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Solicitation Response(SR)

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Ver.: 1

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List View

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Contact

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Document Information

Clarification Request

Procurement Folder: 1523821

Procurement Type: Central Purchase Order

Vendor ID: VC0000099853



Legal Name: RESPEC COMPANY LLC

Alias/DBA:

Total Bid: \$250,000.00

Response Date: 10/29/2024



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Responded By User ID: WFaulkner80



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Phase II

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

State of West Virginia
Solicitation Response

Proc Folder: 1523821
Solicitation Description: AML - EO Morgantown Airport Subsidence Phase II
Proc Type: Central Purchase Order

Solicitation Closes	Solicitation Response	Version
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VENDOR
VC0000099853
RESPEC COMPANY LLC

Solicitation Number: CEOI 0313 DEP2500000001
Total Bid: 250000
Response Date: 2024-10-29
Response Time: 13:11:05
Comments:

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Vendor 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				250000.00

Comm Code	Manufacturer	Specification	Model #
81100000			

Commodity Line Comments:

Extended Description:

EOI Engineering Design Services



SUBMITTED TO:

DEPARTMENT OF ADMINISTRATION
PURCHASING DIVISION
2019 WASHINGTON STREET EAST
CHARLESTON, WV 25305-0130

SUBMITTED BY:

RESPEC COMPANY, LLC
145 EAST THIRD STREET
LEXINGTON, KY 40508

EXPRESSION OF INTEREST - MORGANTOWN AIRPORT SUBSIDENCE PHASE II

RSI/P-10863 // DUE OCTOBER 29, 2024



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

State of West Virginia
Centralized Expression of Interest
Architect/Engr

Proc Folder: 1523821			Reason for Modification:
Doc Description: AML - EOI Morgantown Airport Subsidence Phase II			
Proc Type: Central Purchase Order			
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BID RECEIVING LOCATION

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

VENDOR

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DATE October 29, 2024

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

ADDITIONAL INFORMATION
The Acquisitions and Contract Administration Section of the Purchasing Division is soliciting Expression(s) of Interest for West Virginia Department of Environmental Protection, Division of Land Restoration, Office of Abandoned Mine Lands and Reclamation (WVDEP-DLR-AML), from qualified firms to provide the professional services for design, and construction oversight aspects as needed for the Morgantown Airport Subsidence Phase II project per the attached specifications and terms and conditions.

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

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

Comm Code	Manufacturer	Specification	Model #
81100000			

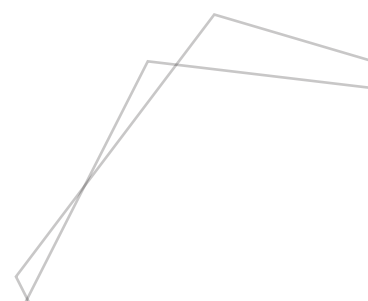
Extended Description:
EOI Engineering Design Services

SCHEDULE OF EVENTS		
<u>Line</u>	<u>Event</u>	<u>Event Date</u>



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CORPORATE SUMMARY

➤ MANAGEMENT SUMMARY / COMPANY OVERVIEW

We are a team dedicated to solving your challenges. Since our founding in 1969, RESPEC has combined applied sciences with technology to deliver cutting-edge outcomes. These integrated solutions offer our clients more value. Serving multiple markets, our clients worldwide trust us as partners to propel them forward with an innovative, clear vision. As a 100 percent employee-owned company with more than 600 employee-owners across 34 offices, we excel in finding effective solutions, no matter the challenge or market.

RESPEC comprises multiple business units, including Mining & Energy, Water, Infrastructure, Transportation, and Data & Technology Solutions. Our AML team includes members from our Mining & Energy, Water, and Infrastructure business units. Together, these business units provide expertise in tasks essential for successfully mitigating mine-related impacts. As detailed in the project examples, RESPEC has completed both large and small projects, from evaluation through construction.

INDUSTRIES SERVED:



MINING & ENERGY

- » Surface Mine Reclamation
- » Subsidence
- » Feasibility Studies
- » Mine Design
- » Ventilation



WATER & NATURAL RESOURCES

- » AML Reclamation
- » Stream Design
- » Flood Studies
- » Water/Wastewater Treatment
- » NEPA Permitting



INFRASTRUCTURE

- » Geotechnical Evaluation
- » Impoundment Design
- » Waterlines
- » Road Design
- » Slope Stabilization

RESPEC AND AML

RESPEC Company, LLC (RESPEC) has a deep understanding of mining and reclamation, with more than 38 years of national involvement in the Abandoned Mine Lands (AML) programs. During this time, RESPEC has successfully completed more than 100 AML projects for both state and federal agencies. Specifically relevant to this project, we have conducted numerous subsidence evaluations for areas impacted by historic coal mining, serving both public and private clients. RESPEC has also been actively involved in site evaluation, design, and construction management for various mine subsidence mitigation projects.

- / Understands the project scope and the specifics of the Morgantown Airport project area
- / Possesses relevant experience in subsidence investigation, modeling, drill and grout project design, and construction management, as well as experience with airport projects
- / Employs professional staff experience in subsidence projects, has an office in Morgantown, and has the depth of resources necessary to undertake the project
- / Has successfully completed numerous subsidence investigation and mitigation projects across the U.S. for both public and private clients



POINT OF CONTACT

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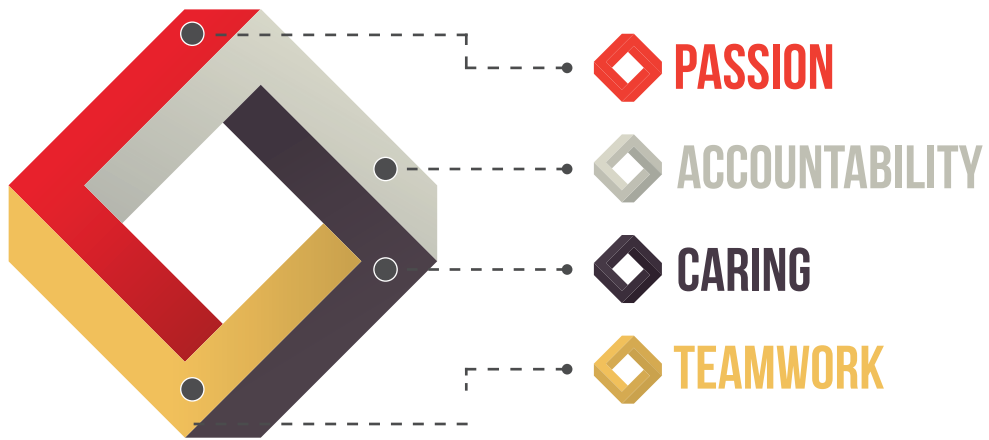
Jesse.Hatter@respec.com

CORPORATE SUMMARY

➤ RESPEC EMPLOYEES SHARE COMMON VALUES

PASSION. ACCOUNTABILITY. CARING. TEAMWORK.

We call it our RESPEC PACT, and it defines us. It manifests in every interaction that we undertake. We share successes with each other and with our partners. We collaborate and are always willing to integrate many perspectives. Most importantly, RESPEC believes in the value of what we do. RESPEC wants to work with you because we know what you want to accomplish is meaningful.



PROJECT TEAM

RESPEC's proposed team includes individuals experienced in subsidence mitigation projects nationwide. They understand the technical issues involved and, importantly, the impacts subsidence can have on infrastructure and community concerns. We have assembled a project team with experience in reclamation, mining, and hazard remediation to address every aspect of the Morgantown Airport Subsidence Phase II project within time and budget constraints. The primary office for this project will be our Morgantown office, which became part of RESPEC through the recent acquisition of EARTHRES Group, Inc./Musser Engineering Group, Inc. (EARTHRES/Musser Engineering). "RESPEC" is used throughout this EOI to refer to RESPEC and its acquisitions. The project will also receive support from staff in our Lexington and Cheyenne offices.

RESPEC staff located across the country will also provide further support, particularly in reclamation, remediation, and airport experience. Please refer to our organizational chart for details on our project team, including specific roles and qualifications of key project members.



SAFETY

At RESPEC, the health and safety of the public and our employees is our highest priority, as demonstrated by our zero-incidence rating for 2023, overseen by our Corporate Safety Director. Abandoned underground workings present a clear danger to the public and those working nearby. Fortunately, RESPEC employees are adept at safely navigating the inherent hazards of both operating and abandoned mines.

Many RESPEC employees have received Mine Safety and Health Administration (MSHA) training, along with specialized training that directly addresses potential hazards in this project. RESPEC will develop and implement a Jobsite Safety and Health Program (JSHP) that complies with all Occupational Safety and Health Administration (OSHA) standards. This will be done in collaboration with the AML Project Manager, RESPEC's Safety Director, RESPEC's Project Manager, and team members to ensure the continued health and safety of everyone involved.

UNDERSTANDING OF PROJECT SCOPE

MORGANTOWN AIRPORT SUBSIDENCE AIRPORT PHASE II

RESPEC is submitting this proposal in response to the West Virginia Department of Environmental Protection (WVDEP), Division of Land Restoration, Office of Abandoned Mine Lands and Reclamation EOI for the Morgantown Airport Subsidence Phase II. This EOI provides WVDEP with an overview of our general approach to performing and managing the project. This submission includes RESPEC's summaries on the primary objectives for managing the project, our technical approach to subsidence projects, and our project-specific understanding and approaches.

➤ PROJECT GOALS

RESPEC will manage the Morgantown Airport Subsidence Phase II project with the same dedication and coordination we apply to all our reclamation projects, including our ongoing work with WVDEP. We will support WVDEP as needed to ensure compliance with federal policies and regulations, manage necessary permits, develop project designs and plans, and provide project representation, management, and oversight. The goals for this project under the contract include:

- / Reviewing historical mine data and assisting WVDEP in locating underground mine maps, if available
- / Conducting a geotechnical investigation to determine coal seam thickness, coal pavement elevations, subsurface open and collapsed workings, etc.
- / Developing designs, construction plans, and technical specifications for drilling and grouting mine workings to stabilize specified areas of the airport
- / Establishing access routes, batch plant locations, etc.
- / Coordinating with federal agencies, managing required permitting, and engaging stakeholders
- / Developing Construction Safety Phasing Plans (CSPP) and ensuring compliance with Federal Aviation Administration (FAA) requirements for performance of work at a Code of Federal Regulation (CFR) Part 139 Airport.
- / Ensuring the project supports the airport Master Plan and runway extension project.





UNDERSTANDING OF PROJECT SCOPE

➤ GENERAL SITE GEOLOGY

The Morgantown Airport is underlain by rocks of the Monongahela Group, which forms the uppermost coal-bearing strata of the Alleghany Plateau. This plateau is the most extensive coal field in the eastern United States. The base of the plateau is the Pittsburgh coal seam, historically the most mined and productive coal seam in West Virginia. Historical maps indicate that the “Pittsburgh Coal Mines” exploited this seam immediately below and adjacent to the Morgantown Airport. The bottom of the Pittsburgh coal seam is the top of the Conemaugh Group.

The Monongahela Group is composed of Pennsylvanian and Permian non-marine sedimentary rocks, divided into the Pittsburgh and Uniontown Formations. This group averages 270 feet in thickness, generally increasing to the east. Mines below the Morgantown Airport extracted coal from the Pittsburgh seam in the lowest part of the Pittsburgh Formation. The Pittsburgh Formation is composed of the following five members, listed from top to bottom:

- / **Upper Member:** Contains four distinct limestone units topped by the Uniontown coal bed
- / **Sewickley Member:** Composed of calcareous mudstone, clayey limestone, and massively bedded limestones of the Benwood unit
- / **Fishpot Member:** The thinnest member, consisting of siltstone, mudstone, and thin sandstones
- / **Redstone Member:** Composed of siltstone and mudstone, including a persistent limestone unit, separated from the Lower Member on the bottom by the Redstone coal bed
- / **Lower Member:** Contains the Pittsburgh coal bed and the overriding Pittsburgh Sandstone, which replaces the coal in some areas

Around the Morgantown Airport, the contact between the Monongahela and Conemaugh Groups varies from approximately 1,260 feet elevation on the east side of the airport to 1,140 feet elevation on the southwest side. The coal seam elevation below the south end of the main runway is approximately 1,160 to 1,180 feet. The main runway elevation ranges from 1,236 feet to 1,244 feet. The seam is reported to be 8 feet thick on average in this area. The remaining overburden is likely composed primarily of the Pittsburgh Sandstone, overlain by a thinner interval of siltstone and mudstone.

➤ SITE HISTORY

The Morgantown Municipal Airport began commercial airline service in 1937. Archived photographs at the West Virginia and Regional History Center show the airport runways in their current layout, with the aprons revegetated by 1965.



UNDERSTANDING OF PROJECT SCOPE

Historical mine maps from the West Virginia Geological and Economic Survey database identify the primary workings beneath the airport as the Bethlehem Mines Corporation Mine No. 25, within the larger Richard Coal Field group of mines. Archived maps of the Metro Coal Company mine, located immediately northwest of the airport, indicate that their southern workings abut those of the Bethlehem Mines Corporation. Bethlehem Mines, a subsidiary of Bethlehem Steel in the early to mid-1900s, was associated with Bethlehem Corporation. The primary coal production in the area came from the Richard Mine, whose tipple was located 2.4 miles south of the current airport terminal along Deckers Creek. The Richard Mine closed in 1953.

Abandoned mine-related subsidence occurred at the Morgantown Municipal Airport in the late 1990s and early 2000s. Grout and concrete were pumped into the voids around the airport terminal to stabilize the subsurface. At least one subsidence feature opened near a runway and was addressed in the early 2000s.

➤ TECHNICAL APPROACH

Subsidence mitigation, such as void fill grouting or daylighting, is only one component of a comprehensive subsidence plan. RESPEC has identified the following critical components as essential to a successful approach:

- / Determining subsidence risk through detailed models, including FLAC 3D
- / Clear understanding of mining history to define mine plan and presence of secondary recovery (pillar robbing)
- / Understanding current groundwater elevations and any expected long-term changes post-investigation and mitigation activities
- / Assessing possible changes in groundwater chemistry and their impact on existing water quality projects related to the mine of concern
- / Evaluating the efficiency of past mitigation techniques and implementations
- / Reviewing successful subsidence mitigation strategies
- / Identifying changes that may have initiated the subsidence
- / Exploring options for long-term stabilization
- / Assessing and selecting the preferred option
- / Developing a conceptual design
- / Representing the state during construction
- / Validating the success of the mitigation efforts
- / Communicating results to all stakeholders

UNDERSTANDING OF PROJECT SCOPE

➤ PROJECT UNDERSTANDING

The Bethlehem Mines Corporation Mine No. 25 underlies the Morgantown Municipal Airport at depths ranging from 50 to 75 feet below the runway grade. Currently, there is limited information available about Mine No. 25. Two previous subsidence mitigation projects have been conducted at the airport: WV-4145 in 1991, which involved drilling and grouting around the main terminal, and WV-5580 in 2000, which addressed a pothole subsidence in the southeast of the airport.

To effectively neutralize or mitigate hazards from abandoned mines, particularly subsidence, it is crucial to understand mine characteristics, including mining methods, geometries, mined thicknesses, and groundwater conditions. Field investigations must carefully balance the need for subsurface data with the safe operation of the airport. While techniques like destructive or rock rotary drilling are often used to mitigate subsidence hazards, improper implementation can exacerbate existing hazards, expedite subsurface failure, cause unwanted and uncontrolled water flows, or even create new subsidence risks. Such outcomes are unacceptable near or below any infrastructure—especially an active runway—but can be avoided through informed and carefully executed investigations.

Subsurface changes, particularly void fill grouting, can alter the chemistry and geometry of the artificial aquifer within the mine. Numerous water quality monitoring and enhancement projects are ongoing in the immediate vicinity and may be related to the mine of concern. Effective

communication with water quality stakeholders and the operators of water handling facilities will be critical during grouting activities to ensure the safe management of mine waters and maintain water quality in associated waterways and water bodies. Preliminary assessments indicate that cementitious grouting will improve water quality issues typically associated with acid mine drainage (AMD) by increasing pH levels, reducing the artificial aquifer of the mine voids, and decreasing the zone of interaction between groundwater and abandoned mine workings.

The legacy of underground mining continues to present subsidence risks at the Morgantown Airport and adjacent areas. A comprehensive understanding of site-specific risks, including previous mitigation attempts and associated methodologies, will inform future actions. RESPEC believes that coordination and collaboration with WVDEP throughout all project phases will lead to the best outcomes for mitigating risks associated with abandoned mine subsidence.

TRADITIONAL GROUTING APPROACHES

Grouting is an effective method for mitigating subsidence risks posed by subsurface voids. However, like drilling, uninformed grouting practices can lead to surface heave, uncontrolled fluid flow to the surface, or induce subsidence by compromising the mine structure's integrity, such as pillar erosion. Grout mixes are tailored to the specific

UNDERSTANDING OF PROJECT SCOPE

conditions and requirements of each site. Core drilling allows for the collection of rock samples from the mine's floor, roof, and overburden, which are then analyzed in a laboratory. This analysis helps accurately model rock mass characteristics, guiding the design of grout specifications and emplacement methods. Some traditional grouting approaches include:

/ **Voidfill Grouting:** This method aims to completely fill underground voids with grout. Low-mobility grout may be used to create barriers that prevent grout migration away from areas of

concern, while high-mobility grout can penetrate areas of rubblization.

- / **Pillar Stabilization Grouting:** In cases where pillar failure is the primary subsidence trigger, partial filling mine voids can provide lateral support to vulnerable pillars. This reduction in void space also decreases the potential for subsidence to reach the surface.
- / **Cone-Pillar Grouting:** This approach uses zero-slump grout to form cones within the voids that function as pillars, using the least amount of grout.

MORGANTOWN AIRPORT/FAA COORDINATION

RESPEC possesses a strong understanding of FAA regulations and is well-equipped to manage airport construction activities in compliance with these standards. The airport's status as a Code of Federal Regulations (CFR) Part 139 certified airport and project location within the Airport Operating Area (AOA) creates some significant phasing and construction requirements that are stipulated by the FAA.

We anticipate the need for a robust Construction Safety Phasing Plan (CSPP) to facilitate work on the project. Due to assumed operational obligations between the airport and FAA, development and management of the CSPP will require extensive and ongoing coordination between both parties. We propose to begin communication between FAA and the airport as soon as the contract is awarded, to ensure the design is developed with major shareholder priorities in mind.

As work will require the use of tall drilling equipment, we anticipate the approval process to be similar to that of FAA's guidance on cranes, which requires submittal of FAA Form 7460-1 Notice of Proposed Construction or Alteration. However, due to the anticipated height of equipment, we anticipate that some runway, taxiway, or airfield closures will be required. Additionally, we anticipate the need to dictate specific equipment access routes and methods based on equipment heights, for work performed within the AOA. As part of our development of the CSPP, we will work with airport and FAA to ensure that required Notice to Airmen / Notice to Air Missions (NOTAMs) for closures and operational impacts are submitted to meet required notification windows.

As most of the work will fall within the secured area of the airport, all onsite personnel will require security clearance and identification per Title 49 of the CFR. Due to potential delays in receiving these clearances, RESPEC will start the process as soon as we get a contract.

RESPEC personnel are experienced with all facets of design / construction activity at airports and will be an integral part of the project team, mitigating impacts to airport operations to the minimum necessary.



UNDERSTANDING OF PROJECT SCOPE

EXISTING DATA ANALYSIS

RESPEC's experience with coal mining-related AML projects equips us with the skills to effectively track down and understand the diverse sources encountered when researching data on abandoned mines. Our local office in Morgantown, West Virginia, provides us with direct access to resources such as undigitized maps in various archives, local historical sites, and opportunities to engage with individuals who have lived and worked in or around the concerned mines. RESPEC's expertise in reviewing historic mine maps, site geology, and past geotechnical investigations will enhance our project planning and ensure the efficient allocation of resources. Comprehensive analyses of data from multiple sources facilitate the efficient identification and mitigation of risks, helping to minimize project costs by tailoring geotechnical investigations and mitigation methods to specific site conditions.

DATA MANAGEMENT

To support the investigation, design, construction management, and monitoring efforts, RESPEC's GIS experts will develop an online geodatabase using Esri's ArcGIS Pro software and ArcGIS Online. This platform will facilitate data management and collection and support field investigation personnel. It will provide ready access to all AML inventory data, underground mine maps, boreholes, and drill log data from past projects for field teams and the AML Project Manager. RESPEC will maintain and regularly update this data throughout the project's life, ensuring simple and immediate access to report project progress to all stakeholders.

INVESTIGATION


Effectively mitigating hazards associated with abandoned mine workings beneath the Morgantown Airport will require a comprehensive understanding of current conditions. RESPEC advocates for an efficient and thorough Investigation phase to achieve this understanding. With expertise in a wide range of investigatory techniques, RESPEC offers the following summary of specific approaches that could be used to inform WVDEP during this phase.

GEOPHYSICS/ROCK MECHANICS

The RESPEC project team has decades of experience evaluating subsidence features and rock mechanics behavior across various applications and geological settings. Our expertise spans deep underground projects with gradual surface subsidence, assessments of large underground caverns' collapse potential, and evaluations of crown pillar collapse in shallow, hard rock operations. Understanding the conceptual behavior of rock and soil and its relationship to the mine and its geology is crucial in subsidence and rock mechanics assessments.

With geotechnical assessments conducted across North America and worldwide, RESPEC offers a pragmatic approach to diverse problems. A significant portion of our work is for mining clients, allowing us to develop practical yet innovative solutions tailored to specific rock mechanics challenges. Our field team is skilled in using advanced geotechnical techniques, including remote-sensing options, to identify critical features such as joint sets, voids, geological changes, and faults that impact stability.

UNDERSTANDING OF PROJECT SCOPE



RESPEC's world-class rock mechanics laboratory in Rapid City, South Dakota, accurately defines material properties essential for geotechnical analysis. Finally, RESPEC has experience in using a full suite of numerical modeling tools to analyze whatever types of geotechnical conditions exist, RESPEC possesses a wide variety of experience in interpreting geophysical results for mining and geotechnical purposes. We are able to vet the benefits and limitations of techniques from all major geophysical families, including acoustic (e.g., seismic refraction, specialty seismic reflection designs for the shallow subsurface, and microseismic interpretation), electromagnetic (e.g., traditional electrical resistivity arrays, electromagnetic surveys, and magnetotellurics), and gravity (e.g., microgravity surveys).

With this deep understanding of geophysical structures, as well as a balanced understanding of client needs, The RESPEC project team is well equipped to provide the AML with detailed and accurate information regarding the subsurface geologies where these underground mines are located.

REMOTE SCANNING AND MAPPING

Understanding the root cause of potential subsidence mechanisms is crucial. RESPEC owns and operates a Carlson C-ALS Gyro system for underground scanning, which has been used to evaluate numerous inaccessible mine workings and voids. These include the

abandoned Greystone Mine in Missouri, the Haile Gold Mine in South Carolina, Cripple Creek and Victor Mines in Colorado, and the Horse Creek Limestone Mine in Wyoming. The C-ALS system has also been sold to and used by various clients across the United States, including multiple operations in Nevada, the Henderson Mine in Colorado, and the Greens Creek Mine in Alaska.

The C-ALS system uses a laser to scan the mine workings and void areas, capturing point cloud data that can be exported in various formats. With a range of 150 meters, exploration holes used for the C-ALS Gyro can be deployed at 300-meter intervals, requiring only a 3.5 inch-diameter hole. Combining the point cloud with the surface topography enables the development of a detailed 3D model of the underground mine workings, aiding in understanding where subsidence is likely to propagate to the surface. The C-ALS system also provides for live video feedback of the probe in underground mine workings.

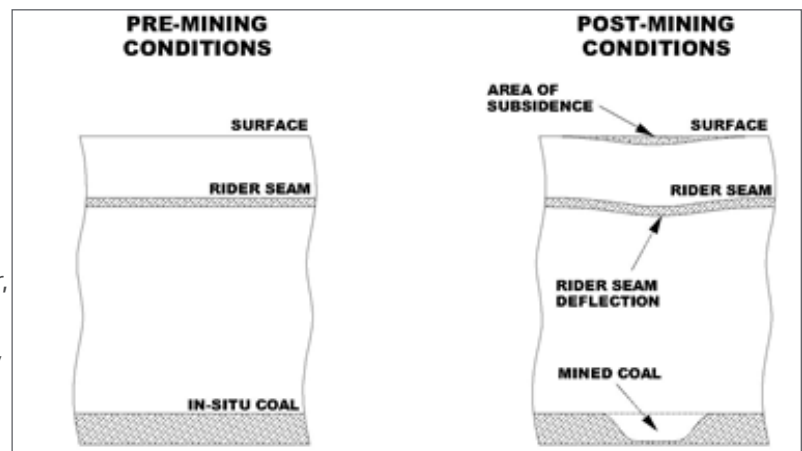
For example, stopping mine operations at the abandoned Horse Creek Limestone Mine in Wyoming created large underground voids. RESPEC conducted underground void scans through existing mine openings to develop a 3D model of these inaccessible workings. A total of 22 scans were collected, creating a 3D point cloud model that enabled RESPEC to assess safety factors along the mine's full length, identifying priority areas for potential remediation.

UNDERSTANDING OF PROJECT SCOPE

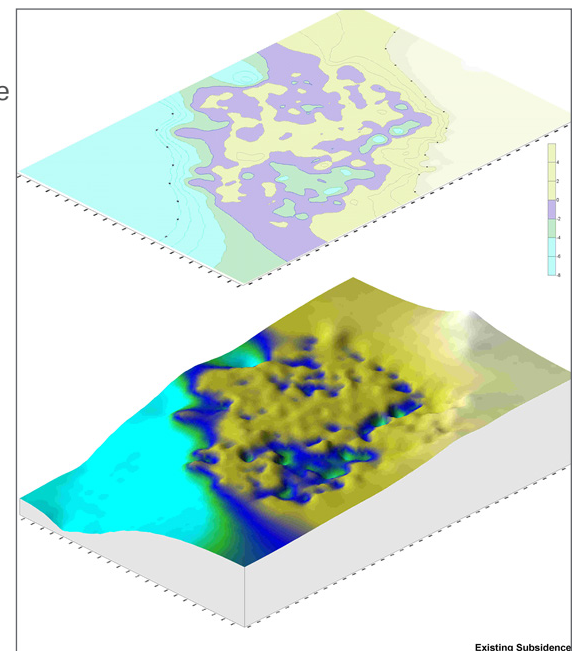
Following geotechnical investigations, RESPEC will consider several factors to determine the subsidence mechanism and potential subsidence impacts:

- / **Overburden Thickness:** Overburden thickness significantly affects the potential for chimney subsidence to reach the surface. A 3D model of each coal seam (floor and roof) will be created using geologic mapping, previous grout/exploration holes, and mine mapping. Combined with surface topography, this model will generate overburden thickness isopachs for both competent and total overburden. If data gaps or inconsistencies are found, RESPEC will recommend additional site exploration.
- / **Mine Extraction Ratio:** This ratio will be determined by reviewing geo-referenced and digitized mine mapping, review of areas subject to secondary mining, supplemented by statistical analysis of previous grouting projects (if available) to determine intersections of grout or exploration holes with pillars.

- / **Subsidence Isopach:**
Understanding the existing deflection or subsidence is crucial for characterizing the area and developing mitigation strategies. Deflection can be modeled using a key lithological marker, such as a rider seam, to validate field data and identify areas that need further site evaluation. The figure to the right is an example of this type of analysis.



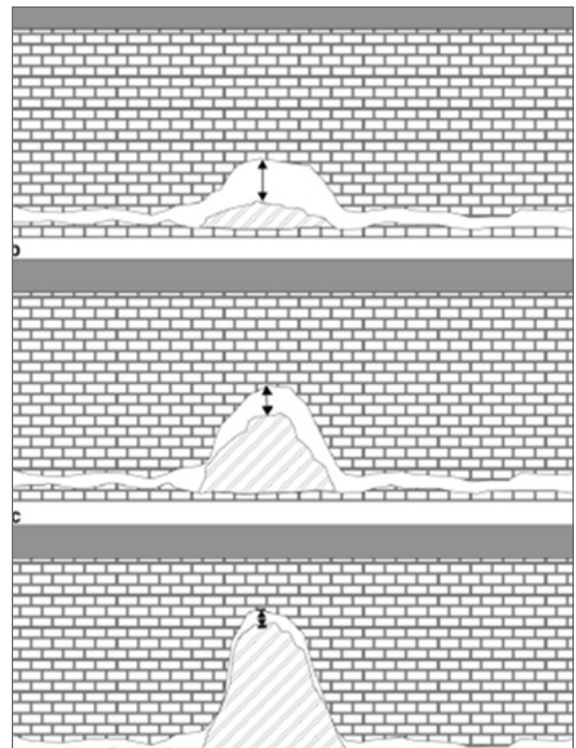
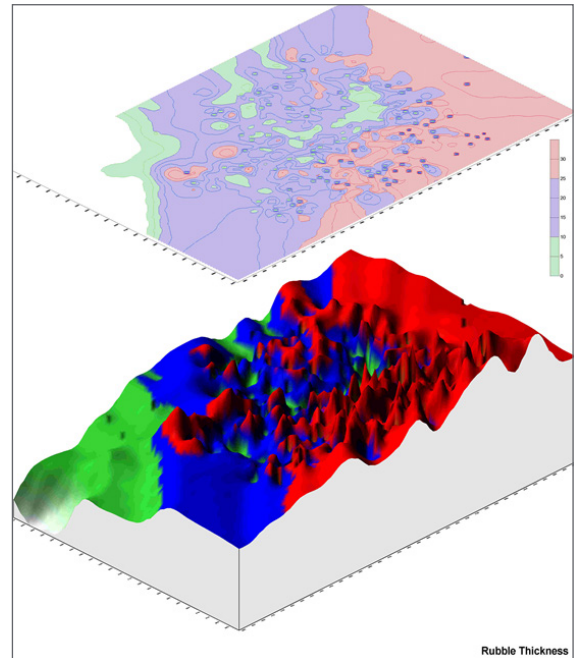
- / **Alluvium:** Alluvium thickness impacts subsidence extent and characteristics, often resulting in a larger area with a shallow trough shape. Mapping of alluvium thickness will allow for the development of a thickness isopach.
- / **Backfill:** The airport's construction on both excavated bedrock and backfill affects subsidence risk. Comparing preconstruction and current topography will help develop an isopach of unconsolidated backfill, which can be mitigated with grouting or compaction methods. The presence of unconsolidated overburden or backfill also impacts the subsidence risk as it decreases the thickness of competent rock above the coal seam.



UNDERSTANDING OF PROJECT SCOPE

- / **Rock Strength:** Rock strength influences subsidence probability and types, such as trough, chimney, or shear. Evaluating residual coal pillar strength and floor material will help calculate potential failures. RESPEC's Material Testing Laboratory will be used to determine these strengths from core samples obtained from site drilling.
- / **Rubble Factor:** This factor varies with the material properties but is challenging to measure using available logging tools because coring through rubblized zones changes the characteristics of the material. Geophysical tools can measure density, but alternatives include conducting a grout test or modeling rubblelization based on laboratory tests from rock cores. Initial grouting would be verified by coring the grouted test area to identify the grouting success.
- / **Rubble Propagation:** Defining the heights of rubblized zones and voids is essential. Data from drillers or geophysical logs should be recorded and mapped in real-time during any site investigation or Construction phase.
- / **Groundwater:** Changes in groundwater can alter subsurface material strength, affecting rubblelization and subsidence propagation.

Examples of rubblelization heights when modeling



UNDERSTANDING OF PROJECT SCOPE

MATERIAL TESTING

A RESPEC geologist will collect representative soil and rock samples during drilling and coring operations. These core samples will be safely shipped to RESPEC's Material Testing Laboratory in Rapid City, South Dakota, where RESPEC will provide rock mechanic testing in our 10,000-square-foot environmentally controlled geotechnical testing facility. RESPEC has over 50 years of experience in advanced rock testing and research for various rock types, and over that time we have developed industry standard failure criteria and constitutive models for various mining operations. RESPEC's research-grade facility specializes in rock mechanics testing for the analysis and design of underground mines and related infrastructure, as well as for mechanical and solution mining of evaporites, storage caverns for hydrocarbons, and nuclear waste disposal.

Laboratory testing will characterize the intact strength and physical properties of relevant rock units. RESPEC anticipates performing the following tests on selected core samples in accordance with ASTM standards:

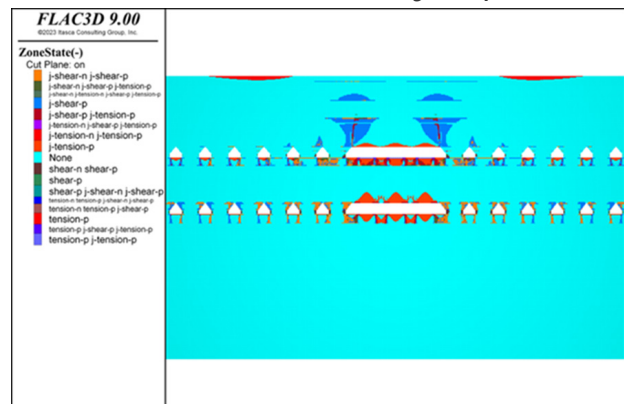
- / Unconfined compressive strength (ASTM D7012)
- / Confined (a.k.a. triaxial) compressive strength (ASTM D7012)
- / Brazilian indirect tensile strength (ASTM D3967)
- / Young's modulus and Poisson's ratio measurements (ASTM D7012)
- / Moisture content and bulk density (ASTM D7263, modified for rock)

The exact number and type of tests conducted will depend on the core recovered during drilling and the number of critical rock types identified. These tests are crucial for understanding the behavior and strength of the rock units and their suitability for engineering and construction purposes. The results will allow us to measure rock and mineral properties, including coal pillars, for use in advanced numerical modeling and design of subsidence mitigation measures.

SUBSIDENCE MODELING

Major trough subsidence usually does not occur long after mining, as up to 95 percent of the maximum displacement occurs within 90 days. Limited subsidence with trough-type characteristics can result from pillar failure or failure of placed artificial support. The presence of unconsolidated overburden material can magnify or obscure the effects of a subsidence event.

FLAC3D Subsidence Modeling Example



UNDERSTANDING OF PROJECT SCOPE

Predictive techniques are essential for understanding surface subsidence and evaluating the long-term impact of underground mines on surface stability and structures. These techniques include empirical methods and numerical modeling to predict final subsidence and subsidence profiles.

We will begin by creating representative models of the mine pillar systems using the Analysis of Coal Pillar Stability program (an MSHA program) to determine the stability factors for mine pillars under the property boundary. This analysis will provide stability factors for different pillar sizes at various overburden depths.

RESPEC proposes using the 3D finite difference program FLAC3D to simulate the geomechanical response of mine pillars, surrounding excavations, and the overburden response. Using data from site investigations, drilling, and laboratory testing, we will create several smaller 2D models and a comprehensive 3D model in FLAC3D to accurately simulate the observed ground conditions. These models will be validated against previously grouted subsidence-impacted zones and observed ground conditions. Critical excavations, such as mine portals, shafts, or voids found during investigations and drilling, will be included in the models. Structural loading from surface features like buildings, utilities, aircraft landings, and other airport infrastructure can also be modeled in FLAC3D.

The modeling results will assess the overall mine stability, identifying any critical areas of concern. Numerical models will predict worst-case scenarios of final subsidence and subsidence profiles and calculate surface deformation indices such as vertical subsidence, horizontal displacements, tensile and compressive strains, slope, and curvature.

Numerical modeling is a powerful tool for assessing the effectiveness of hazard or subsidence mitigation measures. It allows analysis of various mitigation strategies, including grouting, construction of additional infrastructure, or "no action." The model will also allow for evaluation of the type of subsidence mitigation and impacts of future changes, such as groundwater fluctuation and potential seismic events.

DESIGN PHASE

Design options will be evaluated based on the results of site and geotechnical investigations, along with past project data. The project design is separated into two phases: Conceptual Design and Final Design. RESPEC plans to leverage lessons learned from past mitigation practices, such as sand slurry, low slump compaction grouting, permeation grouting, and column building, to inform our designs and plans. We aim for constructive collaboration among project team members, WVDEP, and the AML Project Manager to develop the conceptual design, determine best practices, and finalize the design.



Example of RESPEC remotely constructing a barrier with zero slump grout and then backfilling with high slump grout.



UNDERSTANDING OF PROJECT SCOPE

During the Design phase, the following key elements will be considered when evaluating suitable grouting options:

- / Applicability to the specific subsidence mechanism and site conditions
- / Preferred cost-effective mitigation approach
- / Optimum grout selection
- / Constraints on drill locations because of airport configuration and FAA restrictions
- / Past AML work
- / Ease of construction
- / Availability of qualified contractors
- / Cost competitiveness
- / Ability to verify the success of the design and construction

Design options will be assessed by analyzing prevalent subsidence mechanisms and site-specific conditions, such as rubble characteristics, groundwater, overburden type, unconsolidated overburden, and site infrastructure constraints.

One of the key design challenges will be selecting the optimum type of grout. RESPEC has significant experience in selecting the optimum grout type, such as aggregate backfill, cementitious grouts, and chemical grouts, and can apply this expertise if grouting is chosen as the preferred subsidence mitigation approach.

Cementitious grouts come in various forms, with key adjustable parameters, including slump and strength. Particle size is also a consideration. RESPEC believes that much subsidence mitigation grouting uses unnecessarily high-strength grout, leading to increased costs because of higher cement content. The primary goal of subsidence mitigation grouting is to halt the propagation of rubble zones or fill voids where pillar failure could trigger subsidence. If the void is filled, neither pillar failure nor rubble propagation can continue. Therefore, the grout's purpose is to fill the void, not to provide strength.

Grout should be designed to fill the identified void without migrating to areas that do not require grouting. High-slump grouts, placed under pressure, can be challenging to control as they follow the path of least resistance.

Chemical additives, such as accelerators, retarders, and slump-reducing agents, allow control over the grout's physical properties. While RESPEC has used chemical grouts in other applications, they are unlikely necessary for these mine subsidence applications. For example, a recent project to seal a water-filled fault zone used expansive polyurethane foam with 18× expansion and a strength of 80 to 100 pounds per square inch.

The conceptual design will be completed to a level of detail sufficient to identify any fatal flaws and to develop approximate construction costs.

CONSTRUCTION PHASE

RESPEC Construction Managers anticipate project variabilities during the Construction/Grouting phases. Our team embraces the opportunities presented by project uncertainty

UNDERSTANDING OF PROJECT SCOPE

by developing a reliable construction approach that identifies potential setbacks before commencing work. Using geotechnical, geomechanical, geophysical, structural, underground mapping, and groundwater analysis techniques, RESPEC's Construction manager is equipped with the information required to aid the contractor's project efficiency on a site-specific basis.

RESPEC's Construction Managers prioritize communication, maintaining clear and consistent lines with all stakeholders to ensure smooth operational workflow. Our experience in construction management creates an asset that allows RESPEC to identify incorrect project execution, safety concerns, environmental impacts, and budgetary excesses. Our project team understands their role as the WVDEP AML's representative by maintains open communication to advise, consult, and clarify the project criteria to all stakeholders, reducing the risk of cost overruns and unwarranted claims.

The Construction Managers will have the following duties and responsibilities:

- / Conduct prebid meetings and tours
- / Conduct preconstruction, pre-commencement, and partnering meetings and conferences
- / Attend daily and weekly progress meetings with the contractor
- / Provide quality control and inspection
- / Use technology to expedite field data collection
- / Provide photographic documentation
- / Submit daily/weekly construction reports to the AML Project Manager
- / Implement field design changes and alterations
- / Prepare field and site work orders
- / Conduct quality control/quality assurance (QA/QC) for all work activities \
- / Monitor all site conditions (e.g., monitoring equipment, ground heave, borehole communication)
- / Conduct final inspection with the contractor and the AML Project Manager
- / Review the contractor's application for payment

Daily reports will be submitted electronically to the AML Project Manager, with copies provided to the contractor to eliminate confusion over any concerns and to offer written notification of any problems or deficiencies in the work performed. Our Construction Managers take pride in submitting thorough construction reports promptly after each day, keeping the Project Manager informed throughout the construction process.



UNDERSTANDING OF PROJECT SCOPE

➤ RESPEC PROJECT MANAGEMENT APPROACH

RESPEC boasts a team of professionals experienced in managing AML and permitting projects, as well as those with similar requirements. Our team of seasoned West Virginia Professional Engineers will serve as potential Project Managers, each with a proven track record of successfully managing projects of varying complexity, size, and budget. These individuals excel in coordinating technical staff and contractors; maintaining communication among the design team, the client, and stakeholders; managing conflict; and overseeing the financial aspects of the project. Through frequent communication, detailed budget tracking, and diligent task scheduling and reporting, the Project Manager ensures that projects are completed successfully and exceed client expectations.

The Project Manager's responsibilities will include, at a minimum:

- / Directing project team activities to achieve strategic goals and objectives
- / Assigning work tasks and deadlines to key project team personnel
- / Facilitating open communication between WVDEP and the project team
- / Coordinating project team meetings, reporting, and documentation
- / Ensuring compliance with project schedule and budget
- / Encouraging stakeholder participation, especially from the Morgantown Airport, to avoid conflicts and prevent project interruptions
- / Coordinating all investigation and/or pre-design activities with affected owners early in the project to avoid costly conflicts with current and future interests
- / Ensuring of all work throughout all phases of engagement
- / Performing additional tasks as required by the contract

This technical approach serves as a standard outline for how RESPEC would guide our response to all design projects. We recognize that successful projects begin with a solid foundation built on pre-coordination and a project kick-off meeting to align the project scope and details with all the key parties and individuals involved. Our project framing approach is detailed below.



UNDERSTANDING OF PROJECT SCOPE

PROJECT MANAGER INITIAL RESPONSIBILITIES

The project manager's initial responsibilities will be to work with WVDEP to develop a Task Implementation Plan. This plan will include the following, at a minimum:

- / Providing a detailed description of work and services to be completed
- / Establishing a project schedule and budget
- / Defining the required deliverable(s) early
- / Assembling the optimal design team to meet the project objectives
- / Planning, coordinating, and leading a kick-off meeting
- / Assigning work tasks and deadlines to key project team personnel
- / Directing project team activities to achieve strategic goals and objectives
- / Facilitating open communication between WVDEP and the project team
- / Coordinating project team meetings, reporting, and documentation
- / Ensuring compliance with the project schedule and budget

The Project Manager will generate periodic status reports for WVDEP. Any potential problems identified during the project will be reported to WVDEP, detailing the nature of the problem, potential impacts, and the recommended courses of action.



UNDERSTANDING OF PROJECT SCOPE

➤ PROJECT MANAGEMENT – OUR COMMITMENT TO QUALITY AND RESPONSIVENESS



EXPERIENCED PROFESSIONALS

We have assembled a team of experienced professionals who know how to solve mining-related issues and complete projects within time and budget constraints. Our staff can manage unexpected changes to mine-related projects



SCHEDULE

After determining the schedule, major meetings will be set. This system will provide the RESPEC team with set deliverable dates so that a project will remain on track and meetings will not be rescheduled because of other commitments. Frequent coordination meetings will be conducted via telecommunication between the Project Manager and Task Leads to discuss the project status and goals as well as share and obtain updated information.



QA/QC

The Project Manager will establish a QA/QC program specifically tailored to each project. Fundamental features will include using standard operating practices, staff training, and project checklists. The program will include technical reviews applied while preparing designs, calculations, drawings, details, specifications, quantities, cost opinions, reports, and construction documents. The QA/QC documentation will be provided during the design process to illustrate our commitment to high-quality plans and documentation.



COMMUNICATION AND METHOD OF INTERFACE

Communication is critical. The project scope will include a reporting schedule to WVDEP, which will set the minimum. We routinely communicate via telephone calls, emails, or intermittent progress reports. Our communication philosophy is to be extremely responsive—if we miss a telephone call, we will respond the same day as the voice message.



SCOPE AND BUDGET CONTROL

We plan to maintain the schedule and budget control through regular team meetings and status reports. A comprehensive project task schedule will be established at each project start-up to ensure clarity in project flow and benchmarks. These tools are highly effective in communicating the current project status, identifying potential schedule issues, providing a record of project milestones, and reconciling conflicts. RESPEC will use appropriate project management and cost-tracking software (e.g., Microsoft Project, earned value tracking, and BST accounting systems).



CLIENT SATISFACTION

RESPEC's role is to assist WVDEP in completing the project to WVDEP's specifications. Technical and nontechnical project requirements will be addressed to achieve final products that meet WVDEP goals and objectives.



RELEVANT EXPERIENCE

➤ RESPEC QUALIFICATIONS AND EXPERIENCE

RESPEC has completed and is currently working on AML projects in multiple states. We have been involved with AML projects for more than 30 years and have completed projects in 10 states. RESPEC is currently contracted to complete AML projects in both the North and South regions of West Virginia and has experience with West Virginia AML projects, as well as projects in other states, including Wyoming, Colorado, New Mexico, Montana, Utah, and Pennsylvania. In addition to AML projects, RESPEC and our professional staff have completed projects with similar components. These projects have been completed or are ongoing in multiple states and have been conducted for the OSMRE, the Bureau of Land Management, and many private companies.

RESPEC has grown significantly through the acquisition of strategic partners. In 2014, RESPEC acquired Morgan Worldwide, a consulting firm with experience in AML and SMCRA-related projects. Another significant acquisition was the recent acquisition of EARTHRES/Musser Engineering, who have an office in Morgantown.

Descriptions of selected projects are included below to showcase RESPEC's experience in mine subsidence evaluation and mitigation. These projects are also presented in the "AML and Related Project Experience Matrix" found in Appendix A.

➤ RESPEC AND MINING

Since our founding in 1969, RESPEC has been a steadfast supporter of the mining industry, actively involved in all aspects of the Surface Mining Control and Reclamation Act (SMCRA), both Title IV and Title V. Our projects span the U.S., serving a diverse range of stakeholders, including state and federal governments, mining companies, landowning companies, environmental organizations, watershed groups, and law firms.

RESPEC and its employees have also played a significant role in shaping the mining industry's regulatory framework. Our contributions include developing the Approximate Original Contour guidelines for West Virginia, the Surface Water Runoff Analysis guidelines for West Virginia, the Mountaintop Mining Environmental Impact Statement for the U.S. Environmental Protection Agency (EPA), and the Stream Protection Rule for the Office of Surface Mining Reclamation and Enforcement (OSMRE). Our representatives have also served on the West Virginia Special Reclamation Fund Advisory Council and the WVDEP Permitting QA/QC Panel.

We have been active in major mine permitting projects throughout West Virginia, such as the Hobet 45 Section 404 permit, the Huff Creek SMCRA/404 permit for Patriot Coal, and the Canebrake SMCRA/404 permit for Hampden Coal. RESPEC continues to support the industry with ongoing projects in West Virginia for companies like Mettiki Coal.

RESPEC also supports other mining activities in the state, such as Greer Industries' new underground lime mine in Pendleton County, their new Buckeye Stone underground mine, and their Decker's Creek Limestone operations near Morgantown.

Our involvement extends to reviewing mine reclamation liabilities, such as the Buffalo Coal bankruptcy, the F&N Coal bankruptcy, and the Essar mining permit forfeiture case. In addition to the numerous AML projects for the State of West Virginia, we completed the watershed review of the North Branch of the Potomac, to define AMD treatment priorities.

We fully recognize that West Virginia has a significant legacy of coal mining, having produced the second-largest tonnage of coal in the U.S. (just behind Pennsylvania), with 20 percent of U.S. coal production from 1800 to 1977 being mined in the State.

RELEVANT EXPERIENCE

➤ PAST PROJECT EXPERIENCE

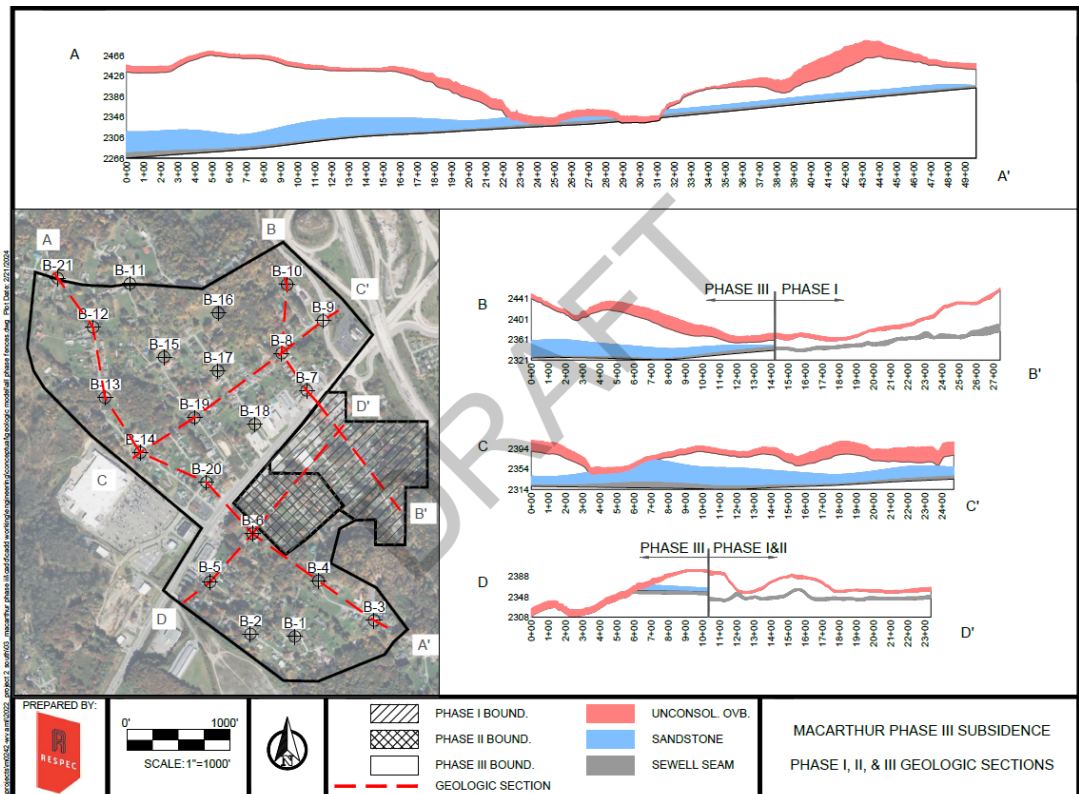
MACARTHUR SUBSIDENCE PHASE III

Project Location: MacArthur, West Virginia // Client: West Virginia Division of Environmental Protection

The MacArthur Subsidence Phase III project is a continuation of the remediation of subsidence throughout the MacArthur, West Virginia, area. Abandoned underground mine workings have caused significant subsidence throughout the town, affecting many homes and businesses. Phases I and II were previously completed in areas where subsidence was already prevalent, while Phase III is being completed in areas where limited subsidence has occurred. The goal of Phase III is to help prevent future subsidence from occurring, protecting homes and people by providing additional support within the abandoned underground mine workings utilizing grouting techniques.

A geotechnical investigation was conducted to evaluate the depth and extent of the underground mine workings and strata above the mine. FLAC3D modeling was used with geotechnical information to evaluate the strength of the mine roof, determine at what overburden depth subsidence is likely to propagate to the surface, and determine the necessary spacing of grouting to provide adequate mine roof support for surface structures.

A comprehensive review of available mine mapping was completed to determine mining extents, while exploratory boreholes will be completed during construction to evaluate possible unmapped mining in the area, as was observed during the geotechnical investigation.



RELEVANT EXPERIENCE

ROCK SPRINGS DRILL AND GROUT PROJECT FOR SUBSIDENCE MITIGATION

Project Location: Rock Springs, Wyoming // Client: Wyoming Department of Environmental Quality (DEQ), Abandoned Mine Land Division (AML)

Rock Springs has been plagued by mine subsidence problems since mining operations along the Union Pacific Railroad began in the late 1800s. This work, which was conducted by RESPEC staff, involved providing subsidence investigation, engineering, analysis, mitigation design, public relations, construction, and geotechnical expertise for abating the Rock Springs mine subsidence liability. The scope of the project was extensive. Subsidence modeling was used to define the potential for subsidence related to the No. 3, No.1, and No. 7 seam coal mine workings underlying the city. This analysis was performed to determine limits for mitigation construction because subsidence prediction was the key project element determining areas where grouting and/or stabilization were needed. Grouting plans using state-of-the-art techniques and innovative applications were crucial for minimizing costs. Assessment and verification of the grouting work by geophysical methods and empirical derivation was the cornerstone of the "final warranty" of the grouting work.



RELEVANT EXPERIENCE

STORM KING MINE ABANDONED MINE RECLAMATION

Project Location: Sheridan, Wyoming // Client: Wyoming DEQ, AML Division

The Storm King Mine is an abandoned underground coal mine that opened in 1919 in Sheridan County, Wyoming. The mine was especially active during the 1930s through the 1940s and into the early 1950s but was abandoned soon afterward. Over time, sinkholes began to develop above the shallow mine, creating a hazard and impacting drainage.

In early 2008, the AML Division directed RESPEC to conduct investigations, develop designs, and manage construction to mitigate several developing sinkholes. Over several years, sinkhole development over the underground mine workings in the Nelson Draw area dramatically increased, specifically in a livestock field near a residential home. RESPEC continued to conduct investigations, develop designs, and manage construction to mitigate the developing sinkholes.

The overall goal of the AML Division was to eliminate safety hazards and repair environmental damage caused by the mine subsidence. To accomplish this goal, in 2018, RESPEC initiated work on a subsidence investigation and developed a subsidence prediction model to facilitate the development of designs to mitigate the safety hazards and minimize the development of future subsidence features. Mitigation designs included excavation, grouting, mine-wide grouting, a rock and concrete wedge, and backfilling. Because of the severe erosion happening in the Nelson Draw, a series of drop structures were built in the drainage channel, and an emergency spillway was constructed in the Thomas Krout Stock Pond, which was being threatened by the erosion.



RELEVANT EXPERIENCE

HORSE CREEK ABANDONED MINE RECLAMATION

Project Location: Cheyenne, Wyoming // Client: Wyoming DEQ, AML Division

RESPEC was selected by the AML Division to investigate and evaluate mining features associated with the underground Horse Creek limestone mine. RESPEC conducted both surface and subsurface investigations at the mine. The first phase of investigations was concerned with the surface impacts of the mine. During the investigations, RESPEC recorded 83 individual surface features, including subsidence, portals, shafts, highwalls, hazardous equipment and facilities, and areas that were environmentally degraded because of mining activities. The investigation team used the ArcGIS Collector application to collect and inventory all features in a geospatial database and recorded pertinent information for each feature.

For the second phase of the investigation, RESPEC engineers evaluated more than 40 million cubic feet of underground workings that posed safety risks to the public. Initial underground void scans, survey data, and historical mapping were used to generate a 3D model of the inaccessible underground workings and voids, which were verified with additional scanning. We collected a total of 22 underground void scans using a Carlson C-ALS remote void scanning system. The 3D models of the workings and updated surface surveys were used to perform a stability analysis of the area. Industry-standard methodology and calculations determined the factor of safety along the full length of the concerned area. We identified priority areas requiring further investigation, potential remediation, and potential solutions.

RESPEC is currently working with the AML Division to develop the next phase of investigation for the priority areas. Final remediations will be developed and initiated once the priority areas have been fully investigated.



RELEVANT EXPERIENCE

WEST KENTUCKY ENERGY PROJECT

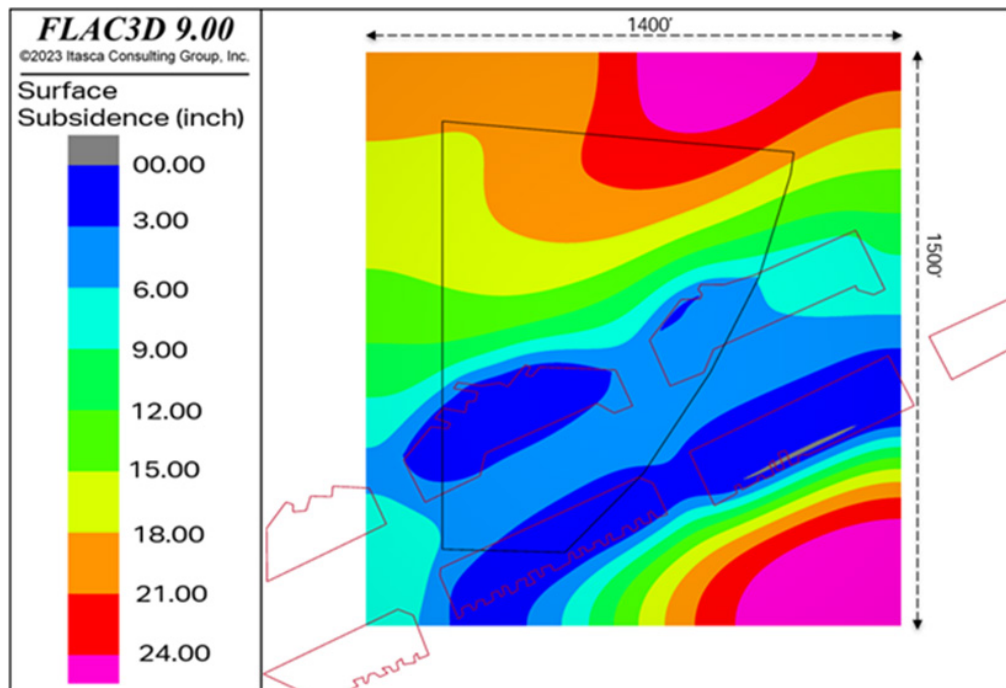
Project Location: Western Kentucky // Client: Kentucky Municipal Energy Authority (KMEA)

RESPEC Company, LLC (RESPEC) conducted this subsidence hazard assessment of a property in Kentucky for constructing power generation facilities

The analyses began with a Task 1 evaluation to review historical coal mining information, regional geology, site visit, and mine stability results. Mine maps and historical data for the coal seams underlying the property were compiled and reviewed to determine which coal seams and mines underly the property, if future mining beneath the property was likely, and if subsidence is possible. A review of historical subsidence in the Madisonville area identified a few recent subsidence events that had caused structural damages.

The subsequent Task 2 assessment included drilling two core holes, core logging, sampling, laboratory testing, and numerical modeling. The core drilling and logging program revealed some rubblization in the coal seams and deterioration, which are consistent with the age and materials in the roof of the WKY 9 and WKY 11 mine levels. Our laboratory testing confirmed that the coal in both seams was stronger than initially assumed but also identified a weak shale unit above the WKY 11 mine level.

The numerical 2D models used for a 4-pillar collapse scenario on both levels at the same time predicted a maximum surface subsidence of slightly more than 3 inches. The maximum predicted surface subsidence was less than 1 inch using the 3D model. Because the same conservative conditions were used in the 3D model as for the 2D section model (i.e., total pillar removal, no support from the rubble, and stacked failures on both mine levels), the 3D numerical model results further reinforced that subsidence risk is low.



RELEVANT EXPERIENCE

MICHIGAN RECLAMATION

Project Location: Saginaw, Michigan // Client: OSMRE

Historical coal mine workings located 100 to 200 feet below the surface were actively subsiding at some sites at the time of remediation. Fall protection, other special safety equipment, and monitoring were used to prevent falling into voids during the work. Underground voids were grouted with different mixtures of cement, fly ash, sand, aggregates, and calcium chloride. Sinkholes on the surface that developed while drilling were backfilled. Drilling was conducted in residential neighborhoods and rural fields, which required coordination with private property owners and city officials. Over 4 months, nearly 11,000 feet were sonic drilled; 6,200 feet of polyvinyl chloride (PVC) casing were installed; and 320 tons of cementitious grout, 1,000 tons of fly ash, and 900 tons of sand were pressure grouted to fill voids. An additional 500 tons of gravel were placed to fill sinkholes and other surface depressions. Finished sites were restored upon completion of surface activities. Our personnel coordinated and managed the drilling activities, performed geological logging of the sonic-drilled core samples, liaised with community personnel, provided overall project supervision, coordinated with all of the necessary logistical and service vendors, and interfaced with the OSMRE technical representative.

THE WILL GROUP - SUBSIDENCE ANALYSIS

Project Location: Ankeny, IA // Client: The Will Group

The Will Group obtained RESPEC to provide an engineering analysis and recommendations to Edged Des Moines, LLC (Edged). Edged was in the process of evaluating the suitability of a property for the construction of a data center. The property is partially underlain by historical coal mine operations, reported to have ceased in 1911. The property is at risk of mining-related subsidence that could lead to differential settlement. Across two phases, RESPEC completed a preliminary geotechnical evaluation regarding subsidence potential and created a subsidence model to predict surface subsidence scenarios related to mine pillar collapses.

As part of the geotechnical evaluation, RESPEC analyzed regional geology, existing mine maps, historical drilling records, and regional subsidence events. The mine maps and historical drilling records were used to complete pillar strength, pillar stress, and safety factor assessments, as well as a stability factor analysis for the mine layout. The resulting safety and stability factors were used to assess subsidence risk because of mine pillar failure.

The project's second phase included core drilling to determine the exact elevation of the coal sea.



RELEVANT EXPERIENCE

GREYSTONE MINE STABILIZATION PROJECT

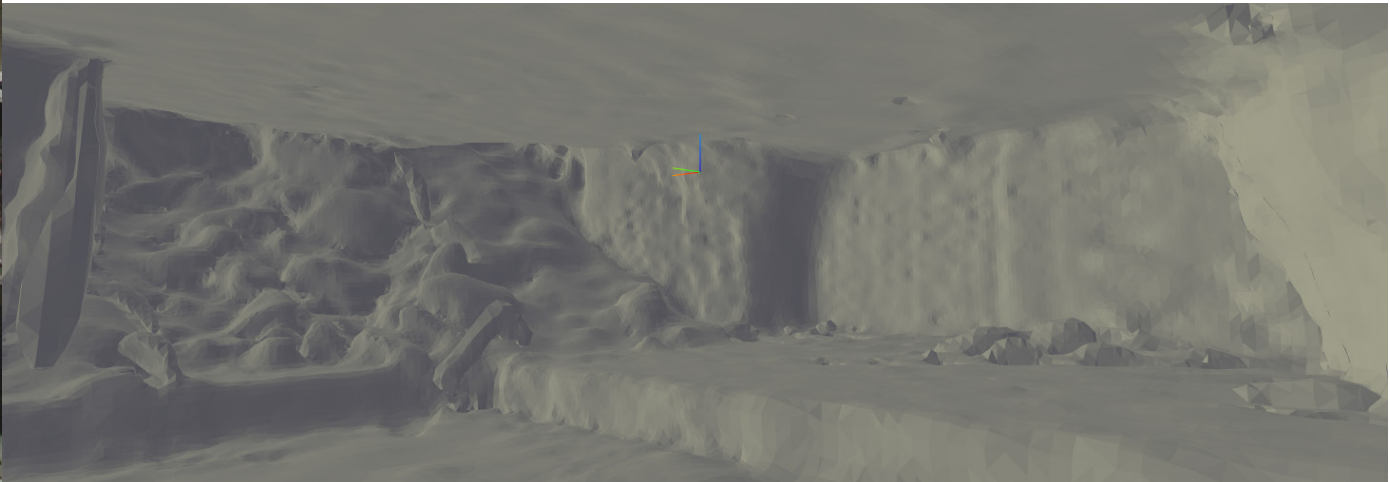
Project Location: Kansas City, Missouri // Client: Copaken Brooks

This project consisted of reviewing the stability and issues associated with an underground limestone mine in Kansas City, Missouri. The mine had been abandoned in the late 1970s and was developed to extract the Bethany Falls limestone using room-and-pillar mining methods. A portion of the mine was subsequently converted to underground cold storage. The mine was inaccessible during the rock mechanics analysis, but old mine maps and historical photos indicated areas of a weak mine roof, small pillars, and large spans. A review of the mine mapping led to concerns regarding the actual extent and accuracy. The overburden above the mine roof consisted of weak shales and a thicker-competent limestone bed. The actual overburden thickness above the Bethany Falls varied from zero at the outcrop to approximately 90 feet. The biggest issue was validating the accuracy of the historical mine mapping and the current condition of the roof and pillars. The approach to obtaining these data (as the mine could not be entered) was using rotary drilled holes and the Carlson C-ALS Gyro. The C-ALS laser measurement used a range of 150 meters to scan and determine the actual position and orientation of the underground workings using a gyro. A 3D rendering was created using the resulting point cloud and was combined with existing corehole data to provide an updated rock mechanics analysis.

The rock mechanics analysis reviewed the following:

- / **Pillar Dimensions:** The slenderness ratio and minimum critical width
- / **Pillar Strength:** Based on load and pillar sizes and the tributary area (using S-pillar analysis)
- / **Pillar Punching:** Analyzing pillar loading and the strength of floor beam materials
- / **Roof Beam Span:** Based on the roof beam strength and observed spans
- / **Caving Failure:** Determining the maximum caving height using swell factor and historical mining height
- / **Plug Failure:** Evaluated using the size and weight of potential plug shear resistance of plug

Based on the analysis, various mitigation methods were evaluated to address the potential failure mechanisms at different parts of the mine. These areas were defined by a mixture of areas with excessive roof beam spans, small pillars, and low overburden.



RELEVANT EXPERIENCE

IDARADO MINE MILL-LEVEL TUNNEL FLOW-CONTROL BULKHEAD

Project Location: Telluride, Colorado // Client: Newmont Corporation

RESPEC worked on a multi-company team to prevent pollution from mine-water discharge by creating a unique flow-control bulkhead design at the Newmont Idarado Mine legacy site outside Telluride, Colorado. RESPEC's performance led to additional assignments and increased responsibilities. We ultimately served as construction manager in executing the project, which was valued at approximately \$5 million.

The high, mountainous regions of the area drain through the mine and discharge near the town of Telluride. Changing weather patterns have caused spring snowmelt flows that are increasingly unpredictable. These flows can exceed 15,000 gallons per minute and threaten to overtop infiltration ponds.

The bulkhead regulates discharge into the settling ponds through redundant piping and automated instrumentation so that water quality and quantity standards are not exceeded. The uniqueness of the bulkhead design is related to its accessibility. A watertight, stainless-steel door (essentially a submarine hatch) is located on the bulkhead and designed for a water pressure of nearly 400 psi. The bulkhead's inby (wet) side can be accessed at low flow to perform maintenance. The design will safely reduce the risk of pollution through unplanned discharge with a largely passive system and eliminate significant energy consumption in water pumping.

Construction encompassed a concrete bulkhead measuring approximately 15 feet high × 15 feet wide by 15 feet long, with a taper suitable to hold a static pressure behind the bulkhead of approximately 400 psi. The bulkhead encompassed pipe penetrations for a 24 inch primary conveyance pipe, an 8-inch overflow pipe, and a 1-inch pressure pipe. The bulkhead also encompassed a 6-foot-square accessway with railway track to allow for access behind the bulkhead. This requirement was accomplished by installing an approximately 9-ton pressure door on the inside side of the bulkhead that could withstand static pressure loads.

Major construction activities were completed in early 2020 and handed over to the owner for final commissioning under restricted site working conditions because of the COVID-19 pandemic.



RELEVANT EXPERIENCE

MARYLAND - MARYLAND BUREAU OF MINES: FROSTBURG SUBSIDENCE RECLAMATION PROJECT

Project Location: Frostburg, Maryland // Client: Maryland Bureau of Mines

This project entailed investigation, design, and construction management related to a collapsing road in a residential neighborhood of Frostburg. Very shallow mine workings were extensively developed just below a road and neighborhood. A drilling investigation confirmed the unstable subsurface features and assisted in qualifying feasible stabilization solutions. The selected design used a stabilization technique entailing grouting at low pressures.

CRAWFORD MOUNTAINS AML STUDY

Project Location: Rich County, Utah // Client: Utah Division of Oil, Gas and Mining

The Utah Division of Oil, Gas & Mining awarded this project to RESPEC to conduct a site evaluation of the abandoned phosphate operation in Crawford Mountain in northeastern Utah. Following the site evaluation and developing a database to categorize the hazards present, RESPEC staff studied the historic mining record to develop various reclamation alternatives. The evaluation indicated that one phosphate bed had been folded to form a syncline structure with the two steeply dipping limbs outcropping on the ridgeline of the Crawford Mountains. The phosphate had been principally underground mined and left access raises up to the surface, as well as numerous areas where the crown pillars remaining were insufficient to provide long-term stability. The two outcroppings extended 7 miles along the ridgeline and contained approximately 200 vertical and horizontal openings that sometimes extended to depths of over 800 feet. The site evaluation provided hazard rankings for the features, but because of the significant vertical drops and unstable edges of the openings, most of the features received the most critical rankings. The evaluated reclamation alternatives encompassed backfilling the workings with on-site materials or via slurry-transported borrow materials, blasting the hanging walls, and installing concrete caps on the openings. The Report of Investigations includes the site evaluation, hazard disturbance, hazard rankings, aerial photographs, reclamation alternatives, and cost estimates.



RELEVANT EXPERIENCE

WASHINGTON - OFFICE OF SURFACE MINING: WINGATE HILL MINE RECLAMATION

Project Location: Carbonado, Washington // Client: Washington Office of Surface Mining

RESPEC staff was contracted to design innovative closures for six deep mine shafts. The shafts were very large and extended to estimated depths of 500 feet. All entries were located approximately 1 mile south of Carbonado, Washington. The shafts were situated in heavily vegetated new forest growth owned by a large timber company. Although the access roads were fenced and gated, hunters and recreationists were permitted paid access to this site year-round, which increased the risk of injury.

A wire mesh and cable net closure was developed to minimize cost and provide an effective closure. Initial clearing and excavation were required to establish a competent connection to in situ soils. Grouted soil anchors were designed to connect 7,000-pound galvanized aircraft cables securely to the indigenous glacial fill. The anchors were arranged in a circular pattern, providing a 4 foot x 4 foot square cable grid system. The grid was overlaid with high-strength gabion wire mesh commonly used for rockfall protection. The anchor and the exterior circumference of the cable/mesh system were then covered with compacted earth to permanently protect the net system. The area directly over the shaft was completely covered with the cable net, providing long-term protection to loggers and recreational visitors.

RESPEC staff provided a full-time construction inspector throughout this project. Inspection duties encompassed daily logs, contractor/client coordination, and equipment and personnel monitoring.



RELEVANT EXPERIENCE

DILLAN CREEK ACID MINE DRAINAGE REMEDIATION

Project Location: Reedsville, West Virginia // Client: Friends of Deckers Creek

Friends of Deckers Creek (FODC) is a nonprofit watershed group working to clean up decades of environmental degradation with the Deckers Creek Watershed. RESPEC partnered with Dr. Paul Ziemkiewicz, Director of the West Virginia Water Research Institute, to design/permit an AMD treatment system located on Dillan Creek, a subsidiary of Deckers Creek. The treatment system will treat multiple AMD seeps emitting from pre-SMCRA mines. FODC requested that the treatment system be passive, so RESPEC designed a passive treatment system consisting of a self-flushing limestone leach bed. RESPEC's Mike Cross is the project manager for this project, which involves preparing and submitting permits to the U.S. Army Corps of Engineers (USACE) and WVDEP. These permits are currently pending.

RESEPEC designed the treatment pond based on the initial conceptual plans. Open limestone channels were designed to collect the drainage from AMD seeps and convey the water into the treatment pond. Approximately 1,400 tons of 1.5- to 3-inch limestone will be placed into the treatment pond. Based on the flow from the seeps, the treatment pond will fill in approximately 24 hours, allowing the

AMD water sufficient time to react with the limestone. An Agri Drain is proposed to be installed in the treatment pond dam that will be computer/timer controlled to open once per day to drain the treated water and to flush the precipitates out of the pond before they coat the limestone and reduce the effectiveness/life of the limestone. Once open, the AgriDrain will drain the treated water approximately 1 hour before closing. After closing, the treatment pond will start to fill and start the cycle again. The self-flushing system has a projected 30-year life.



RELEVANT EXPERIENCE

SUNNYSIDE MINE, DOJ

Project Location: Southwest Colorado // Client: Environment and Natural Resources Division, Environmental Enforcement Section, U.S. Department of Justice (DOJ)

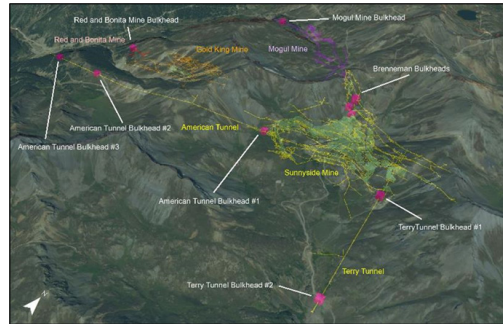
The U.S. DOJ retained RESPEC to evaluate the configuration and extent of the Sunnyside Mine and the adjacent mines in the Bonita Peak Mining District. Before its closure in 1991, the Sunnyside Mine was southwestern Colorado's largest underground metal mine, 6 miles north of Silverton in the San Juan Mountains.

RESPEC used Surpac to construct a 3D model of the Sunnyside Mine workings, the nearby Mogul, Gold King, and Red and Bonita mines, and details of the American Tunnel. The model also encompassed geologic features, such as major fault zones and surface mapping information.

RESPEC used historic mining maps, drilling information, and survey data to re-create the Sunnyside Mine 3D model. In many cases, multiple maps showed an area of the Sunnyside Mine on different dates. Some maps had handwritten notes or edits marked on one version and additional details on a separate map generated at a different time. Some mine maps focused on a specific area of interest, such as a particular portion of the mine that was active at the time of the mapping, and subsequent maps may omit details from areas that are no longer active.

Major faults that intersect mine workings were also modeled based on notations from maps produced by mine operators, USGS data, and observations documented during mine operations. The Bonita Peak Fault intersects Gold King workings and the American Tunnel. Observations during the 1960 American Tunnel extension verified the fault zone intersection.

The final model allowed the interrelationship of the various mine workings to be identified and the volume of excavation to be calculated by elevation, thus allowing the hydrostatic pressure on the various bulkheads to be reviewed.





RELEVANT EXPERIENCE

➤ ADDITIONAL PROJECT EXPERIENCE IN AML RECLAMATION AND REMEDIATION

The following is a partial list of AML projects completed by RESPEC or RESPEC staff for state or federal agencies. Similar projects completed for private clients are not included in this listing.

Bureau of Land Management (BLM):

- / War Eagle Mountain Project

Kentucky Division of Abandoned Mine Lands:

- / Buck Branch Reclamation Project
- / Mare Creek Refuse Reclamation Project
- / Ridge Top Reclamation Project
- / Williams Branch Reclamation Project

Maryland Bureau of Mines:

- / Midlothian Acid Mine Drainage Project
- / Franklin Hill Slide Project
- / Shallmar Refuse Project
- / Vindex Refuse Project
- / Bartlett Hill Landslide Project
- / Frostburg Subsidence Reclamation Project

Ohio AML:

- / Abandoned Coal Mine Reforestation Projects

Oklahoma Conservation Commission:

- / Horsepen Creek Reclamation Project
- / Adams Creek North Reclamation Project

Montana DEQ, Abandoned Mine Section (AMS):

- / Wibaux County Mines Project
- / Montana Hardrock Mine Inventory

Utah Division of Oil, Gas and Mining:

- / Crawford Mountains AML Study
- / Brazier Demonstration Project
- / Molly's Canyon Project

- / Arickaree Project

- / Coal Hollow Project

- / Trespass Coal Mine Closure Project

- / Horse Canyon Coal Mine Fire Project

- / Silver Reef Project

Virginia Department of Natural Resources:

- / Wolfpen Gob Pile Project

- / Roaring Fork Landslide Project

- / Dorchester Drainage Project

- / Arno Sedimentation Project

Office of Surface Mining – Washington State:

- / Wilkeson AML Investigations

- / Buckley No. 2 Mine Reclamation

- / Wingate Hill Mine Reclamation

- / Van Zant Abandoned Mine Investigation

- / Hamilton/Minkler Lake Mine Reclamation

- / Spiketon Emergency Reclamation Project

- / Pack/Dupuis Reclamation Project

West Virginia Division of Environmental Protection:

- / Cook Refuse Reclamation Project

- / Nellis Complex Reclamation Project

- / Florence Hollow Project

- / Whitman Refuse Project

- / Roaring Creek Highwall Project

- / Saltwell Drainage Project

- / Hartford B Project

- / Stowe Structures Complex Project

- / Omar Complex Project

RELEVANT EXPERIENCE

- 
- / Dillon Landslide Project
 - / Sabine Refuse Project
 - / Beaver Creek Highwall Project
 - / Gypsy II Project
 - / Twin Branch Complex Project
 - / Browning Fork Slide Project
 - / Ottawa Portals Project
 - / Widen Refuse Reclamation Project
 - / Beckley Soccer Complex Subsidence
 - / MacArthur Subsidence
 - / Price Hill
 - / Crown Hill
 - / Morris Creek
 - / Summerlee
 - / Beech Bottom
 - / Bethany
 - / Buffalo
 - / Logan Run
 - / Richard Mine
 - / Craft's Run
 - / Wades Run
 - / Hidden Waters Mine Sites – Reclamation of Big Horn, Randall & Ash Creek Strip Mines
 - / Kleenburn Coal Mine Project Hazard Assessment and Mitigation
 - / Plachek Mine & Goose Creek Investigation and Mitigation Design
 - / Storm King Coal Mine Sinkhole Remediation
 - / Drainage Channel Reconstruction for Storm Kind Abandoned Mine
 - / Record-Eveland Mine Reclamation
 - / Wyoming Statewide Abandoned Coal Mine Reclamation
 - / Abandoned Bentonite Mine Hazard Mitigation
 - / Demonstration Plot for Bentonite Pit Reclamation
 - / Restoration of Historical Carissa Gold Mine Mill
 - / 3D Imaging to Restore Carissa Mine Shaft and Cage
 - / Reclamation of Abandoned Wicker-Baldwin Uranium Mine
 - / Reclamation of Abandoned Layland Canyon Phosphate Mine

Wyoming DEQ:

- / Horsecreek Project Phase 1B Horsecreek Project Phase 2
- / Project 17D - Mine Shafts, Subsidence Holes & Flood Control FMC Corporation
- / Copper Mountain Mine Reclamation
- / Double Dee Abandoned Mine Stabilization
- / Snake River Grave Pit and Wetland Reclamation
- / Kirwin Abandoned Mine Stabilization
- / Seahorn-Ramsey Coal Mine Reclamation
- / Gebo Coal Mine Reclamation Phase I and II
- / Little Mo-Arrowhead Uranium Mine Reclamation
- / Northwest Wyoming Abandoned Coal Mine Reclamation
- / Sheridan Mine Fire Supervision
- / Savory Mountain Mine/Thomas Abandoned Mine Reclamation
- / American Nuclear Corporation Uranium Tailings Cleanup and Reclamation
- / Shirley Basin Abandoned Uranium Mines Recamation
- / Kemmerer Coal Mine Fire Hazard Mitigation
- / Wyoming Abandoned Mine Lands Central Wyoming Non-Coal Contract
- / Rock Springs Drill & Grout Subsidence Abatement
- / Glenrock Mine Subsidence Peer Review

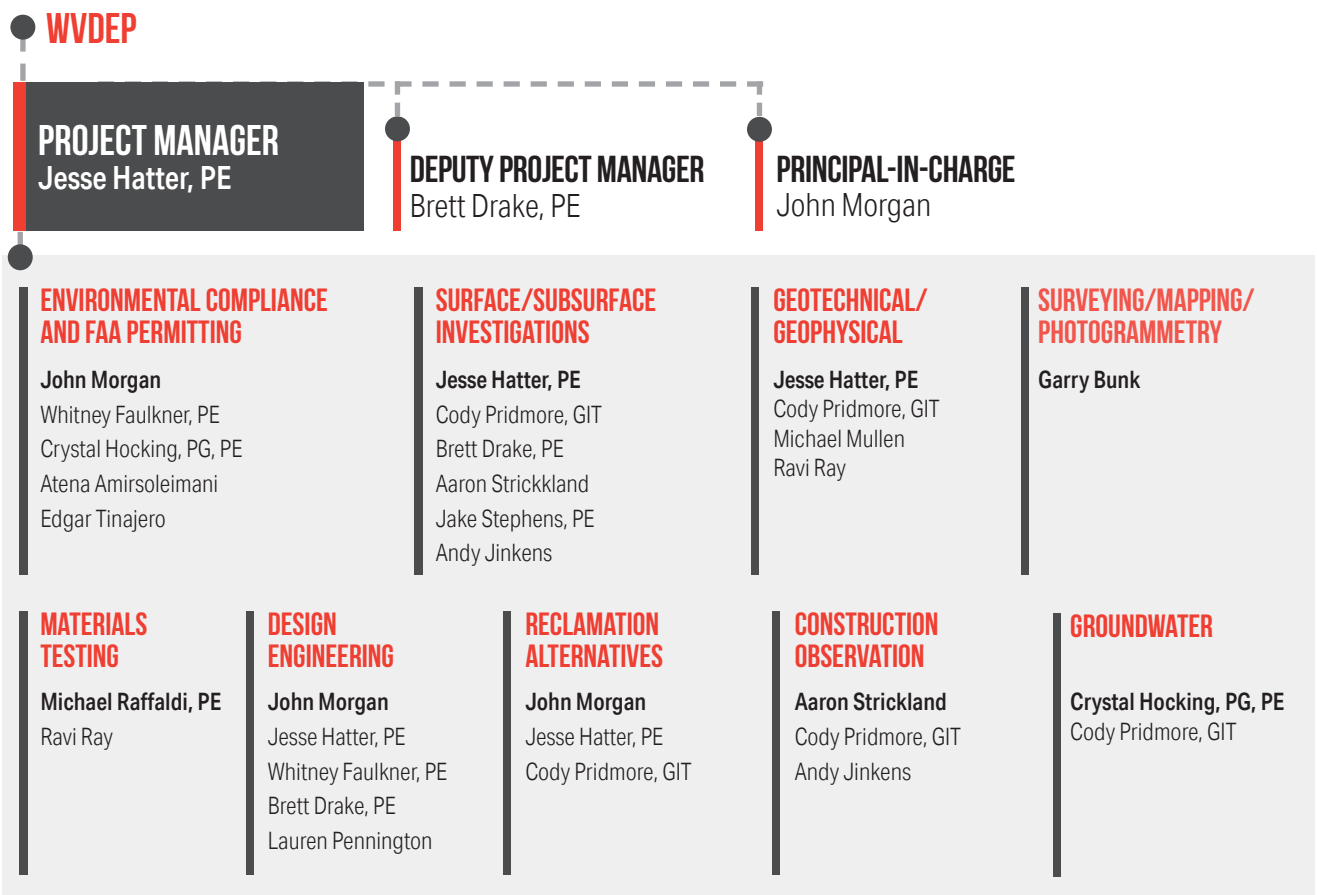
AVAILABLE RESOURCES

➤ CURRENT STAFFING

The Project Manager will assemble their team to suit the project's specific requirements and the results of the initial site investigation. Teams will be customized to meet the unique needs of each project. Most of our staff possess expertise in multiple areas, and where specific expertise is required, subcontractors may be added to the team. Once a project begins, we anticipate task crossover among staff, with Task Leads alternating based on project needs and personnel availability.

The summary organizational chart below illustrates the expertise of the RESPEC project team, grouped into seven general qualification areas relevant to this EOI. The first staff member listed in each category is expected to serve as the team leader. This list is not exhaustive and will be modified as needed to meet the needs of each project.

The Project organization chart is as follows.



AVAILABLE RESOURCES

RESPEC has a substantial number of staff with the expertise required to complete AML projects. We have a history of successfully completing large projects with tight deadlines. Our ability to access our staff from various offices ensures that each project is assigned adequate resources. Our team possesses the capability, both in numbers and talent, to meet the requirements of the EOI. RESPEC maintains an adjustable backlog of active and future projects, complemented by a versatile and adaptable workforce. This flexibility enables us to effectively manage our projects and overall workload, delivering high-quality work on time.

Brief biographies of our Project Managers, Team Leads, and potential Team Leads are included in the following pages. Resumes for our professional staff are provided in Appendix B. Supporting licenses, certifications, and degrees are included in Appendix C.

TECHNICAL/MANAGEMENT STAFF

The expertise of our key personnel, combined with the proven ability of our project team to collaborate effectively, positions us to successfully execute all the required activities for these projects. The number of employees with the necessary expertise allows us to quickly expand our team or provide additional support as needed.

We are proficient at working collaboratively across offices and have developed a system where our files are readily accessible to all team members, regardless of location. For example, we successfully completed large projects during the pandemic using staff from many of our offices. This approach ensures that all our staff are available throughout the company.

ADMINISTRATIVE STAFF

RESPEC uses advanced software to track employee time and project expenses, ensuring accurate invoice generation. Similar to our technical staff, our clerical and support staff, including AutoCAD technicians, are routinely and efficiently shared between offices.



AVAILABLE RESOURCES

➤ KEY STAFF

RESPEC has identified eight key leaders to ensure project success. The following are brief biographies of each leader.



JOHN MORGAN

John Morgan is a mining consultant with experience in surface and underground mining. John has been involved with the mine reclamation business for more than 30 years, including grouting and underground stabilization projects nationwide, including in West Virginia. John will provide oversight and assist the Project Manager by providing guidance with his deep knowledge of injection grouting in underground mines. John is committed to supporting WVDEP, ensuring that RESPEC provides the required assets, and giving our team the necessary tools to accomplish this project's goals.



JESSE HATTER, PE

Jesse Hatter is an accomplished senior engineer with 13 years of demonstrated expertise in engineering design, project management, and environmental oversight. He has a track record of success in steering intricate projects through the entire lifecycle, from conceptualization to execution and implementation. Jesse's leadership approach integrates analytical ingenuity and creative insight to effectively oversee projects. Jesse will manage all aspects of this project and coordinate directly with WVDEP to meet project timelines and goals.



BRETT DRAKE, PE

Brett Drake has exclusively worked in the mitigation of AML for the last 13 years. Brett's background includes work on a variety of AML projects with involvement in every step of the life of a project, from initial research and field investigation to design and specification development, construction management, and finally, the creation of closeout reports. Brett has worked across multiple states investigating abandoned coal mine sites. He deeply understands the processes required to effectively mitigate hazards associated with coal sites, including portals/adits, shafts, mine openings, subsidences, coal slack piles, and highwalls. Brett will assist the RESPEC team with his coal mine subsidence mitigation expertise and provide QA/QC throughout the project process.

AVAILABLE RESOURCES



WHITNEY FAULKNER, PE

Whitney Faulkner has 20 years of experience in civil and environmental engineering and is part of our General Reclamation and Post-mining Stormwater/Stream Mitigation Teams. She was an engineer permit reviewer for 9 years for the Kentucky Department of Natural Resources Division of Mine Permits. She was responsible for reviewing each application that contained a coal-waste-disposal impoundment, high-hazard dams, breakthrough potential, or mining near an impoundment; evaluating the proposal based on its complexity; and assigning the application to the most qualified reviewer. Whitney reviewed approximately 115 applications, which required reviewing stability analyses, seepage analyses, hydraulic modeling, dynamic analyses, pipe deflection analyses, and breakthrough analyses. Whitney currently serves as project manager for a Fee in Lieu Of associated with the Kentucky Department of Fish and Wildlife (Fish & Wildlife). She is responsible for a team of professionals who serve as consultants to Fish & Wildlife and is managing multiple projects for Fish & Wildlife.



CODY PRIDMORE, GIT

Since 2020, Cody has principally acted as a lead geologist for AML programs by performing construction management, planning and overseeing drilling campaigns, and providing technical support. Cody designs, oversees, and reports on exploratory drilling campaigns, groundwater monitoring, and closure and pressure grouting of abandoned coal mines. AML work demands a wide skillset and ample adaptability to change. Cody's broad technical writing background, inclination for fieldwork, and desire for clear, concise communication of information to all stakeholders benefit his team and clients. Cody is skilled in hard rock and soft rock coring, near-surface and downhole geophysical interpretation, downhole hydraulic testing, petrological thin section analysis, analyzing whole rock and aqueous geochemistry, geological mapping, and geological and historical research.



AARON STRICKLAND

Aaron Strickland is a results-driven, client-focused Project Manager with more than 20 years of experience in mining, heavy excavation, and civil site construction. With a background of 15 years in heavy excavation and construction within the oil and gas industry, he brings a wealth of expertise in managing complex projects and delivering exceptional results. His commitment to client satisfaction and a proven track record of successful project completions underscores his dedication to his projects and clients. Aaron will oversee our construction observation for this project to ensure project success.

AVAILABLE RESOURCES



RAVI RAY

Dr. Ravi Ray is an experienced Mining Engineer with a Ph.D. in Geomechanics. He is a registered Professional Engineer in Kentucky and Texas. Ravi specializes in numerical modeling of mines and underground excavations using software tools like FLAC3D, 3DEC, and RS3/RS2. He has performed stability analysis of several open-pit and underground excavations in North America, South America, Africa, Asia, and Europe. Ravi brings over 5 years of operational expertise as a mining engineer in open-pit iron and copper and underground coal and copper mines. He will lead our subsidence modeling teams to help inform the design process to find the most successful mitigation techniques.



EDGAR TINAJERO, PE

Edgar Tinajero is an experienced Lead Civil Engineer familiar with aviation projects' unique design needs. He is an integral part of the Infrastructure business unit and has led multiple aviation design projects for the rehabilitation and replacement of airport pavements, drainage improvements, erosion control systems, navigational aids, and Part 139 Construction Safety Phasing Plans. Edgar has worked closely with other project managers to gain a strong understanding of project management and provide support when needed. Edgar has more than 10 years of civil engineering experience overseeing and preparing design plans, specifications, special provisions, cost estimates, and technical reports for airport and other improvement projects. From his experience, Edgar brings a grounded viewpoint to his design work and a real-world understanding of the actual effort required to implement designs in the field. Edgar will be a technical advisor for the project concerning all FAA and airport regulations and construction activities.





PERFORMANCE HISTORY

➤ OUR HISTORY OF SUCCESS

RESPEC is nationally recognized for our mine reclamation expertise and works with:

- / **Federal Agencies** such as EPA, OSMRE, and DOJ
- / **State AML Programs**, including current projects with West Virginia, Pennsylvania, Wyoming, Colorado, New Mexico and Montana
- / **Mining Companies**, including Newmont, Lhoist, and Summit Materials
- / **Land developers**, including Copaken Brooks, Edge, and National Grid Energy

Our successful completion of projects for these clients has enabled RESPEC to undertake numerous projects for the same organizations.

RESPEC'S COMMITMENT:

"Never Say It Can't Be Done" Attitude:

RESPEC is dedicated to going the extra mile to ensure that our work is completed timely and cost-effectively. We pride ourselves on our flexibility, allowing us to be available at a moment's notice when a deliverable needs to be created and submitted, or when a field investigation is requested by WVDEP or a land owner.

Litigation-Free Projects:

RESPEC is committed to maintaining our history of litigation-free projects, a standard we have upheld for more than 100 AML projects.

38 Years of Mine Reclamation Experience:

RESPEC has received recognition for its innovative and effective work in AML. RESPEC projects have won several awards from the OSMRE and the National Association of Abandoned Mine Lands, including the AML People's Choice Award, Western Regional Award, and the National Hardrock Abandoned Mine Land award.



APPENDIX A.

AML CONSULTANT QUALIFICATION QUESTIONNAIRE &
AML RELATED PROJECT EXPERIENCE MATRIX

WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION AML CONSULTANT QUALIFICATION QUESTIONNAIRE			Attachment "A"	
PROJECT NAME AML – EOI Morgantown Airport Subsidence Phase II		DATE (DAY, MONTH, YEAR) 10/29/2024		FEIN 89-2898293
1. FIRM NAME RSEPEC Company, LLC		2. HOME OFFICE BUSINESS ADDRESS 3824 Jet Drive, Rapid City, South Dakota 57703		3. FORMER FIRM NAME
4. HOME OFFICE TELEPHONE 605.394.6400	5. ESTABLISHED (YEAR) 1969	6. TYPE OWNERSHIP <input type="checkbox"/> Individual <input checked="" type="checkbox"/> Corporation <input type="checkbox"/> Partnership <input type="checkbox"/> Joint-Venture		6a. WV REGISTERED DBE (Disadvantaged Business Enterprise) <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
7. PRIMARY AML DESIGN OFFICE: ADDRESS/ TELEPHONE/ PERSON IN CHARGE/ NO. AML DESIGN PERSONNEL EACH OFFICE 146 East Third Street, Lexington, Kentucky, 40508				
8. NAMES OF PRINCIPAL OFFICERS OR MEMBERS OF FIRM Todd Kenner – CEO; Jason Love – President; Phil Welling - CFO		8a. NAME, TITLE, & TELEPHONE NUMBER - OTHER PRINCIPALS John Morgan – Senior Vice President, 859.410.2931		
9. PERSONNEL BY DISCIPLINE				
<u>65</u> ADMINISTRATIVE ____ ARCHITECTS <u>5</u> BIOLOGIST <u>14</u> CADD Technician ____ CHEMICAL ENGINEERS <u>3</u> CIVIL ENGINEERS <u>3</u> CONSTRUCTION INSPECTORS ____ DESIGNERS ____ DRAFTSMEN	<u>19</u> ECOLOGISTS ____ ECONOMISTS <u>17</u> ELECTRICAL ENGINEERS ____ ENVIRONMENTALISTS ____ ESTIMATORS <u>30</u> GEOLOGISTS ____ HISTORIANS ____ HYDROLOGISTS	____ LANDSCAPE ARCHITECTS ____ MECHANICAL ENGINEERS <u>21</u> MINING ENGINEERS ____ PHOTOGRAMMETRISTS <u>4</u> PLANNERS: URBAN/REGIONAL ____ SANITARY ENGINEERS ____ SOILS ENGINEERS ____ SPECIFICATION WRITERS	<u>13</u> STRUCTURAL ENGINEERS <u>6</u> SURVEYORS ____ TRAFFIC ENGINEERS <u>1</u> COMPUTER PROGRAMMERS <u>20</u> ENVIRONMENTAL ENGINEER / SCIENTIST <u>8</u> GIS SPECIALIST <u>19</u> WATER RESOURCE ENGINEER ____ OTHER <u>534</u> TOTAL PERSONNEL	
TOTAL NUMBER OF WV REGISTERED PROFESSIONAL ENGINEERS IN PRIMARY OFFICE:: <u>4</u>				
*RPEs other than Civil and Mining must provide supporting documentation that qualifies them to supervise and perform this type of work.				

[illegible]

12.	<p>A. Is your firm's personnel experienced in Abandoned Mine Lands Remediation/Mine Reclamation Engineering? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO</p> <p>Description and Number of Projects: RESPEC's Senior Vice President / Technical Advisor and employees have worked on 100+ AML related projects dating back to the 1980's. These projects include refuse impoundments, mine portals, mine shafts, investigation in surface and subsurface conditions, highwall reclamation and stabilization, acid mine drainage, shallow underground mine works, refuse fills, landslides, and mine drainage. RESPEC staff has experience with analyzing AML projects and designing and constructing solutions that provide safe and long-term stable sites. RESPEC has been awarded two OSMRE reclamation awards for projects in Wyoming.</p>
	<p>B. Is your firm experienced in Soil Analysis? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO</p> <p>Description and Number of Projects: RESPEC's staff has extensive experience working on 30+ projects with soil analysis on AML and mining sites. These projects included both geotechnical and environmental analysis of soils. RESPEC has performed slope stability analyses on highwalls, soil testing to determine acid-base accounting, and designed plans to ensure excavated materials would not generate acid mine drainage. RESPEC has designed and implemented re-vegetation plans on both reclaimed highwalls and coal refuse impoundments.</p>
	<p>C. Is your firm experienced in hydrology and hydraulics? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO</p> <p>Description and Number of Projects: RESPEC staff has significant experience in hydrology and hydraulics as it relates to AML and mining sites with 100+ projects. RESPEC has designed sediment control structures, diversions and channels and culverts. Staff have performed storm modeling ranging from a 10-year, 24-hour storm event through a PMP storm event on a high hazard Class C structure. RESPEC has designed stormwater management plans for AML projects, current surface mining and underground mining sites. Many of these projects are located in Appalachia and RESPEC is experienced in designing a stormwater management plan that is unique to the topography in this region.</p>
	<p>D. Does your firm produce its own Aerial Photography and Develop Contour Mapping? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO</p> <p>Description and Number of Projects: RESPEC has the ability to create a contour map to be used in a design through aerial mapping and/or photogrammetry software on approximately 30+ projects. RESPEC has extensive experience using ground control points and drones to capture the data needed to develop a contour map. Existing lidar information from public sources is routinely obtained and utilized to generate contour mapping.</p>
	<p>E. Is your firm experienced in domestic waterline design? (Include any experience your firm has in evaluation of aquifer degradation as a result of mining.) <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO</p> <p>Description and Number of Projects: RESPEC staff has experience with domestic waterline design and has worked on 30+ projects. These projects include water management and septic design at a personnel camp for a mining operation, designed upgrades to the water system in a subdivision located in the North Pole, evaluation of water and sewer system components, conditions and deficiencies and provide a strategic plan for the utilities in the next 50 years.</p>
	<p>F. Is your firm experienced in Acid Mine Drainage Evaluation and Abatement Design? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO</p> <p>Description and Number of Projects: RESPEC and the Team have significant experience in AMD drainage evaluation and abatement design on AML, mining, and other sites. The Team has worked on 35+ AML sites with high volumes of AMD, performed studies to evaluate possible sources of acid drainage and designed and implemented optimum reclamation designs to alleviate AMD. RESPEC has designed and permitted an AMD treatment system related to pre-SMCRA mines seeps. In addition, the Team has published 15+ article related to AMD evaluation, remediation and preventive measures.</p>

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:
Morgan, John Senior Vice President / Technical Advisor	40	40	0

Brief Explanation of Responsibilities: Mr. Morgan's will serve as a Technical Advisor for this project based on his significant experience in AML related work. He has extensive experience in both surface and underground mining. He has served as the project manager for the Rock Springs Mine Subsidence project for the Wyoming DEQ/AML, the North Branch Potomac AMD study and currently serves on the West Virginia Special Reclamation Fund Advisory Council, overseeing the special reclamation fund for post-1977 bond forfeiture sites. Mr. Morgan has significant experience of AML projects, active mining operations and mine closure activities throughout West Virginia. Using his extensive experience, Mr. Morgan will assist RESPEC staff in evaluating each site, identify major issues, and provide expertise in developing an effective solution.

EDUCATION (Degree, Year, Specialization)
BS, 1977, Mining Engineering

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS
Society for Mining, Metallurgy, & Exploration; American Institute for Minerals Appraisers

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:
Hatter, Jesse Project Manager	8	14	7

Jesse Hatter is an accomplished senior engineer with 13 years of demonstrated expertise in engineering design, project management, and environmental oversight. He has a track record of success in steering intricate projects through the entire lifecycle, from conceptualization to execution and implementation. Jesse's leadership approach integrates analytical ingenuity and creative insight to effectively oversee projects.

EDUCATION (Degree, Year, Specialization)
BS, 2010, Mining Engineering

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS
Society for Mining, Metallurgy, & Exploration

REGISTRATION (Type, Year, State)
PE: 2017, KY; 2018, WV; 2023, VA

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.) Drake, Brett Deputy Project Manager	YEARS OF EXPERIENCE		
	YEARS OF AML DESIGN EXPERIENCE: 13	YEARS OF AML RELATED DESIGN EXPERIENCE: 13	YEARS OF DOMESTIC WATERLINE DESIGN EXPERIENCE:
Brief Explanation of Responsibilities Brett Drake will serve as a Project Engineer on the reclamation design team. He has 10 years of experience in AML reclamation project management and construction management services for a variety of abandoned underground and surface hard-rock mine sites that pose hazards to public health and safety or constitute an environmental hazard. Brett has been the project manager and on-site project engineer during the reclamation of shafts, adits, portals, highwalls, open pits, and other abandoned mine-related features. His responsibilities have included observing the quality of the executed work and determining if the work is proceeding in accordance with the contract documents			
EDUCATION (Degree, Year, Specialization) BS., 2011, Architectural Engineer			
MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS International Society of Explosives Engineering (ISEE); Metallurgy & Exploration		REGISTRATION (Type, Year, State) PE, 2019, WY; CO, 2024; NM, 2023; UT, 2024	
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.) Pridmore, Cody Senior Geologist	YEARS OF EXPERIENCE		
	YEARS OF AML DESIGN EXPERIENCE: 4	YEARS OF AML RELATED DESIGN EXPERIENCE: 5	YEARS OF DOMESTIC WATERLINE DESIGN EXPERIENCE: 0
Brief Explanation of Responsibilities: From 2021 to 2024, Cody Pridmore has principally managed construction activities for Abandoned Mine Lands (AML) programs in Wyoming. As a lead geologist in these programs, he designed, oversaw, and reported on exploratory drilling campaigns, groundwater monitoring, and pressure grouting of abandoned coal mines. AML work demands a wide skillset and ample adaptability to change. Cody's broad technical writing and communication background, paired with an inclination for fieldwork and a desire for clear, concise communication of information to all stakeholders, has aided me in this work and benefited my team and clients. Cody is skilled in hard rock and soft rock coring, near surface geophysical interpretation, aqueous and crystalline geochemical sampling and interpretation, and is interested in the exploration and development of economic geological deposits. His background in English Literature has aided him considerably in report preparation, while his graduate work has enabled him to adapt to new projects and challenges with confidence and capability.			
EDUCATION (Degree, Year, Specialization) / MS, 2021, Geology; / BS, 2019, Geology,			
MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS		REGISTRATION (Type, Year, State) Geologist in Training (GIT) in Wyoming (#5211)	

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		
Mullen, Michael Geophysicist	YEARS OF AML DESIGN EXPERIENCE: 13	YEARS OF AML RELATED DESIGN EXPERIENCE: 25	YEARS OF DOMESTIC WATERLINE DESIGN EXPERIENCE:
Brief Explanation of Responsibilities : Michael Mullen is a highly skilled geoscientist with a strong seismic interpretation and geosteering background, holding both a Master of Science and a Bachelor of Science in Geology from Oklahoma State University. With 3 years of experience using advanced seismic interpretation software such as IHS Kingdom, HampsonRussell, and Petrel, Michael has demonstrated expertise in fracture characterization and wellbore placement across various basins, including the Permian, Delaware, DJ, and Powder River Basins. His professional journey includes roles as a remote geosteering geologist, geosteering geologist, and wellsite geologist, where he provided critical technical advice, conducted detailed geological analyses, and trained new team members. Michael's academic achievements are complemented by his participation in the 2020 AAPG Imperial Barrel Awards and his leadership roles in professional organizations. His technical proficiency and a business-minded approach make him a valuable asset in the oil and gas industry			
EDUCATION (Degree, Year, Specialization) MS, Geology; BS Geology			
MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS Society of Exploration Geophysicists OSU Chapter, American Association of Petroleum Geologists, Society of Exploration Geophysicists, Tulsa Geological Society		REGISTRATION (Type, Year, State) PE: 2021 TX; 2021 SD	

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		
Tinagero, Edgar Civil Engineer / FAA	YEARS OF AML DESIGN EXPERIENCE: 0	YEARS OF AML RELATED DESIGN EXPERIENCE: 1	YEARS OF DOMESTIC WATERLINE DESIGN EXPERIENCE: 0
Brief Explanation of Responsibilities : Edgar Tinajero is an experienced lead civil engineer who has worked closely with project managers to gain a strong understanding of project management and provide support when needed. As a result, over the last few years, he has expanded his role to take on project management and assistant project management duties on the Automated Weather Observation System (AWOS), Seward Airport Layout Plan (ALP), and Eielson Air Force Base (AFB) projects. From a broader perspective, Edgar has nearly 10 years of civil engineering experience overseeing and preparing design plans, specifications, special provisions, cost estimates, and technical reports for airport and other improvement projects throughout Alaska. From his experience as a project engineer with the Alaska Department of Natural Resources, both in leading design efforts and managing projects during construction, he brings a grounded viewpoint to his design work and a real-world understanding of the actual effort required to implement designs in the field.			
EDUCATION (Degree, Year, Specialization) BS 2013 Civil Engineering			
MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS		REGISTRATION (Type, Year, State) PE, 2017, AK	

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		
Bunk, Garry Surveyor	YEARS OF AML DESIGN EXPERIENCE: 0	YEARS OF AML RELATED DESIGN EXPERIENCE: 0	YEARS OF DOMESTIC WATERLINE DESIGN EXPERIENCE: 0
Brief Explanation of Responsibilities Garry Bunk is responsible for overall project oversight, planning, and management of the surveying department. With more than 26 years of experience in surveying services, he specializes in boundary surveys, subdivisions, topographic and planimetric surveys, mining-related surveying, as well as control surveys. His expertise also includes construction stakeouts, such as establishing column lines, building corner offsets, grade stakes, and underground mine workings/voids on the surface. Garry has significant experience drafting site development and mine plans, including subdivision plats, property survey plats, existing condition plans, design plans, profiles, cross-sections, and stockpile inventories. He has successfully determined pond volumes and created grading designs for mine pits, refuse/ash piles, and roads. He has also produced detailed survey control reports for permanent control monuments at underground mine sites.			
EDUCATION (Degree, Year, Specialization) BS, 2000, Broadcasting			
MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS Pennsylvania Association of Land Surveyors		REGISTRATION (Type, Year, State) PLS, PA	

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		
Faulkner, Whitney Sr. Environmental / Civil Engineer	YEARS OF AML DESIGN EXPERIENCE: 2	YEARS OF AML RELATED DESIGN EXPERIENCE: 12	YEARS OF DOMESTIC WATERLINE DESIGN EXPERIENCE: 0
Brief Explanation of Responsibilities Ms. Faulkner will serve as an environmental / civil engineer. She has 20 years of experience with 12 years specially related to AML related design experience. Her knowledge of site reclamation, environmental permitting, sediment control structures, coal refuse waste structures, including both refuse piles and impoundment, and project management will help in addressing issues on AML sites and proposing a solution that will improve each site. Her combination experience with environmental and civil engineering allows a unique insight into solutions for AML sites.			
EDUCATION (Degree, Year, Specialization) BS, 2002, Civil Engineering			
MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS		REGISTRATION (Type, Year, State) PE, 2019, WV; 2009, KY,	

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

NAME & TITLE (Last, First, Middle Int.)	YEARS OF EXPERIENCE		
Pennington, Lauren Staff Engineer	YEARS OF AML DESIGN EXPERIENCE: 2	YEARS OF AML RELATED DESIGN EXPERIENCE: 2	YEARS OF DOMESTIC WATERLINE DESIGN EXPERIENCE: 0
Brief Explanation of Responsibilities: Lauren Pennington has experience with environmental permitting, reclamation design, feasibility and due-diligence studies, and critical minerals. She has worked on multiple Abandoned Mine Lands projects in West Virginia and Pennsylvania, focusing on construction designs, site evaluations, and permitting. Lauren has designed numerous drainage control plans for mines throughout the state of Kentucky and worked on projects focused on the extraction of rare earth elements from coal and coal by-products. Work for these projects includes running RFID Tracer Tests on heavy media cyclones, setting up full plant circuit tests, and comparing stack sizers and flotation devices. Lauren has worked with the Kentucky Department of Fish and Wildlife Resources to review and summarize existing stream and wetland mitigation plans, as well as the monitoring of the sites after construction. She also has experience with AutoCAD Map 3D, Carlson, Maptek Vulcan, SEDCAD, AggFlow, and AMD Treat.			
EDUCATION (Degree, Year, Specialization) BS, 2022 Mining Engineering			
MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS Society of Mining, Metallurgy & Exploration (SME) and Women in Mining (WIM)		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		
Amirsoleimani, Atena Environmental Engineer	YEARS OF AML DESIGN EXPERIENCE: 2	YEARS OF AML RELATED DESIGN EXPERIENCE: 2	YEARS OF DOMESTIC WATERLINE DESIGN EXPERIENCE: 1
Brief Explanation of Responsibilities Atena Amirsoleimani is an environmental engineer with multiple research experiences identifying contamination in water, wastewater, and sediment samples. With a solid educational background, including an undergraduate degree in civil engineering and a doctoral degree in environmental engineering, Atena has developed a deep understanding of various contaminants found in water, air, soils, and sediments, as well as effective remediation methods. Her in-depth knowledge of environmental engineering concepts enables her to devise sustainable solutions for a wide range of environmental challenges. Before joining RESPEC, Atena was a civil engineer in water/wastewater, developing designs for piping projects.			
EDUCATION (Degree, Year, Specialization) PhD, 2020, Civil Engineering; MS, 2009, Civil Engineering; BS, 2006, Civil Engineering			
MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS American Society of Civil Engineers		REGISTRATION (Type, Year, State) EIT, KY	

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

NAME & TITLE (Last, First, Middle Int.)	YEARS OF EXPERIENCE		
Stephens, Jake Project Engineer	YEARS OF AML DESIGN EXPERIENCE: 10	YEARS OF AML RELATED DESIGN EXPERIENCE: 10	YEARS OF DOMESTIC WATERLINE DESIGN EXPERIENCE:
Brief Explanation of Responsibilities : Jake Stephens is a seasoned Professional Engineer with experience in engineering, project management, project estimation, and safety and risk consulting. Jake has managed a wide range of capital projects throughout his career, from road-related and shared-use path projects to material handling and storage solutions. His expertise includes overseeing projects from inception to completion, ensuring compliance with environmental regulations, and collaborating with various stakeholders to achieve project goals. Jake has demonstrated strong leadership in managing project financials, coordinating with utility companies, and meeting safety standards. His ability to develop and implement safety programs, conduct risk audits, and provide actionable recommendations has significantly contributed to reducing operational risks and insurance costs for his clients. With a comprehensive background in both the public and private sectors, Jake brings a wealth of knowledge and a proactive approach to every project he undertakes.			
EDUCATION (Degree, Year, Specialization) BS., 2010, Mining Engineer			
MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS American Rock Mechanics Association		REGISTRATION (Type, Year, State) PE, 2019, KY	

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

NAME & TITLE (Last, First, Middle Int.)	YEARS OF EXPERIENCE		
Jinkins, Andrew Project Engineer	YEARS OF AML DESIGN EXPERIENCE: 0	YEARS OF AML RELATED DESIGN EXPERIENCE: 10	YEARS OF DOMESTIC WATERLINE DESIGN EXPERIENCE: 0
Brief Explanation of Responsibilities Andrew Jinkens is a results-driven professional with a client-first mindset. He has 10 years of diverse experience in environmental and engineering consulting, encompassing civil construction/ erosion and sedimentation inspection, mine permitting, geotechnical investigation, hydrogeological investigation, ground/surface water monitoring, process safety management, wastewater discharge monitoring, GIS mapping, and business development.			
EDUCATION (Degree, Year, Specialization) BS, 2003, Geology			
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		
Ray, Ravi Geomechanical	YEARS OF AML DESIGN EXPERIENCE: 11	YEARS OF AML RELATED DESIGN EXPERIENCE: 11	YEARS OF DOMESTIC WATERLINE DESIGN EXPERIENCE: 0
Brief Explanation of Responsibilities Dr. Ravi Ray is a project engineer within the RESPEC Mining & Energy business unit. Ravi has worked in various capacities in stope and backfill underground copper mine, and longwall & continuous miner coal mine in India before getting a PhD in Geomechanics from the University of Kentucky. He is a registered Professional Engineer in Kentucky and Texas. Ravi specializes in numerical modeling of mines and underground excavations using software tools like FLAC3D, 3DEC, RS2, and RS3. He has performed stability analysis of several open pit and underground excavations in North America, South America, Africa, Asia, and Europe. He brings more than 11 years of combined mine operations, mine planning, and geotechnical consulting experience working as a mining engineer across geographies, and mine types. Before joining RESPEC, he worked as a Rock Mechanics consultant at Golder Associates.			
EDUCATION (Degree, Year, Specialization) PhD, 2020, Mining Engineering, BS, 2013, Technology in Mining Engineering			
MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS American Rock Mechanical Association		REGISTRATION (Type, Year, State) PE, 2020, KY; 2021, TX	

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		
Strickland, Aaron Drilling and Grouting	YEARS OF AML DESIGN EXPERIENCE: 0	YEARS OF AML RELATED DESIGN EXPERIENCE: 10	YEARS OF DOMESTIC WATERLINE DESIGN EXPERIENCE: 0
Brief Explanation of Responsibilities: Aaron Strickland is a results-driven, client-focused Project Manager with over 20 years of extensive experience in mining, heavy excavation, and civil site construction. With a strong background spanning 15 years in heavy excavation and construction within the Oil and Gas Industry, he brings a wealth of expertise in managing complex projects and delivering exceptional results. His commitment to client satisfaction, coupled with a proven track record of successful project completions, underscores his dedication to his projects and clients.			
EDUCATION (Degree, Year, Specialization) BS, 2005, History and Religious Studies			
MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS: IOGA – Independent Oil and Gas Association; Ohio Oil & Gas Association, GOWV – Gas & Oil Association of West Virginia		REGISTRATION (Type, Year, State) WV Mine Safety & Health Surface Mining 40-Hour Cert. May 2002	

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

Acoustic Doppler Current Profiler equipment; Autodesk AutoCAD; Autodesk LDD; Autodesk Civil 3D; AQUATOX; Bentley MicroStation; Bentley InRoads; Bentley FlowMaster; Bentley ProjectWise; Carlson Software; Carlson Cavity Auto Laser Scanner (C-ALS); Carlson Boretrak2 (BT2); Colorado Urban Hydrograph Procedure (CUHP); DJI Mavic Mavic 2 Drone; EPA SWMM; Esri ArcGIS; FHWA HY8; Flo-2D; FLUX/Bathtub; Global Mapper; HEC-GeoRAS; HEC-GeoHMS; HEC-HMS; HEC-RAS; Hydrologic Simulation Program–Fortran (HSPF); HyDrone equipment for bathymetric surveys; Nomis Seismographs; Optical televiewer; Rockscience; REAME; SRH-2D; ShotTrack Accelerometer (ViB); ShotTrack; Velocity of Detonation (VOD 305); SEDCAD; SWAT; WASP; UDSewer; USGS PKFQ; USGS WSPRO

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

PROJECT NAME, TYPE AND LOCATION	NAME AND ADDRESS OF OWNER	NATURE OF YOUR FIRM'S RESPONSIBILITY	ESTIMATED CONSTRUCTION COST	PERCENT COMPLETE
MacArthur Subsidence Phase III	WVDEP Office of Abandoned Mine Lands and Reclamation;	Design of Subsidence mitigation plan	\$10.4M	0%
Beckley Soccer Complex	WVDEP Office of Abandoned Mine Lands and Reclamation;	Design a mitigation plan for the subsidence in the parking lot and seal mine portals	\$1.1M	0%
Price Hill Complex Pond Cleaning	WVDEP Office of Abandoned Mine Lands and Reclamation;	Design a pond cleaning plan for four sediment ponds and re-build dikes	\$500,000	0%
Summerlee Water Treatment	WVDEP Office of Abandoned Mine Lands and Reclamation;	Design AMD remediation plan	\$500,000	0%
Crown Hill Refuse, slide and discharge	WVDEP Office of Abandoned Mine Lands and Reclamation;	Design of mine portal closures and stabilize slide	\$616,875	0%
WVU Tech Drainage Morris Creek	WVDEP Office of Abandoned Mine Lands and Reclamation;	Design acid mine drainage remediation plan	\$1.2M	0%
Beech Bottom Highwall	WVDEP Office of Abandoned Mine Lands and Reclamation;	Design reclamation plan for ~ 13k dangerous highwall, 3 hazardous water bodies and 1 dangerous impoundment	\$7.5M	0%
Bethany (Haizlett) DH, Highwall and AMD	WVDEP Office of Abandoned Mine Lands and Reclamation;	Design reclamation plan for dangerous highwall, dangerous slides, hazardous waterbodies	\$3.3M	0%

Buffalo Creek Highwall	WVDEP Office of Abandoned Mine Lands and Reclamation;	Design Reclamation plan for dangerous highwall, danger impoundment and dangerous slide	\$1.8M	0%
Craft's Run Maintenance	WVDEP Office of Abandoned Mine Lands and Reclamation;	Design reclamation plan for 2 dangerous impoundments and a clogged stream	\$846,000	0%
Logan Run Highwall	WVDEP Office of Abandoned Mine Lands and Reclamation;	Design reclamation plan for dangerous highwall, hazardous water bodies and clogged stream	\$1.7M	0%
Richard Mine Drainage Facility	WVDEP Office of Abandoned Mine Lands and Reclamation;	Design reclamation plan for dangerous highwall	\$392,000	0%
Wade's Run Dangerous Embankment Phase II	WVDEP Office of Abandoned Mine Lands and Reclamation;	Design reclamation plan for dangerous slide, remove refuse from clogged stream	\$800,000	0%
Dillian Creek AMD Remediation	Friends of Deckers Creek; P.O. Box 877, Dellslow, WV 26531	Designed the treatment pond based on their conceptual plans	\$144,000	0%
Mettiki AMD Treatment – Alkaline Reinjection Plan	Mettiki Coal, LLC, 292 Table Rock, Oakland, MD 21550	Designed an alkaline reinjection plan due to an acid-producing seam. This plan is ongoing as mining progresses	\$800,000 annually	Ongoing
Rustic Ridge Review	Mountain Watershed Association P.O. Box 408/1414-B ICV Road Melcroft, PA 15462	Technical review of pending underground mine permit and assist in the development of agreed conditions Continue monitoring compliance of the ongoing U/G mining operation	N/A	95%
Northern-Delivery System-Segment C – Water Transmission Project	Triview Metropolitan District; 16055 Old Forest Point, Suite 300; Monument, CO 80132	Providing planning, permitting, and design of the entire 9-mile-long Northern Water Delivery System Providing the construction administration, submittals review, and general construction oversight Portions of this project are very complex as the pipeline crosses endangered species habitat (Preble's Meadow Jumping Mouse), and	\$1.65M	5%

		another portion traverses urban development.		
Alden SMCRA Permitting	Alden Coal, LLC 332 West Cumberland Gap Parkway; Corbin, KY 40701	Completed SMCRA applications which include reclamation design, sediment control, stability analysis	\$100,000 (engineering costs)	Ongoing
Alliance Permitting and SEC reporting	Alliance Coal Company, LLC 1146 Monarch Street, Suite 350; Lexington KY 40513	Completed SMCRA applications which include reclamation design, sediment control, stability analysis Prepared their SEC S-K 1300 Technical Summary, which included reserve/resource analysis and financial modeling	\$250,000 (engineering costs)	Ongoing
Manh Choh	Kinross Gold	Design and construction management of access road to a new gold mine in Alaska, plus water treatment and infrastructure	\$100M	50%
Rattlesnake	Wyoming Department of Environmental Quality; 200 West 17 th Street; Cheyenne, WY 82002	Site Investigation, design, and construction management of abandoned quarry	\$2.1M	50%
AML Project 10C, Horse Creek Mine Subsidence Remediation	Wyoming Department of Environmental Quality; 200 West 17 th Street; Cheyenne, WY 82002	Surface and underground investigation of historical mine-related subsidence	\$2.0M	0%
Greer Lime	Greer Industries: 5630 Earl L. Core Road Morgantown, WV	Design and site support for new underground limestone mine	~\$1.5M	10%
Rapid City Quarry	Pete Lien & Sons: 3811 Universal Drive Rapid City, SD 57702	Design and construction support for new aggregate processing plant	\$1.5M	0%
=Civil Engineer Services for Fee in Lieu of Projects	Kentucky Department of Fish & Wildlife (F&W); 1 Sportsman Lane; Frankfort, KY 40601	Serve as F&W's engineering consultant, which includes identifying potential mitigation sites, stream design, and construction monitoring and permitting	\$3.0M	0%
TOTAL NUMBER OF PROJECTS: Overall projects 2,424		TOTAL ESTIMATED CONSTRUCTION COSTS: \$221M		

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

[illegible]

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)
Idarado Mine Mill Level Tunnel Flow Control Bulkhead; Telluride, Colorado	Newmont Corporation; 6900 E. Layton Avenue, Suite 700; Denver, CO 80237	\$5 Million	2018	Yes
Subsurface Investigation of Historic Gold Mine; South Pass City, Wyoming	Wyoming, DEQ, AML; 200 West 17 th Street, Cheyenne, WY 82002	\$8.5 Million	2019	Yes
Haile Gold Mine Kershaw, South Carolina	OceanaGold; 6911 Snowy Owl Road; Kershaw, SC 29067	\$139,000	2019	Yes
Northeast Wyoming Coal Mine Reclamation	Wyoming Department of Environmental Quality; 200 West 17 th Street; Cheyenne, WY 82002	\$17M	2017	Yes/Ongoing
Moose Creek Water Expansion	City of North Pole; 125 Snowman Lane; North Pole, Alaska 99705	35.0M	2021	Yes
West Water System Expansion – Water Transmission & Storage Project	Woodmen Hills Metropolitan District; 8046 Eastonville Road; Falcon, CO	\$3.9M	2020	Yes
Clear Creek Ecological Restoration	Colorado Department of Transportation	\$300,000	2019	Yes
Huber Underground Mine Grouting and Development	Confidential	\$5.0M	2019	Yes
Rolling Hills Transmission Line and	Widefield Water and Sanitation District; 8495 Fontaine BLVD, Fountain CO 80925	\$3.4M	2022	Yes

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.

20. The foregoing is a statement of facts.

Signature: _____



Title: Principal Consultant

Printed Name: John Morgan

Date: 10/29/2024

AML AND RELATED PROJECT EXPERIENCE MATRIX Attachment "B"																								
PROJECT	Exp. Basis C=Corp. P=Personnel*	Additional Info Provided in Section(s)**	PROJECT EXPERIENCE REQUIREMENTS															PRIMARY STAFF PARTICIPATION/CAPACITY *** M=Management P=Professional						
			Abandoned Surface Mine Reclamation	Abandoned Deep Mine Reclamation	Portal/Shaft Closure	\Hydrologic/Hydraulic Design/Evaluation	Remining Evaluation	Mine/Refuse Fire Abatement	Subsidence Investigation Mitigation	Hazardous Waste Disposal	Project Specifications	Water Quality Evaluation/ Mitigation/ Replacement	Construction Inspection/ Management	Water Treatment	Equipment/ Structure Removal	Stream Restoration	Geotechnical/ Stability	John Morgan	Jesse Hatter	Cody Pridmore				
MacArthur Subsidence Phase III	Both	19	X			X						X		X				P,M						
Rock Springs Drill & Grout Project for Subsidence Mitigation	Both	20	X						X								X	P, M		P, M				
Storm King Mine Abandoned Mine Reclamation	Both	21	X		X			X			X		X		X		X	P, M	P,M					
Horse Creek Abandoned Mine Reclamation	Both	22	X		X	X			X		X		X				X	P, M		P, M				
West Kentucky Energy Project	Both	23	X			X			X		X		X					P, M	P, M					
Michigan Coal Mine Reclamation	Both	24		X	X					X							X	P, M		P, M				
The Will Group - Subsidence Analysis	Both	24							X		X		X		X			P, M	P, M	P, M				
Greystone Mine Stabilization Project	Both	25	X			X					X						X	P, M	P, M					
Idarado Mine Mill-Level Tunnel Flow-Control Bulkhead	Both	26	X		X					X		X				X	X	P, M	P, M					
Frostburg Subsidence Reclamation Project	Both	27	X				X				X						X	P, M	P, M					

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

AML AND RELATED PROJECT EXPERIENCE MATRIX Attachment "B"																								
PROJECT	Exp. Basis C=Corp. P=Personnel*	Additional Info Provided in Section(s)**	PROJECT EXPERIENCE REQUIREMENTS																PRIMARY STAFF PARTICIPATION/CAPACITY *** M=Management P=Professional					
			Abandoned Surface Mine Reclamation	Abandoned Deep Mine Reclamation	Portal/Shaft Closure	\Hydrologic/Hydraulic Design/Evaluation	Remining Evaluation	Mine/Refuse Fire Abatement	Subsidence Investigation Mitigation	Hazardous Waste Disposal	Project Specifications	Water Quality Evaluation/ Mitigation/ Replacement	Construction Inspection/ Management	Water Treatment	Equipment / Structure Removal	Stream Restoration	Geotechnical/ Stability	John Morgan	Jesse Hatter					
Crawford Mountains Abandoned Mine Lands Study	Both	27	X						X		X						X	P, M	P, M					
Wingate Hill Mine Reclamation	Both	28		X	X				X				X				X	P, M	P.M.					
Dillan Creek Acid Mine Drainage Remediation	Both	29										X		X			X	P, M	P, M					
Sunnyside Mine, DOJ	Both	30		X		X						X					X	P, M	P, M					

* List whether project experience is corporate or personnel based or both.

** Use this area to provide specific sections or pages if needed for reference.

*** List Primary Design personnel and their functional capacity for the projects listed.



APPENDIX B.

RÉSUMÉS



JOHN S. L. MORGAN

SENIOR VICE PRESIDENT, MINING & ENERGY

TECHNICAL EXPERTISE

- / Mine Planning
- / Mine Permitting
- / Environmental Regulation Compliance
- / Aggregate Processing Facility Design and Operation
- / Expert Witness Testimony on Mining Issues

EDUCATION

- / BS in Mining Engineering (Upper Second), Royal School of Mines, University of London, London, UK (1977)

PROFESSIONAL MEMBERSHIPS

- / Society for Mining, Metallurgy, & Exploration
- / American Institute for Minerals Appraisers

WORK HISTORY

- / RESPEC (2013–Present)
- / Morgan Worldwide Consultants, Inc. (1995–2013)
- / Weir International Mining Consultants (1992–1995)
- / Morgan Mining & Environmental Consultants Ltd. (1990–1995)
- / Howard Needles Tammen & Bergendoff (1984–1990)
- / Taylor Woodrow Construction and Mining (1977–1984)

OVERVIEW

John Morgan is a mining consultant with extensive experience in both surface and underground mining for extracting metalliferous ores, coal, and industrial minerals. He has a degree in mining engineering from the Royal School of Mines in London, United Kingdom. John founded Morgan Worldwide Consultants, Inc. in 1995. He has been the project manager on several mine technical reviews, mining operation appraisals, many subsidence investigations, and reviews of the environmental compliance and liability analyses for both operating and abandoned mining operations. John has been actively involved in projects worldwide, including Indonesia, Vietnam, Russia, India, Finland, Ukraine, Poland, Bulgaria, Romania, Peru, and Trinidad. In addition to working in every region of the United States, John has worked at several gold mines in South Africa and has been a mine planning engineer for an open-cast coal site in Britain.

PROJECT EXPERIENCE

CRH, Dublin, Ireland. John is the project manager for the raw materials workstream for the Lafarge Holcim asset acquisition and the provision of reserve modeling and mine planning services for the legacy CRH operations. Efforts include developing reserve models and mine plans in countries including the Philippines, France, Poland, Ukraine, and Germany. He also participated in determining the mineral reserve valuation and calculation of restoration provisions.

Continental Cement, Hannibal, Missouri. John was the project principal for preparing a feasibility study for developing an underground limestone mine for Continental Cement in Hannibal, Missouri. As the project proceeded, he was responsible for performing design and technical support to Continental in developing the mine slope, initial underground development, ventilation shaft, conveyor package, and reclaim tunnel.

U.S. Office of Surface Mining, Washington, DC. John was the project manager for the proposed stream protection rule; he developed the concept of using model mines to analyze the effect of the various alternatives being evaluated on each mining type in each region. He also managed the rule impacts analyses on longwall mining and coal preparation plant waste disposal.

Finnsementti, CRH, Dublin, Ireland. John provided technical assistance for the review of the ongoing operation of the limestone quarries in Parainen and Lappeenranta, Finland, to evaluate alternate mining approaches and cost-reduction opportunities.

U.S. Environmental Protection Agency (EPA), Washington, DC. John was the project manager for the review of the Spruce Mine in West Virginia to evaluate alternative mine configurations and fill locations that would minimize stream impacts while still mining the same coal resource.

PennFuture, Pittsburgh, Pennsylvania. John was the expert witness before the Pennsylvania Environmental Hearing Board regarding the potential effects of a shallow longwall mine operated by UMCO on the adjacent streams. The preparation included reviewing subsidence modeling, surface water inventories, and stream characterization data.

Hilltop Big Bend Quarry LLC, Brandenburg, Kentucky. John was the project manager for the design and construction of a new 800-ton per hour aggregate-processing plant that consisted of a jaw crusher station, two cone stations, two screens, and a reclaim tunnel. The project included all of the subcontractor bidding and selection as well as full-time site supervision.



AOC+ Policy/RAM145 Policy, West Virginia and Kentucky. John developed the procedure and policies for optimizing excess spoil placement for steep slope coal mining in Appalachia. The procedures evaluated and ranked possible excess spoil disposal locations based on their excess spoil capacity per foot of stream impact. These policies were developed in participation with the mining industry, state mining regulators, the EPA, and the U.S. Army Corps of Engineers.

National Quarries, Trinidad and Tobago. John completed a restructuring analysis of the quarrying and aggregate industry in Trinidad and Tobago, including a detailed technical audit of National Quarries and an environmental assessment of the industry. The study included determining current and future markets and the economic reserves as well as analyzing import/export potential. The recommendations included a privatization strategy, regulatory framework, and technical improvements.

PRC Holdings, Charleston, West Virginia. John was the project manager for evaluating the coal, gas, and timber resources on 26,000 acres of property in West Virginia. The evaluation developed coal-seam mapping and provided a detailed review of historic and current mining as well as determining surface minable reserves.

Aneka Tambang, Indonesia. As part of the restructuring and privatization process, John completed an environmental review of the mining and processing operations of Aneka Tambang. The review included detailed analyses and recommendations of the environmental performance of the bauxite, ferronickel, iron sand, and gold operations of the company. The implementation phase of the project included developing and monitoring detailed construction schedules for the upgraded environmental program. The program included performing hydrologic design, conducting integrated mine planning, revegetating, handling hazardous materials, and developing an environmental policy.

MINE CLOSURE EXPERIENCE

- / **Reviewed restoration liabilities associated with two large surface mines in the Powder River Basin for Alpha Natural Resources** that included recalculation of the current restoration liability, revised regrade, cast blasting usage, and revised operating costs for shovel truck and dozer fleets. The analysis resulted in significant reductions in the required reclamation bond amount.
- / **Evaluated the reclamation liabilities associated with three mining complexes in West Virginia for Frasure Creek Mining** to determine current liabilities, current bonding, regulatory compliance, and options for the restructuring of operations to reduce liability and allow ongoing economic coal removal.

MINE SUBSIDENCE EXPERIENCE

- / **Conducted a peer review of the ongoing projects in Rock Springs, Wyoming,** to model the geology of the mined area plus analysis of potential residual subsidence and effect of grouting effort. The review included an analysis of contractor performance.
- / **Developed a drill and grout project for the Wyoming Department of Environmental Quality** that involved the design and contract management for the reclamation of numerous underground coal mines under Rock Springs, Wyoming. John's role as project manager included preparation of bid packages, CADD compiled designs, grout design, and subsidence potential evaluation, plus the management of the full-time construction management activity. This project had a total estimated construction cost of \$12 million. The project was awarded the 1995 Abandoned Mine Land Reclamation Award by the U.S. Department of the Interior.
- / **Designed a grouting plan** to reinforce the existing gate road pillars to minimize subsidence effects on a high voltage transmission tower. This project included detailed design construction documents, contractor selection, and construction management.
- / **Reviewed structural damage of a manufacturing facility in eastern Kentucky** to evaluate the contribution of mine subsidence-related damage. The project included evaluation of the costs of ongoing maintenance and repair because of the subsurface conditions. Subsidence impacts were included in the valuation of the property.
- / **Expert witness testimony and analysis for a construction claim** relating to the grouting of mine voids under a new sewage treatment basin in Iowa to prevent potential subsidence effects.
- / **Expert witness testimony relating to the causes of damage** to a property in southern Indiana and the reasons it was not mining related.



JESSE HATTER, PE

PROJECT MANAGER

OVERVIEW

Jesse Hatter is an accomplished senior engineer with 13 years of demonstrated expertise in engineering design, project management, and environmental oversight. He has a track record of success in steering intricate projects through the entire lifecycle, from conceptualization to execution and implementation. Jesse's leadership approach integrates analytical ingenuity and creative insight to effectively oversee projects.

TECHNICAL EXPERIENCE

Project Management. Jesse has established clear objectives, deliverables, and schedules for various projects. He assembled teams, ensuring that they possess the necessary skills and expertise for successful project completion. Throughout these projects, he monitored progress and proactively addressed potential roadblocks to maintain adherence to project timelines. This approach has consistently facilitated the smooth execution and timely completion of projects.

Civil Engineering. Jesse has developed and overseen numerous civil site projects from conception to completion, ranging from single-use commercial projects to large multi-unit residential developments.

Stormwater Management. Jesse has acquired stormwater pollution prevention plan permits and performed onsite inspections. He also provided training to company personnel and developed standards and practices to ensure compliance and efficiency.

Stormwater Modeling. Jesse has used various programs to construct pre-construction, post-construction, and water quality models for construction projects and sites.

Construction Permitting. Jesse has interfaced with local, state, and federal agencies to submit and acquire necessary permits.

PROJECT EXPERIENCE

Electric Utility Transmission Line Replacement, AEP Kentucky Power, Kentucky. Jesse developed construction plans for access roads and secured the necessary permits for a transmission line replacement project. He provided environmental oversight and conducted thorough inspections throughout the project's duration. Jesse also trained company personnel in stormwater inspections and reporting procedures.

Civil Site Projects, Private Equity, Central Kentucky. Jesse oversaw projects from the feasibility study and conceptual design stages through to grading and drainage design, erosion and sedimentation control planning, utility layout, stormwater management, and construction specifications. He also served as the technical representative for planning and zoning matters. Jesse was also responsible for acquiring the necessary permits to ensure project completion.

Lexington Underground 69KV, LG&E KU, Lexington, Kentucky. Jesse assisted with the conceptual design and alternative routing for a proposed underground transmission line through downtown Lexington. He collected and mapped underground utility locations to guide route selection. Jesse engineered the vertical and horizontal alignment, construction plans, quantities, and specifications. He also provided project management for survey services during the construction phase.

Mine Shaft Projects, Patriot Coal Company and River View Coal, Waverly, Kentucky. Jesse provided project management and oversaw underground services for the installation of three ventilation shafts for underground coal mines in Western Kentucky. His role ensured that the critical infrastructure was implemented efficiently and safely, enhancing the mines' operational capabilities.

TECHNICAL EXPERTISE

- / Project Management
- / Civil Engineering
- / Stormwater Management
- / Stormwater Modeling
- / Construction Permitting

EDUCATION

- / BS in Mining Engineering, University of Kentucky, Lexington, KY (2010)

REGISTRATIONS & LICENSES

- / Professional Engineer in Kentucky, West Virginia, and Virginia

CERTIFICATIONS & TRAINING

- / KEPSC Inspector Qualification

WORK HISTORY

- / RESPEC (2024–Present)
- / AGE Engineering Services, Inc (2017–2024)
- / Alliance Resource Partners, L.P. (2013–2017)
- / Patriot Coal Corporation (2010–2013)



CODY PRIDMORE

PROJECT GEOLOGIST

OVERVIEW

Since 2020 Cody has principally acted as a lead geologist in Wyoming Abandoned Mine Lands (AML) programs performing construction management, planning and overseeing drilling campaigns, and providing technical support. Cody designs, oversees, and reports on exploratory drilling campaigns, ground water monitoring, and closure and pressure grouting of abandoned coal mines. AML work demands a wide skillset and ample adaptability to change, Cody's broad technical writing background paired with an inclination for field work and desire for clear concise communication of information to all stakeholders aids and benefits his team and clients.

Cody is skilled in hard rock and soft rock coring, near surface and downhole geophysical interpretation, downhole hydraulic testing, petrological thin section analysis, analyzing whole rock and aqueous geochemistry, geological mapping, and geological and historical research.

TECHNICAL EXPERIENCE

Construction Management. Cody oversees contractor activities to maintain high standards of work that conform to specifications and exceeds stakeholder expectations. Duties include project planning, budgeting, cost and quantity tracking, geospatial data management, contractor oversight, and communication with client, contractor, and all other necessary parties.

Geotechnical Coring and Testing. Cody excels at logging rock core from crystalline and sedimentary rocks according to multiple widespread standards including the Bureau of Reclamation (USBR) as well as soil logging. While tailoring the data collection to the needs of each job, Cody maintains a high standard of neatness, accuracy in measurements, and thoroughness in descriptions. Cody works with project engineers to understand the purpose of engineering tests and sample the best rock from available rock core and soils.

Field Mapping. Cody provides geological field mapping as well as hazard identification. His expertise in tectonic and geological structures aids him in producing top quality geological maps for any need whether for abandoned mine lands applications, quarry development, or economic exploration. He

Geochemical/Assay and Isotopic Sampling and Analysis. Cody can characterize rock or waters according to their geochemical and isotopic signatures. Whether to identify the provenance of polluted waters, see if streams exceed EPA heavy metal limits, or detect the presence of rare earth elements in rocks, Cody applies his knowledge of isotopic systems and geochemical trends to solve clients' problems.

Geospatial Data Management and 3D Modeling. Field data is usually costly and timely to obtain, Cody records, organizes, and communicates these data efficiently, with integrity and per project needs. He is adept at Leapfrog for borehole data management and basic 3D modeling, ArcPRO for geospatial analysis, and has worked with multiple software for acquisition and organization of geological and other field data.

TECHNICAL EXPERTISE

- / Project Management
- / Geodatabase Design and Data Standardization
- / Geospatial Analysis
- / Geospatial Web Application Development
- / Numerical Analyses of Hydrologic Systems
- / Water-Quality Monitoring, Assessment, and Remediation System Design
- / Air-Quality Program Administration

EDUCATION

- / MS in Geology and Geophysics, Wyoming State University, Laramie, WY (2021)
- / BS in Geology and Geophysics Wyoming State University, Laramie, WY (2019)
- / BA in English, University of California, Los Angeles, CA (2011)

REGISTRATIONS & LICENSES

- / Geologist in Training (GIT) in Wyoming (#5211)

HONORS & AWARDS

- / South Dakota Engineering Society Black Hills Chapter Young Engineer of the Year Award (1998)

WORK HISTORY

- / RESPEC (2024–Present)
- / Brierley Associates Corp. (2020–2024)
- / University of Wyoming Near Surface Geophysics Instrument Center (2018–2019)



PROJECT EXPERIENCE

Geotechnical Investigation for Pump Storage Project (Confidential); Geologist, Near Salt Lake City, UT.

Cody oversaw drilling operations, logged rock core, communicated with clients, directed downhole geophysical surveys and performed packer and pump tests. The quartzite-bearing conglomerate encountered during coring posed several technical challenges in addition to remote location and weather. Project included 4 coreholes 200 feet deep and 1 corehole 1700 feet deep.

Wyoming Abandoned Mine Lands Project 17.6D: Carbon County Historic Mine Assessment and Mitigation; Lead Geologist and Construction Manager; Carbon County, WY. Member of a multi-disciplinary team investigating and evaluating subsidence risk over extensive historic underground room and pillar coal mines across Wyoming. This work included comprehensive geotechnical and geologic investigation, GIS analytics and reporting, field deformation and geomorphic studies, subsidence mitigation and design, hydrogeologic assessment and analysis, sub-surface mine mapping using remote sensing techniques (INSAR, LIDAR, photogrammetry, multispectral imagery), geospatial analysis, ground surveying, geophysical analysis, geotechnical sampling, public outreach, technical specification production, and construction management. My primary responsibilities included construction oversight, geological research and interpretation for project designs, core logging, interpreting downhole geophysical data, and technical report writing.

Goldfield Subsidence Risk Assessment; Geologist; Goldfield, NV. Extensive historical underground mine workings exist beneath the footprint for a newly planned open pit gold mine. Cody's and his team logged and sampled rock core for engineering tests over fourteen days of 24/7 drilling with 12+ hour shifts. Cody and his team used Leapfrog to 3D model subsurface mine voids and categorize the risk of subsidence and collapse under load across the project area.

Wyoming Abandoned Mine Lands Jade Drive Shallow Groundwater Characterization Project; Lead Geologist; Hanna, WY. After several reported issues of water infiltration in homes along Jade Drive, less than 1 mile from ongoing grouting of underground mine voids, the Wyoming AML requested an investigation of subsurface water conditions in neighborhood to determine the water's provenance. Cody spearheaded a geochemical and isotopic investigation and supervised the installation of and data collection from 16 monitoring wells. Three deep boreholes were drilled in the area, each reaching 800 to over 900 feet to access the underlying mine voids, obtain water samples and conduct downhole geophysical tests. Waters from municipal sources, shallow monitoring wells, medium depth monitoring wells, and mine voids were characterized geochemically and by sulfate isotopes (sulfur and oxygen). Cody determined that the data pointed to a shallow groundwater provenance and that the shallow groundwater infiltration was not related to current AML grouting projects.

Farthing Ranch Quarry Geologic Site Evaluation and Quarry Development; Lead Geologist; Horse Creek, WY. Cody provided geologic, engineering, and GIS land use information to aid the client in determining the feasibility of developing an aggregate quarry at the Farthing Ranch location in SE Wyoming. Responsibilities included researching and synthesizing available information regarding local geology and requirements for construction aggregate and assays, logging of granitic core with respect to lithology, fracture analysis and rock quality, selected samples for additional laboratory analysis, and technical report writing. The project spanned phases of initial site mapping, rock coring, permitting, the construction of the haul road, and the development and blasting of the test pit.

Wyoming Abandoned Mine Lands 17.6C: Carbon County Exploratory Drilling Program; Lead Geologist; Carbon County, WY.

An extensive county-wide drilling program whose focus was to discover and explore the extents of abandoned underground mine workings throughout Carbon County. Over 65,000 linear feet of rotary drilling and 5,000 linear feet of coring was completed over the course of 8 months. Cody managed the drilling and contractor work for much of the project, including pay applications and project budget tracking, documenting, and organizing drilling progress and data, directing drilling locations, holding the contractors to specifications, and overseeing downhole geophysical surveys.

PUBLICATIONS & PRESENTATIONS

Pridmore, C.J. (2022). Geochemical, Isotopic, and Geochronological Constraints on the Petrogenesis of the Pan- Tak Granite [Thesis]. University of Wyoming.

Chapman, J. B., Runyon, S. E., Shields, J. E., Lawler, B. L., **Pridmore, C. J.**, Scoggin, S. H., ... & Haxel, G. B. (2021). The North American Cordilleran Anatectic Belt. *Earth-Science Reviews*, 215, 103576



MICHAEL MULLEN, MS

GEOLOGIST

OVERVIEW

Michael Mullen is a highly skilled geoscientist with a strong seismic interpretation and geosteering background, holding both a Master of Science and a Bachelor of Science in Geology from Oklahoma State University. With 3 years of experience using advanced seismic interpretation software such as IHS Kingdom, HampsonRussell, and Petrel, Michael has demonstrated expertise in fracture characterization and wellbore placement across various basins, including the Permian, Delaware, DJ, and Powder River Basins. His professional journey includes roles as a geosteering geologist and wellsite geologist, where he provided critical technical advice, conducted detailed geological analyses, and trained new team members. Michael's academic achievements are complemented by his participation in the 2020 AAPG Imperial Barrel Awards and his leadership roles in professional organizations. His technical proficiency and a business-minded approach make him a valuable asset in the oil and gas industry.

TECHNICAL EXPERTISE

- / 3D Seismic Interpretation
- / Geosteering and Wellsite Geology
- / Well-Log Analysis
- / Core Logging
- / Shallow Subsurface Geophysics
- / Fracture Characterization

EDUCATION

- / MS in Geology, Oklahoma State University, Stillwater, OK (2022)
- / BS in Geology, Oklahoma State University, Stillwater, OK (2019)

PROFESSIONAL MEMBERSHIPS

- / Society of Exploration Geophysicists OSU Chapter, President (President, Fall 2020–Spring 2021; Treasurer, 2020)
- / American Association of Petroleum Geologists (2018–Current)
- / Society of Exploration Geophysicists (2018–Current)
- / Tulsa Geological Society (2022–Current)

HONORS & AWARDS

- / Geleeta and Bill York Field Camp Scholarship
- / Oklahoma Geological Foundation Field Camp Grant
- / Devon Energy Graduate Geology Fellowship

WORK HISTORY

- / RESPEC (2024–Present)
- / Columbine Corporation (2023–2024)
- / Geovision (2022–2023)
- / Datalog (2022)

TECHNICAL EXPERIENCE

3D Seismic Interpretation and Fracture Characterization. Michael has provided detailed interpretations using 2D and 3D seismic data for conventional and unconventional oil and gas prospect evaluations in the North Sea off the coast of Norway. Using his diverse geological background, he generated horizons, surfaces, and isopach maps by integrating well-log and seismic data. The utilization of Spectral Decomposition in Petrel was key in identifying subsurface structures to highlight river channels and potential patch reef reservoirs.

Geosteering and Wellsite Geology. Michael spent months at a time on oil and gas rigs, providing gas detection and XRF analysis, creating mud logs, and compiling end-of-well reports for every well drilled. He has trained several new team members to properly retrieve and wash samples from the well bore and trained them in rock and mineral identification. Detailed mud logs assist in making sure the wellbore is in the proper placement within the target reservoir. Michael has geosteered hundreds of wells in various basins across the U.S. As a geosteering geologist, he was responsible for ensuring that the wellbore continued to drill in the target formation while maximizing rate of penetration and minimizing geologic risk while also providing excellent communication to the entire Operations team.

Well-Log Analysis. Michael has spent much time looking at well-logs in academia and his professional career. He has taught large groups of both geologists and engineers how to properly pick formation tops, identify oil/water contacts, identify hydrocarbons, and calculate water saturation, among other things, by using gamma ray, resistivity, photoelectric effect, density, and density neutron logs. Michael used formation micro-imaging and sonic dipole-dipole logs to identify fracture orientations at well locations and provide ground truth to seismic data for his thesis in characterizing fractures within some of Oklahoma's more prolific oil and gas reservoirs. He has also been tasked with picking the top and base of salt in both domal and bedded units while identifying any non-salt interbeds that may reside within.

Core Logging. Michael has logged more than 1,000 feet of core, including sedimentary (carbonate) and domal salt from various locations in the U.S. He also uses the core logging information as needed to generate figures, tables, and other material to include in geologic core reports. He has also spent some time in the field on a sonic drill rig, logging soil, sand, and gravel.

Shallow Subsurface Geophysics. Michael has assisted in acquiring, processing, and interpreting geophysical methods such as electrical resistivity tomography (ERT), seismic reflection, seismic refraction, and ground-penetrating radar. Several of these studies were done to assist the U.S. Army Corps of Engineers in determining dam stability using seismic reflection and ERT for both earthen and concrete dams. He also assisted in the geophysical evaluation of a location in Pitcher, Oklahoma, to detect voids left over by old mining operations.



EDGAR A. TINAJERO, PE

CIVIL ENGINEER

TECHNICAL EXPERTISE

- / Aviation Design
- / Civil Design
- / Park and Recreational Facilities

EDUCATION

- / BS in Civil Engineering, University of Alaska Anchorage, Anchorage, AK (2013)

REGISTRATIONS & LICENSES

- / Professional Civil Engineer in Alaska (No. 12456)

WORK HISTORY

- / RESPEC (2018–Present)
- / Alaska DNR (2013–2018)

OVERVIEW

Edgar Tinajero is an experienced lead civil engineer familiar with Alaska-based aviation projects' unique design needs. He is an integral part of the aviation design group and has been involved in most, if not all, of RESPEC's aviation design, since joining the group in 2018. Edgar has worked closely with Brian Hanson and other project managers to gain a strong understanding of project management and provide support when needed. As a result, over the last few years, he has expanded his role to take on project management and assistant project management duties on the Automated Weather Observation System (AWOS), Seward Airport Layout Plan (ALP), and Eielson Air Force Base (AFB) projects. From a broader perspective, Edgar has nearly 10 years of civil engineering experience overseeing and preparing design plans, specifications, special provisions, cost estimates, and technical reports for airport and other improvement projects throughout Alaska. From his experience as a project engineer with the Alaska Department of Natural Resources, both in leading design efforts and managing projects during construction, he brings a grounded viewpoint to his design work and a real-world understanding of the actual effort required to implement designs in the field.

PROJECT EXPERIENCE

AWOS Projects for Airports; Department of Transportation & Public Facilities (DOT&PF)—Northern Region; Coldfoot, Kotlik, Nulato, and Tok, Alaska; Central Region; Akiachak, Crooked Creek, Perryville, and Tununak, Alaska. Edgar is the current project manager after assuming full project management duties in December 2021. Before this, he was the primary civil designer and assistant project manager. His current responsibilities include coordinating design staff to develop design changes, coordinating deliverables and schedules with DOT&PF, and managing project budgets, including negotiating contract amendments. During design, he was responsible for site grading and embankment construction improvements, equipment and structure siting, construction phasing, and civil-specific cost and quantity computations. He worked closely with the electrical design team to coordinate the siting of equipment and infrastructure elements. Edgar provided design support during construction, such as design clarifications and submittal reviews. These twin concurrent projects consisted of installing eight total (four per region) automated weather observation systems throughout the state of Alaska. As these systems are typically installed by the Federal Aviation Administration (FAA), this project also served as a new venture for DOT&PF and required extensive communication and coordination with FAA from Edgar and the design team.

Seward Airport Master Plan Update, DOT&PF, Seward, Alaska. As the lead designer for the Airport Improvements project, Edgar is intimately familiar with local airport fleet mix changes and reclassification, runway and runway safety area design, and the airport lighting and navigational aid (NAVAID) considerations that went into those design choices. Initially serving as lead designer for the ALP development, his project role was expanded to act as assistant project manager. He supported tasks such as general project correspondence and coordination of junior and support staff resources. For the design, he was responsible for determining the Federal Aviation Regulation Part 77 airspace surfaces, airspace obstruction analysis, NAVAID siting, determining and sizing airport safety areas, and runway pavement classification number calculations. While this project was initially planned as a full master plan, the project was adapted to the client's needs and shifted to a reduced scope of an ALP update to reflect proposed design changes from the concurrent Seward Airport Improvements project.

Eielson AFB Repair Runway Edge Lights, Conceptual Charrette Report (USAF), Eielson AFB, Fairbanks, Alaska. Edgar's formal role on the project was civil design; however, he has assumed many project management duties and has been instrumental in developing the client deliverables. In addition to



leading the effort in developing the charrette report, his responsibilities on the project include client coordination, internal deadlines, and cross-discipline coordination of the design team. This project analyzes the existing conditions and develops preliminary project scope, schedule, cost, and applicable military program documents to repair the runway pavements and lighting infrastructure at the Eielson AFB.

Ted Stevens Anchorage International Airport FedEx Ramp Rehabilitation, FedEx, Anchorage, Alaska. Edgar was integral in the design; he and the design team analyzed the underlying soils and found they were experiencing thaw weakening. Instead of replacing everything, the team provided an FAA-developed Rigid and Flexible Iterative Elastic Layer Design (FAARFIELD) Airport Pavement Modeling software analysis to determine the proper pavement thickness needed to protect against thaw weakening. His other design duties included site grading; development of phasing elements and construction control; cost and quantity computations, and siting for gate elements such as light poles, concrete joints, and utility maintenance holes. He continued to support the project by providing design support during construction, including site grading design changes, reanalysis of required demolition limits, and construction phasing modifications. This project consisted of replacing the full airport ramp for FedEx while avoiding a full dig, cutting the cost to the client by nearly half.

Angoon Airport Design Services, Alaska DOT&PF–Southcoast Region, Angoon, Alaska.

Edgar is the current lead civil engineer on the project and is responsible for design elements such as runway and apron-surface grading and modeling, environmental disturbance and permit documentation, mass haul balances and construction waste logistics, and engineering cost and quantity computations. This project is intended to fill the public need of providing consistent flight access for Angoon and the surrounding communities and consists of developing a new airport facility as part of the DOT&PF National Plan of Integrated Airport Systems.

Seward Airport Improvements Design Services, DOT&PF, Seward, Alaska. Edgar is the lead civil engineer on this project to improve the existing Seward Airport infrastructure and mitigate operational impacts from severe seasonal flooding of the adjacent Resurrection River. As the civil lead, he was responsible for design elements such as the runway embankment, site drainage, NAVAID siting, construction phasing, and civil-specific cost and quantity computations. Due to the airport's location within the floodplain of the Resurrection River and expansive restrictions identified in the Environmental Assessment, the design required special considerations. Edgar worked closely with the project's hydrologist to develop an efficient revetment armor design and provided design support to the project's environmental group in developing project permits.

Airport Taxiway Rehabilitation and Realignment, City and Borough of Juneau, Juneau, Alaska. Edgar primarily served in a support role for the design team through the review of grading and site modeling. This project required phased rehabilitation, realignment, and relocation of three taxiways. The project team overcame the challenge of managing the construction project to allow the airport to continue operations.

Airport Electrical Equipment Building Replacement, DOT&PF, Eagle and Tok, Alaska. Edgar was the lead civil engineer on the project and was responsible for site grading and embankment construction improvements, equipment and structure siting, construction phasing, and civil-specific cost and quantity computations. During construction, he provided design support, including Request for Information (RFI) responses and Obstruction Evaluation/Airport Airspace Analysis support. This project consisted of the replacement of the existing electrical equipment buildings at the Eagle and Tok airports. Because the building's location relative to the airport safety areas, both sites required developing construction safety and phasing plans with temporary airport closures.

Airport Maintenance and Operations Facility, Stage II, DOT&PF–Northern Region, Utqiagvik, Alaska. Edgar was the lead civil engineer on Stage II of this project and was responsible for developing the final civil design and providing construction administration support. His design elements on the project included site grading of the final embankment, siting of security fencing, and developing the construction safety and phasing plan. This project consisted of designing a 36,000-square-foot multipurpose building to support the airport rescue and firefighting crew and provide snow removal equipment and sand storage for maintenance and operations staff.



Musser Engineering
a Division of **RESPEC**

GARRY BUNK, PLS

CHIEF OF SURVEYS



TECHNICAL EXPERTISE

- / Project Management
- / Data Analysis
- / Regulatory Compliance
- / Boundary Resolution
- / Surveying Techniques
- / Survey Data Processing
- / Drafting and Design
- / Geospatial Software
- / GPS and Surveying Instruments
- / Volume Calculations
- / Construction Stakeout
- / Calculation of Grades

EDUCATION

- / BS in Broadcasting, Toccoa Falls College, Toccoa Falls, GA (2000)

REGISTRATIONS & LICENSES

- / Professional Land Surveyor in Pennsylvania (No. SU075464)

PROFESSIONAL MEMBERSHIPS

- / Pennsylvania Association of Land Surveyors

WORK HISTORY

- / RESPEC (2024–Present)
- / Musser Engineering (2020–2024)*
- / Sheesley & Associates, LLC (2019–2020)
- / Earthtech, Inc. (2004–2018)
- / Lake Roeder Hillard & Associates (2001–2004)
- / Nassaux-Hemsley, Inc., (1999–2001)
- / O'Connell & Lawrence Inc. (1997–1999)

**RESPEC acquired Musser Engineering in 2024.*

OVERVIEW

As the Chief of Surveys at Musser Engineering, a Division of RESPEC, Garry Bunk is responsible for overall project oversight, planning, and management of the surveying department. With more than 26 years of experience in surveying services, he specializes in boundary surveys, subdivisions, topographic and planimetric surveys, mining-related surveying, as well as control surveys. His expertise also includes construction stakeouts, such as establishing column lines, building corner offsets, grade stakes, and underground mine workings/voids on the surface.

Garry has significant experience drafting site development and mine plans, including subdivision plats, property survey plats, existing condition plans, design plans, profiles, cross-sections, and stockpile inventories. He has successfully determined pond volumes and created grading designs for mine pits, refuse/ash piles, and roads. He has also produced detailed survey control reports for permanent control monuments at underground mine sites.

Garry's proficiency with various surveying instruments and software, including RTK GPS units, Carlson software, AutoCAD, and IntelliCAD, allows him to deliver accurate and efficient surveying solutions that meet project requirements and regulatory standards.

PROJECT EXPERIENCE

Bison Mine Surveying for Mine Permitting/Design, Allegheny Mineral Corporation, Worthington, Pennsylvania. Garry surveyed a 2-mile traverse loop through an old, inactive (but maintained) underground mine to locate mine workings and the mine pool in relation to proposed surface facilities. He staked the location of injection wells in areas with identified mine voids. Garry also established permanent control monuments and produced a survey control report. He also performed an as-built survey of the surface processing facilities.

Colver Waste Power Plant Surveying for Mining Operations, Interpower/Alcon Partners, Colver, Pennsylvania. Garry drafted design revisions for ash disposal piles to increase the ash placement area, complete with volume calculations. To support ongoing ash placement, he performed construction stakeouts of pile slopes, benches, ditches, and other features. Garry also conducted drafting related to mine permit mapping revisions and annual bond reviews.



WHITNEY FAULKNER, PE

SR. ENVIRONMENTAL / CIVIL ENGINEER

TECHNICAL EXPERTISE

- / Permitting
- / Project Management
- / Stormwater Management
- / Site Development

EDUCATION

- / BS in Civil Engineering, University of Kentucky, Lexington, KY (2002)

REGISTRATIONS & LICENSES

- / Professional Engineer in Kentucky, West Virginia, and Illinois

WORK HISTORY

- / RESPEC (2018–Present)
- / Kentucky DNR Division of Mine Permits (2009–2018)
- / Cambridge Homes (2006–2008)
- / Bollinger, Lach & Associates (2002–2006)
- / H. W. Lochner (1998–2002)

OVERVIEW

Whitney Faulkner has 18 years of experience in civil and environmental engineering. She worked as an engineer permit reviewer for 9 years for the Kentucky Department of Natural Resources (DNR) Division of Mine Permits, which included reclamation of mining sites, backfill and grading, excess spoil structures, sediment-control structures, and coal waste-disposal areas. She also has experience in stormwater detention design, sanitary sewer and watermain design, project management, and stormwater modeling. She can collaborate and work with multiple agencies to secure permits in a timely manner. As a land-development engineer, Whitney managed professional consultants on 1,500-acre projects that involved working closely with city officials and maintaining a \$140 million budget. Whitney has experience in working with various software programs, including SEDCAD, GeoStudio, REAME, AutoCAD, Carlson, and ArcMAP.

TECHNICAL EXPERIENCE

Permitting. Whitney works directly with mining companies in Kentucky, West Virginia, and Indiana to submit and obtain numerous mining applications and permits. She has been responsible for permitting surface- and underground-mining operations. These mining operations required additional permits from the U.S. Army Corps of Engineers (USACE) as well as National Pollutant Discharge Elimination permits.

While working at the Kentucky DNR Division of Mine Permits, Whitney reviewed surface mining permits to ensure they met the appropriate regulations. She was responsible for reviewing each application that contained a coal waste-disposal impoundment, high-hazard dams, breakthrough potential, or mining near an impoundment; evaluating the proposal based on its complexity; and assigning the application to the most qualified reviewer. Whitney also maintained the “slurry list,” which listed each permitting action currently under review and all of the approved permitting actions. During her tenure with the Division of Mine Permits, Whitney reviewed approximately 115 applications dealing with coal waste structures and disposal. These permitting actions required reviewing stability analyses, seepage analyses, hydraulic modeling, dynamic analyses, pipe deflection analyses, and breakthrough analyses.

Project Management. Whitney served as project manager for a 1,500-acre construction project. She managed a large, multidisciplinary team, led communications with internal and external consultants, and worked closely with city officials to obtain the necessary permits and record survey plats. She maintained a \$140 million budget. She also completed quality assurance/quality control (QA/QC) as well as time-and-cost budgeting.

Stormwater Management. Whitney designed and permitted stormwater management features for land-development projects. Her work included reviewing governing agency regulations and designing detention and retention ponds based on those regulations. She developed a stormwater detention model for various phases of an ongoing construction project and was responsible for permitting Stormwater Pollution Prevention Plans.

Site Development. Whitney designed and permitted site plans for private developers, which included grading plans and storm sewer, sanitary sewer, and water main designs. She coordinated with city officials to obtain permits and approvals. Whitney also conducted QA/QC for engineering plans to ensure that the most cost-effective designs were implemented.



PROJECT EXPERIENCE

Calculation of Asset Retirement Obligations, Confidential Client, West Virginia. Whitney assisted in estimating the Asset Retirement Obligations for a coal company in West Virginia. The ongoing operations are covered by 59 Surface Mining Control and Reclamation Act (SMCRA) permits. She estimated the direct reclamation costs to satisfy the SMCRA, 402, and 404 permit conditions for those operations, which included surface mines, underground mines, processing facilities, and mine support structures. The estimate components included consideration for grading to achieve the Approximate Original Contour, pond removal, continued water monitoring with scheduled reductions in frequency, revegetation, costs for perpetual monitoring, stream reconstruction, and road removal.

Hominy No. 2 Surface Mine, Quinwood Coal Company, West Virginia. Whitney served as a project engineer who was responsible for all of the permitting required before mining. Permits from the West Virginia Department of Environmental Protection (WVDEP) Division of Mining Reclamation and USACE were required. To obtain these permits, a mining plan had to be designed that included a reclamation plan, sediment structure designs, excess spoil structures, water quality samples, and wetland and stream determination.

Quinwood No. 1 Haul Road, Quinwood Coal Company, West Virginia. Whitney served as a project engineer who was responsible for all of the permitting requirements for a proposed haul road. Permits from the WVDEP Division of Mining Reclamation and USACE were required. The haul road will be used to connect a surface- and underground-mining job. This project required coordination between all of the permits to ensure that the mining plans were feasible and timing was accurate.

Carlisle Mine, Sunrise Coal, LLC, Sullivan County, Indiana. Whitney served as a project engineer who was responsible for permitting a 4,600-acre underground permit through the Indiana DNR. This project involved ensuring that the application met all of the current SMCRA regulations, the subsidence-control plan, water quality data, and groundwater protection.

Alden Resources, LLC, Corbin Kentucky. Whitney is responsible for designing the sediment-control structures on Alden Resources, LLC mining permits. She works closely with the client to provide a suitable design that is feasible in the field and meets all SMCRA regulations.

Buckeye Impoundment Crest Raise Review, Kentucky DNR Division of Mine Permits, Perry County, Kentucky. Whitney was the engineer permitting reviewer who reviewed and ultimately approved a 100-foot stage increase to a slurry impoundment that did not have a working decant system. The proposal was for two 50-foot increases. Stability analyses for both of the stages were verified and reviewed to ensure that each stage met the required safety factor for the static and pseudostatic conditions. Hydraulic modeling for the probable maximum precipitation (PMP) event was reviewed to ensure that the impoundment had 3.0 feet of freeboard and could decant 90 percent of the PMP storm volume within 10 days per regulation. A pipe deflection analysis had to be conducted to ensure that the proposed decant pipe would not deflect more than 5 percent under the weight of the 100-foot impoundment raise.

Stacy Branch Mine Review, Kentucky DNR Division of Mine Permits, Perry County, Kentucky. Whitney was the engineer permitting reviewer who reviewed and approved a permit that proposed the fill placement optimization process. This process maximized the amount of spoil returned to the mine area while minimizing the amount of spoil placed into excess spoil disposal sites. This protocol was used to facilitate issuing a corresponding USACE 404 permit.

Camp 9 Slurry Impoundment Review, Kentucky DNR Division of Mine Permits, Union County, Kentucky. Whitney reviewed a horizontal and vertical expansion of a four-sided diked impoundment and the associated closure plan. Her review included stability analysis, seepage analysis, groundwater analysis, and hydraulic modeling.

Big Branch Impoundment, Kentucky DNR Division of Mine Permits, Knott County, Kentucky. Whitney reviewed a crest increase of an upstream impoundment. The review required that she conduct a finite element quake analysis to ensure that the impoundment met the regulation requirements of the pseudostatic safety factor.



LAUREN PENNINGTON

MINING ENGINEER

OVERVIEW

Lauren Pennington has experience with feasibility and due diligence studies, environmental permitting, and critical minerals. She has worked on projects focused on extracting rare earth elements from coal and coal byproducts, running radio frequency identification (RFID) tracer tests on heavy media cyclones, setting up full plant circuit tests, and comparing stack sizers and flotation devices. She also has experience with AutoCAD Map 3D, Carlson, Maptek Vulcan, SEDCAD, AggFlow, and AMD Treat.

TECHNICAL EXPERIENCE

Feasibility Studies and Due Diligence. Lauren has assisted in feasibility and due diligence studies for various mineral commodities, including crushed stone, gypsum, bauxite, potash, and construction sand. She has also performed transportation, market, and financial feasibility analyses based on enterprise and royalty approaches.

Permitting. Lauren works with mining companies in Kentucky to submit and obtain numerous mining applications and permits. She has assisted in permitting for surface- and underground mining operations.

Critical Minerals and Rare Earth Elements. Lauren has assisted with a grant-funded project for the U.S. Department of Energy to identify and prioritize critical mineral and rare earth element resources from coal-based sources. Work included collaboration with the West Virginia University research laboratory.

Circuit Optimization. Lauren has run RFID tracer tests on 48-inch heavy media cyclones to determine changes in percent non-magnetics in media, cyclone diameters, and media-to-coal ratios. She has also collected samples and performed analyses to build a report suggesting improvements for the overall functionality of the coal processing plant.

Laboratory Operations. Lauren has been responsible for conducting bench-scale experiments and managing data for multiple projects focused on leaching rare earth elements from coal-related materials.

TECHNICAL EXPERTISE

- / Feasibility Studies and Due Diligence
- / Permitting
- / Critical Minerals and Rare Earth Elements
- / Circuit Optimization
- / Laboratory Operations

EDUCATION

- / BS in Mining Engineering, University of Kentucky, Lexington, KY (2022)

PROFESSIONAL MEMBERSHIPS

- / Mu Nu Gamma, Mining Engineering Honor Society, University of Kentucky
- / Society of Mining, Metallurgy & Exploration (SME)
- / Women in Mining

HONORS & AWARDS

- / CPSA Research Scholarship

WORK HISTORY

- / RESPEC (2021–Present)
- / University of Kentucky, Mining Engineering Department (2019–2022)



ATENA AMIRSOLEIMANI, EIT

ENVIRONMENTAL ENGINEER

TECHNICAL EXPERTISE

- / AutoCAD
- / ArcGIS
- / FEMA Maps
- / SWMM

EDUCATION

- / PhD in Civil Engineering, University of Kentucky, Lexington, KY (2020)
- / MS in Civil Engineering, K.N. Toosi University, Tehran, Iran (2009)
- / BS in Civil Engineering, University of Mazandaran, Mazandaran, Iran (2006)

REGISTRATIONS & LICENSES

- / Engineer in Training in Kentucky (No. 16148)

PROFESSIONAL MEMBERSHIPS

- / American Society of Civil Engineers

WORK HISTORY

- / RESPEC (2023–Present)
- / EXP U.S. Services Inc. (2021–2023)
- / University of Kentucky (2016–2021)
- / Batis Group Company (2013–2015)

OVERVIEW

Atena Amirsoleimani is an environmental engineer with multiple research experiences identifying contamination in water, wastewater, and sediment samples. With a solid educational background, including an undergraduate degree in civil engineering and a doctoral degree in environmental engineering, Atena has developed a deep understanding of various contaminants found in water, air, soils, and sediments, as well as effective remediation methods. Her in-depth knowledge of environmental engineering concepts enables her to devise sustainable solutions for a wide range of environmental challenges. Before joining RESPEC, Atena was a civil engineer in water/wastewater, developing designs for piping projects.

PROJECT EXPERIENCE

Air Permit Application of the West Virginia Department of Environmental Protection, Greenbrier Excavating and Paving Inc., Lewisburg, West Virginia. Atena Amirsoleimani was tasked with calculating the air pollutant concentrations associated with the construction of a hot-mixed asphalt production plant, which had a production rate of 432,000 tons per year. She also handled the online application process and addressed all comments received from the West Virginia Department of Environmental Protection, Division of Air Quality. Her role involved ensuring compliance with environmental regulations and facilitating effective communication between the project and the regulatory agency.

Ash Grove Exploration Permit Application of U.S. Department of the Interior Bureau of Land Management, Ash Grove Cement Company, Leamington, Utah. Atena was responsible for gathering the necessary documents for a mine claim sampling permit application. This involved providing detailed information on exploratory trenches for soil sampling, including nine sampling trenches. Atena also addressed comments regarding the environmental disturbance caused by the project area. She also contributed to re-establishing vegetation in the disturbed area by providing a seed mixture specifically designed to recover vegetation.

S.E. 1st Avenue Water Main Extension Design/Construction, City Fort Lauderdale, Fort Lauderdale, Florida. Atena served as a design engineer for a project involving extending the old water main line on S.E. 1st Avenue, between E Broward Boulevard and Las Olas Boulevard. As part of her responsibilities, she proactively contacted all utility companies to obtain accurate as-built drawings and relevant details. Using this information, Atena prepared new designs and drawings to install the new water main.

Rehabilitation and Replacement Project for Old Bridges in LaSalle, Franklin, and Concordia Parishes, Louisiana Department of Transportation and Development, Louisiana. Atena was a design engineer in this project that included designing and constructing 10 old bridges in three parishes in Louisiana. Atena collected data for Phase I and environmental investigation and assessment for this project. She also contacted all utility companies in the project area to provide details regarding any possible conflicts with utility facilities/lines and prepare multiple technical reports. She also worked on organizing preliminary data to present to the client and collecting flood data from the Federal Emergency Management Agency (FEMA) to account for potential risks in the project area.

Controlling the Spread of SARS-COV-19 Virus in Small Communities, National Institute of Health, Kentucky. Atena was a research manager on this project, which included developing a rapid method for detecting SARS-COV-19 signals from wastewater samples in small communities such as dorms at the University of Kentucky and six nursing homes in Lexington and Louisville. She oversaw sample collection,

processing, data collection, and analysis. She also prepared comprehensive monthly reports to present to the National Institute of Health. The overall cost of the project was \$1 million.

PUBLICATIONS & PRESENTATIONS

Amirsoleimani, A., Brion G. M., Francois, P., 2022. *Identifying Metal Resistance Genes in Staphylococcus Species Isolated from Wastewater and Streams Receiving Treated Effluent*, Environmental Engineering Science, Volume 39 (Issue 11).

Amirsoleimani, A., Brion, G. M., 2021. *Solar Disinfection of Turbid Hygiene Waters in Lexington, KY, USA*, Journal of Water and Health, Volume 19 (Issue 4).

Amirsoleimani, A., Brion, G. M., Francois, P., 2021. *Identifying Co-carriage of Metal and Antibiotic Resistance Genes in Sewage Associated Staphylococci*, Genes, Volume 12 (Issue 10).

Amirsoleimani, A., Brion, G. M., Diene S. M., Francois, P., Richard, E. M., 2019. *Identifying Prevalence and Characterization of Staphylococcus Aureus in Wastewater Treatment Plants by Whole Genomic Sequencing*, Water Research, Volume 158, Pages 193–202.



JAKE L. STEPHENS, PE

PROJECT ENGINEER

OVERVIEW

Jake Stephens is a seasoned Professional Engineer with experience in project and construction management, engineering design and design review, construction management, and safety and risk consulting. Jake has managed a wide range of projects throughout his career, including active and abandoned mine land projects, road-related and shared-use path projects, warehouse material handling and storage solutions, and residential and commercial construction projects. His expertise includes overseeing projects from inception to completion, construction oversight and inspector management, managing project budgeting, installation inspection and quality control, ensuring compliance with safety and environmental regulations, and collaborating with various stakeholders to achieve project goals. Jake has demonstrated strong leadership in developing accurate design plans, providing holistic designs that balance construction costs with maintenance, and ensuring installation meets design plans and specifications. With a comprehensive background in both the public and private sectors, Jake brings a wealth of knowledge and a proactive approach to every project he undertakes.

TECHNICAL EXPERTISE

- / Project Management
- / Engineering Design and Design Review
- / Construction Management
- / Safety and Risk Consulting

EDUCATION

- / BS in Mining Engineering, University of Kentucky, Lexington, KY (2010)

REGISTRATIONS & LICENSES

- / Professional Engineer in Kentucky

CERTIFICATIONS & TRAINING

- / WV Underground Experienced Coal Miner
- / WV Surface Experienced Coal Miner
- / MSHA Approved Instructor (Unlimited, Surface and Underground)
- / Arkansas Workers' Compensation Commission Field Safety Representative
- / Texas Department of Insurance Loss Control Representative

WORK HISTORY

- / RESPEC (2024–Present)
- / Lexington-Fayette Urban County Government (2022–2024)
- / Advanced Handling Systems, LLC (2020–2022)
- / Lexington-Fayette Urban County Government (2018–2020)
- / RAME Contracting (2017–2018)
- / Central Mine Services, Inc. (2013–2017)
- / Alpha Natural Resources, Inc. (2011–2013)
- / Massey Energy Company (2007–2011)

TECHNICAL EXPERIENCE

Project Management. Jake has successfully managed projects of various types and sizes, from single multi-million-dollar projects to multiple projects at different stages of completion, all at once. Project management has included client coordination, estimating costs and obtaining project funding, obtaining and managing consultants and internal engineering staff to complete project design, design review for adherence to local, state, and federal regulations and guidelines, construction material submittal and review, managing construction inspectors and inspecting projects for adherence to design plans and specifications, project budgeting, invoicing, and change orders, and project closeout.

Engineering Design and Design Review. Jake has designed and estimated costs and reviewed project designs for abandoned mine land reclamation, coal slurry impoundments, active and future mining operations, commercial and residential construction, and warehouse material storage and handling projects. He has valuable experience reviewing project designs for accuracy and completeness, designing with consideration of construction and maintenance operations, and conformance with local, state, and federal regulations and design guidelines. His experience with projects from various industries has given him the ability to provide creative solutions and strategies for project designs.

Construction Management. Jake has experience managing material suppliers, site managers, inspectors, and contractors to ensure materials are received in a timely manner and installed per project drawings and specifications. He has experience coordinating installation on multi-discipline projects to ensure project completion, limiting hindrances to and from other trades. Jake has managed client relationships during installation to ensure satisfaction with installation and facilitate any necessary design modifications or change orders while considering project budget and schedule considerations.

Safety and Risk Consulting. Jake has conducted numerous safety and risk audits within the mining and mining-related industries throughout the U.S. Safety and risk audits included interviewing safety management personnel, reviewing job safety processes and safety and risk programs, analyzing safety and insurance claim data, observing workplace conditions and interviewing personnel and observing work habits. He has developed safety topics and training information and completed training for production and safety personnel for various clients.



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ANDREW D. JINKENS, PG

PROJECT ENGINEER



TECHNICAL EXPERTISE

- / Civil Construction/E&S Inspection
- / Compaction Testing
- / Subsurface/Geotechnical Investigation
- / Aquifer Testing
- / Surface Water Sampling/Measurement

EDUCATION

- / BS in Geology, California University of Pennsylvania, California, Pennsylvania

REGISTRATIONS & LICENSES

- / Professional Geologist in Pennsylvania (No. PG005541)

PROFESSIONAL MEMBERSHIPS

- / Ohio Oil & Gas Association
- / Pittsburgh Geological Society
- / Association of Environmental and Engineering Geologists (AEG)
- / PA Council of Professional Geologist (PCPG)

WORK HISTORY

- / RESPEC (2024–Present)
- / EARTHRES (2013–2024)*

*RESPEC acquired EARTHRES in 2024.

OVERVIEW

Andrew Jinks is a results-driven professional with a client-first mindset. He has 10 years of diverse experience in environmental and engineering consulting, encompassing civil construction/erosion and sedimentation inspection, mine permitting, geotechnical investigation, hydrogeological investigation, ground/surface water monitoring, process safety management, wastewater discharge monitoring, GIS mapping, and business development.

PROJECT EXPERIENCE

O&G Well Pad Construction/Reclamation CQA, Washington County, Greene County, Allegheny County, Pennsylvania, and Wetzel County, West Virginia. Andrew was responsible for comprehensive construction oversight, which included the development of detailed daily field reports. He conducted thorough erosion and sediment control inspections, ensuring compliance with all relevant regulations. His role also involved evaluating ground stability and engineered fill, alongside performing nuclear gauge compaction testing to ensure project integrity and safety.

Mining Permitting and Compliance, Somerset County, Pennsylvania, and Garret County, Maryland.

Andrew contributed to Module 8 (Pennsylvania) Hydrology by conducting background sampling and characterization and developing a comprehensive sampling plan. He performed aquifer testing to assess groundwater resources and ensure accuracy in data collection. Andrew also managed surface water permit compliance sampling and flow measurements in Maryland, ensuring adherence to environmental regulations and standards.

Process Safety Management – Standard Operating Procedures for Asphalt Processing, Tampa, Florida; Savannah, Georgia; Indiana; and Dallas, Texas.

Andrew thoroughly reviewed existing procedures to identify information gaps and outdated content. He led process walkthroughs and evaluations to ensure comprehensive understanding and efficiency. Andrew developed updated procedures based on these evaluations, incorporating photographed action items to enhance clarity and implementation.



RAVI RAY, PHD, PE

PROJECT ENGINEER

TECHNICAL EXPERTISE

- / Numerical Modeling & Analysis
- / Ground-Support Evaluation
- / Geomechanical Analysis of Underground Mines
- / Mine Instrumentation and Data Interpretation
- / Rock Mechanics field investigation
- / Technical Writing

EDUCATION

- / PhD in Mining Engineering, University of Kentucky, Lexington, KY, (2020)
- / BS of Technology in Mining Engineering, Indian Institute of Technology (Banaras Hindu University), Varanasi, India, (2013)

REGISTRATIONS & LICENSES

- / Professional Engineer, Kentucky
- / Professional Engineer, Texas

PROFESSIONAL MEMBERSHIPS

- / American Rock Mechanics Association

CERTIFICATIONS & TRAINING

- / MSHA 40-Hour Underground Miner Training
- / OSHA 40-Hour HAZWOPER Training

WORK HISTORY

- / RESPEC (2022–Present)
- / Golder Associates (2020–2022)
- / University of Kentucky (2017–2020)
- / Coal India Limited (2014–2017)
- / Hindustan Copper Limited (2013–2013)

OVERVIEW

Dr. Ravi Ray is a project engineer within the RESPEC Mining & Energy business unit. Ravi has worked in various capacities in stope and backfill underground copper mine, and longwall & continuous miner coal mine in India before getting a PhD in Geomechanics from the University of Kentucky. He is a registered Professional Engineer in Kentucky and Texas. Ravi specializes in numerical modeling of mines and underground excavations using software tools like *FLAC3D*, 3DEC, RS2, and RS3. He has performed stability analysis of several open pit and underground excavations in North America, South America, Africa, Asia, and Europe.

He brings more than 11 years of combined mine operations, mine planning, and geotechnical consulting experience working as a mining engineer across geographies, and mine types. Before joining RESPEC, he worked as a Rock Mechanics consultant at Golder Associates.

TECHNICAL EXPERTISE

Subsidence Prediction and Mitigation over Abandoned Coal Mines. Ravi has performed empirical, analytical, and numerical analysis of coal pillar stability, longwall gob formation, surface subsidence, and subsidence mitigation measures in India, Poland, and the U.S. He uses *FLAC3D*, ACPS, and SDPS programs for coal mine subsidence predictions.

Subsidence Prediction and Mitigation over Abandoned Coal Mines. Ravi has performed empirical, analytical, and numerical analysis of coal pillar stability, longwall gob formation, surface subsidence, and subsidence mitigation measures in India, Poland, and the U.S. He uses *FLAC3D*, ACPS, and SDPS programs for coal mine subsidence predictions.

Numerical Analysis of Salt and Potash Mines. Ravi has performed analytical, and numerical analysis of salt and potash mines to predict surface subsidence, underground excavation response, pillar design, and mine stability in Canada, Brazil, and the U.S. He uses *FLAC3D*, and SALT_SUBSID programs for evaporite mine response predictions.

Numerical Analysis of Hard Rock Mines. Ravi has performed empirical, analytical, and numerical analysis of copper, limestone, gypsum, and other hard rock mines to evaluate pillar stability, sill stability, mine design, surface subsidence prediction, ground support design, and mine stability in India, Mexico, Canada, South Africa, and in the U.S. He uses *FLAC3D*, RS2, RS3, RocSupport, and SDPS programs for hard rock mine response predictions.

Numerical Analysis of Slope Stability. Ravi has performed analytical, and numerical analysis of open-pit slopes for gold and copper mines in Asia and the U.S. He uses *FLAC3D*, RS2, RS3, Slide2Slide2, and Slide3 programs for slope stability problems.

PUBLICATIONS & PRESENTATIONS

Ray, R. C., 2020. *Investigation Into Mine Pillar Design and Global Stability Using the Ground Reaction Curve Concept*, doctorate thesis, University of Kentucky, Lexington, KY. <https://doi.org/10.13023/etd.2020.197>

Ray, R. C., Z. G. Agioutantis, and K. Kaklis, 2019. "Mine Pillar Design Using the Ground Reaction Curve Concept," *Proceedings of the 38th International Conference on Ground Control in Mining*, Morgantown, WV, July 23–25, T. Klametti, B. Mishra, H. Lawson, M. Murphy, and K. Perry (eds.), Society for Mining, Metallurgy, and Exploration, Inc., Englewood, CO.

Ray, R., C., Newman, and Z. Agioutantis, 2019. "Review of the Relation Between Pillar Load and Opening Convergence in Pillar Design Using the Ground Reaction Curve Concept," ARMA-2019-0350, *Proceedings, 53rd Rock Mechanics/ Geomechanics Symposium*, New York, NY, June 23–26.

Ray, R., C. Newman, and Z. Agioutantis, 2019. "Preliminary Assessment of the Relationship of Pillar Load and Opening Convergence Response," *Proceedings, SME Annual Meeting and Exposition*, Denver, CO, February 24–27.



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AARON STRICKLAND

PROJECT MANAGER



TECHNICAL EXPERTISE

- / Project Management
- / Civil Construction Oversight
- / E&S Inspection/Compliance Monitoring
- / Slope Stability and Compaction Testing
- / Subsurface/Geotechnical Investigation
- / Aquifer Testing
- / Surface Water Sampling/Measurement
- / Heavy Equipment Operation/Heavy Excavation Supervision

EDUCATION

- / BA in History and Religious Studies, West Virginia University, Morgantown, WV (2004)

CERTIFICATIONS & TRAINING

- / EQT Enviro H&S Upstream Test
- / EQT E&S Compliance Program
- / Spill Policy SOP Training
- / PEC Safeland Orientation
- / OSHA-30 Construction Safety & Health
- / EnviroCert International, Inc., Qualified Stormwater Manager

WORK HISTORY

- / RESPEC (2024–Present)
- / EARTHRES (2012–2024)*
- / Strickland Consulting (2009–2012)
- / Kanawha Stone (2005–2009)

**RESPEC acquired EARTHRES in 2024.*

OVERVIEW

Aaron Strickland is a results-driven, client-focused Project Manager with more than 20 years of experience in mining, heavy excavation, and civil site construction. With a strong background spanning 15 years in heavy excavation and construction within the oil and gas industry, he brings a wealth of expertise in managing complex projects and delivering exceptional results. His commitment to client satisfaction and a proven track record of successful project completions underscores his dedication to his projects and clients.

PROJECT EXPERIENCE

O&G Well Pad Construction & Reclamation Project Management in West Virginia, Pennsylvania, and Ohio. Aaron's role involved project management and construction oversight for various civil construction projects, including well pad and compressor station construction, as well as the installation of Post-Construction Stormwater Management systems. He also managed road improvement projects and conducted erosion and sediment control inspections, ensuring compliance with environmental regulations. Aaron also performed evaluations of slope stability and engineered fill to maintain site safety and integrity.

NOTABLE PROJECTS

- / Professional Involvement in more than 100 Civil Construction Highlighted Projects from 2012 to Present
- / Rostosky New Build
- / Corsair New Build
- / Kuhn New Build
- / Gallagher PCSM
- / Oxford Well Pads
- / Clemente New Build
- / Haggard New Build
- / EQT Liberty Restoration
- / Sarah New Build
- / Ealy PCSM
- / Mingo New Build



APPENDIX C.

LICENSES, CERTIFICATIONS AND DEGREES


West Virginia State Board of Registration for Professional Engineers

Site Last
Updated
10/28/2024

Search: Details

Name:	JESSE CURTIS HATTER
WV Professional Engineer:	PE License Number: 022782
	PE License Status: Active
	PE Issue Date: 01/23/2018
	PE Expiration Date: 12/31/2024
Continuing Education Claim:	Qualifying Hours from Last Renewal or Reinstatement: 30.00
	Carryover Hours for Next Renewal: 0.00
	Last Renewal or Reinstatement Date*: 12/31/2022
WV Engineer Intern:	EI Certification Number:
	EI Issue Date:
Primary Address of Record:	165 FOSTER LANE STANFORD, KY 40484
Primary Employer of Record:	AGE ENGINEERING SERVICES, INC.
	<div><div>*</div><div>This date reflects the most recent license renewal (or reinstatement) date for this licensee. Continuing education hours earned prior to this date may not be used for future renewals.</div></div>

This data was retrieved on 10/29/2024.

[Export To Excel](#)Show : 10  entries

Last Name	First Name	License#	City	State	Country	Action
Drake	Brett	PE 17325	Cheyenne	WY	United States	

Last Name :	Drake	First Name :	Brett
StreetLine 1 :	623 Phoenix Drive	StreetLine 2 :	
City :	Cheyenne	State :	WY
Zip :	82001	Branch :	CE/CNE
License Date :	06/05/2019	Status :	Active
Business :		Type :	Professional Engineers
Registration Number :	PE 17325		
Expiration Date :	12/31/2024		

[← Close detail](#)

First ()	Previous ()	1 ()	Next ()	Last ()
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WYOMING BOARD OF PROFESSIONAL GEOLOGISTS

2617 E. Lincolnway Suite I
Cheyenne WY 82001
Pamela J. Girt, Executive Director

EMAIL ■ prof.geo@wyo.gov
WEBSITE ■ wbpge.wyo.gov
TELEPHONE ■ (307) 742-1118

Craig Carlson Casper	Erin Campbell Laramie	Andrew K. Finley Casper	Levi J. Hime Laramie	Graeme Finley Casper	Janet Dewey Laramie	Brian Smith Laramie
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May 18, 2022

Cody James Pridmore
713 S. 2nd St.
Laramie, WY 82072

Cjpridmore@gmail.com

Dear Cody James Pridmore:

File #5211

Congratulations. I am pleased to advise you that the Wyoming Board of Professional Geologists has certified you as a Geologist-in-training on May 9, 2022. This certification will be valid forever and fulfills one of the requirements for application to the Professional Geologist (PG) license. There is no renewal fee to the GIT Certification. The certification is valid in any ASBOG affiliated state.

You may use "G.I.T." or "Geologist-in-training" as a title after your name, providing these designations are not used in conjunction with your File # or preceded by the word "licensed", "registered", or any other words that might lead someone to believe you are licensed as a professional geologist. Your File # is for the Board's internal use in tracking your records only.

Your file is maintained in our Board Office indefinitely. If at any time you have a change of address (home or business), it is your responsibility to notify our office by mail or e-mail in order that future correspondence will reach you. Sorry, we do not accept address changes by phone.

If you have any questions, please feel free to contact the Board office.

**GIT
CERTIFICATION
LETTER**

Respectfully,

A handwritten signature in cursive script, reading "Pamela J. Girt".

Pamela J. Girt
Executive Director



FUNDAMENTALS OF GEOLOGY EXAMINATION MARCH 2022

SCORE REPORT FOR PASSING CANDIDATES

You received a passing score on the Fundamentals of Geology (FG) Examination that was administered in March 2022. A scaled score of 70 represents the minimum passing score regardless of which form of the examination is taken. The FG Examination was based on the following content areas:

- A. General & Field Geology
- B. Mineralogy, Petrology, & Geochemistry
- C. Sedimentology, Stratigraphy, & Paleontology
- D. Geomorphology, Surficial Processes, & Quaternary Geology
- E. Structure, Tectonics, & Seismology
- F. Hydrogeology
- G. Engineering Geology
- H. Economic Geology & Energy Resources

To assist you and to furnish individual feedback, the following information indicates your performance in each of the FG content areas. A "+" indicates acceptable performance in a particular content area whereas a "-" shows substandard performance. It may be useful to focus your review on the areas designated with a "-". We hope that you find this information helpful.

NAME	STATE	ABCDEFGH	SCALED	STATUS
PRIDMORE CODY J	WY	++++++	85.00	PASS



STATE BOARD OF REGISTRATION FOR PROFESSIONAL ENGINEERS

To all to whom these presents shall come Greeting
"Know Ye" That The State Board of Registration for Professional Engineers
of the State of West Virginia, reposing special confidence in
the Intelligence, Integrity and Discretion of

Whitney Elaine Faulkner

DOES IN PURSUANCE OF AUTHORITY VESTED IN IT
by law hereby certify that she having submitted
satisfactory evidence of her ability and experience is a

REGISTERED PROFESSIONAL ENGINEER



Registration Number 23735

"To Hold" and use such title in the practice of her profession,
subject to the conditions prescribed by law.



Given under the hand of the
Seal of the Board at the Capitol in the
City of Charleston,
This 20th day of August
in the year of our Lord 2019
and of the State
the One Hundred Fifty-Sixth

Members of the Board

 Blayne S. Saluja
Lester E. Thomas Jr.  Ly C. Nett

Search for Kentucky Licensees

Name: Jacob Stephens

Professional Engineer: Number: 31742

Status: Current

Issue Date: 04/08/2016

Expiration Date: 06/30/2026

Professional Land Surveyor:

Address of Record: 132 Seven Oaks Drive
RICHMOND, KY 40475

Responsible Charge For:

Disciplinary Action?:

RESPEC.COM

