

United States

East Mesa (California, USA)

- Development of 50 MW GEM 2/3 pumped dual-flash power plant and wellfield and decommissioning of 10 MW B.C. McCabe binary power plant (first geothermal binary power plant in western hemisphere); reservoir geochemistry and plant chemical engineering (1989)
- Field trial and identification of optimum carbonate scale inhibitor in pump-flash application (1989)
- Drilling of injection well to support plant operation; highest volume injection well completed at East Mesa field (1992)
- Environmental compliance monitoring and reporting for whole facility (1990-1992)
- Design and installation of cooling water treatment systems for refurbished GEM 2/3 facility (2006)
- Installation of Regenerative Thermal Oxidizer system for mitigation of H₂S emissions (2006)

Salton Sea Geothermal Field (California, USA)

- Development of 100 MW Vulcan and Hoch dual-flash Crystallizer-Reactor-Clarifier power plant and wellfield; UC Riverside geochemical sampling of new production and injection wells for Magma Power Company (1986)
- Resource Manager of 330 MW hypersaline wellfield production and injection wells, including monitoring, workover and replacement well drilling, testing, installation and commissioning
- Design, installation, and operation of state-of-the-art chemical laboratory for entire field (2000)
- Comprehensive chemical sampling of all production wells and power plants for high-precision analysis of brine across entire periodic table for mineral extraction business modeling
- General Manager of CalEnergy Minerals Zinc Extraction Facility from commissioning, evaluation, redesign and commercial operation, producing the world's first High Grade purity geothermal zinc (2002-2004)

Heber Geothermal Field (California, USA)

- Field trial of silica scale inhibitor to mitigate metal-silicate deposition in binary heat exchangers (2004)
- Design and installation of water treatment systems for power plant cooling systems (2006)
- Conversion of water treatment from chlorine gas to liquid chlorine (2006)
- Installation of Regenerative Thermal Oxidizer system for mitigation of H₂S emissions (2007)
- Environmental permit sampling, analysis and regulatory reporting for air emissions compliance (2007-2008)

North Brawley Geothermal Field (California, USA)

- Development of 50 MW Ormat binary power plant and pumped wellfield; geochemical sampling and evaluation of first production well and evaluation of scaling and corrosion potential (2007)
- Design and installation of scale mitigation systems for all production wells (2008)
- Design and installation of water treatment systems for power plant cooling systems (2008)

Fifield Farms (California, USA)

- Geochemical evaluation of low temperature well located south of North Brawley field (2009)

Coso Geothermal Field (California, USA)

- Development of nine (9) single- and dual flash generating units at four (4) locations and associated wellfield to generate 250 MW (2004)
- Design, installation, and operation of scale mitigation systems for forty-five (45) production wells (2004-2006)
- Conduct extensive reservoir chemical tracer system to map fluid pathways in reservoir (2004-2007)

The Geysers Geothermal Field (California, USA)

- Design, installation, and operation of injection well corrosion mitigation systems for Calpine (2005-2009)
- Chemical engineering evaluation of Calpine Stretford H₂S abatement systems for improved performance
- Design, installation, and operation of cooling water treatment systems for refurbished 50 MW Bottle Rock power plant (2007-2008)
- Evaluation, design, installation, and operation of Bottle Rock acid chloride in steam production well mitigation system (2007-2008)

Newberry Volcano Geothermal Field (Oregon, USA)

- Exploration and resource development; well testing and geochemical sampling and evaluation of exploration wells (2005)
- Operations Manager for \$44 million U.S. Department of Energy Newberry Volcano EGS Demonstration Project: developed successful written proposal application, managed contract award through interaction with multiple governmental agencies, researchers and national laboratories, designed and conducted public outreach campaign, successfully completed environmental permitting, and assisted in EGS test engineering design.

Raft River Geothermal Field (Idaho, USA)

- Management of field operations for U.S. Department of Energy Engineer Geothermal System (EGS); well stimulation and monitoring
- Due diligence of power plant and wellfield for potential sale of U.S. Geothermal Inc assets to Kaishan Group (2017)

Neal Hot Springs Geothermal Field (Oregon, USA)

- Due diligence of power plant and wellfield for potential sale of U.S. Geothermal Inc assets to Kaishan Group (2017)

San Emidio Geothermal Field (Nevada, USA)

- Due diligence of power plant and wellfield for potential sale of U.S. Geothermal Inc assets to Kaishan Group (2017)

Akutan Geothermal Field (Alaska, USA)

- Geoscience and exploration core hole drilling of a greenfield prospect in the Aleutian Island chain (2014-2017)

Kelley Hot Springs (California, USA)

- Resource evaluation and process design for low-temperature power generation and direct use aquiculture (2018)

Waunita Hot Springs (Colorado, USA)

Puna Geothermal Field (Hawaii, USA)

- U.S. Environmental Protection Agency (EPA) investigation and assessment of gas emissions in response to public complaints
- Corrosion mitigation (2009)
- Well production decline due to sulfide deposition (2005)

Chena Hot Springs (Alaska)

- Conducted failure analysis of binary heat exchanger tubing. Identified incompatible materials of construction and recommended alternative material for replacement (

Asia

Dieng Geothermal Field (Central Java, Indonesia)

- Design, installation, commissioning, and operation of 50 MW single-flash power plant and wellfield; reservoir geochemistry and power plant chemical engineering (2006-2009)
-

Patuha Geothermal Field (West Java, Indonesia)

- Design and installation of 50 MW single-flash power plant and wellfield; reservoir geochemistry and power plant chemical engineering (2006-2009)

Bedugal Geothermal Field (Bali, Indonesia)

- Resource exploration and wellfield development for proposed 50 MW single-flash geothermal power plant: regional geoscience exploration, evaluation and conceptual modeling (2007-2008)
- Exploration well testing and geochemical evaluation (2007-2008)

Darajat Geothermal Field (West Java, Indonesia)

- Due diligence of wellfield and power plants for Chevron geothermal assets sale, including power plant performance, wellfield performance, resource reservoir model evaluation and forward modeling, assessment of plant, resource and environmental/regulatory risks (2016)

Salak Geothermal Field (West Java, Indonesia)

- Due diligence of wellfield and power plants for Chevron geothermal assets sale, including power plant performance, wellfield performance, resource reservoir model evaluation and forward modeling, assessment of plant, resource and environmental/regulatory risks (2016)

Sarulla Geothermal Field (Sumatra, Indonesia)

- Resource development for 330 MW flash power plant and wellfield; provision and management of drilling supervisors, drilling engineers and well site geologists for drilling of 36 production and injection wells over three-year period (2014-2017)

Mahanagdong Geothermal Field (Tongonan, The Philippines)

- Development of 165 MW triple-unit, single flash power plant and wellfield; geochemical evaluation of well test data for wellfield and power plant design (2006)

Cerro Prieto Geothermal Field (Baja Norte, Mexico)

Germencik Geothermal Field (Aydin Province, Turkey)

- Designed, installed and conducted first application, in the country of Turkey, of production well scale inhibitor for the mitigation of calcium carbonate deposition. Successful application allowed continued development of the Germencik field, which had been at risk due to lack of suitable mitigation technology, as per Ali Karaduman. Documented in *Carbonate Scale Inhibition in a High-Gas Geothermal Well, Germencik, Turkey*, Osborn et al. GRC publication. (2007)
- Designed, fabricated, installed and commissioned production well scale mitigation systems and power plant cooling system chemical treatment equipment for first power plant (2009)

Wabuska Geothermal Field (Nevada, USA)

- Resource evaluation for low-temperature power generation (2018)
-

Africa

Aluto-Langano Geothermal Field (Ethiopia)

- Conducted production well geochemistry and power plant chemical engineering assessment of scale deposition in idle power plant. Provided recommendations for field and plant remediation and production well scale mitigation program (2006)

Ngozi Geothermal Field (Tanzania)

- Conducted resource assessment of Ngozi geothermal prospect, and completed site visit to plan initial exploration drilling and development (2013)

Fiale-Lake Asal Geothermal Field (Djibouti)

- Met with Prime Minister Abdoukader Kamil to discuss geothermal energy development, and toured Fiale Geothermal Field with ODDEG staff (2013)

Latin America and The Caribbean

Cerro Prieto Geothermal Field (Mexico)

- Provided engineering design for implementation of brine injection program (2004)
- Conducted evaluation of production well scale chemistry and deposition mechanisms. Installed and conducted pilot test of silicate scale inhibitor in binary bottoming cycle (2004-2005)

Ceboruco Geothermal Field (Mexico)

- Performed due diligence of Ceboruco exploration data and exploration drilling plans for potential partnership or purchase agreement between RG and Kaishan (2017)

Momotombo Geothermal Field (Nicaragua)

- Developed chemical treatment plan for mitigation of calcium carbonate and amorphous silica scale deposition in production wells and binary bottoming cycle, respectively (2006)
- Constructed comprehensive reservoir model, incorporating all historic data and potential new well performance. Required compilation of disparate sources of data and information into comprehensive project database. (2015-2016)
- Provided plan for acidizing of production well, and traveled to site to supervise acidizing and restart of well (2016)
- Conducted evaluation of wells and wellfield performance. Identified damaged wells and provided detailed workover plan for each well, and comprehensive plan to remediate wellfield while maximizing ongoing power generation (2016)

San Jacinto Geothermal Field (Nicaragua)

- Conducted due diligence of 60 MW power plant and wellfield assets and attended investor forum. Provided comprehensive report outlining recommended improvements for reduced operating cost and increased generation (2014)

Apacheta Geothermal Field (Bolivia)

- Conducted well test of discovery well Apacheta-1, including design and installation of separation equipment, training of site personnel, geochemical sampling and analysis, and wireline PTS surveys of well bore (2015-2016)

Chile

- Conducted due diligence of Energia Andina and extensive evaluation of country-wide assessment of dozens of Energia Andina geothermal leases, assets and exploration data to determine value of company and potential for project development. Selected Tinguiririca as primary development target.

Tinguiririca Geothermal Field (Chile)

- Developed comprehensive project development plan for P50-estimated 160 MW high temperature field located at 3300m elevation, including civil engineering of 35-km access road, 60 MW power plant and wellfield; developed exploration plan including exploration well drilling and testing. Identified primary consultants and contractors for first phase of development. Initiated funding discussions with Inter-American Development Bank.

Wotten Waven Geothermal Field (Commonwealth of Dominica)

- Authored well completion and flow test reports for three exploration coreholes and two commercial wells (2012)
- Supervised flow test and sampling, and compiled comprehensive test report for second exploration corehole well WW-3 (2012)
- Supervised flow test and sampling, and compiled comprehensive test report for third exploration corehole well WW-1 (2012)
- Provided alternative drilling target to client for proposed first production well WWP-1, as improvement to initial ElectroConsult recommendation (2012)
- Supervised flow test and sampling, and compiled comprehensive test report of first production well WWP-1, the most productive geothermal well in The Caribbean (2012)
- Conducted public meetings near geothermal site to inform residents regarding drilling, testing and future power plant. (2012)
- Presented project results at investor forum held at Fort Young Hotel, Roseau, Dominica (2012)

Dominican Republic

- Conducted geochemical assessment of various hot springs for Universidad Nacional Pedro Henriquez Urena (2015-2016)

St Kitts Geothermal Field (St Kitts and Nevis)

- Conducted resource assessment of St Kitts, including review of existing geology, geochemistry and geophysical data, and compiled native-state reservoir model (2017)

West Nevis Geothermal Field (St Kitts and Nevis)

- Conducted resource assessment, including review of geoscience data and results of three exploration coreholes. Provided recommended development program. (2015)

Bouillante Geothermal Field (Guadeloupe)

- Conducted assessment of leaking injection well BO-2 located in power plant area to determine mode of failure. Provided proposed workover plan to correct casing damage (2014)

St George's Geothermal Field (Montserrat)

- Provided well test plan for third exploration/commercial well drilled in field (2017)
- Developed and documented plan to remove solidified drilling mud, acidize well bore and near-well reservoir, and conduct cleanout flow test of well MON-3 (2017)