

*Brian D. Groff, P.E.*

*Profession:* Mining Engineer

*Date of Birth:* 1975

*Present Position:* Project Engineer  
Morgan Worldwide Consultants Inc.

*Nationality:* American

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***Educational and Professional:***

University of Missouri Rolla  
1999 - B.S. Mining Engineering

***Professional Registrations:***

Kentucky Licensed Professional Engineer - #27043  
Missouri Licensed Professional Engineer - #PE-2011008502  
West Virginia Licensed Professional Engineer - #19072

**Career Summary:**

Brian Groff is a mining engineer with a professional emphasis on maintenance and reliability best practices with responsibilities for budget forecasting, operations management, and mine planning – including fleet sizing, dragline pit layout, and advanced production schedule forecasting.

Mr. Groff has in depth knowledge of Carlson Software/SurvCAD in geologic modeling and mine planning. He has monitored surface water runoff from salt storage pads along Cayuga Lake, near Lansing, NY, and supported justification for new electro dialysis water purification plant to treat effluent discharge. Additionally, he researched and tested alternative drilling and blasting techniques and designs focused on reducing peak particle velocity and dynamic strain in roof rock in domal salt formations.

Since 2000, Groff has been a member of the Antique Motorcycle Club of America with specific interest in collecting and restoring Indian motorcycles.

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**Supplementary Data/Key Qualifications:**

- Assisted Patriot Coal in developing an avoidance and minimization mine alternative, which enabled them to obtain the necessary Section 404 IP to continue mining at Hobet.
- Managed a 6-million ton per year 70-cu.yd. dragline operating contract with Bahama Rock.
- Served as an applications engineer for customers seeking draglines and shovels for their operations.
- Estimated and quoted relocation of various sized used draglines for aggregates, coal, and other industrial minerals customers.
- Extensive use of Carlson Software/SurvCAD in geologic modeling and mine planning to best utilize the mine's equipment.
- Frequent involvement in dragline and shovel repairs as a maintenance engineer.
- Supervised maintenance function for solar salt operations including P/L responsibility.
- Bay Area Marshland restoration projects in Redwood City, CA
- Implemented predictive maintenance program, established maintenance business processes, provided crafts training for precision maintenance methods, eliminated unnecessary assets and increased asset reliability and utilization.

- Monitored surface water runoff from salt storage pads along Cayuga Lake, near Lansing, NY, and supported justification for new electro dialysis water purification plant to treat effluent discharge.
- Instrumental in researching, designing, testing, and installing new \$1.2MM crushing and screening process to improve product gradation and customer satisfaction.
- Aided the restructuring of mine maintenance workflow around MAXIMO software for improved equipment reliability.
- Assisted in reclamation of mine areas

### **Underground Specific**

- Researched and tested alternative drilling and blasting techniques and designs focused on reducing peak particle velocity and dynamic strain in roof rock for underground salt mining. Use of multi-channel blast vibration monitors along with high speed digital video employed to detect faults.
- Utilized cryogenic treatment of drill and cutter bits to double their life and slash costs on consumables.
- Experienced in surveying of underground mine workings with the use of ground-based LiDAR scanning. Results of such surveys utilized for rib and pillar strength analysis as well as shock and frictional losses in mine ventilation.
- Experienced in the operation and maintenance of underground mining machinery, including LHD's, Articulated Trucks, Scalers, Roof Bolters, Powder Rigs, roof mounted conveyors and underground rail transportation.

### **Employment Experience:**

**2009 – Present**                      **Morgan Worldwide Consultants, Inc.**  
*Project Engineer – Lexington, Kentucky*

**2005 - 2009**                         **Bucyrus International, Inc**  
*Mining Engineer – Mount Sterling, Kentucky*

**1998 – 2005**                        **Cargill Salt**  
*Maintenance Supervisor - Newark, CA (San Francisco Bay Area)*  
*Mining / Maintenance Engineer - Avery Island, LA*

**1997**                                    **Savage Zinc**  
*Engineer - Gordonsville, TN*