Alan Taylor

Personal Profile

Citizenship	Australia and UK
Education	BSc (Hons.) Chemical Engineering Kings College, Durham University, England, UK
Professional Memberships	SAIMM - Southern African Institute of Mining & Metallurgy (Fellow) TMS – The Minerals, Metals & Materials Society

Summary of Experience

Alan has over 40 years' experience in the metallurgical, mineral, and chemical processing industries in Australasia, New Zealand, North and South America, Africa, Asia, and Europe. He has worked in metallurgical consulting, engineering/construction, plant operations, process development, business development, provision of short courses and conference organization.

Alan has undertaken metallurgical and economic studies, participated in detailed plant design and start-up, supervised metallurgical testwork and development and presented public and in-house technical seminars. Projects and studies have involved the treatment of gold, silver, copper, lead, zinc, nickel, cobalt and uranium ores. Clients have included a variety of major and junior mining, exploration and engineering companies throughout Australia and also overseas.

Alan has been Principal of ALTA Metallurgical Services (ALTA) for over 25 years, which included several years as Chairman of International Project Development Services Pty Ltd (IPDS). Prior to this he was an Executive Engineer with Fluor, for whom he provided senior metallurgical support to projects, feasibility studies and business development involving gold, copper, base metals, and uranium. Alan also spent 17 years with the Davy Group (now WorleyParsons) in Australia, USA, UK, and Canada. He managed process design and metallurgical groups and played a significant role in a wide variety of projects and studies involving gold, silver, copper, uranium, nickel, cobalt, lead-zinc, molybdenum, tungsten, phosphates and alumina. He was also involved in business development and the development of new technology and processes.

He spent three years with Alcan in Canada and Guyana where he was involved with the operation of Bayer process plants for Alumina production. Alan's initial experience was gained with Davy in the UK. His responsibilities included process design of chemical plants and sales support.

Professional Experience

ALTA Metallurgical Services (ALTA)

Managing Director, 1985-Present

Established the company in Melbourne in 1985, and has continued as Principal till the present time. ALTA provides high level metallurgical and project development services, conducts short courses, and organizes technical conferences and seminars involving copper, nickel/cobalt, uranium, gold, solvent extraction/ion exchange and process plant materials of construction.

Metal and mineral processing experience includes copper, nickel/cobalt, gold/silver, base metals, uranium, REE, molybdenum, tungsten, phosphate, and barite.

Treatment process experience includes crushing/grinding, gravity separation/flotation, acid/ammonia/cyanide leach, agitation/pressure/bacterial/heap/dump/pad leach, solid/liquid separation, SX/EW, IX, and electrolytic refining.

International Project Development Services Pty Ltd (IPDS)

Chairman, 1996-2003

IPDS is an internationally orientated project development consulting company established in 1996. ALTA maintains an association with IPDS and offers combined services when appropriate.

Fluor Australia Pty Limited

Executive Engineer, 1984-1985

Assigned to the Melbourne office to provide senior metallurgical support to projects and feasibility studies.

Major initial assignment was to undertake an overview role for the uranium, copper solvent extraction-electrowinning, and gold recovery sections of the Olympic Dam Project. He also provided technical/engineering reviews and consulting services for projects involving the treatment of gold, copper, and base metal ores.

Davy Group (now WorleyParsons)

Manager Mining & Metallurgy to Manager, Melbourne, Process Design, 1980-1984
Senior Process Engineer to Manager Process Design, San Francisco,1973-1980
Senior Development Engineer to Senior Process Engineer, Stockton, UK, 1969-1971
Senior Process Engineer, Montreal, Canada, 1967-1969

Initially joined as Senior Process Engineer in Davy Montreal, where duties covered process design and sales support activities for metallurgical, chemical and food industries.

As Senior Development Engineer, then Senior Process Engineer, worked in the Stockton, England, office where responsibilities covered coordination of a multi-discipline group to develop solvent extraction and related hydrometallurgical techniques for the recovery of copper, uranium, nickel and cobalt, process design activities on projects and studies, and sales/marketing support work.

Posted to the Lakeland, Florida as Senior Process Engineer. Duties included process design work for projects and studies, study management and sales/marketing support.

In 1973 was assigned to the San Francisco office, holding the positions of Senior Process Engineer, Senior Project Engineer, Senior Staff Engineer, and Manager - Process Design.

Duties included, at various times, technical supervision during project and studies, management of process design department, management of feasibility studies, supervision of detailed engineering design, consulting services, and business development support.

Assigned to the Melbourne office for four years, initially as Manager - Mining and Metallurgy, and later promoted to Manager - Process Design.

Initial duties included management of the metallurgy and mining group within the process design department, responsibility for all process design activities for projects and studies and development of the company's technological position in gold/silver including liaison within Davy worldwide. This involved visits to sites of new gold and copper processing facilities in South Africa, North and South America.

As Manager - Process Design, responsibilities included the management of all process design groups including mining, metallurgy, hydrocarbons and chemicals, process computing, and agricultural and food.

ALCAN

Process Engineer, 1964-1967

Process Engineer involved in alumina production plants, Bayer process control, plant studies and implementation of improvements. Worked in Arvida, Canada, and McKenzie, Guyana.

Royal Air Force, England

Flight Lieutenant, 1962-1964)

Underwent basic and advanced pilot training programmes. Attained the rank of Flight Lieutenant.

Davy McKee (now Worley))

Process Engineer, 1960-1962

Based in the Stockton England office, responsibilities were process design and sales support for plants involving gas reforming and other chemical processes.

Project Assignments include:

Nickel and Cobalt

- Confidential Client – Technical Due Dilligence of Battery Recycle Technology (2022)
- Confidential Client – Review of Processes to Produce Nicikel Sulphate from Laterites (2021)
- Confidential Client – Technical Due Dilligence of Battery Recycle Technology (2021)
- Pure Battery Technologies, Australia – Third Party Technical Review of Novel Cobalt Leaching Process (including treatment of black mass from recycled batteries) (2021)
- Pure Battery Technologies, Australia – Third Party Technical Review of Feasibility Study for Novel Nickel Sulphate Production Project (2019)
- Confidential client - Participation in Design of SX Circuit for DFS for a Ni/Co Hydrometallurgy Project - Australia (2019)
- Confidential Client - Preliminary Technical and Economic Study of Hydrometallurgy Treatment of Secondary Cobalt Material - USA (2018)
- Confidential Client - Australia - Prilminary Study of Cobalt Recovery Facility (2017)
- Confidential Client - Review of Processing Options for a Nickel/Cobalt Laterite Deposit - Oceania (2013)
- Mondo Minerals - Netherlands - Overview of Potential HPAL Facilities for Processing Nickel Concentrate (2011)
- CESL - Canada - Peer Review of CESL Process for Nickel Sulphide Concentrates (2011)
- Western Areas - Australia - Due Diligence Reviews of BioHeap process technology for heap bio-Leaching of nickel/cobalt Sulphide and copper ores (2009-2011)
- Ambotovy Laterite Project - Madagascar - SNC Lavalin Chile - Review of SX mixer-settler design (2007-2008)
- Pacific Ore Limited - WA - Australia - Audit of BioHeap process technology for Heap Bio-Leaching of nickel/cobalt sulphide and copper Ores (2005 & 2006)
- Sukinda Laterite Prospect - India - Tata International - Preliminary Assessment of potential processing options (2005-2006)
- Palawan Nickel Laterite Prospects - Philippines - Cambrian Miming - Initial Assessment (2005).
- Kempirsay Nickel/Cobalt Laterite Project - Kazakhstan - Gornoe Buro LLP - Technical & economic assessment of hydrometallurgical & pyrometallurgical processes & recommendations for metallurgical testwork (2005)
- Titan Resources - WA - Australia - Audit of BioHeap technology for treatment of sulphide ores (2003-04)
- Young Nickel/Cobalt Laterite Prospect - NSW - Australia - Jervois Mining - Input into study of application of chloride leaching technology (2003)
- Nickel/Cobalt Laterite Project - South East Asia - Confidential Client - Supervision of Economic Assessment of product treatment options (2000-01)
- Nickel/Cobalt Laterite Prospects - NSW - Jervois Mining - Australia - Consulting input for initial metallurgical testwork for PAL operation and Scandium extraction studies (1998-00)
- Weda Bay Nickel/Cobalt Laterite Project - Indonesia - Weda Bay Minerals Inc. - Project development services for initial development phase for PAL operation (1997-99)
- Normandy Cobalt Tailings Project - NT - Australia - Normandy Group - Preparation of desktop study for treatment options for cobalt & gold recovery (1998)
- Radio Hill Nickel/Copper/Cobalt Project - WA - Australia - North West Nickel - Supervision of flowsheet development, metallurgical testwork and feasibility studies for flotation operation (1996-97)
- Nonoc Nickel Project - Philippines - Arboyne - Review of plant reactivation strategy using ammonia leach process (1996)
- Bulong Nickel/Cobalt Laterite Project - Resolute Resources - WA - Australia - Supervision of metallurgical testwork, co-ordination of appraisal study, and participation in ongoing feasibility study for PAL operation (1988-91). Consulting services to WMC/Resolute for feasibility study (1991-96). Consulting services to Resolute for EPCM phase (1996-97)

- Cawse Nickel/Cobalt Laterite Project - Centaur Mining - WA - Australia - Supervision of metallurgical testwork and participation in feasibility studies for PAL operation (1995)
- Ambatovy Nickel/Cobalt Laterite Project - Phelps Dodge - Madagascar - review of testwork and PAL project concept (1996)
- Siduarsi Nickel/Cobalt Laterite Project - PT Mutiara Iriana Minerals - Irian Jaya - Review of Exploration and Economic Potential (1996)
- Ramu River Nickel/Cobalt/Chromium Laterite Project - Highlands Gold/Nord - PNG - Consulting services for metallurgical testwork, flowsheet development, and engineering studies for PAL operation (1992-96)
- Mr Fitch Cobalt Project - Acacia - NT - Australia - Preliminary study and metallurgical test program for leaching project (1994-96)
- Cobalt Heap Leaching Project - Brancote - NSW - Australia - Supervision of metallurgical testwork and flowsheet development studies (1994)
- Radio Hill Nickel/Copper Flotation and Isasmelt Plant - Resolute Resources - WA - Australia - Due diligence and consulting services for recommissioning of a flotation operation (1994-95)
- Nickel Solvent Extraction Project - Queensland Nickel - QLD - Australia - Engineering consulting services during SX plant design (1987-88)
- Cobalt Project - MIM - QLD - Australia - Supervision of process design for feasibility study for a hydrometallurgical cobalt recovery plant (1980)
- California Nickel Project - USA - Participated in process design work during feasibility study for nickel/cobalt laterite treatment plant (1979)

Copper

- Consulting Services for Development of Novel Copper Sulphide Heap Leaching Technology – Confidential client - Chile - (2021-2022).
- Study of Copper Recovery Options from a Gold Pox Operation – Confidential Client – Australia (2021)
- Peer Review of Gold-Copper POX Process - Confidential Client - Japan (2021)
- Peer Review of Copper Heap Leaching-SX-EW Project-Confidential Client- Australia (2019)
- Copper Blow Copper-Gold Flotation Project - NSW - Australia - Silver City Minerals - Supervision of Preliminary Testwork (2018)
- Review of Process Options and Metallurgical Testwork for Copper Project - Australia - (2014)
- Processing Options for Copper Prospect in North America for Bolitho Mining - WA - Australia (2014)
- Highway Reward Mine Water Water Treatment - QLD - Australia - Red River Resources - Review of Proposed IX/Cementation Project (2014)
- Mt Dore Heap Leach-SX-EW Project - QLD - Australia - Ivanhoe - Australia - Review of Prefeasibility Study with WorleyParsons (2012)
- Review of Heap Leaching Patent Application - Chile - Davies - VIC - Australia (2011)
- Codelco - Chile - Consulting services for copper heap and dump leaching projects, including Chuquicamata (Mina Sur North Extension, Ripios, ROM, LG Dumps), Gaby, San Antonio, Damiana, and Andina, plus preparation of protocols for heap leaching testwork (2001-2009)
- Copper Oxide Vat/Heap Leach-SX-EW Project - South America - Oz Minerals - Australia -Review of Definitive Feasibility Study (2009)
- Aktogay Copper Oxide Heap Leach-SX-EW Project - Kazakhstan - Fluor - Review of metallurgical program and supervision of testwork (2007-2008)
- Wetar Copper Sulphide Heap Leaching-SX-EW Project - Indonesia - Finders Resources - Supervision of heap bio-leaching testwork (2007-2008)
- Leon Heap Copper/Silver Heap Leaching Project - Argentina - Alexander Mining - Review of metallurgical development project for ammoniacal heap leaching of oxide ore (2007)
- Kinsevere Copper/Cobalt Leach-SX-EW Project - Lycopodium/Anvil - Congo- High Level Review & Fatal Flaw Analysis (2007)

- Olympic Dam Project - SA - Australia - URS/BHP Billiton - Assessment of options for improving solution balance in copper/uranium hydromet circuit (2006)
- Marcona Copper Heap Leach-SX-EW Project - Peru - Rio Narcea - Project Review (2006)
- H4 Project - Pakistan - Tethyan Copper - Review of metallurgical testwork and development program for Tanjeel Heap Leach-SX-EW Project (2005-06)
- Codelco - Chile - Consulting services for development of testwork and scale-up protocols for heap leaching of oxide and sulphide ores (2001-06)
- Audit of BioHeap process technology for Heap Bio-Leaching of chalcopyrite, nickel sulphide and other sulphide ores - Pacific Ore Limited - WA - Australia (2005)
- Gossan Hill Project - WA - Australia - Newmont - Review of previous metallurgical testwork, recommendations for additional testwork and provision of testwork procedures, for copper oxide/mixed ore heap leaching project (2004-05)
- Spence Copper Heap Leach-SX-EW Project - Chile - Aker Kvaerner/BHP Billiton - SX Plant Fire Protection Consultancy (2004)
- Tenke Fungurume Copper/Cobalt Project - Congo - Minproc/Phelps Dodge - Participation in review of metallurgical testwork and flowsheet development (2004)
- Review of hydrometallurgical processes and preparation of preliminary economic assessment for the establishment of a refinery for copper sulphide concentrates - Azaran Copper - Iran (2004)
- Input into studies involving implications of Olympic Dam Copper SX Plant fires - Confidential Client - Australia (2003-04)
- Lady Annie Project - Buka Minerals - QLD - Australia - Assessment of potential for grass roots copper heap leach/SX/EW project and supervision of metallurgical development program (2000-03)
- Sepon Project - Oxiana - Laos - Consulting services for testwork acid/ferric leaching/SX/EW project (2000-01)
- Tritton Project - Nord Pacific - NSW - Australia - Review of feasibility study, supervision of additional testwork, preparation of design criteria, & review of tenders for flotation operation (2000)
- Puthep Project - Thailand - Pan Australian Resources - Initial project development input for copper oxide/sulphide heap leaching/SX/EW project (1999)
- Escondida Project - Chile - BHP Copper - Input into technical/engineering audit of concentrator expansion (1999)
- Minto Project - Canada - Minto Explorations - Review of hydrometallurgical technologies for treatment of copper sulphide concentrates (1998)
- Tintaya Project - Peru - BHP Copper - Audit of metallurgical testwork, feasibility study and basic engineering for large scale copper heap leach/SX/EW facility for oxide ore with parallel agitated leaching/CCD for fines (1997-98)
- Intec Demonstration Plant - NSW - Australia - Intec Copper Ltd - Review of demonstration plant performance (1998)
- Electrowinning Technology - Qld - Australia - Cullen & Co. - Review of patent application (1998)
- Kanmantoo Copper Project - SA - Australia - Adelaide Resources - Review of feasibility study and metallurgical testwork for heap leach/SX/EW for copper oxide ore (1998)
- Nifty Copper Operation - WA - Summit Resources - Evaluation of current operation for copper heap leach/SX/EW for oxide and sulphide ores (1998)
- Dikulushi Project - DR Congo - Anvil Mining - Supervision of metallurgical testwork and prefeasibility study input for copper sulphide flotation operation (1997-98)
- W hite Range Copper Cobalt Project - QLD - Australia - Majestic Resources - Metallurgical consulting during testwork and feasibility studies for copper heap leach/SX/EW project with by-product cobalt (1997-98)
- Gossan Hill Project - WA - Australia - Normandy Mining - Review of feasibility study and metallurgical testwork for copper heap leach/SX/EW facility for oxide ores (1997)
- Selwyn Copper Project - QLD - Australia - Australian Resources - Supervision of metallurgical testwork and preliminary economic studies for treatment of copper oxide ore by heap leach/SX/EW and treatment sulphide concentrates by various processes (1996-97)

- Olympic Dam Project - SA - Australia - Bechtel/Davy JV - Optimization of copper SX circuit for plant expansion (1996)
- Mt. Windsor Copper Project - QLD - Australia - Resource Management Group / RGC Thalanga - Tank Bio-leaching/SX/EW for copper sulphide concentrates - consulting services for metallurgical test work and prefeasibility study (1996)
- Olympic Dam Project - SA - Australia - Davy John Brown - Process Design and Evaluation of Alternatives for Plant Expansion and optimization (1995-96)
- Monywa Copper Project - Myanmar - Minproc Engineers - Heap leach/SX/EW for supplied ores. Review of test work and development of design criteria for feasibility study (for supplied heap leach/SX/EW project 1995-96)
- Mt Cuthbert Copper Project - Murchison United - QLD - Australia - Heap Leach/SX/EW for oxide/ supplied ores - Consulting services for metallurgical test work and project development (1994-96)
- Whim Creek Copper Project - Matlock/Dominion - WA - Australia - Heap Leach/SX/EW for oxide ores - Consulting services for metallurgical network and project development (1994-95)
- Labuk Copper Project - East Malaysia - Leadstar - Tank Bio-Leach & Heap leach/SX/EW for sulphide ores - Consulting services for metallurgical testwork and project development (1994-96)
- Andacollo Copper Project - Canada Tungsten - Chile - Heap Leach/SX/EW for sulphide ores - Review of testwork and development of design criteria for feasibility study (1994)
- EMEW Copper EW Technology - Electrometals Mining - NSW - Australia - Technical Audits (1993-96)
- Girilambone Copper Project - NSW - Australia - Straits/Nord JV - Heap leach/SX/EW for oxide and sulphide Ores - Supervision of testwork, flowsheet development, feasibility studies and participation in plant design and start-up (1989-93)
- Punta Del Cobre Project - Chile - Heap leach with reusable pads/SX/EW for mixed copper oxide/ sulphide ore - Consulting services during detailed engineering (1992-93)
- Severonickel Project - Russia - Treatment of copper bearing flue dust by agitated leach/SX/EW - Consulting service for feasibility study and detailed engineering (1992-93)
- Carlota Copper Project - Arizona, USA - Heap leach/SX/EW for mixed oxide/sulphide ore - consulting services for basic engineering phase and detailed engineering (1992-95)
- Hierra Mantua Project - Cuba - Minproc Engineers - Acid cure/SX/EW for mixed copper oxide/sulphide ore - consulting services for feasibility study (1992-93)
- Gunpowder Copper Project - A.B.C. - QLD - Australia - In-Place Leach/SX/EW for sulphide ore - Participation in detailed plant design (1989-90); Consulting services for leach optimization and introduction of heap leaching (1994-95)
- Copper Solvent Extraction Project - Stearns Rodgers - USA - plant design consulting services (1987)
- Gunson/Leigh Creek Copper Project - Adelaide and Wallaroo - SA - Australia - Consulting services during study, project execution, and start-up phases for heap leaching/cementation facilities (1986-87)
- Olympic Dam Project - Roxby Management Services - SA - Australia - Supervision of process design work during detailed design of electrolytic copper refinery and electrowinning plant using ISA technology (1986)
- El Teniente Copper SX/EW Project - Codelco - Chile - Consulting assistance during detailed engineering (1983-84)
- Chuquicamata Project - Codelco - Chile - Dump leach/SX/EW for copper tailings - Supervision of all process design during study and basic engineering phases (1983)
- Gunpowder Copper SX/EW Project - Renison Goldfields - QLD - Australia - Supervised all process design during feasibility and basic engineering phases (1982)
- Ray Mines Copper SX Project - Kennecott - Arizona, USA - Provided consulting services for modification of settlers (1982)
- Cadia Project - Blue Metal Industries - NSW - Australia - Copper concentrator pre-feasibility study - undertook process design activities (1980-81)
- Dump Leach Project - Inspiration Copper - Arizona, USA - Undertook process design and start-up

- Ferric Cure Project - Inspiration Copper - Arizona, USA - Supervised process work during detailed design of heap leach facilities for mixed oxide/sulphide ore and study of new crushing plant (1978-79)
- Casa Grande Project - Hanna Mining - Arizona, USA - Project Manager for feasibility studies for large scale plant to treat copper oxide/sulphide/chloride orebody (1977-79)
- Twin Buttes Project - Anamax - Arizona - USA - Supervised process design work during detailed design of large hydrometallurgical plant to treat copper oxide ore by agitated leach/SX/EW route (1973-74)
- Anaconda Smelter - Anaconda - Montana, USA - Project Manager for study of new copper smelting process for cement copper (1974)
- PASAR Project - Philippines - Undertook process design during basic engineering phase of electrolytic copper refinery (1976)
- Arbiter Plant - Anaconda - Montana, USA - Undertook process design and start-up of SX plant to recover copper from ammonia leach solution (1972-74)
- Participated in numerous studies for the recovery of copper and nickel by hydrometallurgical processes. Role - either Study Manager or Technical Supervisor. Clients included:
  - Kennecott Copper, New Mexico
  - Cananea, Mexico
  - Inspiration Copper, Arizona
  - Continental Copper, Arizona
  - Dupont, Arizona
- Chingola SX Project - NCCM, Zambia - Supervised process design for world's largest (then) copper SX project and associated pilot plant (1970)

Gold/Silver

- Sepon Primary Gold Project - Laos - MMG - Participation in Independent Peer Review of Process Options (2011)
- Kempfield Silver Project - NSW - Australia - Argent Minerals - Update of Processing Opex and Capex for Heap Leach 2011)
- Adelong Gold Project - Macquarie Gold - NSW - Australia - Preparation of revised process design package (2011)
- Laverton Gold Project - Crescent Gold - WA - Australia - Review of metallurgical testwork and assessment of various gold deposits (2008-11)
- Adelong Gold Project - Golden Cross - NSW - Australia - Metallurgical development, testwork supervision, capital & operating costs, & feasibility studies for various flowsheet options including flotation, gravity & CIL (2001/2005)
- Mt Adrah Refractory Gold Prospect - NSW - Australia - Liberty Gold - Preliminary technical economic assessment for the application of GeoCoat heap bio-leach technology (2005)
- Kempfield Silver/Lead/Zinc/Barite Project - Golden Cross - NSW - Australia - Input into initial assessment & project development program for cyanidation & flotation operation (2000-01)
- Cargo Gold Project - Golden Cross - NSW - Australia - Consulting services for evaluation of placer gold recovery (2000-01)
- Lihir Operation - PNG - Lihir Management Company - Client representative services for expansion prefeasibility study and new flotation plant (1999)
- Bowdens Silver Project - NSW - Australia - GSM/Silver Standard - Supervision of metallurgical testwork and prefeasibility study for flotation/leaching flowsheets and input into feasibility study (1996-00)
- Chinese Gold Projects - Worldwide Mining Services - VIC - Australia - Supervision of metallurgical test programs and flowsheet development for four gold projects (1996-97)
- Chalice Gold Project - Resolute Samantha - WA - Australia - Consulting services for metallurgical test program and development of CIP plant design, and participation in detailed engineering (1994-95)

- Bullabulling Gold Project - Samantha Gold - WA - Australia - Consulting services for metallurgical test program and relocation of existing CIP plant (1994)
- Marymia Gold Project - Resolute Resources - WA - Australia - Management of metallurgical test program, participation in feasibility studies, and purchase and relocation of existing CIP gold plant (1990-91)
- Wafi Gold Project - Elders Resources - PNG - Evaluation of refractory gold ore treatment options (1990)
- Golden Cross Gold/Silver Project - Cyprus Gold - NZ - Supervision of detailed engineering for metallurgical plant design for CIP operation (1989)
- Golden Cross Gold/Silver Project - Cyprus Gold - NZ - Supervision of metallurgy/engineering for feasibility study (1988)
- Moline Gold Project - Cyprus Gold - NT - Australia - Supervision of testwork, flowsheet development, and feasibility studies for CIP operation (1987-88)
- Mineral Hill Gold/Copper Project - Triako Resources - NSW - Australia - Participation in metallurgical testwork (1988)
- Carlton Prospect - Cyprus Gold - NT - Australia - Supervision of metallurgical testwork (1988)
- Mt. Adrah Prospect - Cyprus Gold - NSW - Australia - Supervision of metallurgical testwork for sulphide ore (1988)
- New Gold Recovery process - Kaljas - Sydney - Australia - Consulting services (1987-88)
- Glendale Prospect - Cyprus Gold - NSW - Australia - Supervision of metallurgical testwork for sulphide ore (1987)
- Selwyn Gold/Copper Project - Cyprus Gold/Elders JV - QLD - Australia - Supervision of detailed engineering for metallurgical plant design for flotation and cyanidation operation (1986-87)
- Olympic Dam Project - Roxby Management Services - SA - Australia - Supervision of process design work during detailed design of plant to extract gold and silver from copper refinery slimes (1986)
- Golden Cross Project - Cyprus Minerals - New Zealand - Supervision of metallurgical testwork for gold/silver ore and development of process flowsheet and preliminary plant design concepts (1986)
- Selwyn Project - Cyprus Minerals/Elders JV - QLD - Australia - Supervision of metallurgical testwork for gold/copper ore and development of optimum process route (1986)
- Creswick Slimes Project - Planet Resources - VIC - Australia - Consulting services during study for moveable plant (1986)
- Paddington Project - Pancontinental - WA - Australia - Process Design Supervisor during detailed engineering phase of grass roots CIP Gold plant (1984). Technical supervision during feasibility phase (ended December 1983). Consulting Services (1986)
- Red Dome Project - Amoco/Mungana JV - QLD - Australia - Process Design Supervisor for pre-feasibility study for plant to process gold/silver/copper ore (ended June 1984). Consulting services for Elders (1985-86)
- Olympic Dam Project - Roxby Management Services - SA - Australia - Technical review of gold recovery circuit during feasibility study (1985)
- Mt. Percy Project - Windsor Resources - WA - Australia - Technical review of proposed flowsheet and conceptual plant design, and review of tenders (1985)
- Kalgoorlie Tailings Project - Anglo American - WA - Australia - Supervision of process design for pre-feasibility study for plant to reprocess gold tailings (1981)
- North Kalgoorlie Mines - WA - Australia - Supervision of process design work during detailed engineering of new CIP facilities (carried out in 1981 in cooperation with Seltrust)
- Russell Island Project - Government of Burma - Supervision of process design during study of complete gold plant using sea water (1981)
- Kidston Project - Elders Mining - QLD - Australia - Oversight of technical and engineering audit of feasibility study (1984)
- Bougainville Tailings Project - Bougainville Copper - PNG - Project Manager for preliminary study of plant to recover gold from flotation tailing (1984)

- TC-8 Project - Elf Aquitaine, NT - Australia - Supervision of process design for pre-feasibility study for plant to treat high grade gold ore (1982)
- Provided overall technical management for the numerous other studies

Uranium

- Letlhakane Uranium Project - A-Cap Resources - Botswana - Consulting Services for metallurgical test program and process development for acid and alkaline heap leaching project (2009-2017)
- Review of a Australian Uranium Project - UR-Energy - USA - Review of metallurgical testwork and associated studies for process options (2010)
- Ranger Uranium Heap Leaching Project - NT Australia - ERA - Review of testwork and scale-up procedures for feasibility study (2009)
- Olympic Dam Project - SA - Australia - URS/BHP Billiton - Assessment of options for improving solution balance in copper/uranium hydromet circuit (2006)
- Valhalla Project - QLD - Australia - Summit Gold/Paladin Resources - Supervision of metallurgical testwork for flowsheet development including alkaline and acid leaching (1996-99, 2005-2007)
- Olympic Dam Project - SA - Australia - Davy John Brown - Process Design and Evaluation of Alternatives for Plant Expansion and optimization (1995-96)
- Westmoreland Heap Leach Uranium Project - QLD - Australia - Audit of SX and precipitation testwork and conceptual design as part of Normet's audit for Queensland Mines (1993)
- Kintyre Uranium Project - Minenco/Canning Resources - WA - Australia - Supervision of metallurgical testwork, process development, and participation in feasibility study (1987-88)
- Olympic Dam Project - Roxby Management Services - SA - Australia - Overview of uranium plant design during feasibility study (1984/85)
- Koongara Project - NT - Autralia - Denison - Supervised process design for study of CMS based SX plant for uranium recovery (1983)
- Jabiluka Project - Pancontinental - NT - Australia - Consulting services during basic engineering phase (1979/80)
- Bluewater Project - Anaconda - New Mexico - USA - Participation in detailed design and start-up (1976)
- Bear Creek Project - RME - Wyoming - USA:
  a) Project Engineer for detailed engineering for initial plant (1975/76)
  b) Undertook process design for plant expansion (1977/78)
- Anamax Project - Anaconda - Arizona - USA - Undertook process design work during detailed design phase of IX/SX plant to extract uranium from copper leach solution (1977)
- Copper Mountain Project - RME - Wyoming - USA - Supervised process design for feasibility study for various process routes for large low grade deposit (1978-79)
- Sonorem Project - Government of Algeria - Supervised process design work during study of alkaline leach plant (1976)
- Rossing Uranium Project - RTZ - Namibia - Provided consulting services during start-up (1976/77)
- In Situ Leach Project - Wyoming - USA - Project Manager for study to evaluate various IX processes (1976)

Base Metals

- C Paroo Station Project - SNC-Lavalin - WA - Australia - Peer Review of Hydrometallurgical Facility for Procucing Lead from Cerrusite (2018)
- Chakola Project - Capital Mining - NSW - Australia - Supervision of flotation testwork for Copper/Gold/Lead/Zinc Deposit (2005-2008)
- Panorama Copper/Lead/Zinc Project - Liberty Gold - WA - Australia - Review of feasibility study & development of alternative treatment strategies & capital & operating cost reductions to improve project economics (2004)

- Kempfield Silver/Lead/Zinc/Barite Project - Golden Cross - NSW - Australia - Input into initial assessment & project development program for cyanidation & flotation operation (2000-01)
- Panorama Copper/Lead/Zinc Project - North West Metals - WA - Australia - Consulting services for prefeasibility study for flotation operation (1999-2000)
- Bowdens Silver/lead/Zinc Project - NSW - Australia - Supervision of prefeasibility study & input into feasibility study testwork (for flotation operation 1996-2000)
- Zinc Fume Treatment Project - Ausmelt - QLD - Australia - Preliminary cost study (for leaching/EW operation (1994)
- Thalanga Copper/Lead/Zinc Plant - QLD - Australia - Due diligence audit for Resolute Resources (1994)
- Balcooma Copper/Lead/Zinc Project - Triako Resources - QLD- Australia - Supervision of metallurgical testwork and participation in studies for flotation (1988)
- Oceana Lead/Zinc Prospect - Cyprus Gold - TAS - Australia - Appraisal study (1988)
- Lady Loretta Project - Pancontinental - QLD - Australia - Consulting services during studies to develop optimum treatment route for complex lead-zinc-silver ore (1985-86); Due diligence audit for Resolute Resources (1994)
- Treatment processes for complex copper-lead-zinc ores - Fluor - VIC - Australia - Consulting Services during in-house study (1986)
- Lead/Zinc/Copper Prospect - Anglo American - Tasmania - Australia - Undertook process design work for appraisal study for concentrator (1981)
- Molybdenum Prospect - Anglo American - NZ - Undertook process design work for appraisal study for concentrator (1981)
- Wolfram Camp Project - Tenneco - QLD - Australia - Project Manager for pre-feasibility study for tungsten/molybdenum prospect (1983)

Other Metals and Minerals

- Consulting services for design of SX mixer-settlers for REE Project – EMCS International Engineering - Australia (2022)
- Independent desktop review of novel spherical graphite purification process for EcoGraf – WA – Australia (2021)
- Consulting Services for Vanadium SX Process - Confidential Client - Australia - 2020
- Kanyika Niobium Project - Malawi - Development of process flowsheet and supervision of metallurgical testwork (2007-2008)
- Mt Farmer Tantalite Project - RMG - WA - Australia - Input into testwork, plant design & operation (1995)
- Duchess Phosphate Project - QPL - QLD - Australia - Overall technical supervision for series of feasibility studies (1983-84)
- Phosphate Project - Wyoming - USA - Undertook process design for phosphate ore treatment plant (1976)
- Alternative Alumina Processes - Davy McKee - UK - Evaluation of alternatives to Bayer Process (1969-70)
- Alumina Projects - Alcan - Canada and Guyana - Process design for in-house additions and improvements to Bayer process plants (1964-66)