3000

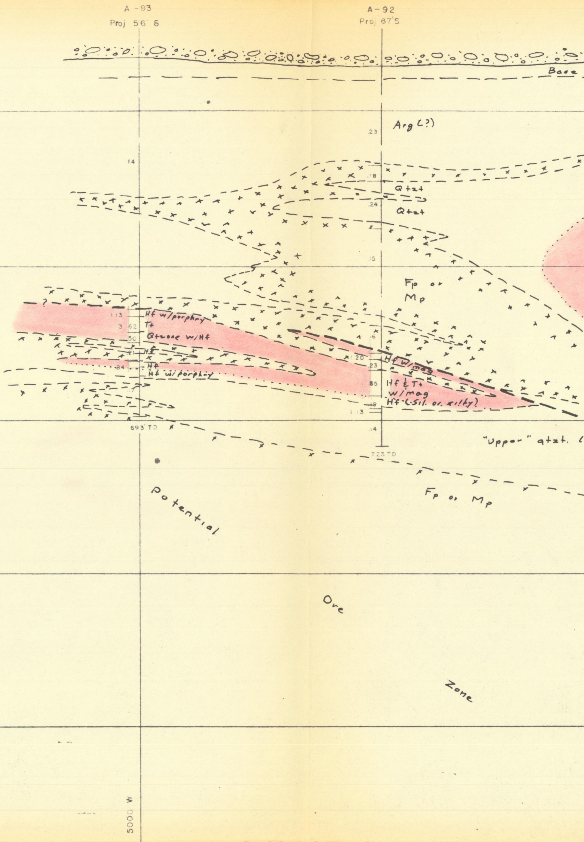
2800

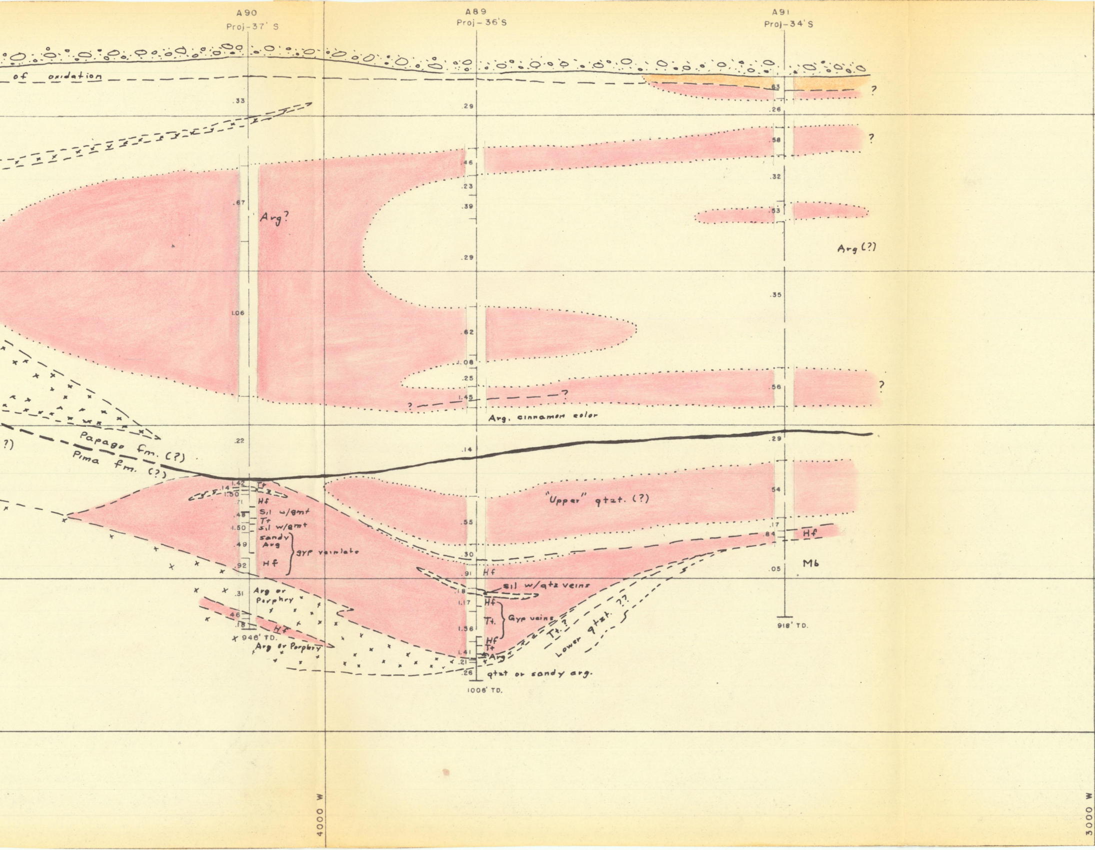
2600

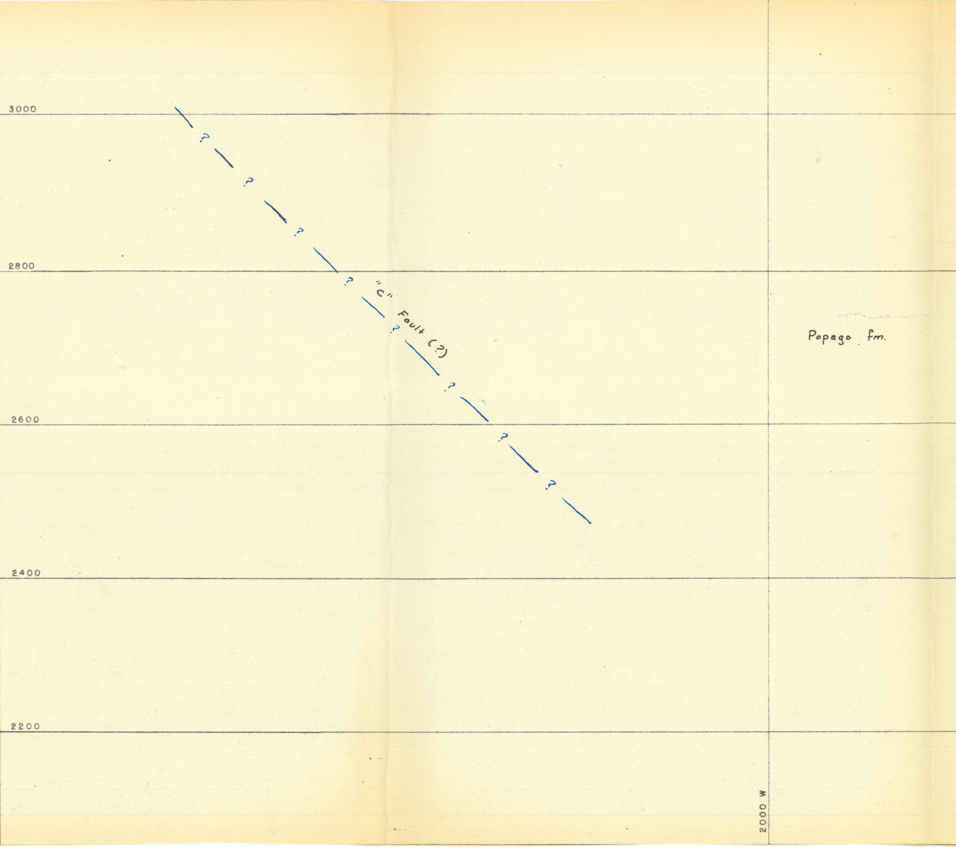
2400

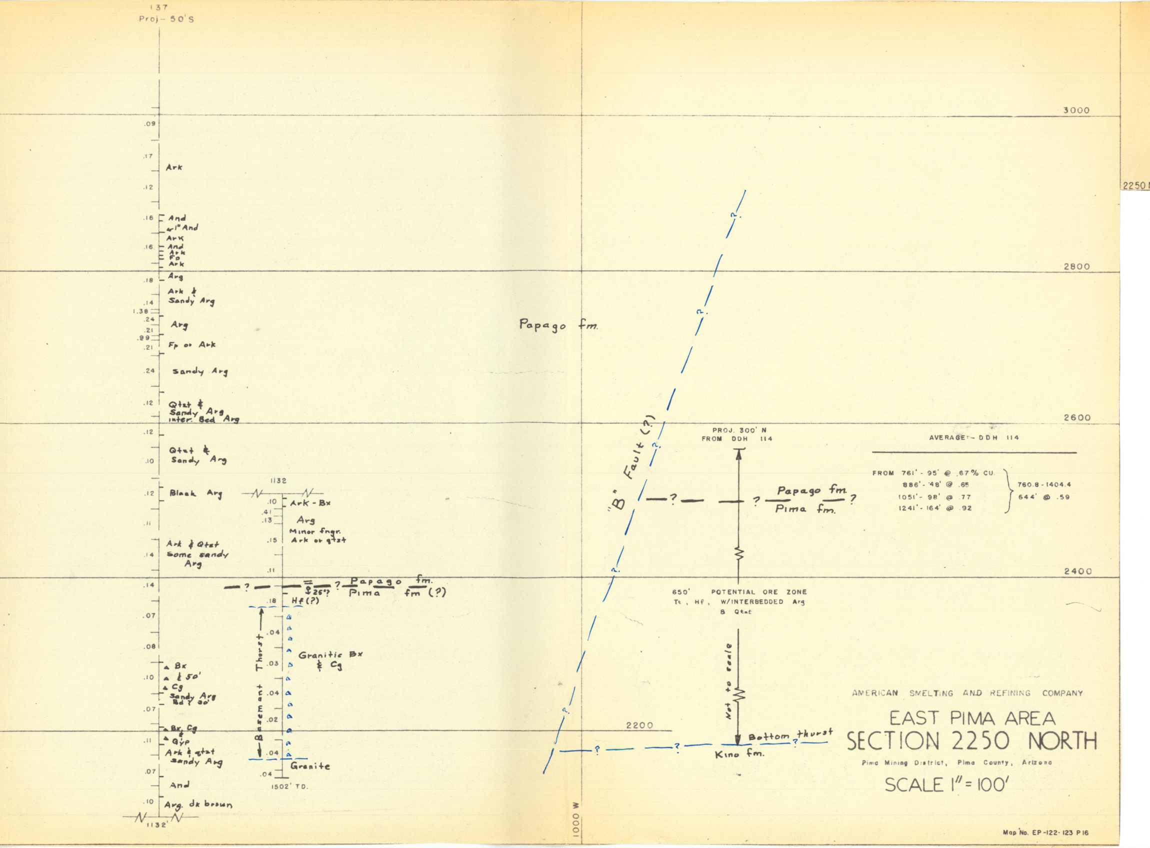
2200

6000 W


A -93
Proj 56' S
A-92
Proj 67'S
Base
Arg (?)
.23
14
.18
Qtzt
.24
Qtzt
.15
Fp or
Mp
?
1.13
Hf w/porphry
3 .62
Tt
.50
Qtzose w/Hf
.21
Hf
.84
Hf
Hf w/porphry
.17
693' TD
.6
1.20
.23
Hf w/mag
1.85
Hf & Tt
w/mag
.18
Hf (sil. or silty)
1.13
.14
723 TD
"Upper" qtzt. (
Fp or Mp
Potential
Ore
Zone
5000 W


A90
Proj-37' S
A89
Proj-36'S
A91
Proj-34'S
of oxidation
.33
.29
.63
?
.26
.58
?
.46
.32
.23
.67
.39
.63
Arg?
Arg (?)
.29
.35
1.06
.62
1.08
.25
.56
?
1.45
?
?
Arg. cinnamon color
?)
Papago fm. (?)
Pima fm. (?)
.22
.14
.29
1.42
Tt
.14
1.50
.71
Hf
Sil w/gmt
.48
Tt
1.50
sil w/gmt
sandy
Arg
.49
Hf
.92
gyp veinlets
54
"Upper" qtzt. (?)
.55
.17
.84
Hf
.30
.05
Mb
.91
Hf
sil w/qtz veins
.18
.31
Arg or
Porphry
1.17
Hf
46
Tt.
Gyp veins
.18
Hf
1.56
946' TD.
Hf
Arg or Porphry
Tt
1.41
Arg
Tt. ?
Lower qtzt. ??
.21
.26
qtzt or sandy arg.
1006' TD.
918' TD.
4000 W
3000 W


3000
2800
2600
2400
2200
"C" Fault (?)
?
Papago fm.
2000 W


137
Proj- 50'S
3000
2800
2600
2400
2200
2250 N
1000 W
.09
.17
Ark
.12
.16
And
w1" And
Ark
.16
And
Ark
Fp
Ark
.18
Arg
Ark &
Sandy Arg
.14
1.38
.24
Arg
.21
.99
Fp or Ark
.21
.24
Sandy Arg
.12
Qtzt &
Sandy Arg
inter. Bed Arg
.12
Qtzt &
Sandy Arg
.10
.12
Black Arg
.11
Ark & Qtzt
Some sandy
Arg
.14
.14
.07
.08
Bx
& 50'
Cg
.10
Sandy Arg
Bd ? 30'
.07
Bx, Cg
&
Gyp
.11
Ark & qtzt
sandy Arg
.07
And
.10
Arg. dk brown
1132'
1132
.10
Ark - Bx
.41
.13
Arg
Minor fngr.
Ark or qtzt
.15
.11
? 25°?
Papago fm.
Pima fm (?)
.18
Hf (?)
Basement Thrust
.04
.03
Granitic Bx
& Cg
.04
.02
.04
Granite
.04
1502' TD.
Papago fm.
"B" Fault (?)
PROJ. 300' N
FROM DDH 114
Papago fm.
Pima fm.
650' POTENTIAL ORE ZONE
Tt, Hf, W/INTERBEDDED Arg
& Qtzt
Not to scale
Bottom thrust
Kino fm.
AVERAGE - DDH 114
FROM 761' - 95' @ .67 % CU.
886' - '48' @ .65
1051' - 98' @ .77
1241' - 164' @ .92
760.8 - 1404.4
644' @ .59

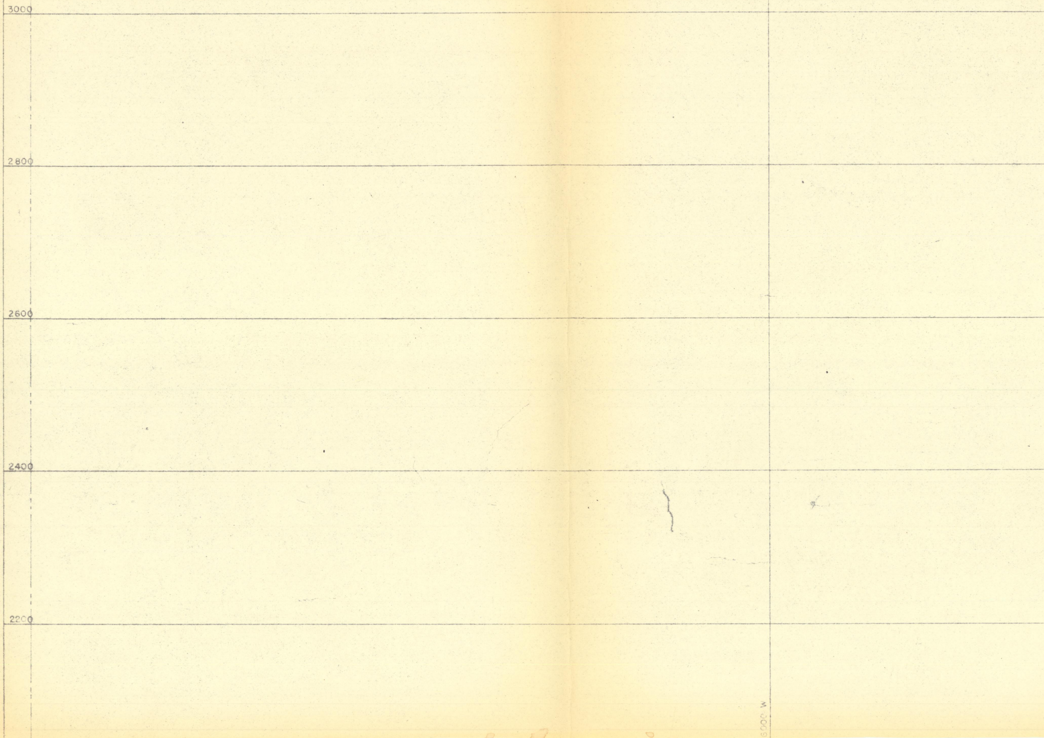
AMERICAN SMELTING AND REFINING COMPANY

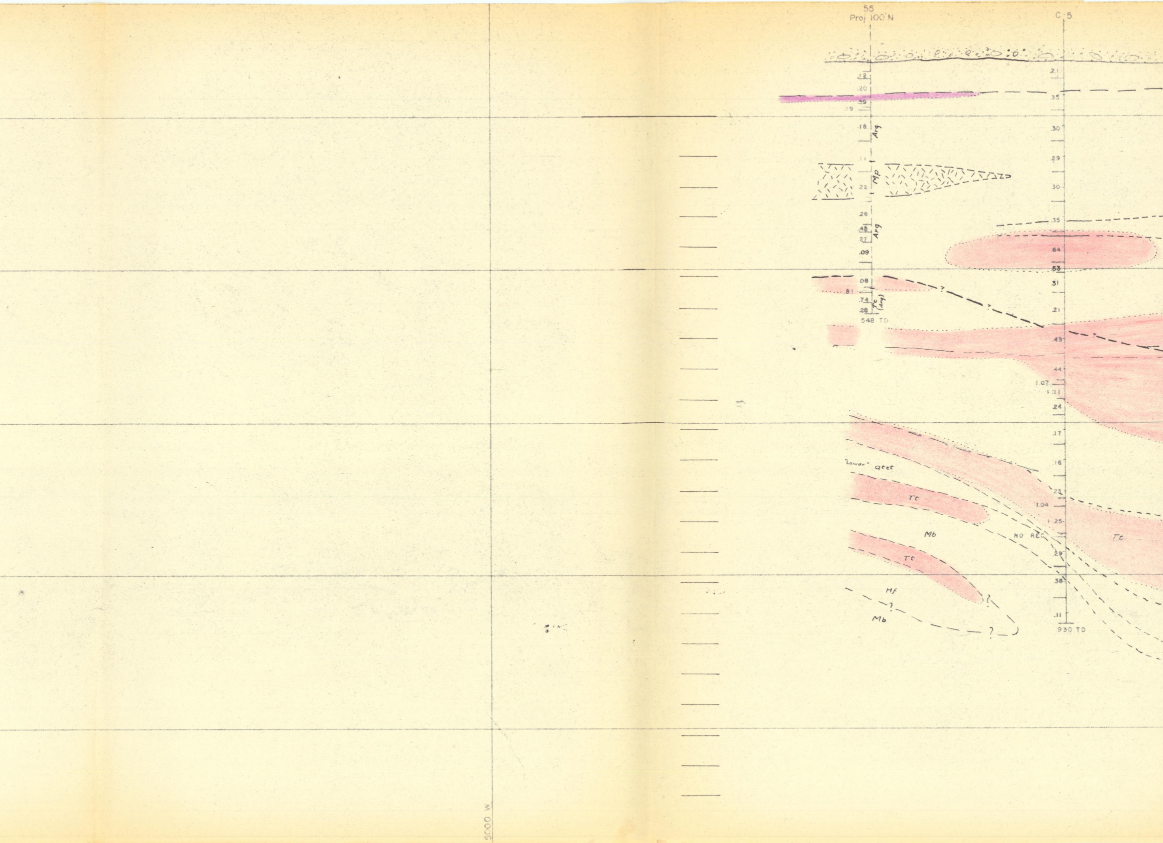
EAST PIMA AREA
SECTION 2250 NORTH

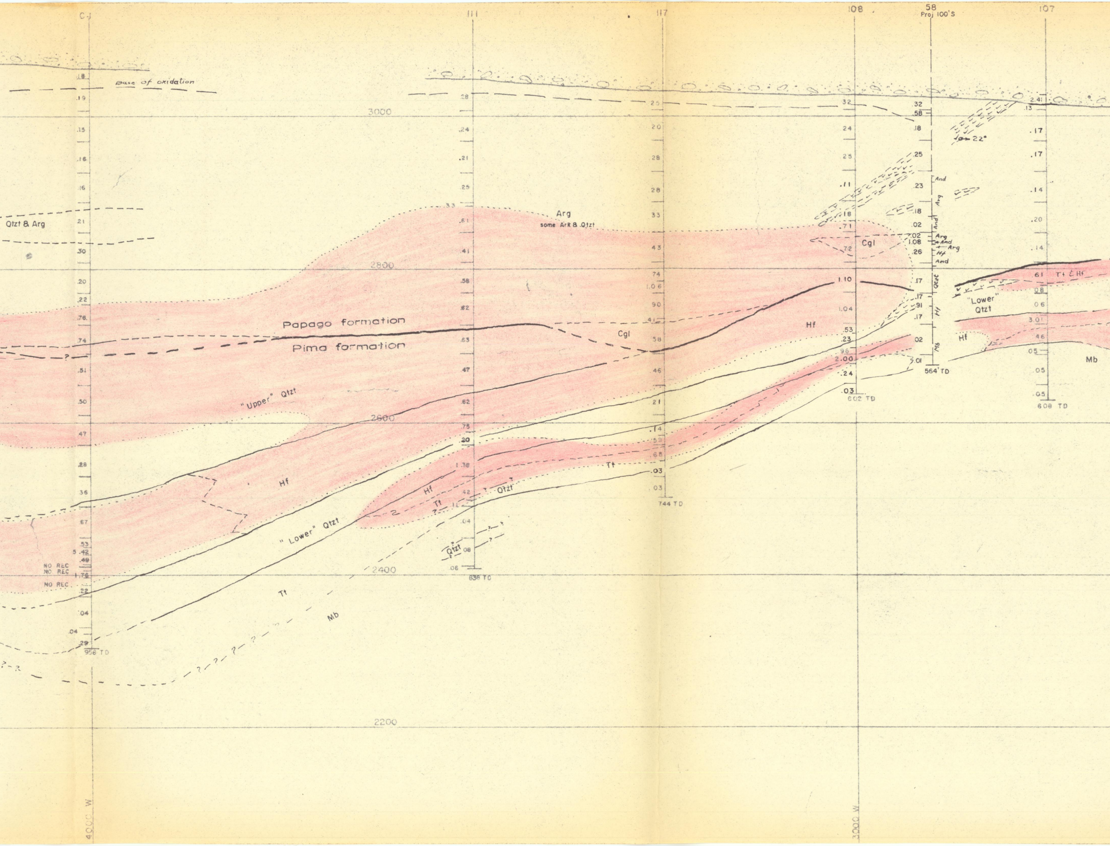
Pima Mining District, Pima County, Arizona

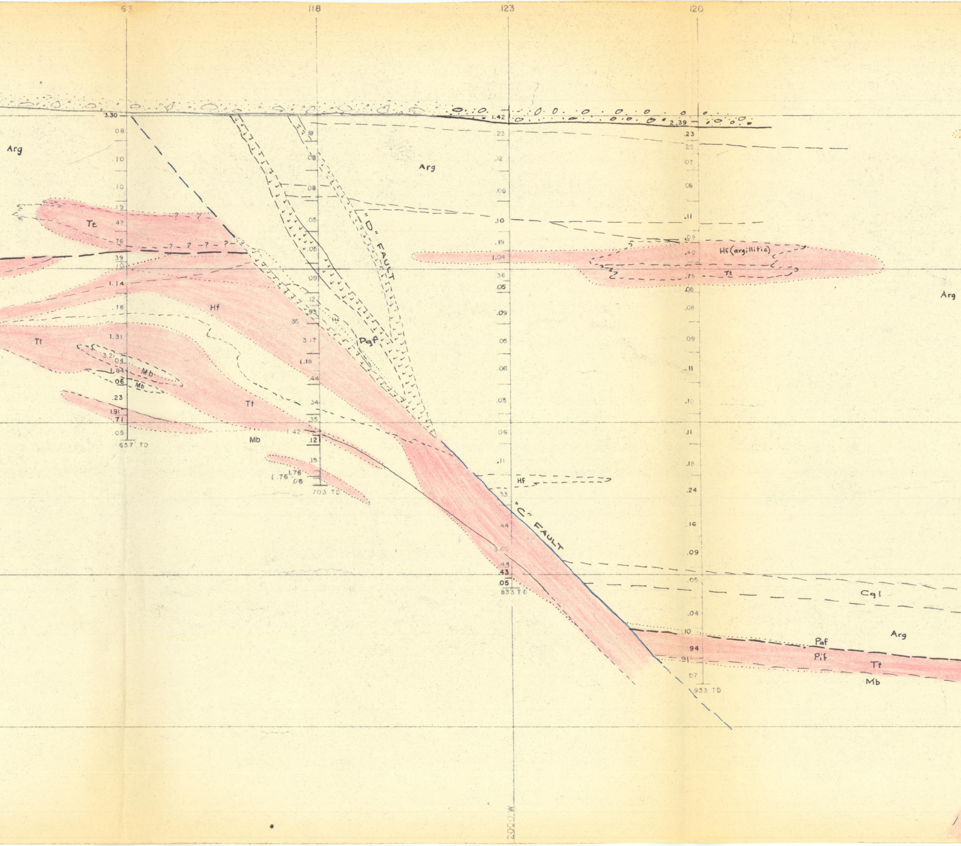
SCALE 1" = 100'

Map No. EP-122-123 P16

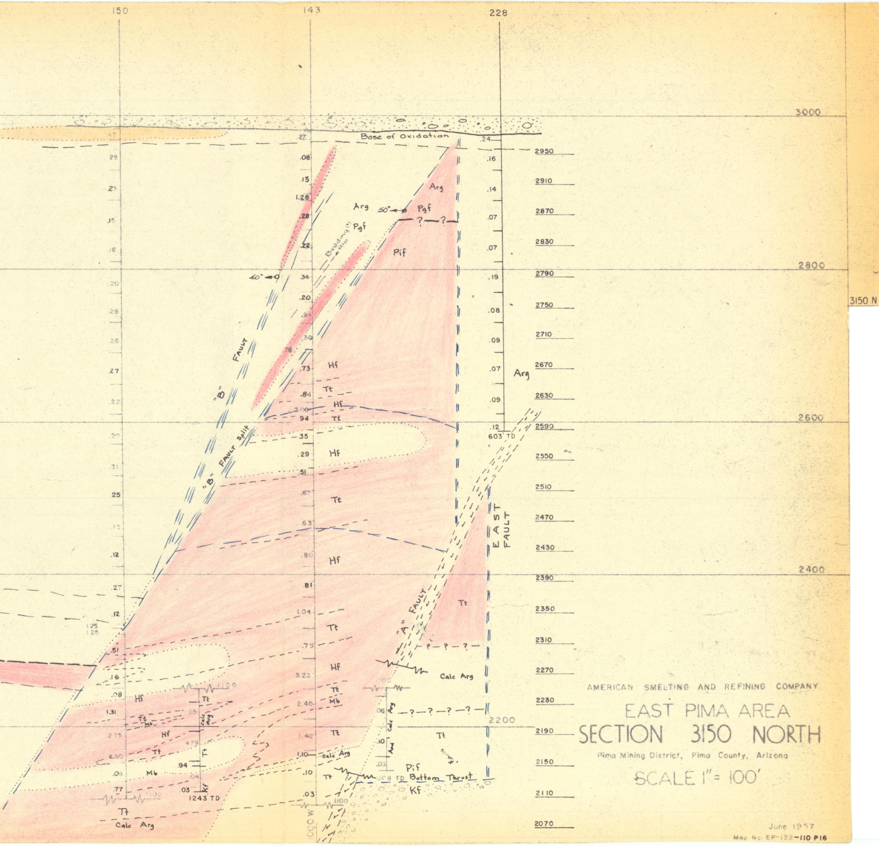



55
Proj 100'N
C-5
.12
.20
.59
.19
.18
Arg
.11
Mp
.22
.26
.48
Arg
.27
.09
.08
.81
.74
.28
Tc (Arg)
548 TD
.21
.35
.30
.29
.30
.35
.64
.53
.31
.21
.43
.44
1.07
1.11
.24
.17
.16
.23
1.04
1.25
.29
.38
.11
930 TD
"Lower" Qtct
Tc
Mb
Tc
NO REC
Tc
Hf
?
Mb
?
5000 W


C-1
111
117
108
58
Proj 100'S
107
3000
2800
2600
2400
2200
4000 W
3000 W
Base of oxidation
Qtzt & Arg
Arg
some Ark & Qtzt
Cgl
Papago formation
Pima formation
"Upper" Qtzt
Hf
"Lower" Qtzt
Tt
Mb
Qtzt
Tt & Hf
"Lower" Qtzt
22°
And
Arg
And
Arg
+And
Arg
Hf
And
Qtzt
Hf
Mb
NO REC
NO REC
NO REC
.18
.19
.15
.16
.16
.21
.30
.20
.22
.76
.74
.51
.50
.47
.28
.36
.67
.53
5 .42
.49
1.76
.22
.04
.04
.29
956 TD
.28
.24
.21
.25
.33
.61
.41
.58
.82
.63
.47
.62
.75
.20
1.38
.42
.11
.04
.08
.06
838 TD
.25
.20
.28
.28
.33
.43
.74
1.06
.90
.41
.58
.46
.21
.14
.59
.68
.03
.03
744 TD
.32
.24
.25
.11
.18
.71
.72
1.10
1.04
.53
.23
.96
2.00
.24
.03
602 TD
.32
.58
.18
.25
.23
.18
.02
.02
1.08
.26
.17
.17
.91
.17
.02
.01
564' TD
2.41
.13
.17
.17
.14
.20
.14
.61
.08
.06
3.01
.46
.05
.05
.05
608 TD



63
118
123
120
3.30
1.42
2.39
Arg
Arg
Arg
Arg
Tt
Tt
Tt
Tt
Hf
Hf
Hf
Hf (argillitic)
Mb
Mb
Mb
Mb
Pgf
"D" FAULT
"C" FAULT
Cgl
Paf
Pif
637' TD
703' TD
833' TD
953' TD
2000 W

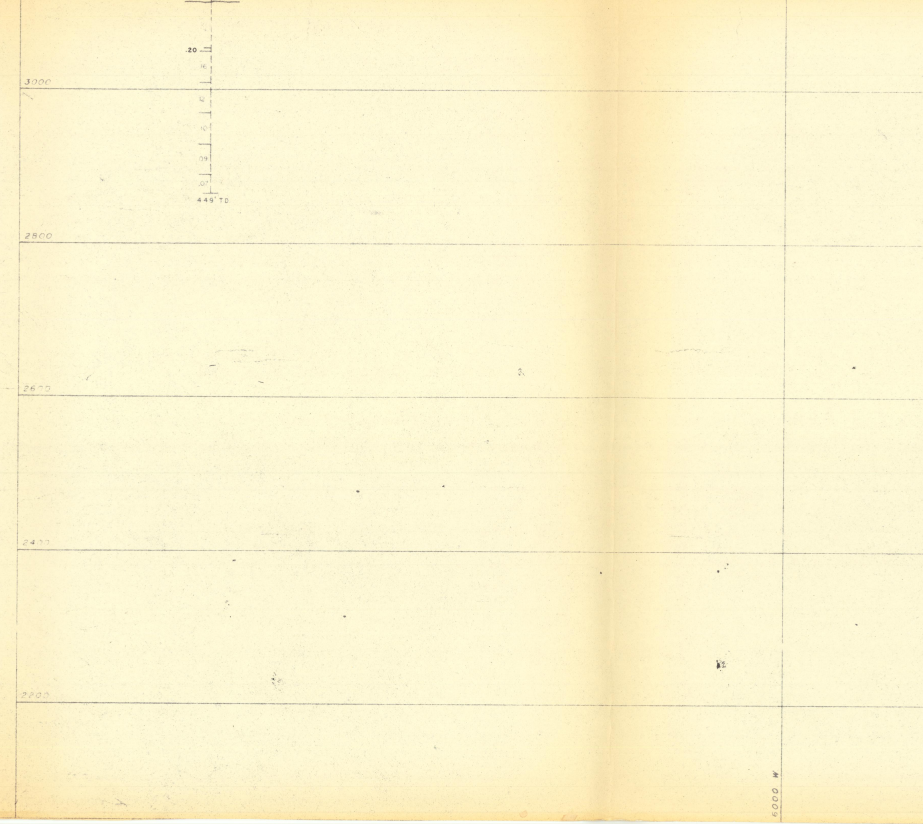

150
143
228
3000
2800
2600
2400
2200
3150 N
Base of Oxidation
2950
2910
2870
2830
2790
2750
2710
2670
2630
2590
2550
2510
2470
2430
2390
2350
2310
2270
2230
2190
2150
2110
2070
"B" FAULT
"B" FAULT Split
"A" FAULT
EAST FAULT
Bedding (?) dip
Arg
Pgf
Pif
Hf
Tt
Mb
Kf
Calc Arg
Bottom Thrust
50°
40°
603' TD
1243 TD
208 TD
1100
1000 W

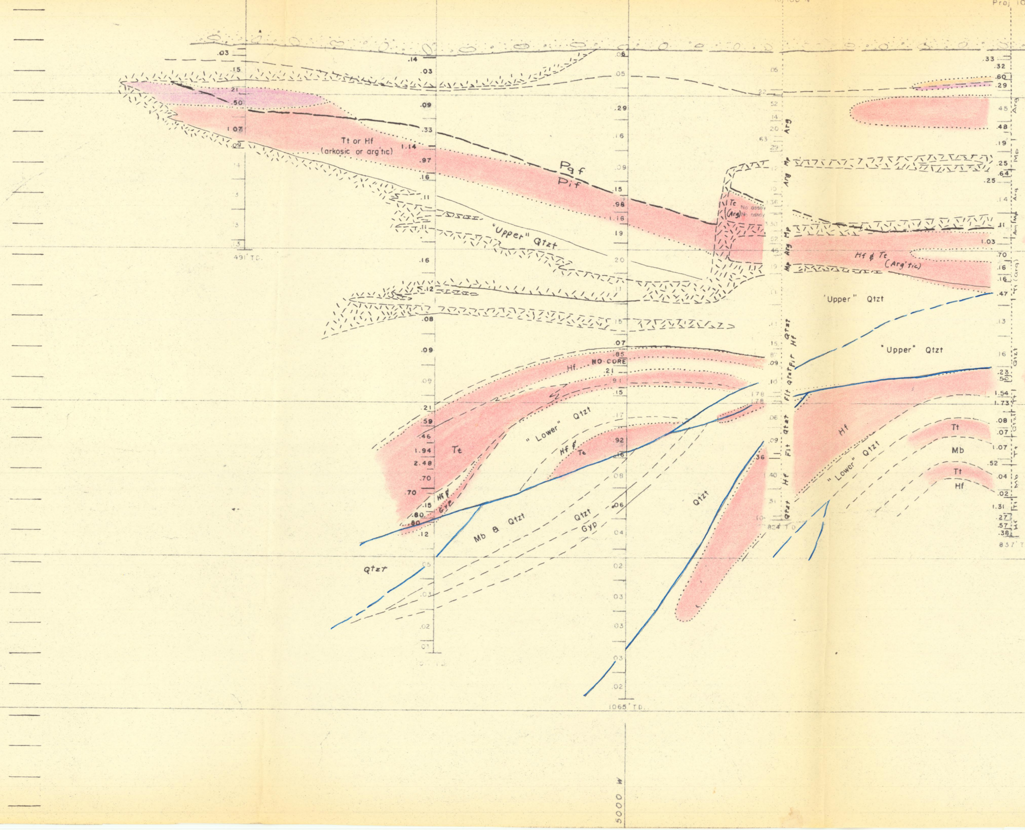
AMERICAN SMELTING AND REFINING COMPANY

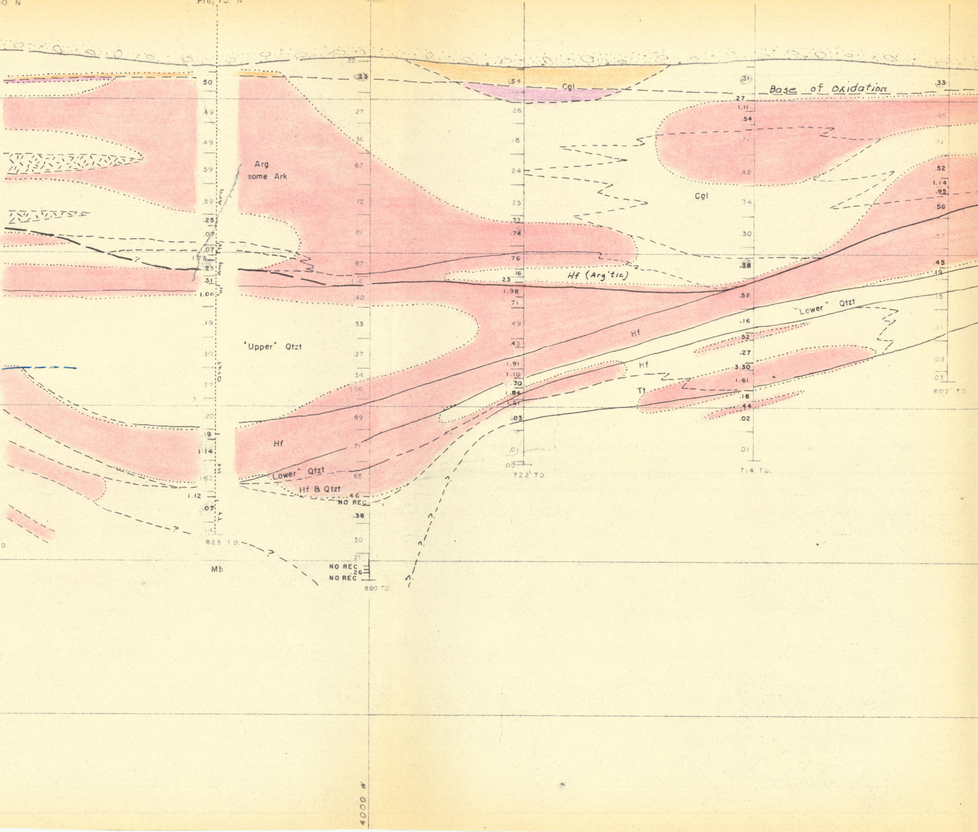
EAST PIMA AREA
SECTION 3150 NORTH
Pima Mining District, Pima County, Arizona

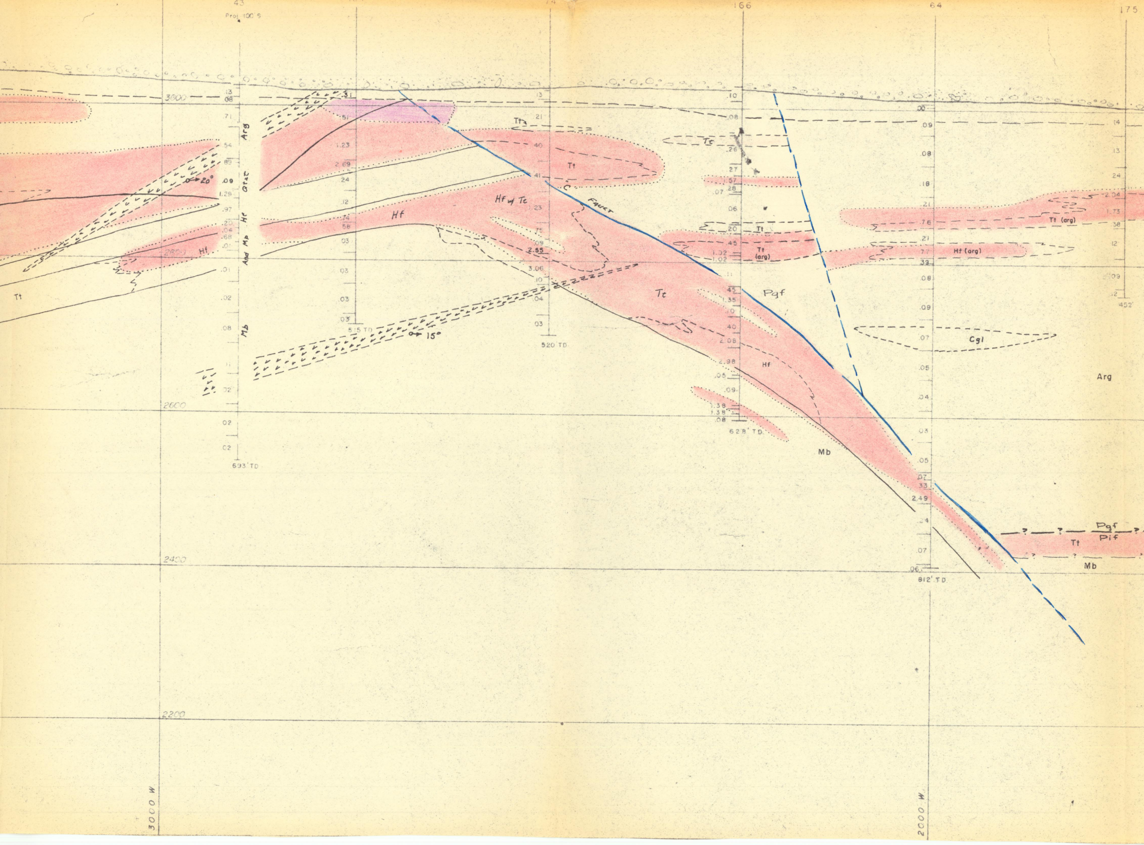
SCALE 1" = 100'

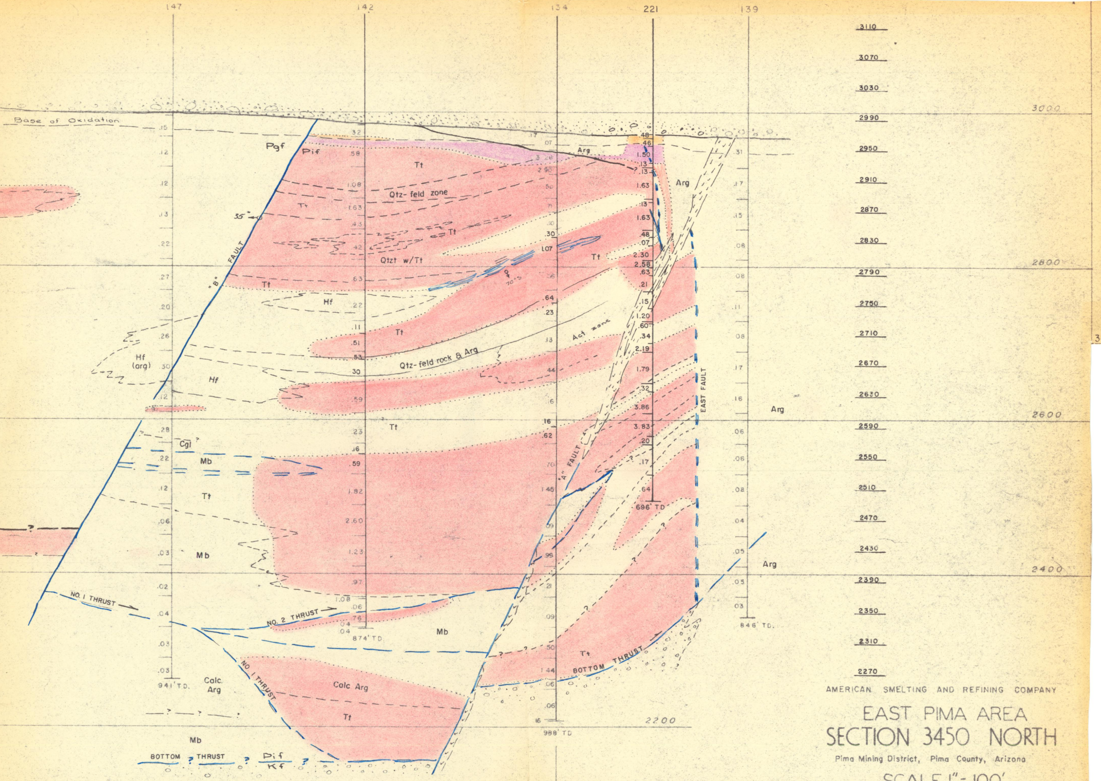
June 1957
Map No. EP-122-110 P16


.20
16
12
10
09
.07
449' TD
3000
2800
2600
2400
2200
6000 W


Tt or Hf
(arkosic or arg'tic)
Pgf
Pif
"Upper" Qtzt
491' T.D.
Tc
(Arg)
No assay
No assay
Arg
Mp
Hf & Tt
(Arg'tic)
'Upper" Qtzt
"Upper" Qtzt
Hf.
NO CORE
"Lower" Qtzt
Tt
Hf & Tt
Hf & Gyp
Mb & Qtzt
Qtzt
Gyp
Qtzt
Qtzt
Hf
"Lower" Qtzt
Tt
Mb
Tt
Hf
824' T.D.
837' T.D.
1065' T.D.
5000 W


0 N
Proj 15' N
Base of Oxidation
Cgl
Cgl
Arg
some Ark
Arg
Qtzt
Hf
Tt
Hf (Arg'tic)
"Upper" Qtzt
Hf
Hf
Hf
"Lower" Qtzt
"Lower" Qtzt
Hf & Qtzt
Tt
Mb
50
.49
.49
.59
.59
.25
.07
.07
1.73
.23
.31
1.06
.19
.30
.27
.20
.19
1.14
.62
1.12
.07
.14
823 TD.
22
.23
27
36
67
72
.81
.67
1.18
.40
33
.37
.34
1.06
.89
.71
.65
.46
NO REC
.38
30
.21
NO REC
.26
NO REC
880 TD
.54
.26
.16
.24
.25
.33
.74
.76
.16
.23
1.98
.71
.49
.43
1.91
1.10
.30
1.84
1.61
.03
.01
.00
722' TD.
.31
.27
1.11
.54
.71
.42
.34
.30
.38
.58
.16
.52
.27
3.30
1.61
.16
.44
.02
.01
714 TD.
.33
.46
.31
.52
1.14
.95
.56
.57
.45
.19
.15
.11
.03
.03
602' TD.
4000 W


43
Proj. 100' S
74
166
64
175
3000
2800
2600
2400
2200
3000 W
2000 W
Arg
Qtz c
Hc
And Mb
Mb
Tt
Hf
Tc
Hf w/ Tc
Fault
Pgf
Pif
Cgl
Tt (arg)
Hf (arg)
Arg
20°
15°
515 TD
520 TD
628' TD
693' TD
812' TD
452'
.13
.08
.71
.54
.89
.09
1.29
.97
.20
.04
.68
.01
.01
.02
.08
.02
.02
.02
.31
.51
1.23
2.69
.24
.12
.74
.58
.03
.03
.03
.03
.13
.21
.40
.41
.23
.75
.09
2.55
3.06
.10
.04
.03
.10
.08
.26
.27
1.57
.28
.07
.06
.20
.45
1.32
1.02
.45
1.35
.10
.40
2.08
2.98
.05
.09
1.38
1.38
.08
.00
.09
.08
.18
.21
.76
.21
.77
.39
.08
.09
.07
.05
.04
.03
.05
.07
.33
2.49
.24
.07
.06
.14
.13
.24
2.04
1.73
.38
.12
.09
.12


147
142
134
221
139
3110
3070
3030
3000
2990
2950
2910
2870
2830
2800
2790
2750
2710
2670
2630
2600
2590
2550
2510
2470
2430
2400
2390
2350
2310
2270
2200
3450 N
Base of Oxidation
Pgf
Pif
Tt
Qtz- feld zone
Qtzt w/Tt
Hf
Hf (arg)
Qtz- feld rock & Arg
Act zone
Arg
"B" FAULT
"A" FAULT
EAST FAULT
35°
70°S
Cgl ?
Mb
NO. 1 THRUST
NO. 2 THRUST
NO. 1 THRUST
BOTTOM THRUST
Calc. Arg
Calc Arg
BOTTOM THRUST
Pif
Kf
941' TD.
874' TD.
988' TD
696' TD
846' TD.
1000 W

AMERICAN SMELTING AND REFINING COMPANY

EAST PIMA AREA

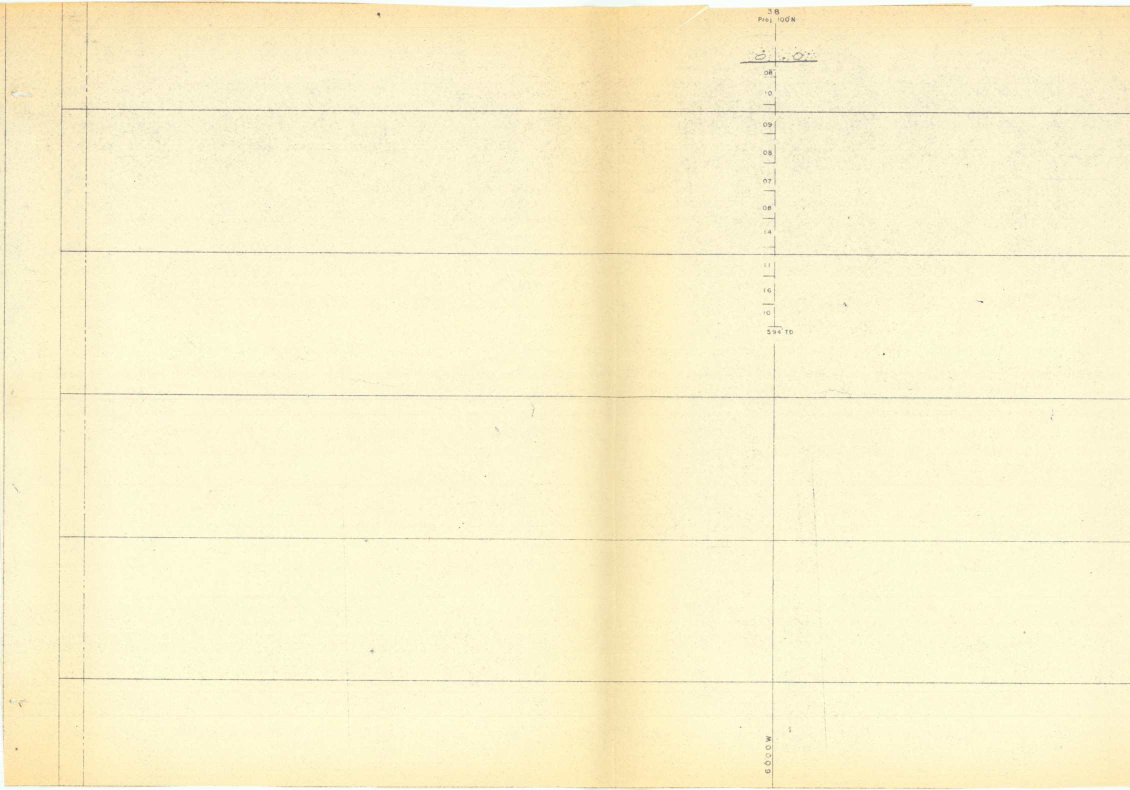
SECTION 3450 NORTH

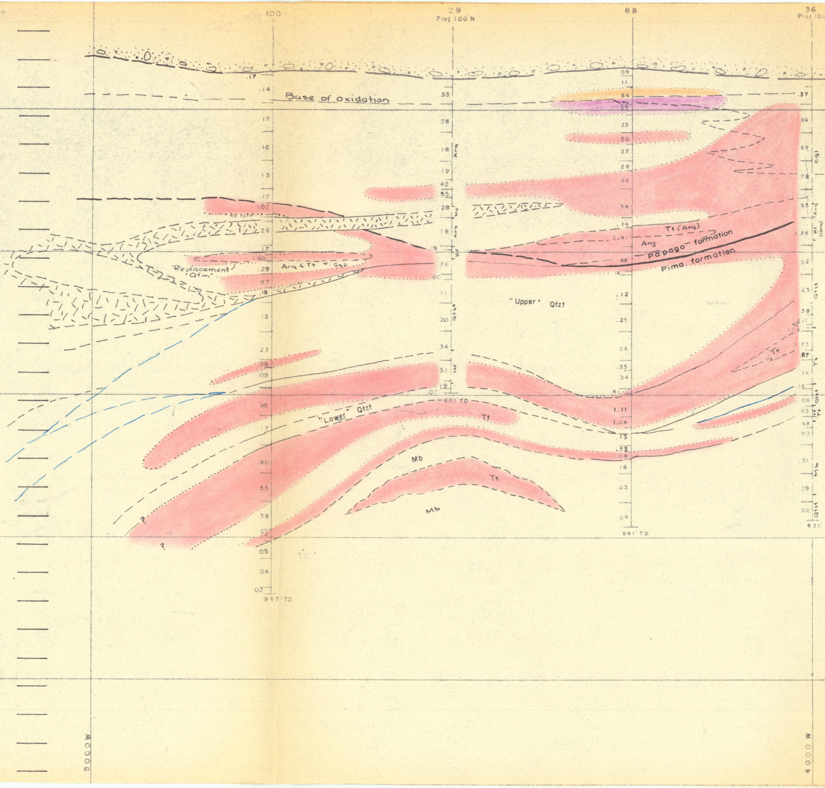
Pima Mining District, Pima County, Arizona

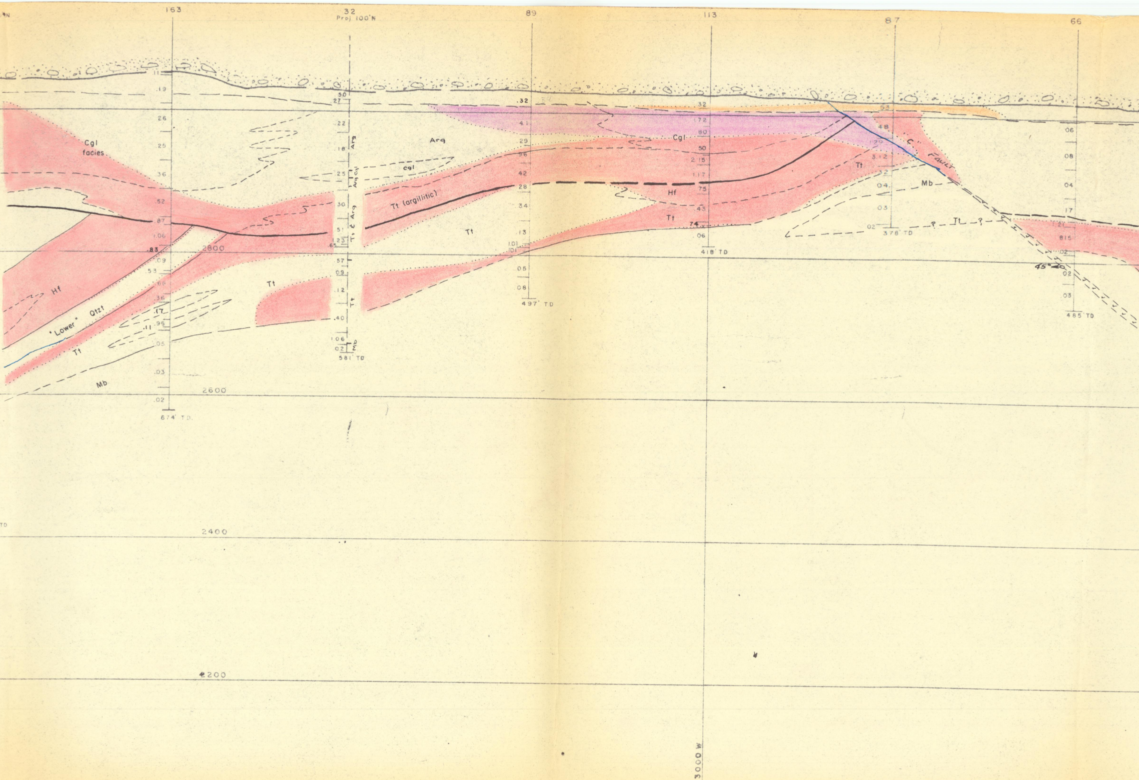
SCALE 1" = 100'

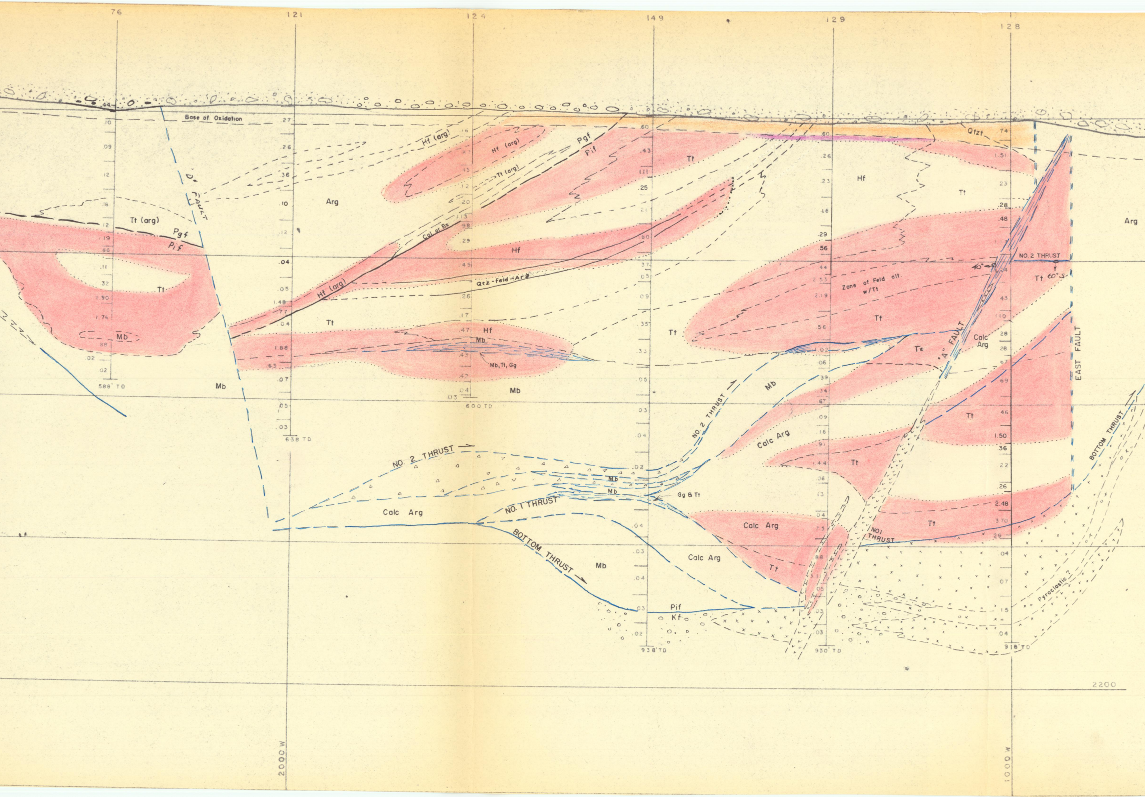
June 1957

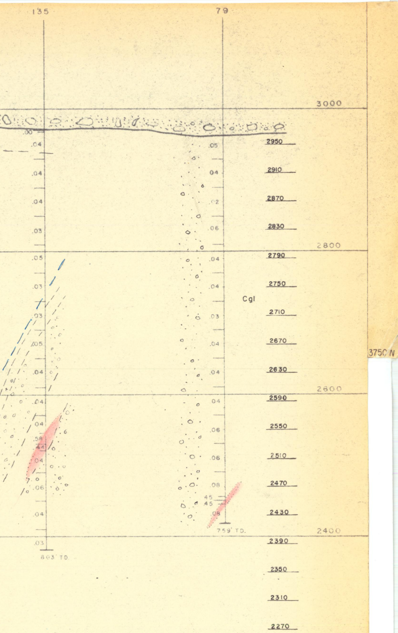
Map No. EP-122-112-P16


38
Proj 100'N
08
10
09
08
07
08
14
11
16
10
594' TD
6000W


100
29
Proj 100'N
88
36
Proj 10
Base of oxidation
Replacement "Qfm"
Arg & Tt w/Gyp
60 core
Arg
Tt (Arg)
Papago formation
Pima formation
"Upper" Qtzt
"Lower" Qtzt
Tt
Mb
Tt
Mb
Tt
Hf
Qtzt
Cgl
Hf (Arg)
Qtzt
Tt
Hf Tt
Mb
Qtzt
?
?
947' TD
861' TD
841' TD
830'
5000 W
4000 W


163
32
Proj. 100'N
89
113
87
66
Cgl facies
Arg
cgl
Cgl
Arg Cgl
Tt & Arg
Tt (argillitic)
Tt
Hf
Mb
"Lower" Qtzt
"C" Fault
45°
2800
2600
2400
2200
3000 W
674' TD
581' TD
497' TD
418' TD
378' TD
485' TD


76
121
124
149
129
128
Base of Oxidation
'D' FAULT
Hf (arg)
Tt (arg)
Pgf
Pif
Arg
Cal or Bx
Qtz-Feld-Arg
Hf
Tt
Mb
Mb, Tt, Gg
Qtzt
Zone of Feld alt. w/Tt
NO. 2 THRUST
40°
Tt 60° S
"A" FAULT
Calc Arg
EAST FAULT
NO. 1 THRUST
BOTTOM THRUST
Gg & Tt
Kf
Pyroclastic ?
588' TD
600 TD
638 TD
938' TD
930' TD
918' TD
2000 W
1000 W
2200


135
79
3000
2800
2600
2400
3750 N
Cgl
.00
.04
.04
.04
.03
.05
.03
.03
.05
.04
.04
.04
.58
.44
.04
.06
.04
.03
863' TD
.05
.04
.02
.06
.04
.04
.03
.04
.04
.04
.06
.06
.08
45
45
.08
759' TD
2950
2910
2870
2830
2790
2750
2710
2670
2630
2590
2550
2510
2470
2430
2390
2350
2310
2270

AMERICAN SMELTING AND REFINING COMPANY

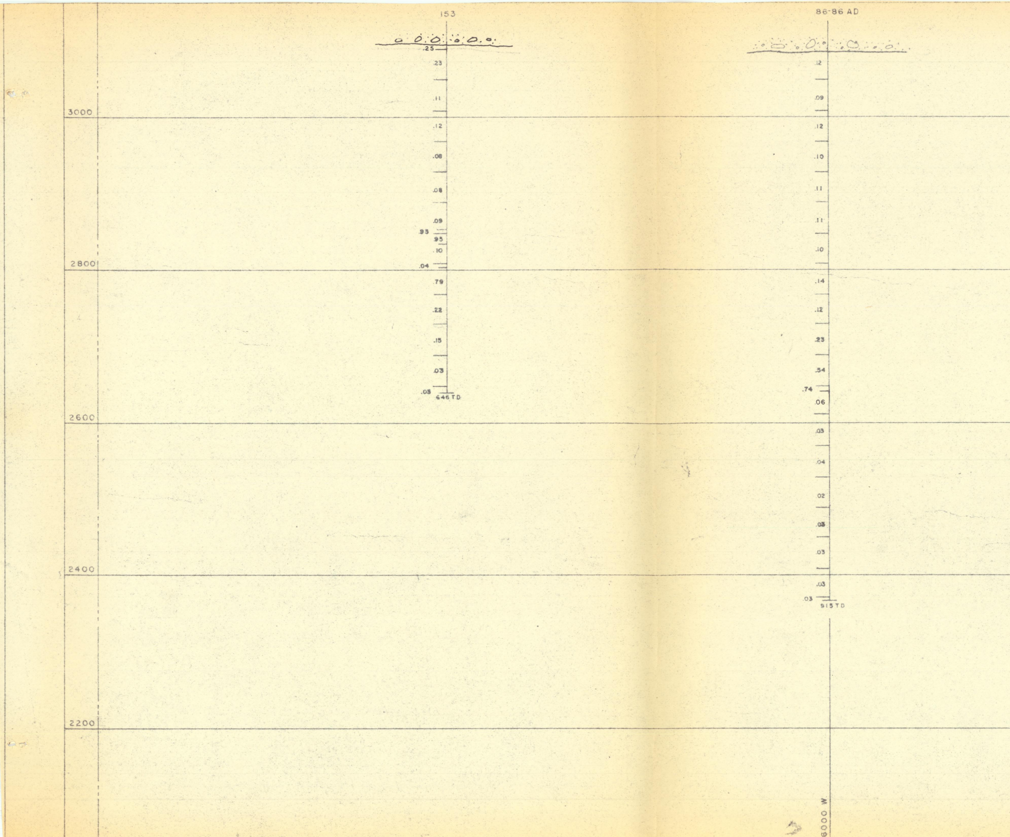
EAST PIMA AREA

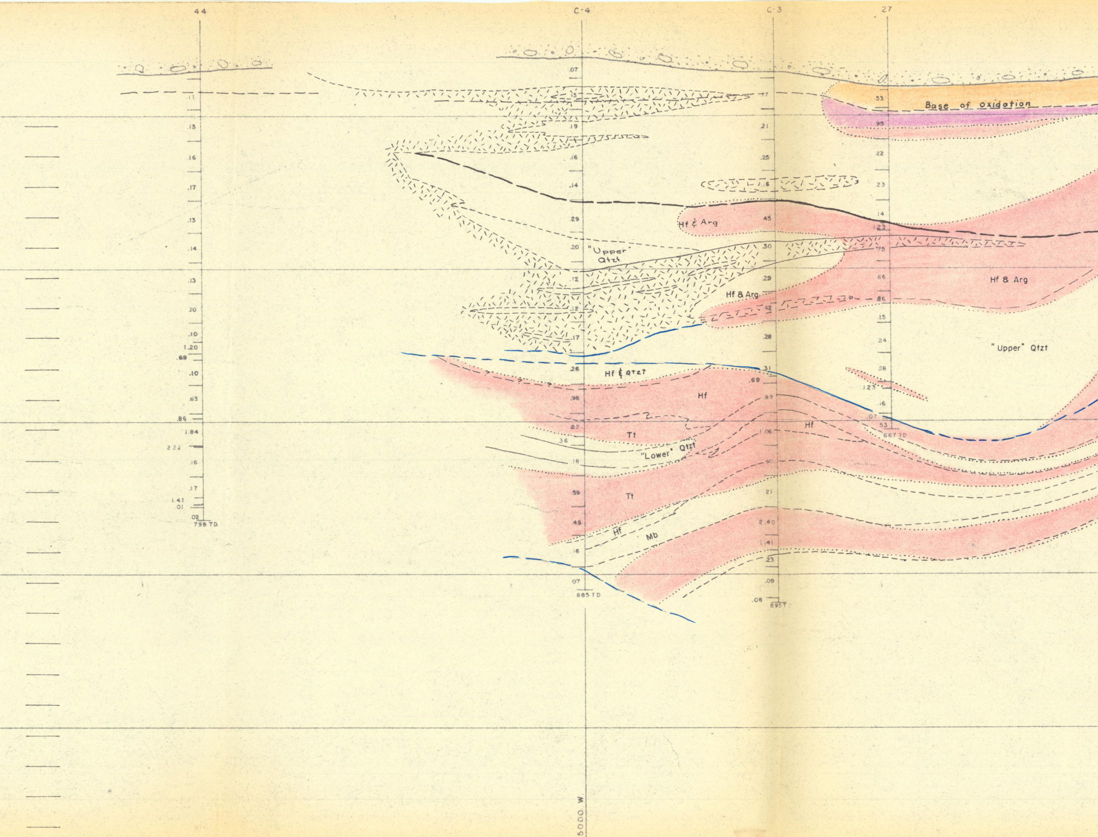
SECTION 3750 NORTH

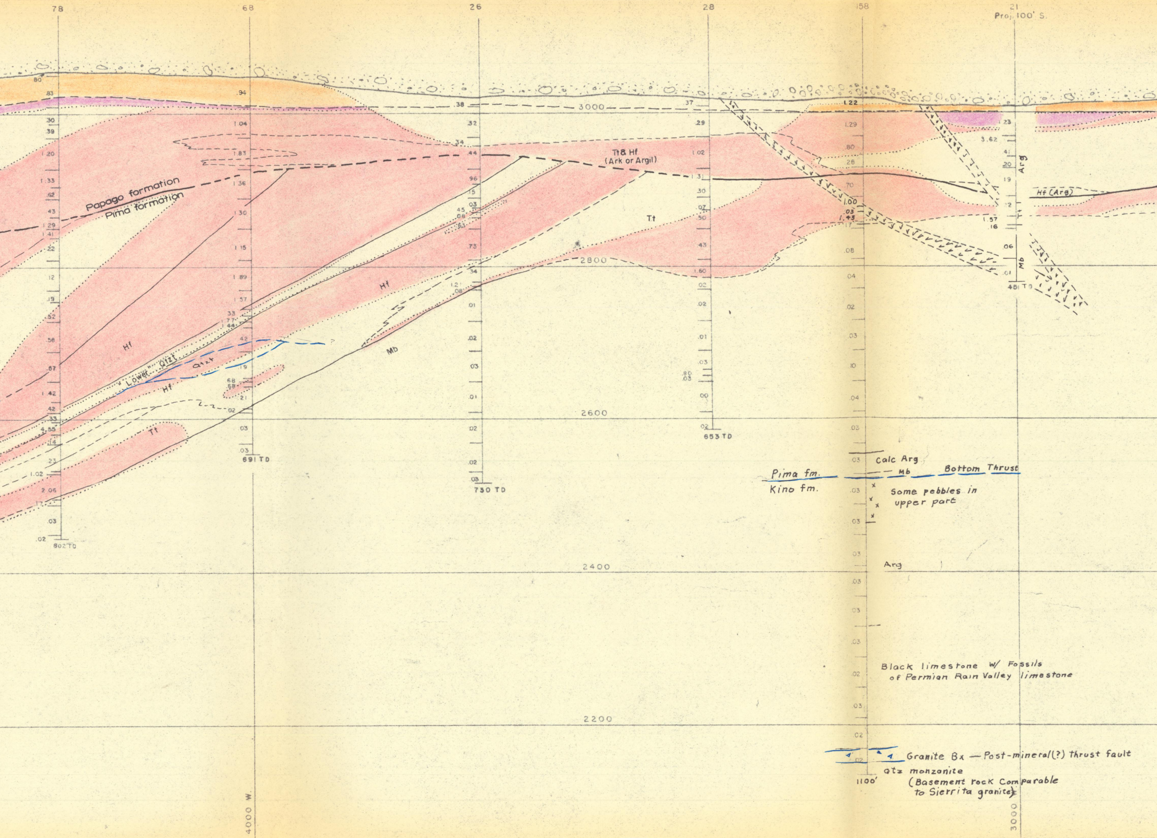
Pima Mining District, Pima County, Arizona

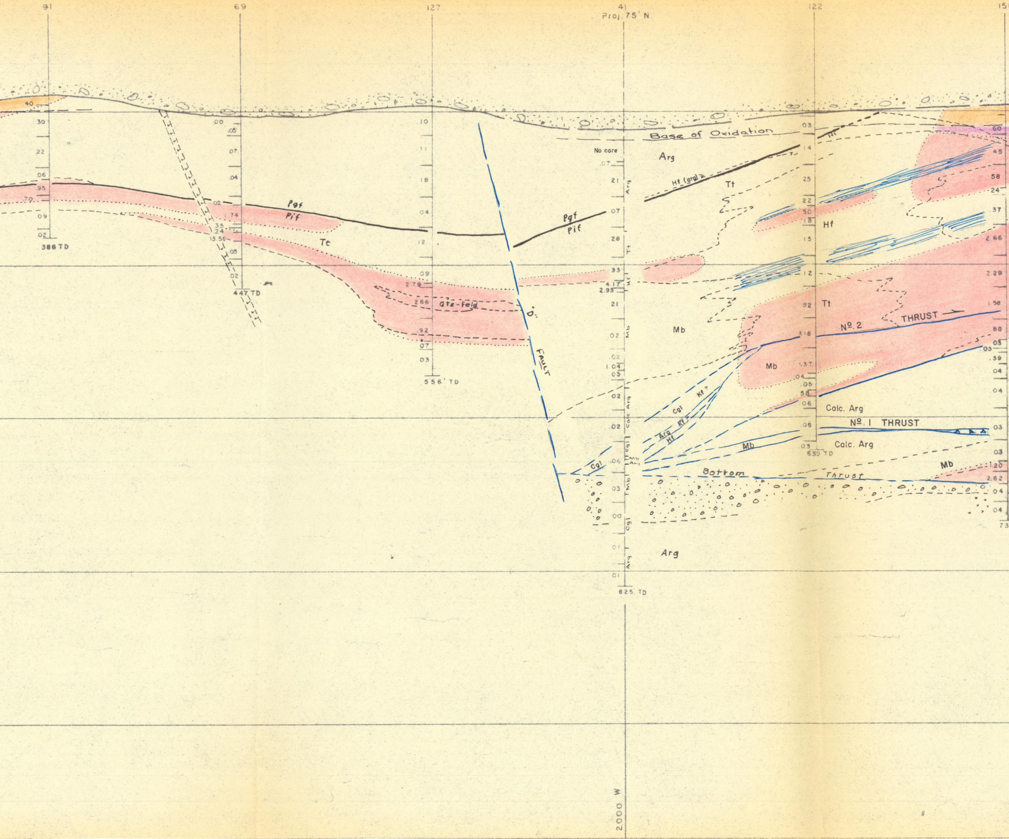
SCALE 1" = 100'

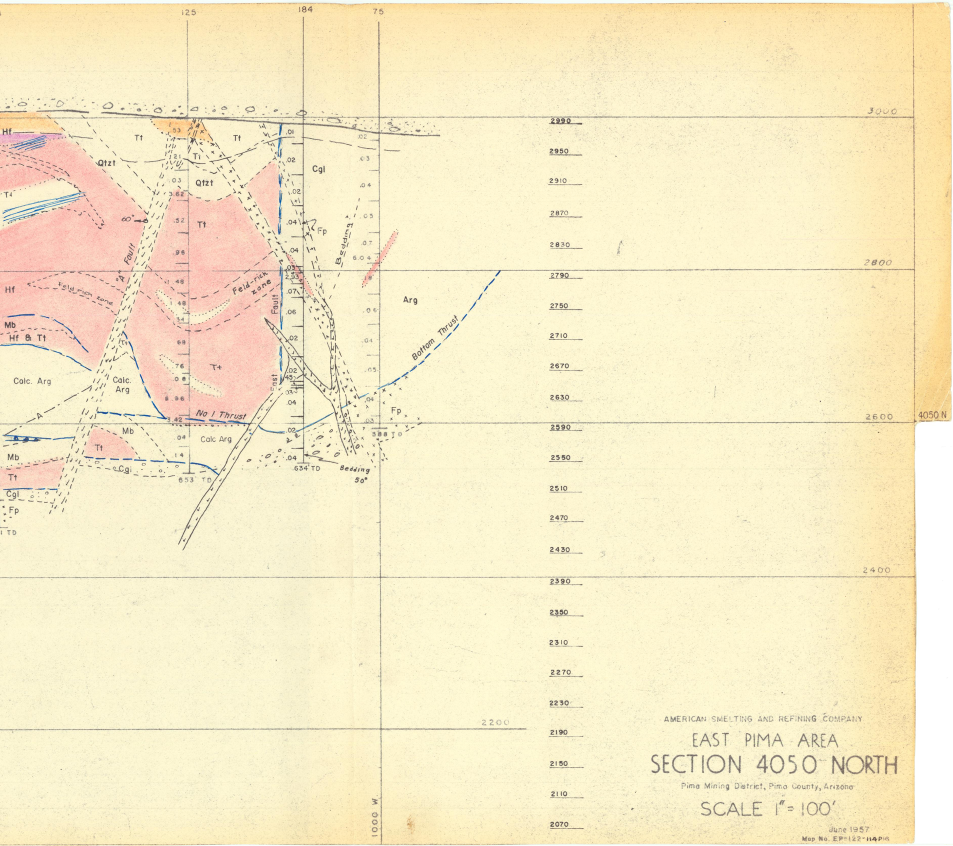
June 1957
Map No. EP-122-113 P16


153
.25
.23
.11
.12
.08
.08
.09
.95
95
.10
.04
.79
.22
.15
.03
.03
646 TD
86-86 AD
.12
.09
.12
.10
.11
.11
.10
.14
.12
.23
.54
.74
.06
.03
.04
.02
.03
.03
.03
.03
915 TD
3000
2800
2600
2400
2200
6000 W


44
C-4
C-3
27
Base of oxidation
Hf & Arg
"Upper" Qtzt
Hf & Arg
Hf & Arg
"Upper" Qtzt
Hf & Qtzt
Hf
Hf
Tt
"Lower" Qtzt
Tt
Hf
Mb
798 TD
885 TD
895 TD
667 TD
5000 W


78
68
26
28
158
21
Proj. 100' S.
3000
2800
2600
2400
2200
4000 W.
3000
Papago formation
Pima formation
Tt & Hf
(Ark or Argil)
Tt
Hf
Hf
Hf
Hf
Mb
Tt
"Lower" Qtz
Qtz
Arg
Hf (Arg)
Tt
Mb
80
.83
30
.39
1.20
1.33
.62
.43
1.29
1.41
.22
.12
.19
.52
.58
.67
1.42
.42
.33
4.55
.14
.23
1.02
2.06
.17
.03
.02
802 TD
.94
1.04
1.83
1.36
1.30
1.15
1.89
1.57
.33
1.77
1.44
.42
.19
.68
.58
.21
.02
.03
.03
691 TD
.38
.32
.34
.44
.96
.15
.03
.45
.08
.83
.75
.34
1.21
.08
.01
.02
.03
.01
.02
.02
.03
730 TD
.37
.29
1.02
1.31
.30
.07
.50
.43
1.60
.02
.02
.01
.03
.80
.03
.00
.02
653 TD
1.22
1.29
.80
.28
.70
1.00
.03
1.43
.17
.08
.04
.02
.03
.10
.04
.03
.03
.03
.03
.03
.03
.03
.03
.02
.03
.02
.02
1100'
1.23
3.62
.41
.20
.19
.12
1.57
.16
.06
.01
481 TD
Calc Arg
Pima fm.
Mb
Bottom Thrust
Kino fm.
Some pebbles in upper part
Arg
Black limestone w/ Fossils of Permian Rain Valley limestone
Granite Bx — Post-mineral(?) thrust fault
Qtz monzonite
(Basement rock Comparable to Sierrita granite)


91
69
127
41
Proj. 75' N.
122
386 TD
447 TD
556' TD
625 TD
639 TD
Base of Oxidation
No core
Arg
Hf (arg)?
Tt
Pgf
Pif
Qtz-feld
"D" FAULT
Hf
Mb
Cgl
Kf?
Calc. Arg
No. 2 THRUST
No. 1 THRUST
Bottom Thrust
2000 W


125
184
75
3000
2800
2600
2400
2200
4050 N
2990
2950
2910
2870
2830
2790
2750
2710
2670
2630
2590
2550
2510
2470
2430
2390
2350
2310
2270
2230
2190
2150
2110
2070
1000 W.
Hf
Tt
Qtzt
Ti
Cgl
Fp
Bedding
Arg
Hf
Feld rich zone
Feld-rick zone
"A" Fault
60°
Fault
Mb
Hf & Tt
Calc. Arg
Calc. Arg
Tt
East
Bottom Thrust
No I Thrust
A
Mb
Calc Arg
Tt
Mb
Tt
Cgl
Cgl
Fp
653 TD
634 TD
388 TD
Bedding 50°
.53
.21
.03
3.62
.52
.96
1.48
1.48
.34
.68
.76
.08
6.96
3.42
.04
.14
.01
.02
.02
.04
.04
.03
2.33
.07
.06
.02
.02
.45
.03
.04
.02
.04
.02
.03
.04
.05
.07
6.04
.18
.06
.04
.05
.04
.03

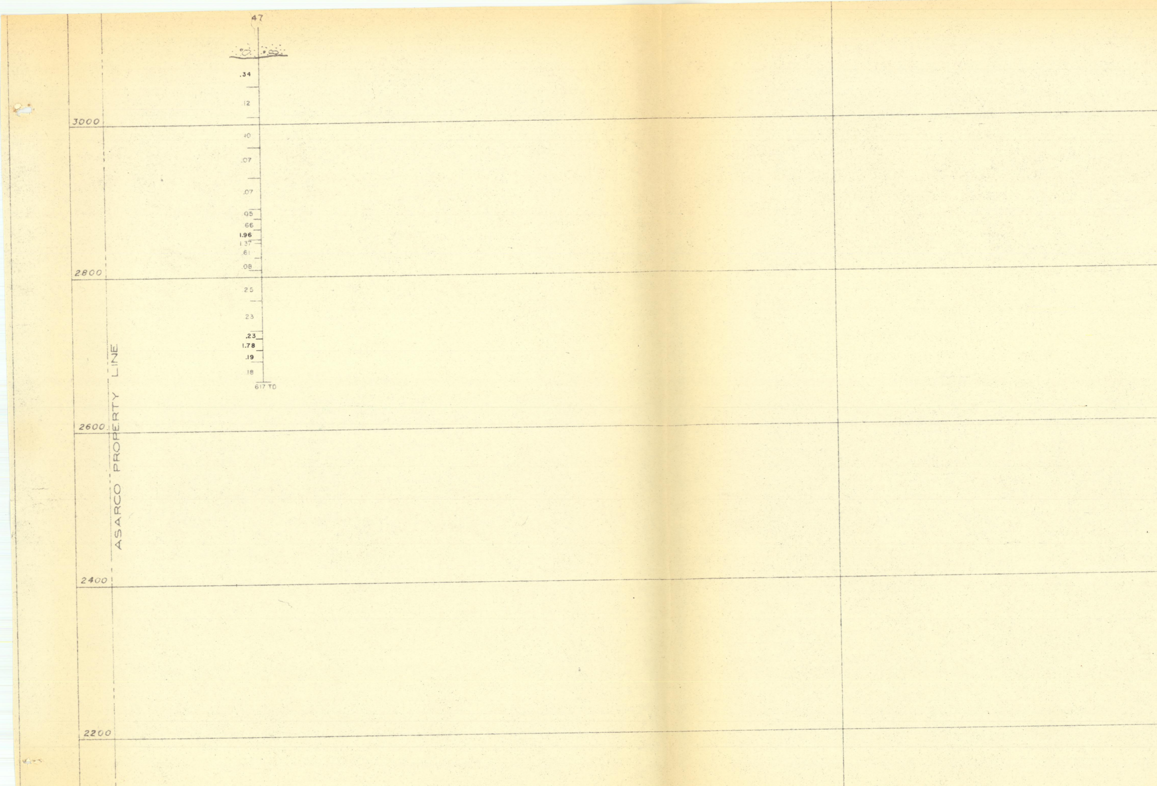
AMERICAN SMELTING AND REFINING COMPANY

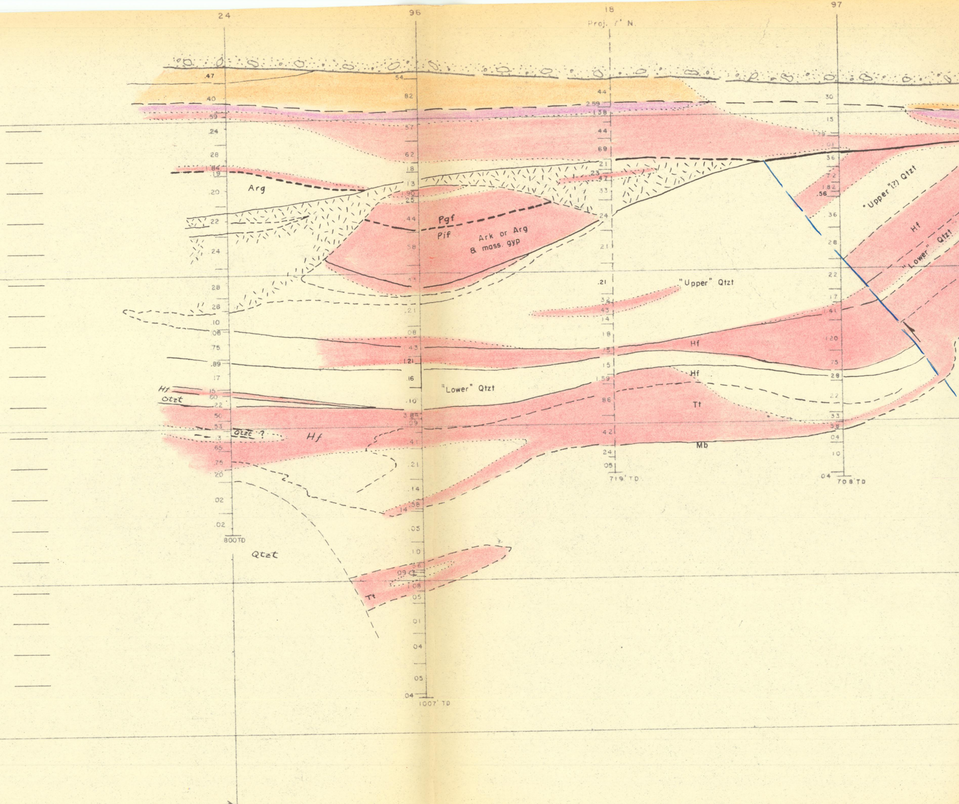
EAST PIMA AREA
SECTION 4050 NORTH

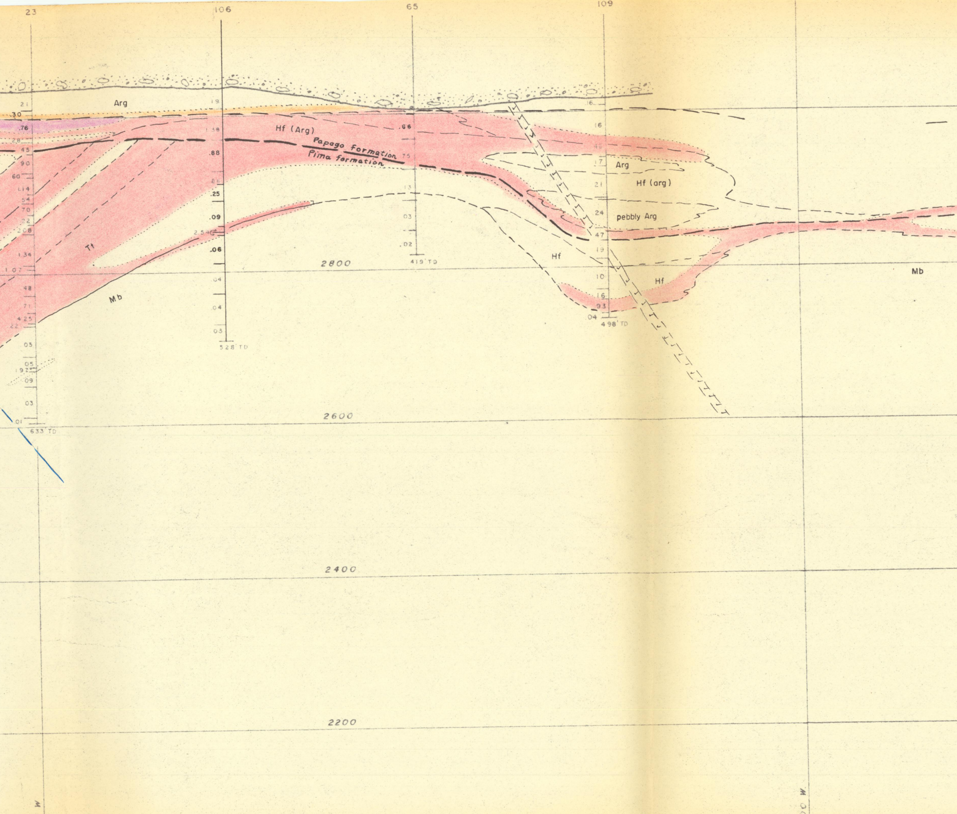
Pima Mining District, Pima County, Arizona

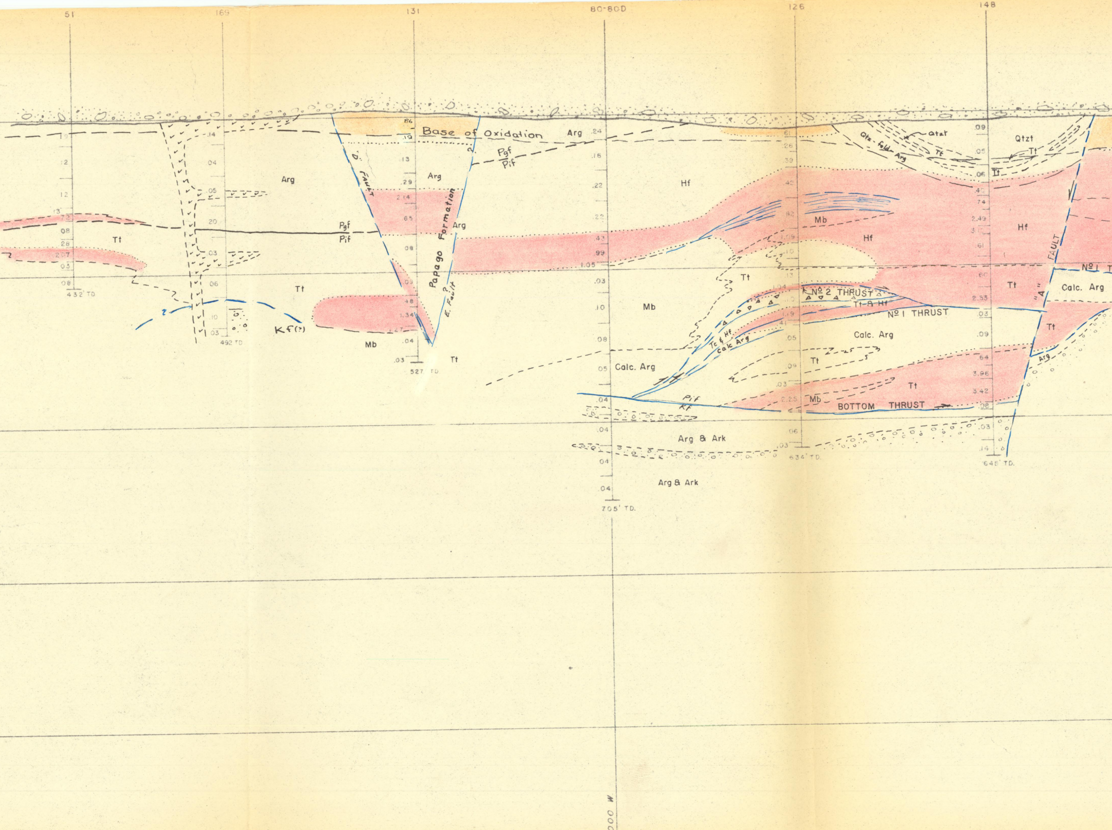
SCALE 1" = 100'

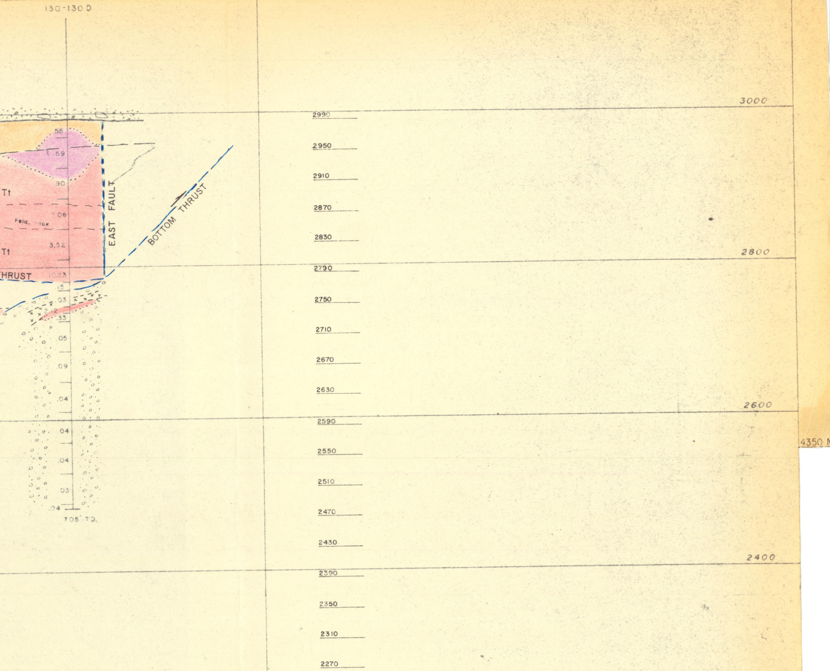
June 1957
Map No. EP-122-114P16


47
.34
.12
.10
.07
.07
.05
.66
1.96
1.37
.61
.08
.25
.23
.23
1.78
.19
.18
617 TD
3000
2800
2600
2400
2200
ASARCO PROPERTY LINE


24
96
18
Proj. 7' N.
97
Arg
Pgf
Pif
Ark or Arg
& mass. gyp
"Upper" Qtzt
"Upper"(?) Qtzt
Hf
"Lower" Qtzt
"Lower" Qtzt
Hf
Tt
Mb
Hf
Qtzt
Qtzt ?
Hf
Hf
Qtzt
Tt
800TD
1007' TD
719' TD
708' TD


23
106
65
109
Arg
Hf (Arg)
Papago formation
Pima formation
Arg
Hf (arg)
pebbly Arg
Hf
Hf
Tt
Mb
Mb
2800
2600
2400
2200
21
.30
.76
28
45
90
60
1.14
54
70
22
2.08
1.34
1.07
48
71
4.25
22
05
05
1.92
09
03
01
633' TD
19
1.38
.88
86
.25
.09
2.54
.06
04
.04
03
528' TD
.66
75
13
03
.02
419' TD
16
16
45
17
21
24
47
19
10
16
93
04
498' TD
W
W.


51
169
131
80-80D
126
148
Base of Oxidation
Arg
Pgf
Pif
Hf
Tt
Mb
Kf(?)
D. Fault
Papago Formation
E. Fault
Calc. Arg
Qtzt
Qtz-feld Arg
No 2 THRUST
Tt & Hf
No 1 THRUST
Tc & Hf
Calc Arg
BOTTOM THRUST
"A" FAULT
Calc. Arg
Arg & Ark
432' TD
492' TD
527' TD
634' TD
645' TD
705' TD
000 W


130-130 D
3000
2800
2600
2400
2990
2950
2910
2870
2830
2790
2750
2710
2670
2630
2590
2550
2510
2470
2430
2390
2350
2310
2270
.55
.69
.90
2.08
3.52
10.23
.15
.03
2.12
.33
.05
.09
.04
.04
.04
.03
.04
705' T.D.
Tt
Feld. rock
Tt
THRUST
EAST FAULT
BOTTOM THRUST
4350 N
1000 W.

AMERICAN SMELTING AND REFINING COMPANY

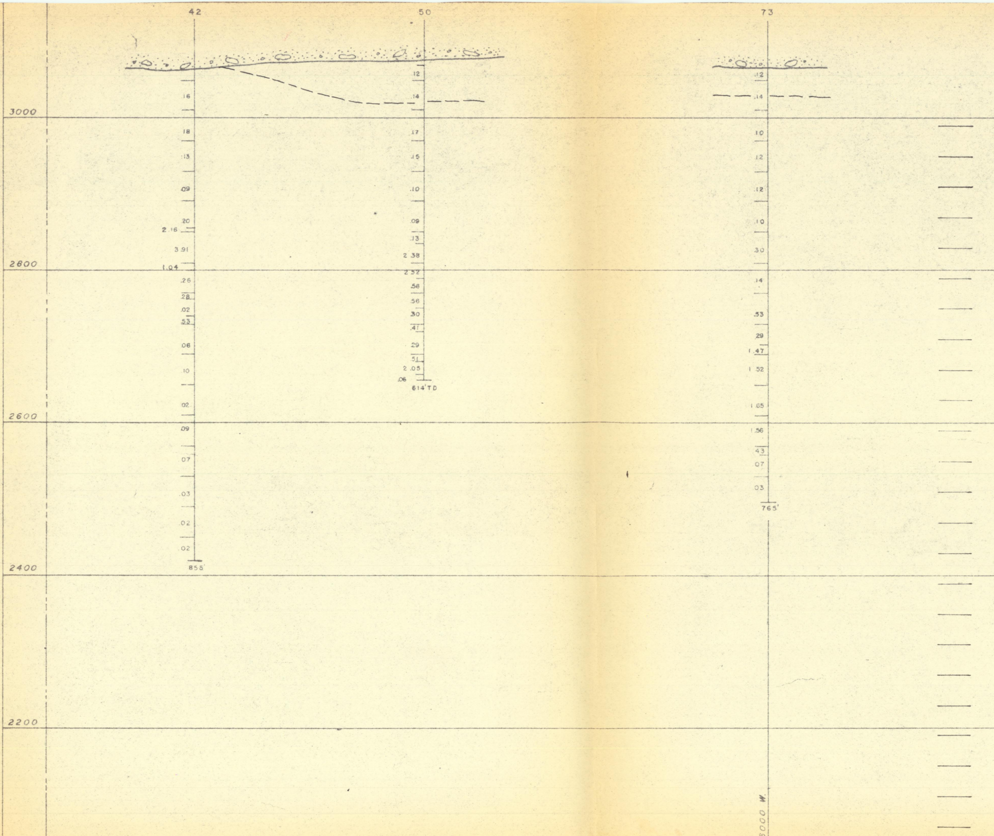
EAST PIMA AREA

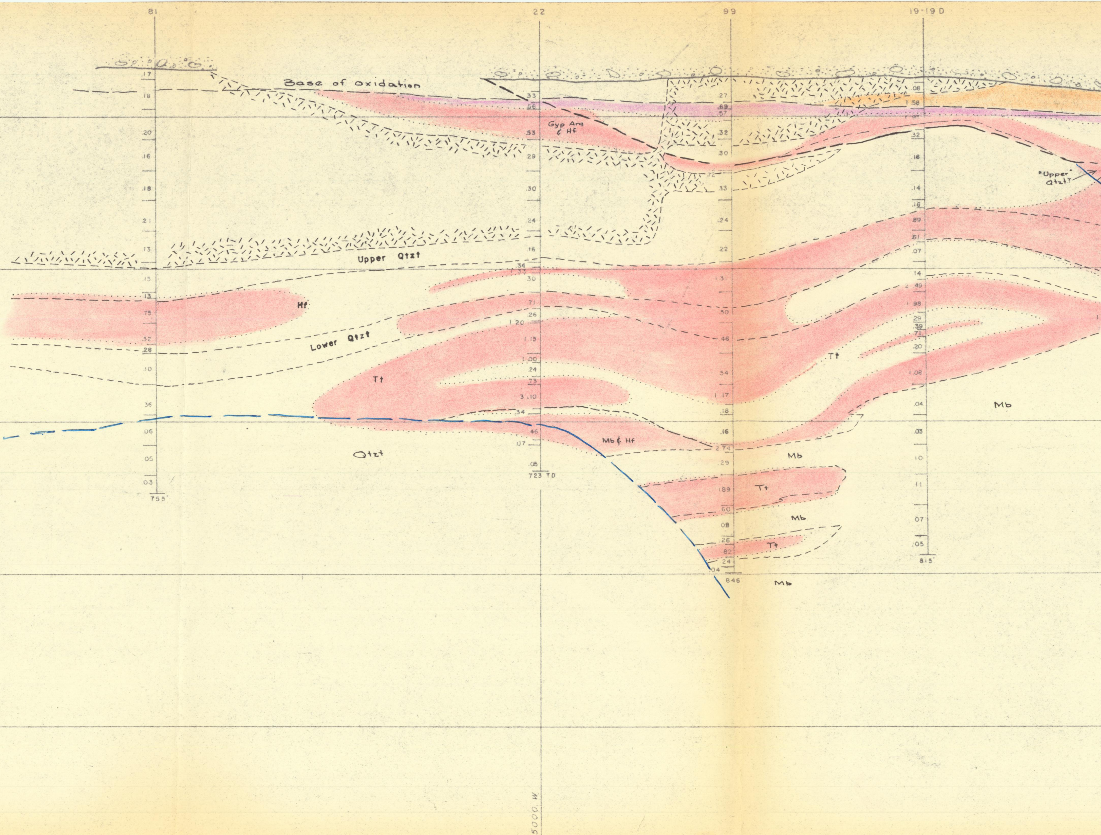
SECTION 4350 NORTH

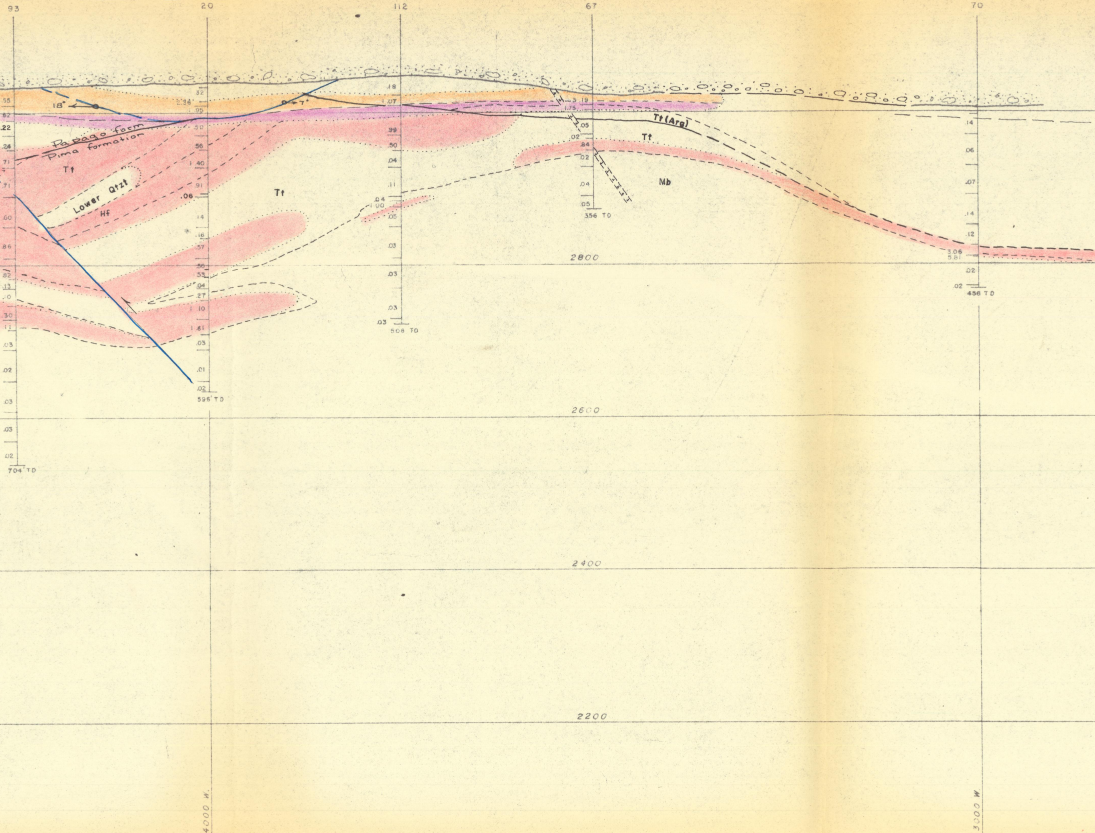
Pima Mining District, Pima County, Arizona

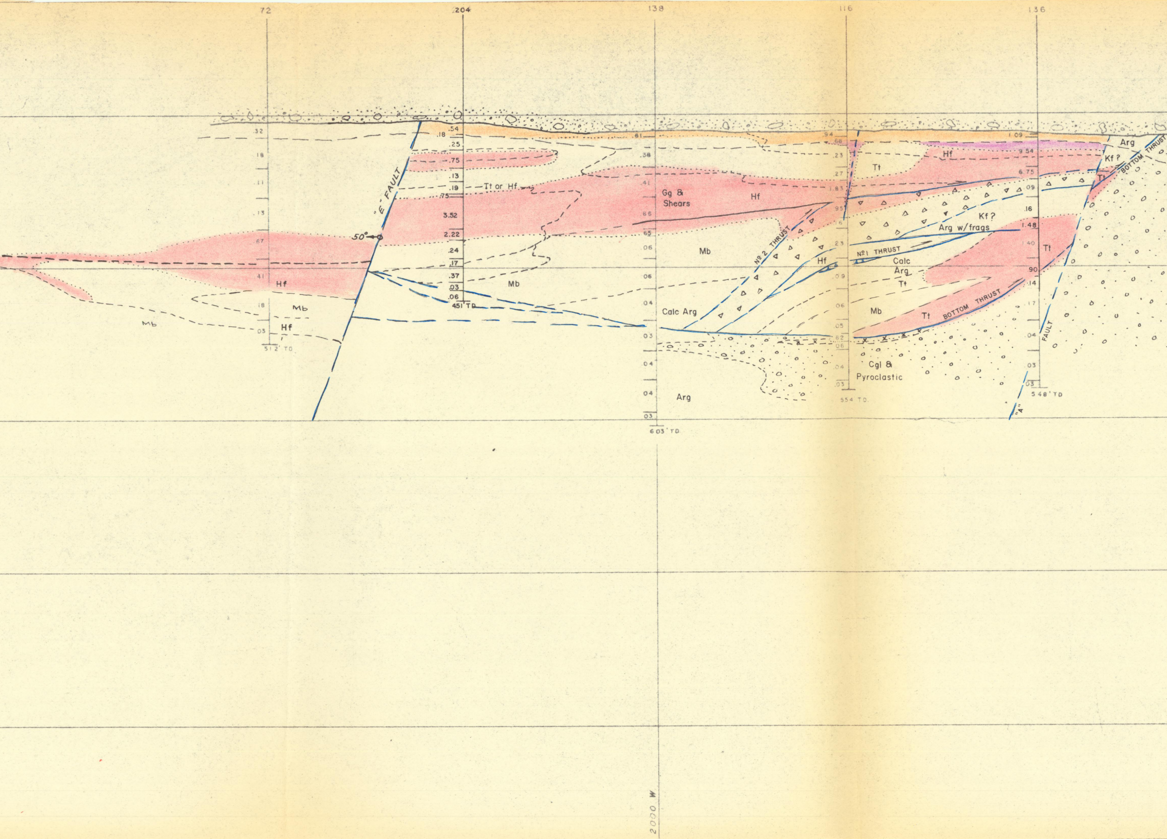
SCALE 1″ = 100′

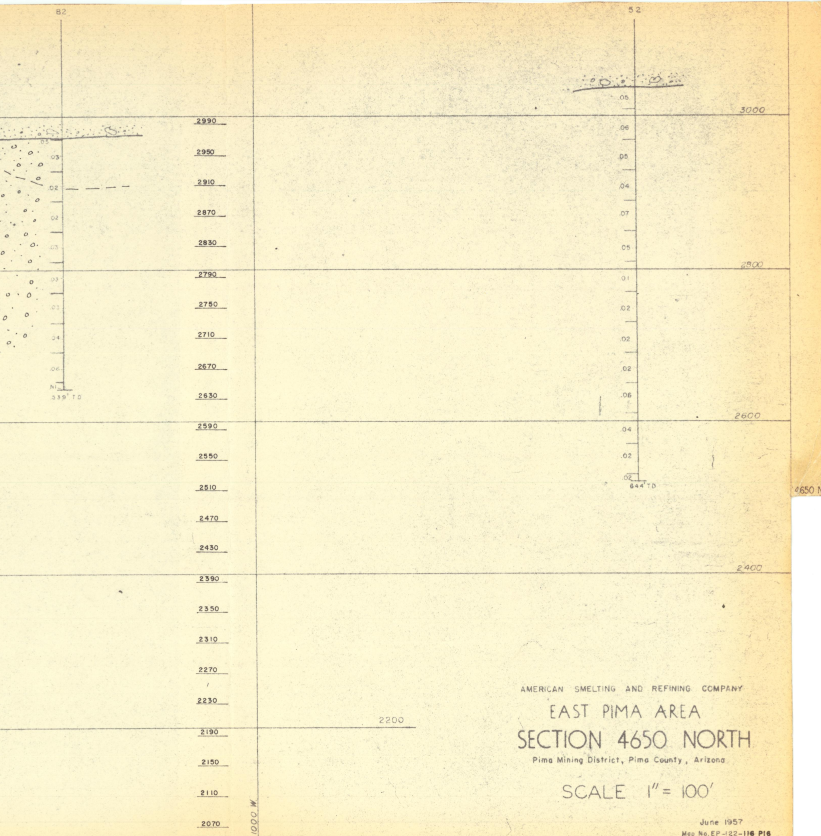
June 1957
Map No. EP-122-115 P16


42
50
73
3000
2800
2600
2400
2200
.16
.18
.13
.09
.20
2.16
3.91
1.04
.26
.28
.02
.53
.06
.10
.02
.09
.07
.03
.02
.02
855'
.12
.14
.17
.15
.10
.09
.13
2.38
2.32
.56
.56
.30
.41
.29
.51
2.05
.06
614' TD
.12
.14
.10
.12
.12
.10
.30
.14
.53
.29
1.47
1.52
1.65
1.56
.43
.07
.03
765'
5000 W.


81
22
99
19-19D
Base of oxidation
Gyp Arg & Hf
Upper Qtzt
Hf
Lower Qtzt
Tt
Qtzt
Mb & Hf
Mb
Tt
Mb
Tt
Mb
Tt
Mb
"Upper" Qtzt?
755'
723 TD
846
815'
5000 W


93
20
112
67
70
18°
7°
Papago form
Pima formation
Tt
Lower Qtzt
Hf
Tt
Tt (Arg)
Tt
Mb
704' TD
596' TD
508 TD
356 TD
456 TD
2800
2600
2400
2200
4000 W.
3000 W


72
204
138
116
136
"E" FAULT
50°
Tt or Hf
Gg & Shears
Hf
Mb
Hf
Mb
Hf
Mb
Calc Arg
Arg
No 2 THRUST
Hf
No 1 THRUST
Calc Arg
Tt
Mb
Tt
BOTTOM THRUST
Kf?
Arg w/frags
Hf
Tt
Tt
Arg
Kf?
Tt
BOTTOM THRUST
Cgl & Pyroclastic
FAULT
"A"
512' TD
451' TD
603' TD
554 TD
548' TD
2000 W


82
52
.05
.03
.02
.02
.03
.03
.03
.04
.06
Ni
539' TD
.05
.06
.05
.04
.07
.05
.01
.02
.02
.02
.06
.04
.02
.02
644' TD
3000
2800
2600
2400
2200
2990
2950
2910
2870
2830
2790
2750
2710
2670
2630
2590
2550
2510
2470
2430
2390
2350
2310
2270
2230
2190
2150
2110
2070
1000 W
4650 N

AMERICAN SMELTING AND REFINING COMPANY

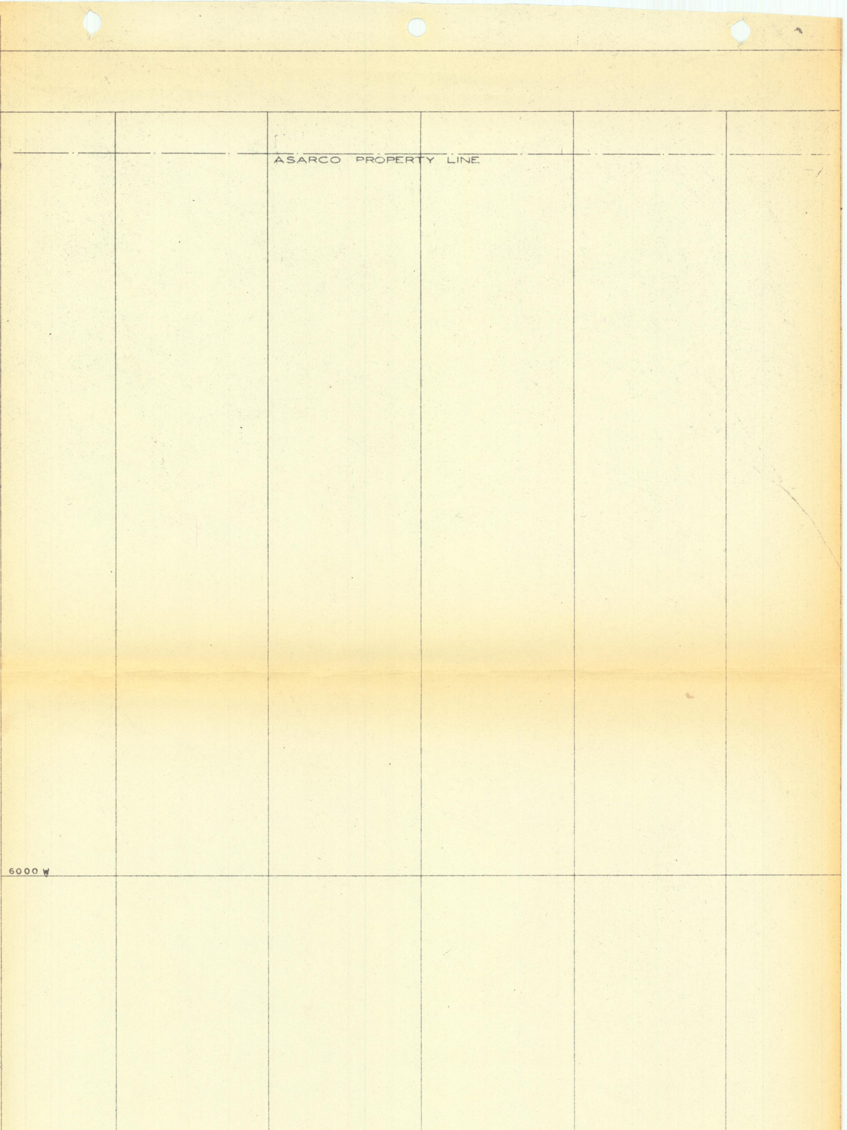
EAST PIMA AREA

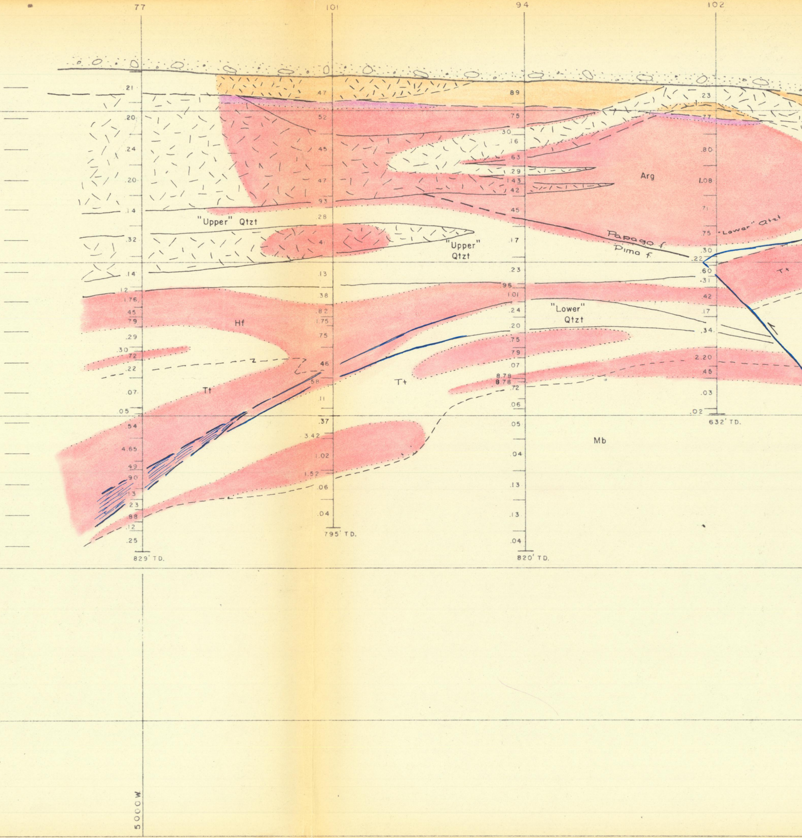
SECTION 4650 NORTH

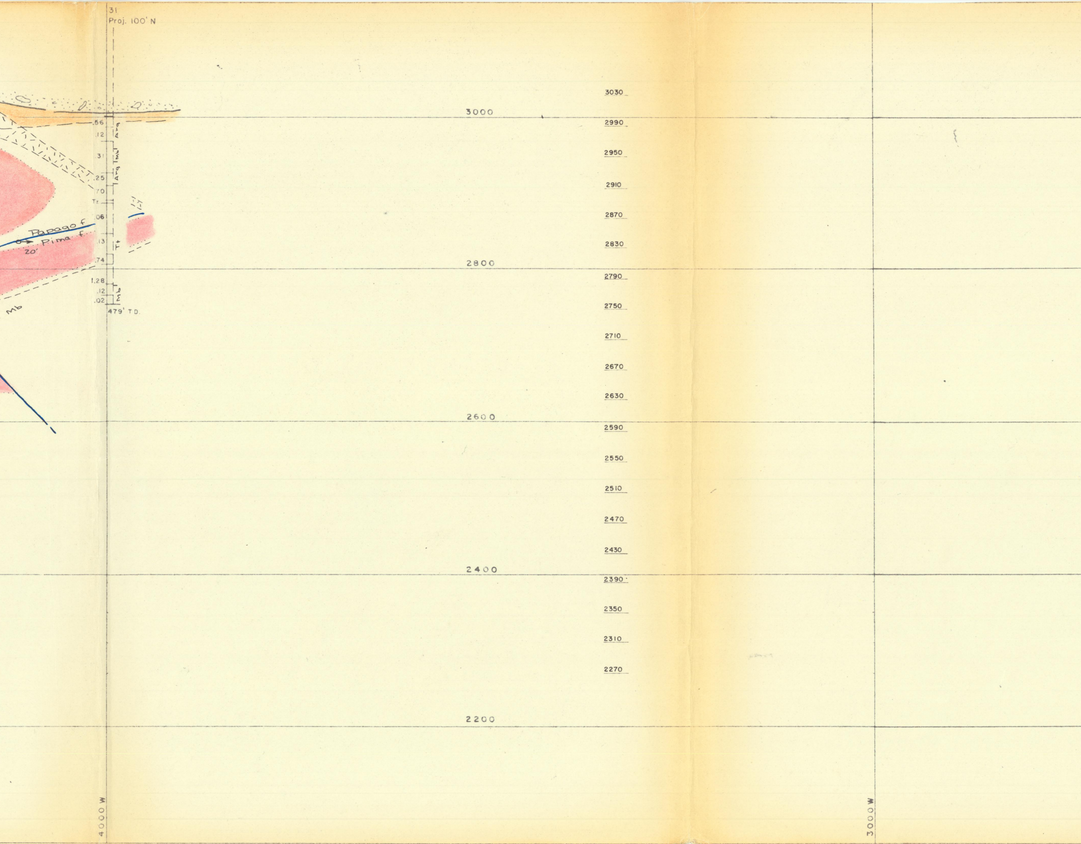
Pima Mining District, Pima County, Arizona

SCALE 1" = 100'

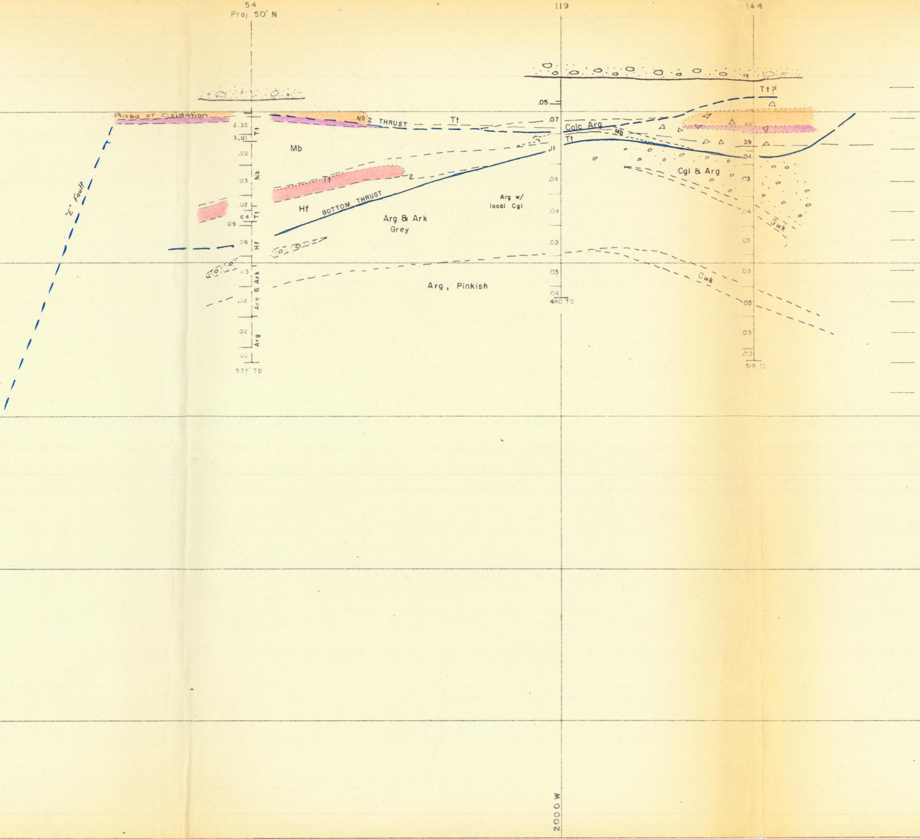
June 1957
Map No. EP-122-116 P16

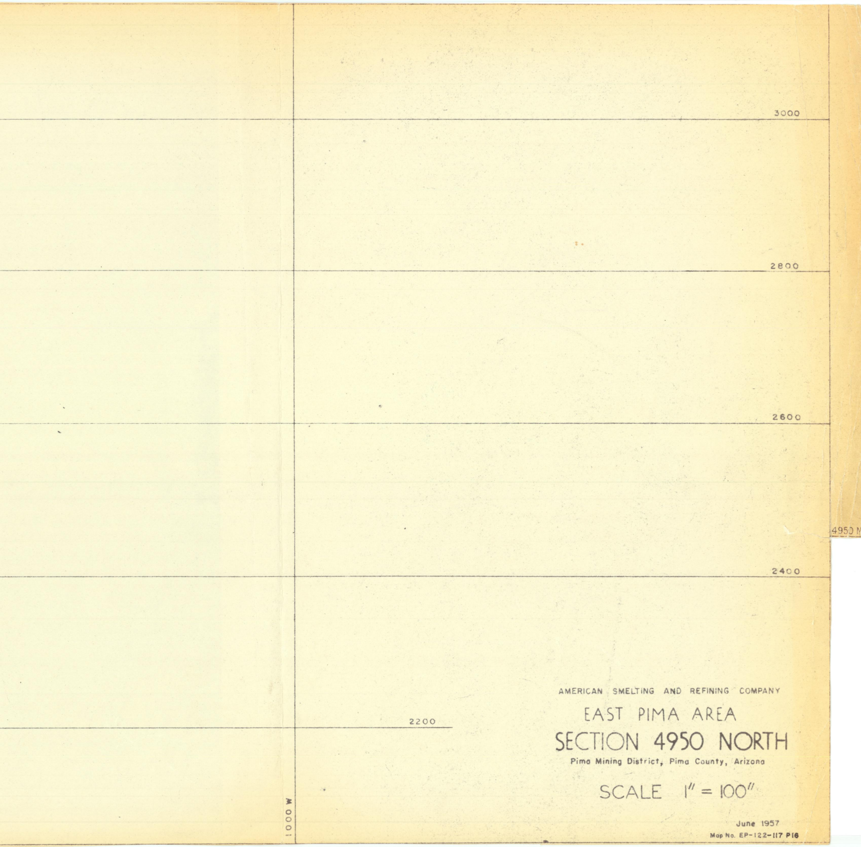

ASARCO PROPERTY LINE
6000 W


77
101
94
102
.21
.20
.24
.20
.14
.32
.14
.12
1.76
.45
.79
.29
.30
.72
.22
.07
.05
.54
4.65
.49
.90
.13
.23
.88
.12
.25
829' TD.
.47
.52
.45
.47
.93
.28
.4
.13
.38
.82
1.75
.75
.46
.58
.11
.37
3.42
1.02
1.52
.06
.04
795' TD.
.89
.75
.30
.16
.63
.29
1.43
.42
.45
.17
.23
.95
1.01
.24
.20
.75
.79
.07
8.79
8.78
.72
.06
.05
.04
.13
.13
.04
820' TD.
.23
.77
.80
1.08
.71
.75
.30
.22
.60
.31
.42
.17
.34
2.20
.45
.03
.02
632' TD.
"Upper" Qtzt
"Upper" Qtzt
Arg
"Lower" Qtzt
Papago f
Pima f
Tt
Hf
"Lower" Qtzt
Tt
Tt
Mb
5000W



31
Proj. 100' N
.56
.12
Arg
.31
Arg Tmbl
.25
.70
Tr.
.06
Papago f
Pima f
20'
.13
Tt
.74
1.28
.12
.02
Mb
Mb
479' TD.
3000
2800
2600
2400
2200
3030
2990
2950
2910
2870
2830
2790
2750
2710
2670
2630
2590
2550
2510
2470
2430
2390
2350
2310
2270
4000 W
3000 W


54
Proj 50' N
119
144
Base of Oxidation
Nº 2 THRUST
Tt
Tt?
.05
.07
Calc Arg
Mb
Tt
.11
48
39
.04
2.35
3.01
.02
Mb
.03
Mb
Tt
Tt
.02
64
.09
Tt
.06
Hf
Hf
BOTTOM THRUST
2
Arg & Ark
Grey
Arg w/
local Cgl
Cgl & Arg
Gwk
Gwk
.03
Arg & Ark
.02
Arg & Ark
.02
Arg
.02
535' TD
.04
.04
.03
.03
.04
440 TD
.03
.04
.03
.03
.05
.03
.03
518 TD
Arg, Pinkish
"E" Fault
2000 W


3000
2800
2600
2400
2200
4950 N
1000 W

AMERICAN SMELTING AND REFINING COMPANY

EAST PIMA AREA

SECTION 4950 NORTH

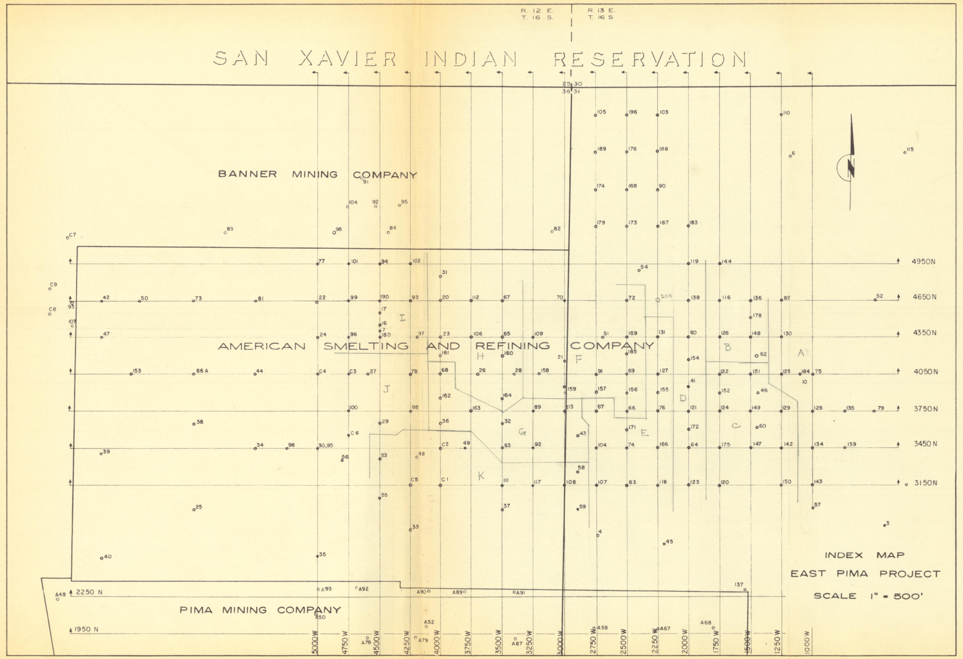
Pima Mining District, Pima County, Arizona

SCALE 1" = 100"

June 1957

Map No. EP-122-117 P16

EXPLANATION


R. 12 E.
T. 16 S.
R. 13 E.
T. 16 S.
SAN XAVIER INDIAN RESERVATION
25 30
36 31
BANNER MINING COMPANY
AMERICAN SMELTING AND REFINING COMPANY
PIMA MINING COMPANY
4950N
4650N
4350N
4050N
3750N
3450N
3150N
2250 N
1950 N
5000W
4750W
4500W
4250W
4000W
3750W
3500W
3250W
3000W
2750W
2500W
2250W
2000W
1750W
1500W
1250W
1000W
A
B
C
D
E
F
G
H
I
J
K

INDEX MAP
EAST PIMA PROJECT
SCALE 1" = 500'

DESCRIPTION OF STRATIGRAPHY AND ROCK TYPES

EAST PIMA ORE BODY

The rocks penetrated to date by drilling at East Pima represent (1) originally chemical (limy or gypsiferous) sediments, (2) clastic sediments, and (3) igneous.

The sedimentary rocks have been grouped into three stratigraphic units which occur structurally from top to bottom as follows:

1. Papago formation – Cretaceous or Tertiary. Principally massive argillite with varying amounts of conglomerate, arkose and quartzite. The rocks are altered and locally recrystallized in the ore zone. Thin lenses of tactite have resulted from silication of original sedimentary limy zones and/or areas of hydrothermally introduced carbonate.

2. Pima formation – Upper Paleozoic. An originally limy series, in part gypsiferous, now consisting principally of lime silicate minerals, with interbedded quartzite and argillite, and a thick unit(s) of marble.

3. Kino formation - Tertiary (?) - A clastic-volcanic unit consisting of conglomerate, arkose, argillite, minor graywacke, volcanic flows or welded tuffs, and pyroclastics.

CLASTIC ROCKS

1. Arkose – A granular-textured rock similar to quartzite but containing enough feldspar grains to be readily recognizable as such. The arkose can be further described as (1) fine grained - 1/4 - 1 mm; (2) medium grained 1 - 2 mm; and (3) coarse-grained 2 - 4 mm. 1/4 mm is approximately the minimum limit of identification with the hand lens.

2. Quartzite – A pure quartzite with grains large enough to be distinguished with a hand lens. The same grain size limits as for arkose apply here.

3. Argillite – A hard, dense, massive rock in which no grains can be identified with a hand lens. Petrographic work shows this type to be a siltstone or sandy siltstone and in field use includes those rocks with some quartz grains in an argillite matrix.

4. Conglomerate - A rock containing 25 % or more of fragments greater than 4 mm.

5. Graywacke - These rocks, which to date have been verified petrographically only in the Kino formation, consist of numerous small fragments of volcanics and dark argillite, and a small percentage of ferro-magnesian minerals.

METAMORPHOSED AND/OR METASOMATIZED LIMY SEDIMENTS

1. Tactite - A coarse-grained to massive lime silicate rock of which garnet is the principal constituent.

2. Hornfels - A hard or soft, slightly greenish to white, generally fine-grained lime silicate rock with minor garnet.

3. Feldspathic-rocks - These rocks vary from extremely fine to coarse grained, and are characterized by quartz and feldspar which vary from a few per cent to 100 per cent of the rock mass. The fine-grained variety is hard and slightly pinkish with a conchoidal fracture. Tactite is commonly intermixed with the feldspathic areas.

4. Marble - Fine to coarse-grained recrystallized limestone.

IGNEOUS

Pre-ore:

1. Meta-porphyry - A quartz monzonite porphyry, the composition and texture of which is due in part to introduced quartz and and orthoclase. This rock intrudes as sill-like bodies into the area of unconformable contact between the Pima and Papago formations in the western part of the ore body. (Previous maps term this rock Q.f.m.)

2. Felsite porphyry - Volcanic - textured acid porphyry rocks generally near latite or quartz-latite in composition. This compositional group may include both intrusive and extrusive rocks.

Post-ore:

1. Andesite.- Dark grey to greenish black, commonly porphyritic and frequently magnetic.

Basement Rock:

The East Pima area is bottomed between 1100 and 1500 feet below surface by a post-ore (?) thrust fault, below which is coarse-grained granitic rock.

GEOLOGIC SYMBOLS AND ABBREVIATIONS

ROCKS

FORMATIONS

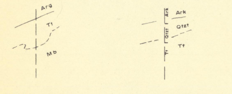
Papago formation — Pgf
Pima formation — Pif
Kino formation — Kf

META-SEDIMENTS

Clastic	Arkose - Ark	▨
	Argillite - Arg	
	Quartzite - Qtzt	
	Conglomerate - Cgl	▨
	Graywacke - Gwk	
Limey	Tactite - Tt	
	Hornfels - Hf	
	Marble - Mb	
Principally East Ore body	Calcareous Argillite - Calc Arg	
	Feldspathic alteration of limey or clastic rocks - Qtz feld or feld rock	
	Overburden and bedrock contact	▨

IGNEOUS

Pre-ore	Meta-porphyry - Mp	▨
	Felsite porphyry - Fp	▨
Post-ore	Andesite - And	▨


Arg
Tt
Mb
Ark
Qtzt
Tt

Geology projected horizontally to section

Geology projected along structural dip of section. Log of DDH showing actual penetration plotted beside hole.

ABBREVIATIONS

MINERALS

Quartz - Qtz
Feldspar - Fld
Gypsum - Gyp
Wollastonite - Woll
Garnet - Grnt
Diopside - Diop
Magnetite - Mag
Pyrite - Py
Chalcopyrite - Cpy
Chalcocite - Cc
Molybdenite - Mo
Sphalerite - Sph

OTHERS

Gouge - Gg
Breccia - Bx
Massive - Mass
Siliceous - Sil
Silicified - Silf
Silicated - Silct
Gypsiferous - Gyp
Argillitic - Arg
Altered - alt

STRUCTURES

Contact

Unconformity between Pgf - Pif

Fault

60° S Any structure line approximately parallel to section, showing amount and direction of dip

30° Any structural line crossing section at an angle showing direction of "dip" into section and angle of horizontal deviation

Above structures dashed where approximately located, and questioned where location or existence is speculative

Fault breccia

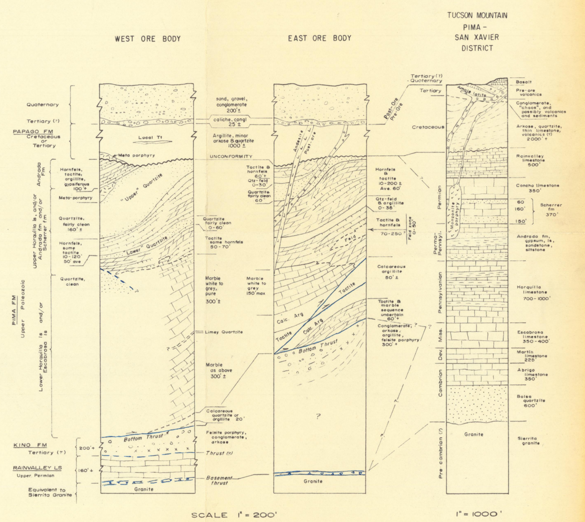
Breccia containing fragments and large and small horses of Kino formation

🟥 Ore (> 0.40 % Cu)

Waste (< 0.40 % Cu)

STRATIGRAPHIC COLUMN

EAST PIMA AREA


WEST ORE BODY
EAST ORE BODY
TUCSON MOUNTAIN
PIMA -
SAN XAVIER
DISTRICT
Quaternary
Tertiary (?)
PAPAGO FM
Cretaceous
or
Tertiary
PIMA FM
Upper Paleozoic
Upper Horquilla ls. and/or Andrada fm and/or Scherrer fm
Andrada Fm
Lower Horquilla ls and/or Escabrosa ls
KINO FM
Tertiary (?)
RAINVALLEY LS
Upper Permian
Equivalent to
Sierrita Granite
200'+
160'+
Local Tt
Meta porphyry
Hornfels, tactite, argillite, gypsiferous 100'+
Meta-porphyry
Quartzite, fairly clean 160' ±
Hornfels, some tactite 10-120' 50' ave
Quartzite, clean
"Upper" Quartzite
"Lower" Quartzite
Bottom Thrust
Thrust (?)
Basement thrust
Granite
sand, gravel, conglomerate 200' ±
caliche, congl 25' ±
Argillite, minor arkose & quartzite 1000' ±
UNCONFORMITY
Quartzite fairly clean 0-60'
Tactite some hornfels 50-70'
Marble white to grey, pure 300' ±
Marble white to grey 150' max
Limey Quartzite
Marble as above 300' ±
Calcareous quartzite or argillite 20'
Felsite porphyry, conglomerate, arkose
Andesite
Post-ore
Post-Ore
Pre-Ore
Tactite & hornfels 60'+
Qtz-feld 0-30'
Quartzite fairly clean 60'
Hornfels & tactite 10-200 ± Ave. 60'
Qtz-feld & argillite 0-35'
Tactite & hornfels 70-250'
Feld zone 0-50
Feld
Calcareous argillite 50' ±
Tactite
Calc. Arg
Tactite & marble sequence uncertain 60'+
Conglomerate, arkose, argillite, felsite porphyry 300'+
?
Tertiary (?) - Quaternary
Tertiary
Cretaceous
Permian
Perma-Pennsyl.
Pennsylvanian
Miss.
Dev.
Cambrian
Pre cambrian (?)
Amole latite
Monzonite porphyry
Basalt
Pre-ore volcanics
Conglomerate, "chaos", and possibly volcanics and sediments
Arkose, quartzite, thin limestone, volcanics (?) 2000'+
Rainvalley limestone 500'
Concha limestone 350'
60
160'
150'
Scherrer fm 370'
Andrada fm, gypsum, ls, sandstone, siltstone
Horquilla limestone 700-1000'
Escabrosa limestone 350-400'
Martin limestone 225'
Abrigo limestone 350'
Bolsa quartzite 600'
Granite
Sierrita granite

SCALE 1" = 200'

1" = 1000'

Formations above base of Cretaceous not to scale

J. E. Kinnison — October, 1957

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