



**James A. Willis, P.E.**

Associate  
Sr. Civil Engineer / Project Manager

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## Education

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BS, Civil Engineering, December 2004, University of Utah, Salt Lake City, Utah

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## Registrations/Certifications

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Professional Engineer Utah (#5340238-2202), Nevada (#23544)

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## Experience Summary

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Mr. Willis is a Senior Civil Engineer with over 16 years of experience in civil design, mining engineering, and water resource management. As a Project Manager and Senior Engineer, he has managed projects ranging from feasibility level designs to final engineering and closure. His project experience in the mining industry includes dam breach analysis, in-pit tailings facility design, heap leach pads (HLPs), tailings storage facilities (TSFs), dam rehabilitation, facility closure plans, and water management facilities, including site-wide water balances, water storage dams, spillways, and diversion channels. In addition, he has supported designs for various mining projects throughout the U.S. and internationally. His design experience on these projects includes site grading design, stormwater management, hydrologic modeling, seepage mitigation, erosion/sediment control, and roadway design.

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## Project Experience

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### ***Civil Design / Hydrology / Hydraulics***

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#### **TURQUOISE RIDGE WATER TREATMENT POND RELINING ENGINEERING DESIGN CHANGE (EDC) | NEVADA GOLD MINES**

As Project Manager, oversaw EDC development for pond relining plans at the site's water treatment plant. Coordinated with the site project manager to obtain required permit approvals and oversaw the construction quality assurance (CQA) program during construction. (Tierra Group, 2020 to Present)

#### **TAJO CRIMEA IN-PIT TAILINGS FACILITY | LA LIBERTAD, NICARAGUA**

As Project Engineer, assisted in developing the design for in-pit TSF. The design included developing a sump collection system, water reclaim system, instrumentation, and civil grading plans. (Tierra Group, 2021 to Present)

#### **BIG LEDGE WATER BALANCE | NEVADA**

Developed probabilistic water balance for an existing pit to assist the owner in determining requirements for the treatment plant and evaporator systems based on modeling results. (Tierra Group, 2019 to Present)

#### **GRANTS COLLECTION POND RELINING DESIGN AND CQA SUPPORT | NEW MEXICO**

Prepared and developed civil design drawings for the pond relining system. Performed CQA oversight, ensuring liner installation met the project specifications and design intent. (Tierra Group, 2019 to Present)

#### **SOUTH PIT EVAPORATOR DESIGN | CALIFORNIA**

Prepared civil design drawings for the pit evaporator system in coordination with the evaporator vendor and owner. (Tierra Group, 2019)

**EL GALLO MINE IN-PIT TSF DESIGN | MEXICO**

Prepared engineering design of an in-pit TSF, including the phased design of the seepage collection system and instrumentation. (Tierra Group, 2018)

**SAN JOSÉ TSF TAILINGS PIPELINE DESIGN, MINA EL LIMÓN | NICARAGUA**

Completed the design of a tailings delivery and reclaim pipeline system from the process plant to the San José TSF using EPANet. Recommended required pumps and pipelines for use in the design. (Tierra Group, 2018)

**LA ESPERANZA CLOSURE DESIGN | LA LIBERTAD, NICARAGUA**

As Project Engineer, evaluated multiple closure cover options, including slurry deposition of the closure cover materials. The design included selecting the location of the closure spillway and closure cover grading design. (Tierra Group, 2018 to Present)

**SAN JOSÉ TSF BREACH ANALYSIS, MINA EL LIMÓN | NICARAGUA**

Completed a breach analysis of the existing TSF design to determine the tailings runout from the facility as well as the downstream limits of inundation. Results were summarized in a design memo and incorporated into the mine's Emergency Action Plan (EAP). (Tierra Group, 2017)

**CIVIL ENGINEERING SUPPORT, McLAUGHLIN MINE | CALIFORNIA**

Prepared multiple civil design projects, including seepage mitigation from existing waste rock facilities to support the maintenance of closed facilities. Provided resident engineering services and oversaw the construction of the prepared civil design. (Tierra Group, 2017 to 2020)

**LOS GATOS TSF BREACH ANALYSIS | MEXICO**

Completed a breach analysis of the proposed TSF design. Analysis included calculation of the tailings runout from the facility as well as the limits of inundation. Results were summarized in a design memo and incorporated into the mine's EAP. (Tierra Group, 2017)

**HOLLISTER MINE PEER REVIEW | NEVADA**

Conducted a peer review of the mine's waste rock storage facility (WRSF) design. Prepared report identifying design issues and detailing proposed modification to allow the project to meet regulatory guidelines. (Tierra Group, 2016 to 2019)

**FIRE CREEK MINE WRSF | CRESCENT VALLEY, NEVADA**

Project Manager and Lead Engineer for the design and construction of a second WRSF to support mining operations. The project's design aspects included open channel design, surface water modeling, and civil grading design. Assisted in permitting and reporting as part of an update to the project's water pollution control permit. (Tierra Group, 2016 to 2020)

**TONKIN DAM DESIGN MODIFICATIONS | NEVADA**

As Project Engineer, managed the preparation of design work and construction of modifications to the existing Tonkin Dam. Design work consisted of a geotechnical analysis, civil grading design, site hydrologic analysis, and a hydraulic analysis of the dam's existing spillway. Modifications to the dam included a buttress design and spillway regrading with riprap protection. (Tierra Group, 2015 to 2016)

**LA ESPERANZA STAGE 6 RAISE AND CONCEPTUAL CLOSURE DESIGN | LA LIBERTAD, NICARAGUA**

As Project Engineer, reviewed and managed the preparation of the TSF Stage 6 raise construction documents. Directed the preparation of surface water management plans, including grouted riprap outfall structures and diversion channels. Also, evaluated conceptual closure design, including closure spillway and closure cover grading designs. (Tierra Group, 2015)

**MIDAS TSF ANALYSIS | MIDAS, NEVADA**

As Project Engineer, prepared the Midas TSF analyses to assist with future operations and planning. Analyses included the preparation of a facility water balance, analysis of existing storage capacity, and a siting study for a new TSF. (Tierra Group, 2014)

**WRSF PERMITTING, FIRE CREEK MINE | CRESCENT VALLEY, NEVADA**

As Project Engineer, reviewed and managed the preparation and design of permitting documents for a proposed WRSF at the Fire Creek Mine. The design included preparing the surface water management plan and civil grading design. (Tierra Group, 2014)

**ESMERALDA MINE TSF CLOSURE PLAN | HAWTHORNE, NEVADA**

As Project Engineer, reviewed and managed the preparation of construction documents for the TSF 1 Closure Plan. Directed the preparation of the surface water management plan including spillway, diversion channel, and closure cover grading designs. (Tierra Group, 2013)

**PITARRILLA PROJECT DEFINITIVE FEASIBILITY STUDY | DURANGO, MÉXICO**

As Project Engineer, managed the civil design and plan preparation for the TSF. Reviewed the civil plan set and design for completeness. Prepared sections of the MIA and TSF Design Report corresponding to the civil design and analysis. (Tierra Group, 2012)

**SANTA ROSA WEST CLOSURE PLAN | MINA EL LIMÓN, NICARAGUA**

As Project Engineer, helped direct the design and plan set development of the closure plan for the Santa Rosa West TSF. The design included preparing a closure grading plan to re-route upland drainage across the facility and stormwater channel design using HEC-HMS model to determine flows. (Tierra Group, 2012)

**ESMERALDA MINE | HAWTHORNE, NEVADA**

As Project Engineer, reviewed and directed the preparation of construction documents for the new TSF. (Tierra Group, 2012)

**ESMERALDA MINE TSF 2 | HAWTHORNE, NEVADA**

As Engineer II, designed dams, diversions, and roadways required for a new TSF at the Esmeralda Mine. The design included site grading, liner layout, earthwork estimates, site hydrologic analysis, and preparation of civil drawings. Helped prepare the engineering design report as part of the permitting submittals to the NDEP and NDWR. (Tetra Tech, 2011 to 2012)

**SOLEDAD STAGE 2 DESIGN | EL MOCHITO, HONDURAS**

As Engineer II, developed designs for the Stage 2 raise at the existing TSF, including grading design, liner layout, earthwork estimates, and preparation of civil drawings. (Tetra Tech, 2011)

**SAN JOSÉ TSF DESIGN, MINA EL LIMÓN | NICARAGUA**

As Engineer II, developed designs for the grading and layout of the TSF, including grading design, liner layout, earthwork estimates, water balance calculations, and preparation of civil drawings. (Tetra Tech, 2011)

**RODEO CREEK SOUTH WALL DIVERSION, GOLDSTRIKE MINE | CARLIN, NEVADA**

As Engineer II, conducted HydroCAD analysis of existing conditions and proposed diversion conditions, assisted in design and sizing of a diversion culvert, and prepared civil plans for review. (Tetra Tech, 2010)

**PONDS 7 & 8 DIVERSION DESIGN, RIO ALGOM | GRANTS, NEW MEXICO**

Developed conceptual designs for diverting surface water around a closed uranium process water facility, including riprap design, HEC-RAS modeling, earthwork estimates, alternatives analysis, and preparation of civil plans for review. (Tetra Tech, 2010)

**SOLEDAD SPILLWAY PRELIMINARY DESIGN | EL MOCHITO, HONDURAS**

As Engineer II, developed conceptual designs for spillway at the existing tailings facility, including channel design, proposed channel alignment, earthwork estimates, alternatives analysis, and preparation of civil exhibits for review. (Tetra Tech, 2010)

**HUMBOLDT PIT | HAWTHORNE, NEVADA**

As Engineer II, developed a hydrological model for surface water around a pit lake, PMP storm computations, and HEC-HMS modeling. (Tetra Tech, 2010)



#### **NEWPARK DEVELOPMENT | PARK CITY, UTAH**

Civil Engineer responsible for preparing the stormwater management model for the Newpark Development. Analyzed existing stormwater system design and prepared watershed analysis for pre- and post-development conditions. Designed and prepared civil stormwater plans for to meet state and county requirements for discharge and pollution control. Provided on-site engineering quality control and inspection during construction of civil plans, coordinating design, and installation with contractors. (Jack Johnson Company, 2005 to 2009)

#### **PROMONTORY | PARK CITY, UTAH**

As Civil Engineer, helped prepare the watershed analysis and stormwater prevention plans for the development. Designed a stormwater collection system to meet county standards for stormwater detention and treatment using detention ponds and ditch design. (Jack Johnson Company, 2005 to 2007)

#### ***Heap Leach Pads***

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##### **STERLING MINE HEAP LEACH FACILITY | BEATTY, NEVADA**

As Project Engineer, managed the civil design and stormwater management plan for a new 20-acre HLP at the Sterling Mine. The new HLP design included slope stability modeling, civil layout, ore capacity optimization, liner design, solution recovery system design, and completion of a stacking plan to guide ore placement during operations. (Tierra Group, 2014)

##### **STERLING MINE SLOT HEAP LEACH FACILITY | BEATTY, NEVADA**

As Project Engineer, managed the civil design and stormwater management plan to expand an existing heap leach facility at the Sterling Mine. The HLP expansion included slope stability modeling, civil layout, ore capacity optimization, liner design, and solution recovery system design. (Tierra Group, 2013)

#### ***Site Design***

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##### **RAPID INFILTRATION BASIN (RIB) CONCEPTUAL DESIGN, COVE PROJECT | BATTLE MOUNTAIN, NEVADA**

As Project Manager, directed the conceptual design of RIBs at the Cove Project, evaluating previous field investigations to determine representative permeability rates for sizing RIBs. Also directed the geotechnical field investigation to establish site lithology below RIBs and permeability rate for final design. (Tierra Group, 2018)

##### **GOLDFIELDS BONANZA UNDERGROUND WASTE ROCK STORAGE | NEVADA**

Prepared construction plans for underground storage of waste rock and the backfilling of existing shafts. Supported permitting process by developing figures and preparing the design report. (Tierra Group, 2017 to 2018)

##### **PLANT ENGINEERING DESIGN CHANGE, STERLING MINE | BEATTY, NEVADA**

As Project Engineer, directed the preparation of an engineering design change submittal for design modifications to the existing process plant piping and repurposing of existing process ponds at the Sterling Mine. (Tierra Group, 2014)

##### **CORE STORAGE EXPANSION | COPPERTON, UTAH**

As an Engineer II, designed the stormwater and site grading portions to expand an existing core storage facility at the Bingham Canyon Mine. Prepared civil construction documents and cost estimates for the site grading and stormwater collection system. Modeled the upland site using HEC-HMS to aid in sizing the stormwater system. (Tierra Group, 2012)

##### **ANTHEM AT MERRILL RANCH | FLORENCE, ARIZONA**

Civil Engineer assisted with roadway designs, utility plans, and site grading plans for the residential development. Design included preparing three sets of plans to meet city design standards, including site grading, utilities, and roadway plans. (Jack Johnson Company, 2004 to 2009)

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## Professional Affiliations

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American Society of Civil Engineers (ASCE), Member  
Society for Mining, Metallurgy & Exploration (SME), Member

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## Publications

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**Willis, J**, 2019. *Baseline Investigation and Preliminary Design for an In-Pit Tailings Storage Facility, El Gallo Mine, Sinaloa, Tailings & Mine Waste, Keystone, Colorado*, 17 November 2019.

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## Employment History

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<b>CURRENT EMPLOYER</b>	<b>TIERRA GROUP INTERNATIONAL, LTD.</b>
<b>POSITION</b>	Sr. Civil Engineer / Project Manager
<b>YEARS</b>	2012 to Present
<b>EMPLOYER</b>	<b>TETRA TECH, INC.</b>
<b>POSITION</b>	Staff Engineer
<b>YEARS</b>	2010 to 2012
<b>EMPLOYER</b>	<b>JACK JOHNSON COMPANY</b>
<b>POSITION</b>	Civil Engineer, EIT
<b>YEARS</b>	2005 to 2009
<b>EMPLOYER</b>	<b>UNIVERSITY OF UTAH</b>
<b>POSITION</b>	Engineering Internship
<b>YEARS</b>	2004 to 2005

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## Language Proficiency

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English: Native  
Spanish: Fluent (spoken and written)