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A GEOLOGICAL STUDY OF THE MOBERLY  
MOUNTAIN SILICA PROPERTY

FOR: MOUNTAIN MINERALS CO. LTD.

BY: T. SHANKS.

MINERAL RESOURCES BRANCH  
ASSESSMENT REPORT  
NO. \_\_\_\_\_

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## ABSTRACT:

The Moberly Mountain silica property owned by Mountain Minerals is located 5 miles northeast of Golden, British Columbia.

The terrain in the area is rugged, with its structure being typical of the middle and southern Rocky Mountains, which are bounded by faults. A homocline containing alternating beds of quartzite and limestone, ranging in thickness from 1600' to 2800' strikes  $305^{\circ}$  to  $320^{\circ}$  across the entire property, dipping  $74^{\circ}$  to nearly vertical to the northeast.

Grab sampling conducted in several areas on the property has yielded chemical analyses in excess of 99.5%  $\text{SiO}_2$ . Further sampling as well as one 500 foot drill hole was also completed in the area, the chemical analyses for which have not yet been completed.

This study has shown the Moberly Mountain silica deposit to be a viable source of silica for the production of silicon carbide, silicon metal and glass manufacture, based on its quality, quantity and accessibility.

## INTRODUCTION:

The purpose of this study was to determine the quality and quantity of quartzite contained in the claims owned by Mountain Minerals in the Golden area. This was established by a series of chained traverses across the area for which a geological map (included in this report) was based. A 500 foot diamond drill hole coupled with grab sampling was also completed for a specific area of interest within the property.

## LOCATION:

The Moberly Mountain silica property is located approximately 5 miles northeast of Golden ( $51^{\circ} 17' \text{ N } 116^{\circ} 58' \text{ W}$  on NTS map sheet 82N/7  $W\frac{1}{2}$ ) in the east-central portion of British Columbia. It includes 42 units contained in the Ralph (20 units), Contact (6 units), Sandy (15 units) and Corner (1 unit) mineral claims.

TO WEST SEE MAP 82 N/6 E

MOBERLY PK.

SANDY  
80 (8)

SANDY  
MC  
2825 M  
KATHY

2826 M  
2826  
KATHY

RALPH MC  
(20 Units)

2827 M  
KATHY

2828 M  
KATHY

2829 M  
KATHY

2830 M  
KATHY

CONTACT MC  
(6 Units)

LOT  
2596  
BC 1727

SANDY MC  
(15 Units)

Corner MC  
1 Unit

CORNER  
MC  
4121 B  
JOHN

4122 B  
JOHN

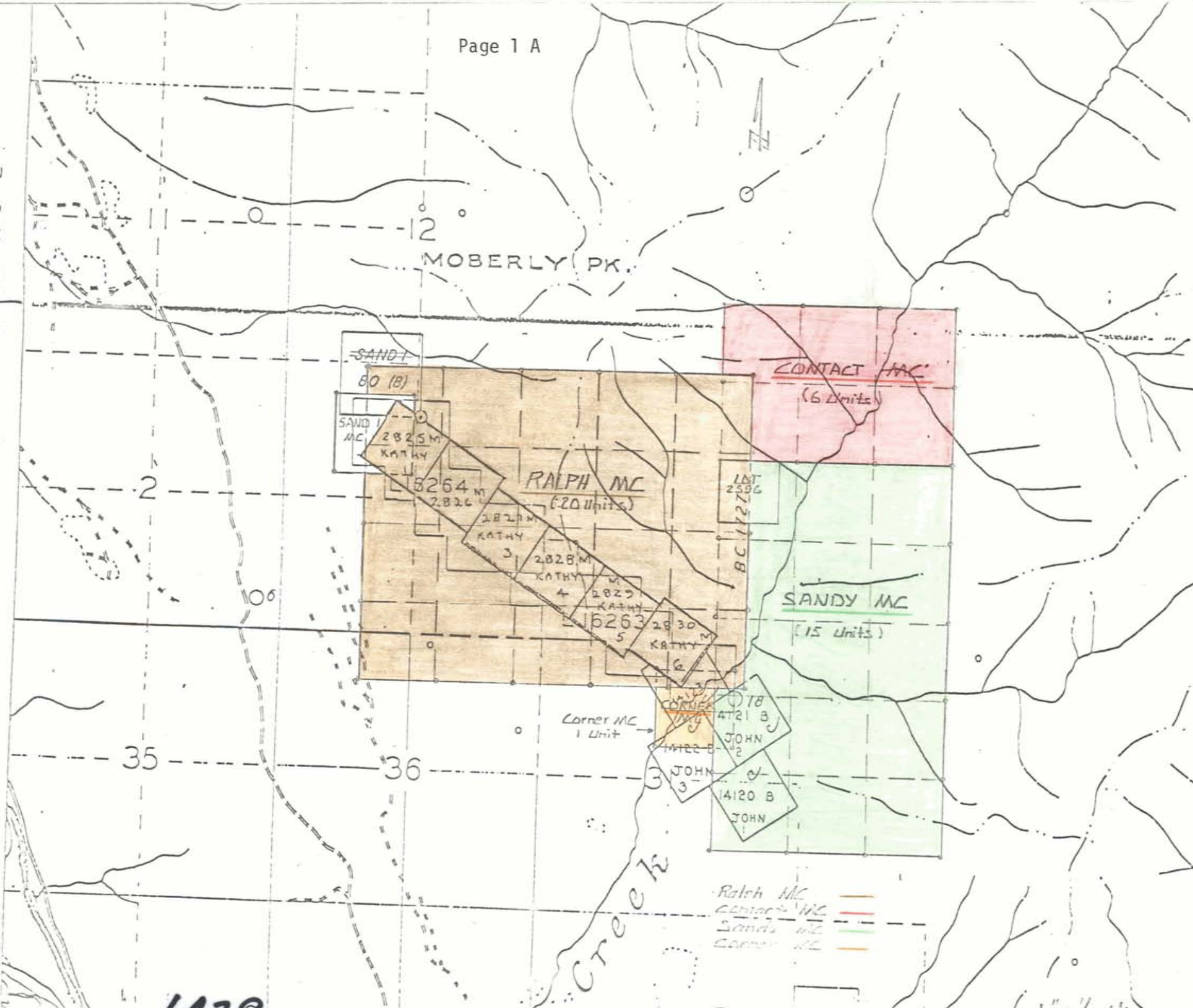
4123 B  
JOHN

4120 B  
JOHN

Ralph MC ———  
 Contact MC ———  
 Sandy MC ———  
 Corner MC ———

6479

1" = 1/2 mi.



Accessibility to these claims is gained by means of two roads which are north branches of the "North Bench Road" which intersects the Trans Canada Highway one mile east of Golden. The first road follows Hospital Creek through the Corner, Sandy and Contact mineral claims, while the second (mine road) runs north through the western portion of the Ralph mineral claim to a sand pit at an elevation of 5,000 feet, near the centre of Section 1, Township 28 N, Range 22, West of the 5th Meridian.

PHYSIOGRAPHY:

The terrain in the map area is rugged with the lowest elevation along Hospital Creek at 4500 feet and the highest elevation at 7,700 feet on Moberly Peak, over a horizontal distance of 5,500 feet. The grade of slope on the mountain ranges from 23<sup>o</sup> to 32<sup>o</sup> usually with a thin veneer of over-burden in the lower portions, to nearly vertical uncovered cliffs toward the peak. The property is bisected in a south westerly direction by Hospital Creek which supplies much of the area's water needs.

Frequent light to moderate intermittent precipitation occurs in the summer, while snow prevails from November until March.

GEOLOGY:

The structure of the area is typical of the middle and southern Rocky Mountains which are bounded by faults, many of which are local thrusts and many others are nearly vertical, yielding structural terraces.

Contact Creek is probably the major low angle thrust in the area which extends under Moberly Mountain from the northeast and represents what could be a fault zone several hundred feet wide of extreme complexity. As a result of this thrust, limestone to the north-east of the zone is typically folded. Another characteristic pattern associated with this major fault type is also evident, the multiple subparallel faults. A single fault trace may be followed into numerous branches some of which may rejoin the master fault or die out along bedding. Slices are formed in this fashion and slice after slice is stacked on top of one another in such zones. Thrusting of the sort

observed in the Moberly Mountain area can be described as imbricate, when a number of subparallel thrusts are found in a belt.

Tear and shear faults are also found in the map area. They are of vertical orientation and are formed as the mountain fronts are rotated to a vertical position during uplifting and thrusting. Tear faults are oriented normal to the direction of movement of the thrusts, whereas shear fractures are oriented approximately  $30^{\circ}$  to the direction of movement.

The structure of the area represents a flexure or a homocline (the meaning of which is used here as a general term for any block of bedded rocks all dipping in the same direction). This may be represented in terms of an isocline, a monocline, or one limb of an anticline or syncline. The field data is insufficient to show which of the categories is represented, the only ascertained element being a dip persisting in one direction. In this case the dip ranges from  $73^{\circ}$  to nearly vertical in a northeasterly direction. The homocline consists of alternating beds of limestone and quartzite striking  $305^{\circ}$  to  $320^{\circ}$  and ranging in true thickness from approximately 1600 feet to 2800 feet in the map area.

#### MINERALIZATION:

The only potentially economic mineralization observed within the map area is quartzite. The quartzite found on the property is a sedimentary deposit known as the "Wonah Quartzite", probably of Ordovician age and is found as two distinct members. The first is a friable quartz sandstone which comes in contact with limestone to the southwest in the area of the sand pit in the pre-existing Kathy 1 claim (now included in the north-western portion of the Ralph mineral claim) with a maximum thickness of 700 feet and a minimum thickness observed of some 300 feet. It continues southeasterly along strike through the Ralph, Corner and at least a portion of the Sandy mineral claim and thus for a strike length of at least 10,500 feet. The remaining quartzite in this 1600 foot to 2000 foot thick zone is hard competent quartzite and is separated from another zone approximately 2800 feet thick of the same lithology by a 2000 foot thick band of limestone. The hard quartzite can be described as frosty white

sedimentary quartzite with a clastic texture containing fine, well-rounded polished grains 1/8 - 1/4 mm in diameter. Very competent bonding allows breaking to occur through the quartz grains. Minor iron staining occurs along some fracture planes and is interstitial to the quartz grains in some small sections. Chemical analysis has shown the quartzite to contain greater than 99.5% SiO<sub>2</sub> in some of the areas sampled.

TEST WORK:

In 1975 grab samples were taken along the Hospital Creek road in the north western corner of the Sandy mineral claim by A. Jones of Hanna Mining Company. These were then chemically analysed and the results are as follows:

SiO <sub>2</sub>	Fe <sub>2</sub> O <sub>3</sub>	CaO	Al <sub>2</sub> O <sub>3</sub>	Ign. Loss	Sample No.
99.61	.07	.005	.13	.01	25652 #1
99.64	.06	.005	.10	.02	25653 #2

In 1976 bulk samples were taken at 3 locations in the north western corner of the Ralph mineral claim within the sand zone. These too were chemically analysed and the results \* are as follows:

	Sample 1	Sample 2	Sample 3
Total weight of sample	110 lbs.	90 lbs.	100 lbs.
Loss on Ignition	0.19	0.11	0.10
Silica as SiO <sub>2</sub>	99.24	99.45	99.50
Iron as Fe <sub>2</sub> O <sub>3</sub>	0.23	0.28	0.20
Aluminum as Al <sub>2</sub> O <sub>3</sub>	0.08	0.08	0.05
Calcium as CaO	0.02	0.02	0.01
Magnesium as MgO	0.02	0.01	0.01
Sodium as Na	0.02	0.01	0.01

\* Note: All results reported in weight percent.

Three test holes were drilled in quartzite in 1977 on the pre-existing lot 2596, now included in the northwest corner of the Sandy and the east-central portion of the Ralph mineral claims. Test holes DDH - M1 and DDH - M2 were terminated at 21 feet and 17 feet respectively as a result of poor core recovery. Test hole DDH - M3 was drilled a distance of 500 feet at -43° bearing 205°. Drill core from this hole was logged

(drill log attached), split and one-half of the core was sampled at 50 foot intervals. Samples were submitted to Hanna Mining Company, Wenatchee, Washington for analysis. A grid sampling pattern was also undertaken in an area 2000 feet by 1600 feet surrounding drill hole DDH - M3. Samples were taken on 400 foot centers and these samples were halved and also submitted to Hanna Mining Company for analysis. (The remainder of the split core is in storage at the location of the company house near Brisco, British Columbia, while the remaining grab samples are being stored by Mountain Minerals in Lethbridge, Alberta.)

CONCLUSIONS:

Based on its quality and quantity the Moberly Mountain silica deposit could be a viable source of silica for the production of silicon carbide, silicon metal and glass manufacture. Previous chemical analyses have shown that silica from this property meets all chemical specifications for all of the above categories. Due to the semi-sugary texture of this rock it is thought that any of contained impurities such as the small amounts of iron staining in some of the drill core samples can easily be removed by washing. Since the silica used in the production of silicon metal must be of a certain size fraction, (+1 to -4 inches), the physical nature of this quartzite will facilitate easy crushing. Concern over producing excessive amounts of undersized fractions is considered immaterial due to the quantity as well as the accessibility of the ore.

T. Shanks.  
29 September, 1977.





# Drill Hole Log

**COMPANY** Mountain Minerals Ltd.      **PROPERTY** Moberly Silica Property      **Section No.**      **HOLE No.** DDH - M3

Started	Bearing S25W	Lat.	Collar El. 5300'	Logged by T. Shanks	Date Aug. 23/77
Completed	Angle from Horiz. 43°	Dep.	Bottom El. 4960'	Remarks	
Driller Phil Whitney PW Drilling	Length 500	Location pre-existing 2596	Lot Level		

Footage		Interval	RECOVERY		Graphic Log	DESCRIPTION	Sample No.	From - To	Interval	ASSAY		
From	To		Ft.	%								
Collar	50'					frosty white sedimentary quartzite - clastic texture - fine well rounded polished grains (1/8 - 1/4 mm) - very competent bonding - breaking occurs through grains - minor iron staining along some fracture planes.						
50'	100'					" "						
100'	150'					" "						
150'	200'					" "						
						- slightly more iron staining than above.						
200'	250'					" "						
						- iron staining almost completely disappeared.						

ROUNDER PRINTING

# Drill Hole Log

COMPANY

PROPERTY

Section No.

HOLE No.

DDH - M3

Started	Bearing	Lat.	Collar El.	Logged by	Date
Completed	Angle from Horiz.	Dep.	Bottom El.	Remarks	
Driller	Length	Location	Level		

Footage		Interval	RECOVERY		Graphic Log	DESCRIPTION	Sample No.	From - To	Interval	ASSAY		
From	To		Ft.	%								
250'	300'					" - iron staining along some fracture planes (as in samples #1,2,3) and also interstitial to the quartz grains in some portions.						
300'	350'					" - iron staining precipitated interstitial to quartz grains is absent in this sample.						
350'	400'					" - iron precipitated in some small sections of this sample interstitial to the quartz grains.						
400'	450'					" minor amounts of iron staining precipitated along fracture planes. (as in samples 1, 2, 3, & 6).						
450'	500'					"						

STATEMENT OF QUALIFICATIONS

I, Sanford Wise, of 13 Nevada Place, Lethbridge, Alberta, am a graduate geologist, having received a BSc degree in Geology from the University of New Mexico, Albuquerque, New Mexico, U.S.A. in 1961. I have been a member of the Society of Mining Engineers of the American Institute of Mining, Metallurgical, and Petroleum Engineers since 1966. I have been employed as an exploration geologist by Placer Development Ltd. (Canex Placer) from 1962 - 1964, and as a mine geologist at Placer's Endako Mines Division from 1964 - 1966. I have been employed as a mining engineer/production superintendent by Baroid Division of NL Industries (Baroid of Canada, Ltd.) from 1966 - 1976. I have been employed as exploration manager of Mountain Minerals Ltd., a Lethbridge, Alberta based company, since February, 1976.

The report entitled "A Geological Study of the Moberly Mountain Silica Property" and the diamond drilling carried out on the Moberly Silica property was performed under my direction by Mr. T. Shanks, 1977 graduate, Honors Geology graduate from Queens University, Kingston, Ontario. This work, and the report and map preparation, was conducted between 24 June and 4 October, 1977.

  
Sanford Wise

October, 1977.

MOUNTAIN MINERALS Co. LTD  
 GOLDEN - SILICA  
1977 EXPENSES TO OCTOBER 1, 1977

1					
2	DIRECT LABOR -	TIM SHANKS			
3		JUNE 24 TO OCTOBER 4, 1977		3290	80
4	PAYROLL BURDEN (C.P.P. & U.I.C.)			123	70
5	H. ALLEN DIAMOND DRILLING LTD.			1261	200
6	FILM PROCESSING				747
7	JANFOLD WISE-EXPENSES				
8		GOLDEN GATE MOTEL		183	13
9		EXPENSE REPORT - AUG 4 - 14		348	10
10		EXPENSE REPORT - JULY 27 TO AUG 4		166	06
11		EXPENSE REPORT - JULY 19 TO 22		157	60
12		EXPENSE REPORT - JUNE 27 - 28		342	58
13	TIM SHANKS - EXPENSES				
14		EXPENSE REPORT - JULY 3 - 24		147	81
15		✓ - ✓ - JULY 24 - AUG. 14		146	50
16		✓ - ✓ - AUG 14 - 28		186	61
17		✓ - ✓ - AUG. 28 - SEPT 3		228	35
18		✓ - ✓ - SEPT 3 - 10		238	35
19		✓ - ✓ - SEPT 10 - 30		375	59
20	THOMPSON & NEVILLE LIMITED - LEASE G.M.C. - AUG			267	50
21					
22				- SEPT	267
23	B.C. HYDRO - FINAL				2367
24	TOTAL EXPENSES				<u>1911332</u>
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					

H. ALLEN DIAMOND DRILLING LTD.

TELEPHONE 378-4494

P.O. BOX 1397  
MERRITT, B.C.  
VOK 2B0.

INVOICE NO. 318.

Sept. 1, 1977.

To: Mountain Minerals Ltd.,  
Box 700,  
Lethbridge, Alberta. T1J 3Z6.

In Account With:

H. Allen Diamond Drilling Ltd.,  
Box 1397,  
Merritt, B.C. VOK 2B0.

This invoice is for drilling at Golden, B.C.

Hole No. M1-77 core drilling from 0 to 29 ft. - 29 ft. @ \$12.00 per ft.....	\$	348.00
Hole No. M <sup>2</sup> -77 core drilling from 0 to 22 ft. - 22 ft. @ \$12.00 per ft.....	\$	264.00
Hole No. M <sup>3</sup> -77 core drilling from 0 to 500 ft. - 500 ft. @ \$22.00 per ft.....	\$	11,000.00
Tractor rental.....	\$	500.00
Drill transportation.....	\$	500.00
		<u>\$12,612.00</u>

Contractor's Representative

Company's Representative

PP. FOR PAYMENT  
ACCT. NO.

AMT.

*H. Allen*

RECEIVED

SEP 6 1977

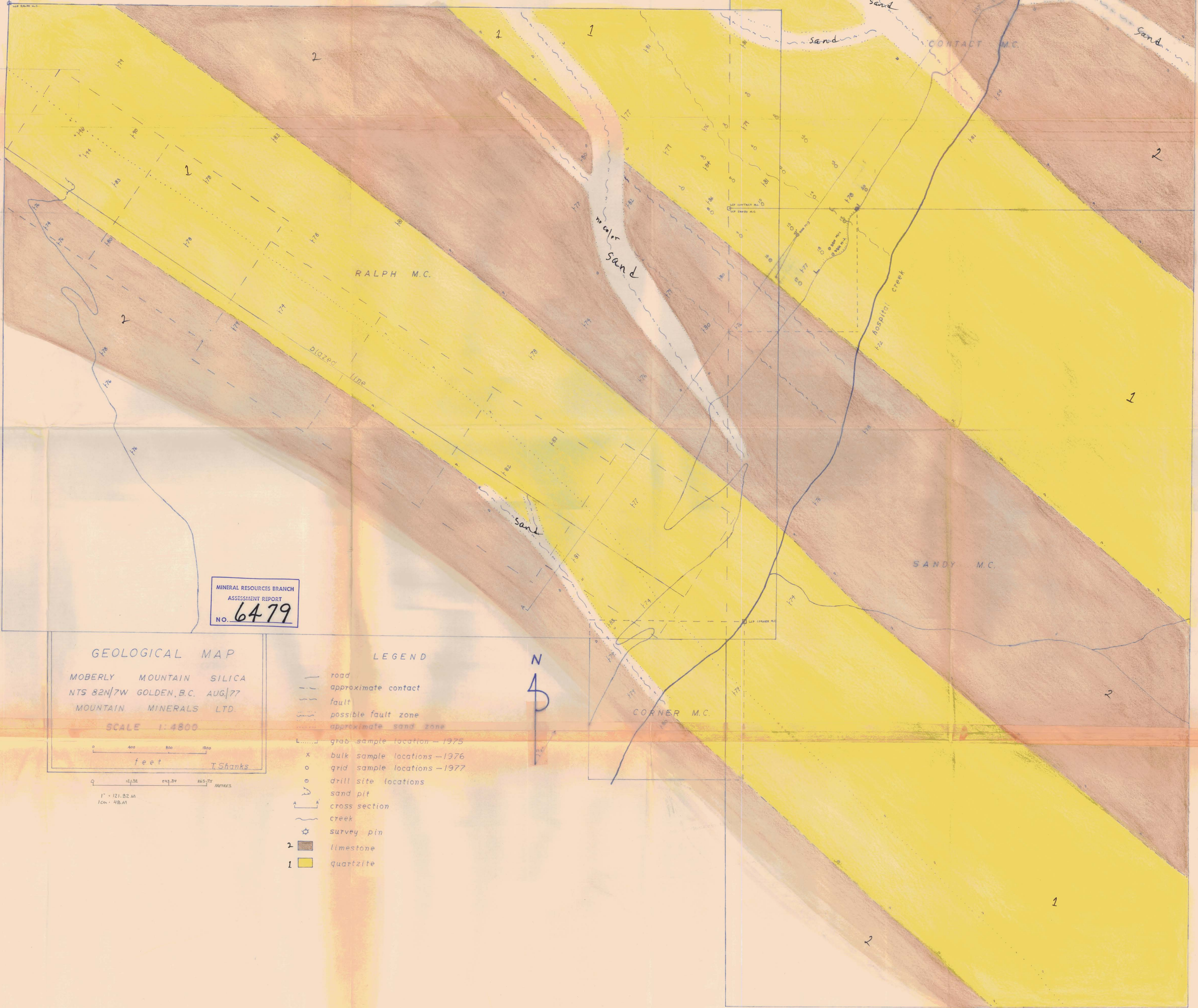
TOTAL

12612<sup>00</sup>

OK

*[Signature]*

CROSS SECTION A-A'

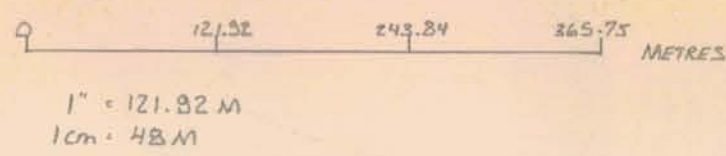
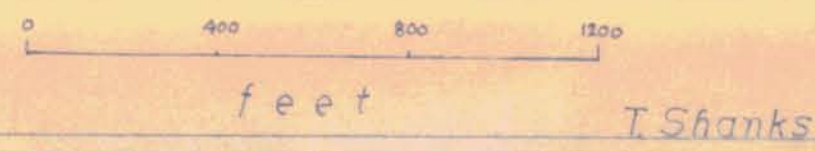


MINERAL RESOURCES BRANCH  
 ASSESSMENT REPORT  
 NO. **6479**

**GEOLOGICAL MAP**

MOBERLY MOUNTAIN SILICA  
 NTS 82N/7W GOLDEN, B.C. AUG/77  
 MOUNTAIN MINERALS LTD.

SCALE 1:4800



**LEGEND**

- road
- - - approximate contact
- ~ ~ ~ fault
- · - · - possible fault zone
- · · · · approximate sand zone
- o grab sample location - 1975
- x bulk sample locations - 1976
- o grid sample locations - 1977
- o drill site locations
- o sand pit
- cross section
- ~ ~ ~ creek
- ☆ survey pin
- 2 limestone
- 1 quartzite

