CONTACT INFORMATION
Mining Records Curator
Arizona Geological Survey
1520 West Adams St.
Phoenix, AZ 85007
602-771-1601
http://www.azgs.az.gov
inquiries@azgs.az.gov

The following file is part of the

Arizona Department of Mines and Mineral Resources Mining Collection

ACCESS STATEMENT

These digitized collections are accessible for purposes of education and research. We have indicated what we know about copyright and rights of privacy, publicity, or trademark. Due to the nature of archival collections, we are not always able to identify this information. We are eager to hear from any rights owners, so that we may obtain accurate information. Upon request, we will remove material from public view while we address a rights issue.

CONSTRAINTS STATEMENT

The Arizona Geological Survey does not claim to control all rights for all materials in its collection. These rights include, but are not limited to: copyright, privacy rights, and cultural protection rights. The User hereby assumes all responsibility for obtaining any rights to use the material in excess of "fair use."

The Survey makes no intellectual property claims to the products created by individual authors in the manuscript collections, except when the author deeded those rights to the Survey or when those authors were employed by the State of Arizona and created intellectual products as a function of their official duties. The Survey does maintain property rights to the physical and digital representations of the works.

QUALITY STATEMENT

The Arizona Geological Survey is not responsible for the accuracy of the records, information, or opinions that may be contained in the files. The Survey collects, catalogs, and archives data on mineral properties regardless of its views of the veracity or accuracy of those data.

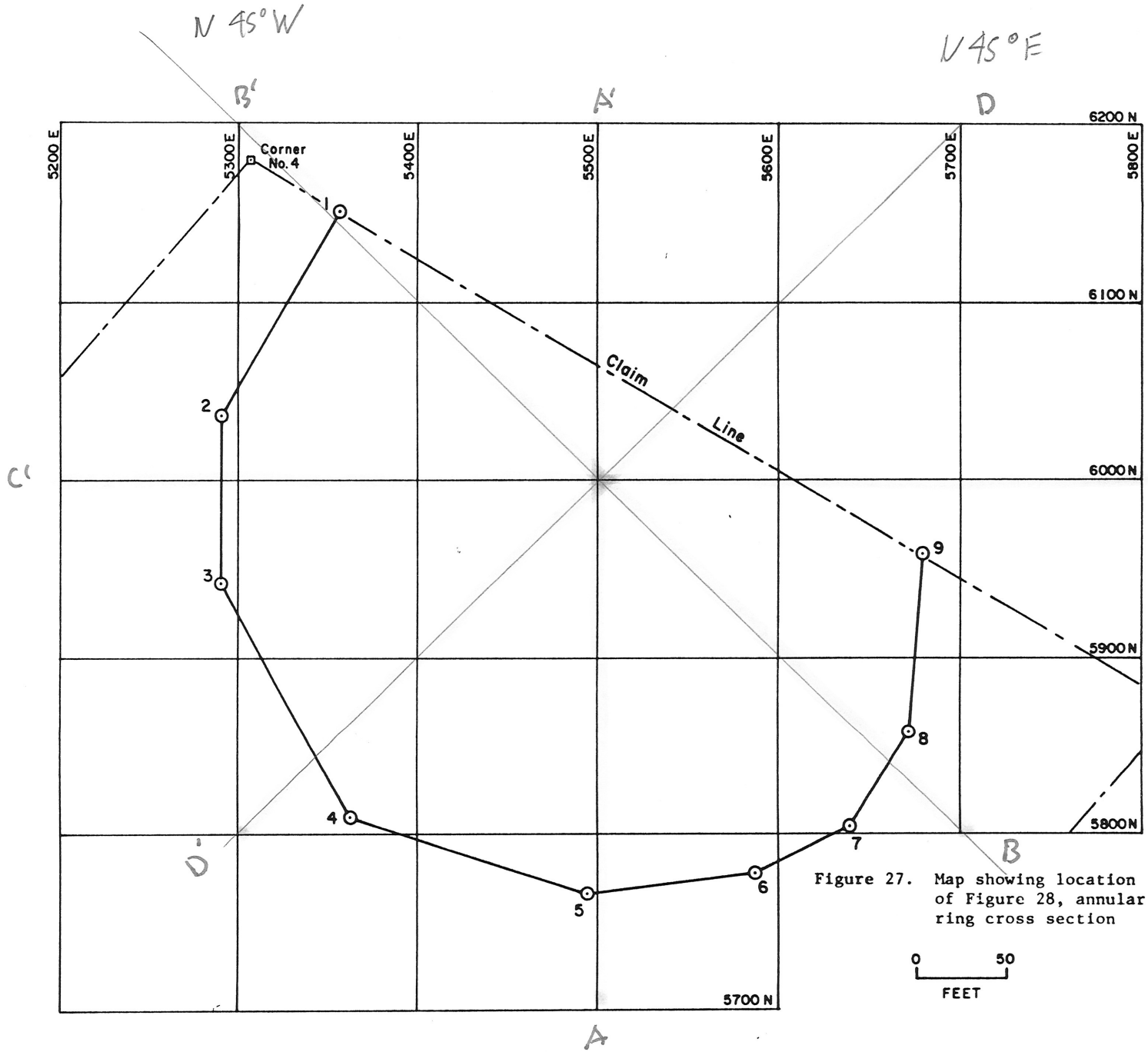


Figure 27. Map showing location of Figure 28, annular ring cross section

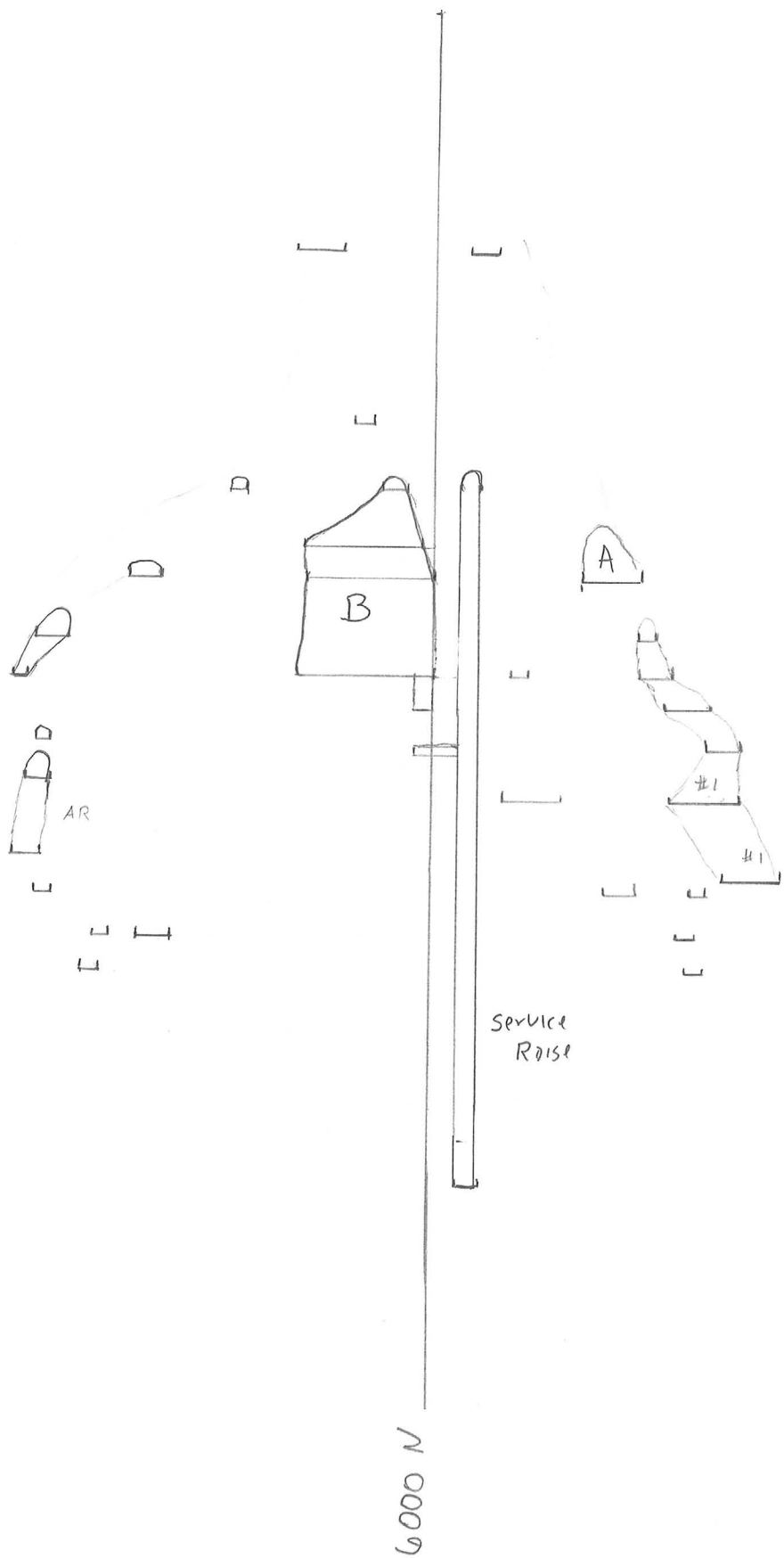
A

SOUTH

5500 E

A'

NORTH



A

140

175

190

225

245

265

285

290

320

365

375

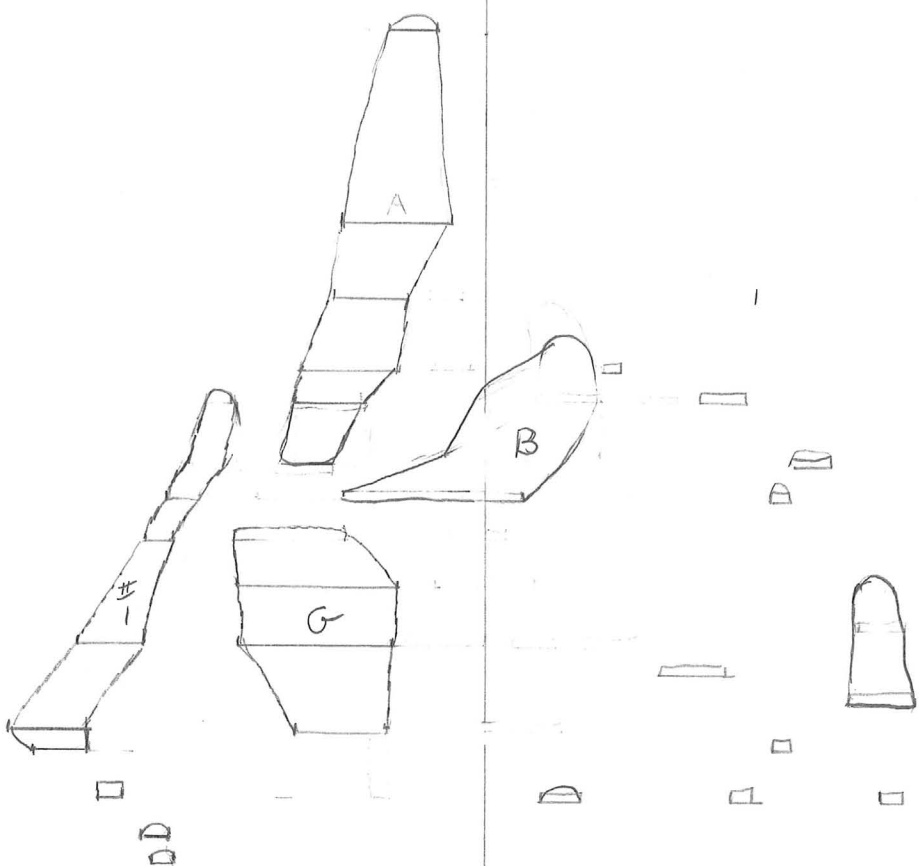
400

420

ALONG 6000 N

C
E

C'
W



14
100
175
190
225
245
265
290
320
335
350
365
375
400
550

5500 E

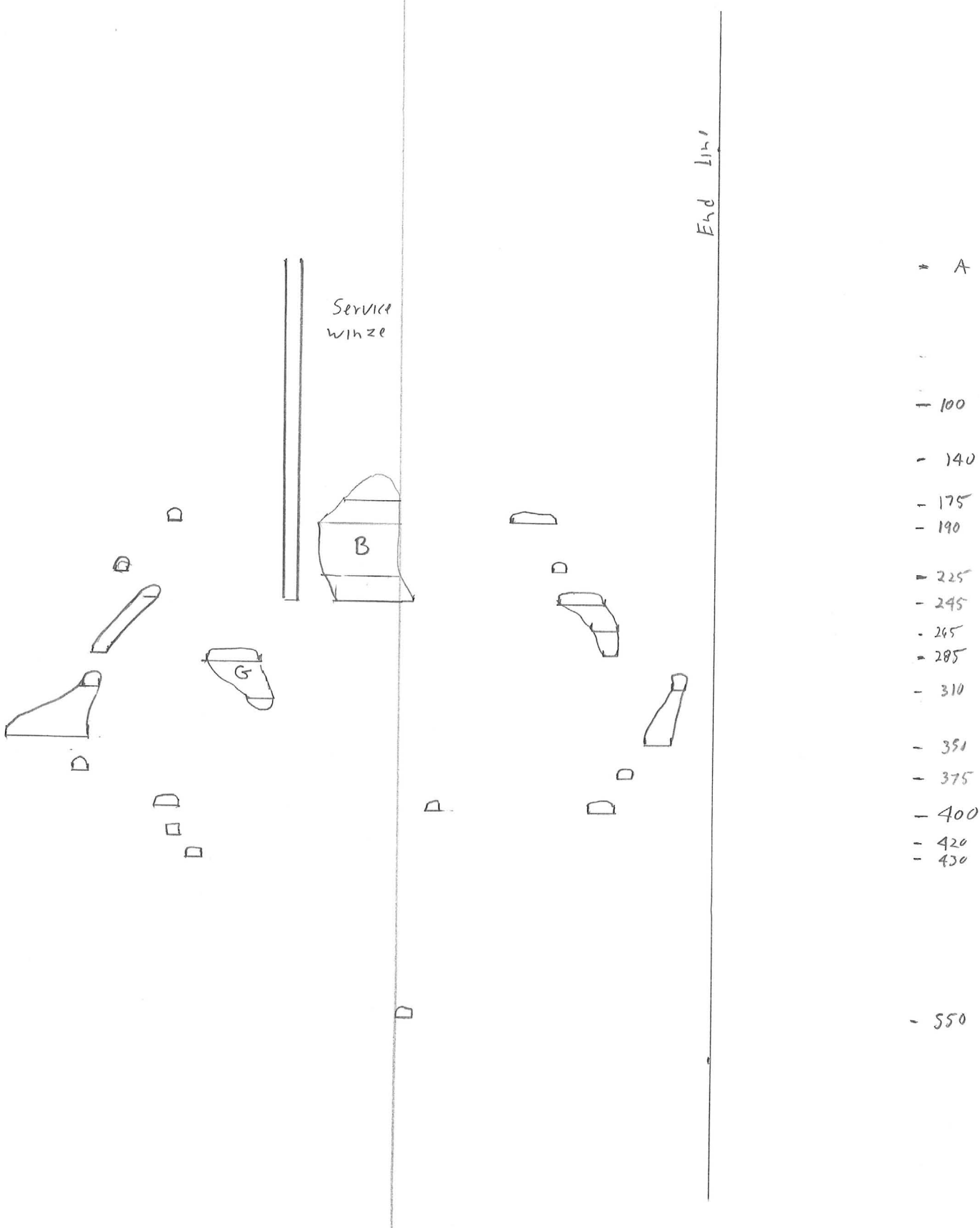
B

SOUTHEAST

5500 E

B'

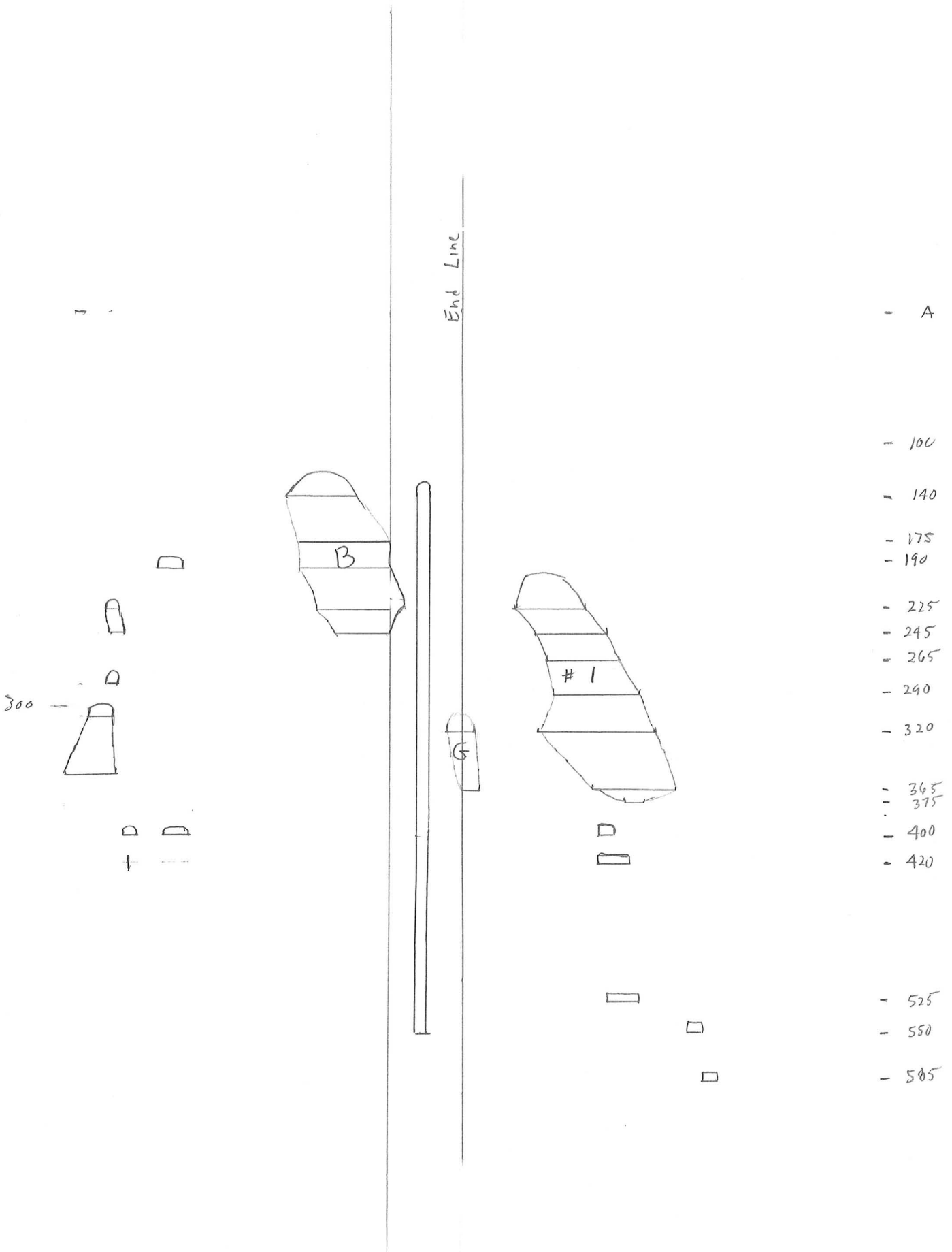
NORTHWEST



P'
SOUTH WEST

D
NORTH EAST

5500 E



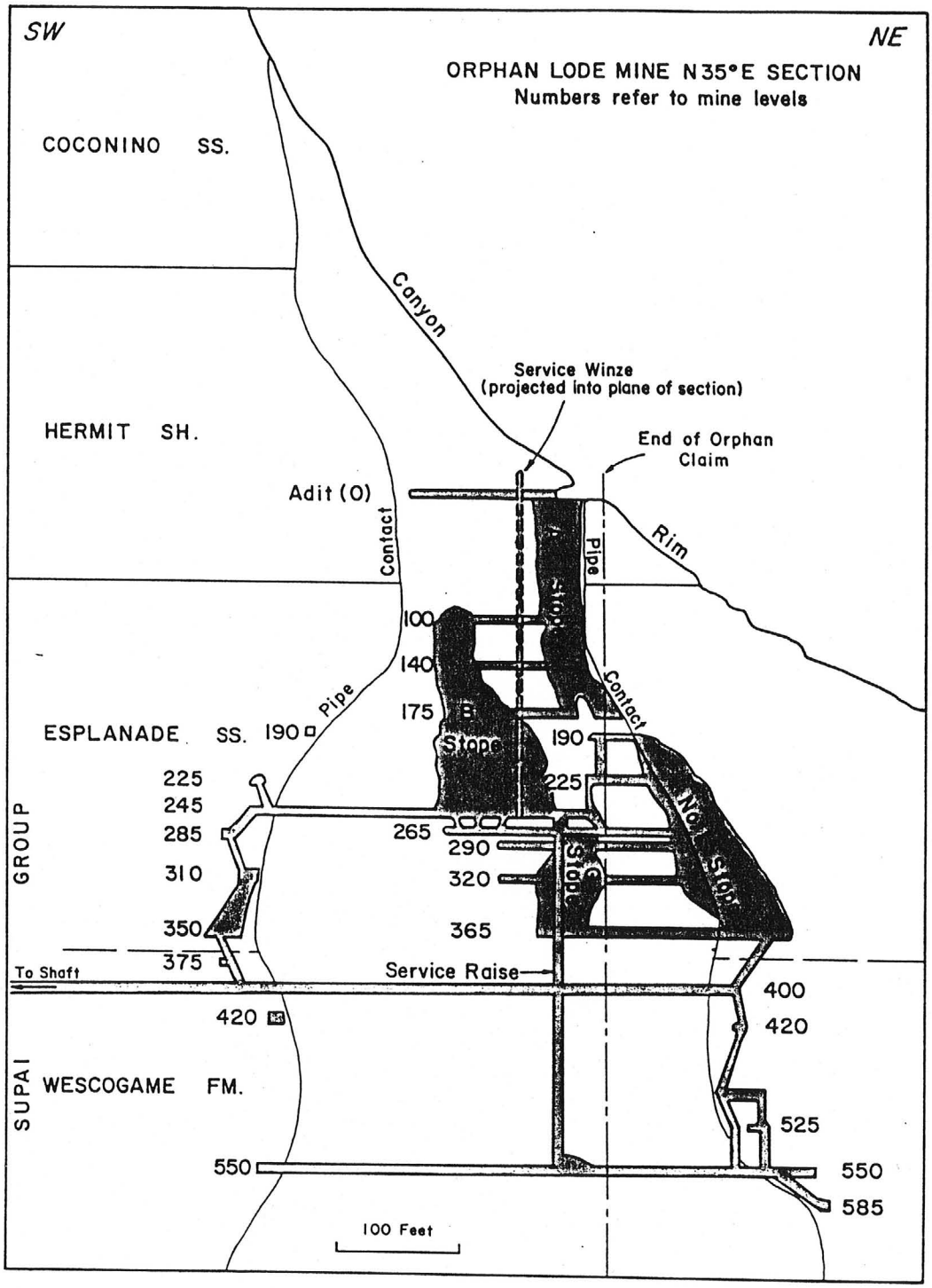


Figure 5. Cross Section, Orphan Lode Mine (Modified from Gornitz and Kerr, 1970)

SAMPLE FOR PETROGRAPHIC ANALYSIS **Nº 4335 X**

Priority Date 8-17-64

Sampler W.L. Chenoweth

OCCURRENCE

Claim Orphan Lode

Location

Drill hole number Depth 225 Level

Formation Member

Structure

Field name Unaltered Supai within pipe

INFORMATION DESIRED

Mineral Identification

Texture Description

Paragenesis

Assay for ppm U_3O_8

Photomicrograph

Spectrogram ✓

Other

NATURE OF THE PROBLEM FOR WHICH ANALYSIS IS NEEDED

Small block of red Supai in breccia near F X-C
6110 N 5540 E

ST-66350

ED-108

SAMPLE FOR PETROGRAPHIC ANALYSIS **Nº 4336**

Priority Date 8-17-64

Sampler W.L. Chenoweth

OCCURRENCE

Claim Orphan Lode

Location

Drill hole number Depth 245 Level

Formation Member

Structure

Field name Unaltered Supai outside pipe

INFORMATION DESIRED

Mineral Identification

Texture Description

Paragenesis

Assay for ppm U_3O_8

Photomicrograph

Spectrogram ✓

Other

NATURE OF THE PROBLEM FOR WHICH ANALYSIS IS NEEDED

A 5941 N 5295 E

B 5791 N 5392 E

66351-2

ED-108

SAMPLE FOR PETROGRAPHIC ANALYSIS **Nº 4337**

Priority Date 8-17-64

Sampler W. L. Chenoweth

OCCURRENCE

Claim Orphan Lode

Location

Drill hole number Depth 400 Level

Formation Member

Structure Samples of Supai along main haulageway into pipe

Field name

INFORMATION DESIRED

Mineral Identification

Texture Description

Paragenesis

Assay for ppm U_3O_8

Photomicrograph

Spectrogram V

Other

NATURE OF THE PROBLEM FOR WHICH ANALYSIS IS NEEDED

A red, charging room 5004 N, 5018 E
B red, thermometer station 5679 N, 5252 E
C red, 400-20 drift 5858 N, 5363 E
D gray, 400-30 drift 5882 N, 5371 E
E breccia start of lagging 5929 N, 5413 E
F breccia "B" ore chute 5994 N, 5470 E

66353 – 8

ED-1C8

SAMPLE FOR PETROGRAPHIC ANALYSIS **No. 4338**

Priority Date 8-17-64

Sampler W. L. Chenoweth

OCCURRENCE

Claim Orphan Lode

Location

Drill hole number K-13 Depth

Formation Member Supai

Structure

Field name Core splits from Company

INFORMATION DESIRED

Mineral Identification

Texture Description

Paragenesis

Assay for ppm U_3O_8

Photomicrograph

Spectrogram ✓

Other

NATURE OF THE PROBLEM FOR WHICH ANALYSIS IS NEEDED

A	141 - 141.5	partly altered
B	166.5 - 167.0	U-bearing ss
C	175.6 - 175.5	altered ss (gray)
D	179.5 - 180.0	unaltered ss (red)

Potential in 475-485 level is based on ore in this single hole.

ED-108

66359 — 62

SAMPLE FOR PETROGRAPHIC ANALYSIS **Nº 4339**

Priority Date 8-17-64

Sampler W. L. Chenoweth

OCCURRENCE

Claim Orphan Lode

Location

Drill hole number P-10 Depth

Formation Supai Member

Structure

Field name Core splits from company

INFORMATION DESIRED

Mineral Identification

Texture Description

Paragenesis

Assay for U_3O_8 ppm

Photomicrograph

Spectrogram ✓

Other

NATURE OF THE PROBLEM FOR WHICH ANALYSIS IS NEEDED

A	306.5 - 309.5	breccia altered (gray)
B	330.0 - 331.0	limonite staining
C	394.0 - 396.0	unaltered (red)

A represents breccia near pipe contact

B represents alteration in ring zone

C represents unaltered Supai

66363-5

ED-108

SAMPLE FOR PETROGRAPHIC ANALYSIS **Nº 4340**

Priority Date 8-17-64

Sampler W. L. Chenoweth

OCCURRENCE

Claim Orphan Lode

Location

Drill hole number P-11 Depth

Formation Supai Member

Structure

Field name Company pulp samples

INFORMATION DESIRED

Mineral Identification

Texture Description

Paragenesis

Assay for V_2O_5 rad & chem

Photomicrograph

Spectrogram ✓

Other

NATURE OF THE PROBLEM FOR WHICH ANALYSIS IS NEEDED

Split of company pulps to check previous assays on splits of core showing disequalibrium

A - 625.0 - 628.5

B - 628.5 - 636.0

66073-74

ED-1B

SAMPLE FOR PETROGRAPHIC ANALYSIS **No 4341**

Priority Date 8-17-64

Sampler W. L. Chenoweth

OCCURRENCE

Claim Orphan lode

Location

Drill hole number P-12 Depth 379-380

Formation Supai Member

Structure

Field name Comany cove split

INFORMATION DESIRED

Mineral Identification

Texture Description

Paragenesis

Assay for ppm U_3O_8

Photomicrograph

Spectrogram ✓

Other

NATURE OF THE PROBLEM FOR WHICH ANALYSIS IS NEEDED

Sample of breccia inside pipe to be used in conjunction with previous samples (54912 thru 54916) from near pipe contact and outside of pipe

66069

ED-108

SAMPLE FOR PETROGRAPHIC ANALYSIS **Nº 4342**

Priority Date 8-17-64

Sampler W. L. Chenoweth

OCCURRENCE

Claim Orphan Lode

Location

Drill hole number #400-3 Depth

Formation Member

Structure Supai

Field name Spits of Company Core

INFORMATION DESIRED

Mineral Identification

Texture Description

Paragenesis

Assay for ppm U_3O_8

Photomicrograph

Spectrogram ✓

Other

NATURE OF THE PROBLEM FOR WHICH ANALYSIS IS NEEDED

A	135.5 - 136.0	red	ss
B	157.0 - 157.5	gray	ss
C	164.0 - 164.5	red	ss

Hole drilled near F raize, bleached ss (B) represents host rock of 585 level ore.

66066-68

ED-108

SAMPLE FOR PETROGRAPHIC ANALYSIS **Nº 4343**

Priority Date 8-17-64

Sampler W.L. Chenoweth

OCCURRENCE

Claim Orphan Lode

Location

Drill hole number #550-12 Depth

Formation Supai Member

Structure

Field name Splits of company core

INFORMATION DESIRED

Mineral Identification

Texture Description

Paragenesis

Assay for ppm U_3O_8

Photomicrograph

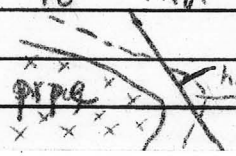
Spectrogram ✓

Other

NATURE OF THE PROBLEM FOR WHICH ANALYSIS IS NEEDED

A	52.0 - 52.5	red
B	59.0 - 59.7	gray
C	107.5 - 108.0	red

Altered ss encountered in hole may represent proximity of pipe to that part of drill hole.



ED-108

66070-72

P-13 A-60-65
B-95-100
C-150-155
D-200-205
E-250-255
F-300-305
G-350-355
H-400-405
I-450-455
J-500-505
K-550-555
L-600-605
M-646-656
N-700-705
O-750-755
P-799-802
Q-846-851
R-901-909
S-956-996
T-996-1001
U-1050-1055
V-1097-1102
W-1150-1156
X-1206-1216
Y-1235-1236 Core
Y-1229.5-1236
Z-1236-1256
AA-1296-1306
BB-1347-1355
CC-1400-1410
DD-1443-1453
EE-1493-1503
FF-1543-1553
GG-1600-1600.5
HH-1650-1651
II-1699.5-1700
JJ-1750-1750.5
KK-1800-1800.7
LL-1850-1851
MM-1900-1900.5

~~Probable~~
Orphan

SAMPLE FOR PETROGRAPHIC ANALYSIS **No 4204**

Priority Date 12-13-63

Sampler W. L. Chenoweth

OCCURRENCE Mineralization @ 1100 Level

Claim Orphan Lode

Location Grand Canyon Arizona

Drill hole number P-11 Depth

Formation Supai Member

Structure Breccia within pipe @ about the 1100 to 1125 Levels

Field name Splits of core

INFORMATION DESIRED

Mineral Identification

Texture Description 4239

Paragenesis

Assay for V_2O_5 Cu

Photomicrograph

Spectrogram Yes

Other

NATURE OF THE PROBLEM FOR WHICH ANALYSIS IS NEEDED

A	626 - 629	(3')	marked P-7187
B	636 - 639	(3')	55,500
C	639 - 641	(3')	
D	646 - 647	(1')	

Company assays as follows

626 - 629 .04% e U_3O_8

637 - 641 .04% e U_3O_8

646 - 651 .05% e U_3O_8

641 - 646 .00% e U_3O_8

ED-16

SAMPLE FOR PETROGRAPHIC ANALYSIS **No. 4205**

Priority Date 12-13-63

Sampler W. L. Chenoweth

OCCURRENCE Mineralization in Redwall Limestone

Claim Orphan Lode

Location Grand Canyon Arizona

Drill hole number P-11 Depth

Formation Redwall Ls. Member

Structure Redwall limestone outside pipe @ 1160 - 1175 level

Field name Splits of core

INFORMATION DESIRED

Mineral Identification

Texture Description 4240

Paragenesis

Assay for U_3O_8 Cu

Photomicrograph

Spectrogram Yes

Other

NATURE OF THE PROBLEM FOR WHICH ANALYSIS IS NEEDED

A 685 - 695 10'

B 701 - 706 5'

Company assays as follows

686 - 691 .05% eU_3O_8

691 - 701 .00% eU_3O_8

701 - 706 .05% eU_3O_8

Boundary of pipe @ 651' in core

ED-108

SAMPLE FOR PETROGRAPHIC ANALYSIS No 4206

Priority Date 12-13-63

Sampler W. L. Chenoweth

OCCURRENCE Mineralization in Supai - 585 Lvl

Claim Orphan Lode

Location Grand Canyon, Arizona

Drill hole number DDH-550 #6 Depth 56.0'-57.5'

Formation Supai Member

Structure

4241

Field name Spits of core

INFORMATION DESIRED

Mineral Identification

Texture Description

Paragenesis

Assay for U_3O_6 Cu

Photomicrograph

Spectrogram Yes

Other S isotopes much pyrite in core

NATURE OF THE PROBLEM FOR WHICH ANALYSIS IS NEEDED

Representative core split of mineralization currently being located @ about the 585 level of pipe outside shear zone in undisturbed Supai fm.

ED-103

SAMPLE FOR PETROGRAPHIC ANALYSIS **Nº 4207**

Priority Date 12-13-63

Sampler W. L. Chenoweth

OCCURRENCE

Claim Orphan Lode

Location Grand Canyon, Arizona

Drill hole number Depth

Formation Supai Member

Structure Annular ring in Park 525 Lv

Field name High sulfides in ore on 525 Lv

INFORMATION DESIRED

Mineral Identification 4242

Texture Description

Paragenesis 4243

Assay for U_3O_8 Cu

Photomicrograph

Spectrogram Yes

Other S isotope

NATURE OF THE PROBLEM FOR WHICH ANALYSIS IS NEEDED

A marked #1 collected on south rib of drift 80' SE of manway

B marked #2 collected on south rib of drift 60' SE of manway, much pyrite and some marcasite

No coord's available

ED-103

SAMPLE FOR PETROGRAPHIC ANALYSIS No. 4208

Priority Date 12-13-63

Sampler W. L. Chenoweth

OCCURRENCE

Claim Orphan Lode

Location Grand Canyon, Arizona

Drill hole number Depth

Formation Supai Member

Structure Annular ring ore above 400 Lv on claim

Field name Representative ore sample

INFORMATION DESIRED

Mineral Identification 4244

Texture Description

Paragenesis

Assay for U_3O_8 Cu

Photomicrograph

Spectrogram Yes

Other

NATURE OF THE PROBLEM FOR WHICH ANALYSIS IS NEEDED

Sample marked #8, collected from heading off of "E" raise on what is called the 375 level High lime, some sulfides. Coords 6025 N, 5360 E

ED-103

SAMPLE FOR PETROGRAPHIC ANALYSIS **No 4209**

Priority Date 12-13-63

Sampler W. L. Chenoweth

OCCURRENCE

Claim Orphan Lode

Location Grand Canyon Arizona

Drill hole number Depth

Formation Supai Member

Structure Annular ring ore on claim on 225 Lv

Field name High copper ore

INFORMATION DESIRED

Mineral Identification 4245

Texture Description

Paragenesis

Assay for U_3O_8 Cu

Photomicrograph

Spectrogram Yes

Other S isotopes

NATURE OF THE PROBLEM FOR WHICH ANALYSIS IS NEEDED

Sample marked #10, collected from rib on 225 level just east of "C" raize. Contains abundant chalcocite. Approx coords are 5785 N., 5540 E

ED-108

SAMPLE FOR PETROGRAPHIC ANALYSIS No 4210

Priority Date 12-13-63

Sampler W. L. Chenoweth

OCCURRENCE

Claim Orphan Lode

Location Grand Canyon Arizona

Drill hole number Depth

Formation Supai Member

Structure Representative Samples from 350 level

Field name

INFORMATION DESIRED

Mineral Identification 4246

Texture Description 4249

Paragenesis

Assay for U_3O_8 Cu

Photomicrograph

Spectrogram Yes

Other S isotopes ?

NATURE OF THE PROBLEM FOR WHICH ANALYSIS IS NEEDED

(A) marked #3 collected from east rib of drift in "inner zone" in Park Coord's are 6160N, 5550 E high grade ore.
(B) marked #4 collected from west rib of drift on claim, high sulfides Coord's are 5870 N, 5685 E

ED-18

Priority Date 12-13-63

Sampler W. L. Chenoweth 4211

OCCURRENCE

Claim Orphan Lode

Location Grand Canyon, Arizona

Drill hole number Depth

Formation Supai Member

Structure Representative samples from ore in Annular ring in Park ground

Field name on 330 level.

INFORMATION DESIRED

Mineral Identification 4248

Texture Description

Paragenesis

Assay for U_3O_8 Cu 4249

Photomicrograph 4250

Spectrogram Yes

Other S isotopes ?

NATURE OF THE PROBLEM FOR WHICH ANALYSIS IS NEEDED

A marked #6 collected from J-4 stope on 330 level, high sulfides

B marked #7 collected from J-4 stope on 330 level, veinlet of sulfides in oxidized sandstone

Coord's of J-4 raize and related stope are 6045 N, 5730 E

C marked #9, collected from F-4 raize on 330 level, coord's are 5520 E, 6195 N ED-108

SAMPLE FOR PETROGRAPHIC ANALYSIS No 4212

Priority Date 12-13-63

Sampler W. L. Chenoweth

OCCURRENCE

Claim Orphan Lode

Location Grand Canyon, Arizona

Drill hole number Depth

Formation Supai Member

Structure Representative sample of ore from 285 level on claim in southern

Field name portion of annular ring

INFORMATION DESIRED

Mineral Identification

Texture Description 4237

Paragenesis

Assay for U_3O_8 Cu

Photomicrograph

Spectrogram Yes

Other

NATURE OF THE PROBLEM FOR WHICH ANALYSIS IS NEEDED

Sample marked #5, collected from new heading being driven north westwardly on 285 level in southern portion of pipe, high lime ore. Coord's are 5790 N, 5390 E.

ED-108

SAMPLE FOR PETROGRAPHIC ANALYSIS **Nº 4344**

Priority Date 8-17-64

Sampler W. L. Chenoweth

OCCURRENCE

Claim Orphan Lode

Location

Drill hole number P-13 Depth

Formation Member

Structure Vertical hole drilled from 550 level to a TD of 1914'

Field name Splits of company pulps

INFORMATION DESIRED

Mineral Identification

Texture Description

Paragenesis

Assay for ppm U_3O_8

Photomicrograph

Spectrogram ✓

Other

NATURE OF THE PROBLEM FOR WHICH ANALYSIS IS NEEDED

a	60 - 65	j	500 - 505	s	950 - 956
b	95 - 100	k	550 - 555	t	996 - 1001
c	150 - 155	l	600 - 605	u	1050 - 1055
d	200 - 205	m	646 - 656	v	1097 - 1102
e	250 - 255	n	700 - 705	w	1150 - 1156
f	300 - 305	o	750 - 755	x	1206 - 1216
g	350 - 355	p	799 - 802	x'	1211 - 1213 core
h	400 - 405	q	846 - 851	y	1229.5 - 1236
i	450 - 455	r	901 - 909	y'	1235 - 1236 core EOH TD 1236

over

z	1246 - 1256	
aa	1296 - 1306	
bb	1347 - 1355	
cc	1400 - 1410	
dd	1443 - 1453	
ee	1493 - 1503	
ff	1543 - 1553	
gg	1600.0 - 1600.5	Core splits from Orphan Core at Park Service Museum
hh	1650.0 - 1651.0	
ii	1699.5 - 1700.0	
jj	1750.0 - 1750.5	
KK	1800.0 - 1800.7	
LL	1850.0 - 1851.0	
mm	1900.0 - 1900.5	Send results to

Merrill Doud Beal Chief
Park Naturalist Grand Canyon
National Park

55500

Orphan lode 1100 level, Vale P-11

626' – 629'

10/23/64

Sample #	Mark.	c	e	Th 230	Ra 226	Po 210
P 7187	55,500	.36	.03	.106	.004	.0004

~~Section~~

Orphan

Austen

Bob

This is interesting

DM

ANALYTICAL DATA
Hole P-11

Sample No	Lab No.	$\%U_3O_8$	$\%eU_3O_8$	$\%CaCO_3$	$\%P_2O_5$	%Cu	%F	$\%SO_4$	Interval
7073	54408	.01	.002	1.10	—	N.I	.10	—	586.0 - 593.0
4340 A	66073	.14	N.I	—	.05	—	—	.07	625.0 - 628.5
4204 A	55500	.43	.04	71.20	—	N.I	—	—	626.0 - 629.0
4340 B	66074	.07	.002	—	.04	—	—	.02	628.5 - 636.0
4204 B	55501	.07	.01	45.50	—	N.I	—	—	636.0 - 639.0
4204 C	55502	.03	.01	83.70	—	N.I	—	—	639.0 - 641.0
4204 D	55503	.03	.01	62.50	—	N.I	—	—	646.0 - 647.0
4205 A	55504	.01	Tr	88.60	—	N.I	—	—	685.0 - 695.0
~~4205 B~~	~~55505~~	~~.01~~	~~Tr~~	~~79.90~~	—	~~N.I~~	—	—	~~701.0 - 706.0~~
7074	54409	Tr	N.I	61.40	—	N.I	.04	—	700.0 - 705.0
4205 B	55505	.01	Tr	79.90	—	N.I	—	—	701.0 - 706.0
7075	54410	Tr	N.I	65.00	—	N.I	.04	—	705.0 - 709.0

P-11 was an inclined core hole drilled from the 550 level, bearing N 60° E, inclined -61°, total length 709 feet.

Limestone breccia encountered at 625 feet. Unbrecciated Redwall Limestone penetrated at 651 feet.

Samples were splits of core, except samples 4340, 7073 - 7075 which were pulps of core.

Analysis by Leeds Pitkin, Inc., ~~January~~ December 1963, 1964, Sample 4340 analyzed September 1964

Sample 4204 A also analyzed for:

Thorium 230 - .06 %
Radium 226 - .004 %
Polonium 210 - .0004 %

AEC Samples Sent to USGS

Sample No.	Level	Description
991-L-C85 ✓	245	Ni Sulphides D Zone
~~-M-C86~~	~~100~~	
991-M-C86 ✓	100	Uraninite A Zone
991-N-C86	175	A Stope
991-O-C86	400	Uraninite / Hematite AR
991-P-C86	———	Galena X's
991-Q-C86 ✓	175	Uraninite : Carnotite A Zone

ANALYTICAL DATA
Hole P-13

~~Hole P-13~~

Sample No.	Lab. No	ppm U_3O_8	% eU_3O_8	% P_2O_5	% SO_4	Interval ~~Depth~~
4344 a	66025	240	.03	.02	.05	60-65
b	66026	225	.02	.03	.07	95-100
c	66027	38	.004	.02	.02	150-155
d	66028	9	.001	.02	.04	200-205
e	66029	12	.001	.07	.01	250-255
f	66030	357	.03	.07	.03	300-305
g	66031	222	.02	.07	.04	350-355
h	66032	40	.003	.06	1.31	400-405
i	66033	7	N.I	.04	.07	450-455
j	66034	56	.003	.07	.28	500-505
k	66035	34	.002	.04	.04	550-555
l	66036	30	.002	.17	.22	600-605
m	66037	25	.005	.04	Tr	646-656
n	66038	7	.001	.04	.03	700-705
o	66039	13	.001	.05	.05	750-755
p	66040	2	N.I	.07	1.31	799-802
q	66041	3	N.I	Tr	N.I	846-851
r	66042	3	N.I	.02	.08	901-909
s	66043	4	N.I	.02	N.I	950-956
t	66044	9	N.I	.05	N.I	996-1001
u	66045	6	.001	.02	N.I	1050-1055
v	66046	10	.001	.01	N.I	1097-1102
w	66047	6	N.I	.02	.01	1150-1156
x	66048	6	N.I	.06	.01	1206-1216
x'	66049	8	.004	.05	N.I	1211-1213

P-13 continued

4344	Y	66050	6	.001	.04	Tr	1229.5 - 1236
	y'	51	10	.002	.02	N.I	1235 - 1236
	Z	52	5	.001	.04	.02	1246 - 1256
	aa	53	6	.004	.07	.04	1296 - 1306
	bb	54	4	.001	.03	.02	1347 - 1355
	cc	55	1	.001	.04	.02	1400 - 1410
	dd	56	4	.001	.08	.14	1443 - 1453
	ee	57	2	Tr	.04	Tr	1493 - 1503
	ff	58	8	.001	.05	.03	1543 - 1553
	gg	59	9	.001	.11	.03	1600.0 - 1600.5
	hh	60	16	.002	.06	.02	1650 - 1651
	ii	61	4	.002	.25	.06	1699.5 - 1700
	jj	62	6	.001	.15	.02	1750 - 1750.5
	kk	63	4	.008	.18	.03	1800 - 1800.7
	ll	64	8	.006	.37	.01	1850 - 1851
	mm	65	7	.001	.21	.02	1900 - 1900.5

P-13 was a vertical core hole drilled from the 550 level to a total depth of 1914 feet. Unbrecciated Redwall Limestone was encountered at 996 feet. The top of the Bright Angel Shale was at 1515 feet and the top of the Tapeats Sandstone was at 1854.4 feet

Samples were pulps of core, except samples 4344 x' and y' which were splits of core.

Analysis by Lucius Pitkin, Inc., September 1964

ANALYTICAL DATA
Hole P-12

Sample No.	Lab No.	%U_3O_8	%eU_3O_8	%$CaCO_3$	%P_2O_5	%Cu	%F	%SO_4	Interval
					.02			.05	379-380
4341	66069	24 ppm	.01						
7076	55411	.01	.006	2.40		N.I	.06		657-662
7077	55412	.02	.02	1.20		.04	.12		662-667
7078	55413	.01	.004	0.60		N.I	.12		710-715
7079	55414	Tr	.005	0.80		N.I	.12		715-720
7080	55415	Tr	.005	0.70		N.I	.10		720-725
7081	55416	Tr	.004	0.30		N.I	.06		725-730

P-12 was an inclined core hole drilled from the 550 level, bearing N 46° W, inclined -55°, total length 746 feet. No limestone breccia encountered. Last 50 feet of core is of unbrecciated sediments, mostly sandstone, but still believed to be within the pipe.

Samples were pulps of core

Analysis by Lucius Pitkin, Inc., ~~January~~ December 1963 ~~1964~~. Sample 4341 analyzed September 1964.

Don't think there
are any Lab. Nos.
for these. RA.

PROCEDURE:

Weigh a 0.50 gm. sample into a 250 ml. beaker. Carry a reagent blank through the procedure. 8/ Pipet in duplicate, 1 ml. of the Pb-210 standard solution (1000 pCi) into 250 ml. beakers. Add 2 ml. sulfuric acid, 15 ml. nitric acid, 5 ml. perchloric acid and 2 ml. hydrofluoric acid to each beaker. Transfer the beakers to a shaking hot plate on low heat for 5 minutes, then evaporate at high heat to approximately 1 ml. Cool, add a few carborundum chips, 50 ml. of water, return the beakers to the hot plate and boil for 10 minutes to dissolve the soluble salts. Filter the samples through a #30 Whatman filter, 12.5 cm. paper into a 250 ml. beaker. Wash the beaker and filter paper four times with water. The final volume must be 100 - 125 ml. to insure proper acid concentration.

Add one ml. of the bismuth carrier to each beaker, return to the hot plate and heat to boiling. Add 6 ml. of 2% thioacetamide solution in 2 ml. portions and boil 5 minutes after the last addition. Remove the beakers from the hot plate and cool for 10 minutes.

Assemble the millipore filter units with type HA millipore filter discs. Pass the sample through the disc with the aid of vacuum. Wash the filtering apparatus 3 times with water, allowing the vacuum to remove most of the water. Break the vacuum, remove the filter disc and affix on a 2 inch flat stainless steel planchet with Scotch "double stick" tape. Air dry for at least 6 hours. 9/ Transfer the reagent blank planchet to the proportional counter 6/, purge with P-10 gas, and count for 10 minutes. 7/ Record the count, remove the reagent blank planchet. Insert a blank planchet, purge, count and record. This count is the background count. 8/ Run the standards and samples in the same manner.

CALCULATIONS:

1. Alpha CPM = $\frac{\text{Total alpha counts}}{\text{Total minutes}}$ - background CPM

2. Curies/gm. Polonium 210 = $\frac{\text{ALPHA CPM}}{(A)\ (B)\ (C)\ (D)\ (E)}$ 3/

   (A) = Geometry factor = .5 for a 2 counter.

   (B) = Sample weight, gm.

   (C) = Recovery factor based on lead 210 standards. A factor of .9 is used.

   (D) = Conversion factor, DPM to microcuries = 2.22×10^6.

   (E) = Conversion factor, Microcuries to Curies = 1×10^6.

3. % equivalent 4/ Polonium 210 = $\frac{\text{Curies/gm. Po-210}}{3.39 \times 10^{-9}}$ 5/

STANDARDIZATION:

One ml. of the Pb-210 solution (1000 pico curies) is mounted directly on a stainless steel planchet, dried under the infrared lamp and counted in the same manner as the samples. Polonium 210 is the only alpha emitter present. Lead 210 and its daughter bismuth 210 are beta emitters. This count is compared with the standards taken through the procedure and yield an average 0.9 recovery factor.

(over)

Due to the discrepancies in sample ———
the following analyses were calculated
Perkin Elmer 1 210 ——

			Lab No	% U_3O_8	% cU_3O_8	% C_2CO_3	% Cu	% F
12-243	P-11	586-93	55408	01	002	1.10	N.I	.1
	"	700-05	9	Tr	Tr	61.40	N.I	.04
	"	705-709	10	Tr	Tr	65.0	N.I	.04
	P-12	657-662	11	.01	.006	2.4	N.I	.06
	"	662-667	12	.02	.02	1.2	.04	.12
	"	710-715	13	01	.004	.6	N.I	.17
	"	715-720	14	Tr	005	.8	N.I	.12
	"	720-725	15	Tr	005	.7	N.I	.10
	"	725-730	16	Tr	.004	.3	N.I	.06

Fluorometric

		9-9-64	Lab No	ppm % U_3O_8	% U_3O_8	% P_2O_5	% SO_4
1	4344	a	66025	240	03	02	05
2			6	225	02	03	07
3			7	38	004	02	02
4			8	9	001	02	04
5			9	12	001	07	01
6		s	30	357	03	07	03
7			1	222	02	07	04
8			2	40	003	06	1.31
9			3	7	Nil	04	07
10			4	56	003	07	28
11		K	5	34	002	04	04
12			6	30	002	17	22
13			7	25	005	04	Tr
14			8	7	001	04	03
15			9	13	001	05	05
16		p	40	2	Nil	07	1.31
17			1	3	Nil	Tr	Nil
18			2	3	Nil	02	08
19			3	4	Nil	02	Nil
20			4	9	Nil	05	Nil
21		J	5	6	001	02	Nil
22		V	6	10	001	01	Nil
23		W	7	6	Nil	02	01
24		X	8	6	Nil	06	01
25		X'	9	8	004	05	Nil
26		Y	50	6	001	04	Tr
27		Y'	1	10	002	02	Nil
28		Z	2	5	001	04	02
29		a	3	6	004	07	04
30		b	4	4	001	03	02
31		c	5	1	001	04	02
32		d	6	4	0.01	08	14
33		e	7	2	Tr	04	Tr
34		f	8	[illegible]	001	05	03
35		g	9	9	001	11	03
36		h	60	16	002	06	02
37		i	1	4	002	25	06
38		J	2	6	001	15	02
39		K	3	4	008	18	03
40		L	4	8	006	37	01
		m	5	7	001	21	02

	Field No		Lab	Lab No.		% U_3O_8	% eU_3O_8	% V_2O_5	% $CaCO_3$	% CU
P-11	4204	A	PTS	55 500	1-3-64	43	04	Tr	TR	Nil
		B	Pulp	1	"	07	01	03	4.55	Nil
		C	Sample	2	"	03	01	01	8.37	Nil
		D	pulp	3	"	03	01	01	6.25	Nil
	4205	A		4	"	01	Tr	01	8.86	Nil
		B		5	"	3 01	3 Tr	3 Tr	7.89	Nil
	4206			6	"	59	45	01	11	Nil
				7	1-7-64	3.45	354	396	07	Nil
				8		3.76	364	8 74	08	Nil
				9		03	04	44	10	Nil
				10						
				11						
				12						
				13						
				14						
				15						
				16						
				17						
				18						
				19						

4207	A	#1
	B	#2
4208		#8
4209		#10
42010	A	#3
	B	#4
4201	A	#6
	B	#7
	C	#9
4212		#5

Fluorimetric

	Field No		Lab No	% U_3O_8 ppm	% eU_3O_4	% P_2O_5	% SO_4	
225 L	4335	X	9-10-64 66350	09	002	04	01	
245 L	4336	A	1	19	001	02	01	
		B	2	44	008	02	01	
400 L	4337	A	3	05	001	04	01	
		B	4	04	001	06	01	
		C	5	04	005	02	03	
		D	6	72	009	04	04	
		E	7	29	002	05	18	
		F	8	301	012	05	1.42	
K-13	4338	A	9	12	002	05	07	
		B	66360	.25 %	.15 %	03	30	
		C	1	23	001	07	01	
		D	2	09	001	07	01	
P-10	4339	A	3	14	001	02	01	
		B	4	115	006	02	02	
		C	5	12	001	22	Tr	
400-3	4342	A	9-9-64 66066	02	002	06	Tr	
		B	7	05	N.I	02	04	
		C	8	02	N.I	05	01	
P-12	4341		66069	24	01	02	05	
				02				
550-12	4343	A	66070	02	N.I	09	01	
		B	71	25	013	16	01	
		C	72	07	N.I	05	01	
P-11	4340	A	73	14	N.I	05	07	625 - 628.5
		B	74	07	002	04	02	628.5 - 636

Book goes to 66350

CERTIFICATE OF ASSAY

REQUESTED BY PED COST CODE NO. PRA DATE 1-14-6

SAMPLE NO.	MARKED	CHEMICAL % U_3O_8	GAMMA ONLY RADIOMETRIC PREDICTED % eU_3O_8	GAMMA ONLY RADIOMETRIC % EMANATION	% eU_3O_8 / % eU_3O_8	% $CaCO_3$	% Cu	% F		
P-7073	54408	0.01	0.002			1.1	NIL	0.10	P-11	586-593
7074	54409	Trace	Trace			61.4	NIL	0.04	P-11	700-705
7075	54410	TRACE	NIL			65.0	NIL	0.04	P-11	705 709
7076	54411	0.01	0.006			2.4	NIL	0.06	P-12	657-662
7077	54412	0.02	0.02			1.2	0.04	0.12	P-12	662-667
7078	54413	0.01	0.004			0.6	NIL	0.12	P-12	710-715
7079	54414	TRACE	0.005			0.8	NIL	0.12	P-12	715-720
7080	54415	TRACE	0.005			0.7	NIL	0.10	P-12	720-725
7081	54416	TRACE	0.004			0.3	NIL	0.06	P-12	725-730

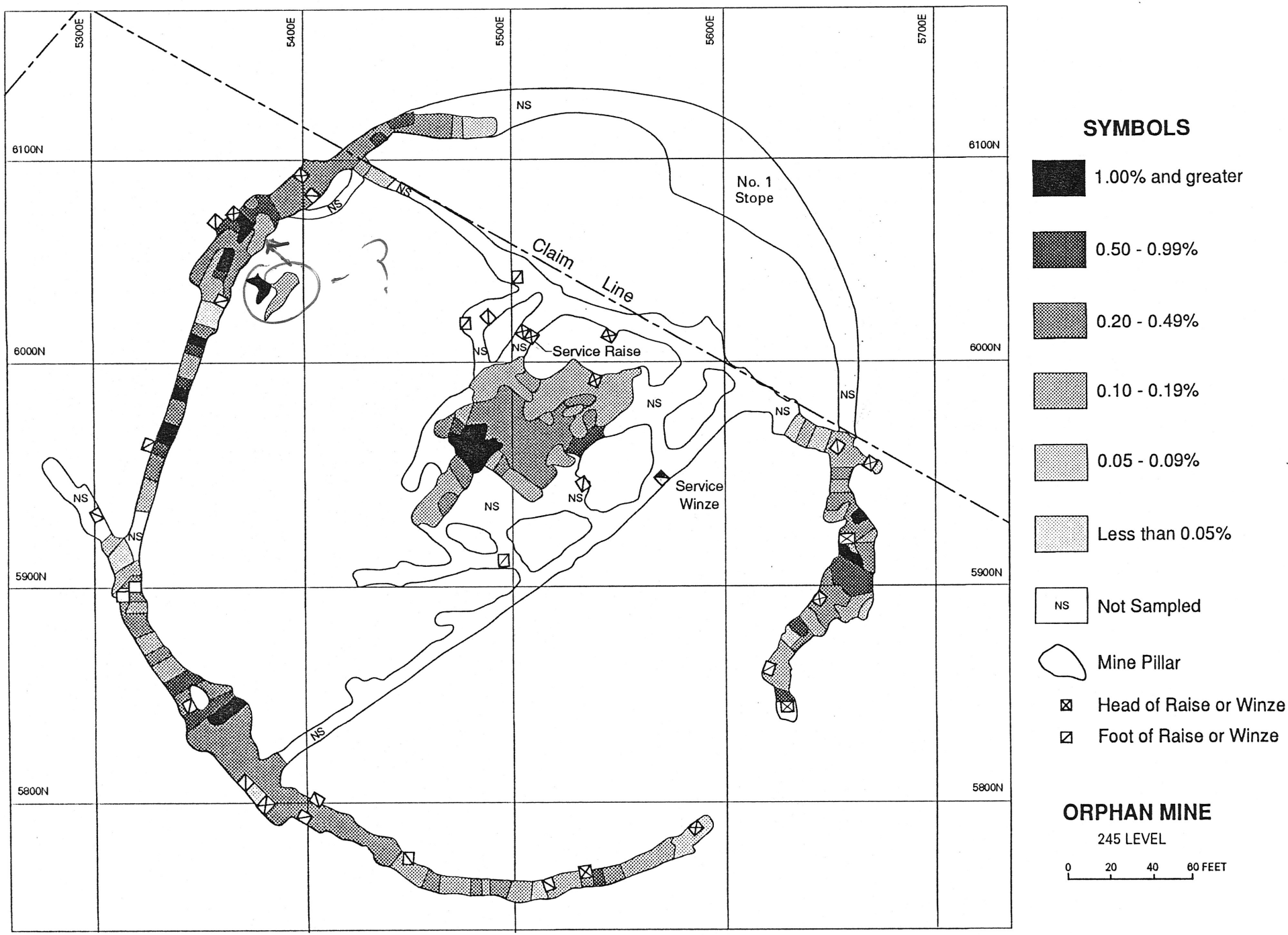
Distribution:
1. Production Services Branch, PED
2. Geophysical Services Branch, PED
3. Sampler Chemcuth
4. Other
5. L.P.I.

W.E. Bush
Chief Chemist

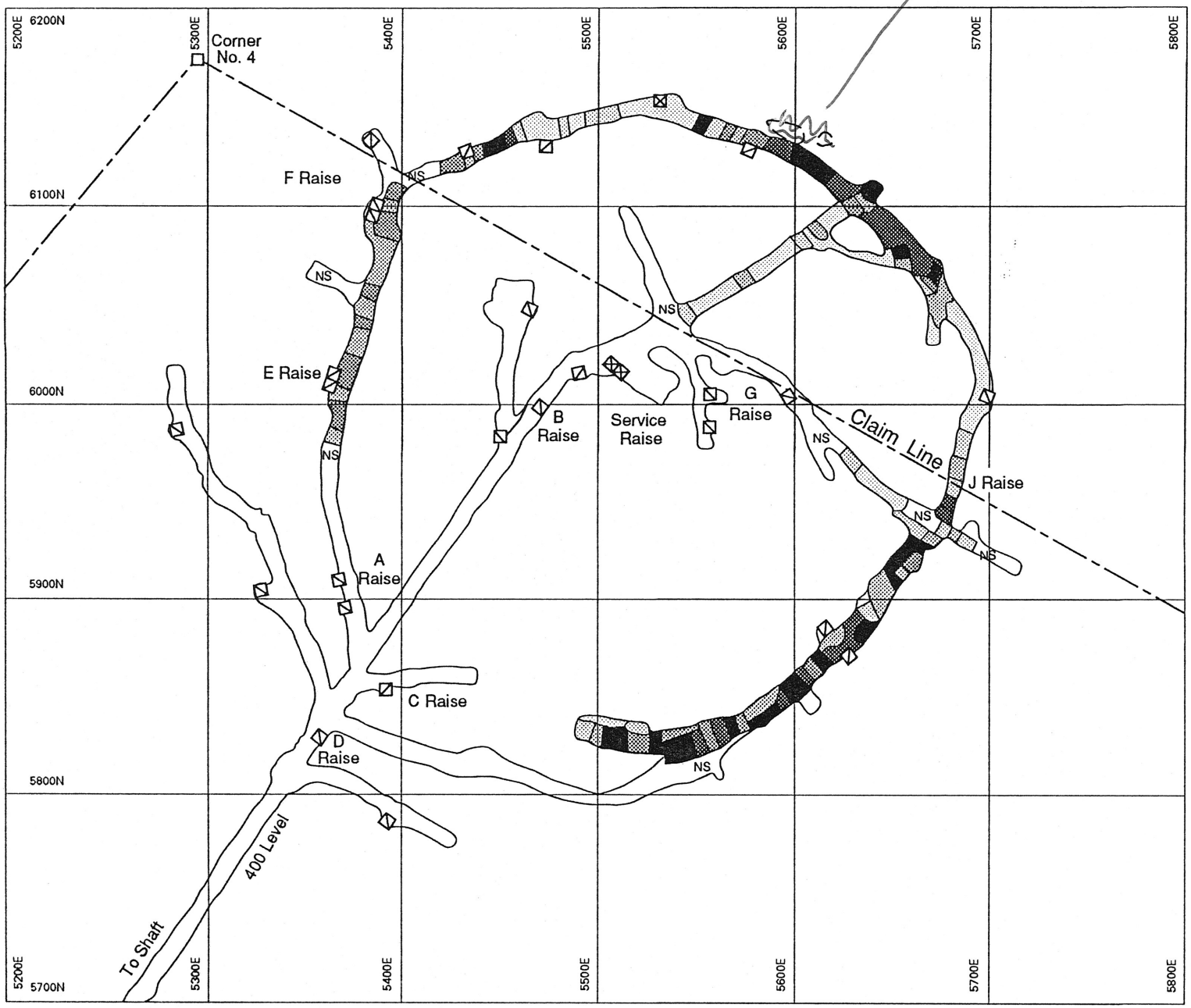
LIST OF MAPS

LEVEL	SCALE	DESCRIPTION	# of Maps
Adit	1/20	Drill holes	2
	1/20	Location of mine cross-section/ Location of drill holes (12,22)	1
	1/20	Ventilation plan	1
100	1/10	Drill hole locations	1
	1/20	Location of mine sections	1
140	1/20	Drill hole plan review	1
	1/20	Locations of cross-sections	1
175	1/10	Drill hole locations	1
	1/20	Drill hole locations	1
	1/20	Geology	3
	1/20	Locations of cross-sections	1
	1/10	Sulfide percentage logs	1
225	1/20	Assay	1
(north)	1/20	Geology	1
	1/20	Stope	1
245	1/20	Assay	2
	1/20	Drill hole	1
	1/20	Fan drilling station	2
	1/20	Geology	6
	1/20	Locations of drilling and sections	1
	1/20	Stope	1
	1/20	Stope w/geology	1
245 & 350	1/20	Fan drilling station	1
260 & 265	1/20	Assay	1
	1/20	Geology	1
	1/20	Stope	1
285			
(east)	1/20	Assay	1
(east)	1/20	Geology	1
(east)	1/20	Survey stations	1
(west)	1/20	Assay	1
(west)	1/20	Survey stations	2
290	1/20	Assay	1
	1/20	Stope	2
310	1/20	Geologic logs	2

310 & 320	1/20	Assay	1
320	1/20	Assay	1
320 & 325	1/20	Geology	1
	1/20	Stope w/geology	1
335	1/20	Assay	1
	1/20	Geology	2
350	1/20	Geology	2
350 & 245	1/20	Fan drilling station	1
350 & 365	1/20	Assay	1
	1/20	Stope	1
	1/20	Stope w/geology	1
375	1/20	Geology (not finished)	1
400	1/20	Assay	2
	1/20	Drill hole	1
	1/20	Geology	3
	1/20	Stope w/geology	1
	1/20	Survey stations	1
430	1/20	Assay	1
	1/20	Geology	2
525	1/20	Assay	1
	1/20	Geology	1
550	1/20	Assay	1
	1/20	Cross-section	1
	1/20	Geology	2
	1/20	Geology (not finished)	1
585	1/20	Assay	1
	1/20	Drifts	1
	1/20	Geology	1


5300E
5400E
5500E
5600E
5700E
6100N
6000N
5900N
5800N
NS
No. 1
Stope
Claim
Line
Service Raise
Service
Winze
SYMBOLS
1.00% and greater
0.50 - 0.99%
0.20 - 0.49%
0.10 - 0.19%
0.05 - 0.09%
Less than 0.05%
NS
Not Sampled
Mine Pillar
Head of Raise or Winze
Foot of Raise or Winze
ORPHAN MINE
245 LEVEL
0
20
40
60 FEET

Delete



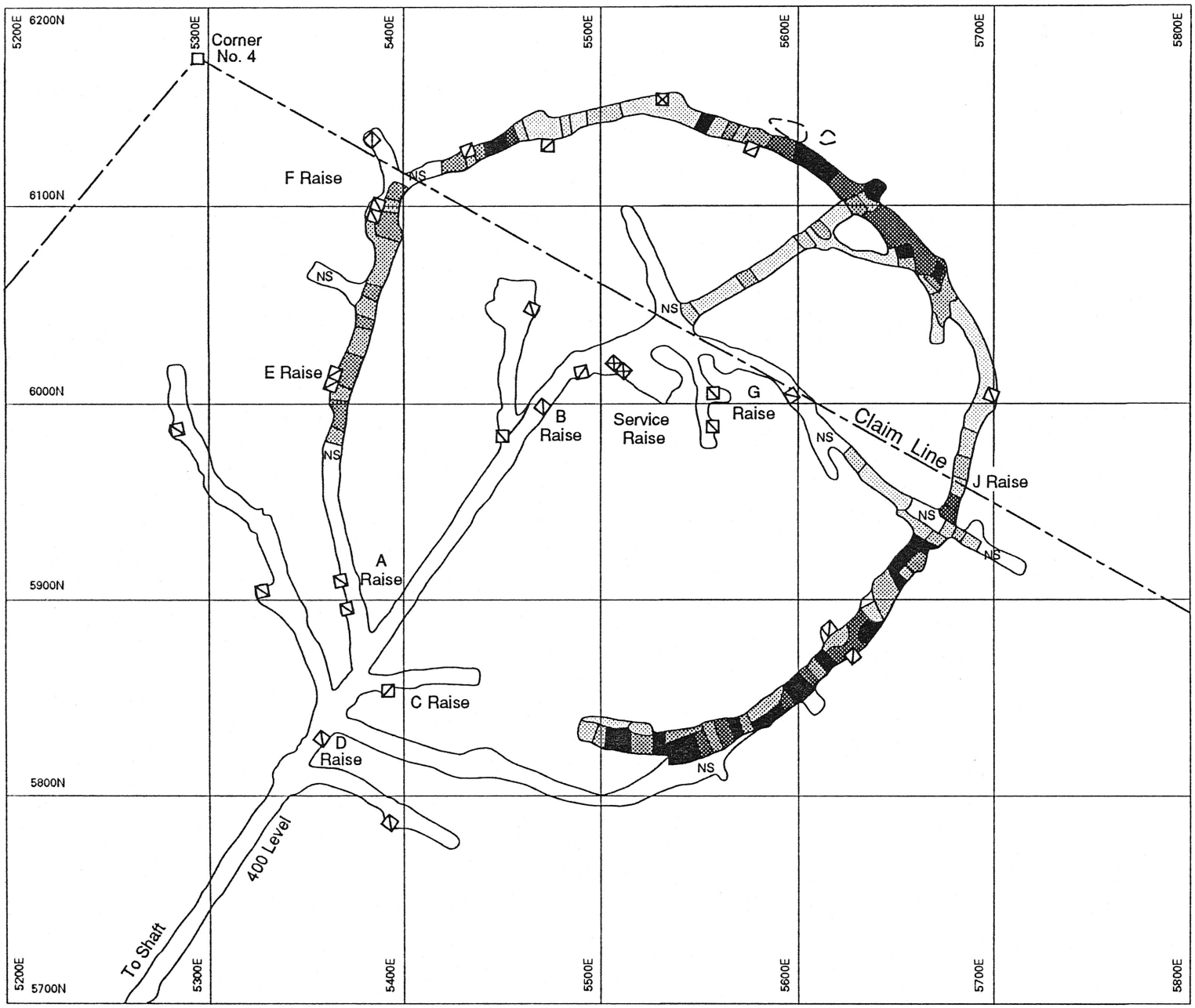
SYMBOLS

- 1.00% and greater
- 0.50 - 0.99%
- 0.20 - 0.49%
- 0.10 - 0.19%
- 0.05 - 0.09%
- Less than 0.05%
- NS — Not Sampled
- Mine Pillar
- Head of Raise or Winze
- Foot of Raise or Winze

ORPHAN LODE MINE

400 Level

0 20 40 60 FEET



SYMBOLS

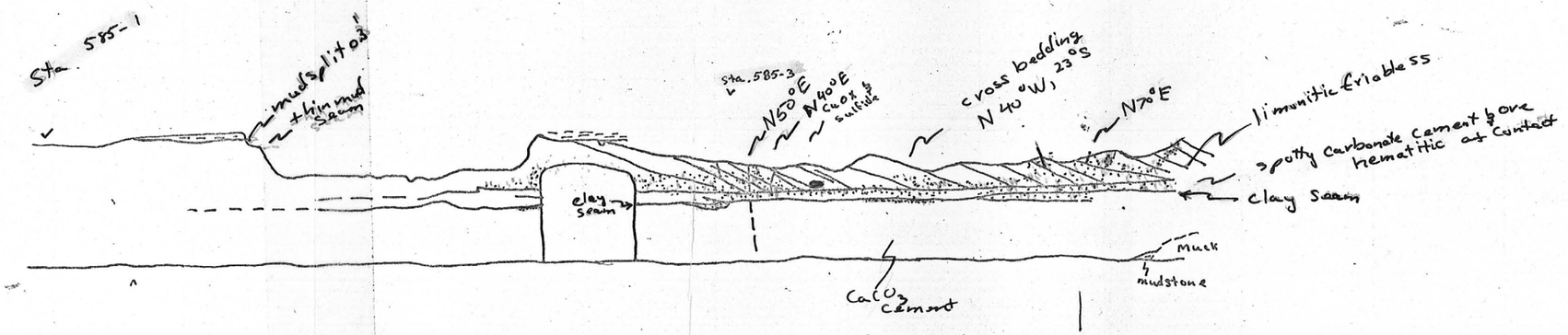
- 1.00% and greater
- 0.50 - 0.99%
- 0.20 - 0.49%
- 0.10 - 0.19%
- 0.05 - 0.09%
- Less than 0.05%
- NS — Not Sampled
- Mine Pillar
- Head of Raise or Winze
- Foot of Raise or Winze

ORPHAN LODE MINE

400 Level

0 20 40 60 FEET

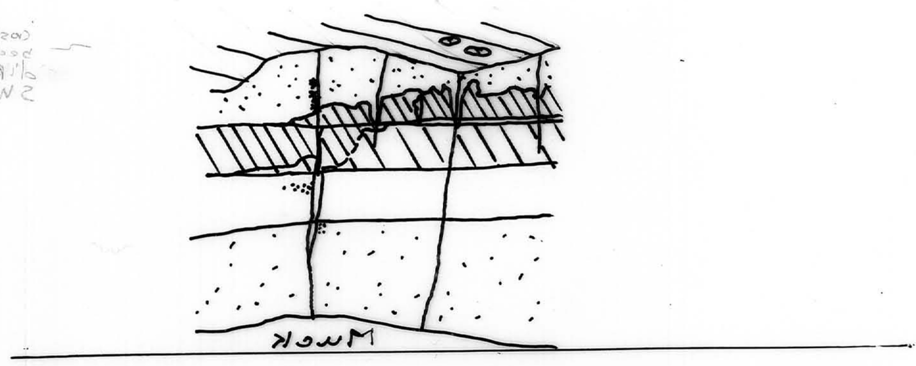
1" = 10'



On opposite rib
Clay seam is channeled out by x-bedded ss

Channel cuts down at least 4'

585 Level



Orphan Mine
585' Level
25' east of Sta.
585-6, outside
rib of drift.

Scale 1" = 5'

Credit Photos to Erik Bowser

Graded bedding in pipe fill.

Breccia fragments decrease in size upward towards the top of the bedded pipe fill.

Pipe fill bedding dips 15° in a nnw direction toward "younger pipe" exposed in the wall of the 585' level.

Gil

Erik Brunn 9-1-92

585 "Pipe with pipe"

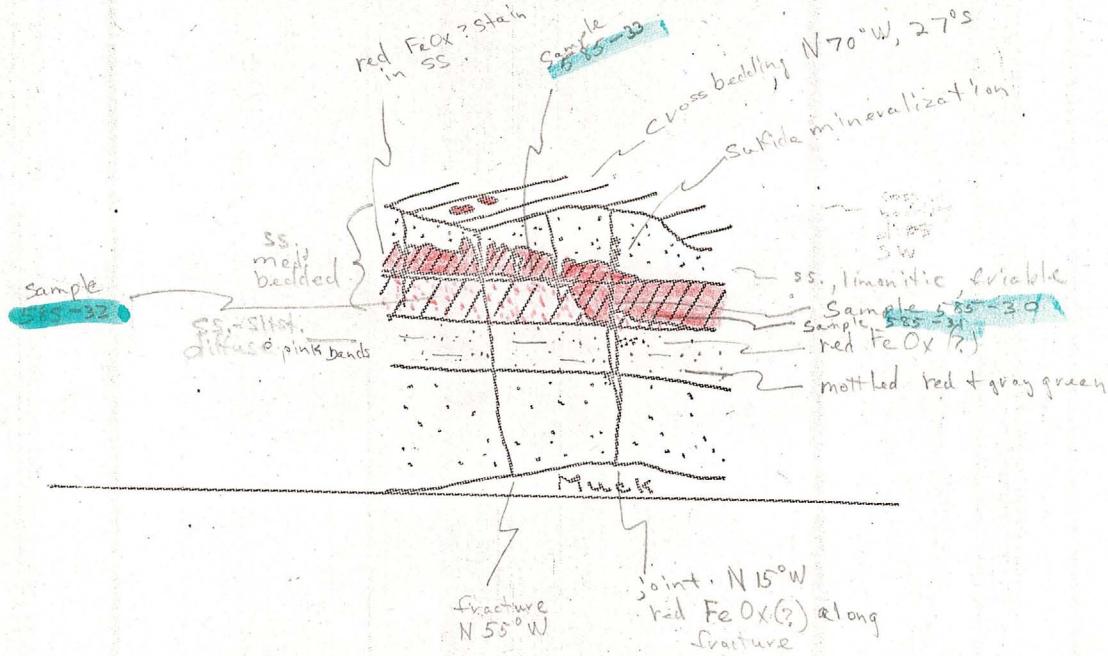
A very local structure

Dissolution of sandstone in annulus ring by later solutions

Occurred when shoulder of old pipe flattened before flaring to a larger diameter.

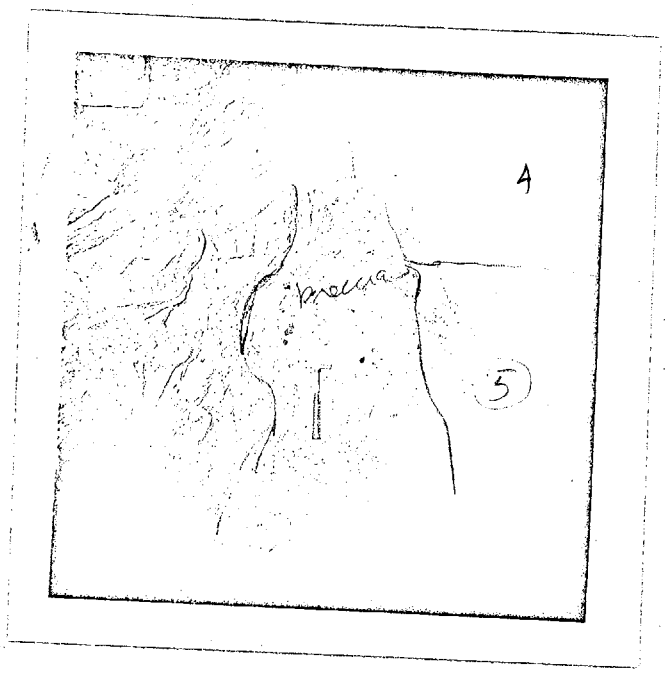
"Very small and local"

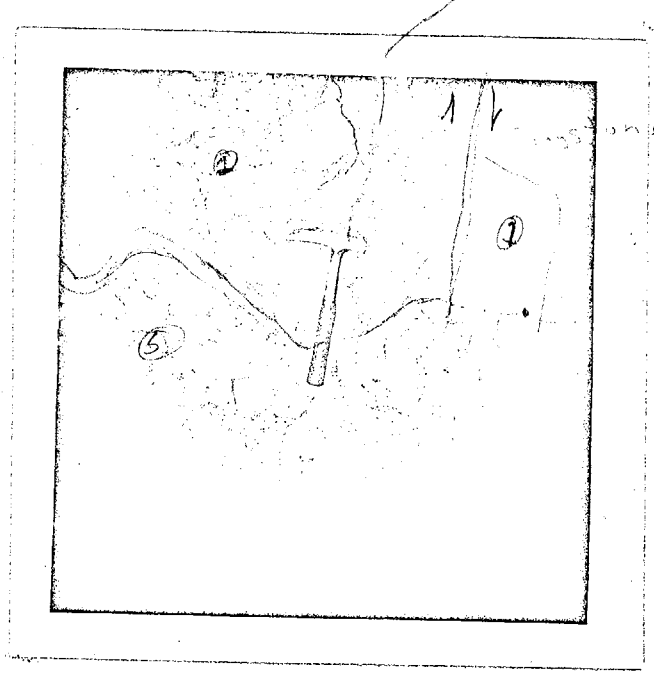
Orphan Mine
585 Level

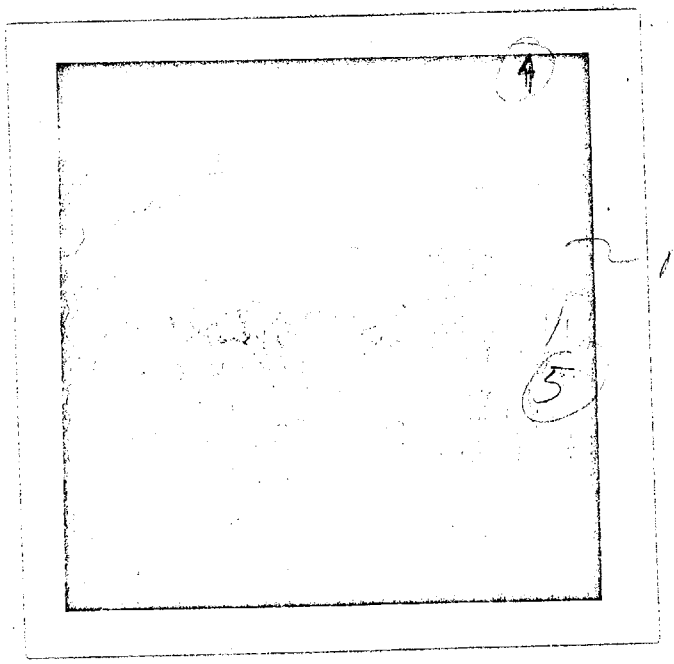


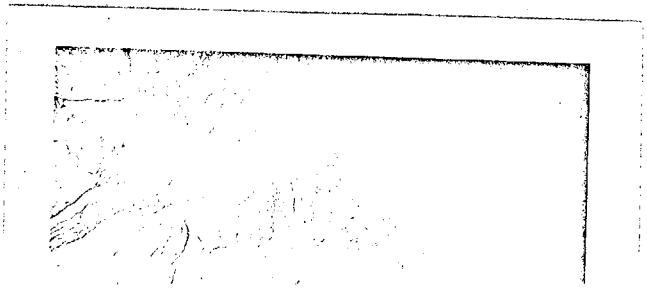
Orphan Mine
585' Level
25' east of Sta. 585'-6, outside rib of drift.

Scale
1" = 5 ft.


4
5







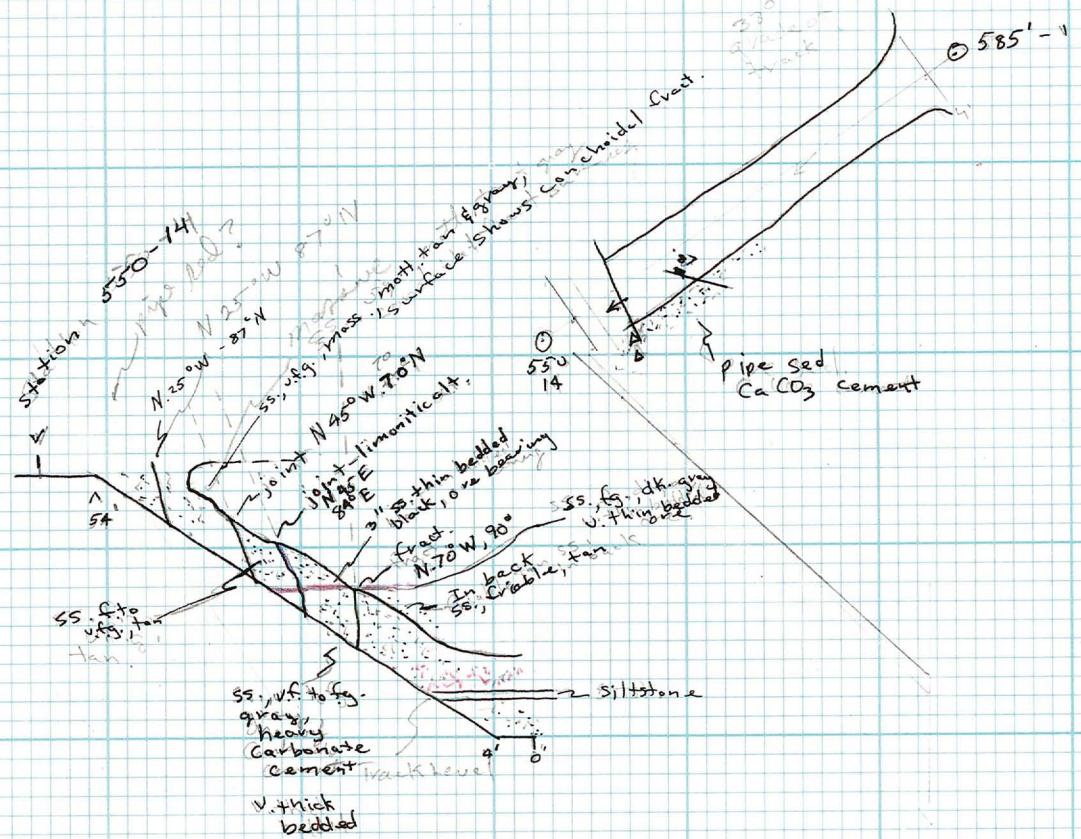
5600 E

5700 E

6200 N

585' level = 0 at 581 - 1 to 4' horizontal
4' to 54' incline 33°
550' level 54' to 60' horizontal

Orphan Mine
Incline 550 - 585
Scale 1" = 20'



6100 N

East rib of incline

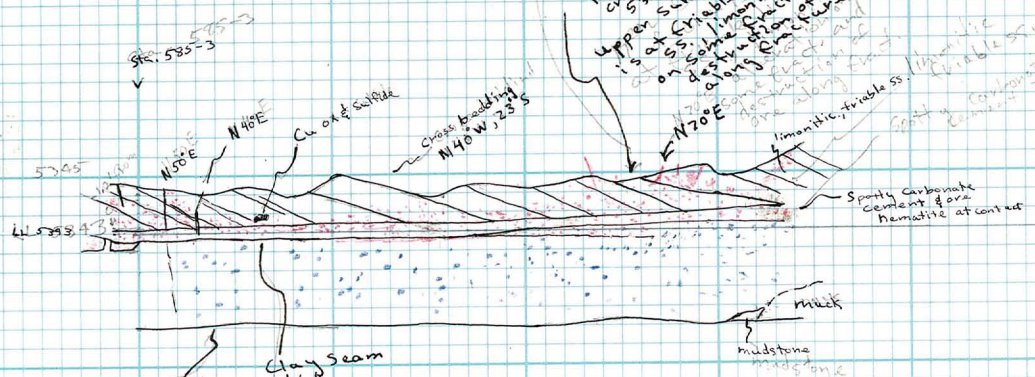
NE rib 585' level

Sta. 585-3

Scale 1"=20'

elev
4L
5343

Scale 1"=10'

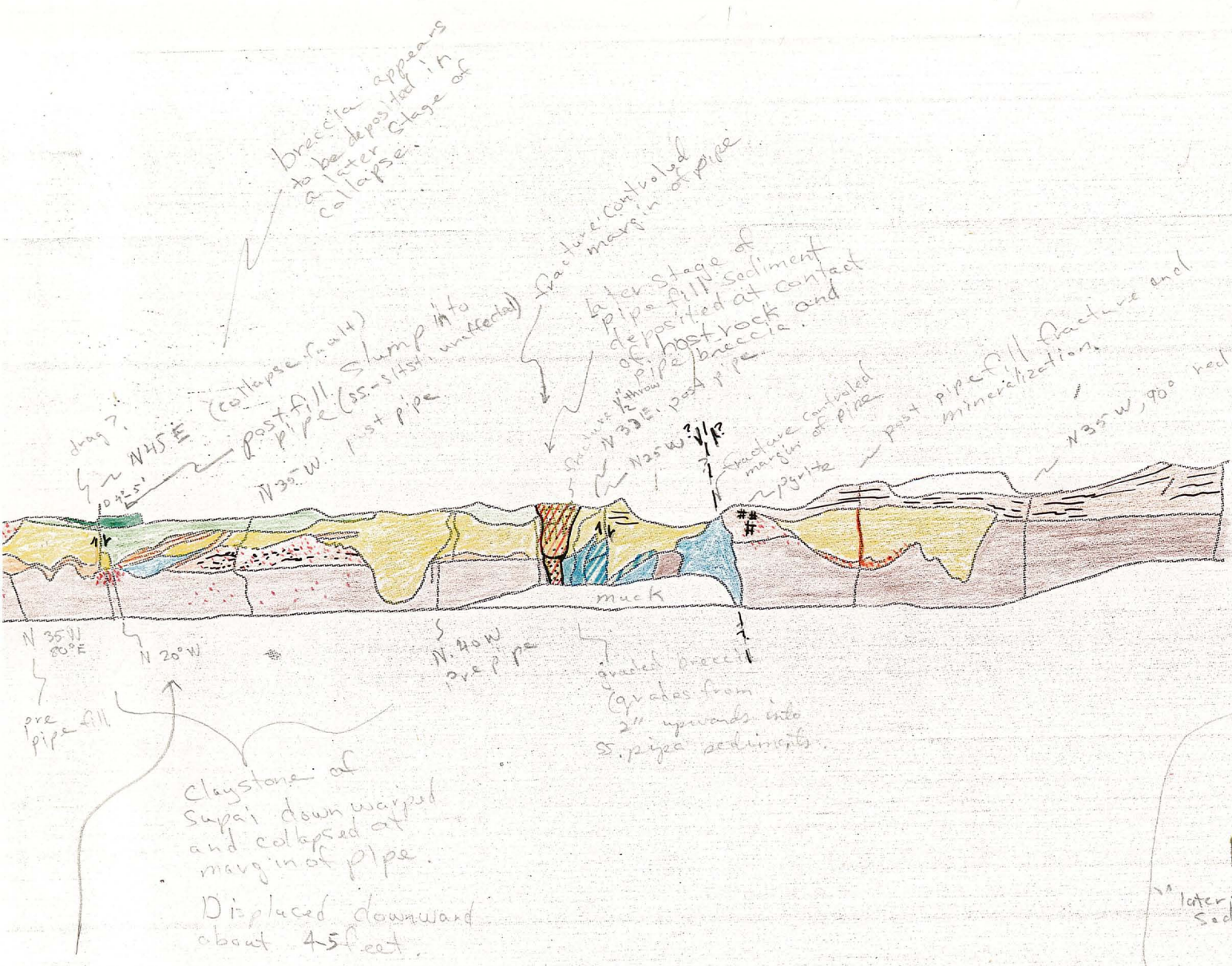


5th Level

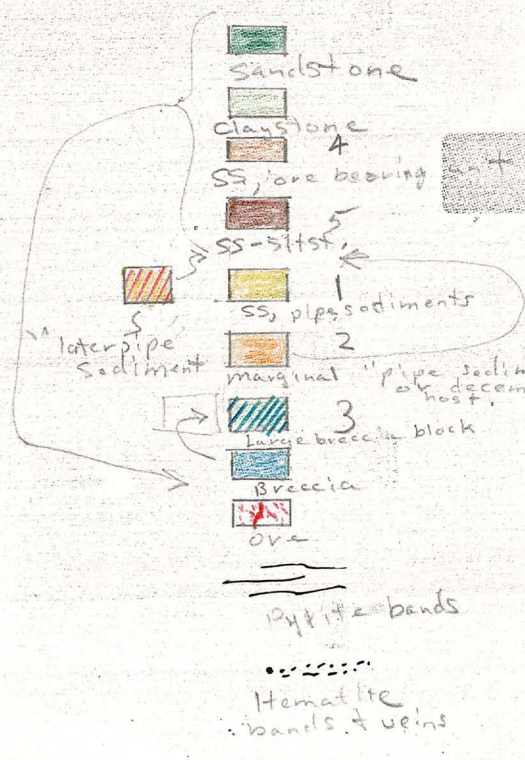
MINE..... LOCATION..... LEVEL.....

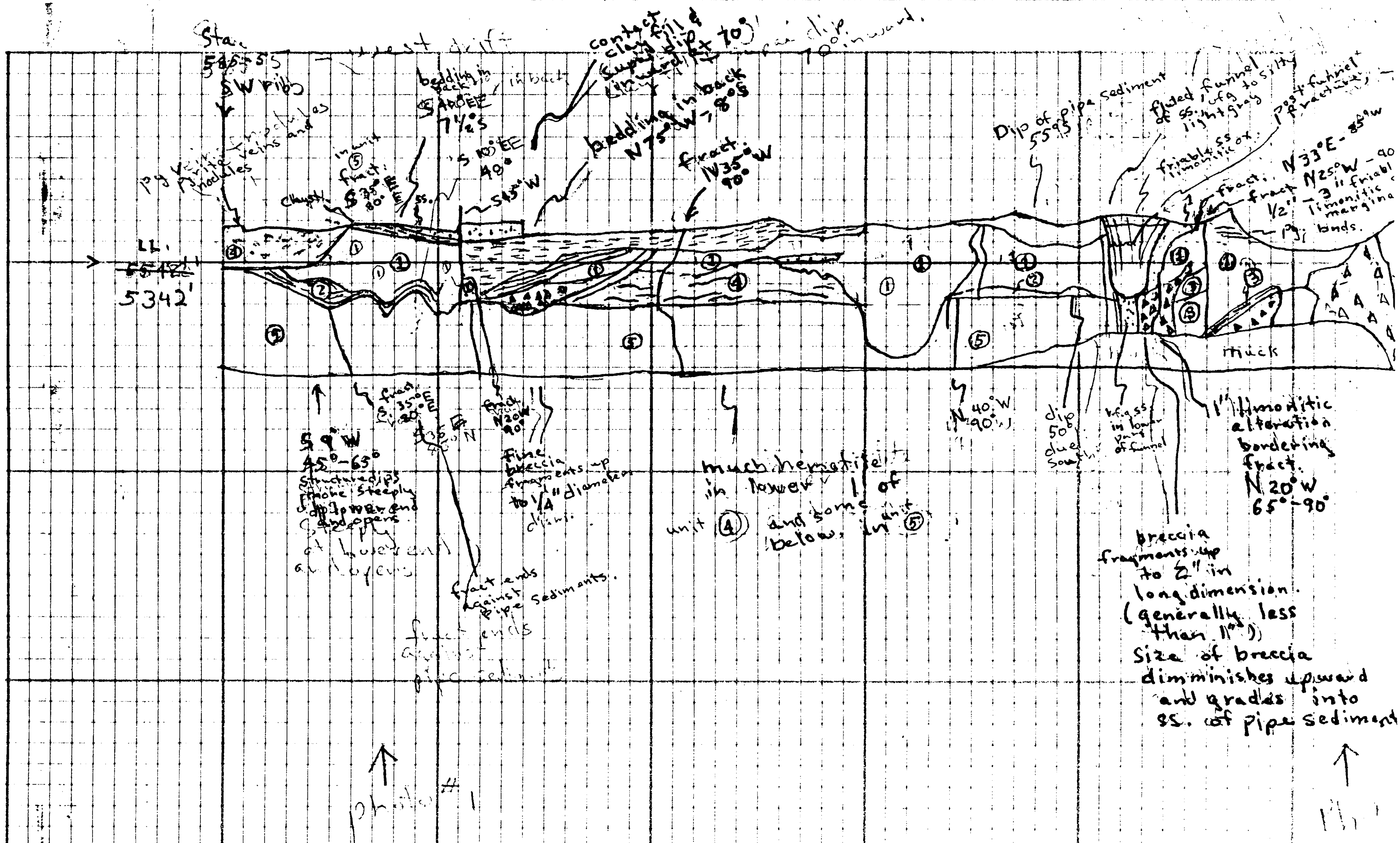
GEOLOGY BY..... SURVEY..... SCALE..... DATE.....

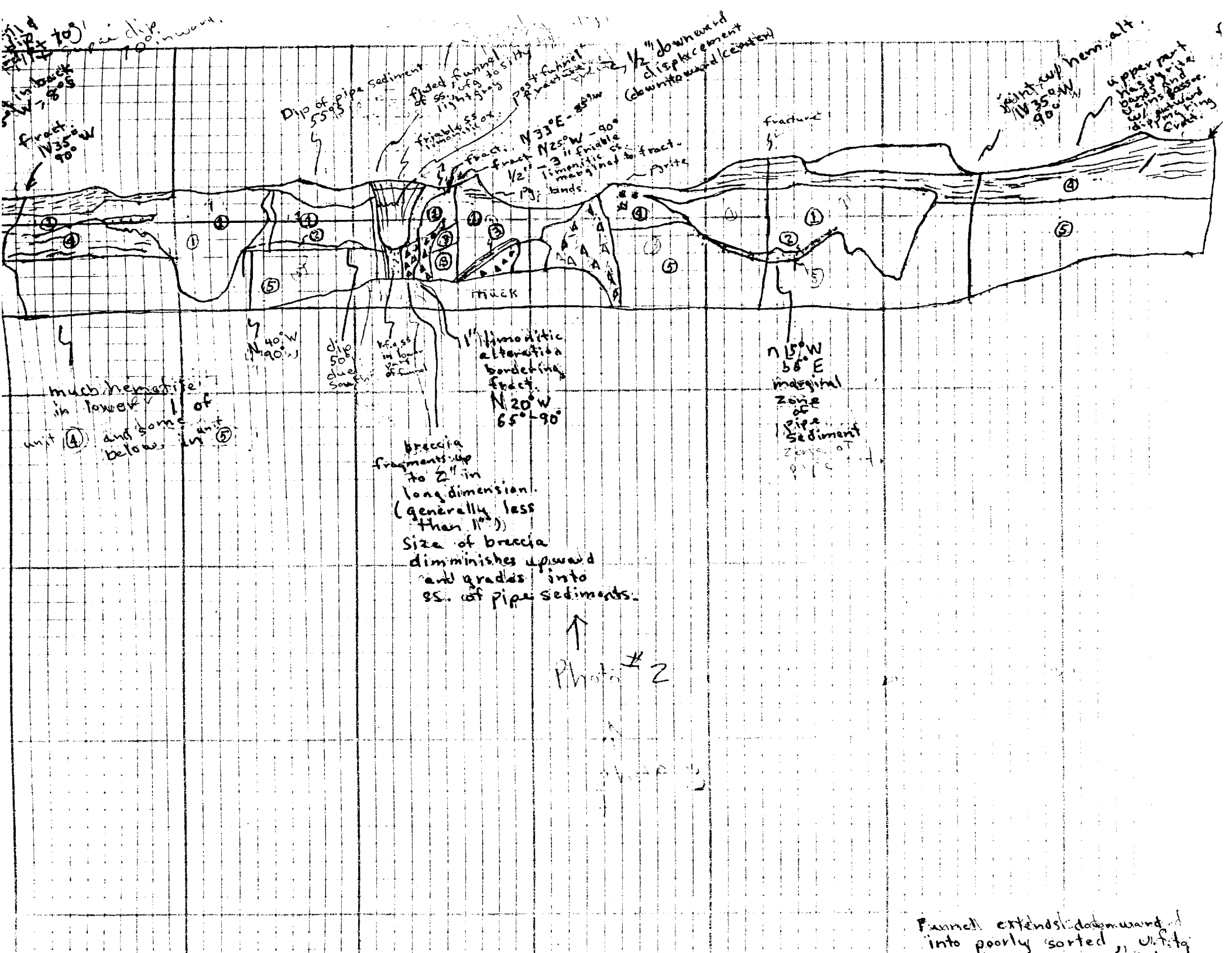
Orphan Mine
585 Level
SW rib
west drift.
Scale 1" = 10'



pipe formation at 3 different times as indicated by "marginal pipe sediment" and pipe sediment contacts.

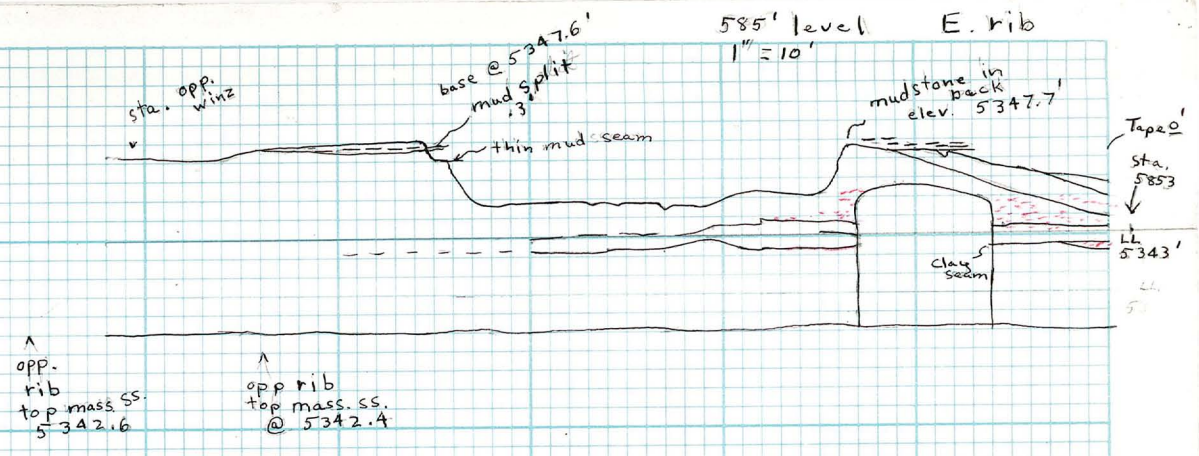


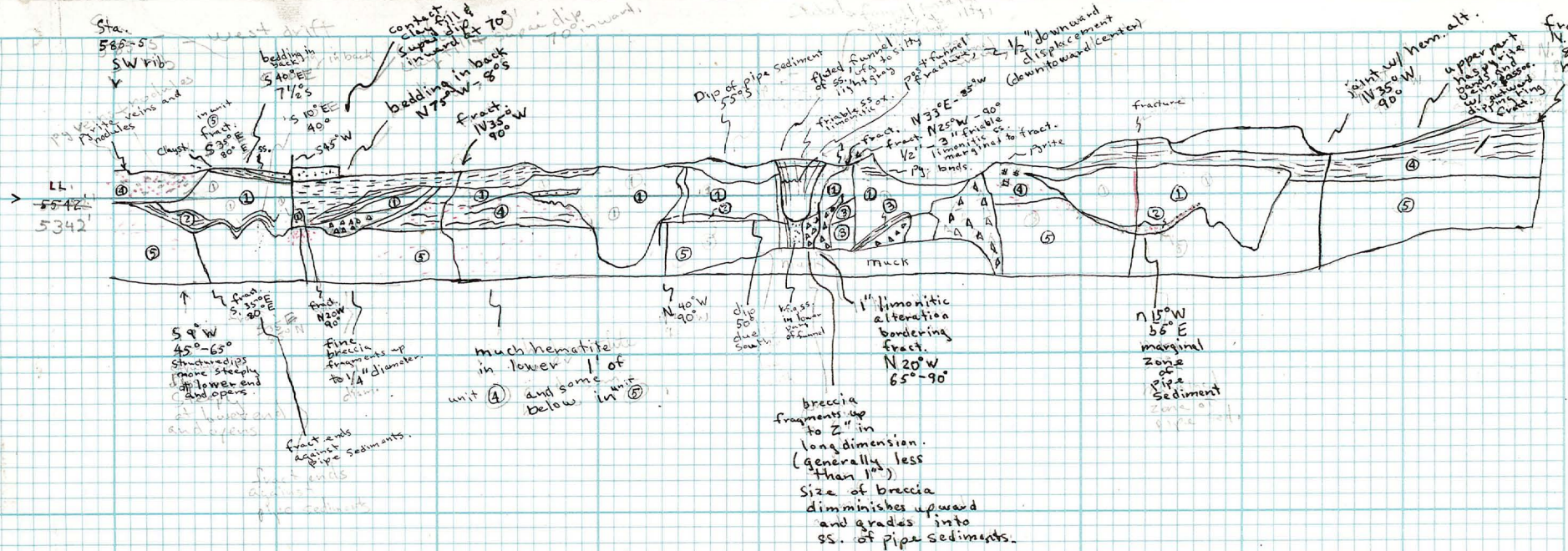

SW rib
LL.
5342'
contact clay fill &
bedding in back
7½°S
S 10° EE
40°
bedding in back
N75°W, 8°S
fract.
N35°W
90°
Dip of pipe sediment
fluted funnel of ss. vfg to silty light gray
friable ss
post funnel fract.
fract. N33°E - 85°W
fract. N25°W - 90
limonitic
bnds.
muck
fract.
35°E
80°E
S 9° W
45°-65°
Structure dips more steeply
Fine breccia fragments up to 1/4" diameter
much hematite
in lower 1' of
unit 4 and some
below in unit 5
N 40°W
90°
dip
50°
due South
1" limonitic
alteration
bordering
fract.
N 20° W
65°-90°
breccia
fragments up
to 2" in
long dimension.
(generally less
than 1")
Size of breccia
dimminishes upward
and grades into
ss. of pipe sediment
fract ends against pipe sediments.
fract ends
against
pipe sediments
photo #1



Funnel extends downward into poorly sorted, vf. fg

585' level E. rib
1" = 10'





Funnel extends downward into poorly sorted, u.f. to med. g. ss.; rounded slump contact of the 2 lithologies.

① ① ss, massive, splits with concoidal fracture, "pipe sediments"

④ ② Sandstone — Corresponds to ore bearing unit on opposite rib

⑤ ⑤ ss.-sltst. diffuse hematite bands & mottling

③ ④ Large breccia blocks

② ③ Marginal "pipe sediments" possible decementation of rocks at margin of pipe sediments

Hematite bands & veins with halo of hematite & th. limonite.

Black U mineralization

Orphan Mine
585 Level
Sta. 585-5
SW rib
West drift.

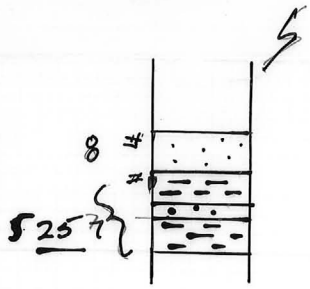
Scale 1" = 10'

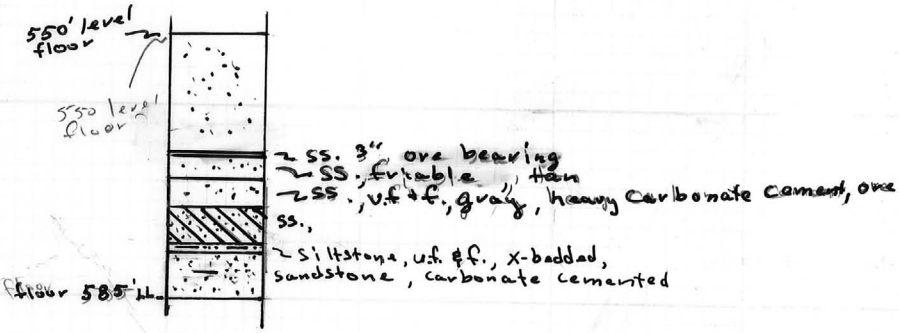
Gil Bowles
USGS

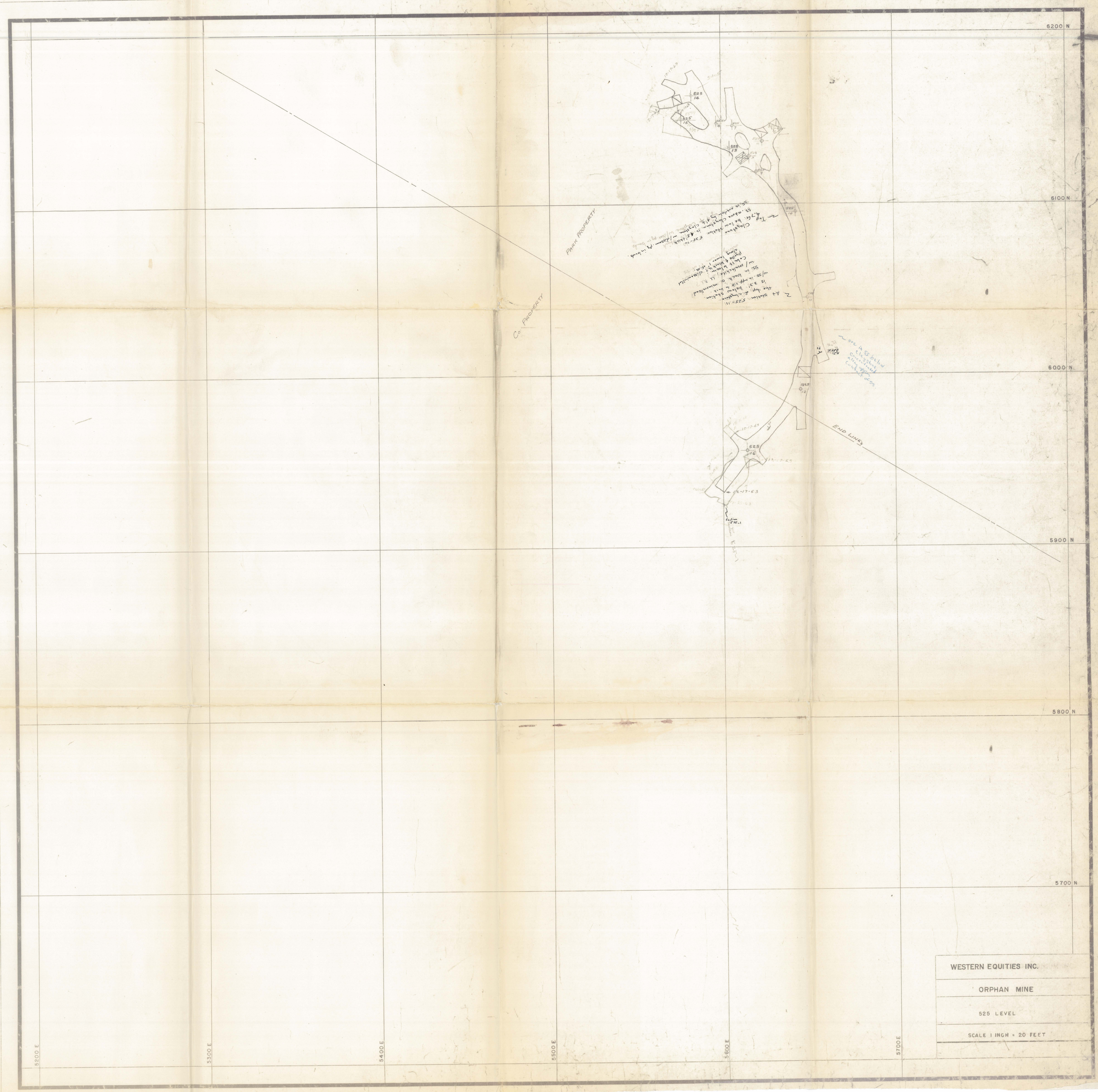
Field Notes and Mapping

525 Level
550 Level
585 Level

Orphan Mine
Section 525-1
near station 525-16






6200 N
6100 N
6000 N
5900 N
5800 N
5700 N
5200 E
5300 E
5400 E
5500 E
5600 E
5700 E
PARK PROPERTY
Co PROPERTY
END LINES
525 / 14
525 / 15
525 / 13
525 / 11
525 / 12
525 / 16
12-17-63
WESTERN EQUITIES INC.
ORPHAN MINE
525 LEVEL
SCALE 1 INCH = 20 FEET

FRIDAY

Sample for age

SEPTEMBER 1981						
S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

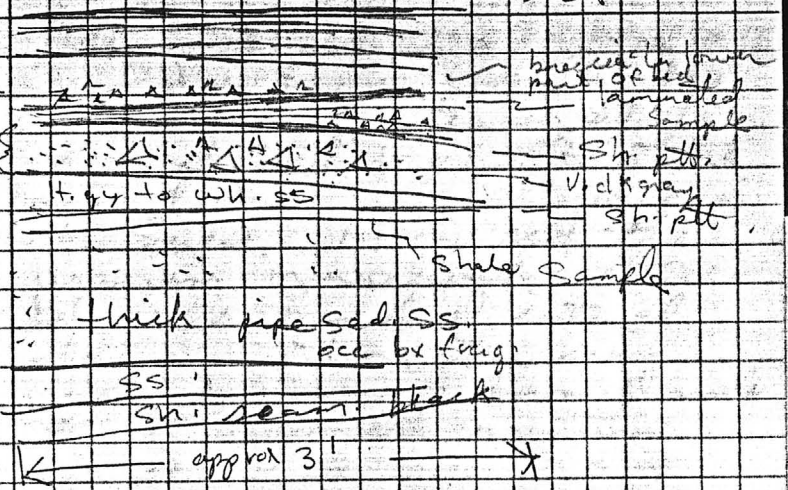
4

SEPT. 1981

Sample 0585-33

taken from base of mineralized zone of White ss with ~~pods~~ of uraninite mineralization 1" zone of interbedded spotty hematitic ss + wh. ss. Sharp contact with red, manganiferous ss that grades into normal red sst

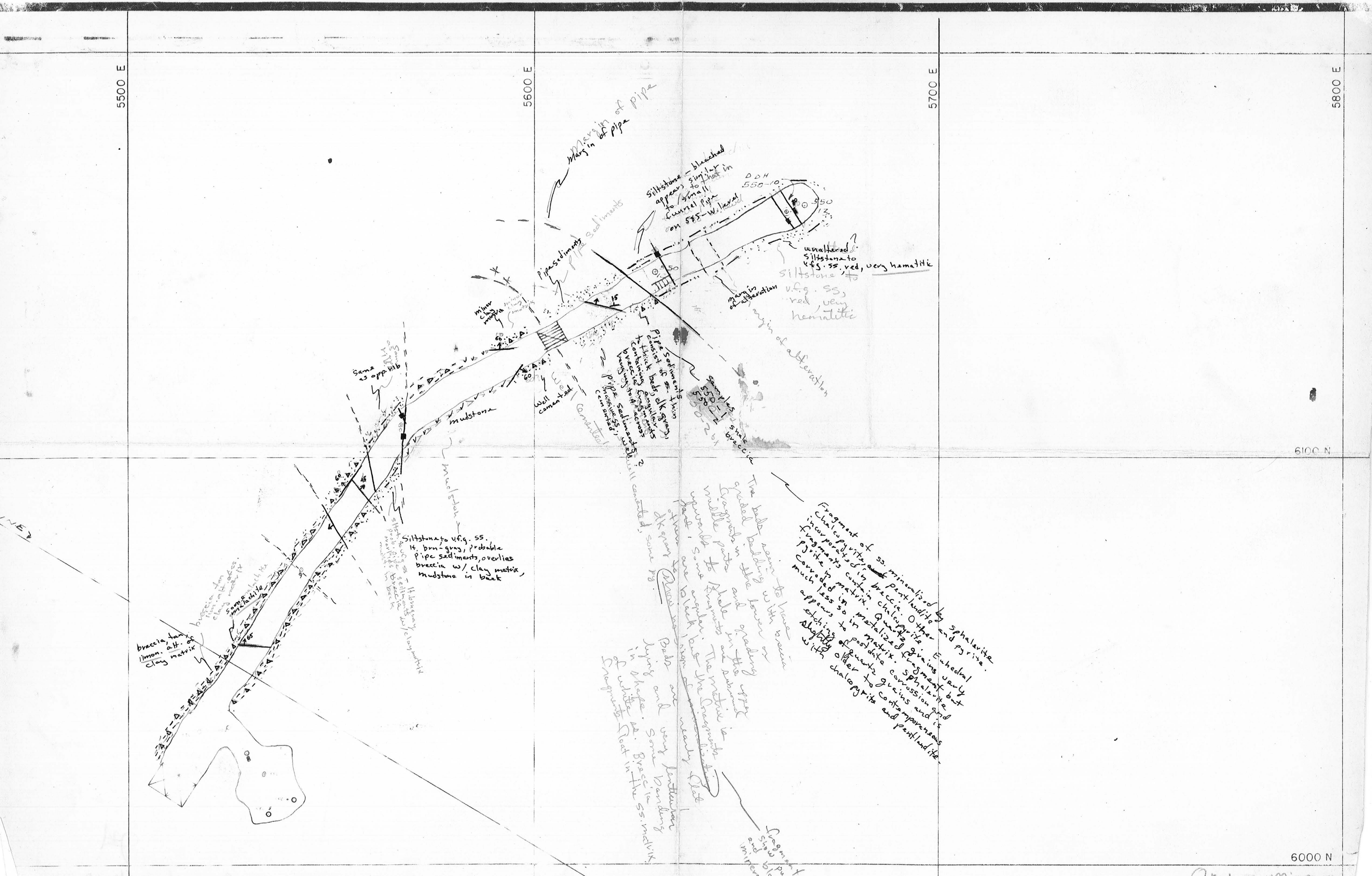
550 Level Top of incline to 585
east rib. SS. back



260 Level west rib at east side of mine Sta 260-2

Black U. Minz. in 4" Sandstone bed which is between two 1" Clay seams. Clay is gy with occ. mottling of Hematite and some U minz. flanking clay seam in over and underlying altered SS. There is 1½" of Uranium Mineralization. The lower band in places is split by a thin clay parting. At the boundaries of the U minz there is usually a thin layer of intense alteration

then a thin streak ~~of~~ enriched in hematite. This may be sharp on the mineralization side and diffuse toward the altered ss of the Supai. Generally the zone of strong alteration extends somewhat beyond hematite streak and diffuses into altered ss of the Supai. At one spot the uranium mineralization extends below the mineralized interval along a fracture. The mineralized zone widens toward sill from 1" across to 8" with less concentration in the wider zone. In part there is a parallel hematite streak which is similar to that along horiz. mins contains mins. is more intense near the outer edge than in other parts of vertical mins.


5500 E
5600 E
5700 E
5800 E
6100 N
6000 N
Margin of pipe
Siltstone - bleached appears similar to that in small Cunniel pipe on 585-W. level
DDH 550-10
unaltered Siltstone to v.f.g. ss. red, very hematitic
Siltstone to v.f.g. ss, red, very hematitic
Margin of alteration
Pipe sediments
mudstone
Well cemented
Same as opp. rib
Siltstone to v.f.g. ss. lt. brn-gray, probable pipe sediments, overlies breccia w/ clay matrix, mudstone in back
breccia, tan, limon. alt. of clay matrix
Fragment of ss. mineralized by sphalerite, chalcopyrite, pentlandite and pyrite. Other fragments contain chalcopyrite. Euhedral pyrite in matrix. Quartz grains very corroded in mineralized fragment but much less so in matrix. Sphalerite appears to postdate corrosion and is slightly older to contemporaneous with chalcopyrite and pentlandite.