



# West Virginia Purchasing Division

2019 Washington Street, East  
Charleston, WV 25305  
Telephone: 304-558-2306  
General Fax: 304-558-6026  
Bid Fax: 304-558-3970

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

## Header

List View

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

Procurement Folder: 114103

SO Doc Code: CEOI

Procurement Type: Central Contract - Fixed Amt

SO Dept: 0313

Vendor ID:

SO Doc ID: DEP1600000002

Legal Name: HATCH MOTT MACDONALD LLC

Published Date: 10/20/15

Alias/DBA:

Close Date: 11/3/15

Total Bid: \$0.00

Close Time: 13:30

Response Date:

Status: Closed

Response Time:

Solicitation Description:

Total of Header Attachments: 0

Total of All Attachments: 0



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

**State of West Virginia  
 Solicitation Response**

**Proc Folder :** 114103  
**Solicitation Description :** Addendum 03 EOI Bickmore Refuse #2  
**Proc Type :** Central Contract - Fixed Amt

Date issued	Solicitation Closes	Solicitation No	Version
	2015-11-03 13:30:00	SR 0313 ESR11021500000001906	1

<b>VENDOR</b>
000000118287 HATCH MOTT MACDONALD LLC

**FOR INFORMATION CONTACT THE BUYER**  
 Beth Collins  
 (304) 558-2157  
 beth.a.collins@wv.gov

Signature X	FEIN #	DATE
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All offers subject to all terms and conditions contained in this solicitation

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

Comm Code	Manufacturer	Specification	Model #
81100000			

**Extended Description :** \*Dates of service are estimated for bidding purposes only.



**Expression of Interest  
for  
Professional Engineering  
Design Services for the  
Bickmore Refuse #2 Design  
Clay County, WV**

**RFQ # DEP16396**





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

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

Proc Folder: 114103

Doc Description: Addendum 03 EOI Bickmore Refuse #2

Proc Type: Central Contract - Fixed Amt

Date Issued	Solicitation Closes	Solicitation No	Version
2015-10-20	2015-11-03 13:30:00	CEOI 0313 DEP1600000002	4

**BID RECEIVING LOCATION**

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

**VENDOR**

**Vendor Name, Address and Telephone Number:**

Hatch Mott MacDonald, LLC  
 Attn: Jeremiah C. Cline, PE  
 12 Rousch Lane  
 Morgantown, WV 26501  
 304.212.4390

**FOR INFORMATION CONTACT THE BUYER**

Beth Collins  
 (304) 558-2157  
 beth.a.collins@wv.gov

Signature X

FEIN # 22-3831806

DATE 10.21.2015

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

**ADDITIONAL INFORMATION:****Addendum No.03**

This addendum is issued to modify the solicitation per the attached documentation and the following:

1. To publish answers to vendor submitted questions.

Bid opening date will not change and will remain as November 3, 2015 at 1:30 PM, EST.

No other changes.

**Addendum No. 02**

This addendum is issued to modify the solicitation per the attached documentation and the following:

1. To modify the bid opening date to November 3, 2015 at 1:30PM, EST.

No other changes.

**Addendum No. 01**

This addendum is issued to modify the solicitation per the attached documentation and the following:

1. To correct a legal advertisement error.

2. To change the question submittal deadline to September 25, 2015 at 5:00 PM, EST

3. To modify the bid opening date to October 8, 2015 at 1:30 PM, EST

No other changes.

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 for the Bickmore Refuse #2 project in Clay County, West Virginia, per the attached bid requirements and specifications.

INVOICE TO	SHIP TO
ENVIRONMENTAL PROTECTION OFFICE OF AML&R 601 57TH ST SE CHARLESTON WV25304 US	ENVIRONMENTAL PROTECTION OFFICE OF AML&R 601 57TH ST SE CHARLESTON WV 25304 US

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

Comm Code	Manufacturer	Specification	Model #
81100000			

**Extended Description :**

\*Dates of service are estimated for bidding purposes only.

**SCHEDULE OF EVENTS**

Line	Event	Event Date
1	Tech Questions Deadline at 5:00 PM, EST	2015-08-31
2	Revised Tech Question Deadline at 5:00 PM, EST	2015-09-25

<b>DEP160000002</b>	<b>Document Phase</b> Final	<b>Document Description</b> Addendum 03 EOI Bickmore Refu se #2	<b>Page 3</b> <b>of 3</b>
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**ADDITIONAL TERMS AND CONDITIONS**

See attached document(s) for additional Terms and Conditions

**CERTIFICATION AND SIGNATURE PAGE**

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

Hatch Mott MacDonald, LLC  
(Company)

 Richard L. Steinhart, Senior VP  
(Authorized Signature) (Representative Name, Title)

T 412.497.2910    F 412.497.2940    10.21.2015  
(Phone Number) (Fax Number) (Date)

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

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

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

**Addendum Numbers Received:**

(Check the box next to each addendum received)

- |  |  |
|--|--|
| <input checked="" type="checkbox"/> Addendum No. 1 | <input type="checkbox"/> Addendum No. 6  |
| <input checked="" type="checkbox"/> Addendum No. 2 | <input type="checkbox"/> Addendum No. 7  |
| <input checked="" 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.

\_\_\_\_\_  
Hatch Mott MacDonald, LLC

Company



\_\_\_\_\_  
Richard L. Steinhart, Senior VP

Authorized Signature

\_\_\_\_\_  
10.21.2015

Date

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.

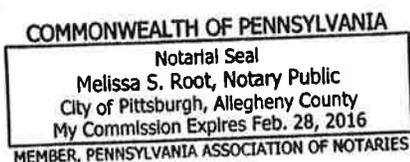
**"Employer default"** means having an outstanding balance or liability to the old fund or to the uninsured employers' fund or being in policy default, as defined in W. Va. Code § 23-2c-2, failure to maintain mandatory workers' compensation coverage, or failure to fully meet its obligations as a workers' 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: Hatch Mott MacDonald, LLCAuthorized Signature:  Richard L. Steinhart, Senior VP Date: 10.21.2015State of PennsylvaniaCounty of Allegheny, to-wit:Taken, subscribed, and sworn to before me this 29 day of October, 2015.My Commission expires February 28, 2016.

AFFIX SEAL HERE

NOTARY PUBLIC Melissa S. Root

**Cover Letter**

**Section 1 – Corporate History & Experience**

**Section 2 – CCQQ – Attachment “B”**

**Section 3 – RPEM – Attachment “C”**



October 21, 2015

Ms. Beth Collins  
West Virginia Department of Environmental Protection  
Purchasing Division  
2019 Washington Street East  
Post Office Box 50130  
Charleston, WV 25305-0130

**RE: RFQ # DEP16396  
Expression of Interest for Professional Engineering Design Services  
for Bickmore Refuse #2 Design  
Clay County, WV**

Dear Ms. Collins:

Hatch Mott MacDonald (HMM) is pleased to submit this Expression of Interest to provide professional engineering and related services for the West Virginia Abandoned Mine Lands (AML) and Reclamation Program. This project focuses on reclamation design which is a core discipline for HMM. Our experienced team has successfully completed many projects to address similar issues throughout the region.

HMM employs a staff of 2,700 and is widely recognized as one of the top rated engineering firms in the country. We have two offices in West Virginia. Professional staff in our Morgantown and Charleston offices collectively has amassed more than 100 years of design and project management experience with AML design projects of various types.

HMM has previously provided engineering services on several projects for WVDEP-AML that are very similar in scope to this project. We have experience and back up data of the most current and up to date design details and specifications being utilized on your projects. Our experienced staff have repeatedly demonstrated HMM's capabilities and commitment to excellence, customer service and efficient project execution to deliver projects on time and within budget expectations.

We appreciate the opportunity to submit this Expression of Interest and look forward to continuing our working relationship.

Respectfully submitted,

**Hatch Mott MacDonald**

**Richard L. Steinhart, PE**  
**Senior Vice President**  
T 412.497.2910 F 412.497.2940  
[richard.steinhart@hatchmott.com](mailto:richard.steinhart@hatchmott.com)

**Jeremiah C. Cline, PE**  
**Engineer**  
T 304.212.4384 F 724.873.9116  
[jeremiah.cline@hatchmott.com](mailto:jeremiah.cline@hatchmott.com)

[corporate history & experience]

## INTRODUCTION

With a lineage stretching back over a century, involvement in the design and construction of the most ambitious infrastructure projects and a multi-disciplined staff with comprehensive engineering skills, Hatch Mott MacDonald (HMM) possesses the practical knowledge and experience needed to meet the technical challenges of any given project. Our approach is strictly client-focused – with a corporate commitment to engineering excellence. HMM provides services for all aspects of engineering projects, from feasibility studies and surveys through design, to project and program management, construction management and supervision, start-up and operations.

## LOCAL OFFICES

HMM is headquartered in Iselin, New Jersey and has many offices throughout North America. Regionally, our offices are located at:

201 Pennsylvania Ave Suite 400 Charleston, WV 25302 T:304.356.3010 F: 304.357.9222	12 Rousch Dr Morgantown, WV 26501 T 304.212.4390 F 724.873.9116	Gateway View Plaza 1600 West Carson Street Pittsburgh, PA 15219 T 412.497.2900 F 412.497-2901
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## CONSULTING AREAS

The resources of HMM are available through the following consulting areas:

- ◆ Construction Engineering Services
- ◆ Contract Operations
- ◆ Environmental Compliance & Remediation
- ◆ Environmental Site Assessment & Remediation
- ◆ Geographical Information Systems
- ◆ Hazardous Waste Management
- ◆ Hydraulic Infrastructure Evaluation & Rehabilitation
- ◆ Hydrogeological Services
- ◆ Industrial Wastewater Management
- ◆ Information Technology & Management
- ◆ Mining Environmental Services
- ◆ Municipal Engineering and Planning
- ◆ Pipeline Services
- ◆ Rails-To-Trails Projects
- ◆ Recreational Facilities
- ◆ Recycling/Solid Waste Management
- ◆ Site Development Engineering
- ◆ Storage Tank Management
- ◆ Stormwater & Watershed Management
- ◆ Transportation Engineering
- ◆ Wastewater Engineering and Management
- ◆ Water Supply Management
- ◆ Wetland / Ecological Studies

## STAFFING

Hatch Mott MacDonald was formed as a joint venture between Hatch Associates of Canada, a leading design engineering firm, and Mott MacDonald, headquartered in London, an infrastructure and education consulting engineering firm. The combined resources of Hatch Associates and Mott MacDonald offer a worldwide engineering staff of over 25,000 people. In 2001, HMM acquired the environmental consulting firm of Killam Associates to offer water, wastewater and environmental services throughout North America. Our total US staff is now approximately 2,500 engineers, scientists and technical support personnel.

## MANAGEMENT STRATEGIES

HMM uses the “Project Team” approach to efficiently manage and complete projects on time and within specified budgets. A Project Manager directs the team and interfaces with the client to ensure an uninterrupted flow of information. Capable managers draw upon the versatile personnel at HMM to provide pertinent technical knowledge relative to a particular project.

Hatch Mott MacDonald’s engineering professionals are fully supported by extensive computer resources (CADD, graphics, and an Information Technology staff), and highly trained field crews for surveying and environmental sampling and monitoring.

From the analysis stage to project implementation, the professional staff of HMM provides clients with cost-effective engineering and planning solutions for their environmental problems. HMM’s outstanding reputation is based upon dedicated service to clients and demonstrated technical abilities.

Hatch Mott MacDonald is proud of its established reputation, which is based on efficient project management, technical expertise, and knowledge of regulatory requirements. These features are reflected in HMM’s success at maintaining long-term client relationships. Experienced staff and an organizational approach make HMM extremely competent in meeting a client’s needs, now and in the future.

The Morgantown office is able to provide one to two different design teams simultaneously, and the Charleston office is currently staffed to provide one to two design teams. These teams generally consist of a Project Engineer and the necessary design, drafting, and support staff.

## EXPERIENCE AND QUALIFICATIONS

Hatch Mott MacDonald (HMM) is a full-service consulting engineering firm offering both public and private clients a complete range of services from conceptual, feasibility/ planning studies and environmental assessment through preliminary and detailed design to procurement, construction engineering inspection and project and construction management services, as well as operations and maintenance. Headquartered in New Jersey, HMM has hundreds

of staff located in the northeast and Mid-Atlantic regions. More than 2,700 employees in 70+ offices throughout the U.S. and Canada will support the local staff. This project will be performed from our Morgantown, WV office.

Our resources in the Appalachian Coal region have grown steadily over the past few years. HMM's focus on mining services has led to a staff of over 50 individuals in this service area. More specifically, the Charleston and Morgantown offices have over 20 staff members dedicated directly to the mining and energy service area, including engineers, geologists, biologists, scientists, and support staff. This growth is attributed to our corporate commitment to the industry and the values established by HMM. Hatch, one of our parent companies, has been in business for 60 years and focuses on mining services on an international level.

## Mining Environmental Services

HMM offers a full spectrum of mining and mining-related environmental and design engineering services. Successfully completed projects range from reserve analyses, permitting and feasibility studies to complex mining and reclamation plans for surface and underground mining installation, prep plants and refuse handling facilities. Versatility is demonstrated by a proven ability to work with large and small operators. Personnel are accustomed to communicating effectively with both multi-department international companies and sole proprietors.



### Surface Mining

- ◆ Surface Mining Permits
- ◆ Auger Mining Permits
- ◆ Feasibility Studies
- ◆ Land Reclamation & Remediation
- ◆ Permit Transfers
- ◆ Pre-Blast Surveys
- ◆ Acid Mine Discharge (AMD) Remediation

### Underground Mining

- ◆ Deep Mine Permits
- ◆ Mine Design & Mapping
- ◆ Ventilation Plans
- ◆ Subsidence Plans
- ◆ Surface Support Plans
- ◆ Air Shaft Design & Coordination
- ◆ Incidental Boundary Revisions (IBR)
- ◆ Pre-Subsidence Surveys

### Support Facilities

- ◆ Preparation Plant Permits
- ◆ Coal Yard & Loadout Permits
- ◆ Refuse Pile Reprocessing Permits
- ◆ Site Planning
- ◆ Air Quality Permits
- ◆ Coal Refuse/Fly Ash Permits
- ◆ Coal Refuse/Fresh Water Impoundments
- ◆ Portal Facilities Design & Construction Management

### Mine Planning

- ◆ Geological Exploration
- ◆ Reserve Studies
- ◆ Economic Evaluations
- ◆ Aerial Mapping
- ◆ Drilling
- ◆ Environmental Site Assessment
- ◆ Natural Stream Design
- ◆ Stream Mitigation



### Professional Surveying

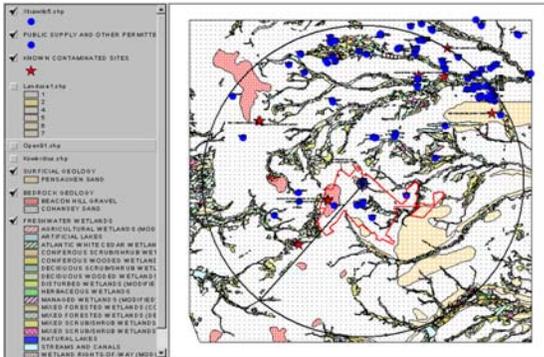
- ◆ Underground Coal Mine Surveys
- ◆ Stockpile Volumetric Surveys
- ◆ Construction Surveys
- ◆ Boundary Retracement
- ◆ Topographic Surveys
- ◆ Horizontal & Vertical Control Networks
- ◆ GIS/GPS Surveys

### Operations Support

- ◆ Small Operator Assistance Program (SOAP) Preparation
- ◆ Thermal-graphic Equipment Analyses
- ◆ Machine & Equipment Appraisal & Analyses
- ◆ Conveyor System Analyses
- ◆ Electrical System Analyses

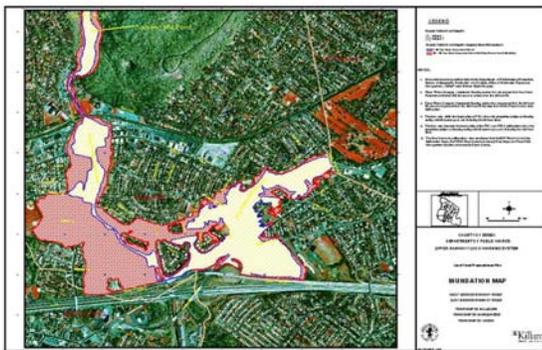
## Geographic Information Systems

Over the last decade, HMM has responded to its clients' growing needs for Geographical Information System (GIS) through investments in software, hardware and employee training. The ability of GIS to integrate central databases with mapping that can be shared throughout an organization is making this information technology a standard for government agencies, utilities and private companies. HMM provides a full range of GIS services in the areas of: water/wastewater utility, stormwater utility, municipal government, hydrology and hydraulics, and natural resources.



### Software Applications

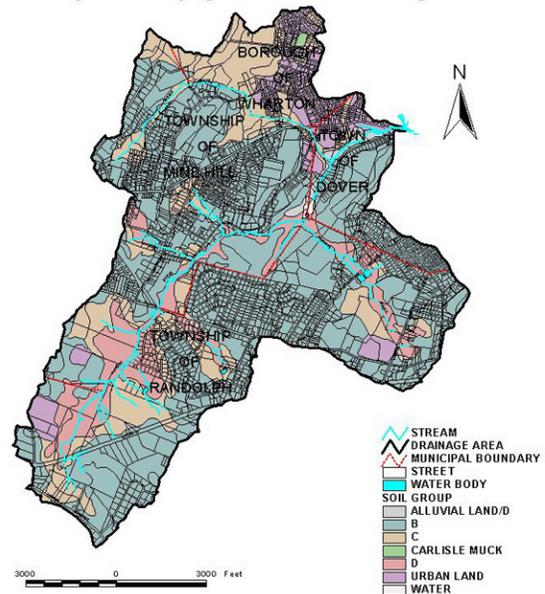
- ◆ ARC/INFO©
- ◆ ArcView©
- ◆ ArcCAD
- ◆ ArcFM
- ◆ AutoCAD/AutoCAD Map
- ◆ Microstation



### Software Capabilities

- ◆ Infrastructure Modeling
- ◆ Document Management
- ◆ Hydrologic/Hydraulic Modeling
- ◆ Groundwater Modeling
- ◆ Coordinate Geometry (COGO)
- ◆ Geographical Positioning Systems (GPS)
- ◆ Digital Elevation/Terrain Modeling
- ◆ Integration of Third Party Modeling Software
- ◆ Internet/Intranet

Major Soil Grouping In Jackson Brook Drainage Area



### Hardware Resources

- ◆ Oce Colorwave 300 and 450 Plotters
- ◆ Dell Precision Workstation 5810 (Quad-Core Intel Processors with 32 GB RAM)
- ◆ GigE Network through Dell PowerEdge R430 Server
- ◆ RAID-5 Array and ShadowCopy for Data Storage
- ◆ Canon ImagePRESS C700 Printer with Fiery

## Construction Engineering Services

HMM's established reputation in providing construction observation and project management services is based upon the firm's experienced professionals' technical expertise and knowledge of the construction field. Interaction with the firm's various design teams is undertaken so that the latest technologies will be implemented with the highest efficiency. State-of-the-art laser and computerized surveying equipment and techniques are employed for data gathering, processing, reporting and construction control.



### Facilities

- ◆ Wastewater & Water Treatment Facilities
- ◆ Mining Facilities
- ◆ Biosolids Removal Facilities
- ◆ Pumping Stations
- ◆ Dams & Dikes
- ◆ Materials Recycling Facilities
- ◆ Solid Waste Transfer Stations
- ◆ Vehicle Maintenance Facilities
- ◆ Parking Garages
- ◆ Storage Facilities
- ◆ Airport Hangars & Terminals
- ◆ Office & Administration Buildings
- ◆ CSO & SSO Rehabilitation
- ◆ Sanitary Sewers & Water Mains
- ◆ Recreational Facilities

### Project Management

- ◆ CPM Scheduling Review
- ◆ Cost Controls
- ◆ Shop Drawing Review
- ◆ Payment Requests Processing
- ◆ Change Order Management
- ◆ Record Plan Preparation
- ◆ Claims Avoidance/Dispute Resolution
- ◆ Progress Meetings
- ◆ Information Management

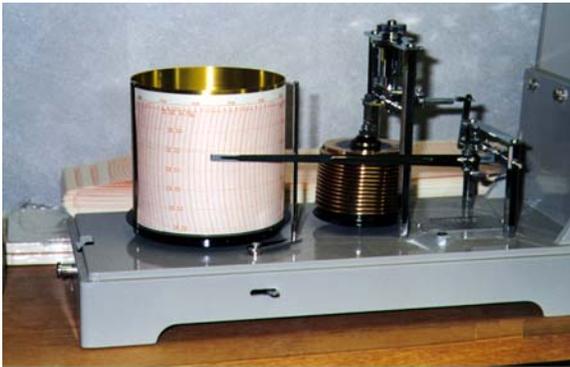


### Resident Engineering

- ◆ Construction Surveys
- ◆ Construction Observation
- ◆ Concrete Testing & Inspection
- ◆ Safety Monitoring

## Hydrogeological Services

HMM's hydrogeological specialists are employed on a wide range of projects, from small urban properties to entire watersheds. The majority of our staff holds advanced degrees and are registered professionals. They evaluate and develop groundwater resources; delineate contamination and predict impacts on human and ecological receptors; provide the technical basis for the design of subsurface wastewater disposal, construction dewatering and aquifer remediation systems; generate hydrogeologic models, frame computer simulations and perform statistical analyses for risk assessments and resource prospecting; provide full technical assistance in permitting in all these areas; provide peer review for the work of outside hydrogeologists; advise legal counsel and provide expert testimony.



### Groundwater Resources

- ◆ Resource Evaluations
- ◆ Water Allocation Permits
- ◆ Well-Head Protection Area Delineation
- ◆ Diversion Impact Assessments

### Dewatering

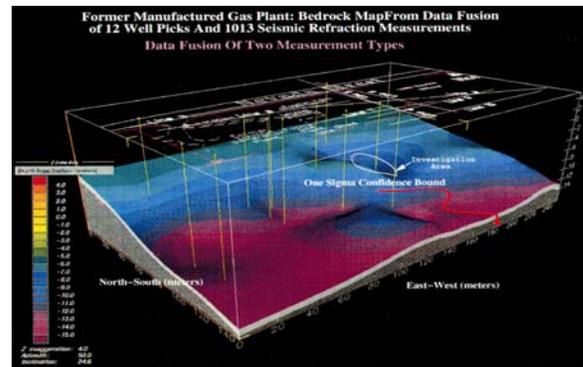
- ◆ Dewatering System Design
- ◆ Temporary Water Allocation Permits
- ◆ Dewatering Permits-by-Rule

### Discharge to Groundwater

- ◆ Hydraulic Mounding Analysis
- ◆ Discharge to Groundwater Permits
- ◆ Dilution Modeling

### Remedial Design

- ◆ Plume Control
- ◆ Treated Wastewater Disposal System Design
- ◆ Contaminant Fate & Transport Modeling
- ◆ Technical Support for Natural Remediation
- ◆ Aquifer Reclassification
- ◆ Ground Water Chemistry
- ◆ Expert Testimony
- ◆ Peer Review



### Landfill Investigations

- ◆ Leachate Generation & Control Modeling
- ◆ Landfill Gas Venting System Design
- ◆ Aquifer Impact Assessments

### Aquifer Investigations

- ◆ Pumping Test Design & Analysis
- ◆ Aquifer Modeling
- ◆ Simulation of Groundwater Flow
- ◆ Aquifer/Surface Water Interaction Analyses

## Environmental Compliance Services

Effective management of ongoing environmental compliance issues is often difficult, especially as many companies continue to cutback on non-production personnel. As a result, many EH&S managers find themselves overloaded with multiple tasks. HMM can be a valuable resource that EH&S managers can use to more effectively and efficiently manage their company's environmental obligations, stay up-to-date with current state and federal regulatory trends, identify areas where cost-effective waste reduction measures can be implemented, and receive an objective third-party review of the company's environmental compliance level and/or liabilities. HMM can add value to the company's bottom line and help the management team to refocus resources on product quality and customer service, while staying abreast of regulatory changes and compliance issues.

### Periodic Reporting

- ◆ Annual SARA Reports (312/313)
- ◆ Annual Air Emission Reports
- ◆ Monthly DMR Sampling / Reports
- ◆ POTW Pretreatment Sampling / Reports
- ◆ Hazardous Waste Biennial Reports
- ◆ Residual Waste Biennial Reports
- ◆ Chemical Analysis of Wastes
- ◆ Source Reduction Strategies
- ◆ Storage Tank Registrations / Inspections



### Air Quality

- ◆ RFD Applications
- ◆ Plan Approval Applications
- ◆ Title V Permit Applications
- ◆ PSD / Permit Modifications
- ◆ System Testing / Balancing

### Contingency Planning

- ◆ Environmental Compliance Audits
- ◆ SPCC Plan Preparation / Recertification
- ◆ PPC Plan Preparation / Recertification
- ◆ Environmental Emergency Response Plans
- ◆ Storm Water Pollution Prevention Plans
- ◆ Hazard Communication Plans
- ◆ Risk Management Plans
- ◆ Training

### Wastewater Management

- ◆ NPDES Part I/ Part II Permit Applications
- ◆ POTW Permit Applications
- ◆ Storm Water Runoff Permit Applications
- ◆ Treatment Plant Troubleshooting
- ◆ Toxicity Reduction Evaluations



## Ecological Services

Hatch Mott MacDonald provides a wide range of scientific and environmental expertise needed to successfully address complex environmental problems and to design practical, cost-effective solutions. HMM is committed to assisting its clients by guiding projects through both the regulatory process and the construction phase utilizing cost effective design and engineering while protecting and enhancing the environment. We have provided ecological services to many types of clients including public and private utilities, state and municipal authorities and agencies, commercial site developers, energy companies, residential and other private property owners, municipalities and institutions. Our scientists and field technicians have the necessary technical expertise required to design and execute ecologically-focused surveys and studies and the capability to set a strategic course of action for projects to be successfully licensed and permitted at all regulatory levels.



### Regulatory Compliance

- ◆ Agency Consultation and Coordination
- ◆ Ecological Resources Policy Development
- ◆ Environmental Audits
- ◆ Environmental Compliance Inspection
- ◆ Environmental Impact Statements and Assessments
- ◆ Environmental Monitoring
- ◆ Environmental Risk Assessment
- ◆ Expert Testimony and Litigation Support
- ◆ Federal, State and Local Permitting

### Environmental Technology

- ◆ Bioengineering
- ◆ Bioremediation and Phytoremediation
- ◆ Engineered Wetlands for Water Treatment
- ◆ Ecological Restoration



### Ecological Resource Surveys/Studies

- ◆ Biota and Ecosystem Baseline Surveys
- ◆ Ecological Resource Management
- ◆ Ecological Risk Assessment
- ◆ Habitat Evaluation and Assessment
- ◆ Rare, Threatened and Endangered Species Assessment
- ◆ Soils, Sediments and Water Quality Investigations
- ◆ Wetland Delineation and Assessment
- ◆ Wetland Mitigation, Replication and Monitoring



### Other Related Services

- ◆ Erosion and Sedimentation Control Plans
- ◆ GPS Survey
- ◆ GIS Applications
- ◆ Stormwater Management Plans
- ◆ Vegetation Management Plans
- ◆ Landscape Planting Plans

## Environmental Site Assessment and Remediation

For nearly two decades, HMM has performed Phase I/Phase II environmental site assessments at hundreds of sites. They have consulted with multi-national and local buyers of property, assisting them with their due diligence efforts prior to acquisition of new companies or properties. On properties where contamination is present in excess of acceptable levels, HMM has designed and implemented remediation measures. Such remediation projects have been completed under a variety of environmental programs, including CERCLA (Superfund), RCRA Corrective Action, ISRA, Pennsylvania Act 2 and other state Brownfield programs. Projects have been completed on numerous sites that have soil and/or groundwater contaminated with chlorinated solvents, petroleum from leaking storage tanks, heavy metals, PCBs, and other organic compounds. Our design engineers are specialists in groundwater collection and treatment, waste removal and facility closure design, and our field staff is fully equipped and instrumented, and appropriately trained and medically monitored.



### Environmental Site Assessments

- ◆ Phase I Site Assessments (ASTM)
- ◆ Transaction Screening Assessments
- ◆ Phase II Site Investigations
- ◆ Geophysical Surveys
- ◆ Monitoring Well Installations/Borings
- ◆ Soil, Air & Water Sampling
- ◆ Waste Sampling & Characterization
- ◆ Groundwater Flow Modeling
- ◆ Contaminant Transport Modeling
- ◆ QA/QC Plans



### Remedial Design

- ◆ Feasibility Studies / Alternatives Analysis
- ◆ Physical/Chemical Treatment
- ◆ Biological Treatment
- ◆ Thermal Treatment
- ◆ Recovery Well Designs
- ◆ Soil Vapor Extraction
- ◆ Air Sparging
- ◆ Hydraulic Containment
- ◆ Closure Plans
- ◆ Pilot & Demonstration Programs
- ◆ Cost Estimating
- ◆ Risk Based Corrective Action
- ◆ Natural Remediation Compliance Plans
- ◆ Permitting



### Site Remediation

- ◆ Contract Administration
- ◆ Construction Oversight Services
- ◆ System Operations & Maintenance
- ◆ Closure Reporting
- ◆ Post-Remediation Monitoring
- ◆ Expert Testimony

## Water Supply Management

HMM has demonstrated a unique combination of talent and experience in meeting hydraulic and water supply engineering challenges for over 60 years. The firm has demonstrated particular strength and developed broad experience in water system planning, hydraulic analysis, design, rehabilitation and implementation. We can provide a full range of water supply management services including hydraulic analyses, planning and feasibility studies, preliminary and final designs, preparation of contract drawings and specifications, construction cost estimates, time schedule outlines, bid analyses, complete resident engineering services during project construction and development of operation and maintenance manuals, as well as start-up assistance and operator training.



### Planning

- ◆ Master Planning for Water Supply & Treatment
- ◆ Resource Management
- ◆ Resource Inventories
- ◆ Grant & Loan Application Assistance

### Construction Services

- ◆ Field Services
- ◆ Liaison Representation
- ◆ Construction Management
- ◆ Contract Administration



### Investigative Studies

- ◆ Hydraulic Analysis
- ◆ System Pressure & Fire Flow Analysis
- ◆ Water Quality Treatability
- ◆ Rate Studies
- ◆ Feasibility Studies
- ◆ Valuations
- ◆ Expert Testimony



### Design

- ◆ Water Supply
- ◆ Water Treatment
- ◆ Air Stripping
- ◆ Pumping Stations
- ◆ Transmission & Distribution Pipelines
- ◆ Storage Facilities
- ◆ Rehabilitation
- ◆ Treatment Plant Optimization & Management

[CCQQ – Attachment “B”]

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

**Attachment "B"**

PROJECT NAME <b>Bickmore Refuse #2</b>		DATE (DAY, MONTH, YEAR) <b>10/21/2015</b>	FEIN <b>22-3831806</b>																																				
1. FIRM NAME <b>Hatch Mott MacDonald LLC</b>		2. HOME OFFICE BUSINESS ADDRESS <b>111 Wood Avenue South Iselin, NJ 08830-4112</b>	3. FORMER FIRM NAME <b>Hatch Associates Consultants, Inc. (Est. 1955) Mott MacDonald Group (Est. 1902)</b>																																				
4. HOME OFFICE TELEPHONE <b>973-379-3400</b>	5. ESTABLISHED (YEAR) <b>1972</b>	6. TYPE OWNERSHIP Individual <b>Corporation</b> Partnership Joint-Venture	6a. WV REGISTERED DBE (Disadvantaged Business Enterprise) YES <b>NO</b>																																				
7. PRIMARY AML DESIGN OFFICE: ADDRESS/ TELEPHONE/ PERSON IN CHARGE/ NO. AML DESIGN PERSONNEL EACH OFFICE <b>12 Rousch Drive, Morgantown, WV 26501, 304-212-4390, Douglas R. Amos, Area Manager/ Morgantown - 28</b>																																							
8. NAMES OF PRINCIPAL OFFICERS OR MEMBERS OF FIRM <b>Richard L. Steinhart, PE, Senior Vice President</b>		8a. NAME, TITLE, & TELEPHONE NUMBER - OTHER PRINCIPALS <b>Douglas R. Amos, Senior Associate, Principal Project Manager (862) 236-1176</b>																																					
9. PERSONNEL BY DISCIPLINE																																							
<table style="width:100%; border:none;"> <tr> <td style="width:25%;">— <u>19</u> ADMINISTRATIVE</td> <td style="width:25%;">— <u>5</u> ECOLOGISTS</td> <td style="width:25%;">— <u>3</u> LANDSCAPE ARCHITECTS</td> <td style="width:25%;">— <u>97</u> STRUCTURAL ENGINEERS</td> </tr> <tr> <td>— <u>12</u> ARCHITECTS</td> <td>— <u>0</u> ECONOMISTS</td> <td>— <u>46</u> MECHANICAL ENGINEERS</td> <td>— <u>409</u> SURVEYORS</td> </tr> <tr> <td>— <u>0</u> BIOLOGIST</td> <td>— <u>54</u> ELECTRICAL ENGINEERS</td> <td>— <u>4</u> MINING ENGINEERS</td> <td>— <u>86</u> TRAFFIC ENGINEERS</td> </tr> <tr> <td>— <u>390</u> CADD OPERATORS</td> <td>— <u>69</u> ENVIRONMENTALISTS</td> <td>— <u>0</u> PHOTOGRAMMETRISTS</td> <td>— <u>980</u> OTHER</td> </tr> <tr> <td>— <u>8</u> CHEMICAL ENGINEERS</td> <td>— <u>18</u> ESTIMATORS</td> <td>— <u>14</u> PLANNERS:</td> <td></td> </tr> <tr> <td>— <u>282</u> CIVIL ENGINEERS</td> <td>— <u>26</u> GEOLOGISTS</td> <td>  URBAN/REGIONAL</td> <td></td> </tr> <tr> <td>— <u>256</u> CONSTRUCTION INSPECTORS</td> <td>— <u>0</u> HISTORIANS</td> <td>— <u>26</u> SANITARY ENGINEERS</td> <td></td> </tr> <tr> <td>— <u>27</u> DESIGNERS</td> <td>— <u>3</u> HYDROLOGISTS</td> <td>— <u>31</u> SOILS ENGINEERS</td> <td>— <u>2865</u> TOTAL PERSONNEL</td> </tr> <tr> <td>— <u>0</u> DRAFTSMEN</td> <td></td> <td>— <u>0</u> SPECIFICATION WRITERS</td> <td></td> </tr> </table>				— <u>19</u> ADMINISTRATIVE	— <u>5</u> ECOLOGISTS	— <u>3</u> LANDSCAPE ARCHITECTS	— <u>97</u> STRUCTURAL ENGINEERS	— <u>12</u> ARCHITECTS	— <u>0</u> ECONOMISTS	— <u>46</u> MECHANICAL ENGINEERS	— <u>409</u> SURVEYORS	— <u>0</u> BIOLOGIST	— <u>54</u> ELECTRICAL ENGINEERS	— <u>4</u> MINING ENGINEERS	— <u>86</u> TRAFFIC ENGINEERS	— <u>390</u> CADD OPERATORS	— <u>69</u> ENVIRONMENTALISTS	— <u>0</u> PHOTOGRAMMETRISTS	— <u>980</u> OTHER	— <u>8</u> CHEMICAL ENGINEERS	— <u>18</u> ESTIMATORS	— <u>14</u> PLANNERS:		— <u>282</u> CIVIL ENGINEERS	— <u>26</u> GEOLOGISTS	URBAN/REGIONAL		— <u>256</u> CONSTRUCTION INSPECTORS	— <u>0</u> HISTORIANS	— <u>26</u> SANITARY ENGINEERS		— <u>27</u> DESIGNERS	— <u>3</u> HYDROLOGISTS	— <u>31</u> SOILS ENGINEERS	— <u>2865</u> TOTAL PERSONNEL	— <u>0</u> DRAFTSMEN		— <u>0</u> SPECIFICATION WRITERS	
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<p><b>TOTAL NUMBER OF WV REGISTERED PROFESSIONAL ENGINEERS IN PRIMARY OFFICE: <u>2</u></b>  <b>*RPEs other than Civil and Mining must provide supporting documentation that qualifies them to supervise and perform this type of work.</b></p>																																							
<p>Rich Steinhart is a WV-PE and is the "Engineer in Charge" for the Morgantown office. Bill Buckel, and Jeremiah Cline are also WV-PE's in the Morgantown office. Gary Facemyer is a WV Registered Professional Engineer and is the Charleston, WV office manager.</p>																																							
10. HAS THIS JOINT-VENTURE WORKED TOGETHER BEFORE? <input type="checkbox"/> YES <input type="checkbox"/> NO <b>N/A</b>																																							

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

<p>NAME AND ADDRESS: Blue Mountain Aerial Mapping 11023 Mason Dixon Highway Burton, WV 26562</p>	<p>SPECIALTY:  Aerial mapping</p>	<p>WORKED WITH BEFORE  <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>
<p>NAME AND ADDRESS: Triad Engineering 4980 Teays Valley Road St. Albans, WV 25177</p>	<p>SPECIALTY:  Geotechnical Drilling/Surveying</p>	<p>WORKED WITH BEFORE  <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>
<p>NAME AND ADDRESS: Highland Engineering 1426 Memorial Drive Oakland, MD 21550</p>	<p>SPECIALTY: Surveying</p>	<p>WORKED WITH BEFORE  <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>
<p>NAME AND ADDRESS Pennsylvania Drilling Company 281 Route 30 Imperial, PA 15126</p>	<p>SPECIALTY: Geotechnical Drilling</p>	<p>WORKED WITH BEFORE  <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>
<p>NAME AND ADDRESS: Test Boring Services, Inc. 142 Mong Road Scenery Hill, PA 15360</p>	<p>SPECIALTY: Geotechnical Drilling</p>	<p>WORKED WITH BEFORE  <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>
<p>NAME AND ADDRESS: Sturm Environmental Services P.O. Box 650 Bridgeport, WV 26330-0650</p>	<p>SPECIALTY: Laboratory Analysis</p>	<p>WORKED WITH BEFORE  <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>
<p>NAME AND ADDRESS: Industrial Lab Analysis, Inc. 65 – 36<sup>th</sup> Street Wheeling, WV 26003</p>	<p>SPECIALTY: Laboratory Analysis</p>	<p>WORKED WITH BEFORE  <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>
<p>NAME AND ADDRESS:</p>	<p>SPECIALTY:</p>	<p>WORKED WITH BEFORE  <input type="checkbox"/> Yes <input type="checkbox"/> No</p>
<p>NAME AND ADDRESS:</p>	<p>SPECIALTY:</p>	<p>WORKED WITH BEFORE  <input type="checkbox"/> Yes <input type="checkbox"/> No</p>

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

**YES** Description and Number of Projects: Several members of the WV office have a combined 100 years of AML design experience. They also have completed over 300 AML design projects.

NO

B. Is your firm experienced in Soil Analysis?

**YES** Description and Number of Projects: Our experienced staff routinely provides expertise to our mining and municipal projects. We have and continue to provide revegetation and reforestation (ARRI) design on AML, permitting, and municipal projects in West Virginia and surrounding states. HMM also has multiple staff with strong wetland delineation backgrounds and skills.

NO

C. Is your firm experienced in hydrology and hydraulics?

**YES** Description and Number of Projects: Our current projects include the study of hundreds of streams and drainage structures over a 1,400 square mile area in southwestern PA and north central WV. This work includes sampling, flow monitoring, modeling, mitigation, remediation, hydrologic and hydraulic analyses, and mapping.

NO

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

**YES** Description and Number of Projects: \_\_\_\_\_

**NO-** We subcontract the aerial photography; however, in-house we provide GPS, surveying and development of the mapping as needed.

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

**YES** Description and Number of Projects: We have completed numerous waterline design projects. Gary Facemyer, Charleston Office Manager, has over 30 years of waterline design and management experience.

NO

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

**YES** Description and Number of Projects: Our staff has personnel experience of over 50 AML projects related to AMD Design and Evaluation. Our staff has performed watershed analysis, doser design, passive system design, and chemical treatment facility planning.

NO

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>Law, Jeffrey L.</b> <b>Principal Project Manager</b>	YEARS OF EXPERIENCE		
	YEARS OF AML DESIGN EXPERIENCE: <b>23</b>	YEARS OF AML RELATED DESIGN EXPERIENCE: <b>31</b>	YEARS OF DOMESTIC WATERLINE DESIGN EXPERIENCE: <b>25</b>

Brief Explanation of Responsibilities  
 Mr. Law is a Project Engineer/Manager for Hatch Mott MacDonald. His experience includes design of AML reclamation plans, permit for 1,000-acre deep mine, barge loading facility, highway entrance permits, mine subsidence evaluations, impoundments, hydrology studies for refuse sites and public water supplies, and has designed storm water management plans for residential and commercial projects. His expertise is in mine subsidence remediation and design; mine facility layout and design; reclamation design; mining permits; design of acid mine drainage abatement plans; pre/post mining surveys; hydraulic and hydrological analysis; pre-blast surveys; slope stability analysis; geotechnical design; storm water management analysis and design; civil site designs; and commercial and residential inspections. Mr. Law has also conducted floodplain evaluations and construction inspection of commercial properties. Mr. Law has experience in project management, coordination and supervision for construction and design of various mining related projects.

EDUCATION (Degree, Year, Specialization)  
 B.S., 1983 Mining Engineering  
 A.A., 1980 Mining Engineering

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS	REGISTRATION (Type, Year, State)

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>Buckel, William D.</b> <b>Professional Engineer</b> <b>Professional Surveyor</b>	YEARS OF EXPERIENCE		
	YEARS OF AML DESIGN EXPERIENCE: <b>3</b>	YEARS OF AML RELATED DESIGN EXPERIENCE: <b>13</b>	YEARS OF DOMESTIC WATERLINE DESIGN EXPERIENCE: <b>3</b>

Brief Explanation of Responsibilities  
 Mr. Buckel is a Project Manager at Hatch Mott MacDonald (HMM). Mr. Buckel's work experience has been primarily in the land surveying and civil engineering design areas. He has considerable experience in property, engineering and construction surveying, heavy construction administration, project engineering, inspection and supervision. He also has some sewer, water and surface mining design experience; AML project lay-out, supervision and execution, including start-up, post audit and compliance assurance. He has also done various permitting and project designs for many construction, coal mining and energy clients. Mr. Buckel has been the owner of his own consulting firm for over 24 years and has also worked for different construction companies, an electric utility, mining companies and design firms as well, on projects of various sizes and types.

EDUCATION (Degree, Year, Specialization)  
 BS Civil Engineering, University of Maryland 1980, Geotechnical

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS ASCE, Past Chairman and state representative of the Western Chapter of the Maryland Society of Surveyors, West Virginia Association of Land Surveyors	REGISTRATION (Type, Year, State) PE, 1983, MD, PA, WV LS, 1982, MD, WV
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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.)	YEARS OF EXPERIENCE		
	YEARS OF AML DESIGN EXPERIENCE:	YEARS OF AML RELATED DESIGN EXPERIENCE:	YEARS OF DOMESTIC WATERLINE DESIGN EXPERIENCE:
<b>Price, Bridget L. Engineer III</b>	<b>9</b>	<b>11</b>	<b>5</b>

Brief Explanation of Responsibilities  
 Ms. Price serves as an engineer/designer at Hatch Mott MacDonald. Her past experience includes civil site design projects as well as mining and environmental permitting. She is knowledgeable with NPDES Stormwater Construction e-permitting, WVDEP General Water Pollution Control Permits, Individual Water Quality State 401 Certification permits, USACOE, Nationwide Permit compliance, Public Land permits and Highway Occupancy permits. Ms. Price is knowledgeable with basic hydraulic and hydrologic computations for drainage structures. She is also familiar with quantity estimates for materials, including earthwork volumetric computations, as well as specification writing. Bridget is very knowledgeable with AutoCADD Civil 3D and the associated design packages.

EDUCATION (Degree, Year, Specialization)  
 BS, Civil Engineering Technology, Fairmont State University, 2004  
 10-Hour OSHA Training Course in Construction Safety & Health

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS	REGISTRATION (Type, Year, State)

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

NAME & TITLE (Last, First, Middle Int.)	YEARS OF EXPERIENCE		
	YEARS OF AML DESIGN EXPERIENCE:	YEARS OF AML RELATED DESIGN EXPERIENCE:	YEARS OF DOMESTIC WATERLINE DESIGN EXPERIENCE:
<b>Facemyer, Gary D. Professional Engineer Professional Surveyor</b>	<b>21</b>	<b>33</b>	<b>33</b>

Brief Explanation of Responsibilities  
 Mr. Facemyer has been responsible for planning, design, permitting, construction management and construction of numerous abandoned mine land reclamation projects over a 20 year period. Projects included mine portal closures, high wall reduction or elimination, refuse piles, burning refuse, burning seams, landslides, stream restoration, drainage correction, acid mine drainage, water feasibility studies and water system designs.  
 This work also included Special Reclamation (bond forfeiture) assessment, water testing, and AMD treatment.

EDUCATION (Degree, Year, Specialization)  
 B. S. Civil Engineering WV Institute of Technology 1975

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS	REGISTRATION (Type, Year, State)
American Society of Civil Engineers – Past President WV American Council of Engineering Companies – WV WV Society of Professional Surveyors	Professional Engineer, WV OH PA MD VA KY Professional Surveyor, 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.)	YEARS OF EXPERIENCE		
	YEARS OF AML DESIGN EXPERIENCE:	YEARS OF AML RELATED DESIGN EXPERIENCE:	YEARS OF DOMESTIC WATERLINE DESIGN EXPERIENCE:
<b>Moore, Brian K. Project Engineer</b>	<b>3</b>	<b>9</b>	<b>9</b>

**Brief Explanation of Responsibilities**  
 Mr. Moore has served as a Project Engineer and Task Manager for various water and wastewater conveyance projects. He has an extensive background in the development and quality control of hydrologic and hydraulic dynamic computer models using various computer programs. He has also generated base maps and plan-profile sheets for various infrastructure projects using automated computer methodologies. Mr. Moore also has site design experience including drainage and parking facilities for several different facilities.

**EDUCATION (Degree, Year, Specialization)**  
 B.S., Civil/Environmental Engineering, 1998, Pennsylvania State University

<b>MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS</b>	<b>REGISTRATION (Type, Year, State)</b> Professional Engineer, 2003, Ohio
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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.)	YEARS OF EXPERIENCE		
	YEARS OF AML DESIGN EXPERIENCE:	YEARS OF AML RELATED DESIGN EXPERIENCE:	YEARS OF DOMESTIC WATERLINE DESIGN EXPERIENCE:
<b>Roderick, Clayton K. Geologist</b>	<b>3</b>	<b>11</b>	<b>0</b>

**Brief Explanation of Responsibilities**  
 Mr. Roderick is experienced in coordination and supervision of coal exploration projects, coal and non-coal surface and deep mine permitting activities, hydrologic studies pertaining to surface and under-ground mine activities, geologic and geo-technical drilling projects, management of field operations for exploration and geo-technical projects and property damage evaluations due to geologic hazards.

**EDUCATION (Degree, Year, Specialization)**  
 Earth Sciences, 1997, California University of Pennsylvania

<b>MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS</b>	<b>REGISTRATION (Type, Year, State)</b>
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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.)		YEARS OF EXPERIENCE	
<b>Green, John L. Professional Surveyor</b>	YEARS OF AML DESIGN EXPERIENCE: <b>3</b>	YEARS OF AML RELATED DESIGN EXPERIENCE: <b>33</b>	YEARS OF DOMESTIC WATERLINE DESIGN EXPERIENCE: <b>0</b>
Brief Explanation of Responsibilities Mr. Green is a Registered Professional Surveyor with over 30 years of experience in the engineering industry in surveying or survey related capacities and as an engineering design technician. He is expertly qualified in most conventional types of surveying with some experience in newer non-conventional types such as GPS surveying. He is also expertly qualified in the right-of-way plan process.			
EDUCATION (Degree, Year, Specialization) Civil Engineering Technology, 1976			
MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS American Congress on Surveying & Mapping West Virginia Society of Professional Surveyors National Society of Professional Surveyors CGIS/LIS Association		REGISTRATION (Type, Year, State) Professional Surveyor, 1991, WV - 901	

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

NAME & TITLE (Last, First, Middle Int.)		YEARS OF EXPERIENCE	
<b>Reese, Jason S. CADD Designer</b>	YEARS OF AML DESIGN EXPERIENCE: <b>9</b>	YEARS OF AML RELATED DESIGN EXPERIENCE: <b>13</b>	YEARS OF DOMESTIC WATERLINE DESIGN EXPERIENCE: <b>6</b>
Brief Explanation of Responsibilities Mr. Reese serves as CADD Designer at Hatch Mott MacDonald. His past experience includes AML design projects for the State of West Virginia. He is also knowledgeable with various forms of mine permitting in West Virginia and Pennsylvania. Mr. Reese is familiar with basic surveying techniques, storm water design, hydraulic and hydrologic computations, erosion and sediment control plans, and 3D Modeling using ACADD.			
EDUCATION (Degree, Year, Specialization) CADD, 1998, Monongalia County Vocational Center			
MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS		REGISTRATION (Type, Year, State)	

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

NAME & TITLE (Last, First, Middle Int.)		YEARS OF EXPERIENCE	
<b>Chambers, Ricardo A. Engineer III</b>	YEARS OF AML DESIGN EXPERIENCE: <b>2</b>	YEARS OF AML RELATED DESIGN EXPERIENCE: <b>4</b>	YEARS OF DOMESTIC WATERLINE DESIGN EXPERIENCE: <b>0</b>
Brief Explanation of Responsibilities Mr. Chambers is as a Field Operations Manager. He is experienced in project management, coordination, and supervision for construction and design of various mining, oil and gas, geotechnical related projects, in addition to extensive fieldwork in environmental projects, data analysis and report compliances, groundwater monitoring, water usage management, hydrologic flow studies, and evaporation pond design. Mr. Chambers is currently managing all the operations and financial aspects, including budgeting, project efficiency metrics, and project completion schedule for the stream mitigation projects and stream augmentation water management. He is proficient in operating numerous pieces of equipment, including, but not limited to, a Trimble GeoXT GPS, a Marsh-McBirney Model T2000 Flow Meter, and various other groundwater and surface water sampling instrumentation.			
EDUCATION (Degree, Year, Specialization) MS, 2006, Environmental Engineering BS, 2004, Civil Engineering AS, 1999, Mathematical Science			
MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS American Society of Civil Engineers		REGISTRATION (Type, Year, State) EIT, West Virginia	

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

NAME & TITLE (Last, First, Middle Int.)		YEARS OF EXPERIENCE	
<b>Cline, Jeremiah C. Professional Engineer</b>	YEARS OF AML DESIGN EXPERIENCE: <b>3</b>	YEARS OF AML RELATED DESIGN EXPERIENCE: <b>5</b>	YEARS OF DOMESTIC WATERLINE DESIGN EXPERIENCE: <b>1</b>
Brief Explanation of Responsibilities Mr. Cline's most recent experience includes project management and oversight for five to eight projects per year. His role on those projects primarily consists of managing budgets, staff, and approving client deliverables. Mr. Cline prepares the estimates for all the stream monitoring and sampling projects in the Waynesburg Office and works with a team to prepare the proposals. His experience also includes monitoring various physical parameters of streams, GPS surveying, construction materials testing, and construction and environmental inspection. Mr. Cline has worked on a number of natural stream channel designs, one of which was recently constructed. He has had over 300 hours of class and field instruction in natural stream design, stream survey techniques, and stream restoration including Rosgen Levels I to IV.			
EDUCATION (Degree, Year, Specialization) BS, 2003, Civil Engineering Technology Rosgen Level 1 – Fluvial Geomorphology for Engineers Rosgen Level 2 – River Morphology and Applications Rosgen Level 3 – River Assessment and Monitoring Rosgen Level 4 – River Restoration & Natural Channel Design		Natural Stream Design Construction Management Workshop Introduction to Stream Surveying 10-Hour OSHA Training Course in Construction Safety & Health	
MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS ASCE – WV Northern Branch (Past President)		REGISTRATION (Type, Year, State) PE, West Virginia, 2014	

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

NAME & TITLE (Last, First, Middle Int.)	YEARS OF EXPERIENCE		
<b>Gill, Eric Engineer II</b>	YEARS OF AML DESIGN EXPERIENCE: <b>2</b>	YEARS OF AML RELATED DESIGN EXPERIENCE: <b>2</b>	YEARS OF DOMESTIC WATERLINE DESIGN EXPERIENCE: <b>2</b>
<p>Brief Explanation of Responsibilities</p> <p>Mr. Gill joined Hatch Mott MacDonald in April of 2012 and is now working as an engineer in the Morgantown office. His experience includes extensive environmental and construction inspection, as well as data analysis and statistical modeling of environmental impacts. In addition to environmental experience, Mr. Gill has municipal engineering experience in domestic waterlines and wastewater collection systems. Specifically, he has served as an inspector and liaison between professional engineer, contractor, owner, and various government agencies, ensuring all waterline was installed to technical specifications and construction was compliant with all regulatory agencies. For collection system-related work, Mr. Gill has experience with EPA consent decree compliance and respective improvements of sewer systems by modeling gray and green infrastructure.</p>			
<p>EDUCATION (Degree, Year, Specialization)</p> <p>BS, 2008, Civil Engineering</p>			
MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS		REGISTRATION (Type, Year, State)	
		EIT, West Virginia	

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

**FIELD EQUIPMENT**

**Sampling Equipment (water/solid)**

Ponar Dredge (solids underwater)  
Automatic Water Samplers – ISCO 6712  
Hand Augers (soil)  
EnCore™ Samplers  
Disposable Field Filters, 0.45 micron  
Bailers (disposable Polyethylene, PVC, Teflon)  
Groundwater Pumps

**Safety Equipment**

O2, LEL, H2S, CO Meter  
Hazmat Kit/Draeger Tubes  
Tripod Confined Space Entry System  
Personal Protective Equipment (PPE)

**General Equipment**

Air Compressor (electric powered, 110V)  
Digital Camera  
Electric 110V-220V Generator (gas powered)  
Jar Test Apparatus  
Settling Column  
Field Analysis Kits (HACH)  
Metering Pumps (0-500 ml/min)

**Measuring Instruments**

Hach FS-950 Flowmeter  
Marsh McBirney T2000 Flow Meter (open channel)  
Fluorometer (water flow open channel)  
Polysonics Flow Meter (closed pipe)  
Water Level Recorder  
Water Level Indicator (wells, tanks)  
Interface Layer Probe (wells, tanks)  
Recording Rain Gauge  
pH/Conductivity/Temp/ORP Meter  
Photoionization Detector  
Hach Colorimeter 900 DR

**Surveying Equipment**

Portable Rangefinder  
Brunton Compass  
Total Station with Data Collector  
Trimble GPS Submeter Unit – Sub-Foot equipped with laser range finder

**General Office**

Microsoft Word  
Microsoft Excel  
Microsoft PowerPoint  
Microsoft Project  
Microsoft Outlook  
Adobe Acrobat Pro  
Adobe CS2 Suite

**Design and Modeling**

AutoCAD 2014  
AutoDesk Land Desktop 2014 (civil/site)  
Autodesk Civil 3D 2014 (civil/site)  
MicroStation V8i 2012  
FlowMaster 2009 (flow design)  
InfoWorks CS (hydraulic modeling)  
XP-SWMM (hydraulic modeling)  
InfoSewer (hydraulic analysis)  
HEC-RAS (open channel modeling)  
PENTOXSD for Windows (effluent limits)  
WQM 7.0 (BOD/NH3 wasteload allocation)

**GIS and Database**

ArcGIS (GIS mapping and database mgmt.)  
SQLServer (database management)  
Oracle (database management)  
Microsoft Access (simple databases)

**OFFICE EQUIPMENT**

Oce TDS 450 B/W Plotter (high speed, wide format)  
Oce TCS 500 Color Plotter (high speed, wide format)  
Oce Wide Format Color Scanner

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

PROJECT NAME, TYPE AND LOCATION	NAME AND ADDRESS OF OWNER	NATURE OF YOUR FIRM'S RESPONSIBILITY	ESTIMATED DESIGN SERVICES COST	PERCENT COMPLETE
<b>Maurin Mine Fire &amp; Portals</b> Marion & Monongalia County, WV	West Virginia Division of Environmental Protection	Drainage Control, Reclamation Design, Mine Closures, Regrade/Revegetation	Design Phase	60%
<b>Fairmont (DAC) S, CS, P</b> Marion County, WV	West Virginia Division of Environmental Protection	Subsidence Stabilization Plan	\$56,393	95%
<b>Hilderbrand Highwall</b> Monongalia County, WV	West Virginia Division of Environmental Protection	Reclamation Design, Mine Closures, Highwall Reduction, Regrade/Revegetation	\$37,919.40	100%
<b>Pepper Portals and Drainage</b> Barbour County, WV	West Virginia Division of Environmental Protection	Reclamation Design, Mine Closures, Highwall Reduction, Regrade/Revegetation	\$60,999	100%
<b>Dale R. Trasher</b> Gilmer County, WV	West Virginia Division of Environmental Protection	Reclamation Design, Mine Closures, Highwall Reduction, Regrade/Revegetation	\$49,248	100%
<b>Winona Complex</b> Fayette County, WV	West Virginia Division of Environmental Protection	Reclamation Design, Mine Closures, Highwall Reduction, Regrade/Revegetation	\$65,864	100%
<b>Wheeling (15<sup>th</sup> Street) Mine Drainage</b> Ohio County, WV	West Virginia Division of Environmental Protection	Mine Drainage Remediation, Investigation and Design	\$29,495	100%
<b>Montana Mines Subsidence</b> Marion County, WV	West Virginia Division of Environmental Protection	Subsidence Stabilization Plan	\$79,085	100%
<b>Shinnston (Osborn) Subsidence</b> Harrison County, WV	West Virginia Division of Environmental Protection	Subsidence Stabilization Plan	\$7,898	100%
<b>Dotson Tipple</b> Monongalia County, WV	West Virginia Division of Environmental Protection	Reclamation Design, Mine Closures, Highwall Reduction, Regrade/Revegetation	\$120,000	100%
<b>Barker Portals &amp; Strip</b> Barbour County, WV	West Virginia Division of Environmental Protection	Reclamation Design, Mine Closures, Highwall Reduction, Regrade/Revegetation	\$149,000	100%
<b>Heather Run No. 2</b> Preston County, WV	West Virginia Division of Environmental Protection	Reclamation Design, Mine Closures, Highwall Reduction, Channel Design	\$102,000	100%

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

PROJECT NAME, TYPE AND LOCATION	NAME AND ADDRESS OF OWNER	NATURE OF YOUR FIRM'S RESPONSIBILITY (CONT'D)	ESTIMATED DESIGN SERVICES COST	PERCENT COMPLETE
<b>Pendleton Creek Strip</b> Tucker County, WV	West Virginia Division of Environmental Protection	Reclamation Design, Natural Stream Channel Design, ARRI Reforestation Plan	\$153,000	100%
<b>Rupert to Rainelle Feasibility Study</b> Greenbrier County, WV	West Virginia Division of Environmental Protection	Water feasibility study	\$30,960	100%
<b>Whispering Woods Feasibility Study</b> Monongalia County, WV	West Virginia Division of Environmental Protection	Water feasibility study	\$22,375	100%
<b>Pallotta Subsidence</b> Marion County, WV	West Virginia Division of Environmental Protection	Subsidence Stabilization plan	\$10,000	100%
<b>Bethlehem (Toothman) Subsidence</b> Harrison County, WV	West Virginia Division of Environmental Protection	Subsidence stabilization plan	\$10,058.00	100%
<b>Douglas Avenue (Kingsland Mine Pool)</b> Allegany County, MD	Maryland Department of Environment	Mine Pool Evaluation and Recommendations	\$22,602.50	100%
<b>Stream Mitigation/ Restoration Project</b> Southwestern, PA	Confidential Coal Client	Stream Mitigation and Restoration of approximately 100,000 lineal feet of stream affected by longwall mining.	\$1,000,000/yr(Aug)	On-going
<b>Stream Monitoring</b> Southwestern, PA	Confidential Coal Client	Stream monitoring of approximately 140 Miles per Month of stream affected by longwall mining.	\$5,000,000/yr(Aug)	On-going
TOTAL NUMBER OF PROJECTS : <b>20</b>		TOTAL ESTIMATED COSTS : \$7,006,897.00		

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
<b>Akron CSO Program Management; Akron, OH</b>	Program Management Support Services including Design Management and Hydraulic Modeling.	City of Akron, OH; 166 S. High Street, Akron, OH 44308	2015	\$14M	\$1.5M
<b>Hamilton Co., OH Program Monitoring Services; Hamilton Co., OH</b>	Provide technical review and oversight of Cincinnati MSD CSO long-term control plan implementation on behalf of Hamilton Co.	Hamilton County, OH  County Administration Building, Room 603  138 E. Court Street  Cincinnati, Ohio 45202	2017	\$10M	\$4M
<b>ALCOSAN Main Pump Station Upgrade Design and Construction Phase Services; Pittsburgh, PA</b>	Design of upgrade to main pumping station to increase capacity from 250 mgd to 435 mgd, including mechanical and electrical systems, ventilation systems.	Allegheny County Sanitary Authority; 3300 Preble Avenue  Pittsburgh, PA 15233-1092	2016	\$22M	\$650K

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)
<b>Stream Mitigation/Restoration Project</b> Southwestern, PA Stream mitigation and restoration of approximately 100,000 lineal feet of stream affected by longwall mining.	Confidential Coal Client	\$1,000,000	2014	Yes
<b>Stream Monitoring</b> Southwestern, PA Stream monitoring of approximately 140 Miles per month of stream affected by longwall mining.	Confidential Coal Client	\$4,600,000	2014	N/A
<b>TVP – Tygart Valley Pipeline</b> Barbour County, WV Prepared design plans and specification for 20 miles of waterline including horizontal directional drilling designs, pump station, storage ponds and waterlines.	Confidential Gas Client Jane Lew, WV	Unknown	2014 / 2015	No

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

PROJECT NAME, TYPE AND LOCATION	NAME AND ADDRESS OF OWNER	ESTIMATED CONSTRUCTION COST OF YOUR FIRM'S PORTION	YEAR	CONSTRUCTED (YES OR NO)	FIRM ASSOCIATED WITH

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.

Hatch Mott MacDonald's talented staff and years of experience in meeting deadlines and delivering a quality product has made us a leader in mining/ mining related field. ENR's May 2015 Top 500 Design Firm List has Hatch Mott MacDonald (HMM) listed as 36. Additionally our current staff has over 100 years of AML experience in six different states and gives us the knowledge and understanding of project management and cost control to complete this project on time and within budget.

20. The foregoing is a statement of facts.

Signature:  \_\_\_\_\_

Title: Senior Vice President

Printed Name: Richard L. Steinhart, PE

Date: October 21, 2015

[RPEM – Attachment “C”]





**Location**

Marion and Monongalia  
Counties, WV

**Client**

West Virginia Department of  
Environmental Protection

**Project Type**

Abandoned Mine Land  
Design

**Services**

- Surveying
- Geotechnical  
Investigations
- Mapping
- Reclamation Design
- Construction Plans  
and Details
- Construction  
Specifications
- Engineering Cost  
Estimate

**On-going****Project Description**

Hatch Mott MacDonald was retained by the client to provide an engineering design package for the reclamation and remediation of an abandoned deep mine and surface facilities in Marion and Monongalia Counties, West Virginia. The project consisted of engineering services to mitigate problems associated with abandon mine lands. The problems specifically addressed at this project included adding seals and bat gates to multiple horizontal mine openings, designing drainage channels to treat water runoff and prevent any further surface erosion, remediation of AMD seeps, trash and structure removal, and soil amendments to coal spoil areas to promote native, vegetative growth. During a field investigation, HMM also found an opening in the stream bank that diverted the stream into the mine. HMM proposed a design to seal this opening and prevent future problems at this site or at the discharge site.



## Location

Marion County, WV

## Client

West Virginia Department of  
Environmental Protection

## Project Type

Abandoned Mine Lands  
Design

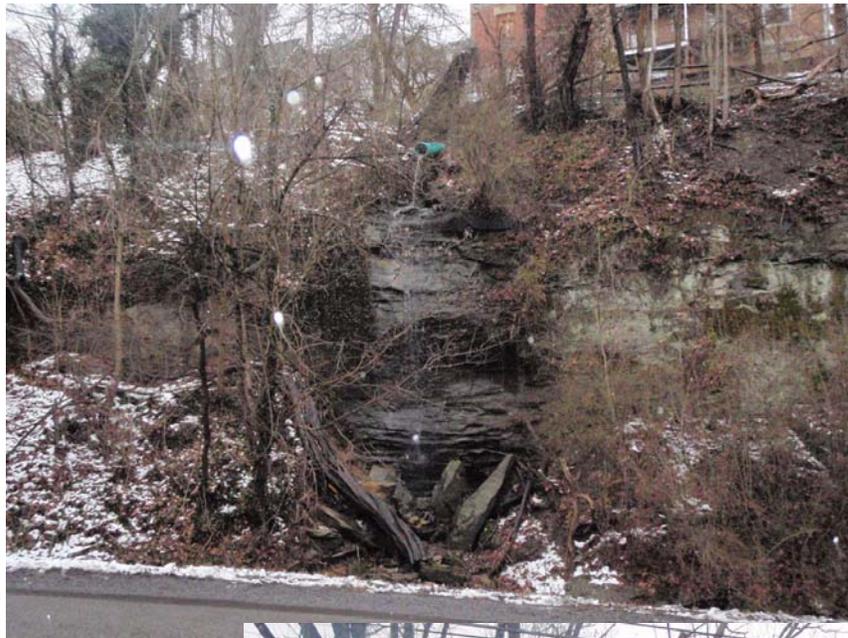
## Services

- Surveying
- Geotechnical  
Investigations
- Mapping
- Reclamation  
Design
- Subsidence  
Control Plan
- Construction  
Plans and Details
- Construction  
Specifications
- Engineering Cost  
Estimate

## On-Going

## Project Description

This project is located in the City of Fairmont, in Marion County, West Virginia. The project located near the intersection of Locust Avenue and Benoni Avenue. This site consists of the stabilization of 2 two-story masonry and frame constructed houses, 1 garage, and a two-story masonry and frame constructed apartment complex, undrain drainage control for a masonry public building, and sealing of 3 mine entries. Project will include vertical and angled drilling, placement of grout or concrete in mine workings, mine seals, underdrain, and reclamation of work area.



**Location**

Barbour County, WV

**Client**

West Virginia Department of  
Environmental Protection

**Project Type**

Abandoned Mine Land  
Design

**Services**

- Surveying
- Geotechnical Investigations
- Mapping
- Reclamation Design
- Landslide Remediation and Repair
- Construction Plans and Details
- Construction Specifications
- Engineering Cost Estimate

**On-going****Project Description**

Hatch Mott MacDonald was retained by the client to provide an engineering design package for the reclamation and remediation of an abandoned surface mine in Barbour County, West Virginia. The project consists of approximately 1,800 linear feet of highwall (approx. 25-30 ft. high), two collapsed portals with mine drainage, small pit impounded pools and a landslide area. The highwall is mostly vertical and unvegetated with large pieces of overhanging rock that are actively slipping from the face. The collapsed mine portals are currently draining significant amounts of mine water with substantial iron (Fe) content as evidenced by the staining. Existing drainage channels from pit areas are poorly defined and flows disperse in several areas creating instability of the spoils.



**Location**

Monongalia County, WV

**Client**West Virginia Department  
of Environmental  
Protection**Services**

- Surveying
- Geotechnical Investigations
- Mapping
- Reclamation Plan
- Construction Plans and Details
- Construction Specifications
- Engineering Cost Estimate

**Project Description**

Hatch Mott MacDonald (HMM) was retained by the client to provide an engineering design package for the reclamation and remediation of an abandoned surface mine in Monongalia County, WV. The surface mine had also encountered deep mine workings. The drainage from this area is tributary to the Monogahala River. There were two main sources of abandoned mine drainage which were also creating an impounded pool of very poor quality water. (See photo: pH of 2.5 and Fe>100 mg/L) A vertical fracture above the highwall caused by subsidence was also allowing surface water to infiltrate the mine workings and contribute to the amount of poor quality water. The mine openings were both designed to be sealed using wet seals and the vertical fracture was addressed by a surface seal design. The designs also provided for the discharge waters to be treated by limestone contact before leaving the reclaimed site.

HMM's work included all design documents necessary for construction and the project specific Corps of Engineers permits. The abandoned mine entries were sealed utilizing dry mine seals, wet mine seals, and bat gates. Drainage channels were designed to safely carry surface water as well as mine discharges utilizing limestone drains and channels as a form of treatment. A wetland is being designed to intercept and treat some of the AMD being generated on-site. All disturbed areas will be soil covered and revegetated.



**Location**

Fayette County, WV

**Client**West Virginia Department  
of Environmental  
Protection**Services**

- Surveying
- Geotechnical Investigations
- Mapping
- Reclamation Plan
- Construction Plans and Details
- Construction Specifications
- Engineering Cost Estimate

**Project Description**

Hatch Mott MacDonald (HMM) was retained by the client to provide engineering design documents for the reclamation of an abandoned surface mine and coal loadout facility in Fayette County, WV. Pre-1977 surface and deep mining activities created an environmental impact along Keeney Creek. Steep refuse slopes were encroaching on the stream and threatening to cause blockage. Outslopes were unvegetated and allowing toxic runoff to occur. Design included stabilizing the streambanks along Keeney Creek, regrading steep outslopes to a stable configuration, designing stable drainage structures to eliminate erosion, and revegetating the impacted area. The loadout area was regraded to provide positive drainage, divert runoff away from potentially toxic areas, and revegetate. Four bat gates were installed in the mine openings along the highwall located above these areas.

HMM's work included all design documents necessary for construction and the project specific Corps of Engineers permits.



**Location**

Gilmer County, WV

**Client**West Virginia Department  
of Environmental  
Protection**Services**

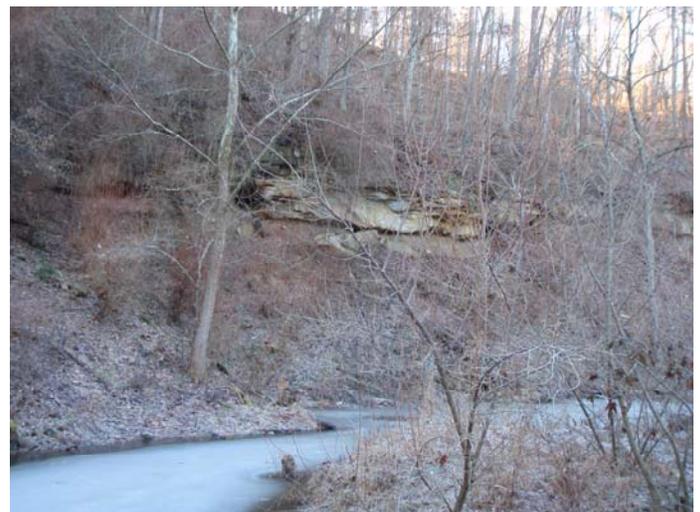
- Surveying
- Geotechnical Investigations
- Mapping
- Reclamation Plan
- Construction Plans and Details
- Construction Specifications
- Engineering Cost Estimate

**Project Description**

Hatch Mott MacDonald (HMM) was retained by the client to provide engineering design documents for the reclamation of an abandoned surface mine in Gilmer County, WV. This area consisted of approximately 2,700 linear feet of highwall ranging in height from 25-30 feet., two collapsed portals with mine drainage, remains of a 12'W x 10'H x 85'L coal load out, 5 mine cars, and miscellaneous trash. The highwall was mostly vertical and unvegetated with large pieces of overhanging rock that are actively slipping from the face. Four mine cars were underwater and the collapsed mine portals were submerged due to beavers building dams on the bench. The portals were the source of mine drainage flowing from the site.

HMM's work included the preparation of design documents that included the regrading of the area to eliminate or reduce the highwall and associated impounded water, reestablishing original contours, and reconnecting drainways that have been interrupted by mining activities. The design also included installing wet mine seals at the two portal locations that will direct the drainage safely off site. The dilapidated, unstable coal load out structure and the abandoned mine cars were razed and properly disposed of. A revegetation plan was established to ensure revegetation of all disturbed areas of the project.

HMM assisted the WVDEP with all necessary permitting requirements, regulatory meetings, the pre-bid meeting, the pre-construction meeting, and quality assurance during construction.



## Location

Monongalia County, WV

## Client

West Virginia Department  
of Environmental  
Protection

## Services

- Surveying
- Geotechnical Investigations
- Mapping
- Acid Mine Drainage Abatement Plan
- Construction Plans and Details
- Construction Specifications
- Engineering Cost Estimate

## Project Description

Hatch Mott MacDonald (HMM) was retained by the client to provide an engineering design package for the remediation of an acid mine drainage discharge that is impacting the residents along 15<sup>th</sup> Street in Ohio County, Wheeling, WV.

The project site is located in Wheeling, West Virginia and consists of mine water entering the basements of Margaret Koller, of 175 15<sup>th</sup> Street, and Ron Thomas, of 173 15<sup>th</sup> Street. Mrs. Koller stated that water enters her basement out of the floor drain located to the rear of the basement. The basement floor is coated with iron staining confirming the presence of mine drainage. Mr. Thomas has similar problems in his basement.



**Location**

Monongalia County, WV

**Client**

West Virginia Department  
of Environmental  
Protection

**Services**

- Surveying
- Geotechnical Investigations
- Mapping
- Reclamation Plan
- Construction Plans and Details
- Construction Specifications
- Engineering Cost Estimate

**Project Description**

Hatch Mott MacDonald (HMM) was retained by the client to provide engineering design documents for the reclamation of an abandoned surface mine in Monongalia County, WV. This abandoned mine land reclamation project consisted of three separate sites.

The first site included two dilapidated, unsafe coal tipple structures and the remains of a coal load out structure that were designed to be demolished and removed from the site. The site also included three sections of abandoned, unsafe highwall, four open mine portals, and approximately five acres of coal refuse material. The site was designed to be regraded such that the highwall areas were eliminated and original contours were reestablished. The mine portals were closed through installation of dry seals, wet seals, and bat gate seals, depending on the conditions of each portal. The refuse was regraded, covered, and amended to promote vegetation.

The second site consisted of approximately 2,500 feet of highwall. The highwall face ranged from vertical with overhanging rocks to sloughed in and vegetated. An existing local high school is located less than 500 feet from the top of the highwall. The site also include seven open mine portals. HMM's design consisted of eliminating the dangerous highwall and reestablishing the original contours. The mine portal locations were sealed using dry, wet, and bat gate mine seals where appropriate.

The third site consisted of the stabilization of a roadway and utility corridor that had been impacted due to the subsidence of the underground mine workings. HMM was responsible for geotechnical investigation, additional mapping to augment the provided aerial mapping, and the preparation of a stabilization design, bid plans and specifications, engineers estimate, and construction services for all three sites.

HMM's work included all design documents necessary for construction and the project specific Corps of Engineers permits. The abandoned mine entries were sealed utilizing dry mine seals, wet mine seals, and bat gates. The area was regraded to eliminate surface irregularities and provide positive drainage. Drainage channels were designed to safely carry surface water as well as mine discharges utilizing limestone drains and channels as a form of alkaline treatment. All disturbed areas will be soil covered and revegetated.



**Location**

Marion County, WV

**Client**

West Virginia Department  
of Environmental  
Protection

**Services**

- Surveying
- Geotechnical Investigations
- Mapping
- Grout Stabilization Plan
- Construction Plans and Details
- Construction Specifications
- Engineering Cost Estimate

**Project Description**

Hatch Mott MacDonald (HMM) was retained by the client to provide engineering design documents for the stabilization of an abandoned deep mine in Marion County, WV.

This project included the stabilization of six residential structures and several garages. There were also three sinkhole features that were stabilized using geosynthetics and aggregate. HMM was responsible for geotechnical investigation, additional mapping to augment the provided aerial mapping provided, and the preparation of a stabilization design, bid plans and specifications, engineers estimate, and construction services. The sinkholes were stabilized using encapsulated aggregate plugs.

The work performed under this design included approximately 7800 linear feet of vertical and angled injection borings, placement of 5000cubic yards of grout material, installation of 3 encapsulated aggregate plugs, site restoration, and revegetation. The engineers estimate for this project was \$1.1M.



**Location**

Tucker County, Thomas,  
WV

**Client**

West Virginia Department  
of Environmental  
Protection

**Services**

- Surveying
- Geotechnical Investigations
- Mapping
- Reclamation Plan
- Natural Stream Design
- ARRI Reforestation
- Construction Plans and Details
- Construction Specifications
- Engineering Cost Estimate

**Project Description**

Hatch Mott MacDonald (HMM) was retained by the client to provide engineering design documents for the reclamation of an abandoned surface mine in Tucker County, WV. Pre-law mining activities intercepted Pendleton Creek and has forced the stream flow to be directed into an abandoned deep mine complex that lies under the community of Thomas, WV. The introduction of this flow is causing deterioration of the coal pillars that support the mine roof and is also generating acid mine drainage (AMD) on the waters of the Blackwater River. Portions of the un-reclaimed surface mine are also generating AMD throughout the project site.

Pendleton Creek is a pristine, Tier III stream which flows southward for less than 2 miles before entering Pendleton Lake in Blackwater Falls State Park. Blackwater Falls is one of the most popular of West Virginia's thirty-four state parks, with Pendleton Lake being one of its many attractions. This lake is used for recreation by thousands of visitors each summer, and much of the land between the project's construction limits and the lake is U.S Fish and Wildlife designated wetlands.

HMM's work included all design documents necessary for construction and the project specific Corps of Engineers permits. Portions of the highwall were reclaimed to provide positive drainage of surface waters. Two separate streams were designed utilizing natural stream design techniques and geosynthetic liners to control losses and maintain stability. Regrading was proposed for selected portions of the abandoned surface mine to reduce the impact of AMD. All disturbed areas were revegetated using ARRI reforestation procedures and native species. The Pendleton Creek Strip project has been selected as the "Excellence in Reforestation" regional award winner for 2011. Also, the Pendleton Creek project has been nominated for the Office of Surface Mining National Reclamation Award, to be determined in the fall of 2012



**Location**

Preston County, WV

**Client**West Virginia Department  
of Environmental  
Protection**Services**

- Surveying
- Geotechnical Investigations
- Mapping
- Reclamation Plan
- Construction Plans and Details
- Construction Specifications
- Engineering Cost Estimate

**Project Description**

Hatch Mott MacDonald (HMM) was retained by the client to provide engineering design documents for the reclamation of an abandoned surface mine in Preston County, WV. Pre-1977 surface and deep mining activities are creating an environmental impact on the headwaters of Heather Run. Sixteen (16) deep mine entries were left unsealed. Of these entries, only 6 are partially collapsed. Some entries are situated such that surface water drainage is allowed to enter the abandoned mine. Others are discharging acid mine drainage (AMD) at an approximate rate of 200 gpm. This AMD discharge is of poor quality, pH 2.6 and Fe > 10 mg/L. Also, approximately 2,000 linear feet of highwall was left abandoned; coal refuse and spoil was left un-covered, and scattered mine debris was left on the site. This site is generating AMD and discharging directly into Heather Run, a tributary of the Cheat River.

HMM's work included all design documents necessary for construction and the project specific Corps of Engineers permits. The abandoned mine entries were sealed utilizing dry mine seals, wet mine seals, and bat gates. The area was regraded to eliminate surface irregularities and provide positive drainage. Drainage channels were designed to safely carry surface water as well as mine discharges utilizing limestone drains and channels as a form of alkaline treatment. All disturbed areas will be soil covered and revegetated.



**Location**

Barbour County, WV

**Client**

West Virginia Department  
of Environmental  
Protection

**Services**

- Surveying
- Geotechnical Investigations
- Mapping
- Reclamation Plan
- Construction Plans and Details
- Construction Specifications
- Engineering Cost Estimate

**Project Description**

Hatch Mott MacDonald (HMM) was retained by the client to provide engineering design documents for the reclamation of an abandoned surface mine in Barbour County, WV. Pre-1977 surface and deep mining activities have created an environmental impact on this site that is situated along the Tygart River. Approximately 6,000 lineal feet of highwall ranging in height from 30-45 feet was left un-reclaimed. Four deep mine portals were left unsealed. Scattered coal refuse and mine spoil are contributing to the production of acid mine drainage (AMD) on this site. This AMD is discharging directly into the Tygart River.

HMM's work included all design documents necessary for construction and the project specific Corps of Engineers permits. The abandoned mine entries were sealed utilizing dry mine seals, wet mine seals, and bat gates. Drainage channels were designed to safely carry surface water as well as mine discharges utilizing limestone drains and channels as a form of treatment. A wetland is being designed to intercept and treat some of the AMD being generated on-site. All disturbed areas will be soil covered and revegetated.



**Location**

Monongalia County, WV

**Client**

West Virginia Department of  
Environmental Protection –  
Office of Abandoned Mine  
Lands & Reclamation

**Project Type**

Water

**Services**

Feasibility Study

**Duration**

Start date: January 2010

End date: July 2010

**Project Description**

Hatch Mott MacDonald (HMM) conducted a water supply feasibility study for the Whispering Woods Community in Monongalia County. The study focused on determining what affect pre-1977 mining activities may have had on the private water wells used by residents in the study area. This study area was comprised of two subdivisions linked by a county roadway. Both surface and deep mining had occurred within the watershed during both pre and post 1977 SMRCA laws which dictate available funding sources.

**HMM Role**

HMM was selected by the West Virginia Department of Environmental Protection – Office of Abandoned Mine Lands & Reclamation to provide engineering services necessary to conduct a water supply study for a location in Monongalia County, WV.

**Highlights**

The project has many challenges and opportunities including:

- Review of mining, geologic and hydrogeologic records
- Prepare maps of study area
- Collect and analyze water samples from private water wells
- Interview residents on the adequacy of their water source
- GPS of well locations
- Plotting of sample data on Piper Diagram

**Location**

Greenbrier County, WV

**Client**

West Virginia Department of  
Environmental Protection –  
Office of Abandoned Mine  
Lands & Reclamation

**Project Type**

Water

**Services**

Feasibility Study

**Duration**

Start date: January 2010

End date: July 2010

**Project Description**

Hatch Mott MacDonald (HMM) conducted a water supply feasibility study for an area along Route 60 in Greenbrier County, West Virginia between the towns of Rainelle and Rupert. The study focused on determining what affect pre-1977 mining activities may have had on the private water wells used by residents in the study area. The study area included approximately 500 homes and businesses located along the Meadow River. The mining of multiple coal seams was researched and evaluated to determine potential impacts to the private water supplies of residents within the study area.

**HMM Role**

HMM was selected by the West Virginia Department of Environmental Protection – Office of Abandoned Mine Lands & Reclamation to provide engineering services necessary to conduct a water supply feasibility study in Greenbrier County, WV.

**Highlights**

The project had many challenges and opportunities including:

- Review of mining, geologic and hydrogeologic records
- Prepare maps of study area
- Collect and analyze water samples from private water wells
- Interview residents on the adequacy of their water source
- GPS of well locations
- Plotting of sample data on Piper Diagram

**Location**

Harrison County, WV

**Client**

West Virginia Department  
of Environmental  
Protection

**Services**

- Surveying
- Geotechnical Investigations
- Mapping
- Stabilization Plan
- Construction Plans and Details
- Construction Specifications
- Engineering Cost Estimate

**Project Description**

Hatch Mott MacDonald (HMM) was retained by the client to provide engineering design documents for the stabilization of an abandoned deep mine in Harrison County, WV.

This project was performed under the WVDEP-Emergency Program and consisted of a single family residence which had experienced subsidence damages. The abandoned Pittsburgh coal workings were located approximately 40 feet beneath the structure. HMM provided the initial site assessment, historical data search, geotechnical investigation, and developed a grout stabilization plan. Design plans, construction specifications, engineers estimate, and a pre-bid meeting were performed. This fast tracked project was delivered to client within two weeks of initial contact and notification of emergency.

HMM's work included all design documents necessary for construction. Work included approximately 650 linear feet of vertical and angled injection borings and the placement of 700 cubic yards of grout. Engineers estimate was in excess of \$150,000.00.



**Location**

Harrison County, WV

**Client**

West Virginia Department  
of Environmental  
Protection

**Services**

- Surveying
- Geotechnical Investigations
- Mapping
- Mine Stabilization Plan
- Construction Plans and Details
- Construction Specifications
- Engineering Cost Estimate

**Project Description**

Hatch Mott MacDonald (HMM) was retained by the client to provide engineering design documents for the stabilization of a shallow, abandoned deep mine in Harrison County, WV.

This project was performed under the WVDEP-Emergency Program and consisted of a single family residence which had experienced subsidence damages. Multiple sinkhole features had appeared in the surrounding lawn area and adjacent properties. The abandoned Pittsburgh coal workings were located approximately 35 feet beneath the structure. HMM provided the initial site assessment, historical data search, geotechnical investigation, and developed a grout stabilization plan. HMM prepared design plans, construction specifications, engineers estimate, and a pre-bid meeting was performed. This fast tracked project was delivered to client within two weeks of initial contact and notification of emergency.

Construction required by this design included in excess of 500 feet of vertical and angled injection borings and the placement of approximately 500 cubic yards of grout. Site restoration and revegetation was also performed. Construction estimate was approximately \$75,000.00.



**Location**

Marion County, WV

**Client**West Virginia Department  
of Environmental  
Protection**Services**

- Surveying
- Geotechnical Investigations
- Mapping
- Grout Stabilization Plan
- Construction Plans and Details
- Construction Specifications
- Engineering Cost Estimate

**Project Description**

Hatch Mott MacDonald (HMM) was retained by the client to provide engineering design documents for the stabilization of an abandoned, deep surface mine in Marion County, WV. This project was performed under the WVDEP- Emergency Program and was completed within two weeks of initial notification.

This project involved the subsidence investigation and stabilization of a multi-unit apartment complex in downtown Fairmont, WV. An abandoned deep mine in the Pittsburgh coal seam was causing damage to the structure and had caused numerous water main leaks in the past. A previous geotechnical study had been performed and the drilling information was used to develop a stabilization plan. HMM was responsible for a site review, mapping, historical records search, development of a stabilization plan, bid plans and specifications, and a pre-bid meeting. Traffic control and pavement protection plans were part of this project.

Construction estimates included in excess of 1,500 linear feet of drilling and the placement of 900 cubic yards of grout. Estimated cost of project was \$225,000.00.



**Location**

Allegany County, MD

**Client**

Maryland Department of  
Environment, Bureau of  
Mines

**Services**

- Surveying
- Geotechnical  
Investigations
- Mapping
- Hydrologic Study
- Engineering Analysis  
and Failure Prediction
- Study  
Recommendations
- Engineering Cost  
Estimate

**Project Description**

Hatch Mott MacDonald (HMM) was retained by the client to provide an engineering assessment of the existing conditions of a flooded, abandoned deep mine and its potential public safety concerns in Allegany County, MD.

This project involved the evaluation of the Kingsland deep mine located in Allegany County along Douglas Avenue in Lonaconing, Maryland for the potential of an uncontrolled discharge (blowout). The area had been extensively deep mined within the Pittsburgh coal seam. A recent “blowout” on the Tyson (Sewickley) seam, located above the Pittsburgh seam, prompted this investigation. HMM utilized subsurface investigations, field reconnaissance, surveying, and a review of the mining history to prepare a report of our findings. This report included an evaluation of the existing conditions, a risk assessment, the probable impacts of a blowout, potential methods to control a blowout, and recommendations for additional immediate action.

HMM’s work included an extensive historical review of the available mine workings records, development of a detailed comprehensive map depicting all known workings and intersections, field reconnaissance, water quality analysis, flow studies, and the installation of two permanent piezometers for mine pool studies. Study included breach analysis and damage predictions.



**Location**

Washington and Greene  
Counties, PA

**Client**

Confidential Mining Client

**Project Type**

Market/Discipline area

**Services**

- Stream Data Collection and Management
- GIS and GPS Data Collection
- Landowner Contacts
- Area Logistics
- Project Scheduling
- Secure Information Exchange
- Integrated Web-based Project

**Duration**

2003-present

**Construction Cost**

\$4,000,000 annually

**Project Description**

This confidential coal mining client is among the nation's top energy companies. They mine more high-Btu bituminous coal than any other producer in the United States, and is the nation's leader in underground coal mining. The client has operations located throughout major US coal-producing regions. They are the largest producer of coal bed methane in the US. For 140 years, the client and its predecessor companies have been industry leaders in production, profitability, safety, and environmental stewardship. Hatch Mott MacDonald (HMM) is currently assisting this client in managing, and developing an extensive study of the streams that overlie longwall coal mines. The study involves studying and documenting the streams' flow; geomorphology, hydrology and noting any changes in streams or the surrounding ecosystem. The accurate and consistent collection of the data is critical to the integrity and quality of the study. The end result is a significant amount of field data that accurately portrays the streams and watersheds of the mining surface areas.

**HMM Role**

Hatch Mott MacDonald (HMM) is currently assisting the client in managing, and developing an extensive study of the streams that overlie longwall coal mines. The study involves studying and documenting the streams' flow; geomorphology, hydrology and noting any changes in streams or the surrounding ecosystem. The accurate and consistent collection of the data is critical to the integrity and quality of the study. The end result is a significant amount of field data that accurately portrays the streams and watersheds of the mining surface areas.

**Project Highlights**

- ♦ **Project Development** – The project development was undertaken by client and HMM teams. The data collection and entry as well as data management are critical to the success of the study. Additional areas of development include
  - Stream data collection techniques and equipment evaluation
  - GIS and GPS data collection and organization
  - Landowner contacts and area logistics
  - Project Scheduling and Information Exchange
  - Web based access to data
- ♦ **Data Collection** – Work included setting up flow monitoring stations along designated sections of streams within the study areas being long-wall mined. Over 600 different flow-monitoring stations and more than 144 miles per month of stream morphology are uploaded into Trimble Geo XH sub-foot GPS units and traversed every month. These units were then used to navigate to each individual site of study. Once sites were located, stream flow measurements, water samples and digital photos were taken. Any changes along the length of stream in the geologic rock structures, stream channel conditions or stream flow were documented photographed, and filmed and entered into the GPS. The stream flow measurements were taken using a Marsh-McBirney Flo-mate 2000. All flow-monitoring sites are monitored monthly at a minimum and daily on a maximum basis. All field data collected is entered into a large data base where the data can be queried and printed for the clients at any given time for regulatory agencies, historical record, or research for expansion in new permit areas.
- ♦ **Landowner Contacts and Logistics** – Managing the landowner contacts, issues, and incidents is essential to the continuity and success of the project. HMM coordinated this activity with the client's land agents and many other consultants being used by the client.
- ♦ **Project Scheduling and Information Exchange** – All HMM field teams and other field teams are scheduled using an open web based system developed by HMM called File Share. Mapping, documents and data can be shared and exchanged using the File Share system.
- ♦ **Web Based Access to Data** –HMM assisted the Client in developing an extensive web based data access system.

**Location**

Greene and Washington  
Counties, PA

**Client**

Confidential Coal Client

**Services**

- Augmentation Work Plans
- Grout Injection Work Plans
- Subsurface Investigation Plans
- Stream Surveying
- Flow Monitoring
- Surface and Groundwater Monitoring
- GIS Mapping
- Hydrologic Modeling
- Channel Design
- Report Preparation
- Construction Inspection

**Duration**

2006-Present

**Project Description**

Hatch Mott MacDonald (HMM) was retained by a private coal client to assist in the mitigation and remediation of over 100,000 lineal feet of streams that have been affected by longwall mining.

Work includes surface and groundwater monitoring, hydrologic modeling, and subsurface investigations to determine minimum base flows for development of augmentation plans. Geologic conditions assessments are used to prepare mitigation plans and develop a grout injection design for remediating the loss segments of the affected streams. This grout injection design consists of a shallow, low-pressure injection of portland and bentonite to seal fractures and reduce water loss. Stream surveying of the remediation sites and control streams was used to establish a stable stream geometry that would effectively carry bankfull flows. Trimble GPS units and GIS software were used to develop maps showing the flow advancement downstream as construction progressed.

HMM performs the construction inspection and construction management of the project. This work includes full-time inspection, evaluation of contractor performance and work product, and approval of contractor quantities.



**Location**

Westmoreland, PA

**Client**Crow's Nest Synfuels,  
L.P.**Services**

- PADEP Permit
- MSHA Permit
- Erosion and Sediment Control Plan
- Mapping
- Surveying
- Surface and Groundwater Monitoring
- Annual Certification
- Reclamation Plan
- Closure Permits
- Construction Monitoring
- Channel Design
- Construction Inspection

**Project Description**

Hatch Mott MacDonald (HMM) was retained by the client to develop a permit for the re-processing of coal waste products at a site in Westmoreland County, Pennsylvania. The site was part of an abandoned surface mine and coal waste pile.

Work included all design and permitting associated with the initial opening of this facility. HMM was also retained to monitor the operations and perform quarterly certifications. Annual renewals, modifications and compliance was also part of HMM's duties. The project was successfully followed through the reclamation and bond release stages of all state and federal regulatory agencies.



## Location

Harrison County, WV

## Client

Harrison County  
Commission, WV

## Project Type

Flood Modeling/Mapping

## Services

Site Characterization  
Hydrologic/Hydraulic  
Evaluations

## Duration

July 2004 - March 2005

## Project Description

The Lost Creek Floodplain Investigation provided the Harrison County Commission with detailed floodplain information for Lost Creek between the Town of Lost Creek corporate limit and Lost Creek's downstream confluence with the West Fork River. Prior to this investigation, Lost Creek was characterized as approximate Zone A on the Harrison County, WV (Unincorporated Areas) Flood Insurance Study (FIS) and Flood Insurance Rate Maps (FIRMs). A final report was prepared for the Harrison County Planning Commission with all necessary documentation and analysis to support a revision to the Flood Insurance Rate Map for the Town of Lost Creek, WV.

## HMM Role

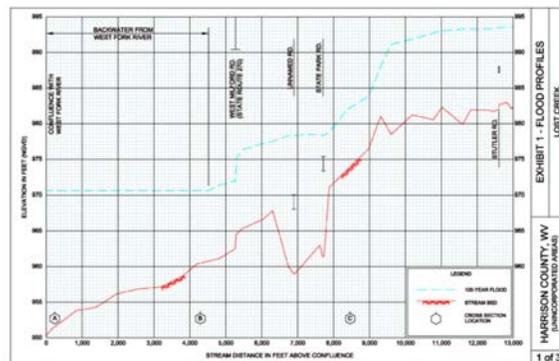
**Site Characterization** - HMM prepared the detailed flood hazard mapping for Lost Creek by conducting field investigations and performing detailed hydraulic evaluations within the project study area. A combination of traditional land surveying and GPS surveying were used to identify cross sections of Lost Creek at set intervals. HMM combined the new cross section survey data with USGS DEM data to create a new Triangular Irregular Network (TIN) in ArcView. Cross sections were automatically extracted from the GIS TIN using HEC-GeoRAS and imported into HEC-RAS for performing the hydrologic and hydraulic evaluations.

**Hydrologic/Hydraulic Evaluations** - HMM used HEC-RAS to establish the peak flow for the 100-year storm using current US Geological Survey (USGS) regression equations for rural watersheds. The resulting floodplain and floodway boundaries for the 100-year storm event were mapped on digital topographic maps overlaid with color aerial photographs. A water surface profile was established for the 100-year storm for the establishment of Base Flow Elevations along Lost Creek.



## Project Highlights

- ◆ Development of hydrologic/hydraulic models
- ◆ Site characterization and delineation of Waterway flood elevation
- ◆ Deterioration of floodway boundaries and development of Flood Insurance Rate Map updates.



**Location**

Harrison County, WV

**Client**

Harrison County

**Services**

- Stormwater Drainage Design
- Trail Head/Parking Layout
- Precast Arch Culvert Design
- Bridge Rehabilitation
- Construction Contract Administration
- Construction Inspection

**Reference**

Terry Schulte, Executive  
Director  
304-624-8690

**Project Description**

Hatch Mott MacDonald was retained by the Harrison County Commissioners to prepare design plans, specifications, and bid documents for the conversion of the abandoned 14-mile CSX Railroad grade to a hiking/biking trail.

Work included digitizing existing railroad right-of-way maps into AutoCAD format; evaluation of existing drainage structures; design of drainage rehabilitation; design of new drainage structures; trail surface design; preparation of clearing, grubbing, and tree pruning specifications; design of trail entrances, gates and fencing; design of access barriers (to prevent unauthorized motor vehicles from gaining entry to the trail); wetland delineation; and bridge decking/rehabilitation.

HMM will also perform the construction inspection and construction management of the project. This work will include full-time inspection; evaluation of contractor performance and work product, and approval of contractor invoices. The project was completed in the Fall of 2003.



**Location**

Bayard, WV

**Client**Confidential Mining  
Client**Project Type**

Hydraulic Analysis

**Services**

Hydraulic Analysis Study

**Duration**September 2004 –  
February 2005**Project Description**

The client had an inactive mine site where they were operating a treatment plant to treat acid mine drainage. During large storm events, the steep slopes of the site caused rapid increases in the flow conveyed through the onsite drainage network. These increases in flow resulted in sudden spikes in the flow rates entering the treatment plant. This project was conducted to provide an evaluation of alternatives for reducing the peak flow rates during storm events that would allow the treatment plant to maintain operation within a preferred flow range during.

**HMM Role**

HMM was tasked with performing a hydraulic and hydrologic study of the site and providing specific alternatives for reducing peak flows at the treatment plant. These alternatives included additional detention basins and the application of real time controls to better utilize storage available within the existing drainage network. HMM also provided supplementary services including collecting the necessary flow monitoring and rainfall data to calibrate the hydraulic model. In addition, HMM provided survey services of the various drainage paths throughout the site that forms the basis of the hydraulic model.

**Highlights**

- ◆ Performed GPS surveying of open drainage channels and various culverts throughout the site
- ◆ Collected flow monitoring data using both weirs (open channel) and area-velocity meters (culverts) in an aggressive chemical environment.
- ◆ Utilized the calibrated hydraulic model to evaluate various alternatives to reduce peak flows entering the treatment plant in addition to reducing the overall operational costs of the plant.



**Location**

Wetzel County, WV

**Client**

Confidential Coal Client

**Services**

- Grout Injection Work Plans
- Subsurface Investigation
- Surveying
- Utility camera survey
- GIS Mapping
- Liner Design
- Cost Analysis
- Construction Inspection

**Project Description**

Hatch Mott MacDonald (HMM) was retained by a private coal client to assist in the mitigation and remediation of an existing private impoundment that had been affected by longwall mining.

Work included investigation of subsurface data, groundwater monitoring, hydrologic modeling, and flow loss analysis. HMM developed a combination grout injection plan and geosynthetic liner design. This grout injection plan consisted of a shallow, low-pressure injection of a mixture of Portland cement and bentonite to seal fractures and reduce water loss. The geosynthetic liner design utilized an impermeable bentonite mat at select locations within the pond bottom. A utility camera was used to observe infiltration and leakage of the pipe principal spillway.

HMM performed the construction inspection and construction management of the project. This work included full-time inspection, evaluation of contractor performance and work product, and approval of contractor quantities.

