



Province of  
British Columbia

Ministry of  
Energy, Mines and  
Petroleum Resources

# MEMORANDUM

TO: F. Hermann  
G. McLaren  
J. Errington  
R. Meyers

886554 August 18, 1995  
File Number: 15140-15/Fish Lake

VOS → FISH  
LK.

**RE: REVIEW OF THE PROPOSED FISH LAKE COPPER PROJECT  
UNDER THE ENVIRONMENTAL ASSESSMENT ACT**

Enclosed for circulation to key members of your staff is a package prepared by the recently created Environmental Assessment office, on Taseko Mine's Fish Lake Copper Project. Details of the contents of the package are contained in the enclosed letter from Norm Ringstad dated August 10, 1995.

Mr. Ringstad has scheduled a meeting for Williams Lake on September 7th to discuss the Draft Project Report Specifications. It is envisioned that any comments or concerns that you or your staff have regarding this report or project should be forwarded to me so that they may be presented to the project committee. I am planning to attend the first meeting. Therefore, to assist in my preparation any comments even of a preliminary nature, would be useful and appreciated. Alternatively, EMPR may request that we have additional representation besides myself on the committee.

I would like you to consider the question of who or what agency should chair the Public Advisory Committee. Ms. Darlyne Brecknock of the Cariboo Regional District was requested to chair the committee in 1993. Also, what staff member(s) would you like to have receive the information on the project as it proceeds through this review?

I look forward to your comments.

*N. Wood*

*EB*  
Ed Beswick  
Regional Manager  
Prince George

EB:njw

cc: D. Lieutard  
R. Smyth  
T. Schroeter

AUG 23 1994

Geological Survey Branch  
MEMPR

VGS → FISH LAKE



Province of British Columbia

GEOLOGICAL SURVEY BRANCH

Ministry of Energy, Mines and Petroleum Resources

# MEMORANDUM

Mailing address: Parliament Buildings, Victoria, British Columbia V8V 1X4 Telephone: (604) 952-0402 Fax: (604) 952-0381

To: Brian R. Braidwood  
Project Evaluation Coordinator  
Mine Development Assessment Process  
Mine Review and Permitting Branch

Date: Oct. 20, 1993  
File No.: 15140-20/Fish Lake

Re: Taseko Mines Ltd., Fish Lake Project Prospectus

OCT 25 1993

Geological Survey Branch

MEMPR

Further to a review of the above captioned report by the undersigned and by T.G. Schroeter, Senior Regional Geologist, the Geological Survey Branch offers the following comments:

## Section 2.0, Geology and Mineralization:

### 2.1 Regional Geological Setting

This section is adequate for the purpose of this report, although it does not stress the fact that the Yalakom Fault is a major regional feature not far from the Fish Lake deposit which has a demonstrable dextral strike slip displacement of about 115 km. Structures related to this major fault may have provided controls which localized the porphyry system. They may also have contributed to the elevated levels of mercury, arsenic and antimony in the deposit, as known at other localities along or near the Yalakom Fault.

### 2.2 Property geology and mineralization

A summary description of the geology, rock alteration and mineralization is presented but is severely undermined by the lack of accompanying maps and cross-sections. Any further attempt to describe the geology of this deposit should include:

- a simplified regional geological map clearly showing the location of the deposit in relation to regional geological features
- a geological map of the mineral deposit and its immediate vicinity accompanied by representative cross-sections. This map and cross sections should clearly show all rock types, faults, and other structural features, rock alteration and grade distribution. The distribution of the various types of rock alteration is of utmost importance as it relates to the acid generating potential of any mined material. In this respect, mention is made on page 2-4 of a pyrite halo coextensive with a zone of phyllic alteration. How much of this material has been included in the acid-base accounting tests, and how much will be mined? Will it, wholly or in part, be disposed of in waste dumps or used for construction purposes, such as for roads or tailings dams? Tables 3.1 and 3.2 summarize acid-base accounting results but are not accompanied by a map clearly showing the location of the 24 samples tested in relation to the projected pit outline. This information should also be provided.

### 2.3 Mineral Inventory

A summary description of how two independent calculations of the mineral inventory were done is provided. This is not supported by a needed map and cross-sections indicating how the polygons used in these calculations relate to the internal geology and structure of the deposit. This information should be provided.

Cross-sections should also be provided, illustrating external and internal ore/waste boundaries relative to the various cut off grades used, as determined by metal prices, gold and copper recovery rates, and international exchange rates assumed. These cross-sections should also show the distribution of deleterious elements such as mercury, antimony and arsenic as related to ore and waste, and thus to the possible removal, disposal or use of such material.

Less specific comments pertaining to other sections are:

- The price sensitivity of the project should be tested by using at least two, preferably three, assumed prices for copper and gold. These could significantly affect mineable reserves and the resulting mine plan.
- Aboriginal, Heritage and Land Use issues have also been referred to at various points in the report. These may become critical issues in the permitting of this project and should be dealt with more fully in any later reports.

We appreciate the opportunity of reviewing this document and providing our comments.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'V.A. Preto', written in a cursive style.

V.A. Preto

VAP:ikh

cc: W.R. Smyth  
T.G. Schroeter  
R.E. Meyers

→ FISH LK.



Province of British Columbia  
GEOLOGICAL SURVEY BRANCH

Ministry of Energy, Mines and Petroleum Resources

# DRAFT MEMORANDUM

Mailing address: Parliament Buildings, Victoria, British Columbia V8V 1X4 Telephone: (604) 952-0402 Fax: (604) 952-0381

To: Brian R. Braidwood  
Project Evaluation Coordinator  
Mine Development Assessment Process  
Mine Review and Permitting Branch

Date: Sept. 29, 1993  
File No.: 15140-20/Fish Lake

Re: Taseko Mines Ltd., Fish Lake Project Prospectus

*MMS → Tom S.  
Comments please  
before send to Ron  
MOAP.*

We have reviewed the above captioned report as requested in your letter of September 20.

With reference to Section 2.0, Geology and Mineralization, the Geological Survey Branch offers the following comments:

### 2.1 Regional Geological Setting

This section is adequate for the purpose of this report, although it does not stress the fact that the Yalakom Fault is a major regional feature not far from the Fish Lake deposit which has a demonstrable dextral strike slip displacement of about 115 km. Structures related to this major fault may have provided controls which localized the porphyry system.

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We appreciate the opportunity of reviewing this document and providing our co:

Yours sincerely,

W.R. Smyth, Ph.D.  
Chief Geologist

FEED FAX THIS END

**FAX**

To: Tom Schroeter

Dept.: GSB

Fax No.: \_\_\_\_\_

No. of Pages: 1

From: Paula

Date: Please Review

Company: \$ comment

Fax No.: E-mail or fax

Comments: OK. Thnx

Paula

Post-it<sup>®</sup> fax pad 7903E

70% rx. = acid-consuming; rel. high carbonate min. conc.

Pg. 1-6 Quintana Minerals Ltd. (1973) drilled in pyritic rx. north (east) of the presently known deposit is ARD potential?

Pg. 2-3 - QFP/diabase dykes - dilution?

Pg. 2-7 - Min. Inv. - 'best' cut-off @ .5 (% Cu + g/t Au)

Pg. 3-1 Fundamental assumptions used in assessing economics  
Au = \$US 350/oz, Cu = \$US .00/1b  
+ exchange rate \$ CDN .78 to \$US 1.00

~~Characteristics (ARD) of each rock type~~

Pg. 3-10 no mention of deleterious elements in conc.  
i.e. As, Sb, Hg

Pg. 4-2 % As ✓ % Hg ✓, % Sb ✓ plus Table 5.1

Pg. 4-3 work indices 16.7 to 18.2 to 19.1  
upper → lower

~~Pg. 8-27~~ Heritage studies - '93 study - need salvage excavation  
p. 9-10 9.110

Aboriginal issues / Native land cl.

OSC '93 studies - airborne, fills, surficial geol.

Pg. 8-27 Other Land Uses - status of CRUP (PAs) - Big area.

OCT 8 1993

I N T E R O F F I C E M E M O R A N D U M

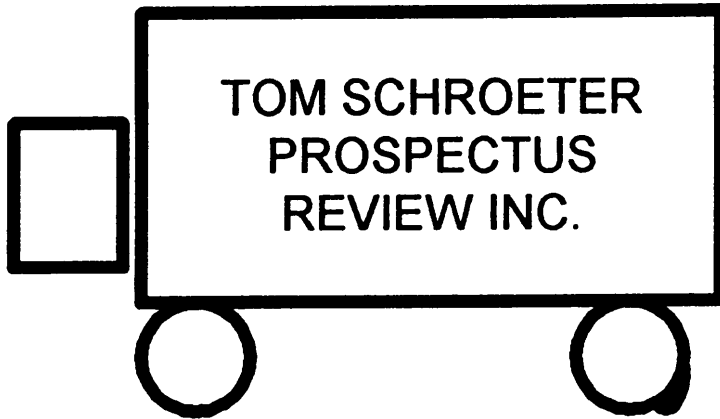
Geological Survey Branch  
MEMPR

Date: 05-Oct-1993 10:02am PDT  
From: Tom Schroeter  
TSCROETER  
Dept: Energy, Mines & Petroleum Res.  
Tel No: 660-2812

TO: Paula Ashby ( PASHBY )  
Subject: RE: Fish Lake Project Prospectus

By 5-ton truck? Thanks, Tom

*Ashby!*  
*T.*





Province of  
British Columbia

Ministry of  
Energy, Mines and  
Petroleum Resources

Government Buildings  
Victoria  
British Columbia  
V8V 1X4

Mine Review and Permitting Branch  
4th Floor, 1810 Blanshard Street, Victoria, B.C., V8V 1X4

September 20, 1993

Mr. Ron Smyth  
Chief Geologist  
Geological Survey Branch  
Ministry of Energy, Mines and Petroleum Resources  
5th Floor, 1810 Blanshard Street  
Victoria, B.C.  
V8V 1X4

RECEIVED
GSB - EMPR
SEP 21 1993
CHIEF GEOLOGIST

Phone - 952-0478  
Fax - 952-0489

File: 15140-20/Fish Lake

FILE # ?
Please File _____
Draft Reply <u>Vic Pardo</u>
Refer to _____
BF Date _____
Other _____

Dear Mr. Smyth:

**RE: TASEKO MINE LTD. - FISH LAKE PROJECT PROSPECTUS**

Please find enclosed for your review ~~and comment~~, a copy of Taseko Mines Ltd.'s Fish Lake Project prospectus submission. The project has now entered the Mine Development Assessment Process (MDAP) for review, and I have enclosed a brochure on the process for your information.

The proposed Fish Lake project is approximately 125 kilometres southwest of Williams Lake, British Columbia. The project site is accessible by travelling west from Williams Lake via Highway 20 to Lees Corner, south from Lees Corner to the Taseko River crossing, along the river to Fish Creek then up the creek to Fish Lake. Estimated reserves are currently calculated at 1.28 billion tons of 0.22% copper and 0.43 % g/t of gold, with 60,000 t/day to be processed using a conventional flotation method. The company plans an open pit method to mine the porphyry deposit and a land based tailings disposal site.

The objective of the prospectus review is to determine the environmental, technical or policy issues that need to be addressed in the company's Application for a Mine Development Certificate. A certificate is required by the company before it can obtain the permits and licences necessary to construct and operate the mine. The prospectus review is being conducted by provincial, federal and local governments,

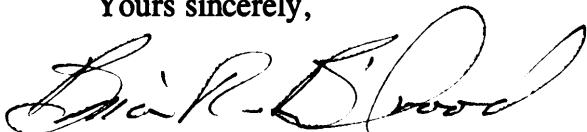
as well as aboriginal groups, stakeholders, special interest groups and the general public. As part of the public consultation process, a Fish Lake Public Advisory Committee will be established. The purpose of the committee will be to provide a forum for Taseko Mines to update the public on the project, and for members to raise any issues or concerns they have on various aspects of the project. Invitations to sit as a member on this committee will be extended by the province to selected representatives of local and municipal governments, environmental organizations and stakeholders.

Additionally, a public and aboriginal consultation program is planned starting with company sponsored workshops in Williams Lake and at locations near the mine site area. Advertisements will be placed in local papers in the near future announcing the details of the meetings.

Please forward any comments you have on the prospectus to me at the above address by **November 12, 1993**. For those agencies with regional and/or provincial or federal coordinators involved in the review of this project, would you please ensure that your review and submission of final agency comments by the review deadline, reflects your agency's overall position. All comments will be compiled into a Terms of Reference for use by Taseko Mines in the development of its Application for a Mine Development Certificate. Issues raised by reviewers that are of a strategic nature should be presented in a separate section from those issues which are permit and license related. Comments should include requests for additional clarification, information and data, as well as additional studies the company should undertake. If additional studies are requested, the type and level of detail should be specified. The company has agreed to conduct a field tour of the site as well as provide a walk-through of the prospectus for review participants early in the review process. Information regarding these activities will be forwarded to you in the near future.

If you have any questions regarding the proposal, the Mine Development Assessment Process, or if you require additional copies of the proposal, please contact me at 952-0478, in Victoria.

Yours sincerely,



Brian R. Braidwood  
Project Evaluation Coordinator  
Mine Development Assessment Process

BB:mm



**Enclosures: Fish Lake prospectus  
MDAP brochure**

**cc: D. Pow  
G. Alexander**



Mailing address: Parliament Buildings, Victoria, British Columbia V8V 1X4 Telephone: (604) 952-0382 Fax: (604) 952-0381

To: W.R. Smyth  
From: Tom Schroeter  
Senior Regional Geologist  
Date: October 14, 1993  
Subject: Taseko Mines Ltd. FISH LAKE Project Prospectus

---

I have reviewed the above noted prospectus and concur with Vic Preto's comments in his draft letter dated September 29, 1993 (for your signature). Additional comments/questions relative to a further submission are:

1. Pg. 1-6: How much of the pyritic halo (e.g. Guiltana, 1973) will be disturbed, especially on the north and east sides of the deposit? What will be the effects on the potential for acid rock drainage and how will remedial factors be taken?
2. What would be the relative proportions of ore/waste (i.e. dilution) mined from the QFP and diorite dykes (with reference to a map and/or cross section)?
3. Pg 2-7: Mineral inventory tables - sections should illustrate the various cut-off grades used (especially with respect to variable metal prices).
4. Pg 3-1: Fundamental assumptions used in assessing economics should show 2 or 3 metal prices and exchange rates.
5. Concentrate/tails grade: deleterious elements (Hg, Sb, As). These should be mentioned (e.g. pg. 3-10). Is there any zoning to these elements (in the proposed pit); if so, a section should be supplied.
6. Pg 4-3: The work indices increase with depth. This is relatively good news for the early years of operation, but may have a significant negative impact in the later years of mining.

7. Heritage studies: results of the 1993 study need to be reviewed and if warranted, an instructed salvage excavation program may be required (pg. 9-10).
8. Aboriginal issues: the involvement of the local First Nations tribes is critical to the land use scenario (incl. Native Land Claims).
9. Other Land Uses (pg. 8-27): update/clarification required re: status of LRUP in Big Creek area.

*G. McArthur for T. Schroeter*

FISH LAKE



Province of  
British Columbia

Ministry of  
Energy, Mines and  
Petroleum Resources  
GEOLOGICAL SURVEY BRANCH

# MEMORANDUM

Suite 301, 865 Hornby Street, Vancouver, B.C. V6Z 2G3

Telephone: (604) 660-2708

Fax: (604) 775-0313

MEG LUNCHEON TALK

March 4/92

FISH LAKE

Notes: Lane

Speaker: Nadia Cairn, Taseko Mines Ltd.

920/041,  
042

- JV between Taseko Mines Ltd, Cominco & Cascade Investments.
- Fish lake deposit is located approx. 170 km southwest of Williams Lake.
- land holdings consist of 165 two post claims & 15 modified grid claims (overlaid)

### History

- mid-1930s: mineralized boulder trains led to the discovery of the deposit
- 1960s: Phelps Dodge performed RC drilling (1965: 2,200 metres in 18 holes)
- 1966: Phelps Dodge allows claims to lapse; ground restaked by Taseko Mines Ltd.
- 1969: Taseko Mines, Amax: 1265m percussion drilling & 1036m ddh
- 1979: Bethlehem Copper core drilling totalled 6,000 metres in 23 holes
- 1980: Cominco took over Fish Lake Deposit from Bethlehem
- 1980s: Cominco conducted geophysical & geochemical surveys, total of > 13,000 in ddh and m
- 1990: metallurgical assessment
- late 1990: Taseko Mines Ltd. & Cominco settle legal dispute and Taseko becomes operator; former directors of Continental Gold Corp (of Mt. Milligan 'fame': Hunter, Dickenson, Forster & Franzen) gain control of Taseko
- 1991: Taseko completes 7,500 m ddh, in 10 deep large dia. holes (to avg. depth of 770m) and extensive metallurgical testing; expanded deposit reserves to 600 million tons @ 0.28% Cu and 0.018 oz Au/ton (0.86% Cu equiv.)
- to date: 33,642 metres in 178 holes; (729,000 metres of drilling define the deposit)  
50 line km each of IP, Mag & soil geochemistry, IP anomaly measures 3 km X 4 km  
diamond drilling defined a vertically oriented, cylindrical ore body 900m in diameter.

### Setting

- deposit lies N of NW trending Yalakom-Taseko transcurrent fault - structures relating to this major break may have played a part in controlling the emplacement of the Fish Lake deposit.
- virtually NO outcrop .. deposit geology based entirely on information obtained from drill core. (numerous bench plan maps used to depict geology)

## Geology

- mapped seven distinct phases of qtz dioritic intrusion
  - 2 early phases of crowded plag. & plag-phyric diorites
  - "middle" phases: QFP dyke (E-trending & S dipping), plagioclase porphyry diorite & intrusive breccia related genetically to QFP? (locally intensely bi alt.) & enriched in cpy
  - 2 late/post + ore phases plag. porphyritic dyke & plag. + hornblende porph. dyke (most prominent in SE area of deposit)
- intrusive phases occur primarily in upper half of deposit; in lower part volcanic rocks predominate & consist of andesitic to dacitic debris flows & ash tuffs
- phase 1 & 2 diorites appear to widen toward the S part of the deposit
- Fish Lake Thrust forms base of deposit (poss. related to Hungry Valley Thrust to SE?) *clastic rocks below*
- Carraumba Fault, a vertical fault, forms S edge of deposit, although mineralization was detected south of the structure during 1991 drilling (more testing to be done in 1992).  
many steeply east dipping minor faults offset volcanic stratigraphy & QFP dykes within the deposit.
- 5 alteration types identified (ser. + carb: dominates, esp. in upper intrusive part of deposit; bi + mgt + chl; qz + ca; chl + cal; qtz + chl + mgt)
- ser + carb alteration dominates, esp. in upper intrusive part of deposit
- bi-alteration is most common in lower part of deposit associated with volcanics. *1*
- a gypsum line in the deposit is at ~ 100m depth
- an anhydrite line in the deposit occurs at about a 450m depth
- total sulphide content in deposit is 3% ✓ *outer 'halo' = 5 to 7% py*
- py accounts for 2% on average (locally reaches 10%); cpy avgs 1%; py:cpy = 2:1
- minor sulphide minerals include Bo, TT, DIG, covellite, chalcocite & Mo (at depth in veinlets in volcanics)
- sulphide mineralization occurs as dissemination, blebs & clots and fracture controlled/stringers. stockwork zones (esp. assoc. with ser-carb-qtz alt).
- specularite also occurs as well as magnetite
- Au occurs as individual grains on cpy-py grain boundaries (up to 0.1 x mm dia.)
- metal recoveries: study commissioned by Cominco
  - 90% for Cu
  - 80% for Au*Ag in tetra-ferr*
- work index of ore in 10-11 range. *(up to 15?)*
- high ph ore - acid consuming not acid generating
- proposed tailings storage to be on site — *Fish Lk.*
- 1992 expl. plans - diamond drill test other areas of large IP anomaly: program to start immediately!

FISH IK



Province of British Columbia

Ministry of Energy, Mines and Petroleum Resources

GEOLOGICAL SURVEY BRANCH

# DRAFT MEMORANDUM

Mailing address: Parliament Buildings, Victoria, British Columbia V8V 1X4 Telephone: (604) 952-0402 Fax: (604) 952-0381

To: Brian R. Braidwood  
Project Evaluation Coordinator  
Mine Development Assessment Process  
Mine Review and Permitting Branch

Date: Sept. 29, 1993  
File No.: 15140-20/Fish Lake

Re: Tasako Mines Ltd., Fish Lake Project Prospectus (Draft)

1008 → Tom S.  
Comments please  
Reviewed by Vic) before  
1008.

We have reviewed the above captioned report as requested in your letter of September 20.

With reference to Section 2.0, Geology and Mineralization, the Geological Survey Branch offers the following comments:

Good point!  
- also possible reason for high VGS  
Sb, Hg, As.

Done - to be part of CIM Porphyry Sequel paper VGS

I have seen these sections and calculations during my Aug. 24 visit VGS

DRAFT

Comments from Paul S.(?)

### 2.1 Regional Geological Setting

This section is adequate for the purpose of this report, although it does not stress the fact that the Malakom Fault is a major regional feature not far from the Fish Lake deposit which has a demonstrable dextral strike slip displacement of about 115 km. Structures related to this major fault may have provided controls which localized the porphyry system.

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We appreciate the opportunity of reviewing this document and providing our co.

Yours sincerely,

W.R. Smyth, Ph.D.  
Chief Geologist

hon, I haven't seen the prospectus, so I can't comment too much more. I would be pleased to review a follow-up submission. TOM  
Sept. 30/93

FEED FAX THIS END

<b>FAX</b>	
To:	Tom Schroeter
Dept:	GSB
Fax No.:	
No. of Pages:	1
From:	Paula
Date:	Please Review
Company:	& comment.
Fax No.:	E-mail or fax
Comments:	OK Thnx Paula
Postnet:	