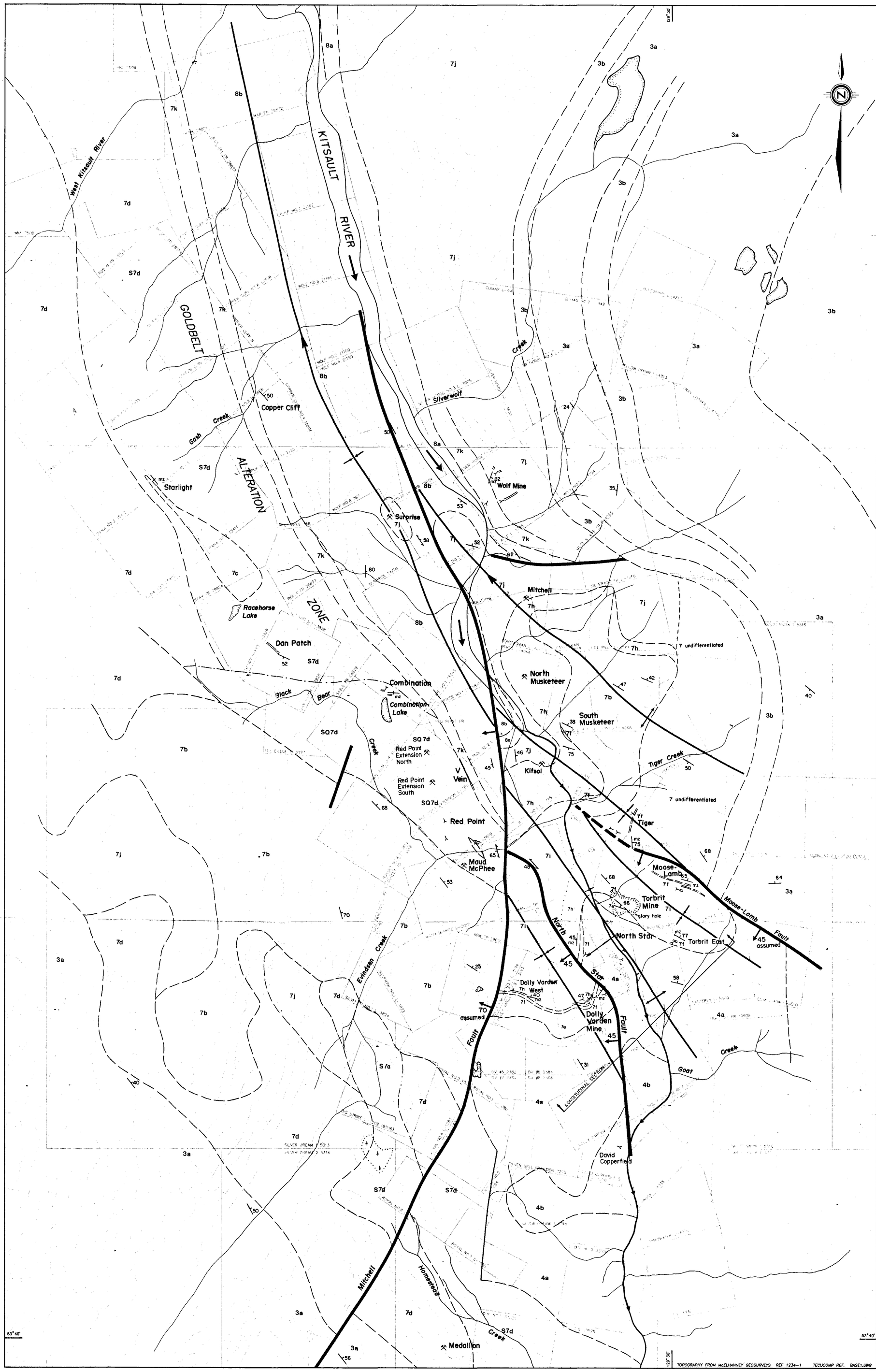


LITHOLOGIES

QUATERNARY

21	Alluvium
20	Glacial drift, colluvium

INTRUSIVE ROCKS

TERTIARY

EOCENE AND YOUNGER

11	Lamprophyre, basalt dykes
10	Diorite, microdiorite

VOLCANIC AND SEDIMENTARY ROCKS

LOWER TO MIDDLE JURASSIC

TOARCIAN TO BAJOCIAN : SALMON RIVER FORMATION

8b	Siltstone, shale, and minor sandstone
8a	Basal fossiliferous wacke

TOARCIAN : PARTIAL EQUIVALENTS OF MT DILWORTH / BETTY CREEK FORMATIONS

7k	Siliceous, pyritic, sericitic felsic pyroclastic rocks
7j	Pale green andesite ash tuff
7i	Maroon and green andesite lapilli tuff, ash tuff. Locally carbonaceous
7h	Grey and greenish grey andesite lapilli tuff. Commonly contains carbonate–chlorite (–sericite) altered andesite fragments in a strongly chloritic matrix. The base of this unit is locally comprised of finely laminated chloritic ash tuff
7g	Polylithic exhalitic breccia. A debris flow facies containing fragments of volcanics, chert, jasper, sulfates, carbonates, and sulfides in a chloritic or sericitic tuffaceous matrix
7f	Exhalite : Volcanic exhalative silica, sulfates, carbonates, sulfides, oxides, and native silver. Includes some debris flow facies with an exhalite matrix
7e	Green andesite shard tuff, includes some epiclastics
7d	Grey–green porphyritic andesite lapilli tuff, minor flows and flow breccia. Partly amygdaloidal, commonly trachytic.
7c	Black siltstone, argillite
7b	Maroon and green andesite lapilli tuff
7a	Maroon coarsely graded–bedded volcanic sandstone marker

SYN–VOLCANIC AND EXHALATIVE ALTERATION FACIES

Chst	Chlorite–pyrite–quartz–carbonate stockwork, most commonly a footwall stringer zone near exhalite horizons
Qst	Quartz–chalcedony–chlorite–carbonate–pyrite–chalcopyrite stockwork +– precious metals (Goldbelt Zone)
ChBx	Hydrothermal breccia : altered rock fragments in a matrix of dark chlorite and pyrite. (Goldbelt Zone)
Kfp	Potassium feldspar, pervasive (Goldbelt Zone)
SQ	Sericite–pyrite pervasive alteration, with abundant quartz stringers (Goldbelt Zone)
S	Sericite–pyrite, pervasive. Occurs in Goldbelt Zone and also in hangingwall and footwall of exhalite horizons

SINEMURIAN TO PLIENSBACHIAN(?) : UNUK RIVER FORMATION

4b	Green and maroon porphyritic andesite – probably massive flows, in part might be intrusive equivalent of 7d
4a	Green and maroon basaltic andesite ash tuff and lapilli tuff

UPPER TRIASSIC

3b	Green and purple andesite breccia with minor siltstone, sandstone, and conglomerate
3a	Black siltstone

ABBREVIATIONS

ba	barite
ca	calcite
cp	chalcopyrite
gn	galena
hem	hematite
qz	quartz
sp	sphalerite
sc	sericite
py	pyrite
chl	chlorite

SYMBOLS

geological boundary defined, approximate, assumed

fault defined, approximate, assumed

adit

showing

bedding, jointing, foliation

axial plane
plunge direction of fold axis

attitude of mineralization

CONTOUR INTERVAL 10m

0 500 1000 1500 2000 feet

0 200 400 600 800 metres

SCALE 1 : 10 000

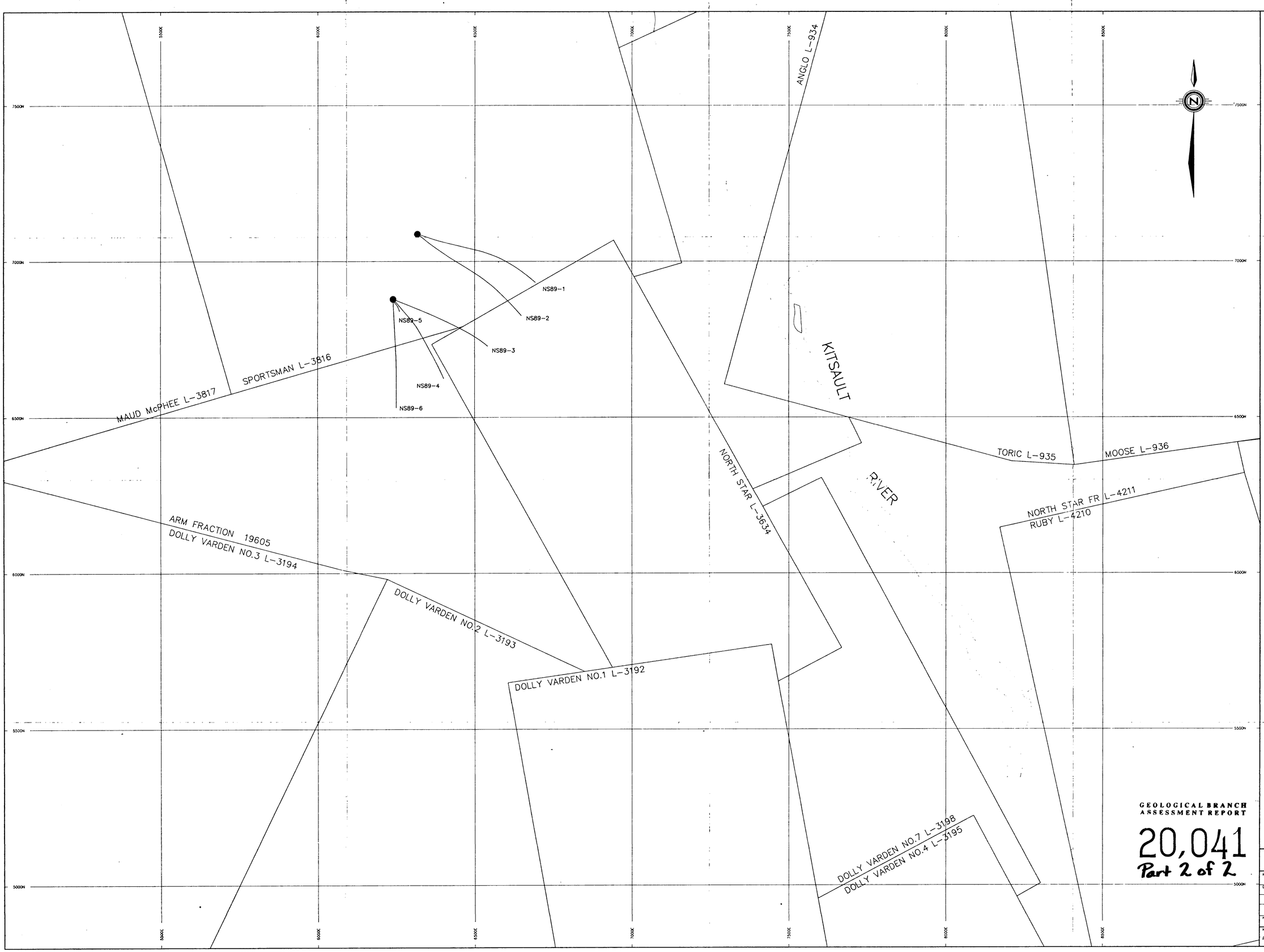
GEOLOGICAL BRANCH
ASSESSMENT REPORT

20,041

Part 2 of 2

DOLLY VARDEN MINERALS INC.

Report by: TD/PM/WM	DOLLY VARDEN PROJECT Property Geology Compilation
Date: January /90	
Mining Division: Skeena	Tecucomp Geological Inc.
NTS: 103P/11–12	Map: 1.



GEOLOGICAL BRANCH
ASSESSMENT REPORT

20,041
Part 2 of 2

NOTE: Coordinates are from Original TORBRIT MINE GRID in Feet.

SCALE 1"=100'
100 0 100
FEET

DOLLY VARDEN MINERALS INC.

Report by: TD/PM/WM Date: January /90	NORTH STAR PROJECT
NTS: 103P/11-12	DRILL HOLE LOCATION MAP
Mining Division Skeena Ref. # PL10258.DWG	Tecucomp Geological Inc. — Map: 1A

SOUTHWEST

NORTHEAST

2500

2000

1500

1000

500

Sea Level

Elevation in Feet.

Surface Profile

Dolly Varden West Zone

DOLLY VARDEN MINE

NORTH STAR MINE

TORBRIT MINE

MOOSE–LAMB showing 500 ft. east.

1780 Level

1640 Level

1410 Level

Mined to Date

Area of Reserves

1660 Level

1560 Level

1500 Level

1025 Level

KITSAULT RIVER

SULPHIDE RICH EXHALITE FACIES

1279 Level

1149 Level

1000 Level

981 Level

914 Level

810 Level

660 Level

Glory Hole

Approximate Stope Outline

MITCHELL FAULT & DVT HORIZON INTERSECTION

NORTH STAR FAULT & DVT HORIZON INTERSECTION AT DOLLY VARDEN

NO DVT EXHALITE IN THIS AREA DUE TO THE DIRECTION OF THE VIEW AND FAULT OFFSET

NORTH STAR FAULT & DVT HORIZON INTERSECTION AT NORTH STAR

MOOSE–LAMB FAULT (assumed Position)
ASSUMED EASTERN FAULT LIMIT OF DVT EXHALITE

ABBREVIATIONS & SYMBOLS

1989 NORTH STAR DRILLING

AFP	andesite feldspar porphyry
AFL	andesite flow
ABX	andesite breccia
ALT	andesite lapilli tuff
AT	andesite tuff
AAP	andesite augite porphyry
AABX	andesite augite breccia
AAFL, AAO	andesite augite flow
AALT	andesite augite lapilli tuff
AAPT	andesite augite porphyry tuff
AFPT	andesite feldspar porphyry tuff
ABXG	andesite plagioclase porphyry breccia
APLT	andesite plagioclase porphyry lapilli tuff
DFL	dacite flow
DFP	dacite feldspar porphyry
DLT	dacite lapilli tuff
DTF	dacite tuff
DBX	dacite breccia
RYFL	rhyolite flow
RYFP	rhyolite feldspar porphyry
RYLT	rhyolite lapilli tuff
RYTF	rhyolite tuff
RYBX	rhyolite breccia
POLYLITHIC EXHALITIC BRECCIA – DEBRIS FLOW FACIES	
DEBF	exalite flow
EXHALITE FACIES	
EQSA	exhalite quartz–barite
EQCA	exhalite quartz–calcite
EQTF	exhalite cocite tuff
EQBX	exhalite quartz breccia
EQBRX	exhalite quartz breccia
LAMP	lamprophyre dyke
F, FALT	fault
OVB	overburden
EOH	end of hole
CASE	casing

PRE–1989 DRILLING

PREVIOUSLY LOGGED AS VEIN – PROBABLY EXHALITE	
VB	vein: barite
VQ	vein: quartz
VQBA	vein: quartz–barite–calcite
VQBX	vein: quartz–breccia
VQC	vein: calcite–quartz
VQSL	vein: quartz–sulfide
VQB	vein: quartz–calcite–barite
VQJ	vein: quartz–jasper
CHBX	chloritic green breccia
SKQ	volcanic rock: quartz altered
DIK	dyke
NG	no geology (geology not summarized)

NS–14 — Hole No.

1.2/ 16.0 — % Zn Equiv. / Core Interval (ft.)

VQB — Host Rock Abbreviation

Zn equivalent (%)= Zn% + (0.5 x Pb%) + (0.3125 x Ag oz/t)

Recommended pierce point of Stage One diamond drill holes

Comment: The continuation of the DVT Exhalite west of the Mitchell Fault is probable in the Red Point / V–Vein area.

Comment: The continuation of the DVT Exhalite east of the Moose – Lamb Fault has not been located.

RECOMMENDATIONS:

1990 STAGE ONE: Dolly Varden

Compile past drilling.

Rehabilatate workings to allow mapping and sampling.

Prepare new cross sections.

DOLLY VARDEN DEPOSIT

Past Production:
36,600 tons / 35.66 oz Ag/ton

Reserves:
47,000 tons / 22.00 oz Ag/ton

Total:
83,600 tons / 27.98 oz Ag/ton

RECOMMENDATIONS:

1990 STAGE ONE: North Star

Complete drill hole compilation and underground mapping.

NORTH STAR DEPOSIT

Past Production:

Reserves:
141,577 tons / 11.71 oz Ag/ton
(mineable, diluted)

Total:
141,577 tons / 11.71 oz Ag/ton

RECOMMENDATIONS:

1990 STAGE ONE: Torbrit

Compile past drilling and development.

Geological mapping: defer if possible due to expense of rehabilitation.

Prepare new cross sections and plans.

TORBRIT DEPOSIT

Past Production:
1,377,382 tons / 13.58 oz Ag/ton / 0.39 % Pb

Reserves:
777,000 tons / 9.8 oz Ag/ton

Total:
2,154,382 tons / 12.22 oz Ag/ton

RECOMMENDATIONS:

1990 STAGE ONE: Dolly Varden

Surface diamond drilling to the 500 ft. elevation.

Total approximately 20,000 feet.

Depending on layout, some holes can be drilled from underground.

(Drill tests at 500' centers.)

RECOMMENDATIONS:

1990 STAGE ONE: NORTH STAR

Surface diamond drilling to Sea Level.

Total: 22,000 feet.

(Drill tests at 500' centers.)

SCALE 1"=100'

100 0 100

FEET

GEOLOGICAL BRANCH
ASSESSMENT REPORT

20,041
Part 2 of 2

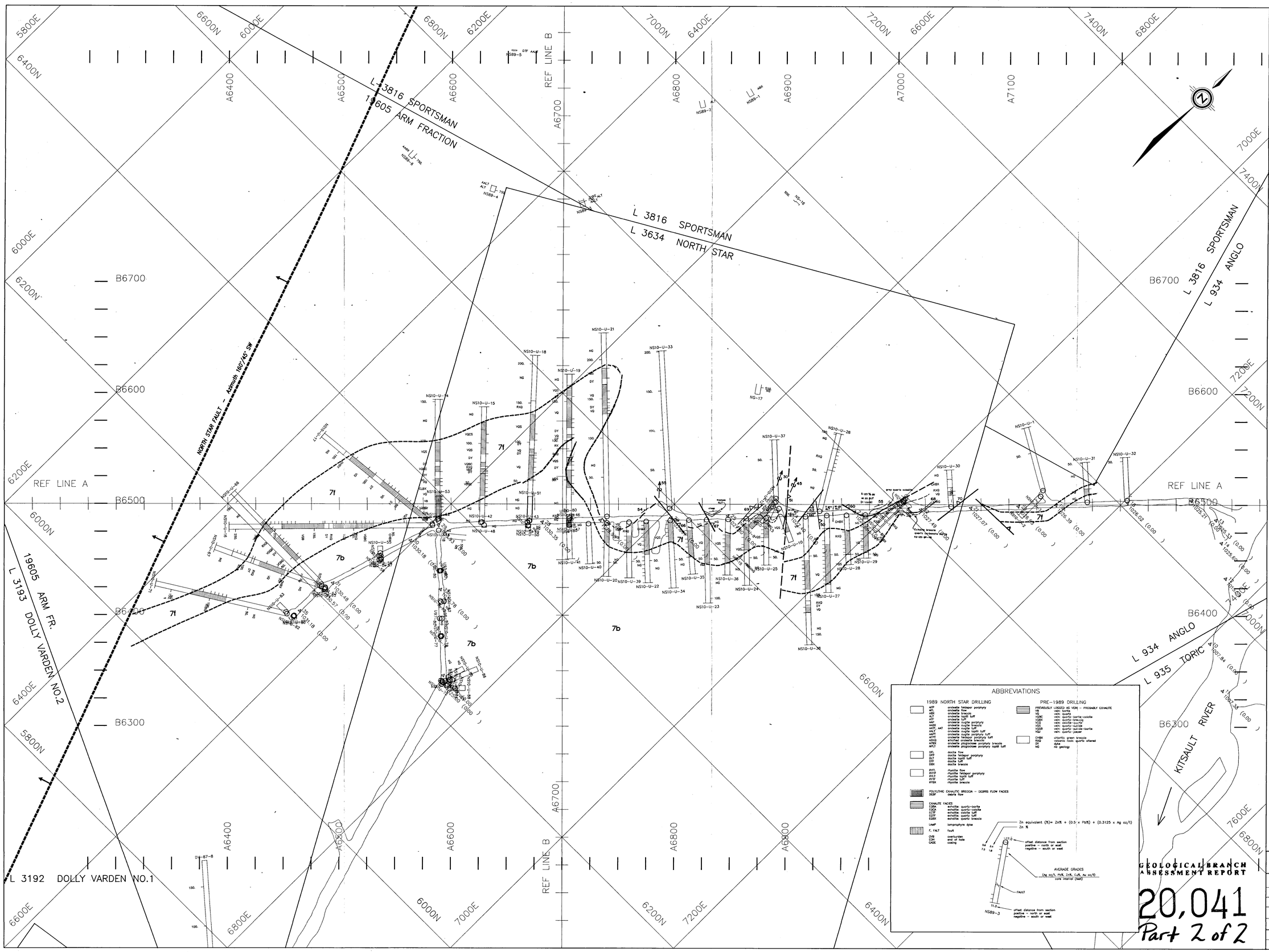
DOLLY VARDEN MINERALS INC.

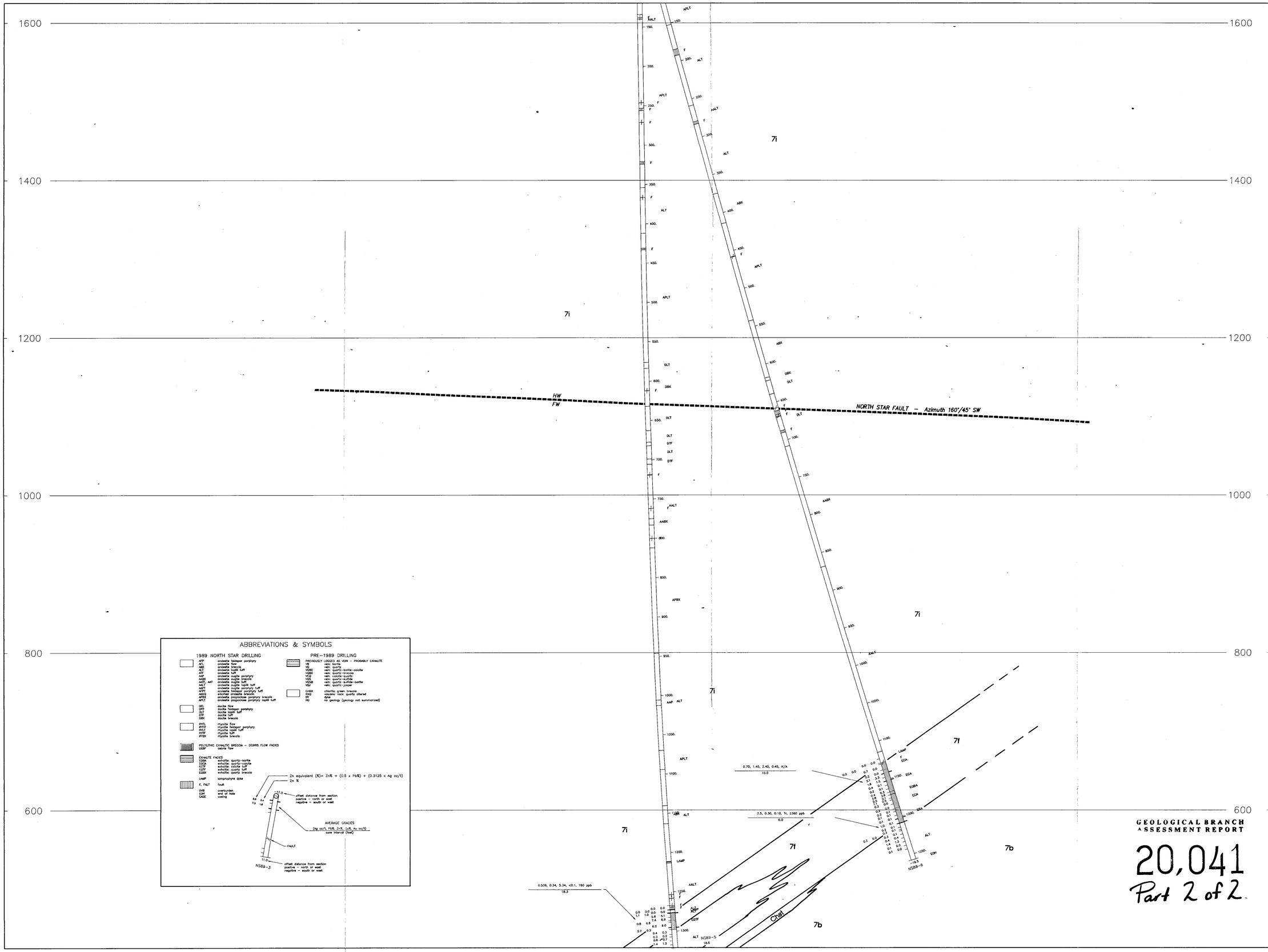
Report by: TD/PJM/MM
Date: January / 90
NTS: 103P/ 11–12
Mining Division: Skeena
Ref. # LDMGA.DWG

DOLLY VARDEN PROJECT
DVT EXHALITE
Vertical Longitudinal Projection
Looking NW
Dolly Varden, North Star, & Torbrit Mines

Tecucomp Geological Inc.

Map 2


L 3816 SPORTSMAN
19605 ARM FRACTION
L 3816 SPORTSMAN
L 3634 NORTH STAR
L 3816 SPORTSMAN
L 934 ANGLO
NORTH STAR FAULT - Azimuth 160°/45° SW
19605 ARM FR.
L 3193 DOLLY VARDEN NO.2
L 3192 DOLLY VARDEN NO.1
L 934 ANGLO
L 935 TORIC
KITSAULT RIVER
REF LINE A
REF LINE B
B6700
B6600
B6500
B6400
B6300
A6400
A6500
A6600
A6700
A6800
A6900
A7000
A7100
5800E
6000E
6200E
6400E
6600E
6800E
7000E
7200E
7400E
7600E
5800N
6000N
6200N
6400N
6600N
6800N
7000N
7200N
7400N
7600N
7b
7l
7i
NS10-U-1
NS10-U-10
NS10-U-18
NS10-U-19
NS10-U-21
NS10-U-23
NS10-U-24
NS10-U-25
NS10-U-26
NS10-U-27
NS10-U-28
NS10-U-29
NS10-U-30
NS10-U-31
NS10-U-32
NS10-U-33
NS10-U-34
NS10-U-35
NS10-U-36
NS10-U-37
NS10-U-38
NS10-U-39
NS10-U-40
NS10-U-41
NS10-U-42
NS10-U-43
NS10-U-48
NS10-U-51
NS10-U-53
NS10-U-55
NS10-U-56
NS10-U-57
NS10-U-58
NS10-U-59
NS10-U-60
NS10-U-62
NS10-U-63
NS10-U-66
NS10-U-67
NS10-U-71
NS10-U-80
NS89-1
NS89-2
NS89-3
NS89-4
NS89-5
NS89-6
NS-17
DV-87-8
ABBREVIATIONS
1989 NORTH STAR DRILLING
ATF andesite feldspar porphyry
AFL andesite flow
ABX andesite breccia
AIT andesite lapilli tuff
ATF andesite tuff
AAP andesite augite porphyry
AABX andesite augite breccia
AAFL, AAT andesite augite flow
AALT andesite augite lapilli tuff
AAPT andesite augite porphyry tuff
AFPT andesite feldspar porphyry tuff
ABPX andesite plagioclase porphyry
APBX andesite plagioclase porphyry breccia
APLT andesite plagioclase porphyry lapilli tuff
DFL dacite flow
DFP dacite feldspar porphyry
DLT dacite lapilli tuff
DTF dacite tuff
DBX dacite breccia
RYFL rhyolite flow
RYFP rhyolite feldspar porphyry
RYLT rhyolite lapilli tuff
RYTF rhyolite tuff
RYBX rhyolite breccia
POLYLITHIC EXHALITIC BRECCIA - DEBRIS FLOW FACIES
DEBF debris flow
EXHALITE FACIES
EQBA exhalite quartz-barite
EQCA exhalite quartz-calcite
ECTF exhalite calcite tuff
EQTF exhalite quartz tuff
EQBX exhalite quartz breccia
LAMP lamprophyre dyke
F, FALT fault
OVB overburden
EOH end of hole
CASE casing
PRE-1989 DRILLING
PREVIOUSLY LOGGED AS VQN - PROBABLY EXHALITE
VB vein: barite
VQ vein: quartz
VQBC vein: quartz-barite-calcite
VQC vein: quartz-calcite
VQZ vein: calcite-quartz
VQS vein: quartz-sulfide
VQSZ vein: quartz-sulfide-barite
VQZ vein: quartz-barite
CHBX chloritic green breccia
RXQ volcanic rock: quartz altered
AB ankerite
NG no geology
Zn equivalent (%)= Zn% + (0.5 x Pb%) + (0.3125 x Ag oz/t)
Zn %
offset distance from section
positive - north or east
negative - south or west
AVERAGE GRADES
(Ag oz/t, Pb%, Zn%, Cu%, Au oz/t)
core interval (feet)
FAULT
offset distance from section
positive - north or east
negative - south or west
LITHOLOGIES
QUATERNARY
21 Alluvium
20 Glacial drift, colluvium
INTRUSIVE ROCKS
TERTIARY
EOCENE AND YOUNGER
11 Lamprophyre, basalt dykes
10 Diorite, microdiorite
VOLCANIC AND SEDIMENTARY ROCKS
LOWER TO MIDDLE JURASSIC
TOARCIAN TO BAJOCIAN : SALMON RIVER FORMATION
8b Siltstone, shale, and minor sandstone
8a Basal fossiliferous wacke
TOARCIAN : PARTIAL EQUIVALENTS OF
MT DILWORTH / BETTY CREEK FORMATIONS
7k Siliceous, pyritic, sericitic felsic pyroclastic rocks
7j Pale green andesite ash tuff
7i Maroon and green andesite lapilli tuff, ash tuff. Locally carbonaceous
7h Grey and greenish grey andesite lapilli tuff. Commonly contains carbonate-chlorite (-sericite) altered andesite fragments in a strongly chloritic matrix. The base of this unit is locally comprised of finely laminated chloritic ash tuff
7g Polylithic exhalitic breccia. A debris flow facies containing fragments of volcanics, chert, jasper, sulfates, carbonates, and sulfides in a chloritic or sericitic tuffaceous matrix
7f Exhalite : Volcanic exhalative silica, sulfates, carbonates, sulfides, oxides, and native silver. Includes some debris flow facies with an exhalite matrix
7e Green andesite shard tuff, includes some epiclastics
7d Grey-green porphyritic andesite lapilli tuff, minor flows and flow breccia. Partly amygdaloidal, commonly trachytic.
7c Black siltstone, argillite
7b Maroon and green andesite lapilli tuff
7a Maroon coarsely graded-bedded volcanic sandstone marker
SYN-VOLCANIC AND EXHALATIVE ALTERATION FACIES
Chat Chlorite-pyrite-quartz-carbonate stockwork, most commonly a footwall stringer zone near exhalite horizons
Qat Quartz-chalcedony-chlorite-carbonate-pyrite-chalcopyrite stockwork +- precious metals (Goldbelt Zone)
ChBx Hydrothermal breccia : altered rock fragments in a matrix of dark chlorite and pyrite. (Goldbelt Zone)
Kfp Potassium feldspar, pervasive (Goldbelt Zone)
SQ Sericite-pyrite pervasive alteration, with abundant quartz stringers (Goldbelt Zone)
S Sericite-pyrite, pervasive. Occurs in Goldbelt Zone and also in hangingwall and footwall of exhalite horizons
SINEMURIAN TO PLIENSBACHIAN(?) : UNUK RIVER FORMATION
4b Green and maroon porphyritic andesite - probably massive flows, in part might be intrusive equivalent of 7d
4a Green and maroon basaltic andesite ash tuff and lapilli tuff
UPPER TRIASSIC
3b Green and purple andesite breccia with minor siltstone, sandstone, and conglomerate
3a Black siltstone
ABBREVIATIONS
ba barite
ca calcite
cp chalcopyrite
gn galena
hem hematite
qz quartz
sp sphalerite
sc sericite
py pyrite
chl chlorite
SYMBOLS
geological boundary defined, approximate, assumed
fault defined, approximate, assumed
trench
ddh collar and trace
adit, test pit
showing
X gn-sp-cp
bedding, jointing, foliation
axial plane
plunge direction of fold axis
lineation
Survey Stn No.
Spot elevation (feet)
Rail elevation (feet)
11
1007.33 (0.00)
Coordinates are from the TORBRIT MINE GRID in feet
SCALE 1"=40'
40 0 40 80 120
FEET
GEOLOGICAL BRANCH
ASSESSMENT REPORT
20,041
Part 2 of 2
DOLLY VARDEN MINERALS INC.
Report by:
Date: January /90
NTS: 103P
Mining Division Skeena
Ref No. PLAN40.DWG
DOLLY VARDEN PROJECT
NORTH STAR MINE
GEOLOGY
1025 LEVEL
Tecucomp Geological Inc.
Map 3.



GEOLOGICAL BRANCH
ASSESSMENT REPORT

20,041
Part 2 of 2.

LITHOLOGIES

QUATERNARY

- 21 Alluvium
- 20 Glacial drift, colluvium

INTRUSIVE ROCKS

TERTIARY

EOCENE AND YOUNGER

- 11 Lamprophyre, basalt dykes
- 10 Diorite, microdiorite

VOLCANIC AND SEDIMENTARY ROCKS

LOWER TO MIDDLE JURASSIC

TOARCIAN TO BAJOCIAN : SALMON RIVER FORMATION

- 8b Siltstone, shale, and minor sandstone
- 8a Basal fossiliferous wacke

TOARCIAN : PARTIAL EQUIVALENTS OF
MT DILWORTH / BETTY CREEK FORMATIONS

- 7k Siliceous, pyritic, sericitic felsic pyroclastic rocks
- 7j Pale green andesite ash tuff
- 7i Maroon and green andesite lapilli tuff, ash tuff. Locally carbonaceous
- 7h Grey and greenish grey andesite lapilli tuff. Commonly contains carbonate–chlorite (–sericite) altered andesite fragments in a strongly chloritic matrix. The base of this unit is locally comprised of finely laminated chloritic ash tuff
- 7g Polylithic exhalitic breccia. A debris flow facies containing fragments of volcanics, chert, jasper, sulfates, carbonates, and sulfides in a chloritic or sericitic tuffaceous matrix
- 7f Exhalite : Volcanic exhalative silica, sulfates, carbonates, sulfides, oxides, and native silver. Includes some debris flow facies with an exhalite matrix
- 7e Green andesite shard tuff, includes some epiclastics
- 7d Grey–green porphyritic andesite lapilli tuff, minor flows and flow breccia. Partly amygdaloidal, commonly trachytic.
- 7c Black siltstone, argillite
- 7b Maroon and green andesite lapilli tuff
- 7a Maroon coarsely graded–bedded volcanic sandstone marker

SYN–VOLCANIC AND EXHALATIVE ALTERATION FACIES

- Chat Chlorite–pyrite–quartz–carbonate stockwork, most commonly a footwall stringer zone near exhalite horizons
- Qat Quartz–chalcedony–chlorite–carbonate–pyrite–chalcopyrite stockwork +– precious metals (Goldbelt Zone)
- ChBx Hydrothermal breccia : altered rock fragments in a matrix of dark chlorite and pyrite. (Goldbelt Zone)
- Kfp Potassium feldspar, pervasive (Goldbelt Zone)
- SQ Sericite–pyrite pervasive alteration, with abundant quartz stringers (Goldbelt Zone)
- S Sericite–pyrite, pervasive. Occurs in Goldbelt Zone and also in hangingwall and footwall of exhalite horizons

SINEMURIAN TO PLIENSBACHIAN(?) : UNUK RIVER FORMATION

- 4b Green and maroon porphyritic andesite – probably massive flows, in part might be intrusive equivalent of 7d
- 4a Green and maroon basaltic andesite ash tuff and lapilli tuff

UPPER TRIASSIC

- 3b Green and purple andesite breccia with minor siltstone, sandstone, and conglomerate
- 3a Black siltstone

ABBREVIATIONS

ba	barite
ca	calcite
cp	chalcopyrite
gn	galena
hem	hematite
qz	quartz
sp	sphalerite
ser	sericite
py	pyrite
chl	chlorite

SCALE 1"=40'

40 0 40 80 120

FEET

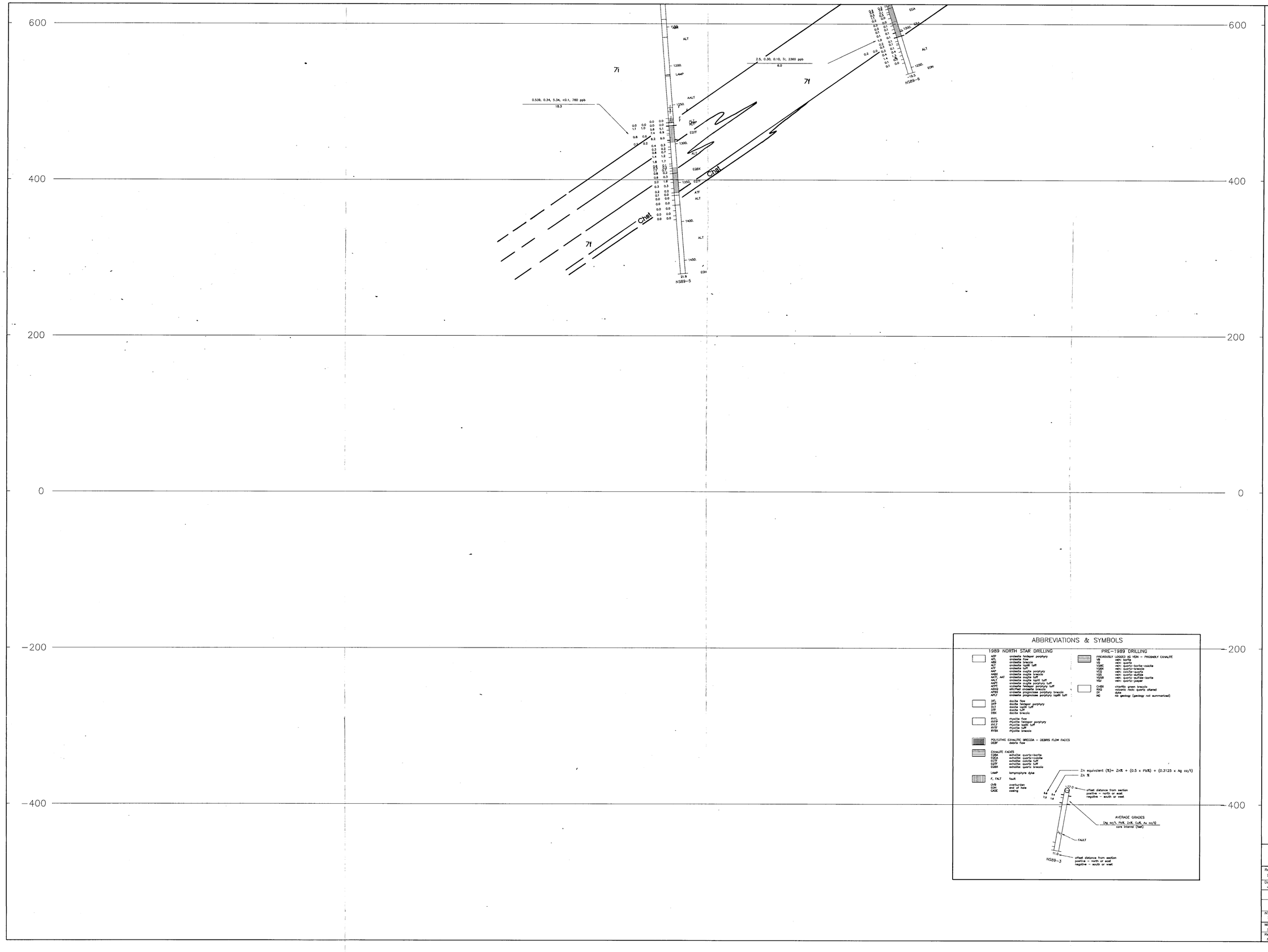
DOLLY VARDEN MINERALS INC.

Report by: TD/PJM/WM
Date: January /90
NTS: 103P/ 11-12
Mining Division: Skeena
Ref. # NS89-6.DWG

DOLLY VARDEN PROJECT
North Star Mine
Cross Section NS89-6
Section Azimuth – 175° Looking E

Tecucomp Geological Inc.

Nogr. 4.



ABBREVIATIONS & SYMBOLS

1989 NORTH STAR DRILLING

- APF andesite feldspar porphyry
- AFL andesite flow
- ABX andesite breccia
- ALT andesite lapilli tuff
- ATF andesite tuff
- APX andesite augite porphyry
- AABX andesite augite breccia
- AATF, AAT andesite augite tuff
- AALT andesite augite lapilli tuff
- AAPT andesite augite porphyry tuff
- ABXT andesite augite breccia tuff
- ASBXQ silicified andesite breccia
- APBX andesite plagioclase porphyry breccia
- APLT andesite plagioclase porphyry lapilli tuff
- DFL dacite flow
- DFP dacite feldspar porphyry
- DLT dacite lapilli tuff
- DTF dacite tuff
- DBX dacite breccia
- RYFL rhyolite flow
- RYFP rhyolite feldspar porphyry
- RYLT rhyolite lapilli tuff
- RYTF rhyolite tuff
- RYBX rhyolite breccia
- POLYLITHIC EXHALITIC BRECCIA – DEBRIS FLOW FACIES
- DEBF debris flow
- EXHALITE FACIES
- EQBA exhalite: quartz-barite
- EQTA exhalite: quartz-tuffaceous
- EQTS exhalite: calcite tuff
- EQTF exhalite: quartz tuff
- EQBX exhalite: quartz breccia
- LAMP lamprophyre dyke
- F, FALT fault
- OVB overburden
- EOH end of hole
- CASE casing

PRE-1989 DRILLING

- PREVIOUSLY LOGGED AS VGH – PROBABLY EXHALITE
- VB vein: barite
- VC vein: calcite
- VQBC vein: quartz-barite-calcite
- VQBX vein: quartz-breccia
- VCQ vein: calcite-quartz
- VQ vein: quartz-sulfide
- VQSB vein: quartz-sulfide-barite
- VQJ vein: quartz-jasper
- CHBX chloritic green breccia
- FQQ volcanic mafic quartz altered
- DY dyke
- NG no geology (geology not summarized)

Zn equivalent (%)= Zn% + (0.5 x Pb%) + (0.3125 x Ag oz/t)

Zn %

offset distance from section
positive – north or east
negative – south or west

AVERAGE GRADES
(Ag oz/t, Pb%, Zn%, CuR, Au oz/t)
core interval (feet)

FAULT

NS89-3

offset distance from section
positive – north or east
negative – south or west

LITHOLOGIES

QUATERNARY

- 21 Alluvium
- 20 Glacial drift, colluvium

INTRUSIVE ROCKS

TERTIARY

EOCENE AND YOUNGER

- 11 Lamprophyre, basalt dykes
- 10 Diorite, microdiorite

VOLCANIC AND SEDIMENTARY ROCKS

LOWER TO MIDDLE JURASSIC

TOARCIAN TO BAJOCIAN : SALMON RIVER FORMATION

- 8b Siltstone, shale, and minor sandstone
- 8a Basal fossiliferous wacke

TOARCIAN : PARTIAL EQUIVALENTS OF
MT DILWORTH / BETTY CREEK FORMATIONS

- 7k Siliceous, pyritic, sericitic felsic pyroclastic rocks
- 7j Pale green andesite ash tuff
- 7i Maroon and green andesite lapilli tuff, ash tuff. Locally carbonaceous
- 7h Grey and greenish grey andesite lapilli tuff. Commonly contains carbonate-chlorite (-sericite) altered andesite fragments in a strongly chloritic matrix. The base of this unit is locally comprised of finely laminated chloritic ash tuff
- 7g Polylithic exhalitic breccia. A debris flow facies containing fragments of volcanics, chert, jasper, sulfides, carbonates, and sulfides in a chloritic or sericitic tuffaceous matrix
- 7f Exhalite : Volcanic exhalative silica, sulfates, carbonates, sulfides, oxides, and native silver. Includes some debris flow facies with an exhalite matrix
- 7e Green andesite shard tuff, includes some epiclastics
- 7d Grey-green porphyritic andesite lapilli tuff, minor flows and flow breccia. Partly amygdaloidal, commonly trachytic.
- 7c Black siltstone, argillite
- 7b Maroon and green andesite lapilli tuff
- 7a Maroon coarsely graded-bedded volcanic sandstone marker

SYN-VOLCANIC AND EXHALATIVE ALTERATION FACIES

- Chat Chlorite-pyrite-quartz-carbonate stockwork, most commonly a footwall stringer zone near exhalite horizons
- Qet Quartz-chalcedony-chlorite-carbonate-pyrite-chalcopyrite stockwork +- precious metals (Goldbelt Zone)
- ChBx Hydrothermal breccia : altered rock fragments in a matrix of dark chlorite and pyrite. (Goldbelt Zone)
- Kfp Potassium feldspar, pervasive (Goldbelt Zone)
- SQ Sericite-pyrite pervasive alteration, with abundant quartz stringers (Goldbelt Zone)
- S Sericite-pyrite, pervasive. Occurs in Goldbelt Zone and also in hangingwall and footwall of exhalite horizons

SINEMURIAN TO PLIENSBACHIAN(?) : UNUK RIVER FORMATION

- 4b Green and maroon porphyritic andesite – probably massive flows, in part might be intrusive equivalent of 7d
- 4a Green and maroon basaltic andesite ash tuff and lapilli tuff

UPPER TRIASSIC

- 3b Green and purple andesite breccia with minor siltstone, sandstone, and conglomerate
- 3a Black siltstone

ABBREVIATIONS

ba	barite
ca	calcite
cp	chalcopyrite
gn	galena
hem	hematite
qz	quartz
sp	sphalerite
ser	sericite
Py	pyrite
chl	chlorite

GEOLOGICAL BRANCH
ASSESSMENT REPORT

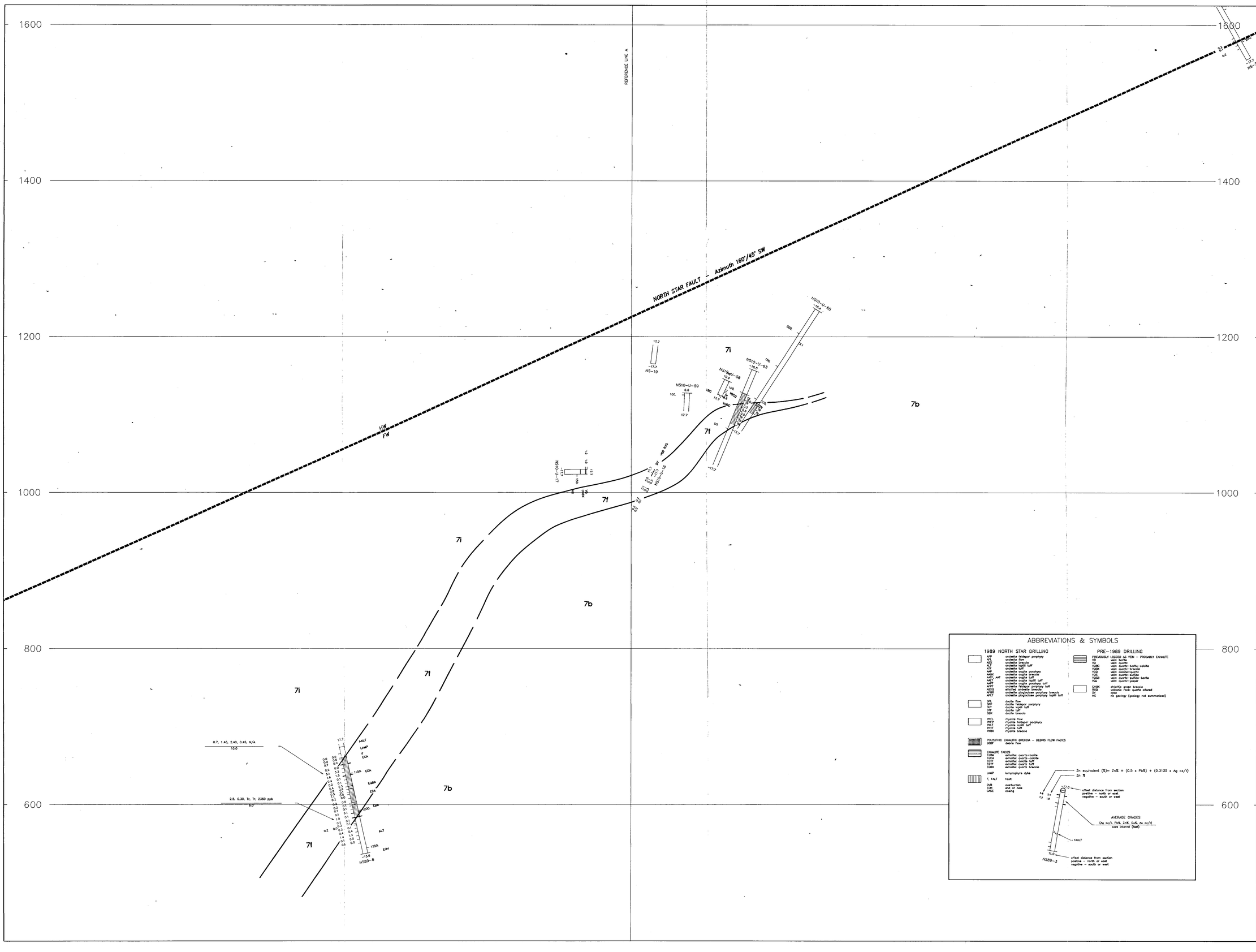
20,041
Part 2 of 2

SCALE 1"=40'

40 0 40 80 120
FEET

DOLLY VARDEN MINERALS INC.

Report by: TD/PJM/WM	DOLLY VARDEN PROJECT North Star Mine Cross Section NS89-6 Section Azimuth – 175° Looking E
Date: January /90	
NTS: 103P/ 11-12	
Mining Division: Skeena	Tecucomp Geological Inc.
Ref. # NS89-6C.DWG	Map: 5.



LITHOLOGIES

QUATERNARY

- 21 Alluvium
- 20 Glacial drift, colluvium

INTRUSIVE ROCKS

TERTIARY

EOCENE AND YOUNGER

- 11 Lamprophyre, basalt dykes
- 10 Diorite, microdiorite

VOLCANIC AND SEDIMENTARY ROCKS

LOWER TO MIDDLE JURASSIC

TOARCIAN TO BAJOCIAN : SALMON RIVER FORMATION

- 8b Siltstone, shale, and minor sandstone
- 8a Basal fossiliferous wacke

TOARCIAN : PARTIAL EQUIVALENTS OF MT DILWORTH / BETTY CREEK FORMATIONS

- 7k Siliceous, pyritic, sericitic felsic pyroclastic rocks
- 7j Pale green andesite ash tuff
- 7i Maroon and green andesite lapilli tuff, ash tuff. Locally carbonaceous
- 7h Grey and greenish grey andesite lapilli tuff. Commonly contains carbonate–chlorite (–sericite) altered andesite fragments in a strongly chloritic matrix. The base of this unit is locally comprised of finely laminated chloritic ash tuff
- 7g Polylithic exhalitic breccia. A debris flow facies containing fragments of volcanics, chert, jasper, sulfates, carbonates, and sulfides in a chloritic or sericitic tuffaceous matrix
- 7f Exhalite : Volcanic exhalative silica, sulfates, carbonates, sulfides, oxides, and native silver. Includes some debris flow facies with an exhalite matrix
- 7e Green andesite shard tuff, includes some epiclastics
- 7d Grey–green porphyritic andesite lapilli tuff, minor flows and flow breccia. Partly amygdaloidal, commonly trachytic.
- 7c Black siltstone, argillite
- 7b Maroon and green andesite lapilli tuff
- 7a Maroon coarsely graded–bedded volcanic sandstone marker

SYN–VOLCANIC AND EXHALATIVE ALTERATION FACIES

- Chat Chlorite–pyrite–quartz–carbonate stockwork, most commonly a footwall stringer zone near exhalite horizons
- Qrt Quartz–chalcedony–chlorite–carbonate–pyrite–chalcopyrite stockwork +– precious metals (Goldbelt Zone)
- ChBx Hydrothermal breccia : altered rock fragments in a matrix of dark chlorite and pyrite. (Goldbelt Zone)
- Kfp Potassium feldspar, pervasive (Goldbelt Zone)
- SQ Sericite–pyrite pervasive alteration, with abundant quartz stringers (Goldbelt Zone)
- S Sericite–pyrite, pervasive. Occurs in Goldbelt Zone and also in hangingwall and footwall of exhalite horizons

SINEMURIAN TO PLIENSBACHIAN(?) : UNUK RIVER FORMATION

- 4b Green and maroon porphyritic andesite – probably massive flows, in part might be intrusive equivalent of 7d
- 4a Green and maroon basaltic andesite ash tuff and lapilli tuff

UPPER TRIASSIC

- 3b Green and purple andesite breccia with minor siltstone, sandstone, and conglomerate
- 3a Black siltstone

ABBREVIATIONS

ba	barite
ca	calcite
cp	chalcopyrite
gn	galena
hem	hematite
qz	quartz
sp	sphalerite
ser	sericite
py	pyrite
chl	chlorite

ABBREVIATIONS & SYMBOLS

1989 NORTH STAR DRILLING

- AFP andesite feldspar porphyry
- AFL andesite flow
- ABR andesite breccia
- ALT andesite lapilli tuff
- ATF andesite tuff
- AHP andesite hornblende porphyry
- AABX andesite augite breccia
- AAT, AAT andesite augite tuff
- AALT andesite augite lapilli tuff
- APPT andesite augite porphyry tuff
- ABPT andesite augite porphyry lapilli tuff
- ABXQ silicified andesite breccia
- APBX andesite plagioclase porphyry breccia
- APLT andesite plagioclase porphyry lapilli tuff

- DFL dacite flow
- DFP dacite feldspar porphyry
- DLT dacite lapilli tuff
- DTF dacite tuff
- DBX dacite breccia

- RYFL rhyolite flow
- RYFP rhyolite feldspar porphyry
- RYLT rhyolite lapilli tuff
- RYTF rhyolite tuff
- RYBX rhyolite breccia

POLYLITHIC EXHALITIC BRECCIA – DEBRIS FLOW FACIES

- DEBF debris flow

EXHALITE FACIES

- EQBA exhalite: quartz–barite
- EBA exhalite: barite–quartz
- ECA exhalite: calcite tuff
- EQTF exhalite: quartz tuff
- EQBX exhalite: quartz breccia

- LAMP lamprophyre dyke

- F, FALT fault

- OVB overburden
- EOH end of hole
- CASE casing

PRE–1989 DRILLING

PREVIOUSLY LOGGED AS VEIN – PROBABLY EXHALITE

- VB vein: barite
- VQ vein: quartz
- VQBC vein: quartz–barite–calcite
- VQBX vein: quartz–breccia
- VCQ vein: calcite–quartz
- VQB vein: quartz–barite
- VQSB vein: quartz–sulfide–barite
- VQJ vein: quartz–jasper

- CHBX chloritic green breccia
- RXQ volcanic rock: quartz altered
- DY dyke
- NG no geology (geology not summarized)

Zn equivalent (%)= Zn% + (0.5 x Pb%) + (0.3125 x Ag oz/t)

Zn %

offset distance from section
positive – north or east
negative – south or west

AVERAGE GRADES
(Ag oz/t, Pb%, Zn%, Cu%, Au oz/t)
core interval (feet)

FAULT

offset distance from section
positive – north or east
negative – south or west

GEOLOGICAL BRANCH
ASSESSMENT REPORT

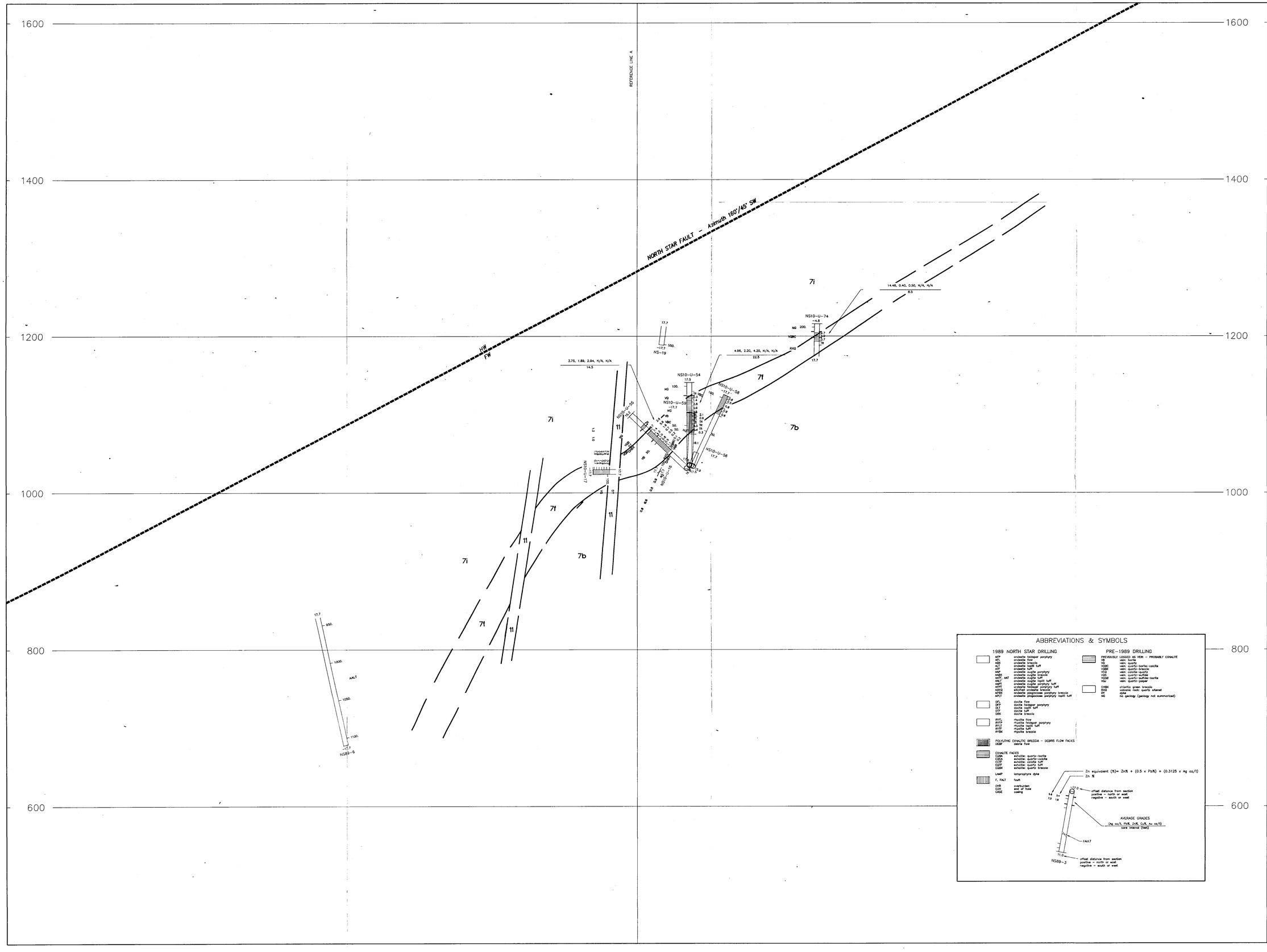
20,041
Part 2 of 2

SCALE 1"=40'

40 0 40 80 120
FEET

DOLLY VARDEN MINERALS INC.

Report by: TD/PJM/WM	DOLLY VARDEN PROJECT North Star Mine Cross Section A 6500 Looking NE
Date: January /90	
NTS: 103P/ 11-12	
Mining Division Skeena	Tecucomp Geological Inc.
Ref. # SECA6500.DWG	Map: 6.



LITHOLOGIES

QUATERNARY

- 21 Alluvium
- 20 Glacial drift, colluvium

INTRUSIVE ROCKS

TERTIARY

EOCENE AND YOUNGER

- 11 Lamprophyre, basalt dykes
- 10 Diorite, microdiorite

VOLCANIC AND SEDIMENTARY ROCKS

LOWER TO MIDDLE JURASSIC

TOARCIAN TO BAJOCIAN : SALMON RIVER FORMATION

- 8b Siltstone, shale, and minor sandstone
- 8a Basal fossiliferous wacke

TOARCIAN : PARTIAL EQUIVALENTS OF MT DILWORTH / BETTY CREEK FORMATIONS

- 7k Siliceous, pyritic, sericitic felsic pyroclastic rocks
- 7j Pale green andesite ash tuff
- 7i Maroon and green andesite lapilli tuff, ash tuff. Locally carbonaceous
- 7h Grey and greenish grey andesite lapilli tuff. Commonly contains carbonate–chlorite (–sericite) altered andesite fragments in a strongly chloritic matrix. The base of this unit is locally comprised of finely laminated chloritic ash tuff
- 7g Polylithic exhalitic breccia. A debris flow facies containing fragments of volcanics, chert, jasper, sulfides, carbonates, and sulfides in a chloritic or sericitic tuffaceous matrix
- 7f Exhalite : Volcanic exhalative silica, sulfates, carbonates, sulfides, oxides, and native silver. Includes some debris flow facies with an exhalite matrix
- 7e Green andesite shard tuff, includes some epiclastics
- 7d Grey–green porphyritic andesite lapilli tuff, minor flows and flow breccia. Partly amygdaloidal, commonly trachytic.
- 7c Black siltstone, argillite
- 7b Maroon and green andesite lapilli tuff
- 7a Maroon coarsely graded–bedded volcanic sandstone marker

SYN–VOLCANIC AND EXHALATIVE ALTERATION FACIES

- Chat Chlorite–pyrite–quartz–carbonate stockwork, most commonly a footwall stringer zone near exhalite horizons
- Qat Quartz–chalcedony–chlorite–carbonate–pyrite–chalcopyrite stockwork +– precious metals (Goldbelt Zone)
- ChBx Hydrothermal breccia : altered rock fragments in a matrix of dark chlorite and pyrite (Goldbelt Zone)
- Ktp Potassium feldspar, pervasive (Goldbelt Zone)
- SQ Sericite–pyrite pervasive alteration, with abundant quartz stringers (Goldbelt Zone)
- S Sericite–pyrite, pervasive. Occurs in Goldbelt Zone and also in hangingwall and footwall of exhalite horizons

SINEMURIAN TO PLIENSBACHIAN(?) : UNUK RIVER FORMATION

- 4b Green and maroon porphyritic andesite – probably massive flows, in part might be intrusive equivalent of 7d
- 4a Green and maroon basaltic andesite ash tuff and lapilli tuff

UPPER TRIASSIC

- 3b Green and purple andesite breccia with minor siltstone, sandstone, and conglomerate
- 3a Black siltstone

ABBREVIATIONS

ba	barite
ca	calcite
cp	chalcopyrite
gn	galena
hem	hematite
qz	quartz
sp	sphalerite
sc	sericite
py	pyrite
chl	chlorite

GEOLOGICAL BRANCH
ASSESSMENT REPORT

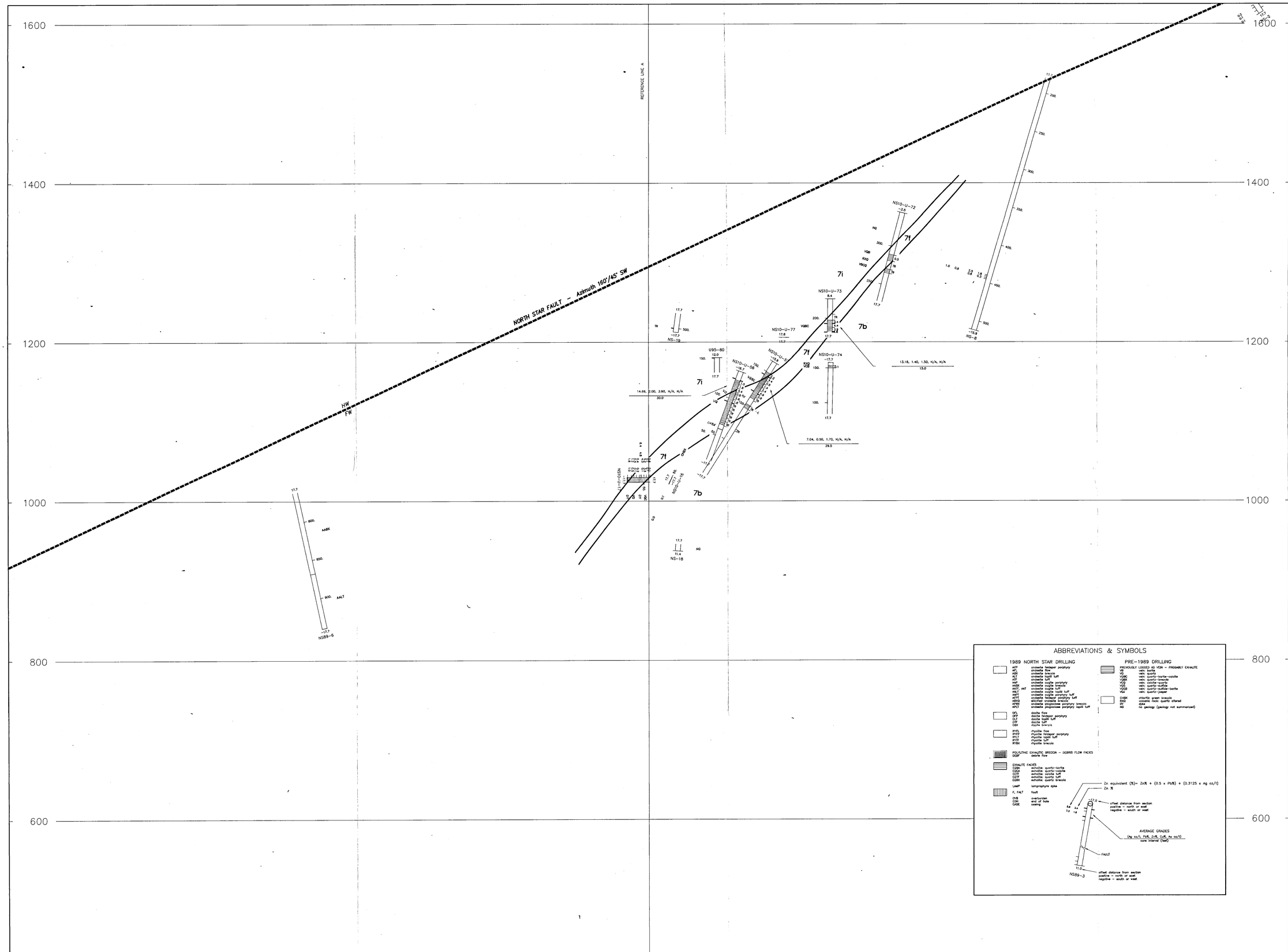
20,041
Part 2 of 2

SCALE 1"=40'

40 0 40 80 120
FEET

DOLLY VARDEN MINERALS INC.

Report by: TD/PUM/WM	DOLLY VARDEN PROJECT North Star Mine Cross Section A 6525 Looking NE
Date: January /90	
NTS: 104P/ 11–12	
Mining Division: Skeena	Tecucomp Geological Inc.
Ref. # SEQA6525.DWG	Map: 7.



ABBREVIATIONS & SYMBOLS

1989 NORTH STAR DRILLING

APP	andesite feldspar porphyry
AFP	andesite flow
ABR	andesite breccia
ALT	andesite lapilli tuff
ATF	andesite tuff
AAP	andesite augite porphyry
AABX	andesite augite breccia
AATF, AAT	andesite augite tuff
AALT	andesite augite lapilli tuff
APLT	andesite feldspar lapilli tuff
APTF	andesite feldspar porphyry tuff
AEBXD	silicified andesite breccia
APPBX	andesite plagioclase porphyry breccia
APPLT	andesite plagioclase porphyry lapilli tuff
DFL	dacite flow
DFP	dacite feldspar porphyry
DLT	dacite lapilli tuff
DTF	dacite tuff
DBX	dacite breccia
RYFL	rhyolite flow
RYFP	rhyolite feldspar porphyry
RYLT	rhyolite lapilli tuff
RYTF	rhyolite tuff
RYBX	rhyolite breccia
POLYLITHIC EXHALITIC BRECCIA – DEBRIS FLOW FACIES	
DEBF	debris flow
EXHALITE FACIES	
EQCA	exhalite: quartz–barite
EQCB	exhalite: quartz–calcite
ECTF	exhalite: calcite tuff
EQTF	exhalite: quartz tuff
EQBX	exhalite: quartz breccia
LAMP	lamprophyre dyke
F, FALT	fault
OVB	overburden
EOH	end of hole
CASE	casing

PRE-1989 DRILLING

PREVIOUSLY LOGGED AS VEIN – PROBABLY EXHALITE	
VBR	vein: barite
VQ	vein: quartz
VQBC	vein: quartz–barite–calcite
VQC	vein: quartz–calcite
VQCD	vein: calcite–quartz
VQS	vein: quartz–sulfide
VQSB	vein: quartz–sulfide–barite
VQJ	vein: quartz–jasper
CHBX	chloritic green breccia
RXQ	volcanic rock: quartz altered
DY	dyke
NG	no geology (geology not summarized)

Zn equivalent (%)= Zn% + (0.5 x Pb%) + (0.3125 x Ag oz/t)

Zn %

offset distance from section
positive – north or east
negative – south or west

AVERAGE GRADES
(Ag oz/t, Pb%, Zn%, Cu%, Au oz/t)
core interval (feet)

FAULT

offset distance from section
positive – north or east
negative – south or west

LITHOLOGIES

QUATERNARY

21	Alluvium
20	Glacial drift, colluvium

INTRUSIVE ROCKS

TERTIARY

EOCENE AND YOUNGER

11	Lamprophyre, basalt dykes
10	Diorite, microdiorite

VOLCANIC AND SEDIMENTARY ROCKS

LOWER TO MIDDLE JURASSIC

TOARCIAN TO BAJOCIAN : SALMON RIVER FORMATION

8b	Siltstone, shale, and minor sandstone
8a	Basal fossiliferous wacke

TOARCIAN : PARTIAL EQUIVALENTS OF
MT DILWORTH / BETTY CREEK FORMATIONS

7k	Siliceous, pyritic, sericitic felsic pyroclastic rocks
7j	Pale green andesite ash tuff
7i	Maroon and green andesite lapilli tuff, ash tuff. Locally carbonaceous
7h	Grey and greenish grey andesite lapilli tuff. Commonly contains carbonate–chlorite (–sericite) altered andesite fragments in a strongly chloritic matrix. The base of this unit is locally comprised of finely laminated chloritic ash tuff
7g	Polylithic exhalitic breccia. A debris flow facies containing fragments of volcanics, chert, jasper, sulfides, carbonates, and sulfides in a chloritic or sericitic tuffaceous matrix
7f	Exhalite : Volcanic exhalative silica, sulfates, carbonates, sulfides, oxides, and native silver. Includes some debris flow facies with an exhalite matrix
7e	Green andesite shard tuff, includes some epiclastics
7d	Grey–green porphyritic andesite lapilli tuff, minor flows and flow breccia. Partly amygdaloidal, commonly trachytic.
7c	Black siltstone, argillite
7b	Maroon and green andesite lapilli tuff
7a	Maroon coarsely graded–bedded volcanic sandstone marker

SYN–VOLCANIC AND EXHALATIVE ALTERATION FACIES

Chrt	Chlorite–pyrite–quartz–carbonate stockwork, most commonly a footwall stringer zone near exhalite horizons
Qrt	Quartz–chalcedony–chlorite–carbonate–pyrite–chalcopyrite stockwork +– precious metals (Goldbelt Zone)
Chflx	Hydrothermal breccia : altered rock fragments in a matrix of dark chlorite and pyrite. (Goldbelt Zone)
Kfp	Potassium feldspar, pervasive (Goldbelt Zone)
SQ	Sericite–pyrite pervasive alteration, with abundant quartz stringers (Goldbelt Zone)
S	Sericite–pyrite, pervasive. Occurs in Goldbelt Zone and also in hangingwall and footwall of exhalite horizons

SINEMURIAN TO PLIENSBACHIAN(?) : UNUK RIVER FORMATION

4b	Green and maroon porphyritic andesite – probably massive flows, in part might be intrusive equivalent of 7d
4a	Green and maroon basaltic andesite ash tuff and lapilli tuff

UPPER TRIASSIC

3b	Green and purple andesite breccia with minor siltstone, sandstone, and conglomerate
3a	Black siltstone

ABBREVIATIONS

ba	barite
cc	calcite
cp	chalcopyrite
gn	galena
hem	hematite
qz	quartz
sp	sphalerite
ser	sericite
py	pyrite
chl	chlorite

GEOLOGICAL BRANCH
ASSESSMENT REPORT

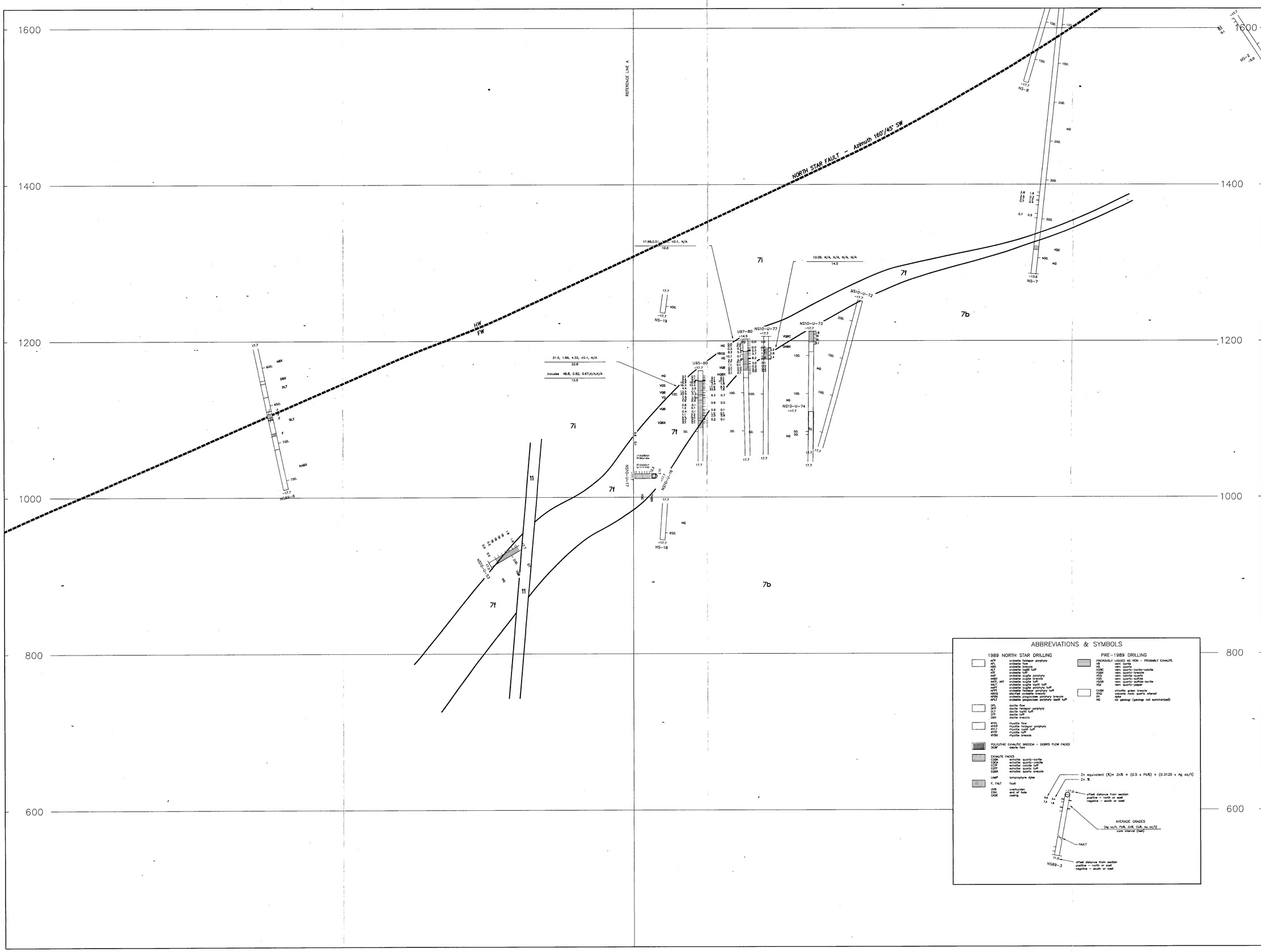
20,041
Part 2 of 2

SCALE 1"=40'

40 0 40 80 120
FEET

DOLLY VARDEN MINERALS INC.

Report by: TD/PJM/WM	DOLLY VARDEN PROJECT
Date: January /90	North Star Mine
	Cross Section A 6550
	Looking NE
NTS: 103P/ 11–12	
Mining Division: Skeena	Tecucomp Geological Inc.
Ref. # SEC6550.DWG	Map: 8.



LITHOLOGIES

QUATERNARY

21	Alluvium
20	Glacial drift, colluvium

INTRUSIVE ROCKS

TERTIARY

EOCENE AND YOUNGER

11	Lamprophyre, basalt dykes
10	Diorite, microdiorite

VOLCANIC AND SEDIMENTARY ROCKS

LOWER TO MIDDLE JURASSIC

TOARCIAN TO BAJOCIAN : SALMON RIVER FORMATION

8b	Siltstone, shale, and minor sandstone
8a	Basal fossiliferous wacke

TOARCIAN : PARTIAL EQUIVALENTS OF MT DILWORTH / BETTY CREEK FORMATIONS

7k	Siliceous, pyritic, sericitic felsic pyroclastic rocks
7j	Pale green andesite ash tuff
7i	Maroon and green andesite lapilli tuff, ash tuff. Locally carbonaceous
7h	Grey and greenish grey andesite lapilli tuff. Commonly contains carbonate–chlorite (–sericite) altered andesite fragments in a strongly chloritic matrix. The base of this unit is locally comprised of finely laminated chloritic ash tuff
7g	Polylithic exhalitic breccia. A debris flow facies containing fragments of volcanics, chert, jasper, sulfates, carbonates, and sulfides in a chloritic or sericitic tuffaceous matrix
7f	Exhalite : Volcanic exhalative silica, sulfates, carbonates, sulfides, oxides, and native silver. Includes some debris flow facies with an exhalite matrix
7e	Green andesite shard tuff, includes some epiclastics
7d	Grey–green porphyritic andesite lapilli tuff, minor flows and flow breccia. Partly amygdaloidal, commonly trachytic.
7c	Black siltstone, argillite
7b	Maroon and green andesite lapilli tuff
7a	Maroon coarsely graded–bedded volcanic sandstone marker

SYN–VOLCANIC AND EXHALATIVE ALTERATION FACIES

Chat	Chlorite–pyrite–quartz–carbonate stockwork, most commonly a footwall stringer zone near exhalite horizons
Qat	Quartz–chalcedony–chlorite–carbonate–pyrite–chalcopyrite stockwork +– precious metals (Goldbelt Zone)
ChBx	Hydrothermal breccia : altered rock fragments in a matrix of dark chlorite and pyrite. (Goldbelt Zone)
Kfp	Potassium feldspar, pervasive (Goldbelt Zone)
SQ	Sericite–pyrite pervasive alteration, with abundant quartz stringers (Goldbelt Zone)
S	Sericite–pyrite, pervasive. Occurs in Goldbelt Zone and also in hangingwall and footwall of exhalite horizons

SINEMURIAN TO PLIENSBACHIAN(?) : UNUK RIVER FORMATION

4b	Green and maroon porphyritic andesite – probably massive flows, in part might be intrusive equivalent of 7d
4a	Green and maroon basaltic andesite ash tuff and lapilli tuff

UPPER TRIASSIC

3b	Green and purple andesite breccia with minor siltstone, sandstone, and conglomerate
3a	Black siltstone

ABBREVIATIONS

ba	barite
ca	calcite
cp	chalcopyrite
gn	galena
hem	hematite
qz	quartz
sp	sphalerite
sc	sericite
py	pyrite
chl	chlorite

ABBREVIATIONS & SYMBOLS

1989 NORTH STAR DRILLING

AFP	andesite feldspar porphyry
AFL	andesite flow
AFB	andesite breccia
ALT	andesite lapilli tuff
ATF	andesite tuff
AAP	andesite augite porphyry
AAFP	andesite augite feldspar porphyry
AATF, AAT	andesite augite tuff
AALT	andesite augite lapilli tuff
APPT	andesite augite porphyry tuff
AFPTF	andesite feldspar porphyry tuff
ADFPB	andesite diabase porphyry
APBX	andesite plagioclase porphyry breccia
APLT	andesite plagioclase porphyry lapilli tuff
DFL	dacite flow
DFP	dacite feldspar porphyry
DLT	dacite lapilli tuff
DTF	dacite tuff
DBX	dacite breccia
RYFL	rhyolite flow
RYFP	rhyolite feldspar porphyry
RYLT	rhyolite lapilli tuff
RYTF	rhyolite tuff
RYBX	rhyolite breccia
POLYLITHIC EXHALITIC BRECCIA – DEBRIS FLOW FACIES	
DEBF	debris flow
EXHALITE FACIES	
EQBA	exhalite: quartz–barite
EQCA	exhalite: quartz–calcite
EQHE	exhalite: quartz–hem
EQTF	exhalite: quartz tuff
EQBX	exhalite: quartz breccia
LAMP	lamprophyre dyke
F, FALT	fault
OVB	overburden
EOH	end of hole
CASE	casing

PRE–1989 DRILLING

PREVIOUSLY LOGGED AS VEIN – PROBABLY EXHALITE	
VQ	vein: quartz
VQB	vein: quartz–barite
VQBC	vein: quartz–barite–calcite
VQBX	vein: quartz–breccia
VQCQ	vein: calcite–quartz
VQC	vein: quartz–calcite
VQCB	vein: quartz–sulfide–barite
VQJ	vein: quartz–jasper
CHBX	chloritic green breccia
EXQ	volcanic rock: quartz altered
DY	dyke
NG	no geology (geology not summarized)

Zn equivalent (%)= Zn% + (0.5 x Pb%) + (0.3125 x Ag oz/t)

Zn %

offset distance from section
positive – north or east
negative – south or west

AVERAGE GRADES
(Ag oz/t, Pb%, Zn%, Cu%, Au oz/t)
core interval (feet)

FAULT

NS89–3

offset distance from section
positive – north or east
negative – south or west

GEOLOGICAL BRANCH
ASSESSMENT REPORT

20,041
Part 2 of 2

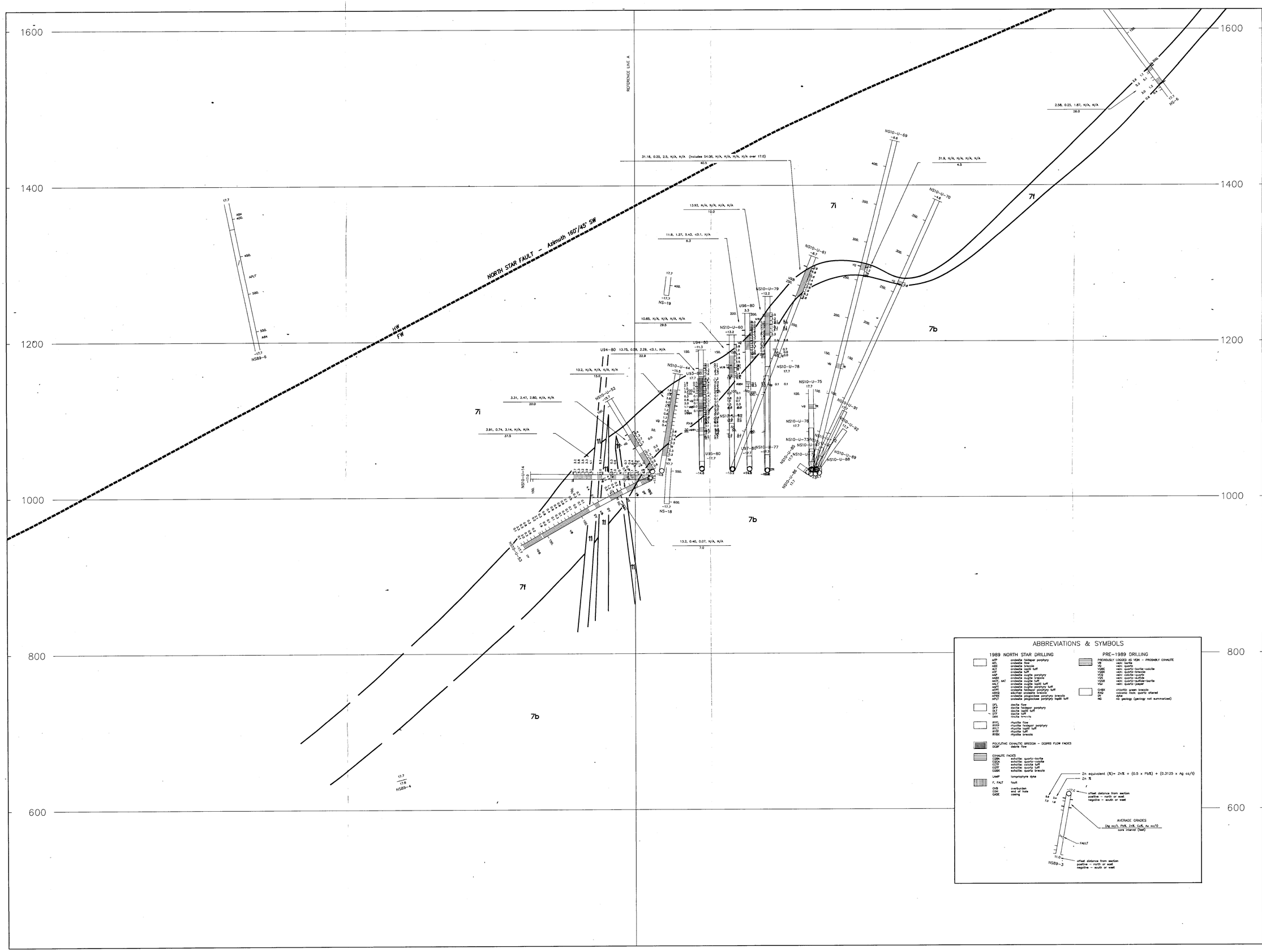
SCALE 1"=40'

40 0 40 80 120

FEET

DOLLY VARDEN MINERALS INC.

Report by: TD/PJW/WM	DOLLY VARDEN PROJECT North Star Mine
Date: January /99	Cross Section A 6575 Looking NE
NTS: 103P/ 11–12	
Mining Division Skeena	Tecucomp Geological Inc.
Ref. # STCA6575.DWG	Map: 9.



ABBREVIATIONS & SYMBOLS

1989 NORTH STAR DRILLING

- APT — andesite feldspar porphyry
- AFL — andesite flow
- AFP — andesite lapilli
- ALT — andesite lapilli tuff
- AST — andesite tuff
- AAP — andesite augite porphyry
- AABX — andesite augite breccia
- AAT, AAC — andesite augite tuff
- AALT — andesite augite lapilli tuff
- AAPT — andesite augite porphyry tuff
- APFT — andesite feldspar porphyry tuff
- ABBX — andesite plagioclase breccia
- APBX — andesite plagioclase porphyry breccia
- APLT — andesite plagioclase porphyry lapilli tuff
- DFL — dacite flow
- DFP — dacite feldspar porphyry
- DLT — dacite lapilli tuff
- DTF — dacite tuff
- DBX — dacite breccia
- RYFL — rhyolite flow
- RYFP — rhyolite feldspar porphyry
- RYLT — rhyolite lapilli tuff
- RYTF — rhyolite tuff
- RYBX — rhyolite breccia
- POLYLITHIC EXHALITIC BRECCIA – DEBRIS FLOW FACIES
- DEBF — debris flow
- EXHALITE FACIES
- EQBA — exhalite: quartz–barite
- EQCA — exhalite: quartz–calcite
- EQTF — exhalite: calcite tuff
- EQFP — exhalite: quartz–feldspar
- EQBX — exhalite: quartz breccia
- LAMP — lamprophyre dyke
- F, FALT — fault
- OVB — overburden
- EOH — end of hole
- CASE — casing

PRE-1989 DRILLING

- PREVIOUSLY LOGGED AS VEIN – PROBABLY EXHALITE
- VB — vein: barite
- VC — vein: calcite
- VQBC — vein: quartz–barite–calcite
- VQBX — vein: quartz–breccia
- VCQ — vein: calcite–quartz
- VQS — vein: quartz–sulfide
- VQBS — vein: quartz–barite–sulfide
- VQJ — vein: quartz–jasper
- CHBX — chloritic green breccia
- RXQ — volcanic rock: quartz altered
- DY — dyke
- NG — no geology (geology not summarized)

Zn equivalent (%)= Zn% + (0.5 x Pb%) + (0.3125 x Ag oz/t)

Zn %

offset distance from section
positive – north or east
negative – south or west

AVERAGE GRADES
(Ag oz/t, Pb%, Zn%, Cu%, Au oz/t)
core interval (feet)

FAULT

offset distance from section
positive – north or east
negative – south or west

LITHOLOGIES

QUATERNARY

- 21 — Alluvium
- 20 — Glacial drift, colluvium

INTRUSIVE ROCKS

TERTIARY

EOCENE AND YOUNGER

- 11 — Lamprophyre, basalt dykes
- 10 — Diorite, microdiorite

VOLCANIC AND SEDIMENTARY ROCKS

LOWER TO MIDDLE JURASSIC

TOARCIAN TO BAJOCIAN : SALMON RIVER FORMATION

- 8b — Siltstone, shale, and minor sandstone
- 8a — Basal fossiliferous wacke

TOARCIAN : PARTIAL EQUIVALENTS OF MT DILWORTH / BETTY CREEK FORMATIONS

- 7k — Siliceous, pyritic, sericitic felsic pyroclastic rocks
- 7j — Pale green andesite ash tuff
- 7i — Maroon and green andesite lapilli tuff, ash tuff. Locally carbonaceous
- 7h — Grey and greenish grey andesite lapilli tuff. Commonly contains carbonate–chlorite (–sericite) altered andesite fragments in a strongly chloritic matrix. The base of this unit is locally comprised of finely laminated chloritic ash tuff
- 7g — Polylitnic exhalitic breccia. A debris flow facies containing fragments of volcanics, chert, jasper, sulfates, carbonates, and sulfides in a chloritic or sericitic tuffaceous matrix
- 7f — Exhalite : Volcanic exhalative silica, sulfates, carbonates, sulfides, oxides, and native silver. Includes some debris flow facies with an exhalite matrix
- 7e — Green andesite shard tuff, includes some epiclastics
- 7d — Grey–green porphyritic andesite lapilli tuff, minor flows and flow breccia. Partly amygdaloidal, commonly trachytic.
- 7c — Black siltstone, argillite
- 7b — Maroon and green andesite lapilli tuff
- 7a — Maroon coarsely graded–bedded volcanic sandstone marker

SYN–VOLCANIC AND EXHALATIVE ALTERATION FACIES

- Chat — Chlorite–pyrite–quartz–carbonate stockwork, most commonly a footwall stringer zone near exhalite horizons
- Qct — Quartz–chalcedony–chlorite–carbonate–pyrite–chalcopyrite stockwork +– precious metals (Goldbelt Zone)
- Chlbx — Hydrothermal breccia : altered rock fragments in a matrix of dark chlorite and pyrite. (Goldbelt Zone)
- Kfp — Potassium feldspar, pervasive (Goldbelt Zone)
- SQ — Sericite–pyrite pervasive alteration, with abundant quartz stringers (Goldbelt Zone)
- S — Sericite–pyrite, pervasive. Occurs in Goldbelt Zone and also in hangingwall and footwall of exhalite horizons

SINEMURIAN TO PLIENSBACHIAN(?) : UNUK RIVER FORMATION

- 4b — Green and maroon porphyritic andesite – probably massive flows, in part might be intrusive equivalent of 7d
- 4a — Green and maroon basaltic andesite ash tuff and lapilli tuff

UPPER TRIASSIC

- 3b — Green and purple andesite breccia with minor siltstone, sandstone, and conglomerate
- 3a — Black siltstone

ABBREVIATIONS

ba	barite
ca	calcite
cp	chalcopyrite
gn	galena
hem	hematite
qz	quartz
sp	sphalerite
sc	sericite
py	pyrite
chl	chlorite

GEOLOGICAL BRANCH
ASSESSMENT REPORT

20,041
Part 2 of 2

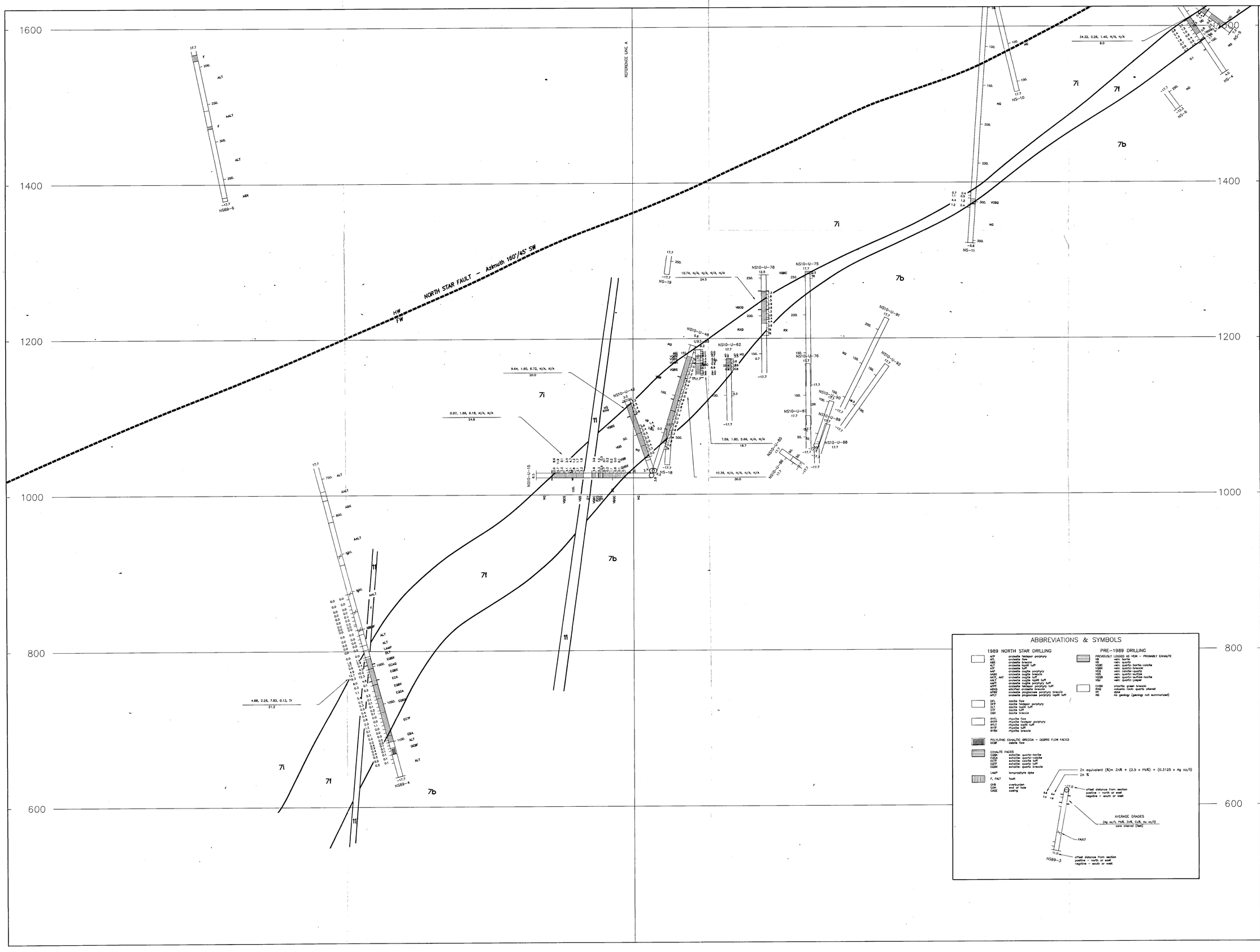
SCALE 1"=40'

40 0 40 80 120

FEET

DOLLY VARDEN MINERALS INC.

Report by: TD/PJM/WM	DOLLY VARDEN PROJECT North Star Mine Cross Section A 6600 Looking NE
Date: January /90	
NTS: 103P/ 11–12	
Mining Division: Skeena Ref. # SECA6600.DWG	Tecucomp Geological Inc. — Map: 10.



ABBREVIATIONS & SYMBOLS

1989 NORTH STAR DRILLING

- AFP andesite feldspar porphyry
- AT andesite tuff
- ABX andesite breccia
- ALT andesite lapilli tuff
- ATF andesite tuff
- AAPX andesite augite porphyry
- AABX andesite augite breccia
- AATF, AAT andesite augite tuff
- AALT andesite augite lapilli tuff
- APPT andesite hoppie porphyry
- APPTT andesite hoppie porphyry tuff
- ABBQ silicified andesite breccia
- APBX andesite plagioclase porphyry breccia
- APLT andesite plagioclase porphyry lapilli tuff

- DFL dacite flow
- DFP dacite feldspar porphyry
- DLT dacite lapilli tuff
- DTF dacite tuff
- DBX dacite breccia

- RYFL rhyolite flow
- RYFP rhyolite feldspar porphyry
- RYLT rhyolite lapilli tuff
- RYTF rhyolite tuff
- RYBX rhyolite breccia

- POLYLITHIC EXHALITIC BRECCIA – DEBRIS FLOW FACIES
- DEBF exhalite flow

- EXHALITE FACIES
- EQBA exhalite: quartz–barite
- EQBC exhalite: quartz–calcite
- EQTF exhalite: calcite tuff
- EQTF exhalite: quartz tuff
- EQBR exhalite: quartz breccia

- LAMP lamprophyre dyke

- F, FALT fault

- OVB overburden
- EOH end of hole
- CASE casing

PRE–1989 DRILLING

PREVIOUSLY LOGGED AS VEIN – PROBABLY EXHALITE

- VB vein: barite
- VQ vein: quartz
- VQBC vein: quartz–barite–calcite
- VQBX vein: quartz–breccia
- VQS vein: quartz–sulfide
- VQS vein: quartz–sulfide
- VQSB vein: quartz–sulfide–barite
- VQJ vein: quartz–jasper

- CHBX chloritic green breccia
- FOQ volcanic rock: quartz altered
- DY dyke
- NG no geology (geology not summarized)

Zn equivalent (%)= Zn% + (0.5 x Pb%) + (0.3125 x Ag oz/t)
Zn %
offset distance from section
positive – north or east
negative – south or west
AVERAGE GRADES
(Ag oz/t, Pb%, Zn%, Cu%, Au oz/t)
core interval (feet)
FAULT
offset distance from section
positive – north or east
negative – south or west

LITHOLOGIES

QUATERNARY

- 21 Alluvium
- 20 Glacial drift, colluvium

INTRUSIVE ROCKS

TERTIARY

EOCENE AND YOUNGER

- 11 Lamprophyre, basalt dykes
- 10 Diorite, microdiorite

VOLCANIC AND SEDIMENTARY ROCKS

LOWER TO MIDDLE JURASSIC

TOARCIAN TO BAJOCIAN : SALMON RIVER FORMATION

- 8b Siltstone, shale, and minor sandstone
- 8a Basal fossiliferous wacke

TOARCIAN : PARTIAL EQUIVALENTS OF MT DILWORTH / BETTY CREEK FORMATIONS

- 7x Siliceous, pyritic, sericitic felsic pyroclastic rocks
- 7j Pale green andesite ash tuff
- 7i Maroon and green andesite lapilli tuff, ash tuff. Locally carbonaceous
- 7h Grey and greenish grey andesite lapilli tuff. Commonly contains carbonate–chlorite (–sericite) altered andesite fragments in a strongly chloritic matrix. The base of this unit is locally comprised of finely laminated chloritic ash tuff
- 7g Polylithic exhalitic breccia. A debris flow facies containing fragments of volcanics, chert, jasper, sulfates, carbonates, and sulfides in a chloritic or sericitic tuffaceous matrix
- 7f Exhalite : Volcanic exhalative silica, sulfates, carbonates, sulfides, oxides, and native silver. Includes some debris flow facies with an exhalite matrix
- 7e Green andesite shard tuff, includes some epiclastics
- 7d Grey–green porphyritic andesite lapilli tuff, minor flows and flow breccia. Partly amygdaloidal, commonly trachytic.
- 7c Black siltstone, argillite
- 7p Maroon and green andesite lapilli tuff
- 7a Maroon coarsely graded–bedded volcanic sandstone marker

SYN–VOLCANIC AND EXHALATIVE ALTERATION FACIES

- Chst Chlorite–pyrite–quartz–carbonate stockwork, most commonly a footwall stringer zone near exhalite horizons
- Qst Quartz–chalcedony–chlorite–carbonate–pyrite–chalcopyrite stockwork +– precious metals (Goldbelt Zone)
- ChBx Hydrothermal breccia : altered rock fragments in a matrix of dark chlorite and pyrite. (Goldbelt Zone)
- Kfp Potassium feldspar, pervasive (Goldbelt Zone)
- SQ Sericite–pyrite pervasive alteration, with abundant quartz stringers (Goldbelt Zone)
- *S Sericite–pyrite, pervasive. Occurs in Goldbelt Zone and also in hangingwall and footwall of exhalite horizons

SINEMURIAN TO PLIENSBACHIAN(?) : UNUK RIVER FORMATION

- 4b Green and maroon porphyritic andesite – probably massive flows, in part might be intrusive equivalent of 7d
- 4a Green and maroon basaltic andesite ash tuff and lapilli tuff

UPPER TRIASSIC

- 3b Green and purple andesite breccia with minor siltstone, sandstone, and conglomerate
- 3a Black siltstone

ABBREVIATIONS

ba	barite
cc	calcite
cp	chalcopyrite
gn	galena
hem	hematite
qz	quartz
sp	sphalerite
sc	sericite
py	pyrite
chl	chlorite

GEOLOGICAL BRANCH
ASSESSMENT REPORT

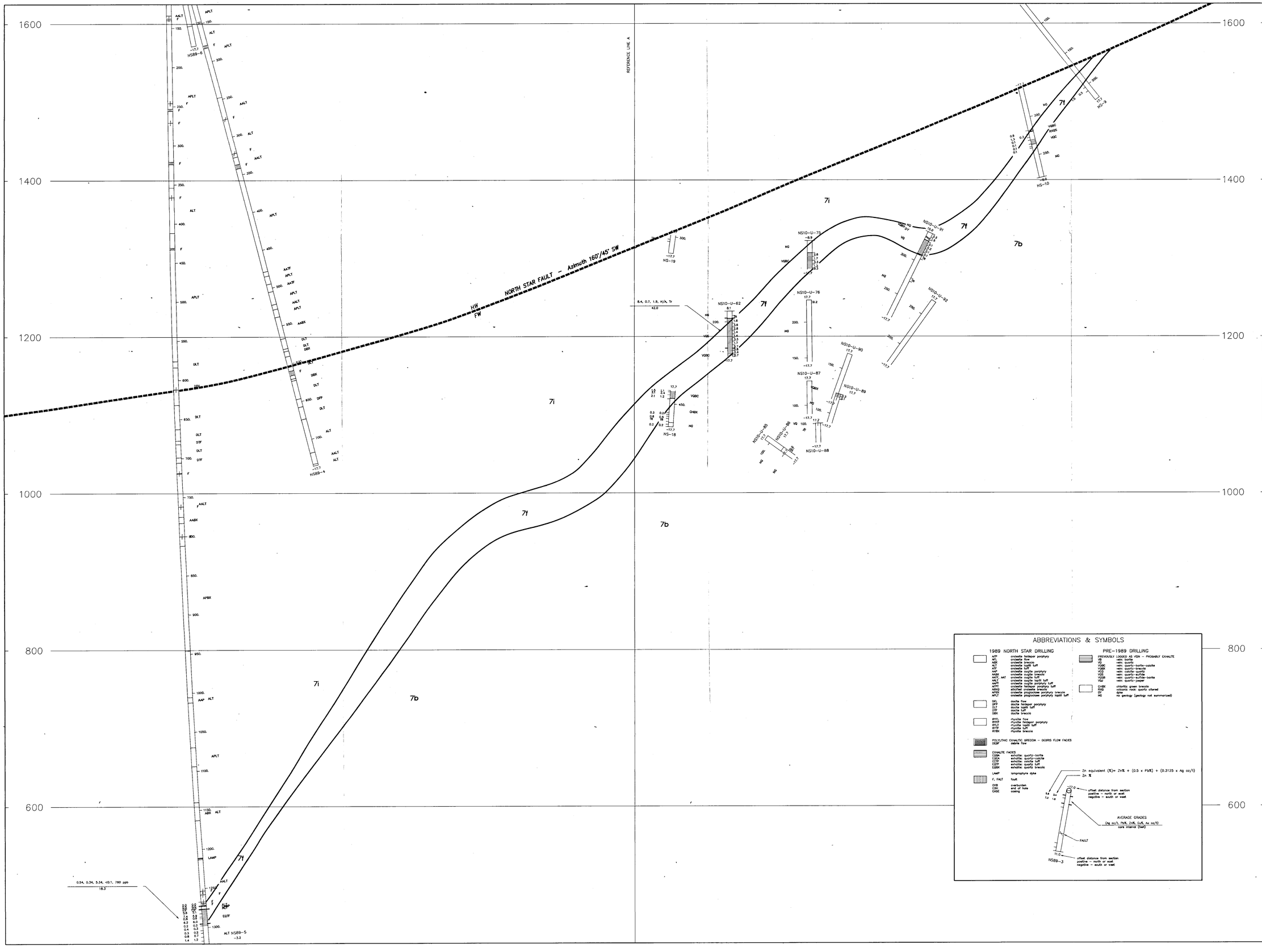
20,041
Part 2 of 2

SCALE 1"=40'

40 0 40 80 120
FEET

DOLLY VARDEN MINERALS INC.

Report by: TD/PJM/WM	DOLLY VARDEN PROJECT North Star Mine
Date: January /90	Cross Section A 6625 Looking NE
NTS: 103P/ 11–12	
Mining Division Skeena	Tecucomp Geological Inc.
Ref. # SECA6625.DWG	Map: 11.



LITHOLOGIES

QUATERNARY

- 21 Alluvium
- 20 Glacial drift, colluvium

INTRUSIVE ROCKS

TERTIARY

EOCENE AND YOUNGER

- 11 Lamprophyre, basalt dykes
- 10 Diorite, microdiorite

VOLCANIC AND SEDIMENTARY ROCKS

LOWER TO MIDDLE JURASSIC

TOARCIAN TO BAJOCIAN : SALMON RIVER FORMATION

- 8b Siltstone, shale, and minor sandstone
- 8a Basal fossiliferous wacke

TOARCIAN : PARTIAL EQUIVALENTS OF MT DILWORTH / BETTY CREEK FORMATIONS

- 7k Siliceous, pyritic, sericitic felsic pyroclastic rocks
- 7j Pale green andesite ash tuff
- 7i Maroon and green andesite lapilli tuff, ash tuff. Locally carbonaceous
- 7h Grey and greenish grey andesite lapilli tuff. Commonly contains carbonate-chlorite (–sericite) altered andesite fragments in a strongly chloritic matrix. The base of this unit is locally comprised of finely laminated chloritic ash tuff
- 7g Polylithic exhalitic breccia. A debris flow facies containing fragments of volcanics, chert, jasper, sulfates, carbonates, and sulfides in a chloritic or sericitic tuffaceous matrix
- 7f Exhalite : Volcanic exhalative silica, sulfates, carbonates, sulfides, oxides, and native silver. Includes some debris flow facies with an exhalite matrix
- 7e Green andesite shard tuff, includes some epiclastics
- 7d Grey-green porphyritic andesite lapilli tuff, minor flows and flow breccia. Partly amygdaloidal, commonly trachytic.
- 7c Black siltstone, argillite
- 7b Maroon and green andesite lapilli tuff
- 7a Maroon coarsely graded-bedded volcanic sandstone marker

SYN-VOLCANIC AND EXHALATIVE ALTERATION FACIES

- Chst Chlorite-pyrite-quartz-carbonate stockwork, most commonly a footwall stringer zone near exhalite horizons
- Qst Quartz-chalcedony-chlorite-carbonate-pyrite-chalcopyrite stockwork +– precious metals (Goldbelt Zone)
- ChBx Hydrothermal breccia : altered rock fragments in a matrix of dark chlorite and pyrite. (Goldbelt Zone)
- Kfp Potassium feldspar, pervasive (Goldbelt Zone)
- SQ Sericite-pyrite pervasive alteration, with abundant quartz stringers (Goldbelt Zone)
- S Sericite-pyrite, pervasive. Occurs in Goldbelt Zone and also in hanging-wall and footwall of exhalite horizons

SINEMURIAN TO PLIENSBACHIAN(?) : UNUK RIVER FORMATION

- 4b Green and maroon porphyritic andesite – probably massive flows, in part might be intrusive equivalent of 7d
- 4a Green and maroon basaltic andesite ash tuff and lapilli tuff

UPPER TRIASSIC

- 3b Green and purple andesite breccia with minor siltstone, sandstone, and conglomerate
- 3a Black siltstone

ABBREVIATIONS

ba	barite
ca	calcite
cp	chalcopyrite
gn	galena
hem	hematite
qz	quartz
sp	sphalerite
sc	sericite
py	pyrite
chl	chlorite

ABBREVIATIONS & SYMBOLS

1989 NORTH STAR DRILLING

- APT andesite feldspar porphyry
- AFL andesite flow
- ABX andesite breccia
- ALT andesite lapilli tuff
- AIT andesite tuff
- AAPX andesite augite porphyry
- AABX andesite augite breccia
- AAIT, AAT andesite augite tuff
- AALT andesite augite lapilli tuff
- AAPT andesite augite porphyry tuff
- APIT andesite plagioclase porphyry tuff
- ABRQ silicified andesite breccia
- APBX andesite plagioclase porphyry breccia
- APLT andesite plagioclase porphyry lapilli tuff
- DFL dacite flow
- DFP dacite feldspar porphyry
- DLT dacite lapilli tuff
- DTF dacite tuff
- DBX dacite breccia
- RYFL rhyolite flow
- RYFP rhyolite feldspar porphyry
- RYLT rhyolite lapilli tuff
- RYTF rhyolite tuff
- RYBX rhyolite breccia
- POLYLITHIC EXHALITIC BRECCIA – DEBRIS FLOW FACIES
- DEBF debris flow
- EXHALITE FACIES
- EQBA exhalite: quartz-barite
- EQCA exhalite: quartz-calcite
- EQTF exhalite: quartz tuff
- EQTT exhalite: quartz tuff
- EQBX exhalite: quartz breccia
- LAMP lamprophyre dyke
- F, FALT fault
- OVB overburden
- EOH end of hole
- CASE casing

PRE-1989 DRILLING

- PREVIOUSLY LOGGED AS VGN – PROBABLY EXHALITE
- VB vein: barite
- VC vein: calcite
- VQBC vein: quartz-barite-calcite
- VQBX vein: quartz-barite
- VCQ vein: calcite-quartz
- VQC vein: quartz-calcite
- VCQB vein: quartz-calcite-barite
- VQJ vein: quartz-jasper
- CHBX chloritic green breccia
- EQQ volcanic rock: quartz altered
- DY dyke
- NG no geology (geology not summarized)

Zn equivalent (%)= Zn% + (0.5 x Pb%) + (0.3125 x Ag oz/t)

Zn %

offset distance from section
positive – north or east
negative – south or west

AVERAGE GRADES
(Ag oz/t, Pb%, Zn%, Cu%, Au oz/t)
core interval (feet)

FAULT

NS89-3

offset distance from section
positive – north or east
negative – south or west

GEOLOGICAL BRANCH
ASSESSMENT REPORT

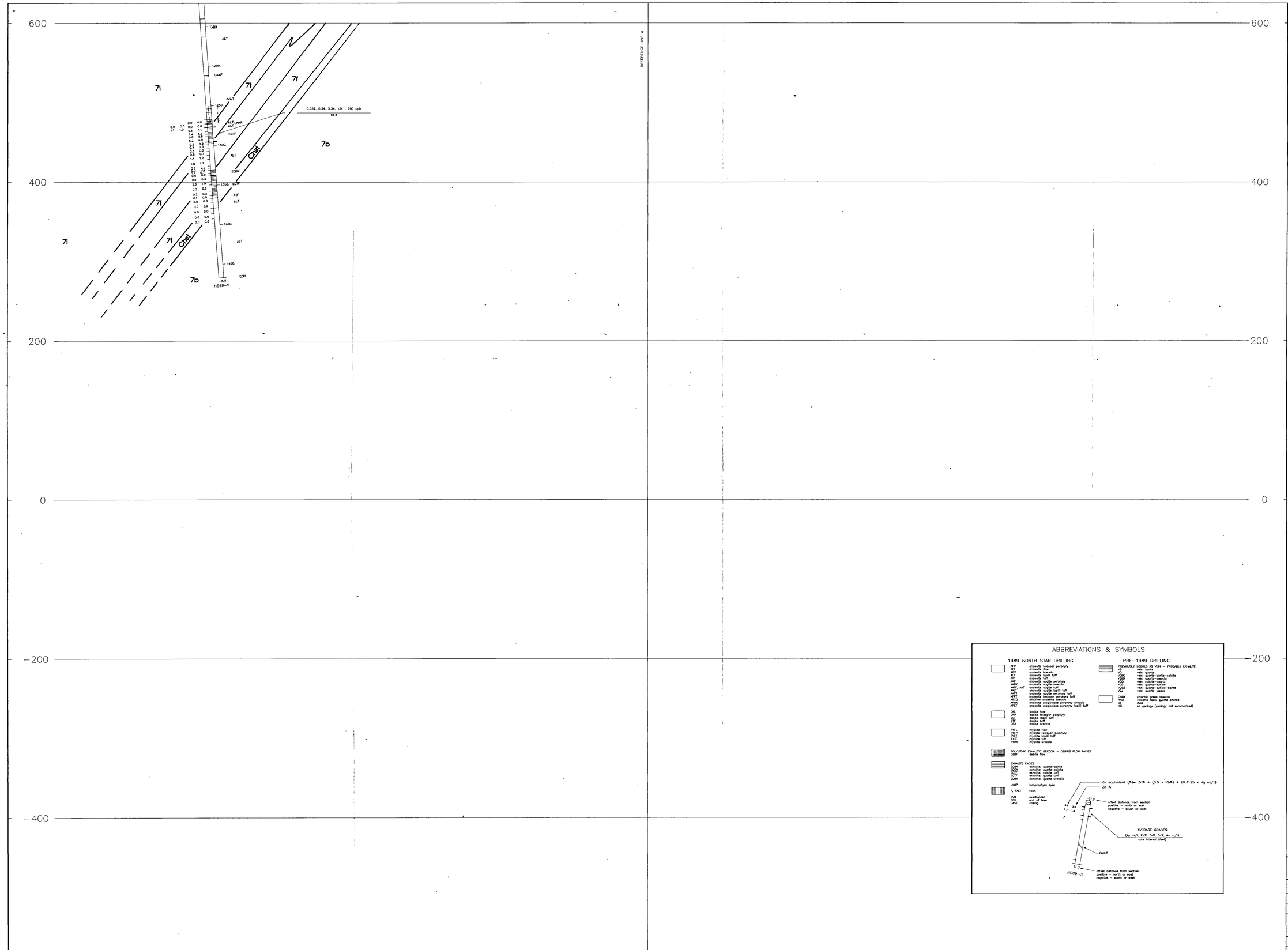
20,041
Part 2 of 2

SCALE 1"=40'

40 0 40 80 120
FEET

DOLLY VARDEN MINERALS INC.

Report by: TD/PJM/RM	DOLLY VARDEN PROJECT North Star Mine Cross Section A 6650 Looking NE
Date: January /90	
NTS: 103P/ 11-12	
Mining Division Skeena	Tecucomp Geological Inc.
Ref. # SECA6650.DWG	Map: 12.



ABBREVIATIONS & SYMBOLS

1989 NORTH STAR DRILLING

AFP	andesite feldspar porphyry
AFL	andesite flow
ABX	andesite breccia
ALT	andesite lapilli tuff
ATF	andesite tuff
AAP	andesite augite porphyry
AABX	andesite augite breccia
AAT, AAT	andesite augite tuff
AALT	andesite augite lapilli tuff
AAPT	andesite augite porphyry tuff
AFPT	andesite feldspar porphyry tuff
APBX	andesite plagioclase breccia
APBQ	andesite plagioclase porphyry breccia
APLT	andesite plagioclase porphyry lapilli tuff
DFL	dacite flow
DFP	dacite feldspar porphyry
DLT	dacite lapilli tuff
DTF	dacite tuff
DBX	dacite breccia
RYFL	rhyolite flow
RYFP	rhyolite feldspar porphyry
RYLT	rhyolite lapilli tuff
RYTF	rhyolite tuff
RYBX	rhyolite breccia
POLYLITHIC EXHALITIC BRECCIA – DEBRIS FLOW FACIES	
DEBF	debris flow
EXHALITE FACIES	
EQBA	exhalite: quartz–barite
EQCA	exhalite: quartz–calcite
EQTF	exhalite: calcite tuff
EQTF	exhalite: quartz tuff
EQBX	exhalite: quartz breccia
LAMP	lamprophyre dyke
F, FALT	fault
OVB	overburden
EOH	end of hole
CASE	casing

PRE–1989 DRILLING

PREVIOUSLY LOGGED AS VEIN – PROBABLY EXHALITE

VB	vein: barite
VQ	vein: quartz
VQBC	vein: quartz–barite–calcite
VQBX	vein: quartz–breccia
VQCQ	vein: calcite–quartz
VQS	vein: quartz–sulfide
VQSB	vein: quartz–sulfide–barite
VQJ	vein: quartz–jasper
CHBX	chloritic green breccia
CHQ	chloritic rock: quartz altered
CHL	chlorite
NG	no geology (geology not summarized)

Zn equivalent (%)= Zn% + (0.5 x Pb%) + (0.3125 x Ag oz/t)

Zn %

offset distance from section
positive – north or east
negative – south or west

AVERAGE GRADES
(Ag oz/t, Pb%, Zn%, Cu%, Au oz/t)
core interval (feet)

FAULT

NS89-3

offset distance from section
positive – north or east
negative – south or west

LITHOLOGIES

QUATERNARY

21	Alluvium
20	Glacial drift, colluvium

INTRUSIVE ROCKS

TERTIARY

EOCENE AND YOUNGER

11	Lamprophyre, basalt dykes
10	Diorite, microdiorite

VOLCANIC AND SEDIMENTARY ROCKS

LOWER TO MIDDLE JURASSIC

TOARCIAN TO BAJOCIAN : SALMON RIVER FORMATION

8b	Siltstone, shale, and minor sandstone
8a	Basal fossiliferous wacke

TOARCIAN : PARTIAL EQUIVALENTS OF MT DILWORTH / BETTY CREEK FORMATIONS

7k	Siliceous, pyritic, sericitic felsic pyroclastic rocks
7j	Pale green andesite ash tuff
7i	Maroon and green andesite lapilli tuff, ash tuff. Locally carbonaceous
7h	Grey and greenish grey andesite lapilli tuff. Commonly contains carbonate–chlorite (–sericite) altered andesite fragments in a strongly chloritic matrix. The base of this unit is locally comprised of finely laminated chloritic ash tuff
7g	Polylithic exhalitic breccia. A debris flow facies containing fragments of volcanics, chert, jasper, sulfates, carbonates, and sulfides in a chloritic or sericitic tuffaceous matrix
7f	Exhalite : Volcanic exhalative silica, sulfates, carbonates, sulfides, oxides, and native silver. Includes some debris flow facies with an exhalite matrix
7e	Green andesite shard tuff, includes some epiclastics
7d	Grey–green porphyritic andesite lapilli tuff, minor flows and flow breccia. Partly amygdaloidal, commonly trachytic.
7c	Black siltstone, argillite
7b	Maroon and green andesite lapilli tuff
7a	Maroon coarsely graded–bedded volcanic sandstone marker

SYN–VOLCANIC AND EXHALATIVE ALTERATION FACIES

Chst	Chlorite–pyrite–quartz–carbonate stockwork, most commonly a footwall stringer zone near exhalite horizons
Qst	Quartz–chalcedony–chlorite–carbonate–pyrite–chalcopyrite stockwork +– precious metals (Goldbelt Zone)
ChBx	Hydrothermal breccia : altered rock fragments in a matrix of dark chlorite and pyrite. (Goldbelt Zone)
Kfp	Potassium feldspar, pervasive (Goldbelt Zone)
SQ	Sericite–pyrite pervasive alteration, with abundant quartz stringers (Goldbelt Zone)
S	Sericite–pyrite, pervasive. Occurs in Goldbelt Zone and also in hanging–wall and footwall of exhalite horizons

SINEMURIAN TO PLIENSBACHIAN(?) : UNUK RIVER FORMATION

4b	Green and maroon porphyritic andesite – probably massive flows, in part might be intrusive equivalent of 7d
4a	Green and maroon basaltic andesite ash tuff and lapilli tuff

UPPER TRIASSIC

3b	Green and purple andesite breccia with minor siltstone, sandstone, and conglomerate
3a	Black siltstone

ABBREVIATIONS

ba	barite
ca	calcite
cp	chalcopyrite
gn	galena
hem	hematite
qz	quartz
sp	sphalerite
sc	sericite
py	pyrite
chl	chlorite

GEOLOGICAL BRANCH
ASSESSMENT REPORT

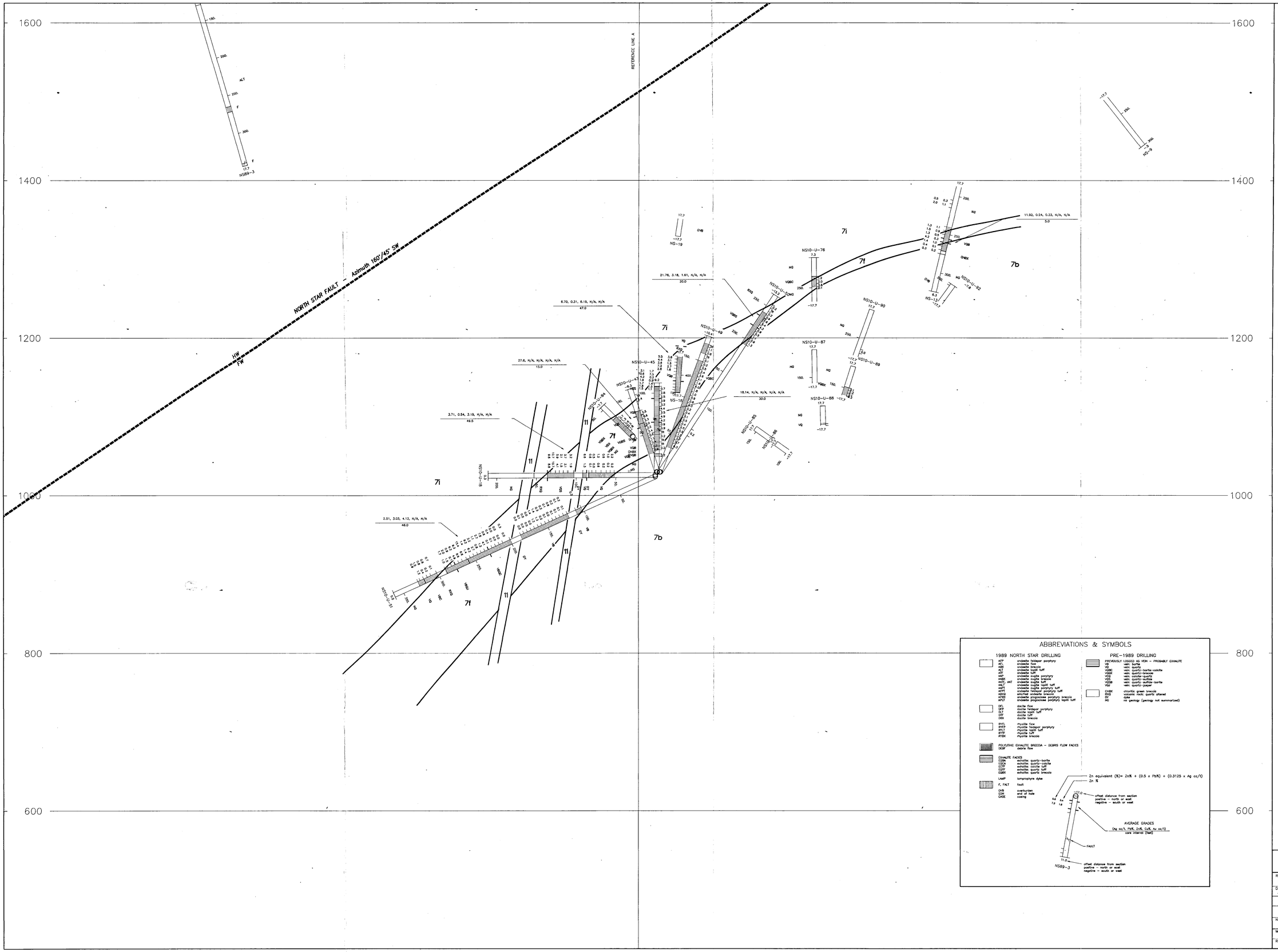
20,041
Part 2 of 2

SCALE 1"=40'

40 0 40 80 120
FEET

DOLLY VARDEN MINERALS INC.

Report by: TD/PJM/WM	DOLLY VARDEN PROJECT North Star Mine Cross Section C 6650 Looking NE
Date: January /90	
NTS: 103P/ 11–12	
Mining Division Skeena	Tecucomp Geological Inc.
Ref. # SECC6650.DWG	Map 13.



LITHOLOGIES

QUATERNARY

21	Alluvium
20	Glacial drift, colluvium

INTRUSIVE ROCKS

TERTIARY

EOCENE AND YOUNGER

11	Lamprophyre, basalt dykes
10	Diorite, microdiorite

VOLCANIC AND SEDIMENTARY ROCKS

LOWER TO MIDDLE JURASSIC

TOARCIAN TO BAJOCIAN : SALMON RIVER FORMATION

8b	Siltstone, shale, and minor sandstone
8a	Basal fossiliferous wacke

TOARCIAN : PARTIAL EQUIVALENTS OF MT DILWORTH / BETTY CREEK FORMATIONS

7k	Siliceous, pyritic, sericitic felsic pyroclastic rocks
7j	Pale green andesite ash tuff
7i	Maroon and green andesite lapilli tuff, ash tuff. Locally carbonaceous
7h	Grey and greenish grey andesite lapilli tuff. Commonly contains carbonate-chlorite (–sericite) altered andesite fragments in a strongly chloritic matrix. The base of this unit is locally comprised of finely laminated chloritic ash tuff
7g	Polylithic exhalitic breccia. A debris flow facies containing fragments of volcanics, chert, jasper, sulfates, carbonates, and sulfides in a chloritic or sericitic tuffaceous matrix
7f	Exhalite : Volcanic exhalative silica, sulfates, carbonates, sulfides, oxides, and native silver. Includes some debris flow facies with an exhalite matrix
7e	Green andesite shard tuff, includes some epiclastics
7d	Grey–green porphyritic andesite lapilli tuff, minor flows and flow breccia. Partly amygdaloidal, commonly trachytic.
7c	Black siltstone, argillite
7b	Maroon and green andesite lapilli tuff
7a	Maroon coarsely graded–bedded volcanic sandstone marker

SYN–VOLCANIC AND EXHALATIVE ALTERATION FACIES

Chat	Chlorite–pyrite–quartz–carbonate stockwork, most commonly a footwall stringer zone near exhalite horizons
Qat	Quartz–chalcedony–chlorite–carbonate–pyrite–chalcopyrite stockwork +– precious metals (Goldbelt Zone)
Chlbx	Hydrothermal breccia : altered rock fragments in a matrix of dark chlorite and pyrite. (Goldbelt Zone)
Kfp	Potassium feldspar, pervasive (Goldbelt Zone)
SQ	Sericite–pyrite pervasive alteration, with abundant quartz stringers (Goldbelt Zone)
S	Sericite–pyrite, pervasive. Occurs in Goldbelt Zone and also in hangingwall and footwall of exhalite horizons

SINEMURIAN TO PLIENSBACHIAN(?) : UNUK RIVER FORMATION

4b	Green and maroon porphyritic andesite – probably massive flows, in part might be intrusive equivalent of 7d
4a	Green and maroon basaltic andesite ash tuff and lapilli tuff

UPPER TRIASSIC

3b	Green and purple andesite breccia with minor siltstone, sandstone, and conglomerate
3a	Black siltstone

ABBREVIATIONS

ba	barite
cc	calcite
cp	chalcopyrite
gn	galena
hem	hematite
qz	quartz
sp	sphalerite
se	sericite
py	pyrite
chl	chlorite

ABBREVIATIONS & SYMBOLS

1989 NORTH STAR DRILLING

APF	andesite feldspar porphyry
AFL	andesite flow
AFX	andesite flow-crack
ALT	andesite lapilli tuff
ATF	andesite tuff
AMP	andesite augite porphyry
AABX	andesite augite breccia
ALT, AA2	andesite augite tuff
ALLT	andesite augite lapilli tuff
AAPT	andesite augite porphyry tuff
AATF	andesite augite porphyry tuff
ABXB	altered andesite breccia
APBX	andesite plagioclase porphyry breccia
APLT	andesite plagioclase porphyry lapilli tuff
DFL	dacite flow
DFP	dacite feldspar porphyry
DLT	dacite lapilli tuff
DTF	dacite tuff
DBX	dacite breccia
RVFL	rhyolite flow
RVFP	rhyolite feldspar porphyry
RVLT	rhyolite lapilli tuff
RVTF	rhyolite tuff
RVBX	rhyolite breccia
POLYLITHIC EXHALITIC BRECCIA – DEBRIS FLOW FACIES	
DEBF	debris flow
EXHALITE FACIES	
EQSX	exhalite quartz–barite
EQTF	exhalite quartz tuff
EQLT	exhalite quartz lapilli tuff
EQTF	exhalite quartz tuff
EQBX	exhalite quartz breccia
LAMP	lamprophyre dyke
F, FALT	fault
OVB	overburden
EOH	end of hole
CASE	casing

PRE–1989 DRILLING

PREVIOUSLY LOGGED AS VEIN – PROBABLY EXHALITE	
VB	vein: barite
VQ	vein: quartz
VQBC	vein: quartz–barite–calcite
VQBX	vein: quartz–breccia
VQS	vein: sericite–quartz
VQSP	vein: quartz–sulfide
VQSB	vein: quartz–sulfide–barite
VGJ	vein: quartz–jasper
CHBX	chloritic green breccia
RHD	volcanic rock: quartz altered
DY	dyke
NG	no geology (geology not summarized)

GEOLOGICAL BRANCH
ASSESSMENT REPORT

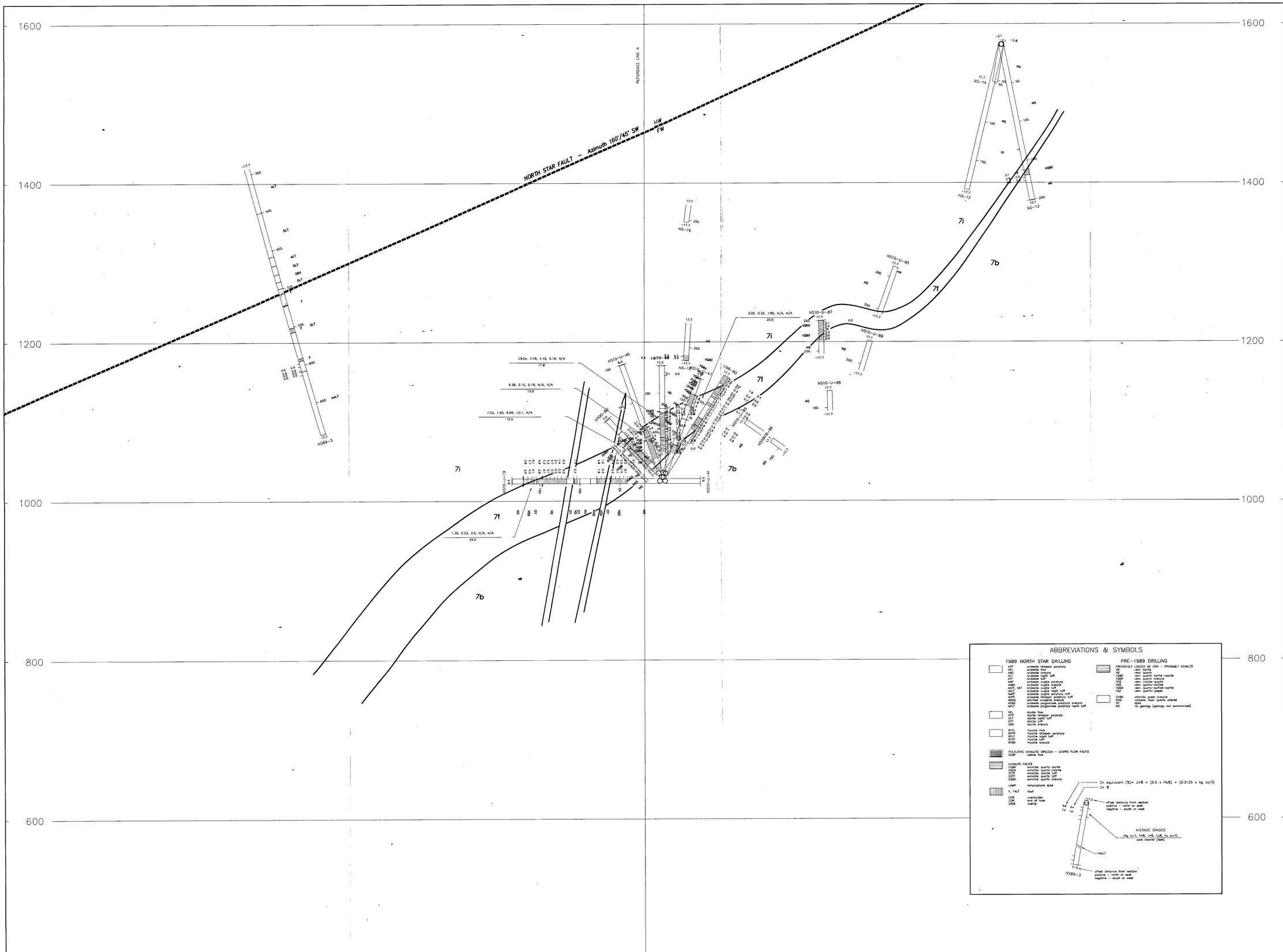
20,041
Part 2 of 2

SCALE 1"=40'

40 0 40 80 120
FEET

DOLLY VARDEN MINERALS INC.

Report by: TD/PJM/WM	DOLLY VARDEN PROJECT North Star Mine
Date: January /90	Cross Section A 6675 Looking NE
NTS: 103P/ 11–12	
Mining Division Skeena	Tecucomp Geological Inc.
Ref # SECA6675.DWG	Map: 14.



ABBREVIATIONS & SYMBOLS

1989 NORTH STAR DRILLING

AFP	andesite feldspar porphyry
AFT	andesite tuff
ABX	andesite breccia
ALT	andesite lapilli tuff
AMP	andesite porphyry
AAP	andesite augite porphyry
AABX	andesite augite breccia
AATX, AAT	andesite augite tuff
AALT	andesite augite lapilli tuff
AATT	andesite augite crystal tuff
AFPT	andesite feldspar porphyry tuff
ABXQ	silicified andesite breccia
APBX	andesite plagioclase porphyry breccia
APLT	andesite plagioclase porphyry lapilli tuff
DFL	dacite flow
DFP	dacite feldspar porphyry
DLT	dacite lapilli tuff
DTT	dacite tuff
DBX	dacite breccia
RYFL	rhyolite flow
RYFP	rhyolite feldspar porphyry
RYLT	rhyolite lapilli tuff
RYTF	rhyolite tuff
RYBX	rhyolite breccia
POLYLITHIC EXHALITIC BRECCIA – DEBRIS FLOW FACIES	
DEBF	debris flow
EXHALITE FACIES	
EQBA	exhalite: quartz–barite
EQCA	exhalite: quartz–calcite
ECTF	exhalite: calcite tuff
EQTF	exhalite: quartz tuff
EQBX	exhalite: quartz breccia
LAMP	lamprophyre dyke
F, FALT	fault
OVB	overburden
EOH	end of hole
CASE	casing

PRE–1989 DRILLING

PREVIOUSLY LOGGED AS VEIN – PROBABLY EXHALITE	
VQ	vein: quartz
VQ	vein: quartz
VQBC	vein: quartz–barite–calcite
VQB	vein: quartz–barite
VQC	vein: calcite–quartz
VQS	vein: quartz–sulfide
VQSB	vein: quartz–sulfide–barite
VQJ	vein: quartz–jasper
CHBX	chloritic green breccia
RHXQ	volcanic rock; quartz altered
DY	dyke
NO	no geology (geology not summarized)

Zn equivalent (%)= Zn% + (0.5 x Pb%) + (0.3125 x Ag oz/t)
Zn %
offset distance from section
positive – north or east
negative – south or west
AVERAGE GRADES
(Ag oz/t, Pb%, Zn%, Cu%, Au oz/t)
core interval (feet)
FAULT
NS89–3
offset distance from section
positive – north or east
negative – south or west

LITHOLOGIES

QUATERNARY

- 21 Alluvium
- 20 Glacial drift, colluvium

INTRUSIVE ROCKS

TERTIARY

EOCENE AND YOUNGER

- 11 Lamprophyre, basalt dykes
- 10 Diorite, microdiorite

VOLCANIC AND SEDIMENTARY ROCKS

LOWER TO MIDDLE JURASSIC

TOARCIAN TO BAJOCIAN : SALMON RIVER FORMATION

- 8b Siltstone, shale, and minor sandstone
- 8a Basal fossiliferous wacke

TOARCIAN : PARTIAL EQUIVALENTS OF MT DILWORTH / BETTY CREEK FORMATIONS

- 7k Siliceous, pyritic, sericitic felsic pyroclastic rocks
- 7j Pale green andesite ash tuff
- 7i Maroon and green andesite lapilli tuff, ash tuff. Locally carbonaceous
- 7h Grey and greenish grey andesite lapilli tuff. Commonly contains carbonate–chlorite (–sericite) altered andesite fragments in a strongly chloritic matrix. The base of this unit is locally comprised of finely laminated chloritic ash tuff
- 7g Polylitnic exhalitic breccia. A debris flow facies containing fragments of volcanics, chert, jasper, sulfates, carbonates, and sulfides in a chloritic or sericitic tuffaceous matrix
- 7f Exhalite : Volcanic exhalative silica, sulfates, carbonates, sulfides, oxides, and native silver. Includes some debris flow facies with an exhalite matrix
- 7e Green andesite shard tuff, includes some epiclastics
- 7d Grey–green porphyritic andesite lapilli tuff, minor flows and flow breccia. Partly amygdaloidal, commonly trachytic.
- 7c Black siltstone, argillite
- 7b Maroon and green andesite lapilli tuff*
- 7a Maroon coarsely graded–bedded volcanic sandstone marker

SYN–VOLCANIC AND EXHALATIVE ALTERATION FACIES

- Chst Chlorite–pyrite–quartz–carbonate stockwork, most commonly a footwall stringer zone near exhalite horizons
- Qst Quartz–chalcedony–chlorite–carbonate–pyrite–chalcopyrite stockwork +– precious metals (Goldbelt Zone)
- ChBx Hydrothermal breccia : altered rock fragments in a matrix of dark chlorite and pyrite. (Goldbelt Zone)
- Kfp Potassium feldspar, pervasive (Goldbelt Zone)
- SQ Sericite–pyrite pervasive alteration, with abundant quartz stringers (Goldbelt Zone)
- S Sericite–pyrite, pervasive. Occurs in Goldbelt Zone and also in hangingwall and footwall of exhalite horizons

SINEMURIAN TO PLIENSBACHIAN(?) : LINUK RIVER FORMATION

- 4b Green and maroon porphyritic andesite – probably massive flows, in part might be intrusive equivalent of 7d
- 4a Green and maroon basaltic andesite ash tuff and lapilli tuff

UPPER TRIASSIC

- 3b Green and purple andesite breccia with minor siltstone, sandstone, and conglomerate
- 3a Black siltstone

ABBREVIATIONS

ba	barite
ca	calcite
cp	chalcopyrite
gn	galena
hem	hematite
qz	quartz
sp	sphalerite
sc	sericite
py	pyrite
chl	chlorite

GEOLOGICAL BRANCH
ASSESSMENT REPORT

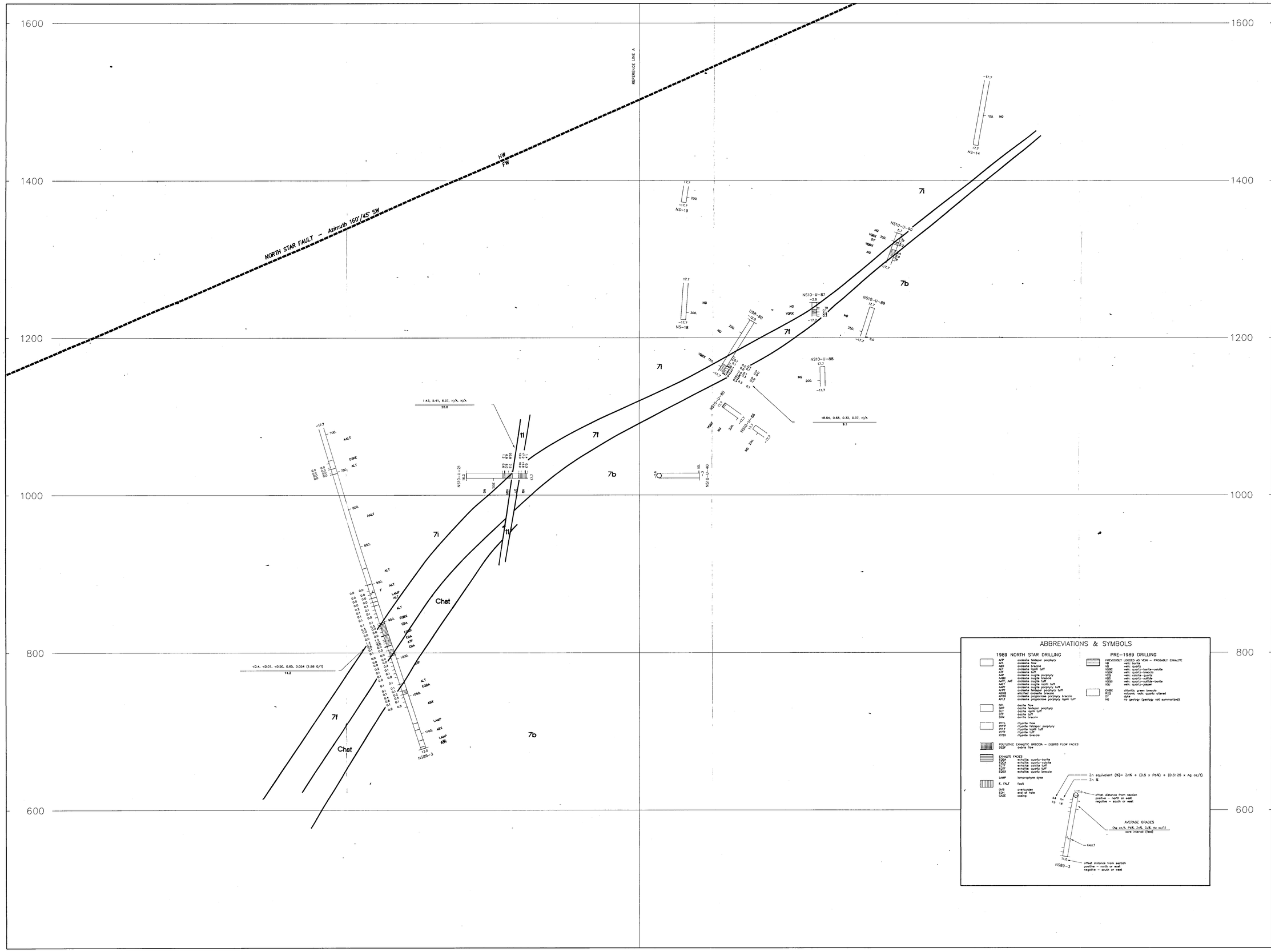
20,041
Part 2 of 2

SCALE 1"=40'

40 0 40 80 120
FEET

DOLLY VARDEN MINERALS INC.

Report by: TG/PJM/WM	DOLLY VARDEN PROJECT North Star Mine
Date: January /90	Cross Section A 6700 Looking NE
NTS: 103P/ 11–12	
Mining Division Skeena	Tecucomp Geological Inc.
Ref. # SECA6700.DWG	Map: 15.



ABBREVIATIONS & SYMBOLS

1989 NORTH STAR DRILLING

- AFP andesite feldspar porphyry
- AFL andesite flow
- ABR andesite breccia
- ALT andesite lapilli tuff
- AT andesite tuff
- AAP andesite augite porphyry
- AABR andesite augite breccia
- AAT, AAT andesite augite tuff
- AALT andesite augite lapilli tuff
- AAPT andesite augite porphyry tuff
- AFPT andesite feldspar porphyry tuff
- ABBRD andesite brecciated
- AFPBR andesite feldspar porphyry breccia
- AFPLT andesite feldspar porphyry lapilli tuff
- DFL dacite flow
- DFP dacite feldspar porphyry
- DLT dacite lapilli tuff
- DTF dacite tuff
- DBX dacite breccia
- RYFL rhyolite flow
- RYFP rhyolite feldspar porphyry
- RYLT rhyolite lapilli tuff
- RYTF rhyolite tuff
- RYBX rhyolite breccia
- POLYLITHIC EXHALITIC BRECCIA – DEBRIS FLOW FACIES
- DEBF debris flow
- EXHALITE FACIES
- EQBA exhalite: quartz–barite
- EQCA exhalite: quartz–calcite
- ECTF exhalite: calcite tuff
- EQTF exhalite: quartz tuff
- EQBX exhalite: quartz breccia
- LAMP lamprophyre dyke
- F, FALT fault
- OVB overburden
- EOH end of hole
- CASE casing

PRE–1989 DRILLING

- (PREVIOUSLY LOGGED AS VEIN – PROBABLY EXHALITE
- VB vein: barite
- VQ vein: quartz
- VQBC vein: quartz–barite–calcite
- VQC vein: quartz–calcite
- VQQ vein: calcite–quartz
- VQS vein: quartz–sulfide
- VQSB vein: quartz–sulfide–barite
- VQU vein: quartz–jasper
- CHBX chloritic green breccia
- RVQ volcanic rock: quartz altered
- DYK dyke
- NG no geology (geology not summarized)

Zn equivalent (%)= Zn% + (0.5 x Pb%) + (0.3125 x Ag oz/t)

Zn %

offset distance from section
positive – north or east
negative – south or west

AVERAGE GRADES
(Ag oz/t, Pb%, Zn%, Cu%, Au oz/t)
core interval (feet)

FAULT

offset distance from section
positive – north or east
negative – south or west

NS89–3

LITHOLOGIES

QUATERNARY

- 21 Alluvium
- 20 Glacial drift, colluvium

INTRUSIVE ROCKS

TERTIARY

EOCENE AND YOUNGER

- 11 Lamprophyre, basalt dykes
- 10 Diorite, microdiorite

VOLCANIC AND SEDIMENTARY ROCKS

LOWER TO MIDDLE JURASSIC

TOARCIAN TO BAJOCIAN : SALMON RIVER FORMATION

- 8b Siltstone, shale, and minor sandstone
- 8a Basal fossiliferous wacke

TOARCIAN : PARTIAL EQUIVALENTS OF MT DILWORTH / BETTY CREEK FORMATIONS

- 7k Siliceous, pyritic, sericitic felsic pyroclastic rocks
- 7j Pale green andesite ash tuff
- 7i Maroon and green andesite lapilli tuff, ash tuff. Locally carbonaceous
- 7h Grey and greenish grey andesite lapilli tuff. Commonly contains carbonate–chlorite (–sericite) altered andesite fragments in a strongly chloritic matrix. The base of this unit is locally comprised of finely laminated chloritic ash tuff
- 7g Polylithic exhalitic breccia. A debris flow facies containing fragments of volcanics, chert, jasper, sulfates, carbonates, and sulfides in a chloritic or sericitic tuffaceous matrix
- 7f Exhalite : Volcanic exhalative silica, sulfates, carbonates, sulfides, oxides, and native silver. Includes some debris flow facies with an exhalite matrix
- 7e Green andesite shard tuff, includes some epiclastics
- 7d Grey–green porphyritic andesite lapilli tuff, minor flows and flow breccia. Partly amygdaloidal, commonly trachytic.
- 7c Black siltstone, argillite
- 7b Maroon and green andesite lapilli tuff
- 7a Maroon coarsely graded–bedded volcanic sandstone marker

SYN–VOLCANIC AND EXHALATIVE ALTERATION FACIES

- Chat Chlorite–pyrite–quartz–carbonate stockwork, most commonly a footwall stringer zone near exhalite horizons
- Qst Quartz–chalcedony–chlorite–carbonate–pyrite–chalcopyrite stockwork +– precious metals (Goldbelt Zone)
- ChBx Hydrothermal breccia : altered rock fragments in a matrix of dark chlorite and pyrite. (Goldbelt Zone)
- Kfp Potassium feldspar, pervasive (Goldbelt Zone)
- SQ Sericite–pyrite pervasive alteration, with abundant quartz stringers (Goldbelt Zone)
- S Sericite–pyrite, pervasive. Occurs in Goldbelt Zone and also in hangingwall and footwall of exhalite horizons

SINEMURIAN TO PLIENSBACHIAN(?) : UNUK RIVER FORMATION

- 4b Green and maroon porphyritic andesite – probably massive flows, in part might be intrusive equivalent of 7d
- 4a Green and maroon basaltic andesite ash tuff and lapilli tuff

UPPER TRIASSIC

- 3b Green and purple andesite breccia with minor siltstone, sandstone, and conglomerate
- 3a Black siltstone

ABBREVIATIONS

ba	barite
cc	calcite
cp	chalcopyrite
gn	galena
hem	hematite
qz	quartz
sp	sphalerite
sc	sericite
py	pyrite
chl	chlorite

GEOLOGICAL BRANCH
ASSESSMENT REPORT

20,041
Part 2 of 2

SCALE 1"=40'

40 0 40 80 120
FEET

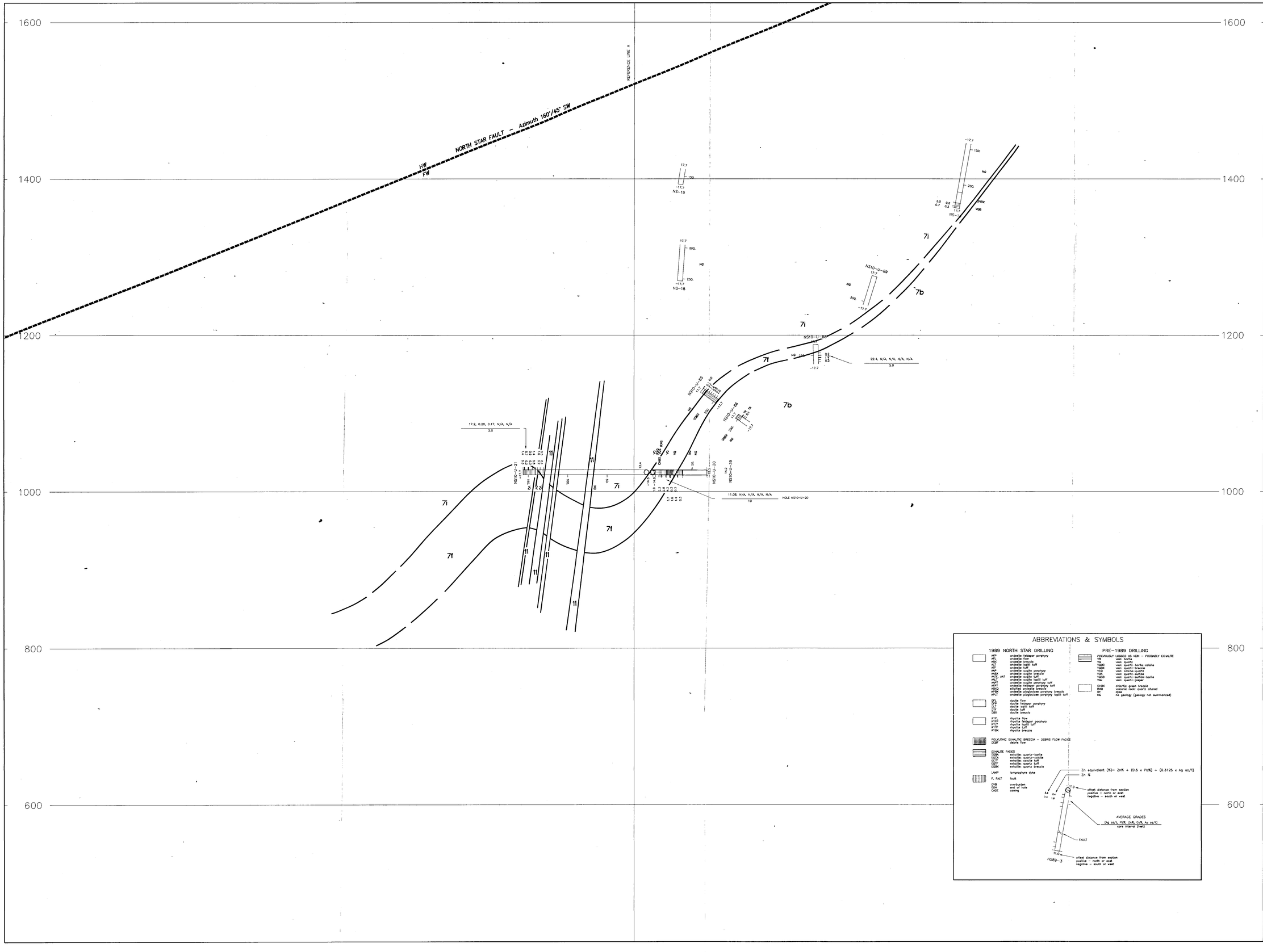
DOLLY VARDEN MINERALS INC.

Report by: TD/PJM/WM
Date: January /90
NTS: 103P/ 11–12
Mining Division: Skeena
Ref. # SECA6725.DWG

DOLLY VARDEN PROJECT
North Star Mine
Cross Section A 6725
Looking NE

Tecucomp Geological Inc.

Map: 16.



ABBREVIATIONS & SYMBOLS

1989 NORTH STAR DRILLING

APP	andesite feldspar porphyry
AFL	andesite flow
ABR	andesite breccia
ALT	andesite lapilli tuff
ATF	andesite tuff
AAP	andesite augite porphyry
AAFP	andesite augite feldspar
AABP, AAT	andesite augite breccia
ABLT	andesite augite lapilli tuff
APPT	andesite augite porphyry tuff
AFPT	andesite feldspar porphyry tuff
APBTB	andesite plagioclase porphyry
APBB	andesite plagioclase porphyry breccia
APLT	andesite plagioclase porphyry lapilli tuff
DFL	dacite flow
DFP	dacite feldspar porphyry
DLT	dacite lapilli tuff
DTF	dacite tuff
DBX	dacite breccia
RYFL	rhyolite flow
RYFP	rhyolite feldspar porphyry
RYLT	rhyolite lapilli tuff
RYTF	rhyolite tuff
RYBX	rhyolite breccia
POLYLITHIC EXHALITE BRECCIA – DEBRIS FLOW FACIES	
DEBF	debris flow
EXHALITE FACIES	
EQBA	exhalite: quartz–barite
EQCA	exhalite: quartz–calcite
EQSP	exhalite: quartz–sphalerite
EQTF	exhalite: quartz tuff
EQBX	exhalite: quartz breccia
LAMP	lamprophyre dyke
F, FALT	fault
OVB	overburden
EOH	end of hole
CASE	casing

PRE-1989 DRILLING

PREVIOUSLY LOGGED AS VEIN – PROBABLY EXHALITE	
VB	vein: barite
VQ	vein: quartz
VQBC	vein: quartz–barite–calcite
VQBX	vein: quartz–breccia
VCQ	vein: calcite–quartz
VQS	vein: quartz–sulfide
VQSB	vein: quartz–sulfide–barite
VJU	vein: quartz–jasper
CHBX	chloritic green breccia
SHQ	silicic neck: quartz altered
DYK	dyke
NG	no geology (geology not summarized)

Zn equivalent (%)= Zn% + (0.5 x Pb%) + (0.3125 x Ag oz/t)

Zn %

17.0 — offset distance from section: positive = north or east; negative = south or west

5.6 / 7.3 — 2.4 / 1.8

AVERAGE GRADES (Ag oz/t, Pb%, Zn%, Cu%, Au oz/t) / core interval (feet)

FAULT

11.0 — offset distance from section: positive = north or east; negative = south or west

NS89-3

LITHOLOGIES

QUATERNARY

- 21 Alluvium
- 20 Glacial drift, colluvium

INTRUSIVE ROCKS

TERTIARY

EOCENE AND YOUNGER

- 11 Lamprophyre, basalt dykes
- 10 Diorite, microdiorite

VOLCANIC AND SEDIMENTARY ROCKS

LOWER TO MIDDLE JURASSIC

TOARCIAN TO BAJOCIAN : SALMON RIVER FORMATION

- 6b Siltstone, shale, and minor sandstone
- 6a Basal fossiliferous wacke

TOARCIAN : PARTIAL EQUIVALENTS OF MT DILWORTH / BETTY CREEK FORMATIONS

- 7k Siliceous, pyritic, sericitic felsic pyroclastic rocks
- 7j Pale green andesite ash tuff
- 7i Maroon and green andesite lapilli tuff, ash tuff. Locally carbonaceous
- 7h Grey and greenish grey andesite lapilli tuff. Commonly contains carbonate–chlorite (–sericite) altered andesite fragments in a strongly chloritic matrix. The base of this unit is locally comprised of finely laminated chloritic ash tuff
- 7g Polylithic exhalitic breccia. A debris flow facies containing fragments of volcanics, chert, jasper, sulfates, carbonates, and sulfides in a chloritic or sericitic tuffaceous matrix
- 7f Exhalite : Volcanic exhalative silica, sulfates, carbonates, sulfides, oxides, and native silver. Includes some debris flow facies with an exhalite matrix
- 7e Green andesite shard tuff, includes some epiclastics
- 7d Grey–green porphyritic andesite lapilli tuff, minor flows and flow breccia. Partly amygdaloidal, commonly trachytic.
- 7c Black siltstone, argillite
- 7b Maroon and green andesite lapilli tuff
- 7a Maroon coarsely graded–bedded volcanic sandstone marker

SYN–VOLCANIC AND EXHALATIVE ALTERATION FACIES

- Chst Chlorite–pyrite–quartz–carbonate stockwork, most commonly a footwall stringer zone near exhalite horizons
- Qst Quartz–chalcedony–chlorite–carbonate–pyrite–chalcopyrite stockwork +– precious metals (Goldbelt Zone)
- CHBx Hydrothermal breccia : altered rock fragments in a matrix of dark chlorite and pyrite. (Goldbelt Zone)
- Kfp Potassium feldspar, pervasive (Goldbelt Zone)
- SQ Sericite–pyrite pervasive alteration, with abundant quartz stringers (Goldbelt Zone)
- S Sericite–pyrite, pervasive. Occurs in Goldbelt Zone and also in hangingwall and footwall of exhalite horizons

SINEMURIAN TO PLIENSBACHIAN(?) : UNUK RIVER FORMATION

- 4b Green and maroon porphyritic andesite – probably massive flows, in part might be intrusive equivalent of 7d
- 4a Green and maroon basaltic andesite ash tuff and lapilli tuff

UPPER TRIASSIC

- 3b Green and purple andesite breccia with minor siltstone, sandstone, and conglomerate
- 3a Black siltstone

ABBREVIATIONS

ba	barite
ca	calcite
cp	chalcopyrite
gn	galena
hem	hematite
qz	quartz
sp	sphalerite
sc	sericite
py	pyrite
chl	chlorite

GEOLOGICAL BRANCH
ASSESSMENT REPORT

20,041 Part 2 of 2

SCALE 1"=40'

40 0 40 80 120

FEET

DOLLY VARDEN MINERALS INC.

Report by: TG/PJM/WM	DOLLY VARDEN PROJECT North Star Mine
Date: January /90	Cross Section A 6750 Looking NE
NTS: 103P/ 11–12	
Mining Division: Skeena	Tecucomp Geological Inc.
Ref. # SECA6750.DWG	Map 17.

ABBREVIATIONS & SYMBOLS

1989 NORTH STAR DRILLING

AFP	andesite feldspar porphyry
AFL	andesite flow
ABX	andesite breccia
ALT	andesite lapilli tuff
AT	andesite tuff
AAP	andesite augite porphyry
AABX	andesite augite breccia
AATT, AAT	andesite augite tuff
AALT	andesite augite lapilli tuff
AAPT	andesite augite porphyry tuff
AFPT	andesite feldspar porphyry tuff
APPG	andesite plagioclase porphyry
APBX	andesite plagioclase porphyry breccia
APLT	andesite plagioclase porphyry lapilli tuff
DFL	dacite flow
DFP	dacite feldspar porphyry
DLT	dacite lapilli tuff
DTT	dacite tuff
DBX	dacite breccia
RYFL	rhyolite flow
RYFP	rhyolite feldspar porphyry
RYLT	rhyolite lapilli tuff
RYTT	rhyolite tuff
RYBX	rhyolite breccia
POLYLITHIC EXHALITIC BRECCIA – DEBRIS FLOW FACIES	
DEBF	debris flow
EXHALITE FACIES	
EQBA	exhalite: quartz-barite
EQCA	exhalite: quartz-calcite
EQSO	exhalite: quartz-sericite
EQTT	exhalite: quartz tuff
EQBX	exhalite: quartz breccia
LAMP	lamprophyre dyke
F, FALT	fault
OVB	overburden
EOH	end of hole
CASE	casing

PRE-1989 DRILLING

PREVIOUSLY LOGGED AS VEIN – PROBABLY EXHALITE

VB	vein: barite
VQ	vein: quartz
VQBC	vein: quartz-barite-calcite
VQBX	vein: quartz-breccia
VCQ	vein: calcite-quartz
VQS	vein: quartz-sulfide
VQSB	vein: quartz-sulfide-barite
VQJ	vein: quartz-jasper
CHBX	chloritic green breccia
SEQ	sericitic felsic quartz altered
DYK	dyke
NG	no geology (geology not summarized)

Zn equivalent (%)= Zn% + (0.5 x Pb%) + (0.3125 x Ag oz/t)

Zn %

offset distance from section
positive = north or east
negative = south or west

AVERAGE GRADES
(Ag oz/t, Pb%, Zn%, Cu%, Au oz/t)
core interval (feet)

FAULT

NS89-3

offset distance from section
positive = north or east
negative = south or west

LITHOLOGIES

QUATERNARY

21	Alluvium
20	Glacial drift, colluvium

INTRUSIVE ROCKS

TERTIARY

EOCENE AND YOUNGER

11	Lamprophyre, basalt dykes
10	Diorite, microdiorite

VOLCANIC AND SEDIMENTARY ROCKS

LOWER TO MIDDLE JURASSIC

TOARCIAN TO BAJOCIAN : SALMON RIVER FORMATION

8b	Siltstone, shale, and minor sandstone
8a	Basal fossiliferous wacke

TOARCIAN : PARTIAL EQUIVALENTS OF MT DILWORTH / BETTY CREEK FORMATIONS

7k	Siliceous, pyritic, sericitic felsic pyroclastic rocks
7j	Pale green andesite ash tuff
7i	Maroon and green andesite lapilli tuff, ash tuff. Locally carbonaceous
7h	Grey and greenish grey andesite lapilli tuff. Commonly contains carbonate-chlorite (-sericite) altered andesite fragments in a strongly chloritic matrix. The base of this unit is locally comprised of finely laminated chloritic ash tuff
7g	Polylithic exhalitic breccia. A debris flow facies containing fragments of volcanics, chert, jasper, sulfates, carbonates, and sulfides in a chloritic or sericitic tuffaceous matrix
7f	Exhalite : Volcanic exhalative silica, sulfates, carbonates, sulfides, oxides, and native silver. Includes some debris flow facies with an exhalite matrix
7e	Green andesite shard tuff, includes some epiclastics
7d	Grey-green porphyritic andesite lapilli tuff, minor flows and flow breccia. Partly amygdaloidal, commonly trachytic.
7c	Black siltstone, argillite
7b	Maroon and green andesite lapilli tuff
7a	Maroon coarsely graded-bedded volcanic sandstone marker

SYN-VOLCANIC AND EXHALATIVE ALTERATION FACIES

Chst	Chlorite-pyrite-quartz-carbonate stockwork, most commonly a footwall stringer zone near exhalite horizons
Qst	Quartz-chalcedony-chlorite-carbonate-pyrite-chalcopyrite stockwork +- precious metals (Goldbelt Zone)
Chbx	Hydrothermal breccia : altered rock fragments in a matrix of dark chlorite and pyrite. (Goldbelt Zone)
Kfp	Potassium feldspar, pervasive (Goldbelt Zone)
SQ	Sericite-pyrite pervasive alteration, with abundant quartz stringers (Goldbelt Zone)
S	Sericite-pyrite, pervasive. Occurs in Goldbelt Zone and also in hangingwall and footwall of exhalite horizons

SINEMURIAN TO PLIENSBACHIAN(?) : UNUK RIVER FORMATION

4b	Green and maroon porphyritic andesite – probably massive flows, in part might be intrusive equivalent of 7d
4a	Green and maroon basaltic andesite ash tuff and lapilli tuff

UPPER TRIASSIC

3b	Green and purple andesite breccia with minor siltstone, sandstone, and conglomerate
3a	Black siltstone

ABBREVIATIONS

ba	barite
co	calcite
cp	chalcopyrite
gn	galena
hem	hematite
qz	quartz
sp	sphalerite
sc	sericite
py	pyrite
chl	chlorite

GEOLOGICAL BRANCH
ASSESSMENT REPORT

20,041 Part 2 of 2

SCALE 1"=40'

40 0 40 80 120

FEET

DOLLY VARDEN MINERALS INC.

Report by: TD/PJM/WM

Date: January /90

NTS: 103P/ 11-12

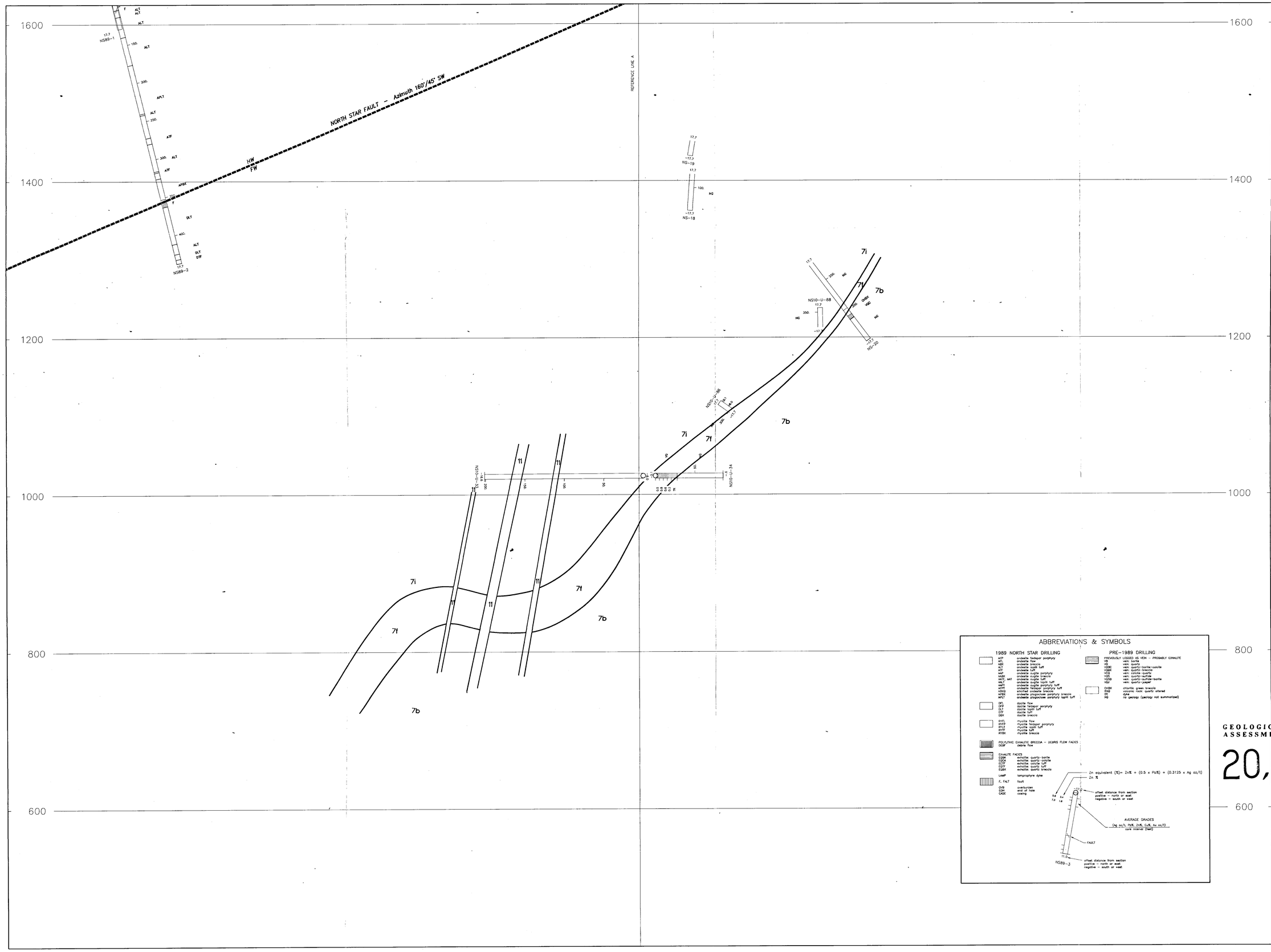
Mining Division: Skeena

Ref. # SEC6775.DWG

DOLLY VARDEN PROJECT
North Star Mine
Cross Section A 6775
Looking NE

Tecucomp Geological Inc.

Map: 18.



LITHOLOGIES

QUATERNARY

21	Alluvium
20	Glacial drift, colluvium

INTRUSIVE ROCKS

TERTIARY

EOCENE AND YOUNGER

11	Lamprophyre, basalt dykes
10	Diorite, microdiorite

VOLCANIC AND SEDIMENTARY ROCKS

LOWER TO MIDDLE JURASSIC

TOARCIAN TO BAJOCIAN : SALMON RIVER FORMATION

8b	Siltstone, shale, and minor sandstone
8a	Basal fossiliferous wacke

TOARCIAN : PARTIAL EQUIVALENTS OF MT DILWORTH / BETTY CREEK FORMATIONS

7k	Siliceous, pyritic, sericitic felsic pyroclastic rocks
7j	Pale green andesite ash tuff
7i	Maroon and green andesite lapilli tuff, ash tuff. Locally carbonaceous
7h	Grey and greenish grey andesite lapilli tuff. Commonly contains carbonate-chlorite (–sericite) altered andesite fragments in a strongly chloritic matrix. The base of this unit is locally comprised of finely laminated chloritic ash tuff
7g	Polylithic exhalitic breccia. A debris flow facies containing fragments of volcanics, chert, jasper, sulfates, carbonates, and sulfides in a chloritic or sericitic tuffaceous matrix
7f	Exhalite : Volcanic exhalative silica, sulfates, carbonates, sulfides, oxides, and native silver. Includes some debris flow facies with an exhalite matrix
7e	Green andesite shard tuff, includes some epiclastics
7d	Grey-green porphyritic andesite lapilli tuff, minor flows and flow breccia. Partly amygdaloidal, commonly trachytic.
7c	Black siltstone, argillite
7b	Maroon and green andesite lapilli tuff
7a	Maroon coarsely graded-bedded volcanic sandstone marker

SYN-VOLCANIC AND EXHALATIVE ALTERATION FACIES

Chst	Chlorite-pyrite-quartz-carbonate stockwork, most commonly a footwall stringer zone near exhalite horizons
Qtzt	Quartz-chalcedony-chlorite-carbonate-pyrite-chalcopyrite stockwork +- precious metals (Goldbelt Zone)
ChBx	Hydrothermal breccia : altered rock fragments in a matrix of dark chlorite and pyrite. (Goldbelt Zone)
Kfp	Potassium feldspar, pervasive (Goldbelt Zone)
SQ	Sericite-pyrite pervasive alteration, with abundant quartz stringers (Goldbelt Zone)
S	Sericite-pyrite, pervasive. Occurs in Goldbelt Zone and also in hangingwall and footwall of exhalite horizons

SINEMURIAN TO PLIENSBACHIAN(?) : UNUK RIVER FORMATION

4b	Green and maroon porphyritic andesite – probably massive flows, in part might be intrusive equivalent of 7d
4a	Green and maroon basaltic andesite ash tuff and lapilli tuff

UPPER TRIASSIC

3b	Green and purple andesite breccia with minor siltstone, sandstone, and conglomerate
3a	Black siltstone

ABBREVIATIONS

ba	barite
cb	cerussite
cp	chalcopyrite
gn	galena
hem	hematite
qz	quartz
sp	sphalerite
se	sericite
py	pyrite
chl	chlorite

ABBREVIATIONS & SYMBOLS

1989 NORTH STAR DRILLING

AFP	andesite feldspar porphyry
AFL	andesite flow
AFB	andesite breccia
ALT	andesite lapilli tuff
ATF	andesite tuff
AAP	andesite augite porphyry
AABX	andesite augite breccia
AAT, AAT	andesite augite tuff
AALT	andesite augite lapilli tuff
AAPT	andesite augite porphyry tuff
ABXT	andesite augite breccia tuff
ABXG	silicified andesite breccia
APBX	andesite plagioclase porphyry breccia
APLT	andesite plagioclase porphyry lapilli tuff
DFL	dacite flow
DFP	dacite feldspar porphyry
DLT	dacite lapilli tuff
DTF	dacite tuff
DBX	dacite breccia
RYFL	rhyolite flow
RYFP	rhyolite feldspar porphyry
RYLT	rhyolite lapilli tuff
RYTF	rhyolite tuff
RYBX	rhyolite breccia
POLYLITHIC EXHALITIC BRECCIA – DEBRIS FLOW FACIES	
DEBF	debris flow
EXHALITE FACIES	
EQBA	exhalite: quartz-barite
EQCB	exhalite: quartz-calcite
EQSE	exhalite: quartz-sericite
EQTF	exhalite: quartz tuff
EQBX	exhalite: quartz breccia
LAMP	lamprophyre dyke
F, FALT	fault
OVB	overburden
EOH	end of hole
CASE	casing

PRE-1989 DRILLING

PREVIOUSLY LOGGED AS VEIN – PROBABLY EXHALITE	
VB	vein: barite
VC	vein: calcite
VQBC	vein: quartz-barite-calcite
VQBX	vein: quartz-breccia
VCQ	vein: calcite-quartz
VQS	vein: quartz-sulfide
VQSB	vein: quartz-sulfide-barite
VQJ	vein: quartz-jasper
CHBX	chlorite green breccia
RXQ	volcanic rock: quartz altered
DY	dyke
NG	no geology (geology not summarized)

GEOLOGICAL BRANCH
ASSESSMENT REPORT

20,041 Part 2 of 2

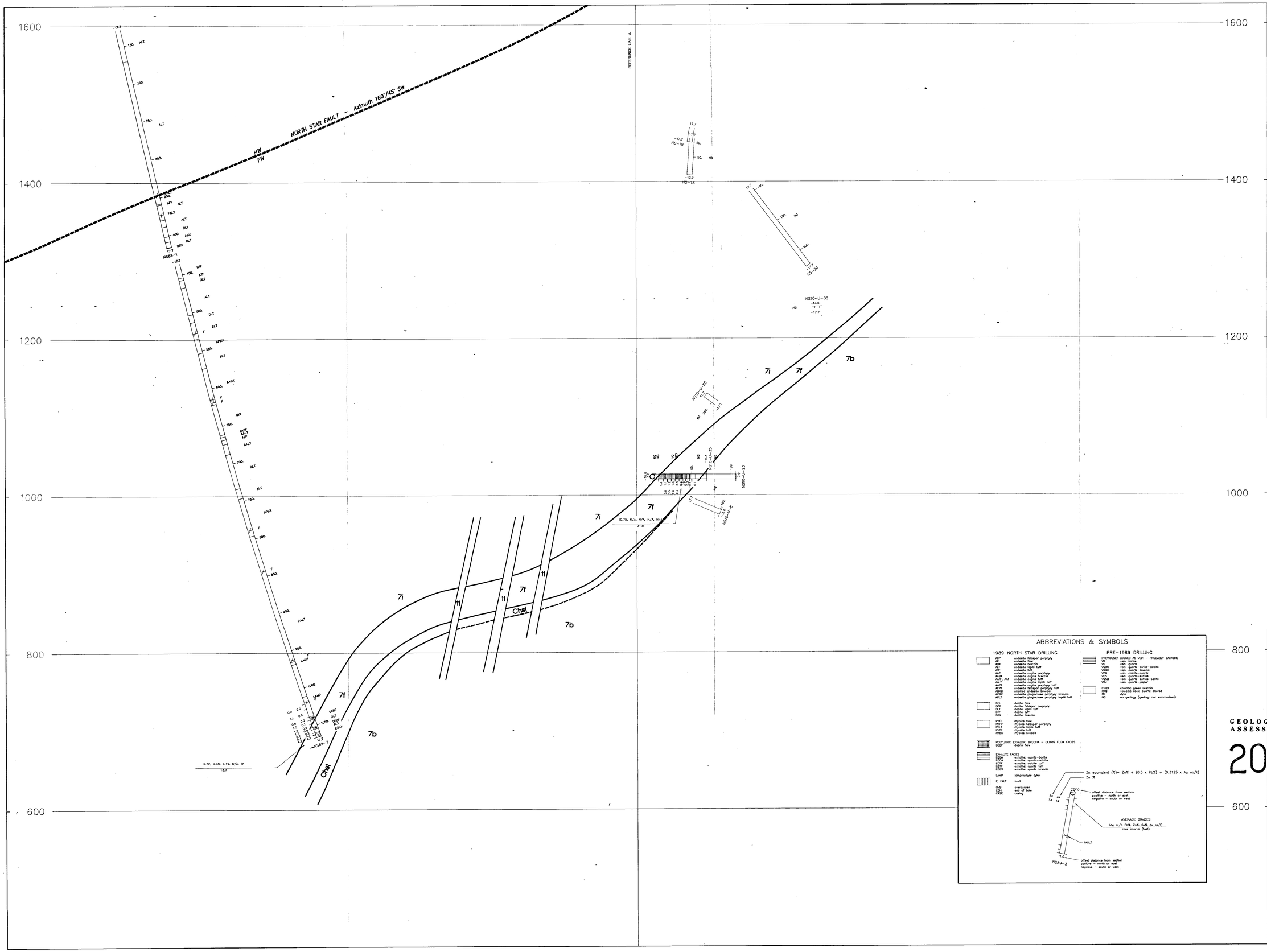
SCALE 1"=40'

40 0 40 80 120

FEET

DOLLY VARDEN MINERALS INC.

Report by: TD/PJM/WM	DOLLY VARDEN PROJECT North Star Mine Cross Section A 6800 Looking NE
Date: January /90	
NTS: 103P/ 11-12	
Mining Division Skeena	Map: 19.
Ref. # SECA6800.DWG	Tecucomp Geological Inc.



LITHOLOGIES

QUATERNARY

21	Alluvium
20	Glacial drift, colluvium

INTRUSIVE ROCKS

TERTIARY

EOCENE AND YOUNGER

11	Lamprophyre, basalt dykes
10	Diorite, microdiorite

VOLCANIC AND SEDIMENTARY ROCKS

LOWER TO MIDDLE JURASSIC

TOARCIAN TO BAJOCIAN : SALMON RIVER FORMATION

8b	Siltstone, shale, and minor sandstone
8a	Basal fossiliferous wacke

TOARCIAN : PARTIAL EQUIVALENTS OF MT DILWORTH / BETTY CREEK FORMATIONS

7k	Siliceous, pyritic, sericitic felsic pyroclastic rocks
7j	Pale green andesite ash tuff
7i	Maroon and green andesite lapilli tuff, ash tuff. Locally carbonaceous
7h	Grey and greenish grey andesite lapilli tuff. Commonly contains carbonate-chlorite (-sericite) altered andesite fragments in a strongly chloritic matrix. The base of this unit is locally comprised of finely laminated chloritic ash tuff
7g	Polylithic exhalitic breccia. A debris flow facies containing fragments of volcanics, chert, jasper, sulfates, carbonates, and sulfides in a chloritic or sericitic tuffaceous matrix
7f	Exhalite : Volcanic exhalative silica, sulfates, carbonates, sulfides, oxides, and native silver. Includes some debris flow facies with an exhalite matrix
7e	Green andesite shard tuff, includes some epiclastics
7d	Grey-green porphyritic andesite lapilli tuff, minor flows and flow breccia. Partly amygdaloidal, commonly trachytic.
7c	Black siltstone, argillite
7b	Maroon and green andesite lapilli tuff
7a	Maroon coarsely graded-bedded volcanic sandstone marker

SYN-VOLCANIC AND EXHALATIVE ALTERATION FACIES

Chst	Chlorite-pyrite-quartz-carbonate stockwork, most commonly a footwall stringer zone near exhalite horizons
Qst	Quartz-chalcedony-chlorite-carbonate-pyrite-chalcopyrite stockwork +- precious metals (Goldbelt Zone)
ChBx	Hydrothermal breccia : altered rock fragments in a matrix of dark chlorite and pyrite. (Goldbelt Zone)
Kfp	Potassium feldspar, pervasive (Goldbelt Zone)
SQ	Sericite-pyrite pervasive alteration, with abundant quartz stringers (Goldbelt Zone)
S	Sericite-pyrite, pervasive. Occurs in Goldbelt Zone and also in hangingwall and footwall of exhalite horizons

SINEMURIAN TO PLIENSBACHIAN(?) : UNUK RIVER FORMATION

4b	Green and maroon porphyritic andesite – probably massive flows, in part might be intrusive equivalent of 7d
4a	Green and maroon basaltic andesite ash tuff and lapilli tuff

UPPER TRIASSIC

3b	Green and purple andesite breccia with minor siltstone, sandstone, and conglomerate
3a	Black siltstone

ABBREVIATIONS

ba	barite
ca	calcite
cp	chalcopyrite
gn	galena
hem	hematite
qz	quartz
sp	sphalerite
sc	sericite
py	pyrite
chl	chlorite

ABBREVIATIONS & SYMBOLS

1989 NORTH STAR DRILLING

AFP	andesite feldspar porphyry
AFL	andesite flow
ABX	andesite breccia
ALT	andesite lapilli tuff
AT	andesite ash tuff
AAP	andesite augite porphyry
AABX	andesite augite breccia
AAT, AAT	andesite augite tuff
AALT	andesite augite lapilli tuff
AAPT	andesite augite porphyry tuff
AFPT	andesite feldspar porphyry tuff
ABBXB	altered andesite breccia
APBX	andesite plagioclase porphyry breccia
APLT	andesite plagioclase porphyry lapilli tuff
DFL	dacite flow
DFP	dacite feldspar porphyry
DLT	dacite lapilli tuff
DTF	dacite tuff
DBX	dacite breccia
RYFL	rhyolite flow
RYFP	rhyolite feldspar porphyry
RYLT	rhyolite lapilli tuff
RYTF	rhyolite tuff
RYBX	rhyolite breccia
POLYLITHIC EXHALITIC BRECCIA – DEBRIS FLOW FACIES	
DEBF	debris flow
EXHALITE FACIES	
EQBA	exhalite: quartz-barite
EQCA	exhalite: quartz-calcite
EQTF	exhalite: cherty tuff
EQLT	exhalite: cherty lapilli tuff
EQBX	exhalite: quartz breccia
LAMP	lamprophyre dyke
F, FALT	fault
OVB	overburden
EOH	end of hole
CASE	casing

PRE-1989 DRILLING

PREVIOUSLY LOGGED AS VEIN – PROBABLY EXHALITE

VB	vein: barite
VQ	vein: quartz
VQBC	vein: quartz-barite-calcite
VQBX	vein: quartz-breccia
VCQ	vein: calcite-quartz
VQS	vein: quartz-sulfide
VQBS	vein: quartz-barite-sulfide
VQJ	vein: quartz-jasper
CHBX	chloritic green breccia
RSQ	volcanic rock: quartz altered
NS	no sample
NG	no geology (geology not summarized)

Zn equivalent (%)= Zn% + (0.5 x Pb%) + (0.3125 x Ag oz/t)

Zn %

offset distance from section
positive – north or east
negative – south or west

AVERAGE GRADES
(Ag oz/t, Pb%, Zn%, Cu%, Au oz/t)
core interval (feet)

FAULT

offset distance from section
positive – north or east
negative – south or west

GEOLOGICAL BRANCH
ASSESSMENT REPORT

20,041 Part 2 of 2

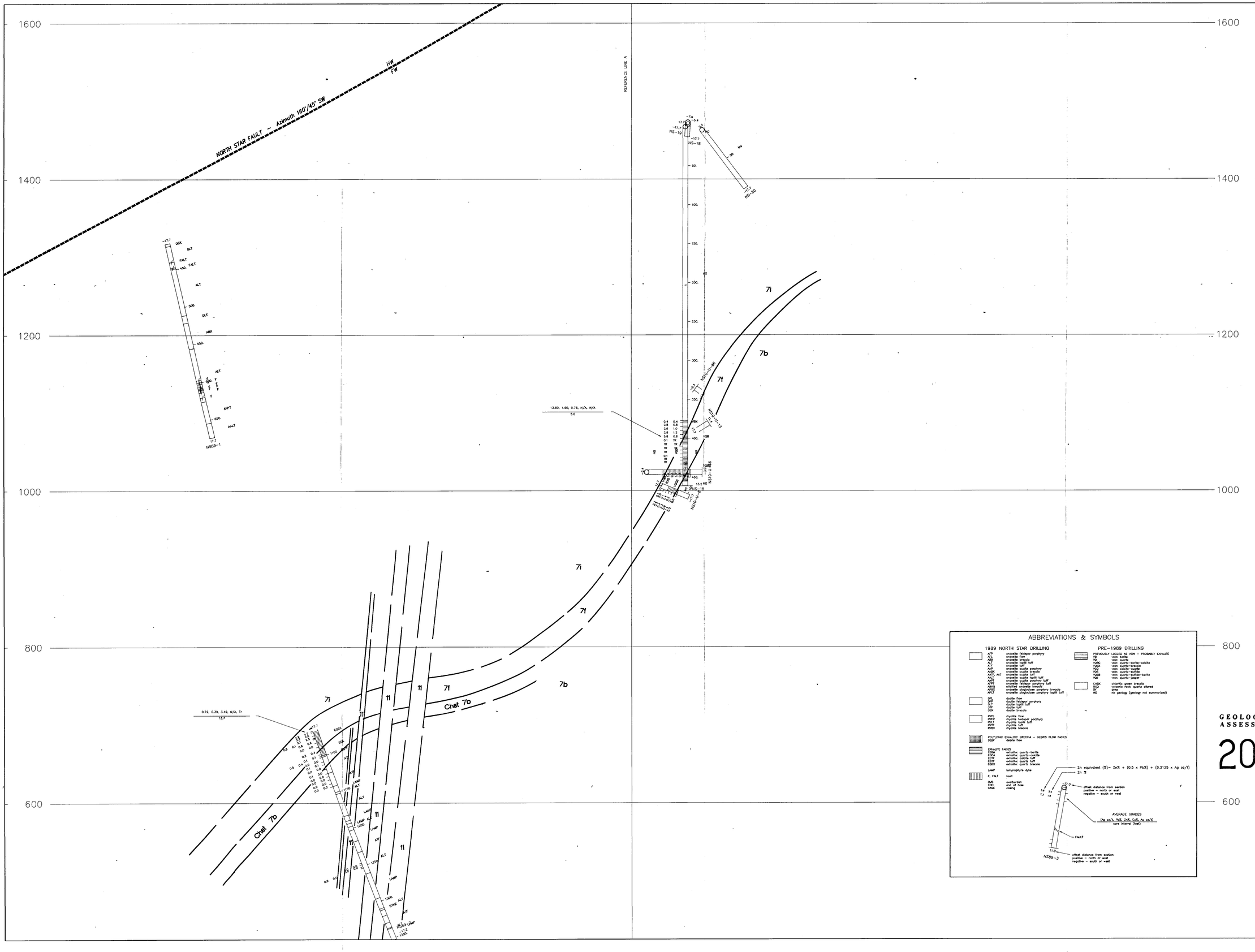
SCALE 1"=40'

40 0 40 80 120

FEET

DOLLY VARDEN MINERALS INC.

Report by: TD/PJM/WM	DOLLY VARDEN PROJECT North Star Mine
Date: January /90	Cross Section A 6825 Looking NE
NTS: 103P/ 11-12	
Mining Division Skeena	Tecucomp Geological Inc.
Ref # SEC6A6825.DWG	Map: 20.



LITHOLOGIES

QUATERNARY

- **21** Alluvium
- **20** Glacial drift, colluvium

INTRUSIVE ROCKS

TERTIARY

EOCENE AND YOUNGER

- **11** Lamprophyre, basalt dykes
- **10** Diorite, microdiorite

VOLCANIC AND SEDIMENTARY ROCKS

LOWER TO MIDDLE JURASSIC

TOARCIAN TO BAJOCIAN : SALMON RIVER FORMATION

- **8b** Siltstone, shale, and minor sandstone
- **8a** Basal fossiliferous wacke

TOARCIAN : PARTIAL EQUIVALENTS OF MT DILWORTH / BETTY CREEK FORMATIONS

- **7k** Siliceous, pyritic, sericitic felsic pyroclastic rocks
- **7j** Pale green andesite ash tuff
- **7i** Maroon and green andesite lapilli tuff, ash tuff. Locally carbonaceous
- **7h** Grey and greenish grey andesite lapilli tuff. Commonly contains carbonate–chlorite (–sericite) altered andesite fragments in a strongly chloritic matrix. The base of this unit is locally comprised of finely laminated chloritic ash tuff
- **7g** Polylithic exhalitic breccia. A debris flow facies containing fragments of volcanics, chert, jasper, sulfates, carbonates, and sulfides in a chloritic or sericitic tuffaceous matrix
- **7f** Exhalite : Volcanic exhalative silica, sulfates, carbonates, sulfides, oxides, and native silver. Includes some debris flow facies with an exhalite matrix
- **7e** Green andesite shard tuff, includes some epiclastics
- **7d** Grey–green porphyritic andesite lapilli tuff, minor flows and flow breccia. Partly amygdaloidal, commonly trachytic.
- **7c** Black siltstone, argillite
- **7b** Maroon and green andesite lapilli tuff
- **7a** Maroon coarsely graded–bedded volcanic sandstone marker

SYN–VOLCANIC AND EXHALATIVE ALTERATION FACIES

- **Chst** Chlorite–pyrite–quartz–carbonate stockwork, most commonly a footwall stringer zone near exhalite horizons
- **Qst** Quartz–chalcedony–chlorite–carbonate–pyrite–chalcopyrite stockwork +– precious metals (Goldbelt Zone)
- **ChBx** Hydrothermal breccia : altered rock fragments in a matrix of dark chlorite and pyrite. (Goldbelt Zone)
- **Kfp** Potassium feldspar, pervasive (Goldbelt Zone)
- **SQ** Sericite–pyrite pervasive alteration, with abundant quartz stringers (Goldbelt Zone)
- **S** Sericite–pyrite, pervasive. Occurs in Goldbelt Zone and also in hangingwall and footwall of exhalite horizons

SINEMURIAN TO PLIENSBACHIAN(?) : UNUK RIVER FORMATION

- **4b** Green and maroon porphyritic andesite – probably massive flows, in part might be intrusive equivalent of 7d
- **4a** Green and maroon basaltic andesite ash tuff and lapilli tuff

UPPER TRIASSIC

- **3b** Green and purple andesite breccia with minor siltstone, sandstone, and conglomerate
- **3a** Black siltstone

ABBREVIATIONS

ba	barite
ca	calcite
cp	chalcopyrite
gn	galena
hem	hematite
qz	quartz
sp	sphalerite
sc	sericite
py	pyrite
chl	chlorite

GEOLOGICAL BRANCH ASSESSMENT REPORT

20,041 Part 2 of 2

SCALE 1"=40'

40 0 40 80 120

FEET

DOLLY VARDEN MINERALS INC.

Report by: TD/PLM/RM	DOLLY VARDEN PROJECT North Star Mine
Date: January /90	Cross Section A 6850 Looking NE
NTS: 103P/ 11–12	
Mining Division Skeena	Tecucomp Geological Inc.
Ref. # SECA6850.DWG	Map 21.

ABBREVIATIONS & SYMBOLS

1989 NORTH STAR DRILLING

AFP	andesite feldspar porphyry
AFL	andesite flow
ABX	andesite breccia
ALT	andesite lapilli tuff
ATF	andesite tuff
APP	andesite augite porphyry
ABBX	andesite augite breccia
AATF, AAT	andesite augite tuff
AALT	andesite augite lapilli tuff
APPT	andesite augite porphyry tuff
AFPT	andesite feldspar porphyry tuff
ABSSQ	silicified andesite breccia
APBX	andesite plagioclase porphyry breccia
APLT	andesite plagioclase porphyry lapilli tuff
DFL	dacite flow
DFP	dacite feldspar porphyry
DLT	dacite lapilli tuff
DTF	dacite tuff
DBX	dacite breccia
RYFL	rhyolite flow
RYFP	rhyolite feldspar porphyry
RYLT	rhyolite lapilli tuff
RYTF	rhyolite tuff
RYBX	rhyolite breccia
POLYLITHIC EXHALITIC BRECCIA – DEBRIS FLOW FACIES	
DEBF	debris flow
EXHALITE FACIES	
EQBA	exhalite: quartz–barite
EQCA	exhalite: quartz–calcite
EQTF	exhalite: calcite tuff
EQTF	exhalite: quartz tuff
EQBX	exhalite: quartz breccia
LAMP	lamprophyre dyke
F, FALT	fault
OVB	overburden
EOH	end of hole
CASE	casing

PRE–1989 DRILLING

PREVIOUSLY LOGGED AS VEIN – PROBABLY EXHALITE

VB	vein: barite
VQ	vein: quartz
VQBC	vein: quartz–barite–calcite
VQBX	vein: quartz–breccia
VQC	vein: quartz–calcite
VQS	vein: quartz–sulfide
VQSB	vein: quartz–sulfide–barite
VQJ	vein: quartz–jasper
CHBX	chloritic green breccia
RQ2	volcanic rock: quartz altered
DY	dyke
NG	no geology (geology not summarized)

Zn equivalent (%)= Zn% + (0.5 x Pb%) + (0.3125 x Ag oz/t)

Zn %

offset distance from section
positive – north or east
negative – south or west

AVERAGE GRADES
(Ag oz/t, Pb%, Zn%, Cu%, Au oz/t)
core interval (feet)

FAULT

offset distance from section
positive – north or east
negative – south or west

NSBg-3

GEOLOGICAL BRANCH
ASSESSMENT REPORT

20,041 Part 2 of 2

SCALE 1"=40'

40 0 40 80 120

FEET

LITHOLOGIES

QUATERNARY

21	Alluvium
20	Glacial drift, colluvium

INTRUSIVE ROCKS

TERTIARY

EOCENE AND YOUNGER

11	Lamprophyre, basalt dykes
10	Diorite, microdiorite

VOLCANIC AND SEDIMENTARY ROCKS

LOWER TO MIDDLE JURASSIC

TOARCIAN TO BAJOCIAN : SALMON RIVER FORMATION

8b	Siltstone, shale, and minor sandstone
8a	Basal fossiliferous wacke

TOARCIAN : PARTIAL EQUIVALENTS OF
MT GILMORTH / BETTY CREEK FORMATIONS

7k	Siliceous, pyritic, sericitic felsic pyroclastic rocks
7j	Pale green andesite ash tuff
7i	Maroon and green andesite lapilli tuff, ash tuff. Locally carbonaceous
7h	Grey and greenish grey andesite lapilli tuff. Commonly contains carbonate–chlorite (–sericite) altered andesite fragments in a strongly chloritic matrix. The base of this unit is locally comprised of finely laminated chloritic ash tuff
7g	Polylithic exhalitic breccia. A debris flow facies containing fragments of volcanics, chert, jasper, sulfates, carbonates, and sulfides in a chloritic or sericitic tuffaceous matrix
7f	Exhalite : Volcanic exhalative silica, sulfates, carbonates, sulfides, oxides, and native silver. Includes some debris flow facies with an exhalite matrix
7e	Green andesite shard tuff, includes some epiclastics
7d	Grey–green porphyritic andesite lapilli tuff, minor flows and flow breccia. Partly amygdaloidal, commonly trachytic.
7c	Black siltstone, argillite
7b	Maroon and green andesite lapilli tuff
7a	Maroon coarsely graded–bedded volcanic sandstone marker

SYN–VOLCANIC AND EXHALATIVE ALTERATION FACIES

Chst	Chlorite–pyrite–quartz–carbonate stockwork, most commonly a footwall stringer zone near exhalite horizons
Qrt.	Quartz–chalcedony–chlorite–carbonate–pyrite–chalcopyrite stockwork +– precious metals (Goldbelt Zone)
Chlbx	Hydrothermal breccia : altered rock fragments in a matrix of dark chlorite and pyrite. (Goldbelt Zone)
Kfp	Potassium feldspar, pervasive (Goldbelt Zone)
SQ	Sericite–pyrite pervasive alteration, with abundant quartz stringers (Goldbelt Zone)
S	Sericite–pyrite, pervasive. Occurs in Goldbelt Zone and also in hanging–wall and footwall of exhalite horizons

SINEMURIAN TO PLIENSBACHIAN(?) : UNUK RIVER FORMATION

4b	Green and maroon porphyritic andesite – probably massive flows, in part might be intrusive equivalent of 7d
4a	Green and maroon basaltic andesite ash tuff and lapilli tuff

UPPER TRIASSIC

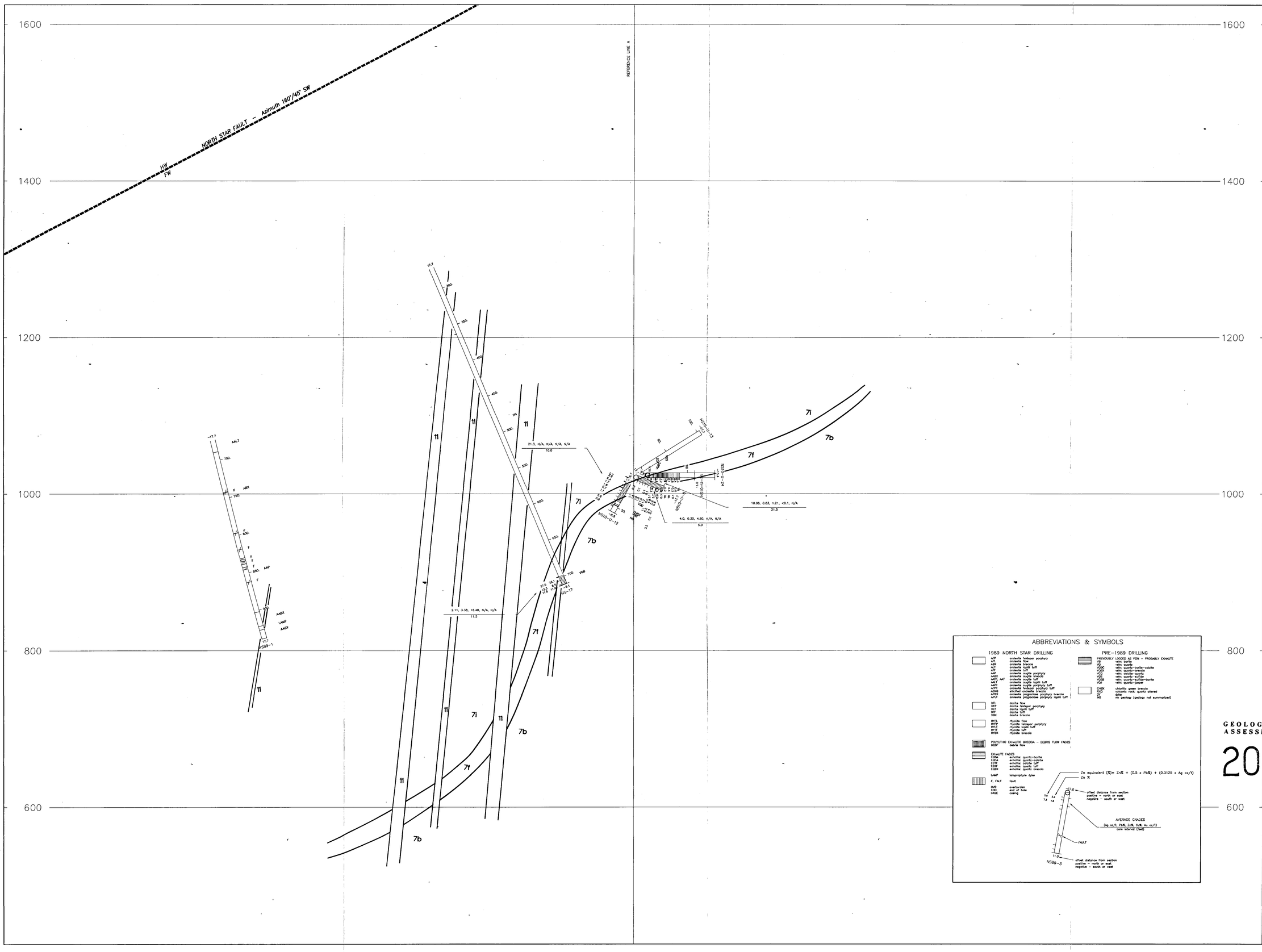
3b	Green and purple andesite breccia with minor siltstone, sandstone, and conglomerate
3a	Black siltstone

ABBREVIATIONS

ba	barite
cc	calcite
cp	chalcopyrite
gn	galena
hem	hematite
qz	quartz
sp	sphalerite
sc	sericite
py	pyrite
chl	chlorite

DOLLY VARDEN MINERALS INC.

Report by: TD/PJM/WM	DOLLY VARDEN PROJECT North Star Mine Cross Section C 6850 Looking NE
Date: January /90	
NTS: 103P/ 11–12	
Mining Division: Skeena	Tecucomp Geological Inc.
Ref. # SECC6850.DWG	Map: 22.



ABBREVIATIONS & SYMBOLS

1989 NORTH STAR DRILLING

APP	andesite feldspar porphyry
AFL	andesite flow
ABR	andesite breccia
ALT	andesite lapilli tuff
AAT	andesite ash tuff
AAP	andesite augite porphyry
AABR	andesite augite breccia
AAL, AAT	andesite augite flow
AALT	andesite augite lapilli tuff
AAPT	andesite augite porphyry tuff
AFPT	andesite feldspar porphyry tuff
ABRS	silicified andesite breccia
AFPB	andesite feldspar porphyry breccia
APLT	andesite plagioclase porphyry lapilli tuff
DFL	dacite flow
DFP	dacite feldspar porphyry
DLT	dacite lapilli tuff
DTF	dacite tuff
DBX	dacite breccia
RYFL	rhyolite flow
RYFP	rhyolite feldspar porphyry
RYLT	rhyolite lapilli tuff
RYTF	rhyolite tuff
RYBX	rhyolite breccia
POLYLITHIC EXHALITIC BRECCIA – DEBRIS FLOW FACIES	
HDBF	exalite flow
EXHALITE FACIES	
EQBA	exhalite: quartz–barite
EQCA	exhalite: quartz–calcite
ELTF	exhalite: calcite tuff
EQTF	exhalite: quartz tuff
EQBX	exhalite: quartz breccia
LAMP	lamprophyre dyke
F, FALT	fault
OVB	overburden
EOH	end of hole
CASE	casing

PRE–1989 DRILLING

PREVIOUSLY LOGGED AS VEIN – PROBABLY EXHALITE	
VB	vein: barite
VQ	vein: quartz
VQBC	vein: quartz–barite–calcite
VQBA	vein: quartz–barite
VCQ	vein: calcite–quartz
VQS	vein: quartz–sulfide
VQSB	vein: quartz–sulfide–barite
VQJ	vein: quartz–jasper
CHBX	chloritic green breccia
RKQ	volcanic rock: quartz altered
DYKE	dyke
NG	no geology (geology not summarized)

Zn equivalent (%)= Zn% + (0.5 x Pb%) + (0.3125 x Ag oz/t)

Zn %

offset distance from section
positive – north or east
negative – south or west

AVERAGE GRADES
(Ag oz/t, Pb%, Zn%, CuS, CuA, Au oz/t)
core interval (feet)

FAULT

NS89–3

offset distance from section
positive – north or east
negative – south or west

LITHOLOGIES

QUATERNARY

21	Alluvium
20	Glacial drift, colluvium

INTRUSIVE ROCKS

TERTIARY

EOCENE AND YOUNGER

11	Lamprophyre, basalt dykes
10	Diorite, microdiorite

VOLCANIC AND SEDIMENTARY ROCKS

LOWER TO MIDDLE JURASSIC

TOARCIAN TO BAJOCIAN : SALMON RIVER FORMATION

8b	Siltstone, shale, and minor sandstone
8a	Basal fossiliferous wacke

TOARCIAN : PARTIAL EQUIVALENTS OF MT DILWORTH / BETTY CREEK FORMATIONS

7k	Siliceous, pyritic, sericitic felsic pyroclastic rocks
7j	Pale green andesite ash tuff
7i	Maroon and green andesite lapilli tuff, ash tuff. Locally carbonaceous
7h	Grey and greenish grey andesite lapilli tuff. Commonly contains carbonate–chlorite (–sericite) altered andesite fragments in a strongly chloritic matrix. The base of this unit is locally comprised of finely laminated chloritic ash tuff
7g	Polylithic exhalitic breccia. A debris flow facies containing fragments of volcanics, chert, jasper, sulfates, carbonates, and sulfides in a chloritic or sericitic tuffaceous matrix
7f	Exhalite : Volcanic exhalative silica, sulfates, carbonates, sulfides, oxides, and native silver. Includes some debris flow facies with an exhalite matrix
7e	Green andesite shard tuff, includes some epiclastics
7d	Grey–green porphyritic andesite lapilli tuff, minor flows and flow breccia. Partly amygdaloidal, commonly trachytic.
7c	Black siltstone, argillite
7b	Maroon and green andesite lapilli tuff
7a	Maroon coarsely graded–bedded volcanic sandstone marker

SYN–VOLCANIC AND EXHALATIVE ALTERATION FACIES

Chst	Chlorite–pyrite–quartz–carbonate stockwork, most commonly a footwall stringer zone near exhalite horizons
Qst	Quartz–chalcedony–chlorite–carbonate–pyrite–chalcopyrite stockwork +– precious metals (Goldbelt Zone)
Chlbx	Hydrothermal breccia : altered rock fragments in a matrix of dark chlorite and pyrite. (Goldbelt Zone)
Kfp	Potassium feldspar, pervasive (Goldbelt Zone)
SQ	Sericite–pyrite pervasive alteration, with abundant quartz stringers (Goldbelt Zone)
S	Sericite–pyrite, pervasive. Occurs in Goldbelt Zone and also in hangingwall and footwall of exhalite horizons

SINEMURIAN TO PLIENSBACHIAN(?) : UNUK RIVER FORMATION

4b	Green and maroon porphyritic andesite – probably massive flows, in part might be intrusive equivalent of 7d
4a	Green and maroon basaltic andesite ash tuff and lapilli tuff

UPPER TRIASSIC

3b	Green and purple andesite breccia with minor siltstone, sandstone, and conglomerate
3a	Black siltstone

ABBREVIATIONS

ba	barite
ca	calcite
cp	chalcopyrite
gn	galena
hem	hematite
qz	quartz
sp	sphalerite
se	sericite
py	pyrite
chl	chlorite

GEOLOGICAL BRANCH
ASSESSMENT REPORT

20,041 Part 2 of 2

SCALE 1"=40'

40 0 40 80 120

FEET

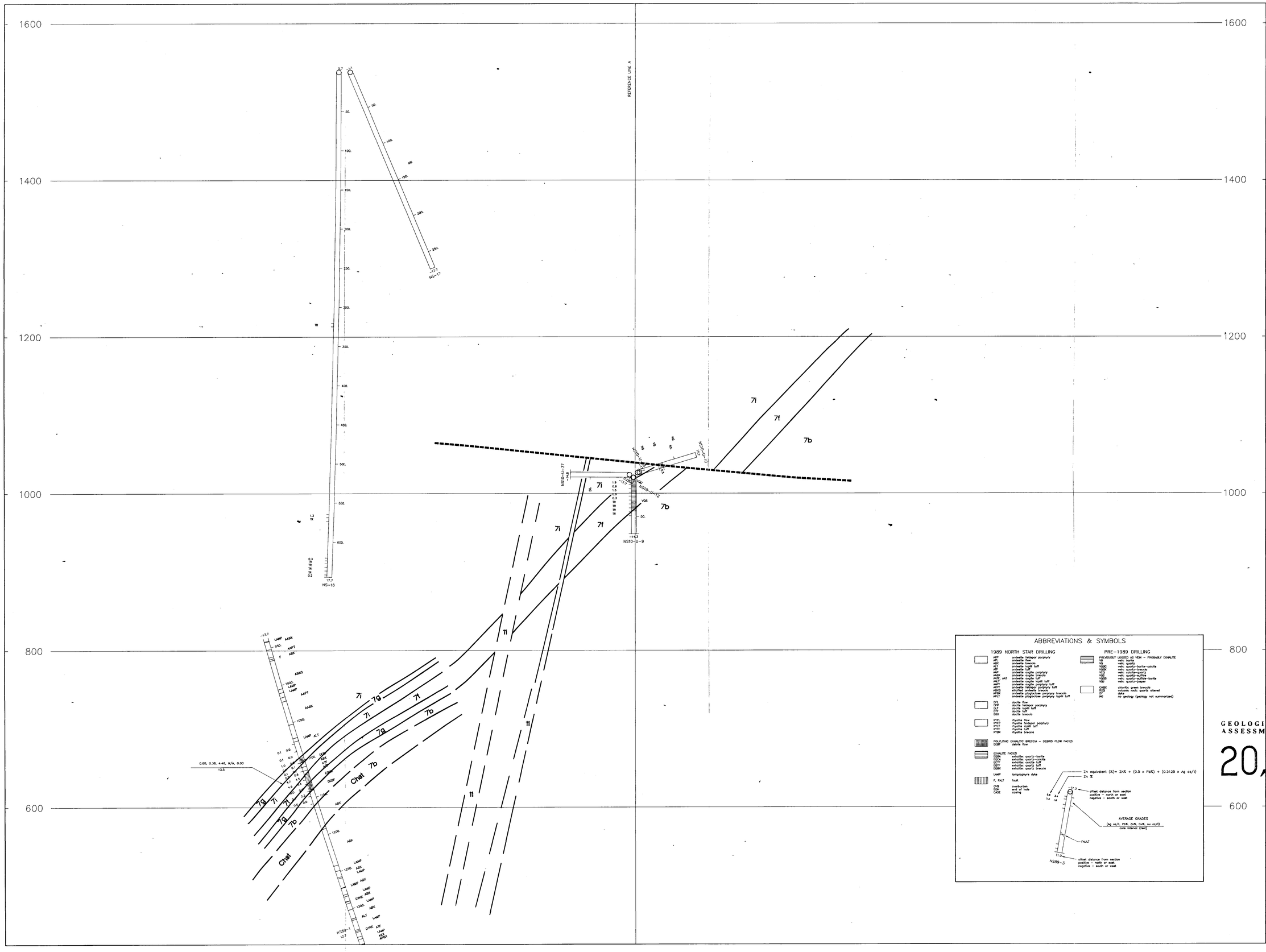
DOLLY VARDEN MINERALS INC.

Report by: TD/PJM/WM
Date: January /90
NTS: 103P/ 11–12
Mining Division: Skeena
Ref. # SECA6875.DWG

DOLLY VARDEN PROJECT
North Star Mine
Cross Section A 6875
Looking NE

Tecucomp Geological Inc.

Map: 23.



LITHOLOGIES

QUATERNARY

- 21 Alluvium
- 20 Glacial drift, colluvium

INTRUSIVE ROCKS

TERTIARY

EOCENE AND YOUNGER

- 11 Lamprophyre, basalt dykes
- 10 Diorite, microdiorite

VOLCANIC AND SEDIMENTARY ROCKS

LOWER TO MIDDLE JURASSIC

TOARCIAN TO BAJOCIAN : SALMON RIVER FORMATION

- 8b Siltstone, shale, and minor sandstone
- 8a Basal fossiliferous wacke

TOARCIAN : PARTIAL EQUIVALENTS OF MT DILWORTH / BETTY CREEK FORMATIONS

- 7k Siliceous, pyritic, sericitic felsic pyroclastic rocks
- 7j Pale green andesite ash tuff
- 7i Maroon and green andesite lapilli tuff, ash tuff. Locally carbonaceous
- 7h Grey and greenish grey andesite lapilli tuff. Commonly contains carbonate–chlorite (–sericite) altered andesite fragments in a strongly chloritic matrix. The base of this unit is locally comprised of finely laminated chloritic ash tuff
- 7g Polylithic exhalitic breccia. A debris flow facies containing fragments of volcanics, chert, jasper, sulfates, carbonates, and sulfides in a chloritic or sericitic tuffaceous matrix
- 7f Exhalite : Volcanic exhalative silica, sulfates, carbonates, sulfides, oxides, and native silver. Includes some debris flow facies with an exhalite matrix
- 7e Green andesite shard tuff, includes some epiclastics
- 7d Grey–green porphyritic andesite lapilli tuff, minor flows and flow breccia. Partly amygdaloidal, commonly trachytic.
- 7c Black siltstone, argillite
- 7b Maroon and green andesite lapilli tuff
- 7a Maroon coarsely graded–bedded volcanic sandstone marker

SYN–VOLCANIC AND EXHALATIVE ALTERATION FACIES

- Chat Chlorite–pyrite–quartz–carbonate stockwork, most commonly a footwall stringer zone near exhalite horizons
- Qzt Quartz–chalcedony–chlorite–carbonate–pyrite–chalcopyrite stockwork +– precious metals (Goldbelt Zone)
- ChBx Hydrothermal breccia : altered rock fragments in a matrix of dark chlorite and pyrite. (Goldbelt Zone)
- Kfp Potassium feldspar, pervasive (Goldbelt Zone)
- SQ Sericite–pyrite pervasive alteration, with abundant quartz stringers (Goldbelt Zone)
- S Sericite–pyrite, pervasive. Occurs in Goldbelt Zone and also in hangingwall and footwall of exhalite horizons

SINEMURIAN TO PLIENSBACHIAN(?) : UNUK RIVER FORMATION

- 4b Green and maroon porphyritic andesite – probably massive flows, in part might be intrusive equivalent of 7d
- 4a Green and maroon basaltic andesite ash tuff and lapilli tuff

UPPER TRIASSIC

- 3b Green and purple andesite breccia with minor siltstone, sandstone, and conglomerate
- 3a Black siltstone

ABBREVIATIONS

ba	barite
ca	calcite
cp	chalcopyrite
gn	galena
hem	hematite
qz	quartz
sp	sphalerite
sc	sericite
py	pyrite
chl	chlorite

ABBREVIATIONS & SYMBOLS

1989 NORTH STAR DRILLING

- AFP andesite feldspar porphyry
- ADL andesite lapilli
- ABX andesite breccia
- ALT andesite lapilli tuff
- AAT andesite tuff
- AAP andesite augite porphyry
- AABR andesite augite breccia
- AAT, AAX andesite augite tuff
- AALT andesite augite lapilli tuff
- AAPT andesite augite porphyry tuff
- AFPT andesite feldspar porphyry tuff
- ABRQ silicified andesite breccia
- APBX andesite plagioclase porphyry breccia
- APLT andesite plagioclase porphyry lapilli tuff

- DFL dacite flow
- DFP dacite feldspar porphyry
- DLT dacite lapilli tuff
- DT dacite tuff
- DBX dacite breccia

- RYFL rhyolite flow
- RYFP rhyolite feldspar porphyry
- RYLT rhyolite lapilli tuff
- RYTF rhyolite tuff
- RYBX rhyolite breccia

POLYLITHIC EXHALITIC BRECCIA – DEBRIS FLOW FACIES

- DEBF debris flow

EXHALITE FACIES

- EQBA exhalite quartz–barite
- EQCA exhalite quartz–calcite
- EQTF exhalite quartz tuff
- EQTT exhalite quartz tuff
- EQBX exhalite quartz breccia

- LAMP lamprophyre dyke

- F, FALT fault

- OVB overburden
- EOH end of hole
- CASE casing

PRE–1989 DRILLING

PREVIOUSLY LOGGED AS VEIN – PROBABLY EXHALITE

- VQ vein: quartz
- VQB vein: quartz–barite
- VQBC vein: quartz–barite–calcite
- VQBX vein: quartz–breccia
- VQS vein: calcite–quartz
- VQSC vein: quartz–calcite
- VQSB vein: quartz–sulfide–barite
- VQJ vein: quartz–jasper

- CHBX chloritic green breccia
- SXQ volcanic rock: quartz altered
- DY dyke
- NG no geology (geology not summarized)

Zn equivalent (%)= ZnX + (0.5 x PbX) + (0.3125 x Ag oz/t)

Zn %

offset distance from section
positive – north or east
negative – south or west

AVERAGE GRADES
(Ag oz/t, PbX, ZnX, CuX, Au oz/t)
core interval (feet)

FAULT

offset distance from section
positive – north or east
negative – south or west

GEOLOGICAL BRANCH
ASSESSMENT REPORT

20,041 Part 2 of 2

SCALE 1"=40'

40 0 40 80 120

FEET

DOLLY VARDEN MINERALS INC.

Report by: TD/PJW/WM	DOLLY VARDEN PROJECT North Star Mine
Date: January /90	Cross Section A 6900 Looking NE
NTS: 103P/ 11–12	
Mining Division Skeena	Tecucomp Geological Inc.
Ref. # SECA6900.DWG	Map: 24.

LITHOLOGIES

QUATERNARY

- 21 — Alluvium
- 20 — Glacial drift, colluvium

INTRUSIVE ROCKS

TERTIARY

EOCENE AND YOUNGER

- 11 — Lamprophyre, basalt dykes
- 10 — Diorite, microdiorite

VOLCANIC AND SEDIMENTARY ROCKS

LOWER TO MIDDLE JURASSIC

TOARCIAN TO BAJOCIAN : SALMON RIVER FORMATION

- 8b — Siltstone, shale, and minor sandstone
- 8a — Basal fossiliferous wacke

TOARCIAN : PARTIAL EQUIVALENTS OF MT DILWORTH / BETTY CREEK FORMATIONS

- 7k — Siliceous, pyritic, sericitic felsic pyroclastic rocks
- 7j — Pale green andesite ash tuff
- 7i — Maroon and green andesite lapilli tuff, ash tuff. Locally carbonaceous
- 7h — Grey and greenish grey andesite lapilli tuff. Commonly contains carbonate-chlorite (-sericite) altered andesite fragments in a strongly chloritic matrix. The base of this unit is locally comprised of finely laminated chloritic ash tuff
- 7g — Polylithic exhalitic breccia. A debris flow facies containing fragments of volcanics, chert, jasper, sulfates, carbonates, and sulfides in a chloritic or sericitic tuffaceous matrix
- 7f — Exhalite : Volcanic exhalative silica, sulfates, carbonates, sulfides, oxides, and native silver. Includes some debris flow facies with an exhalite matrix
- 7e — Green andesite shard tuff, includes some epiclastics
- 7d — Grey-green porphyritic andesite lapilli tuff, minor flows and flow breccia. Partly amygdaloidal, commonly trachytic.
- 7c — Black siltstone, argillite
- 7b — Maroon and green andesite lapilli tuff
- 7a — Maroon coarsely graded-bedded volcanic sandstone marker

SYN-VOLCANIC AND EXHALATIVE ALTERATION FACIES

- Chst — Chlorite-pyrite-quartz-carbonate stockwork, most commonly a footwall stringer zone near exhalite horizons
- Qst — Quartz-chalcedony-chlorite-carbonate-pyrite-chalcopyrite stockwork +- precious metals (Goldbelt Zone)
- CHBx — Hydrothermal breccia : altered rock fragments in a matrix of dark chlorite and pyrite. (Goldbelt Zone)
- Kfp — Potassium feldspar, pervasive (Goldbelt Zone)
- SQ — Sericite-pyrite pervasive alteration, with abundant quartz stringers (Goldbelt Zone)
- S — Sericite-pyrite, pervasive. Occurs in Goldbelt Zone and also in hangingwall and footwall of exhalite horizons

SINEMURIAN TO PLIENSBACHIAN(?) : UNUK RIVER FORMATION

- 4b — Green and maroon porphyritic andesite — probably massive flows, in part might be intrusive equivalent of 7d
- 4a — Green and maroon basaltic andesite ash tuff and lapilli tuff

UPPER TRIASSIC

- 3b — Green and purple andesite breccia with minor siltstone, sandstone, and conglomerate
- 3a — Black siltstone

ABBREVIATIONS

ba	barite
ca	calcite
cp	chalcopyrite
gn	galena
hem	hematite
qz	quartz
sp	sphalerite
sc	sericite
py	pyrite
chl	chlorite

ABBREVIATIONS & SYMBOLS

1989 NORTH STAR DRILLING

APP	andesite feldspar porphyry
AFL	andesite flow
ABX	andesite breccia
ALT	andesite lapilli tuff
ATF	andesite tuff
AHP	andesite augite porphyry
AABX	andesite augite breccia
AATF, AAT	andesite augite tuff
AALT	andesite augite lapilli tuff
AAPT	andesite augite porphyry tuff
APPT	andesite feldspar porphyry tuff
ABXB	altered andesite breccia
APBX	andesite plagioclase porphyry breccia
APLT	andesite plagioclase porphyry lapilli tuff
DFL	dacite flow
DFP	dacite feldspar porphyry
DLT	dacite lapilli tuff
DTF	dacite tuff
DBX	dacite breccia
RYFL	rhyolite flow
RYFP	rhyolite feldspar porphyry
RYLT	rhyolite lapilli tuff
RYTF	rhyolite tuff
RYBX	rhyolite breccia
POLYLITHIC EXHALITIC BRECCIA — DEBRIS FLOW FACIES	
DEBF	debris flow
EXHALITE FACIES	
EQBA	exhalite quartz-barite
EQCA	exhalite quartz-calcite
EQTF	exhalite calcite tuff
EQLT	exhalite calcite tuff
EQBX	exhalite quartz breccia
LAMP	lamprophyre dyke
F, FALT	fault
OVB	overburden
EOH	end of hole
CASE	casing

PRE-1989 DRILLING

PREVIOUSLY LOGGED AS VEIN — PROBABLY EXHALITE

VB	vein: barite
VQ	vein: quartz
VQBC	vein: quartz-barite-calcite
VQBA	vein: quartz-barite
VCQ	vein: calcite-quartz
VQS	vein: quartz-sulfide
VQSB	vein: quartz-sulfide-barite
VQJ	vein: quartz-jasper
CHBX	chloritic green breccia
RXQ	volcanic rock: quartz altered
DYKE	dyke
NG	no geology (geology not summarized)

Zn equivalent (%)= Zn% + (0.5 x Pb%) + (0.3125 x Ag oz/t)

Zn %

17.0 — offset distance from section positive — north or east negative — south or west

5.6 / 7.3 — 4.4 / 1.6

AVERAGE GRADES (Ag oz/t, Pb%, Zn%, Cu%, Au oz/t) / core interval (feet)

FALT

11.0 — offset distance from section positive — north or east negative — south or west

NSB9-3

GEOLOGICAL BRANCH
ASSESSMENT REPORT

20,041 Part 2 of 2

SCALE 1"=40'

40 0 40 80 120

FEET

DOLLY VARDEN MINERALS INC.

Report by: TD/PUM/WM

Date: January /90

NTS: 103P/ 11-12

Mining Division: Skeena

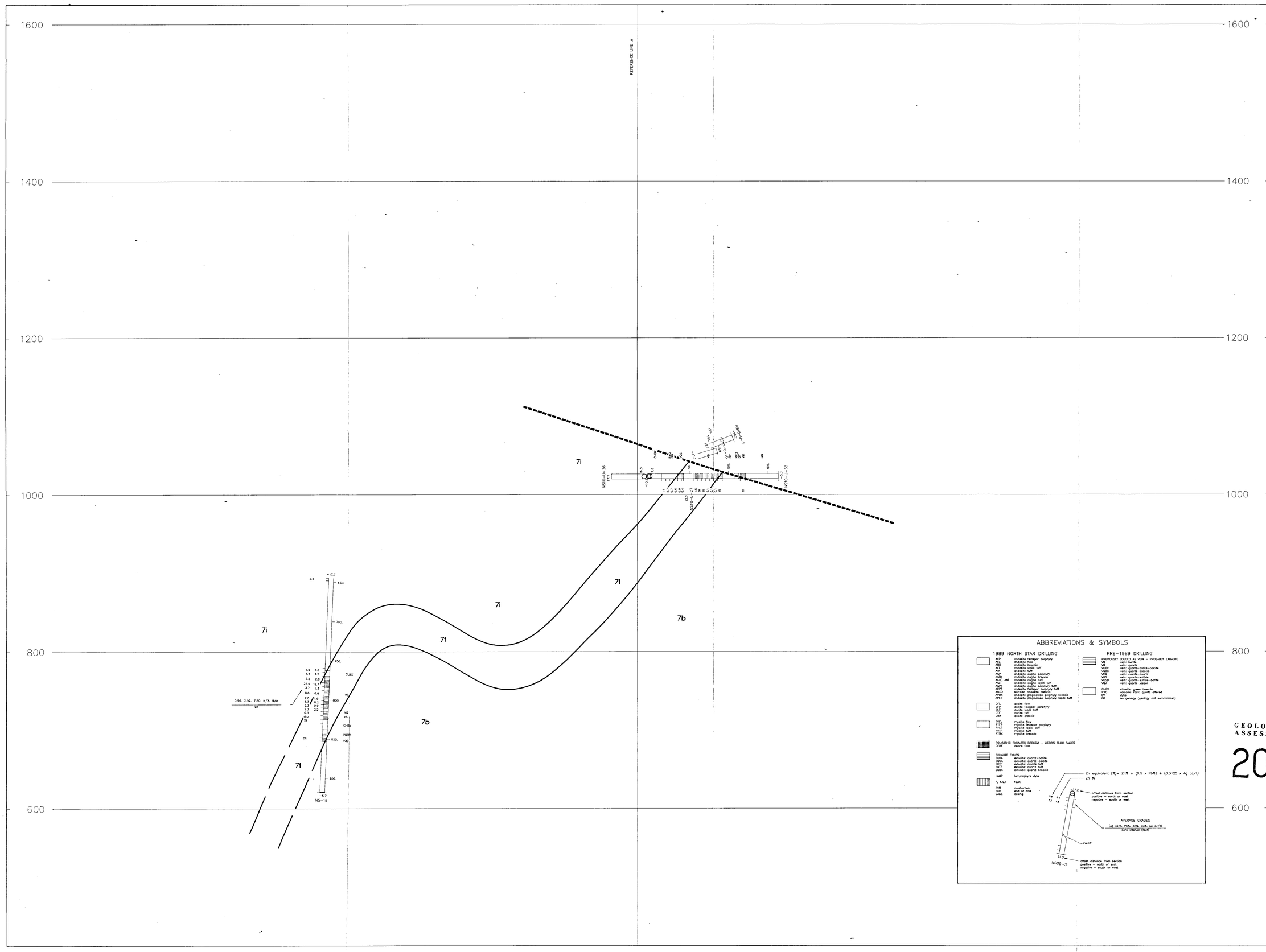
Ref. #: SECC6900.DWG

DOLLY VARDEN PROJECT
North Star Mine

Cross Section C 6900
Looking NE

Tecucomp Geological Inc.

Map: 25.



LITHOLOGIES

QUATERNARY

- 21 Alluvium
- 20 Glacial drift, colluvium

INTRUSIVE ROCKS

TERTIARY

EOCENE AND YOUNGER

- 11 Lamprophyre, basalt dykes
- 10 Diorite, microdiorite

VOLCANIC AND SEDIMENTARY ROCKS

LOWER TO MIDDLE JURASSIC

TOARCIAN TO BAJOCIAN : SALMON RIVER FORMATION

- 8b Siltstone, shale, and minor sandstone
- 8a Basal fossiliferous wacke

TOARCIAN : PARTIAL EQUIVALENTS OF MT DILWORTH / BETTY CREEK FORMATIONS

- 7k Siliceous, pyritic, sericitic felsic pyroclastic rocks
- 7j Pale green andesite ash tuff
- 7i Maroon and green andesite lapilli tuff, ash tuff. Locally carbonaceous
- 7h Grey and greenish grey andesite lapilli tuff. Commonly contains carbonate-chlorite (-sericite) altered andesite fragments in a strongly chloritic matrix. The base of this unit is locally comprised of finely laminated chloritic ash tuff
- 7g Polylithic exhalitic breccia. A debris flow facies containing fragments of volcanics, chert, jasper, sulfates, carbonates, and sulfides in a chloritic or sericitic tuffaceous matrix
- 7f Exhalite : Volcanic exhalative silica, sulfates, carbonates, sulfides, oxides, and native silver. Includes some debris flow facies with an exhalite matrix
- 7e Green andesite shard tuff, includes some epiclastics
- 7d Grey-green porphyritic andesite lapilli tuff, minor flows and flow breccia. Partly amygdaloidal, commonly trachytic.
- 7c Black siltstone, argillite
- 7b Maroon and green andesite lapilli tuff
- 7a Maroon coarsely graded-bedded volcanic sandstone marker

SYN-VOLCANIC AND EXHALATIVE ALTERATION FACIES

- Chst Chlorite-pyrite-quartz-carbonate stockwork, most commonly a footwall stringer zone near exhalite horizons
- Qst Quartz-chalcedony-chlorite-carbonate-pyrite-chalcopyrite stockwork +- precious metals (Goldbelt Zone)
- ChBx Hydrothermal breccia : altered rock fragments in a matrix of dark chlorite and pyrite. (Goldbelt Zone)
- Kfp Potassium feldspar, pervasive (Goldbelt Zone)
- SQ Sericite-pyrite pervasive alteration, with abundant quartz stringers (Goldbelt Zone)
- S Sericite-pyrite, pervasive. Occurs in Goldbelt Zone and also in hangingwall and footwall of exhalite horizons

SINEMURIAN TO PLIENSBACHIAN(?) : UNUK RIVER FORMATION

- 4b Green and maroon porphyritic andesite - probably massive flows, in part might be intrusive equivalent of 7d
- 4a Green and maroon basaltic andesite ash tuff and lapilli tuff

UPPER TRIASSIC

- 3b Green and purple andesite breccia with minor siltstone, sandstone, and conglomerate
- 3a Black siltstone

ABBREVIATIONS

ba	barite
ca	calcite
cp	chalcopyrite
gn	galena
hem	hematite
qz	quartz
sp	sphalerite
sc	sericite
py	pyrite
chl	chlorite

GEOLOGICAL BRANCH
ASSESSMENT REPORT

20,041 Part 2 of 2

SCALE 1"=40'

40 0 40 80 120

FEET

DOLLY VARDEN MINERALS INC.

Report by: TD/PJM/WM
Date: January /90
NTS: 103P/ 11-12
Mining Division: Skeena
Ref. # SECA6925.DWG

DOLLY VARDEN PROJECT
North Star Mine
Cross Section A 6925
Looking NE

Tecucomp Geological Inc.

Map 26.