



Statement of Qualifications





Statement of Qualifications Consulting Engineering Services



7950 Security Circle, Reno, Nevada USA 89506
www.kcareno.com



INTRODUCTION

Since 1972, KAPPES, CASSIDAY & ASSOCIATES (KCA) has provided process metallurgical services to the international mining industry. KCA specializes in all aspects of heap leach and cyanide processing including laboratory testing, project feasibility studies, engineering design, construction, and operations management.

While primarily known for its heap leach expertise, KCA's staff includes experienced process professionals with design capabilities in a wide range of metallurgical processes. For example, KCA engineered, constructed and operated a complex acid leach process for a Bolivian silver project, and since 1993, KCA has maintained an active bio-leaching program for several clients with refractory ores, including a program for a major mining company.

For several years, KCA has routinely expanded its client base and service capabilities. KCA occupies a 3,800 square meter building in Reno, NV, which greatly increases KCA's capacity for engineering, manufacturing, purchasing, warehousing and testing. KCA also provides modular laboratories and modular or permanent processing plants and related equipment for the mining industry. Florin Analytical Services, part of the KCA group, operates as an independent commercial analytical lab, providing high quality reliable assays.

Engineering Services

- Process engineering
- Scoping and pre-feasibility studies
- Feasibility analyses
- Construction management
- Turnkey projects
- Start-up management
- Decommissioning services

Laboratory Testing

- Pilot scale column testing
- Milling studies
- Flotation testing
- Pilot scale HPGR tests
- Assay testing
- Process/flowsheet testing
- Environmental testing
- Precious and base metals
- Industrial minerals

Process Equipment

- Modular gold recovery plants
- Stationary gold recovery plants
- Merrill Crowe plants
- Equipment packages
- Plant retrofits
- Plant decommissioning
- Custom steel fabrication





ENGINEERING SERVICES

The KCA staff constitutes a team with varied technical abilities especially adapted to work on projects requiring a complete range of engineering services. KCA is one of the pioneering firms in precious metals heap leaching. Our first US project at Manhattan, NV, in 1972 was only the third in the world.

Initial Scoping Studies Through Bankable Feasibility Studies

KCA can provide basic “concept studies” to help guide your exploration efforts. As the project matures, KCA can provide other studies up to complete bankable feasibility studies. KCA’s bankable studies have an admirable track record for securing financing.

Complete Project Packages

KCA can provide a complete turnkey project to process your ore in the most cost-effective manner. KCA can handle your project from laboratory testing through gold production. KCA works throughout the world from our offices in Nevada, Mexico, and Australia.

Design of Process Components

The layout and design of the heaps, ore preparation, and stacking systems, are the keys to process success. KCA designs heaps and mill facilities from a process engineering viewpoint, with many years of experience as a guide.

Reviews and Audits of Operations

KCA is often called in to de-bottleneck, review mine facilities, and audit operations.



San Martin, Honduras



Puquio Norte, Bolivia



Yatela Project, Mali



Itos, Bolivia



Metallurgical Process Technology

Since 1972, KCA has been performing commercial testing services aimed at providing data for the heap leaching and milling, of gold, silver and base metal ores. KCA tests over 100 different ores each year. KCA maintains complete laboratory facilities in Reno, Nevada.

KCA's staff is experienced with testing and designing a wide range of metallurgical processes. KCA handles all aspects of cyanide processing, including laboratory testing, project feasibility studies, engineering design, construction, operations management, and plant design.

KCA's lab capabilities now extend beyond its traditional focus on gold/silver metallurgy including bio-oxidation testing programs on refractory ores. In addition to cyanide leach test-work, KCA has the capabilities for copper and base metal leaching, flotation, solvent extraction, gravity concentration, and electrowinning.

KCA's Laboratory services group now includes a full-service, commercial analytical laboratory named **Florin Analytical Services**. The analytical services team offers a wide range of analytical techniques including ICP-AES, Flame-AAS and Fire Assay.

Precious Metal Ores

- Custom Designed Test Programs
- Laboratory Facilities For Treatment of Bulk Samples
- Pilot Scale Heap Leach Columns For Up to 12 Tons Ore
- Vat Leach Testing
- Milling & Flotation Studies
- Agglomeration Testing
- Flocculants Scoping & Thickener Sizing
- In-Situ Bulk Density Analysis

Process/Flowsheet Testing

- HPGR Evaluations
- Carbon Adsorption/Activation Tests
- Oxidation & Roasting Tests
- CIP/CIL Leach Tests
- Flotation/Concentrate Treatment

Environmental Testing

- Washing Studies to Remove CN From Leached Ores
- Residual Cyanide Analysis
- Acid/Base Potential of Ore and Waste
- Trace & Heavy Metals
- Acidification/Volatilization/Re-neutralization & Other CN Regeneration Tests
- Environmental Audits

Base Metals

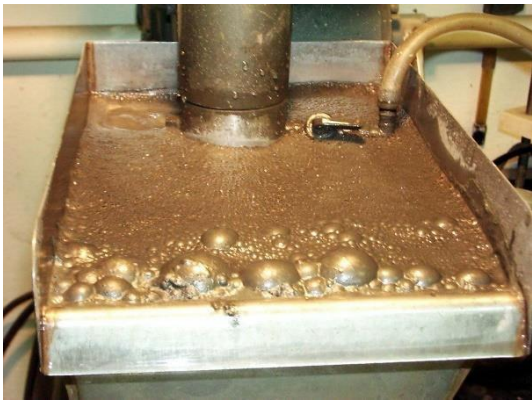
- Copper Leaching Testing
- Small Scale Roast Leach Plants

Industrial Minerals/Aggregate

- Whole Rock Analysis

FACILITIES

KCA occupies a 40,000 square foot building that rests on three acres of land just north of Reno, Nevada. The building, acquired in 1994, was purchased to address the expanding needs of KCA. The laboratory division of KCA maintains its complete sample preparation, wet-analytical and bench-scale processing divisions within this building.



The lab is capable of receiving samples of up to 40 tonnes, on pallets, in barrels or in bulk. Sample preparation of bulk samples can be completed utilizing a Bobcat Front End Loader, a large gasoline engine driven Jaw Crusher, a pilot-sized HPGR as well as smaller laboratory-scale crushers, screen decks, mills and pulverizers.



The laboratory maintains the following major equipment items:

- 1-PilotWal HPGR
- 1-10X12 Jaw Crusher
- 2-4X6 Jaw Crushers
- 2-10 inch Cone Crushers
- 2-Standard Bico Disc Grinders
- 2-Standard TM Ring and Puck Pulverizers
- 2-Gilson Screen Decks
- 4-tyler Roto-taps
- 1-Standard Bond Ball Mill
- 1-Denver Lab Flotation Machine
- 2-WEMCO Flotation Machines
- 2-High Temperature Tube Furnaces
- 7-Jar Mill Rolling Tables
- 2-Perkin Elmer Flame AAS Units
- 1-Perkin Elmer ICP-AES
- 1-Perkin Elmer Mercury Analyzer (FIMS)
- 1-3 inch Knelson Bowl Concentrator
- 1-No. 13 Wilfey Table (Sand Table)
- 1- Deister Table (Finishing Table)
- 4-Gas and or electric drying ovens
- 1-Flotation Pilot Plant
- 1-Williams and Wilson Fire Assay Furnace
- 3-Cress Fire Assay Furnaces



KEY PERSONNEL

The KCA staff constitutes a team with varied technical abilities, especially adapted to work on projects requiring a complete range of engineering services. The permanent staff consists of 70 people (including 25 professionals) in the United States, Australia and Mexico. Key professional personnel are briefly introduced below.

- **DANIEL W. KAPPES, *President, KCA***

A Mining and Metallurgical Engineer, Dan has been associated with the company since 1972. He is a recognized authority on precious metals heap leaching and has presented several technical papers on the subject. In addition to providing engineering and design work on numerous projects, he has directed laboratory and field testing on several projects that have subsequently become major precious metal mines.

- **RANDALL A. PYPER, *General Manager, KCAA (Kappes, Cassidy & Associates, Australia)***

Randall holds a MS degree in Metallurgical Engineering. Before joining the KCA staff, he was Chief Metallurgist of the 2500 ton per day agitated leach plant and 3000 ton per day heap leach facility of Newmont Gold Corporation. His earlier professional background includes production and process engineering for PPG Industries, Lake Charles, Louisiana, and mining chemicals technical service and development for the Dow Chemical Company at Walnut Creek, California.

- **CARL E. DEFILIPPI, *Engineering Group Manager, KCA***

Carl holds a BS degree in Chemical Engineering and an MS degree in Metallurgical Engineering. Prior to joining KCA, Carl was the General Mill Foreman at Newmont's Mill #2, a 9000 tpd CIP mill, and was involved in all phases of the start-up of that mill. He also had extensive experience with Newmont as a senior metallurgist at Carlin, a 2500 tpd CCD mill, and at Maggie Creek, a 3000 tpd heap leach facility. Carl has been the manager for feasibility studies on several projects from which financing was obtained and eventually went into operation.

- **TERENCE E. ALBERT, *Laboratory Manager, KCA***

Terry has a background of extensive laboratory test work experience including flotation testing, gravity concentration, and cyanidation. As manager of laboratory operations, his primary functions are to oversee the operation of the Reno laboratory, to set up field laboratory projects for client companies and to oversee the process control of field operations.

- **TIMOTHY D. SCOTT, *Senior Engineer & Project Manager, KCA***

Tim holds a BS degree in Geological Engineering with over 30 years of experience and is a Registered Member of SME. He was the metallurgical manager for Goldfields Tarkwa gold mine in Ghana for five years. Tim worked in operations at Barrick Goldstrike for over seven years. He is an independent contractor working on selected projects with KCA. He was the assistant project manager for the Los Filos project, the construction manager for the Pinos Altos project, and the project manager at the La India and Dolores Pulp Agglomeration projects. Tim has also completed several studies (scoping to feasibility) while working with KCA.



- **KENJI UMENO, *Senior Metallurgical Engineer, KCA***

A 2006 graduate from the University of British Columbia, Kenji holds a Bachelor's of Applied Science in Materials Engineering and is a registered Professional Engineer in the Province of British Columbia (Canada). Kenji has worked in the mining industry for over fifteen years, and has held positions in engineering, metallurgy, and operations management. At KCA, his work has primarily focused on the engineering support of various studies by mining clients.

- **HORACIO PAEZ, *General Manager, Kappes, Cassiday del Norte (KCN)***

Horacio holds a BS degree in Mining and Metallurgical Engineering (2002) and a BS degree in Civil Engineering (2004) from the Universidad Autonoma de Chihuahua. Previous work for KCA includes construction management and construction discipline supervision for earthworks, rock mechanics, pads and ponds, on the Agnico Eagle Pinos Altos heap leach and mill project. In addition, Horacio has worked as a chief engineer (technical services and construction) for Agnico Eagle de Mexico on AEM's Mascota Project.

- **JOHN S. BRIDEGUM *Senior Project Engineer & Project Manager, KCA***

John has a BS degree in Geology. He is project manager for KCA's carbon adsorption and Merrill-Crowe recovery plants and has been responsible for the detailed engineering, construction, installation, and commissioning of these circuits. John has worked for KCA for over 25 years, including major projects such as Ocampo, Pinos Altos, Itos, Los Filos, La Colorada, and La India.

- **CALEB D. COOK, *Senior Engineer & Project Manager, KCA***

A 2010 graduate from the University of Nevada, Reno, Caleb holds a BS in Chemical Engineering and is a registered Professional Chemical Engineer in the State of Nevada. At KCA Caleb has provided engineering support for various studies and EPCM projects and was the manager for the Inlice construction project in Turkey.

- **TRAVIS MANNING, *Senior Engineer & Project Manager, KCA***

Travis holds a BS in Metallurgical Engineering, is a registered Professional Engineer in the State of Utah and Registered Member of SME. He has over 10 years of experience, most recently 2.5 years for the start-up of the Kensington Gold Mine as Chief Metallurgist for this 1,250 ton/day gold flotation plant. He co-authored the chapter on Heap Leaching for the SME Mining Engineering Handbook, third edition. He has experience in all levels of engineering studies, project management and EPCM activities while at KCA.

- **CARMINA GARCIA, *Procurement Manager, KCN***

Carmina manages KCA and KCN's independent logistics/procurement company for northern Mexico, SECL. Involved with the mining industry since 1992, she has worked with Glamis Gold and Minas de la Alta Pimeria, now Goldcorp, providing procurement services to those companies and now leads these efforts for KCA and KCN in Mexico.



- **DAVID A. KRUTH, *Metallurgical Engineer, KCA***

David received an MS degree in Metallurgical Engineering from Mackay Institute of Earth Sciences and Engineering in 2007 and began his career working at the South Dakota operations of Wharf Resources Corporation. David is part of the KCA laboratory management team and acts as a senior engineer for process development programs.

- **PEDRO ROSALES VALENZUELA, *Support Engineer & Senior Designer, KCA***

Pedro has over ten years of experience as a senior designer and draftsman for numerous mining projects and holds a MS degree in Civil Engineering. While at KCA, he has provided engineering and design support for various studies and detailed engineering projects including Ocampo, Pinos Altos, Dolores and Shahuindo.

- **MARK GORMAN, *Senior Engineer & Project Manager, KCA***

Mark is a Metallurgical and Civil Engineer with over 25 years of experience. He has been a metallurgist, worked in process operations and been a design engineer. Mark has experience in precious metals, copper and molybdenum. Mark is a Registered Professional Engineer in Nevada.

- **NICK VALDEZ, *Support Engineer, KCA***

Nick holds a BS degree in Materials Science and Engineering from the University of Nevada, Reno. At UNR, Nick's studies were focused on extractive metallurgy. He has experience as a metallurgical lab technician and has worked on the acid wash circuit for Newmont's Twin Creeks Mine and the roaster at Barrick's Goldstrike Mine. Currently, Nick is an assistant laboratory manager for KCA.

- **JOHN WALSH, *Mining Engineer, KCA***

A 2018 University of Nevada graduate, John holds a BS degree in Mining Engineering with an emphasis in Metallurgical Engineering. While working at KCA, John has assisted on laboratory and research projects, including the KCA Carbon Converter. Additionally, John has provided engineering support on various engineering projects.

- **KYLEE AMADOR, *Metallurgical Engineer, KCA***

A recent University of Nevada, Reno Graduate, Kylee holds a BS degree in Metallurgical Engineering with an emphasis in Mining Engineering from the Mackay School of Mines. Additionally, Kylee also holds a minor in Geology. Prior to joining KCA, Kylee worked as a laboratory technician for a local metallurgical testing company.



- **SAMIR DEL REAL, *Metallurgical Engineer, KCA***

Samir holds a BS degree in Mining and Metallurgical Engineering, Samir has been involved in all phases of project development, from equipment fabrication, project feasibility studies, process design and drafting, equipment procurement, construction management, project commissioning and startup, personnel training, and mining operations, most recently acting as Construction & Commissioning Manager for the 1,000 m³/hr. Camino Rojo Recovery Plant and Refinery.

- **CARTER COSTANTINO, *Project Engineer, KCA***

Carter holds a BS in Chemical and Biochemical Engineering from the Colorado School of Mines. After graduating in 2017, he began his mineral processing career with Halliburton Baroid in Nevada, working on prefeasibility studies for industrial mineral applications. With Halliburton, he gained active operational experience internationally in Karazhal, Kazakhstan, and domestically in Colony, Wyoming. In the world of hydrometallurgy, he started as a process operator with Nevada Gold Mines at the Turquoise Ridge autoclaves in 2021, later joining the metallurgy team in 2022. While at KCA, Carter has provided engineering support on a number of projects.

- **JETRO G. HERNANDEZ, *Chemical Engineer, KCA***

A 2015 graduate from the University of Guatemala USAC, holds a BS in Chemical Engineering. At KCA, Jetro has been responsible of commissioning the KCA Carbon Converter in different countries as Brazil, Argentina, Mexico and Armenia. Fluent in English, Portuguese and Spanish. Currently working as Jr engineer in the head office in Reno, Nevada.

- **LUKE W. STOKES, *Junior Chemical Engineer, KCA***

A 2023 graduate from the University of Nevada, Reno, Luke holds a BS in Chemical Engineering. At UNR Luke maintained and monitored several biochemistry projects for years on end. Luke has provided lab support for various projects at KCA.

- **ISAAC LONTZ, *Junior Chemical Engineer, KCA***

A University of Nevada graduate, Isaac holds a BS degree in Chemical Engineering. Isaac is working towards obtaining his Professional Engineering license in Nevada and has been directly involved in process design, equipment procurement, and flowsheet development on a number of engineering projects at KCA.



REPRESENTATIVE PROJECT DESCRIPTIONS

CAMINO ROJO

Orla Mining Limited.

Dates: 2017 - 2021

Location: Zacateas, Mexico

KCA completed two feasibility studies for this gold-silver heap leach project: one without the adjacent owner's mine resources and one with those resources after an agreement was reached. KCA was subsequently awarded a contract to supply the Merrill-Crowe recovery plant on a turnkey basis for this 18,000 tpd crushed ore heap leach operation.

DOLORES EXPANSION

Pan American Silver.

Dates: 2016 - 2017

Location: Sonora, Mexico

KCA provided complete EPCM services for this 5,000 tpd pulp agglomeration project. The project included two-stage crushing, rod mill with Vertimill grinding circuit, pressure filtration, blending of lower grade ore with the filtered pulp, cement addition and drum agglomeration. The final product was transferred to the existing lower grade crushed ore overland conveyor that fed existing heap leach facilities.

INLICE

Eczacibasi Esan A.S.

Dates: 2013 - 2017

Location: Turkey

Inlice is located west of Konya in Turkey. KCA provided engineering and site assistance. KCA has also supplied a Model ADR 60 recovery plant that will utilize an alcohol strip for this 1,000 TPD heap leach operation.

SOLEDAD MOUNTAIN

Golden Queen

Dates: 2015 - 2017

Location: Mojave, CA, USA

Soledad Mountain is a 13,000 tpd crushed ore heap leach project, with an HPGR as the third stage of crushing. KCA assisted with commissioning and start-up of the crushing, agglomeration and heap stacking facilities. KCA also supplied the complete Merrill-Crowe plant and process pumping system. Periodic metallurgical reviews have also been conducted to track gold and silver recoveries.

LA INDIA Agnico-

Eagle Dates: 2012 - 2013

Location: Sonora, Mexico

KCA completed detailed engineering and fast-track EPCM for 17,250 mtpd 3-stage crushing, field-conveyor stacking system, and heap leach facility. The project was completed in 13 months.

HYCROFT Allied

Nevada Dates:

2012 - 2014

Location: Nevada, USA

KCA provided the design, supply and installation supervision of a 5-tonne carbon atmospheric strip circuit in 2012. For Hycroft's Merrill-Crowe plant expansion a couple of years later, KCA provided the design and supply of a 4770 m³/hr vacuum/deaeration tower, including all associated pumps and ancillaries. At that time, this was the largest known deaeration tower in operation for a precious metals project.



Statement of Qualifications

BOLKARDAG
(Tepeköy Gold Mine)
Gumustas
Dates: 2008 - 2012
Location: Turkey

KCA completed the EPCM of the Bolkardag Project located in Turkey, near the town of Ulukışla in the Niğde province. Bolkardag is a gold and silver recovery plant; utilizing a hot lime pretreatment followed by an agitated sodium cyanide leach and finally using the Merrill-Crowe process for precious metal extraction.

EL CASTILLO
Minera Real del Oro S.A. de C.V.
(Argonaut)
Dates: 2010 - 2015
Location: Sonora, Mexico

KCA provided EPC services for two sets of 840 m³/hour carbon columns at El Castillo plus pond pumping systems and main heap headers.

MASCOTA
Agnico-Eagle Mexico S.A. de C.V.
Dates: 2008 - 2009
Location: Chihuahua, Mexico

KCA provided EPCM services for the ADR portion of their Mascota Project. Also directly involved with the operation as a whole, KCA prepared the scoping study for the project in November 2008, and acted as project engineer through the completion of construction and commissioning of the plant. The operation includes three stage crushing, screening, agglomeration, CIC adsorption, pressure Zadra desorption, recovery and refining. The project was built on budget, which was based on the results of the scoping study.

PINOS ALTOS
Agnico-Eagle
Dates: 2006 - 2009
Location: Chihuahua, Mexico

KCA completed a feasibility study for this mill/heap leach project. KCA was subsequently awarded an EPCM contract for this US\$142 million combination mill/heap leach project. Site construction began in early 2008 and startup in 2009. Pinos Altos includes a 2,000 tpd heap leach facility and a 4,000 tpd CCD mill with dry stack tailings.

LOS FILOS BERMEJAL EXPANSIONS
Desarrollos Mineros San Luis
Dates: 2012 - 2013
Location: Mezcala, Mexico

The Los Filos Project expanded to add a 5th carbon adsorption train (900 m³/h) to the existing four trains to increase flow rate to 4400 m³/h to the recovery plant. KCA provided the design, supply and install of the CIC train. Separate expansions included booster systems for Phase 2 heap operation and a pumping expansion that increased solution application rates.

LOS FILOS BERMEJAL
Desarrollos Mineros San Luis
later under Goldcorp ownership
Dates: 2004 - 2009
Location: Mezcala, Mexico

Los Filos Bermejil is a 24 million tonne/year heap leach operation with 3500 m³/hr ADR plant. KCA provided metallurgical flowsheet development, followed by the processing sections of a bankable feasibility study. KCA supplied detailed engineering, procurement and construction management services for the ADR plant.

LA COLORADA
Argonaut
Dates: 2011 - 2013
Location: Sonora, Mexico

KCA provided EPC services for the La Colorada, including fabricating a 700 m³/hour CIC circuit with a 3.5 tonne strip circuit planned for future construction.



Statement of Qualifications

OCAMPO

Gammon Lake Resources
Dates: 2004 – 2007
Location: Chihuahua, Mexico

After presenting a highly favorable feasibility study in 2004, KCA was awarded an EPCM contract for the mill and heap-leach facilities at this US\$104 million gold-silver production complex. Ocampo includes a 4½ million tonne per year heap leach operation and a Merrill-Crowe gold process plant to handle 1500 tonnes per day of high-grade ore from the underground mine.

SÃO FRANCISCO

Yamana Gold Inc.
Dates: 2004
Location: Mato Grosso, Brazil

São Francisco is one of two open pits, heap leach properties held by Yamana in west central Brazil. In 2004 KCA completed a bankable feasibility study for the property. The project was financed and went into production.

YATELA

Anglogold Ltd.
Dates: Started in 1998
Location: Mali, West Africa

KCA was the owner's representative for this 8000 tonne per day heap leach project. KCA provided technical support and guidance in all aspects of this project including metallurgy, feasibility, detailed design, construction, and commissioning.

MAGISTRAL

Queenstake Resources Inc.
Dates: 1996 – 2004
Location: Sinaloa, Mexico

Magistral is a one million tonne per year heap leach facility. KCA's involvement included metallurgical testing, completion of a bankable feasibility study, detailed design and construction management. KCA had an engineer on site during the six-month construction period to provide field engineering and commissioning assistance for all aspects of the process facilities.

LERO/FAYALALA –

Kenor
Dates: 1995 – 2006
Location: Guinea, West Africa

Lero is a 2500 tonne per day heap leach project, which includes crushing and agglomeration of higher grade saprolitic ore. Fayalala is adjacent to Lero and is a 20,000 tonne per day ROM dump leach of lower grade, lateritic material. KCA had engineers onsite for several years and provided process management and technical support. Previously, KCA conducted a complete laboratory testing program including, bottle roll, agglomeration and column tests. KCA completed the feasibility study on Fayalala, which was ultimately used to internally finance the dump leach project.

ITOS

Barex Empresa Minera, S.A.
(BAREMSA) - COMIBOL
Dates: 1992 - 2001
Location: Bolivia, South America

Itos is a 600 tonne/day agitated leach plant designed to recover precious metals and base metals from previously processed flotation tailings using a complex acid leach process. Phase I of the project recovered silver and copper. Later phases of development included the recovery of lead, antimony and tin. KCA's role began with laboratory testing, process development, and preparation of a feasibility study, and progressed to include all engineering, procurement, construction management, start up services, and operations management.



SAN MARTIN RECOVERY PLANT

Glamis Gold Inc.

Dates: 2000

Location: Honduras

KCA constructed and installed a 900 m³/hr carbon ADR plant including two parallel adsorption column sets and a complete carbon desorption and processing plant. Under a turnkey project, KCA constructed complex items of equipment in its Reno shop and subcontracted large tanks to Honduran fabricators. To keep costs at a minimum, KCA erected the facility with local crews and skilled craftsmen from Reno and Bolivia.

TARKWA

Gold Fields Ghana

Dates: 1994 to 1999

Location: Ghana, West Africa

The Tarkwa Heap Leach Project is a US\$120 million, 13 million ounce open pit heap leach gold mine. Phase I of the project processes ore by heap leaching at a rate of 10,000 tpd; this was doubled to 20,000 tpd in a second phase. KCA's involvement began with advising Gold Fields Laboratories regarding metallurgical testing procedures, followed by preparation of a preliminary design and cost study for the heap leach operation. KCA then prepared the heap leach portion of a bankable feasibility study and executed all process design from crushing through doré production. KCA maintained five engineers on site during the construction process, and one engineer on site for one year to train Gold Fields personnel in operation of the heap leach.

MIZEK

Steppe Gold Resources Ltd.

Dates: 1996 to 1997

Location: Kazakstan

KCA conducted a complete laboratory testing program including bottle roll, agglomeration and column leach tests for this heap leach project. KCA then completed a definitive feasibility study for a 4000 tonne per day heap leach facility. All elements of mining, processing, and infrastructure were included in the study. KCA provided detailed engineering and construction management services for site earthworks, including the leach pad and ponds.

CHOQUELIMPIE - Sociedad

Contractural Minera Vilacollo

(Operated by KCA subsidiary

Decommissioning Corporation)

Dates: 1992 - 1996

Location: Chile, South America

This 7 million tonne gold heap leach is located at an altitude of 4600 meters (15,000 feet) in northern Chile. KCA provided engineering, procurement and construction management services for the washing of and subsequent gold recovery from the heap. KCA was responsible for the complete metallurgical process design, construction of a carbon ADR plant, and management of commissioning operations. In October 1994, KCA entered into a contract to provide complete project management services. During a 3-year heap rinsing operation the project recovered 30,000 ounces of gold, essentially identical to the projection which KCA made following the initial heap evaluation.



Statement of Qualifications

SAN FRANCISCO - Geomaque
Explorations
Date: 1993-1994
Location: Northern Mexico

KCA produced a bankable feasibility study that was successfully used to obtain financing.

VUELTAS DEL RIO - Geomaque
Explorations Ltd.
Date: 1998
Location: Honduras

KCA produced a bankable feasibility study that was used to obtain sufficient funding to begin construction of the project.

PUQUIO NORTE - Comsur, S. A.
Dates: 1992 - 1997
Location: Bolivia, South America

Laboratory testing and a complete feasibility study, including mining, for the installation of a 1000 tonne per day heap leach for this project were conducted in 1992 and 1993. Expanded reserves changed the scope of the project from heap leaching to milling. KCA then produced a bankable feasibility study, including mining, for the installation of a 1500 tonne per day CIL mill at Puquio Norte. KCA provided design of the cyanidation circuit and fabricated the stripping and regeneration sections and provided installation and start up supervision services.

BREWERY CREEK - Loki Gold
Corporation
Dates: 1990 - 1994
Location: Yukon Territory, Canada

KCA performed the laboratory testing on this 2.3 million tonne per year heap leach project including large (600 mm x 6 m) column leach tests. KCA also completed the engineering and design of the processing facilities, which were incorporated into a feasibility study, and was responsible for the processing section of an initial environmental evaluation document that was required by the local regulatory agencies. The harsh winter climate in the Yukon made the design of the heap leach facilities an interesting challenge. This project began operation in the summer of 1996.

SANTA ROSA - Greenstone
Resources Ltd.
Dates: 1991 - 1993
Location: Panama, Central America

KCA conducted a feasibility study for this 1.33 million metric tonne per year heap leach project. KCA, working with several other consulting firms, produced a final study that included all aspects of environmental permitting, geology, mining, processing and infrastructure. KCA also provided construction management services for a small heap leach test pad that was constructed during the "wet season" to determine the feasibility of constructing production leach pads during prolonged periods of wet weather in Panama.



Statement of Qualifications

SANSU

Ashanti Goldfields Corp

Dates: 1989 - 1990

Location: Ghana, West Africa

The Sansu mine is a 100,000 tonne per month gold heap leach operation located in a tropical, high rainfall environment. KCA was responsible for all aspects of the testing, design, water balance and leaching concepts. Once the project was approved, KCA provided design engineering, fabrication, procurement supervision, installation services, and a complete modular 125 cubic meter per hour carbon recovery plant. Following start up, KCA provided one year of supervision/training.

POTOSI

Comsur, S.A.

Dates: 1985 - 1990

Location: Bolivia, South America

Potosi is a 1000-TPD dry grind/heap leach project. The process included a three-stage crushing circuit, a dry grind ball mill, an agglomeration drum, a conveyor and stacking system, and a 150 cubic meter per hour Merrill-Crowe recovery plant. This heap leach project is unique in that the mined ore is fine crushed to 8 mesh and then reduced in size by dry grinding to 20 mesh prior to agglomeration for heap leaching. KCA provided the original design and construction supervision and the engineering supervision for subsequent expansion from 500 to 1000 TPD. KCA also completed conceptual design for further expansion.

MILL 2/5

Newmont Gold Co.

Dates: 1988 - 1990

Location: Carlin, Nevada, USA

KCA assisted Newmont Gold Co. in the start up of Mill #5, an 18,000-TPD CIL mill with an SABC grinding circuit. KCA also assisted in the implementation of automatic control of the grinding circuits and the prioritization of the alarm systems (approximately 8,000 alarm points). Operator training and optimization of the operation to increase throughput and reduce operating costs were conducted.

GILBERT

Kemco, Inc.

AURORA - Minerex/Aurora Partners

Dates: 1987 - 1988

Location: Nye County, Nevada

KCA provided testing, project design, and complete portable process plants at both locations (1200 and 1500 tons per day plant capacity). At Aurora, KCA also provided extensive field project construction management and built and installed a portable laboratory.

MARVEL LOCH –

Marvel Loch Gold Mine

Dates: 1986 - 1987

Location: Marvel Loch,
Western Australia

KCA provided testing and design services and developed processing techniques. A project engineer was then provided to supervise all aspects of construction and startup for the 2500 TPD operation which processes a soft white pure clay ore. The heaps were constructed to a height of over 30 feet and performed according to design.



Statement of Qualifications

LITTLE BALD MOUNTAIN MINE –

Northern Dynasty Explorations Ltd

Dates: 1985 - 1991

Location: White Pine County, Nevada

KCA conducted laboratory investigations on ore samples from the deposit and provided conceptual design of heap leach pads, ponds, and operating philosophy. KCA then provided the design, construction, and start-up of a complete gold adsorption-desorption-recovery plant rated at a production capacity of 300 tons per day. Direct capital and operating costs were repaid within the first season.

HOG RANCH

Western Goldfields, Inc.

Dates: 1981 - 1986

Location: Nevada, USA.

KCA performed the project engineering and construction management for this 4000 ton per day open pit heap leach gold operation. KCA had turnkey responsibility for offices, power and utilities, and infrastructure as well as processing. The project was brought into production after only 16 weeks of construction, ahead of schedule and under budget at a capital cost of US\$ 7.7 million. The project was sold, after 18 months of successful operation, for a value exceeding 10 times the original investment.

GETCHELL FRM

Minerals Dates:

1982 - 1985

Location: Humboldt County, Nevada

The design, engineering, and construction of this 1200-TPD heap leach project was completed by KCA. KCA supplied the agglomeration drum and conveying and stacking systems. A 180-GPM adsorption-desorption-recovery plant was also built and installed by KCA. The adsorption section of the plant was repurchased and installed by KCA at the Atlas Gold Bar mine in 1988.

MEEKATHARRA OPERATION

Argosy Gold Mines, Inc.

Dates: 1981

Location: Meekatharra, Western Australia

KCA designed, built, and started up a 300 tonne per day carbon-in-pulp plant. Limited reserves made the life of the project brief (30,000 tonnes were processed). Operating costs were within target and the plant was moved to another site in Western Australia.

HAVELUCK MINE

Whim Creek Consolidated N.L.

Dates: 1976

Location: Meekatharra, Western Australia

KCA developed concepts and constructed and operated the first test heap leach on the Haveluck Deposit, which was the first major heap leach in Australia. This project subsequently became a 1000 tonne per day combined agitated leach/heap leach operation owned by Whim Creek Consolidated.



REPRESENTATIVE COPPER PROJECTS

MT. POLLEY

Imperial Metals

Dates: 2004 - 2005

Location: BC, Canada

KCA completed the processing sections of a feasibility study on the proposed copper heap leach project, utilizing the addition of elemental sulfur to produce sulfuric acid required for the leaching of copper concentrate.

CERRO VERDE

Phelps Dodge

Dates: 2000

Location: Arequipa, Peru

KCA reviewed field heap performance, laboratory and production data to help management determine how possible solutions to heap flow problems affected copper recovery and copper in inventory within the heaps. KCA also recommended possible changes to current operating practices to enhance heap permeability.

MORENCI

Phelps Dodge

Dates: 1999

Location: Safford, Arizona

KCA assisted PD with internal laboratory testwork which was a key part of their decision to shut down the Morenci concentrators and move that production to heap leach processing. KCA supplied compacted permeability testing apparatus and provided assistance with setup, training, testing of samples, and interpretation of results.

NIFTY COPPER OPERATIONS

WMC Resources

Dates: 1995 - 1996

Location: Australia

KCAA has been involved with testing and process modifications for the Nifty Copper Operations. This included evaluation of agglomeration techniques and reagents, culminating in the design, operation and evaluation of a 35,000 tonne field trial incorporating full ore agglomeration. This trial has formed the basis for current processing techniques at full production rates.

KCAA completed the EPCM contract for Leach Pad 4 at Nifty that included the complete engineering package for all aspects of the project.

Date: 1996

MAZRA COPPER HEAP LEACH PROJECT

MB Petroleum Services

LLC

Location: Oman

KCA completed a conceptual design and cost study for a proposed 1,000 tpd copper heap leach. The study included all aspects of the project except mining.

SULLIVAN

Arimetco

Date: 1995 - 1996

Location: Nevada, USA

KCA conducted a large diameter column test program including solvent extraction on the pregnant leach solutions.



Statement of Qualifications

KURIDALA

Metana Minerals
Date: 1989 - 1990
Location: Queensland,
Australia

KCA prepared a study, which included design of leach pads, process ponds, leach system piping and stacking requirements for a 3,000 tonne per day leach operation.

GIRILAMBONE

Nord Resources
Dates: 1991 - 1992
Location: Queensland,
Australia

For the 5000 tonne/day Girilambone mixed oxide/sulfide heap leach project KCA participated in the owner's design/oversight team along with several well-known copper leach specialists. KCA's role was to develop design and layout plans for the heaps, solution management concepts, and heap stacking/air injection concepts to insure optimum delivery of air and chemicals.

QUEBRADA BLANCA -

Cominco Resources
Date: 1991
Location: Chile

KCA provided limited design review and evaluation of air flow models. KCA also provided a field engineer to oversee field agglomeration/stacking/heat loss tests. These tests were designed to evaluate heap permeability and temperature characteristics for this high altitude copper bio-leach heap.

MENGAPUR

Malaysia Mining Corp.
Date: 1988
Location: Malaysia

KCA prepared a complete design and cost study for a 10,000 tonne per day copper-silver vat leach operation at Mengapur, Malaysia, which employed acid agglomeration. The study included an extensive laboratory phase, which was geared to optimize agglomerating conditions and evaluate recovery options. Large scale column tests with an SX-EW pilot plant designed and built by KCA were conducted on site.

SAN MANUEL

Magma Copper
Date: 1985
Location: Arizona

Bechtel Civil & Minerals, Inc. was the prime contractor. KCA's responsibilities included design of the leach pad, ore stacking schedules for the first 5 years of operation, leaching schedules, design of solution collection system and development of solution management concepts. At the time this was the largest copper heap leach in the USA (15,000 ton/day) and the first geomembrane lined leach project in Arizona.



KCA CARBON ADR GOLD RECOVERY PLANTS & REGENERATION KILNS (FABRICATION AND/OR DETAILED DESIGN)

Starting in 1981, KCA has fabricated and designed portable, modular, and non portable carbon adsorption plants and Merrill-Crowe plants. KCA has fabricated over 30 of these gold/silver recovery plants as modular plants. The plants have developed an outstanding reputation for quality, simplicity, ease of start-up and fail-safe operation. A list of projects for which KCA has fabricated or had a major role in construction follows:

<u>Operation</u>	<u>Location</u>	<u>Type</u>	<u>Size (m³/hr)</u>
RECENT PROJECTS			
El Castillo	Mexico	CIC Cascade	1400
El Magistral	Mexico	CIC Tower	70
Fazenda Nova	Brazil	CIC Cascade	450
Hycroft	Nevada USA	5 Ton Caustic Atmospheric Strip	5 ton
Irvindi	Turkey	CIC Cascade/ (7-Tonne) Zadra Strip	3200
La Colorada	Mexico	CIC Cascade/ (2: 5-Tonne) Zadra Strip	1300
La India	Mexico	CIC Cascade/ (7-Tonne) Zadra Strip	1400
Los Filos	Mexico	CIC Cascade/ (12-Tonne) Zadra Strip	3600
Los Filos	Mexico	Pumping Expansion	4500
Los Filos	Mexico	CIC Expansion	900
Mascota	Mexico	CIC Cascade/ (3-Tonne) Zadra Strip	340
Nixon Fork	United States	1.5 Ton Zadra Strip	N/A
SSATE	Saudi Arabia	CIC Carousel/ Strip	125
Sterling II	Nevada	CIC Carousel/Ethanol Strip	200
HISTORICAL PROJECTS			
Afema	Ivory Coast	CIC Carousel/Ethanol Strip	50
Afema II	Ivory Coast	CIC Carousel/Ethanol Strip	100
Afema II	Ivory Coast	Carbon Regeneration	25 kg/hr
Al Hajal	Saudi Arabia	CIC Carousel/Ethanol Strip	15
Ashanti	Ghana	CIC Carousel/Ethanol Strip	125
Aurora	United States	CIC Carousel/Ethanol Strip	50
Bolnisi	Georgia, CIS	Carbon Regeneration	25 kg/hr
Bolnisi	Georgia, CIS	CIC Carousel/Ethanol Strip	50
Choquelimpie	Chile	CIC Carousel/Ethanol Strip	225
Cripple Creek	United States	CIC Tower/Ethanol Strip	55
El Plomo	United States	CIC Carousel/Ethanol Strip	15
Essakan	Burkina Faso	CIC Carousel/Ethanol Strip	30



Statement of Qualifications

Getchell	United States	CIC Carousel/Ethanol Strip	45
Gilbert	United States	CIC Carousel/Ethanol Strip	50
Golden Bear	British Columbia	CIC Carousel	250
Gordex	New Brunswick	CIC Carousel/Ethanol Strip	30
Hassai	Sudan	CIC Carousel/Ethanol Strip	20
Hayden Hill	United States	CIC Carousel/Ethanol Strip	45
Hog Ranch	United States	CIC Carousel/Ethanol Strip	150
Ity	Ivory Coast	CIC Carousel/Ethanol Strip	30
Little Bald Mtn.	United States	CIC Carousel/Ethanol Strip	20
Magistral	Mexico	CIC Carousel/Ethanol Strip	70
Marvel Loch	Australia	CIC Carousel/Ethanol Strip	35
Newmont Tailings	United States	CIC Carousel	22
Puquio Norte	Bolivia	CIC Cascade/ (1.5-Tonne) Zadra Strip	70
São Francisco	Brazil	CIC Cascade	700
San Martin	Honduras	CIC Cascade/ (3-Tonne) Zadra Strip	900
Santiago de Chuco	Peru	CIC Carousel/Ethanol Strip	20
Scott-European	Russia	CIC Carousel/Ethanol Strip	20
Seligdar	Siberia	CIC Carousel/Ethanol Strip	50
South Area	Nevada	CIC Cascade	3500
Sterling I	United States	CIC Carousel/Ethanol Strip	35
Tarkwa	Ghana	CIC Carousel/Strip With Hot Zinc Precipitation	700
Tarkwa II	Ghana	CIC Tower	230



KCA MERRILL CROWE RECOVERY PLANTS (FABRICATION AND/OR DETAILED DESIGN)

<u>Operation</u>	<u>Location</u>	<u>Type</u>	<u>Size (m³/hr)</u>
RECENT PROJECTS			
Bolkardag	Turkey	Merrill-Crowe	45
Cetco Mill Circuit	Russia	Vacuum/Deareation Circuit	250
Hycroft Circuit	USA	Vacuum/Deareation Circuit	4772
La Sorpresa Mill Circuit	Mexico	Merrill-Crowe	65
Ocampo Heap Leach	Mexico	Merrill-Crowe	800
Ocampo Mill Circuit	Mexico	Merrill-Crowe	233
Pinos Altos Mill Circuit	Mexico	Merrill-Crowe	551
Soledad Mtn .Heap Leach	USA	Merrill-Crowe	660
HISTORICAL PROJECTS			
Aurex Mill Circuit	Peru	Merrill-Crowe	30
San Martin Mill Circuit	Mexico	Merrill-Crowe	70
El Cubo Mill Circuit Phase I	Mexico	Merrill-Crowe	120
El Cubo Mill Circuit Phase II	Mexico	Merrill-Crowe	120
San Antonio Mill Circuit	Mexico	Merrill-Crowe	70



KCA MODULAR LABORATORY, LABORATORY DESIGN & EQUIPMENT SUPPLY PROJECTS

<u>Operation</u>	<u>Company</u>	<u>Location</u>	<u>Type</u>	<u>Capacity</u>
RECENT PROJECTS				
Pan Project	Midway Gold	Nevada/ USA	Modular Lab Sample Prep/Wet Lab/Fire Assay	170 Samples/Day
La India	Agnico Eagle	Mexico	Modular Starter Lab Sample Prep/Wet Lab/ Fire Assay	25 Samples/Day
Comstock	Comstock Mining Inc.	Nevada/ USA	Sample Prep/Wet Lab/ Fire Assay	150 Samples/Day
Las Lagunas	EnviroGold	Dominican Republic	Lab Equipment Package Supply	100 Samples/Day
Bolkardag	Gumustas Madencilik	Turkey	Modular Lab Sample Prep/Wet Lab/Fire Assay	100 Samples/Day
Cerro de Maimon	Minera Dominicana	Dominican Republic	Modular Lab Sample Prep/Wet Lab/ Fire Assay	100 Samples/Day
Bella Keno Hill	Alexco Res. Corp.	Yukon/ Canada	Sample Prep/Wet Lab/Fire Assay	100 Samples/Day
Kensington	Coeur Alaska.	Alaska/ USA	Sample Prep/Wet Lab/Fire Assay	100 Samples/Day
La Guitarra	Genco Resources	Mexico	Sample Prep/Wet Lab/Fire Assay	300 Samples/Day
Meadowbank	Agnico Eagle	Nunavet Canada	Sample Prep/Wet Lab/Fire Assay	100 Samples/Day
Tambor	Exminqua	Guatamala	Sample Prep/Wet Lab/Fire Assay	100 Samples/Day
HISTORIC PROJECTS				
Condor	Condor Mine SA	Ecuador	Sample Prep/Wet Lab/Fire Assay	200 Samples/Day
Gilbert	Aurora Partners	USA	Wet Lab	
Kubaka	Davy International	Russia	Sample Prep/Wet Lab/Fire Assay	300 Samples/Wk



Decommissioning Services LLC Affiliate of Kappes, Cassiday & Associates



Moundhouse, Nevada



Goldfields, Nevada



Goldfields, Nevada

Decommissioning Services LLC was formed in 1989 to provide evaluation and process services for the closure of mineral processing operations, and for the mitigation of cyanides and heavy metals during hazardous waste cleanup activities.

Reclamation Services

- § Comprehensive early review of operations with preparation of schedules and budget for shutdown
- § Management and conduct of late stage operations including recovery of residual metal values
- § Security and upkeep for suspended operations
- § Bond or surety release
- § Presentation for resale
- § Chemical Recovery
- § Chemical neutralization
- § Hazardous material removal
- § Environmental monitoring
- § Site cleanup
- § Facilities dismantling
- § Revegetation
- § Complete reporting and age