

M. John Brodie, P.Eng. (B.C & NWT/NU)

Education:

B.A.Sc. Geological Engineering, University of British Columbia, 1982

Experience

Jan '95 -

Mine Reclamation Specialist, Brodie Consulting Ltd.

Brodie Consulting provides geotechnical and environmental services in the field of mine reclamation on over 50 sites. This work has included:

- evaluation of closure plans and reclamation liability for new and existing mines,
- review of mine closure plans for abandoned mines,
- technical management of abandoned mines under government control,
- preparation of guidelines on mine closure planning and reclamation standards,
- development of the RECLAIM model for reclamation security estimates,
- discussion papers on factors in mine closure security,
- presentation of short courses on mine closure,
- risk characterization of mine closure hazards.
- design of pressure bulkheads for mine closure.

I am currently working on a long-term part-time basis as the Technical Manager for the Faro Mine Closure Planning Office.

Other current and recent projects include development of a cost estimation methodology for the Peru Ministry of Mines, preparation of the closure plan for the Cerro Crucitas project in Costa Rica, mine waste disposal options and costing for the CEAA Panel on Kemess North, lead engineer for rehabilitation of the B2 Dam at Giant Mine, estimation of mine closure costs for INAC on the Diavik Diamond Mine.

July '93 - Jan. '95

Manager of Engineering, Reclamation Management Limited (RML)

While with RML I conducted the technical assessment of several acquisition targets involving mine reclamation and was responsible for the environmental and engineering aspects of ongoing projects.

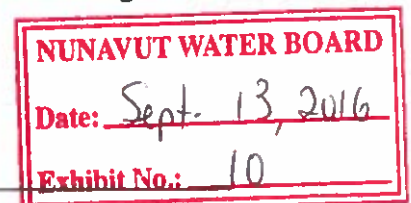
1987 - 1993

Senior Geotechnical Engineer, Steffen Robertson And Kirsten (Canada) Inc. (SRK)

At SRK, I was involved in mine design, permitting and closure planning. This work included: environmental liability assessment, closure planning, control of acid rock drainage, design and construction of waste management facilities, and preparation of several manuals and guidelines pertaining to mine waste management and mine closure.

1983 - 1986

Mine Geotechnical Engineer, Westmin Resources Ltd., Campbell River, B.C. Responsible for all aspects of the geotechnical program in a underground mine.



SUMMARY OF MINE CLOSURE PROJECTS

February 2007

A site liability assessment or participation in mine closure planning has been conducted at following mines, through Brodie Consulting Ltd, or sub-contract to other firms or in previous employment. Involvement in many of these projects has been on behalf of a third party, such as government regulator or prospective purchaser.

Operating mines

1. Boliden Myra Falls, B.C.
2. Snip Mine, B.C.
3. Goldstream Mine, B.C.
4. Samatosum Mine, B.C.
5. Equity Silver Mine, B.C.
6. Quinsam Coal Mine, B.C.
7. Musselwhite Mine, Ont.
8. Hemlo Gold Mine, Ont.
9. Winston Lake Mine, Ont.
10. Mt. Nansen Mine, Yukon
11. Brewery Creek Mine, Yukon
12. Colomac Mine, N.W.T.
13. Ekati Mine, N.W.T.
14. Miramar Con Mine, N.W.T.
15. Giant Mine, N.W.T.
16. Nanisivik Mine, Nunavut
17. Polaris Mine, Nunavut
18. Lupin Mine, Nunavut
19. Cerro De Pasco Mine, Peru

Proposed mines

1. Cerro Crucitas, Costa Rica
2. Mt. Nansen Mine, Yukon
3. Dublin Gulch Mine, Yukon
4. Brewery Creek, Yukon
5. Western Copper, Yukon
6. BHP Diamonds, N.W.T.
7. Diavik Diamond Mine, N.W.T.
8. Prarie Creek Mine, NWT.
9. Doris North Mine, Nunavut
10. Jericho Diamond Mine, Nunavut

Closed Mines

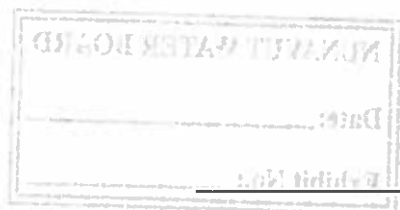
1. Ainsworth Properties, B.C.

2. Silver Standard Mine, B.C.
3. Duthie Mine, B.C.
4. Britannia Mine, B.C.
5. Kitsault Mine, B.C.
6. Baker Mine, B.C.
7. Laura/Peppa Mines, B.C.
8. Mt. Washington Mine, B.C.
9. Similco Mine, B.C.
10. Tulsequah Chief Mine, B.C.
11. Quirke I Mine, Ont.
12. Quirke II Mine, Ont.
13. Panel Mine, Ont.
14. Sturgeon Lake Mine, Ont.
15. Zenmac Mine, Ont.
16. McFinley Mine, Ont.
17. Whitehorse Copper Mine, Yukon
18. Ketz River Mine, Yukon
19. United Keno Hill Mine, Yukon
20. Cantung Mine, N.W.T.
21. Treminco/Ptarmigan Mine, N.W.T.
22. Holden Mine, Wash. USA
23. Pend Orielle Mine, Wash. USA
24. Solution Gold (Druid) Mine, Colorado, USA

Advanced Exploration & Bulk Sample Projects

1. Goose Lake Gold Project, Nunavut
2. Jericho Diamond Project, Nunavut
3. Boston Gold Project, Nunavut
4. Ulu Project, Nunavut
5. Nicholas Lake Project, N.W.T.

Note: Many sites appear more than once in the above lists due to ongoing involvement.



Key Project Experience

Faro Mine Closure Planning Office

- Technical manager for ongoing closure planning studies.

Vannessa Ventures Ltd.

- Preparation of mine closure plan – Las Crucitas Project, Costa Rica

CIDA – PERCAN

- Preparation of mine reclamation costing methodology for Peru Ministry of Mines
- Technical training sessions on mine reclamation costing for Peruvian industry and government engineers.

Indian & Northern Affairs Canada, N.W.T.

- Giant Mine, ongoing engineering relating arsenic storage bulkheads and chamber water management,
- Snap Lake project, geotechnical review for Environmental Assessment,
- Estimation of mine closure costs for Diavik, Ekati, Cantung, Colomac, Giant & Ptarmigan mines.
- Training government staff in method of estimating mine closure liability.
- Recommendations on mine closure guidelines for mine permitting.
- Project manager/technical advisor for water management and site maintenance of the Colomac Mine.

Indian & Northern Affairs Canada, Yukon

- Pre-feasibility closure plan development, Mt. Nansen Mine,
- Estimation of mine closure costs on Brewery Creek, Mt. Nansen, Western Copper & Dublin Gulch mines.
- Preparation of guidelines on mine closure and discussion paper on reclamation security issues.

Public Works & Government Services

- Lead engineer (under sub-contract to SRK) for re-construction of the B2 Dam,
- Giant Mine, development of plan, budget and risk characterization for long-term care and maintenance,
- Discovery Mine, review of sediment management options for clay borrow pit.

Placer Dome Inc.

- Mine closure liability assessment of an operating gold mine in Ontario. This project included development and application of risk methodology for characterization of potential closure costs.

Silver Standard Resources

- Start of mine closure plan for the Silver Standard Mine in northern B.C.

Cominco Ltd.

- Mine closure liability assessment of Cerro De Pasco Mine, Peru.

Copper Beach Estates

- Geotechnical design of soil covers at the 2200 portal area at the former Britannia Mine.

Climax Canada Ltd.

- Preparation of mine decommissioning plan and cost estimate, Kitsault Mine.

Hudson Bay Mining And Smelting

- Environmental and mine closure liability assessment of 3 potential acquisitions.

Ontario Ministry of Northern Development and Mines

- Prepared the feasibility report; "Mine Assets In Reclamation Security".

Publications

1. Brodie, M. J., *Issues & Methods In Mine Reclamation Costing*, Canadian Institute, Vancouver, 2005.
2. Brodie, M. J. and Cronk, M. *Management of Arsenic Confining Bulkheads at Giant Mine*, 2003, Assessment and Remediation of Contaminated Sites in Arctic and Cold Climates, Edmonton, Alta.
3. Brodie, M. J. and Milburn, D. (2001), *The "RECLAIM" Model*; Northern Latitudes Mining Reclamation Workshop, Whitehorse, Yukon
4. Brodie, M. J. and Thompson, N. (2001), *Colomac Mine Site Maintenance & Closure Planning of an Orphaned Site*; Assessment and Remediation of Contaminated Sites in Arctic and Cold Climates, Edmonton, Alta.
5. Brodie, M. J. (1998): "*Acquisitions and Mine Closure Liability*". Canadian Mining Journal, Aug. 1998.
6. Brodie, M. J. (1994): "*Corporate Considerations In Mine Decommissioning*". Proceedings of District 6 Canadian Institute of Mining Annual General Meeting, Vancouver, B.C., October 11 - 15.
7. Brodie, M. J. and Chapman, J. T. (1993): "*Development of Rehabilitation Plans For Acid Rock Drainage Control at Two Closed Underground Mines*". Proceedings of the Seventeenth Annual British Columbia Mine Reclamation Symposium, Port Hardy, B.C., May 4 - 6.
8. Brodie, M. J. and Healey, P.M. (1993): "*Design and Installation of a Lined Mill-Effluent Containment Facility*". Geosynthetics '93 Conference, Vancouver, B.C., March, 1993.
9. Brodie, M. J., Robertson, A. MacG. and Gadsby, J.W. (1992): "Cost Effective Closure Plan Management for Metal Mines". Proceedings of the Sixteenth Annual British Columbia Mine Reclamation Symposium, Smithers, B.C., June 15 - 18.
10. Brodie, M. J. and Healey, P.M. (1992): *The Design and Installation of an Effluent Containment Facility*". Geotechnical Fabrics Report , Volume 10 Number 3, April.
11. Brodie, M. J., Broughton, L. M. and Robertson, A. MacG. (1991): "*A Conceptual Rock Classification System for Waste Management and a Laboratory Method for ARD Prediction from Rock Piles*". Second International Conference on the Abatement of Acidic Drainage, Montreal.
12. Chance, A.V. and Brodie, M. J. (1987): "*Rock Mechanics at the Westmin HW Mine*". CIM Convention.

Presentations

- CIDA PERCAN
 - Reclamation Cost Estimation – 2 day short course, , August 2006, Lima Peru
 - Introduction to PERU-RECLAIM – 2 day short course, October 2006, Lima Peru
- Introduction to Mine Reclamation, half day short course, May 2003, ARCSAC, Edmonton, Alta.
- Mine Technical Short Course, 5 days Oct/Nov. 2002, INAC, Iqaluit, Nunavut, (one of four presenters)
- RECLAIM Model and Mine Reclamation, ½ short course, Nov. 1997 and Nov. 2000, Yellowknife, NWT
- Mine Decommissioning and Reclamation Workshop, April 1994 CIM Convention, Toronto, Ontario, (one of five presenters)
- Short Course – Closure Cost Management for Mines, September 1992, 2nd Int'l Conference on Environmental Issues and Management of of Waste In Energy and Mineral Production, (one of four presenters).