60001937

Mining District File Summary Sheet

DISTRICT	Rosebud
DIST_NO	4010
COUNTY If different from written on document	Pershing
TITLE If not obvious	Presentation about Rosebud
AUTHOR	Lassiter P; Allen K
DATE OF DOC(S)	1999
MULTI_DIST Y / (N?) Additional Dist_Nos:	
QUAD_NAME	Sulphur 7½'
P_M_C_NAME (mine, claim & company names)	Rosebud Mine; Rosebud Project; ASARCO; LAC Minerals (USA) Inc; Equinox Resources; Hecla Mining Co; South Zone; East Zone; North Zone; Far East Zone; Hecla-Santa Fe Joint Venture; Northwest Corridor Valley; Dogerstrom; Brown Palace; White Alps; Lucky Boy; Dreamland; East Dreamland; Gold Hill; Motherlode Cave Fault; North Dixie
COMMODITY If not obvious	gold; silver
NOTES	Geology; production; resources; reserves; cross sections; geologic map; statistics handwritten notes; about half is on mylars for overhead projection. 124 p.

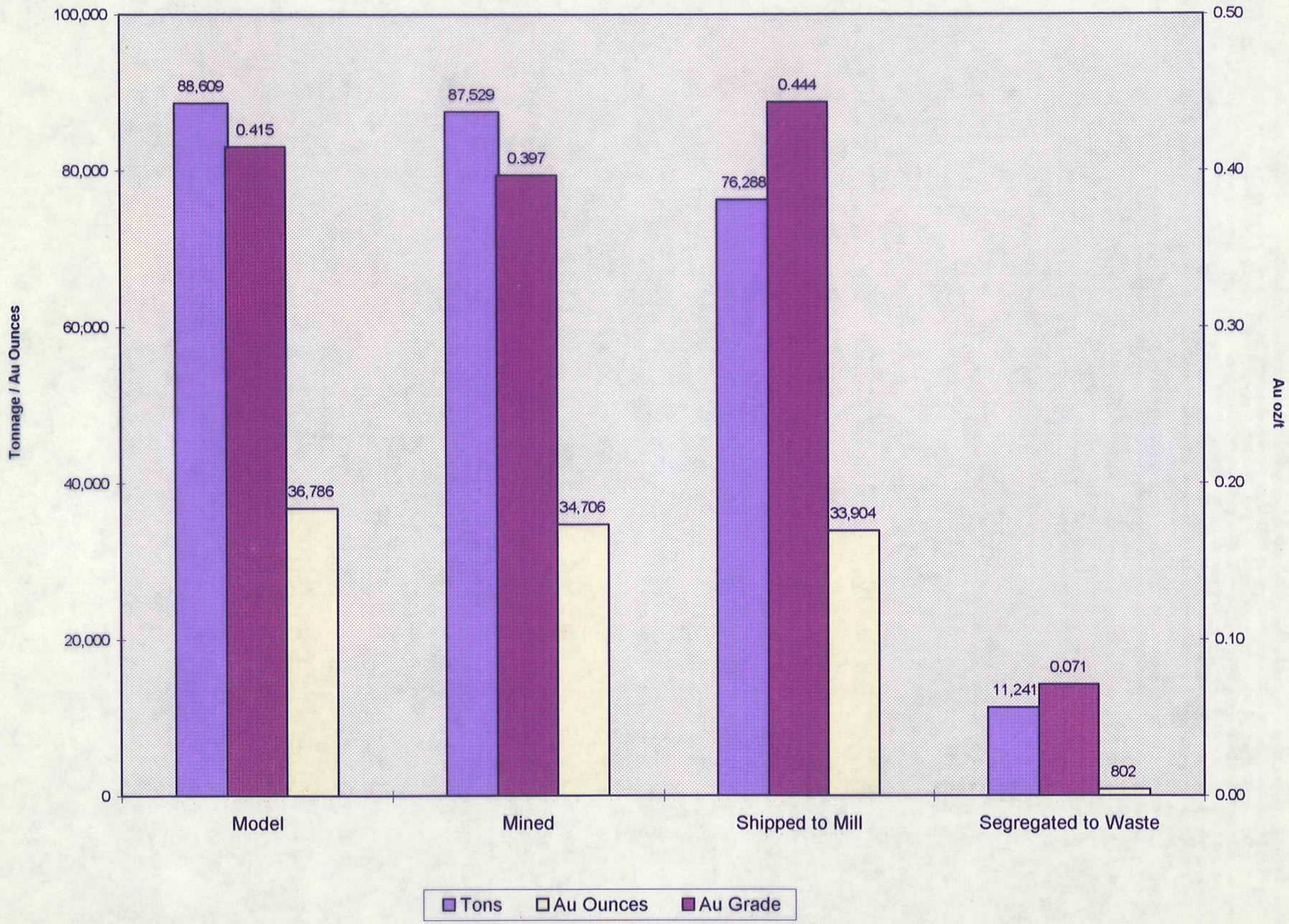
Keep docs at about 250 pages if no oversized maps attached
(for every 1 oversized page (>11x17) with text reduce
the amount of pages by ~25)

SS: DP 9/11/08
Initials Date

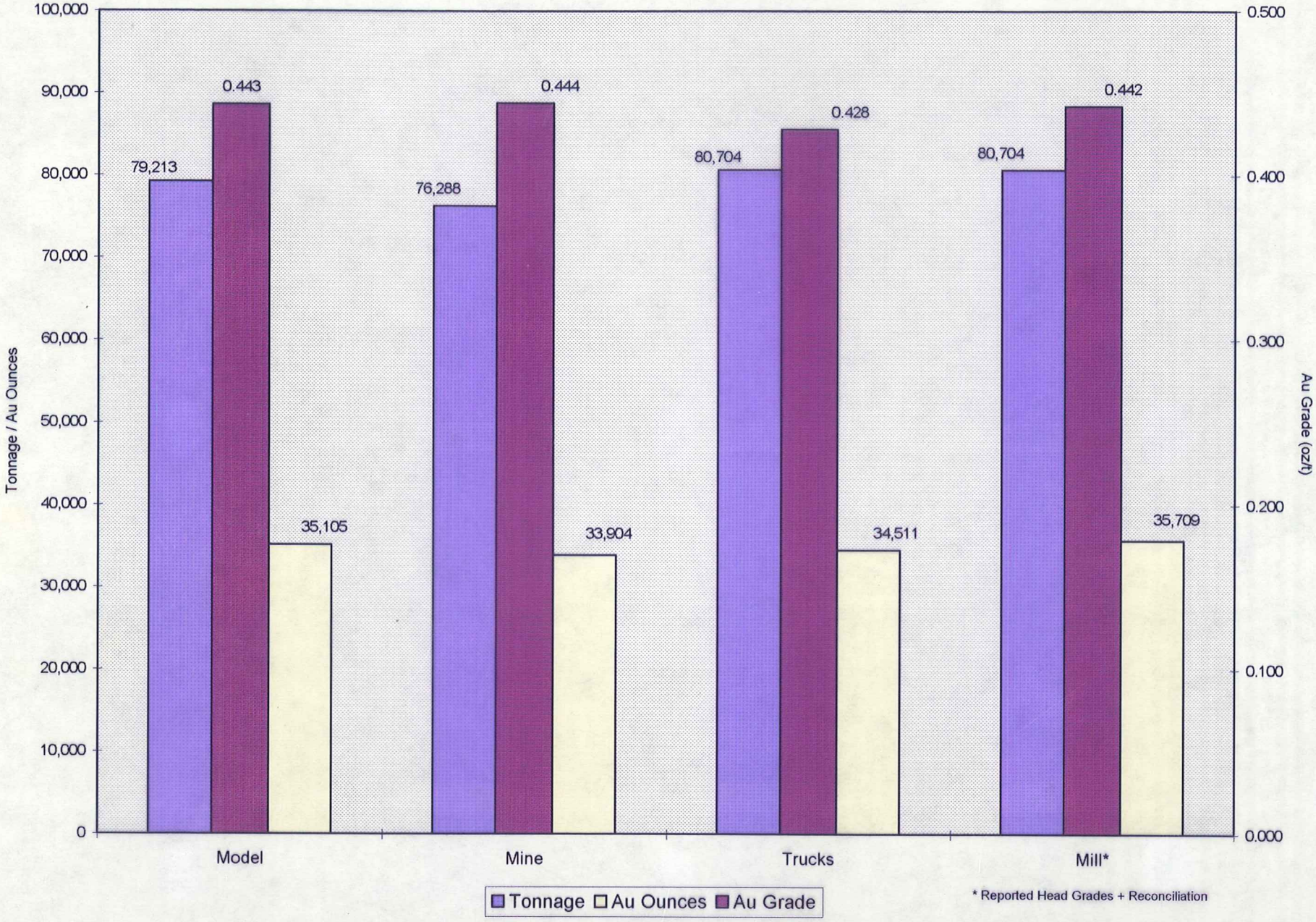
DB: _____
Initials Date

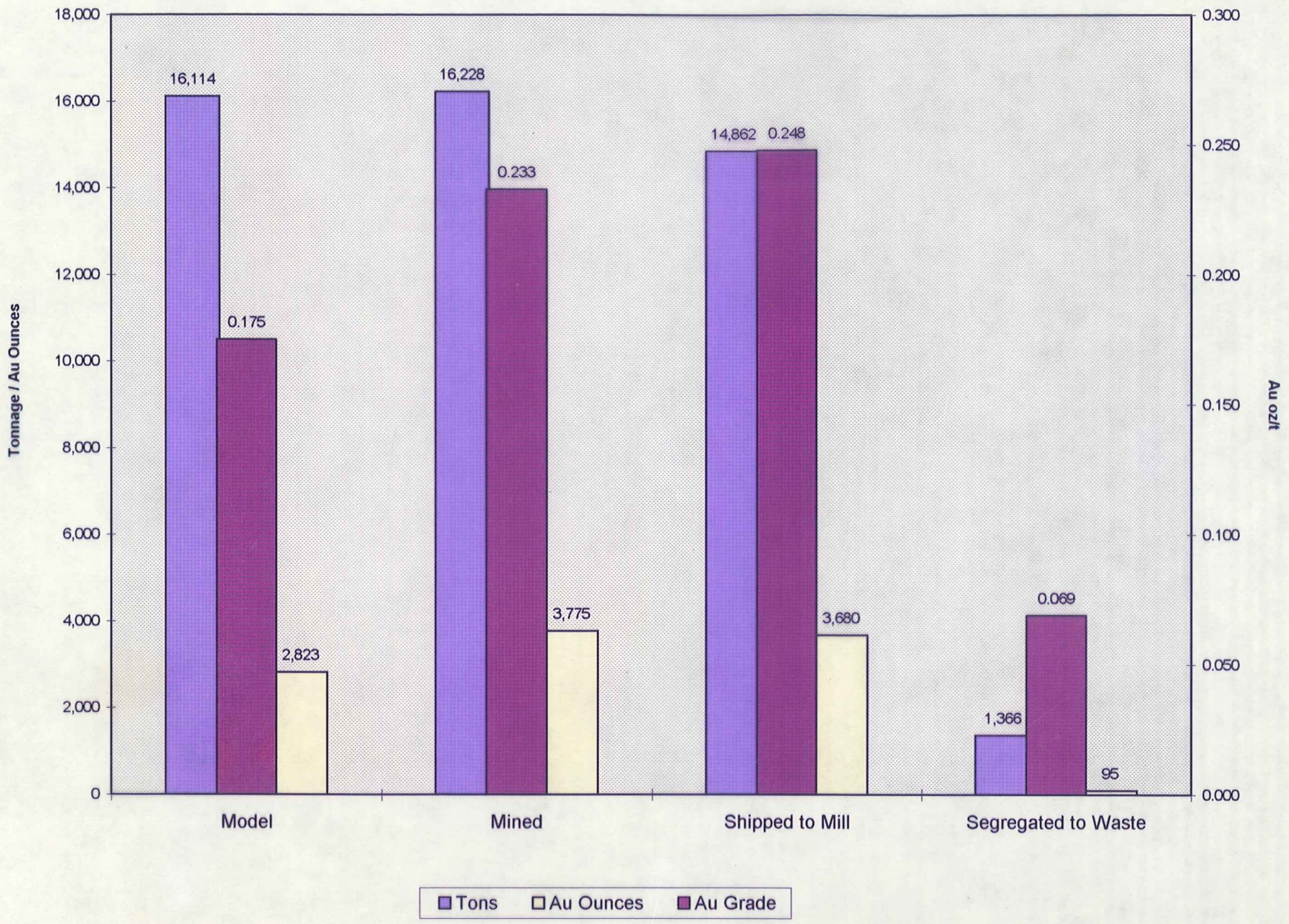
SCANNED: _____
Initials Date

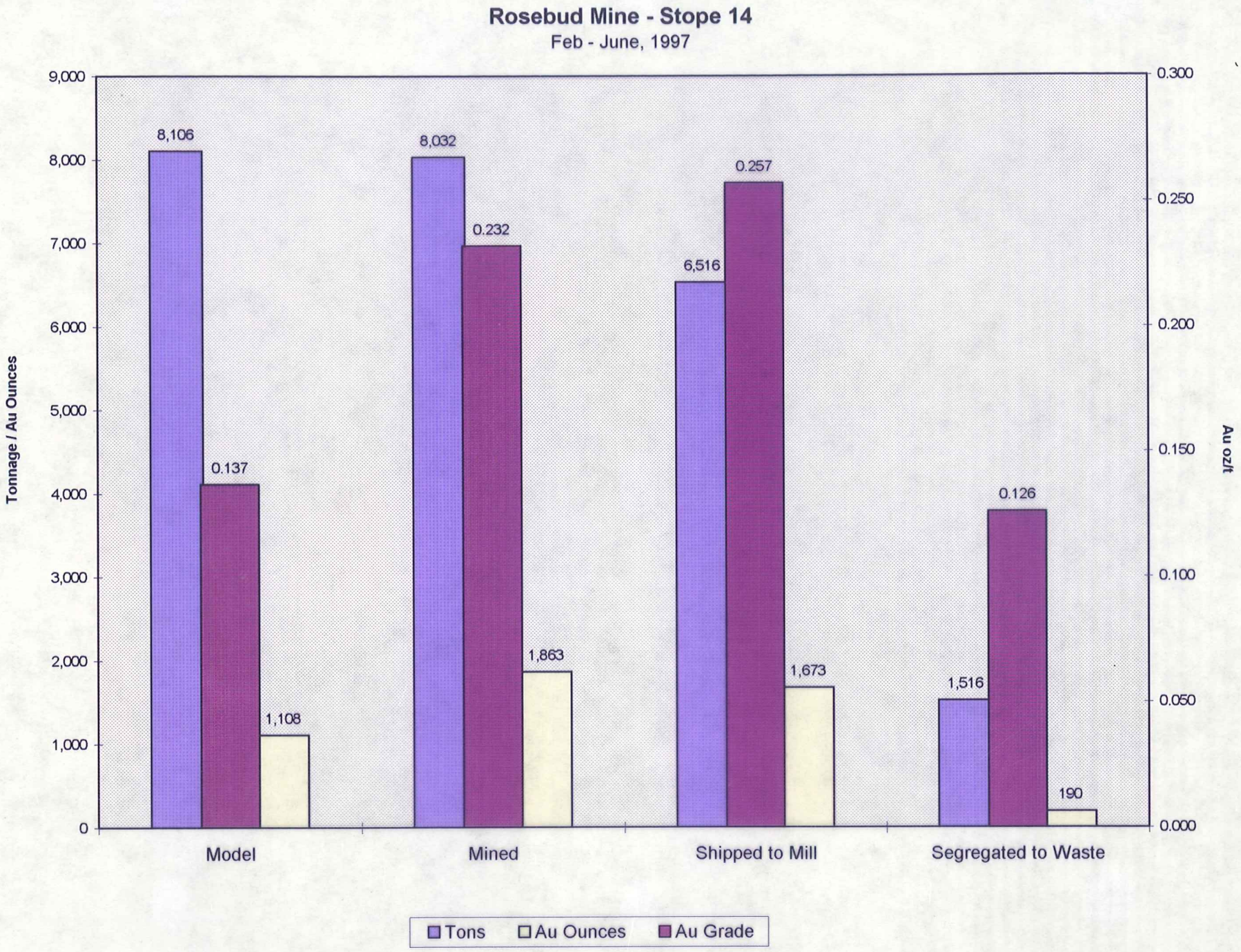
Revised: 1/22/08

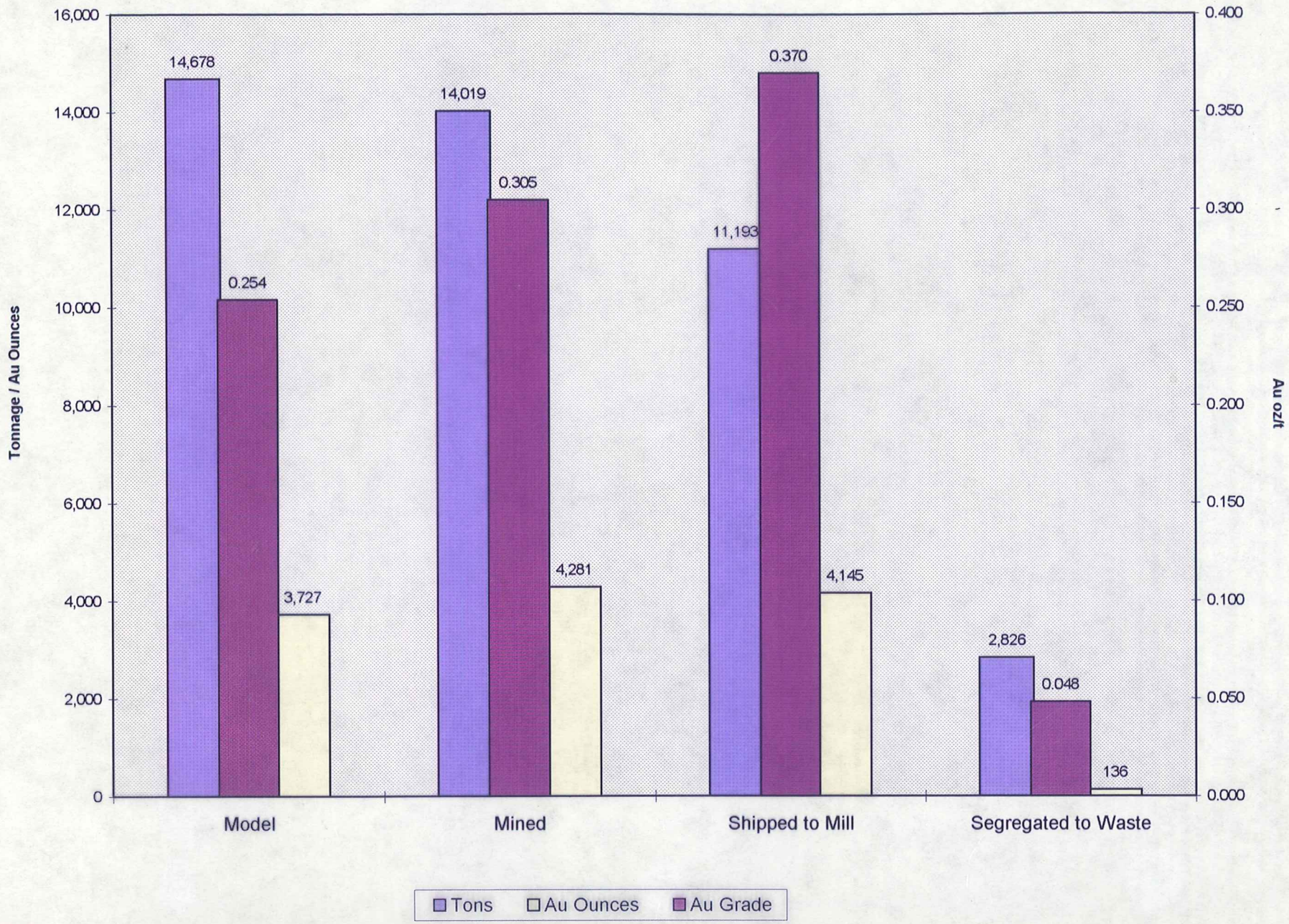

Rosebud Mine Production
Feb - June, 1997
Tonnage / Au Ounces
Au oz/t
100,000
80,000
60,000
40,000
20,000
0
0.50
0.40
0.30
0.20
0.10
0.00
88,609
0.415
36,786
87,529
0.397
34,706
76,288
0.444
33,904
11,241
0.071
802
Model
Mined
Shipped to Mill
Segregated to Waste
Tons
Au Ounces
Au Grade

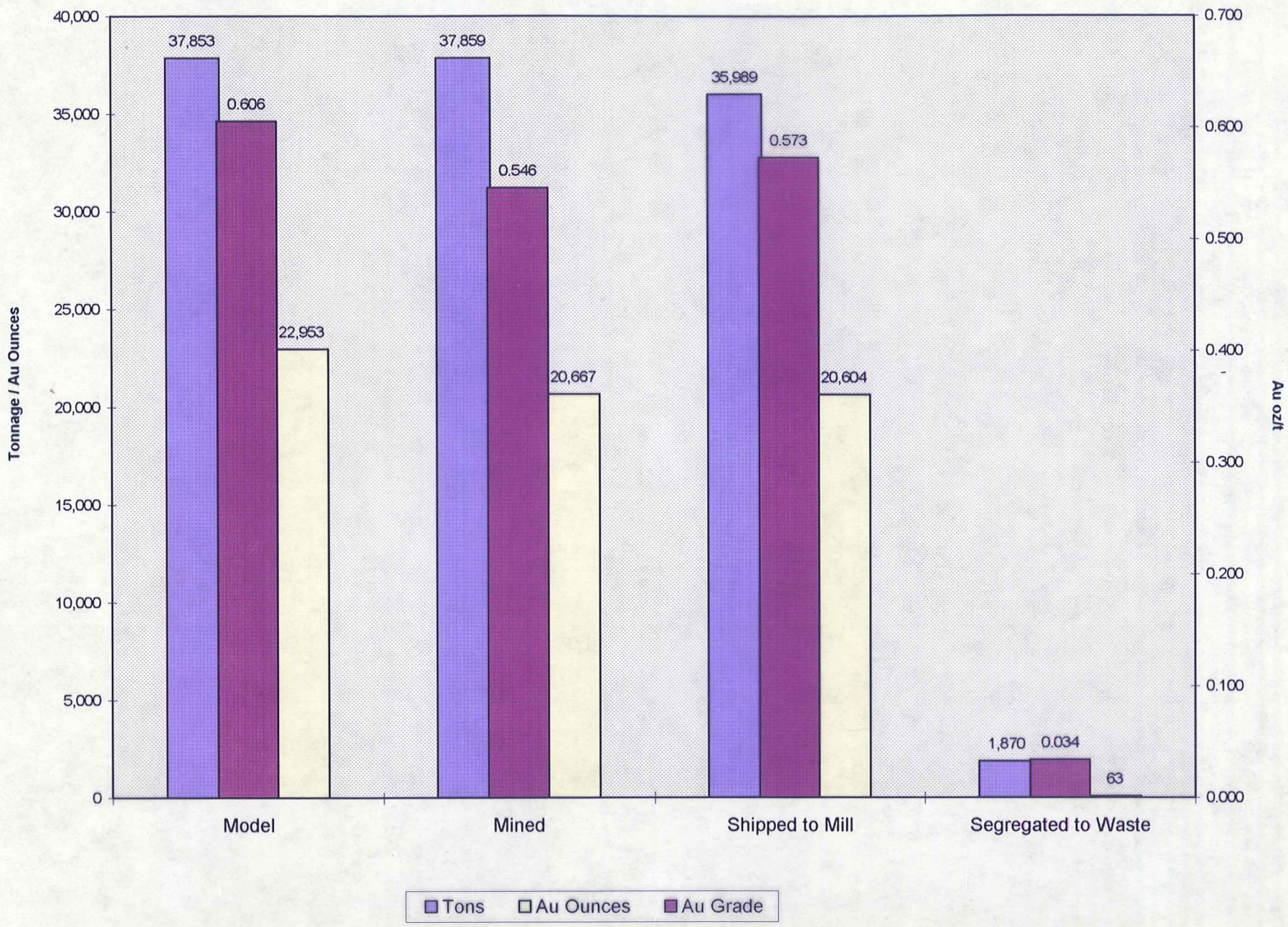
Rosebud Mine
February thru June, 1997 Production
Model vs. Mine vs. Trucks vs. Mill




Rosebud Mine - Stope 13
Feb - June, 1997
Tonnage / Au Ounces
Au oz/t
18,000
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
0.300
0.250
0.200
0.150
0.100
0.050
0.000
16,114
0.175
2,823
16,228
0.233
3,775
14,862
0.248
3,680
1,366
0.069
95
Model
Mined
Shipped to Mill
Segregated to Waste
Tons
Au Ounces
Au Grade

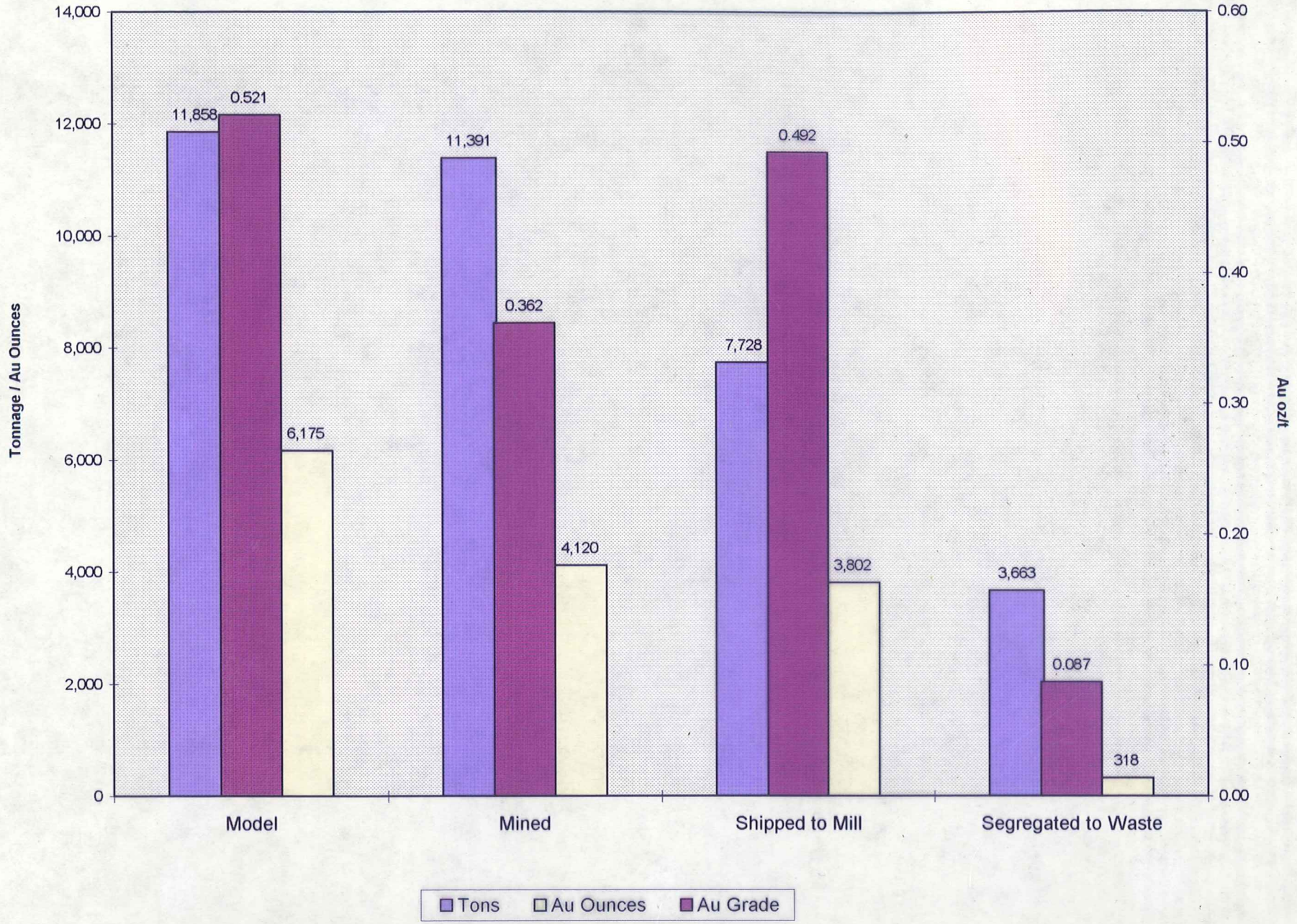

Rosebud Mine - Stope 14
Feb - June, 1997
Tonnage / Au Ounces
Au oz/t
9,000
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
0.300
0.250
0.200
0.150
0.100
0.050
0.000
8,106
0.137
1,108
8,032
0.232
1,863
6,516
0.257
1,673
1,516
0.126
190
Model
Mined
Shipped to Mill
Segregated to Waste
Tons
Au Ounces
Au Grade


Rosebud Mine - Stope 21
Feb - June, 1997
Tonnage / Au Ounces
Au oz/t
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
0.400
0.350
0.300
0.250
0.200
0.150
0.100
0.050
0.000
14,678
0.254
3,727
14,019
0.305
4,281
11,193
0.370
4,145
2,826
0.048
136
Model
Mined
Shipped to Mill
Segregated to Waste
Tons
Au Ounces
Au Grade

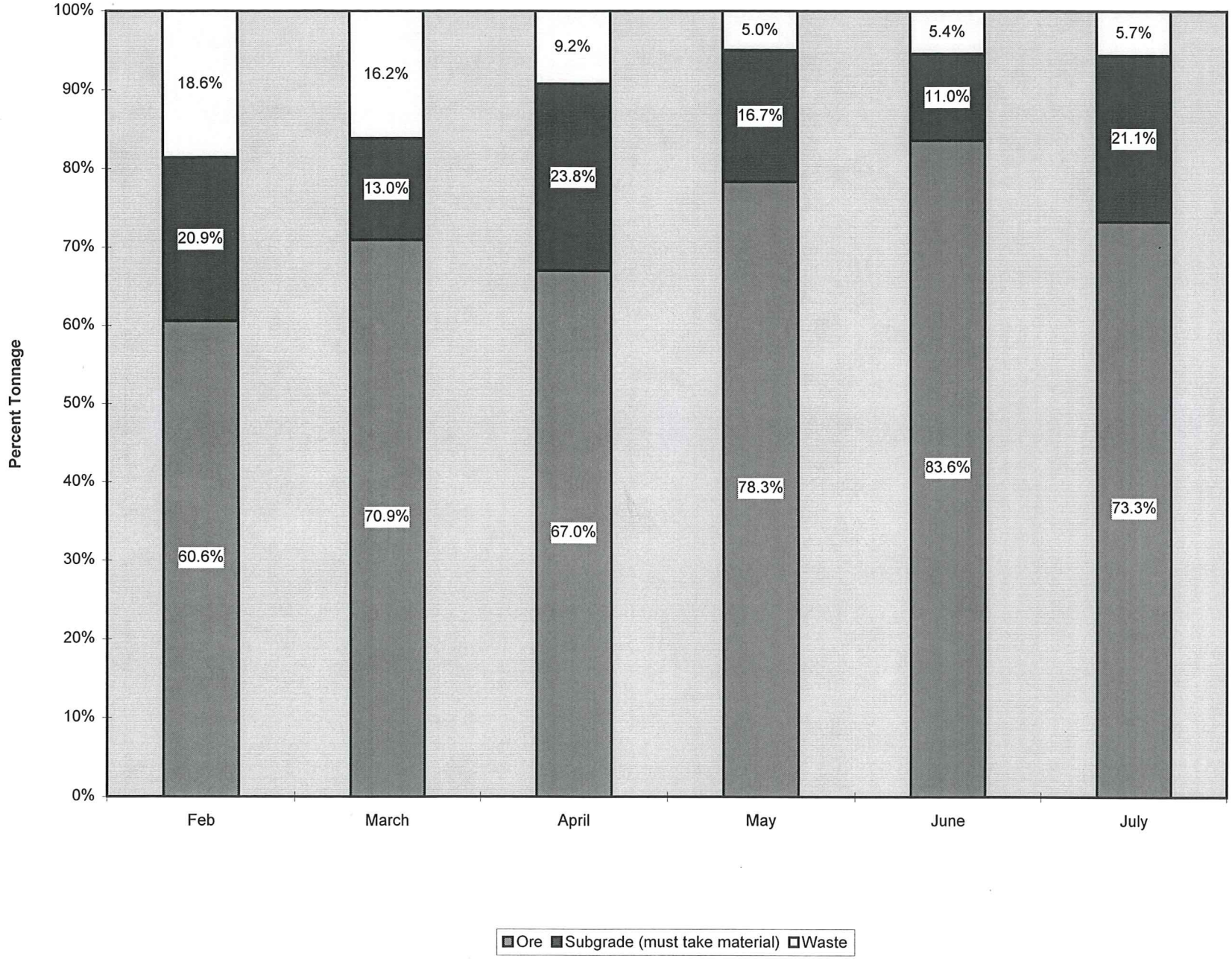

Rosebud Mine - Stope 22
Feb - June, 1997
Tonnage / Au Ounces
Au oz/t
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
0.700
0.600
0.500
0.400
0.300
0.200
0.100
0.000
37,853
0.606
22,953
37,859
0.546
20,667
35,989
0.573
20,604
1,870
0.034
63
Model
Mined
Shipped to Mill
Segregated to Waste
Tons
Au Ounces
Au Grade

Rosebud Mine - Stope 23

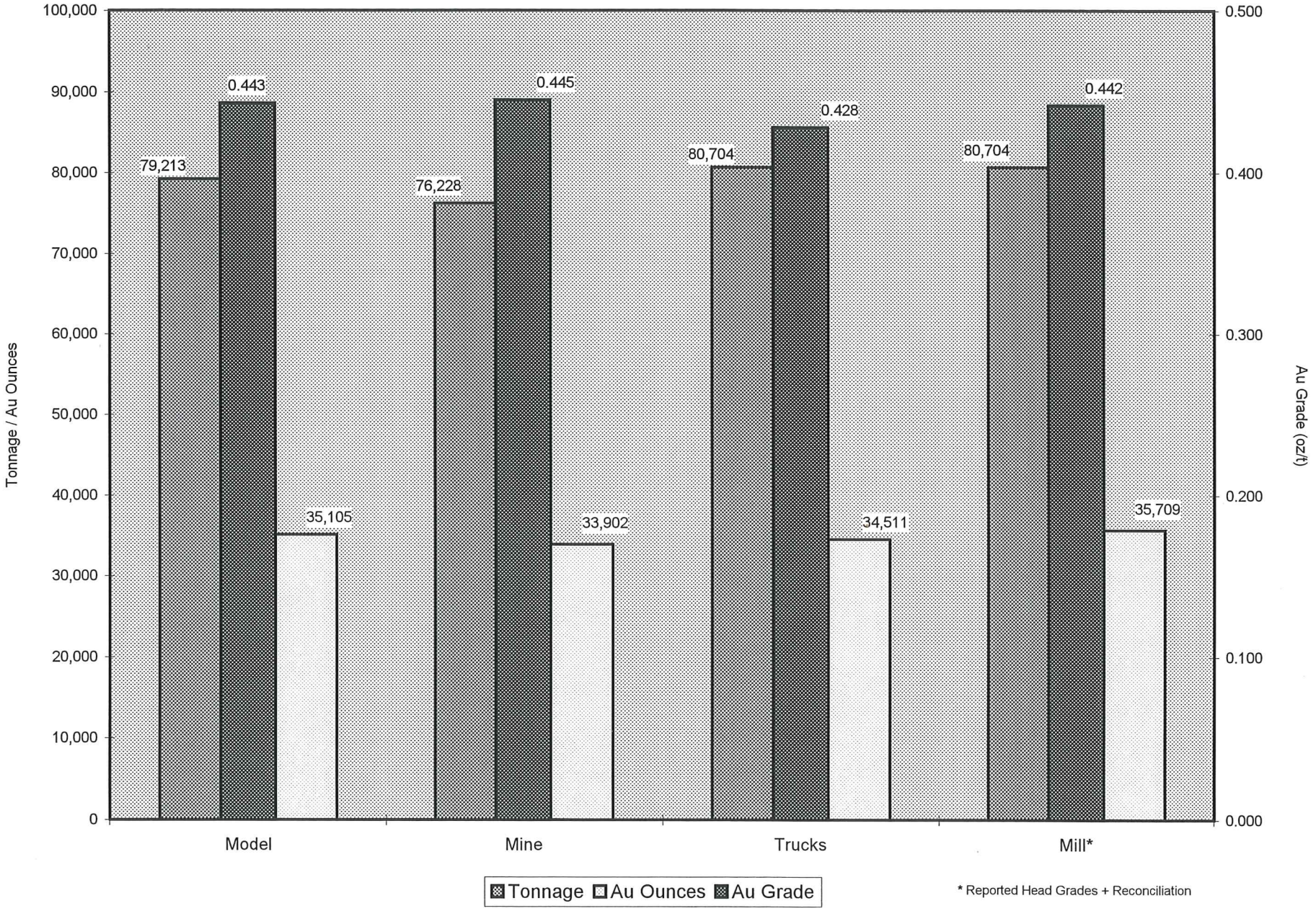
Feb - June, 1997



Rosebud Mine
Material Reporting to Ore Stockpiles



Rosebud Mine
February thru June, 1997 Production
Model vs. Mine vs. Trucks vs. Mill



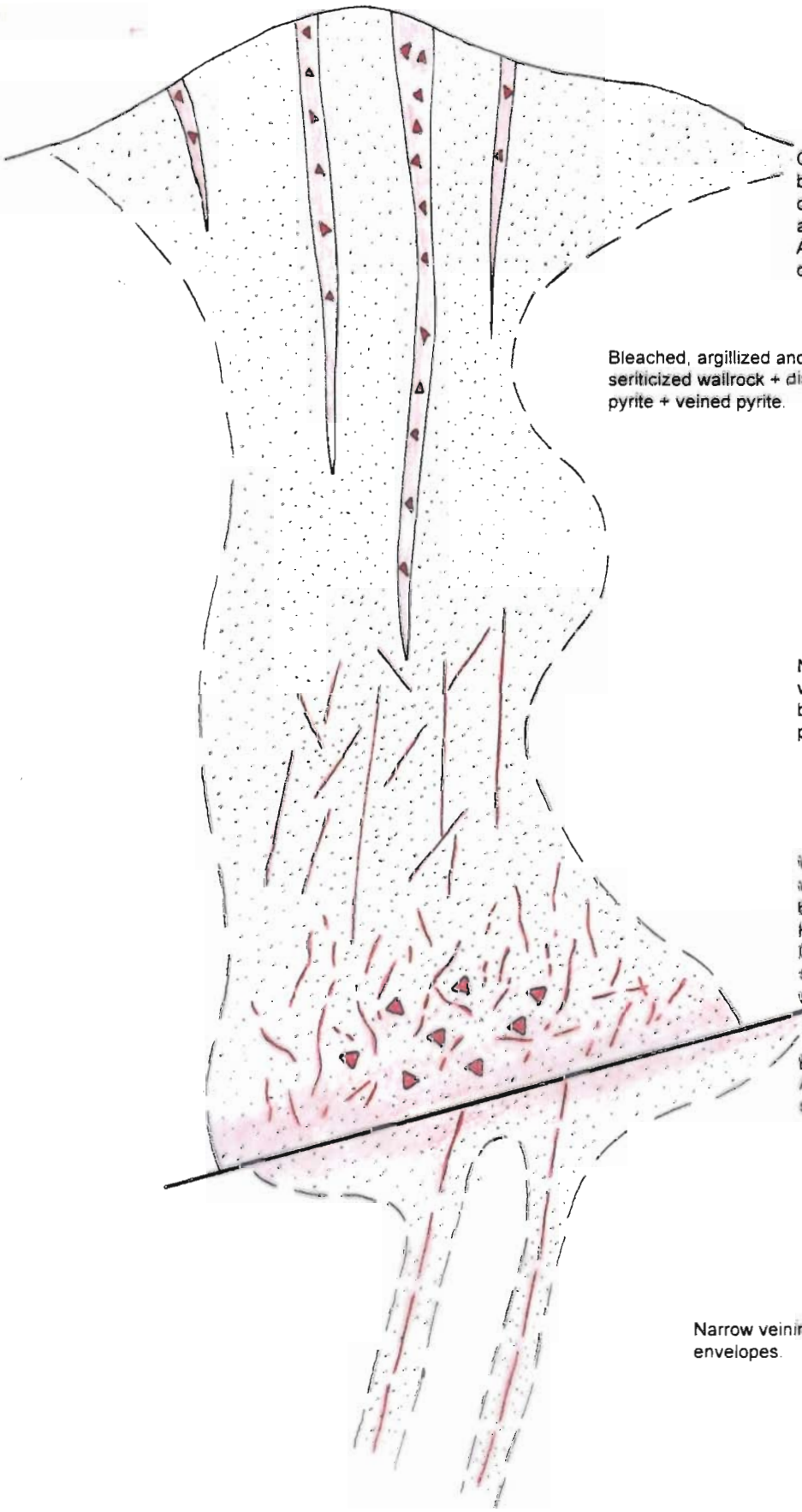
* Reported Head Grades + Reconciliation

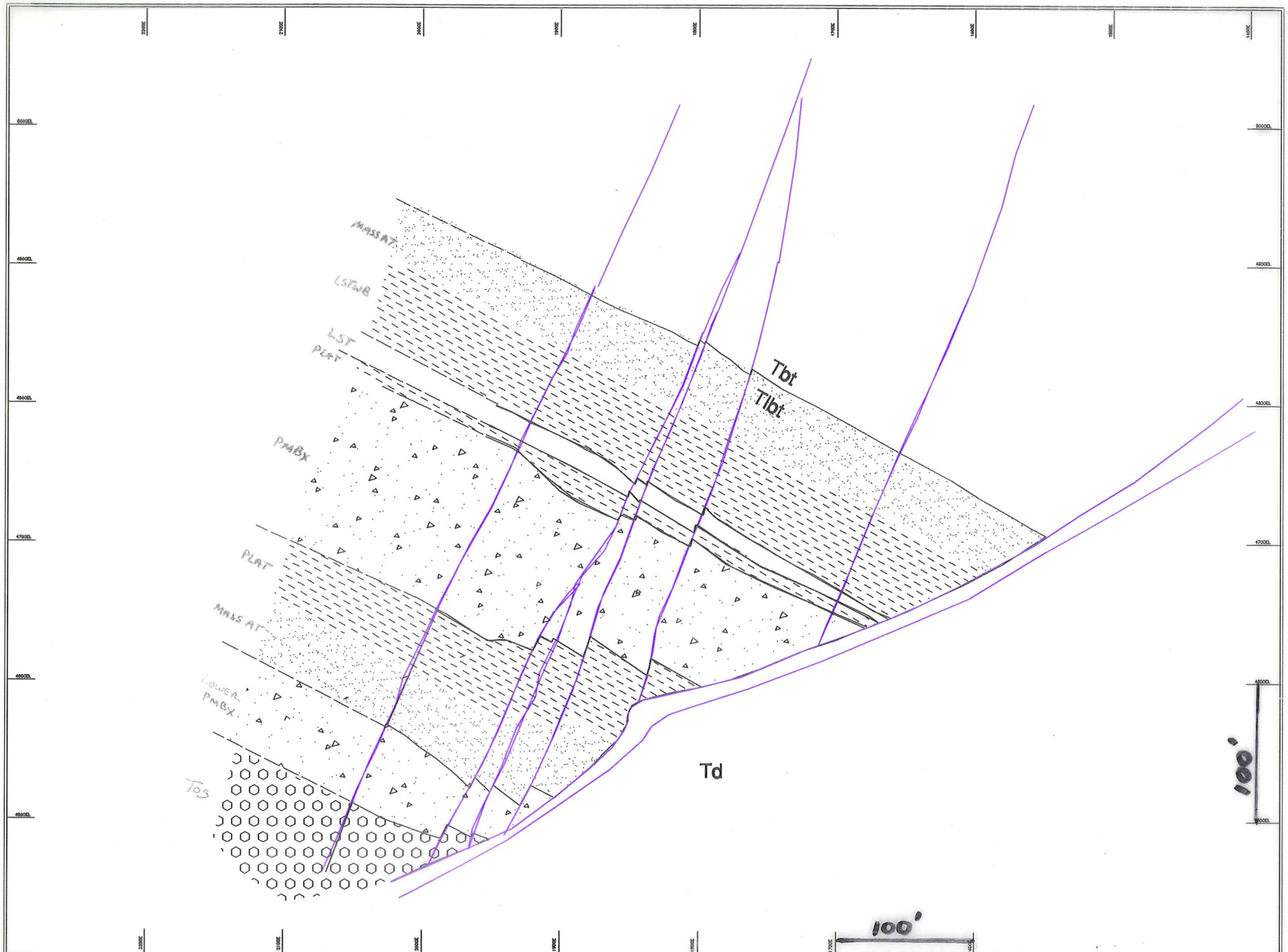
JULY UPDATE

Model vs. Mine Comparison - February thru July, 1997

All Stopes	Model			Mine			Difference Mined vs. Model			% Difference Mined vs. Model		
	Tons	Au Grade	Au Ounces	Tons	Au Grade	Au Ounces	Tons	Au Grade	Au Ounces	Tons	Au Grade	Au Ounces
Feb - July	102,617	0.452	46,404	98,817	0.459	45,330	-3,800	0.007	-1,074	-3.7%	1.4%	-2.3%

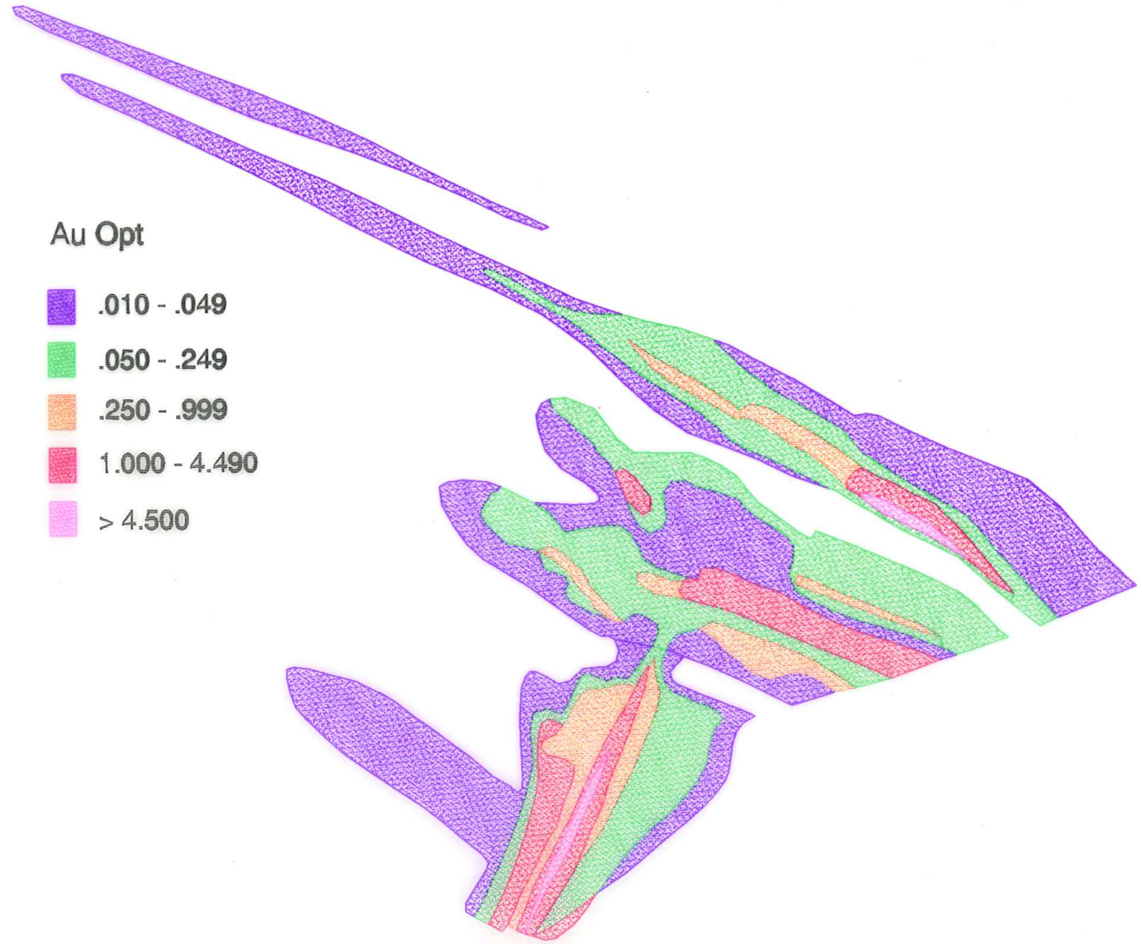
ROSEBUD DISTRICT EPITHERMAL SYSTEM SCHEMATIC MODEL




MASS AT.
LSTWB
LST
PLAT
PMBX
PLAT
MASS AT.
LOWER
PMBX
TOS
Tbt
Tlbt
Td
100'
100'

HECLA MINING COMPANY - ROSEBUD PROJECT

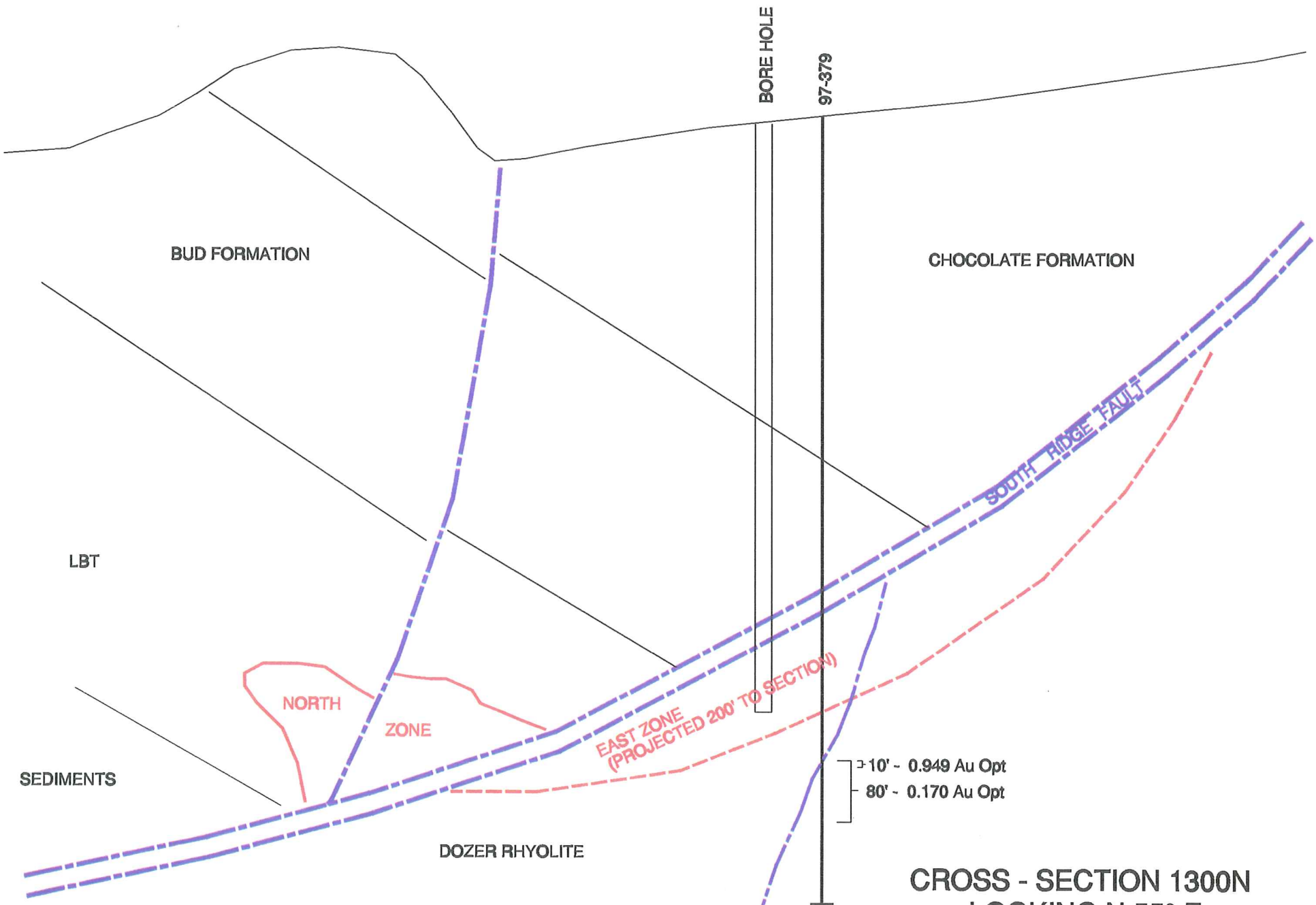
Au DOMAIN BOUNDARY SECTION 800N



JULY UPDATE

Model vs. Mine Comparison - February thru July, 1997

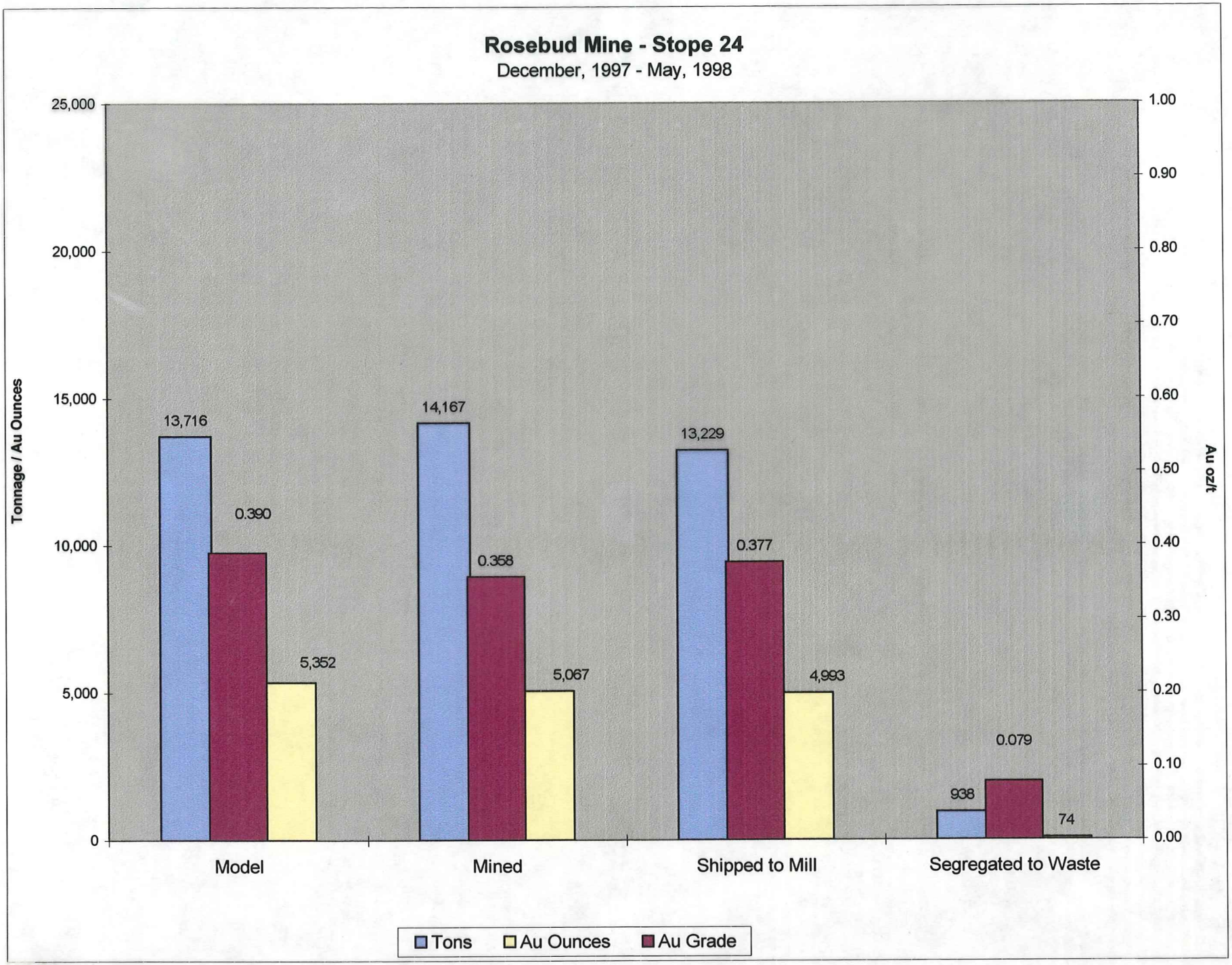
All Stopes	Model			Mine			Difference Mined vs. Model			% Difference Mined vs. Model		
	Tons	Au Grade	Au Ounces	Tons	Au Grade	Au Ounces	Tons	Au Grade	Au Ounces	Tons	Au Grade	Au Ounces
Feb - July	102,617	0.452	46,404	98,817	0.459	45,330	-3,800	0.007	-1,074	-3.7%	1.4%	-2.3%

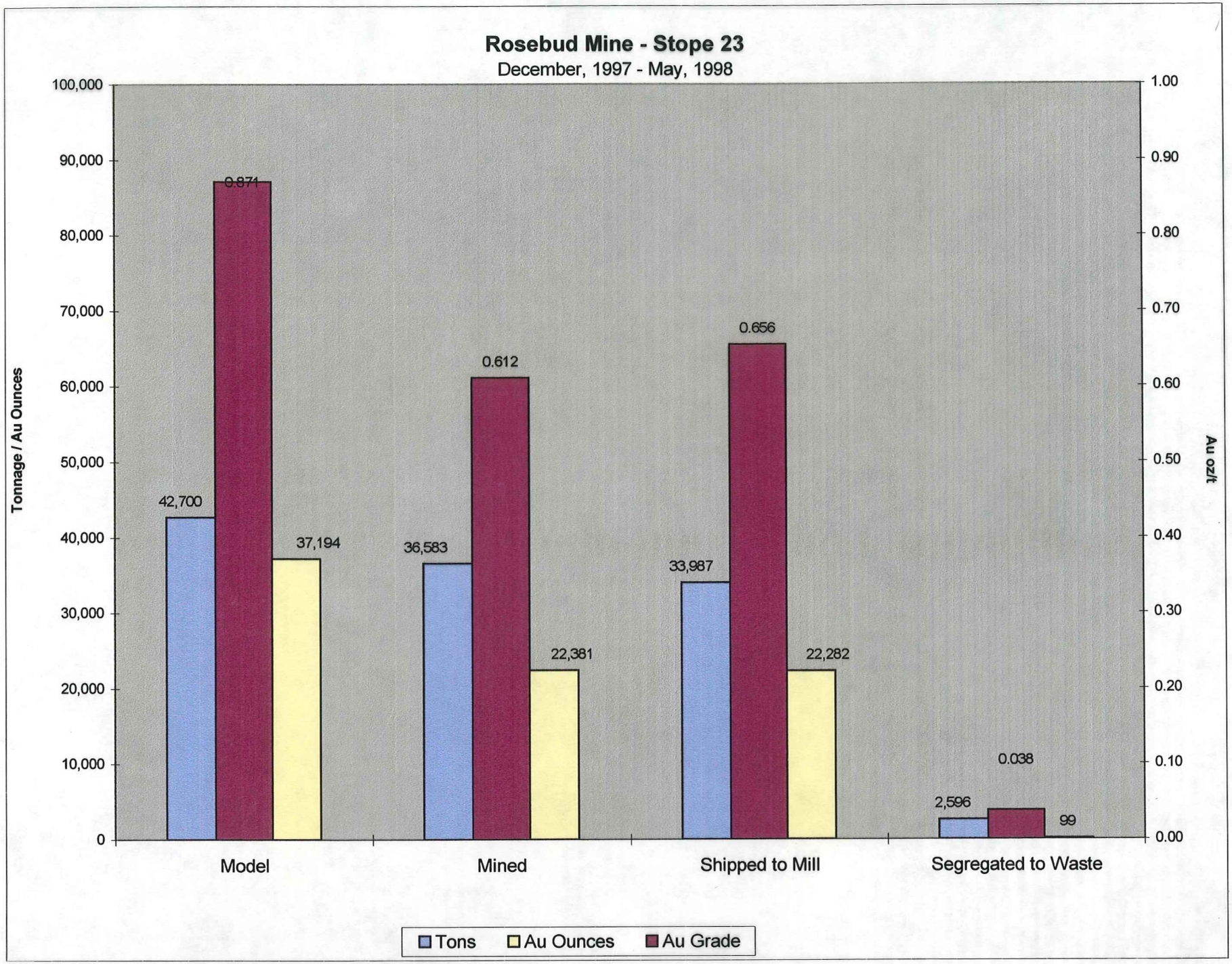


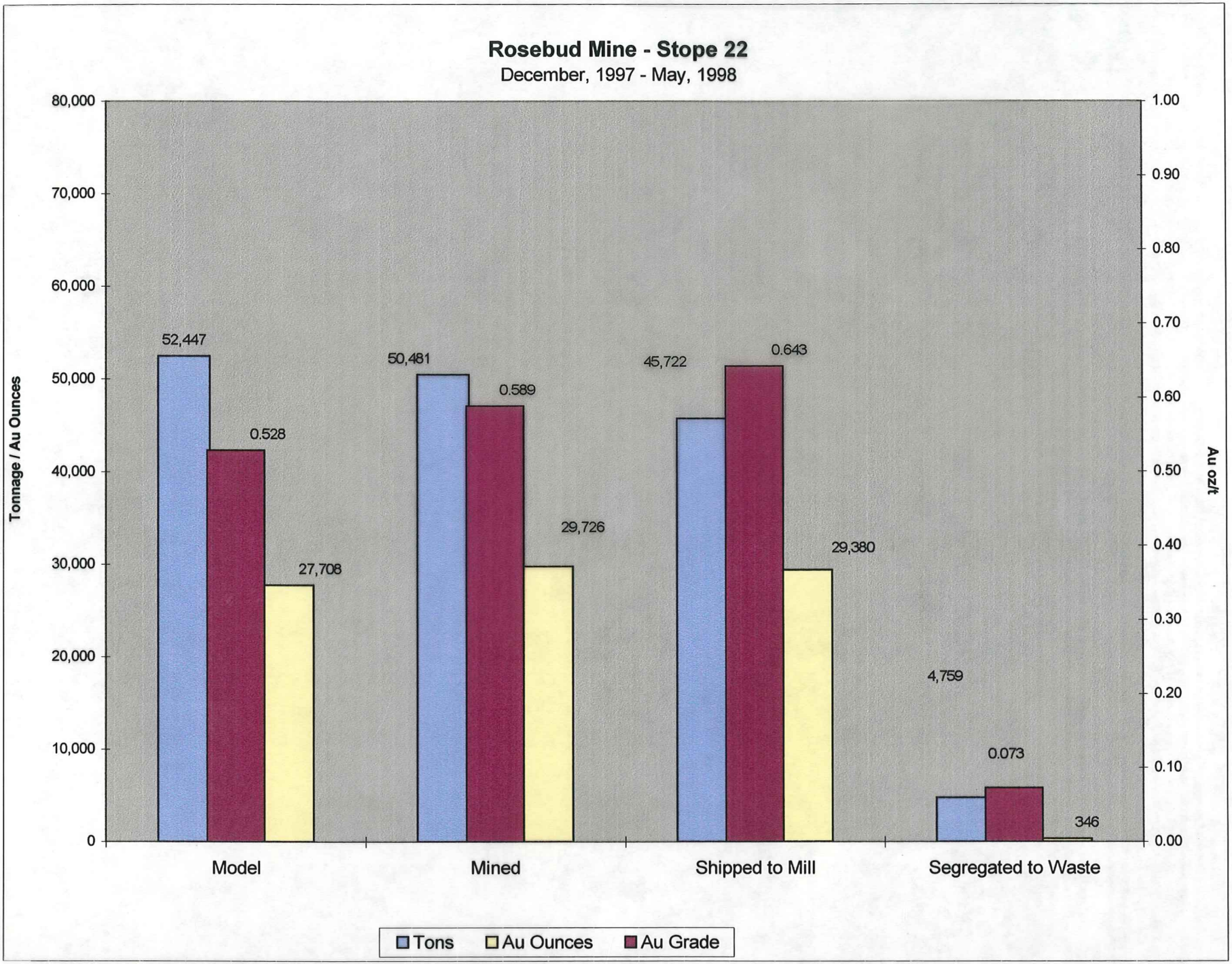
CROSS - SECTION 1300N
LOOKING N 55° E

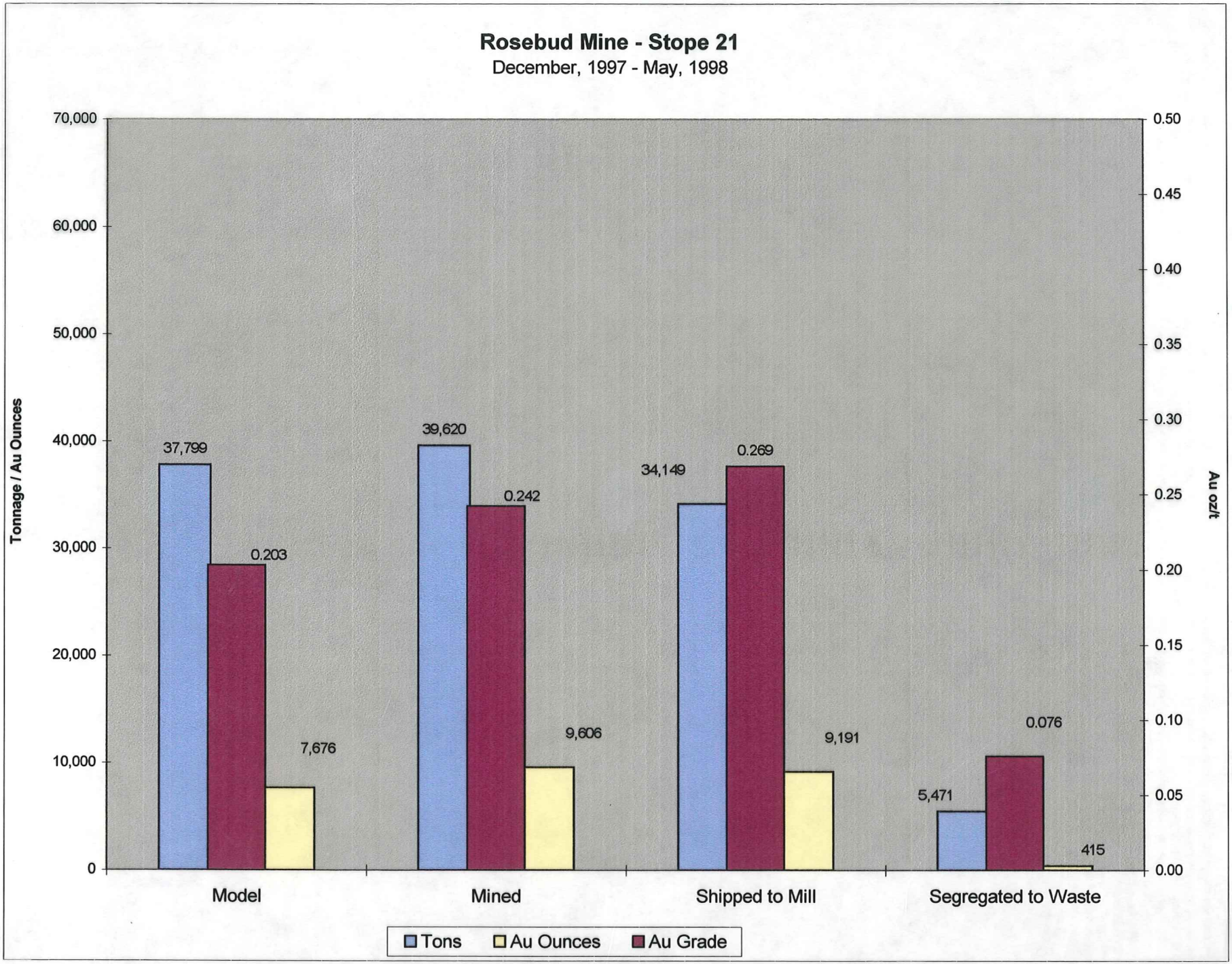
1998 ROSEBUD DEPOSIT

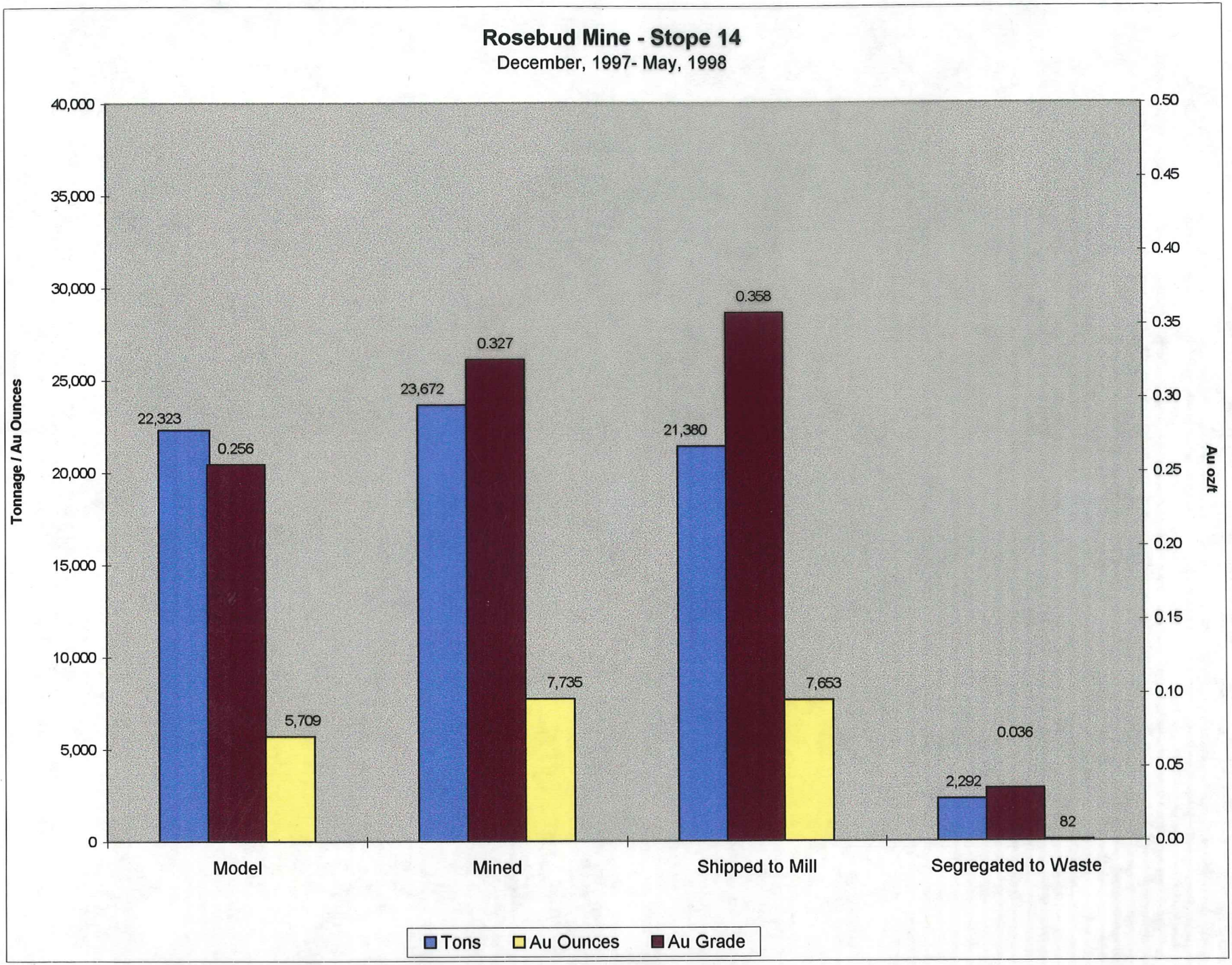
Proven and Probable Reserve						Inferred Resource				
ZONE	Tonnage	Au Grade (oz/ton)	Ag Grade (oz/ton)	Au Ounces	Ag Ounces	Tonnage	Au Grade (oz/ton)	Ag Grade (oz/ton)	Au Ounces	Ag Ounces
SOUTH	427,727	0.514	4.22	219,867	1,842,428	15,561	1.075	6.13	16,734	95,458
NORTH	168,078	0.333	1.18	55,907	198,593	98,874	0.355	1.42	35,126	140,038
EAST	347,237	0.345	2.16	119,860	750,923	21,370	0.599	2.63	12,763	56,462
TOTAL	943,042	0.420	2.92	395,634	2,791,944	135,805	0.476	2.15	64,623	291,958

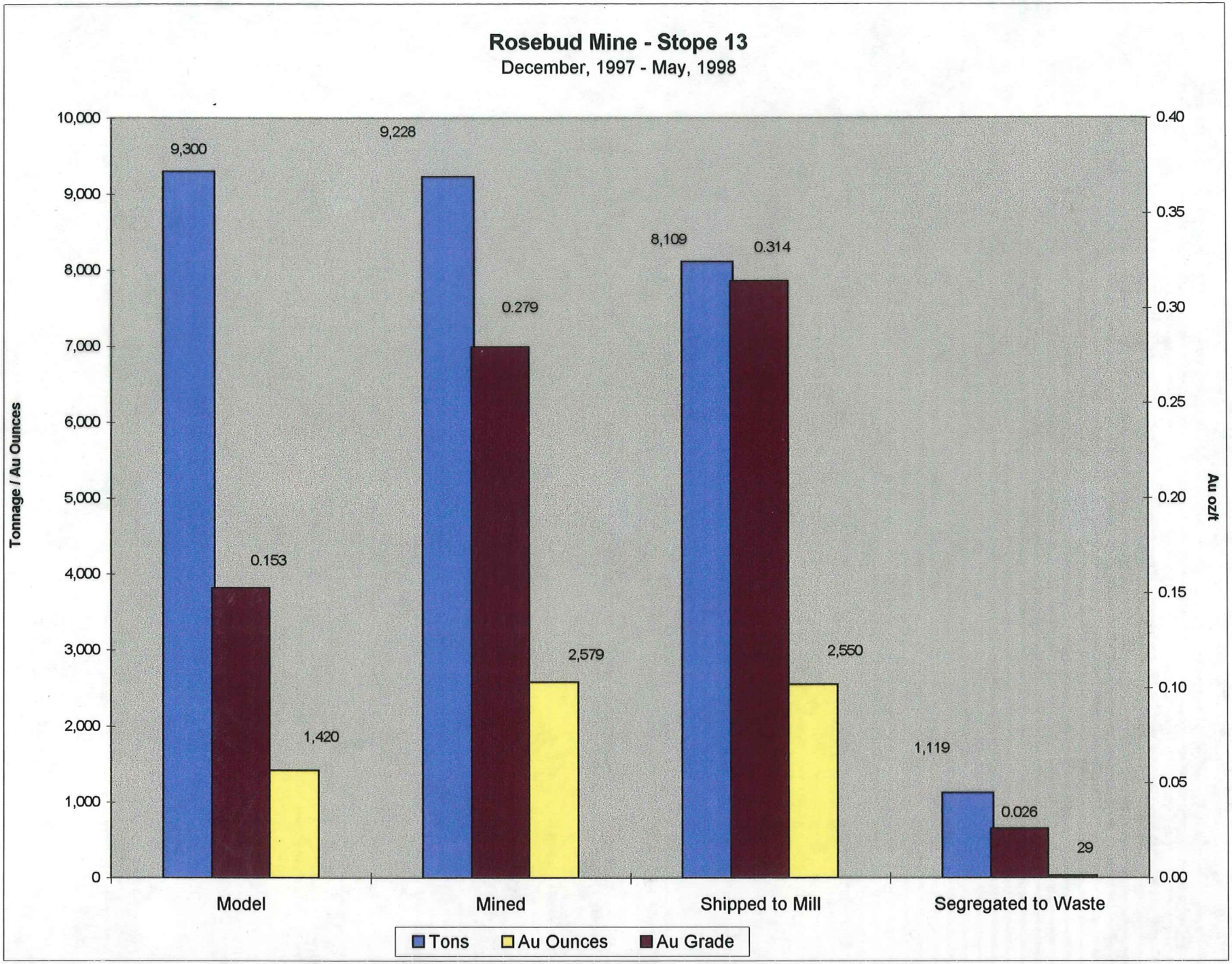

Rosebud Mine - Stope 24
December, 1997 - May, 1998
Tonnage / Au Ounces
Au oz/t
25,000
20,000
15,000
10,000
5,000
0
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
13,716
0.390
5,352
14,167
0.358
5,067
13,229
0.377
4,993
938
0.079
74
Model
Mined
Shipped to Mill
Segregated to Waste
Tons
Au Ounces
Au Grade

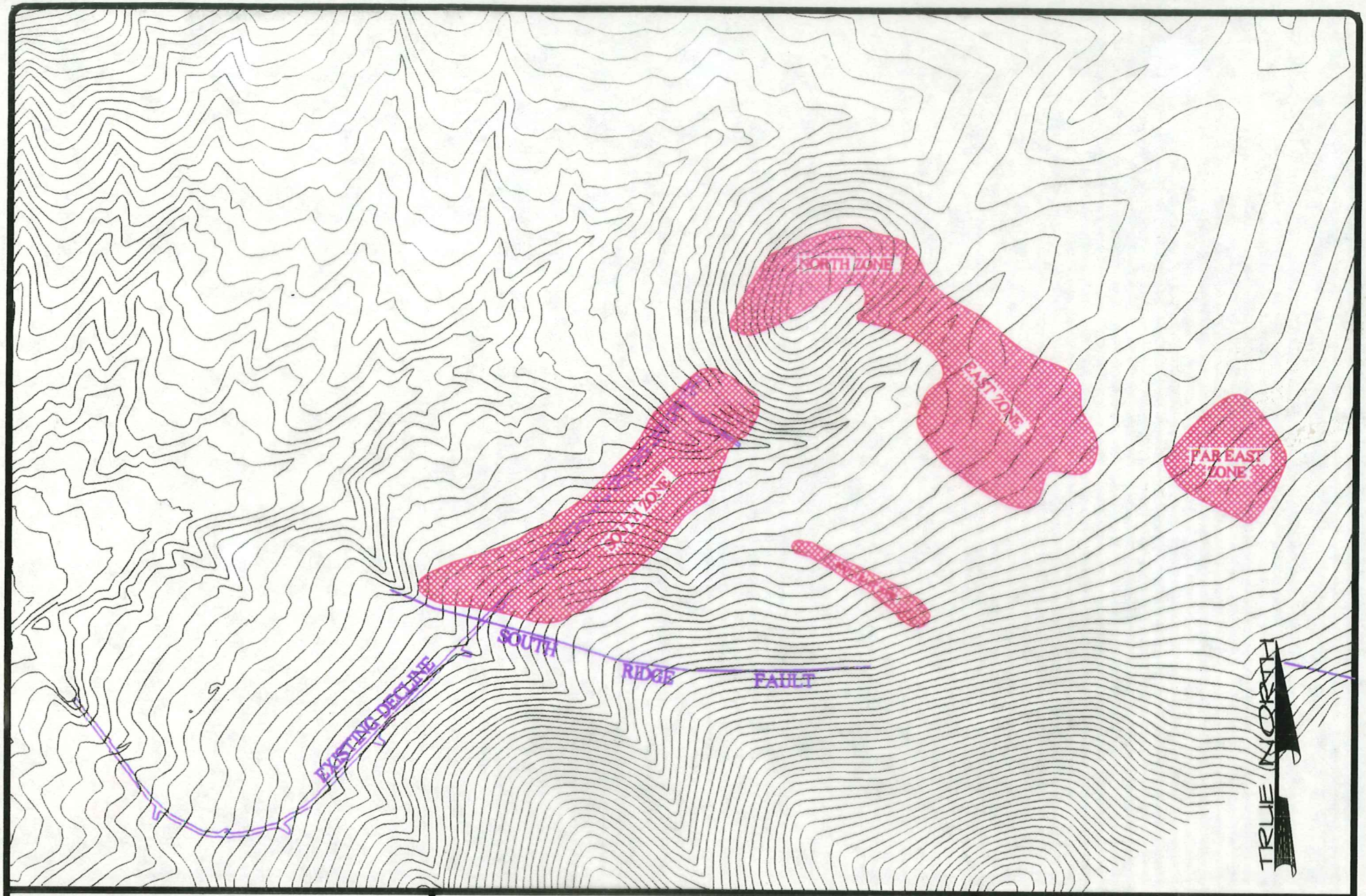

Rosebud Mine - Stope 23
December, 1997 - May, 1998
Tonnage / Au Ounces
Au oz/t
100,000
90,000
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
42,700
0.871
37,194
36,583
0.612
22,381
33,987
0.656
22,282
2,596
0.038
99
Model
Mined
Shipped to Mill
Segregated to Waste
Tons
Au Ounces
Au Grade


Rosebud Mine - Stope 22
December, 1997 - May, 1998
Tonnage / Au Ounces
Au oz/t
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
52,447
0.528
27,708
50,481
0.589
29,726
45,722
0.643
29,380
4,759
0.073
346
Model
Mined
Shipped to Mill
Segregated to Waste
Tons
Au Ounces
Au Grade


Rosebud Mine - Stope 21
December, 1997 - May, 1998
Tonnage / Au Ounces
Au oz/t
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
0.50
0.45
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
37,799
0.203
7,676
39,620
0.242
9,606
34,149
0.269
9,191
5,471
0.076
415
Model
Mined
Shipped to Mill
Segregated to Waste
Tons
Au Ounces
Au Grade


Rosebud Mine - Stope 14
December, 1997- May, 1998
Tonnage / Au Ounces
Au ozt
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
0.50
0.45
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
22,323
0.256
5,709
23,672
0.327
7,735
21,380
0.358
7,653
2,292
0.036
82
Model
Mined
Shipped to Mill
Segregated to Waste
Tons
Au Ounces
Au Grade


Rosebud Mine - Stope 13
December, 1997 - May, 1998
Tonnage / Au Ounces
Au oz/t
10,000
9,000
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
9,300
0.153
1,420
9,228
0.279
2,579
8,109
0.314
2,550
1,119
0.026
29
Model
Mined
Shipped to Mill
Segregated to Waste
Tons
Au Ounces
Au Grade

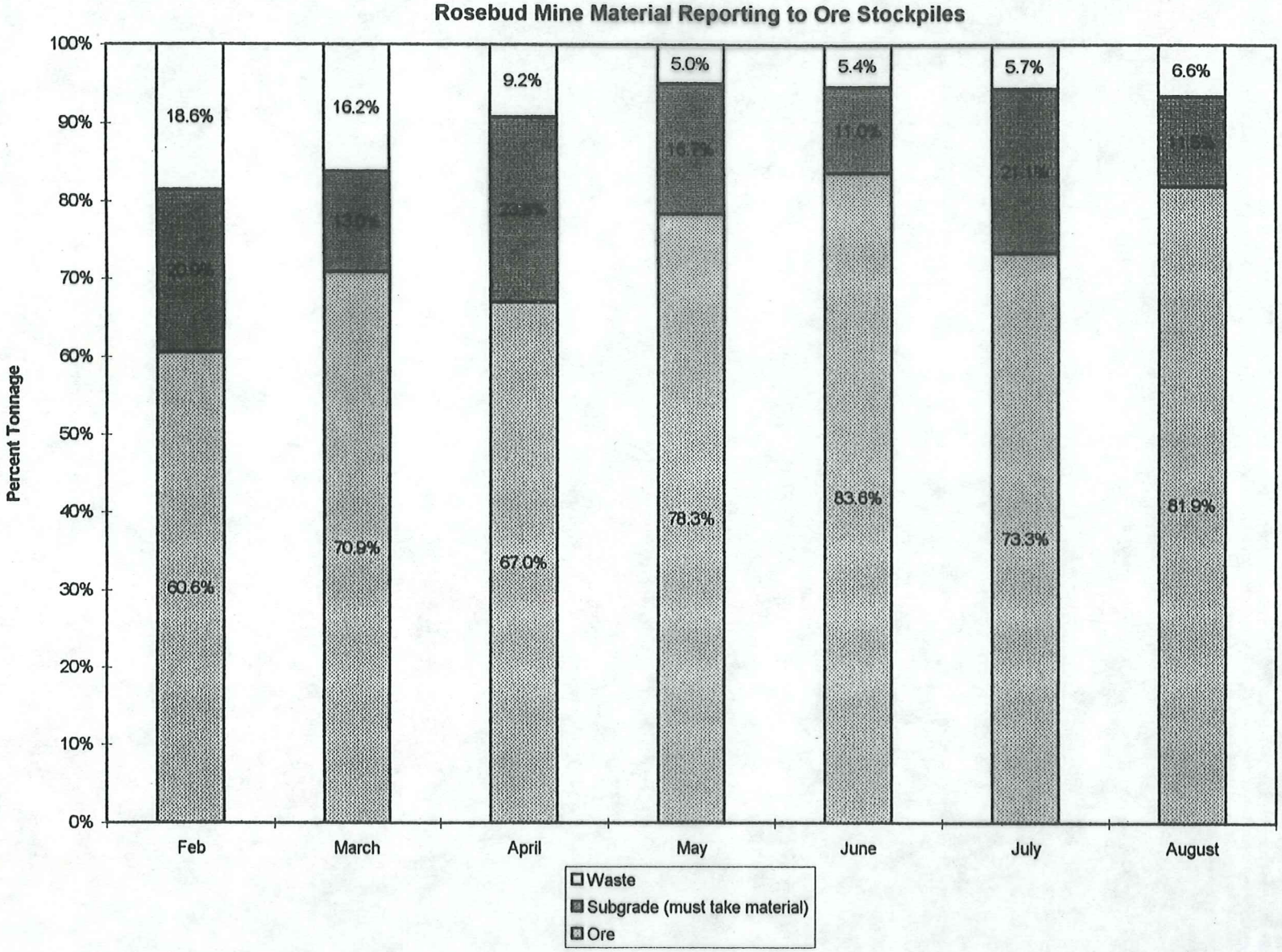


Hecla MINING COMPANY

ROSEBUD PROJECT

EXISTING DECLINE AND AREAS OF MINERALIZATION

SCALE: NOT TO SCALE
CONTOUR INTERVAL: 10'
DATE: 9-26-95
DRAWN BY: M. SHEEN


Rosebud Mine Material Reporting to Ore Stockpiles
Percent Tonnage
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
18.6%
16.2%
9.2%
5.0%
5.4%
5.7%
6.6%
60.6%
70.9%
67.0%
78.3%
83.6%
73.3%
81.9%
Feb
March
April
May
June
July
August
Waste
Subgrade (must take material)
Ore

RESOURCE MODELING

Geologically-controlled Geostatistical Model

- Geologic cross-sections on 50-foot centers
- Gold grade distribution analysis
  - four major gold grade populations: 0.01 - 0.05 opt
    0.05 - 0.25 opt
    0.25 - 0.60 opt
    >0.60 opt
  - eight major gold domains, defined by: grade distribution
    geologic controls
    style of mineralization
- Gold domain cross-sections on 50-foot centers
- Bench plan maps on 10-foot centers
- Construction of 3-D model
- Variography performed over entire dataset; performed for each gold domain
- Ordinary kriging performed internal to each gold domain
  - high-grade search limiter applied
  - 10 ft^3 block size
- Audits performed by: Mine Development Associates, Inc. (S. Ristorcelli, Scott Hardy)
  The Winters Company (D. Earnest, R. Sims)
  HMC internal audit (D. Cameron)

Rosebud Deposit

1996 Reserve vs. 1997 Reserve

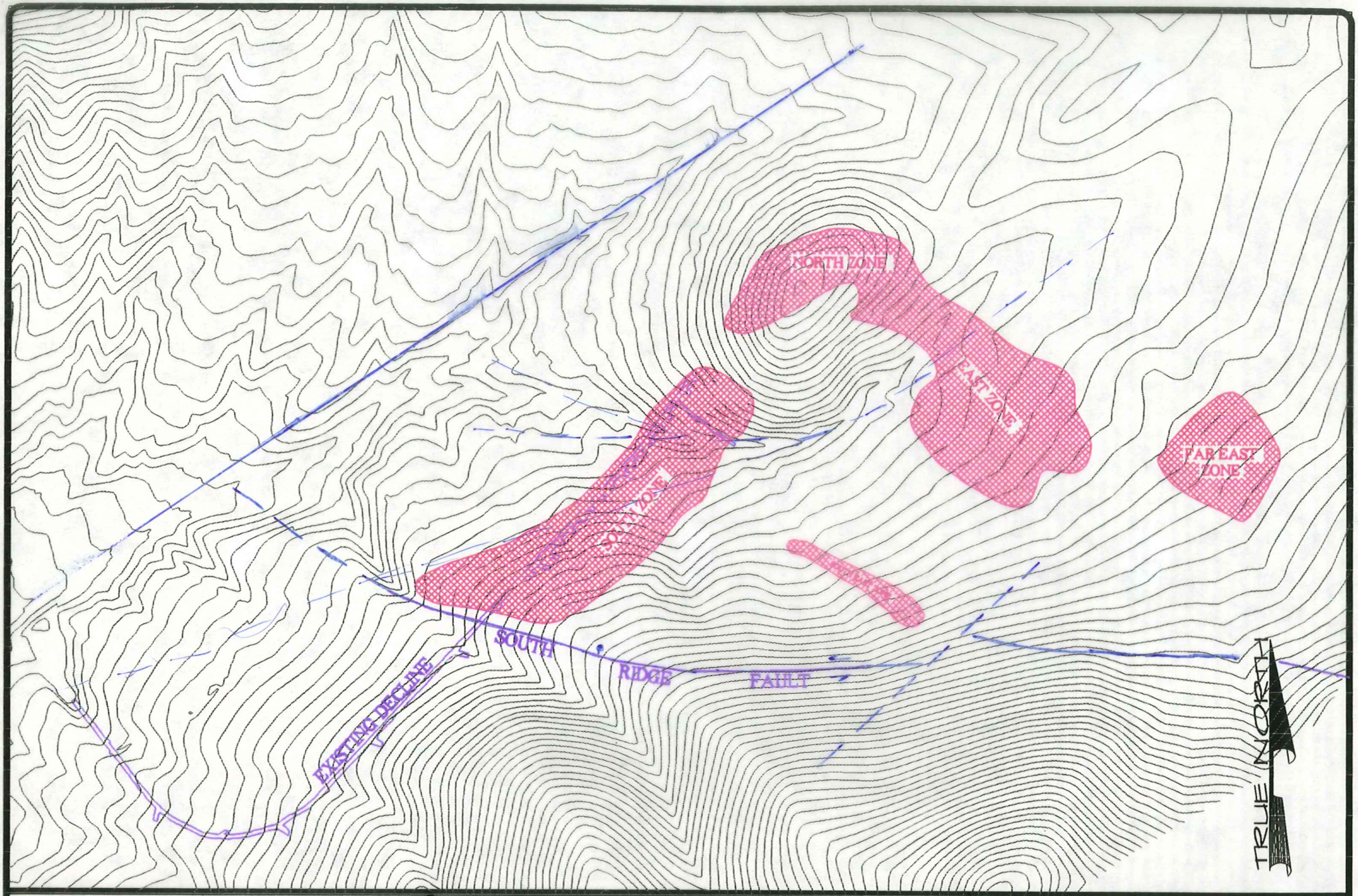
	1996 Proven & Probable Reserve (0.14 Au oz/t cut-off)			1997 Proven & Probable Reserve (0.14 Au oz/t cut-off)			Difference (1997-1996)		
Zone	Tonnage	Au Grade (oz/t)	Au Ounces	Tonnage	Au Grade (oz/t)	Au Ounces	Tonnage	Au Grade	Au Ounces
South	594,245	0.560	332,603	720,262	0.443	318,897	126,017	-0.109	-13,706
North	221,581	0.351	77,734	176,371	0.323	56,959	-45,210	0.460	-20,775
East	333,577	0.346	115,358	380,000	0.326	124,028	46,423	0.187	8,670
Far East	40,000	0.299	11,960	0		0	-----	-----	-----
Total	1,189,403	0.452	537,655	1,276,634	0.392	499,884	87,231	-0.433	-37,771

Rosebud Deposit

1996 Inferred Resource vs. 1997 Inferred Resource

	1996 Inferred Resource (0.14 Au oz/t cut-off)			1997 Inferred Resource (0.14 Au oz/t cut-off)			Difference (1997-1996)		
Zone	Tonnage	Au Grade (oz/t)	Au Ounces	Tonnage	Au Grade (oz/t)	Au Ounces	Tonnage	Au Grade	Au Ounces
South	2,459	0.674	1,656	17,185	1.171	20,125	14,726	1.254	18,469
North	2,243	0.425	954	103,102	0.347	35,739	100,859	0.345	34,785
East	29,218	0.388	11,334	23,155	0.564	13,048	-6,063	-0.283	1,714
Far East	14,396	0.459	6,608	*	*	*	-----	-----	-----
Total	48,316	0.425	20,552	143,442	0.480	68,912	95,126	0.508	48,360

* Far East reclassified as Other Resources category for 1997.

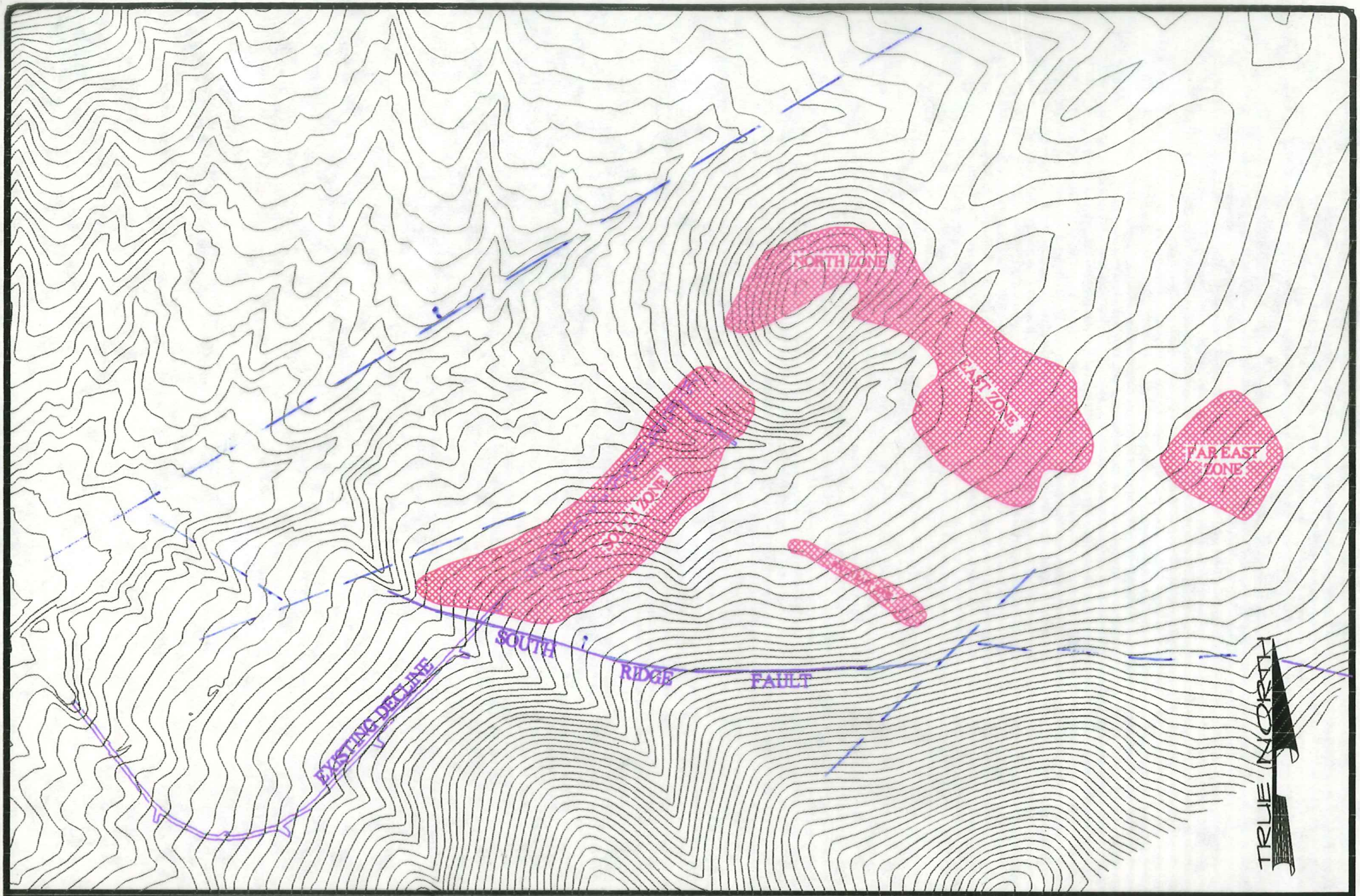


Hecla MINING COMPANY

ROSEBUD PROJECT

EXISTING DECLINE AND AREAS OF MINERALIZATION

SCALE: NOT TO SCALE
CONTOUR INTERVAL: 10'
DATE: 9-26-95
DRAWN BY: M. SHEEN



Hecla MINING COMPANY

ROSEBUD PROJECT

EXISTING DECLINE AND AREAS OF MINERALIZATION

SCALE: NOT TO SCALE
CONTOUR INTERVAL: 10'
DATE: 9-26-95
DRAWN BY: M. SHEEN

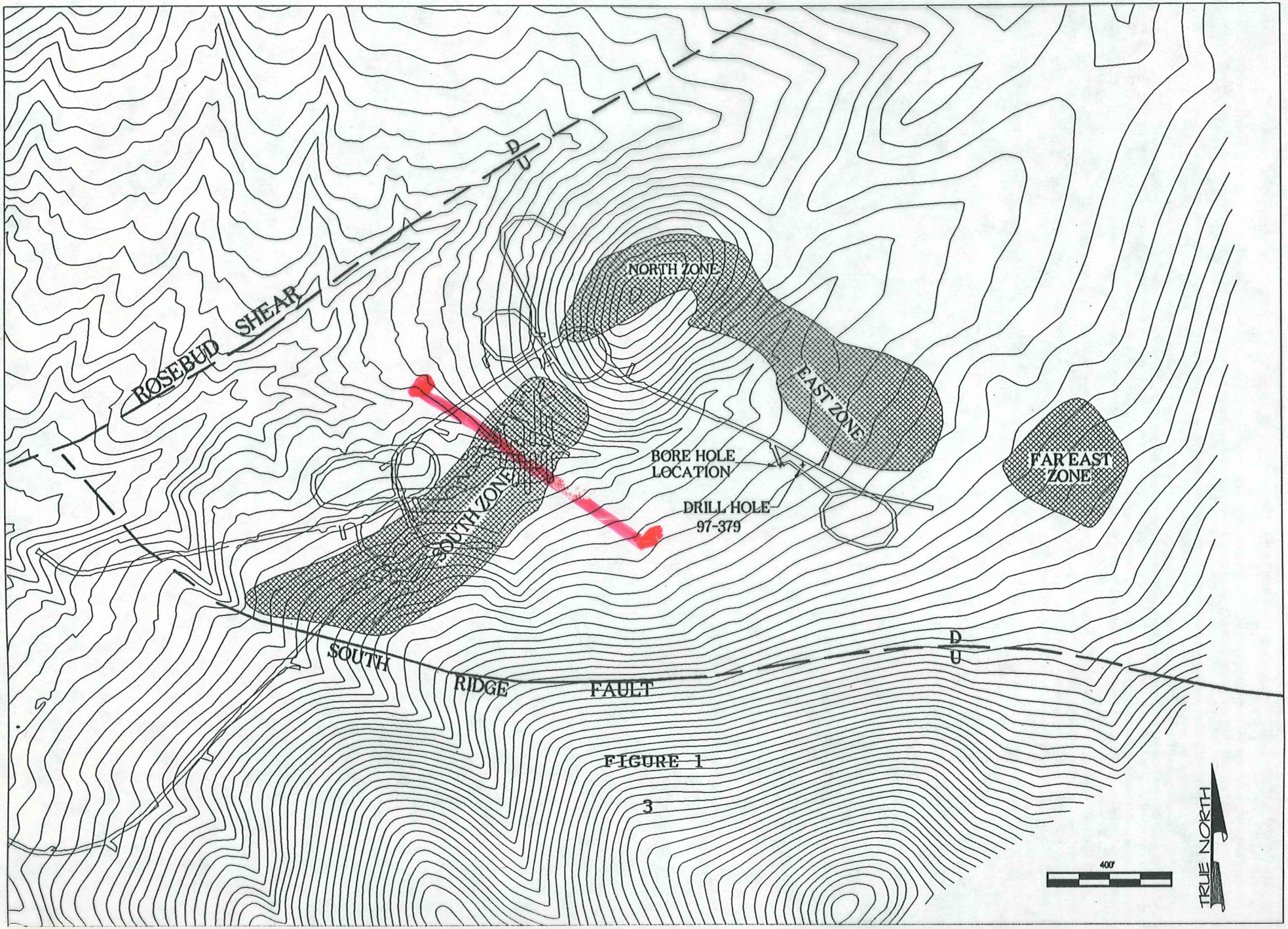

ROSEBUD SHEAR
D
U
NORTH ZONE
EAST ZONE
FAR EAST ZONE
SOUTH ZONE
BORE HOLE LOCATION
DRILL HOLE 97-379
SOUTH RIDGE FAULT
D
U
400'
TRUE NORTH

FIGURE 1

RESOURCE MODELING

Geologically-controlled Geostatistical Model

- Geologic cross-sections on 25-foot centers at a scale of 1"=20' for the South Zone.
- Geologic cross-sections on 50-foot centers at a scale of 1"=40' for the North and East Zones
- Geologic bench plan maps on 12-foot centers at a scale of 1"=40'
- Gold grade distribution analysis:
  - -five major gold grade populations:
    - 0.010 - 0.049 opt Au
    - 0.050 - 0.249 opt Au
    - 0.250 - 0.999 opt Au
    - 1.000 - 4.499 opt Au
    - 4.500 +
  - -fifteen major gold domains, defined by:
    - grade distribution
    - geologic controls
    - style of mineralization
- Gold domain cross-sections at same centers and scales as geologic cross-sections
- Gold domain bench plan maps at same centers and scale as geologic plan maps
- Construction of 3-D model
- Variography performed over entire dataset; performed for each gold domain
- Ordinary kriging performed internal to each gold domain
  - -high-grade search limiter applied
  - -10'x10'x12' block size
- Audits performed by:
  - Mine Development Associates, Inc. (S. Ristorcelli, Scott Hardy)
  - The Winters Company (D. Earnest, R. Sims)
  - HMC internal audit (D. Cameron)

ROSEBUD DEPOSIT DISCOVERY & DELINEATION

1975 - 1985 ASARCO, Freeport McMoRan Exploration, St. Joe Minerals, USMX, Homestake
- surface exploration
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- 204,000 feet of reverse-circulation and core drilling

1994 Hecla Mining Company
- excavated 3,000-foot decline into South Zone
- excavated 240-foot cross-cut into South Zone ore body (approx. 400 tons @ 0.92 Au opt)
- 25,000 feet of underground core drilling in South Zone along 50-foot spaced drill fans
- 32,000 feet of surface core drilling in South, East, & North Zones (approx. 75 to 100 ft. spacing)

1995 Hecla Mining Company
- completed additional 7,100 feet of underground core drilling along 25-foot spaced drill fans in the South Zone "chimney" area and portions of the stratabound ore zones

A) GEOLOGIC MODELING:

1) Geologic CROSS-SECTIONS - 1"=20' @ 25' INCREMENTS FOR SOUTH ZONE } Reflects Drillhole Spacing.
1"=40' @ 50' INCREMENTS FOR NORTH & EAST ZONE }

THEN TO PLAN MAPS - EVERY 12' @ scale of 1"=480'

[LITHOLOGY, STRUCTURE, ALTERATION ETC.

B) STATISTICAL MODELING:

- FOREACH ZONE - (SOUTH-NORTH-EAST) CUMULATIVE FREQUENCY (RAW ASSAY DATA) CURVES REVEALED 5 populations of Gold grades IN South Zone
  0.01-0.140-1.00+ 3 " " " " " " NORTH ZONE
  0.01-0.049-0.349-1.00+ 4 " " " " " " EAST ZONE

- "these gold grade "DOMAINS" Reflect Different Styles, Occurrences, AND LOCATIONS of MINERALIZATION ASSOCIATED W/ EACH ZONE.

- A "Second" set of CROSS-SECTIONS MADE TO MATCH GEO SECTIONS to define the geometry of the gold domains. Domain boundarys Reflect Lithologic & Structural Controls unique to EACH Zone. & Refined on 12' PLAN MAPS.

- ASSAY DATA Composited to 5' INCREMENTS & ASSIGNED its CORRESPONDING gold DOMAIN CODE ACCORDING to its LOCATION w/in DOMAIN model -

- VARIOGRAPHY WAS DONE ON EACH Zone, DOMAIN, & DOMAINS Grouped By Zone. CORRELOGRAMS WERE Calculated on Multiple DOMAINS.

- HIGH-GRADE outlier Composites INTERNAL to EACH DOMAIN were cut to the HIGH-END VALUE of that DOMAIN!

- ORDINARY KRIGING WAS CHOSEN AS THE ESTIMATION METHOD – PERFORMED ON EACH DOMAIN SEPARATELY

- SEARCH RANGES VIA VARIOGRAPHY OFTEN EXCEEDED THE GEOMETRY OF DOMAIN BOUNDARIES → DOMAIN BOUNDARIES VIA GEOLOGY ALWAYS TOOK PRECEDENCE. PROVIDING TIGHTER CONTROL ON GRADE EXTRAPOLATION.

MINERALIZATION & ORE CONTROLS

- Volcanic-hosted, low sulfidation, epithermal, Au-Ag deposit.
- Age of mineralization is currently unknown but estimated at 16 MY (+/-).
- South zone mineralization:
  - ✓ Two major episodes of mineralization.
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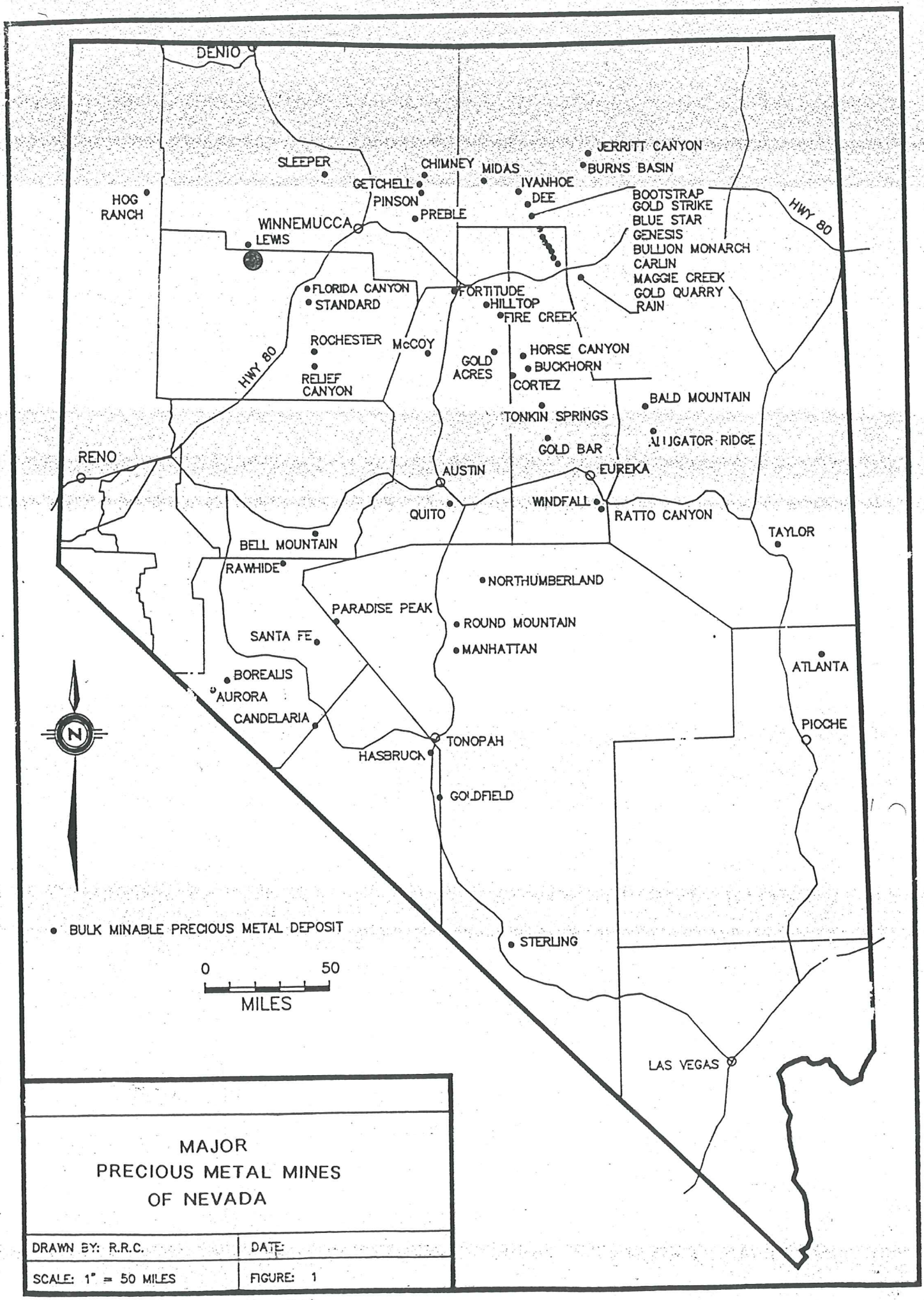
    - ➢ Middle stockwork and dissemination of mg-rich calcite + pyrite + marcasite + Ag-sulfosalts +/- Ag-selenides + Ag-sulfides + native silver + electrum.
- East zone mineralization:
  - ✓ One main episode of mineralization
    - ➢ Quartz veining and silica replacement + electrum + silver sulfosalts + pyrite + marcasite +/- chalcopyrite.
- North zone mineralization:
  - ✓ A combination of the South zone and East zone episodes of mineralization.
- Ore controls
  - ✓ South zone.
    - ➢ Main ore control is the intersection between LBT stratigraphy and the South Ridge fault, a low-angle early reverse dextral fault with later sinistral normal movement.
    - ➢ South Ridge fault northeast trending extension fractures.
  - ✓ East zone.
    - ➢ High permeability zone in the footwall of the South Ridge fault created by transpressional compression and local hydro fracturing across an inflection of the South Ridge fault.
  - ✓ North zone.
    - ➢ Combination of South zone and East zone ore controls.



MAJOR
PRECIOUS METAL MINES
OF NEVADA

DRAWN BY: R.R.C.	DATE:
SCALE: 1" = 50 MILES	FIGURE: 1

ROSEBUD DEPOSIT DISCOVERY & DELINEATION

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  - 16 surface RVC pre collars = 10,031 feet
  - surface core tails = 3,420 feet
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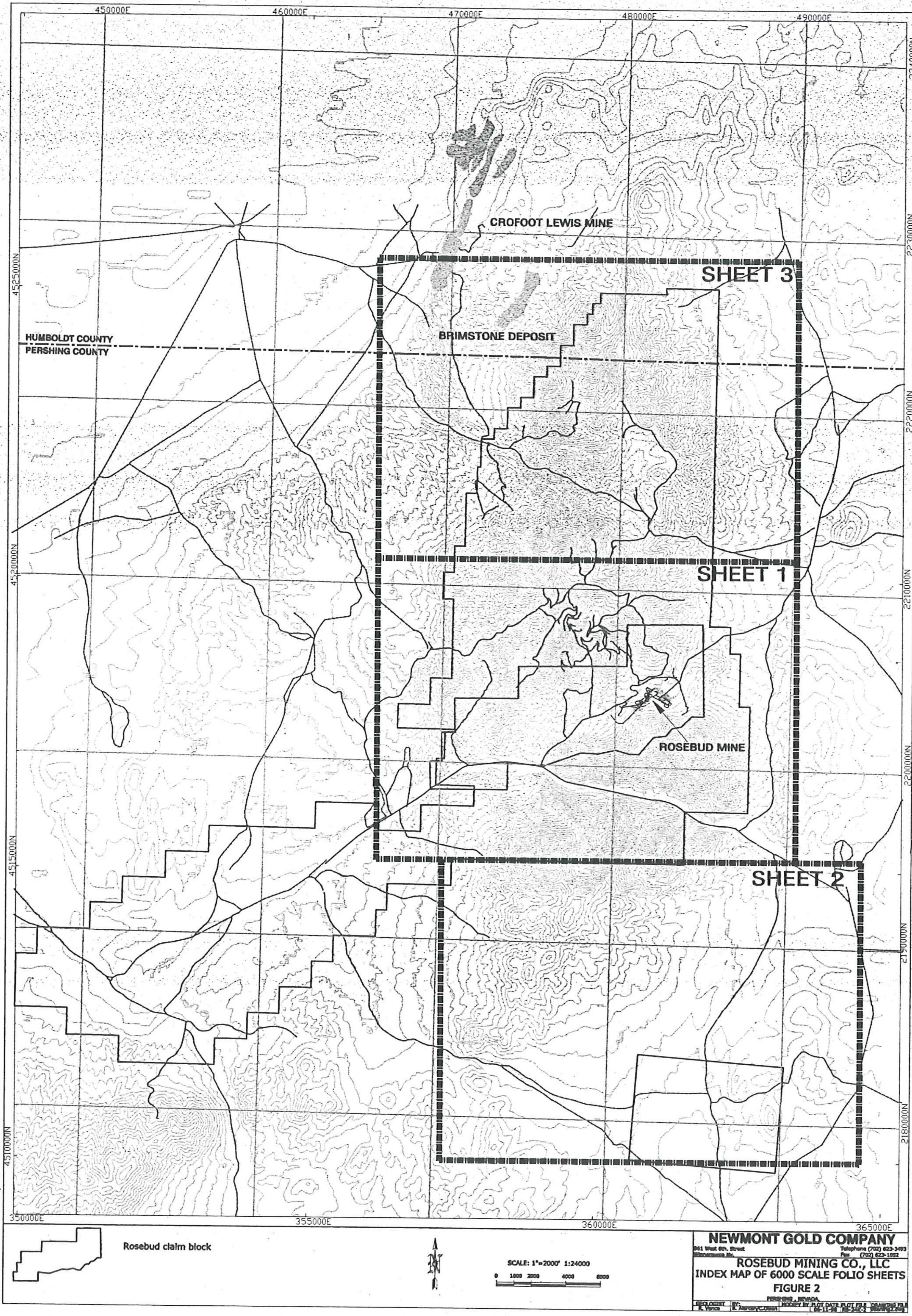
- Completed development drilling in North Zone
  - 68 underground NTW core = 18,761 feet


450000E
460000E
470000E
480000E
490000E
2240000N
2230000N
2220000N
2210000N
2200000N
2190000N
2180000N
4525000N
4520000N
4515000N
4510000N
350000E
355000E
360000E
365000E
CROFOOT LEWIS MINE
SHEET 3
BRIMSTONE DEPOSIT
HUMBOLDT COUNTY
PERSHING COUNTY
SHEET 1
ROSEBUD MINE
SHEET 2
Rosebud claim block
N
SCALE: 1"=2000' 1:24000
0 1000 2000 4000 6000
NEWMONT GOLD COMPANY
361 West 6th. Street
Telephone (702) 623-3493
Fax (702) 623-1052
ROSEBUD MINING CO., LLC
INDEX MAP OF 6000 SCALE FOLIO SHEETS
FIGURE 2
PERSHING, NEVADA

ROSEBUD PRODUCTION THROUGH JUNE 1999 AND RESERVE AS OF JUNE 1999						
		TONS	Au GRADE	Ag GRADE	Au OUNCES	Ag OUNCES
PRODUCTION	1997	197,951	0.485	3.08	95,991	610,500
	1998	316,825	0.451	3.43	134,026	1,085,961
	Jun-99	141,422	0.504	1.85	71,260	262,042
RESERVE	Jun-99	395,550	0.316	1.43	124,994	565,490
TOTAL		1,051,748	0.405	2.40	426,271	2,523,993

ROSEBUD STRATIGRAPHY

Kamma Mountain Volcanics (Tertiary)

- **Tb – Badger Formation**
  - ✓ Conglomerates, fanglomerates, and possibly lahars derived in part from mass wasting.
  - ✓ Clasts are volcanic and are supported in hematitic mud to silt matrix.

- **Tc – Chocolate Formation**
  - ✓ Quartz latitic dikes, sills, and flows.
  - ✓ Rhyolitic to trachytic flows, sills, and volcanic breccias.
  - ✓ Interbedded epiclastics.

- **Tbud – Bud Formation**
  - ✓ Ubud – Epiclastics with thin interbedded ash flow tuffs.
  - ✓ Pabx – Rhyolitic porphyritic auto-brecciated flow/sill.
  - ✓ Mbud – Epiclastics with thin interbedded ash flow tuffs.
  - ✓ Bmb – Bud marker rhyolitic porphyry dike and sill.
  - ✓ Lbud – Epiclastics with thin interbedded ash flow tuffs.

- **Lbt – LBT Formation**
  - ✓ Plat – Fine-grained, rhyolitic, planar laminated to massive (Mass) flow.
  - ✓ Lst – Vesicular flow, "leopard skin tuff".
  - ✓ Plat – Fine-grained, rhyolitic, planar laminated to massive (Mass) flow.
  - ✓ Upmbx – Rhyolitic block and ash flow tuff.
  - ✓ Plat – Fine-grained, rhyolitic, planar laminated to massive (Mass) flow.
  - ✓ Lpmbx – Rhyolitic, basal flow breccia.

- **Tos – Oscar Sediments**
  - ✓ Epiclastics commonly with clasts of Auld Lang Syne Formation graphitic phyllite.

- **Td – Dozer Formation**
  - ✓ Flow banded, locally vesicular, rhyolitic flow dome(s).

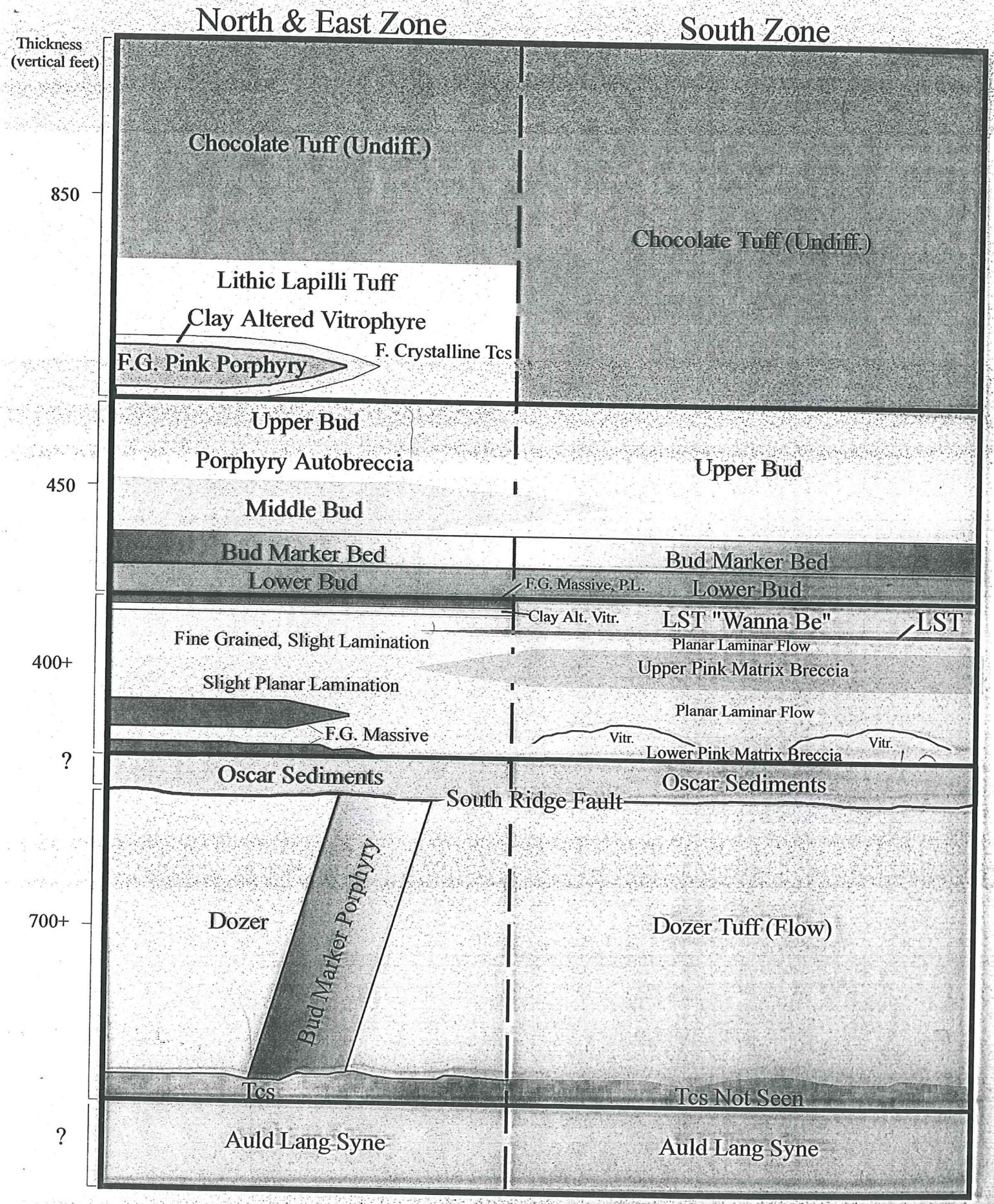
- **Tcs – Carbonaceous Sediment Sequence]**
  - ✓ Carbonaceous sandstones and siltstones.

- **Toa – Oscar Andesite**
  - ✓ Andesitic flows and fine-grained flow breccias,

- **Als – Auld Lang Syne Formation**
  - ✓ Metasediments including graphitic slates, phyllites, quartzites, and hornfels.

ROSEBUD GEOLOGY

ROSEBUD MINE STRATIGRAPHY

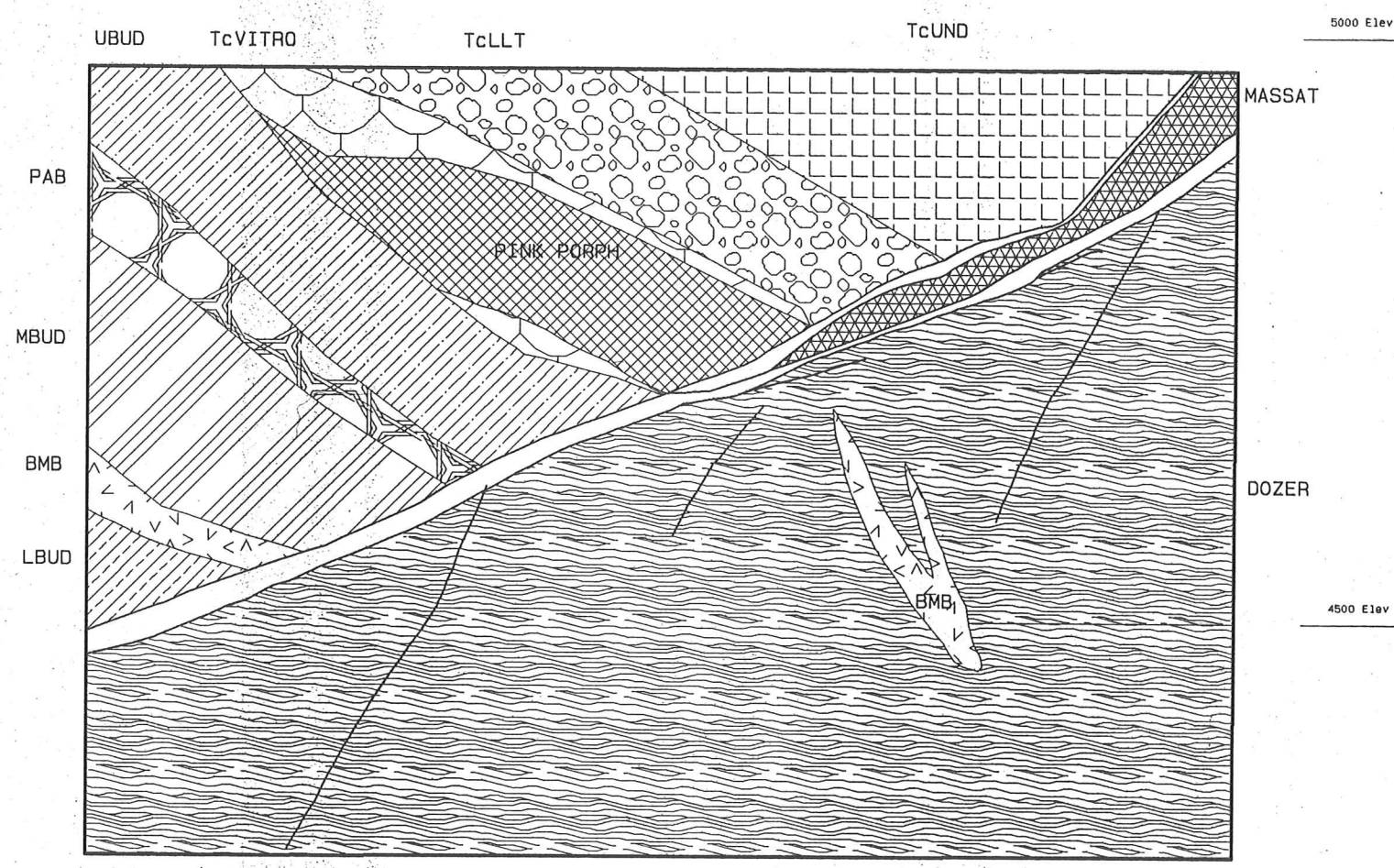


ROSEBUD DEPOSIT AREA SURFACE GEOLOGY

presentc pf

HECLA MINING COMPANY - ROSEBUD PROJECT

East Zone Geology - Section 1500N



rosebuda.pf

-1500 Offset

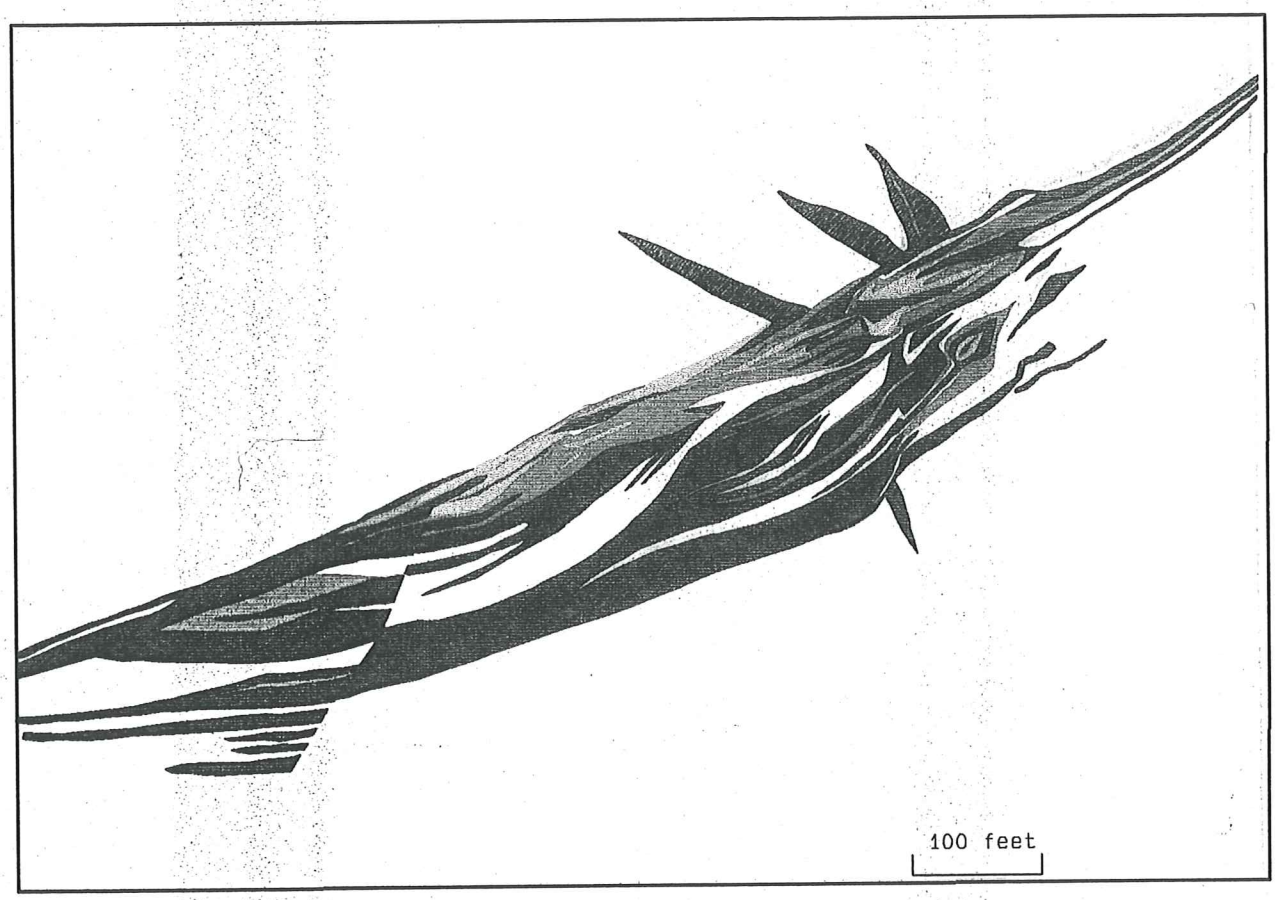
-1000 Offset

HECLA MINING COMPANY - ROSEBUD PROJECT

East Zone Au Domain Boundaries - Section 1500N

5000 Elev

5000 Elev



4500 Elev

4500 Elev

-1500 Offset

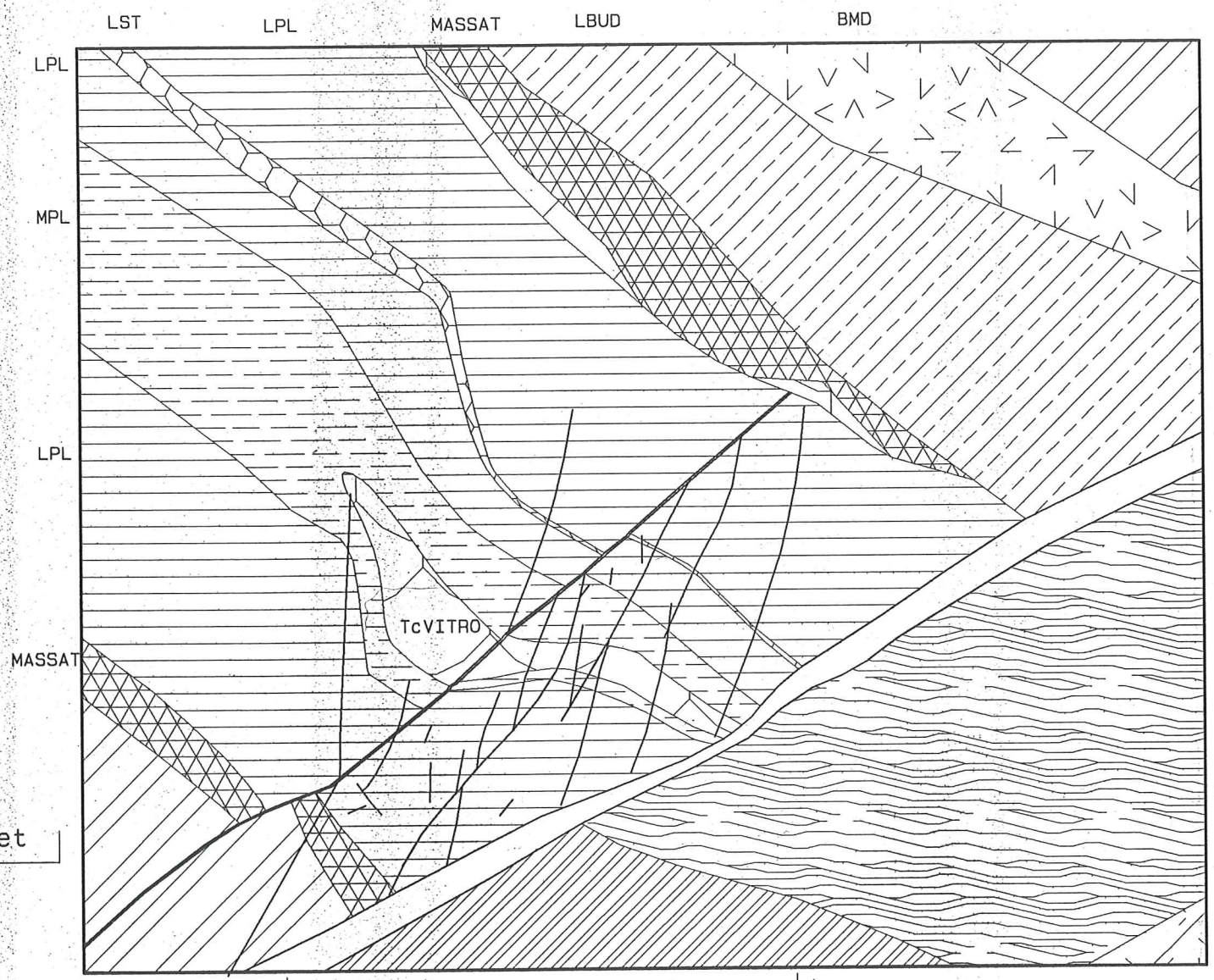
-1000 Offset

east_aua.pf

SURPAC2000 - SURPAC Software International

HECLA MINING COMPANY - ROSEBUD PROJECT

North Zone Geology - Section 1525N

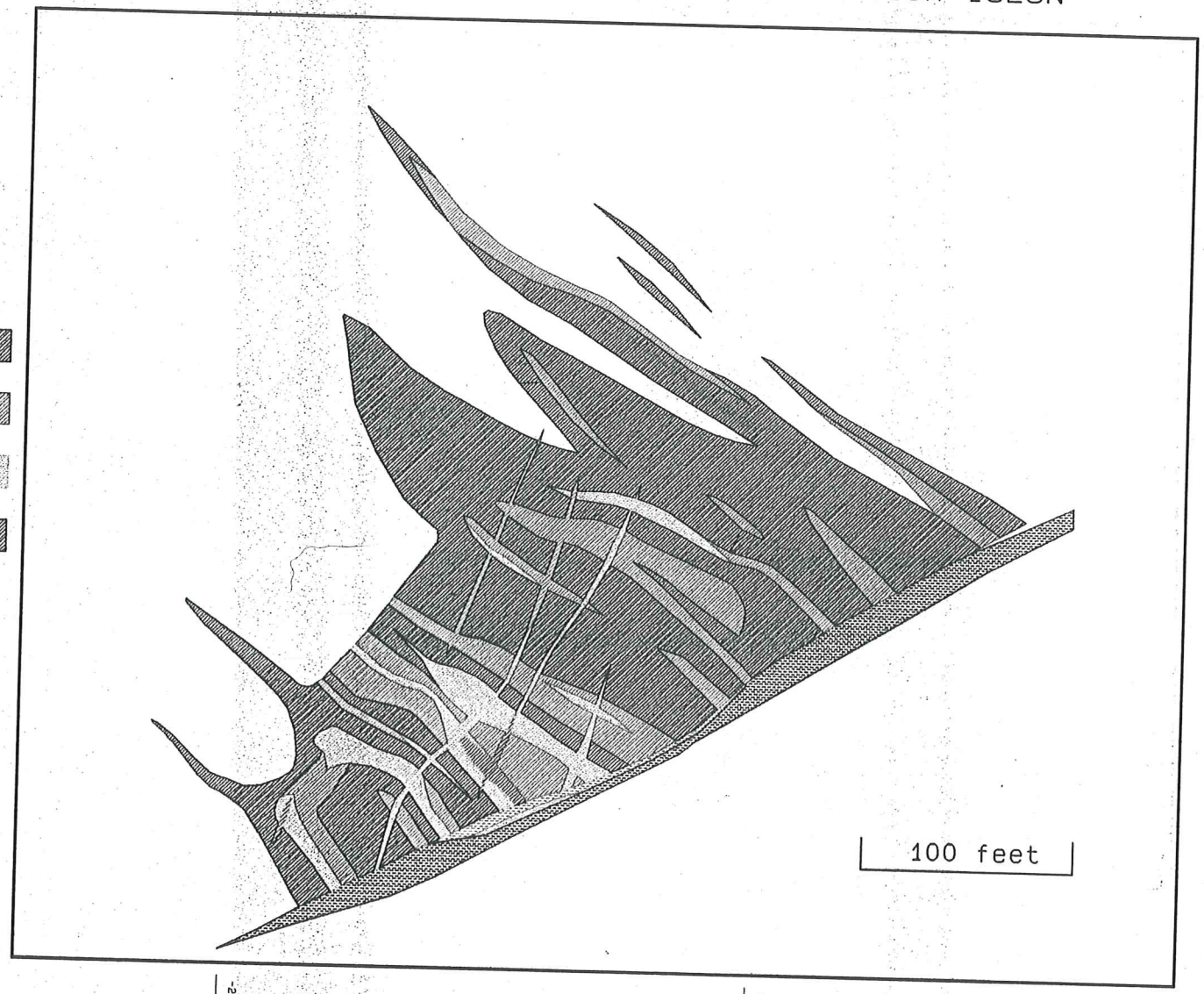


rosebud.pf

SURPAC2000 - SURPAC Software International

HECLA MINING COMPANY - ROSEBUD PROJECT

North Zone Au Domain Boundaries - Section 1525N

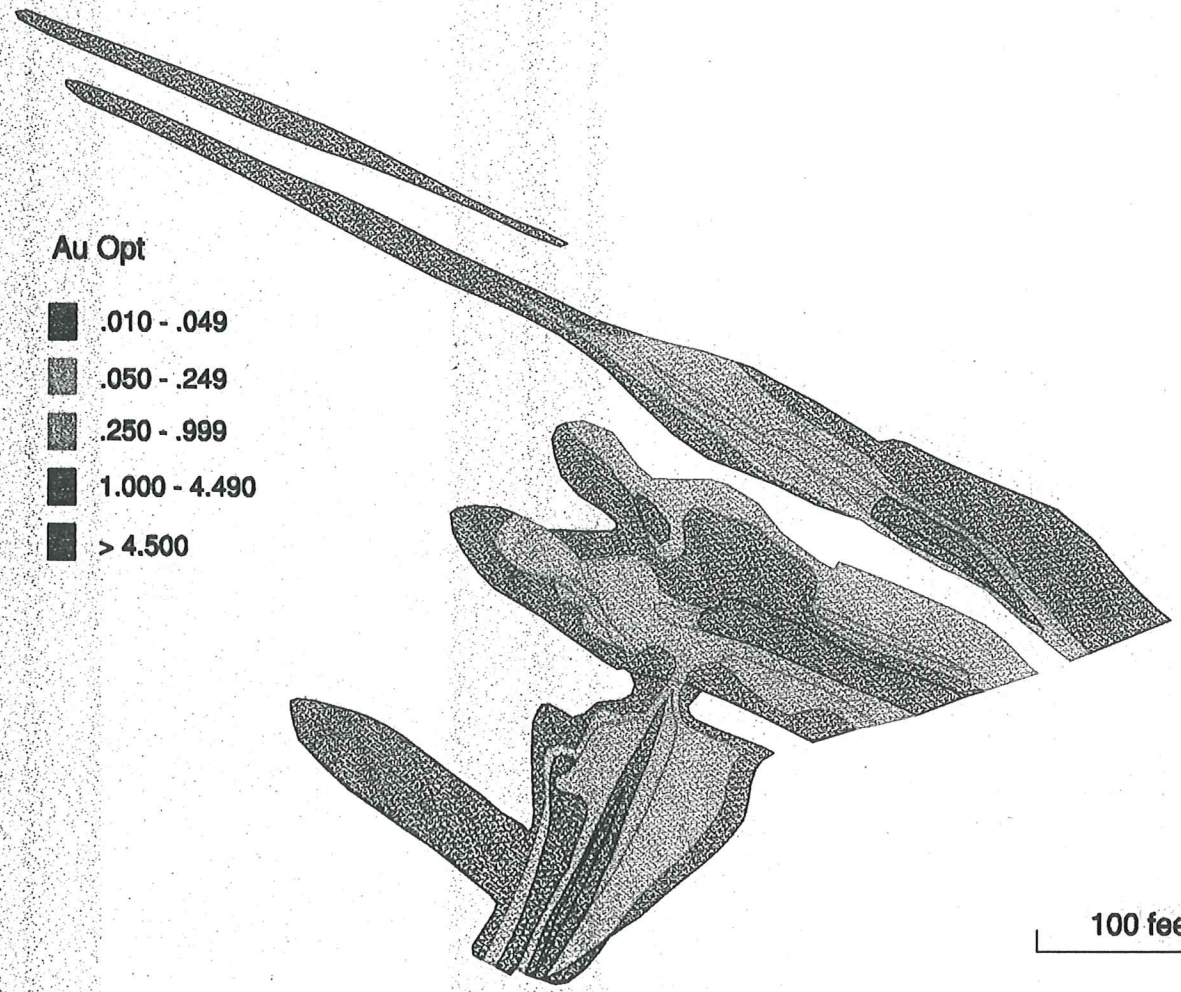


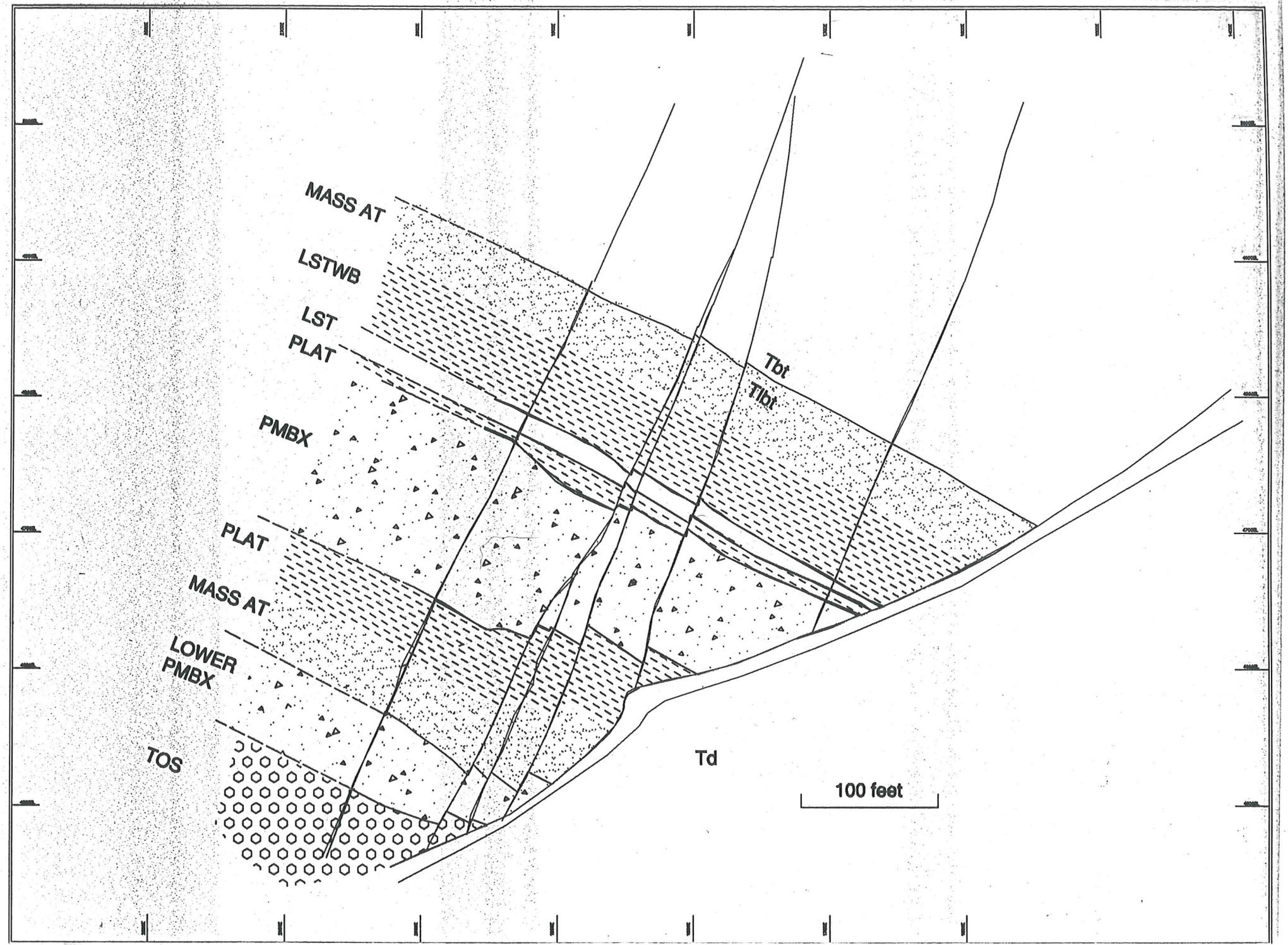
north_aa.pf

SURPAC2000 - SURPAC Software International

HECLA MINING COMPANY - ROSEBUD PROJECT

Au DOMAIN BOUNDARY SECTION 800N




MASS AT
LSTWB
LST
PLAT
PMBX
PLAT
MASS AT
LOWER
PMBX
TOS
Tbt
Tlbt
Td
100 feet

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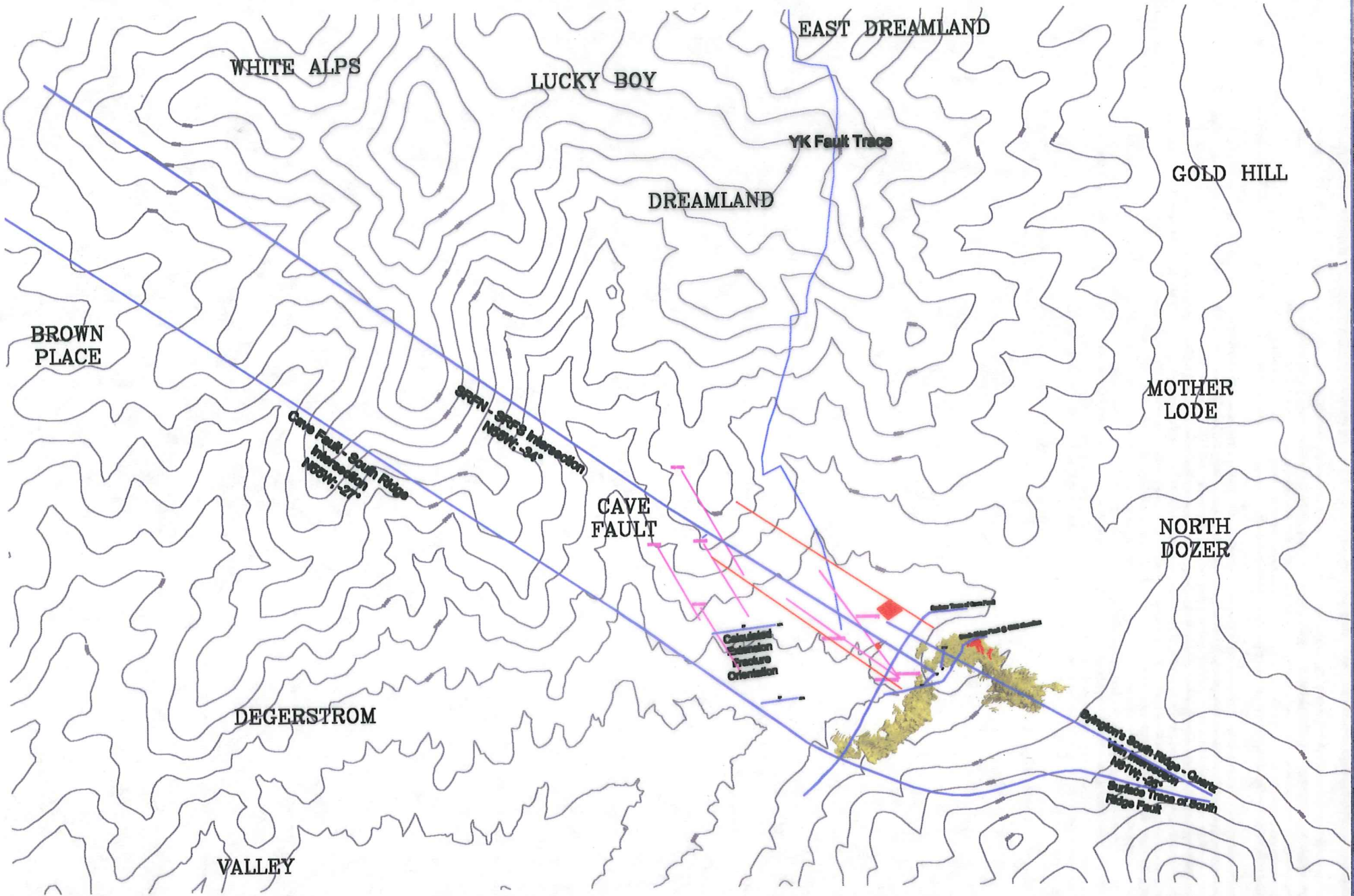
NORTHWEST CORRIDOR TARGET AREA



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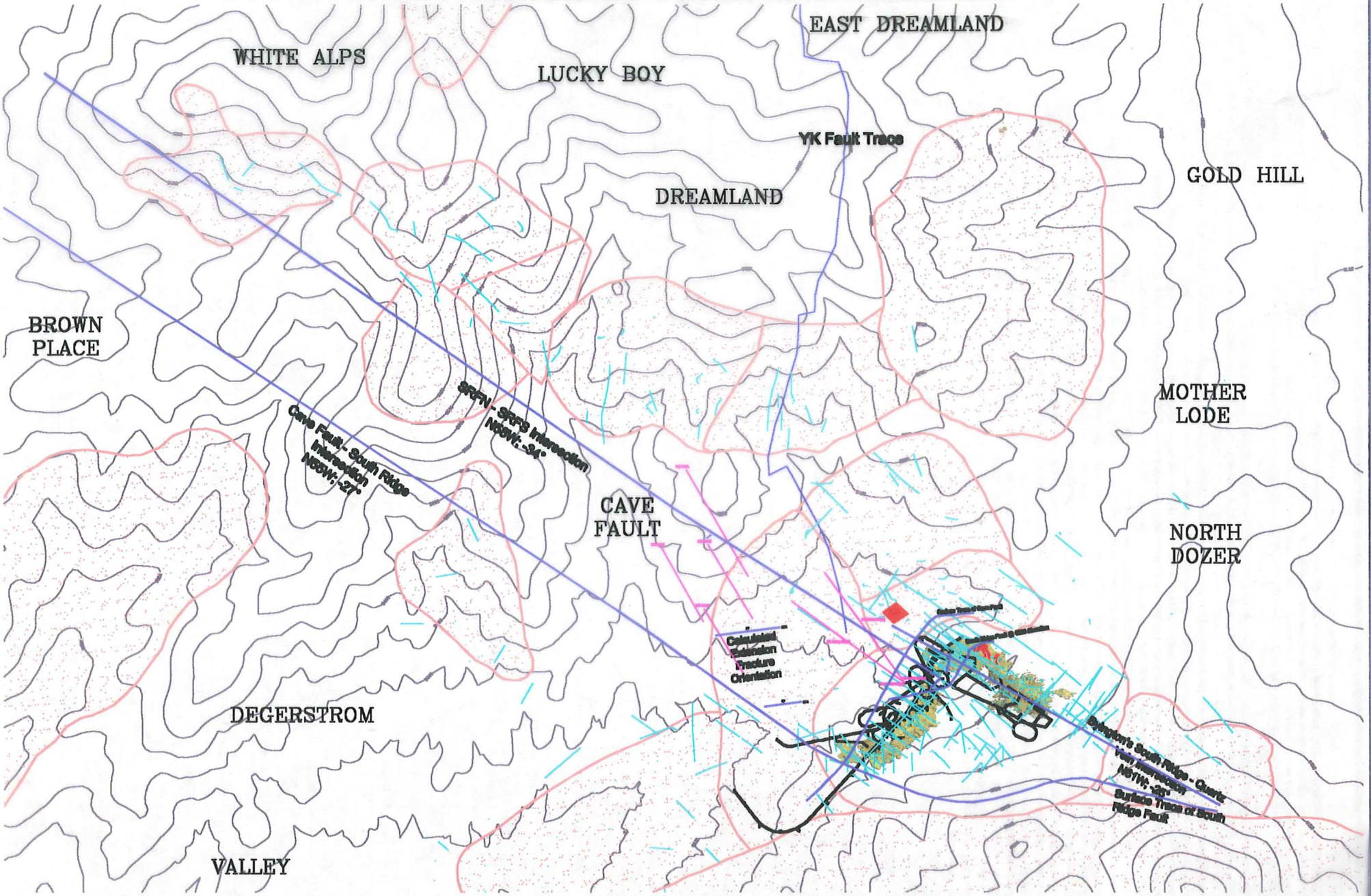
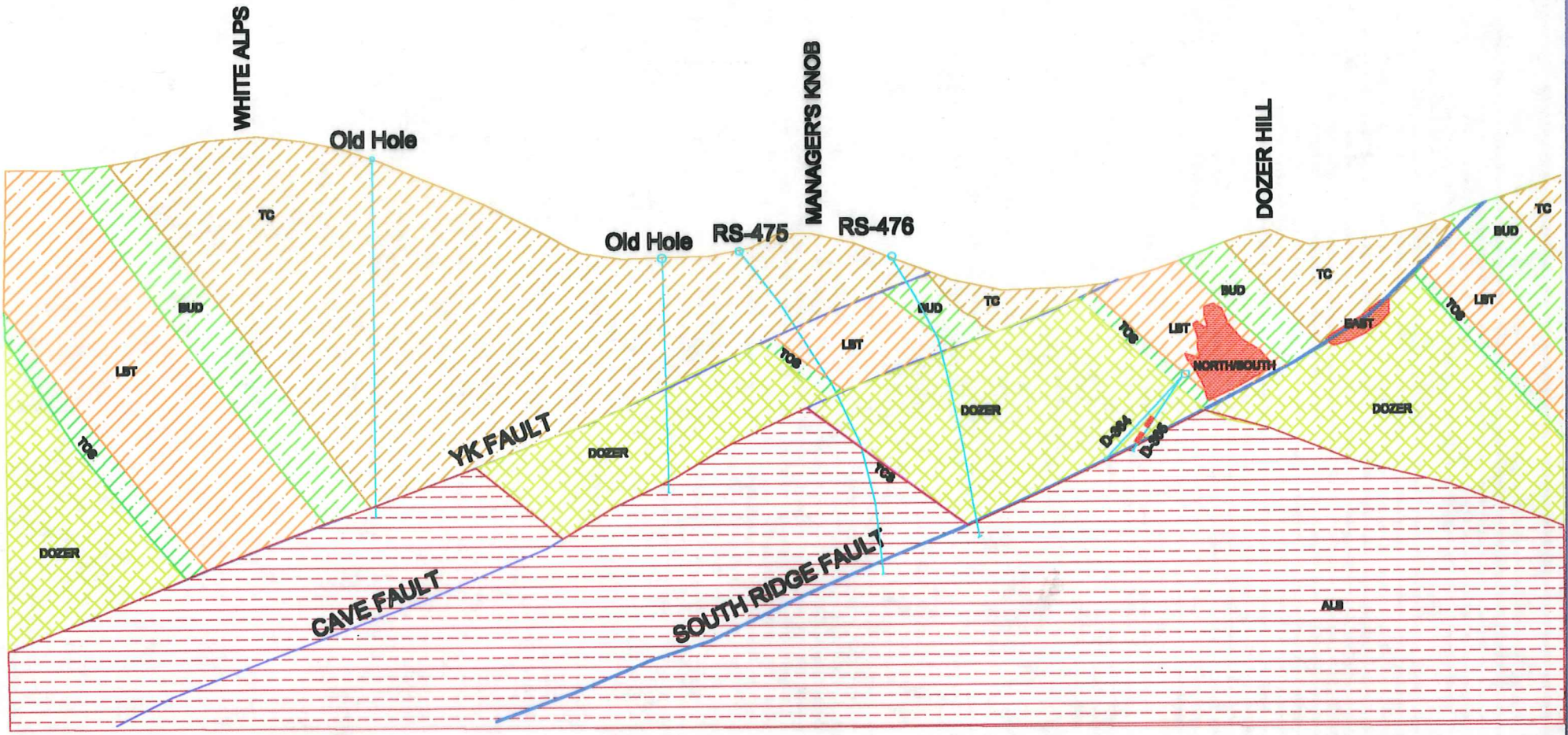
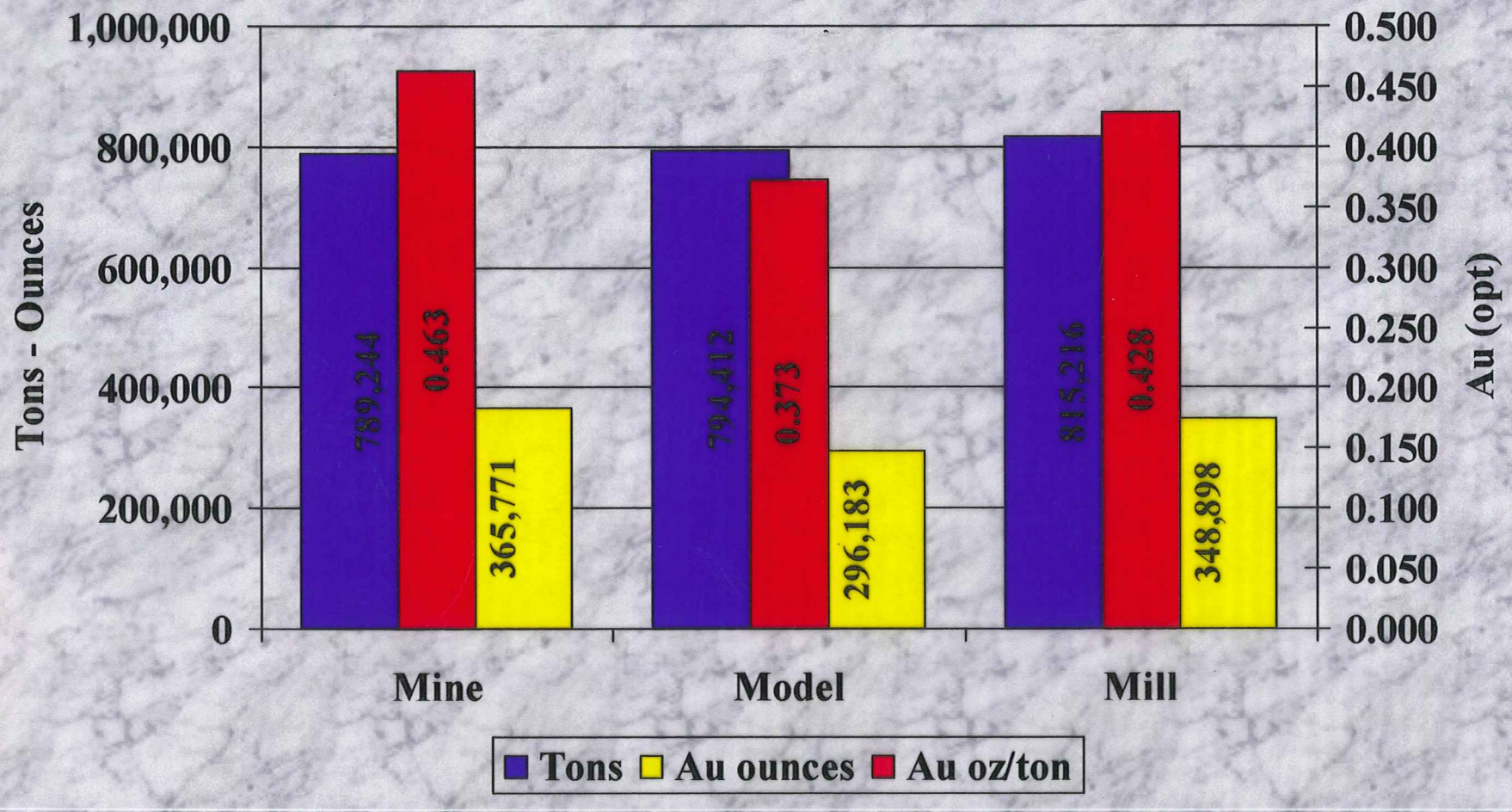


GEOLOGIC SECTION THROUGH THE NORTHWEST CORRIDOR



Rosebud Gold Production to Date



South Ore Zone Controls

- South Ridge Fault
  - Listric normal with sinistral component
- Northeast High Angle (Extension Factures)
- East-West Extensional Fault/Fracture System
- Stratigraphy

Two Major Episodes of Mineralization

- Stockwork and dissemination of quartz+ pyrite + marcasite ± chalcopyrite ± electrum ± Ag sulfosalts ± arsenopyrite ± sphaelerite ± galena ± pyrrhotite ± anatase ± tetrahydrite-tennantite.

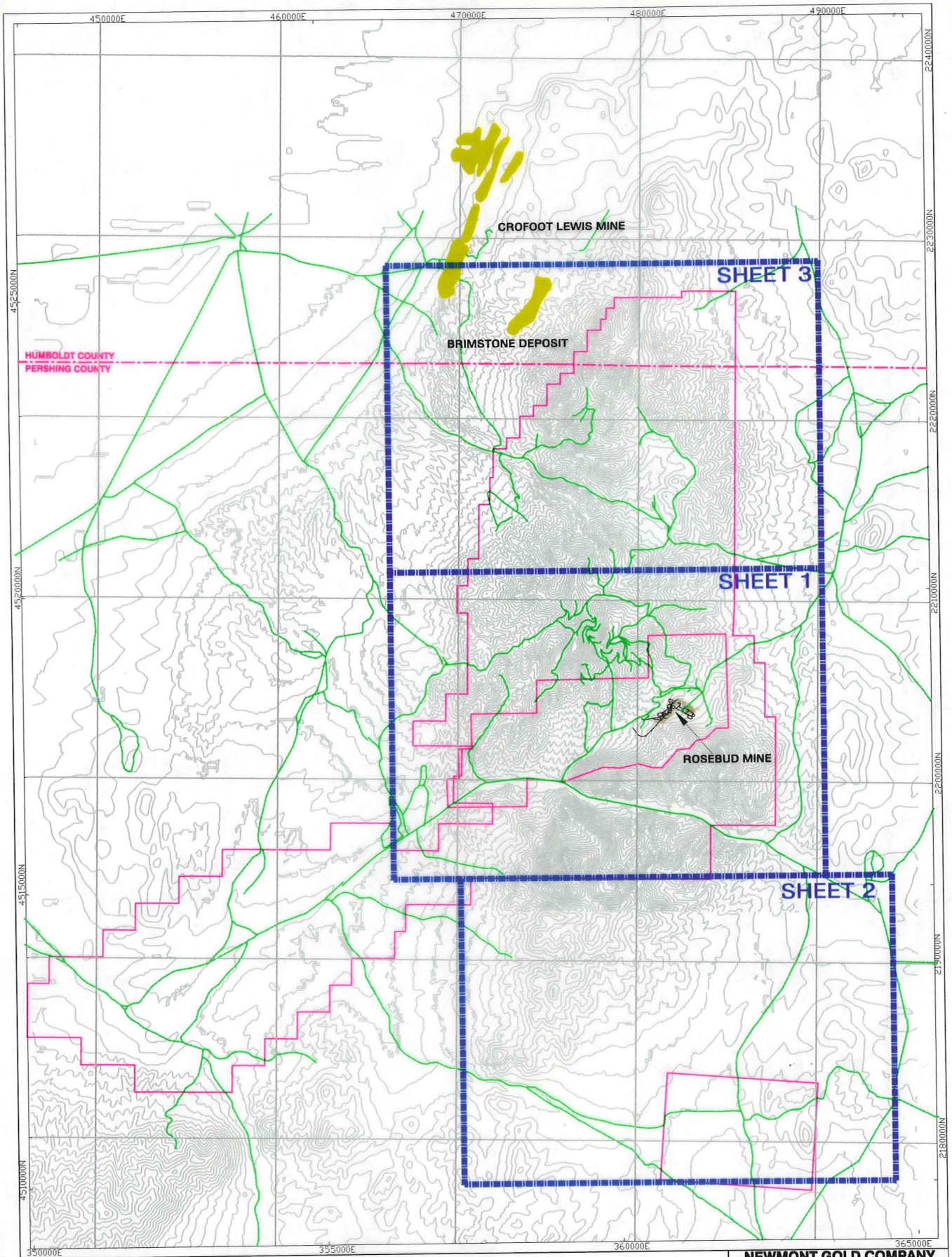
- Stockwork and dissemination of Mg-rich calcite + pyrite + marcasite + Ag sulfosalts + Ag selenides + Ag sulfides + native silver + auriferous Ag + electrum.

South Ore Zone Mineralization and Controls

- Within the Rosebud South Zone, there is a core of moderate to intense argillic alteration within the ore body. This core extends upward (proximal to structure) and outwards (along stratigraphy) into an intermediate zone of propylitic alteration ($CaCO_3$ - Chlorite dominant). This is overprinted by a halo of quartz-chalcedony-clay alteration assemblage. The external distal alteration package of the mineral deposit is a calcite assemblage. These zones overlap, which is suggestive of alteration overprinting due to a fluctuating hydrothermal cell.

East Zone Mineralization Events

- The main mineralization event appears to be quartz veining and silica flooding. Gold is present as gold-rich electrum either in silica or with marcasite + pyrite ± illite ± nacrite. Associated sulfides include pyrite, marcasite ± arsenopyrite ± chalcopyrite ± sphaelerite ± pyrrhotite ± galena. Barite and stibnite are common above the gold ore zone as are nacrite/dickite vienlets containing pyrargyrite.



Rosebud claim block

SCALE: 1"=2000' 1:24000

0 1000 2000 4000 6000

NEWMONT GOLD COMPANY

861 West 6th. Street
Winnemucca Nv.

Telephone (702) 623-3493
Fax (702) 623-1052

ROSEBUD MINING CO., LLC

INDEX MAP OF 6000 SCALE FOLIO SHEETS

FIGURE 2

PERSHING , NEVADA

GEOLOGIST	BY:	MODIFY BY	PLOT DATE	PLOT FILE	DRAWING FILE
R. Yenco	B. Alarcon/C.Olsen		05-11-98	RB-MAP2	RBMAP2.dwg

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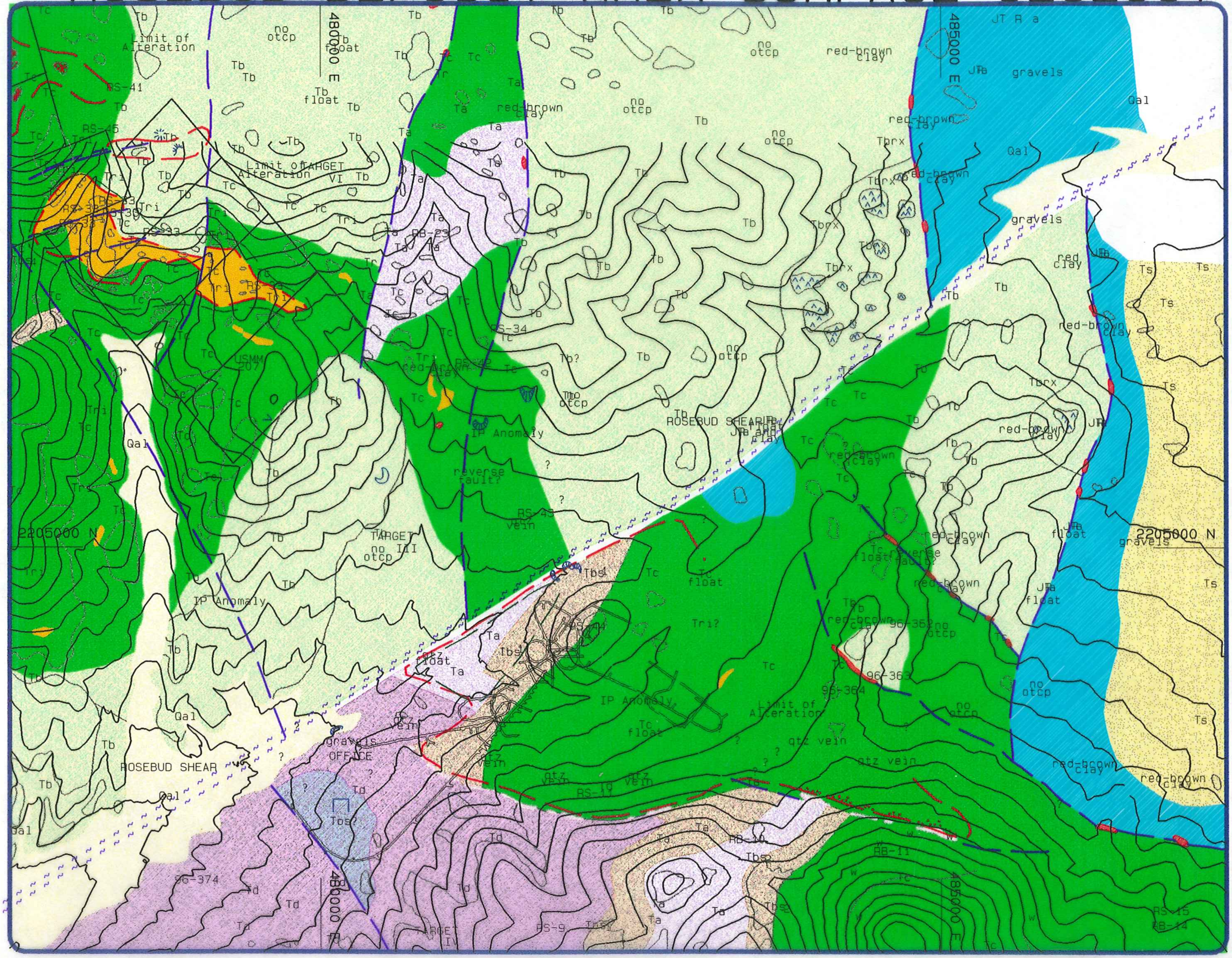

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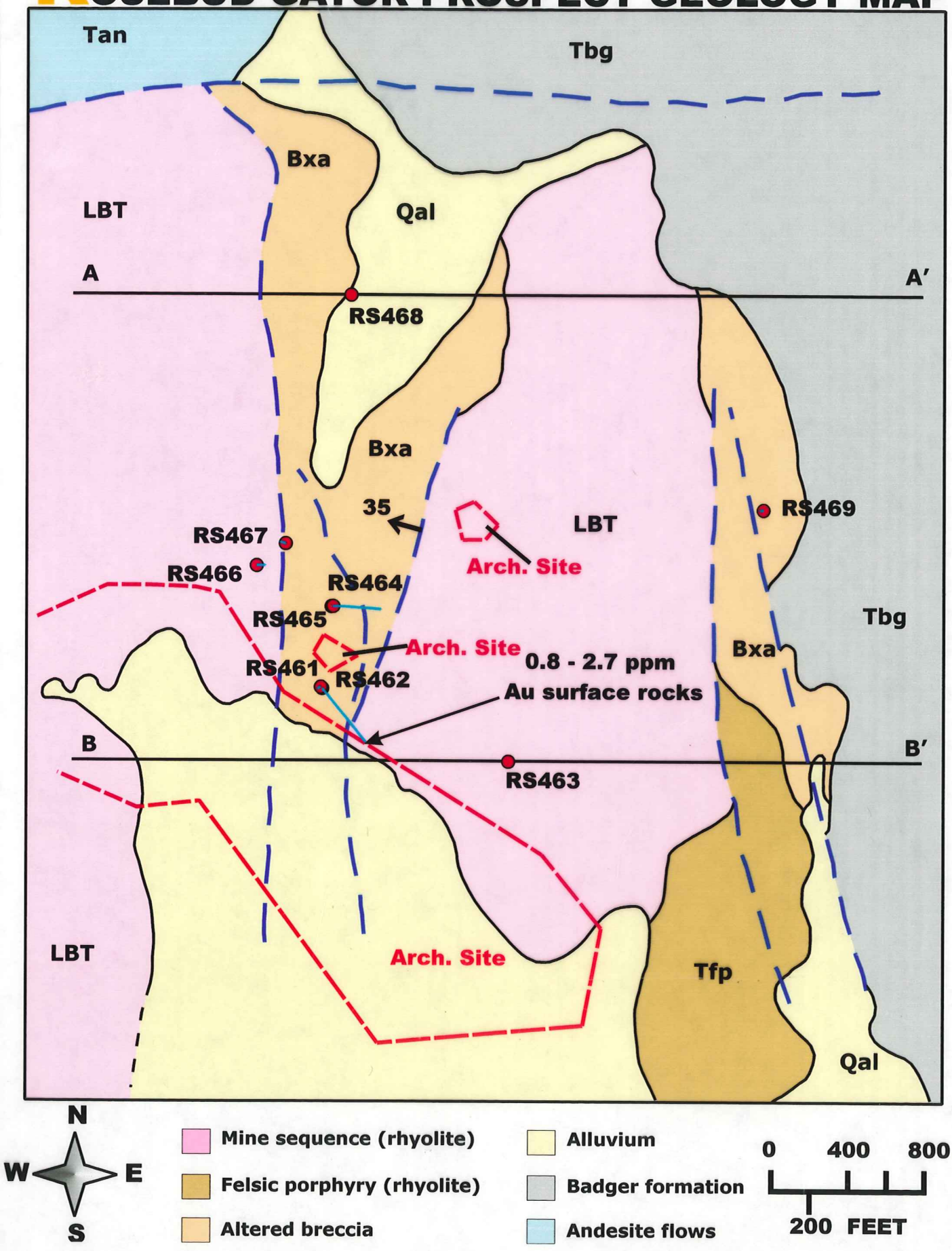
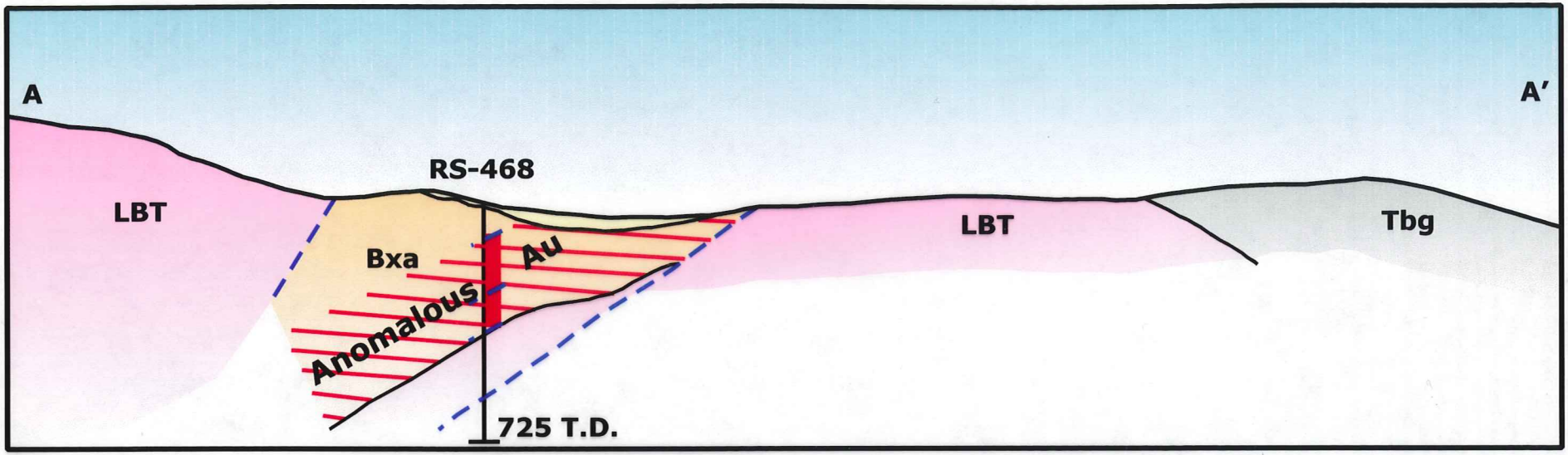
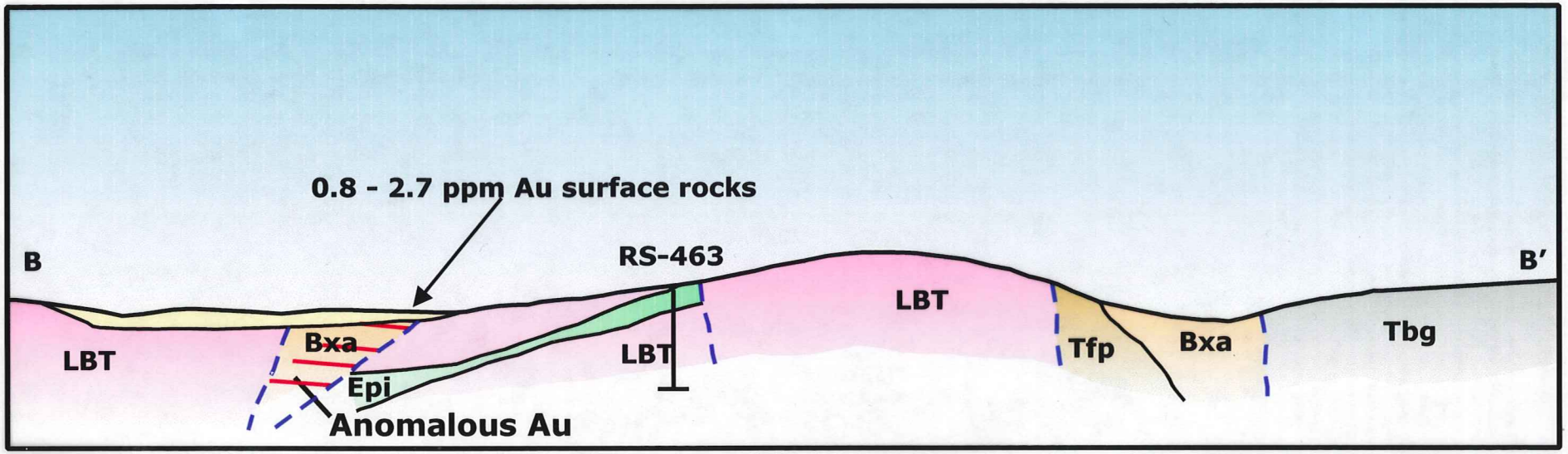
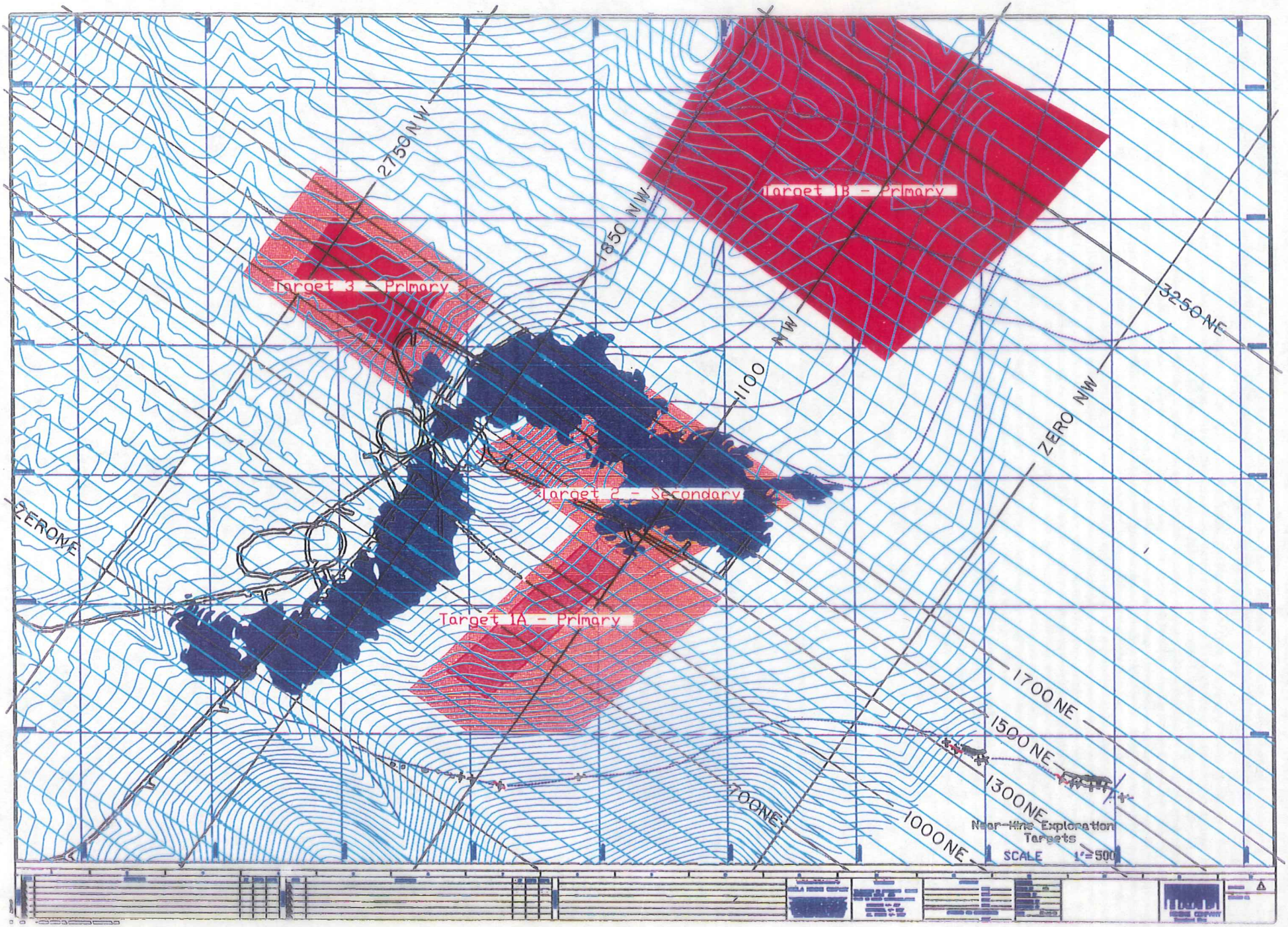
ROSEBUD GATOR PROSPECT GEOLOGY MAP

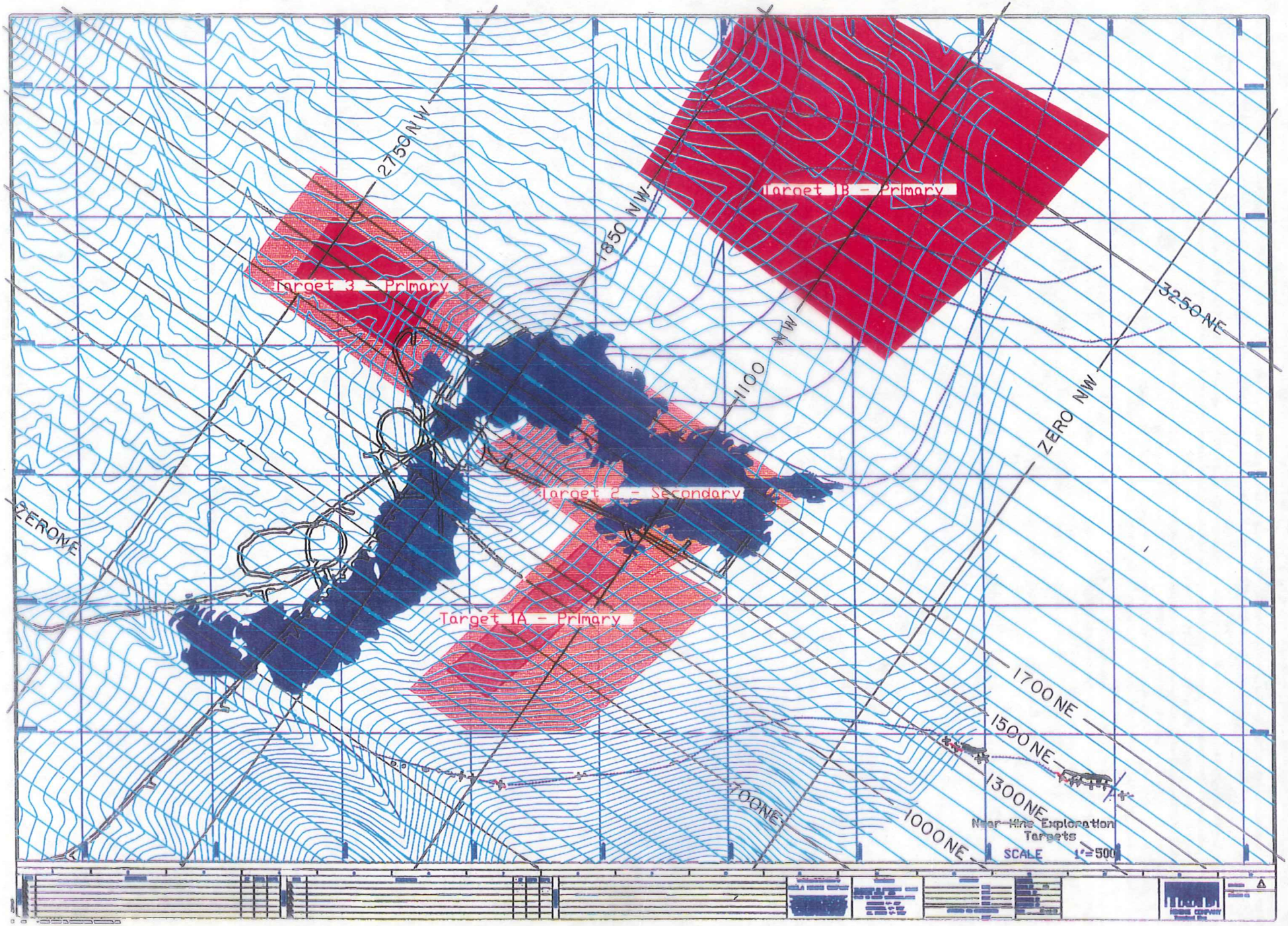


ROSEBUD GATOR PROSPECT CROSS SECTIONS



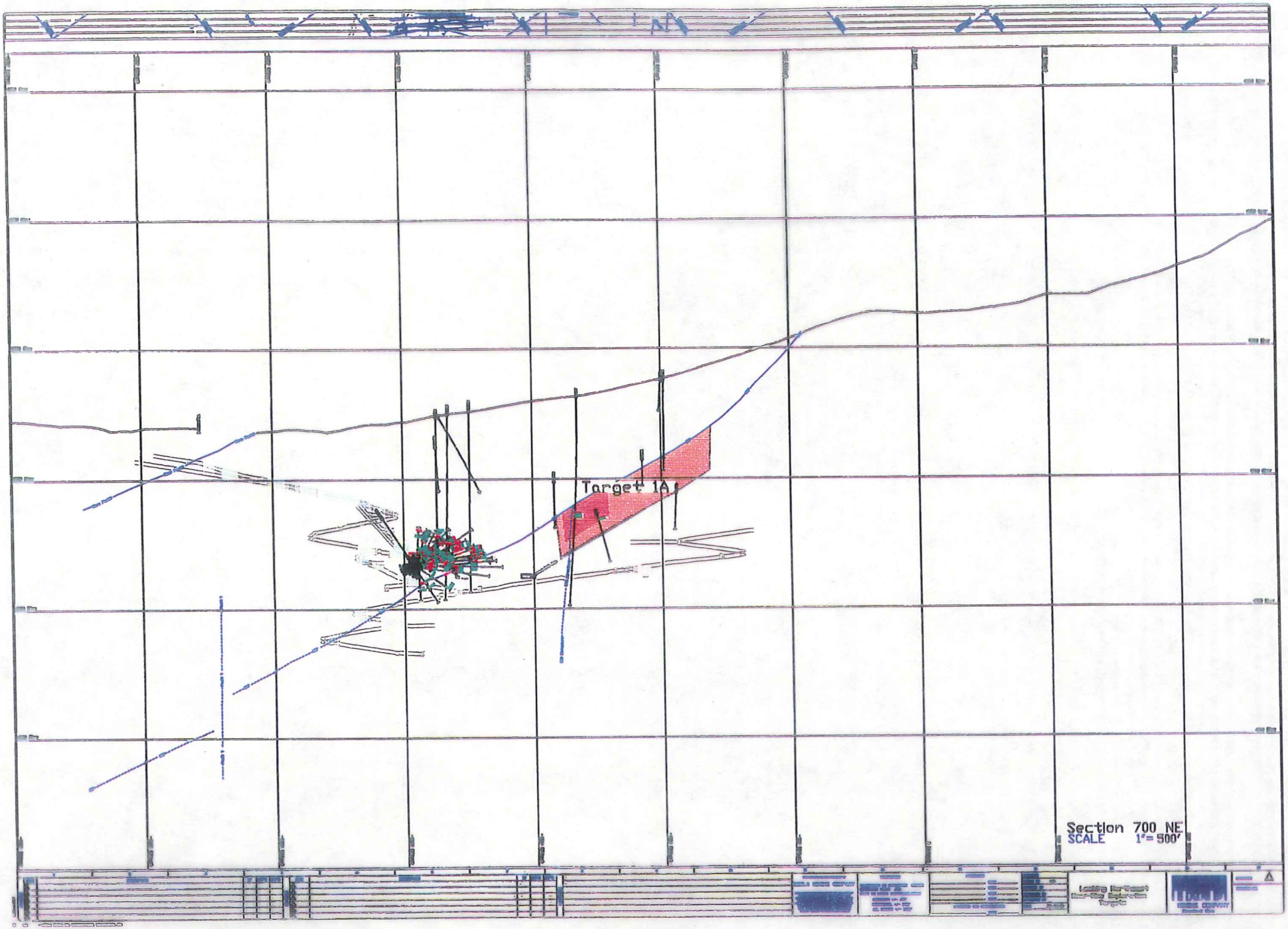


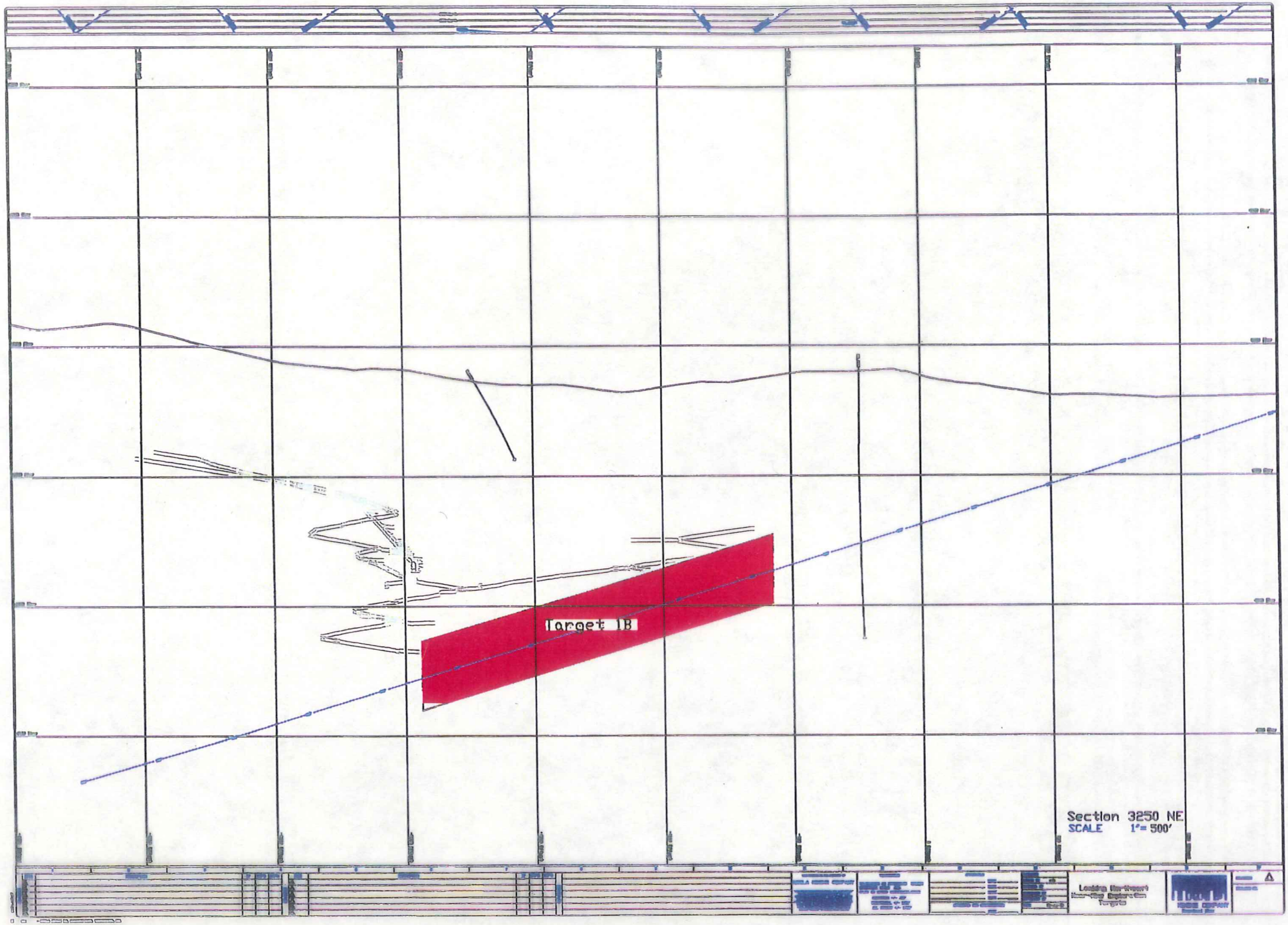

Target 1B - Primary
Target 3 - Primary
Target 2 - Secondary
Target 1A - Primary
2750 NW
1850 NW
1100 NW
ZERO NW
3250 NE
ZERO NE
1700 NE
1500 NE
1300 NE
1000 NE
700 NE
Near-Mine Exploration Targets
SCALE 1"=500'

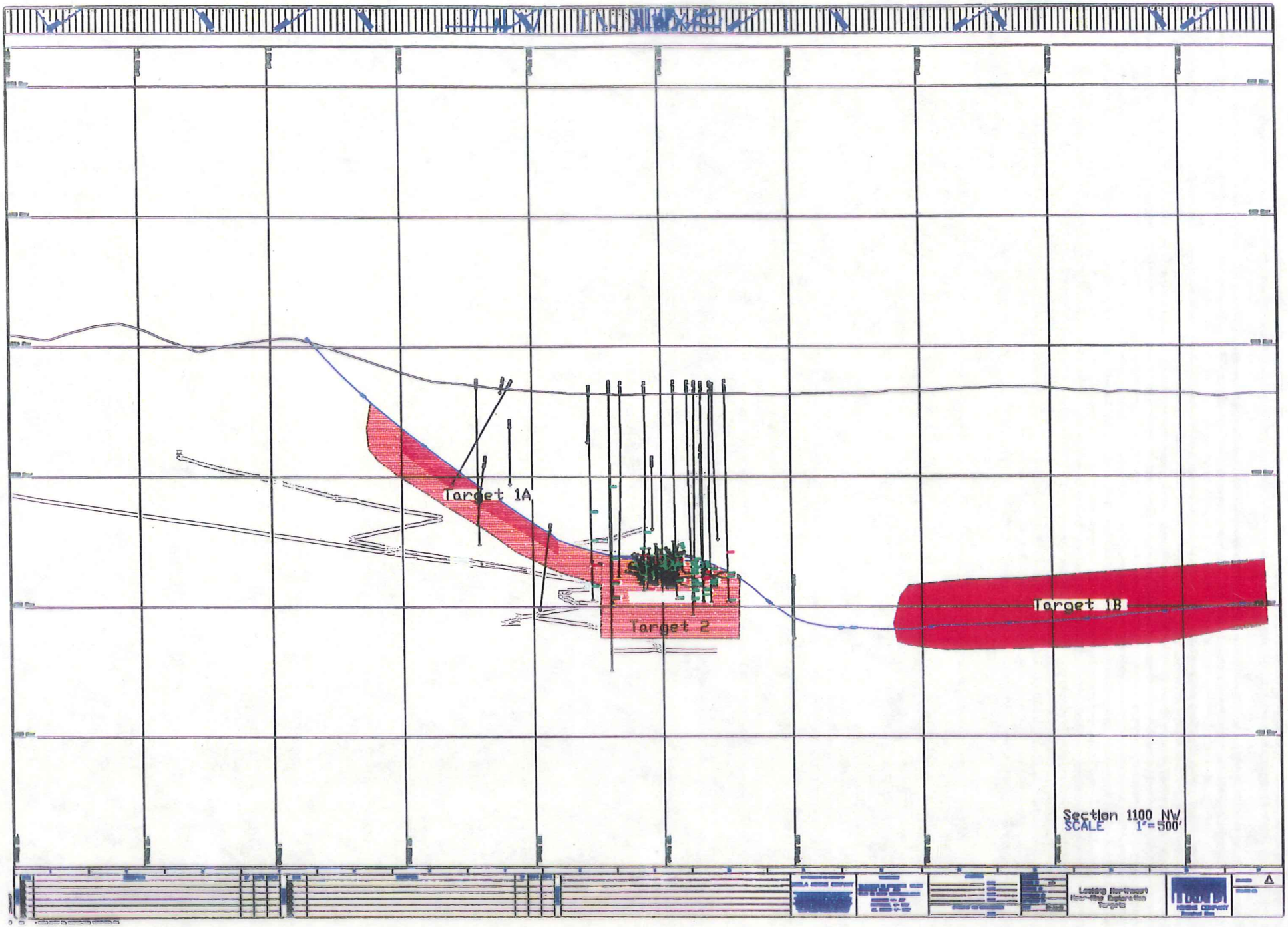

Target 1B - Primary
Target 3 - Primary
Target 2 - Secondary
Target 1A - Primary
2750 NW
1850 NW
1100 NW
ZERO NW
3250 NE
ZERO NE
1700 NE
1500 NE
1300 NE
1000 NE
700 NE
Near-Mine Exploration Targets
SCALE 1"=500'

1999 ROSEBUD NEAR MINE UNDERGROUND EXPLORATION DRILLING

DRILL STATION/ SECTION #	TARGET	LAYOUT TARGET	TARGET TESTED	DRILL HOLE #	DIP	BEARING	TOTAL DEPTH	ZONE
North Decline Sect# 1350	2b	d - ALS	EZ/NZ Feeder 24	RS-D340-99	-33	S55E	960	East
North Zone X-Cut Sect# 1475	2b	a - ALS	NZ Feeder 24	RS-D341-99	-14	S55E	600	East
North Zone X-Cut Sect# 1700	2b	b - ALS	NZ Feeder 24	RS-D342-99	-5	S55E	600	East
North Zone X-Cut Sect# 1700	2b	c - Td	NZ Feeder 24	RS-D343-99	13	S55E	749	East
North Zone X-Cut Sect# 1700	6	c -Td,Tcs	D343 Intercept	RS-D344-99	6	S55E	600	NORTH
North Zone X-Cut Sect# 1500	3	a - Td	356 Intercept	RS-D345-99	-26	N55W	1000	356
North Zone X-Cut Sect# 1500	3	b - ALS	Basement	RS-D346-99	-40	N55W	558	356
Stope 41 Muck Bay	5	a - RL220	Far East	RS-D347-99	45	S75E	658	Far East
Stope 41 Muck Bay	5	b - RL273	Far East	RS-D348-99	30	S85E	400	Far East
Stope 41 Muck Bay	5	c - RL214	Far East	RS-D349-99	-44	N85E	524	Far East
Stope 41 Muck Bay	5	d - Shark	Sharkfin	RS-D350-99	-30	S05E	824	Far East
Vent Raise Bay	2a	a	97-379c Intercept	RS-D351-99	-21	S67E	200	East
Vent Raise Bay	2a	b	97-379c Intercept	RS-D352-99	-59	S67E	253	East
Vent Raise Bay	2a	c	97-379c Intercept	RS-D353-99	-30	S38E	367	East
Drill Station 2300	4	c	South Zone Feeders	RS-D354-99	-40	N50W	1477	SOUTH
Drill Station 2300	1a	a	1a and Sharkfin		39	South		SOUTH
North Zone X-Cut Sect# 1700+	2b	c -Td,Tcs	D343 Intercept	RS-D356-99	10	S62E	598	NORTH
North Zone X-Cut Sect# 1650	2b	c -Td,Tcs	D343 Intercept	RS-D357-99	5	S55E	870	NORTH
North Zone X-Cut Sect# 1550	3	a - Td	D345 Intercept	RS-D358-99	-30	N55W	800	356
North Zone Muck Bay	3	a - Td	D345 Intercept	RS-D359-99	-37	N50W	602	356
North Zone Muck Bay	3	a - Td	D345 Intercept	RS-D363-99	-36	N40W	742	356
25 MUCK BAY	7	ALS	NW TREND	RS-D355-99	-30	N55W	1452	NW
25 MUCK BAY	7	ALS	NW TREND		-36	N55W		NW
25 MUCK BAY	7	ALS	NW TREND	RS-D364-99	-31	N35W	1703	NW
25 MUCK BAY	7	ALS	NW TREND	RS-D365-99	-42	N35W	974	NW
25 MUCK BAY	7	FAULT	NW TREND	RS-D366-99	-42	N25W	710	NW
25 MUCK BAY	7	FAULT	NW TREND	RS-D367-99	-38.5	N20W	942	NW
				25 holes totalling			19163	


Target 1A
Section 700 NE
SCALE 1"= 500'


Target 1B
Section 3250 NE
SCALE 1"= 500'


Target 1A
Target 2
Target 1B
Section 1100 NW
SCALE 1"=500'

FAR EAST AND SHARKFIN ASSAY RESULTS

TARGET	HOLE	FROM	TO	INTERVAL	GOLD GRADE	SILVER GRADE
5	RS-D347-99	NO SIGNIFICANT INTERCEPTS				
	RS-D348-99	NO SIGNIFICANT INTERCEPTS				
	RS-D349-99	317'	318.3'	1.3'	0.211 opt	0.29 opt
		462.2'	464.2'	2'	0.214 opt	0.77 opt
	RS-D350-99	NO SIGNIFICANT INTERCEPTS				

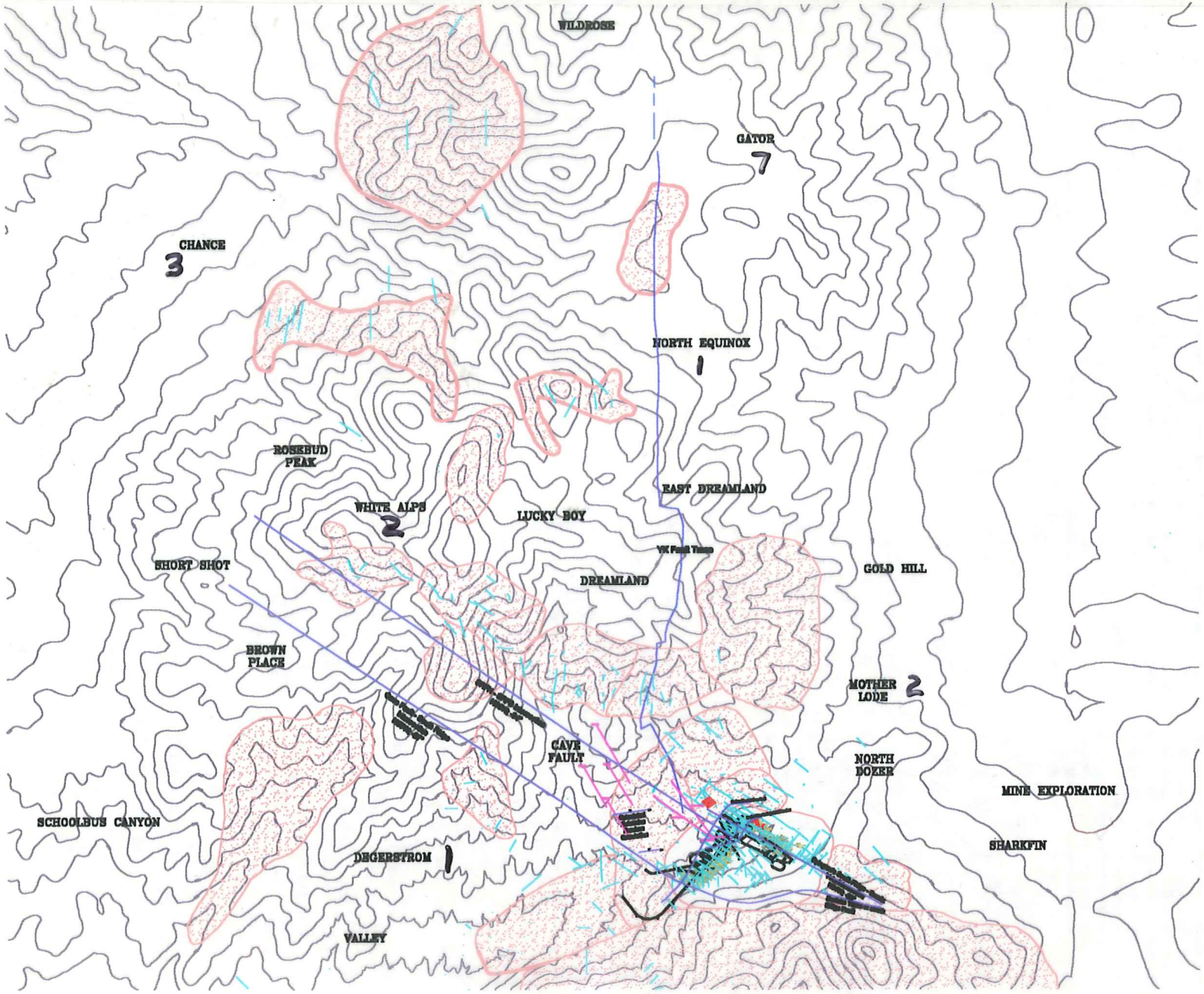
97-379 VENT RAISE ASSAY RESULTS

TARGET	HOLE	FROM	TO	INTERVAL	GOLD GRADE	SILVER GRADE
2a	RS-D351-99	69.7'	72.1'	2.4'	1.125 opt	2.14 opt
	RS-D352-99	NO SIGNIFICANT INTERCEPTS				
	RS-D353-99	59'	66.5'	7.5'	0.247 opt	0.24 opt

SOUTH ZONE FEEDER TARGET ASSAY RESULTS

TARGET	HOLE	FROM	TO	INTERVAL	GOLD GRADE	SILVER GRADE
4	RS-D354-99	NO SIGNIFICANT INTERCEPTS				

ROSEBUD AREA EXPLORATION TARGETS



1999 ROSEBUD SURFACE EXPLORATION DRILLING

Hole ID	Target	Inclination	Bearing	RVC Pre-Collar	Core Tail	Total Depth
RS-457	Mother Lode	-90		1,465		1,465
RS-458	Mother Lode	-60	N55W	1,765		1,765
RS-459	White Alps	-90		1,578	505	2,082
RS-460	White Alps	-90		1,701	410	2,111
RS-461	Gator	-90		480		480
RS-462	Gator	-50	S45E	585		585
RS-463	Gator	-90		500		500
RS-464	Gator	-50	East	385		385
RS-465	Gator	-90		520		520
RS-466	Gator	-64.5	East	455		455
RS-467	Gator	-90		1,425		1,425
RS-468	Gator	-90		725		725
RS-469	Gator	-75	West	485		485
RS-470	Chance	-90		750		750
RS-471	Chance	-90		1,115		1,115
RS-472	Chance	-90		755		755
RS-473	North Equinox	-90		1,345		1,345
RS-474	Degerstrom	-90		1,860	387	2,247
RS-475	Northwest Corridor	-60	S30E	1,600	1,400	3,000
RS-476	Northwest Corridor	-55	S30E	1,000	808	1,808
RS-477	Northwest Corridor	-55	S30E	1,540	692	2,232
RS-478	Northwest Corridor	-55	S30E	1,600	797	2,397
22 Drill Holes Totaling				23,634	4,998	28,631

1999 ROSEBUD SURFACE EXPLORATION ASSAY RESULTS

1999 MOTHER LODE TARGET ASSAY RESULTS

HOLE	FROM	TO	INTERVAL	GOLD GRADE	SILVER GRADE
RS-457	NO SIGNIFICANT INTERCEPTS				
RS-458	NO SIGNIFICANT INTERCEPTS				

1999 WHITE ALPS TARGET ASSAY RESULTS

HOLE	FROM	TO	INTERVAL	GOLD GRADE	SILVER GRADE
RS-459	NO SIGNIFICANT INTERCEPTS				
RS-460	NO SIGNIFICANT INTERCEPTS				

1999 GATOR TARGET ASSAY RESULTS

HOLE	FROM	TO	INTERVAL	GOLD GRADE	SILVER GRADE
RS-461	NO SIGNIFICANT INTERCEPTS				
RS-462	140'	180'	40'	0.016 opt	0.15 opt
RS-463	NO SIGNIFICANT INTERCEPTS				
RS-464	NO SIGNIFICANT INTERCEPTS				
RS-465	5'	10'	5'	0.051 opt	0.22 opt
RS-466	80'	95'	15'	0.012 opt	0.07 opt
RS-467	235'	250'	15'	0.013 opt	0.08 opt
	265'	290'	25'	0.013 opt	0.08 opt
RS-468	545'	550'	5'	0.017 opt	0.04 opt
RS-469	NO SIGNIFICANT INTERCEPTS				

1999 CHANCE TARGET ASSAY RESULTS

HOLE	FROM	TO	INTERVAL	GOLD GRADE	SILVER GRADE
RS-470	NO SIGNIFICANT INTERCEPTS				
RS-471	5'	10'	5'	0.034 opt	
RS-472	NO SIGNIFICANT INTERCEPTS				

1999 ROSEBUD SURFACE EXPLORATION ASSAY RESULTS

1999 NORTH EQUINOX TARGET ASSAY RESULTS

HOLE	FROM	TO	INTERVAL	GOLD GRADE	SILVER GRADE
RS-473	400'	420'	20'	0.027 opt	

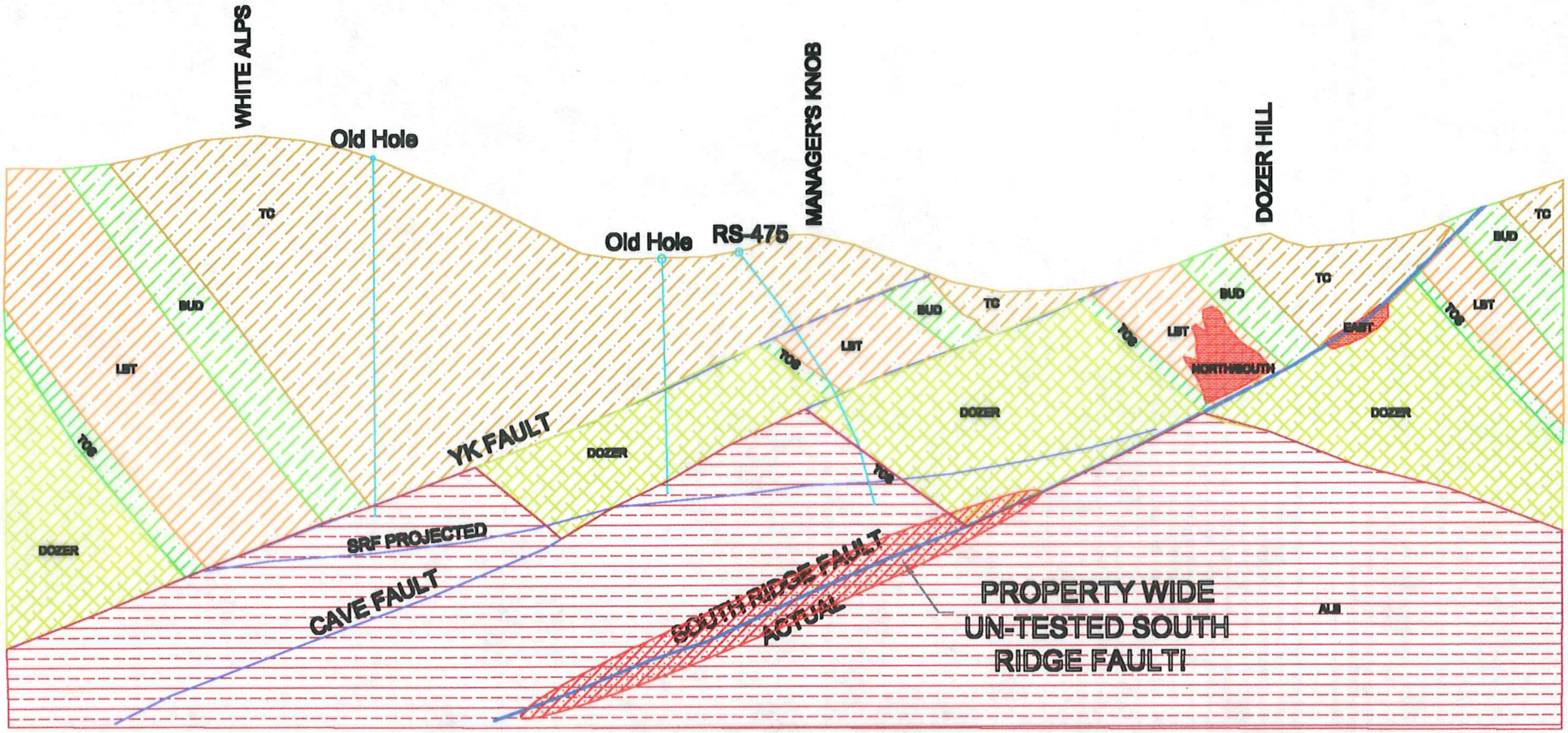
1999 DEGERSTROM TARGET ASSAY RESULTS

HOLE	FROM	TO	INTERVAL	GOLD GRADE	SILVER GRADE
RS-474	1850'	1855'	5'	0.207 opt	

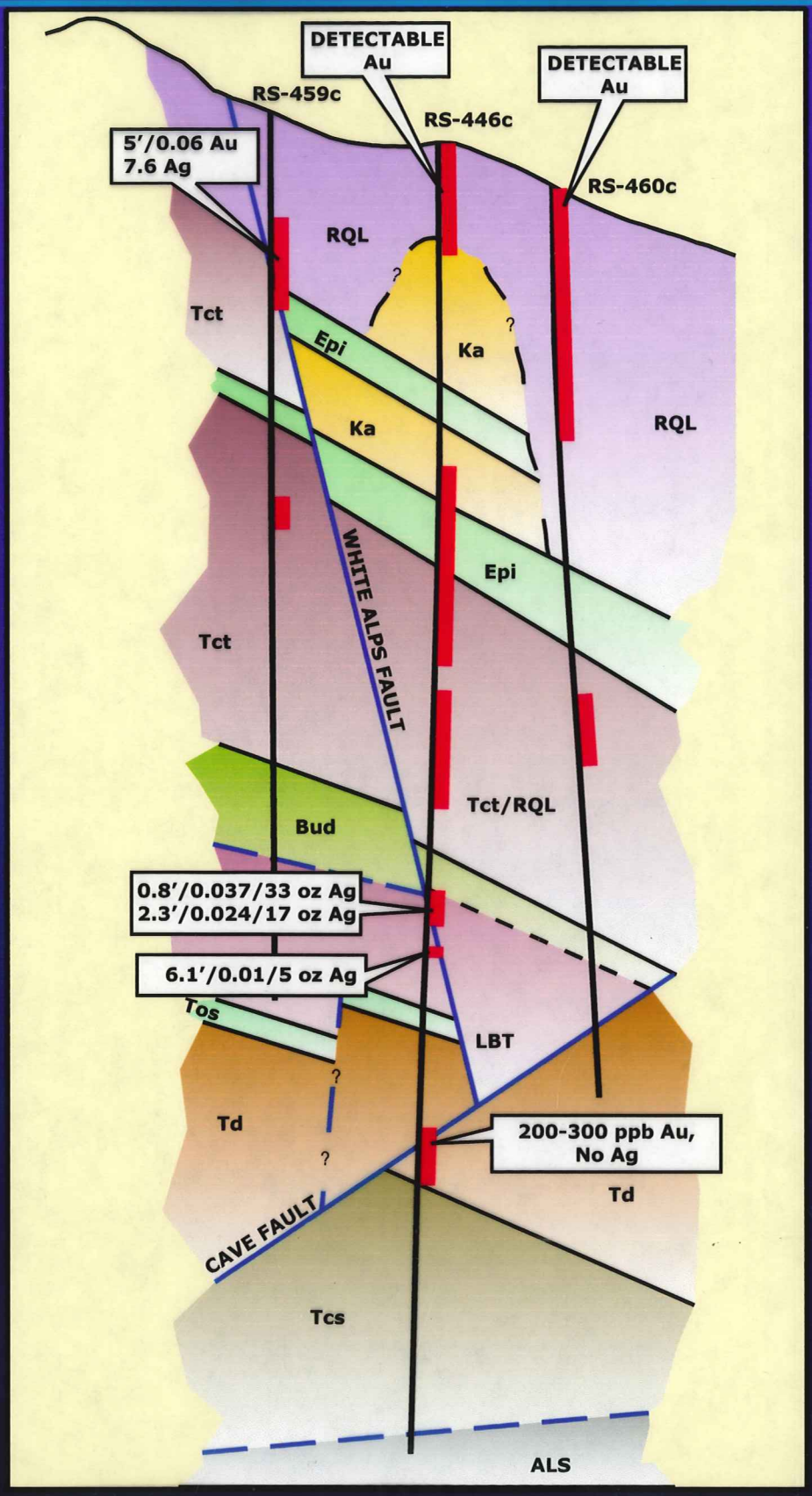
1999 NORTHWEST CORRIDOR TARGET ASSAY RESULTS

HOLE	FROM	TO	INTERVAL	GOLD GRADE	SILVER GRADE
RS-475	NO SIGNFICANT INTERCEPTS				
RS-476	725'	730'	5'	0.012 opt	0.08 opt
	1245'	1276.5'	31.5'	0.017 opt	0.06 opt
	1276.5'	1808'	PENDING		
RS-477	0'	1540'	NO SIGNIFICANT INTERCEPTS		
	1540'	2232'	PENDING		
RS-478	0'	1600'	NO SIGNIFICANT INTERCEPTS		
	1600'	2396.5'	PENDING		

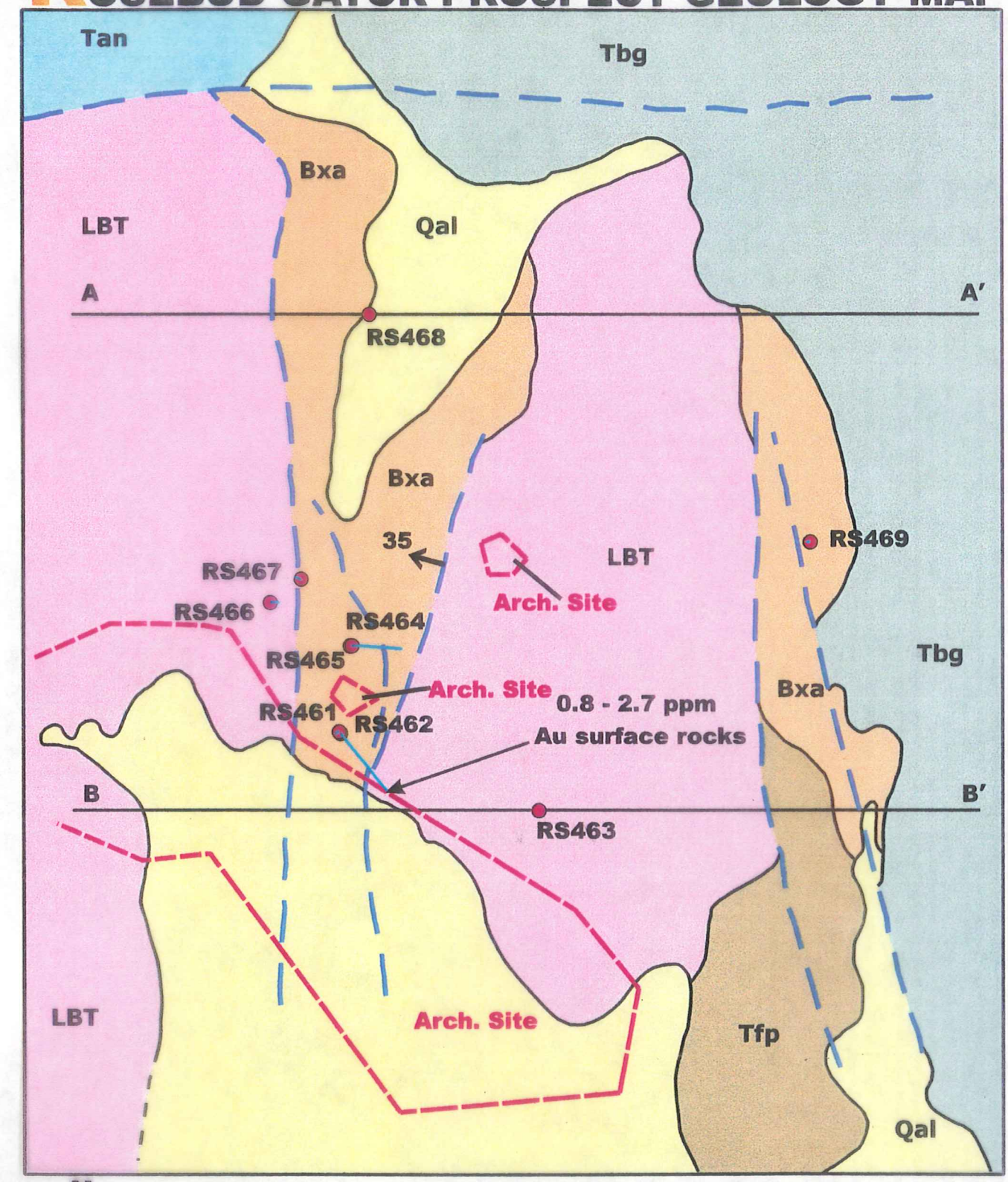
RE-INTERPRETED GEOLOGIC SECTION THROUGH THE NORTHWEST CORRIDOR



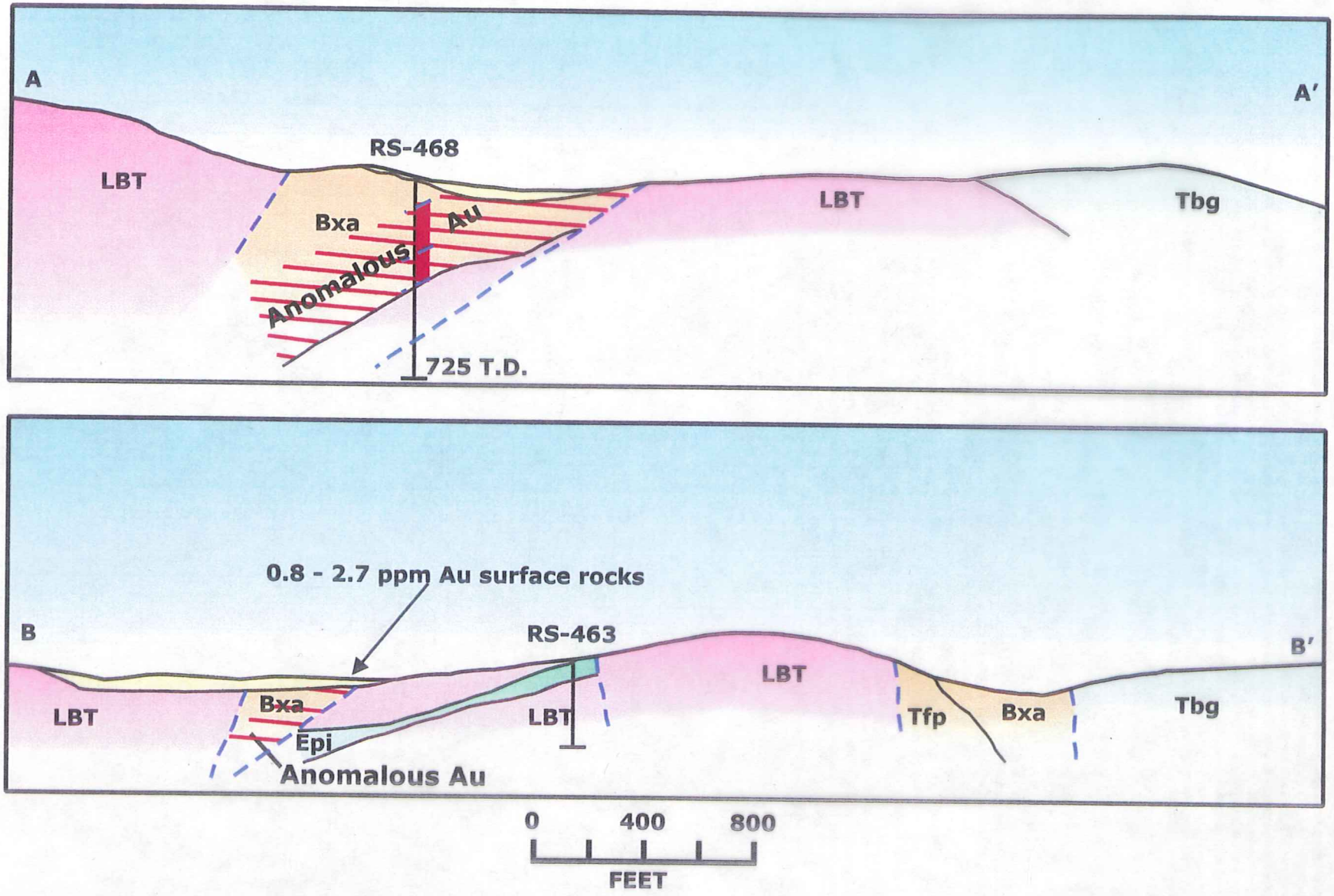
ROSEBUD WHITE ALPS 2500 NW CROSS-SECTION



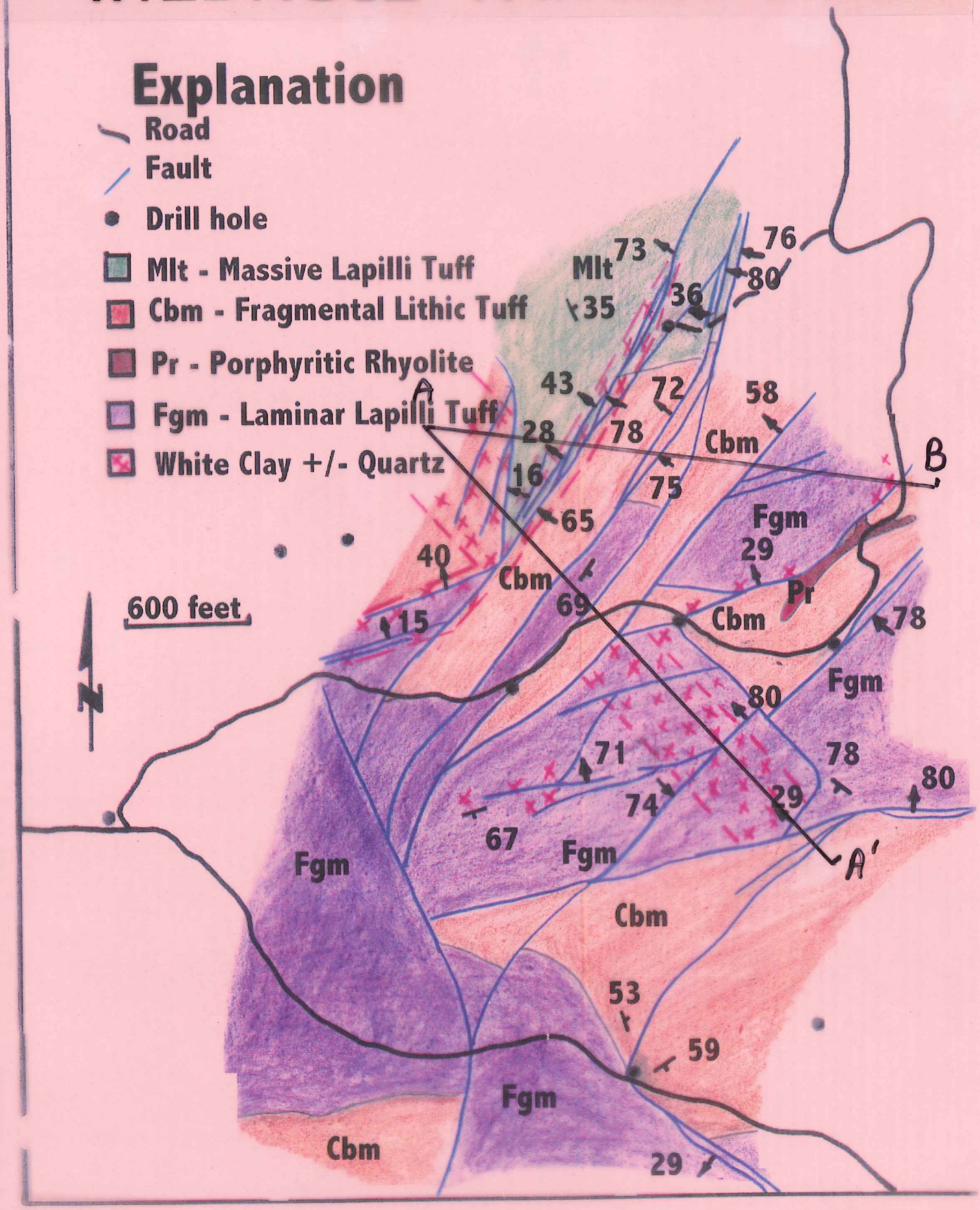
ROSEBUD GATOR PROSPECT GEOLOGY MAP



ROSEBUD GATOR PROSPECT CROSS SECTIONS



WILDROSE TARGET AREA



WILDROSE TARGET ARE

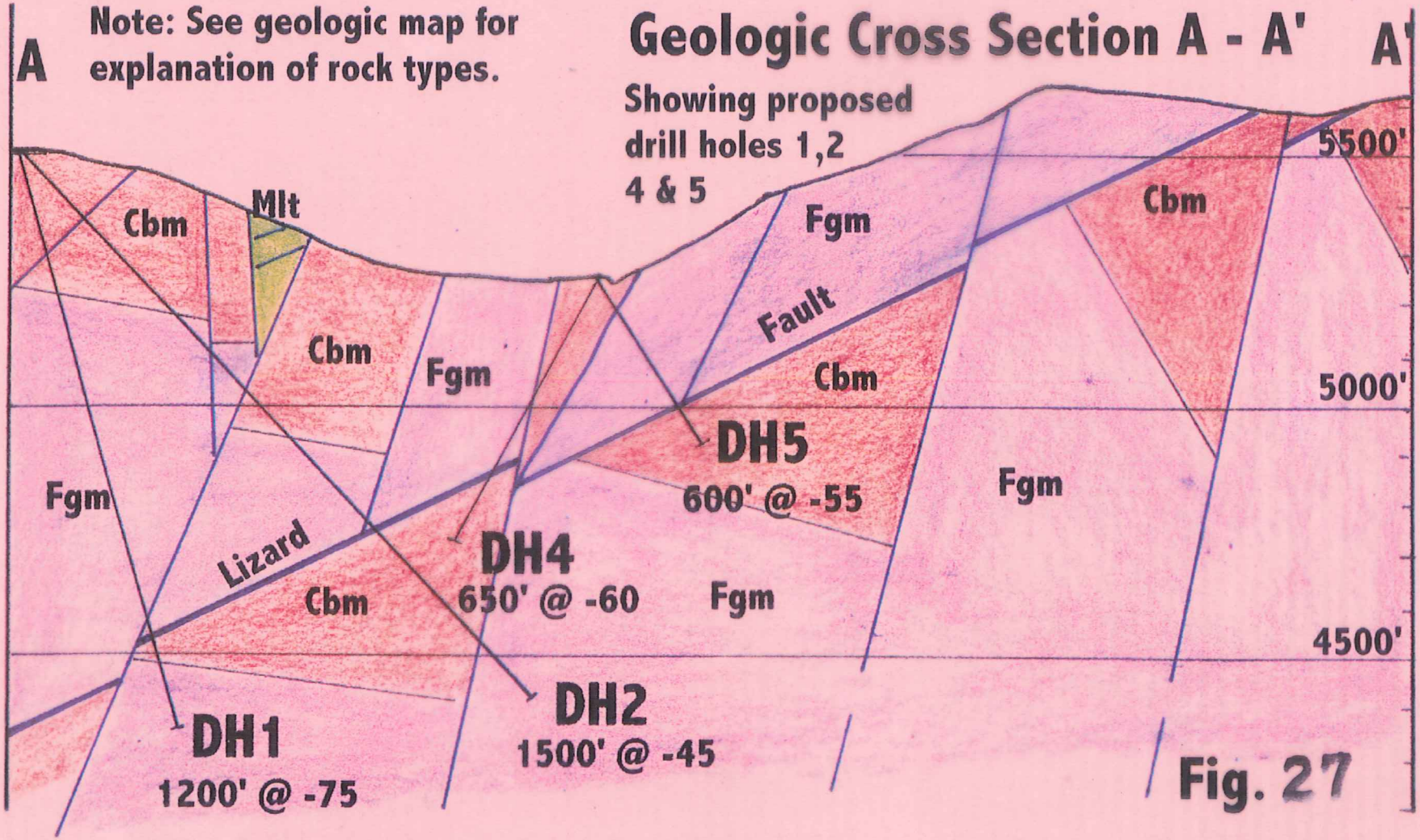


Fig. 27

WILDROSE TARGET AREA

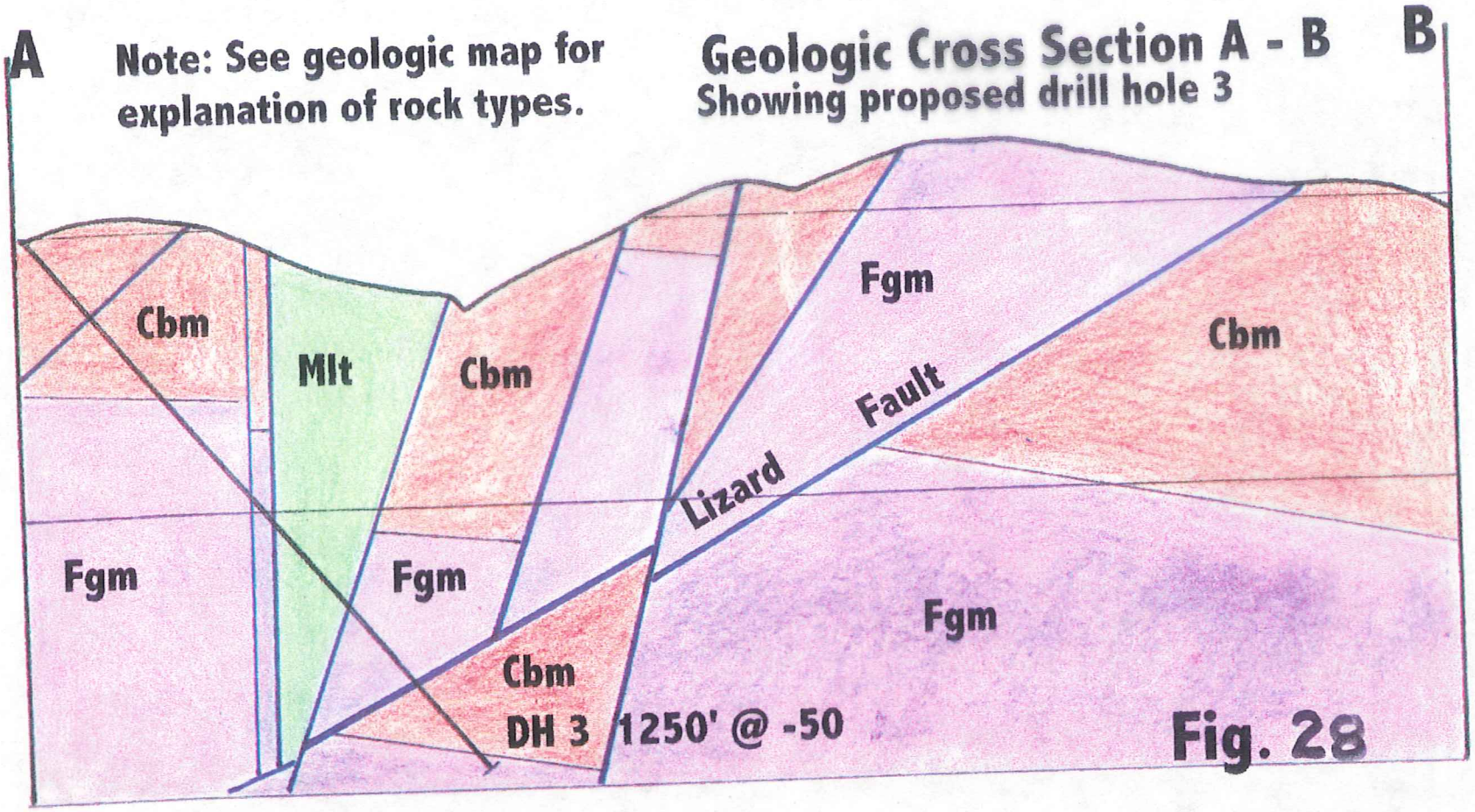


Fig. 28

Project: Northwest Corridor Target

Target(s): Underground Minable Bonanza Stockwork Zone

Administrator: Kurt D. Allen, Chief Geologist, Rosebud

Staff: Pat Lassiter

Description: The goal of this program is to identify underground minable gold and silver orebodies. A description of the project and the work program follows:

The Northwest Corridor target encompasses an area approximately 1,500 feet wide by in excess of 10,000 long. The zone begins at the Rosebud deposit and is oriented lengthways along a N55° to 61°W strike. This Target zone was defined as the result of the drill hole re-logging and systematic geologic cross-section creation program during 1999. Understanding the South Ridge and Cave faults control on the Rosebud deposits and the structural relationships between them define the boundaries of the Northwest Corridor target.

The Northwest Corridor target area is underlain by the complete Miocene Kamma Mountain volcanic sequence which is in turn underlain by the Triassic-Jurassic Auld Lang Syne Formation consisting dominantly of graphitic phyllites. The Rosebud deposit host rocks exist throughout the Northwest Corridor target area

Structure is the main defining feature of the Northwest Corridor Target. The southwestern boundary of this target is defined by the intersection between the main shear Cave fault and the conjugate shear South Ridge fault. The rake of this intersection is oriented N55°W; 27°. It is important to note that the South Ridge fault terminates against the Cave fault, and that the Rosebud deposits currently being mined occur between the two structures (footwall side of the Cave fault and within and the hanging wall side of the South Ridge fault). The northeastern boundary of this target is defined by the calculated rake of the intersection between the South Ridge fault in the East ore zone and the quartz outcrops at the surface (conjugate shear). This intersection rakes N61°W; 25°, which matches the mineralization trend between the East and North zone quite well. In addition, plotting the rake between the orientation of the South Ridge fault in the South zone and the orientation of the South Ridge fault in the North zone, shows a N58°W; 34° orientation which is the orientation of the strike inflection of the South Ridge fault. This strike inflection is the major controlling factor in the location of the North and East zones at Rosebud and the intersection between the South Ridge fault and volcanic stratigraphy is the major controlling factor in the location of the South zone at Rosebud.

It is believed that the main fluid flow channel for the mineralizing fluids at Rosebud occurs along the South Ridge fault and near the zone of strike inflection described above. Recent underground drilling in that area has returned intercepts of 16 feet of 0.445 Au oz/ton and 9' to 0.245 Au oz/ton. Two offset holes have been drilled, one returning 0.4 feet of 0.281 Au oz/ton in a zone 36.6 feet thick averaging 0.059 Au oz/ton, with the results of the other hole pending. This zone is located approximately 400 feet southwest of the 345 target and intercept, and appears to be related to the same structural zone. A

drift is currently being driven in order to set a drill station which will allow further exploration drilling into both of the above described zones from a much better drilling angle.

Continued mapping, sampling, cross-section construction, and drilling compose the work program for 2000.

Detailed mapping and sampling along with continued geologic and geochemical cross-section construction within the Northwest Corridor target area boundary will be completed during 2000. The above work will further define and refine the target zones within the Northwest Corridor Target boundary.

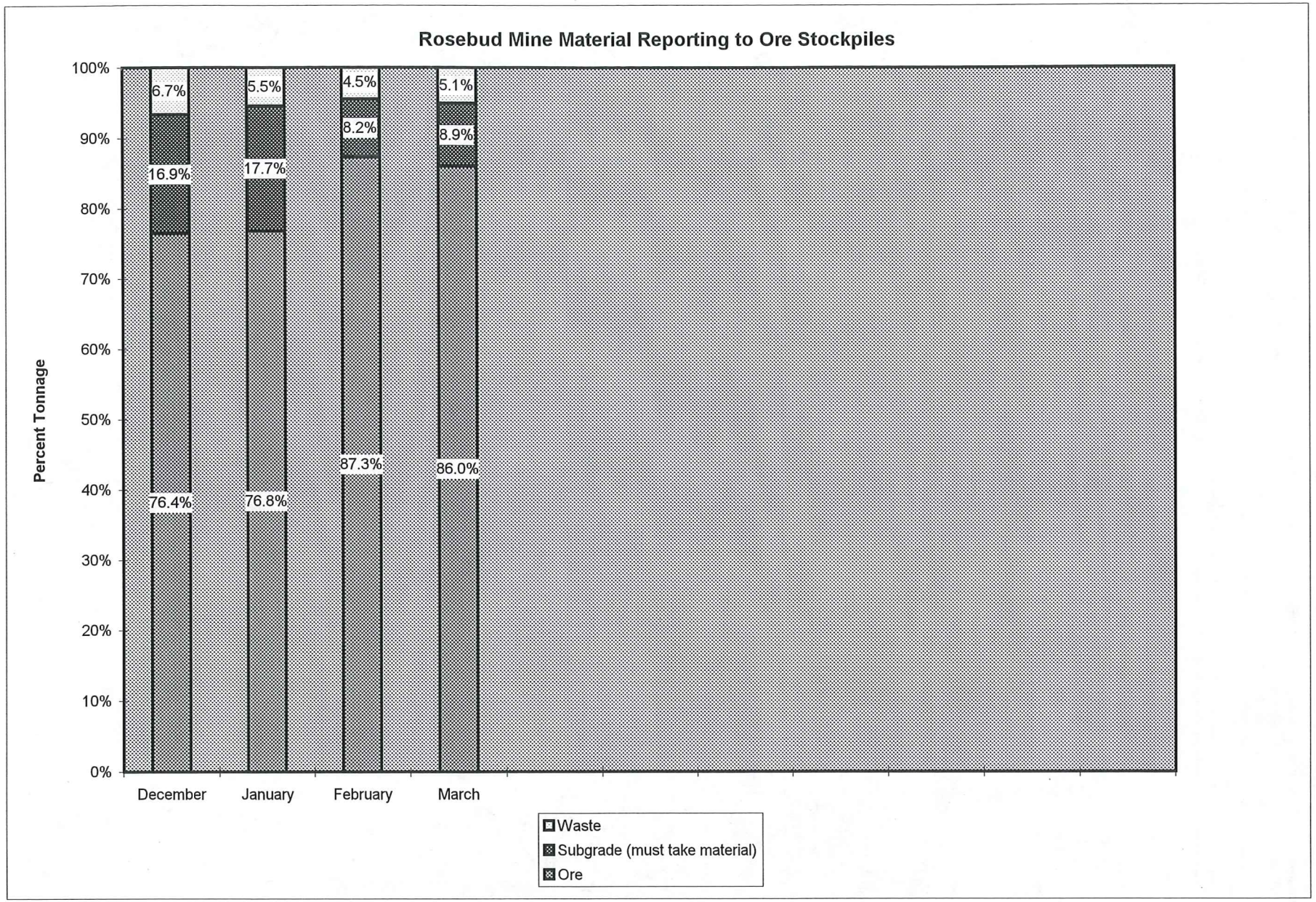
Drilling during 2000 will consist of 15 underground core holes, 5 reverse circulation drill holes and 3 reverse circulation pre-collars with core tails. The 15 underground core holes will be drilled from the new drill station currently being driven to test the extent of mineralization in the 365 intercept. The 5 reverse circulation drill holes will test the altered wedge of LBT that is bound between the Yellow Knob and Cave faults. The remaining 3 holes will be located based on results of the continued mapping and sampling of the target area.

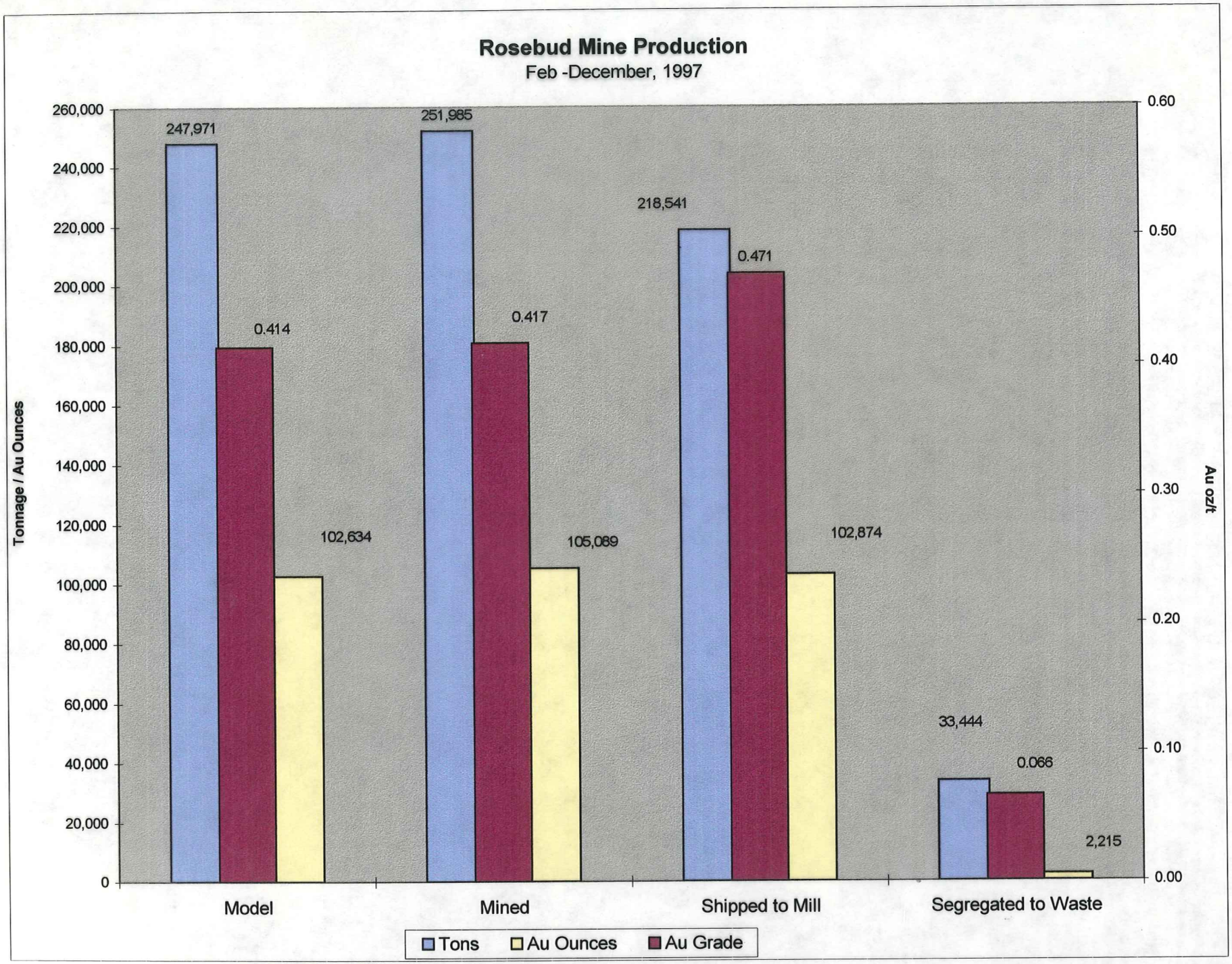
Comments:

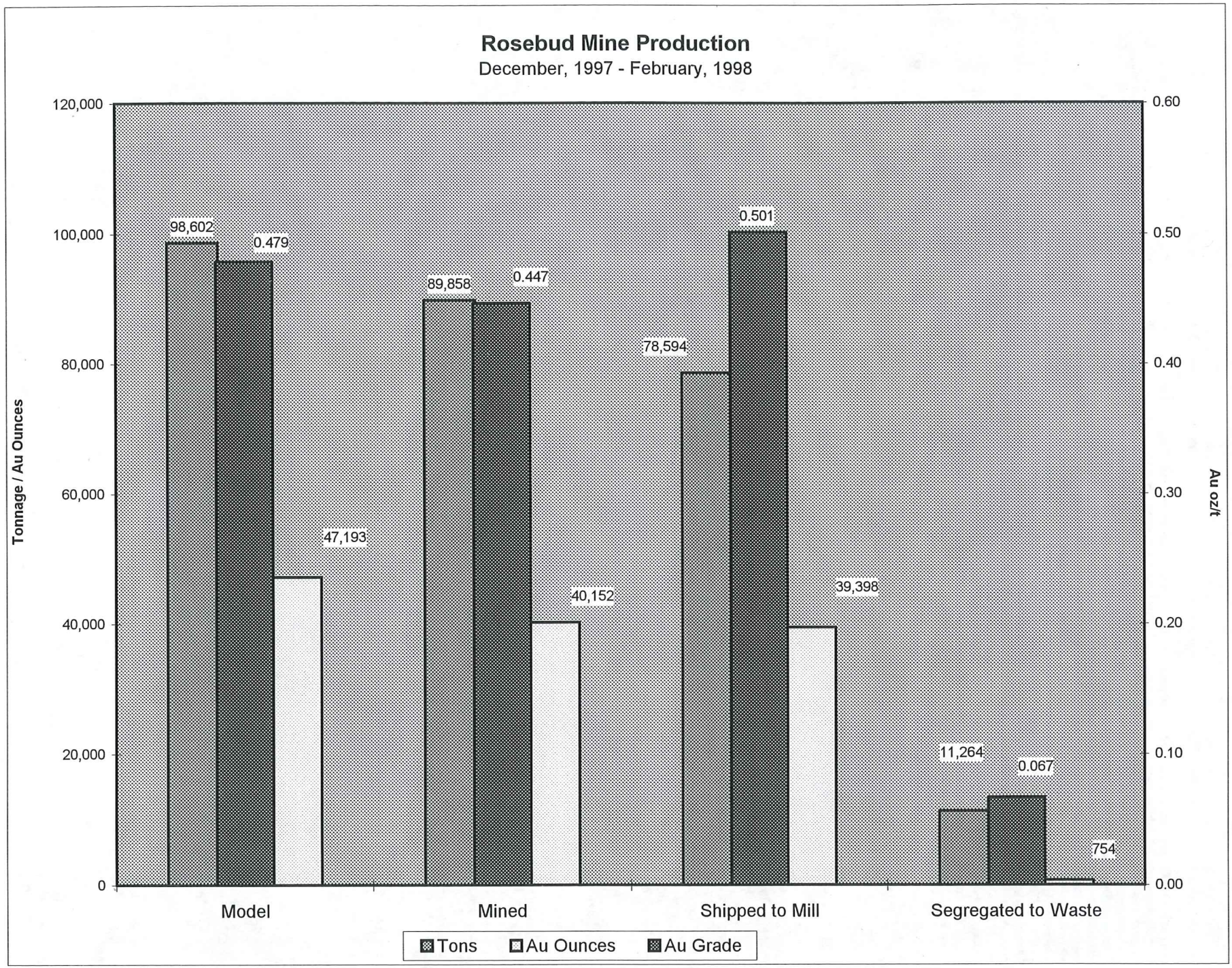
Area: Domestic

Type: Project

Cost: $999,000


Rosebud Mine Material Reporting to Ore Stockpiles
Percent Tonnage
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
6.7%
16.9%
76.4%
5.5%
17.7%
76.8%
4.5%
8.2%
87.3%
5.1%
8.9%
86.0%
December
January
February
March
Waste
Subgrade (must take material)
Ore


Rosebud Mine Production
Feb -December, 1997
Tonnage / Au Ounces
Au oz/t
260,000
240,000
220,000
200,000
180,000
160,000
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
0.60
0.50
0.40
0.30
0.20
0.10
0.00
247,971
0.414
102,634
251,985
0.417
105,089
218,541
0.471
102,874
33,444
0.066
2,215
Model
Mined
Shipped to Mill
Segregated to Waste
Tons
Au Ounces
Au Grade


Rosebud Mine Production
December, 1997 - February, 1998
Tonnage / Au Ounces
Au oz/t
120,000
100,000
80,000
60,000
40,000
20,000
0
0.60
0.50
0.40
0.30
0.20
0.10
0.00
98,602
0.479
47,193
89,858
0.447
40,152
78,594
0.501
39,398
11,264
0.067
754
Model
Mined
Shipped to Mill
Segregated to Waste
Tons
Au Ounces
Au Grade

Mill vs. Mine
1997

	Mine			Mill			Difference Mill vs. Mine			% Mill vs.Mine		
	Tons	Au Grade	Au Oz	Tons	Au Grade	Au Oz	Tons	Au Grade	Au Oz	Tons	Au Grade	Au Oz
Feb-March	24,090	0.459	11,049	26,656	0.372	9,960	2,566	-0.087	-1,089	10.6%	-19.0%	-9.9%
April	20,705	0.413	8,552	19,373	0.304	5,864	-1,332	-0.109	-2,688	-6.4%	-26.4%	-31.4%
May	16,099	0.359	5,775	16845	0.325	5,476	746	-0.034	-299	4.6%	-9.4%	-5.2%
MILL 2ND QUARTER ADJUSTMENT						4,435						
June	15,394	0.554	8,529	17797	0.570	10,149	2,403	0.016	1,620	15.6%	2.9%	19.0%
July	22,528	0.507	11,427	23847	0.517	12,333	1,319	0.010	906	5.9%	1.9%	7.9%
August	19,598	0.496	9,723	20725	0.606	12,559	1,127	0.110	2,836	5.8%	22.1%	29.2%
MILL 3RD QUARTER ADJUSTMENT						-497						
September	22,997	0.466	10,709	22060	0.516	11,389	-937	0.050	680	-4.1%	10.7%	6.3%
October	27,483	0.486	13,363	25872	0.498	12,889	-1,611	0.012	-474	-5.9%	2.5%	-3.5%
November	22,573	0.479	10,811	22722	0.489	11,111	149	0.010	300	0.7%	2.1%	2.8%
MILL 4TH QUARTER ADJUSTMENT						1,611						
Totals	191,467	0.470	89,938	195,897	0.497	97,279	4,430	0.027	7,341	2.3%	5.7%	8.2%

totaled 148,758 tons at a gold grade of 0.606 oz/ton containing 90,147 gold ounces. The model predicted 130,750 tons at a gold grade of 0.644 oz/ton containing 84,203 gold ounces. The mine outperformed the model by producing an additional 18,008 tons (+14%) and 5,944 gold ounces (+7%) than predicted by the model.

Due to this close agreement between the mining (gold grade, silver grade, and geology) and milling (gold grade, silver grade, and ounces produced) to the 1997 resource and reserve model estimate, re-modeling was not completed for the 1998 resource and reserve estimate. For the 1997 Resource modeling procedures and parameters the reader is referred to "The Rosebud Mining Company, LLC, Rosebud Deposit Resource and Reserve Estimate as of January 1, 1997" report dated January 29, 1997 by Charles V. Muerhoff. In November, Dr. Harry Parker, Senior Vice President of Mineral Resources Development, Inc., completed a resource audit including a review of production data, and Charlie Muerhoff, Senior Geologist of Mine Development Associates completed a review of 1997 production data. The 1998 Rosebud resource estimate was prepared jointly by Hecla staff and personnel from Mine Development Associates, Inc.

Data used for the 1998 Resource and Reserve reconciliation included:

- Mine to mill reconciliation figures through November, 1997 (i.e., through October production);
- November, 1997 production figures;
- South zone Measured and Indicated resource block Model (10X10X12);
- South zone Measured, Indicated, and Inferred resource block model (10X10X12);
- South zone Measured, Indicated, and Inferred resource sub-block model (2.5X2.5X3);
- 2-D and 3-D as-built models of all stopes (current to Nov., 30, 1997);
- 2-D and 3-D South zone mine design models (pre-mining);
- 40-scale Measured and Indicated resource block model maps;
- 40-scale mine planning maps.

Differences in Model and Reserve Parameters Between 1997 and 1998

There are three main differences in the tabulation of the resource and reserve between the 1997 model and the 1998 model:

1) The tonnage factor of the South zone only was changed from 14.4 ft^3/ton in 1997 to 13.8ft^3/ton in 1998.
2) The cut off grade was increased from 0.140 oz Au/ton in 1997 to 0.150 oz Au/ton in 1998.
3) The percent dilution included in the South zone Proven and Probable reserve was changed from 27.6% in 1997 to an average of 13.8% in 1998. The change in dilution is the actual dilution experienced over the past year's mining, as measured by the percentage of ounces and tons mined below the 0.14 cut-off that was sent to the mill.

Model Checks

The sub-blocked Measured, Indicated, and Inferred (MI&I) resource model was loaded in Surpac along with the 3-D solids of the as-built (actual surveyed mine openings) stopes. An extraction of the MI&I resource within the as-built solids was performed to check for correlation of model tons to actual production:

Extracted MI&I model tonnage:	228,523 tons
Actual production tonnage:	229,916 tons
Difference:	-1,393 tons

ounces greater than or equal to 0.140 oz Au/ton. This comparison was completed with all tons at the 13.8 ft^3/ton.

Table 3. Measure of Accuracy of the Model:

	Tons	Au Grade	Cont.'d Au Oz
Model >0.140 oz Au/t	130,750	0.644	84,203
Actual >0.140 oz Au/t	148,758	0.606	90,147
Actual/Model	114%	94.1%	107.1%
Difference	18,008	0.330	5,944

The gold grades and tonnages for the actuals above are based on the face and rib samples and geology measurements and will not correspond to the mill settlement tonnages and grades. The above measure of the accuracy of the model strongly indicates that not only did we indeed mine the ounces estimated by the 1997 Resource and Reserve Estimate, but we also mined an additional 18,008 tons at a grade of 0.330 oz/ton for an addition 5,944 gold ounces.

Please be aware that the overall adjustment to the reserve (-103,676 tons at a gold grade of 0.061 oz/ton) will not match the total of the itemized adjustments listed above because of the differences in tonnage factors from one year to the next and because of the methodology used to derive the new reserve. It was not a straight subtraction of production from the 1997 reserve to derive the 1998 reserve, but rather, the total amount of material within the designed stopes not yet mined constituted the 1998 reserve. There are some minor spatial/geometry/distribution discrepancies between the model and what is actually experienced underground, but the reserve tonnage and ounces appear to correlate well. There were several instances where the actual mining of ore grades occurred in locations where sub-grade material was modeled (and vice-versa), therefore, a one-to-one reconciliation is not possible (we mined ore in areas where ore was not projected). The areas where the actual gold distribution is inconsistent with the current model will be the focus of the work in early 1998 when the South Zone is remodeled utilizing our actual production data.

Summary & Conclusions

The first year of production at Rosebud has, with minor exceptions, successfully substantiated the South zone model as production during 1997 has matched well with what the model was predicting. The majority of the negative adjustment to the reserve can be attributed to the removal of sub-economic material. Those few areas where the model hasn't matched well, will be the focus of work next year when the South zone is remodeled.

The 1998 Rosebud proven and probable reserve is 943,042 tons grading 0.420 Au oz/ton and 2.92 Ag oz/ton containing 395,634 ounces of gold and 2,756,402 ounces of silver. The subtraction of the lower grade sub-economic material from the reserve as compared to the 1997 reserve has raised the average grade and increased the potential for mining higher margin rock. The biggest impact to the reserve is the change in dilution. In addition, there are a few tons of material that was classified as Inferred that were successfully mined as ore.

Discussion

The 1998 Rosebud ore reserve contains 333,592 fewer tons, 104,250 fewer gold ounces, and 671,488 fewer silver ounces than the reported 1997 Rosebud ore reserve (summarized in table 2.). These figures include 229,916 tons of production containing 97,913 ounces of gold and 625,843 ounces of silver, and a negative adjustment of 103,676 tons containing 6,337 gold ounces and 45,645 silver ounces.

Table 2. **1998 Ore Reserve vs. Reported 1997 Ore Reserve**

	Tons	oz Au/t	oz Ag/t	AuOz	AgOz
Reserves as of 1/1/97	1,276,634	0.392	2.69	499,884	3,427,890
1997 Production					
Mill Settlements	197,951	0.485	3.08	95,991	610,500
Segregated to Waste	31,965	0.060	0.48	1,922	15,343
Reserves as of 1/1/98	943,042	0.420	2.92	395,634	2,756,402
Adjustments	(103,676)	0.061	0.44	(6,337)	(45,645)

The change in the reserve from 1997 to 1998 can be attributed to:

- 1997 production.
- A decrease in dilution in the South zone from 27.6% at a gold grade of 0.073 oz/ton and a silver grade of 0.62 oz/ton to 13.8% at a gold grade of 0.077oz/ton and a silver grade of 1.06 oz/ton. This reduction in dilution for the South zone is based on actual dilution figures from production during 1997 and represents the subtraction of 81,518 tons grading 0.077 oz Au/ton, 1.06 oz Ag/ton from the 1998 South zone reserve.
- An increase in cutoff grade from 0.140 Au oz/ton to 0.150 Au oz/ton. Since only a slight increase (0.10 oz Au/ton) in the cut off grade occurred, the impact to the reserve was minimal:

South Zone	(11,506) tons @ 0.142 oz Au/ton (1,633) AuOz
North Zone	(8,293) tons @ 0.127 oz Au/ton (1,052) AuOz
East Zone	(32,763) tons @ 0.127 oz Au/ton (4,168) AuOz
Total	(52,562) tons @ 0.130 oz Au/ton (6,853) AuOz

  The removal of this material from the reserve will increase the average grade of the 1998 reserve. We will undoubtedly recover and process the majority of this material regardless, since it is inside the stoping boundaries and well above our incremental cut off. It is only removed from the reserve because it does not meet cut off grade definitions.

- Reclassification of ore blocks (blocks that were classified as Proven and Probable in the 1997 reserve that no longer meet that criteria). These blocks were located in the mined out areas of South zone stopes 13, 22, and 23. They were removed from the Proven and Probable category because they were situated outside of the as-built stope solids and inside of the design solids on levels that mining (as attested to by the production figures), but the location of this material was inaccurate in the model. The negative adjustment to the reserve due to the removal of these blocks totals 27,818 tons and 13,137 gold ounces. Care was taken not to exclude blocks from the reserve that can be mined from adjacent levels.

- A decrease in the South zone tonnage factor from 14.4 ft^3/ton to 13.8 ft^3/ton resulted in 18,289 tons at a grade of 0.514 oz Au/ton (9,401 Au ounces) being added to the 1998 reserve.

To get a measure of the accuracy of the model, Dr. Harry Parker recommended dividing the model tons, gold grade, and ounces greater than or equal to 0.140 oz Au/ton by the actual tons, gold grade, and

With a 0.150 Au oz/t resource cut-off applied, there are 135,805 tons grading 0.476 gold ounces per ton and 2.15 silver ounces per ton in the Rosebud Inferred Resource, for 64,653 contained gold ounces and 291,658 contained silver ounces. This inferred resource represents the very near-term up-side potential of the deposit (as it is currently defined). The majority of ore-grade inferred material is either proximal to or within the planned stoping areas and mine plan has been designed so that the inferred material can be extracted utilizing the current stope layout, if warranted.

Other Resources - Indicated and Inferred Resource

Other resources at Rosebud include the Far East and East Zone hanging wall areas of mineralization. These two areas were not re-modeled for the 1998; tonnages and grades for the *Other Resources* category are the same as in the 1997 resource document.

The Indicated Resource for Other Resources (0.01 Au oz/t resource cut-off) is 1,010,364 tons grading 0.034 gold ounces per ton and 0.21 silver ounces per ton, containing 34,352 gold ounces and 212,982 silver ounces.

The Inferred Resource for Other Resources is 576,220 tons grading 0.034 gold ounces per ton 0.21 silver ounces per ton, for contained gold and silver ounces of 19,591 and 121,464, respectively.

Proven and Probable Ore Reserve

The 1998 Rosebud Proven and Probable Ore Reserve is 943,042 tons at an average grade 0.420 gold ounces per ton and 2.92 silver ounces per ton, at a cut-off grade of 0.150 Au oz/t, for 395,634 contained gold ounces and 2,756,402 contained silver ounces. A summary of the ore reserve by zone is presented in table 1, and a detailed summary is included in the appendix.

Table 1. **1998 Rosebud Proven and Probable Ore Reserve**

Zone	Tonnage	Au Grade (oz/t)	Ag Grade (oz/t)	Au Ounces	Ag Ounces
South	427,727	0.514	4.22	219,867	1,842,428
North	168,078	0.333	1.18	55,907	198,593
East	347,237	0.345	2.16	119,860	750,923
Total	943,042	0.420	2.92	395,634	2,756,402

2,

The 1998 ore reserve calculation began by completing a detailed reconciliation between the 1997 ore reserve estimate and 1997 production figures. A total of 5 mining levels in the South zone were completely mined out during 1997. Within the South zone, the measured and indicated resource contained within the stope boundaries was tabulated according to material at or exceeding 0.150 Au oz/t and material less than 0.15 Au oz/t. On a bench by bench basis, comparing the resource tonnage and ounces to the tonnage and ounces tabulated for the stopes, extraction factors averaged 91 percent for tonnage and 95 percent for gold and silver ounces. Dilution based on 1997 production figures averaged 13.8 percent tonnage at a gold grade of 0.077 oz/ton and silver grade of 1.06 oz/ton. This actual dilution factor was then applied to the remainder of the South zone resource only. The 1997 Resource and Reserve Estimate dilution of 27.6% at a gold grade of 0.073 oz/ton was again used for the North and East zone resource to determine the overall proven and probable ore reserve.

Cut-off grade calculations and resource to reserve calculations for the 1997 proven and probable reserve are located in the appendix of this report. The 1998 Measured and Indicated Resource grade / tonnage curve is shown in Figure 2.

Since there was no sub-blocked model available for the Measured and Indicated (M&I) resource, a tabulation of all material inside the as-built stope solids was performed on the 10X10X12 and 2.5X2.5X3 MI&I models to check for differences in volumes due to block sized. If the volume difference was found to be minimal, we would proceed to use the 10X10X12 block models to complete the rest of the reconciliation.

MI&I 10X10X12 model blocks within as-built stope solids: 229,776 tons / 93,828 AuOz
MI&I 2.5X2.5X3 model blocks within as-built stope solids: 228,523 tons / 92,115 AuOz

The resultant tonnage variance of 0.5% and gold ounce variance of 1.8% was considered acceptable and the reconciliation was performed on the 10X10X12 block models.

Reconciliation Procedures

The reconciliation of the South zone resource and reserve was completed by tabulating all of the M&I blocks above and below a cut off grade of 0.150 oz Au/ton that occurred both outside of the as-built stope solids and inside of the remaining mine design solids. The result represents all M&I material that is scheduled to be mined beyond November 30, 1997 (December's production was included in the 1998 resource and reserve since that material will still be on a stockpile at January 1, 1998). The actual percent dilution, tons and grade, experienced in the mine throughout the past years' production was calculated on a stope-by-stope basis and added to the tabulated model blocks that equaled or exceeded 0.150 oz Au/ton in grade. Those stoping areas that are yet to be mined were assigned the average mine-wide dilution of 13.8% at a grade of 0.077 oz Au/ton and 1.06 oz Ag/ton. No changes were made to the East and North zone resource and reserve except for the increase in the reserve cut off grade from 0.140 oz Au/ton to 0.150 oz Au/ton.

1998 Reserve

1998 Measured, Indicated, and Inferred Resource

The following resource estimates reflect in-place tonnages and ounces for the Rosebud Deposit and for Other Resources on the Rosebud Property (Far East / East Zone hanging wall). Silver was not modeled independently from gold in the 1997 Resource and Reserve Estimate; silver grades and ounces contained have been determined based on the average silver-to-gold ratio calculated for each gold domain. A tabulation of the Measured, Indicated, and Inferred Resource at 0.01 Au oz/t increments is included in the appendix.

Rosebud Deposit - Measured and Indicated Resource

The 1998 Measured and Indicated Global Resource (0.01 Au oz/t resource cut-off) for the Rosebud Deposit (South, North, and East zones) is 10,138,952 tons at an average grade of 0.067 gold ounces per ton and 0.77 silver ounces per ton, for 680,485 contained gold ounces and 7,822,172 contained silver ounces.

At a resource cut-off of 0.150 Au oz/t, the Measured and Indicated Resource for the Rosebud Deposit is 802,216 tons grading 0.496 gold ounces per ton and 3.40 silver ounces per ton, for contained gold ounces of 397,957 and contained silver ounces of 2,730,397.

Rosebud Deposit - Inferred Resource

The 1998 Rosebud Deposit Inferred Global Resource (0.01 Au oz/t resource cut-off) is 925,691 tons at an average grade of 0.099 gold ounces per ton and 0.78 silver ounces per ton. Gold and silver ounces contained in inferred material total 92,084 and 723,785, respectively.

Specific Gravity

Density measurements were taken on 959 core samples, proportionally representing the three ore zones, by Hecla geologists during the 1994 drilling campaign. From this data, tonnage factors of 13.4 cubic feet per ton for the South Zone and 12.9 cubic feet per ton for the North and East zones were determined. These tonnage factors were used for calculating the 1995 resource estimate and the 1996 resource and reserve estimate.

As reported in mid-1996, it became apparent that the specific gravity testing performed in 1994 was flawed, whereas some of the interstitial water was apparently still contained within the samples during the density measurement tests, thus biasing the results. Comparing the 1994 specific gravity results to laboratory testing completed by McClelland Laboratories for LAC Minerals indicated an overestimation of the specific gravity by approximately six percent overall. As a result, tonnage factors for the South, North, and East zones for the 1997 Resource and Reserve Estimate were adjusted to 14.4, 13.8, and 13.4 cubic feet per ton, respectively. Application of these tonnage factors to the 1996 Rosebud reserve resulted in a decrease of approximately 72,000 tons and 32,000 gold ounces. These revised tonnage factors were incorporated into the 1997 resource and reserve estimate.

During 1997 production, mine calculated ore tonnages (both survey volumes and geology measured volumes using the above 14.4 ft^3/ton) consistently underestimated the scaled ore tonnages shipped to the Pinon mill. In July and August, a total of 45 ore host rock samples were collected from Stopes 13, 14, 21, 22, and 23, and sent to McClelland Labs in Reno for bulk density analysis. Results from these samples indicated that the average bulk density was 13.8 ft^3/ton instead of the previously used 14.4 ft^3/ton. This amounted to a 4.3% decrease in tonnage factor (increase in density). In addition, Francis Pitard stated in his report titled "Review of Mining and Processing Sampling Practices at the Rosebud Mining Company" dated August 25, 1997 that using data from the Rosebud Heterogeneity Test, he calculated an average density of 2.37. This density equated to a tonnage factor of 13.5 ft^3/ton. The results from the samples collected in the active mining areas and Francis' calculation indicated that the previous tonnage factor used was conservative and should be changed. The new tonnage factor of 13.8 ft^3/ton was put in use beginning October 1, 1997, and correlation between mine calculated ore tonnage and scaled ore tonnage shipped to the Pinon mill in October and November were in good agreement.

A memorandum addressing the change in specific gravity is included in the appendix[5].

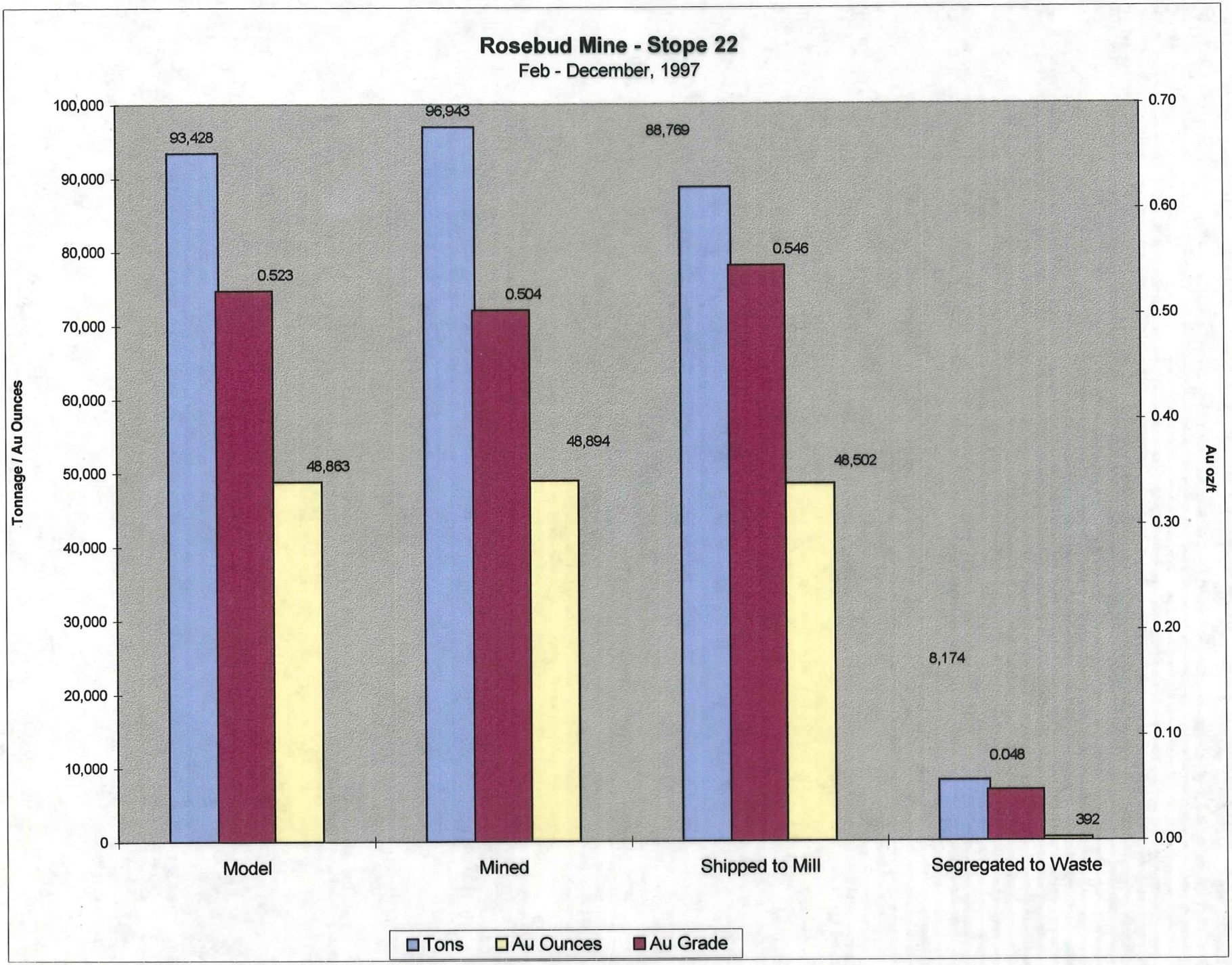
1997 Production

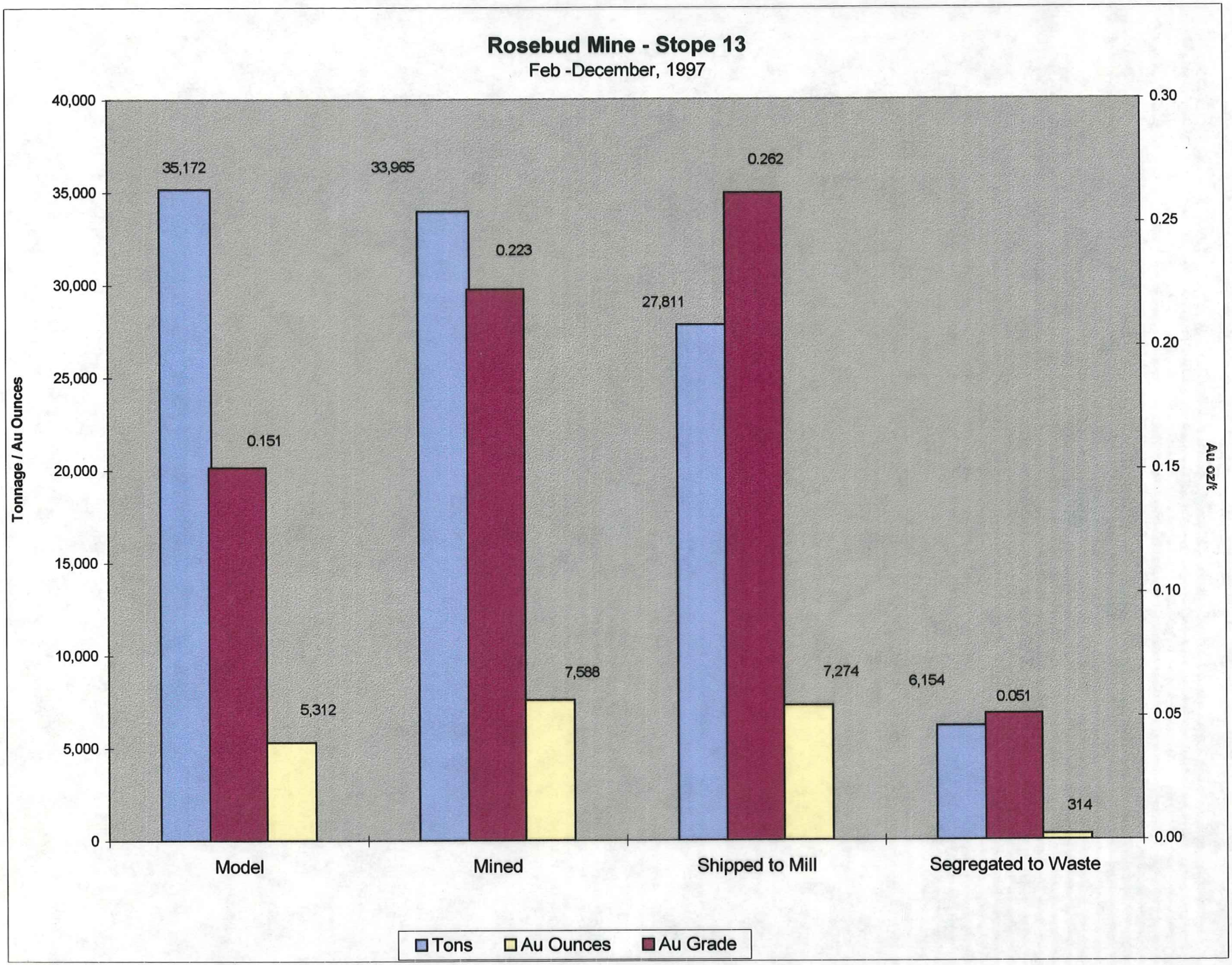
Production during 1997 totaled 229,916 tons at a gold grade of 0.426 oz/ton and silver grade of 2.72 oz/ton totaling 97,913 gold ounces and 625,843 silver ounces. The ore portion of the 1997 production consists of 197,951 tons at a gold grade of 0.485 oz/ton and a silver grade of 3.08 oz/ton for a total of 95,991 gold ounces and 610,500 silver ounces. In addition, the 1997 production includes segregated waste tonnage of 31,965 tons at a gold grade of 0.060 oz/ton and a silver grade of 0.48 oz/ton for a total of 1,922 gold ounces and 15,343 silver ounces that was shipped to the waste dump. The ore production numbers for 1997 are based on mill settlements.

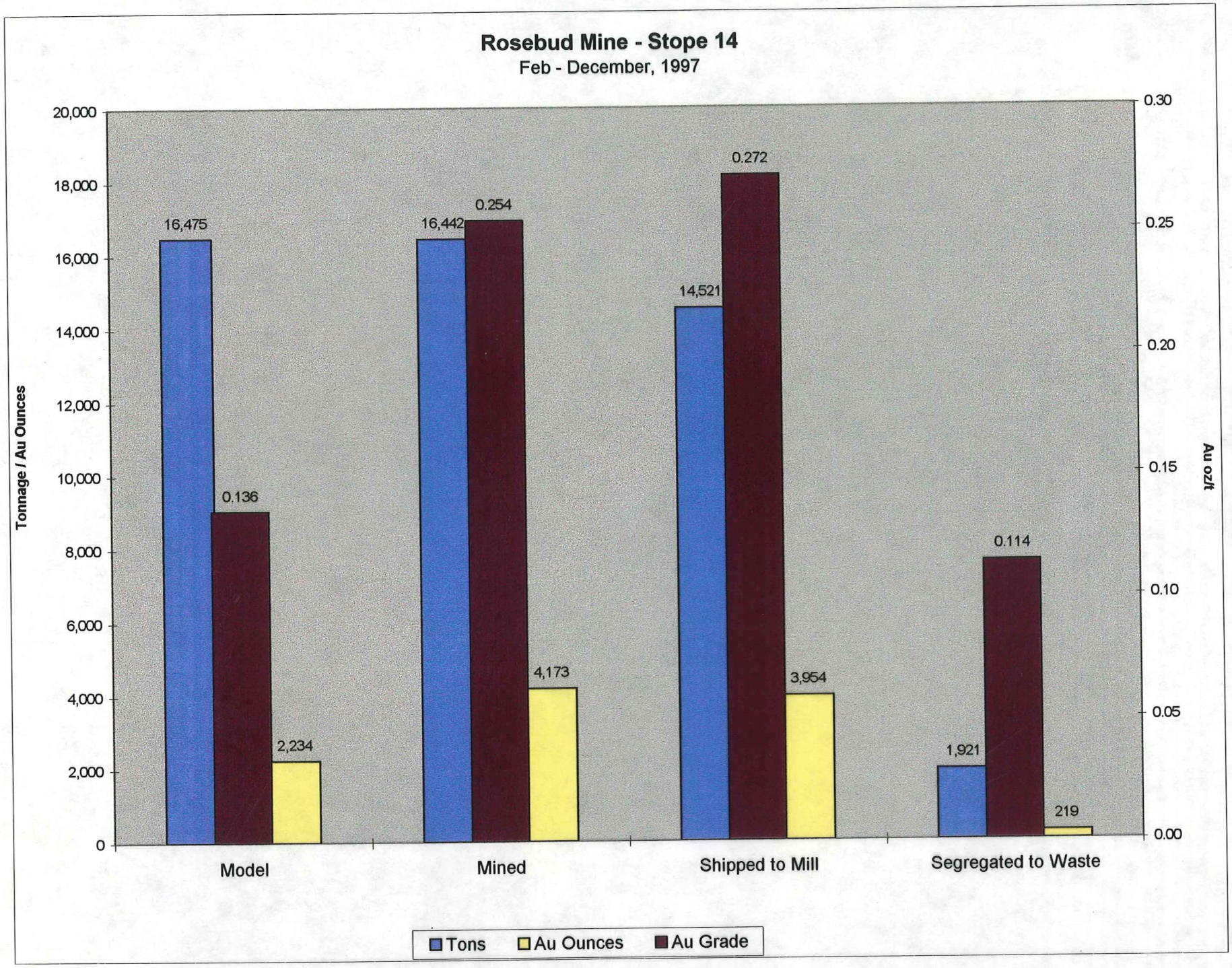
Resource Reconciliation

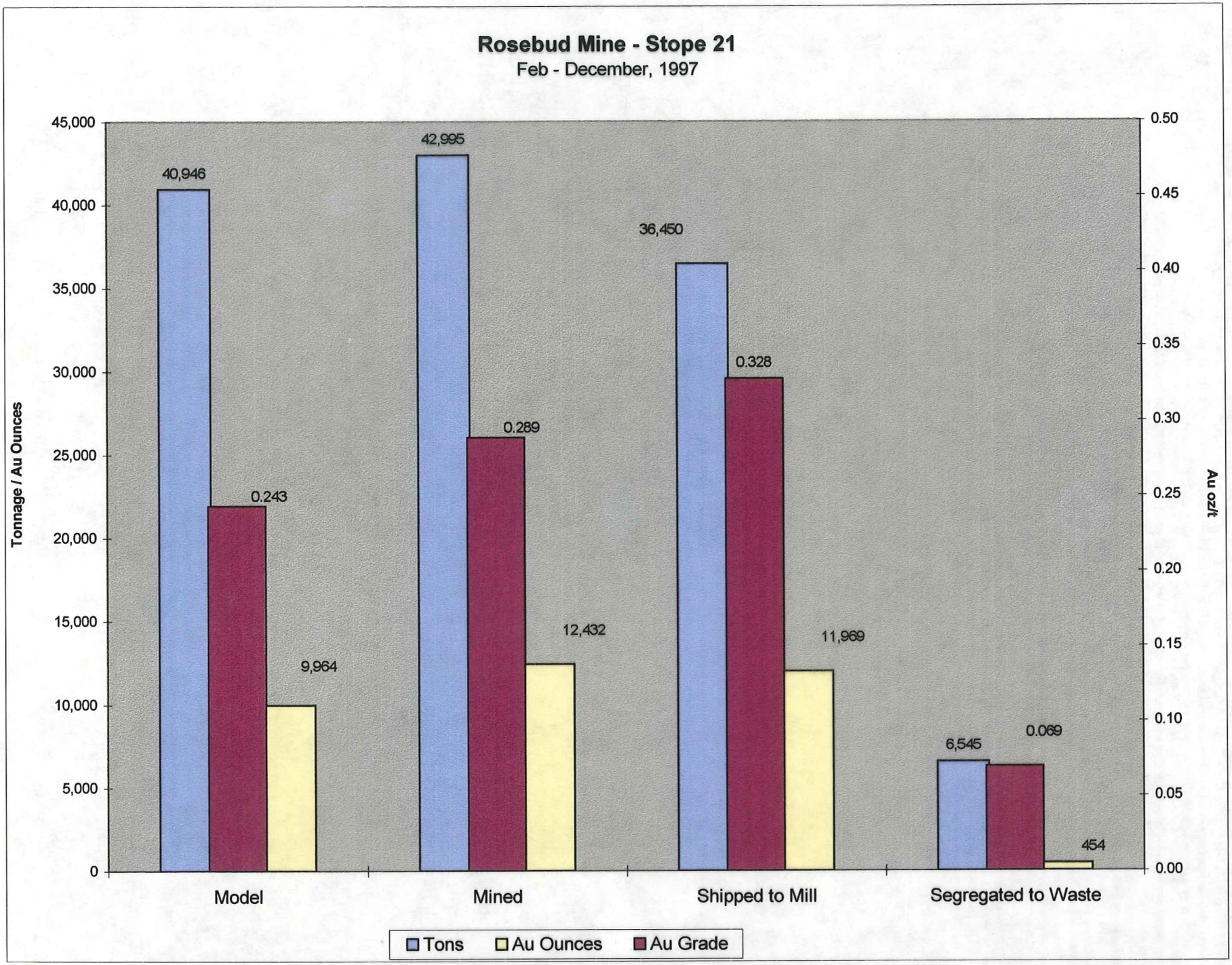
During 1997, production at Rosebud came from the South zone only, within stopes 13, 14, 21, 22, 23, and 24 and substantiated the 1997 South zone model. Ore production during 1997 @ >0.140 Au oz/ton

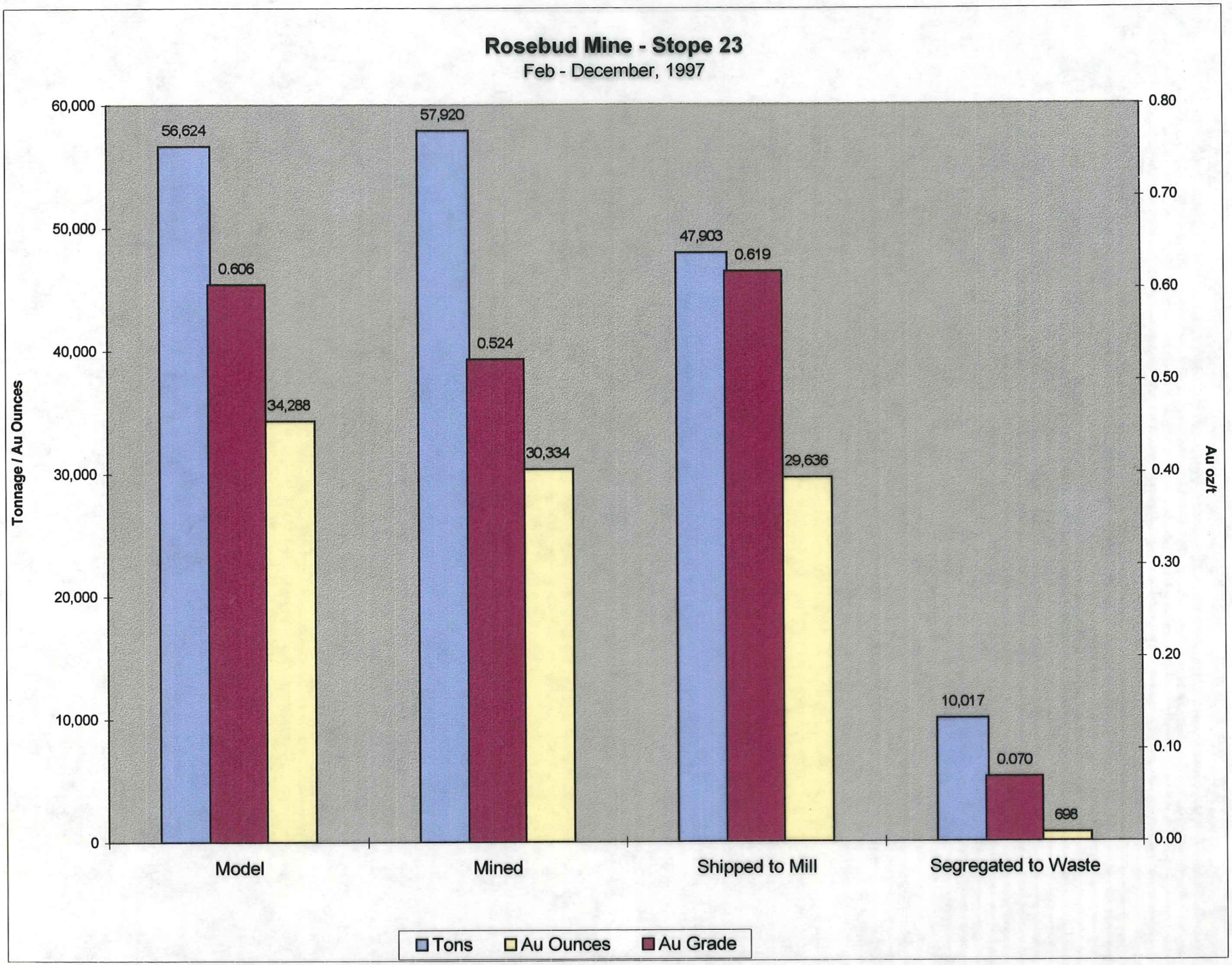
[5] Allen, K, D., Results of the 45 Bulk Density Samples Submitted to McClelland Labs, Hecla Mining Company internal memorandum, July 1, 1996.

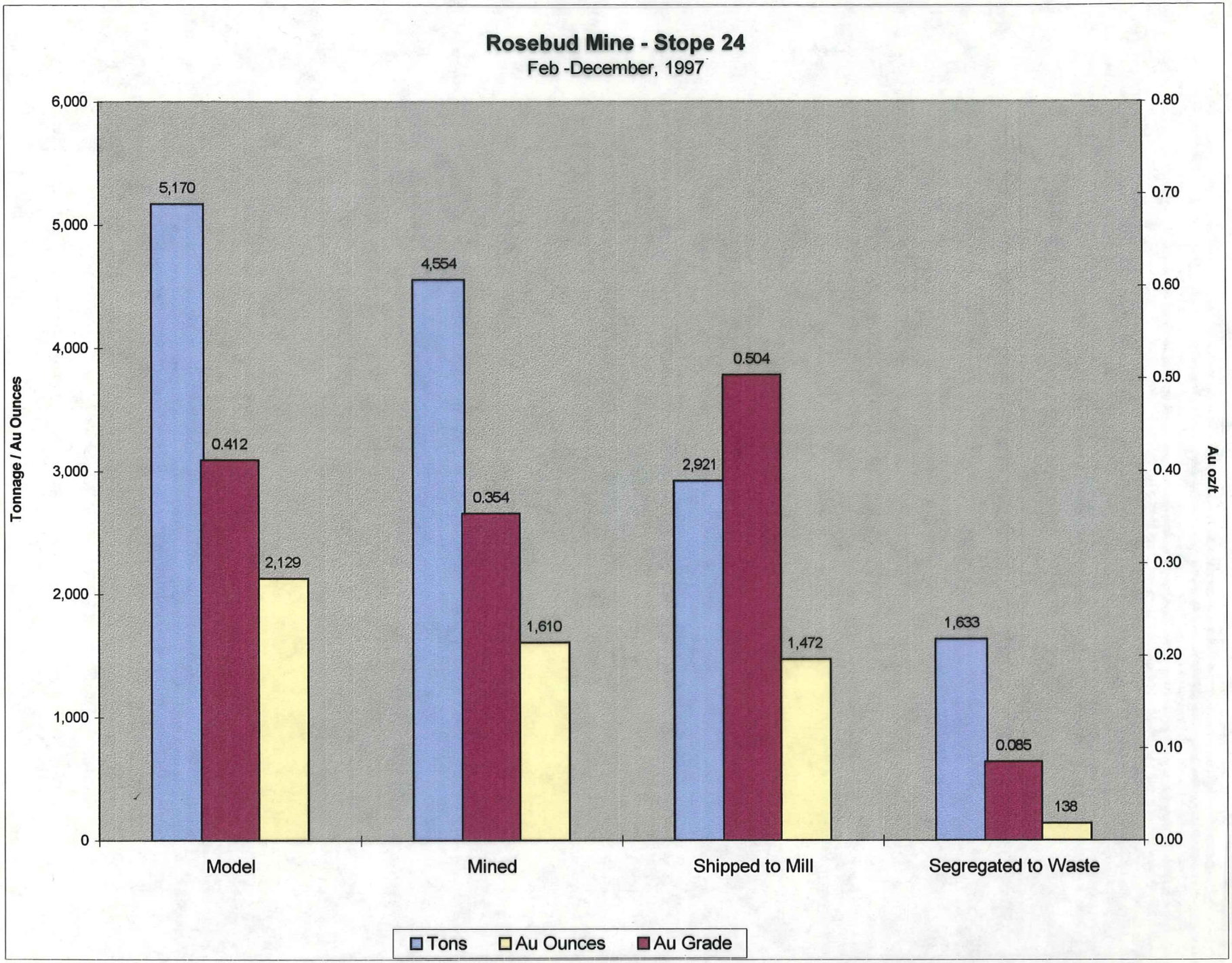

Rosebud Mine - Stope 22
Feb - December, 1997
Tonnage / Au Ounces
Au oz/t
100,000
90,000
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
93,428
0.523
48,863
96,943
0.504
48,894
88,769
0.546
48,502
8,174
0.048
392
Model
Mined
Shipped to Mill
Segregated to Waste
Tons
Au Ounces
Au Grade


Rosebud Mine - Stope 13
Feb -December, 1997
Tonnage / Au Ounces
Au oz/t
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
0.30
0.25
0.20
0.15
0.10
0.05
0.00
35,172
0.151
5,312
33,965
0.223
7,588
27,811
0.262
7,274
6,154
0.051
314
Model
Mined
Shipped to Mill
Segregated to Waste
Tons
Au Ounces
Au Grade


Rosebud Mine - Stope 14
Feb - December, 1997
Tonnage / Au Ounces
Au oz/t
20,000
18,000
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
0.30
0.25
0.20
0.15
0.10
0.05
0.00
16,475
0.136
2,234
16,442
0.254
4,173
14,521
0.272
3,954
1,921
0.114
219
Model
Mined
Shipped to Mill
Segregated to Waste
Tons
Au Ounces
Au Grade


Rosebud Mine - Stope 21
Feb - December, 1997
Tonnage / Au Ounces
Au oz/t
45,000
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
0.50
0.45
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
40,946
0.243
9,964
42,995
0.289
12,432
36,450
0.328
11,969
6,545
0.069
454
Model
Mined
Shipped to Mill
Segregated to Waste
Tons
Au Ounces
Au Grade


Rosebud Mine - Stope 23
Feb - December, 1997
Tonnage / Au Ounces
Au oz/t
60,000
50,000
40,000
30,000
20,000
10,000
0
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
56,624
0.606
34,288
57,920
0.524
30,334
47,903
0.619
29,636
10,017
0.070
698
Model
Mined
Shipped to Mill
Segregated to Waste
Tons
Au Ounces
Au Grade


Rosebud Mine - Stope 24
Feb -December, 1997
Tonnage / Au Ounces
Au oz/t
6,000
5,000
4,000
3,000
2,000
1,000
0
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
5,170
0.412
2,129
4,554
0.354
1,610
2,921
0.504
1,472
1,633
0.085
138
Model
Mined
Shipped to Mill
Segregated to Waste
Tons
Au Ounces
Au Grade

ROSEBUD DEPOSIT

- Low-temperature (140°-160C), epithermal Au-Ag deposit
- Hosted in Miocene-age volcanics (predominantly rhyolite)
- Age of mineralization 16 MY (±)
- Two major episodes of precious metal mineralization
    - stockwork & dissemination of quartz + pyrite + marcasite ± chalcopyrite ± Ag-sulfosalts (pyrargyrite) ± electrum ± arsenopyrite ± sphalerite ± galena ± pyrrhotite ± anatase ± tetrahedrite-tennantite-freibergite
    - stockwork & dissemination of Mn-rich calcite + quartz + marcasite + pyrite + Ag-sulfosalts (pyrargyrite, miargyrite, stylotypite, proustite, polybasite) + Ag-selenides (naumanite, aguilarite) + Ag-sulfides (acanthite) + native Ag + auriferous Ag + electrum
- Late-stage mineralization dominated by calcite + kaolinite + barite + stibnite
- Ore controls
    - East-West listric normal faulting
    - NE-SW extensional high-angle fracturing
    - lesser NW-SE extensional high-angle fracturing
    - flow / volcaniclastic facies of high permeability (natural and/or induced)

ROSEBUD DISTRICT EXPLORATION

- East-West / Northeast-Southwest Structural Intersections
- East-West Structures Proximal to Intrusive Activity
- Alteration Zonation

Proximal — Argillic - Potassic

Propylitic (carbonate-chlorite dominant)

Quartz/Chalcedony - Sericite

Distal — Hematite - Carbonate

- Geochemical Indicators

  As, Sb, Se, Cu, Mn, Ag, Au, Ba, Mo

- Geophysics
  - VLF — Structural identification
  - IP — Stockworked / disseminated sulfides
  - Mag — Delineation of intrusive margins

Type I Targets - Potential for expanding reserves; within drifting distance of planned development

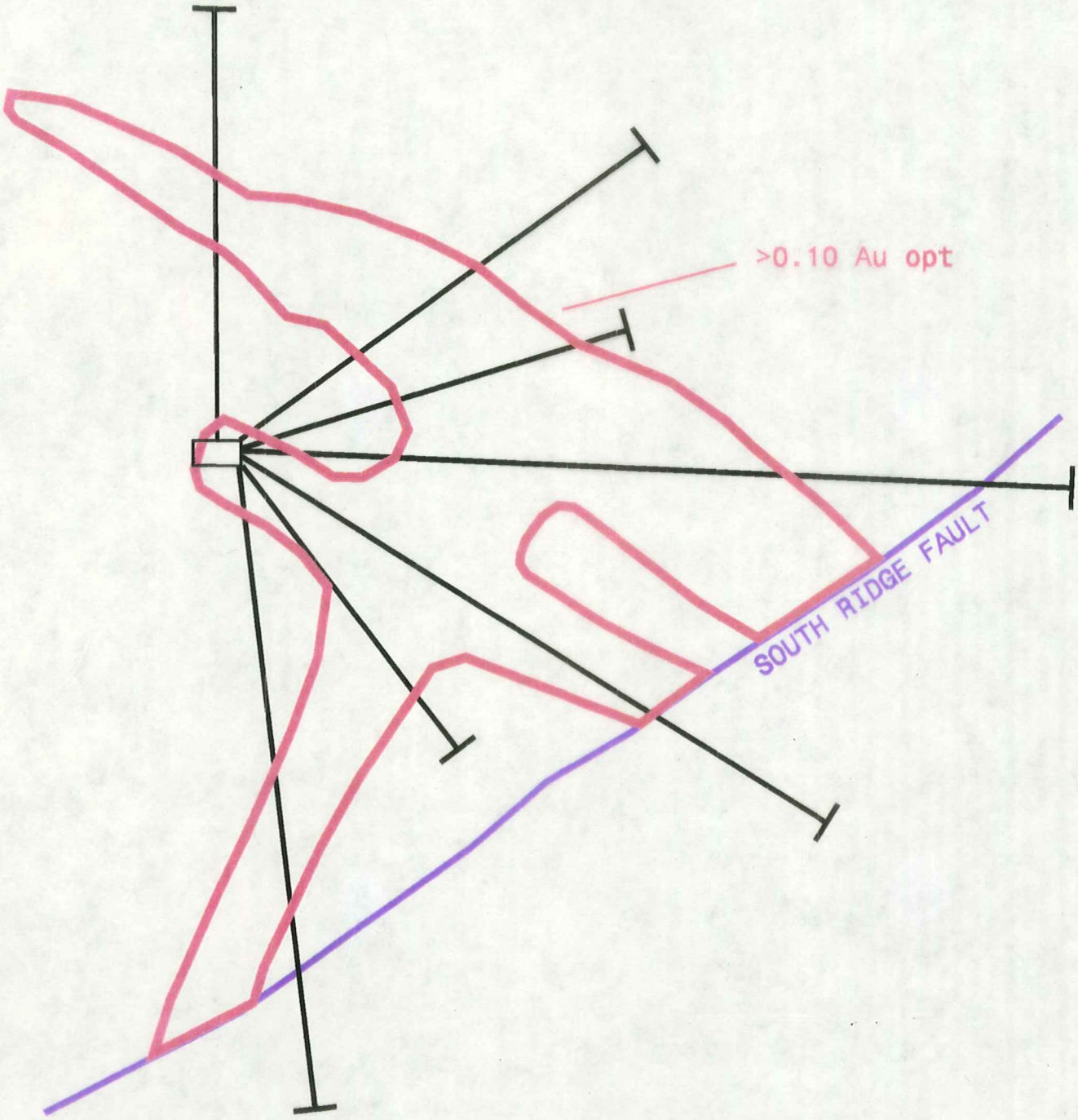
- Rosebud North Zone — Down-plunge extension; In-fill drilling
- North Rosebud
- Deep East Zone

Type II Targets - Anomalous geochemistry, favorable structure orientation ± intrusive activity ± geophysical anomaly ± encouraging reconnaissance drill data

- Dreamland / White Alps
- North Equinox
- Wildrose
- North Rosebud Peak
- Gator

Type III Targets - Conceptual or very limited exploration data

TYPICAL DRILL FAN THROUGH SOUTH ZONE CHIMNEY AREA

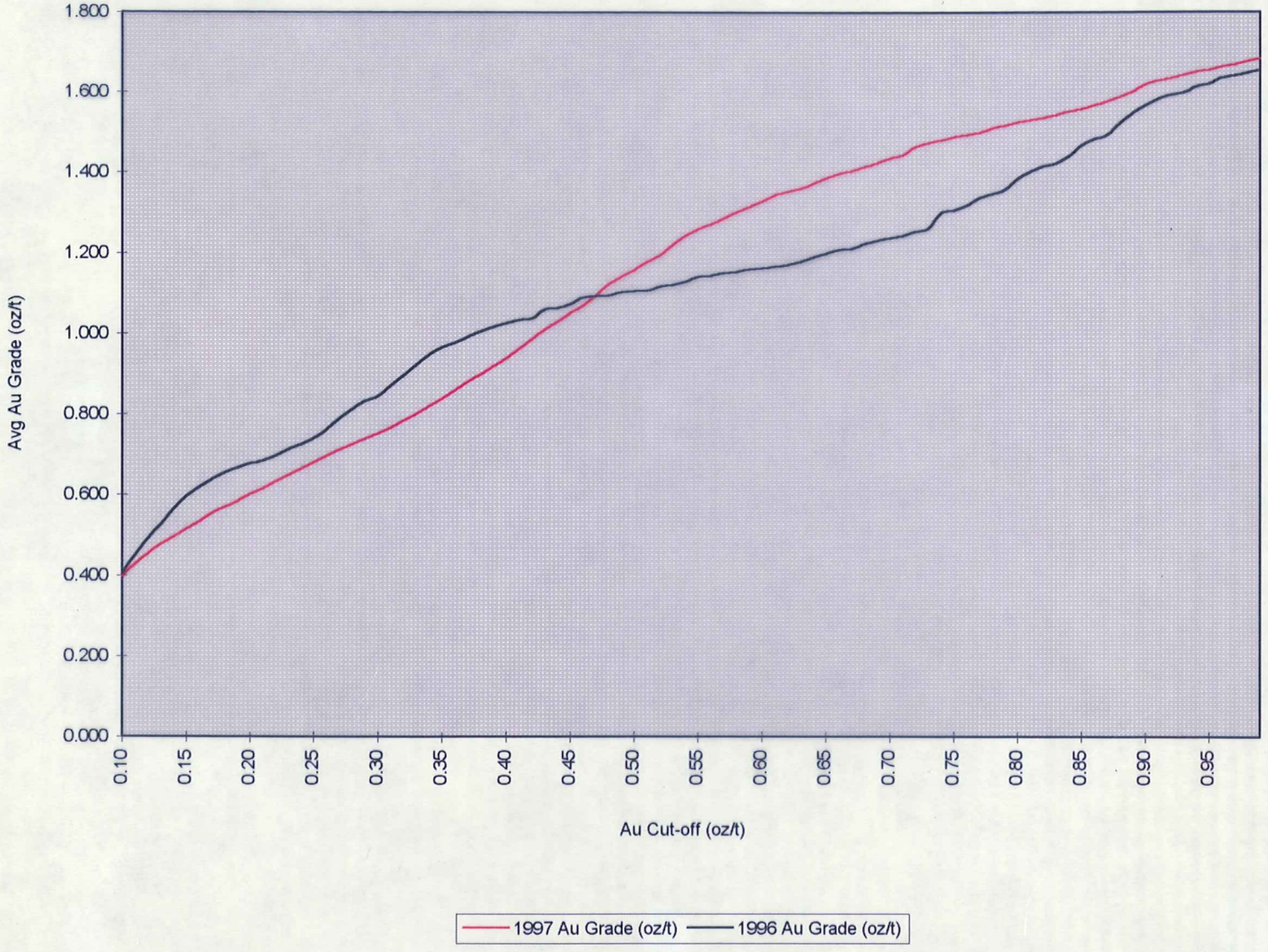


Hecla MINING COMPANY

ROSEBUD PROJECT
SECTION 850N

SCALE
50'

Rosebud Deposit M & I Resource
1997 Avg Au Grade vs. 1996 Avg Au Grade



Rosebud Mine
Face & Rib Sample Results vs. Block Model

Stope 22 - 4652 Access

Round No.	Actual Au Grade (oz/t)	Block Model Au Grade (oz/t)
1	0.001	0.000
2	0.002	0.000
3	0.009	0.000
4	0.020	0.015
5	0.017	0.076
6	0.090	0.110
7	**0.213**	**0.142**
8	**0.168**	**0.152**
9	**0.158**	**0.230**
10	**0.163**	**1.183**
11	**0.791**	**1.190**
12	**2.393**	**1.044**
Average (1-12)	0.335	0.345
Average (7-12)	**0.648**	**0.657**
Actual Au Grade in Ore Zone is 1.4% Less than Block Model		

Stope 13 - 4880 Access

Round No.	Actual Au Grade (oz/t)	Block Model Au Grade (oz/t)
1	0.006	0.012
2	0.021	0.013
3	0.054	0.007
4	0.032	0.011
5	0.088	0.136
6	**0.148**	**0.233**
7	**0.432**	**0.147**
8	**0.207**	**0.113**
9	**0.257**	**0.118**
10	**0.183**	**0.214**
11	**0.093**	**0.329**
12	**0.054**	**0.141**
Average (1-12)	0.131	0.123
Average (6-12)	**0.196**	**0.185**
Actual Au Grade in Ore Zone is 5.7% Greater than Block Model		

Rosebud Deposit

Resource & Reserve Changes from 1996 to 1997

- **Specific Gravity**

  Specific Gravity testing underestimated in-situ density by 6%.

  Resulted in losses of 72,000 tons & 31,500 gold ounces from 1996 ore reserve.

- **Revised Geologic & Mineralogic Interpretation**

  Based on information acquired from late-1995 South Zone drilling program; suggested high-grade tonnages were slightly overestimated & lower-grade (economic) projections were conservative.

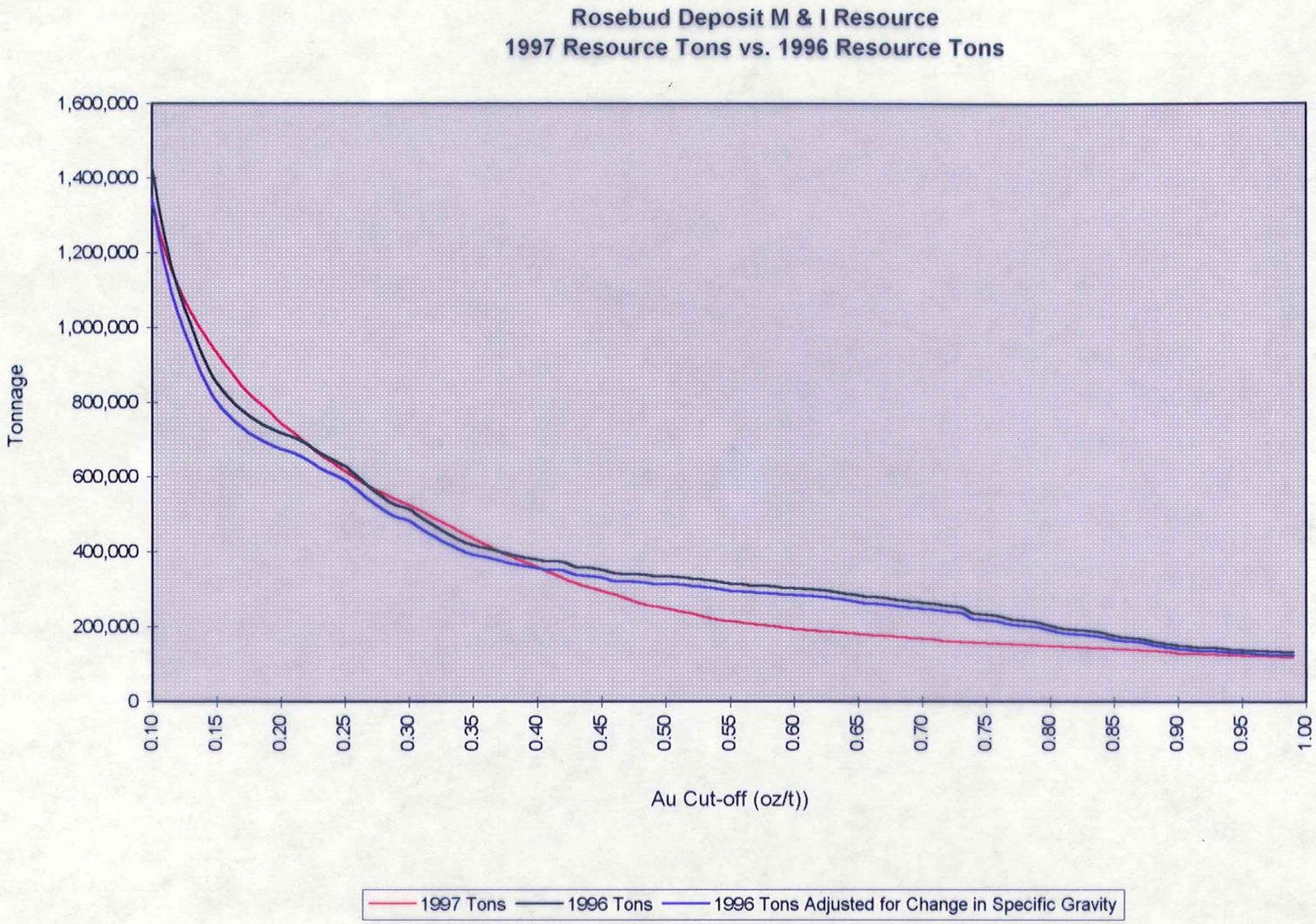
- **Changes in Modeling Methodology**

  Reflect increased understanding of ore controls and distribution of mineralization.

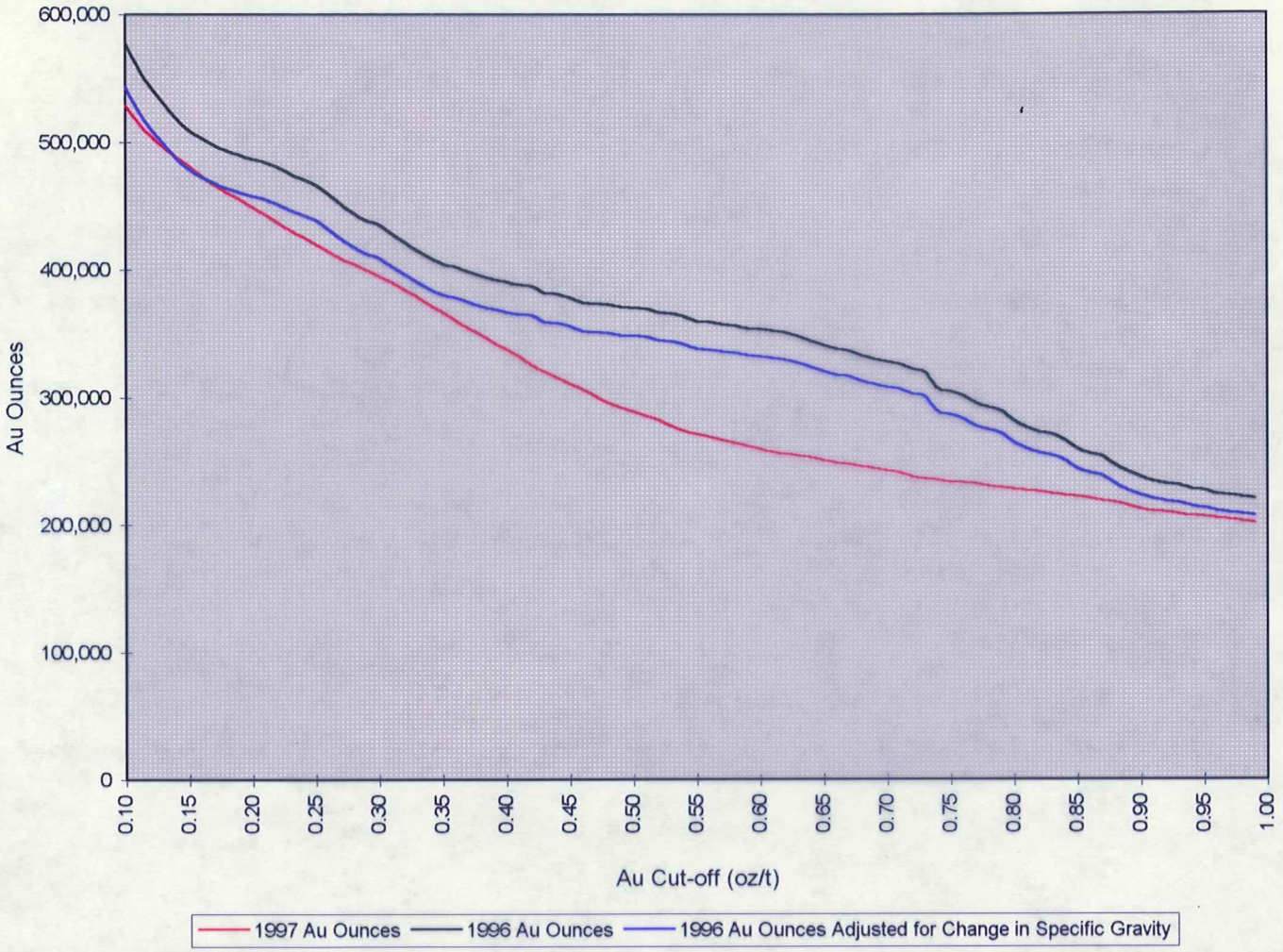
- **Increase in Dilution Tonnage & Decrease in Dilution Grade**

  1996 Dilution: 296,278 tons (24.9%) @ 0.111 Au oz/t.

  1997 Dilution: 352,379 tons (27.6%) @ 0.073 Au oz/t.


Rosebud Deposit M & I Resource
1997 Resource Tons vs. 1996 Resource Tons
Tonnage
1,600,000
1,400,000
1,200,000
1,000,000
800,000
600,000
400,000
200,000
0
0.10
0.15
0.20
0.25
0.30
0.35
0.40
0.45
0.50
0.55
0.60
0.65
0.70
0.75
0.80
0.85
0.90
0.95
1.00
Au Cut-off (oz/t))
1997 Tons
1996 Tons
1996 Tons Adjusted for Change in Specific Gravity

Rosebud Deposit M & I Resource
1997 Resource Au Ounces vs. 1996 Resource Au Ounces



1994 - 1995 Drilling Campaigns

- Surface: 32,000 feet HQ core
- Underground: 32,000 feet NBDGM core
- Whole core assay
  - strict sample protocol
  - all samples 2 AT (60 g) fire assays with AA finish
  - repeat 2 AT fire assay with gravimetric finish if Au >= 0.05 opt
  - metallic screen assay checks (±200 samples)
  - CN-soluble Au + tail assay (±1,000 samples)
- Geotechnical / Rock Quality Data (approximately 50% of core)
  - RQD
  - rock density (±1,000 measurements)
  - hardness / point load testing
  - fracture density / fracture roughness / fracture filling
  - core recovery

1995 IN-FILL DRILLING CAMPAIGN

- Underground
  - 7,200 feet NBDGM core
  - high-grade "chimney" area
  - 25-foot spaced drill fans
  - same sample protocol as 1994 program

- Results

  Ore Footage Drilled = 83% of the Block Model

  Grade x Thickness Drilled = 99% of Block Model

  Weighted Avg. Grade Drilled = 119% of Block Model

1994 DRILLING CAMPAIGN

- Surface: 32,000 feet HQ Core
- Underground: 25,000 feet NBDGM Core
- Analytical
  - whole core assay
  - strict sample protocol
  - all samples 2AT (60 g) fire assay with AA finish
  - repeat 2AT fire assay with gravimetric finish if Au >= 0.05 opt
  - metallic screen check assays on 200 (±) high-grade samples
  - CN-soluble Au + tail assay on 1000 (±) samples covering all zones / styles of mineralization
- Geotechnical / Rock Quality Data
  - approximately 50% of core
  - RQD
  - rock density (1000 (±) measurements)
  - hardness / point load testing
  - fracture density / roughness / filling
  - core recovery (solid & total)

Measured & Indicated Resource

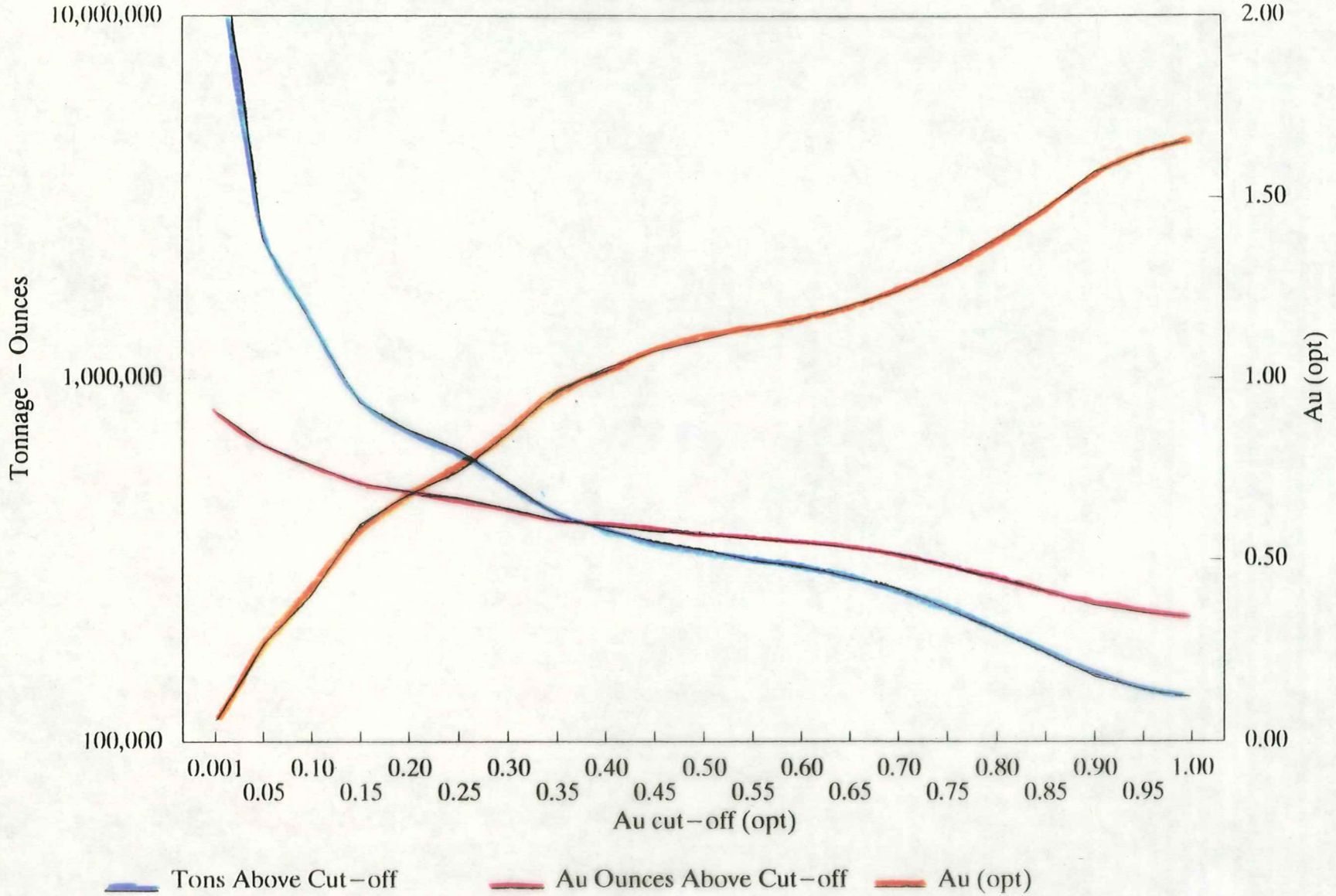
(0.14 Au opt cut-off)

918,735 tons @ 0.555 Au opt, 3.44 Ag opt
509,523 AuOz, 3,159,046 AgOz

- South Zone 473,898 tons @ 0.678 Au opt, 4.20 Ag opt
  321,079 AuOz, 1,990,692 AgOz
- East Zone 252,121 tons @ 0.419 Au opt, 2.60 Ag opt
  105,675 AuOz, 655,185 AgOz
- North Zone 167,473 tons @ 0.425 Au opt, 2.64 Ag opt
  71,182 AuOz, 441,330 AgOz
- Far East 25,243 tons @ 0.459 Au opt, 2.85 Ag opt
  11,587 AuOz, 71,839 AgOz

HECLA MINING COMPANY – ROSEBUD PROJECT

GRADE – TONNAGE CHART



ROSEBUD DEPOSIT DISCOVERY & DELINEATION

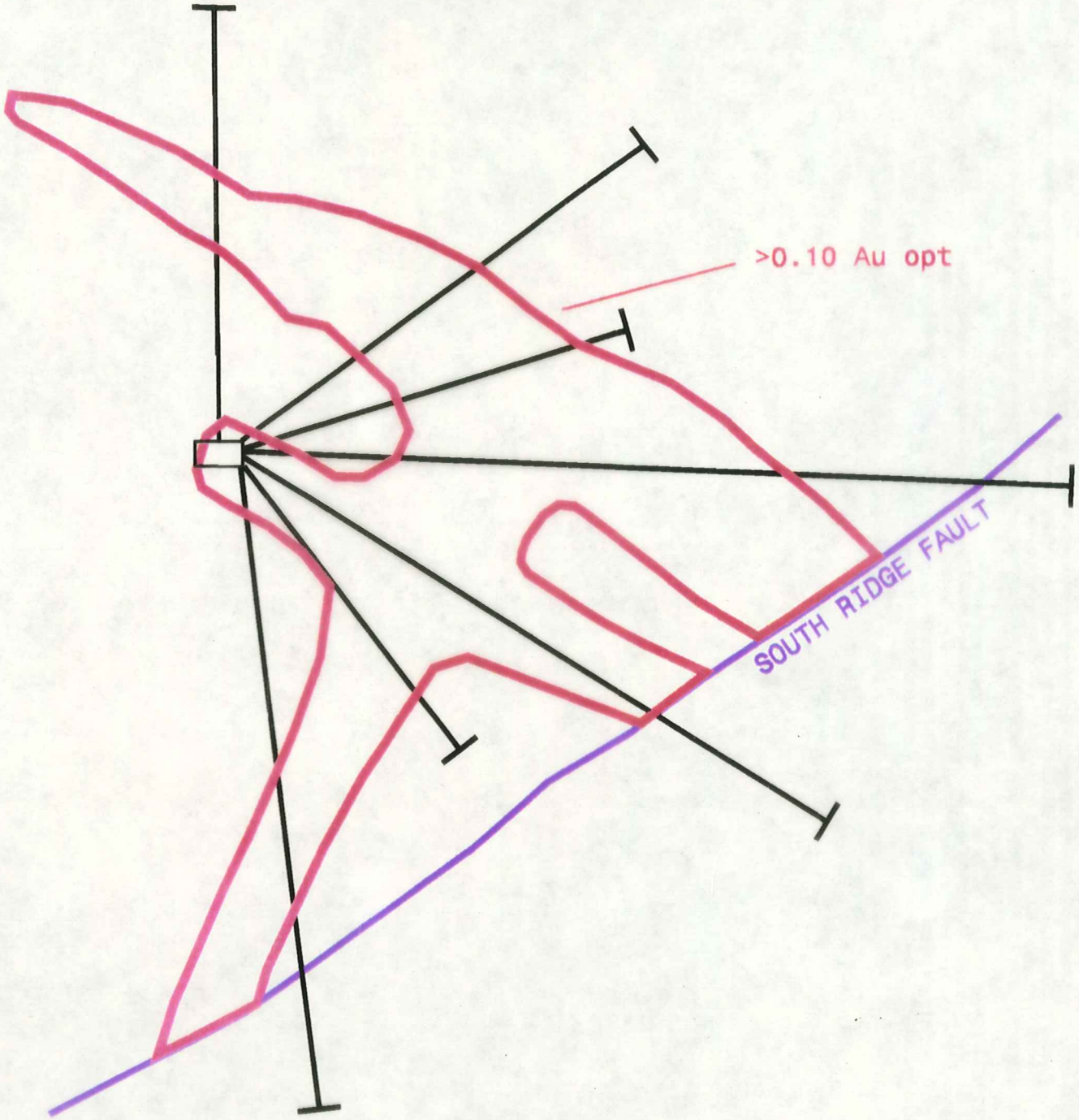
1975 - 1985 ASARCO, Freeport McMoRan Exploration, St. Joe Minerals, USMX
- surface exploration
- limited drilling

1985 - 1993 LAC Minerals, Equinox Resources
- consolidated district claim group
- surface exploration
- Rosebud Deposit discovered 1990
- 204,000 feet of drilling

1994 Hecla Mining Company
- excavated 3,000 feet decline into South Zone
- excavated 240-foot cross-cut into South Zone ore body (approx. 400 tons @ 0.92 Au opt)
- 25,000 feet of underground core drilling in South Zone in 50-foot spaced fans
- 32,000 feet of surface core drilling in South, East, & North Zones (East & North Zone drill spacing 75 to 100 feet)

1995 Hecla Mining Company
- completed additional 7,093 feet of underground core drilling along 25-foot spaced fans in the South Zone "chimney" area and portions of the stratabound ore zone

TYPICAL DRILL FAN THROUGH SOUTH ZONE CHIMNEY AREA



Hecla MINING COMPANY

ROSEBUD PROJECT
SECTION 850N

SCALE
50'

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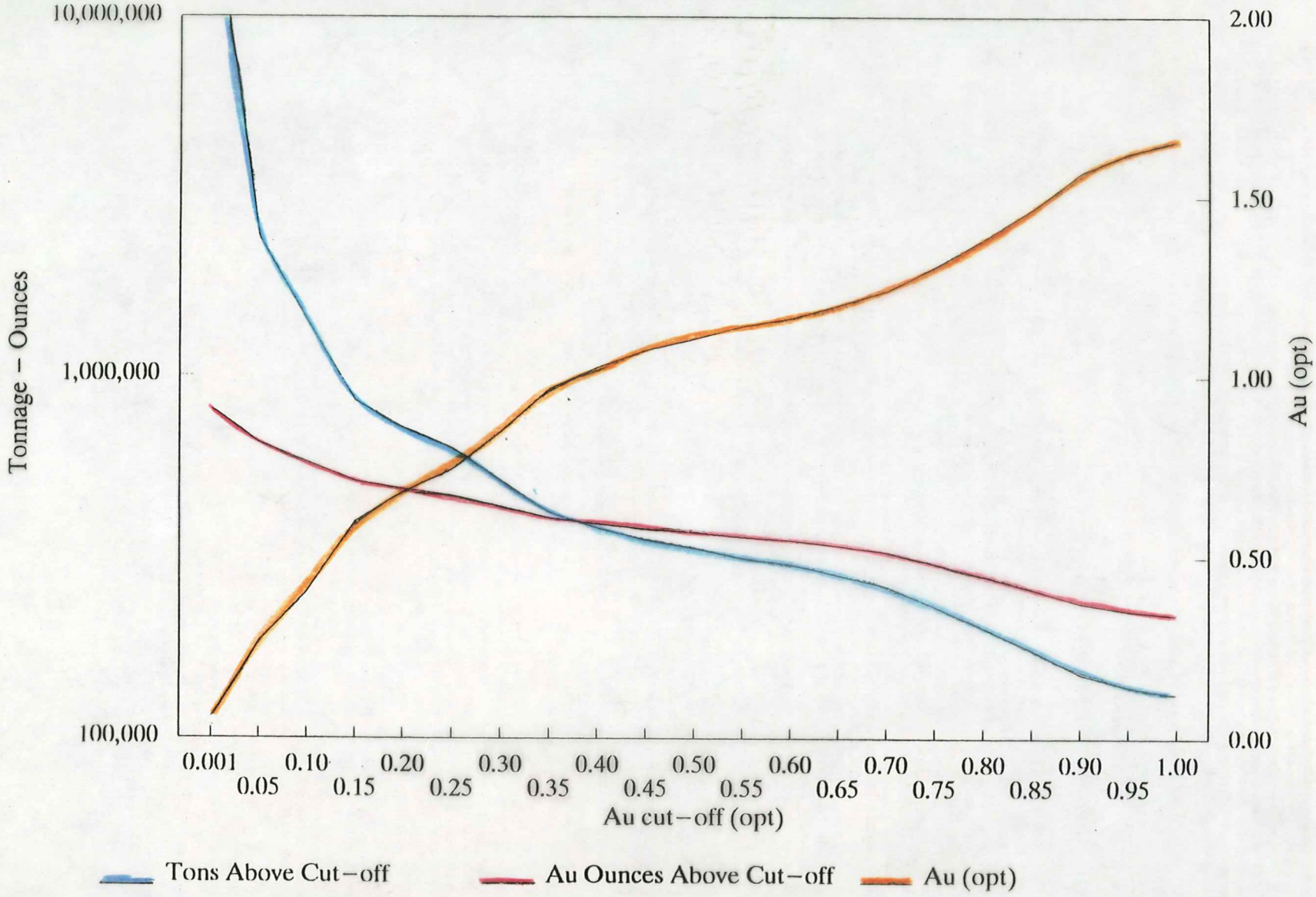


STRATIGRAPHY

Kamma Mountain Volcanics (Tertiary)

- Badger Formation
  - volcaniclastic breccia, conglomerates, epiclastics
  - post-mineral

- Chocolate Formation
  - rhyolitic to trachytic flows & volcanic breccia
  - Far East

- Bud Tuff
  - latitic ash flow tuff, tuff breccia, & epiclastics
  - porphyritic alkali rhyolite flow

- LBT (Lower Bud Tuff)
  - waterlain & airfall ash tuff, lithic ash flow tuff, & tuff breccia
  - main ore host South & North Zones

- - - Unconformity - - - South Ridge Fault - - -

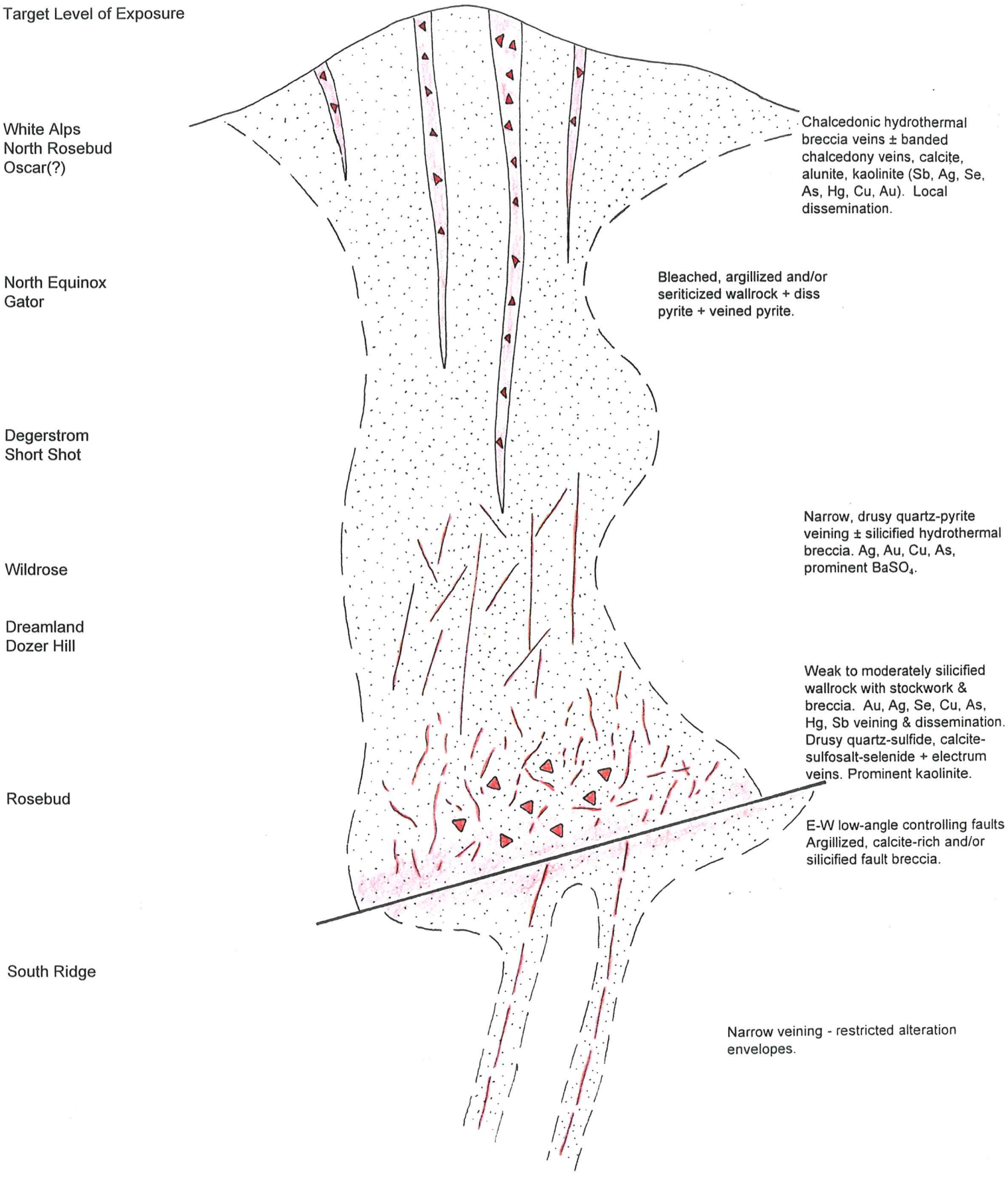
- Dozer Formation
  - very fine-grain, siliceous ash flow
  - main ore host East Zone (± North Zone)

- - - Angular Unconformity - - -

Auld Lang Syne Group

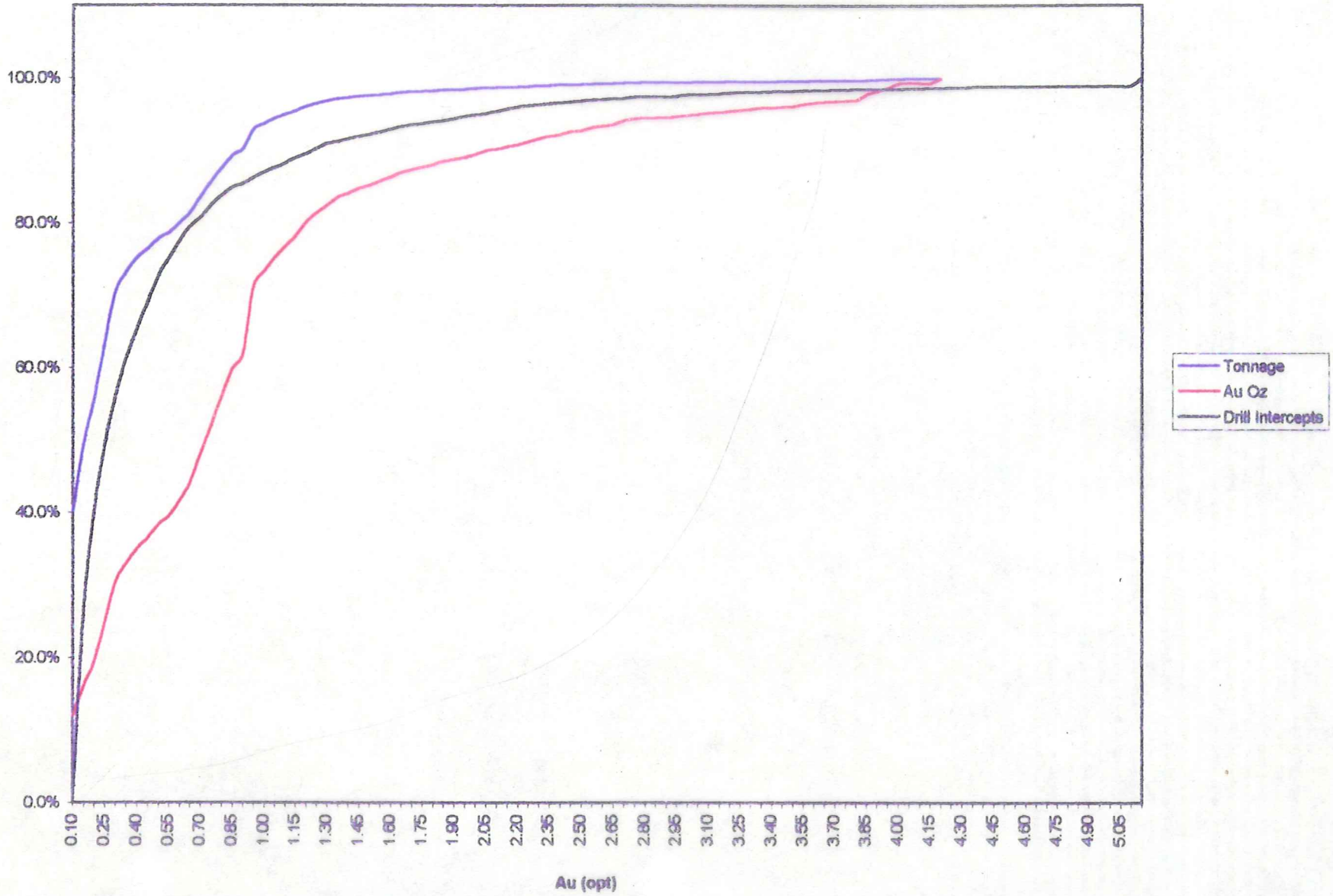
- Jurassic-Triassic metasediments

ROSEBUD DISTRICT EPITHERMAL SYSTEM SCHEMATIC MODEL

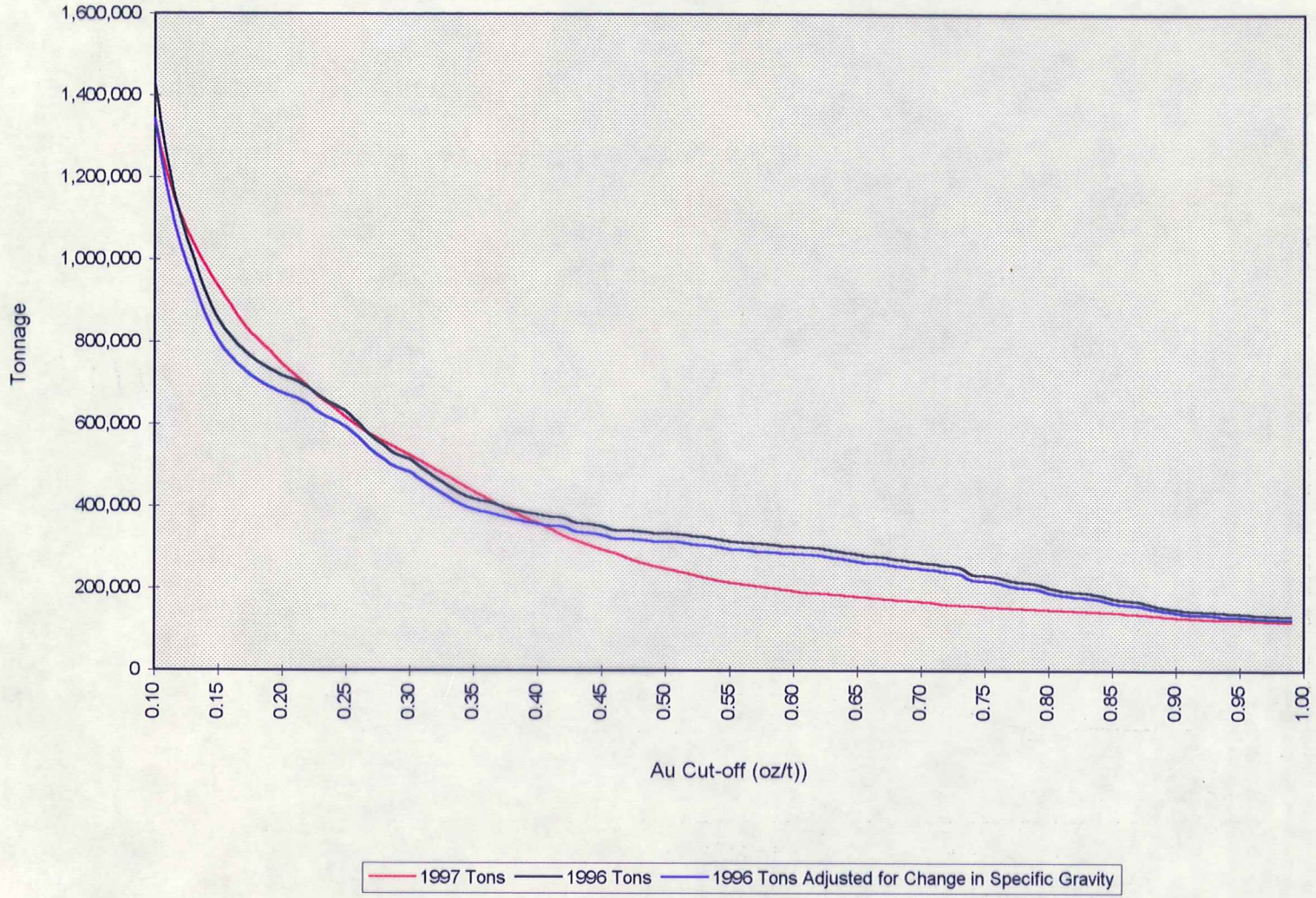


HECLA MINING COMPANY
ROSEBUD PROJECT

Cumulative Frequency: Drill Intercepts vs. Tonnage vs. Gold Ounces



Rosebud Deposit M & I Resource
1997 Resource Tons vs. 1996 Resource Tons



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ROSEBUD PROJECT

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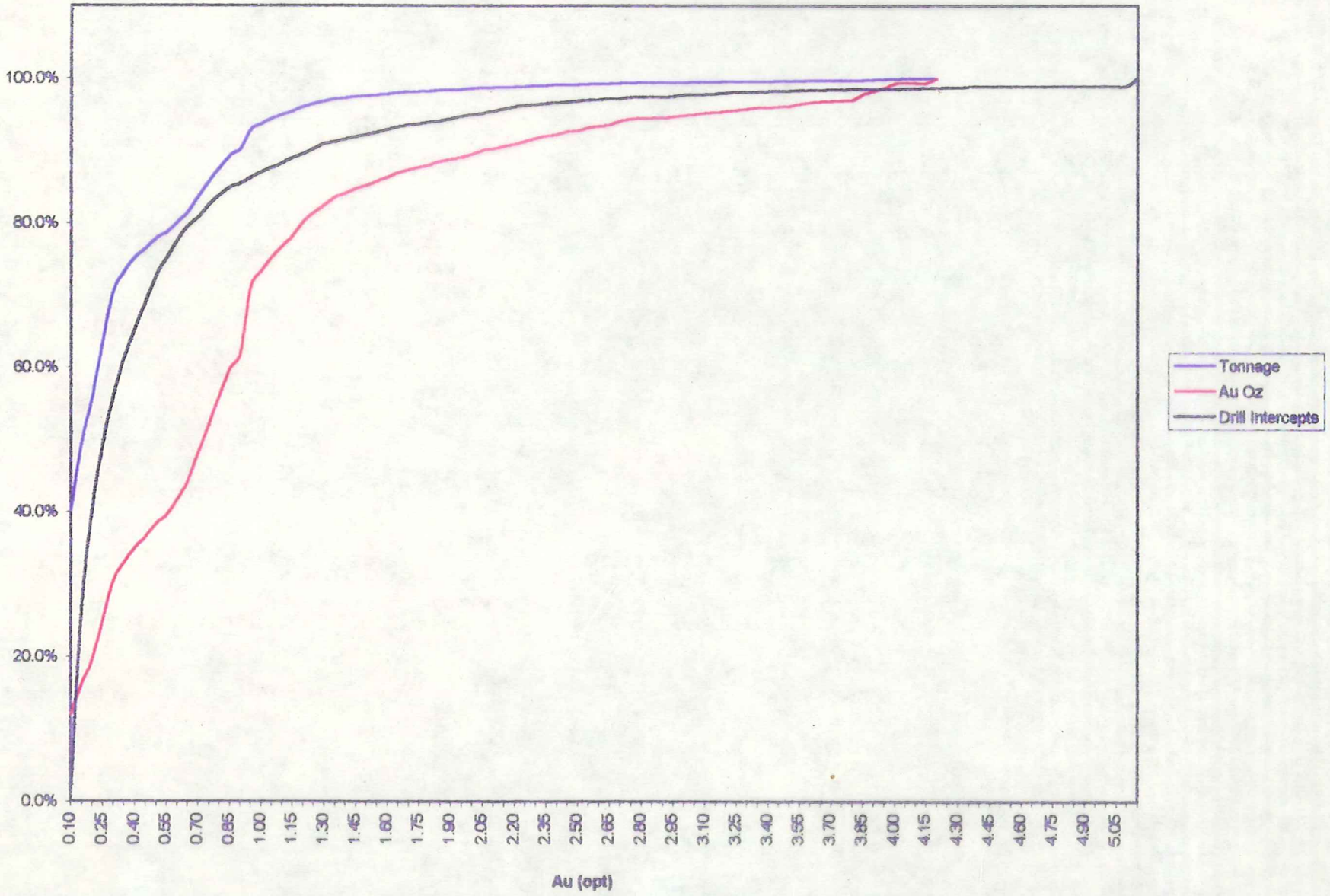

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