824029

1990 Exploration Report
on the
Dusty Mac Property

Osoyoos Mining Division

NTS 82E/5E

Minnova Inc.
Vancouver, B.C.

Graeme Evans

March 29, 1990

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Location and Access

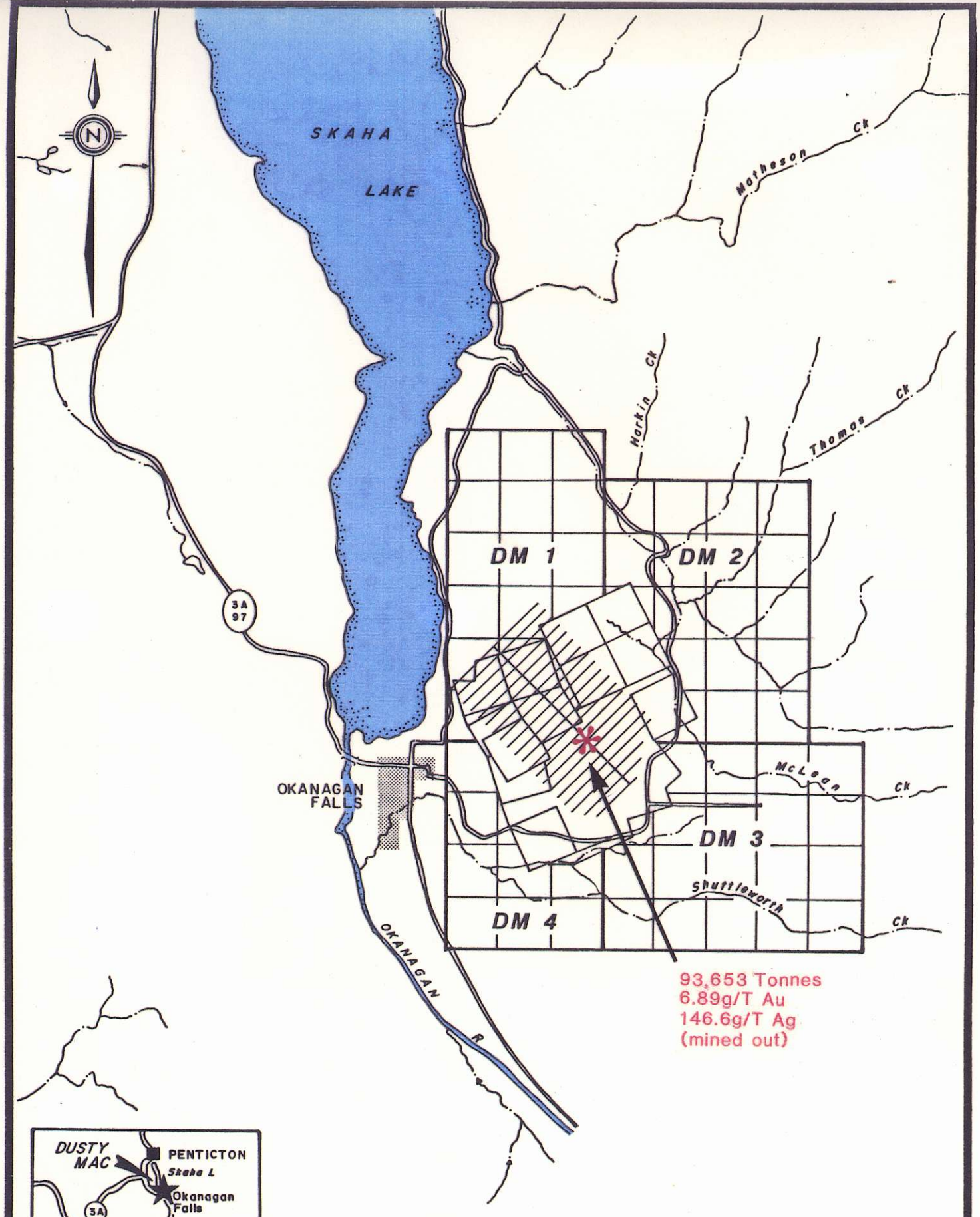
The Dusty Mac property is located in the Okanagan Valley approximately 250 km east of Vancouver. The property is situated 19 km south of Penticton at the southern end of Skaha Lake and 1.5 km east of Okanagan Falls. The co-ordinates of the property are longitude 119° 32' and latitude 49° 20'.

The open pit and waste dumps are situated behind a large bluff locally referred to as Peach Cliff.

The village of Okanagan Falls is situated on Highway 97, approximately 5 km south of the Highway 3A - 91 junction.

A paved two lane road, parallels Shuttleworth Creek east of Okanagan Falls, circles Peach Cliff to a point within 500 meters of the open pit.

Penticton is a modern community and a principal supplier for the area where all services are available including air and road.



DUSTY MAC OPTION

GRID LOCATION

82E/5

MINNOVA

Fig1

History and Past Production

The exploration history of the Dusty Mac property dates back to the turn of the century as witnessed by the four short adits and several open cuts at the western end of the property overlooking Okanagan Falls. The adits were driven on quartz veins which are sparsely mineralized in chalcopyrite and pyrite.

Interest in the area was revived in 1966 when native silver was discovered in quartz veins on the property. The first recent claims were staked the same year and in 1968 Dusty Mac Mines Ltd. acquired the property.

An exploration program was conducted by Cannon Engineering Ltd., and later by Cannon-Hicks Associates Ltd. in the late 1968 and 1969 under the direction of Dusty Mac Mines. The work included surface trencing, geological mapping, diamond and percussion drilling, and a limited underground program. The program outlined 61,485 tonnes grading 7.88 g/tonne Au and 170.4 g/tonne Ag.

In 1970, the property was optioned to Noranda Exploration Ltd. which carried out a diamond drilling program. The program failed to add significant tonnage to the known reserves.

In 1973, Dusty Mac Mines carried out an extensive percussion drilling program of 1635.5 m

Ore reserves based on 3319 m of diamond drilling in 76 holes and 4642 m in 221 percussion holes were estimated in October, 1974 to be 120,280 tonnes grading 7.06 g/tonne Au and 123.4 g/tonne Ag, plus 21,521 tonnes indicated grading 4.59 g/tonne Au and 57.59 g/tonne Ag.

In April, 1975 an agreement was reached for custom milling the ore at the Dankoe mill. Production started August 1, 1975 and ceased in June, 1976. The orebody was mines by open pit at 318 tonnes per day. The total ore milled was 93,653 tonnes grading 6.89 g/tonne Au and 146.59 g/tonne Ag. Total production was 581,551 g Au, 10,180.367 g Ag, 2,880 kg Cu and 1,527 kg Pb.

Milling was completed June 9, 1976 and reclamation of the mine area was finished on September 21, 1976.

Further property exploration was carried out in 1976 by Amadeus Consultants Ltd. The program consisted of geochemical soil sampling and percussion drilling over favourable structures. A total of 153 percussion holes were drilled for an aggregate of 5981m.

Canex Placer Ltd. conducted 1.5 line miles of IP in June, 1976 under a data sharing arrangement with Dusty Mac. The results were not encouraging.

Scintrex Pty Ltd. conducted a Rapid Reconnaissance Magnetic Induced Polarization survey (RRMIP) in October, 1981. Results were inconclusive.

The Dusty Mac property remained idle until 1984 when Esso Minerals conducted a surface sampling and mapping program in the vicinity of the open pit and to the northwest, encompassing previously known mineralized areas. In 1985, Esso drilled 18 reverse circulation drill holes and three diamond drill holes for a total of 1518.3 m.

In 1987, Minnova Inc. optioned the property from Dusty Mac Mines Ltd.

Claim Status

CLAIM NAME	RECORD #	EXPIRY DATE
Au 2 Fr.	24347	97/01/17
Au 5 Fr.	24349	97/01/17
Au 6 Fr.	24350	97/01/17
Au 7 Fr.	24351	97/01/17
Au 9 Fr.	24353	97/01/17
Au 10 Fr.	24354	97/01/17
Au 11 Fr.	24355	97/01/17
At Last	19501	97/04/13
JG 1	21688	97/01/25
JG 2	21689	97/01/25
JG 3	21690	97/01/25
JG 4	21691	97/01/25
JG 8	21695	97/01/25
JG 10	21697	97/01/25
JG 11	21698	97/01/25
JG 12	21699	97/01/25
JG 13	22403	95/06/28
JG 14	22425	95/07/03
Prod. Lease	Lot 4079-S	89/04/09

The Production Lease P-3 (Lot 4079-S) consists of the following claims:

Au 1 Fr.	24346
Au 3 Fr.	24348
J Gus 1	22468
J Gus 3	22532
JG 5	21692
JG 7	21694
JG 9	21696
JOE 1	22689
HUNT 7 Fr.	24289
HUNT 22 Fr.	24305
CLAIRE 1 Fr.	30580

CLAIM NAME	UNITS	RECORD #	EXPIRY DATE
DM-1	18	2013	93/05/04
DM-2	20	2014	93/05/04
DM-3	20	2015	93/05/04
DM-4	12	2016	93/05/04

Summary of Work 1987 - 1989

1987

1. Property examination and sampling
2. 26 km re-established Esso grid
3. 21 km pole-dipole IP survey

1988

1. Mapping structures and checking Esso mapping with 47 samples taken for base study - 63 elements plus (analyzed for Cu, Pb, Zn, Ag, Au)
2. 11 trenches totalling 310 m over mineralized zones, 81 channel samples taken
3. 14.85 km CSAMT survey over the grid area
4. 1537.1 m of NQ diamond drilling in 11 holes; 381 samples of core taken and analyzed for Cu, Pb, Zn, Ag, Au and some with 32 element ICP
5. Total metallic study done, 10 samples from drill core previously analyzed

1989

1. 94 km of AEM survey flown
2. Geological mapping of the property @ 1:5000 scale
3. 44 rock assays for Cu, Pb, Zn, Ag, Au; 457 rock geochem for Cu, Pb, Zn, Ag, Au; 127 litho samples including geochem
4. Blasted the A zone to assess potential
5. 3244 m of NQ diamond drilling, 13 holes

1989 Airborne Geophysical Survey

A Dighem IV airborne survey was carried out in early June, 1989. East-west flight lines were flown approximately 200 m apart over a majority of the property. A total of 94 line km were flown and final results included a total field magnetic survey as well as a resistivity survey at three frequencies (900, 7200, 56000 Hz).

Cultural effects hampered the survey and large areas of Quaternary lake silts obscured the resisitivity survey, but the survey outlined several large scale structures on the property. Magnetic low features outlined the major fault zones including the Okanagan Fault, McLean Creek Fault and Shuttleworth Creek Fault. More subdued fault structures include the pit structure, another subsidiary northwest trending fault one km north of the pit and a N trending fault up Harkin Creek. In general the Eocene volcanics have a higher magnetic intensity than the surrounding gneisses and this is typical throughout the Okanagan. Resistivity low features also defined the structures mentioned above but are much more sensitive to areas with clay layers in Quaternary lake silts.

Possible targets outlined along these structures are co-incident magnetic lows and resistivity lows, where hydrothermal systems produce clay-sericite alteration which reduces the resistivity and destroys the magnetite content of the host rock. Further studies and ground proofing will be required on these targets.

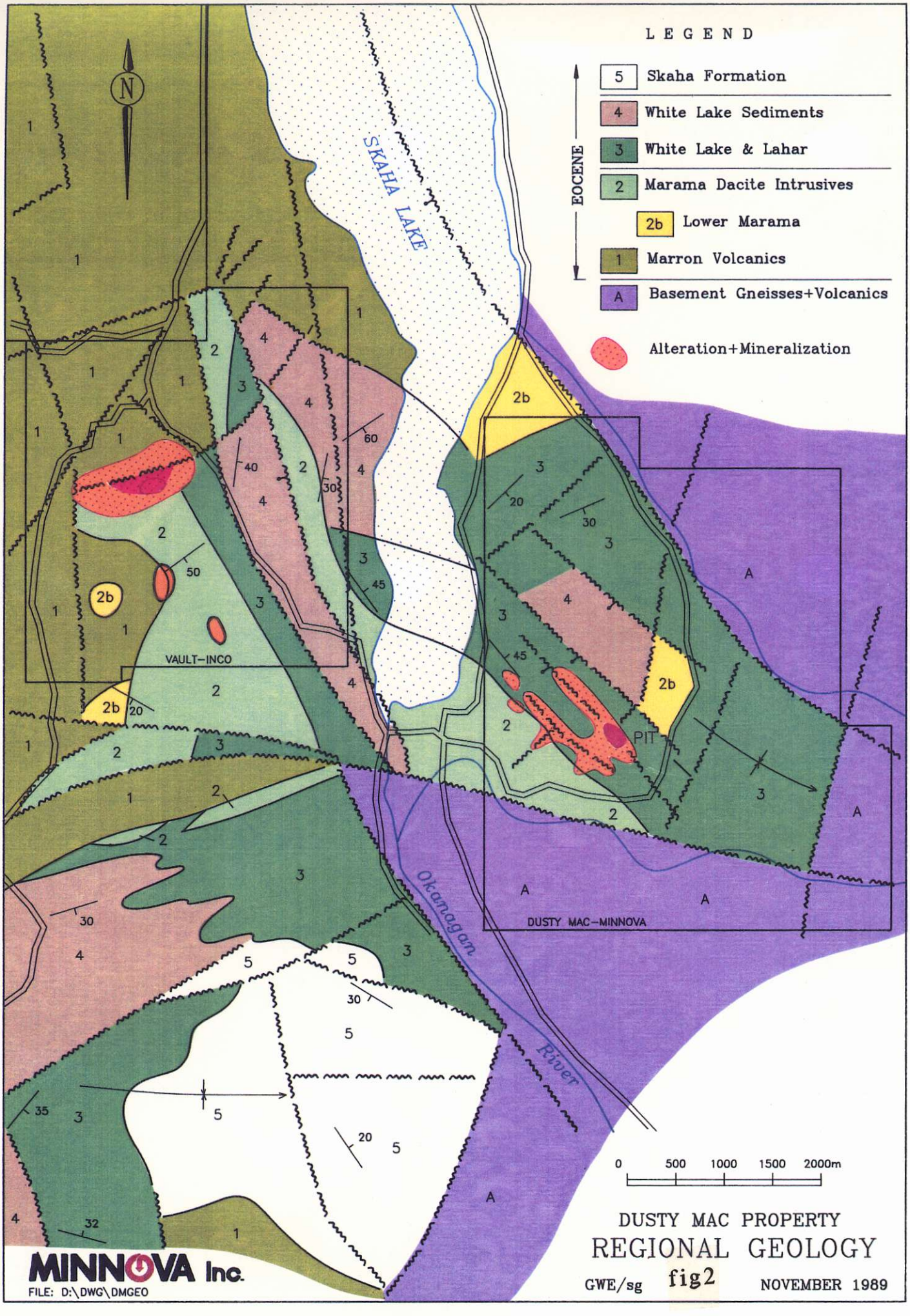
1989 Property Geological Mapping

In 1989 the Dusty Mac property was geologically mapped at 1:5000 scale. The mapping revealed a majority of the property is underlain by Lower White Lake lahars, and no Marron volcanics are present as was previously mapped. The lowest stratigraphic unit identified on the property is the Lower Marama tuffs and pyroclastics located at the north end of the property. and an area on the eastern side of the property. This unit in these localities is not overlain by Marama dacites but grades directly into Lower White Lake lahars.

The Lower White Lake lahars form a thick monotonous sequence of multilithic mud flows with minor flows and occasional thinly bedded sandstone units. The only distinctive feature from the surrounding Marron volcanics and Upper White Lake lahars is the presence of Marama dacite fragments which make the lahars coeval or post depositional in relation to the Marama dacite dome sequence.

The Marama Dacite domes form a northwest trending linear pattern along the western side of the property. These at several spots formed subaerial paleotopographic high features with dacite flows proximal and a lateral facies transition to the paleotopograhic lows with lacustrine sediments of the White Lake sequence. At this time it is felt that there is no unconformity between the Marron Formation and the White Lake Formation and the Marama dacites form localized domes along possible calderas during the deposition of the upper Marron volcanics and the Lower White Lake volcanics. Later block faulting occurred forming much of the present day topography and appears to control the epithermal style mineralization. A majority of the faults are filled by Quaternary overburden and very little alteration was seen in the northern portion of the property. Along the eastern side of the property a large area of Lower Marama pyroclastics is exposed. This area displays strong carbonate alteration with minor silicification

along a fault structure which has a strong magnetic low with a low resistivity anomaly. Further work should be carried out to assess this structure and define drill targets.


LEGEND
EOCENE
5 Skaha Formation
4 White Lake Sediments
3 White Lake & Lahar
2 Marama Dacite Intrusives
2b Lower Marama
1 Marron Volcanics
A Basement Gneisses+Volcanics
Alteration+Mineralization
SKAHA LAKE
VAULT-INCO
PIT
DUSTY MAC-MINNOVA
Okanagan River
0 500 1000 1500 2000m
DUSTY MAC PROPERTY
REGIONAL GEOLOGY
GWE/sg
fig2
NOVEMBER 1989
MINNOVA Inc.
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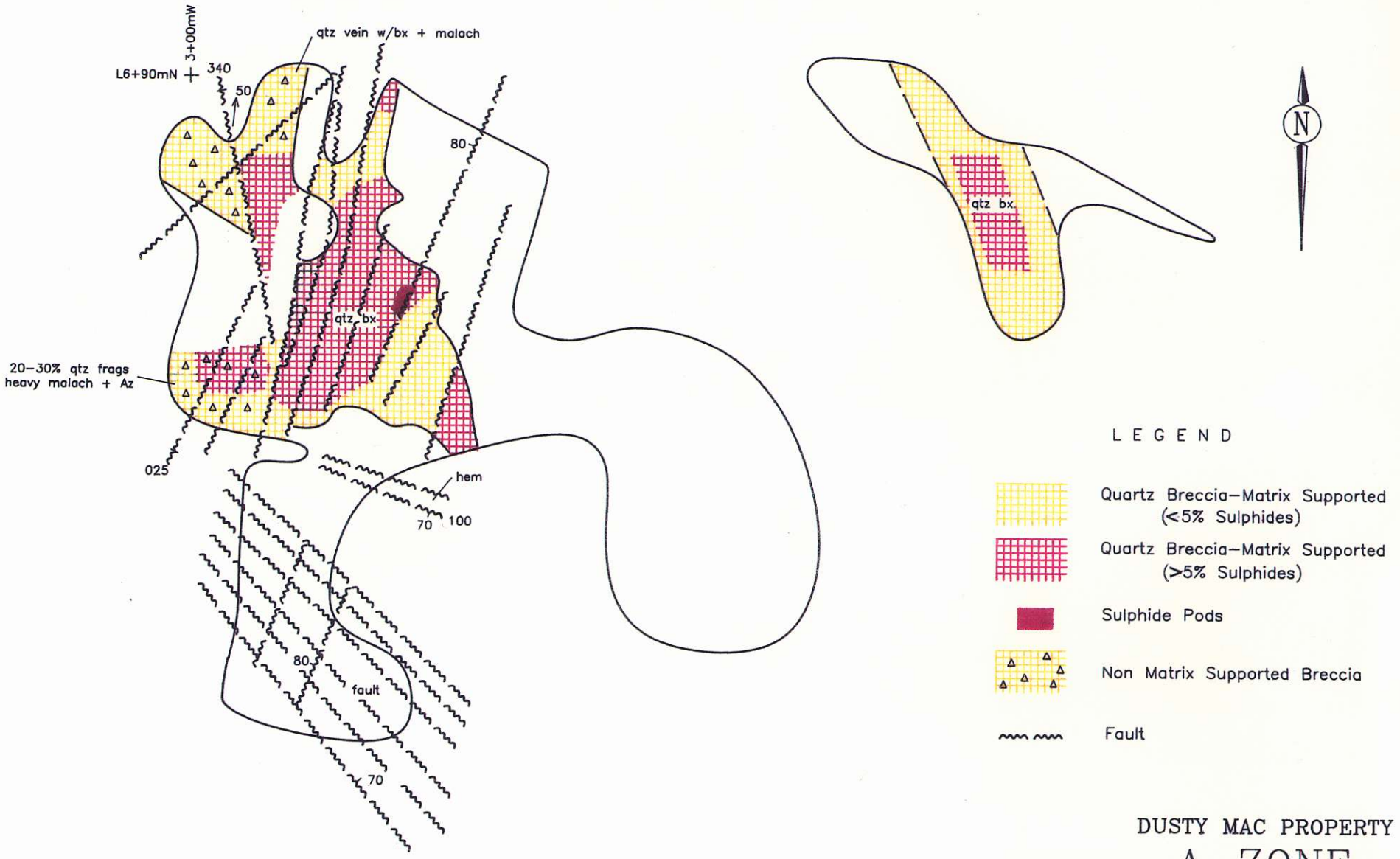
"A" Zone Trenching

In August of 1989 the "A" zone showing was blasted clear to gain an understanding of the geometry of the mineralization. An air compressor was then used to clear off the debris and provide a fresh surface for mapping and sampling.

After trenching in 1988 (trenches 6 & 7) and diamond drill holes DM-10 and 16 failed to define the ore controls, the blasting revealed a structurally controlled quartz breccia body that forms a pipe-like body. The breccia pipe is controlled by a 010-030° fault set and a 100-120° fault set. The quartz breccia pipe exhibits a complex multiepisodic formation. The core consisting of massive crudely banded quartz veins and matrix supported angular quartz breccias with disseminated and pods of sulphides (py, cpy, ga, sp, tet). This core zone changes laterally to non matrix supported breccias with subangular quartz and fluorite fragments in chloritic matrix with minor (>2%) sulphides (py, cpy).

Sampling revealed the erratic nature of the mineralization with very high gold and silver values within one meter of low grade material, this combined with the rapid change from matrix supported breccias to non matrix supported breccias indicates how easily a low grade quartz breccia drill hole intersection could be very close to an ore zone. Also the silver appears largely present as tetrahedrite with a high correlation to base metals and generally gold is in a free form with a low correlation coefficient to base metal values.



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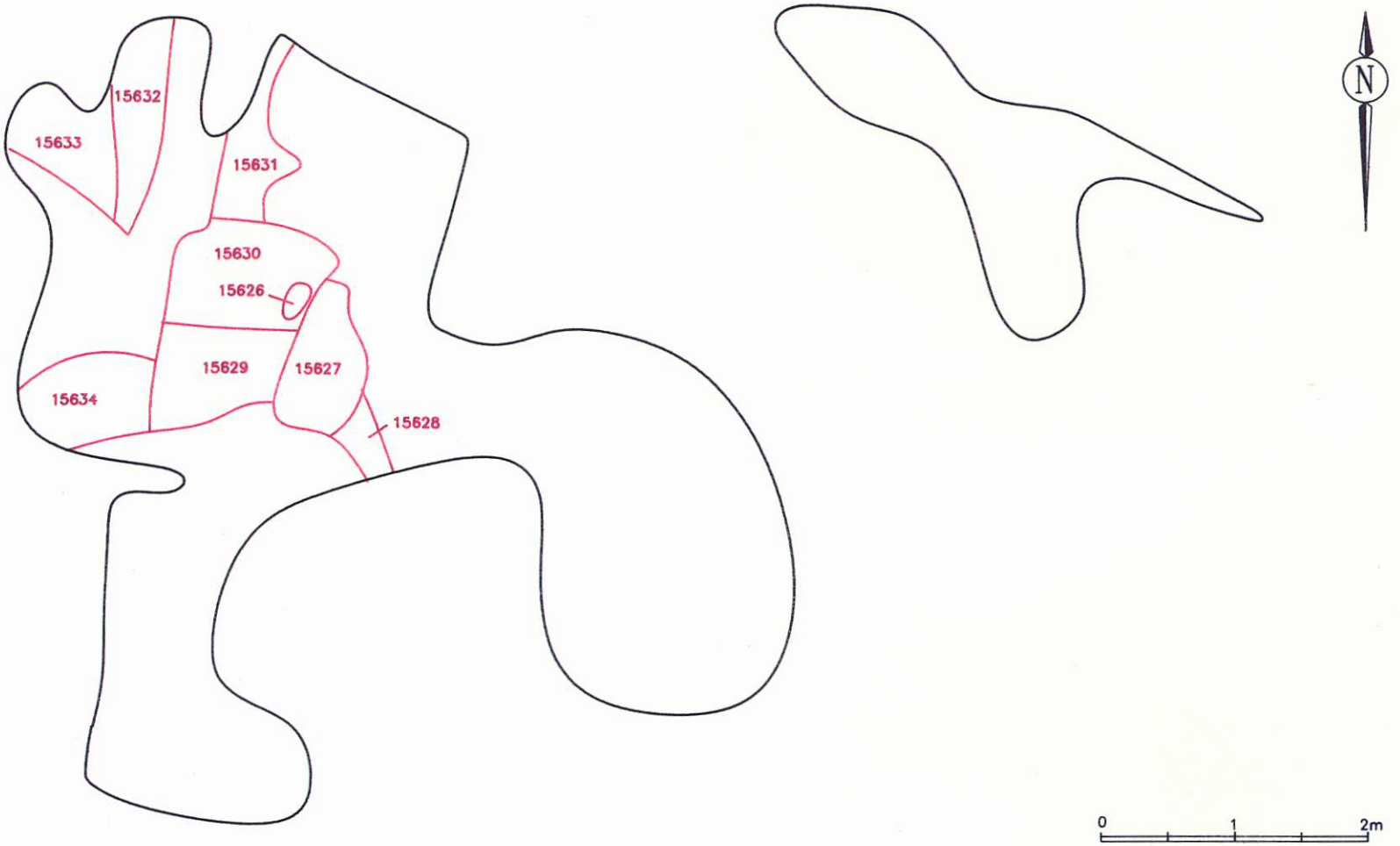
DUSTY MAC PROPERTY

A–ZONE GEOLOGY

GWE/sg fig 3 MARCH 1990



PANEL SAMPLE RESULTS

SAMPLE No.	Cu%	Pb%	Zn%	Ag g/T	Ag oz/T	Au g/T	Au Oz/T
BCS15626	2.170	1.58	0.28	1585.0	46.23	7.95	0.232
BCS15627	0.079	0.06	0.24	13.9	0.41	0.13	0.004
BCS15628	0.520	0.65	0.11	610.0	17.79	3.48	0.102
BCS15629	0.539	1.12	0.14	1290.0	37.63	6.39	0.186
BCS15630	0.910	1.04	0.27	895.0	26.10	5.61	0.164
BCS15631	0.605	0.68	0.20	308.0	8.98	1.72	0.050
BCS15632	0.323	0.62	0.11	310.0	9.04	26.10	0.761
BCS15633	0.037	0.02	0.10	2.9	0.02	0.02	0.001
BCS15634	0.496	1.49	0.09	186.0	51.75	51.75	1.509

DUSTY MAC PROPERTY

PANEL SAMPLES LOCATIONS & RESULTS

GWE/sg fig4 MARCH 1990

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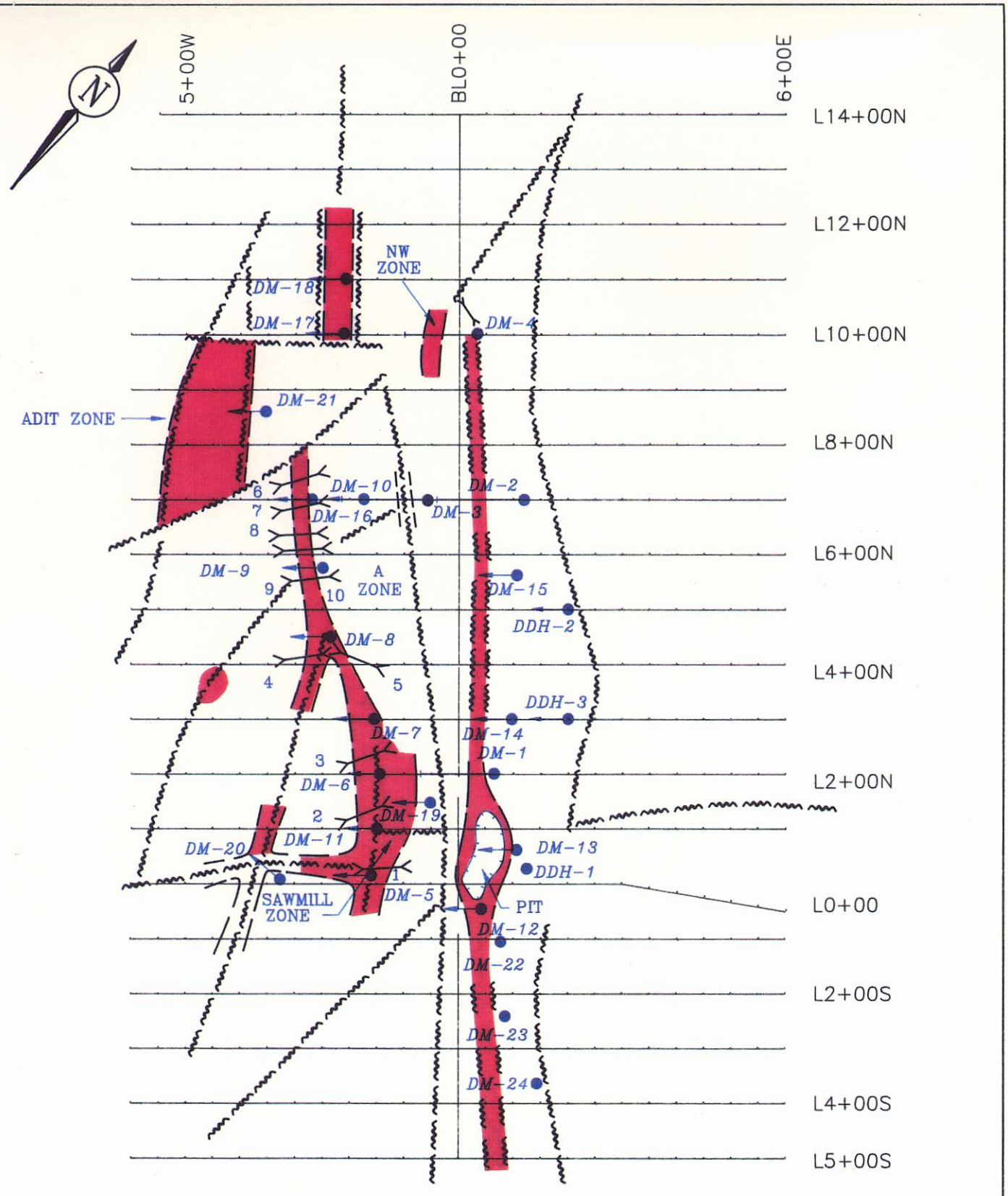

Mineralization

Alteration Zone

Fault

1988 Trench location

DM (MINNOVA 1988,1989)
DDH (ESSO 1986)

DUSTY MAC PROPERTY
STRUCTURE & MINERALIZATION
WITH DRILL HOLE LOCATIONS

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GWE/sg

300 metres
SCALE 1:10000

fig5

SEPTEMBER 1989

1989 Diamond Drilling

During the year thirteen diamond drill holes were completed (DM 12-24) for a total of 3244 meters. Summary drill logs are included in Appendix I and significant intersections are summarized at the end of this section. Five main areas of interest were drilled namely the A Zone, Adit Zone, Chalcedony Zone, Sawmill Zone as well as the main Pit structure. These are briefly summarized below.

A Zone

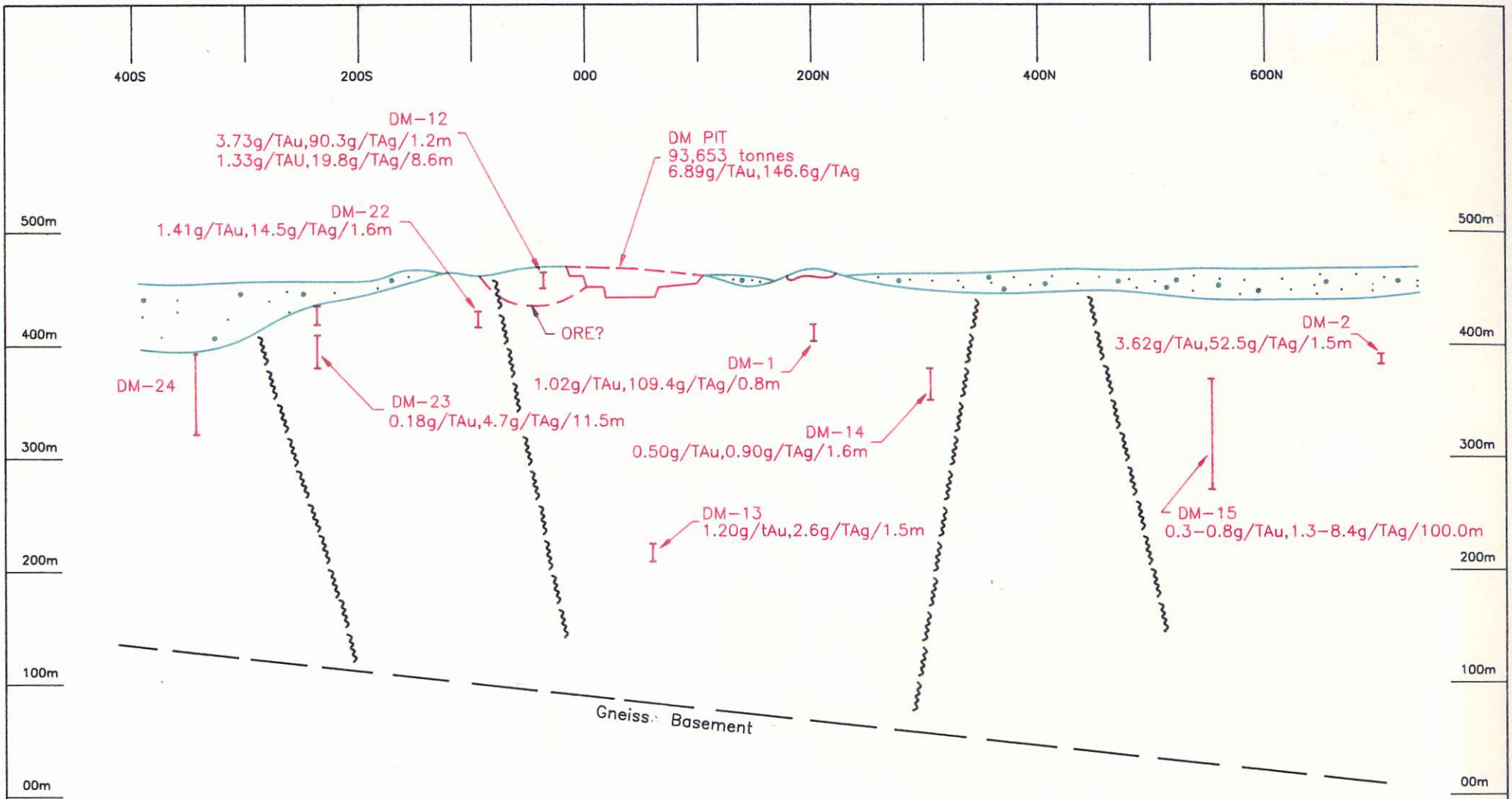
DM-16 was drilled below the A Zone showing and DM-10 to test the zone at depth. No economic mineralization was intersected in the drill hole.

Adit Zone

The large quartz breccia zone and low angle quartz veins were tested with DM-21. Quartz breccias and alteration within fault zones were intersected with anomalous silver and base metal values but only low gold values. Visually and chemically these zones are identical to ore zones in the Dusty Mac pit but are lacking the gold values. This perhaps is a barren zone within the epithermal system.

Chalcedony Zone

A large area in the northwest portion of the grid has laminated and brecciated chalcedonic quartz veins averaging a consistent 1.15 g/t au and 6.3 g/t Ag on surface. In 1989 two holes (DM 17, 18) tested below this zone. Near vertical fault zones with clay-chlorite alteration and minor silicification were intersected below the surface showings. Visually these zones were



NOTE: FAULT IS NEAR VERTICAL

DUSTY MAC PROPERTY
MAIN FAULT LONGITUDINAL SECTION
(LOOKING SOUTHWEST)

MINNOVA Inc.

0 50 100 150 200m

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GWE/sg fig6 NOVEMBER 1989

not unusual, yet values as high as 7.73 g/t Au and 7.4 g/t Ag over 1.5 meters were obtained in these alteration zones and further drilling is required. It also emphasizes that the precious metal values are erratic and not always in silicified zones but can be found in several types of alteration.

Sawmill Zone

In 1989, two holes (DM-19, 20) tested structures in the Sawmill Zone at depth. One of the main targets in the 1989 program was to test the porous lower Marama units at depth. This horizon hosts much of the mineralization on the Vault property but the 1989 drilling discovered the Marama dacites lie unconformably on basement gneisses with no lower Marama or Marron volcanics present. Fault controlled alteration was encountered at depth in both holes but carried no significant mineralization. The upper portion of the Sawmill Zone was intersected in the upper zone of DM-19 with anomalous gold and silver values.

Main Pit Fault

This large northwest trending mineralized fault structure was tested in 1989 with several drill holes (DM-12 - 15, 22-24). Wide zones of alteration were consistently intersected over a strike length of 1.1 km and to a depth of at least 250 m below the surface. Argillic and sericitic envelopes regularly surround silicified cores with multi-episodic quartz breccias and quartz stockwork. This fault zone ranges in true width from 20 meters to an excess of 100 meters with pervasive alteration and 2-15% disseminated sulphides. DM-15 and DM-20 encountered felsic mica (phlogopite?) bearing dykes in the cores of fault zones and appear to be related to surrounding silicification and maybe the heat source for the epithermal system at Dusty Mac. This is only speculation at this point but these dykes are very similar in

appearance to Scatter Creek rhyodacitic dykes which occur near the deposits in the Republic district of Washington. This structure is open along strike and at depth with anomalous gold and silver values throughout (see Figure 6). 1989 mapping of the pit area and the A Zone indicate that the quartz breccia bodies are structurally controlled at fault intersections and these should be focussed on during future work. This includes the pit itself where DM-12 intersected 20 meters of mineralized quartz breccia, near the surface but was not previously recognized due to the fact it is a near vertical zone and previous drilling was vertical drilling.

DUSTY MAC 1989 DRILL INTERSECTIONS

Hole	From	To	Interval	Au(g/t)	Ag(g/t)	Host
DM-12						
	9.0	13.5	4.50	0.20	2.30	Qtz Bx
	13.5	18.8	5.30	1.84	22.30	Qtz Bx
	18.8	22.1	3.30	0.51	15.90	Qtz Bx
	23.6	25.1	1.50	0.65	25.60	Qtz Bx
	27.8	29.0	1.20	3.73	90.30	Qtz Bx
	108.8	111.8	3.00	0.45	2.00	And
DM-13						
	25.4	28.4	3.00	0.42	10.20	Clay Alt'n
	42.2	52.7	10.50	0.07	3.70	Talc & Clay Alt'n
	212.4	216.2	3.80	0.24	1.20	Silicification
	226.7	228.2	1.50	1.20	2.60	Qtz Bx
DM-14						
	135.1	136.7	1.60	0.50	0.90	Silicification
DM-15						
	39.7	42.7	3.00	0.19	2.20	Clay Alt'n
	111.5	113.0	1.50	0.75	1.30	Silicification
	122.7	127.2	4.50	0.38	5.60	Qtz veinlets
	188.6	193.1	4.50	0.28	2.60	Qtz veinlets
	197.6	199.1	1.50	0.40	8.40	Qtz veinlets
	215.7	217.2	1.50	0.77	1.40	Qtz veinlets
DM-17						
	15.9	18.9	3.00	0.27	1.40	Clay Alt'n
	18.9	20.4	1.50	7.73	7.40	Clay & Chl. Alt'n
	28.5	30.5	3.00	0.27	2.20	Qtz vein
	35.0	36.4	1.40	3.18	2.10	Silicification
	41.9	44.1	2.20	0.20	0.70	Clay Alt'n
	67.1	69.2	2.10	0.23	2.50	Clay Alt'n
DM-18						
	28.0	32.0	4.00	0.33	2.60	Clay Alt'n
	36.6	38.2	1.60	0.11	2.60	Clay Alt'n

DUSTY MAC 1989 DRILL INTERSECTIONS(cont)

Hole	From	To	Interval	Au(g/t)	Ag(g/t)	Host
DM-19						
	26.4	28.3	1.90	0.22	0.80	Clay Alt'n
	30.1	31.6	1.50	1.63	2.70	Qtz-Carb Vein
	53.7	58.6	4.90	0.59	1.80	Clay-Chl Alt'n
	66.8	68.4	1.60	0.26	1.20	Clay alt'n
	414.2	415.7	1.50	0.22	0.80	Carbonate Vein
DM-21						
	43.7	49.5	5.80	0.03	5.10	Qtz Bx
	78.7	80.2	1.50	0.16	0.60	Clay-Chl Alt'n
	98.5	100.0	1.50	0.19	1.10	Clay [illegible]n
DM-22						
	23.0	24.6	1.60	1.41	14.50	QV Frag
	39.6	42.5	2.90	0.21	1.70	QV [illegible]g
	135.7	137.2	1.50	0.25	1.70	Clay-Chl Alt'n
	138.7	140.2	1.50	0.24	0.90	Clay-Chl Alt'n
DM-23						
	27.4	28.9	1.50	0.13	2.70	QV frag mineralized
	34.1	34.8	0.70	0.25	0.30	Qtz Bx
	70.7	80.7	11.50	0.18	4.70	Qtz Bx
	93.2	94.7	1.50	0.11	1.20	Qtz Bx
	97.9	99.4	1.50	0.11	1.00	Qtz Bx

Grid Geology, Structure and Mineralization

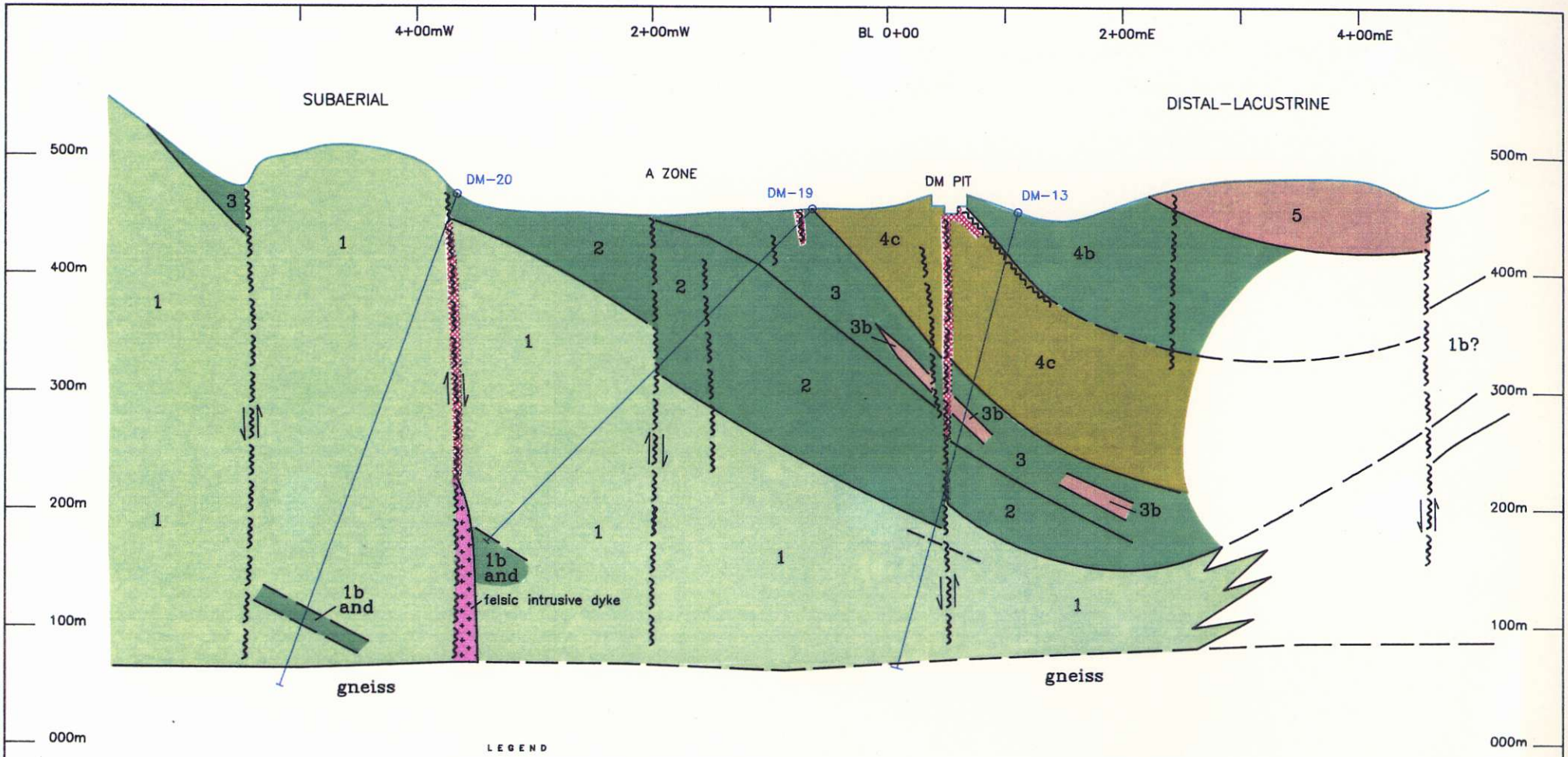
With further drilling in 1989 a much improved understanding of the geology in the grid area was obtained. Figures 7, 8, 9 illustrate a three dimensional sequence of the grid area geology. The Tertiary sequence sits unconformably on gneiss basement approximately 400 meters below the surface. The lowest Tertiary unit is the Marama dacite dome complex. These form subaerial domes in the southwestern portion of the grid and appear coeval with the lower White Lake andesites. The sequence grades into a more complex lacustrine sequence in paleotopographic depressions on the flanks of the domes to the east as well as the north. The best developed sequence of Upper White Lake sediments are in the south east portion of the grid area to the east of the Dusty Mac pit. Primary fault structures appear reactivated several times and control the formation of the epithermal systems at Dusty Mac and Vault property.

Northwest trending high angle faults are major epithermal conduits. Intersections of these faults with 010, 090 and bedding plane faults appear to control quartz breccia bodies at the known showings on the property. Detailed mapping in 1989 of the A zone and the pit areas indicate the quartz breccia bodies are irregular shaped, particularly in the pit where they trend both north-south and east-west and have variable dips from flat lying to vertical.

Alteration consists of peripheral propylytic alteration (chlorite, epidote, carbonate) grading into argillic and sericitic cores in the fault zones. Commonly a potassic overprint occurs but is not regular and mixing of these alteration zones is very common with multiple pulses of the hydrothermal system. Argillic and sericitic alteration commonly have 2-15% disseminated pyrite present. Silicification is present in several forms including discrete quartz veins, various quartz breccia bodies (indicating multiple episodes), laminated chalcedony veins and pervasive wallrock silicification. Silicification has varying amounts of

sulphides present ranging from sulphide free chalcedony veins to massive sulphide zones within the quartz breccias (contain py, ga, cpy, sp, tet). The Dusty Mac property has a epithermal system of the low sulphur adularia-sericite type system also identified on the Vault property and the Republic district in Washington.

Mineralization can be found in all forms of alteration and is generally erratic in nature. The best potential are deposits are in silicified zones and their surrounding alteration. Alteration studies in 1989 show a low correlation of pathfinder elements in relation to precious metal values but in general values are near ones depleted in Na_2O, CaO, MgO and enhanced in F, Sb, As, Cu, Pb, Zn. There is good potential for high grade bonanza lodes in both quartz breccia bodies and discrete chalcedony veins.



LEGEND

WHITE LAKE FORMATION
- 5 SEDIMENTS
  - 5a Volcanic Conglomerate
  - 5b Sandstone
  - 5c Shale
- 4 VOLCANIC
  - 4a Tuff Breccia
  - 4b Lahars
  - 4c Flows

- 3 UPPER FELDSPAR PORPHYRY LAHAR
  - 3a Lava Flows
  - 3b Sandstone, Shale
- 2 LOWER LAHAR WITH DACITE FRAGMENTS
  - 2a Minor Tuff–Breccia & Sandstone
  - 2b Flows

MARAMA FORMATION
- 1 VOLCANIC
  - 1a Dacite Lava
  - 1b Minor Breccia

ALTERATION
- a Quartz–Chalcedony Veins
- b Quartz Breccia
- c Argillite + Sericitic
- d
- e Propytytic
- f Carbonate Alteration

0 100 200m

DUSTY MAC PROPERTY
IDEALIZED CROSS SECTION
L1+00mN
(LOOKING NW)

GWE/sg fig7 MARCH 1990

MINNOVA Inc.

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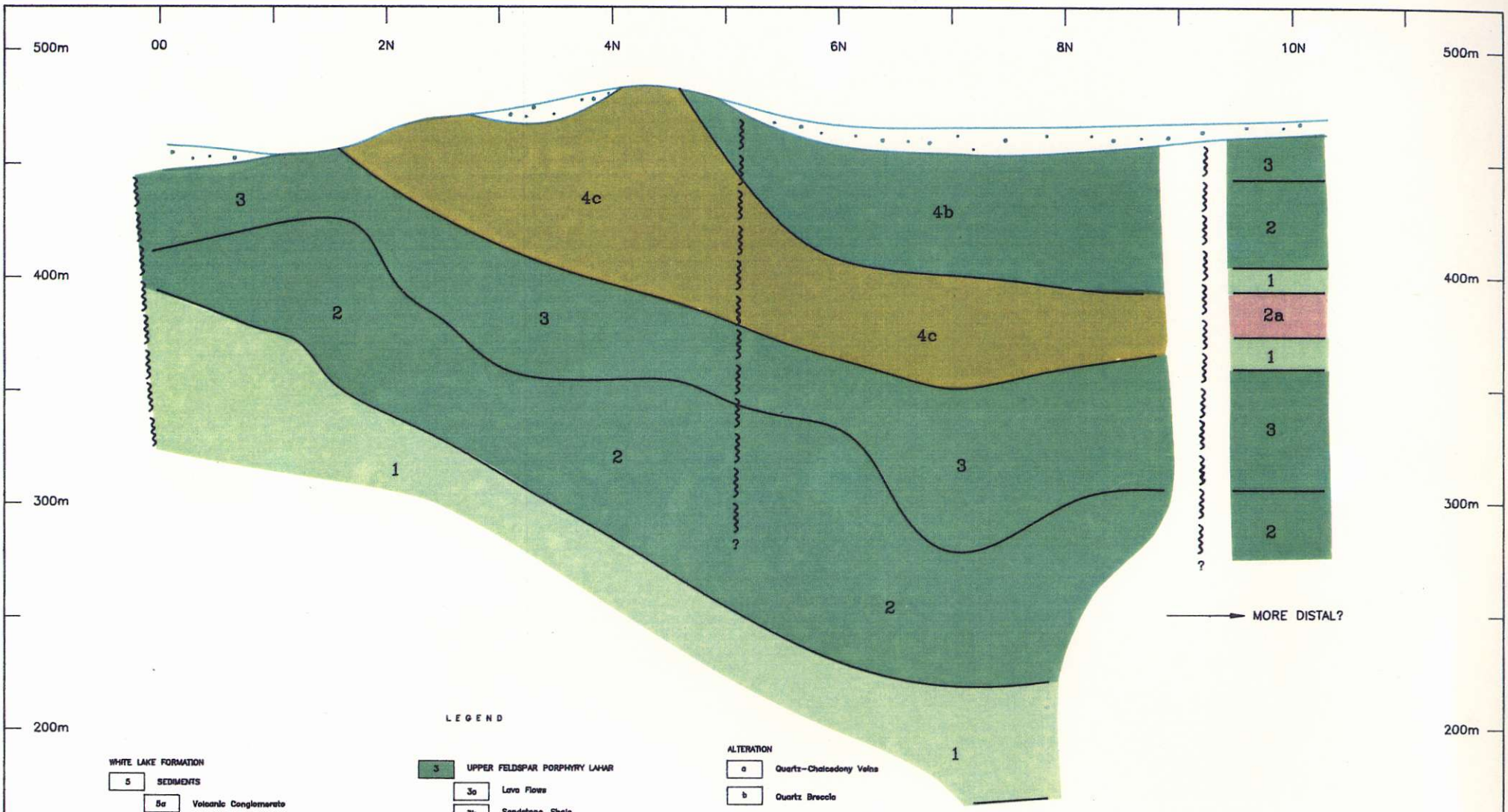

MINNOVA Inc.

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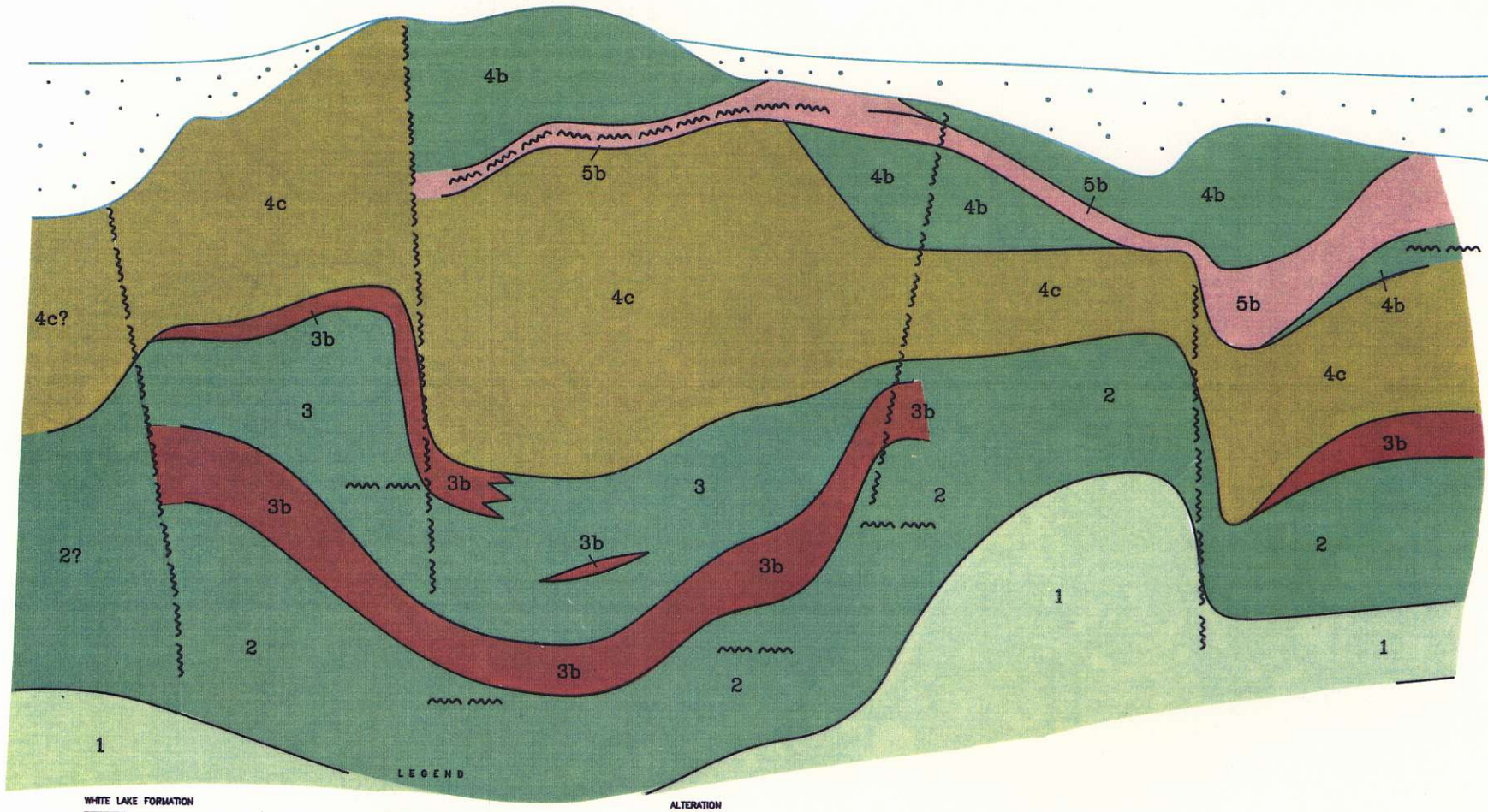
DUSTY MAC PROPERTY

VERTICAL SECTION 2+00mW

(LOOKING SW)

GWE/sg fig8 MARCH 1990



WHITE LAKE FORMATION

- 5 SEDIMENTS
  - 5a Volcanic Conglomerate
  - 5b Sandstone
  - 5c Shale
- 4 VOLCANIC
  - 4a Tuff Breccia
  - 4b Lahars
  - 4c Flows

- 3 UPPER FELDSPAR PORPHYRY LAHAR
  - 3a Lava Flows
  - 3b Sandstone, Shale
- 2 LOWER LAHAR WITH DACITE FRAGMENTS
  - 2a Minor Tuff–Breccia & Sandstone
  - 2b Flows

MARAMA FORMATION

- 1 VOLCANIC
  - 1a Dacite Lava
  - 1b Minor Breccia

ALTERATION

- a Quartz–Chalcedony Veins
- b Quartz Breccia
- c Argillite + Sericite
- d
- e Propylytic
- f Carbonate Alteration

0 25 50 75 100m

DUSTY MAC PROPERTY

VERTICAL SECTION 1+00mE

(LOOKING SOUTHWEST)

GWE/sg

MARCH 1990

fig9

MINNOVA Inc.

FILE: D:\DWG\DM100E

Conclusions and Future Work

The Dusty Mac property has a large precious metal bearing adularia - sericite type epithermal system present. Work in 1989 outlined several large fault structures which serve as conduits for the epithermal systems within the Tertiary graben. Mineralization appears controlled by various forms of fault intersections along the major structures. Future work will not require such deep drilling as the basement gneisses were intersected approximately 400 meters below the present surface and the lower Marama is absent in the grid area. Fault controlled mica bearing felsic dykes may be related to the epithermal system.

Future work will continue with detailed drilling within the grid and evaluation of targets outlined in 1989 on other portions of the property.

Within the grid area work is required to define and test intersecting structures along the Main pit fault including the Dusty Mac pit itself where a significant tonnage of ore may remain untested (past vertical drilling did not test vertical mineralized zones). A higher density of drilling is required to test this wide fault structure near the outlined fault intersections. Other areas requiring drill testing are the Chalcedony Zone and east-west structures such as the Sawmill Zone which remain untested.

Other targets to be assessed include the geophysical A.E.M. targets, specifically structural, magnetic and resistivity low features. In particular a priority should be placed on testing the area of lower Marama east of the grid area which is strongly altered over a large area along a A.E.M. anomaly.

Appendix I

Summary Drill Logs

DM-12 Summary Log

AZIMUTH	225°	DIP -45°
COLLAR	LINE	0+42S
	STN.	0+38E
	ELEV.	470 m.

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0 - 4.6 m	Casing
4.6 - 9.0 m	FP AND. with 30% QTZ fragments
9.0 - 29.0 m	Qtz. Breccia (Dusty Mac Zone) - @ 45° to c.a. (near vertical) - mainly wht. to lt. green quartz breccias with occas. black matrix breccia - main breccia core 15.8-20.6 m with up to 1.0% tet, tr cpy, sp and native silver - Zone is fault controlled
29.0 - 67.3 m	Feldspar Porphyry Flow
67.3 - 70.0 m	Argillite and Sandstone
70.0 - 75.1 m	Andesite Lahar
75.1 - 80.1 m	Sandstone and Conglomerate
80.1 - 131.4 m	Andesite Lapilli Tuff 95.1-101.3 - healed fault zone 7-8% py, minor QV frags
131.4 - 140.0 m	Sandstone and Conglomerate
140.0 - 151.5 m	Andesite Lahar
151.5 m	E.O.H.

DM-13 Summary Log

AZIMUTH	225°	DIP -75°
COLLAR	LINE	0+50N
	STN.	1+05E
	ELEV.	472 m

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0 - 3.0 m	Casing
3.0 - 30.0 m	Andesite Lahar
30.0 - 36.2 m	Siltstone & Argillite
36.2 - 59.3 m	Fault Zone - Dusty Mac alteration zone along fualteed contact - strong bleaching and talc alteration with 5% QV fragments, tr py, -50° dip E.
59.3 - 66.7 m	FP Andesite Flow
66.7 - 95.4 m	Fault Zone - similar to fault zone above
95.4 - 149.9 m	FP Andesite Flow
149.9 - 181.8 m	Andesite Lahar
181.8 - 185.0 m	Argillite & Sandstone
185.0 - 206.4 m	Andesite Lahar
206.4 - 216.2 m	Altered Andesite Lahar - 1% py, 5% QV frags, talc and carbonate alteration
216.2 - 230.2 m	Fault with alteration - 20% QV frags, 5% py and strong clay alteration - steep dipping fault possibly relates to the faults in the pit
230.2 - 260.8 m	Lower Andesite Lahar
260.8 - 270.4 m	Fault with Alteration - steep fault with 15% QV frags and 5% py dissemination

270.4 - 281.3 m	Lower Andesite Lahar
281.3 - 390.7 m	Marama Dacite Flow - with minor seds and ash beds
390.7 - 413.6 m	Gneiss - contact is at 70° to c.a. and is a fault contact - gneiss and Marama altered for several meters above and below the contact by similar silicification and clay(?) veinlets
413.6 m	E.O.H.

DM-14 Summary Log

0 - 9.14 m	Overburden
9.14 - 15.53 m	Andesite Lahar
15.53 - 30.50 m	Interbedded Sandstone, Argillites with minor Lahar
30.50 - 83.50 m	Andesite Lahar
83.50 - 116.05 m	Andesite Feldspar Porphyry Flow and Flow Breccia
116.05 - 142.30 m	Fault (near vertical) 116.05-135.08 - chloritic alteration with minor clay and carbonate alteration 135.08-137.02 - silicification 142.34-145.80 - chloritic alteration with minor quartz veining
142.30 - 200.30 m	Andesite Lahar

DM-15 Summary Log

AZIMUTH 225° DIP 60°

LINE 5+50N
STN. 1+00E
ELEV. 457 m

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0 - 21.6 m	Overburden
21.6 - 39.7 m	Andesite Lahar
39.7 - 44.8 m	Fault with minor alteration (near vertical)
44.8 - 62.5 m	Andesite Lahar
62.5 - 83.7 m	Sandstone with Marama dacite fragments
83.7 - 105.5 m	FP Andesite flow
105.5 - 119.9 m	Fault Zone with alteration - near vertical fault with 5% QV frags, 5 dissem. py and clay alteration
119.9 - 135.8 m	Andesite Lahar
135.8 - 141.3 m	Silicified Andesite Lahar - intense silicification with 5% dissem. py
141.3 - 151.2 m	Andesite Lahar
151.2 - 166.7 m	Fault Zone - near vertical fault with clay gouge, 5% celadonite, 4% dissem. py
166.7 - 176.0 m	Andesite Lahar
176.0 - 188.6 m	Fault with felsic intrusive - 3-4% dissem. py, silicified patches - felsic matrix with 2 mm FP's and brown micas - possible heat source for mineralized system
188.6 - 217.2 m	Silicified Andesite Lahar - pervasive silicification, 8% banded QV's, 3% dissem. py
217.2 - 272.3 m	Lower Andesite Lahar
272.3 m	E.O.H.

DM-16 Summary Log

AZIMUTH 225° DIP -45°

LINE 7+02N
STN. 1+95W
ELEV. 462 m

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0 - 18.3 m	Casing
18.3 - 41.8 m	Andesite Lahar
41.8 - 51.9 m	Fault with clay alteration
51.9 - 72.7 m	Andesite Feldspar porphyry flow and breccia 63.27-75.28 - Fault with clay alteration and pottassium or hematitic alteration
72.7 - 107.4 m	Andesitic Flow and Breccia 92.4-97.1 - Fault with clay alteration 103.5-107.4 - Fault with clay alteration (silicification with 15% py at 106.4-107.0)
107.4 - 130.8 m	Lower Andesite Lahar
130.8 - 139.9 m	Andesitic Flow
139.9 - 151.5 m	Lower Andesite Lahar
151.5 - 154.4 m	Marama Dacite Breccia
154.4 - 169.5 m	Lower Andesitic Lahar 164.7-167.6 - near vertical fault with clay alteration
169.5 - 176.8 m	Andesitic Flow 170.6-181.9 - fault with clay and weak chloritic alteration
176.8 - 195.4 m	Lower Andesitic Lahar
195.4 - 221.6 m	Marama Dacite Flow
221.6 m	E.O.H.

DM-17 Summary Log

AZIMUTH 225° DIP -45°

LINE 9+80N
STN 1+95W
ELEV. 472 m

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0 - 6.48 m	Casing
6.5 - 55.1 m	Andesite Lahar 13.9-20.0 fault with clay alteration 41.9-44.4 fault with clay alteration
55.1 - 63.8 m	Marama Dacite Flow 59.2-62.7 5% pyrite
63.8 - 73.8 m	Conglomerate 67.1-70.71 near vertical fault with clay and chloritic alteration containing 5% pyrite
73.8 - 86.2 m	Marama Dacite Flow 77.0-82.0 Fault
86.2 - 90.1 m	Fault
90.1 - 182.0 m	Andesite Lahar interbedded with lower Andesite Lahar 93.5-99.9 near vertical Fault with clay and chloritic alteration 116.2-121.5 Fault with clay alteration

DM-18 Summary Log

AZIMUTH 225° DIP 45°

LINE 11+08N
STN 2+12W
ELEV. 462 m (approx.)

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0 - 3.1 m	Casing
3.1 - 7.0 m	Lower Andesite Lahar
7.0 - 32.0 m	Fault Zone in Lower Conglomerate - 3-7% py, 1-2% QV frags, in a near vertical fault
32.0 - 46.3 m	Lower Andesite Lahar
46.3 - 54.7 m	Fault Zone - 5% py, weak pervasive silicification
54.7 - 71.9 m	Marama Dacite Flow
71.9 - 75.3 m	Lower Andesite Lahar
75.3 m	E.O.H.

*** Teste underneath the chalcedony zone and only found vertical fault boundaries with minor silicification

DM-19 Summary Log

AZIMUTH 225° DIP -45°

LINE 1+50N
STN 0+60W
ELEV. 456 m

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0 - 18.3 m	Casing
18.3 - 23.5 m	Andesite Feldspar Porphyry
23.5 - 28.2 m	Fault with clay and chloritic alteration
28.2 - 173.0 m	Andesite Lahar 53.7-59.0 - Fault with clayy and chloritic alteration 63.8-68.4 - Fault with clay alteration 121.5-133.6 - near vertical fault with clay and weak chloritic alteration
173.0 - 183.8 m	Marama Dacite Breccia Flow
183.8 - 376.9 m	Marama Dacite Flows and Breccias
376.9 - 420.2 m	Andesitic Breccia - grey, moderate to intensely silicified rock containing an average of 5% py, that varies from 10% near the beginning of the intersection, down to 1% at the end of the intersection 379.9-384.4 - near vertical fault containing 10% py in the clay altered host
420.2 - 458.7 m	Felsic Intrusive
458.7 m	E.O.H.

DM-20 Summary Log

AZIMUTH	180°	DIP	60°

LINE	010S
STN	380 W
ELEV	470 m

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0 - 3.4 m	Casing
3.4 - 19.4 m	Lower Andesite Lahar
19.4 - 41.8 m	Marama Dacite Fl-Bx
41.8 - 49.7 m	Fault Zone - near vertical, heavily oxidized, poor recovery
49.7 - 106.3 m	Marama Dacite Flow
106.3 - 110.1 m	Fault Zone - intense chlorite and sericite alteration with a tr. py in a near vertical fault
110.1 - 307.0 m	Marama Dacite Flow
307.0 - 321.4 m	Altered Fault Zone - strongly chlorite altered and silicified with 8% py
321.4 - 351.1 m	Marama Dacite Flow
351.1 - 378.5 m	Altered Andesite Flow - heavily silicified with talc and fluorite common and an average of 5% pyrite
378.5 - 452.0 m	Marama Dacite Flow
452.0 m	E.O.H.

*** Alteration was increasing at the bottom of the hole and this hole will be deepened when drilling materials are available

DM-21 Summary Log

AZIMUTH 225° DIP -45°

LINE
STN
ELEV.

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0 - 6.1 m	Casing
6.1 - 34.4 m	Andesite Lahar 21.1-21.4 - qtz breccia with no visible mineralization 23.7-25.3 - Fault with clay alteration, 1% malachite found within fault at 23.7-24.0
34.4 - 40.3 m	Andesite Feldspar Porphyry Flow Breccia
40.3 - 52.3 m	Fault Zone containing Quartz Breccias - Fault is clay altered with minor chloritic alteration 43.8-44.2 - qtz breccia with 2% cpy, 1% tet, 2% py 45.0-45.2 - qtz breccia 47.4-48.0 - qtz breccia with 1% cpy, 1% tet, 1% py 48.4-48.7 - qtz breccia with 1% cpy, tr. tet 48.9-49.6 - qtz breccia with 1% cpy, tr. tet
52.3 - 57.1 m	Andesite-rich Lahar
57.1 - 63.0 m	Andesite Feldspar Porphyry Flow Breccia
63.0 - 64.9 m	Near Vertical Fault with Alteration 63.0-64.0 - silicificationn 64.0-64.9 - clay alteration
64.9 - 72.0 m	Andesite-rich Lahar
72.0 - 81.8 m	Fault with Alteration - chloritic and clay altered with a celadonite-rich zone between 76.3-76.6

81.8 - 203.3 m	Lower Andesite Lahar 97.0-102.1 - Fault with clay and chlorite alteration 110.3-110.4 - qtz breccia with 5% py
203.3 m	E.O.H.

DM-22 Summary Log

AZIMUTH 225° DIP -45°

LINE 1+00S
STN 0+75E
ELEV. 474 m

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0 - 3.0 m	Casing
3.0 - 42.4 m	Andesite Rich Lahar - contains 2-5% qtz clasts
42.4 - 45.8 m	Fault - chlorite and clay altered
45.8 - 87.4 m	Andesite Feldspar Porphyry Flow 49.1-50.7 - Fault with clay alteration
87.4 - 96.4 m	Sediments (interbedded Sandstone and Siltstone)
96.4 - 129.7 m	Andesite-rich Lahar 106.5-109.5 - Fault with clay alteration
129.7 - 143.6 m	Fault - near vertical, steeply dipping, clay and chlorite altered, with 2% py
143.6 - 175.6 m	Andesite-rich Lahar
157.6 m	E.O.H.

DM-23 Summary Log

AZIMUTH 225° DIP -45°

LINE 2+40N
STN 0+75E
ELEV. 452 m

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0 - 24.4 m	Casing
24.4 - 64.1 m	FP Andesite Flow 24.4-45.3 - vertical Fault zone with 3-5% py, several small qtz bx's and clay ± talc ± potassic alteration
64.1 - 67.2 m	Sandstone and Argillite
67.2 - 70.7 m	Andesite Lahar - faulting with sericite and silicification
70.7 - 80.7 m	Quartz Breccia - complex quartz breccia with at least 4 stages of silicification, 80% qtz, 4% py and the remainder clay gouge
80.7 - 97.9 m	Andesite Lahar
97.9 - 101.0 m	Quartz Breccia - 40% qtz veinlets and frags with 5-6% py
101.0 - 149.8 m	Lower Andesite Lahar - Conglomerate
149.8 - 169.8 m	Fault Zone - near vertical fault with clay-chlorite alteration and 10% py
169.8 - 185.3 m	Lower Andesite Lahar
185.3 m	E.O.H.

DM-24 Summary Log

AZIMUTH 225° DIP -45°

LINE 3+50S
STN 1+25E
ELEV.

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0 - 81.8 m	Overburden
81.8 - 112.0 m	Fault Zone with Quartz Breccia Zones 81.8-86.7 - clay alteration 85.6-86.7 - quartz breccia 86.7-88.6 - 10% qtz clasts and veins 86.7-90.2 - weak chlorite, hematite, and sericite/iron carbonate alteration 90.2-92.2 - weak potassium alteration 92.2-92.5 - qtz breccia 92.9-93.2 - clay alteration 92.9-93.2 - qtz breccia 99.7-105.2 - chloritic and clay alteration 105.2-107.9 - potassium alteration 107.9-112.0 - chlorite and clay alteration
112.0 - 124.0 m	Andesite Lahar 118.0-122.3 - pyritic zone
124.0 - 137.6 m	Fault Zone - clay alteration with zones of chlorite and clay alteration 132.6-133.2 - silicification
137.6 - 146.1 m	Andesite Lahar 137.6-140.4 - chlorite alteration 140.4-142.1 - clay alteration 142.1-146.1 - clay and chlorite alteration
146.1-177.5 m	Fault Zone 149.7-156.1 - pyritic zone 149.7-171.6 - clay alteration 171.6-177.5 - clay and chlorite alteration
177.5 - 194.0 m	Andesite Lahar (Lower)
194.0 - 206.4 m	Marama Dacite Flow
206.4 m	E.O.H.