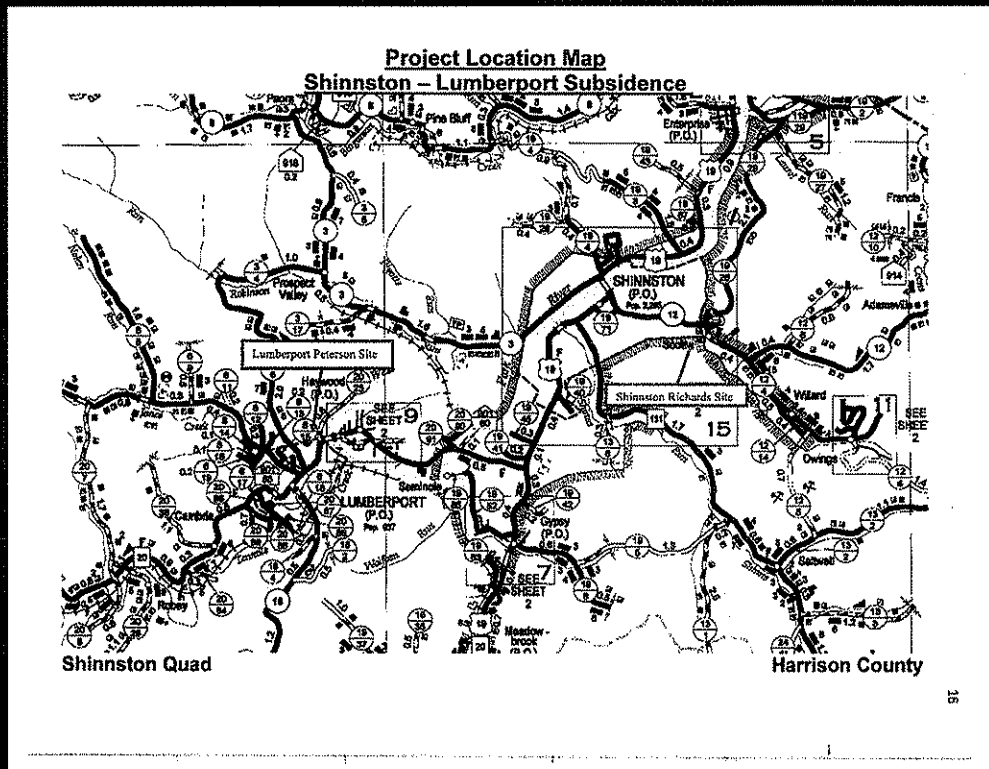
Presented To: **West Virginia Department of Environmental Protection, Office of Abandoned Mine Lands & Reclamation**

In Response To: **DEP15028-Shinnston-Lumberport Subsidence Design**  
Date: **May 26, 2010**

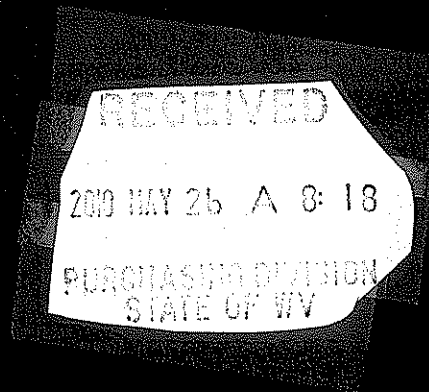
**Expression of Interest**

Submitted To:

Mr. Chuck Bowman, Buyer  
Department of Administration  
Purchasing Division  
2019 Washington Street, East  
Charleston, WV 25305-0130



Location map of the project as provided in the Request for Quotation.



**TERRADON** CORPORATION

401 Jacobson Drive  
Poca, WV 25159

304.755.8291 phone  
304.755.2636 fax  
terraddon.com web

Submitted by: Timothy T. White, P.E.

Signed: *Timothy T. White*

Date: 5-26-10



P.O. Box 519  
Nitro, WV 25143  
Tel: (304) 755-8291  
Fax: (304) 755-2636  
www.terraddon.com

P.O. Box 1635  
Lewisburg, WV 24901  
Tel: (304) 645-4636  
Fax: (304) 645-7614

5310 Market Road  
Suite 102  
Richmond, VA 23230  
Tel: (804) 673-2560  
Fax: (804) 673-2561

May 24, 2010

Mr. Chuck Bowman, Buyer  
Department of Administration  
Purchasing Division  
2019 Washington Street, East  
Charleston WV 25305-0130

**Re: Expression of Interest  
Shinnston-Lumberport Subsidence Design (DEP15028)**

Dear Mr. Bowman:

TERRADON Corporation is pleased to submit this Expression of Interest to provide professional engineering services to the WV Department of Environmental Protection, Office of Abandoned Mine Lands and Reclamation (WVDEP/AML) for the Shinnston-Lumberport Subsidence Design project located in Harrison County, West Virginia.

TERRADON has a rich background and history in providing quality design and construction services to the WVDEP/AML. Our diverse staff can provide complete full services for any problem area that may be included in this project. We welcome the challenge this project will offer, and our goal is to be your preferred consultant.

We look forward to an opportunity to interview for this project. Should you have any questions regarding the submittal or TERRADON, please do not hesitate to contact me.

Sincerely,

Timothy P. White, P.E.  
Principal Engineer

## DEP15028 SHINNSTON-LUMBERPORT SUBSIDENCE DESIGN

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TERRADON has extensive knowledge and experience on all types of AML problem areas. This photo is taken from our Venus (Hamilton, R.) project located in McDowell County showing drainage flowing thru a pipe from an existing open portal. Water from this open portal has been a major concern of property owners located below it. Our design has remedied the problem by directing flow from homes below via a grouted riprap channel.

## About TERRADON Corporation

TERRADON Corporation is a multidiscipline engineering firm that routinely provides planning, design, construction phase, resident inspection, and utility management services on civil engineering projects throughout West Virginia and surrounding states. In addition to consulting civil engineering services, TERRADON Corporation has professionals that provide technical services in the areas of surveying, environmental permitting, geotechnical engineering, structural engineering, and landscape architecture/land development.

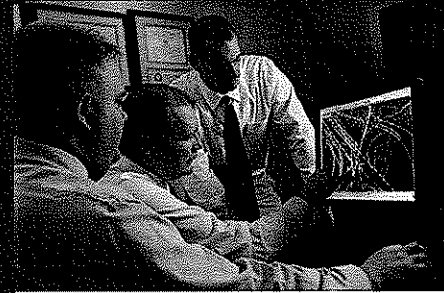
TERRADON Corporation has provided design consulting services to the West Virginia Department of Environmental Protection, Office of Abandoned Mine Lands & Reclamation, for more than sixteen years. The company has a diverse staff that can handle any project where the need exists, and welcomes new challenges.

## TERRADON SERVICES

- » Civil Engineering
- » Surveying and Mapping
- » Land Planning and Site Design
- » Geotechnical Engineering
- » Highway and Structural Design
- » Materials Testing and Construction Monitoring

## Presentation of Expression of Interest

TERRADON Corporation has prepared the materials of this expression of interest in accordance with RFQ DEP 15028. For review convenience, the following pages are arranged in order of the evaluation criteria listed in the RFQ.



## WV Registered Professional Engineers (Civil or Mining) in the Primary Office

TERRADON offers a professional and experienced staff to perform the tasks required for this project. TERRADON has been responsible for all aspects of numerous successfully completed environmental projects including AML projects.

TERRADON maintains six West Virginia Registered Professional Engineers located in its Primary office at Rock Branch Industrial Park in Poca, West Virginia. Additionally, Phillip Reed, P.E., is a member of the TERRADON team located in the Lewisburg, West Virginia office.

Total number of WV Registered Professional Engineers (Civil or Mining) in the Primary Office located in Poca, West Virginia:

- » Timothy T. White, P.E.  
Project Manager/Principal Engineer
- » John James, P.E.  
Project Manager/Project Engineer
- » William (Bill) White, P.E.  
Project Manager/Project Engineer
- » Jim Nagy, P.E.  
Project Manager/Project Engineer
- » Bud McCallister, P.E.  
Project Manager/Project Engineer
- » Mike Pyles, P.E.  
Project Manager/Project Engineer

### KEY RESOURCES

TERRADON Staff have been working on projects for the WVDEP/AML for over sixteen years. Our diverse staff offers full service that can be tailored for any problem area projects.

#### **Timothy T. White, P.E.**

Mr. White has provided Project Manager services for AML projects, as well as providing quality control, specifications and cost control.

#### **John James, P.E.**

Mr. James has been active in AML projects over his storied career. He provides geotechnical services related to various problem areas presented on projects.

#### **Bill Gerencir**

Mr. Gerencir has been involved with AML projects for over sixteen years. He serves as the lead designer and has vast knowledge of solutions for any problem area related to AML projects.

#### **Kevin Sarrett**

Mr. Sarrett has provided engineering design for drainage on AML projects, and works closely with Mr. Gerencir to provide quality plans for each project.

#### **Dave Brown, P.S.**

Mr. Brown has experience in all facets of surveying, and has provided services for AML projects over the years.

CORPORATION  
**TERRADON**



TERRADON has the experience and personnel to handle the wide array of problem areas associated with AML projects. This photo was taken from our Sarah Ann (Vance) project in Logan County, and shows the amount of drainage exiting one of the portals on site. The design will convey the water away from homes located below the site.

## Reclamation Engineering Design Experience as it Relates to Project Problem Areas

TERRADON has extensive experience in both wet and dry mine seals, with or without bat gates. Our recent experience with Stonecoal Creek had more than two dozen mine seals, and Morgan Run had over twenty as well. In addition, TERRADON has provided regrading services on numerous refuse piles and highwalls including Jenkin Jones, Micajah, Linger, Camp Mahonegan, Cedar Creek, Roaring Creek, and Morgan Run. TERRADON has also provided regrading services on Tupper's Creek, Gerath and Drews Creek Landslides. Currently TERRADON is regarding over 6 miles of highwall on the Garden Ground site in Fayette County. TERRADON also has experience with all facets of drainage that have been associated with the majority of projects we have completed over the years, from acid mine drainage to basic conveyance of water from problem areas via channels, ditches and pipes. Our years of experience with AML problem areas, coupled with our quick response time to WVDEP/AML needs, makes TERRADON an excellent fit for any project.

### Timothy T. White, P.E - WVRPE

Mr. Timothy T. White, P.E., is TERRADON's principal engineer. He brings nearly 20 years of design experience to the project and will serve as Project Manager. He has been the Project Manager for TERRADON on the previous five AML projects that have been developed by the firm. He has experience with wet and dry seals, landslide areas and conveyance of drainage for each site. Mr. White is also responsible for managing the quality control and cost control for each project. He is also responsible for preparing specifications and bid documents for all AML projects.



## Available WV AML Design Teams

TERRADON maintains the following personnel available to assign to the Shinnston-Lumberport Subsidence Design project. All persons listed have previous design or inspection experience on AML projects.

### Project Engineers

- » John James, P.E.
- » Timothy T. White, P.E.
- » Jim Nagy, P.E.
- » William (Bill) White, P.E.
- » Bud McCallister, P.E.
- » Mike Pyles, P.E.

### CAD Designers

- » Bill Gerencir
- » Kevin Sarrett
- » Kevin Garnes
- » Earl Oldham
- » Russ Lester
- » Mark Clutter

### Engineer Techs

- » Bruce Frame
- » Dave Wallace

### Surveyors

- » Robert Thaw, P.S.
- » Dave Brown, P.S.

## Principles for Project Management Success

TERRADON Corporation has enjoyed a working relationship with the office of Abandoned Mine Lands (AML) for more than sixteen years. TERRADON adheres to a proven project management strategy that will again be used on this project.

TERRADON Corporation assigns a single point of contact manager for the term of the project. This manager is responsible for meeting with AML representatives to discuss the scope of the project and to begin the development of tasks for work. This gives the client a single point for obtaining information regarding status and cost of all work in process for the project.

The TERRADON Project Manager works directly with AML staff to complete the outlined tasks. TERRADON's Project Manager will provide regular status reporting to AML as a source of information of the status and costs of the project.





# AML Consultant Qualification Questionnaire (CQQ)

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**WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION  
AML CONSULTANT QUALIFICATION QUESTIONNAIRE Attachment "B"**

PROJECT NAME DEP15028 Shinnston-Lumberport Subsidence Design	DATE (DAY, MONTH, YEAR) 05/26/2010	FEIN 55-0687626	
1. FIRM NAME TERRADON Corporation	2. HOME OFFICE BUSINESS ADDRESS 401 Jacobson Drive, Poca, WV, 25159	3. FORMER FIRM NAME	
4. HOME OFFICE TELEPHONE (304) 755-8291	5. ESTABLISHED (YEAR) 1989	6. TYPE OWNERSHIP Individual <input checked="" type="checkbox"/> Corporation Partnership <input type="checkbox"/> Joint-Venture YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	
7. PRIMARY AML DESIGN OFFICE: ADDRESS/ TELEPHONE/ PERSON IN CHARGE/ NO. AML DESIGN PERSONNEL EACH OFFICE 401 Jacobson Drive, Poca, WV 25159 / (304)-755-8291 / Thomas Y. Kittredge, President / 38 persons			
8. NAMES OF PRINCIPAL OFFICERS OR MEMBERS OF FIRM Thomas Y Kittredge, President Virginia L. King, CFO Timothy T White, P.E., Principal Engineer			
9. PERSONNEL BY DISCIPLINE			
5 ADMINISTRATIVE ARCHITECTS BIOLOGIST 4 CADD OPERATORS CHEMICAL ENGINEERS 6 CIVIL ENGINEERS 2 CONSTRUCTION INSPECTORS 5 DESIGNERS DRAFTSMEN	ECOLOGISTS ECONOMISTS ELECTRICAL ENGINEERS 1 ENVIRONMENTALISTS ESTIMATORS 1 GEOLOGISTS HISTORIANS HYDROLOGISTS	4 LANDSCAPE ARCHITECTS MECHANICAL ENGINEERS MINING ENGINEERS PHOTOGRAMMETRISTS PLANNERS: URBAN/REGIONAL SANITARY ENGINEERS 1 SOILS ENGINEERS SPECIFICATION WRITERS	1 STRUCTURAL ENGINEERS 8 SURVEYORS TRAFFIC ENGINEERS OTHER
TOTAL NUMBER OF WV REGISTERED PROFESSIONAL ENGINEERS IN PRIMARY OFFICE: <u>6</u> *RPEs other than Civil and Mining must provide supporting documentation that qualifies them to supervise and perform this type of work.			
10. HAS THIS JOINT-VENTURE WORKED TOGETHER BEFORE? <input type="checkbox"/> YES <input type="checkbox"/> NO			

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

NAME AND ADDRESS:		WORKED WITH BEFORE Yes _____ No _____
NAME AND ADDRESS:		WORKED WITH BEFORE Yes _____ No _____
NAME AND ADDRESS:		WORKED WITH BEFORE Yes _____ No _____
NAME AND ADDRESS:	SPECIALTY:	WORKED WITH BEFORE Yes _____ No _____
NAME AND ADDRESS:	SPECIALTY:	WORKED WITH BEFORE Yes _____ No _____
NAME AND ADDRESS:	SPECIALTY:	WORKED WITH BEFORE Yes _____ No _____
NAME AND ADDRESS:	SPECIALTY:	WORKED WITH BEFORE Yes _____ No _____
NAME AND ADDRESS:	SPECIALTY:	WORKED WITH BEFORE Yes _____ No _____
NAME AND ADDRESS:	SPECIALTY:	WORKED WITH BEFORE Yes _____ No _____

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12. A. Is your firm experienced in Abandoned Mine Lands Remediation/Mine Reclamation Engineering?

**YES** Description and Number of Projects: **45 Projects for WVDEP/AML&R**

**NO**

B. Is your firm experienced in Soil Analysis?

**YES** Description and Number of Projects: **32 WVDEP/AML&R projects included some soil analysis. TERRADON provides geotechnical engineering on a wide variety of projects including dams, highways, bridges, etc.**

**NO**

C. Is your firm experienced in hydrology and hydraulics?

**YES** Description and Number of Projects: **35 WVDEP/AML&R projects included hydrology and hydraulics.**

**NO**

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

**YES** Description and Number of Projects:

**NO** **We routinely provide photo control surveys and field edit the mapping provided.**

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

**YES** Description and Number of Projects: **9 WVDEP/AML&R projects included the evaluation of aquifer degradation as a result of mining. Four of those projects have been designed and constructed. TERRADON has also designed hundreds of miles of waterline in the last 5 years.**

**NO**

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

**YES** Description and Number of Projects: **5 WVDEP/AML&R projects included acid mine drainage evaluation and abatement. In addition, TERRADON was 1 of only 2 firms evaluating and designing AMD abatement of special reclamation projects in 1992, 1993 and 1994.**

**NO**

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

NAME & TITLE (last, First, Middle Int.) <b>James, John W., P.E.</b> <b>Senior Geotechnical Engineer</b>	YEARS OF AML DESIGN EXPERIENCE: 9	YEARS OF EXPERIENCE YEARS OF AML RELATED DESIGN EXPERIENCE: 31	YEARS OF DOMESTIC WATERLINE DESIGN EXPERIENCE: 8
	Brief Explanation of Responsibilities		

**Geotechnical Project Manager for TERRADON Corporation. Responsible for contract administration and project management; peer review of design, construction drawings and specifications; constructability review and construction cost estimate.**

EDUCATION (Degree, Year, Specialization)  
**B.S., 1968, Civil Engineering**

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS  
**American Society of Civil Engineers (Past President, WW Section)**

REGISTRATION (Type, Year, State)  
**P.E., 1973, WV**

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

NAME & TITLE (last, First, Middle Int.) <b>White, Timothy T., P.E.</b> <b>Project Manager, Principal Civil Engineer</b>	YEARS OF AML DESIGN EXPERIENCE: 4	YEARS OF EXPERIENCE YEARS OF AML RELATED DESIGN EXPERIENCE: 15	YEARS OF DOMESTIC WATERLINE DESIGN EXPERIENCE: 1
	Brief Explanation of Responsibilities		

**Project Manager responsible for resource management to assure project schedule and cost. Engineer responsible for grading, hydraulic design, erosion and sediment control, natural stream channel assessment and design.**

EDUCATION (Degree, Year, Specialization)  
**B.S., 1992, Civil Engineering**

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS  
**American Society of Civil Engineers**  
**American Council of Engineering Companies**

REGISTRATION (Type, Year, State)  
**P.E., 1999, OH; P.E., 1999, WV; P.E., 2007, VA; P.E., 2008, MD; P.E., 2008, PA; P.E., 2001, AR; P.E., 2003, TX; P.E., 2008, TN; P.E., 2001, KY**

13. PERSONAL HISTORY STATEMENT OF PRINCIPALS AND ASSOCIATES RESPONSIBLE FOR AML PROJECT DESIGN (Furnish complete data but keep to essentials)			
NAME & TITLE (Last, First, Middle Int.) <b>White, William G., P.E. Senior Structural Engineer</b>	YEARS OF AML DESIGN EXPERIENCE: <b>4</b>	YEARS OF EXPERIENCE YEARS OF AML RELATED DESIGN EXPERIENCE: <b>19</b>	YEARS OF DOMESTIC WATERLINE DESIGN EXPERIENCE: <b>0</b>
Brief Explanation of Responsibilities <b>Senior engineer responsible for structural analysis, design engineering, field investigation, specification writing, engineer's cost estimate, prebid and preconstruction meetings. Has experience in grading of refuse, mine seals, and pile and lagging walls.</b>			
EDUCATION (Degree, Year, Specialization) <b>B.S., 1987, Civil Engineering</b>			
MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS <b>American Society of Civil Engineers American Council of Engineering Companies</b>			
13. PERSONAL HISTORY STATEMENT OF PRINCIPALS AND ASSOCIATES RESPONSIBLE FOR AML PROJECT DESIGN (Furnish complete data but keep to essentials)			
NAME & TITLE (Last, First, Middle Int.) <b>Brown, David A., P.S. Professional Surveyor</b>	YEARS OF AML DESIGN EXPERIENCE: <b>7</b>	YEARS OF EXPERIENCE YEARS OF AML RELATED DESIGN EXPERIENCE: <b>13</b>	YEARS OF DOMESTIC WATERLINE DESIGN EXPERIENCE: <b>6</b>
Brief Explanation of Responsibilities <b>Responsible for all aspects of surveying including photogrammetry control, if required, field editing of mapping, topographic mapping, establishment of survey control monuments and establishing base lines for construction layout and quantity measurement. Also, tax map overlays and detailed property clarifications.</b>			
EDUCATION (Degree, Year, Specialization) <b>B.S., 1996, Engineering Technology</b>			
MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS <b>West Virginia Association of Land Surveyors</b>			
REGISTRATION (Type, Year, State) <b>P.S. 2003, WV; P.S. 2008, TN</b>			

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

Software

Autodesk 2010 Civil 3D  
SedCad 4 - Erosion Control and Hydrology Software  
Haested Method Flowmaster Software for Channel Design  
Haested Methods - Water CADD (Pipe Network Analysis)  
Slope Stability -  
PC Stable  
REAME  
SBSLOPE  
WinStable and WinStable 2003  
Piling Walls, Anchors and Reinforced Earth Walls -  
Lpile  
HeliCAP  
Anchor 400  
KeyWall 2004  
TR 55, TR 20, TR 66 (Sites) - Hydrology  
Hec-1, Hec HMS 2.22, Hec R As 3.1.2 - Hydrology  
LC 58 + RP 61 - Structural (wall)  
Microstation V8

Surveying Equipment

Trimble 4700 modular, RTK Global Positioning Total Station  
Trimble Geomatics Office Software  
Topcon Total Stations (3)  
SMI Data Collectors (3)

Printing/Plotting/Reproduction

HP DesignJet T1120  
HP DesignJet 1050C Plotter (2)  
HP LaserJet 8000 Printer (2)  
HP Color LaserJet 3700  
HP Color LaserJet 5500  
Sharp AR-550 Copier/Printer (2)  
Sharp AR-C150 Full Color Copier/Printer  
Océ 7056 Engineering Size Copier

15. PRESENT ACTIVITIES ON WHICH YOU ARE THE DESIGNATED ENGINEER OF RECORD

PROJECT NAME, TYPE AND LOCATION	NAME AND ADDRESS OF OWNER	ESTIMATED CONSTRUCTION COST	PERCENT COMPLETE
Garden Ground Highwalls AML Reclamation Design Fayette County, West Virginia	WVDEP/AML&R 601 57 <sup>TH</sup> Street SE Charleston WV 25304	\$10,000,000	5%
City Beer Bridge on I-77 Bridge Replacement Project Wood County, West Virginia	WVDOT Building 5, Room A-110 1900 Kanawha Blvd. East Charleston WV 25305	\$6,000,000	0%
Venus (Hamilton) Drainage AML Reclamation Design McDowell County, West Virginia	WVDEP/AML&R 601 57 <sup>TH</sup> Street SE Charleston WV 25304	\$200,000	90%
Drews Creek Highway AML Reclamation Design Raleigh County, West Virginia	WVDEP/AML&R 601 57 <sup>TH</sup> Street SE Charleston WV 25304	\$500,000	90%
Manila Ridge Water Extensions Putman County, West Virginia	Putman County Commission 3389 Winfield Road Winfield, WV 25213-9370	\$1,500,000	75%
Boys Scouts of America Jamboree Site Fayette County, West Virginia	Trinity Works 2128 Mistletoe Boulevard Fort Worth, Texas 76110	\$100,000,000	10%
Sanitary Landfill Expansion Design, West Virginia	Confidential Client	\$25,000,000	90%

Continued on next page

15. PRESENT ACTIVITIES ON WHICH YOU ARE THE DESIGNATED ENGINEER OF RECORD

PROJECT NAME, TYPE AND LOCATION	NAME AND ADDRESS OF OWNER	ESTIMATED CONSTRUCTION COST	PERCENT COMPLETE
Sarah Ann (Vance) Drainage Logan County, West Virginia	WVDEP/AML&R 601 57 <sup>TH</sup> Street SE Charleston WV 25304	\$600,000	90%
Greenbrier County Schools 5 various school projects in Greenbrier County, West Virginia	Greenbrier County Schools 202 Chestnut Street Lewisburg, WV 24901	\$50,000,000	80%
Little Beaver State Park Campground Design, Beaver, West Virginia	WV DNR, Parks Section 1900 Kanawha Blvd. East Capitol Complex, Bldg. #3 Charleston, WV 25305	\$1,000,000	80%
NAPA Headquarters Pavement Design/Geotech Nitro, West Virginia	Genuine Parts LLC 2999 Circle 75 Parkway Atlanta, Georgia 30399	\$200,000	50%
Tucker County Landfill Expansion Design of Cell 7 Thomas, West Virginia	Tucker County Solid Waste Authority PO Box 58 Thomas WV 26292	\$15,000,000	90%
Cabell County Water Extensions Cabell County, West Virginia	Salt Rock Sewer PSD 100 Padero Dr Ona, WV 25545-9527	\$1,500,000	90%
Various Survey Projects Throughout West Virginia	Various Clients	\$3,000,000	50%

Continued on next page

15. PRESENT ACTIVITIES ON WHICH YOU ARE THE DESIGNATED ENGINEER OF RECORD

PROJECT NAME, TYPE AND LOCATION	NAME AND ADDRESS OF OWNER	ESTIMATED CONSTRUCTION COST	PERCENT COMPLETE
Fairmont Water Park Fairmont, West Virginia	City Fairmont 200 Jackson Street Fairmont, West Virginia 26554	\$3,000,000	90%
Relocate CR 18, Eccles, Raleigh County, West Virginia	WVDOT Building 5, Room A-110 1900 Kanawha Blvd. East Charleston WV 25305	\$2,000,000	90%
Sleeths Run Bridge CR119/1 Lewis County West, Virginia	WVDOT Building 5, Room A-110 1900 Kanawha Blvd. East Charleston WV 25305	\$2,000,000	99%
Charleston Replacement Housing Site/Civil for CRH 1-5 Charleston, West Virginia	Alan Ives Construction 10 South La Salle Street, Suite 3440 Chicago, Illinois 60603	\$20,000,000	90%
Tucker County Landfill Tucker County, West Virginia	Tucker County Solid Waste Authority	\$3,000,000	60%
TOTAL NUMBER OF PROJECTS: 19		TOTAL ESTIMATED CONSTRUCTION COSTS: \$244,500,000	

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

PROJECT NAME, TYPE AND LOCATION	NATURE OF FIRMS RESPONSIBILITY	NAME AND ADDRESS OF OWNER	ESTIMATED COMPLETION DATE	ESTIMATED CONSTRUCTION COST	
				ENTIRE PROJECT	YOUR FIRMS RESPONSIBILITY
Mingo Central High Sch Mingo County, West Virginia	Civil, Site Design, Surveying	Mingo County BOE Sycamore Street Williamson, WV 25661	2011	\$20,000,000	15%
Shepherdstown Elementary Shepherdstown, West Virginia	Civil, Site Design, Surveying	Jefferson County BOE 110 Mordington Avenue, Charles Town, WV 25414	2010	\$15,000,000	15%
Braxton County Schools Six Various School Projects, Braxton County, West Virginia	Civil, Site Design, Surveying	Braxton County BOE 411 N Hill Road, Sutton, WV 26601	2010	\$12,000,000	15%
State Office Building, Fairmont, West Virginia	Civil, Site Design, Surveying,	WV Dept. of Admin. Bldg. 1, Rm. E119 State Capitol Complex Charleston, WV 25305	2010	\$15,000,000	15%
Poca Middle School Poca, West Virginia	Civil, Site Design, Surveying,	Putnam County BOE Courthouse Drive Winfield, WV 25213	2010	\$20,000,000	15%
Confidence Elementary School Putnam County, West Virginia	Civil, Site Design, Surveying,	Putnam County BOE Courthouse Drive Winfield, WV 25213	2010	\$8,000,000	15%
Winfield Middle School Winfield, West Virginia	Civil, Site Design, Surveying,	Putnam County BOE Courthouse Drive Winfield, WV 25213	2010	\$22,000,000	15%

Continued on next page

16. CURRENT ACTIVITIES ON WHICH YOUR FIRM IS SERVING AS A SUB-CONSULTANT TO OTHERS					
PROJECT NAME, TYPE AND LOCATION	NATURE OF FIRMS RESPONSIBILITY	NAME AND ADDRESS OF OWNER	ESTIMATED COMPLETION DATE	ESTIMATED CONSTRUCTION COST	
				ENTIRE PROJECT	YOUR FIRMS RESPONSIBILITY
Marshall Community & Technical College Huntington, West Virginia	Civil, Site Design, Surveying	Marshall University Facilities Planning & Management, Huntington, WV	2009	\$20,000,000	15%
New Teays Elementary Scott Depot, West Virginia	Civil, Site Design, Surveying	Putnam County BOE Winfield, WV 25213	2009	\$12,000,000	15%
Moorefield Intermediate School Moorefield, West Virginia	Civil, Site Design, Surveying,	Hardy County BOE 510 Ashby Street Moorefield, WV 26836	2009	\$12,000,000	15%
Marshall University, Health & Wellness Center, Dormitories Huntington, WV	Civil, Site Design, Hardscape	Marshall University Facilities Planning & Management, Huntington, WV	2009	\$27,000,000	10%
Twin Falls State Park Lodge Expansion McDowell County, WV	Civil, Site Design	WV Division of Natural Resources, Capitol Building 3, R663 Charleston, WV 25305	2009	\$5,500,000	15%
University High School Monongalia County, WV	Civil, Site Design	Monongalia County Schools, 668 River Rd Morgantown, WV 26507	2009	\$12,000,000.00	20%



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

PROJECT NAME, TYPE AND LOCATION	NAME AND ADDRESS OF OWNER	ESTIMATED CONSTRUCTION COST	YEAR	CONSTRUCTED (YES OR NO)
Montgomery Wastewater Treatment Plant Upgrade, Design Montgomery, West Virginia	City of Montgomery 706 3 <sup>rd</sup> Avenue Montgomery WV 25136	\$2,800,000	2009	Under Const.
Sleeths Run Bridge CR119/1 Lewis County West Virginia	WV DOT Building 5, Room A-110 1900 Kanawha Blvd. East Charleston WV 25305	\$ 1,800,000	2009	Under Construction
Fairmont Connector, Value Engineering, Kanawha Stone Company	WV DOT Building 5, Room A-110 1900 Kanawha Blvd. East Charleston WV 25305	Savings of \$2,500,000	2009	Under Construction
Derrick Creek Water Line Extensions Sissonville, West Virginia	West Virginia American Water PO Box 1906 Charleston WV 25327	\$1,500,000	2009	Yes
Gypsy Bridge S317-19-23.25 00 Erection Plans Harrison County, West Virginia	Bilco Construction Company, Inc. 805 Wisteria Drive South Charleston, WV 25309	\$ 20,000 fee	2008	Yes
South Branch Potomac River Bridge, X316-H-100.40 04 Erection Plans Hardy County, West Virginia	Vecellio & Grogan, Inc. P.O. Box 2438 Beckley, WV 25902	\$31,000,000	2008	Yes
WV Route 2 Water Line Extensions Huntington, West Virginia	West Virginia American Water PO Box 1906 Charleston WV 25327	\$450,000	2008	Yes
Sawmill Village Development Site/civil Design, Snowshoe, West Virginia	Summit III, LLC 295 Seven Farms Drive Charleston, WV 29492	\$100,000,000	2008	Yes

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17. COMPLETED WORK WITHIN LAST 5 YEARS ON WHICH YOUR FIRM WAS THE DESIGNATED ENGINEER OF RECORD				
PROJECT NAME, TYPE AND LOCATION	NAME AND ADDRESS OF OWNER	ESTIMATED CONSTRUCTION COST	YEAR	CONSTRUCTED (YES OR NO)
Derrick Creek Water Line Extensions Sissonville, West Virginia	West Virginia American Water PO Box 1906 Charleston WV 25327	\$1,200,000	2008	Yes
Upper Fishers Branch/Guthrie Water Main Extension Kanawha County, West Virginia	West Virginia American Water PO Box 1906 Charleston WV 25327	\$2,800,000	2008	Under Const.
Upper Frame Phase 2 Water Main Extension Kanawha County, West Virginia	Kanawha County RDA & West Virginia American Water PO Box 1906 Charleston WV 25327	\$2,100,000	2008	Under Const.
Back Fork Water Main Extension Webster County, West Virginia	West Virginia American Water PO Box 1906 Charleston WV 25327	\$800,000	2008	Under Const.
New Hope 1 MG Water Storage Tank Princeton, West Virginia	WV American Water PO Box 1906 Charleston WV 25327	\$600,000	2008	Yes
Putnam County 2007 Water Main Extensions, Putnam County, West Virginia	Putnam County Commission 3389 Winfield Road Winfield, WV 25213	\$2,000,000	2008	Yes
Fort Lee Hydraulic Study, Water Line Extensions, and New Fuel Tanks Hope Well, Virginia	Virginia American Water Co. 900 Industrial Street Hopewell, VA 23860	\$450,000	2008	Yes
Yeager Airport Rental Car Parking Deck Charleston, West Virginia	Central West Virginia Airport 100 Airport Road #175 Charleston, WV 25311	\$3,000,000	2008	Yes

Continued on next page

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

PROJECT NAME, TYPE AND LOCATION	NAME AND ADDRESS OF OWNER	ESTIMATED CONSTRUCTION COST	YEAR	CONSTRUCTED (YES OR NO)
Salt Rock PSD Water Main Extensions Salt Rock, West Virginia	Salt Rock PSD & Cabell County Commission Huntington, West Virginia	\$1,500,000	2008	Yes
US 35 Value Engineering, Ramp 1, WV 34 Interchange Putnam County, West Virginia	WVDOT Building 5, Room A-110 1900 Kanawha Blvd. East Charleston WV 25305	Saving \$3,000,000	2007	Yes
Tucker County Landfill Expansion Design of Cell 6 Thomas, West Virginia	Tucker County Solid Waste Authority PO Box 58 Thomas WV 26292	\$2,500,000	2007	Yes
Rabel Mountain Water Main Extensions Kanawha County, West Virginia	WV American Water PO Box 1906 Charleston WV 25327	\$600,000	2007	Yes
Sedalia Arch Bridge, Bridge Replacement Sedalia, West Virginia	WVDOT Building 5, Room A-110 1900 Kanawha Blvd. East Charleston WV 25305	\$890,000	2006	Yes
Fairmont Coke Works Redevelopment Traffic Study, Fairmont, West Virginia	City Fairmont 200 Jackson Street Fairmont, West Virginia 26554	\$20,000 fee	2006	No
Hinton Landslide, Landslide Reclamation Hinton, West Virginia	WVDOT, Division of Highways Building 5, Room A-110 1900 Kanawha Boulevard East Charleston, WV 25305	\$1,000,000	2006	Yes
Fort Lee Water Distribution System Upgrade Fort Lee, Virginia	WV American Water PO Box 1906 Charleston WV 25327	\$1,000,000	2006	Yes
Prince Williams 1 Million Gallon Elevated Water Storage Tank Prince Williams County, Virginia	WV American Water PO Box 1906 Charleston WV 25327	\$1,500,000	2006	Yes
Hickory Ridge Water Storage Tank Relocation, County, West Virginia	WV American Water PO Box 1906 Charleston WV 25327	\$1,000,000	2006	Yes
Winfield High School Expansion Winfield, West Virginia	Putnam County BOE Winfield, WV 25213	\$2,000,000	2006	Yes

Continued on next page

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

PROJECT NAME, TYPE AND LOCATION	NAME AND ADDRESS OF OWNER	ESTIMATED CONSTRUCTION COST	YEAR	CONSTRUCTED (YES OR NO)
Fountain Place Mall Phase 2 Site/Civil Design Logan, West Virginia	Fountain Place Mall PO Box 794 Logan, WV 25601	\$10,000,000	2005	Yes
Jenkin Jones Refuse Piles Mine Reclamation McDowell County, West Virginia	WVDEP/AML&R 601 57 <sup>TH</sup> Street SE Charleston WV 25304	\$4,000,000	2005	Yes
Bendale Dam Repair Design Lewis County, West Virginia	WV American Water PO Box 1906 Charleston WV 25327	\$100,000	2005	Yes
Corridor L Widening Design US Route 19 Summersville, West Virginia	WVDOT, Division of Highways Building 5, Room A-110 1900 Kanawha Boulevard East Charleston, WV 25305	\$12,100,000	2005	No
WV 73 Turning Lanes Fountain Place Development Logan County, West Virginia	WVDOT Building 5, Room A-110 1900 Kanawha Blvd. East Charleston WV 25305	\$ 600,000	2005	Yes

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

PROJECT NAME, TYPE AND LOCATION	NAME AND ADDRESS OF OWNER	ESTIMATED CONSTRUCTION COST	YEAR	CONSTRUCTED (YES OR NO)
Fountain Place Mall Phase 2 Site/Civil Design Logan, West Virginia	Fountain Place Mall PO Box 794 Logan, WV 25601	\$10,000,000	2005	Yes
Jenkin Jones Refuse Piles Mine Reclamation McDowell County, West Virginia	WVDEP/AML&R 601 57 <sup>TH</sup> Street SE Charleston WV 25304	\$4,000,000	2005	Yes
Bendale Dam Repair Design Lewis County, West Virginia	WV American Water PO Box 1906 Charleston WV 25327	\$100,000	2005	Yes
Corridor L Widening Design US Route 19 Summersville, West Virginia	WVDOT, Division of Highways Building 5, Room A-110 1900 Kanawha Boulevard East Charleston, WV 25305	\$12,100,000	2005	No
WV 73 Turning Lanes Fountain Place Development Logan County, West Virginia	WVDOT Building 5, Room A-110 1900 Kanawha Blvd. East Charleston WV 25305	\$ 600,000	2005	Yes

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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 AS RESPONSIBLE)						
PROJECT NAME, TYPE AND LOCATION	NAME AND ADDRESS OF OWNER	ESTIMATED CONSTRUCTION COST OF YOUR FIRM'S PORTION	YEAR	CONSTRUCTED (YES OR NO)	FIRM ASSOCIATED WITH	
Fairmont State University Campus Improvements Fairmont, West Virginia	Fairmont State University 1201 Locust Avenue Fairmont, WV 26554	\$1,000,000	2007	Yes	Omni Associates	
Mountain View Elementary Civil, Site Design, Surveying Scott Depot, West Virginia	Putnam County BOE Winfield, WV 25213	\$1,000,000	2008	Yes	Williamson Shriver Architects	
Mountain State University Health Science Building Civil/Site/Surveying Beckley, WV	Mountain State University PO Box 9003 Beckley, WV 25802-9003	\$1,500,000	2007	Yes	Dan Sneed Architects	
WVU Recreation Center Master Plan Morgantown, WV	West Virginia University	\$2,000,000	2006	No	Omni Associates	
Doddridge County High School Doddridge County, West Virginia	Doddridge County BOE 104 Sistersville Pike West Union, WV 26456	\$1,500,000	2006	Yes	Williamson Shriver Architects	
Capon Bridge Intermediate School Hampshire County, West Virginia	Hampshire County BOE 46 South High Street Romney, WV 26757	\$1,000,000	2006	Yes	Williamson Shriver Architects	
Fairmont Public Safety Building, Fairmont, West Virginia	City Fairmont 200 Jackson Street Fairmont, West Virginia 26554	\$4,000,000	2005	Yes	Omni Associates	
Mountain View Elementary Scott Depot, West Virginia	Putnam County BOE Winfield, WV 25213	\$2,000,000	2008	Yes	Williamson Shriver Architects	
Moorefield Intermediate School Moorefield, West Virginia	Hardy County BOE 510 Ashby Street Moorefield, WV 26836	\$12,000,000	2008	Yes	Williamson Shriver Architects	

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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 AS RESPONSIBLE)

PROJECT NAME, TYPE AND LOCATION	NAME AND ADDRESS OF OWNER	ESTIMATED CONSTRUCTION COST OF YOUR FIRM'S PORTION	YEAR	CONSTRUCTED (YES OR NO)	FIRM ASSOCIATED WITH
WVDEP Headquarters Building, Site/Civil, Survey Kanawha County, WV	WVDEP 601 57 <sup>th</sup> Street SE Charleston WV 25304	\$30,000,00.00	2005	Yes	BBL-Carlton
Marshall University, Health & Wellness Center, Dormitories Site/Civil, Survey Huntington, WV	Marshall University Facilities Planning & Management, Huntington, WV	\$27,000,000	2009	Yes	Capstone Development
Pikeview Middle School Site/Civil, Survey Mercer County, West Virginia	Mercer County Public Schools 1403 Honaker Avenue Princeton, WV 24740	\$5,000,000	2009	Under Construction	E.T Boggess Architects
Doddridge County High School US Route 50 Turning Lanes Design Doddridge County, West Virginia	WVDOT Building 5, Room A-110 1900 Kanawha Blvd. East Charleston WV 25305	\$100,000	2006	Yes	Williamson Shriver Architects
WV ARNG Eleanor Access Road Surveying & Roadway Design Eleanor, West Virginia	WV Army National Guard 1740 Coonskin Drive Charleston WV 25311	\$300,000	2009	Yes	Williamson Shriver Architects

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

TERRADON has extensive experience in both wet and dry mine seals, with or without bat gates. Our recent experience with Stonecoal Creek had over two dozen mine seals, and Morgan Run had over twenty as well. In addition, we have done regrading on numerous refuse piles and highwalls including Jenkin Jones, Micajah, Linger, Camp Mahonegan, Cedar Creek, Roaring Creek and Tappers Creek, Gerath and Drews Creek Landslides. We have experience regarding over 6 miles of dangerous highwall on the Garden Ground site in Fayette County. TERRADON also has experience designing road upgrades and pile and lagging walls, as well as experience in drainage design on all projects.

20. The foregoing is a statement of facts.

Signature: 

Printed Name: Timothy T. White, P.E.

Title: Principal Engineer

Date: April 27, 2010

NOTE: THIS DOCUMENT WILL BECOME VOID AFTER DECEMBER 31 IN CALENDAR YEAR OF DATE HEREON.

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# AML and Related Project Experience Matrix

1. The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that this is crucial for ensuring the integrity of the financial statements and for providing a clear audit trail. The text also mentions that proper record-keeping is essential for identifying trends and anomalies in the data.

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**Shinnston-Lumberport Subsidence Design  
DEP15028**

TERRADON AML and RELATED PROJECT EXPERIENCE MATRIX													PRIMARY STAFF PARTICIPATION/CAPACITY <small>M=Management P=Professional ***</small>												
PROJECT NAME	Exp. Basis C=Corp. P=Personal *	Additional Info Provided in Section (s) **	PROJECT EXPERIENCE													Tim White, P.E.	John James, P.E.	Bill Gerencol	Dave Brown, P.S.	Kevin Sarrett					
			Abandoned Surface Mine Reclamation	Abandoned Deep Mine Reclamation	Portal/Shaft Closure	Hydrologic/Hydraulic Design/Eval.	Remining Evaluation	Mine/Reuse Fire Abatement	Subsidence Investigation	Hazardous Waste Disposal	Project Specifications	Water Quality Evaluation/Mitigation/Replacement	Construction Inspection/Management	Water Treatment	Equipment/Structure Removal						Stream Restoration	Geotechnical/Stability			
Roaring Creek #4	C/P	yes	X						X										M/P	P	P	P	P		
Stonecoal Creek Complex	C/P	yes		X									X						M/P	P	P				
Stonecoal Creek Complex #2	C/P	yes		X									X							M/P	P				
Stonecoal Creek Complex #3	C/P	yes		X									X							M/P	P				
Jenkin Jones	C/P	yes		X				X												M/P	P				
Micajah Refuse Pile	C/P	yes		X				X												M/P	P	P			
Carswell Hollow (Smith) Refuse	C/P	yes		X									X								P	P			
Cedar Creek Refuse	C/P	yes		X																	P	P			
Spring Branch Burning Refuse Pile	C/P	yes		X																	P	P			
Grass Run Refuse (Award Winner)	C/P	yes		X									X								P	P			
Black Wolfe Refuse	C/P	yes		X																	P	P			
Lower Burning Creek Refuse	C/P	yes		X																	P	P			
Morgan Run PA #2	C/P	yes		X																	M/P	P	P	P	
Draws Creek "A" Highwall	C/P	yes		X																	M/P	P	P	P	
Venus (Hamilton, R) Drainage	C/P	yes		X																	M/P	P	P	P	
Sara Ann (Vance) Drainage	C/P	yes		X																	M/P	P	P	P	
Garden Ground Highwalls	C/P	yes		X																	M/P	P	P	P	

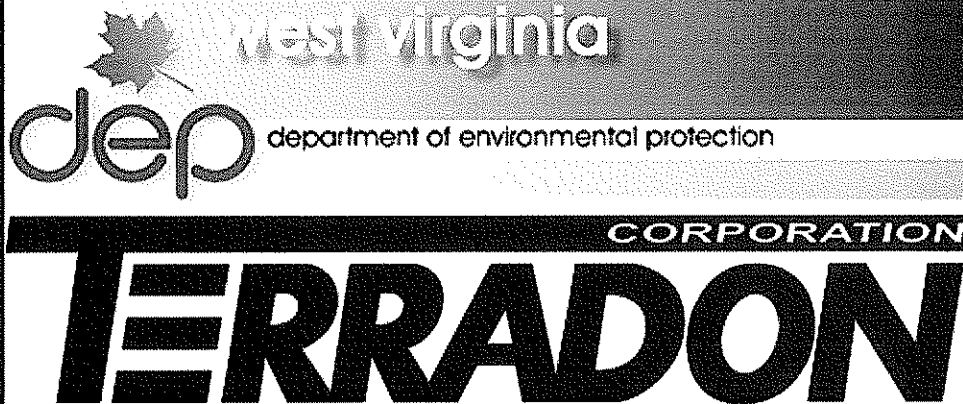
\* List whether project experience is corporate or personal based or both.  
 \*\* Use this area to provide specific sections or pages if needed for reference.  
 \*\*\* List primary design personnel and their functional capacity for the projects listed.



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### Sarah Ann (Vance) Drainage

Sarah Ann (Vance) is a current project that is located along Conley Branch near Sarah Ann in Logan County. The site is comprised of open and collapsed draining portals, as well as an area that consists of a slide.

We have been provided with mapping for the site by the WVDEP-AML. We will also provide additional surveying to include the new slide that has developed on the site. Currently, we have identified 24 portals; 8 that require wet or dry seals, along with 9 bat gate dry seals, 6 rip rap chutes and 3 cisterns. Our approach for handling the drainage will be to establish channels to divert the water from the site and install stream bank protection as needed. Excavation and re-grading of the slide area will be designed to establish stable slopes, and we also plan to drill two holes on the slide to determine the depth to rock, as well as classify the soil.

### KEY RESOURCES

**Timothy T. White, P.E.**  
Principal Engineer  
Department Head – Highways

White has nearly 20 years experience in engineering roadway design and construction. As head of a TERRADON's Highway and AML projects, White oversees all AML work.

White's background includes geometric design, drainage, and all other facets required to complete a set of plans for construction.

White has worked on a number of projects for AML, and he has experience with wet and dry mine seal, regrading of refuse piles and conveyance of drainage. He also serves as Project Manager and is responsible for specifications and cost control for all AML projects.

## Drews Creek "A" Highwall

Drews Creek "A" Highwall consists of a large landslide and three (3) existing mine portals. The slide starts below a pre-law surface mine bench and consists mostly of "shoot and shove" material. A local resident stated that he saw a large stream of water flowing out of the toe for several days during the initial stages. The toe of the slide is located next to the stream bank. Large boulders and very large trees have fallen over and are obstructing the stream flow. This slide is approximately six (6) acres in size. Most of the six acres is exposed soil, eroding very fast during rain events. Approximately 0.25 miles below this slide is a community of approximately 50 people living in close proximity to the creek. The slide has the potential of impounding water (during heavy rain events), in the waterway, and therefore, the potential to flood these 50 people and homes exists.

Two of the mine portals are partially collapsed. One portal is 4 feet wide and 3 feet high; the second is 6 feet wide and 3 feet high. Both of these portals have mine drainage seeping from the partially collapsed openings.

These portals are located on the above mentioned highwall bench, and are easily accessible by humans. The third portal is located inside an existing block building on the same bench.

The project approach consists of wet and dry seals on all open portals, conveyance of all drainage to new channels leading to all drainage dispensing into Drews Creek. The landslide will be regraded and all drainage from the grading will be conveyed to Drews Creek.

## KEY RESOURCES

**Robert Thaw, P.S.**  
Professional Surveyor  
Department Head – Survey

Robert Thaw is Department Head for TERRADON's survey operations. Thaw organizes and supervises survey crews; designs commercial sites for drainage, building site locations, parking and utility easements; reviews project plans; and creates base mapping.

Thaw specializes in control surveys (conventional and GPS), topographical surveys, waste management facilities, boundary surveys, site design, gas well locations and permitting, and construction stakeout.

With nearly 25 years of surveying experience, Thaw brings a wealth of knowledge to TERRADON projects and provides solid results to clients.

CORPORATION  
**TERRADON**

"Working with the TERRADON staff is an exceptional experience. They always respond to our needs with urgency and professionalism. Not only do they provide outstanding design engineering services, they continue to support us through construction right up to placing the infrastructure in service. The answer to every question posed to their engineers is 'yes sir, we can do that... how soon do you need it?'"

Jimmy Wriston, P.E.  
Regional Design Engineer  
West Virginia Division of Highways, Engineering Division  
Charleston, WV



## Stonecoal Creek Complex

The Stonecoal Creek Complex project is located along Stonecoal Creek, near the community of Lillybrook, in southern Raleigh County. The site consisted of numerous coal refuse piles and open mine portals which occupied approximately 66 acres of conglomerate land area. All the refuse piles had areas of steep, unstable slopes; the primary source of a very high sediment load to Stonecoal Creek. The subsequent sediment deposits in Stonecoal Creek resulted in a significant reduction of the flow-carrying capacity of Stonecoal Creek, resulting in more frequent flooding of adjacent areas. The open mine portals were easily accessible and represented a significant life safety hazard from roof falls, potential deadly gases, and other hazards.

The purpose of this reclamation program was to regrade the refuse piles to stable slopes, provide proper stabilization with vegetative cover and permanent drainage channel improvements, and seal open mine portals. Generally, the refuse piles were regraded to stable slopes and permanent drainage patterns were established, relocating portions of Stonecoal Creek where necessary. Where refuse piles toe into the creek, stream bank protection was provided. The open mine portals

were closed with an appropriate mine seal. All disturbed areas were revegetated or otherwise stabilized with structural methods.

## KEY RESOURCES

**John James, P.E.**  
Professional Engineer  
Department Head – Geotechnical

James is TERRADON's senior engineer for various geotechnical, environmental, and mining projects. James has a solid background in AML work, as he has been involved in a number of AML engineering projects.

Prior to joining TERRADON in 2004, Mr. James was the proprietor of James Engineering, a one-man consulting engineering company with projects in geotechnical, hydrological, environmental, foundation, structural and general civil engineering, as well as forensic engineering.

James specializes in innovative and cost saving concepts for his projects. Typical projects include numerous foundation investigations, studies and designs for landfills and environmental facilities, surface and ground water studies and remediation, foundation investigations and designs ranging in size from houses to major industrial complexes, roads, highways and bridges, earth and rock fill dams, storm drainage facilities, airport facilities, landslide analysis and correction, and forensic engineering.

## Stonecoal Creek Complex #2

The Stonecoal Creek Complex project is located along Stonecoal Creek, near the community of Lillybrook, in southern Raleigh County. The site consisted of eight coal refuse piles and twelve open mine portals. All the refuse piles had areas of steep, unstable slopes; they are the primary source of a very high sediment load to Stonecoal Creek. The subsequent sediment deposits in Stonecoal Creek had resulted in a significant reduction of the flow-carrying capacity of Stonecoal Creek, resulting in more frequent flooding of adjacent areas. The open mine portals were easily accessible and represent a significant life safety hazard from roof falls, potential deadly gases, and other hazards.

The purpose of this reclamation program was to regrade the refuse piles to stable slopes, provide proper stabilization with vegetative cover and permanent drainage channel improvements, and seal open mine portals. Generally, the refuse piles were regraded to stable slopes and permanent drainage patterns were established, relocating portions of Stonecoal Creek where necessary. Where refuse piles toe into the creek, stream bank protection was provided. The open mine portals were closed, wet seals were placed in the 12 portals consisting of two drainage pipes. Two of the wet seals received cisterns since local residents are using the mine

water. In addition, one of the portals receiving the cistern had a bat gate installed. Two of the remaining 10 wet mine seals received bat gates. Bat gates consisted of either 24 or 36-inch diameter plastic pipe with an angle iron grill. The wet mine seals were stowed with stone and covered with soil.

All disturbed areas were revegetated or otherwise stabilized with structural methods. The access roads to gas wells were maintained and returned to as good or better condition as they were found. Existing utilities were relocated, where necessary.

“Vecellio & Grogan has appreciated TERRADON’s continuous effort in providing us with construction-friendly design support on our bridge projects in West Virginia. Bill White has been a pleasure to work with.”

Matt Farley  
Vecellio & Grogan, Inc.  
Structure Operation Engineer  
Beckley, WV

## KEY RESOURCES

### William (Bill) White, P.E. Professional Engineer

Mr. White has more than twenty years experience as a structural engineer and has a solid background in AML work. His AML experience includes the design of drainage pipe and channels, mine seals, pile and lagging walls, gabion basket retaining walls, and the regrading of refuse piles.

White has a strong background in structural analysis and design of bridge structures as well, including designing various superstructure and substructure types. Superstructure design experience includes post-tensioned concrete box girders, curved plate girders, plate girders, rolled beams, pre-stressed concrete beams and timber. Substructure design experience includes integral abutments, semi-integral abutments, pile supported footings, spread footings, piers and drilled shafts.

His first position was as a Structural Design Engineer for the bridge section of the West Virginia Department of Transportation. While at the West Virginia Department of Transportation, Mr. White also served as a member of the Bridge Design Manual Task Force.

### Stonecoal Creek Complex #3

The Stonecoal Creek Complex project is located along Stonecoal Creek, near the community of Lillybrook, in southern Raleigh County. The site consisted of five coal refuse piles, scattered gob, and six open mine portals. The open mine portals were easily accessible and represent a significant life safety hazard from roof falls, potential deadly gases, and other hazards.

The purpose of this reclamation program was to regrade the refuse piles to stable slopes, provide proper stabilization with vegetative cover and permanent drainage channel improvements, and seal open mine portals. Wet seals were needed in 5 of the portals consisting of two drainage pipes. Discharge from the mine drained into the existing drainage in front of the portal or channeled to the stream. Four of the wet mine seals received bat gates. Bat gates consisted of either 24 or 36-inch diameter plastic pipe with an angle iron grill. There was only one dry mine seal needed on this project. The wet and dry mine seals were stowed with stone and covered with soil.

All disturbed areas were revegetated or otherwise stabilized with structural methods. The access roads to gas wells were maintained and returned to as good or better condition as they were found. Existing utilities were relocated, where necessary. Two piles were to receive permanent access roads. A resident lives at the end of one of the permanent access roads, which remained open.

Several foundations and piers, and railroad trestle abutments were removed.

## KEY RESOURCES

**Bill Gerencir**  
AutoCAD Designer/Technician

Gerencir has more than 18 years experience in the engineering field and more than 16 years experience as a CADD designer for a broad scope of projects. Gerencir is responsible for design, drafting, quantity estimates, and site design.

Gerencir has a wealth of experience on AML projects and has been responsible for all TERRADON AML water feasibility studies during the past 5 years, as well as lead technician for all AML projects.

Gerencir's most recent AML experience includes:

- » Stonecoal Creek Complex #2 - June 2008 (Final)
- » Stonecoal Creek Complex #3 - June 2008 (Final)
- » Jenkin Jones Refuse Piles #1 - July 2008 (Final)
- » Roaring Creek #4 - April 2009 (Final)
- » Morgan Run PA #2 - April 2009 (Final)
- » Drews Creek "A" Highwall - October 2009 (Final)
- » Venus (Hamilton) Drainage - September 2009 (In Review)
- » Sarah Ann (Vance) Drainage - Current

Gerencir's other related experience includes NPDES stormwater permitting, DOH permit preparation, stormwater calculations, layout and design for various projects.

## Jenkin Jones Refuse

The Jenkin Jones project is located near Anawalt, in southern McDowell County. The site consisted of four large coal refuse piles which occupied approximately 75 acres of land area. All the refuse piles had areas of steep, unstable slopes that could slide creating a substantial hazard. In addition, two large buildings were demolished.

The purpose of this reclamation program was to regrade the refuse piles to stable slopes, and provide proper vegetative cover to minimize erosion. Permanent drainage channels were provided to conduct the surface water off of, and around, the refuse piles. Generally, the refuse piles were regraded by excavating back the top portion to original ground while filling the bottom portion to form stable slopes. This required keying the toe into the steep hillside.

The structures consisted of a mine office building and company store with a small warehouse. The structures were built in 1917 by the Pocahontas Fuel Company. The buildings are substantial being constructed of brick, steel, and

concrete. It is likely that some asbestos was used in the construction and asbestos sampling was conducted.

## KEY RESOURCES

**Kevin Sarrett**  
Civil Engineer/CAD Designer

Mr. Sarrett has over 15 years of design experience in all facets of civil engineering. He has been involved in various highway projects located throughout the state of West Virginia and has provided geometric design and right-of-way services. Mr. Sarrett has also provided drainage design for highway projects, and currently he designs all drainage for AML projects for TERRADON. He works closely with Mr. Bill Gerencir to provide quality design plans for AML projects.

**TERRADON**  
CORPORATION

"I want to let you know that John Emmons and I enjoy working with TERRADON and believe you guys are hand-down the best firm in the area. In fact, one of the best I have ever worked with."

Paul Gotta  
Project Manager  
Alan Ives Construction  
Chicago, IL

## Micajah Refuse Pile

The Micajah Refuse Pile project is located in Wyoming County, near Covel, West Virginia. The area was deep mined resulting in two refuse dumps and an open portal. An access road crosses both refuse piles. One access road embankment had a 12-foot diameter culvert. The site was mined by United Pocahontas Coal Company and was last mined in the 1960's. The site is south of Herndon on WV Route 16/2, off of WV Route 10. A frequently used gas well access road crossed the refuse piles.

The refuse piles have steep, unstable side slopes that span the valley and toe out in the creek. During heavy precipitation, refuse eroded from the side slopes and entered the stream. The refuse piles could impound water. Failure of the impoundments could endanger a railroad and public road. One of the piles was burning, creating noxious fumes and possible voids that presented a cave-in hazard. Also an open portal existed that was draining.

The refuse piles were regraded to a stable configuration and stream drainage was channelized across the refuse. Scattered gob was

incorporated into the regraded areas. The access road across the refuse piles was rerouted to a better condition than it was found. Existing gas lines were also relocated. The burning refuse was extinguished. The existing 12-foot steel plate pipe was removed and disposed of. The refuse on the valley floor of this site was "mucked" and backfilled with select rock fill over geotextile to provide a stable foundation for the regarded refuse. The existing portal was closed with a wet seal consisting of a double-block wall and two drainage pipes.

## KEY RESOURCES

**Kevin Garnes**  
AutoCAD Manager  
Design/Technician

Garnes is vastly experienced in the design, specification, development, and preparation of construction documents. His experience includes AML work on a number of projects, including:

- » Pond Gap Extension Water Study in Kanawha County, WV
- » Town Run Water Study in Weston, WV
- » Witcher Creek Water Study in Kanawha County, WV
- » Century Volga Water Study in Barbour County, WV

## Carswell Hollow Refuse Project

The site is located on Carswell Hollow Road, near Kimball, in northeastern McDowell County. The area drains to Laurel Branch, a tributary of Elkhorn Creek, which flows to Tug Fork. The entire project area had been extensively mined over several decades. The project area contained a large, steep, unstable coal refuse pile as well as an area consisting of structures, foundations, retaining walls, deep shafts and a tall smoke stack, from an abandoned mining operation.

The refuse pile was very steep and highly eroded along Laurel Branch. The refuse extended into the creek and was contributing significant sediment loads to the stream. The top of the embankment continues to slough off. The steepness of the eroding slopes represented a significant life safety hazard. The dilapidated buildings, retaining walls and smoke stack created a significant life safety hazard as well. The roof structures were collapsing, walls were in ruin and retaining walls had no fall protection.

The refuse pile was re-graded to establish a stable slope and stream

bank protection was installed to eliminate erosion. All disturbed areas were re-vegetated. The dilapidated structures were demolished and properly disposed. The area was re-graded as well to provide proper drainage and vegetative cover.

### Philip Reed, P.E. Professional Engineer

Mr. Reed has 17 years of experience in many types of civil engineering projects. His emphasis has been on water, wastewater, landfill, land development, geotechnical engineering, and construction management.

Mr. Reed was responsible for the design, permitting, and construction management for several landfill projects. He has also been extensively involved in environmental permitting of coal and quarry facilities and has performed hydrologic evaluations for many land development projects



"I just wanted to thank you and Tom for recommending Phil Reed. We had some minor issues that he was able to take an initial look at and he was very helpful and professional. We will certainly recommend him to others in the future."

Andrea Marano-King, Esq.  
John R. Fowler, PLLC  
Charleston, WV

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## Cedar Creek Refuse

The Cedar Creek Refuse Pile project is located near the former town of Mahan, in Fayette County, West Virginia. The project area was deep mined in three coal seams, No. 2 Gas, Powellton (Eagle "A"), and Eagle, each with open or draining portals. A large refuse pile was located near a portal in the Eagle seam. The site was mined by the Christian Colliery Company and the Carbon Fuel Company. The last mining was by the Carbon Fuel Company in the No. 2 Gas seam in the 1970s. The site is about one half mile south of the Mahan exit of the West Virginia Turnpike on County Route 15. A frequently used gas well access road leads to the refuse pile.

The refuse pile had steep, unstable side slopes which toe out in the creek below. The refuse covers the creek in several locations, creating the potential for impounding water and causing significant amounts of refuse to wash downstream. Additionally, during heavy precipitation, refuse erodes from the side slopes.

The site had multiple portals in all three coal seams, many were draining. The mine drainage from these portals was a contributor to poor water quality on the lower Paint Creek watershed. The roof of the portals, which

remained open were severely weathered and the rock strata was cracked. The partial remains of a brick structure exist at one of the portals.

The refuse pile was excavated and regraded to a stable configuration. The regrade required a valley fill with underdrains and surface water control structures. Exposed refuse received soil cover. The structures were dismantled and removed. The draining portals had wet seals installed after the mine workings were dewatered. The discharge was treated and diverted to the stream. Debris and scrap metal was disposed of properly. All disturbed areas were revegetated.

## KEY RESOURCES

**Tom Kittredge**  
President  
Certified PMP

Kittredge is a second generation family business owner and executive and manages TERRADON Corporation along-side the first generation of the King Family. Kittredge and family operate multiple family-owned businesses ranging from heavy construction to orange orchards, solidifying their familiarity with diversification.

Kittredge is a graduate of the University of Denver. He is a Past President of the Mountain State Chapter of the Young Presidents Organization, the President elect of the Charleston Rotary Club, and a member of the Greater Kanawha Valley Foundation Development Committee.

Additionally, Kittredge is a certified Project Management Professional (PMP) and is responsible for the daily operations of TERRADON Corporation.

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## KEY RESOURCES

**Russ Lester**  
CAD Technician

Mr. Lester has over 20 years of experience in CAD design for various projects. He has been involved in AML projects for over 10 years, in which his experience is in regrading refuse piles, mine drainage conveyance and mine seals.

### Spring Branch Burning Refuse

The Spring Branch Burning Refuse Pile project is located around the former town of Milburn, in Fayette County, West Virginia. The project had three separate sites, each with coal refuse piles. Site one was just below Milburn on Paint Creek, it was a small refuse pile between County Road 15 and Paint Creek. Site two was across Paint Creek from Milburn and about a half-mile up Spring Branch. It had a large refuse disposal area covering about 4 acres and two other refuse areas about two acres each. Site three was about one half-mile above Milburn on Paint Creek, it was a small refuse pile between Interstate 64/77 and the CSX railroad right-of-way.

Refuse Pile No. 1 was regraded to stabilize the slope, covered with soil and revegetated, and had drainage structures installed to prevent erosion.

Refuse Pile No. 2A was excavated, burning refuse extinguished and regraded to a stable configuration. The regrade required a valley fill with underdrains and surface water control structures. The upper area of the pile was removed to original ground due to the steep slopes, thereby requiring the relocation of the gas company access road that crossed the pile. Exposed refuse received soil cover. All disturbed

areas were revegetated.

Refuse Pile No. 2B was removed to original ground. The refuse was hauled to Pile No. 2A and incorporated in the valley fill. Surface water diversion was installed and all disturbed areas were revegetated.

Refuse Pile No. 2C was handled in the same manner as Refuse Pile No. 2B.

Refuse Pile No. 3 was regraded to stabilize the steep slopes, covered with soil and revegetated, and had drainage structures installed to prevent erosion.

Areas on any of the three sites that have trees or shrubs established were direct seeded or soil covered in such a way that did not harm the existing vegetation.

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**“Overall the project finished ahead of schedule and under budget. DEP is very pleased with the project outcome.”**

B.F. Smith, P.E.  
Chief of Administration  
West Virginia Department of Environmental Protection  
Building Project Director (Retired)  
Charleston, WV



## KEY RESOURCES

**Dave Brown, P.S.**  
Professional Surveyor

Mr. Brown has over 15 years of surveying experience and is a licensed surveyor in West Virginia and Tennessee. He has provided surveys for various projects completed by TERRADON. Mr. Brown has been involved in many AML projects completed by TERRADON over the years.

### Lower Burning Creek Refuse

The Lower Burning Creek Refuse project is located at the intersection of U.S. Routes 52 and 52/12 in Mingo County, West Virginia. The project site was approximately one-half mile southeast of the town of Kermit. The site consisted of two ponds, coarse coal refuse disposal areas, foundations of preparation plant and loadout facility, open mine entries, and an unreclaimed highwall.

Two ponds were identified at the site. The ponds were adjacent to each other and next to Lower Burning Creek at the entrance to the site. The ponds appeared to have been sediment control structures and/or water treatment structures. Both ponds had failing outlet pipes and the potential to cause downstream flooding. The embankments of both ponds appeared to be constructed of refuse material. One pond had a seep at its toe that was orange from iron precipitate. Uncontaminated surface water was infiltrating through the refuse material causing acid mine drainage (AMD).

Just upstream from the ponds were the remains of a preparation plant and loadout facility. This area had debris that was potentially hazardous, including old capacitors and scrap metal. There were also deteriorating retaining walls, small refuse piles and abandoned rail lines. Additionally, several old building remains were scattered across the project area.

Coarse coal refuse was primarily disposed in two piles next to Lower Burning Creek. The first was approximately 500 feet upstream of the loadout facility. It was 1.5 acres and as much as 25 feet deep. The pile was restricting the creek as it eroded and slid into the channel.

The second refuse pile was approximately 500 feet upstream from the first. It was 3.5 acres in area and had very little vegetation. The pile was as much as 50 feet deep and had several eroded areas. There was a small illegal dump next to this pile.

The purpose of this reclamation program was to regrade and cover the exposed coal refuse at the site, and seal the open mine portals. Areas of standing water in contact with acidic coal refuse were eliminated. Drainage channels were constructed to minimize contact between runoff and the refuse. The settling ponds (presently inoperative) were removed. Garbage at the site was disposed of properly. All areas with sparse or no vegetation were vegetated.

The approximate area contained within the limits of construction was 50 acres.

## KEY RESOURCES

**Mike Pyles, P.E.**  
Professional Engineer

Pyles is a Senior Project Engineer for various civil and environmental engineering projects with emphasis on water and sewer projects. Pyles bring a wealth of experience to TERRADON including participation on a number of AML projects in his career.

He is responsible for engineering studies, design, contract documents, engineering analysis, computer modeling, regulatory compliance, and permitting with emphasis on public water and sewer systems.

### Venus (Hamilton, R.) Drainage

In the community of Venus, McDowell County, on a steep mountain side, mine drainage is discharging from a collapsed portal. The amount of water flowing from this portal changes from time to time throughout the year. This mine water discharges down the mountain side, on the surface of the ground and also through underground voids, causing damage to the homes and property of the approximate seven (7) homeowners living down slope of this discharge.

A wet seal was designed at the open portal and the drainage from this mine was conveyed into a pipe across the gas well road. A grouted rip rap drainage channel was designed to carry all flow away from the property owners, down the hillside to a point of discharge near the railroad.

### Camp Mahonegan Surface Mine

The Camp Mahonegan Surface Mine project is located along the border of Randolph and Barbour Counties, West Virginia. The problem area included acid mine drainage (AMD) seeping from numerous locations over an area of approximately 100 acres. AMD is believed to be a result of surface mining the Kittanning coal seam by mountaintop mining methods during the 1960s and early 1970s. During mining, the Homewood sandstone overburden was brought to the surface as spoil. This acidic overburden was responsible for sparse vegetation over portions of the site.

TERRADON identified more than 20 locations where AMD seeps impacted surface water. The reclamation plan included constructing both anoxic limestone drains (ALD) and open limestone channels (OLC) to generate alkalinity to buffer the AMD. Two existing ponds had the existing pipe outlets removed, the embankments lowered and new spillways installed. Areas that had standing water were regraded to provide positive drainage. Areas that lacked soil cover and vegetation were covered with soil from borrow areas. All disturbed areas were limed, fertilized, seeded and mulched.

## Black Wolfe Refuse

The Black Wolfe Refuse project is located approximately one mile northwest of the intersection of State Routes 103 and 161 in McDowell County, West Virginia. The project site was approximately three miles southeast of Gary. The site consisted of a 12 acre refuse pile and one smaller pile, five (5) portals, an abandoned tipple and mining equipment. The refuse pile was unstable, as evidenced by slips and erosion, and had already begun to block the stream at the toe of the pile. Three (3) of the portals had large openings with hazardous roof conditions.

Near the center of the project site, there were the remains of a preparation plant and load out facility. This area had debris that was potentially hazardous, including old scrap metal. There were also deteriorating retaining walls, small refuse piles and abandoned rail lines. Additionally, old building remains were scattered around the old preparation area.

Coal refuse had been primarily disposed in two piles. They were approximately 1500 feet upstream of the confluence of the Tug Fork and Doc Branch. The large pile was as much as 50 feet deep and both had several eroded areas which were impacting Doc Branch. There was a small illegal dump next to the large pile.

The purpose of this reclamation program was to regrade and cover the exposed coal refuse at the site, properly seal the mine portals, and remove the building remains. Drainage channels were constructed to minimize uncontrolled runoff and erosion. Garbage at the site was disposed of properly. All areas with sparse or no vegetation were vegetated.

The approximate area contained within the limits of construction was 28 acres.

## KEY RESOURCES

**Bud McCallister, P.E.**  
Professional Engineer

Mr. McCallister is a Senior Project Engineer for various civil and environmental engineering projects with emphasis on water and sewer projects. He is responsible for engineering studies, design, contract documents, engineering analysis, computer modeling, regulatory compliance, and permitting with emphasis on public water and sewer systems.

Mr. McCallister also has previous experience dealing with coal mines and mine related issues.

## Grass Run Refuse

The Grass Run Refuse project is located approximately one mile north of the intersection of Routes 33/3 and 119/19 (Grass Run Road) in Lewis County, West Virginia. The project site was approximately five miles east of Weston. The Grass Run Refuse project included a series of water treatment ponds, coarse coal refuse disposal areas, fine coal refuse slurry ponds, foundations associated with a preparation plant, unreclaimed highwalls, and backfilled mine entries. Acid mine drainage (AMD), high suspended solids, and excessive runoff contributed to poor water quality and flooding along Grass Run, a tributary of Stonecoal Creek.

Coarse coal refuse was disposed at numerous locations over the site. The main disposal area was a valley fill constructed in the north fork of the site. The fill covered approximately 11 acres and contained coal refuse to a depth of over 60 feet. Other coarse coal refuse disposal areas existed in the east fork of the site.

Fine coal refuse was disposed in several slurry ponds. Based on visual observations, disposal of fine coal refuse is evident along the west side of the north fork and in two ponds near the confluence of the north and east forks. The surface area of these ponds was approximately 5 acres.

Several water treatment ponds existed

at the site for sediment control and AMD treatment. Some of these ponds contained water and sediments while others were breached.

The reclamation of the site included regrading areas of coal refuse to provide positive drainage. Areas of coarse coal refuse located in the east fork were regraded. Two breached ponds were covered and developed into wetland areas. Two ponds were rehabilitated to provide stormwater detention to lessen downstream flooding. One pond was covered and vegetated. Dangerous highwalls were eliminated. Surface water channels were constructed to convey runoff through the site. Finally, exposed coal refuse were covered with a 1 foot layer of soil and revegetated.

The approximate area contained within the limits of construction was 120 acres.

## KEY RESOURCES

**Jim Nagy, P.E.**  
Professional Engineer

Mr. Nagy performs civil engineering related to water and waste water projects at TERRADON. He specializes in the design of water treatment and distribution systems.

Nagy has more than 23 years of on-hand experience providing engineering for the largest private water company in West Virginia.

## Tuppers Creek (Layne) Landslide

The Tuppers Creek (Layne) Landslide project is located two miles southeast of the Tuppers Creek exit off Interstate 77 near Charleston, in Kanawha County, West Virginia. The site is accessed by turning right (if coming from Charleston) from the exit ramp onto County Route 26/1. Proceed for approximately 7/10 mile to County Route 26/9 and turn right, the intersection is in a sharp curve to the left. Proceed approximately 7/10 mile to an intersection with an unmarked gravel road in a cluster of houses. Turn right onto the gravel road and proceed toward the head of the hollow. The gravel road splits about 500' from County Route 26/9. The right hand fork follows the creek and leads to the Layne residence (bottom of the landslide). The left hand fork immediately narrows and climbs sharply toward the two Haynes residences. The project area had numerous houses built on and below the Pittsburgh coal seam. Numerous collapsed portals discharge acid mine drainage B killing vegetation and causing landslides. One section of the workings was

known to be completely flooded with other sections suspected to be at least partially flooded. The proximity of residences downstream of the flooded mine workings required that any pooled water be eliminated.

The remedial measures for this project included:

- » Establishing positive drainage around the landslide at the Layne residence.
- » Removal of the landslide material to a waste area.
- » Installing wet mine seals and dewatering the mine workings.
- » Providing positive drainage from the wet mine seals to natural drainage features.
- » Revegetating all disturbed areas.
- » Resurfacing the existing roads in the project area after construction is completed.

## Gerath Landslide

The Gerath Landslide project is located adjacent to the Weston/Buckhannon exit off Interstate 79 near Weston, in Lewis County, West Virginia. The site is accessed by turning left (if coming from Charleston) from the exit ramp onto U.S. Route 33. Proceed for approximately 2/10 mile to County Route 119/16 (Mud Lick Road) and turn left. Proceed approximately 7/10 mile to an intersection with an unmarked dirt road. Turn right onto the dirt road and proceed 3/10 mile to the project site. The project area consisted of three landslides; one above the access road to RPM Salvage and two below. The two slides below the road were blocking the stream below and threatening the stability of the access road. The slide above the road was being addressed in this project.

The remedial measures for this project included:

- » Establishing positive drainage around the landslide.
- » Removal of the landslide material to a waste area.
- » Installing underdrains and riprap buttresses.
- » Revegetating all disturbed areas.
- » Resurfacing the existing road in the project area after construction is completed.

“TERRADON has done a comprehensive engineering program for a 900-acre development in Greenbrier County. TERRADON’s planning, research, knowledge and advice was complete with sound judgment. Before this project was completed, we had also engaged the engineering group to do a 4,000 acre development just North of Boone, NC on the Tennessee/North Carolina State Line.”

Ted H. Thieman, Manager  
Thieman Enterprises, LLC  
Dayton, OH



## Highland Avenue Mine Drainage

The Highland Avenue Drainage Project consisted of replacement of existing mine seals, the addition of an underdrain system, and the replacement of corroded underground sanitary sewer systems. The drainage system installed intercepts and drains subsurface waters from abandoned mine shafts which lie above Nuttal, Clifton, and Highland Avenues in the City of Wheeling, Ohio County, West Virginia.

The problem created a nuisances and property damage from the mineral-laden subsurface seepage onto the residential properties and public streets. This problem

was caused by roof falls and clogged mine drains. Existing mine seals were removed and replaced with new seals and drainage system. A special underdrain system was installed continuously on three parcels to intercept subsurface seepage and prevent further damage to foundation walls and basements. The existing corroded sanitary sewer systems downstream of the problem were replaced to properly transport the intercepted drainage and sewer flows.

## North View Mine Drainage

The North View Mine Drainage project is located in the North View section of Clarksburg, West Virginia. The proposed mine drainage project consisted of interceptor and piping systems, wet mine seals, and a special basement treatment for mine water. Mine water was intercepted just below the coal seam elevation along Richards Avenue on both sides of its intersection with North 18th Street. The intercepted mine water was conveyed through 12 PVC pipe to the existing catch basins at the corners of the intersection. Similarly, water from sealed mine portals about ½ mile away from the above mentioned site was conveyed to the existing storm sewer system.

The wet mine seals were installed after excavating and dewatering the mine portal. During dewatering of the existing mine, the discharge was monitored and treated, as necessary, to meet state and federal discharge limits. The wet seal consists of drainage stone, 12 inch PVC perforated pipe, and a compacted soil cover.

A special basement treatment is required to intercept

seepage at the perimeter and beneath the floor of a garage. The treatment included removing the existing floor and installing both a perimeter drain, and a drainage blanket in the floor area. A new concrete floor was installed over the area drain. These drains collect AMD into a pipe which discharges into the sewer at the end of the driveway. This project solved wet conditions in basements, on roads, and in yards.



## Morgan Run PA#2

The Morgan Run PA #2 project was located in Preston County and contained over twenty (20) open portals, gob piles and drainage associated with open draining portals on Site 1. This site also contained a partially graded gob pile on the opposite side of the road.

Site 2 consisted of one (1) deep mine portal with a borehole at stream level. The borehole was discharging at 25gpm and the associated drainage was running into a creek. A large depression was also located behind the deep mine portal.

The project area was analyzed and a design was completed to correct the problems on both sites. Wet and dry mine seals were designed to close all open portals, and the drainage was conveyed away from the

homes below the site into a channel. All gob piles were regraded as well. A mine seal was designed for the deep mine portal at Site 2 and the open borehole drainage was conveyed into a newly designed channel. Both sites were designed to keep all drainage away from the property and homes below the site.

## Roaring Creek #4

The site consisted of surface mine spoil material that was cast to the outslope and not reclaimed to the original contour. Large areas of unvegetated spoil were found throughout the site. Also, large erosion gullies have developed in several areas which is causing spoil and fines to wash into Roaring Creek.

The landowner, Marshall Walls, raises horses and he is very concerned about the highwalls and spoil areas. One horse broke its leg and had to be destroyed. Mr. Walls has two small children and he is concerned about their safety on the areas of the farm that was mined.

The 63 acre site was graded in the design phase to remove the highwalls and revegetation was included in the design. In addition, all drainage on the site was directed to new channels and conveyed away from the problem areas. Underdrain was also utilized in the design.

"TERRADON has done a fantastic job of engineering several residential developments in our area. As real estate brokers, we can readily appreciate the creativity and functionality of their design work."

Richard Grist  
Foxfire Mountain Properties  
Lewisburg, WV





## Proposal Information

Submitted by:

### **TERRADON Corporation**

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