

Project/Client	Scope Description	Date	Company (Sub)
Geohazard Management (see also Pipeline Geohazards and Geotechnical Engineering)			
Linear infrastructure geohazard assessment / Confidential	Proof-of-concept R&D project assessing application of pipeline geohazard assessment strategies to electrical grid linear infrastructure in Iceland as input to real-time reliability assessment.	2020-2021	RSRead Consulting Inc.
Geohazard assessment algorithm compilation / Via+	Compilation of geohazard assessment algorithm references for use in pipeline geohazard assessment, and covered in 2019 ASME book on pipeline geohazards (see publication list)	2018	RSRead Consulting Inc.
Turtle Mountain Monitoring Project / Alberta Geological Survey	Monitoring data review and analysis for the Turtle Mountain Monitoring Project focused on stability of South Peak, Frank, Alberta, Canada. Involved developing an analysis approach tied to early warning protocols and applying the approach to monitoring data from the project.	2005	RSRead Consulting Inc.
Turtle Mountain Monitoring Project / Emergency Management Alberta	Planning and implementation of a monitoring framework for the South Peak of Turtle Mountain, Frank, Alberta, Canada as part of the Turtle Mountain Monitoring Project. Involved project technical coordination, planning of instrumentation and monitoring system, public engagement, project reporting, and peer review.	2003-2005	RSRead Consulting Inc.
Turtle Mountain Monitoring Project / Alberta Municipal Affairs	Development of a monitoring framework for the South Peak of Turtle Mountain, Frank, Alberta, Canada. Involved review of landslide monitoring systems and strategies, conceptual design of a three-stage monitoring system for Turtle Mountain, review of operational logistics and emergency response protocol, development of an implementation strategy and preliminary cost estimates.	2002	RSRead Consulting Inc.
Foothills slope stability assessment / Confidential	Slope stability assessment in Rocky Mountain Foothills colluvial terrain near Millarville, Alberta, Canada.	2001	RSRead Consulting Inc.
<i>Frank Slide geohazard assessment / Alberta Environment</i>	<i>Geotechnical hazard assessment of the south flank of Frank Slide, Hillcrest, Alberta, Canada. Involved field investigation, land use study, numerical modelling, runout analysis, and review of historical information to assess the hazard posed by the potentially unstable rock mass associated with the South Peak of Turtle Mountain.</i>	2000	<i>Confidential</i>
Pipeline Geohazards and Geotechnical Engineering			
Dawson Groundbirch Pipeline Project / Confidential	Review of geohazard assessment of pipeline project in east-central British Columbia, Canada	2020-2021	Confidential (RSRead Consulting Inc.)
Medicine Hat Looping Project / Confidential	Review of geohazard assessment of pipeline looping project in eastern Alberta, Canada	2020-2021	Confidential (RSRead Consulting Inc.)

Project/Client	Scope Description	Date	Company (Sub)
Eagle Mountain – Woodfibre Gas Pipeline / Confidential	Geotechnical SME supporting risk assessment team for tunnel section of a proposed gas pipeline in mountainous terrain on the west coast of British Columbia, Canada	2020	Confidential (RSRead Consulting Inc.)
Eagle Mountain – Woodfibre Gas Pipeline / Confidential	Geotechnical SME supporting pipeline design team for a proposed gas pipeline in mountainous terrain on the west coast of British Columbia, Canada	2019-2021	Confidential (RSRead Consulting Inc.)
Trans Mountain Expansion Project / Trans Mountain Corp.	Geotechnical SME supporting geotechnical consultant to pipeline construction team for a large-diameter pipeline in mountainous terrain near the west coast of British Columbia, Canada	2019-2021	Confidential (RSRead Consulting Inc.)
P'nyang Development Project / ExxonMobil	Geotechnical engineering for a proposed natural gas pipeline in Papua New Guinea including desktop pipeline geohazard assessment, geohazard mitigation assessment, and route refinement support	2019	Worley (RSRead Consulting Inc.)
Trans Mountain Pipeline / Trans Mountain Corp.	Review of CANSIS agronomic database information along existing pipeline in British Columbia and Alberta, Canada as a basis for input to geohazard assessment.	2018, 2019	Confidential (RSRead Consulting Inc.)
Swan Hills slope instability review / Confidential	Site review of slope instability conditions affecting an access road close to a pipeline near Swan Hills, Alberta, Canada	2018	Confidential (RSRead Consulting Inc.)
Trans Mountain Expansion Project / Trans Mountain Corp.	Geotechnical SME supporting pipeline construction team for a large-diameter pipeline in mountainous terrain near the west coast of British Columbia, Canada	2017-2019	Macro Spiecapag Joint Venture (RSRead Consulting Inc.)
SGS North Leg pipeline / Confidential	Geotechnical review of geotechnical information for Saskatchewan Gathering System North leg expansion application.	2017-2018	Confidential (RSRead Consulting Inc.)
ND pipeline risk assessment / Confidential	Desktop geohazard assessment of a gas pipeline route in North Dakota as input to a quantitative risk assessment of the pipeline by others.	2017	Confidential (RSRead Consulting Inc.)
Regulatory support for Alaska pipeline / AGDC	Technical support for FERC regulatory filings and Requests for Information for proposed Alaska gas pipeline	2017	Worley (RSRead Consulting Inc.)
Site-specific pipeline integrity review / Confidential	Review of geotechnical/geological conditions and geotechnical investigations related to geohazard effects on pipeline integrity at identified hazard sites, Western Canada	2016-2018	WorleyParsons (RSRead Consulting Inc.)
Pipeline incident root cause analysis / Confidential	Geotechnical review of site conditions contributing to a pipeline incident at a crossing of the North Saskatchewan River near Maidstone, Saskatchewan, supporting root cause analysis and restart of the pipeline.	2016-2017	Confidential (RSRead Consulting Inc.)
Straits of Mackinac risk assessment / Confidential	Geotechnical review of geological conditions and potential geohazards associated with an alternative pipeline crossing of Straits of Mackinac, Lake Michigan	2016-2017	Confidential (RSRead Consulting Inc.)

Project/Client	Scope Description	Date	Company (Sub)
Alaska LNG Project / ExxonMobil, BP, TCPL, ConocoPhillips	Geotechnical Lead and Subject Matter Expert (SME) for geotechnical engineering analyses and geohazard assessment of a proposed large-diameter natural gas pipeline in Alaska, including geologic model development, geotechnical quantities estimation, and system-wide quantitative assessment of a suite of credible geohazard mechanisms	2014-2016	WorleyParsons (RSRead Consulting Inc.)
GasAndes pipeline geohazard assessment / Confidential	Review of geohazards affecting a gas pipeline in mountainous terrain in Chile, including identification and prioritization of debris flow sites for subsequent field review.	2016-2017	Via+ (RSRead Consulting Inc.)
Camisea pipeline geohazard management / Confidential	Expert review and refinement of a geohazard assessment methodology used for a major existing South American pipeline system, including natural gas and natural gas liquids lines, Peru	2016-2017	RSRead Consulting Inc.
Camisea pipeline geohazard management / Confidential	Expert review and gap analysis of geohazard assessment methodology used for a major existing South American pipeline system, including natural gas and natural gas liquids lines, Peru	2016	RSRead Consulting Inc.
Trans Alaska Pipeline System / Confidential	Technical oversight committee participation and expert review of geotechnical investigations related to geohazard assessment and monitoring along a large-diameter Alaska pipeline, Alaska, including Fels Glacier landslide, Copper River basin sites, Yukon River crossing south bank, and others.	2013-2021	RSRead Consulting Inc.
Coastal GasLink Pipeline Project / Coastal GasLink Ltd.	Geohazard assessment, engineering analysis of geotechnical quantities and geohazard mitigation requirements, and detailed engineering of a proposed large-diameter natural gas pipeline through diverse mountain and interior plateau terrain in British Columbia, Canada.	2012-2015; 2019-2021	WorleyParsons (RSRead Consulting Inc.)
Westcoast Connector Gas Transmission / Spectra Energy	Geohazard assessment and engineering analysis of geotechnical quantities and geohazard mitigation requirements of a proposed large-diameter natural gas pipeline through diverse mountain and interior plateau terrain in British Columbia, Canada.	2013-2014	WorleyParsons (RSRead Consulting Inc.)
Colombia oil pipeline geohazard assessment / Confidential	Geohazard assessment of an existing large-diameter pipeline traversing diverse mountain and volcanic terrain in a seismically active region, Colombia	2013	Via+ (RSRead Consulting Inc.)
Northern Gateway Pipeline Project / Northern Gateway Pipelines Inc.	Expert review and refinement of a geohazard assessment approach, and field verification of geohazard assessment results, for a major proposed large-diameter pipeline in British Columbia, Canada.	2012-2013	WorleyParsons (RSRead Consulting Inc.)
Ecuador pipeline geohazard assessment / OCP	Development and application of a quantitative geohazard assessment methodology involving LiDAR evaluation of landslides for risk assessment of a major existing pipeline in difficult terrain, Ecuador.	2011	Naviq Consulting Inc. (RSRead Consulting Inc.)
Gasoducto Andino del Sur / Odebrecht Perú Ingeniería y Construcción	Expert review of a geohazard assessment approach for a major South American pipeline, Peru.	2010	WorleyParsons (RSRead Consulting Inc.)

Project/Client	Scope Description	Date	Company (Sub)
GHA review / Confidential	Review of a geohazard assessment approach for a major pipeline company in the Netherlands.	2009	Confidential (RSRead Consulting Inc.)
Alaska Pipeline Project / ExxonMobil, TCPL	Geohazard assessment and engineering analysis of geotechnical quantities and geohazard mitigation requirements of the international Alaska Pipeline Project crossing Alaska, USA and Yukon Territory, and British Columbia, Canada. Development and implementation of a geohazard assessment process applied system-wide to challenging Arctic and mountain terrains. Geotechnical engineering analysis to support strain-based design.	2008-2012	WorleyParsons (RSRead Consulting Inc.)
Camisea pipeline risk assessment / Confidential	Geohazard assessment of the Camisea Pipeline, Peru. Development of a geohazard assessment process for a major operating South American pipeline project through challenging rainforest, mountain and coastal terrains.	2007-2010	Via+ (RSRead Consulting Inc.)
Pipeline data review / Via+	Analysis of construction and operating data for a pipeline in the USA.	2006	RSRead Consulting Inc.
Mackenzie Gas Project / Imperial Oil Resources Ventures Ltd., ConocoPhillips Canada (North) Ltd., Shell Canada Ltd., ExxonMobil Canada Properties	Geotechnical engineering aspects of the Mackenzie Gas Project including right-of-way preparation, trencher trial analysis, geotechnical quantities estimation, geohazard assessment, numerical analysis of karst collapse and other geohazards, frost heave and uplift resistance testing, numerical modeling of uplift resistance, planning of frost heave drilling program, route database development, data analysis and reporting, and public hearing support.	2003-2008	Colt Engineering (RSRead Consulting Inc.)
Trencher performance review / Geo-Engineering (MST) Ltd.	Review of rock mechanics issues related to mechanical trencher performance in permafrost for the Mackenzie Gas Project	2001	RSRead Consulting Inc.
<i>La Salle River slope failure analysis / TransCanada Pipelines</i>	<i>La Salle River rupture in 1996 due to slope movement associated with artesian pore pressure in the Upper Carbonate Aquifer, and fluctuations in river level. Full numerical analysis of the interaction of slope deformation with basal aquifer pore pressure and river level using a coupled hydro-mechanical model was conducted</i>	1999	<i>Confidential</i>
<i>Pipeline geohazard monitoring / Confidential</i>	<i>Analysis of data from slope inclinometers from several sites along the main pipeline in Saskatchewan, Manitoba and Ontario. Slope stability analyses conducted using limit equilibrium models</i>	1998-99	<i>Confidential</i>
<i>Pipeline geohazard assessment / Confidential</i>	<i>Geotechnical hazard assessment of slopes and river crossings along main pipeline. Sites ranked on the basis of BGC Engineering classification matrix</i>	1998-99	<i>Confidential</i>
<i>Settlement analysis / Confidential</i>	<i>Compressor station footing settlement assessment. Identification of possible causes of footing settlement</i>	1999	<i>Confidential</i>
<i>Soil-pipe interaction methodology review / Confidential</i>	<i>Assessment of soil-pipe interaction methodology employed by Client, and limitations of approach. Methodology applied to several river crossings to rank sites for potential remediation</i>	1999	<i>Confidential</i>

Project/Client	Scope Description	Date	Company (Sub)
<i>Red River slope stability assessment / Confidential</i>	<i>Red River slope stability assessment. Installed slope inclinometers and assessed slope movements in area of old pipelines (~1954). Worked with Stresstech Engineering to provide soil-pipe interaction data for pipe stress analysis</i>	1999	<i>Confidential</i>
<i>Borehole stability assessment / Confidential</i>	<i>Back analysis of borehole stability of failed directional drill crossing of the North Saskatchewan River</i>	1999	<i>Confidential</i>
<i>Borehole stability assessment / Confidential</i>	<i>Borehole stability analysis of proposed directional drill path beneath landslide terrain at two river crossings (Poplar River and Horse Creek)</i>	1999	<i>Confidential</i>
Rock Mechanics R&D for Deep Geologic Disposal of Nuclear Waste			
ONKALO underground repository R&D / Posiva Oy (Finland)	Rock mechanics technical advisory support for R&D review and reporting at the ONKALO underground facility on Olkiluoto Island, western Finland, including the Posiva Olkiluoto Spalling Experiment and related regulatory reporting.	2017-2021	RSRead Consulting Inc.
Feasibility study for L/ILW repository / Confidential	Expert geomechanics support for a feasibility study of a deep geologic repository in Canada for low and intermediate level radioactive waste management at an existing nuclear research site.	2015-2016	RSRead Consulting Inc.
Earthquake-induced rock shear effects study / Nuclear Waste Management Organization (Canada), SKB (Sweden)	Continued support for development of laboratory-scale testing of earthquake-induced rock shear effects (in collaboration with SKB, Sweden), and summary of features, events and processes (FEPs) associated with rock mechanics engineering and long-term performance of a deep geologic repository.	2009-2011	RSRead Consulting Inc.
Yucca Mountain geomechanical stability and monitoring review / Confidential	Review of geomechanical stability issues associated with the nuclear waste disposal concept planned for Yucca Mountain, including long-term monitoring of a repository.	2009-2010	RSRead Consulting Inc.
Earthquake-induced rock shear effects study / Nuclear Waste Management Organization (Canada), SKB (Sweden)	Continued support for development of laboratory-scale testing of earthquake-induced rock shear effects (in collaboration with SKB, Sweden), and summary of the state-of-the-knowledge on the excavation damaged zone (EDZ) around underground excavations.	2008-2009	RSRead Consulting Inc.
Earthquake-induced rock shear effects study / Nuclear Waste Management Organization (Canada), SKB (Sweden)	Continued support for development of laboratory-scale testing of earthquake-induced rock shear effects (in collaboration with SKB, Sweden), and assessment of the role of rock mechanics engineering in siting, design and construction of a deep geologic repository in sedimentary rock formations.	2007-2008	RSRead Consulting Inc.
Yucca Mountain geomechanical stability and monitoring review / Confidential	Review of geotechnical issues associated with the nuclear waste disposal concept planned for Yucca Mountain, including long-term monitoring of a repository.	2004-2009	RSRead Consulting Inc.

Project/Client	Scope Description	Date	Company (Sub)
Geomechanical issues related to deep geologic disposal in crystalline rock / Ontario Power Generation (Canada), SKB (Sweden)	Review of geomechanical issues associated with the Canadian concept for nuclear waste isolation in crystalline rock. Specific issues included assessment of potential for large-scale fracturing due to glacial and thermal-mechanical loading history, and planning laboratory-scale testing to assess rock shear effects associated with earthquake loading (in collaboration with SKB, Sweden).	2004-2006	RSRead Consulting Inc.
Excavation damage zone studies / Kajima Technical Research Institute (Japan)	Summary of international experiments and tools for investigating the excavation damage zone around underground openings	2002	RSRead Consulting Inc.
Shaft sealing studies / Kajima Technical Research Institute (Japan)	Summary of international tunnel and shaft sealing concepts related to radioactive waste disposal for input into the Japanese concept for waste disposal	2001	RSRead Consulting Inc.
Seals Engineering Program / AECL	Investigate technologies and existing capabilities for designing sealing systems for underground openings in a nuclear waste repository. Includes development of numerical modelling capabilities using continuum and discontinuum codes, microseismic and acoustic emission monitoring techniques and instruments, and integration of modelling and monitoring technologies	2001-2002	RSRead Consulting Inc.
Geotechnical gap analysis for UFDP / Ontario Power Generation	Engineering gap analysis for the Used Fuel Disposal Program to identify state-of-the-art in geotechnical engineering tools and capabilities, and development needs for underground repository design	1999	RSRead Consulting Inc.
Thermal-Mechanical Stability Study / AECL	Investigate technologies and existing capabilities for designing underground openings for a nuclear waste repository. Included development of numerical modelling capabilities using continuum and discontinuum codes, microseismic and acoustic emission monitoring techniques and instruments, and integration of modelling and monitoring technologies	1998-2001	RSRead Consulting Inc.
<i>Excavation Stability Study / AECL</i>	<i>Two year project designed to evaluate stability and the extent of excavation-induced damage in underground openings as a function of tunnel geometry and orientation, geology and excavation method. Involved excavation of 10 different tunnel geometries, microseismic monitoring, convergence measurements, characterization using microvelocity and borehole camera surveys and numerical modeling</i>	<i>1995-1997</i>	<i>Atomic Energy of Canada Ltd.</i>

Project/Client	Scope Description	Date	Company (Sub)
<i>Tunnel Sealing Experiment / AECL</i>	<i>Five year project designed to assess the performance of clay- and concrete-based tunnel seals and their interaction with the rock mass. Involved international involvement of JNC (Japan), WIPP (US) and ANDRA (France) to conduct in situ characterization and monitoring of the rock mass and seals, numerical modelling and design. Included design and excavation of an elliptical tunnel at the 420 Level of the URL, and construction of a clay-based and a concrete-based bulkhead. Bulkhead key design was based on results from the Mine-by Experiment and numerical modeling</i>	1995-2000	Atomic Energy of Canada Ltd.
<i>Heated Failure Tests / AECL</i>	<i>Four year project designed to study the effects of thermal loading on progressive failure and the development of the excavation damaged zone. Involved thermal-mechanical modelling and monitoring of acoustic emissions, seismic velocity, tunnel convergence, temperature and pore pressure generated around a series of vertical underground openings</i>	1993-1997	Atomic Energy of Canada Ltd.
<i>Mine-by Experiment / AECL</i>	<i>Six year project designed to study the progressive failure and excavation response of the rock mass around a full-scale circular tunnel under ambient conditions. Involved international peer review and a multi-disciplinary team to perform numerical modelling, microseismic and acoustic emission monitoring, geomechanical monitoring, and geological and geophysical characterization of the rock mass</i>	1989-1996	Atomic Energy of Canada Ltd.
<i>In Situ Characterization / AECL</i>	<i>Development of a computer-based corelogging system, geological and geotechnical characterization, research and development into in situ stress determination, investigation of residual stress in rock masses, and analysis of the effect of rock mass quality on selection of a waste emplacement option</i>	1987-1990	Atomic Energy of Canada Ltd.
Oil and Gas Geomechanics			
<i>Risk assessment of CO₂ sequestration / ECO-Matters</i>	<i>Review of risk assessment methodology for CO₂ sequestration project in Saskatchewan.</i>	2003	RSRead Consulting Inc.
<i>Greenhouse gas disposal in salt domes / Alberta Geological Survey</i>	<i>Investigation of in situ stresses in salt formations in northeastern Alberta to assess the feasibility of greenhouse gas disposal in salt caverns. Included literature review and data compilation.</i>	2001	Confidential
<i>Water disposal well geotechnical evaluation / Confidential</i>	<i>Geotechnical evaluation of water disposal well alignments in north-eastern Alberta, including in situ stress modeling, slope stability analysis, and borehole stability analysis</i>	2001	Confidential
<i>Geomechanical analysis of water disposal / Confidential</i>	<i>Analysis of the geomechanical effects associated with water disposal at two areas in northeast Alberta. Simulations were conducted using analytical solutions and numerical modeling with FLAC.</i>	2001	Confidential
<i>Caprock integrity criteria review / Confidential</i>	<i>Review of caprock permeability criteria.</i>	2001	Confidential

Project/Client	Scope Description	Date	Company (Sub)
<i>Geotechnical characterization for cyclic steam stimulation / Confidential</i>	<i>Geotechnical characterization in east-central Alberta, including preliminary development of a geomechanical classification system for cyclic steam stimulation operations.</i>	2001	<i>Confidential</i>
<i>Borehole stability analysis for cyclic steam stimulation / Confidential</i>	<i>Borehole stability analysis of proposed cyclic steam stimulation wells in eastern British Columbia. Included laboratory testing at the University of Alberta to obtain strength and mechanical properties for simulations.</i>	2001	<i>Confidential</i>
<i>Geomechanical assessment of SAGD heating / Confidential</i>	<i>Geomechanical analysis of bitumen properties in east-central Alberta. Analyses used the numerical code FLAC to simulate the combined effects of SAGD heating and pressure declines.</i>	2001	<i>Confidential</i>
<i>Feasibility of microseismic monitoring of gas storage / Confidential</i>	<i>Feasibility study on the application of microseismic monitoring to gas storage in west-central Alberta. Geomechanical simulations of gas storage and withdrawal were conducted using FLAC to assess the likelihood of induced microseismicity, and optimum monitoring period.</i>	2001	<i>Confidential</i>
<i>Geomechanical assessment of SAGD heating / Confidential</i>	<i>Geomechanical analysis of bitumen properties in east-central Alberta. Analyses used the numerical code FLAC to simulate the combined effects of SAGD heating and pressure declines.</i>	2000	<i>Confidential</i>
<i>Geotechnical characterization / Confidential</i>	<i>Geotechnical characterization in east-central Alberta, including an extensive laboratory testing program on core from the area.</i>	2000	<i>Confidential</i>
<i>Borehole stability analysis / Confidential</i>	<i>Numerical analysis of borehole stability for an offshore project in eastern Canada, including laboratory testing to assess material properties and to correlate laboratory and in-situ properties. Numerical simulations were conducted using FLAC to consider the complete life-cycle of a borehole, including drilling, overpressuring, underbalanced conditions, and thermal effects.</i>	2000	<i>Confidential</i>
Transportation			
<i>Mt. Shaughnessy tunnel / Canadian Pacific Railway</i>	<i>Instrumentation, monitoring and construction supervision of the Mt. Shaughnessy Tunnel remediation project. Project involved extensometer and convergence measurements before and during installation of concrete lining in previously shotcreted tunnel segments. Rogers Pass, BC.</i>	2003	<i>Confidential (RSRead Consulting Inc.)</i>
<i>Mt. Shaughnessy tunnel / Canadian Pacific Railway</i>	<i>Geotechnical drilling program to characterize the rock mass around the Mt. Shaughnessy. Involved drilling supervision, core logging, water sampling, laboratory testing, analysis and reporting of conditions in the previously shotcreted tunnel. Rogers Pass, BC.</i>	2002	<i>Confidential (RSRead Consulting Inc.)</i>
<i>Kickinghorse Pass realignment / BC Ministry of Transportation</i>	<i>Participation on Value Analysis team considering realignment of TransCanada Highway through the Kickinghorse Pass near Golden, BC.</i>	2002	<i>RSRead Consulting Inc.</i>
<i>Yale rock slope mitigation / Canadian National Railway</i>	<i>Construction supervision for rock slope stabilization, Mile 4.1 4.26, Yale Subdivision. Included scaling, rock bolt installation, shotcreting and trim blasting.</i>	1998	<i>Confidential</i>

Project/Client	Scope Description	Date	Company (Sub)
<i>Albreda geohazard assessment / Canadian National Railway</i>	<i>Geotechnical assessment of railway cut and natural slopes to identify remedial measures, Albreda Subdivision.</i>	1998	<i>Confidential</i>
<i>Squamish Highway upgrade / BC Ministry of Highways</i>	<i>Construction inspection of remediation measures on the Squamish Highway, near North Vancouver, BC.</i>	1987	<i>Golder Associates</i>
<i>Railway tunnel investigation / Canadian Pacific Railway</i>	<i>Tunnel Investigation, Rogers Pass, BC. Alignment investigation for short railway tunnel including supervision of drilling contractor, geological characterization, instrumentation installation and monitoring.</i>	1986	<i>Golder Associates</i>
<i>Revelstoke to Albert Canyon railway twinning project / Canadian Pacific Railway</i>	<i>Construction supervision for twinning of CP Rail mainline from Revelstoke to Albert Canyon, BC. Included supervision of soil cut-and-fill operations including replacement of clay foundation material, application of geotextiles, drainage installation, development of paved concrete track test section, soil density monitoring, retaining wall construction, bridge pile installation and track placement, Albert Canyon, BC.</i>	1983-84	<i>CP Rail Special Projects</i>
<i>Highway 23 upgrade / BC Ministry of Highways</i>	<i>Aggregate inspection for paving project, Highway 23 North, Goldstream, BC. Involved gradation analysis and inspection.</i>	1980	<i>BC Ministry of Highways</i>
Mines and Quarries			
<i>Cigar Lake in situ stress determination / COGEMA</i>	<i>Hydraulic fracture testing, Cigar Lake uranium deposit, SK. Evaluation of in situ stresses surrounding high-grade uranium deposit using hydraulic fracturing. Site support for testing, geological characterization of drill core, interpretation and reporting of investigation.</i>	1987	<i>Golder Associates</i>
<i>Northern riprap quarry investigation / Government of Canada, Department of Supply and Services (DSS)</i>	<i>Quarry investigation, Northwest and Yukon Territories. Evaluation of riprap sources for shielding offshore islands. Geotechnical characterization of potential quarry sites and identification of potential environmental impacts.</i>	1986	<i>Golder Associates</i>
Dams			
<i>St. Mary's Dam spillway replacement project / Alberta Government</i>	<i>Analysis of rock bolt performance and assessment of specifications for spillway replacement project, southern AB. Included development of filter criteria and analysis of monthly data from installed instrumentation.</i>	1997	<i>Klohn Crippen</i>
<i>Oldman River Dam project/ Alberta Government</i>	<i>Site support for construction and monitoring of a test diversion tunnel to assess ground conditions expected in the main diversion tunnels. Support during tunnel excavation included geological characterization, ground stabilization and displacement monitoring.</i>	1986	<i>Golder Associates</i>
<i>Oldman River Dam project / Alberta Government</i>	<i>Site characterization of dam abutments and foundation, including drilling, corelogging and geological mapping, to assess engineering design. Pincher Creek, AB.</i>	1985-86	<i>Golder Associates</i>
<i>Revelstoke Dam project / BC Hydro</i>	<i>Soils inspection for earthfill dam construction, Revelstoke Dam Project, Revelstoke, BC.</i>	1981	<i>BC Hydro</i>

Project/Client	Scope Description	Date	Company (Sub)
Foundations and Waterwells			
<i>Boston Bar bunkhouse / Canadian National Railway</i>	<i>Foundation inspection and material selection for development of new bunkhouse, Boston Bar, BC</i>	<i>1998</i>	<i>Confidential</i>
<i>Waterwell drilling / Harrison Bay, BC</i>	<i>Water well drilling for First Nations reserve. Site supervision for drilling, well completion and water sampling</i>	<i>1986</i>	<i>Golder Associates</i>
<i>Waterwell drilling / Balfour, BC</i>	<i>Water well drilling for school development. Site supervision for drilling, well completion and water sampling.</i>	<i>1986</i>	<i>Golder Associates</i>
<i>Waterwell drilling / McLeod Lake, BC</i>	<i>Supervision of water well drilling, soils logging, well screen selection, water sampling and pump testing</i>	<i>1986</i>	<i>Golder Associates</i>
<i>Pile inspection / North Vancouver, BC</i>	<i>Pile inspection for shopping mall expansion, North Vancouver, BC</i>	<i>1986</i>	<i>Golder Associates</i>
<i>Greeley Creek pile inspection / Canadian Pacific Railway</i>	<i>Pile inspection for bridge construction, Greeley Creek, Revelstoke, BC</i>	<i>1984</i>	<i>CP Rail Special Projects</i>

Note: Items in italics are projects involving Dr. Rod Read, but not conducted by RSRead Consulting Inc.