TIERRA GROUP INTERNATIONAL, LTD.

Sean Robinson, EIT

Hydraulic / Hydrologic Engineer

Education

BS, Civil Engineering, Colorado State University, 2008

MS, Hydraulic and Hydrologic Engineering, University of Colorado, 2012

Registrations/Certifications

Fundamentals of Engineering, Colorado

Experience Summary

Mr. Robinson is a Hydraulic and Hydrologic Engineer (EIT) with 11 years of experience performing hydrologic analyses and general civil engineering design for projects in South America, Central America, Alaska, California, Colorado, Idaho, and Nevada. Sean is proficient in AutoCAD Civil 3D, HEC-HMS, HEC-RAS, SEDCAD, and HY-8 software.

Project Experience

Water Resources

HEAP LEACH PAD (HLP) DESIGN, ROUND TOP COMMERCIAL PAD | TEXAS

Designed collection ponds to store pregnant leach solution and storm runoff reporting from the HLP. Designed diversion channels to convey the peak flow from the design storm event downstream from the HLPs and into existing drainages. Determined optimal size for collection pipes to convey pregnant leach solution and stormwater to the ponds. Prepared construction drawings and figures using AutoCAD Civil 3D. (Tierra Group, 2022 to 2023)

GRAMALOTE | MEDELLIN, COLOMBIA

Optimized sediment pond designs to meet client-required specifications. Designed a new sediment pond with emergency and operational spillways. Designed diversion channels to safely convey surface runoff from the design storm event from mine infrastructure. Worked with the client to update and optimize the designed mine infrastructure. (Tierra Group, 2022)

EVAPORATION POND DESIGN, MCLAUGHLIN MINE | CALIFORNIA

Designed evaporation ponds to store and evaporate contact water from the decommissioned pits. Determined the peak flow from the 100-year 24-hour design storm event using HEC-HMS software to design the emergency spillways for each pond. Determined booster pump sizes and pipe corridors to convey contact water to the ponds. Sized culverts and knife gates to control flow out of and between the ponds. Prepared construction drawings using AutoCAD Civil 3D. (Tierra Group, 2020 to 2021)

GRINDER AREA AND STOCKPILE REGRADE, MCLAUGHLIN MINE | CALIFORNIA

Produced a grading plan for the Grinder and Stockpile Areas to convey surface runoff off and away from the facilities. Determined the peak flow from the 100-year 24-hour design storm event using HEC-HMS. Designed shotcrete-lined diversion channels to prevent runoff from ponding around the facilities. Prepared construction drawings using AutoCAD Civil 3D. (Tierra Group, 2019)

ROCK DISPOSAL AREA (RDA) CLOSURE ENGINEERING | NEVADA

Developed hydraulic controls for an RDA closure cover surface. Using the peak flow resulting from the 500-year 24-hour design storm event, calculated using HEC-HMS, diversion channels were designed to convey runoff off and away from the closure surface. (Tierra Group, 2019)

EMERGENCY ACTION PLAN ANALYSIS, MCLAUGHLIN | CALIFORNIA

Designed and executed dam breach inundation analyses using hydrologic and hydraulic modeling for two tailings storage facilities (TSF) at the McLaughlin Mine: Tailings Impoundment Facility (TIF) and Davis Creek Reservoir (DCR). Calculated storm and breach flow using hydrologic model software HEC-HMS. Determined water surface elevations using hydraulic modeling software HEC-RAS. Mapped the inundation limits using AutoCAD Civil 3D. (Tierra Group, 2019)

STIBNITE TSF DIVERSION CHANNEL TRADE-OFF | STIBNITE, IDAHO

Analyzed diversion options for a new TSF in the Meadow Creek valley for the Stibnite Gold Project. The diversions were designed to discharge runoff from the design storm while preserving the wetland habitat. Hydrologic and hydraulic modeling was performed to provide five diversion channel options for the client to choose the most practical design. (Tierra Group, 2017 to 2019)

SEDIMENT POND MITIGATION | GYPSUM, COLORADO

Conceptually designed sediment ponds for the Eagle-Gypsum Mine operation. The sediment ponds were designed to accommodate flows and sediment loads from their drainages. SEDCAD was used to size the sediment ponds for the design storm discharge and the accumulated sediment. (Tierra Group, 2017 to 2019)

EAST PIT AND ACCESS ROAD DESIGN | GYPSUM, COLORADO

Designed a sediment pond for the proposed East Pit at the Eagle-Gypsum Mine operation. The sediment pond was designed to accommodate flows from the drainages impacted by the East Pit development and other developed areas near the East Pit. SEDCAD was used to size the sediment pond for the design storm discharge and the accumulated sediment. Designed an emergency spillway to safely pass the design storm from the sediment pond. (Tierra Group, 2016 to 2019)

SWEETWATER 1138 FOOT TSF RAISE DESIGN | VIBURNUM, MISSOURI

Analyzed spillways for a new TSF Raise at the Sweetwater Mine. The emergency spillway was designed to discharge runoff from the design storm. Hydrologic and hydraulic modeling was performed for four spillways, and a water balance was completed providing a planning tool for use throughout the facility's life. (Tierra Group, 2016 to 2017)

BRUSHY CREEK 3 TSF RAISE DESIGN | VIBURNUM, MISSOURI

Designed spillways for a new TSF at the Brush Creek Mine. Each spillway was designed to discharge runoff from the Design Storm. The new TSF dam is planned for construction in four stages, including a clay starter dam and three raises using tailings cyclone underflow. Hydrologic and hydraulic modeling was performed to design four spillways, and a water balance was completed providing a planning tool for use throughout the facility's life. (Tierra Group, 2016 to 2017)

BRUSHY CREEK TSF RAISE DESIGN | VIBURNUM, MISSOURI

Produced a spillway design for an existing TSF at the Brushy Creek Mine. The dam was built in stages in 1973 using tailings cyclone underflow (coarse tailings) and the upstream construction method. The spillway raise was designed, requiring hydrology and hydraulic modeling and riprap design. The Missouri Department of Natural Resources (MDNR) Dam and Reservoir Safety Council approved the design in February 2015. (Tierra Group, 2014 to 2015)

BRUSHY CREEK 2 TSF | VIBURNUM, MISSOURI

Staff Engineer responsible for a new TSF spillway design at the Brushy Creek Mine capable of convening the design storm away from the facility. The new TSF requires a 185-foot tall dam planned for construction in four stages, including a clay starter dam and three raises using tailings cyclone underflow. Hydrology and hydraulic modeling were performed to design four spillways, and a water balance was completed providing a planning tool for use throughout facility life. The Brushy Creek 2 TSF design is currently under review by MDNR. (Tierra Group, 2014 to 2016)

LA ESPERANZA EMERGENCY ACTION PLAN ANALYSIS | NICARAGUA

Executed hydrologic and hydraulic modeling for a TSF dam breach inundation analysis. Calculated storm and breach flow using hydrologic model software HEC-HMS. Determined water surface elevations using hydraulic modeling software HEC-RAS. Mapped the inundation limits using AutoCAD Civil 3D. (Tierra Group, 2014)

CAMPO MORADO TSF MECHANICALLY STABILIZED EARTH (MSE) WALL RAISE | MEXICO

Developed a hydrologic and hydraulic analysis to support the Campo Morado TSF MSE wall raise. Incorporated climatological data and existing operating parameters to determine the correct storage capacity for the time allotted. (Tierra Group, 2013)

CONSTANCIA | SOUTH-EASTERN PERÚ

Performed hydrologic and hydraulic modeling for diversion channels, sediment ponds, reservoir sizing, and spillway sizing. Conducted permitting studies on watershed impacts due to the construction of mining structures for government approval. Implemented groundwater modeling techniques for site-wide analysis. (Knight Piésold, 2012 to 2013)

HYCROFT PROJECT | HUMBOLDT COUNTY, NEVADA

Provided climate analysis report support, including regional precipitation station selection, precipitation and temperature adjustments, creating design storms, and raw data assessment. Completed hydrologic and hydraulic models to design diversion channels, sediment ponds, and spillway sizing. (Knight Piésold, 2012 to 2013)

GRAMALOTE | NEAR MEDELLIN, COLOMBIA

Worked with senior engineers to complete geotechnical analysis for mining structures such as the TSFs and other embankments. Executed hydrologic and hydraulic modeling for diversion channels, sediment ponds, and reservoir and spillway sizing. (Knight Piésold, 2012 to 2013)

Civil Engineering

SOLEDAD TSF DAM 810-M AND 813-M RAISES | MINA EL MOCHITO, HONDURAS

Designed upstream TSF dam lifts to provide additional tailings storage and prolong the life of the mine. Prepared designs for an emergency spillway, diversion channel realignments, and culvert road crossings. Provided design drawings and reports for the dam raise design. (Tierra Group, 2022)

SOLEDAD TSF STAGE 4 DESIGN MODIFICATION | MINA EL MOCHITO, HONDURAS

Provided design support for the Stage 4 TSF Dam Raise emergency spillway, including access roads, culverts, diversion channels, and outlets. (Tierra Group, 2020 to 2021)

EAST PIT AND UPPER PIT DESIGN | GYPSUM, COLORADO

Provided pit design and permitting support for the Eagle-Gypsum Mine East and Upper pits. In addition to the pit planning and layouts, the design included an access road and floodwater drainage control structures. (Tierra Group, 2018 to 2019)

BOULDER VALLEY PIPELINE, CORTEZ HILLS MINE | CRESCENT VALLEY, NEVADA

Developed pipeline to bypass flow from channel to an existing lined pond. Created roadway crossways and floating outlet systems for the pipeline design. Assisted colleagues on the final hydraulic design of the Boulder Valley Pipeline. (Tierra Group, 2014)

FIRE CREEK WASTE ROCK STORAGE FACILITY (WRSF) DESIGN | LANDER COUNTY, NEVADA

Performed civil design work for a proposed WRSF at the Fire Creek Mine. Designed sediment and stormwater ponds and channels based on site-wide hydrology. Completed a detailed construction drawing set and design report. (Tierra Group, 2013)

GRAMALOTE | NEAR MEDELLIN, COLOMBIA

Produced site-wide embankment quantity analysis and provided civil design and technical writing support. Completed a site-wide Feasibility Study for gravity-fed pipe and pump systems. (Knight Piésold, 2012 to 2013)

Employment History

Current Employer	**Tierra Group International, Ltd.**
Position	Hydraulic and Hydrologic Engineer
Years	2013 to Present
Employer	**Knight Piésold and Co.**
Position	Engineer / Scientist I
Years	2012 to 2013
Employer	**Newmont Mining Corporation**
Position	Engineering and Business Analysis Intern
Years	2011
Employer	**Colorado State University Engineering Research Center**
Position	Hydraulic Lab Assistant
Years	2006 to 2008

Language Proficiency

English: Native