



## PROJECT EXAMPLES

### WATER MANAGEMENT

#### LAKE MALOYA

*Raton Water Works, Springer, New Mexico*

Engineering Analytics, Inc. (EA) staff worked with the New Mexico Office of the State Engineer to develop and perform a geotechnical site investigation to examine the condition of two existing, earthfill, municipal water storage dams and provide designs for rehabilitation. The project included a range of geotechnical sampling, subsurface instrumentation, laboratory testing, and seepage and stability modeling of the dams. Subsequently, a design for rehabilitation of the dam will be developed.

#### SPRINGER DAM

*Town of Springer, New Mexico*

Engineering Analytics staff developed and completed a geotechnical site investigation to examine the condition of two existing, earthfill, municipal water storage dams and provide designs for rehabilitation. The project included a full range of geotechnical sampling, subsurface instrumentation, laboratory testing, and seepage and stability modeling of the dams using the GeoStudio 2007 software. Global seepage analyses were conducted to provide an estimate of the location of the phreatic surface for use in geotechnical analyses of global slope stability. A downstream buttress was designed to improve the stability of the dam.

#### DAWSON DAM

*Dawson Ranch Company, Dawson, New Mexico*

Engineering Analytics staff performed a feasibility study for selection of off-stream dam sites. Maps were prepared outlining the ranch property and detailing the locations of eight potential dam sites and their areas of inundation. A preliminary design for an additional off-stream dam located east of the Vermejo River was designed with a conveyance pipeline to provide water to the reservoir. Cost estimates were prepared for the construction of the off-stream dam by comparing an earthfill construction with an RCC method.

#### PINEY POINT PHOSPHATE FACILITY

*Florida DEP, Ruskin, Florida*

Engineering Analytics staff managed the design and permitting associated with remediation and re-plumbing of a large network of treatment ponds at the Piney Point phosphate facility. Project required clean-up of more than 1 billion gallons of acid-laden water. EA staff used a complex set of GIS coverages to develop a model of surface water flow during treatment that was used to successfully obtain an Environmental Resources Permit and a Water Use Permit to allow the remedy to be implemented.

#### Highlighted Services

- Dam and Impoundment Feasibility and Conceptual Design
- Design Services-Plans and Specifications
- Water Conveyance Design
- Industrial and Mining Waste Management
- Water Treatment
- Water Supply
- Permitting
- Construction Management





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### WATER MANAGEMENT

#### MINERS LAKE DAM

*North Poudre Irrigation Company, Wellington, Colorado*

In order to remove a restriction placed by the Colorado State Engineer's Office at Miners Lake Dam, Engineering Analytics, Inc. (EA) staff designed remediation to improve the stability of the downstream slope by designing a 3H:1V (horizontal:vertical) downstream buttress, designing erosion protection on the upstream face, and designing a replacement of the outlet works of the dam. EA staff performed the seepage and stability analyses in conjunction with these improvements for review by the State Engineer's Office.



#### SPRING WATER DEVELOPMENT AND PERMITTING

*Nestle Waters, NA, and Crystal Springs, Florida*

Engineering Analytics staff developed, permitted designed and supervised construction of five large-diameter water supply wells at 3 springs to support production of bottled spring water. The turnkey projects involved location of potential sites, hydrologic testing (drill stem and pumping tests), water quality analysis, permitting of sources, and design and construction of 8" to 20" stainless steel production wells. Because FDA regulations do not permit treatment, wells had to generate pristine "spring" water that could be bottled as is.



#### STRATCOR DAM

*Umetco Minerals Corporation, Hot Springs, Arkansas*

Engineering Analytics staff designed and provided construction services for the reclamation and raise of a 125-foot-high dam near Hot Springs, Arkansas. The project involved laying back the downstream face of the dam to a prescribed angle and concurrently raising and improving the dam for future operations. Work included geotechnical characterization of the earthfill material, design of the dam raise, development of the reclamation plan, and construction management.



#### YORK CANYON DAMS NO'S 1, 2, & 3

*Pittsburgh Midway & Coal Company, Raton, New Mexico*

Engineering Analytics staff performed a review of the geotechnical design and hydrology of the Phase I construction of the dam. EA staff was the design Engineer of Record for the Phase 2 and 3 raises and performed seepage and stability analyses, hydrologic analysis, hydraulic design, riprap design, filter and drain design, and seismic design.

#### TALACHE TAILINGS DAM

*Atlanta Gold Company, Atlanta, Idaho*

Engineering Analytics staff provided technical evaluation of the causes of the tailings dam failure at the mill site. EA performed hydrologic analyses, seepage analyses, water balance modeling, and stability analyses for the tailings impoundment. Review of the historic records of mill operations were completed, and an evaluation and cost estimate was prepared for measures that could have been implemented to avoid failure.

#### CHURCH ROCK TAILINGS DAM FAILURE

*U.S. Nuclear Regulatory Commission and Sphere Insurance Company, Church Rock, NM*

The Church Rock Tailings Dam failed as a result of piping and internal erosion caused by high levels of tailings water in the impoundment. EA staff served as the Chief Technical Reviewer for the USNRC. EA staff participated in public hearings on the failure, and reviewed the proposed remediation plans on behalf of the USNRC. Subsequent to the governmental review period, EA staff was retained by the Sphere Insurance Co. as a consulting witness for litigation regarding the cause of failure.