



Resume

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E X P E R T I S E

- Eleven years experience in design/design implementation for CERCLA and RCRA projects.
- Fourteen years supervision experience for general and environmental construction projects.
- Cost estimating and cash flow projections.
- Developing construction, QA/QC, sampling, monitoring and safety plans/specifications.
- Agency negotiations to obtain cost-effective design approvals and avoid construction impacts.

P R O F E S S I O N A L E X P E R I E N C E

MINE/SMELTER CLOSURE AND OPERATIONS DESIGN:

Pecos Mine Operable Unit, New Mexico – Comprehensive mine closure redesign and construction oversight/management for historic works located in the Pecos wilderness along the Pecos River. Original design required extensive redesign based on unforeseen site conditions encountered during construction. Primary work included hydrogeologic, hydrologic, hydraulic, geotechnical, infiltration, slope stability and revegetation evaluations to: regrade a 14-acre waste rock pile; reclaim/reconstruct 1,000 feet of Willow Creek after removal of waste rock; placement of a geosynthetic clay liner and two foot earthen cover over the regraded waste rock pile; and construction of an underdrain to intercept subsurface flow upgradient of the waste rock pile.

Brewer Gold Mine Closure, South Carolina – Comprehensive mine closure design to backfill/cap three open pits and close six heap leach piles, a waste rock dump and several process/sedimentation ponds. Design work: geochemical, geotechnical, slope stability, infiltration, hydrogeologic, hydrologic, hydraulic and revegetation evaluations; a 2K gpm magnesium oxide, low pH pit water treatment system to process 120M gallons to meet NPDES discharge criteria; storm water channel design using gabions; an adit bulkhead; and agency negotiations for design approval for the first mine closed in the state. Pre-construction work: construction plans; technical specifications; bid packages; and contractors solicitation/contracting.

National Zinc Site Remediation, Oklahoma - Final design reports for clean-up of over 1,000 residential and commercial/industrial properties and over 100 alleyways with soils impacted by historic smelting operations. Design work: preparation of work, air monitoring, health and safety, sampling and analysis, data management, quality assurance, community relations and institutional controls plans to guide remedial actions.

Blackwell Zinc Site Remediation, Oklahoma - Final design for remediation of: a 188-acre former zinc smelter property in preparation for commercial redevelopment under the Brownfields Program; approximately 100 residential properties; and two area track facilities surfaced with smelter cinders. Design work: vehicle-loading evaluations to specify cap material and geotextile types/thicknesses; and hydrologic/hydraulic evaluations to design surface water erosion control structures. Pre-

construction work: construction plans, technical specifications, bid packages; and contractors solicitation/contracting.

Acid Rock Drainage Control, Arizona - Acid rock drainage (ARD) interception system design to control a low quality seep and run-off from waste rock piles. Design work: core drilling/packer testing to define weathered bedrock extent and permeability profiles; development of a storm water management plan based on hydrologic/hydraulic calculations to control drainage into, and intercept impacted run-off from, 73 acres of waste rock; and sizing a seep/run-off interception system and evaporation pond to collect/evaporate the ARD.

Earthen Dam, Colorado - Final design for a 1,200-foot long earthen dam with a slurry wall to contain/prevent impacted seep water flows from commingling with a fresh water reservoir down gradient. Design work: geotechnical evaluations of area borrow materials to identify suitable materials for dam and slurry wall construction; cost-benefit analyses using flow net modeling of slurry wall impermeabilities and Packer test results to evaluate seepage and specify dam/slurry wall design; slope stability analyses considering steady state and rapid drawdown conditions for dam stability with each side of the dam impounding water; dam zone particle size by filtration analyses to specify gradation requirements for the three dam zones; spillway, dam underdrain conveyance and headwall designs; and development of construction drawings/specifications.

Pregnant Leachate Solution Conveyance System, Arizona – Final design of a low O&M, 4K gpm gravity flow, 800 foot long, HDPE lined, inclined borehole conveyance system to connect upper/lower pregnant leachate solution ponds and facilitate copper leaching operations expansion. Design work: preliminary designs for cost-benefit evaluations of four gravity feed and pressure pipeline alternatives; final design of the chosen alternative; a seepage interception/control basin design down gradient of one solution pond; and construction drawings/specifications.

Flue Dust Operable Unit, Montana - Design for a cement-lime based stabilization of approximately 500,000 CY of copper smelting flue dust waste and impoundment in an 800,000 CY modified RCRA Subtitle D repository. Design work: development of design, work, transportation and QA/QC plans and construction drawings/specifications.

Uranium Mine Reclamation, Utah - Tailings cover design for reclamation of a 2.6 million cubic yard uranium tailings facility. Cover thickness design work: hydrologic/hydraulic evaluations to evaluate infiltration; and specify a regrading plan with soil cover erosion protection/slope stability to meet NRC/EPA radon flux attenuation guidelines.

FEASIBILITY STUDIES:

Tailings Reclamation Project, Arizona - Evaluated numerous infiltration controlling and oxygen-consuming tailings cover options for seven impoundments totaling over 1,200 acres. Cover options were evaluated based on performance, cost, constructability, longevity and O&M requirements to screen the appropriate cover for each impoundment. Preliminary cover design work considered: impacts to ground water; wind/storm water run-off erosion; a lined process pond; relocation/consolidation of existing utility corridors that are vital to mine operations; and future land uses.

Reservoir Seepage Abatement, Arizona - Evaluated feasibility of alternatives for a 150 acre reservoir bottom sealing project. Expanding mine operations required a reservoir storage elevation that had a historically documented ten acre-feet daily seepage rate. Preliminary design alternatives considered: geophysical evaluations of the reservoir bottom area to identify primary seepage pathways using self potential and very low frequency surveying methods; and cost-benefit and constructability analyses of possible sealing alternatives.

COST ESTIMATING/CASH FLOW PLANNING:

Brewer Gold Mine Closure – Developed: a mine closure approach to meet client cash flow ability whereby client procured all materials and functioned as general contractor for downsized mine staff and

local contractors to support mine closure; and a hard dollar closure cost estimate for client cash flow projections (see above/below for project design/construction work summary)

Mine Reclamation Planning, Arizona (Cyprus Miami Mining Corporation) - Mine closure reclamation plan for an active copper facility. Worked with mine operations personnel to focus a 20-year mine operations plan toward on going and end-term mine reclamation. Project included working within the framework of both state and federal regulatory guidelines and development of a facility-wide demolition and land reclamation cost estimate to establish minimum State bonding requirements.

Leach Vat Demolition, Arizona - Demolition plan identifying phased costs and scheduling for demolition of 10 concrete storage vats and associated pipelines, conveyors and excavator assembly used to leach high grade copper ore prior to establishment of larger scale heap leach operations when lower grade ores were encountered.

Facility Closure Planning, Michigan – Comprehensive detailed facility closure cost estimate to provide reclamation cost and cash flow projections for surface reclamation of an underground copper mine. Estimate based on: take-offs from construction drawings of each facility to develop a focused building demolition cost estimate that included salvage and scrap estimates; site reconnaissance including subsurface investigations to determine environmental impact extents; and regrading/capping cost estimates for closure of 5,000 acres of tailings ponds and several on-site landfills.

CONSTRUCTION MANAGEMENT:

Pecos Mine Operable Unit, New Mexico – Comprehensive mine closure construction management/oversight support. Primary work: waste rock consolidation and regrading of a 14-acre waste rock pile; reclaiming/reconstructing 1,000 feet of Willow Creek after removal of waste rock; placement of a geosynthetic clay liner and two foot earthen cover over the regraded waste rock pile; construction of an impermeable underdrain and confluence tie-ins to bedrock to intercept subsurface flow upgradient of the waste rock pile; permitting/development/reclamation of several borrow areas; gabion lined surface water channels and an extensive revegetation/reforestation program.

Brewer Gold Mine Closure – Comprehensive contracts management, project planning, scheduling, cost tracking and QA/QC oversight. Construction work: backfilling/capping three open pits with 6M CY in six heap leach piles, a waste rock dump and several process/sedimentation ponds; survey control and earthworks calculations for managing contractors and design changes; a 2K gpm magnesium oxide system to dewater/treat 120M gallons to access primary pit for backfill and maintain project stormwater controls; a 1,200LF HDPE-lined/limestone-filled subdrain; 2,500LF of gabion lined channels; development/reclamation of on-site borrow areas; demolition of ancillary mine facilities; and transfer of over 10M gallons of hydroxide sludges into the main pit in conjunction with backfill operations (see above for project design/cost estimating work summary).

Blackwell/National Zinc Sites Remediation – Comprehensive contracts management, project planning, scheduling, cost tracking and QA/QC oversight of primary contractor. Also performed general contracting on components of these multi-year projects (see projects summary above).

Acid Rock Drainage Control - Project planning, scheduling, cost tracking and QA/QC oversight. Field and construction work: core drilling/packer testing to define weathered bedrock extent and permeability profiles; installation of five shallow seepage interception wells and associated pumping and conveyance systems; general site backfill and regrading; a two-acre HDPE lined detention basin; and channels lined with either permalon or an asphaltic sealant and culverts to convey channel flow under site roads (see project design summary above).

Flue Dust Operable Unit - Contract management, planning and cost tracking assistance and QA/QC oversight. Construction work: managing an on-site technical staff of six engineers overseeing a 275 man work force; an 800,000 CY modified RCRA Subtitle D repository with leachate detection/collection systems; lime-cement stabilization of 500,000 CY of copper smelting flue dust; rail spur construction for bulk material shipping; riprap lined drainage channels; a concrete lined decontamination pad and sprung structure for equipment decontamination during winter months; TCLP tracking by 100 ton stabilized

material batches in laydown areas prior to repository placement; and screening operations to provide riprap and protective cover materials (see project design summary above).

Arbiter/Beryllium Expedited Response Actions, Montana (Atlantic Richfield Corporation) - Contract management, planning and cost tracking assistance and QA/QC oversight. Construction work: two RCRA Subtitle C multimedia lined repositories with leachate detection/collection systems; and placement of 275,000 CY of copper processing wastes and 5,000 CY of beryllium wastes.

Defense Depot Superfund Site, Utah (U.S. Army Corps of Engineers) – General Contractor for a contaminated aquifer characterization/VOC plume delineation to provide baseline data for an extraction, treatment and reinjection design. Construction work: installed/sampled pumping, injection and monitoring wells; sampled 27 existing monitoring wells; and separate excavation and manifesting of pesticide/herbicide impacted soils containerized for off-site incineration.

Gypsum Stacks Reclamation, Missouri (W.R. Grace & Company) – General Contractor for a phospho-gypsum piles reclamation project. Construction work: excavation of 350K CY to regrade the gypsum stacks and place a low-permeability clay cap; survey control; geotechnical testing and clay cap material QA/QC; sediment basins and site channels; and site revegetation.

Hudson River Superfund Site, New York (General Electric Company) – General Contractor for reclamation of PCB-contaminated remnant deposits. Construction work: site characterization proceeding in advance of construction to define the lateral/vertical extents of contamination; a 460-foot-long temporary bridge across the Hudson River to access remote areas; excavation, transport and regrading of 400K CY of soil and waste materials; placement of 50 acres of geosynthetic clay liner; geotextile/riprap placement for erosion control along 4,000 feet of river embankment; 2,000 LF of HDPE-lined surface water transfer channels; development/reclamation of three borrow areas; and revegetation of over 200 acres.

General Contracting, Pennsylvania (Flynn Construction Company) – Family-owned general contracting business performing turnkey construction services for major oil companies. Construction work: old building demolition/new building construction; installation/certified petrotite testing of tank/pump field systems; and concrete/asphalt placement.

E D U C A T I O N

Villanova University, Villanova, PA	
M.S. Water Resources and Environmental Engineering	1989
Civil Engineering Prerequisite Courses for Masters Program	1986-1988
Dickinson College, Carlisle, PA	
B.S. Business and Literature	1980

P R O F E S S I O N A L D E V E L O P M E N T

OSHA HEALTH & SAFETY TRAINING (29 CFR 1910.120) 40-HR. BASIC/8-HR. REFRESHER

MSHA NEW MINER TRAINING

SUPERVISOR SAFETY TRAINING FOR HAZARDOUS WASTE OPERATIONS

FIRST AID AND CPR

NUCLEAR DENSITY GAUGE OPERATION

P U B L I C A T I O N S

Booth, D.G., and Flynn, J.M. 1996. Closure of the Brewer Gold Mine Applying a Pit Backfill Plan. Association of Abandoned Mine Lands Programs 18th Annual conference, September 1996, Kalispell, Montana.