Education

MS Civil Engineering, University of Arizona, Tucson, 1989

BS Civil Engineering, University of Arizona, Tucson, 1987

AS Civil Engineering, Vincennes University, Indiana, 1978

Certifications

Registered Professional Engineer (PE) in Arizona, Nevada, and New Mexico

Golder Associates Inc. – Tucson

Professional Summary

Dave Kidd is a principal and senior geotechnical program leader in Golder's Tucson office. He has more than 35 years of experience on a variety of mining, civil, environmental, and construction projects, including more than 30 years specializing in heap leach and tailings facility design, permitting, construction, and closure in the base and precious metal mining sectors. Mr. Kidd's professional experience has been primarily focused in the western and southwestern U.S. and Mexico, but he has also worked on mining-related projects in the South and Central Americas and Asia.

Employment History

Golder Associates Inc. – Tucson, Arizona
Principal, Geotechnical Engineer (1993 to Present)

Evaluates geotechnical, geologic, hydrologic, and environmental conditions at a variety of mining and civil sites with special expertise in slope stability, surface hydrology, and all aspects of mine waste containment and heap leach facility design and construction. Supervises junior engineering personnel, providing technical oversight and review.

Welsh Engineering Science & Technology, Inc. – Reno, Nevada
Geotechnical Engineer (1989 to 1993)

Conducted hazardous-waste investigations for mines, designed geosynthetic liner systems, designed and inspected dams and earthworks, performed hydraulic and surface-water hydrology analysis and design, conducted geotechnical investigations, and construction engineering and inspection.

Buck Lewis Engineering – Tucson
Consultant (1989)

Assisted with the hydraulic evaluation of a domestic water-supply system in rural Arizona using the Kentucky Pipes computer software package.

University of Arizona – Tucson
Lecturer/Graduate Teaching Assistant (1988 to 1989)

Prepared and presented lectures and laboratory sessions for undergraduate Civil Engineering Graphics. Thesis topic was the statistical strength characterization of the Gila Conglomerate, a cemented boulder conglomerate formation. Used strength information to statistically model pit slope walls cut into the Gila Formation to determine probability of failure.

University of Arizona – Tucson
Head Undergraduate Teaching Assistant (1986 to 1987)

Taught surveying fundamentals to undergraduate engineering students.

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Amax Coal Company – Gillette, Wyoming
Staff Engineer (1987)

Designed dewatering wells and drainage systems, assembled 10-year mine plan, and conducted equipment performance study.

Amax Coal Company – Indianapolis, Indiana
Engineering Technician (1977 to 1985)

Designed layout of, and implemented construction of, mine drainage systems; conducted pit surveys and legal surveys; prepared end-of-month reports; and performed exploration surveys.

Pike County Development – Petersburg, Indiana
Survey Draftsman Technician (1977)

Performed general civil engineering and surveying drafting.

PROJECT EXPERIENCE – DAM / EARTHWORKS

Resolution Copper
Arizona

Mr. Kidd was the project director for the Order of Magnitude (OoM) level design of a 1.5 billion ton tailing storage facility that will store clean and rougher tailings in adjacent but separate areas for environmental controls. Design considerations include: sand separation with cyclone underflow used to build the primary dam for the rougher tailings. Separate cells will be constructed to store the cleaner tailings with each cleaner cell concurrently reclaimed to minimize water loss. Our team also performed all of the pipeline and cyclone station engineering and prepared an OoM-level capital and operating cost estimate.

Velardeña Mill
Mexico

Mr. Kidd was the project manager and supervised the engineering analyses, alternatives study, feasibility-level design, engineering cost estimates, detailed engineering drawings, technical specifications, and construction quality control/quality assurance for a 500,000-ton gold and silver mill tailings impoundment.

Teck Resources Ltd.
Mexico

Mr. Kidd was the project director for the Feasibility Level design of a 120 million metric ton tailing storage facility that will contain volcanogenic massive sulfide (VMS) tailings. Design considerations include: site selection; geotechnical and hydrogeological field investigation; an evaluation across the spectrum of tailing thickening technologies; co-use of waste rock, native soils and tailing to form a stable and environmentally compliant TSF design, and preparation of a feasibility-level capital and operating cost estimate.

New Mexico Copper Corporation
New Mexico

Project director for the feasibility design of the tailings storage facility (TSF) and waste rock and reclamation material stockpiles at the Copper Flat Mine. Design components include rough grading, full geomembrane lining system, starter dam, toe berm, phased tailing construction using cycloned and compacted sand to raise the embankment and preliminary TSF reclamation design. Assisted with quantity and cost estimating in the feasibility study for the mine conducted by others.

Hecla Mining Co.
Durango, Mexico

Project Manager for the construction level design of the Tailings Storage Facility III Expansion 3A-1 for the Velardeña mine, in the state of Durange, Mexico. Our team calculated design parameters for permits and engineering for detailed design. We also supported the Construction Management and the Construction Quality Assurance activities during the construction phase of the project.

M3 Engineering and Technology Corp
Hidalgo, Mexico

Project director for a portion of a feasibility study to re-process and relocate more than 100 million metric tons of tailings from historical silver mining. The tailings were to be hydraulically mined, transported by slurry pipeline, ground, and leached with cyanide to recover residual gold, then dewatered by filtration and dry stacked in the new disposal facility approximately 25 kilometers away. Supervised Golder engineers' review of existing geotechnical studies and identification of data gaps, feasibility-level design of the proposed dry stack facility, geotechnical characterization of filtered tailings, and development and monitoring of a field testing plan to evaluate the tailings' drying and compaction requirements under site-specific weather conditions.

Chevron Mining Inc. Questa, New Mexico	Project Manager, Engineer of Record, and principal author of a comprehensive Emergency Action Plan (EAP) for the tailing dams at Questa Mine. The EAP is a "living and registered" document: periodic updates are signed and hand-delivered to all document holders and maintained in corporate files.
Chevron Mining Inc. Questa, New Mexico	Project Manager, Engineer of Record, and principal author of a comprehensive Operations and Maintenance Manual for the tailing dams at the Questa Mine. The manual covers all of the jurisdictional tailing dams at the site, which are governed under two New Mexico Office of the State Engineer (OSE) permits.
Chevron Mining Inc. Questa, New Mexico	Project Manager and Engineer of Record for quarterly dam inspections. Conducted visual inspections, interpreted piezometer and deformation monitoring data, and prepared quarterly inspection reports. The quarterly reports are submitted to the New Mexico OSE and to Chevron Mining Inc. Quarterly inspection and reporting has been continuous since 2006.
Creston Moly Sonora, Mexico	Project Manager for PEA and feasibility-level design of tailings storage facility of approximately 230 million metric tons of molybdenum and copper tailings. Assessed eight candidate sites and prepared a ranking matrix for comparison. Conducted a field investigation and produced design criteria, plan sets, quantity take-offs, slurry pipeline and distribution system layouts, and cost estimates Prepared the report for NI43-101 submittal.
Vulcan Sun City Quarry Phoenix, Arizona	Project Manager and Engineer of Record for the permitting, design, and construction of approximately 19,000 lineal feet of soil/cement embankment to protect the Agua Fria River. The constructed design will remove the aggregate quarry and proposed residential development from the 100-year floodplain.
Chevron Mining Inc. Questa, New Mexico	Project Manager and Engineer of Record for the No. 4 tailings embankment raise from 7,537 to 7,550 feet above mean sea level. Two additional raises are planned for the embankment. Cost-saving innovations include using both the upstream and centerline methods of embankment construction to minimize earthwork quantities.
Barrick Bullfrog Beatty, Nevada	Project Manager for the construction-level design for a geomembrane-lined evaporation pond used in the permanent closure of a gold tailings impoundment. Design included earthworks, geomembrane liner, and gravity pipeline design to route multiple flows to the new evaporation pond. Prepared a permit application document, which was submitted to the State of Nevada, and bid documents to multiple bidders for contract construction. Also provided ongoing engineering support during construction.
Phoenix Project Battle Mountain, Nevada	Project Manager: supervised and conducted portions of the engineering analyses, alternatives study, and feasibility-level design. Coordinated the production of engineering cost estimates, permitting drawings, and technical specifications for a 170-million-ton tailings impoundment for gold mill tailings. Design components included modifying the tailings deposition scheme to incorporate the use of a side-slope decant to reclaim supernatant solutions and facilitate reclamation grading.

Resolution Copper Mining Superior, Arizona	Project Manager: supervised and conducted parts of the engineering analyses, alternatives study, prefeasibility-level design, and engineering cost estimates for a 1.5-billion-metric-ton, 110,000-metric-ton-per-day tailings impoundment for copper mill tailings. Technical aspects included various dewatering strategies ranging from high-rate thickening and paste thickening, to dry stacking of filter cake to maximize water recovery at this arid site.
Molycorp Mountain Pass, California	Task Manager: supervised and coordinated engineering analyses, site selection and alternatives study, prefeasibility- and feasibility-level designs, engineering cost estimates, and report preparation for a 20-million-ton rare earth tailings disposal facility. Recommended strategies included dewatering the tailings to the consistency of paste, then depositing the paste in a rotational pattern of thin lifts to create a partially saturated mass that will stand at outslopes of 3H:1V without confining earthen embankments. Also investigated cement amendments to the paste tailings.
Velardeña Mill Vista Hermosa, Durango, Mexico	Project Manager: supervised the engineering analyses, alternatives study, feasibility-level design, engineering cost estimates, detailed engineering drawings, technical specifications, and construction quality control/quality assurance for a 500,000-ton gold and silver mill tailings impoundment.
Confidential Project Arizona	Task Manager: supervised and conducted portions of the engineering analyses, alternatives study, conceptual designs, and engineering cost estimates to assess the requirements to close and reclaim three copper tailings impoundments. The alternatives study included scenarios for various levels of care and maintenance that would be required during the design life of the closed facilities.
Mercur Mine Toole, Utah	Task Manager: supervised and conducted portions of the engineering analyses, alternatives study, and detailed engineering design to produce engineering cost estimates, technical specifications, and bid documents for the closure and reclamation of a 25-million-ton tailings impoundment and waste rock stockpile for a decommissioned gold mine.
Phoenix Project Battle Mountain, Nevada	Project Manager: supervised and conducted portions of the engineering analyses, alternatives study, and feasibility-level design to produce the engineering cost estimates, permitting drawings, and technical specifications for a 150-million-ton tailings impoundment for gold mill tailings.
Confidential Client Arizona	Project Manager: supervised and conducted portions of the field investigation, design, and construction certification associated with a pipe penetration through a jurisdictional dam. The design package was reviewed and approved by the Arizona Department of Water Resources, Dam Safety Section.
Phoenix Project Battle Mountain, Nevada	Project Manager: supervised and conducted portions of the engineering analyses, alternatives study, and feasibility-level design to produce engineering cost estimates, permitting drawings, and technical specifications for a 90-million-ton tailings impoundment for gold mill tailings.

Francisco I. Madero Zacatecas, Mexico	Project Manager: supervised and conducted portions of the site investigation, conceptual-level design alternatives, and water balance to produce the engineering cost estimate, conceptual-level engineering drawings, and summary report to evaluate a 30-million-metric-ton impoundment for lead/zinc tailings. Design components included phased construction to minimize capital costs and using materials generated on site for mine backfill.
Barrick Bullfrog Beatty, Nevada	Project Manager: supervised and conducted portions of the field investigation, permit analysis, and construction-level design to produce the engineering cost estimate, construction drawings, technical specifications, and contractor bid documents. Reviewed construction submittals and supervised construction quality assurance (CQA) crew during design and construction of a 7.5-million-metric-ton tailings impoundment for gold mill tailings. Design considerations included a fully geomembrane-lined impoundment with an overlying hydraulic relief system to minimize hydraulic head on the liner system.
Phoenix Project Battle Mountain, Nevada	Project Manager: supervised and conducted portions of the field investigation and feasibility-level design to produce the engineering cost estimate, construction drawings, technical specifications, and contractor bid documents for a 50-million-ton tailings impoundment for gold mill tailings. Design considerations included a liner system to accommodate high strains, as the new impoundment was built over existing copper mill tailings.
Barrick Bullfrog Beatty, Nevada	Project Manager: supervised and conducted hydrological and geotechnical analyses for the Final Permanent Closure Plan for a decommissioned tailings impoundment. Design components included a surface-water collection system to remain operational following consolidation settlement of the underlying tailings, and a site-specific hydrodynamic soil cover that retains meteoric water until it evaporates, preventing percolation through the tailings.
LAC Bullfrog Beatty, Nevada	Conducted a field investigation and geotechnical evaluation for construction of a 4-meter-high upstream embankment raise of a tailings disposal facility in a high seismic region.
Barrick Goldstrike Mines, Inc. Elko, Nevada	Developed the Reclamation Plan for closure of 25-million-ton tailings impoundment of gold mill tailings.
16 to 1 Project Silver Peak, Nevada	Conducted a field investigation and design engineering for a 5.5-million-ton tailings disposal dam. Prepared the design report and detailed design drawings.
T.S. Ranch Dam Elko, Nevada	Conducted finite element computer modeling of embankment and foundation for seepage analysis during the design phase. Acted as field engineer during Phase I construction and designed an installation of 10 open-hole piezometers to monitor subsurface water levels while impoundment filled.
WIDCO Waste Dump Centralia, Washington	Engineer: assisted in design of a 15-million-cubic-yard waste dump. Special design features included displacement of several million yards of low-strength refuse, as well as weak foundation conditions and difficult construction conditions. Conducted cone penetrometer analysis, seismic analysis, settlement analysis, and stability design, and prepared the final report and detailed drawings.

PROJECT EXPERIENCE – MINING HEAP LEACH

Confidential Client
Arizona

Project Manager for the detailed engineering of a 540-million-ton, 600-foot-high geosynthetic lined copper heap leach pad and associated solution and stormwater ponds. Designed the ore loading rate on the heap leach pad as 114,000 tons per day. The Phase 1 footprint of the heap leach pad was approximately 19.2 million square feet, ultimately constructed to 32 million square feet. Also planned and supervised geotechnical investigations and provided geotechnical recommendations for the ore handling circuit, Hydromet facilities, and all of the electrical substations.

Capital Gold Corporation
Caborca, Mexico

Project Manager for the detailed engineering and construction quality control (CQA) on the heap leach pad and associated solution ponds for the El Chanate Gold Project. Supervised data collection, a geotechnical field investigation, and a heap leach facility engineering analysis. Performed a surface water hydrologic analysis and designed surface water diversions. Coordinated and supervised the preparation of design drawings, technical specifications, and a final report. Provided construction management and construction quality assurance (CQA) for the Phase 1 heap leach pad and solution ponds.

Jinshan Mining Co.
Inner Mongolia, China

Project Director for the final design and CQA for the 217 Gold Project heap leach pad facility. Supervised a site visit to review conditions in the mine area, and a subsurface geotechnical field investigation of the pad, processing area, and living area to characterize the subsurface geology and near-surface groundwater conditions. Developed plan and coordinated the geotechnical laboratory testing of samples collected from the boreholes and test pits to classify the soils and to determine key engineering properties. Supervised the preliminary layout of the facility; static and pseudostatic limit-equilibrium stability analyses of the heap to optimize pad slope angles; a water balance model to predict make-up water requirements and return water pump requirements; and hydrologic analyses of basins tributary to the facility using HEC-HMS software. Provided recommendations for foundation support for the process plant/lab and administrative office buildings. Coordinated and supervised the preparation of construction drawings, technical specifications, and the design report.

Cobre del Mayo, Piedras Verdes Project
Mexico

Project Director for construction-level designs of a 500,000-square-meter heap leach pad, process ponds, and foundation designs for the facilities of a 190-million-metric-ton copper mining project. Coordinated and supervised site reconnaissance, detailed field investigation, and laboratory testing. Supervised and coordinated preparation of design drawings, technical construction specifications, and CQA plans for earthworks and geomembrane installation. Provided support to EPCM contractor for subcontractor bid documents and meetings. Supervised CQA for the Phase 1 and Phase 2 heap leach pad and solution ponds.

Minefinders Dolores Project Chihuahua, Mexico	Project Director for the feasibility design of an earthen fill, zoned embankment for a water storage reservoir. The design consisted of a 1.5-million-cubic-meter storage capacity earthen embankment, bedrock-excavated emergency spillway, and an internal concrete low-flow primary spillway to supply the mining facilities with process water. Also designed surface water diversions to handle design storm events and reservoir overflow from the emergency spillway. Surface water flows were directed around process facilities and overburden stockpiles.
Minas de Oro Mulatos Project Chihuahua, Mexico	Project Manager for geotechnical investigation for stormwater and runoff control and retention/storage dam design. Supervised field mapping and interpreted aerial photographs, planned and supervised borehole drilling and logging to define the subsurface conditions, and test pits excavated in the dam foundation and abutments to collect soil and rock samples for laboratory testing to develop appropriate subsurface soil characteristics and determine foundation requirements.
Confidential Client Arizona	Project Manager for the construction design of stockpile upgrades for solution handling of process solutions associated with their residual leach project. Conducted a surface water evaluation and designed gravity solution pipelines for several drainages along the toe of the stockpile. Also developed grading plans for constructing the headwalls within each drainage and solutions were conveyed to either a stainless-steel production tank or a geomembrane-lined stormwater pond. The designs were developed in accordance with Arizona Department of Environmental Quality's (ADEQ) prescriptive standards for conveyance structures and non-stormwater ponds.
Confidential Client Arizona	Project Manager for the construction-level design of the Best Available Demonstrated Control Technology (BADCT) upgrades of two headwalls, as well as the associated solution conveyance channels. Developed designs in accordance with ADEQ's prescriptive standards for process ponds.
Confidential Client Arizona	Project Manager for the conceptual design of stockpile upgrades for solution collection and handling of process solutions associated with a proposed mine for leach (MFL) project. Conducted a surface water evaluation and designed gravity solution pipelines. Solution handling options included gravity flow to several collection ponds located at the toe of the stockpile then pumping to the solution extraction/electrowinning (SX) plant, or regrading to establish gravity flow to the SX plant. Created a plan that minimized grading while maintaining positive flow during post-settlement conditions associated with high stockpile loading conditions.
Confidential Client Arizona	Project Manager for the feasibility-level design of the geomembrane-lined heap leach pad. Design considerations included the 600-foot-high heap and phased construction to minimize capital costs. The evaluation also considered alternative sources for the low-permeability soil layer and the overliner drainage layer. Planned and supervised a geotechnical field investigation and provided foundation recommendations for the process facilities.

Erdenet Mining Concern Mongolia, China	Project Director for the construction-level design of the geomembrane-lined heap leach pad for 150 million metric tons of crushed copper leach ore. Coordinated with an in-country geotechnical engineer to conduct the field investigation and specialized laboratory testing to determine flow properties of the spent leach residue, geomembrane liner interface shear strength properties, and curvilinear shear strength envelopes for the ore materials.
Erdenet Mining Concern Mongolia, China	Project Director for the construction-level design of upgrades for solution handling of process solutions associated with their residual dump leach project. Developed a surface water evaluation and designed a gravity-flow solution pipeline. Designed a grading plan for constructing a headwall within the drainage and solutions were conveyed to a geomembrane-lined pregnant leach solution (PLS) and stormwater pond.
Cerro Vanguardia Sociedad Anonima Cerro Vanguardia, Argentina	Project Manager for the evaluation and conceptual-level design of a series of gold heap leach pad options. Planned and supervised a limited site investigation, developed several grading plans utilizing balanced cut to fill earthworks, evaluated solution handling alternatives and expansion capabilities, and compared the capital and operating costs for the various alternatives.
Minera Penmont La Herradura Project Caborca, Sonora, Mexico	Project Manager for the design and construction of the Phases 4, 5, and 6 expansions of gold heap leach facility. Supervised the design, which included an optimized layout to best suit the gently sloping topography, facilitated winter construction, and a liner system to accommodate 100 meters of ore. Also managed the compilation of technical specifications, a CQA plan, and detailed loading and leaching plans.
Kimber Resources, Monterde Project Chihuahua, Mexico	Project Manager for the conceptual design of a gold heap leach facility. Supervised a conceptual evaluation of candidate leach facility sites around the open pit based on topography, layout of a heap/valley leach pad and solution containment system to accommodate an estimated 8 million metric tons of ore, and preparation of a technical memorandum summarizing the conceptual evaluation, comparing typical liner systems, estimating construction costs for similar projects, and recommending future work to advance the design.
Confidential Client Arizona	Project Manager and/or Senior Reviewer for portions of pre-feasibility, feasibility, and detailed geotechnical engineering design and construction quality control/quality assurance associated with placing crushed leach ore on top of an existing run-of-mine copper stockpile. The spent run-of-mine ore was decrepitated and amenable to surface compaction following regrading, due to its age and past leaching practices, to achieve a 550-acre low-permeability “interlift” surface. Designed a solution collection pipeline system on the compacted surface to enhance the performance of the interlift liner system. Technical considerations included engineering material properties developed for leached and non-leached run-of-mine ore, agglomerated and non-agglomerated leached crushed ore, low-permeability liner material, as well as analyses of a final stockpile configuration with a composite height of 925 feet.

Confidential Client Arizona	Project Manager: supervised and conducted portions of a field investigation, design, and construction certification of a downgradient interceptor trench and riser system to contain PLS. The design package was reviewed and approved by ADEQ.
CENRE/Geomaque Sula, Honduras	Project Manager: supervised and conducted portions of a field investigation, engineering design, procurement assistance, field engineering, and CQA for a 5-million-metric-ton gold heap leach facility. Special considerations for the wet climate included an extensive stormwater diversion system and a geomembrane-lined contingency pond sized to contain the accumulation of solution during the wet season.
Confidential Client New Mexico	Project Manager: supervised and conducted portions of the work plan preparation, comprehensive data review, geotechnical field investigation, laboratory testing, slope stability analyses, and report preparation in support of the Closure/Closeout Plan Addendum for an open-pit mine. The addendum addressed six existing and five proposed facilities. The final report was submitted to the New Mexico Environment Department (NMED) and Mining and Minerals Division (MMD) for approval.
Confidential Client New Mexico	Project Manager: supervised and conducted portions of the work plan preparation, comprehensive data review, geotechnical field investigation, laboratory testing, slope stability analyses, and report preparation. Provided expert testimony in support of the Closure/Closeout Plan Addendum for a large open-pit mine. The addendum addressed six existing stockpiles and five existing tailings disposal facilities. The final report was submitted to the NMED and MMD for approval.
Battle Mountain Gold Company Nevada	Project Manager for the feasibility-level design of a gold heap leach pad expansion. Supervised and coordinated design of cut/fill earthworks for a multi-phase heap leach facility using various design production rates and phased construction scenarios to optimize storage volume and minimize costs. Produced cost estimates for each scenario considering site-specific conditions and potential concerns throughout the life of the facility.
La Balsa Project Michoacan, Mexico	Managed a prefeasibility-level design of a copper heap leach pad. Supervised and directly designed portions of cut/fill earthworks for a multi-phase heap leach facility using various design production rates and phased construction scenarios to optimize storage volume and minimize costs. Produced cost estimates for each scenario considering site-specific conditions and potential concerns throughout the life of the facility.
Confidential Client New Mexico	Project Manager: supervised and conducted portions of the work plan preparation, comprehensive data review, geotechnical field investigation, laboratory testing, slope stability analyses, and report preparation. Provided expert testimony in support of the Closure/Closeout Plan Addendum for a large open-pit mine. The addendum addressed six existing stockpiles and six existing tailings disposal facilities. The final report was submitted to the NMED and MMD for approval.

GTN Copper Corporation Casa Grande, Arizona	Project Manager: supervised and conducted a bankable feasibility-level design and detailed cost estimate for a 14.9-million-square-foot copper heap leach facility to accommodate approximately 129 million tons of ore. Design components included a detailed solution distribution system and a PLS settling pond system to provide adequate retention time for clarification. Also designed a waste rock stockpile at the feasibility level.
Confidential Client Arizona	Provided technical assistance for specific components of the engineering and BADCT evaluations of an area-wide Aquifer Protection Permit (APP) application for a 16-square-mile mine property. The 15-volume APP application evaluated BADCT for heap leaching operations, 2 landfills, 87 process and mine circuit ponds, process facilities, 3 open pits, historical underground workings, 10 waste rock dumps, and 10 leach dumps. BADCT considerations for each of the facilities included geotechnical descriptions, aquifer loading analyses, discharge controls, evaluation of acid drainage potential, closure designs, upgrade and closure cost estimates, and monitoring and maintenance plans. This work included developing a qualitative risk ranking system to evaluate the discharge potential, potential impacts at the point of compliance, prioritizing field investigations, prioritizing the relative degree of rigor applied to the BADCT evaluations, and scheduling the BADCT upgrades.
Confidential Client New Mexico	Project Manager: supervised and conducted portions of the field investigation and engineering design of the lateral expansion of a 150-million-ton copper heap leach facility. Provided permitting assistance to aid in the short-duration schedule. Designed the waste rock grading fill and a partial geomembrane-liner system to enhance the gravity flow of PLS solution.
Minera Penmont La Herradura Project Caborca, Sonora, Mexico	Project Manager for the design and construction of a 40-million-metric-ton gold heap leach facility. Designed an optimized layout to best suit the gently sloping topography, facilitated winter construction, and a liner system to accommodate 100 meters of ore. Supervised the preparation of technical specifications, a CQA plan, and detailed loading and leaching plans.
Geomaque de Mexico, S.A. de C.V. Est. Llano, Sonora, Mexico	Project Manager for the redesign and construction of the Phases 2, 3, and 4 of the gold heap leach facility. Redesigned facility with waste rock to steepen the foundation grades to enhance the solution flow, a comprehensive clay borrow investigation, and an alternate solution conveyance channel to enable counter-current leaching.
Minera Maria Mariquita Project Cananea, Sonora, Mexico	Project Manager for the bankable feasibility-level design and Phase 1 construction drawings for a 1.8-million-square-meter, 60-million-metric-ton copper heap leaching facility. Designed facility with a liner system able to accommodate 100-meter-high ore lifts, steep mountainous topography, and solution segregation for control of intermediate and PLS solutions.
Confidential Client Arizona	Project Manager: supervised and conducted portions of a feasibility-level design and detailed cost estimate for a 16-million-square-foot copper heap leach facility to accommodate approximately 120 million tons of ore. Facility designed with a detailed solution distribution system and a PLS settling pond system to provide adequate retention time for clarification.

ASARCO - Santa Cruz Casa Grande, Arizona	Project Manager: supervised CQA personnel during the earthwork construction and double geosynthetic-liner installation of two process solution ponds and two large evaporation ponds at the SX facility for the in-situ copper leach facility.
Ivanhoe Myanmar, Mining Enterprise No. 1 Monywa, Myanmar	Acting Project Manager: supervised and conducted portions of the field investigation and design. Produced construction cost estimate, prepared bid document, assisted with procurement, and managed the construction of a 50,000-ton pilot copper heap leach facility. Site-specific design considerations included expansive soils in a wet climate. Construction was performed primarily with hand labor using only a few pieces of old mechanized equipment.
Confidential Client Arizona	Project Manager: supervised and conducted portions of the field investigation, engineering design, and construction management of an interlift liner for an existing copper heap leach facility. Design components included an underliner raffinate application system and an overliner PLS collection system able to withstand high strains from settlement.
Cresson Heap Leach Facility Cripple Creek, Colorado	Project Manager: supervised and conducted portions of the field investigation, engineering design, design report preparation, and managed construction for the Cripple Creek and Victor Gold Mining Company. The constructed facility was a 7.4-million-square-foot valley heap leach pad with a design heap height of 340 feet, two construction phases, and PLS storage within the heap.
Confidential Client Arizona	Performed engineering layout and design to permit a large copper heap leach expansion. Designed following the BADCT guidance to obtain an APP. The expansion accommodated approximately 800 million tons of copper leach ore at three sites.
Battle Mountain Gold Company Battle Mountain, Nevada	Project Manager: supervised and conducted portions of the field investigation, engineering design, and design document preparation for the Reona Heap Leach Facility. The facility is a 4.3-million-square-foot heap leach pad with a designed heap height of 200 feet and a 7-million-gallon event pond.
Barrick Goldstrike Mines Inc. Elko, Nevada	Project Coordinator for all WESTEC work conducted. Prepared tailings management and reclamation plan for a 25-million-ton tailings impoundment; evaluated the hydraulics of an existing leaching facility to permit increased solution application; designed a 0.5-million-square-foot pad extension; and supervised a field investigation that included a drilling program and field permeability testing used in designing a cyanide heap leach pad and tailings impoundment, design of a 5.4-million-square-foot heap leach pad, and a three-pond solution system.
Canyon Resources Corporation California	Performed a detailed statistics-based water balance for the Briggs Project heap leach facility and designed a solution system with four ponds, based on the results of the water-balance model and operating parameters established by the client.
Cochise Project Arizona	Completed a comprehensive field investigation and the preliminary design for a 9.5-million-square-foot copper heap leaching facility. The design followed the BADCT guidance to obtain an APP. The design included hydrology, pad and PLS pond layout, earthwork volumes, slope stability analysis, and a design report with construction drawings and technical specifications.

McDonald-7UP Pete Project
Lincoln, Montana

Performed a detailed clay investigation for a double-lined cyanide heap leach pad. The design incorporated hydrology, pad layout, earthwork volumes, slope stability analysis, and a detailed water balance, which accounted for snow melt and high-intensity, short-duration storms.

Denton-Rawhide Project
Fallon, Nevada

Redesigned Phase II and III of a double-lined cyanide heap leach pad. The redesign included hydrologic analyses, pad layout, earthwork volumes, and slope stability analyses, and maintained compliance with the facility's existing permit.

Big Blackfoot Heap Leach Project
Lincoln, Montana

Performed engineering related to design of a double-lined, valley-fill cyanide heap leach pad.

PROJECT EXPERIENCE – FOUNDATION INVESTIGATIONS

Santan Power Expansion Project
Gilbert, Arizona

Project Manager: coordinated the field investigation and supervised the design of a combination soil nail, mechanically stabilized earth (MSE), and gravity wall system to construct the walls of a power pit. The wall design incorporated three heavily reinforced ramps to be used by heavy haulers bringing generating units to the bottom of the power pit.

Diamond Shamrock Fuel Tank Project
Tucson, Arizona

Project Manager: supervised the geotechnical field investigation and provided recommendations during this post-mortem investigation of a concrete slab that failed, in anticipation of litigation. The results of the investigation indicated that the earthen fill materials surrounding the fuel tanks were not placed in accordance with the engineer's specifications, causing the overlying concrete slab to settle and break.

Milpillas Project
Sonora, Mexico

Project Manager: supervised the geotechnical field investigation, laboratory testing, and geotechnical engineering analyses to produce a geotechnical recommendations report for a solvent extraction/electrowinning (SX) plant, ore crushing facility, ore hoist head frame, and heap leaching facility.

Esperanza Ore Transfer Project
Green Valley, Arizona

Project Manager: supervised and conducted portions of the geotechnical field investigation, laboratory testing, and geotechnical engineering analyses and produced the geotechnical recommendations report for a 1-mile-long, copper ore overland conveyor system. Technical considerations included an alignment where the conveyor bench foundations will be constructed on mine waste fill, naturally occurring alluvium, and steeply sloping bedrock.

Cresson Project
Cripple Creek, Colorado

Conducted construction material investigation for primary and secondary crushers, Hilfiker wall, conveyor transfer towers, lime silo, truck load-out facility, and an ADR building and provided foundation and construction recommendations.

Washoe County, Department of Public Works
Lemmon Valley, Nevada

Provided foundation design and construction recommendations for a water storage tank and transmission line. Conducted a detailed field and laboratory investigation, tested the collapse potential of a wind-blown sand deposit, and prepared a design report and detailed design drawings.

Sleeper Project
Winnemucca, Nevada

Conducted a detailed investigation that included drilling, field permeability testing, laboratory testing, and permeability calculations for a dewatering facility on government land associated with the mining project.

TRAINING

Mine Tailings as a Paste for Underground and Surface Disposal
Short Course, 1996

Geotextile Engineering Workshop
J.P. Giroud, 1992

Flood Plain Hydrology using HEC-1
University of California, 1990

PROFESSIONAL AFFILIATIONS

Registered Professional Engineer (PE) in Arizona, Nevada, and New Mexico

American Society of Civil Engineers (ASCE)

Society for Mining, Metallurgy, and Exploration (SME)

Tau Beta Pi, Engineering Honors Society

PUBLICATIONS

Earley, D., D.A. Kidd, T. Shelley, and C. Adam, 2003. Slope Stability of Leached Copper Stockpiles. Tailings and Mine Waste, 2003, Proceedings of the Tenth International Conference of Tailings and Mine Waste. October 12 - 15, 2003. Vail, Colorado.

Durkee, D.B., A.J. Augello, B. Joshi, and D.A. Kidd, 2003. Seismic Slope Stability and Deformation Analyses for a Heap Leach Facility. Tailings and Mine Waste, 2003, Proceedings of the Tenth International Conference of Tailings and Mine Waste. October 12 – 15, 2003. Vail, Colorado.

Kidd, D.A and D.A. Kump, 2000. Closure and Reclamation of a Gold Tailings Impoundment in an Arid Climate, A Case History. Tailing Dams 2000, Conference Proceedings, Association of State Dam Safety Officials and U.S. Committee on Large Dams. March 2000.

Nowatzki, E.A. and D.A. Kidd, 1992. A Method for Estimating the In Situ Cohesion of Cemented Conglomerate, Stability and Performance of Slopes and Embankments II. Proceedings of a Specialty Conference, Geotechnical Engineering Division of the American Society of Civil Engineers.

Kidd, D.A., 1989. In-Situ Testing of Gila Conglomerate with Application to Statistical Slope Stability Analysis. Presented to the Graduate Faculty of School of Engineering, University of Arizona, in partial fulfillment of Master of Science in Civil Engineering.