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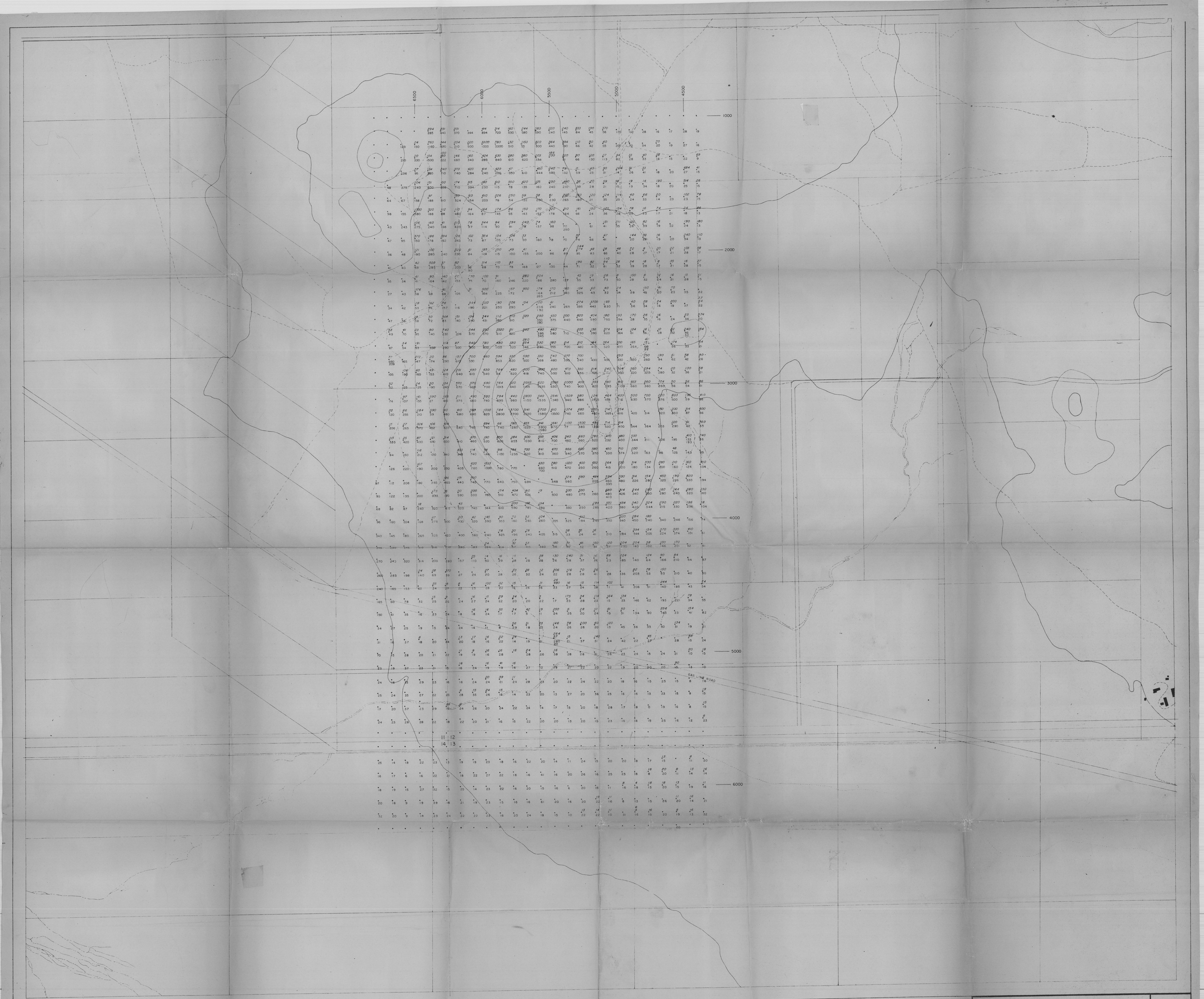
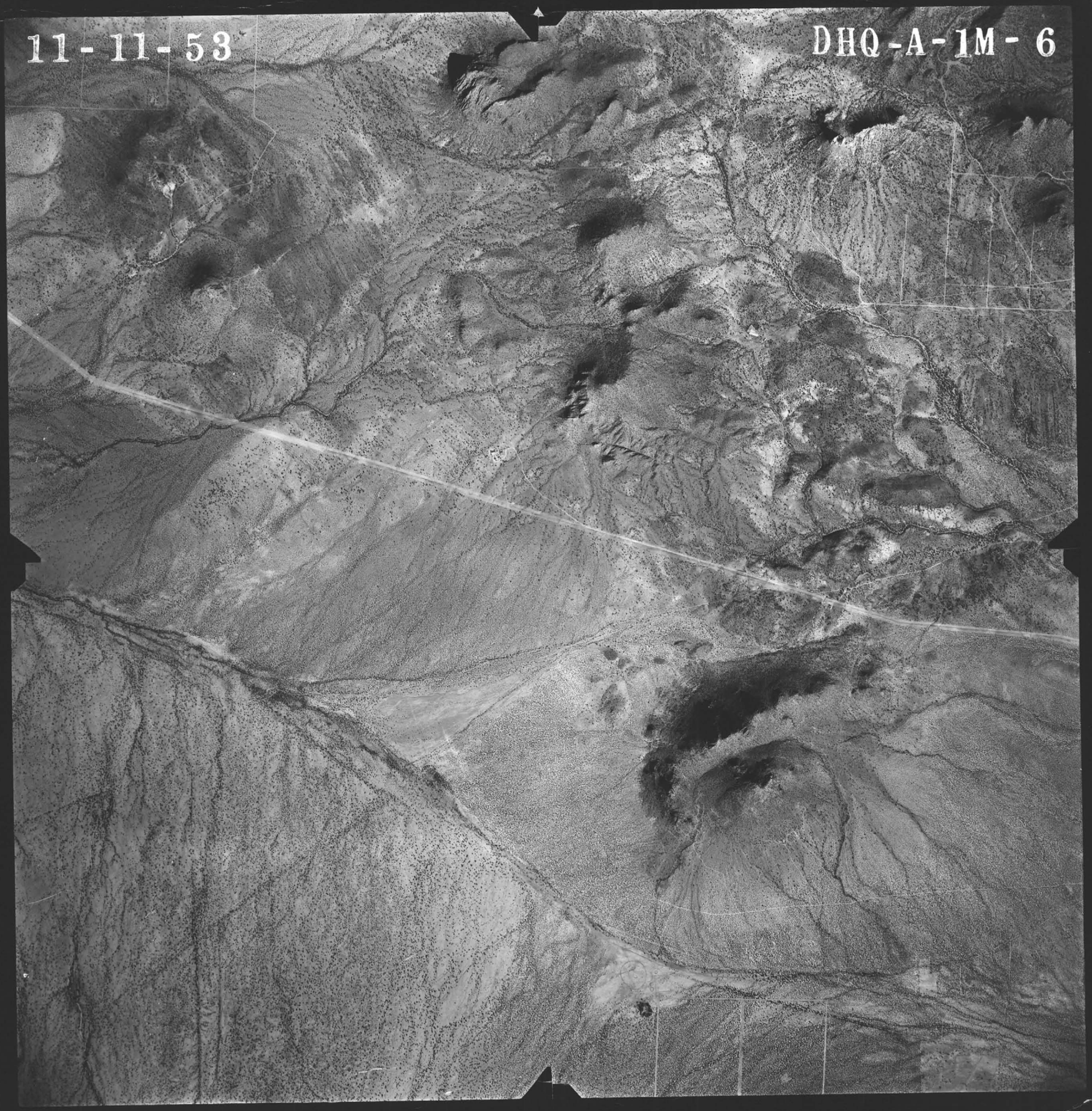

6500
6000
5500
5000
4500
1000
2000
3000
4000
5000
6000
GAS LINE ROAD
11 12
14 13
LEGEND
156 PPM CU IN ROCK
• STATION
160 PPM CU IN SOIL
N
BEAR CREEK MINING COMPANY
SOUTHWEST DISTRICT
SAGINAW HILL AREA
AMOLE MINING DISTRICT
PIMA COUNTY, ARIZONA
GEOCHEMICAL SURVEY MAP
PPM COPPER IN ROCK, PPM COPPER IN SOIL
SCALE 1" = 200'
200 100 0 200 400 600
DRAWN BY: TLM, JWK
CONTOUR INTERVAL 50'
DATE: 3-9-61
MAP NO.
8

11-11-53
DHQ-A-1M-38


11-11-53
DHQ-A-1M-6

DDH NO. S-H-4

STATE Arizona
COUNTY Pima
SEC 12 T15S R12E
MINING DISTRICT Arole
PROJECT Sagenaw Hill
COORDINATES C150 N 59 E
COLLAR ELEVATION
INCLINATION Lev. BEARING
DATE STARTED 10-26-60
DATE COMPLETED 11-29-60
DRILLING CO. Jory
FINAL DEPTH 1014.3

FOOTAGE		UNALT	CHLOR.	EPIDOTE	MONTMOR.	BIOTITE	KAOL.	HY. MICA.	ORTHO.	SER.	SIL.		STAGE NO.	ROCK TYPE	SECTION	CU5FES4	CUFES2	FE S2	CU2S	CUS	MOS2			OXIDE ZONE: LEACHED CAVITIES-COLOR ETC. / SULPHIDE ZONE-CHAR OF MIN. DISS. VEIN, ETC.	< INCL.	FRACTURING	GEOLOGY	LOG BY
0	10													Rock Silt														Bird.
10	21													Po-Ark										Py, cp		20°, 60°	Porphyry is light gray, dense, hard. Minerals included plagioclase, orthoclase, biotite, quartz. Slightly altered feldspars and biotite is altered locally to chlorite. Some limonite along fractures. Weak sulphides pyrite and chalcopyrite, disseminated in rock. Arkose is light flesh gray, fragments with pieces up to several inches. Weak silicified (?) feldspar. Manganese stain. Limonite. Very weak sulphides. Thin very rock types grade in and out. Rock chip and broken fragments of rock other than contacts.	
21	31	THIN SECT. 26.5'												Po										" "	Nil	40°	Porphyry as above. Possibly very fine garnets.	
31	41													Po-Ark										" "		30° - 60°	Porphyry to 36. Arkose has weak sulphides.	
41	51													Arkose										" " Pb Zn		30° - 80°	Arkose as above. Weak bed sulphide. Very weak Zn	
51	61													"										" " " "		30° - 80°	"	
61	71													"										" "		40°	"	
71	81													Ark-Po										" "		40°	Arkose to 79.8.	
81	95													Po-Ark										" "		40°	Porphyry to 94.3. Weak sulphides.	
95	104													Arkose										" " " "	60°	45°	Weak Pb and Zn.	
104	114													Ark-Po										" "		40°	Arkose to 108.0. Fault at 114.2	
114	124													Po-Ark										" "			Above fault is contact to arkose. Arkose altered to 17[illegible]	
124	134													Arkose										" "	60	45°	Arkose as above. Very weak sulphides.	
134	141													Arkose										" "			at 131.0 arkose contacts a very dense, dark hornfels which continues to 138.0. Very weak sulphides.	
141	151													Arkose										" "		30°	Arkose as above. Calcite stringers.	
151	161													Arkose										" " " "		20°	" Some kaolin.	
161	171													Ark-Po										" " " "		40°	" " Contact to porphyry 167.	
171	181													Por, Hornfels										" " limits (?)		50°	Porphyry contact hornfels at 177.5. Magnetite	
181	191													Hornfels-Por										" " magnetite		40°	inclusions and moderate sulphides. Contact at 191.5	
191	201													Por.										" "		60°	Pieces of porphyry in hornfels at contact.	
201	210													Por										"		50°	Large euhedral pyrite cubes.	
210	220													Por										" " Pb Zn		60°	Moderate sulphides.	
220	230													Por										" " " "		60°	Weak sulphides.	
230	240													Por										" " " "		70°	" "	
240	250													Por										"		70°	" " Mostly pyrite	
250	257													Por										" " " "		60°	" "	
257	267													Por										"		70°	" "	
267	283													Por										"		30°	" "	
283	293													Latite										" "		30°	Fine-grained, mafic poor, rare qz. Fair, dense, qtz veinlets	
293	303													"										" " Zn		30°	" " Incl. in chalcopyrite	
303	313													"										" " "		40°	" "	
313	324													"										" "		40°	" "	
324	334													"										" "		40	" "	
334	344													"										" " " "		20°-40°	" "	
344	354													"										" " " "		30°	" "	
354	364	THIN SECTION 355'												"										" " " "		30	" " Chalcopyrite still in veinlets	
364	374													"										" " " "		20°	" "	
374	384													"										"			Sharp decline in sulphides. Small vertical contact of porphyry & porphyry in rhyolite (?)	
384	391													"										"		20°	Weak chalcopyrite - moderate pyrite	
391	400													"										"		20-30°	" "	
400	408													"										"		30°	Incl. in cp.	

#15

DDH NO. SH-4

STATE ____ MINING DISTRICT ____ COORDINATES ____ N ____ E ____ DATE STARTED ____ DRILLING CO. ____

COUNTY ____ PROJECT ____ COLLAR ELEVATION ____ DATE COMPLETED ____

INCLINATION ____ BEARING ____ FINAL DEPTH ____

FOOTAGE		L1	L2	CORE % REC. BY FT.	CORE LBS. REC.	CORE % REC. BY WT.	CORE TOT. CU.	CORE OX CU	CORE MO S2	CORE ASSAY Pb	CORE ASSAY Zn	CORE ASSAY Au	CORE ASSAY Ag	CORE SIZE	CORE SAMP. NO.	SLUDGE SAMP. NO.	SLUDGE LBS. REC.	SLUDGE % REC. BY WT.	SLUDGE SPLIT	SLUDGE ASSAY TOT. CU.	SLUDGE ASSAY OX CU	SLUDGE ASSAY MO S2	COMBINED ASSAY PERCENT 0.1 0.5 1.0	COMBINED ASSAY TOT. CU
10 0	21 0	11 0	11 0	100			0.10		0.002					WX	9305									
21 0	31 0	10 0	10 0	100			0.18								9306									
31 0	41 0	10 0	9 2	92			0.18								9307									
41 0	51 0	10 0	10 0	100			0.16			0.05	0.35	Tr	0.3		9308									
51 0	61 0	10 0	10 0	100			0.18			Tr	0.70	0.005	0.4		9309									
61 0	71 0	10 0	9 8	98			0.10								9310									
71 0	81 6	10 6	10 5	99			0.07								9311									
81 6	95 3	13 7	13 7	100			0.19								9312									
95 3	104 7	9 4	9 4	100			0.04			0.05	0.05	Tr	0.2		9313									
104 7	114 3	10 0	9 7	97			0.15			Tr	Tr	Tr	0.2		9314									
114 3	124 7	10 0	10 1	101			0.17								9315									
124 7	134 7	10 0	10 0	100			0.20								9316									
134 7	141 5	6 8	6 8	100			0.12								9317									
141 5	151 5	10 0	10 0	100			0.20								9318									
151 5	161 5	10 0	10 0	100			0.22			Tr	Tr	Tr	0.2		9319									
161 5	171 5	10 0	10 0	100			0.18			Tr	0.05	Tr	0.3		9320									
171 5	181 5	10 0	10 0	100			0.10			0.05	0.10	Tr	0.3		9321									
181 5	191 5	10 0	10 2	102			0.14			0.05	Tr	0.005	0.2		9322									
191 5	201 5	10 0	8 4	84			0.08								9323									
201 5	210 5	8 8	9 9	112			0.14								9324									
210 5	220 5	10 0	10 0	100			0.11			0.15	0.10	Tr	0.2		9325									
220 5	230 5	10 0	10 0	100			0.15			0.05	Tr	0.005	0.2		9326									
230 5	240 5	10 0	10 0	100			0.08			Tr	Tr	Tr	0.1		9327									
240 5	250 5	10 0	10 0	100			0.08								9328									
250 5	257 5	7 0	7 0	100			0.06			Tr	0.05	0.005	0.3		9341									
257 5	267 5	10 0	10 0	100			0.09								9342									
267 5	277 5	10 0	10 7	107			0.11								9343									
277 5	287 5	10 0	10 0	100			0.10								9344									
287 5	297 5	10 0	10 3	98			0.08			0.05	Tr	Tr	0.2		9345									
297 5	307 5	10 0	10 0	100			0.11			0.05	Tr	Tr	0.1		9346									
307 5	317 5	10 1	9 9	98			0.08								9347									
317 5	327 5	10 0	9 8	98			0.11								9348									
327 5	337 5	10 0	10 0	100			0.15			Tr	0.05	Tr	0.2		9349									
337 5	347 5	10 0	10 2	102			0.12			0.05	Tr	Tr	0.1		9350									
347 5	357 5	10 0	9 7	97			0.10			Tr	Tr	Tr	0.2		9351									
357 5	367 5	10 1	9 8	99			0.12			0.05	1.00	Tr	0.4		9352									
367 5	377 5	10 0	10 0	100			0.22								9353									
377 5	391 3	7 2	7 1	99			0.22								54									
391 3	400 0	8 7	8 2	96			0.11								55									
400 0	408 1	8 1	8 7	104			0.22								56									

DDH NO. SH-4

STATE Arizona
COUNTY Pima
MINING DISTRICT Amole
PROJECT Sagiman Hill
Sec 12 T15S R12E

COORDINATES C50 N 59 E
COLLAR ELEVATION
INCLINATION vert
BEARING

DATE STARTED 10-26-60
DATE COMPLETED 11-29-60
FINAL DEPTH 1014.3
DRILLING CO. Jay

FOOTAGE	UNALT	CHLOR.	EPIDOTE	MONTMOR.	BIOTITE	KAOL.	HY. MICA.	ORTHO.	SER.	SIL.		STAGE NO.	ROCK TYPE	SECTION	CuFeS4	CuFeS2	FeS2	CU2S	CUS	MoS2			OXIDE ZONE: LEACHED CAVITIES-COLOR ETC. / SULPHIDE ZONE-CHAR OF MIN. DISS. VEIN, ETC.	< INCL.	FRACTURING	GEOLOGY	LOG BY
408.1 – 418.3													Sabie										Py, cp, Pb, Zn		20°-30°	Sulfides in entirety	Dick
418.3 – 428.3													"										" "		20°	Weak to moderate sulphides.	
428.3 – 438.6													"										" " " "		Vert. 80°	"	
438.6 – 448.2													"										" "		20°	Weak sulphides.	
448.2 – 458.5													"										" "		80°	" "	
458.5 – 468.5													"										" " Py, Zn		40°, 80°	" "	
468.5 – 478.5													"										" " " "		50°		
478.5 – 486.5													Calcite-Qtz										" "		30°, 60	Porphyry contact at 486.2	
486.5 – 495.5													Porphyry										" " Pb, Zn			Porphyry has calcite stringers, some with moderate pt. Zn.	
495.5 – 503.7													Porphyry										" " Pb Zn		50°	Oak brecciated with angular inclusions from 497.5.	
503.7 – 518.5													"										" " " "		80	Brecciated to 511.9. Contact is 80° fault	
518.5 – 528.5													"										" "		Vert. 60°	Fault gouge and breccia (1') at 527.5	
528.5 – 538.5													"										" " " "		Vert. 80°	Weak sulphides	
538.5 – 548.5													"										" "		Vert.	Sulphides along fine fractures	
548.5 – 557.5													" – Incident Gen 598.8										" " " "		Vert. 40°	Slight clay alteration. Pencil at 555.5	
557.5 – 567.5													Qtzd										" " " "		40°	" "	
567.5 – 577.1													"										" " " "		40°, 50°	Very weak sulphides	
577.1 – 587.3													"										" " " "		Vert. 40°	Weak Pb. Zn.	
587.3 – 597.5													" – Por										" "		40°	Small porphyry dikes from 592 to 599	
597.5 – 607.6													Qtzd										" "		40°	Very weak sulphides.	
607.6 – 617.8													Por-Qtzd										" " "		40°	Slight clay alteration.	
617.8 – 628.0													" – "										" " "		Vert. 30	Vertical stringers of sulphides.	
628.0 – 638.0													" – "										" " "		Vert. 40	Weak sulphides	
638.0 – 649.2													" – "										" "		60°	" "	
649.2 – 659.2													" – "										" "		30	" "	
659.2 – 669.2													Fault Breccia										"		30	Porphyry contains inclusions of mudstone. Mudstone then contacts breccia at 662 (70° dip)	
669.2 – 679.0													" "										"		30°	Breccia gives way to fault at 666. Fault and breccia continue to 679.0	
679.0 – 689.0													"										"		40°	Breccia contains large (4-5") fragments of unique mudstone porphyry.	
689.0 – 699.4													Breccia - Porphyry										"		60°	Contact of breccia is 65° dip fault. Porphyry has small qz. stringers with pyrite.	
699.4 – 716.0													Porphyry										" Pb - Zn		80°	Showed small stringer of galena, pt. Zn. (?)	
716.0 – 722.2													"										"		70°	Fault 716' - 721.0. NB core 714.0 - 716.0.	
722.2 – 732.0													"										" " "		60°	Weak sulphides.	
732.0 – 741.2													"										" " "		70°	" "	
741.2 – 756.0													"										" "		70°, 30°	" "	
756.0 – 767.0													"										" "		70°, 60°	Moderate clay alteration	
767.0 – 777.5													"										" "		Vert. 50	Crushed sulphides along fractures.	
777.5 – 787.5													"										" "		70°	Clay seam from 785 - 787. Dip of bedding 40°	
787.5 – 797.7													"										" Pb "		60°	2" gritty-galena stringer.	
797.7 – 806.0													"										" "		50°		
806.0 – 813.8													"										" " "		50°	Fine disseminated Pb. - Rock is fine-grained	
813.8 – 822.5													"										" " "			from 807 - 815. Then sodic porphyry again.	
822.5 – 832.8													"										" Cp " "			Sulphides along calcite stringers	
832.8 – 840.7													"										" " " "		Vert. 75°		
840.7 – 850.8													"										" " "		50°		
850.8 – 860.8													"										"				
860.8 – 870.9													"										"			Rock is fine-grained this run, as above	
870.9 – 880.9													Pr-Siltstone										"		40°	Slit from 875 - 879.8' Contact 45° dip & 50° dip	
880.9 – 890.9													"										" " "	50	40°-50°	" " 889.3 - 890.9. Magnetite	
890.9 – 900.9													Arkose Quartzite										" " "		40°	Calcite stringers. Weak pyrite. Quartz vein	
																								20		carrying sulphides.	

DDH NO. SH-4

STATE _____ MINING DISTRICT _____ COORDINATES _____ N _____ E _____ DATE STARTED _____ DRILLING CO. _____

COUNTY _____ PROJECT _____ COLLAR ELEVATION _____ DATE COMPLETED _____

INCLINATION _____ BEARING _____ FINAL DEPTH _____

FOOTAGE		L1	L2	CORE % REC. BY FT.	CORE LBS. REC.	CORE % REC. BY WT.	CORE TOT. CU.	CORE OX CU	CORE MO S2	CORE ASSAY Pb	CORE ASSAY Zn	CORE ASSAY Au	CORE ASSAY Ag	CORE CORE SIZE	CORE SAMP. NO.	SLUDGE SAMP. NO.	SLUDGE LBS. REC.	SLUDGE % REC. BY WT.	SLUDGE SPLIT	SLUDGE ASSAY TOT. CU.	SLUDGE ASSAY OX CU	SLUDGE ASSAY MO S2	COMBINED ASSAY PERCENT 0.1 0.5 1.0	COMBINED ASSAY TOT. CU
408.1	418.3	10.2	10.1	99			0.02			Tr	0.05	0.2	0.005		9357									
418.3	428.3	10.0	10.2	102			0.08								9386									
428.3	438.6	10.3	9.5	92			0.08								87									
438.6	448.2	9.6	10.3	107			0.06								88									
448.2	458.5	10.3	10.0	98			0.03								89									
458.5	468.5	10.0	10.0	100			0.04								9390									
468.5	478.5	10.0	9.9	99			0.04								91									
478.5	486.5	8.0	7.8	98			0.04								92									
486.5	495.5	9.0	9.1	101			0.05								93									
495.5	503.7	8.2	8.2	100			0.03								9405									
503.7	518.5	14.8	14.9	101			0.03								9406									
518.5	528.5	10.0	9.7	97			0.03								07									
528.5	538.5	10.0	10.0	100			0.04								08									
538.5	548.5	10.0	8.8	88			0.04								09									
548.5	557.5	9.0	10.0	111			0.06								10									
557.5	567.5	10.0	9.9	99			0.05								9424									
567.5	577.1	9.6	10.0	104			0.07								25									
577.1	587.3	10.2	10.2	100			0.04								26									
587.3	597.5	10.2	10.1	99			0.03								27									
597.5	607.6	10.1	10.2	101			0.04								28									
607.6	617.8	10.2	10.2	100			0.02								9444									
617.8	628.0	10.2	10.2	100			0.03								45									
628.0	638.0	10.0	10.2	102			0.08								46									
638.0	649.2	11.2	11.0	98			0.04								47									
649.2	659.2	10.0	10.0	100			0.04								48									
659.2	669.2	10.0	9.0	90			0.07								9508									
669.2	679.0	9.8	9.7	99			0.03								09									
679.0	689.0	10.0	9.9	99			0.03								10									
689.0	699.4	10.4	10.1	97			0.03								11									
699.4	714.0	14.6	10.4	71			0.06								12									
714.0	722.2	6.2	3.2	61			0.06								13									
722.2	732.0	9.8	9.8	100			0.03								14									
732.0	747.2	15.2	14.8	97			0.06								15									
747.2	756.0	8.8	8.6	97			0.06								16									
756.0	767.0	10.0	10.7	107			0.05								17									
767.0	777.5	10.5	10.3	98			0.03								18									
777.5	787.5	10.0	9.9	99			0.03								19									
787.5	797.7	10.2	10.2	100			0.08								20									
797.7	806.0	8.3	8.1	98			0.06								21									
806.0	813.8	7.8	7.9	101			0.02								22									
813.8	822.5	8.7	8.3	95			0.02								23									
822.5	832.8	10.3	10.3	100			0.02								24									
832.8	840.7	7.9	8.2	104			[illegible]			01	15	007	03		9630									
840.7	850.8	10.1	10.1	100			[illegible]								37									
850.8	860.8	10.0	10.0	100			0.02								38									
860.8	870.9	10.1	9.9	98			[illegible]								39									
870.9	880.8	9.9	9.9	100			[illegible]				005		09		40									
880.8	890.9	10.1	9.9	98			0.05				005		03		41									
890.9	900.9																							

DDH NO. SH-4

STATE Arizona MINING DISTRICT Amole
COUNTY Pima PROJECT Sagenaw Hill
SEC 12 T15S R12E

COORDINATES C-50 N 59 E
COLLAR ELEVATION
INCLINATION Vert. BEARING

DATE STARTED 10-26-60 DRILLING CO. Joy
DATE COMPLETED 11-29-60
FINAL DEPTH 1014.3

FOOTAGE	UNALT	CHLOR.	EPIDOTE	MONTMOR.	BIOTITE	KAOL.	HY. MICA.	ORTHO.	SER.	SIL.	STAGE NO.	ROCK TYPE	SECTION	CU5FES4	CUFESZ	FE S2	CU2S	CUS	MOS2	OXIDE ZONE: LEACHED CAVITIES-COLOR ETC. / SULPHIDE ZONE-CHAR OF MIN. DISS. VEIN, ETC.	< INCL.	FRACTURING	GEOLOGY	LOG BY
900 9 910 9												Siltstone-Arkose								Py - cp	horiz	10-20°	Very weak sulphide	[illegible]
910 9 920 9												Arkose								"	"	20°	Occasional finger (5") of porphyry	
920 9 931 1												"								"	"	30°		
931 1 941 2												" - siltstone								" "	"	60°	Siltstone starts at 933'	
941 2 956 6												siltstone								"	"	20°	Weak sulphides	
956 6 966 6												"								"	"	30°		
966 6 980 5												"								"	"	Vert 40°		
980 5 990 5	THIN SECTION 981											"								"	"	Vert 40°		
990 5 1003 9												"								"	"	60°	Sulphides as fine & rare disseminations	
1003 9 1014 3												siltstone - intrusive								"		60°	Fine grained - dark intrusive into silt from 1005.9 - 1007.9 & 1009.5 - 1011.5.	

DDH NO. SH-4

STATE Arizona
COUNTY Pima
sec 12 T15S R12E
MINING DISTRICT Arnole
PROJECT Sagimaw Hill
COORDINATES C 50 N 59 E
COLLAR ELEVATION
INCLINATION vert
BEARING
DATE STARTED 10-26-60
DATE COMPLETED 11-29-60
FINAL DEPTH 1014.3
DRILLING CO. Jey

FOOTAGE	UNALT	CHLOR.	EPIDOTE	MONTMOR.	BIOTITE	KAOL.	HY. MICA.	ORTHO.	SER.	SIL.		STAGE NO.		ROCK TYPE	SECTION	CU_5FES_4	$CUFES_2$	$FE\ S_2$	CU_2S	CUS	MOS_2			OXIDE ZONE: LEACHED CAVITIES-COLOR ETC. / SULPHIDE ZONE-CHAR OF MIN. DISS. VEIN, ETC.	< INCL.	FRACTURING	GEOLOGY	LOG BY

SH-4

*

50 -
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1.05 -
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80 -
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40 -
50 -
1.10 -
1.10 -
1.01 -
95 -
40 -
1.10 -
65 -
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30 -
45 -
25 -

54 | 29.32 *

270
232

DDH NO. SH-3

STATE Arizona MINING DISTRICT Ajo
COUNTY Pima PROJECT Sagiuaro Hill
SEC 12 T15S R12E

COORDINATES 0.75 N 62 E
COLLAR ELEVATION
INCLINATION Vert. BEARING

DATE STARTED 10-24-60 DRILLING CO. Jay
DATE COMPLETED 11-3-60
FINAL DEPTH 441.1

FOOTAGE	UNALT	CHLOR.	EPIDOTE	MONTMOR.	BIOTITE	KAOL.	HY. MICA.	ORTHO.	SER.	SIL.		STAGE NO.	ROCK TYPE	SECTION	CuSFeS4	CuFeS2	FeS2	Cu2S	CuS	MoS2	OXIDE ZONE: LEACHED CAVITIES-COLOR ETC. / SULPHIDE ZONE-CHAR OF MIN. DISS. VEIN, ETC.	< INCL.	FRACTURING	GEOLOGY	LOG BY
100 179													Arkose								oxide		60°	Dark gray fine grained arkose. Hematite after magnetite (?). Slightly calcareous. Calcite in open fractures. Some manganese stain along fractures. No core from 175-179.	
179 280													"								hematite	53	30	do Fine to coarse 190'. Bedding 50°	
280 409													"								"	50	40°	do Bedding 50° Manganese stain locally.	
409 593													"								pyrite	52	50°	do Bedding 52° Open fine to coarse-grained. Small pyrite blebs. Fault at 49'	
593 635													"								"		30°	do Hematite after pyrite.	
635 663													"								"		30°	do	
663 735													"								"	38	40°	do Bedding 38° Pyrite in calcite stringers	
735 810													"								"	30	55°	do Bedding 30°	
810 912													"								"		30°	do " 50°, coarse-grained for 13	
912 1019													"								"		50°	do Veins to 98.' Chert pyrite at 40° Abundant hematite.	
1019 1139													"								" ZnS, PbS		30° - 70°	do At 110' is small pegmatite contact beginning pyritic zone - 110.5-110.5' feldspars weathered out leaving coarse pyrite cubes and quartz. No contact to fine arkose with pyrite.	
1139 1235													"								" " "	30	40°	do Bedding 30°. Sulphides in crude bands along bedding planes. Sph colored ZnS around blackjack	
1235 1343													"								" " "	40	40°	Light colored - fine-arkose from 120 - 123.5 do Bedding 40°. Cal veins	
1343 1444													"								"		40°	do Arkose slightly altered.	
1444 1541													"								"		40°	do Fine to coarse-grained arkose	
1541 1642													"								"		40°	do Very weak sulphides.	
1642 1779													"								"		40°	do	
1779 1885													" - Porphyry								"		40°	do Porphyry 181-186.5	
1885 2006													"								"		35°	do Some edge pyrite under along fracture.	
2006 2109													"								"		60°	do	
2109 2206													"								"		50°	do Fragmental arkose. Pyrite in fine - grained massive.	
2206 2301													"								" Zn S		Vert. 30°	do Moderate pyrite. Light sphalerite	
2301 2422													"								"	35	30°	do Bedding dip 35°. Fragmental arkose	
2422 2535													"								"		70°	do Solution seams with pyrite x/s bedding.	
2535 2638													"								"	40	50°	do Bedding 40°.	
2638 2714													"								"		50°	do	
2714 2814													"								"		40°	do	
2814 2942													"								"		40°	do	
2942 3078													"								"		70°	do moderate pyrite.	
3078 3197													"								"	60	50°	do " "	
3197 3338													"								"		50°	do	

#4

DDH NO. SH-3

STATE Arizona
COUNTY Pima
SEC 12 T15S R13E
MINING DISTRICT Arnold
PROJECT Sagamore Hill
COORDINATES 0 W N 62 E
COLLAR ELEVATION
INCLINATION Vert
BEARING
DATE STARTED 10-24-60
DATE COMPLETED 11-3-60
FINAL DEPTH 441.1
DRILLING CO. Jay

FOOTAGE	UNALT	CHLOR.	EPIDOTE	MONTMOR.	BIOTITE	KAOL.	HY. MICA.	ORTHO.	SER.	SIL.		STAGE NO.	ROCK TYPE	SECTION	CU5FES4	CUFES2	FE S2	CU2S	CUS	MOS2			OXIDE ZONE: LEACHED CAVITIES-COLOR ETC. / SULPHIDE ZONE-CHAR OF MIN. DISS. VEIN, ETC.	< INCL.	FRACTURING	GEOLOGY	LOG BY
333.5 – 339.0													Diabase										Py		50°	— do — Moderate pyrite along fracture	
339.5 – 359.0													"										Py		60°	— do — " "	
359.0 – 368.5													"										Py		60°	— do — " "	
368.5 – 378.5													"										Py		70°	— do — " "	
378.5 – 388.5													Alt – Clay										Py		70°	— do — " " Clay at 379.5 wet	
388.5 – 401.7													"										Py		70	gray into fine layered aspe at 392 Clay is chiefly. Large pyrite 1/5.	
401.7 – 412.0													Diabase										Py		50	Clay ends at 397. Contacts above & below.	
412.0 – 421.1													"										Py		60°	Diabase contains chunks of porphyry.	
421.1 – 431.1													"										Py		60°	— do —	
431.1 – 441.1													"										Py		50	— do — Small clay bands, chiefly	

DDH NO. S-H-3

STATE Arizona MINING DISTRICT Ajo
COUNTY Pima PROJECT Sagimaw Hill
Sec 12 T15S R12E

COORDINATES Q.75 N 62 E
COLLAR ELEVATION
INCLINATION Vert. BEARING

DATE STARTED 10-24-60 DRILLING CO. Joy
DATE COMPLETED 11-3-60
FINAL DEPTH 441.1

FOOTAGE	UNALT	CHLOR.	EPIDOTE	MONTMOR.	BIOTITE	KAOL.	HY. MICA.	ORTHO.	SER.	SIL.		STAGE NO.		ROCK TYPE	SECTION	CU5FeS4	CUFeS2	FeS2	CU2S	CUS	MoS2			OXIDE ZONE: LEACHED CAVITIES-COLOR ETC. / SULPHIDE ZONE-CHAR OF MIN. DISS. VEIN, ETC.	< INCL.	FRACTURING	GEOLOGY	LOG BY

SH 3

DDH NO. S.H. 2

STATE Arizona MINING DISTRICT Amole COORDINATES P.50 N 57 E DATE STARTED 10-3-60 DRILLING CO. Joy

COUNTY Pima PROJECT Saginaw Hill COLLAR ELEVATION DATE COMPLETED 10-22-60

Sec 12 T15S R12E INCLINATION vert. BEARING FINAL DEPTH 910.5

FOOTAGE				UNALT	CHLOR.	EPIDOTE	MONTMOR.	BIOTITE	KAOL.	HY. MICA.	ORTHO.	SER.	SIL.		STAGE NO.	ROCK TYPE	SECTION	CU5FES4	CUFESZ	FE S2	CU2S	CUS	MOS2			OXIDE ZONE: LEACHED CAVITIES-COLOR ETC. / SULPHIDE ZONE-CHAR OF MIN. DISS. VEIN, ETC.	< INCL.	FRACTURING	GEOLOGY	LOG BY
0	0	10	0													Porch														
10	0	22	2													Arkose												30°	A fine to medium-grained, yellowish arkose. Abundant limonite, clay. Moderately calcareous. No sulphides. Bedding dips 55°.	
22	2	30	4													Arkose												30°	Arkose intermixed with clay seams. Bedding dips 40°. Limonite, manganese stain. Calcite stringers. Moderately calcareous.	
30	4	39	5													Arkose												30°	Arkose with abundant hematite and limonite. Iron-stained calcite lining vugs in arkose. Small calcite stringers.	
39	5	55	3													Arkose-graywacke											py, cp.	40°	Few small clay seams dipping 65°. Abundant hematite-limonite. Calcareous. Vuggy. Fresh graywacke at 52.3' with sulphides. Carbonaceous clay at 54.3 feet.	
55	3	63	6													Arkose-clay											py, cp.	40°	Carbonaceous clay dipping 70° at 57', 59.8', 62'-63'. Arkose interbeds with carbonaceous material. Fine disseminations of sulphides.	
63	6	75	8													Arkose-shale											py	60°	Arkose-graywacke interbeds with clay (carbon). Fine pyrite disseminations. Calcite seams up to 1" wide.	
75	8	84	0													Arkose-shale											py	60°	Fine-grained arkose interbedded with black carbonaceous, calcareous clay. Bedding dips 60°. Pyrite as fine dissemination. 1' fault at 76'.	
84	0	95	6													Shale arkose											py	60°	Essentially mudstone with few bands of fine-grained arkose. Pyrite fairly abundant in the arkose bands. Few small blebs of pyrite in the mud.	
95	6	102	5													Shale											py.	60°	Mud and arkose very calcareous. Pyrite as small blebs in mud. Small seams of calcite.	
102	5	112	9													Shale											py	60°, vert	Quite a few stringers of calcite. Pyrite fairly abundant.	
112	9	121	6													Shale											py	50°	Dark blue alternating mudstone. Few pebbles of arkose in mud carrying pyrite. Pyrite cubes fairly abundant in mud. Stringers of calcite. Calcareous.	
121	6	131	6													Shale											py	50°	Several small pyrite stringers in mud. A large calcite seam-vertical. Bedding dips 60°.	
131	6	142	5													Shale											py	50°	Slight pyrite disseminations. Maybe some chalcopyrite. Bedding 60°.	
142	5	152	0													Shale											py		Core quite broken up. Small faults. Small seam of arkose. Fairly abundant FeS2. Calcite seams numerous.	
152	0	160	7																								py	Vert. 50°	Calcite stringers cutting bedding. Sharp vertical fractures filled by calcite and pyrite.	
160	7	174	2													Shale											py	50°	Dark mudstone, calcareous with small calcite stringers. Several bands of soft siltstone, gray. Pyrite stringers in this material.	
174	2	184	3													Shale											py	50°	Pyrite along stringers and as fine grains. Calcite stringers.	

#13

DDH NO. SH-2

STATE Arizona MINING DISTRICT Amole COORDINATES P.50 N 57 E DATE STARTED 10-3-60 DRILLING CO. Joy

COUNTY Pima PROJECT Saginaw Hill COLLAR ELEVATION DATE COMPLETED 10-22-60

Sec 12 T15S R12E INCLINATION vert BEARING FINAL DEPTH 910.5

FOOTAGE	UNALT	CHLOR.	EPIDOTE	MONTMOR.	BIOTITE	KAOL.	HY. MICA.	ORTHO.	SER.	SIL.	STAGE NO.	ROCK TYPE	SECTION	CU5FeS4	CUFeS2	FeS2	CU2S	CUS	MoS2	OXIDE ZONE: LEACHED CAVITIES-COLOR ETC. / SULPHIDE ZONE-CHAR OF MIN. DISS. VEIN, ETC.	< INCL.	FRACTURING	GEOLOGY	LOG BY
184 3 200 7												Shale-Arkose								py		40°	Arkose begins (contact as 65° dip) at 185.3. Pyrite disseminated in arkose. Small seam of mud or gouge at 188.4. Broken and gouge at 199.4.	
200 7 210 7												Arkose								py		50°	Argillaceous arkose to 204.4. Few bands of shale grade into shaly arkose. Moderate sulphides.	
210 7 220 9												Shaly-arkose								py		40°	Fault gouge at 214.4. Shaly arkose goes into arkose at 217.4. Fault contact. Medium-grained arkose with no sulphides.	
220 9 231 0												Arkose										40°	Hard, tight, medium-grained arkose with very rare sulphide dissemination.	
231 0 241 2												Arkose								py		40°	" " " "	
241 2 255 0												Arkose								py		60°	Arkose is more coarse-grained. Slightly more pyrite.	
255 0 264 1												Arkose								py		60	Fault at 257.0. Coarse-grained arkose. Slight pyrite dissemination. Arkose	
264 1 280 0																							becoming more shaly. Fault at 279.0-280.2.	
280 0 290 2												Arkose								py		60°	Much shaly material to 282. Little increase in sulphides. Fault starting at 290.	
290 2 300 2												Arkose								py		60°	Fault to 291.2. Some calcite stringers. Small and few stringers of sulphide.	
300 2 316 7												Arkose-shale								py		60°	Arkose has been cut out by many small fractures normal to bedding. Very rare pyrite. Interfingering of shale in arkose.	
316 7 324 0												arkose-shale								py		50°	Shale interfingering arkose. Extremely rare pyrite disseminations. Small blebs in rare calcite stringers.	
324 0 334 0												Arkose								py		50°	Small bands of mud into arkose. Extremely rare pyrite.	
334 0 343 8												Arkose								py		30°	Mudstone grades into arkose. Calcite stringers. Arkose is calcareous.	
343 8 353 7												Arkose								py, sphalerite		40°	Small grains of sphalerite along bedding planes.	
353 7 363 8												Arkose-shale								py, sphalerite		60°	Pyrite blebs along calcite seams. Arkose grades into mudstone - arkose. Some small sphalerite grains.	
363 8 373 9												Shale-arkose								py, sphalerite		50°	Some fracturing normal to bedding. Arkose again at 368.8. Few sulphides in shale - moderate in arkose.	
373 9 384 0												Arkose								py, sphalerite		30°	Several stringers of calcite carrying sulphides - mostly pyrite, some sphalerite.	
384 0 394 1												Arkose-shale								py		30°	Exceedingly fine pyrite disseminations. Grades into shale at 392 to 397.	
394 1 404 1												Arkose								py, sphalerite		30°	Sulphides in shale as stringers. Shale grades into arkose at 397. Steeply dipping calcite stringers - any sulphides.	
404 1 410 4												Arkose								py, sphalerite		30°, 70°	Arkose and mudstone in small bands. Fine pyrite grains. Little sphalerite.	
410 4 420 5												Arkose								py		40, 70°	Hard, dense arkose & mudstone. Little pyrite ± sphalerite.	

DDH NO. SH-2

STATE Arizona MINING DISTRICT Ajmole
COUNTY Pima PROJECT Saginaw Hill
Sec 12 T15S R12E

COORDINATES P.50 N 57 E
COLLAR ELEVATION
INCLINATION vert. BEARING

DATE STARTED 10-3-60 DRILLING CO. Joy
DATE COMPLETED 10-22-60
FINAL DEPTH 910.5

FOOTAGE	UNALT	CHLOR.	EPIDOTE	MONTMOR.	BIOTITE	KAOL.	HY. MICA.	ORTHO.	SER.	SIL.	STAGE NO.	ROCK TYPE	SECTION	CU5FES4	CUFESZ	FE S2	CU2S	CUS	MOS2	OXIDE ZONE: LEACHED CAVITIES-COLOR ETC. / SULPHIDE ZONE-CHAR OF MIN. DISS. VEIN, ETC.	< INCL.	FRACTURING	GEOLOGY	LOG BY
420 5 430 6												Arkose								py		30°	Bedding 40°-45°. Arkose and mudstone. Slight - to moderately calcareous. Small calcite stringers.	
430 6 440 8												Arkose-porphyry								py, sphalerite		30°	Arkose to 433.0. Then quartz porphyry. Quite altered to clay. Disseminated pyrite and some sphalerite.	
440 8 451 0												Porphyry								py, sphalerite		30°	Clay alteration. Porphyry cut by small quartz stringers carrying sulphides. Porphyry slightly calcareous.	
451 0 461 0												Porphyry								py, sphalerite		Vert. 60°	Small quartz stringers carrying sulphides. Disseminated sulphides also. Clay alteration.	
461 0 471 0												Porphyry								py, sphalerite		70° 40°	Medium sized grains of pyrite. Few quartz xls unaltered. Clay alteration.	
471 0 481 2												Porphyry								py, sphalerite		60° 30°	Some chlorite. Pyrite disseminations. Clay alteration. Few large zoned feldspar crystals.	
481 2 491 3												Porphyry								py, sphalerite		60°	Slight sulphide disseminations. Clay alteration. Quartz xls.	
491 3 501 4												Porphyry-arkose								py, sphalerite		40°	Moderate sulphides. Some pyrrhotite. Zinc increases. Clay alteration.	
501 4 509 7												Arkose								py, sphalerite		30°	Contact to arkose at 502.4. Arkose carries pyrite - some sphalerite.	
509 7 520 0												Arkose								py		30°	Arkose is hard, dense. Slightly altered. Some pyrite and sphalerite.	
520 0 530 0												Arkose								py		30	Arkose grades into fine-grained mudstone, gray. Very slight pyrite.	
530 0 540 2												Arkose-porphyry-arkose								py		40°	Arkose contacts porphyry (contact dips 40°) at 530.8'. Sulphides by porphyry side of contact. Other contact at 540. (45°)	
540 2 550 2												Arkose								py		40°	Fine to coarse-grained arkose. Very little pyrite. Bedding dip 55°.	
550 2 560 7												Arkose								py		40°	Bedding dips 55°. Arkose fine to coarse grained. Little pyrite.	
560 7 570 9												Arkose								py, sphalerite		30°	Fine grained arkose with some small bands of gray clay. Little pyrite and sphalerite.	
570 9 580 9												Arkose								py		30°	Fine to coarse grained pyrite. Small faults at 573 and 577.	
580 9 590 6												Arkose								py		40°, 70°	Fine-grained arkose - resembles a quartzite due to abundance of quartz. Rare and fine pyrite.	
590 6 600 6												Arkose								py		40°	Fine to coarse grained arkose. Some pyrite. Small band of clay.	
600 6 610 6												Arkose								py		50°	Arkose is slightly calcareous. Small seams of calcite. Fair pyrite disseminations.	
610 6 620 6												Arkose								py		50°	Arkose is somewhat darker due to some mud intermixed. Fair pyrite.	
620 6 630 6												Arkose								py, sphalerite		50°	Arkose with some calcite stringers. Sphalerite in calcite. Some pyrite.	
630 6 640 6												Arkose								py		50°	Small clay seam. Some calcite stringers. Pyrite disseminations.	
640 6 650 6												Arkose								py		30°, 40°	Dark gray, fine-grained arkose. Extremely rare pyrite cubes.	
650 6 660 6												Arkose								py		50°	Fine to coarse-grained arkose. Small masses of massive pyrite - some small disseminations.	

DDH NO. SH-2

STATE Arizona MINING DISTRICT Amole
COUNTY Pima PROJECT Sequimar Hill
Sec 12 T15S R12E

COORDINATES P. 50 N 57 E
COLLAR ELEVATION
INCLINATION Vert BEARING

DATE STARTED 10-3-60 DRILLING CO. Jay
DATE COMPLETED 10-22-60
FINAL DEPTH 910.5

FOOTAGE	UNALT	CHLOR.	EPIDOTE	MONTMOR.	BIOTITE	KAOL.	HY. MICA.	ORTHO.	SER.	SIL.		STAGE NO.	ROCK TYPE	SECTION	$CuSFeS_4$	$CuFeS_2$	FeS_2	Cu_2S	CuS	MoS_2		OXIDE ZONE: LEACHED CAVITIES-COLOR ETC. / SULPHIDE ZONE-CHAR OF MIN. DISS. VEIN, ETC.	< INCL.	FRACTURING	GEOLOGY	LOG BY
660 6 – 670 6		Sh	Ch										Arkose									Py, sphalerite		50°	Coarse sandy arkose over fine sandy	
																									Bedding dip 50°. Fine grained arkose	
																									consolidated mid-stone in places. Calcite	
670 6 – 680 6													Arkose									py, sphalerite		50°	Rhyolite include small chalcopyrite grains.	
																									Arkose is fine grained.	
680 6 – 690 6													Arkose									py, sphalerite		40°	Coarse to fine-grained arkose. Bedding	
																									dips 55°. Some pyrite.	
690 6 – 700 6													Arkose									py, sphalerite		30°	Sphalerite surrounding calcite masses	
																									in some places. Marcasite	
																									along fracture.	
700 6 – 712 5													Arkose – porphyry – Arkose									py, sphalerite		50°	Fine-grained arkose to 701.6. This	
																									contact along to porphyry.	
																									Sphalerite along contact. Porphyry is	
																									calcareous – stands to 709.1. Very	
																									arkose again. Small amounts of	
																									sulphide in porphyry – more in arkose.	
712 5 – 724 3													Arkose									py, sphalerite		60°	Weak pyrite and sphalerite mineralization	
																									along fractures. Arkose is fine-grained.	
724 3 – 736 3													Arkose									py, sphalerite		70° – 40°	Sphalerite around small masses of calcite.	
																									Vertical calcite stringers. Bedding dips 60°.	
736 3 – 748 7													Arkose									py, sphalerite		60°	Zone parallel arkose. Vertical shear seams.	
																									Weak sulphides in calcite stringers.	
748 7 – 760 5													Arkose									py, sphalerite		60°	Arkose is fine-grained, approaches a	
																									silt-stone. Calcite stringers. Pyrite in	
																									chips and in rock.	
760 5 – 767 1													Arkose									py, sphalerite		50°	Arkose is calcareous. Perhaps dolomit!	
																									Calcite stringers.	
767 1 – 777 1													Arkose									py, sphalerite		30°	Small veinlets of sphalerite. Also elongated	
																									calcite stringers. Little pyrite.	
777 1 – 792 3													Arkose									py, sphalerite		30° – 50°	Gypsum & calcite stringers. Bedding	
																									dips 45°.	
792 3 – 802 4													Arkose									py, sphalerite		50.	Strong dip 50°. Pyrite and sphalerite	
																									along bedding planes into which	
802 4 – 812 9													Arkose									py, sphalerite		30°.	calcite has been deposited. West.	
																									Sulphides (pyrite) as fine and some	
																									disseminations in arkose. Bedding flattens	
																									out to between 20° & 30°.	
812 9 – 822 7													Arkose									py, sphalerite		40	Bedding dip steepens to 40°. Rare,	
																									used mineralization. Some calcite.	
822 7 – 832 7													Arkose									py, sphalerite		30°	Bedding 30-40°. Some fine grained	
																									reddish material in one foot (2.5") seam.	
832 7 – 842 8													Arkose									py, sphalerite		30°	Small vertical fractures filled with	
																									calcite associated also w/ sphalerite & pyrite.	
																									Reddish material (?) from 845-847.	
842 8 – 853 0													Arkose									py, sphalerite		30° – 40°	Bedding 40°. Small stringers of calcite	
																									with sulphide. Arkose moderately cal-	
																									careous.	
853 0 – 863 0													Arkose									py, sphalerite		40°	Fine-grained arkose. Calcite stringers.	
																									Some sphalerite along calcite stringers.	
863 0 – 870 2													Arkose									py, sphalerite		40.	Bedding dips 45°. Core broken. Arkose	
																									slightly calcareous.	
870 2 – 882 6													Arkose									py, sphalerite		Vert – 30°	Bedding 10°-25°. Gypsum & calcite	
																									stringers. Very weak sulphides.	
882 6 – 894 7													Arkose									py, sphalerite		Vert – 40°	Bedding 40° — do —	
894 7 – 910 5													Arkose									py, sphalerite			— do — tiny veinlets with pyrite.	

DDH NO. SH-2

STATE Arizona
COUNTY Pima
Sec 12 T15S R12E

MINING DISTRICT Ajnole
PROJECT Saginaw Hill

COORDINATES P.50 N 57 E
COLLAR ELEVATION
INCLINATION vert. BEARING

DATE STARTED 10-3-60
DATE COMPLETED 10-22-60
FINAL DEPTH 910.5

DRILLING CO. Joy

FOOTAGE	UNALT	CHLOR.	EPIDOTE	MONTMOR.	BIOTITE	KAOL.	HY. MICA.	ORTHO.	SER.	SIL.		STAGE NO.		ROCK TYPE	SECTION	CU5FES4	CUFES2	FE S2	CU2S	CUS	MOS2			OXIDE ZONE: LEACHED CAVITIES-COLOR ETC. / SULPHIDE ZONE-CHAR OF MIN. DISS. VEIN, ETC.	< INCL.	FRACTURING	GEOLOGY	LOG BY

SH-2

DDH NO. SH-6

STATE Arizona MINING DISTRICT
COUNTY Pima PROJECT Sagnaw Hill
Sec 12 R12E T15S

COORDINATES E. 50 N. 61 E
COLLAR ELEVATION
INCLINATION vert. BEARING

DATE STARTED 11/29/60 DRILLING CO.
DATE COMPLETED 12/28/60
FINAL DEPTH 815.3

FOOTAGE	UNALT	CHLOR.	EPIDOTE	MONTMOR.	BIOTITE	KAOL.	HY. MICA.	ORTHO.	SER.	SIL.	STAGE NO.	ROCK TYPE	SECTION	CuSFeS4	CuFeS2	FeS2	CU2S	CuS	MoS2	THICKNESS	OXIDE ZONE: LEACHED CAVITIES-COLOR ETC. / SULPHIDE ZONE-CHAR OF MIN. DISS. VEIN, ETC.	< INCL.	FRACTURING	GEOLOGY	LOG BY
0.0 – 8.0												—								0	OXIDE	30°	80°-40°	ROCK B.T.	
8.0 – 18.1												Siltstone-Arkose									"			Siltstone is fine-grained, dark gray, dense rock. Manganese stain. Some hematite. Arkose is fine-grained light gray, slightly limy. No sulphides.	
18.1 – 30.0												" - "								<1.5	Pyrite	Vert	80°	Z sd - Very weak pyrite	
30.0 – 40.2												Arkose								<1.5	"	40	50°	-do- Fine to coarse-grained arkose - blue color	
40.2 – 50.3												"								<1.5	"	30	50°	-do- From 47' the rock is relatively unaltered.	
50.3 – 58.0												"								<1.5	"	30	40°-50°	-do-	
58.0 – 67.0												"								<1.0	"		Vert	-do-	
67.0 – 81.8												" - Pb								<1.0	"		70°-80°	-do- arkose has large fragments of chert in it. Porphyry interfingers arkose with "obscured" contact.	
81.8 – 95.0												" - Pb - Sil/H								<1.0	"	30	60°	-do- Hard, dense, siliceous clay interfingers arkose as does porphyry.	
95.0 – 108.0												" " "								<1.0	"	30	30°	-do- " . Locally arkose is quite calc	
108.0 – 114.0												" " "												-do- " quartzite.	
114.0 – 123.2												" " "								<1.0	" Pb	30	50°	-do- " Gypsum & calcite stringers with pyrite in claystone	
123.2 – 140.1												Siltstone								<1.0	"	30	30°	-do- Hard dense siltstone	
140.1 – 157.1												" - Ark								<1.0	"		40°	Siltstone & arkose interfinger.	
157.1 – 158.6												Arkose								<1.0	"			-do- Small seams of clay.	
158.6 – 171.2												" - Siltstone								<1.0	"	Horiz	50°	-do- Gypsum seams.	
171.2 – 185.1												" "								<1.0	"	55		-do- Arkose 171.5-172.8.	
185.1 – 190.4												Siltstone								<1.5	"	50	50°	-do-	
190.4 – 199.0												" - Ark								<1.5	"		40°	-do- Arkose at 191'	
199.0 – 210.6												Ark - Silt								<1.5	"	40	vert	-do- Silt at 204.6	
210.6 – 224.8												Silt - Ark								<1.5	"	50	30°-40°	-do- Ark from 212-217. No core 224.6-224.8	
224.8 – 237.0												" "								<1.5	" 3n	40	20°	-do- Small arkose interfingers. Well jointed.	
237.0 – 246.4												"								<1.5	"	40	40°	-do-	
246.4 – 251.3												"								<1.5	"	45	40°	-do-	
251.3 – 261.4												"								<1.5	"	45	40°	-do- Gypsum stringers	
261.4 – 271.4												"								<1.5	"	40	40°	-do- Hard siliceous zone from 264-276.	
271.4 – 281.4												"								<1.5	"		50°	-do- Gypsum & calcite stringers.	
281.4 – 292.0												" - Arkose								<1.5	"		40°	-do- Arkose starts 288'.	
292.0 – 308.6												Arkose								<1.5		40	40°	-do-	
308.6 – 321.5												" - Silt.								<1.5	"		40°	-do- Arkose to 310'	
321.5 – 331.3												Silt - Arkose								<1.5	"	50	35°	-do- Arkose starts 325.	
331.3 – 339.9												Ark - Silt								<1.5	"		40°	-do- " to 332.	
339.9 – 349.2												Arkose								<1.5	"		40°	-do-	
349.2 – 361.5												"								<1	" 3n	50	50°	-do-	
361.5 – 375.5												"								<1	" "	50	40°	-do-	
375.5 – 385.2												"								<1	" Cp "	50	40°	-do- Very weak chalcopyrite.	
385.3 – 391.6												"								<1	" " "		30°-40°	-do-	
391.6 – 400.2												"								<1	" "		50°	-do- Arkose grading into siltstone	
400.2 – 412.0												Siltstone								<1	"		40°	-do- Calcite stringers.	
412.0 – 422.3												"								<1	"		40°	-do-	
422.3 – 432.2												"								<1	"		50°	-do-	
432.2 – 448.0												"								<1	"	50	50°	-do-	
448.0 – 457.2												"								<1	"	50	50°	-do- No cores 450.4-450.7. Many small fractures containing pyrrhotite-pyrite.	
457.2 – 468.7												"								<1	"	50°	60°	-do- 462-466 a zone of screen fine (?) with numerous calcite seams.	
468.7 – 475.0												"								<1	"			-do- Calcite seams	
475.6 – 481.9												"								<1	"		30°	-do- Clay stone toward end of run	
481.9 – 491.8												Arkose								<1	"		40°	-do-	
491.8 – 501.7												"								<1	"			-do-	

#17

DDH NO. SH-6

STATE Arizona
COUNTY Pima
MINING DISTRICT Amole
PROJECT Sagmaw Hill
Sec 12 T15S R12E

COORDINATES E 50 N 61 E
COLLAR ELEVATION
INCLINATION Vert
BEARING

DATE STARTED 11-29-60
DATE COMPLETED 12-28-60
DRILLING CO. Joy
FINAL DEPTH 815.3

FOOTAGE	Unalt	Chlor.	Epidote	Montmor.	Biotite	Kaol.	Hy. Mica.	Ortho.	Ser.	Sil.		Stage No.	Rock Type	Section	$CuSFeS_4$	$CuFeS_2$	FeS_2	Cu_2S	CuS	MoS_2			Oxide Zone: Leached Cavities-Color Etc. / Sulphide Zone-Char of Min. Diss. Vein, Etc.	< Incl.	Fracturing	Geology	Log By
50 - 510.7													Ark-Silt										Py	40°	40°	-do- Gypsum seams	
510.7 - 522.2													Silt-Ark										"		40°	-do-	
522.2 - 536.5													"										"		50°	-do- Clay layers	
539.5 - 543.7													"										"		40°	-do- Clay and calcite	
543.7 - 556.8													Ark-Silt										"	50	50°	-do- Qtz to 549 ft.	
556.8 - 569.1													Sil-Ark										"		50°	-do- Pyrite only along fractures	
569.1 - 578.9													"										"		50	-do-	
578.9 - 589.0													"										"		50	-do-	
589.0 - 597.6													"										"	60	30	-do- Alcove and slip seams	
597.6 - 604.1													"										"		30°	-do-	
604.1 - 619.2													"										" Zn Co(?)		Vert	-do- Epidote zone 2' with Zn.	
619.2 - 629.3													"										"		Vert	-do- Small pocket lower	
629.3 - 639.4													"										"		60-80°	-do-	
639.4 - 649.5				Sample	(silt)								Silt-Ark									<	Py, Pb Zn Py, sphalerite(?)	60	60-30, vert.	-do- V. chaotic structure*: calcite along bed & fracture some CuFeS ep. Sulphides as stringers, as concentrations oxidizing & as disseminations. Copper pyrite minerals in chaotic siltstone: Chlorite well developed	
649.5 - 659.5				Sample	(Ark)								"										" Py, Pb Zn				
659.5 - 673.4													"										" " "				
																							" " "				
																							" " "				
																							" " "				
673.4 - 682.0													Ark-Silt										" Py, sphal gal	50	30	-do- 3 ft. arkose, fine to med. grained, limy: then brecciated siltstone. Sulphides mainly in siltstone & these, in a second coarser fragments. Mostly: sulphides mostly pyrite.	
682.0 - 692.0													Silt									1	" " "	50	30, 45	do silt is brecciated. Sulphides generally in coarser rock of which fragments in silt, also compared. Gen. space filled by calcite derived by superposition of superfly dry minor, sometimes well developed	
692.0 - 702.6													Silt-banded silt & lime										" " "	50	40-60	do first 3' is brecciated siltstone: most of sulphides — Py & sphal mostly — along laminae & in brecciated portions: this is followed by 3 feet of siltstone in which brecciation is well as in lime: this is in turn followed by further 1' of banded rock, silt stone & calcite, which is also brecciated up but not strongly	
702.6 - 711.9			Thin Section										banded silt & lime										" Py, Sphal	50	30 - 45	do banded siltstone & calcite continuous with varying degree of brecciation. Fractures often filled w/ calcite. Some thick bands of black siltstone. Ca-Mg-silicates present in bands and in coarser fragments in brecciated portions (Mostly garnets - andradite(?) - Tremolite(?) wollastonite(?)). Sulphides along fractures & lamination	
711.9 - 720.0													banded silt & lime — Arkose —										" py, sphal	50-40	20, 35	dark siltstone bands in lime & silica rock for 1st ~5'. Ca-Mg silicates developed: sphal, Py & possibly Pyrrhotite mostly along bedding planes and esp. where laminae, disseminations. Slightly alc. arkose is present last 5' of interval: it is fine & shed. [illegible]	
720.0 - 732.0													Ark.										" Py	50	20, 45	med to fine gr. grained, green & fine gr. in purple arkose, Py along fractures; sometimes in stringers of calcite & pyrrhotite.	
732.0 - 746.9													Ark-banded silt & fine silty arkose										" Py	45	30, 45	grained arkose w/ Py along fractures followed by lime-silica and silt banded rock w/ Py & sphal along laminae & in disseminated portions of rock for about 6 feet followed by fine grained purple & green arkose w/ siltstone fragments & Py & sphal in thin stringers & as disseminations, esp. at dis-[illegible]	
746.9 - 755.8													Ark										" Py, sphal	50	35, 45	-do-	
755.8 - 765.2													Ark										" " "	50	45, 20, 30	about first 7' beds are disrupted, lamination [illegible] Sulphides along beds esp. in disrupted areas.	
765.2 - 774.3													Ark										" " "	50	40, 25	Sulphides dry minor, lamination only disrupted in a few areas of less than 3" in thickness.	

DDH NO. SH-6

STATE _____ MINING DISTRICT _____
COUNTY _____ PROJECT _____

COORDINATES _____ N _____ E
COLLAR ELEVATION _____
INCLINATION _____ BEARING _____

DATE STARTED _____ DRILLING CO. _____
DATE COMPLETED _____
FINAL DEPTH _____

FOOTAGE				L1		L2		CORE % REC. BY FT.	LBS. REC.	% REC. BY WT.	TOT. CU.	OX CU	MO S2	ASSAY Pb	ASSAY Zn	CORE SIZE	SAMP. NO.	SLUDGE SAMP. NO.	LBS. REC.	% REC. BY WT.	SPLIT	ASSAY TOT. CU.	ASSAY OX CU	ASSAY MO S2	COMBINED ASSAY PERCENT 0.1 0.5 1.0	TOT. CU
~~589~~	~~0~~	~~589~~	~~6~~	~~10~~	~~6~~																					
589	0	599	6	10	6	10	6	100			Tr			.005	Tr		NX 9930									
599	6	604	1	4	5	4	5	100			.002			.005	Tr		9931									
604	1	619	2	15	1	15	0	99			.002			Tr	.005		9932									
619	2	629	3	10	1	10	1	100			Tr			Tr	Tr		9933									
629	3	639	4	10	1	10	2	101			Tr			.005	.055		9934									
639	4	649	5	10	1	10	0	99			Tr			Tr	.010		9935									
649	5	659	5	10	1	10	0	100			.002			Tr	.040		9936									
659	5	673	4	13	9	13	4	96			Tr			Tr	Tr		9937									
673	4	682	0	8	6	8	6	100			Tr			Tr	.010		9938									
682	0	692	0	10	0	10	0	100			Tr						9939									
692	0	702	6	10	6	10	8	102			.002			Tr	.050		9940									
702	6	711	9	9	3	9	3	100			Tr			Tr	.035		9941									
711	9	720	1	8	2	7	4	91			Tr			.005	.020		9955									
720	1	732	0	11	9	7	6	64			.002			.005	.010		9956									
732	0	746	9	14	9	20	1	135			.003			Tr	.010		9957									
746	9	755	8	8	9	8	8	99			.002			Tr	Tr		9958									
755	8	765	2	9	4	100	97				.002			Tr	Tr		9959									
765	2	774	3	9	1						.003			.005	Tr		9960									

DDH NO. SH-6

STATE Arizona MINING DISTRICT Ajo
COUNTY Pima PROJECT Saginaw Hill
Sec 12 T15S R12E

COORDINATES E. 50 N 61 E
COLLAR ELEVATION
INCLINATION Ver BEARING

DATE STARTED 11-29-60 DRILLING CO. Jory
DATE COMPLETED 12-28-60
FINAL DEPTH 815.3

FOOTAGE	UNALT	CHLOR.	EPIDOTE	MONTMOR.	BIOTITE	KAOL.	HY. MICA.	ORTHO.	SER.	SIL.		STAGE NO.	ROCK TYPE	SECTION	$CuSFeS_4$	CuFeS2	FeS_2	CU_2S	CuS	MoS_2		OXIDE ZONE: LEACHED CAVITIES-COLOR ETC. / SULPHIDE ZONE-CHAR OF MIN. DISS. VEIN. ETC.	< INCL.	FRACTURING	GEOLOGY	LOG BY
774.3 782.7													Arkose									<1 py, sphal	50	70, 30	fine grained grey arkose: calcareous: py + sphal in stringers in qtz: py as disseminations also development of Ca-Mg silicates. Some siltstone fragments and one six inch silt bed within the arkose. Py. as disseminations + along fractures. Pyrrhotite very rare, fine disseminations.	
782.7 794.4			Thin Section										"									<1 py, pyrrhotite	40	35, 25, 50		
794.4 806.5													"									<1 py, pyrrhotite	40	50, 15	Varies from fine grained to coarse granular to highly crystalline. Siltstone fragments present. Ca-Mg silicates present in small amts. Pyrrhotite is rare	
806.5 815.3			Thin Section										Silt-Silty (Graywacke) Arkose									<1 py	35	60, 55, 35, 75	purple to green silt to fine grained arkose w/ some thin calcite layers to dark green, fine grained arkose or as gillite. Some Pyrite on fractures - very minor.	

DDH NO. SH-6

STATE ______ MINING DISTRICT ______ COORDINATES ______ N ______ E ______ DATE STARTED ______ DRILLING CO. ______

COUNTY ______ PROJECT ______ COLLAR ELEVATION ______ DATE COMPLETED ______

INCLINATION ______ BEARING ______ FINAL DEPTH ______

CORE																SLUDGE										COMBINED ASSAY	
FOOTAGE		L1	L2	% REC. BY FT.	LBS. REC.	% REC. BY WT.	TOT. CU.	OX CU	MO S2	ASSAY Pb	Zn			CORE SIZE	SAMP. NO.	SAMP. NO.	LBS. REC.	% REC. BY WT.	SPLIT	ASSAY TOT. CU.	OX CU	MO S2				PERCENT 0.1 0.5 1.0	TOT. CU
774.3	782.7	8.4	8.4	100			004			005	Tr			NX	9961												
															1000.0												
782.7	794.4	11.7	11.5	98			003			005	010				1000.0												
794.4	806.5	12.1					002			Tr	Tr				1000.1-1												
			21.2	101																							
806.5	815.3	8.8					Tr			005	Tr				1000.1-2												

DDH NO. SH-10

STATE Arizona MINING DISTRICT Amole
COUNTY Pima PROJECT Sagenaw Hill
Sec 12, T15S, R12E

COORDINATES N.50 N 55 E
COLLAR ELEVATION
INCLINATION vert BEARING

DATE STARTED 1/16/61 DRILLING CO. Joy
DATE COMPLETED 2/10/61
FINAL DEPTH 524.6

FOOTAGE	UNALT	CHLOR.	EPIDOTE	MONTMOR.	BIOTITE	KAOL.	HY. MICA.	ORTHO.	SER.	SIL.	STAGE NO.	ROCK TYPE	SECTION	CU5FES4	CUFES2	FE S2	CU2S	CUS	MOS2	% sulphides	OXIDE ZONE: LEACHED CAVITIES-COLOR ETC. / SULPHIDE ZONE-CHAR OF MIN. DISS. VEIN, ETC.	< INCL.	FRACTURING	GEOLOGY	LOG BY
																								of a darker grey (med grey, bluish) siltstone which lasts to the end of the interval. Chalcocite & pyrite fairly abundant in v. fine gr. arkose esp. Some calcite veins up to a 1/4 of an inch in width carry some (rare) sphalerite & chalcopyrite as well as chalcocite & pyrite. Sulphides mostly as dessemination: some thin stringers. Mineralization mostly follows bedding (or laminations) except where it is in calcite stringers (which also sometimes follow bedding) Shearing generally follows bedding	
130 2 142 3												Ark-Silt -Ark-Silt								<1	Py, chalcocite, sphal., chalcopy, gal.	70	40, 70, 60, 50	Lt to med grey (bluish), fine to v. fine ss. grained, occasionally laminated (w/ coarser gr. size particles) arkose alternating w/ lt. grey to med grey siltstone. Gougey at 136.8 and frequently brecciated. Occasional calcite stringers. One, 1/2" vein calcite vein dip. ~60° and at an angle to the bedding carries chalcopy, gal, sphal, py, and chalcocite: otherwise, sulphide mineralization restricted to desseminated py, chalcocite, (& sphal (?)) dessemination often conc. along laminae	
142 3 154 6												Silt-Ark -Silt-Ark								<1	Py, chalcocite, chalcopy, sphal & gal.	70	60, 25, 35, vert	Alternating med to lt (bluish) grey arkose (frequently laminated w/ darker ~~lands~~, coarser material carrying conc. of sulphide dessemination) and lt. grey siltstone. Rock frequently brecciated, sheared, & some what altered (clay) calcite as thin fracture fillings abundant. Sulphides as dessemination & thin stringers ~~[illegible]~~ very minor chalcopy, py, sphal, gal, & chalcocite seen in one 1/2 inch, calcite vein dipping about 50°	
154 6 164 3												Ark								<1	"	70	vert, 35, 45	Lt to med (bluish) grey fine ss. gr. arkose: desseminated chalcocite & pyrite. Some thin stringers & veins of pyrite. Possibly some desseminated sphal. Some v. minor sulphides seen in thin calcite stringers, (which are abundant) ~~[illegible]~~ py, sphal, chalcocite, gal, v. rare chalcopy. Calcite fracture filling (frequent)	
164 3 171 2												Ark-silt								<1	chalcocite, py, sphal lim & hem			Med to lt grey (bluish), fine ss gr. arkose becoming increasingly more brecciated, gougey, and altered until about 167' where it ~~[illegible]~~ rock becomes oxidized in addition to the above and the rock seems more silty and is a lt. grey. Sulphides in grey arkose are mostly as dessemination, occasionally in calcite stringers.	
171 2 179 0												Ark-silt								<1	Py, lim, hem, sphal, chalcocite ?(rare).	55	35, vert, 65	Lt grey, calc. arkose (fine to med grained) to about 176.2: oxidized to about 173' - oxidized, vugg, brecciated, alt. Some pyrite, strong sericitization & gouge in unox. portion: lim, hem, & calcite in stringers & as vug filling in oxidized portion. Lt grey siltstone begins about 176.2. It is gougey & frequently brecciated and carries calcite, mind pyrite and occasional sphalerite as fracture filling	
179 0 186 0												Silt-Ark								<1	Py, lim, hem, sphal, gal, chalcocite (?)		70, 85, 55, 45	Lt. grey siltstone, brecciated & oxidized along fractures, vugg to about 181.5. Then lt grey arkose w/ mod. development of clay, abundant calcite fracture filling, minor py., rare sphal & chalcocite (?) as dessemination; pyrite also as stringers generally dipping at 55, 70°. Also possible gal. w/ py. (rare)	
186 0 195 8												Ark								<1	Py, sphal.	55	vert, 50, 75	Lt grey arkose. Mod. clay alt. minor to abundant pyrite as dessemination, & stringers along bedding and in steep fractures. Rare sphalerite, dessem. calcite string	

* Note: Much of the chalcocite reported actually sphalerite or finely divided py (Microchem. test)

DDH NO. SH-10

STATE _____ MINING DISTRICT _____ COORDINATES _____ N _____ E _____ DATE STARTED _____ DRILLING CO. _____

COUNTY _____ PROJECT _____ COLLAR ELEVATION _____ DATE COMPLETED _____

INCLINATION _____ BEARING _____ FINAL DEPTH _____

FOOTAGE		L1		L2		CORE: % REC. BY FT.	CORE: LBS. REC.	CORE: % REC. BY WT.	CORE: TOT. CU.	CORE: OX CU	CORE: MO S2	CORE: ASSAY Pb	CORE: ASSAY Zn	CORE SIZE	CORE: SAMP. NO.	SLUDGE: SAMP. NO.	SLUDGE: LBS. REC.	SLUDGE: % REC. BY WT.	SPLIT	SLUDGE: ASSAY TOT. CU.	SLUDGE: ASSAY OX CU	SLUDGE: ASSAY MO S2	COMBINED ASSAY: PERCENT 0.1 0.5 1.0	COMBINED ASSAY: TOT. CU
130	2	142	3	12	1	12	1	100			Tr			Tr	Tr									
142	3	154	6	12	3	12	3	100			.002			.005	.005									
154	6	164	3	9	7	9	7	100			Tr			Tr	Tr									
164	3	171	2	6	9	6	9	100			Tr			Tr	Tr									
171	2	179	0	7	8	7	8	100			Tr			.005	Tr									
179	0	186	0	7	0	6	6	94			Tr			Tr	.005									
186	0	195	0	9	8	9	8	100			Tr			Tr	Tr									

DDH NO. SH-10

STATE Arizona MINING DISTRICT Oracle
COUNTY Pima PROJECT Sugarloaf Hill
Sec 12, T15S, R12E

COORDINATES N. 50 N 55 E
COLLAR ELEVATION
INCLINATION vert. BEARING

DATE STARTED 11/6/61 DRILLING CO. Joy
DATE COMPLETED 2/10/61
FINAL DEPTH 524.6

FOOTAGE	UNALT	CHLOR.	EPIDOTE	MONTMOR.	BIOTITE	KAOL.	HY. MICA.	ORTHO.	SER.	SIL.	STAGE NO.	ROCK TYPE	SECTION	$CuSFeS_4$	$CuFeS_2$	FeS_2	Cu_2S	CuS	MoS_2	% Sulphides	Oxide Zone: Leached Cavities-Color Etc. / Sulphide Zone-Char of Min. Diss. Vein, Etc.	< INCL.	FRACTURING	GEOLOGY	LOG BY
195.8 206.1												Ark								<1	py, sphal, chalcopy. lim stain seen on few fractures.	45	80, 40, 60, 30	Lt grey, fine to med. sa grained arkose; a med to coarse grained arkose from 203 & 204. Sheared & gouged along a few fractures - probably bedding plane / slippage. Thin lamin. stains of py / marc. radiating occasionally. Py, minor, sphalerite, rare as / dissem. & thin gels. Py / sphalerite more abundant in coarser arkose except for interval 204 & 206 where there is some chalcopy. color in pyrite with sphal. Calcite veins & stringers frequently often along bedding planes.	
206.1 217.3												Ark								<1	Py, sphal Lim, lim		80, 45	Lt grey, med to fine grained, arkose. Badly broken up & slightly altered zone from 212 & 216.5 Generally moderately to strongly sericitized (pyrite as pyrite relicts where not altered). Py as dissem., some thin stringers, sphal. rare, scattered microscopic disseminations.	
217.3 227.0												Ark								<1	py, sphal Lim.		40, 55, vert, 70	Lt grey, med to fine gr. arkose. Mod to str. sericite alteration in feldspar and gouge zones where calcite w/ abundant pyrite fill holes has flooded open spaces; esp gouge at 223 & 227 & 217.3. Calcite w/ pyrite seems to favor sericite. Sphal. as scattered rare disseminations. Pyrite often has gold coloration - may carry some copper.	
227.0 232.9												Silt-Ark								<1	Py, lim	45	vert, 30, 55	Lt grey siltstone, gouged & broken up along vert. fract (?), in parts a alteration zone of sericite, for first few inches to about (227.7'). Then lt grey fine to med gr. arkose. Some py. & calcite gouge, arkose zone and some py. as fine stringers in silt. Arkose carries disseminated py, calcite stringers, & lim. on some fractures	
232.9 241.5												Ark-Silt								<1	Py, lim	40	70, vert, 40	Lt. grey fine to med. gr. arkose to about 235'. Py. for calcite minor. Some lim. stain on fractures. About 235' begins fine gr., med grey siltstone alternating w/ lt. grey, laminated, frequently chlorite-rich siltstone (contained along some laminae); contact w/ arkose is irregular, generally dips about 70° here. Through all of bedding about 40°. Siltstone is frequently brecciated w/ calcite stringers, sometimes carrying minor py, and sometimes w/ lim. stain, visibly fracturing, esp. vert. ones or offsets of vert. fractures. Pyrite also along bedding or laminae planes; very minor as disseminations.	
241.5 247.3												Silt								<1	Py lim	30	85, 20	Med grey, laminated sl calc. siltstone, laminae are irregular, gnarled, varying colors - dark gray to lt gray-green - and are interrupted by (spaced between) thin beds of the siltstone "proper" which is generally coarser (but not always) than the laminae. Pyrite often in discrete cubes of strong, along laminae (minor), as disseminations (v. minor), and as clusters of disseminations (occasionally). Calcite along stringers & fractures very minor. Oxidation occurs along some fractures esp. in gouge zones (about 247')	
247.3 254.9												Silt								<1	Py, lim.	30	40, 50, vert	-do- strongly fractured (vert. esp) & zone from 248.5 to 250.5 w/ gouge zone about 249 (flat); gouge ox. & fract surfaces ox.: also laminae adjacent to gouge zone: gouge zone nearly flat (~15°). Broken-up at 254.9	

DDH NO. SH-10

STATE ____ MINING DISTRICT ____ COORDINATES ____ N ____ E DATE STARTED ____ DRILLING CO. ____

COUNTY ____ PROJECT ____ COLLAR ELEVATION ____ DATE COMPLETED ____

INCLINATION ____ BEARING ____ FINAL DEPTH ____

FOOTAGE		L1	L2	CORE: % REC. BY FT.	LBS. REC.	% REC. BY WT.	TOT. CU.	OX CU	MO S2	ASSAY Pb	ASSAY Zn	CORE SIZE	SAMP. NO.	SLUDGE: SAMP. NO.	LBS. REC.	% REC. BY WT.	SPLIT	ASSAY TOT. CU.	ASSAY OX CU	ASSAY MO S2	COMBINED ASSAY PERCENT 0.1 0.5 1.0	TOT. CU
195.8	206.1	10.3	10.3	100			.002			.005	.005	NX	435-1									
206.1	217.3	11.2	9.1	81			.002			.005	Tr		436-1									
217.3	227.0	9.7	9.7	100			Tr			Tr	Tr		437-1									
227.0	232.9	5.9	4.2	71			Tr			Tr	Tr		438-1									
232.9	241.5	8.6	7.9	92			Tr			Tr	.005		439-1									

DDH NO. SH-10

STATE Arizona
COUNTY Pima
SEC 12 T 15S R 12E
MINING DISTRICT Oracle
PROJECT Sequoia Hill
COORDINATES M.50 N 55 E
COLLAR ELEVATION
INCLINATION vert BEARING
DATE STARTED 11/16/61
DATE COMPLETED 2/10/61
DRILLING CO. Jory
FINAL DEPTH 524.6

FOOTAGE	UNALT	CHLOR.	EPIDOTE	MONTMOR.	BIOTITE	KAOL.	HY. MICA.	ORTHO.	SER.	SIL.		STAGE NO.	ROCK TYPE	SECTION	CU5FES4	CU2FES2	FE S2	CU2S	CUS	MOS2	% Sulphides	OXIDE ZONE: LEACHED CAVITIES-COLOR ETC. / SULPHIDE ZONE-CHAR OF MIN. DISS. VEIN, ETC.	< INCL.	FRACTURING	GEOLOGY	LOG BY
254.9 – 265.3													Silt	[redacted]	25°						<1	Py, lim.	35	40, vert, 70	-do- and lim on fract. rare (one or two occurrences), begins at about 265'.	
265.3 – 273.0													Silt								<1	Py, lim	35	70, vert, 55	[redacted] Calc., frequently laminated (w/ dark & light laminae) med. gray siltstone, Grays, alt. to chlorite along some laminae), sheared (esp. along vert. & near vert. fractures) and occasionally brecciated in interval 267-271. Calcite stringers along bedding planes occasional, esp. fracture fill. Frequent all the way through this interval. From 271 to 273, limonite stain on fractures. Pyrite minor, mostly along bedding planes & parallel laminae ±, ~~and~~ sometimes along fractures and as disseminations. Silt fairly coarse in places.	
273.0 – 278.6													Silt-ark								<1	Py, lim, tan, sphal, chalcopy.	35	vert, 60	lt. gray, calc, siltstone w/ some med., some dark gray laminae and bands, and some gray bands (carry epidote). Calcite along bedding planes & irg. fractures frequent. Pyrite minor, locally abundant along bedding planes & parallel laminae; also in occasional fractures and as disseminations (from minor to rare). Many sphal. grains to tan, & lim. w/ some chalcopy along some laminae. Some lim. staining along some fractures. From about 278 to 278.6, lt. gray, calc, arkose carrying very minor to rare py. as disseminations & thin stringers along fractures.	
278.6 – 287.5													Ark-silt-ark-silt-ark-silt								<1	"	35	vert, 45, 10	dark lt. gray, med. gray, calc. arkose w/ minor py. as d. Thin stringers on frac. rare sphal. grains to tan & lim. w/ very rare chalcopy & pyrite along one or two laminae. Some calcite alt. in laminae, some calcite. Calcite also along some fractures. At about 280', med. gray silt. (calc.) w/ occasional chlorite laminae to about 280.5. This is followed by a very fine sr. grained calc., med. gray arkose w/ very minor py as disem. & as stringers (both kept & along bedding). Calcite along fractures, & some lim. staining along fractures to about 283'. At 283 lt. gray, calc. & brecciated siltstone w/ some py. in calcite along bedding planes & fractures, usually w/ calcite, and w/ some chlorite along some laminae. This is followed by sl. calc. med. to lt. gray, v. fine ark. w/ minor py, mostly along laminae, to about 285'. At 285 alt. gray to med. gray, sometimes purple, frequently laminated, sl. calc. siltstone w/ minor py., generally most abundant along parallel laminae (more parallel laminae seem to be coarser ones).	
287.5 – 295.5													Silt-ark-								<1	Py	35	20, 60, 55	Med. to dark gray to purplish gray laminated & banded, sl. calc. siltstone w/ py. (minor), mostly along coarser, dark gray laminae to about 289.5. From 289.5 to 295.5, mostly lt. gray, fine gr. arkose (calc.) w/ py. as disseminations (minor), as stringers along frac (v. minor) w/ calcite, and as strings &	

DDH NO. SH-10

STATE Arizona MINING DISTRICT Ensle
COUNTY Pima PROJECT Sagenaw Hill
Sec 12, T15S, R12E

COORDINATES N 50 N 55 E
COLLAR ELEVATION
INCLINATION vert BEARING

DATE STARTED 1/16/61 DRILLING CO. Joy
DATE COMPLETED 2/10/61
FINAL DEPTH 524.6

FOOTAGE	UNALT	CHLOR.	EPIDOTE	MONTMOR.	BIOTITE	KAOL.	HY. MICA.	ORTHO.	SER.	SIL.	STAGE NO.	ROCK TYPE	SECTION	CU5FES4	CUFESZ	FES2	CU2S	CUS	MOS2	% sulphides	OXIDE ZONE: LEACHED CAVITIES-COLOR ETC. / SULPHIDE ZONE-CHAR OF MIN. DISS. VEIN, ETC.	< INCL.	FRACTURING	GEOLOGY	LOG BY
																								along some laminae (minor) w/ calcite (frequently). One or two thin lands of lt. grey to purplish grey, sl. calc. siltstone also present.	
295 5 304 3												Ark-silt-ark-silt-ark-silt.								<1	Py, sphal.	35	vert, 70, 45	Lt. grey, calc. fine sc-grained arkose w/ some py. as dissem. & in calcite (frequently) as stringers along fractures & bedding to about 297.5. From about 297.5 to 298.5, lt. grey siltstone w/ v. minor py. as v. thin stringers and as v. minor dissem. Very rare sphal. & py. that has sl. copper tarnish w/ py. in calcite stringers in lt. grey, calc. arkose from 298.5 to about 300.5; py. also as dissem. (v. minor). From about 300.5 arkose grades to lt. grey silt. which is calc. & carries v. minor py. as dissem. & along minor, thin fractures & bedding. This silt continues to about 301.5 where calc. lt. grey arkose, containing minor py., mostly as dissem. along bedding, comes in and continues to about 303.5. Then lt. grey silt. w/ some v. fine purplish lands and coarser med. grey lands which usually carry most of py. in interval to about 304.3	
304 3 312 6												Silt								<1	Py, sphal.	35	vert, 45	purplish, dark grey laminated, sl. calc. siltstone w/ minor py., mostly along laminae, to about 309. Then a coarser siltstone, lt. grey w/ darker grey laminae & lands and more abundant calcite stringers and py. rite (along bedding, fractures, & as dissemination) to 312.6. Moderately foliated & brecciated at 309.0 & at 312.6. Pyrite is treatly rather abundant (up to 3%) in last interval (309-312.6) and seems to have Cu-tarnish. Also, there is to rare, disseminated sphal. w/ py., generally where they occur in calcite stringers.	
312 6 321 0												Ark-silt-ark-silt-etc.								<1	Py	35	vert, 40, 70	Alternating fine gr., calc., lt. grey arkose and slightly calc., lt. grey, dark grey, purplish grey, laminated siltstones. Calcite along laminae & fractures abundant. Py., generally minor, mostly along laminae in siltstone and along laminae, thin fractures and as disseminations in fine arkose. Vertical shearing from about 319 to 321.6'. Alternating beds are .5' to 2' thick.	
321 0 327 5												Ark-silt-ark								<1	Py, chalcopy?	35	40, 50, 80	Brecciated, med. to lt. grey calc. arkose w/ calcite filling around fragments to about 322.5, then unbrecciated arkose to ~323'. From 323' to about 325.5 laminated lt. grey, med. grey, purplish grey, sl. calc. silt. w/ frequent thin calcite filling along fractures & between laminae (w/ calcite, carrying some py.) to about 325.5. Then lt. grey, calc. arkose (to 327.5) carrying some calcite veins & stringers & dissem. py. Some chalcopy. - very rare, mostly a discoloration - w/ py. in calcite laminae in siltstone.	
327 5 337 6												Ark w/ some silt lands								<1	Py, chalcopy?	35	vert, 45, 70	Mostly lt. grey, calc., arkose w/ some thin (3-6") lands of purplish, silty material. Py. minor to abundant, dissem. & as stringers and along laminae, often w/ calcite. Discoloration in pyrite rarely appears to be chalcopy rite. Gouge at 330.5 - siltstone land.	

DDH NO. 514-10

STATE Arizona
COUNTY Pima
MINING DISTRICT Arnold
PROJECT Sagamon Hill
Sec 12, T15S, R12E

COORDINATES M.50 N 55 E
COLLAR ELEVATION
INCLINATION vert
BEARING

DATE STARTED 1/6/61
DATE COMPLETED 2/10/61
FINAL DEPTH 524.6

DRILLING CO. Jay

FOOTAGE	UNALT	CHLOR.	EPIDOTE	MONTMOR.	BIOTITE	KAOL.	HY. MICA.	ORTHO.	SER.	SIL.	STAGE NO.	ROCK TYPE	SECTION	CuSFeS4	CuFeS2	FeS2	CU2S	CuS	MoS2	% Sulphides	OXIDE ZONE: LEACHED CAVITIES-COLOR ETC. / SULPHIDE ZONE-CHAR OF MIN. DISS. VEIN, ETC.	< INCL.	FRACTURING	GEOLOGY	LOG BY
337.6 – 347.9												Arkose & Silt								<1	Py	35	vert, 45	Alternating dk. grey arkose (calc.) and med grey & purplish grey, sl. calc., laminated siltstone, arkose beds thicker than siltstone, generally. Pyrite mostly along laminae in silt, dissem. and along laminae & fractures (often w/ calcite) in arkose. Generally well broken-up; gouge at end of interval. Calcite fracture filling abundant
347.9 – 355.2												Silt								<1	Py	35	20, 45, vert, 80	med grey to greenish grey, calc., occasionally laminated (w/ purplish sh. or dark green or black laminae) siltstone w/ sl. coarser gradations (to fine sa-grained arkose) toward end of interval. Well broken up, esp. at 349.7, 353, & 354' where it is sl. gouge. Calcite fracture filling common, esp. along steep fractures. Pyrite along laminae, as very fine dissemination, sheared rock, esp. in coarser gradations, as rare crystals in calcite veins, and along some faint laminae (dark green laminae, usually
355.2 – 363.6												Silt								<1	Py, sphal, gal	35	vert, 20, 45, 70	except for first 1½', which is caught to be grey siltstone with only occasional faint laminae, rock is poorly laminated lt. grey, med grey, greenish grey, purplish calc. siltstone. Clay alteration & chlorite alteration peak first present. Calcite alt. generally follows laminae where it often "blossoms", sometimes follows stringers of pyrite, sometimes as occasional disseminated "spots". Py to minor, generally along fractures & laminae & fractures, also as fine dissemination. Sphal & gal. as rare, restricted to pure calcite stringers along fractures & they associated w/ py. Calcite fracture filling abundant. Step, irregular & sharp along wedge. Frequent, bounded after electrically inherent solids. Pyrite now abundant than last interval. Gouge at 362 & 363.6'
363.6 – 368.7												Silt								<1	Py	35	45, 20, vert	– do – and whole interval more alt. – clay & chlorite – and gouge up gouge at end of interval.
368.7 – 375.0												Silt								<2	Py, sphal, chalcopy, gal?	35	45, 20, vert, 70	– do – whole rock. Interval generally strongly alt. – chlorite & clay – multifractured & sheared, frequently gouge. Step along steep fractures, w/ calcite filling fractures & gouge as crystals in open fractures. Py abundant along laminae, disseminated & in calcite. Chalcopyrite rare, w/ py. Sphal. v. minor, w/ py, esp. in calcite filling. Galena questionable, w/ sphal. Py gems & replace altered minerals
375.0 – 382.8												Silt – Arkose – Silt								<1	Py, sphal, chalcopy, gal?	40	50, vert, 45, 70	– do – rock same as above to about 376.5' from 376.5' to about 379.7, v. fine grained, calc., lt. grey arkose w/ minor dissem. py, & py w/ rare sphal, gal, & chalcopy in some steeply (70) dipping calcite stringers from about 379.7' to 382.8. Lt. grey, calc. silt w/ some calcite stringers, some coarse portions (arkose) and v. minor py, mostly as dissemination (fine) and along occasional carbonaceous.
382.8 – 391.5												Silt w/ some arkose bands								<1	Py, sphal, chalcopy, gal.	35	20, 70, vert, 45	Lt. grey, calc. siltstone w/ occasional ½' bands of lt. grey arkose & frequent calcite stringers and occasional laminae of darker grey & greens. Py to minor, mostly

DDH NO. SH-10

STATE _____ MINING DISTRICT _____
COUNTY _____ PROJECT _____

COORDINATES _____ N _____ E
COLLAR ELEVATION _____
INCLINATION _____ BEARING _____

DATE STARTED _____ DRILLING CO. _____
DATE COMPLETED _____
FINAL DEPTH _____

CORE																SLUDGE								COMBINED ASSAY		
FOOTAGE		L1	L2	% REC. BY FT.	LBS. REC.	% REC. BY WT.	TOT. CU.	OX CU	MO S2	ASSAY Pb	ASSAY Zn			CORE SIZE	SAMP. NO.	SAMP. NO.	LBS. REC.	% REC. BY WT.	SPLIT	ASSAY TOT. CU.	ASSAY OX CU	ASSAY MO S2		PERCENT 0.1 0.5 1.0	TOT. CU	
355.2	363.6	8.4	8.4	100			.004			.005	Tr				492-1											
363.6	368.9	5.3	5.2	98			.004			Tr	Tr				493-1											
368.9	375.0	6.1	6.1	100			.008			.005	.005				494-1											
375.0	382.8	7.8	7.8	100			.004			Tr	.005				495-1											
382.8	391.5	8.7	7.8				.003			Tr	Tr				496-1											

DDH NO. SH-10

STATE Arizona
COUNTY Pima
Sec 12, T15S, R12E
MINING DISTRICT Ajo
PROJECT Sonoran Hill
COORDINATES M150 N 55 E
COLLAR ELEVATION
INCLINATION vert
BEARING
DATE STARTED 1/16/61
DATE COMPLETED 2/10/61
FINAL DEPTH 524.6
DRILLING CO. Jeg

FOOTAGE	UNALT	CHLOR.	EPIDOTE	MONTMOR.	BIOTITE	KAOL.	HY. MICA	ORTHO.	SER.	SIL.	STAGE NO.	ROCK TYPE	SECTION	CU5FES4	CUFES2	FES2	CU2S	CUS	MOS2	OXIDE ZONE: LEACHED CAVITIES-COLOR ETC. / SULPHIDE ZONE-CHAR OF MIN. DISS. VEIN, ETC.	< INCL.	FRACTURING	GEOLOGY	LOG BY
391.5 402.6									Sil-Alt-Sil-											<1 Py, sphal, gal	40	vert, 50, 40, 70	as fine disseminations and also some fine laminae & few calcite stringers. Chalcopy, gal, & sphal occur generally in calcite stringers and calcite filled cavities in preferred irregular portions of rock. Last 1.0' or so of interval is dominantly altered (chlor. & clay) w/ abundant calcite filled cavities replacing & alternating with laminae of clay & pyrite. Also in this last foot or so of altered laminated siltstone Tri sphal. etc. cease to be most abundant, they still occur. Moderately to strongly alt. (mostly clay, some chlor), pitted, calcite flooded, w/ long streaks of mostly py, rare sphal and a rare galena, mostly as disseminations to about 396.5 from about 392. (391.5 to 392 is lt py, laminated siltstone) There are some siltstone clasts and fragments in this interval. Also, from about 396 to about 396.5, altered feld. phenocrysts showing layering, not in qtz, mostly may be porphyry dike, strong gouge zone at 396.5. Followed by lt to med py, calc. frequently brecciated & gouge siltstone. Rare abundant calcite filling along fractures to ~~about~~ end of interval. At about 400.6' gouge zone, strongly altered w/ abundant pyrite. Py in this last interval of siltstone is generally of minor abundance (except clay gouge zone, blow).
402.6 410.8												Silt								<1 Py, sphal, chalcopy	40	45, vert 60	lt. to med. gray calc. coarse siltstone w/ frequent calcite filling along fractures and very minor, disseminated pyrite to about 407.5: last foot or so of this interval carries some altered, calcite flooded brecciated portions or "lenses" that carry rare sphal and a rare chalcopyrite. From about 407.5 to end of interval rock is a siltstone breccia — fragments of mostly siltstone "floating" in a sea of calcite. The fraction of rock is py, carries minor pyrite, generally replacing siltstone fragments, and rare appearance of pyrite.
410.8 420.5												Silt								<1 Py	40	vert, 40, 50, 70	lt to med gray siltstone (calc.). Last foot is alt (mostly clay) & sheared. Last 6' is laminated of dark green, purplish, and dark gray bands. Calcite fracture filling frequent throughout interval. Chlorite fragments in lamination of last 6'. Py as fine disseminations and along some fossil laminae in last 6'. Also, some sphaero (or thin) along fractures.
420.5 430.7												Ark	[redacted]							<1 Py, chalcopy?	40?	Drill to vert, 20, 55, 70	Lt, gray, med grained (ss grained), calc. (cement) arkose of med. alt. (gray) feld. & occasional small (length 10 mm) alt. fragments. Some calcite fracture filling in arkose grains. Become coarser w/ depth. At about 428' contact, dipping about 25°, to coarse arkose (may be porphyry?) Coarse arkose (calc.) continues to end of interval. Py is minor, as disseminations and thin (very thin stringers); disseminations seem to grow more abundant, as lead grains are larger, in coarser arkose than in fine arkose (med. ss gr. arkose) & rare, questionably chalcopy as dissem.

DDH NO. SH-10

STATE _____ MINING DISTRICT _____
COUNTY _____ PROJECT _____

COORDINATES _____ N _____ E
COLLAR ELEVATION _____
INCLINATION _____ BEARING _____

DATE STARTED _____ DRILLING CO. _____
DATE COMPLETED _____
FINAL DEPTH _____

FOOTAGE		L1	L2	CORE % REC. BY FT.	CORE LBS. REC.	CORE % REC. BY WT.	CORE TOT. CU.	CORE OX CU	CORE MO S2	CORE ASSAY Pb	CORE ASSAY Zn	CORE SIZE	CORE SAMP. NO.	SLUDGE SAMP. NO.	SLUDGE LBS. REC.	SLUDGE % REC. BY WT.	SLUDGE SPLIT	SLUDGE ASSAY TOT. CU.	SLUDGE ASSAY OX CU	SLUDGE ASSAY MO S2	COMBINED ASSAY PERCENT 0.1 0.5 1.0	COMBINED ASSAY TOT. CU
391.5	402.6	111	106	96			Tr			Tr	.005		497-1									
402.6	410.8	82	82	100			.003			Tr	Tr		498-1									
410.8	420.5	97	97	100			.002			Tr	Tr		499-1									

DDH NO. SH-10

STATE Arizona
COUNTY Pima
MINING DISTRICT Cornelia
PROJECT Sugarloaf Hill
Sec 12, T15S, R12E

COORDINATES M.50 N 55 E
COLLAR ELEVATION
INCLINATION Vert
BEARING

DATE STARTED 11/6/61
DATE COMPLETED 12/10/61
FINAL DEPTH 524.6
DRILLING CO. Jay

FOOTAGE	UNALT	CHLOR.	EPIDOTE	MONTMOR.	BIOTITE	KAOL.	HY. MICA	ORTHO.	SER.	SIL.		STAGE NO.	ROCK TYPE	SECTION	$CuFeS_4$	$CuFeS_2$	FeS_2	CuS_2	CuS	MoS_2			OXIDE ZONE: LEACHED CAVITIES-COLOR ETC. / SULPHIDE ZONE-CHAR OF MIN. DISS. VEIN, ETC.	< INCL.	FRACTURING	GEOLOGY	LOG BY
430 7 443 2													Ark-Silt			(Lt gry, calc. Ark 1" or so. irg. contact)							Py chalcopy.	35	vert, 50, 20	—do— coarse gr. (ss-grained), lt. grey, calc. arkose as at end of last run only clearly in ~~stages~~ in places and more frequent thin siltstone frags. at about 439.2' interval of about .3' of finer gr. (about med ss gr) arkose shows bedding. Rare, questionably chalcopy as disseminations. Lt grey, calc, silt. shows arkose. Contact of coarse arkose at end of last interval. Silt continues to about 444'. From about 444' to about 445.6 silt & coarse grained arkose (except?) are irregularly interspersed. From 445.6 to about 446.5' coarse, calc. siltstone (lt. grey). At 446.5' lt. grey calc. med to coarse ss. gr. arkose showing faint bedding as coarser and finer portions w/ the 4" band of a fine arkose. At the very end of interval (last 6" or so) very coarse arkose that looks almost like porphyry. Pyrite is minor to abundant as disseminations, but most abundant in coarser clastics, Py also occurs in thin stringers along fractures and in siltstone, along laminae. Sphalerite is very rare, occurs as disseminations. Chalcopyrite is rare and questionable. May only be alteration on pyrite. Calcite fracturing fairly occasional; fracturing and calcite frequently. Grey. Mod alt. (clay of feld.
443 2 452 4												Silt-Arkose	Silt (?) Arkose	~~Silt~~ 445.6									Py, chalcopy? & sphal	<1	35	55, 35, vert.	
452 4 460 0													Ark										Py, chalcopy	<1	30	85, 20	Med. to coarse ss grained, calc. arkose (mod alt-clay of feld.) w/ some thin fine grained ss-grained bands. Definitely a clastic. Py as disseminations, mostly, and some stringers. Chalcopy. Very rare & questionable. Very, 80°, fracturing w/ fragments (brecciated) last 2 feet of interval. Fracture is rusty, calcite-filled.
460 0 468 4													Ark 460										Py.	<1	35	vert, 45, 55	Lt grey, calc. coarse grained arkose w/ silt frags to about 461' where it becomes coarser grained & takes on more of texture of porphyry. At about 464 the rock looks quite coarse grained, definite arkose (granular) which continues to about 466.5 where it becomes coarser & looks more like porph. (mosaic texture) which continues to end of interval. Last 6" or so of interval shows an increase in silt fragments which are dry & rusty & parallel, dipping about 30°. Py. more & abundant, esp. in coarser portions; mostly disseminations, thin stringers. Chalcopy. very rare, questionable. Calcite fracture fairly frequent. Strong at 55° at about 466.7
																							Note Most of chalcopy since 363' has been furnished by carrying very minor Cu — microchem test.				
468 4 474 7													Silt-Ark										Py	<1 mostly <.5	70, 35, vert.	Lt. grey, calc. silt to about 470'. Then medium to occasionally coarse ss-gr. arkose (calc.). Arkose, where coarse, looks very much like porphyry: carries silt frags. Py. disseminations, mostly. Greatest abundance of Py in coarse ss-gr. arkose. Calcite veins frequent. Clay alt. moderate & weak

DDH NO. SH-10

STATE Arizona
COUNTY Pima
Sec 12, T15S, R12E
MINING DISTRICT Amole
PROJECT Saginaw Hill
COORDINATES M.50 N 55 E
COLLAR ELEVATION
INCLINATION vert
BEARING
DATE STARTED 1/16/61
DATE COMPLETED 2/10/61
FINAL DEPTH 524.6
DRILLING CO. Joy

FOOTAGE	UNALT	CHLOR.	EPIDOTE	MONTMOR.	BIOTITE	KAOL.	HY. MICA.	ORTHO.	SER.	SIL.	STAGE NO.	ROCK TYPE	SECTION	CU5FES4	CUFESZ	FES2	CU2S	CUS	MOS2		OXIDE ZONE: LEACHED CAVITIES-COLOR ETC. / SULPHIDE ZONE-CHAR OF MIN. DISS. VEIN, ETC.	< INCL.	FRACTURING	GEOLOGY	LOG BY
474 7 483 4												Ark								<1	Py		60, 45, vert	Shearing on 45 & 60 fractures, esp. around 474.7. Also badly broken up around 476.8' & 483.4'. Lt. grey med. ss-grained calc. arkose. At about 482', silt frags. and definite rock change, though contact is indistinct, to coarser grained more porphyritic look rock. Py. mostly as dessem. Most abundant in coarser grained rock. Clay alt. mod. Calcite veins frequent.	
483 4 493 5												Ark		483.5						<1	Py		35, 55, 60, vert	Lt grey rock is coarse grained and looks porphyritic to about 485.5, then looks like fairly good med to coarse grained arkose (calc.) Calcite veins frequent sometimes vugy. Py mostly dissem though sometimes in stringers, sometimes in calcite veins. Clay alt. mod. Py. most abundant in porphyritic looking arkose	
493 5 504 0												Ark		497'						<1	Py	40	75, vert, 40	Lt grey, med. grained calc, ark to about 498'. Minor dessem py., weak to moderate clay alt. At about 498' entire zone, which is gougy, strong to mod. Clay alt. Abundant py, rock frags., porphyritic looking arkose to about 499.5' when begin to pick up bedding and rock looks more like a typical arkose. Here in more typical arkose, amt. of py. diminishes. Where arkose is bedded, there is often bedding along bedding planes. Rock continues fairly gougy to 504'. Calcite veins abundant	
504 0 513 5												Ark								<1	Py		40, 55	Lt. grey, med. to coarse ss-grained, calc. arkose. Calcite fracture filling frequent. Py mostly as dessem, very minor. Clay alt. mod. Rock frequently gougy, broken up, esp. from about 504 to 507.2', 512 to 513.5	
513 5 518 5												Ark								<1	Py		70, 40, 50	-do- rock continues badly broken up, esp. between 513 & 514', 517' to 518'	
518 5 524 6												Ark								<	Py	30	30, 45, vert.	-do- rock continues badly broken up, esp. between 518.5 & 520.5. Coarse(?) between 523.4 & 524.6. Pyrite along fractures more abundant than in last two intervals; generally accompanied by shearing & str. clay alt. Arkose is generally finer grained from about 522 on & bedding can be discerned.	

DDH NO. SH-9

STATE Arizona MINING DISTRICT Cornole
COUNTY Pima PROJECT Sleeping Hill
Sec 12, T15S, R12E

COORDINATES 6.50 N 61 E
COLLAR ELEVATION
INCLINATION vert BEARING

DATE STARTED 12/23/60 DRILLING CO. Jay
DATE COMPLETED 1/16/61
FINAL DEPTH 733.0

FOOTAGE	UNALT	CHLOR.	EPIDOTE	MONTMOR.	BIOTITE	KAOL.	HY. MICA.	ORTHO.	SER.	SIL.	STAGE NO.	ROCK TYPE	SECTION	CU5FES4	CUFES2	FE S2	CU2S	CUS	MOS2	% Sulphides	OXIDE ZONE: LEACHED CAVITIES-COLOR ETC. / SULPHIDE ZONE-CHAR OF MIN. DISS. VEIN, ETC.	< INCL.	FRACTURING	GEOLOGY	LOG BY
0 0 21 0	RAH					✓																			
21 0 30 0				?		✓			✓			Qtz Monz		Qph						0	lim, hem, Mn-dendrites		40, 10, 70	Med. grained, pl. porphyritic, lt. gray qtz monz. Qtz subhedral & pn. hedral (rarely euhedral). Fld strongly alt. (clay). Oxidation strong. Lim, hem, & Mn stain & incrustations; Fe & Mn stain as "spots" after dissemminated pyrite(?). Hem. staining along fractures. Clay alt. & stained along fractures. Fuzzy Qtz/qtz vlts occur in vugs. Badly broken top and gouge through out entire interval. Oxide zone. Some slickenlines	
30 0 41 2						✓			✓			"		1 / 45						0	"		20, 10, vert, 60	-do- Oxidation & clay alt. dim in size some what toward end of rush.	
41 2 50 0				?		✓			✓			"								<1	hem, lim, Mn, py, chalcocite		40, 60, 30	Oxide to sulphide zone; oxides to about 45', then sulphides w/ oxides restricted to zones in & around fractures. Pyrite & c. fine chalcocite coatings on py. & as disseminations. Pyrite also along fracture. Clay alt. med. to strong - strong generally near fractures. Calcite along some fractures & also some Fe+2 stain along fractures & with pyrite. Rock contains med. gr., lt. gray pl. porphyritic w/ lt. gray qtz & fld. porphyritic	
50 0 60 7				✓		✓			✓			"								<1	"		60, 45, 15	Sulphide zone, oxides restricted to fractures & gouge zones. Gouge zone 51.5 to 53.0+ Qtz monz. crysts coarser, darker (to red. gray) color. Clay alt. generally moderate; strong in gouge zones. Qtz monz. has a darker matrix and fld. phenocrysts are larger & darker in color, mostly due to Fe. Strong development of weight lys. may be diff. phase for med. sized fld. phenocrysts far more common in abundance & size, large phenocrysts far diminished in size. Fe & Mn. oxides restricted to fractures and gouge zones. Pyrite & chalcocite coatings on py. as disseminations & along some fractures, dipping gland 30°, generally. Dark green, clay alt. w/ py. Clusters (mass ox. & dyed, bleached zone (or / intruded fld.?); very strong alt. from 70.5 to 71.5, otherwise moderate to strong. Oxides along some fractures & in gouge zones.	
60 7 69 8						✓			✓			"								<1	"		30, 40, 50		
69 8 80 8						✓			✓			"		75.5' / 80.5'						<1	"		10, 25, 60	Some darker, finer grained, phases in thin (1" = 4") bands. Rock more porphyritic toward end of interval. Darker, finer gr. bands are structural & fracture carrying oxides & sulphides. Stringers ground & lost "pulp". Sulphides, dominantly chalcocite question. Oxides only on fracture zones in darker (alt.) finer gr. qtz. monz. Pyrite increasing. Clay alt. med to strong.	
80 8 91 3						✓			✓			"								~1	"		55, 25		
91 3 100 7						✓			✓			"								~1	py, chalcocite		35, 75, 20, vert.	Mod. to very strong clay alt. (very str. in shear zones). Some fld. phenocrysts up to 7 mm across; pyrite abundant - pyrite to redox situations on cubes where pyrite crystals well developed. Chalcocite very minor as coatings on py. and as disseminations.	
100 7 109 1						✓			✓			"								~1	"		30, 60	-do- and py. becomes more abundant. Below 106', dark green clay alt. of fld., associated w/ clusters of pyrite gives rock "spotted" appearance. Clay alt. generally strong. Chalcocite rare, disseminations.	
109 1 121 2						✓			✓			"		119.1'						~1	"		30, 50, 70	Rock generally coarse, more equigranular, chalcocite rare, pyrite abundant. Dark green clay alt. w/ py. becomes rare	

RAH

DDH NO. SH-9

STATE _____ MINING DISTRICT _____ COORDINATES _____ N _____ E DATE STARTED _____ DRILLING CO.

COUNTY _____ PROJECT _____ COLLAR ELEVATION _____ DATE COMPLETED _____

INCLINATION _____ BEARING _____ FINAL DEPTH _____

FOOTAGE	L1	L2	CORE: % REC. BY FT.	CORE: LBS. REC.	CORE: % REC. BY WT.	CORE: TOT. CU.	CORE: OX CU	CORE: MO S2	CORE: ASSAY	CORE SIZE	SAMP. NO.	SLUDGE: SAMP. NO.	SLUDGE: LBS. REC.	SLUDGE: % REC. BY WT.	SLUDGE: SPLIT	SLUDGE: ASSAY TOT. CU.	SLUDGE: ASSAY OX CU	SLUDGE: ASSAY MO S2	COMBINED ASSAY: PERCENT 0.1 0.5 1.0	COMBINED ASSAY: TOT. CU
21 0 30 0	9 0	8 7	97			0 02				NX	59-1									
30 0 41 2	11 2	9 1	81			0 03					60-1									
41 2 50 0	8 8	8 7	99			0 03					61-1									
50 0 60 7	10 7	10 5	98			0 04					62-1									
60 7 69 8	9 1	9 1	100			0 04					63-1									
69 8 80 8	11 0	11 0	100			0 02					64-1									
80 8 91 3	10 5	10 5	100			Tr					65-1									
91 3 100 7	9 4	9 4	100			Tr					66-1									
100 7 109 1	8 4	8 3	99			Tr					67-1									
109 1 121 2	12 1	12 1	100			0 02					68-1									

DDH NO. SH-9

STATE Arizona MINING DISTRICT Amole COORDINATES G 50 N 61 E DATE STARTED 12/28/60 DRILLING CO. Joy

COUNTY Pima PROJECT Saginaw Hill COLLAR ELEVATION DATE COMPLETED 1/16/61

Sec 12, T15S, R12E INCLINATION Vert BEARING FINAL DEPTH 733.0

FOOTAGE	UNALT	CHLOR.	EPIDOTE	MONTMOR.	BIOTITE	KAOL.	HY. MICA.	ORTHO.	SER.	SIL.	STAGE NO.	ROCK TYPE	SECTION	CU5FES4	CUFES2	FES2	CU2S	CUS	MOS2	% Sulphides	OXIDE ZONE: LEACHED CAVITIES-COLOR ETC. / SULPHIDE ZONE-CHAR OF MIN. DISS. VEIN, ETC.	< INCL.	FRACTURING	GEOLOGY	LOG BY
121 2 132 3						✓			✓			Qtz Monz Porphyry								~1	Py, chalcocite		35, 60, 80	-do- & rock more porphyritic.	[illegible]
132 3 140 4						✓			✓			"								~1	"		20, 30, 55, 70	-do- & fractured zone w/ ground-up sulphides & gouge from 132' to 134.5'	
140 4 147 6						✓			✓			"		142.5						<1	"		60, 30, 40	-do- and degree of porphyriticity variable; py diminishes	
147 6 155 5						✓			✓			"								<1	"		20, 50, vert	-do- and rock often gougey.	
155 5 166 5				✓		✓			✓			"								<1	"		30, 40, 50, vert.	Rock still porphyritic. Very gougey to about 157'; strong clay alt. Broken-up strongly from 160 to 161.8'; 165' to 166.5'. About 163' clastic rock fragment w/ py. extending into it. Rock fragment about 15 mm in length. Rock seems to become more porphyritic about 157'. Clay alt. frequently has a greenish cast. Pyrite minor, disseminated and along fractures. Chalcocite rare, as fine, scattered flakes & coatings on py.	
166 5 173 0						✓			✓			"								<1	"		30, 40, vert.	-do- and largest feld. phenocrysts up to 6 mm long. Rock broken-up strongly and gougey, esp. around 168.5'; 170'; & 173'. Clay alt. generally strong, esp. in broken up portions. Mod. to str. replacement of large feld. phenocrysts by py. frequent. No rock fragments seen.	
173 0 178 1						✓			✓			"		183.8						<1	"		vert, 10, 40	-do-	
178 1 186 5						✓			✓			"		183.8						<1	"		vert, 15, 40	-do- and green (dark) clay alt. of feld. phenocrysts associated w/ py. clusters frequent. Pyrite abundant. Grey, fine gr. clastic rock fragment 1" in length (max.) present at about 185.5'. Gougey zone about 186.5. 2 samples for thin section collected at 183.8'. Clay alt. mod. to str.	
186 5 194 2						✓			✓			"								<1	"		30, 60, 75	-do- and gougey zone at 189'; some calcite fracture filling. Clastic rock fragments present but rare.	
194 2 201 0						✓			✓			"								<1	"		25, 35, 80, vert.	-do- & dark green clay alt. of feld. phenocrysts associated w/ py. becomes rare. Py still replaces feld. pheno.	
201 0 214 7						✓			✓			"		202.5						<1	"		60, 20, 45	-do- and minor calcite veinlets, irregular. Feld. phenocrysts up to 1"	
214 7 223 9						✓			✓			"								<1	"		30, 80, 20, 40	-do- and dark green clay alt. of feld. phenocrysts associated w/ py. Clusters frequent toward end of interval (last 4 feet).	
																								Note: microchem. tests indicate that much of material indentified as chalcocite is ~~sphal~~ sphalerite & finely divided pyrite.	
223 9 235 6						✓			✓			"								<1	py, chalcopy, sphal		30, 20, 55, vert.	Flat fractures (~20°) often gougey (2.25' zone from 229.6' to 231.85'). Occasional clastic fragments & large feld. phenocrysts, often euhedral. Clay alt. mod. to strong, strong esp. along fracture zones. Some dark green clay alt. w/ clusters of py. Gouge zone along flat fracture at 235.6. Chalcopy rare, dissem. Black "flecks" probably sphal.	
																								Note: Palo Verde Fault zone has been postulated near vert.: most of fractures w/ shearing & gouge in #9 are flat.	
235 6 246 5						✓			✓			"								<1	py, sphal		30, 35, 50, vert	-do- and clastic frags. more numerous, often carry py, once w/ sphal around py; feld. phenocrysts more numerous, up to 14 mm. in length. Gouge zone 244.7-246.5	

DDH NO. SH-9

STATE Arizona　MINING DISTRICT Amole　COORDINATES 6,50 N 61 E　DATE STARTED 12/ /60　DRILLING CO. Joy

COUNTY Pima　PROJECT Saginaw　COLLAR ELEVATION　DATE COMPLETED 1/6/61

INCLINATION vert　BEARING　FINAL DEPTH 733.0

FOOTAGE		L1	L2	% REC. BY FT.	LBS. REC.	% REC. BY WT.	CORE ASSAY TOT. CU.	OX CU	MO S2	CORE SIZE	SAMP. NO.	SLUDGE SAMP. NO.	LBS. REC.	% REC. BY WT.	SPLIT	SLUDGE ASSAY TOT. CU.	OX CU	MO S2	COMBINED ASSAY PERCENT 0.1 0.5 1.0	TOT. CU
121 2	132 8	11 1	11 0	99			0 02			NX	69-1									
132 3	140 4	8 1	8 1	100			Tr				70-1									
140 4	147 6	7 2	7 0	97			Tr				71-1									
147 6	155 5	7 9	7 9	100			Tr				72-1									
155 5	166 5	11 0	10 4	95			Tr				73-1									
166 5	173 0	6 5	5 6	86			0 02				74-1									
173 6	178 1	5 1	3 3	65			0 02				75-1									
178 1	186 5	8 4	8 6	102			Tr				76-1									
186 5	194 2	7 7	7 7	100			Tr				77-1									
194 2	201 0	6 8	6 5	96			0 02				78-1									
201 0	214 7	13 7	13 9	101			Tr				79-1									
214 7	223 9	9 2	9 6	104			0 02				80-1									
223 9	235 6	11 7	11 7	100			0 04				133-1									
235 6	246 5	10 9	10 9	100			0 04				134-1									

DDH NO. SH-9

STATE Arizona
COUNTY Pima
Sec 12, T15S, R12E
MINING DISTRICT Arnole
PROJECT Sugnaw Well
COORDINATES G.50 N 61 E
COLLAR ELEVATION
INCLINATION Vert
BEARING
DATE STARTED 12/28/60
DATE COMPLETED 1/16/61
FINAL DEPTH 733.0
DRILLING CO. Jay

FOOTAGE	UNALT	CHLOR.	EPIDOTE	MONTMOR.	BIOTITE	KAOL.	HY. MICA.	ORTHO.	SER.	SIL.	STAGE NO.	ROCK TYPE	SECTION	CU5FES4	CUFES2	FES2	CU2S	CUS	MOS2	% Sulphide	OXIDE ZONE: LEACHED CAVITIES-COLOR ETC. / SULPHIDE ZONE-CHAR OF MIN. DISS. VEIN, ETC.	< INCL.	FRACTURING	GEOLOGY	LOG BY
246 5 – 257 8						✓			✓			Qtz Mon Porph.								<1	py, sphal?		20, 70, 40	-do- quite clay alt w/ py still present, very minor calite filling	
257 8 – 266 0						✓			✓			"								<1	py, sphal?		30, 35, vert	-do- and gouge zone at 266.0 about 1" wide. Sphal & py. been abundant. Alt slightly stronger	
266 0 – 279 7						✓			✓			"		275'						~1	" , sphal		30, 40, 55, 20	-do- and gouge, alt. 276-277, brecciated. Slight mean. dark green clay & py clusters more abundant.	
279 7 – 285 1						✓			✓			"								~1	py, sphal?		35, 60	-do- and esp. gouge 280.8-282.3', flat fractures	
285 1 – 294 8						✓			✓			"								<1	" "		50, 70, 20	-do- med. to strong clay alt. pyrite. frequently gouge in lands also flat (~20°) fractures	
294 8 – 303 4						✓			✓			"								<1	" "		45, 50, 30	-do- & large fld. phenocrysts (5-10 mm) still present but matrix fine grained, beginning about 331'. Clastic rock frags. rare. Very rare.	
303 4 – 317 0						✓			✓			"								<1	" "		25, 35	-do- grain size of matrix coarse (med.) fld phenocrysts more numerous. Rock gouge, trends up. Often have py along fractures. One set of py stringers dipping 60° offset by 20° shears	
317 0 – 325 3						✓			✓			"								"	" "		20, 50	-do- and very gouged; py most abundant in gouge zones	
325 3 – 336 9						✓			✓			"								"	" "		30	-do- alt generally strong; py most abundant in gouge zones	
336 9 – 345 4						✓			✓			"								"	" "		20, 40, 50	-do-	
345 4 – 351 5						✓			✓			"								"	" sphal		30, 20	-do- some thin sphal stringers. No rock frags.	
351 5 – 357 0						✓			✓			"								"	" "		40, 20	-do-	
357 0 – 365 3						✓			✓			"								"	" "		20, 30, 70	-do- clastic rock frags. present but rare	
365 3 – 375 4						✓			✓			"								"	" sphal(?)		65, 40	-do- fractures >30° as well as flat fractures gouge	
375 4 – 385 9						✓			✓			"								"	" "		40, 20, 30	-do- and clastic rock frags. up to 70 mm in length	
385 9 – 395 0						✓			✓			"								"	" "		vert, 45, 20, 30	-do- fld. phenocrysts frequently euhedral	
395 0 – 408 5						✓			✓			"								"	" "		35, 60	-do- no rock frags.	
408 5 – 418 0						✓			✓			"								"	" "		30, 20	-do-	
418 0 – 427 7						✓			✓			"								"	" "		30, 20, 50	-do- Black "flecks" - sphal(?) - present everywhere.	
427 7 – 436 0						✓			✓			"								"	" "		35, 25, 60.	-do-	
436 0 – 446 6						✓			✓			"								"	" "		40, 60, 20	-do- rock not as gouge, still broken up. Pyrite (copper total sulphides) content probably less than 0.5% to some 351'	
446 6 – 456 2						✓			✓			"		465.5'						"	" "		70, 30	-do- rock still gouge in some zones; clay alt generally strong	
456 2 – 466 3						✓			✓			"								"	" "		70, 40, 30	-do- from about 462.5 on clay alt. moderate to strong only; rock not gouge & occasional euhedral "zoned" fld. Py. more abundant.	
466 3 – 474 8						✓			✓			"								"	" "		60, 80, 30	-do- gouge zone at 467' & doubly terminated qtz xtl.	
474 8 – 483 4						✓			✓			"								"	" "		60, vert, 50, 30	-do- Rock well broken up, strongly alt. last 2', w/ calite crystals filling open vert. fractures. No rock fragments	
483 4 – 495 0						✓			✓			"								"	" "		30, 45, 70	-do- clay alt. mod to strong & very strong, rock broken up	
495 0 – 505 8						✓			✓			"								"	" "		30, vert, 50	-do- 501 to 503', broken up, w. strong clay alt. frequent gouge zones along flat (<30°) fractures. Some calite filling in broken up zones along steep fractures	
505 8 – 513 5						✓			✓			"		508						"	" "		50, 20, 30, 60	-do- gouge from 510-511.6, very str. clay alt. one dyke(?) qtz xtl 10 mm across top.	
513 5 – 524 5						✓			✓			"								"	" "		50, 30, 40, 70	-do- frequent gouge & v. str. clay alt. from 513.5 to 516.7 generally on fractures dipping <40°. Calcite still filling some steep open fractures	
524 5 – 531 4						✓			✓			"								"	" "		20, 30, 50, vert	-do- mod. to strong & very strong clay alt. Gouge broken zone around 532'	
531 4 – 537 3						✓			✓			"		551.1'						"	" "		30, 20, vert	-do- gouge, broken zone bounded by <30° fractures around 537'.	
537 3 – 545 0						✓			✓			"								"	" "		15, 20, 70	-do- gouge zone around 545'; shearing on both flat & steep fractures. One fld phenocryst 20 mm long	
545 0 – 557 3						✓			✓			"								"	" "		15, vert, 30	-do- broken up & gouge for whole interval	
557 3 – 567 4						✓			✓			"								"	" "		40, 50, 75, 30	-do- clay alt. strong & moderate	

DDH NO. SH-9

STATE _____ MINING DISTRICT _____ COORDINATES _____ N _____ E _____ DATE STARTED _____ DRILLING CO. _____

COUNTY _____ PROJECT _____ COLLAR ELEVATION _____ DATE COMPLETED _____

INCLINATION _____ BEARING _____ FINAL DEPTH _____

FOOTAGE		L1	L2	CORE % REC. BY FT.	CORE LBS. REC.	CORE % REC. BY WT.	CORE ASSAY TOT. CU.	CORE ASSAY OX CU	CORE ASSAY MO S2	CORE SIZE	CORE SAMP. NO.	SLUDGE SAMP. NO.	SLUDGE LBS. REC.	SLUDGE % REC. BY WT.	SLUDGE SPLIT	SLUDGE ASSAY TOT. CU.	SLUDGE ASSAY OX CU	SLUDGE ASSAY MO S2	COMBINED ASSAY PERCENT 0.1 0.5 1.0	COMBINED ASSAY TOT. CU
246.5	257.8	11.3	11.1	98			0.04			NX	135-1									
257.8	266.0	8.2	8.2	100			0.06				136-1									
266.0	279.7	13.7	13.3	97			0.04				137-1									
279.7	285.1	5.4	5.2	96			0.04				138-1									
285.1	294.8	9.7	9.7	100			0.04				139-1									
294.8	303.4	8.6	8.6	100			0.06				140-1									
303.4	317.0	13.6	13.6	100			0.03				141-1									
317.0	325.3	8.3	8.3	100			0.05				142-1									
325.3	336.9	11.6	11.6	100			0.04				143-1									
336.9	345.4	8.5	8.2	97			0.04				144-1									
345.4	351.5	6.1	5.8	95			0.02				145-1									
351.5	357.0	5.5	5.4	99			Tr.				203-1									
357.0	365.3	8.3	8.4	101			Tr.				204-1									
365.3	375.4	10.1	9.3	92			0.02				205-1									
375.4	385.9	10.5	10.7	102			Tr.				206-1									
385.9	395.0	9.1	9.2	101			Tr.				207-1									
395.0	408.5	13.5	13.4	99			Tr.				208-1									
408.5	418.0	9.5	9.0	95			Tr.				209-1									
418.0	427.7	9.7	8.6	89			Tr.				210-1									
427.7	436.0	8.3	6.8	82			0.03				211-1									
436.0	446.6	10.6	10.5	99			0.02				212-1									
446.6	456.2	9.6	7.2	75			0.02				213-1									
456.2	466.3	10.1	10.1	100			Tr.				214-1									
466.3	473.4	7.1	7.1	100			Tr.				215-1									
473.4	483.4	10.0	10.0	100			0.02				216-1									
483.4	495.0	11.6	11.6	100			0.02				217-1									
495.0	505.8	10.8	9.5	88			Tr.				218-1									
505.8	513.5	7.7	9.3	121			Tr.				219-1									
513.5	524.5	11.0	11.0	100			Tr.				220-1									

DDH NO. SH-9

STATE Arizona MINING DISTRICT Amole
COUNTY Pima PROJECT Saginaw Hill
Sec 12 T15S, R12E

COORDINATES G.50 N 61 E
COLLAR ELEVATION
INCLINATION vert. BEARING

DATE STARTED 12/28/60 DRILLING CO. Joy
DATE COMPLETED 1/16/61
FINAL DEPTH 733.0

FOOTAGE	UNALT	CHLOR.	EPIDOTE	MONTMOR.	BIOTITE	KAOL.	HY. MICA.	ORTHO.	SER.	SIL.	STAGE NO.	ROCK TYPE	SECTION	CU5FES4	CUFESZ	FE S2	CU2S	CUS	MOS2	% sulphides	OXIDE ZONE: LEACHED CAVITIES-COLOR ETC. / SULPHIDE ZONE-CHAR OF MIN. DISS. VEIN, ETC.	< INCL.	FRACTURING	GEOLOGY	LOG BY
567 4 573 0						✓			✓			Qtz Monz Porph.								<1	Py, sphal (?)		60, 20	-do-	
573 0 583 0						✓			✓			"								"	" "		45, 30, 60	-do- clay alt. generally strong, sometimes mod. dark green clay alt. w/ pyrite still present but v. minor rock still frequently gorgey w/ calcite filling fractures frequent. Py. still minor sphal v. rare, fine disseme, questionable	
583 0 594 5						✓			✓			"								"	" "		40, 35, 20	-do-	
594 5 604 6						✓			✓			"								"	" "		30, 40, 70, vert	-do-	
604 6 609 0						✓			✓			"								"	" "		70, 45, 35	-do- dark green clay alt. w/ py. more abundant	
609 0 613 5						✓			✓			"								"	" "		40, 30, vert	-do- rock well broken up, frequently gorgey & strongly alt.	
613 5 623 5						✓			✓			"								"	" "		45	-do-	
623 5 633 2						✓			✓			"								"	" "		40, 60, 30, vert.	-do- gorgey from 631 to 632.3	
633 2 643 2						✓			✓			"								"	" "		60, 30	-do-	
643 2 659 1						✓			✓			"								"	" "		35, 50, 65	-do-	
659 1 674 4						✓			✓			"								"	" "		70, 45	-do- large feld. xls more abundant	
674 4 680 3						✓			✓			"								"	" "		50, 60, vert	-do-	
680 3 695 8						✓			✓			"								"	" "		40, 70, vert.	-do- py. more abundant, dark green clay alt. w/ py clusters around feld. phenocrysts more abundant.	
695 8 714 0						✓			✓			"								"	" "		30, 50, 65	-do- gorgey last 2' of interval	
714 0 724 4						✓			✓			"								"	" "		60, 70, 30, 40	-do-	
724 4 730 7						✓			✓			"								"	" "		80, 55, 30, vert	-do- sometimes gorgey, clay alt. slightly stronger	
730 7 733 0						✓			✓			"								"	" "		60, 30	-do-	

DDH NO. SH-10

STATE Arizona MINING DISTRICT Amole
COUNTY Pima PROJECT Saginaw Hill
Sec 12, T15S, R12E

COORDINATES M.50 N 55 E
COLLAR ELEVATION
INCLINATION Vert BEARING

DATE STARTED 1/16/61 DRILLING CO. Joy
DATE COMPLETED 2/10/61
FINAL DEPTH 524.6

FOOTAGE				UNALT	CHLOR.	EPIDOTE	MONTMOR.	BIOTITE	K-FEL.	HY. MICA	ORTHO.	SER.	SIL.	STAGE NO.	ROCK TYPE	SECTION	CuFeS4	CuFeS2	FeS2	CuZS	CuS	MoS2	% Sulphides	OXIDE ZONE: LEACHED CAVITIES-COLOR ETC. / SULPHIDE ZONE-CHAR OF MIN. DISS. VEIN, ETC.	< INCL.	FRACTURING	GEOLOGY	LOG BY
																											R.K.b.t	
0	0	8	0																										
8	0	11	1												Arkose								0	Mn-dendrites, limonite - hematite stain, hem. x-ls. on fractures	65°	40, 60°	lt grey to tan, fine to med. sandstone-grained arkose, slightly calcareous. Some thin calcite stringers. Oxides of Mn & Fe generally along fractures. General Fe-ox. staining of rock. Fe stain often occ. in zone on either side of calcite stringers.	
11	1	20	5												Ark-Silt-Ark-Silt								0	" (also hem. "blebs" in calcite veins)	60	40, 65, vert	Arkose for first few inches. Then purplish grey (med grey) coarse siltstone to about 15', then lt. grey to tan, fine to med. ss-gr. arkose to about 19.5', then siltstone to about 20.5. Siltstone was frequent thin (.1") calcite stringers. Arkose from 15' to 19.5' is broken up with calcite veins up to .5" in thickness carrying "blebs" of Fe-ox. (hem & lim.); calcite & siderite present. Thicker calcite veins & offsets in arkose generally along apparent fractures. Siltstone carries only minor amt. of blebs, generally as stain, esp. on fractures and in zones adjacent to calcite.	
20	5	30	0												Ark								0	"	65	85, 70, 40	Variation in color of arkose beds. Some lt. grey to tan, some lt. to med. grey, sl. purplish. Grain size is both about same (fine to med. gr.) & both sl. calc. Arkose often broken-up & fractures filled w/ calcite carrying Fe-oxides.	
30	0	40	8												Ark-silt								0	Mn, hem, hem	60	35, 65, 20, 80	lt grey to tan arkose with minor calcite stringers along fractures and bedding planes; oxides are minor, generally along bedding planes & fractures. At 34.2', med. grey coarse siltstone of v. minor. Thin calcite stringers & oxide stringers; also some oxide specks - probably hem & lim after py.; at about 36.5' a lt. reddish or purplish grey med. gr. siltstone to end of interval; well broken up & coated w/ oxides & some calcite along fractures. All of calc beds are v. sl. calc. except last lt. purplish grey & lt grey beds at end which are sl. calc. & calc. Last beds have banded towards end of interval - lt. reddish and dark greenish black. Thin bands of lt grey, broad bands. From about 36.8 on rock becomes increasingly more broken up, sl. greyish (w/ some clay alt) and finer grained.	
40	8																												
40	8	47	3												Silt/Ark ?									"	65	70, 55, vert, 65	Very gouge, well broken up & strongly altered & oxidized for whole interval. Hem & lim. stringers and blebs - stringers often displaced - are quite common as well as hem, lim, & Mn stain. Calcite veins & stringers & very pitting common. Rock shows bedding (laminae) and seems to be of a v. calc. silty nature in some places but in other places it is ground up and cly. with qtz grains and all filled matrix so that it resemb. arkose (or greywacke?). Bedding plane shearing and sec. shearing w/ appreciable displacements common.
47	3	56	5												Silt/Ark Ark Silt/Arkose Ark								<1	py, chalcocite		50, 40, 60, 75	First 1½ feet altered & gouge w/ silt & arkose in fault contact? (w/ arkose below) along about a 40° plane; last 6" of this seems to be siltstone again in fault contact? (w/ arkose below) along 40° plane. Siltstone is fine gr. & lt grey; oxidized (hem & lim), strongly altered in places, generally along fractures. Below about 48.8', there is about a foot of med. gr. arkose; it is a lt. grey and is oxidized. It is in contact w/ a finer gr. rock (silt) of a reddish color along a 75° fracture. This reddish fine siltstone (arenaceous) is in turn in contact (along an irregular, fairly flat contact) with a fine gr. med. (blank) grey arkose. This arkose starts about at about 50' and carries some sulphides - c. mineral

Sulphides? Pyrite

Brecciated, bad contact

DDH NO. SH-10

STATE Arizona MINING DISTRICT Amole COORDINATES M.50 N 55 E DATE STARTED 1/16/61 DRILLING CO.
COUNTY Pima PROJECT Saginaw Hill COLLAR ELEVATION DATE COMPLETED 2/10/61 Joy
Sec 12, T15S, R12E INCLINATION vert BEARING FINAL DEPTH 524.6

FOOTAGE	UNALT	CHLOR.	EPIDOTE	MONTMOR.	BIOTITE	KAOL.	HY. MICA.	ORTHO.	SER.	SIL.	STAGE NO.	ROCK TYPE	SECTION	CU5FES4	CUFESZ	FES2	CU2S	CUS	MOS2	% Sulphides	OXIDE ZONE: LEACHED CAVITIES-COLOR ETC. / SULPHIDE ZONE-CHAR OF MIN. DISS. VEIN, ETC.	< INCL.	FRACTURING	GEOLOGY	LOG BY
																								pyrite in very thin stringers, disseminations & clusters and rare chalcocite in very thin stringers and scattered "specks" (as coatings on py?) At about 53', rock oxidized and brecciated to about 55.5' w/ med grey siltstone (unox.), oxidized lt. grey siltstone, oxidized coarse arenaceous siltstone in contact with one another and with med. grey arkose along fractures and along fragment borders. This brecciated zone is frequently calcified by veins & vugs of calcite: it seems to be a steeply dipping zone. Last foot of interval (55.5 – 56.5) is med grey (bluish) fine gr. arkose in vert contact w/ fine med. grey siltstone along vert. fract. which is filled w/ calcite and contains fragments of the siltstone.	
56 5 66 5												Silt/Ark Ark		51' 64'						<1	Lim, lim, Mn, Py, chalcocite	65	70, 25, 60, vert, 55	med grey fine gr. siltstone becoming lt. grey w/ reddish siltstone beds up to 2 inches thick faulted in. From about 60.5 to 62.0 siltstones – reddish & lt. grey – are brecciated & oxidized. From about 62.0 to 65.5, fine gr. med. (bluish) grey sl. calc. arkose: often sheared & gougey (clay alt. on frac.) w/ v. minor pyrite in thin stringers – often w/ calcite – and/or scattered disseminations and rare calcocite in very thin stringers and scattered specks, very gougey & sheared at end of interval.	
66 5 73 2												Ark-Silt ~~silt/ark~~ brecciated contact								<1	Py, chalcocite, pyrrhotite? lim, hem	65	65, 25, 35	brecciated and faulted – w/ strongest shearing along 70' fracture – for first 3 feet or so: sulphides abundant – py, chalcocite, pyrrhotite – in this zone, especially first part (first feet or so) near strongly sericitized fractures (70°): sulphides near this first strongly sericitized, sheared fracture are approx. aligned w/ fracture and appear to be pulled-apart stringers (of pyrite, mostly): there are some pyrite clusters aligned at rt. angles to the general 70° dip. Bedding is obscure here but perhaps the pyrite stringers follow the bedding and the fracture is a bedding plane fault. A general zone of sulphides along fractures & bedding, gouge & alt. along fractures, minor disseminated sulphides, & brecciation w/ some sides along fracture surfaces that are not sheared & sericitized continues for the whole interval of arkose which ends at about 71'. Below the arkose is a siltstone which is a lt. grey with some reddish bands & irregular discolorations, minor sulphides – pyrite, rare chalcocite(?) – along bedding planes, & oxidized calcite along fractures.	
73 2 80 0												Silt/Ark Ark/Silt Silt								<1	Py "	65	65, 70, 40	The rock at the very begining of the run is med & lt. grey siltstone. Within a foot it is in contact along a 70° calcified fracture w/ a siltstone & arkose breccia. This continues to about 75' where it	

DDH NO. SH-10

STATE _____ MINING DISTRICT _____ COORDINATES _____ N _____ E DATE STARTED _____ DRILLING CO.

COUNTY _____ PROJECT _____ COLLAR ELEVATION _____ DATE COMPLETED _____

INCLINATION _____ BEARING _____ FINAL DEPTH _____

FOOTAGE	L1	L2	CORE: % REC. BY FT.	LBS. REC.	% REC. BY WT.	TOT. CU.	OX CU	MO S2	ASSAY Pb	Zn			CORE SIZE	SAMP. NO.	SLUDGE: SAMP. NO.	LBS. REC.	% REC. BY WT.	SPLIT	ASSAY TOT. CU.	OX CU	MO S2				COMBINED ASSAY: PERCENT 0.1 0.5 1.0	TOT. CU		
66 5 73 2	7 7	7 2	94			0 03			0 05	0 05			NX	329-1														
73 2 80 0	6 8	6 2	91			Tr			Tr	Tr				330-1														

DDH NO. SH-10

STATE Arizona MINING DISTRICT Amole
COUNTY Pima PROJECT Saginaw Hill
Sec 12, T15S, R12E

COORDINATES M.50 N 55 E
COLLAR ELEVATION
INCLINATION vert BEARING

DATE STARTED 1/16/61 DRILLING CO. Joy
DATE COMPLETED 2/10/61
FINAL DEPTH 524.6

FOOTAGE	UNALT	CHLOR.	EPIDOTE	MONTMOR.	BIOTITE	KAOL.	HY. MICA.	ORTHO.	SER.	SIL.	STAGE NO.	ROCK TYPE	SECTION	CUSFES4	CUFES2	FES2	CU2S	CUS	MOS2	% sulphides	OXIDE ZONE: LEACHED CAVITIES-COLOR ETC. / SULPHIDE ZONE-CHAR OF MIN. DISS. VEIN, ETC.	< INCL.	FRACTURING	GEOLOGY	LOG BY
																								is separated by a 70° fracture (at an acute angle to bedding) from med grey siltstone below. This brecciated interval carries calcite, sericite, minor oxides of Fe rare chalcocite & minor py. Siltstone below brecciated, altered zone carries some scattered pyrite & chalcocite and is oxidized and calcified along fractures and oxidized along some laminae. The end of the interval is badly broken up and oxidized to a light rust color.	
80 0 91 7												Silt		86'						<1	py, chalcocite lim, hem	70	80, 65, 35	lt. bluish grey, sl. arenaceous (?) siltstone w/ some dark grey* bands of laminae. Chalcocite & pyrite mostly as fine disseminations but some "pencil-thin" stringers (less than .05" wide): most chalcocite in darker bands, but not restricted to darker bands. Oxides of Fe+++ along fractures as coating, esp. in first 2' of interval where there are rugg calcite veins filling fractures. *[sl. coarser]	
91 7 103 0												Silt								<1	"	70	75, 60, 40	Same as last interval except that from about 96' to 100' rock is strongly altered, pitted, oxidized along bands - dark bands which are more frequent, more finely laminated - gouging & sheared, and more mineralized w/ py & chalcocite (this is true in last interval also) Rock is slightly brecciated along steep fractures last 3 ft. of interval. Thin calcite seams frequent.	
103 0 109 3												Silt									"	70	80, 40, 60	Same lt. (bluish) grey siltstone w/ darker, finely lam., coarser bands but with some lt grey siltstone - one bed, ~~[illegible]~~ about a foot thick - with rare sulphides toward end of interval. Rock is gouged, brecciated, sheared & strongly altered, esp. in the first four feet. Abundant mineralization - py. & chalcocite - in first 4 feet or so: last foot also carries py & chalcocite in lt grey (bluish) siltstone w/ darker bands. Oxides occur along bedding planes and fracture planes as thin coatings. Thin calcite stringers and occasional veins. Sulphides occur as disseminations (and in stringers less frequently) disseminations generally conc. in bands - this is probably why first four feet are so strongly mineralized: this portion of rock is mostly made up of the coarser, finely laminated siltstone that occurs in bands, in very fine, bedded silt.	
109 3 119 3												Alk-Silt-Alk								<1	"	70	45, 80, 60	Breccia zone w/ various siltstone fragment & calcite filling at end of last interval ~~[illegible]~~ is beginning of lt to med. grey (bluish) v. fine ~~gr.~~ ss. grained arkose - a silty arkose, almost a siltstone. It carries py. & chalcocite, both fairly minor, and is itself brecciated. Oxides occur along some fractures. At about 112' strongly altered, brecciated, & partially oxidized zone brings in a lt. grey siltstone containing purple "areas" and abundant oxide staining - but rare sulphides. A zone of shearing at about 116.7' separates this siltstone from a lt. grey, very fine ss-gr. arkose (almost a silt) contain very minor pyrite & chalcocite. This continues to about 119.3 where there is another gouge zone.	
119 3 130.2												Alk-Silt		120.3						<1	Chalcocite, py, sphal (& gal?), chalco py.	70	70, 40, 30	Med to lt. grey v. fine ss-gr, sl. calc. arkose to about 128.0 where a steep gouge zone marks the beginning of	

DDH NO. SH-10

STATE _____ MINING DISTRICT _____
COUNTY _____ PROJECT _____

COORDINATES _____ N _____ E
COLLAR ELEVATION _____
INCLINATION _____ BEARING _____

DATE STARTED _____ DRILLING CO. _____
DATE COMPLETED _____
FINAL DEPTH _____

FOOTAGE		L1	L2	CORE % REC. BY FT.	CORE LBS. REC.	CORE % REC. BY WT.	CORE TOT. CU.	CORE OX CU	CORE MO S2	CORE ASSAY Pb	CORE ASSAY Zn	CORE SIZE	CORE SAMP. NO.	SLUDGE SAMP. NO.	SLUDGE LBS. REC.	SLUDGE % REC. BY WT.	SLUDGE SPLIT	SLUDGE ASSAY TOT. CU.	SLUDGE ASSAY OX CU	SLUDGE ASSAY MO S2	COMBINED ASSAY PERCENT 0.1 0.5 1.0	COMBINED ASSAY TOT. CU
80.0	91.7	11.7	11.6	99			.002			Tr	Tr		UX 377-1									
91.7	103.0	11.3	11.3	100			.002			Tr	.08		378-1									
103.0	109.3	6.3	6.3	100			.002			.005	.005		379-1									
109.3	119.3	10.0	10.0	100			Tr			Tr	Tr		380-1									
119.3	130.2	10.9	10.9	100			Tr			Tr	Tr		381-1									

DDH NO. SH-8

STATE Arizona
COUNTY Pima
Sec 12, T 15S, R 12E
MINING DISTRICT Ajo
PROJECT Saginaw Hill

COORDINATES J 50 N 61 E
COLLAR ELEVATION
INCLINATION vert BEARING

DATE STARTED 12/24/60 DRILLING CO. Joy
DATE COMPLETED 1/17/61
FINAL DEPTH 966.8

FOOTAGE	UNALT	CHLOR.	EPIDOTE	MONTMOR.	BIOTITE	KAOL.	HY. MICA	ORTHO.	SER.	SIL.	STAGE NO.	ROCK TYPE	SECTION	CU5FES4	CUFES2	FES2	CU2S	CUS	MOS2	Est. pct. sulfides	OXIDE ZONE: LEACHED CAVITIES-COLOR ETC. / SULPHIDE ZONE-CHAR OF MIN. DISS. VEIN, ETC.	< INCL.	FRACTURING	GEOLOGY	LOG BY
0 0 11 1	Rabbit																								
11 1 19 6						✓			✓			Qtz Monz Porph								0	limonite, Mn-dendrites, hematite		50, 20, 30, ~vert	Qtz monzonite porphyry: lt. gray, med. grained, slightly porphyritic with clear, frequently euhedral to subhedral qtz. xls. Qtz. xls. sometimes larger than large. See bel. Moderate to strong clay alt. (kaolinite + sericite, etc.) Fe-oxides and mostly limonite (after pyrite?) in stringers + disseminations. Mn stain (+ hematite?) on fracture surfaces. Fracturing well developed and abundant.	
19 6 29 6						✓			✓			"								0	"		45, 15, 70, 30, vert	-do-	
29 6 41 1						✓			✓			"								0	"		65, 20, vert.	-do- Some qtz veinlets	
41 1 51 1						✓			✓			"								0	"		5, 40, 20, vert, 50	-do-	
51 1 59 4						✓			✓			"								0	"		70, 40, vert	-do- fault gouge at 55, 57' + 59'	
59 4 68 5						✓			✓			"		76.5						0	"		45, 20, 65	-do- fault gouge at 66'	
68 5 78 7						✓			✓			"								F	limonite, lim, Mn dendrite, py		65, 20, 70	Oxidized to about 68.5; then relatively unfractured zone w/ sulfides to about 77; then back to oxides. Clear from oxide to sulfide zone gradual, sulphide to oxide abrupt. Oxide zone 74.1 - 74.6 along 70° fracture zone; very sulphide zone has moderate clay alt. w/ py as disseminations + in some stringers.	
78 7 90 5						✓			✓			"								0	lim, hem, Mn ox		40, 60, 25	Oxide zone. Fault gouge from 81 - 83.5'. Strong clay alt. along fractures.	
90 5 100 5						✓			✓			"								<1	limonite, hematite, py, chalcocite, chalcopyrite.		40, 55	Mixed oxide - sulphide zone, mostly oxides. Strong clay alt., fractures often wide w/ qtz. xls. in gouge. Sericite well developed along many shears w/ chalcocite coating pyrite lapilli + pyrite euhedrons setting in sericite (at 99.5') Chalcopy. as V. minor disseminations.	
100 5 106 6						✓			✓			"								<1	lim, hem, Mn-ox, py, Cu-ox (green)		50, 40, 70	-do- Sulphides only last 3" of interval in any abundance. Green Cu-ox, disseminated at 104.6 + 105.6, but well broken-up + gouge for whole interval	
106 6 114 4						✓			✓			"								<1	lim, hem, Mn ox, py, chalcocite(?), sphal(?)		40, 50, vert.	-do- Sulphides except for oxide between about 110.1 + 114.4. Oxides are concentrated in gouge zone. Py, + chalcocite(?) sphal(?) as disseminations. *Note Chalcocite is questionable, occurs as very fine flakes. McCochem test indicates much of simply disseminated material is sphalerite + py (ground up).	
114 4 123 2						✓			✓			"								<1	py, sphal(?)		65, 45, 30	~~do~~ Sulphides, no oxides. Mod. to str. clay alt. Pyrite as disseminations. Very fine black flakes probably sphal. Gouge ~~from 123.2 to~~ at 123' + 125.2'. Some oxide along fractures. Clay developed often greenish.	
123 2 130 7						✓			✓			"								<1	py, sphal(?), lim, hem, Mn.		40, 25, vert	Sulphides w/ oxides along fracture surfaces. Clay alt. mod. to strong, rock broken up, frequently gouge. Oxidation strong in gouge zone. Calcite along some fractures. Py + few flakes of sphal(?) as disseminations.	
130 7 139 3						✓			✓			"								"	"		25, 40, vert.	-do-	
139 3 148 5						✓			✓			"								"			70, 40, 15, vert	-do- feld. coarse	
148 5 158 5						✓			✓			"								"	Py, lim, hem, sphal(?)		50, 30, 10	-do- Py increasing, as disseminations + along fractures as stringers. Also in calcite veins. Oxides minor, only along fractures. Qtz. not as abundant.	

DDH NO. SH-8

STATE ____ MINING DISTRICT ____ COORDINATES ____ N ____ E DATE STARTED ____ DRILLING CO. ____

COUNTY ____ PROJECT ____ COLLAR ELEVATION ____ DATE COMPLETED ____

INCLINATION ____ BEARING ____ FINAL DEPTH ____

CORE

FOOTAGE		L1	L2	% REC. BY FT.	LBS. REC.	% REC. BY WT.	TOT. CU.	OX CU	MO S2	ASSAY	CORE SIZE	SAMP. NO.
11 1	19 6	8 5	8 5	100			.002				NX	28-1
19 6	29 6	10 0	8 5	85			.008					29-1
29 6	41 1	11 5	12 9	112			.004					30-1
41 1	51 2	10 1	10 2	101			.004					31-1
51 1	59 4	8 3	8 2	99			.008					32-1
59 4	68 5	9 1	9 1	100			.008					33-1
68 5	78 7	10 2	10 2	100			.003					34-1
78 7	90 5	11 8	11 8	100			.009					35-1
90 5	100 5	10 0	9 8	98			.008					36-1
100 5	106 6	6 1	6 0	99			.031					37-1
106 6	114 4	7 8	7 8	100			.004					38-1
114 4	123 2	8 8	8 6	98			.006					39-1
123 2	130 7	7 5	7 5	100			.006					40-1
130 7	139 3	8 6	8 6	100			.004					41-1
139 3	148 5	9 2	9 2	100			.003					42-1
148 5	158 8	10 3	10 2	99			.007					43-1

SLUDGE

SAMP. NO.	LBS. REC.	% REC. BY WT.	SPLIT	ASSAY TOT. CU.	OX CU	MO S2

COMBINED ASSAY

PERCENT 0.1 0.5 1.0	TOT. CU

DDH NO. SH-8

STATE Arizona
COUNTY Pima
MINING DISTRICT Amado
PROJECT Sagenaw-Hill
Sec. 12, T15S, R12E

COORDINATES J.50 N 61 E
COLLAR ELEVATION
INCLINATION vert
BEARING

DATE STARTED 12/24/60
DATE COMPLETED 1/17/61
DRILLING CO. Joy
FINAL DEPTH 966.8

FOOTAGE	UNALT	CHLOR.	EPIDOTE	MONTMOR.	BIOTITE	KAOL.	HY. MICA.	ORTHO.	SER.	SIL.	STAGE NO.	ROCK TYPE	SECTION	CU5FES4	CUFES2	FE S2	CU2S	CUS	MOS2	% sulphide	OXIDE ZONE: LEACHED CAVITIES-COLOR ETC. / SULPHIDE ZONE-CHAR OF MIN. DISS. VEIN, ETC.	< INCL.	FRACTURING	GEOLOGY	LOG BY
158.8 168.9						v			v			"								2	Py, sphal(?), lim, hem		40, 70, vert	-do-	
168.9 178.7						v			v			"								"	Py, lim, hem, sphal(?)		80, 55, 10, 5, vert	-do- feld. not as coarse, qtz more abundant. Fracturing strong er.	
178.7 188.7						v			v			"								"	Py, sphal(?), lim		40, 60, 20	-do- lim. & minor, as coating on some fracture surfaces	
188.7 193.4						v			v			"		20	2.5'					"	Py, sphal(?)		45, 70, vert, 10	-do- some fractures show shearing	
193.4 203.4						v			v			"								"	Py, sphal(?) limonite, hem		20, 70, vert., 40	-do- lim & hem along loading of calcite fracture filling	
203.4 213.4						v			v			"								"	Py, lim, hem, sphal(?)		30, 75, vert	-do- minor oxide along fractures & in veins along fractures. Py not as abundant.	
213.4 223.4						v			v			"		22.4'						"	Py, sphal(?)		85, 45, 10	-do- qtz & py increasing, feld. coarser, no oxides.	
223.4 233.2						v			v			"								"	Py, sphal(?), chalcopy.		50, 30	-do- feld. coarser & more abundant below 225.5'. Py. minor, chalcopy very rare, disseim.	
233.2 243.2						v			v			"								"	Py, chalcopy		35, 50, 80	-do- rock varies from med. to coarse grained	
243.2 253.2						v			v			"								"	" " Py		40, 60	-do- chalcopy (c. var.) & py. frequently in calcite veins.	
253.2 263.2						v			v			"								"	" "		35, 45, 60	-do- sulphides increasing in abundance	
263.2 270.9						v			v			"								"	Py, chalcopy, sphal(?)		5, 70, 10, vert	-do- rock finer grained towards end of interval. Rock frequently gassy along fractures. Clay alt. mod. & str.	
270.9 280.9						v			v			"								"	Py, sphal(?)		45, 70, 20	-do- rock coarser grained, more feldspathic. Sulphides more abundant as stringers.	
280.9 291.1						v			v			"								"	Py, sphal(?)		45, 20	-do- sulphides more abundant. Sphal(?) frequently as halos around py.	
291.1 297.9						v			v			"								"	Py, sphal(?) chalcopy		60, 35	-do- shearing frequent.	
297.9 306.9						v			v			"								"	Py, sphal(?) chalcopy		45, 30, 50	-do- rock more porphyritic.	
306.9 317.9						v			v			"								"	py, sphal(?), chalcopy		30, 40, 70	-do- chalcopy & sphal(?) still very rare, in fine flakes.	
317.9 326.9						v			v			"								"	py, sphal(?)		50, 20, vert	-do- feld. phenocrysts up to 1/8" long. Rock well broken up & gassy between 318 & 319.5	
326.9 336.9						v			v			"								"	Py, sphal(?)		45, 70	-do- feld. phenocrysts up to 1/4" long	
336.9 346.9						v			v			"								"	" " chalcopy		70, 35	-do- calcite veins still present: often oxidized, often carry py. & chalcopy. Sphal(?) increases in abundance in broken up, strongly sericitized portions of rock.	
346.9 356.0						v			v			"		355.25' porphyritic						<1	py, sphal(?)		vert, 70, 45, 20	-do- rock well broken up, calcite fillings abundant. Sulphides often conc. along borders of calcite fracture filling.	
356.0 366.9						v			v			"								<1	py, sphal(?)		30, 40, 70	-do- more porphyritic from 356 to 357.5, then phenocrysts equigranular. Py. often replaces feld. phenocrysts. More porphyritic about 362'.	
366.9 376.9						v			v			"								"	" "		30, 45, 65, vert	-do-	
376.9 386.9						v			v			"								"	" "		45, 70	-do- fault gouge of calcite filling & fragments ~382'	
386.9 393.0						v			v			"								"	" "		30, 60, 40	-do- very gassy & broken up 391 - 393. Feldspar phenocrysts to 1/4" long	
393.0 404.6						v			v			"								"	" "		30, 50, 60	-do- feld. phenocrysts up to 1/8" long. Clay alt. mod. & strong.	
404.6 418.6						v			v			"								"	" "		70, 50	-do- very gassy & broken up to 414.5'. Dark green clay alt. up. Clusters of py. abundant, feld. phenocrysts up to 3/4" long, sometimes zoned.	
418.6 426.6						v			v			"		422.9						"	" "		40, 60	-do-	
426.6 435.8						v			v			"		441.5						"	" "		70, 50, vert	-do- rock porphyritic but no. & size of feld. phenocrysts decreased	
435.8 444.0						v			v			"								"	" "		35, 70, vert	-do- qtz. content increases slightly toward end of interval	
444.0 454.0						v			v			"								"	" "		50, 60, 50, vert.	-do- rare feld. fracture filling (feld. crystals)	
454.0 463.9						v			v			"								"	" "		20, 70	-do- coarser phases prevalent, w/ feld. phenocrysts up to 5 mm	
463.9 473.8						v			v			"								"	" "		45, 60, 50, vert	-do- most in tense alt. & grains up sulphides along 45° fracture. Rock more equigranular.	
473.8 483.8						v			v			"								"	Py Chalcopy		50, 55, vert, 70, 20	-do- py. increasing. Most intense alt. & sulphides along flat (>50°) fracture. Chalcopy very rare. Rock more porphyritic. "Black flecks", identified as very, very small, generally, or so fine py. almost totally gone from rock & when present are generally pyrite.	
483.8 493.8						v			v			"								"	Py		40, 50	-do- gouge, strong clay alt. between 50° fractures from 492.8 - 498.6	

DDH NO. 514-8

STATE ____ MINING DISTRICT ____ COORDINATES ____ N ____ E ____ DATE STARTED ____ DRILLING CO. ____

COUNTY ____ PROJECT ____ COLLAR ELEVATION ____ DATE COMPLETED ____

INCLINATION ____ BEARING ____ FINAL DEPTH ____

FOOTAGE		L1		L2		CORE % REC. BY FT.	CORE LBS. REC.	CORE % REC. BY WT.	CORE TOT. CU.	CORE OX CU	CORE MO S2	CORE ASSAY	CORE SIZE	CORE SAMP. NO.	SLUDGE SAMP. NO.	SLUDGE LBS. REC.	SLUDGE % REC. BY WT.	SLUDGE SPLIT	SLUDGE ASSAY TOT. CU.	SLUDGE ASSAY OX CU	SLUDGE ASSAY MO S2	COMBINED ASSAY PERCENT 0.1 0.5 1.0	COMBINED ASSAY TOT. CU
158 8	168 9	10 1	9 8	97					006				NX	44-1									
168 9	178 7	9 8	10 2	104					007					45-1									
178 7	188 7	10 0	10 0	100					008					46-1									
188 7	193 4	4 7	4 7	100					007					47-1									
193 4	203 4	10 0	10 0	100					009					48-1									
203 4	213 4	10 0	10 0	100					008					49-1									
213 4	223 4	10 0	10 0	100					011					50-1									
223 4	233 2	9 8	9 8	100					011					51-1									
233 2	243 2	10 0	10 0	100					009					52-1									
243 2	253 2	10 0	10 1	101					009					53-1									
253 2	263 2	10 0	10 2	102					009					54-1									
263 2	270 9	7 7	7 7	100					011					55-1									
270 9	280 9	10 0	10 2	102					006					56-1									
280 9	291 1	10 2	9 9	97					004					57-1									
291 1	297 9	6 8	6 8	100					012					58-1									
297 9	307 9	10 0	10 2	102					006					81-1									
307 9	317 9	10 0	9 9	99					009					82-1									
317 9	326 9	9 0	9 1	101					011					83-1									
326 9	336 9	10 0	9 9	99					008					84-1									
336 9	346 9	10 0	9 8	98					009					85-1									
346 9	356 9	10 0	9 1	91					008					86-1									
356 9	366 9	10 0	10 0	100					009					87-1									
366 9	376 9	10 0	10 0	100					008					88-1									
376 9	386 9	10 0	10 0	100					011					89-1									
386 9	393 0	6 1	6 1	100					013					90-1									
393 0	404 6	11 6	11 1	96					011					98-1									
404 6	418 6	14 0	14 1	101					012					99-1									
418 6	426 6	8 0	8 0	100					011					100-1									
426 6	435 8	9 2	9 2	100					010					101-1									
435 8	444 0	8 2	8 4	102					006					102-1									
440 0	454 0	10 0	9 9	99					007					118-1									
454 0	463 9	9 9	10 3	104					007					119-1									
463 9	473 8	9 9	9 9	100					006					120-1									
473 8	483 8	10 0	10 0	100					006					121-1									
483 8	493 8	10 0	9 8	98					004					122-1									

DDH NO. SH-8

STATE Arizona
COUNTY Pima
Sec 12 T15S R12E
MINING DISTRICT Arole
PROJECT Sheinaw Hill
COORDINATES J 50 N 61 E
COLLAR ELEVATION
INCLINATION vert. BEARING
DATE STARTED 12/24/60
DATE COMPLETED 11/7/61
DRILLING CO. Foy
FINAL DEPTH 966.8

FOOTAGE	UNALT	CHLOR.	EPIDOTE	MONTMOR.	BIOTITE	KAOL.	HY. MICA	ORTHO.	SER.	SIL.	STAGE NO.	ROCK TYPE	SECTION	CU5FES4	CUFES2	FE S2	CU2S	CUS	MOS2	% Sulphides	OXIDE ZONE: LEACHED CAVITIES-COLOR ETC. / SULPHIDE ZONE-CHAR OF MIN. DISS. VEIN, ETC.	< INCL.	FRACTURING	GEOLOGY	LOG BY
493.8 504.1						✓			✓			Qtz Porp Rhyl.								<1	Py.		60, 30, 80	-do- fracture zone from 493.8 continues to 498.0 calcite fracture filling still present.	
504.1 514.1						✓			✓			"								"	"		30, 55, 60, 70, vert	-do- Py most abundant along fractures, also in calcite. "Black flecks" still present but very, very rare - probably finely disseminated Py not, maybe some sphal.	
514.1 520.2						✓			✓			"								"	"		55, 60, 80, vert, 30	-do-	
520.2 528.3						✓			✓			"		581.3'						"	"		70, 60, vert, 30	-do- rock coarser grained	
528.3 538.5						✓			✓			"								"	Py, chalcopy		40, 60, 50	-do- clay alt. generally mod., strong only along fractures. Chalcopy as disseminations and in clusters, sometimes associated w/ fel.-rich portions of rock; Chalcopy abundance very minor to rare.	
538.5 545.9						✓			✓			"								"	" "			-do- Chalcopy very rare. Clay alt. mod. to strong to occasionally very strong with depth as a fractured, gouge zone is approached at about 545.5' to 545.9	
545.9 551.4						✓			✓			"								"	" "		vert, 50, 30, 60	-do- Shears generally along fractures >60°, accompanied by strong sericitization. Chalcopy very rare. Clay alt. rock fragments about 10-15 mm. present, very rare. Rock still coarse, porphyritic.	
551.4 560.7						✓			✓			"								"	Py		30, 40, 50, 60	-do- Some felds. phenocrysts up to 15 mm, calcited. No clastic rock fragments.	
560.7 568.8						✓			✓			"								"	"		60, 20, 30	-do- steep fractures generally utilized for shears, generally strong, clay filled.	
568.8 579.4						✓			✓			"								"	"		30, 50, 60, vert	-do- Comp long thin qtz frag. mod. w/ felds, alt. to clay, in it. Some steep Py. String ang. gouge 571.5-574.4.	
579.4 590.6						✓			✓			"								"	"		20, 30, 50, 70	-do- dark green clay alt. of felds. w/ Py more abundant. Clay alt. generally strong. Rock fragments.	
590.6 594.1						✓			✓			"								"	"		55	-do- alt. generally strong to v. strong (clay), esp. from 592.7 to 594.1	
594.1 603.9						✓			✓			"		602.8						"	"		65, 50, 40	-do- more porphyritic. Qtz crystals quite large, euhedral & sub-hedral Py and hedra.	
603.9 612.4						✓			✓			"								"	"		70, 50	-do- Py more abundant. dark green clay alt. of feld. w/ Py. more abundant.	
612.4 624.7						✓			✓			"								"	"		30, 40, 60	-do- some felds. phenocrysts up to 10 mm, fresh. Rock frequently coarser. clay fractures.	
624.7 634.3						✓			✓			"		641'						"	"		30, 50, 60	-do- clay alt. generally strong.	
634.3 644.3						✓			✓			"								"	"		30, 50	-do- coarser, more strongly alt. for last 4' of interval, dark green clay alt. w/ Py most abundant.	
644.3 654.3						✓			✓			"								"	"		30, 55	-do- coarse phase w/ abundant dark green clay alt. w/ Py for first 4'; then rock is more medium grained, dark green clay alt. minor. Clay alt. generally mod. to str., becoming strong to very strong toward end of interval.	
654.3 664.2						✓			✓			"								"	"		30, 40, vert.	-do- gradually darker up, first 4' of interval strong to mod. Clay alt.	
664.2 674.2						✓			✓			"								"	Py, chalcopy		50, 75, 30	-do- shears on both steep and shallow fractures. Chalcopy still very rare, seen along fractures.	
674.2 684.2						✓			✓			"								"	Py		50	-do- dynamically qtz, more abundant.	
684.2 694.2						✓			✓			"								"	"		60, 70	-do- dark green clay alt. w/ Py still present	
694.2 704.2						✓			✓			"								"	"		vert, 50, 30	-do- rock strongly to very strongly alt. (clay)	
704.2 714.2						✓			✓			"								"	"		30, 40	-do-	
714.2 724.4						✓			✓			"		731.3'						"	"		40	-do- dark green clay alt. w/ Py decreases in abundance	
724.4 734.3						✓			✓			"								"	Py, sphal, chalcopy		45	-do- calcite seams & veinlets more abundant. very rare sphal.; very, very rare chalcopy. Sphal. most frequent. Chalcopy seen in str. alt. feld. adjacent to qtz seam. Rock has chalcedonic grained matrix. Dark green clay alt. still present but minor. Some rock is the phenodacite.	

DDH NO. SH-8

STATE ____ MINING DISTRICT ____ COORDINATES ____ N ____ E ____ DATE STARTED ____ DRILLING CO. ____

COUNTY ____ PROJECT ____ COLLAR ELEVATION ____ DATE COMPLETED ____

INCLINATION ____ BEARING ____ FINAL DEPTH ____

FOOTAGE		L1	L2	CORE % REC. BY FT.	CORE LBS. REC.	CORE % REC. BY WT.	CORE TOT. CU.	CORE OX CU	CORE MO S2	CORE ASSAY Pb	CORE ASSAY Zn	CORE SIZE	SAMP. NO.	SLUDGE SAMP. NO.	SLUDGE LBS. REC.	SLUDGE % REC. BY WT.	SLUDGE SPLIT	SLUDGE ASSAY TOT. CU.	SLUDGE ASSAY OX CU	SLUDGE ASSAY MO S2	COMBINED ASSAY PERCENT 0.1 0.5 1.0	COMBINED ASSAY TOT. CU
493.8	504.1	10.3	9.4	91			0.23					1x	123-1									
504.1	514.1	10.0	10.0	100			0.12						124-1									
514.1	520.2	6.1	6.2	102			0.10						125-1									
520.2	528.3	8.1	8.0	99			0.07						126-1									
528.3	538.5	10.2	10.2	100			0.13						127-1									
538.5	545.9	7.4	7.4	100			0.15						128-1									
545.9	551.4	5.5	5.5	100			0.04						153-1									
551.4	560.7	9.3	9.3	100			0.04						154-1									
560.7	568.8	8.1	8.1	100			0.03						155-1									
568.8	579.4	10.4	10.3	99			0.07						156-1									
579.4	590.6	11.2	11.4	102			0.05						157-1									
590.6	594.1	3.5	3.4	97			0.03						158-1									
594.1	603.9	9.8	9.8	100			0.06						159-1									
603.9	612.4	8.5	8.4	99			0.03						160-1									
612.4	624.7	12.3	12.3	100			0.04						161-1									
624.7	634.3	9.6	9.4	98			0.02						162-1									
634.3	644.3	10.0	9.8	98			Tr						163-1									
644.3	654.3	10.0	10.0	100			Tr						164-1									
654.3	664.2	9.9	9.9	100			0.02						165-1									
664.2	674.2	10.0	10.0	100			Tr						167-1									
674.2	684.2	10.0	10.0	100			0.03						168-1									
684.2	694.2	10.0	10.0	100			0.02						169-1									
694.2	704.2	10.0	10.1	101			Tr			Tr	Tr		170-1									
704.2	714.2	10.0	10.1	101			0.02			Tr	0.05		171-1									
714.2	724.4	10.2	10.2	100			Tr			Tr	Tr		172-1									
724.4	734.3	9.9	9.9	100			Tr			Tr	Tr		173-1									

DDH NO. SH-8

STATE Arizona
COUNTY Pima
MINING DISTRICT Arnole
PROJECT Sagineaw Hill
Sec 12 T15S R12E

COORDINATES 750 N 60 E
COLLAR ELEVATION
INCLINATION Vert
BEARING

DATE STARTED 12/24/60
DATE COMPLETED 1/17/61
DRILLING CO. Foy
FINAL DEPTH 966.8

FOOTAGE	UNALT	CHLOR.	EPIDOTE	MONTMOR.	BIOTITE	KAOL.	HY. MICA.	ORTHO.	SER.	SIL.	STAGE NO.	ROCK TYPE	SECTION	CU5FES4	CUFES2	FES2	CU2S	CUS	MOS2	% Sulphides	OXIDE ZONE: LEACHED CAVITIES-COLOR ETC. / SULPHIDE ZONE-CHAR OF MIN. DISS. VEIN, ETC.	< INCL.	FRACTURING	GEOLOGY	LOG BY
734.3 744.3						✓			✓			Qtz Mon. Porph.								<1	Py sphal		40	-do- clay alt. mod & strong, rock coarse, lighter color. Sphal. very rare.	
744.3 754.3						✓			✓			"								<1	py, sphal, gal, chalcopy.		45, 20, vert	-do- dark & green clay alt. present but rare chalcopy minor, generally in thin stringers along fract. w/ ∠ ~20° dip. Sphal. minor, generally along calcite seams. Py w/ chalcopy in pyrite ledges.	
754.3 764.3						✓			✓			"								"	"		70, 50, 20	-do- my seam of py, chalcopy, gal, & sphal in calcite 3/8" wide. Py > other sulphides.	
764.3 774.3						✓			✓			"		770.7						"	"		30, 70, 60	-do- 2 parts thick sulphide veins (Approx 1" wide) These two veins dip 50°; gal & sphal in footwall py in middle; chalcopy w/ py, also w/ sphal. Zoning is not rigid in order (Approx py on borders, etc.)	
774.3 784.3						✓			✓			"								"	py, chalcopy, sphal		50, 70, 30	-do- minor dissem. chalcopy, v. minor sphal. very qtz veins (½" wide) lattices; conc. of feld. crystals rare, dissem. sphal.	
784.3 794.3						✓			✓			"								"	py, chalcopy, sphal, gal.		vert, 45, 30, 70	-do- mod to str. clay alt. sphal. v. gal. rare, chalcopy very rare, py minor, ~½" wide band of dark green clay alt. w/ indefinite borders and py stringers in middle dipping about 80°. Noted: predally zone of alt. along py stringers. A calcite vein (¾" wide) w/ qtz on borders and carrying minor dissem. sphal noted. Sulphides are mostly as dissem. along although py is frequently in stringers. Dark green clay alt. & feld. w/ py present. Little minor, Clastic rock frag. ~15 mm long noted at 791'	
794.3 804.3						✓			✓			"								"	py, sphal		35	-do- sphal rare, as fine dissemnations only calcite seams, flat dipping ~30°	
804.3 808.8						✓			✓			"								"	py, sphal, gal, chalcopy		30	-do- very large orthoclase phenocrysts (up to & greater than 10 mm) present. Chalcopy, sphal, & gal. very very rare, as dissemnations except for 2 stringers, each about ½" wide. One dips 80°, contains v. minor sphal. & gal w/ py & calcite, and cuts across the stringer 45° and contain a abundant sphal, gal, py and minor chalcopy, and calcite. Dark green clay alt. more abundant toward end	
808.8 818.8						✓			✓			"								"	py, sphal, gal, ~~chalcopy~~		50, 70	-do- sphal. rare, as dissemnations and along few fine pyrite stringers w/ very rare calcite. Frequent very thin py stringers generally dipping about 65° in same direction. Some feldspar stringers that frequently display annisomerel along their length. Dark, fine grained, one inch wide bands w/ py stringers in middle, sometimes w/ rare sphal. as dissemnations along band. These dark bands are often offset by 60-70° fractures which carry pyrite. Dark bands have fuzzy borders and probably represent alteration zone bordering pyrite. Dark green clay alt. w/ py. increases in abundance & area toward end, 15 mm diam. clast	
818.8 829.9						✓			✓			"								"	Py, sphal		50, 70, 20, vert	-do- fr. sep. intervals from 823' & 827'; also strong development of dark green clay alt. w/ py. Gouge zone at 827' Dark band w/ py. stringer in middle dipping 45°. Clay alt. generally strong. Sphal. v. rare, py. minor	

DDH NO. SH-8

STATE ____ MINING DISTRICT ____ COORDINATES ____ N ____ E DATE STARTED ____ DRILLING CO. ____

COUNTY ____ PROJECT ____ COLLAR ELEVATION ____ DATE COMPLETED ____

INCLINATION ____ BEARING ____ FINAL DEPTH ____

FOOTAGE		L1	L2	CORE % REC. BY FT.	CORE LBS. REC.	CORE % REC. BY WT.	CORE TOT. CU.	CORE OX CU	CORE MO S2	CORE ASSAY Pb	CORE ASSAY Zn	CORE SIZE	SAMP. NO.	SLUDGE SAMP. NO.	SLUDGE LBS. REC.	SLUDGE % REC. BY WT.	SPLIT	SLUDGE ASSAY TOT. CU.	SLUDGE ASSAY OX CU	SLUDGE ASSAY MO S2	COMBINED ASSAY PERCENT 0.1 0.5 1.0	COMBINED ASSAY TOT. CU
734.3	744.3	100	100	100			Tr			Tr	005	BX	174-1									
744.3	754.3	100	100	100			003			Tr	Tr		197-1									
754.3	764.3	100	102	102			005			Tr	005		198-1									
764.3	774.3	100	102	102			015			140	120		199-1									
774.3	784.3	100	100	100			004			005	005		200-1									
784.3	794.3	100	97	97			002			Tr	005		201-1									
794.3	804.3	100	49	49			002			005	Tr		202-1									
804.3	808.8	45	97	215			003			Tr	Tr		234-1									
808.8	818.8	100	102	102			002			005	Tr		235-1									
818.8	829.9	111	111	100			Tr			Tr	Tr		236-1									

DDH NO. SH-8

STATE Arizona
COUNTY Pima
MINING DISTRICT Ajo
PROJECT Sequoia Hill
Sec 12 T15S R12E

COORDINATES J.50 N 6 E
COLLAR ELEVATION
INCLINATION vert BEARING

DATE STARTED 12/24/60
DATE COMPLETED 1/17/61
FINAL DEPTH 966.8
DRILLING CO. Foy

FOOTAGE	UNALT	CHLOR.	EPIDOTE	MONTMOR.	BIOTITE	KAOL.	HY. MICA.	ORTHO.	SER.	SIL.	STAGE NO.	ROCK TYPE	SECTION	CuSFeS4	CuFeS2	FeS2	CU2S	CuS	MoS2	Sulphides	Oxide Zone: Leached Cavities-Color Etc. / Sulphide Zone-Char of Min. Diss. Vein, Etc.	< INCL.	FRACTURING	GEOLOGY	LOG BY
829 9 840 0						✓			✓			Qtz Mon Porph. 839'								<1	Py, sphal, gal, chalcopy.		70, 45, vert.	- do - clay alt. continues strong, becomes mod. to strong toward end of 8 interval. Chalcopy is rare, as disseminations and as stringers: gal & sphal rare, py. minor & abundant. One ½" wide stringer of py, sphal, gal, calcite & qtz, dipping 60° ± tho largest stringers & greatest concentration of sulphides dip 20°. Calcite stringer observed cutting ore, calcite & py stringer (¼" wide). Some dark fine grained bands w/ py stringers in middle that are often in close intervals as present: dip ~ 40°
840 0 850 0						✓			✓			"								1	py, sphal, gal		35, 50, vert, 70	- do - py, sphal, gal as disseminations. Py in stringers, py abundant, sphal rare. Minor galena rare. Py > gal + sphal. Zone from 844' to 847' is very strongly sericitized & all. & clay. Carbonaceous & 5% sulphides, mostly pyrite (maybe as much as 10%). The sulphides here are associated w/ sericite, qtz, & calcite. This interval from 844 to 847 seems to be a zone of weak (fracture) intersection (fractures - 50° vert) etc.) Clay & fine grained bands w/ py stringers in middle still present.
850 0 858 0						✓			✓			"								<1	py, sphal, gal, ~~chalcopy~~		30, 60	- do - py. also in stringers & veins (mod. thickness ½" & w/ calcite) dipping about 60°. Dark green clay alt. w/ py crystals still present. Darker bands w/ py still present; dip about 45°. Sphal & gal also present as disseminations and w/ py & calcite in veins.
858 0 868 0						✓			✓			"								"	py, sphal(?)		40, 60, vert, 20	- Mod. to strongly alt., generally, w/ strong sericitization occurring in strongly fractured portions. Dark green clay alt. w/ py crystals still present. Dark, fine, grained bands w/ py stringers in middle present. Py abundant. Sphal is very rare; galena also as disseminations very few. Calcite veins
868 0 877 0						✓			✓			"								<1	py, sphal(?)		vert, 65, 45	- do - dark green clay alt. abundant for about first 3', then minor. Last 2' of interval is fractured & "ground up" frequently.
877 0 886 2						✓			✓			"								<1	py, sphal(?)		40, 60, 70	- do - dark green clay alt. w/ py as previous in abundance last 1' of interval. Large feldspar phenocrysts - up to 25 mm in length - seen last, increase in abundance. General clay alt. diminished in intensity, still mod. & sometimes strong. Py as disseminations and most often present in strong (~80°) stringers w/ calcite & qtz.
886 2 894 0						✓			✓			"								<1	py, sphal, gal.		30, 60, 70	- do - Clay alt. generally strong, not frequently sheared & gouge. Sphal. disseminated & in calcite veins (which dip generally about 60° and are as thick as ½") & w/ py & gal. Py abundant as disseminations & in calcite veins & stringers, sphal very minor, gal. rare.
894 0 901 0						✓			✓			"								"	py, sphal, gal		20, 45, 70	- do - sphal & gal. w/ py in 70° dipping

DDH NO. SH-8

STATE ______ MINING DISTRICT ______ COORDINATES ______ N ______ E ______ DATE STARTED ______ DRILLING CO. ______

COUNTY ______ PROJECT ______ COLLAR ELEVATION ______ DATE COMPLETED ______

INCLINATION ______ BEARING ______ FINAL DEPTH ______

CORE

FOOTAGE				L1		L2		% REC. BY FT.	LBS. REC.	% REC. BY WT.	TOT. CU.	OX CU	MO S2	ASSAY Pb	Zn	CORE SIZE	SAMP. NO.
829	9	840	0	10	1	10	1	100			Tr			Tr	Tr	BX	237-1
840	0	850	0	10	0	9	6	96			Tr			Tr	Tr		238-1
850	0	858	0	8	0	8	4	105			002			Tr	005		239-1
858	0	868	0	10	0	9	9	99			Tr			Tr	Tr		258-1
868	0	877	0	9	0	8	4	93			002			005	Tr		259-1
877	0	886	2	9	2	9	2	100			Tr			010	005		260-1
886	2	894	0	7	8	7	8	100			004			005	005		261-1
894	0	901	0	7	0	7	0	100			004			010	065		262-1

SLUDGE

SAMP. NO.	LBS. REC.	% REC. BY WT.	SPLIT	ASSAY TOT. CU.	OX CU	MO S2

COMBINED ASSAY

PERCENT 0.1 0.5 1.0	TOT. CU

DDH NO. SH-8

STATE Arizona MINING DISTRICT Ajo
COUNTY Pima PROJECT Bergman Hill
Sec 12, T15S, R12E

COORDINATES J.50 N 61 E
COLLAR ELEVATION
INCLINATION vert. BEARING

DATE STARTED 12/14/60 DRILLING CO. Jay
DATE COMPLETED 1/17/61
FINAL DEPTH 966.8

FOOTAGE	UNALT	CHLOR.	EPIDOTE	MONTMOR.	BIOTITE	KAOL.	HY. MICA	ORTHO.	SER.	SIL.	STAGE NO.	ROCK TYPE	SECTION	CU15FES4	CUFES2	FE S2	CU2S	CUS	MOS2			OXIDE ZONE: LEACHED CAVITIES-COLOR ETC. / SULPHIDE ZONE-CHAR OF MIN. DISS. VEIN, ETC.	< INCL.	FRACTURING	GEOLOGY	LOG BY
																									veins w/ calcite; veins as up to ½" in thickness veins occur generally in strongly alt., well broken up rock. Dark green clay alt. w/ clusters of py. still present but much generally quite abundant where general clay alt. prevailing, & calcite veins also least abundant. Rock generally sheared & gouge 894-897'	
901 0 910 5						✓			✓			Qtz. Mon. Porphyry									4	py, sphal, gal		40	-do- sphal & gal. as very fine disseminations and in stringers generally dipping 60°; very rare to barren. Dark green clay alt. w/ py. Clusters more abundant. Py as disseminations and in stringers & calcite veins, stringers, & sug. filling commonly & sometimes carry very minor sphal, gal, & py. Dark & green clay alt. still present, less abundant where general clay alt. prevailing & where calcite most abundant. Clasts rock fragments carrying fine py. gouge present at 919.7'. Rock fairly broken up, very gouge about 910.5 & 918.0	
910 5 920 9						✓			✓			"	919.7								4	py, sphal, gal		70, 40, vert.		
920 9 930 9						✓			✓			"									"	py, sphal (?)		30, 40	-do- sphal (?) very rare & questionably as fine, scattered flakes & grains.	
930 9 940 9						✓			✓			"									"	" "		60, 80, 40	-do- calcite veins as thick as 3/4", dip > 60	
940 9 951 0						✓			✓			"	951.5'								"	" "		60, vert, 45, 30	-do- dark green clay alt. w/ py. more abundant	
951 0 961 0						✓			✓			"									"	" "		vert, 25, 60	-do- rock generally strongly alt., well broken up. Dark green clay alt. w/ py & calcite veins abundant	
961 0 966 8						✓			✓			"									"	" "		50, 65, 55, 30	-do-	

DDH NO. SH-8

STATE _____ MINING DISTRICT _____
COUNTY _____ PROJECT _____

COORDINATES _____ N _____ E
COLLAR ELEVATION _____
INCLINATION _____ BEARING _____

DATE STARTED _____ DRILLING CO. _____
DATE COMPLETED _____
FINAL DEPTH _____

FOOTAGE		L1	L2	CORE % REC. BY FT.	CORE LBS. REC.	CORE % REC. BY WT.	CORE TOT. CU.	CORE OX CU	CORE MO S2	CORE ASSAY Pb	CORE ASSAY Zn	CORE CORE SIZE	CORE SAMP. NO.	SLUDGE SAMP. NO.	SLUDGE LBS. REC.	SLUDGE % REC. BY WT.	SLUDGE SPLIT	SLUDGE ASSAY TOT. CU.	SLUDGE ASSAY OX CU	SLUDGE ASSAY MO S2	COMBINED ASSAY PERCENT 0.1 0.5 1.0	COMBINED ASSAY TOT. CU
910 0	911 0	100	99	99			002			010	005	BX	263-1									
911 0	920 9	99	97	98			Tr			Tr	Tr		264-1									
920 9	930 9	100	100	100			Tr			005	005		265-1									
930 9	940 9	100	101	101			Tr			005	Tr		266-1									
940 9	951 0	101	102	101			002			010	005		267-1									
951 0	961 0	100	100	100			Tr			015	005		268-1									
961 0	966 8	58	57	98			Tr			005	Tr		269-1									

DDH NO. SH-5

STATE Arizona MINING DISTRICT Ajo
COUNTY Pima PROJECT Sonoran Hill
Sec 12 T15S R12E

COORDINATES 11,50 N 59 E
COLLAR ELEVATION
INCLINATION vert BEARING

DATE STARTED 11-3-60 DRILLING CO. Foy
DATE COMPLETED 11-30-60
FINAL DEPTH 1130.0

FOOTAGE	UNALT	CHLOR.	EPIDOTE	MONTMOR.	BIOTITE	KAOL.	HY. MICA.	ORTHO.	SER.	SIL.		STAGE NO.	ROCK TYPE	SECTION	CU5FES4	CUFES2	FE S2	CU2S	CUS	MOS2			OXIDE ZONE: LEACHED CAVITIES-COLOR ETC. / SULPHIDE ZONE-CHAR OF MIN. DISS. VEIN, ETC.	< INCL.	FRACTURING	GEOLOGY	LOG BY
12 0 19 6													Porphyry										Py. Cpy.		20°	Py. monzonite tex large euhedral to subhedral	
																										Quartz xls. in grey-brown matrix. Fractures	
																										Breakaround xls. Very weak sulphide. Moderate	
																										Leaouts. Slight phyl. alteration. Limonite	
19 6 28 3													"										" "		30°	— do — Small veinlets stringers	
																										Weak to moderate (?) chloropyte	
																										with prehnite veinlets	
28 3 43 7													"										" "		50°	— do — " malachite	
43 7 53 7													"										" "		40°	— do — " veinlets along fracture	
53 7 63 7													"										" "		40°	— do — " prehnite (very weak)	
63 7 73 7													"										" "		60°	— do — "	
73 7 81 1													"										" "		50°	— do — " Rutile in quartz. (Red Mineral)	
81 1 90 6													"										" "		50°	— do — "	
90 6 100 6													"										" "		50°	— do — Drilled from 91-100	
100 6 110 6													"										" " Cu Co		70°	— do — Pyrite, chlorite, veinlets also	
110 6 120 6													"										" "		40°	— do — Drilled from 102-115	
120 6 130 6													"										" "		40°	— do — " " 122-135	
130 6 140 6													"										" "		50°	— do —	
140 6 150 6													"										" "		50°	— do — No oxidation, slightly altered weak	
																										sulphide	
150 6 160 6													"										" "		50°	— do — Weak to intense alteration Clay	
																										weak sulphide	
160 6 170 6													"										" "		60°	— do — weak to locally sulphide	
170 6 180 6													"										" "		40	— do — "	
180 6 190 6													"										" "		30°	— do — "	
190 6 200 6													"										" "		50°	— do — Large euhedral feldspar xls	
200 6 210 6													"										" "		50°	— do — Oxidized	
210 6 220 6													"										" "		30°	— do — " to 215	
220 6 230 6													"										" "		30°	— do — " 220 — 227.	
230 6 240 6													"										" "		50°	— do —	
240 6 250 6													"										" Pb		40°	— do — Weak pb	
250 6 260 6													"										" "		70°-30°	— do — Moderate alteration - clay	
260 6 270 6													"										" "		60°	— do —	
270 6 278 4													"										" "		70°	— do — Weak sulphide. Very weak chalcopyrite.	
278 4 288 4													"										" "		40°	— do — " "	
288 4 298 4													"										" "		40°	— do — " "	
298 4 308 4													"										" "		40°	— do — " "	
308 4 318 4													"										" "		55°	— do — "	
318 4 328 4													"										" "		50°	— do — Oxidized from 324-330.6. Intensely	
328 4 338 4													"										" " Zn		70°-30°	— do — Weak Blood-pink "	
338 4 348 4													"										" "		40°	— do —	
348 4 358 4													"										" Pb		60°	— do — Covellite stained chalcopyrite	
358 4 368 4													"										" "		60°	— do —	
368 4 378 4													"										" "		50°	— do —	
378 4 388 4													"										" "		70°	— do — Feldspars become intensely altered	
																										around fault at 385.6	
388 4 398 4													"										" "		40°	— do —	
398 4 408 4													"										" "		30°	— do —	
408 4 418 4													"										" "		70°, 60°	— do —	
418 4 428 4													"										" "		Vert. 30°, 60°	— do — Small veins w/ euhedral quartz xls.	
428 4 438 4													"										" "		Vert 30°	— do —	
438 4 448 4													"										" "		50°	— do — Weak sulphide	
448 4 461 0													"										" "		40°	— do — 3 faults (50° dip) within 6' core	
461 0 471 0													"										" Cp		60°	— do — Weak sulphide	
471 0 481 0													"										" "		50°	— do — " " Very weak copper	
481 0 491 0													"										" "		50°	— do —	

#16

DDH NO. SH-5

STATE _____ MINING DISTRICT _____ COORDINATES _____ N _____ E DATE STARTED _____ DRILLING CO. _____

COUNTY _____ PROJECT _____ COLLAR ELEVATION _____ DATE COMPLETED _____

INCLINATION _____ BEARING _____ FINAL DEPTH _____

FOOTAGE		L1	L2	CORE % REC. BY FT.	CORE LBS. REC.	CORE % REC. BY WT.	CORE TOT. CU.	CORE OX CU	CORE MO S2	CORE ASSAY Pb	CORE ASSAY Zn	CORE ASSAY Au	CORE ASSAY Ag	CORE CORE SIZE	CORE SAMP. NO.	SLUDGE SAMP. NO.	SLUDGE LBS. REC.	SLUDGE % REC. BY WT.	SLUDGE SPLIT	SLUDGE ASSAY TOT. CU.	SLUDGE ASSAY OX CU	SLUDGE ASSAY MO S2	COMBINED ASSAY PERCENT 0.1 0.5 1.0	COMBINED ASSAY TOT. CU
63.7	63.7	10.0	10.1	101										NX	2371									
100.3	110.6	10.0	10.1	101											2372									
130.2	130.2	10.0	10.0	100											73									
130.2	140.2	10.0	10.1	101											74									
140.2	150.2	10.0	10.0	100											75									
150.2	160.2	10.0	10.0	100											76									
160.2	170.2	10.0	10.0	100											77									
170.2	180.2	10.0	10.0	100											78									
180.2	190.2	10.0	10.0	100											79									
190.2	200.2	10.0	10.0	100											80									
200.2	210.2	10.0	10.0	100											81									
210.2	220.2	10.0	10.0	100											82									
220.2	230.2	10.0	10.0	100											83									
230.2	240.2	10.0	10.0	100											84									
240.2	250.2	10.0	10.0	100											85									
250.2	260.2	10.0	10.0	100											86									
260.2	270.2	10.0	10.0	100											87									
270.2	280.2	10.0	10.0	100											88									
280.2	290.2	10.0	10.0	100											89									
290.2	300.2	10.0	10.0	100											90									
300.2	310.2	10.0	10.0	100											91									
310.2	320.2	10.0	10.0	100											92									
320.2	330.2	10.0	10.0	100											93									
330.2	340.2	10.0	10.0	100											94									
340.2	350.2	10.0	10.0	100											95									
350.2	360.2	10.0	10.2	102											96									
360.2	370.2	10.0	10.0	100											97									
370.2	380.2	10.0	10.0	100											98									
380.2	390.2	10.0	10.1	101											99									
390.2	400.2	10.0	10.1	101											100									
400.2	410.2	10.0	10.0	100											31									
410.2	420.2	10.0	10.2	102											32									
420.2	430.2	10.0	9.8	98											33									
430.2	440.2	10.0	10.2	102											34									
440.2	450.2	10.0	10.0	100											35									
450.2	460.2	10.0	10.0	100											36									
460.2	470.2	12.6	12.2	99											37									
470.2	480.2	10.0	10.0	100											38									
480.2	490.2	10.0	10.0	100											39									
490.2	500.2	10.0	10.0	100											40									

DDH NO. SH-5

STATE Arizona MINING DISTRICT Ajo
COUNTY Pima PROJECT Sagenaw Hill
Sec 12 T15S R12E

COORDINATES 4,50 N 59 E
COLLAR ELEVATION
INCLINATION vert BEARING

DATE STARTED 11-3-60 DRILLING CO.
DATE COMPLETED 11-30-60 Jay
FINAL DEPTH 1130.0

FOOTAGE	UNALT	CHLOR.	EPIDOTE	MONTMOR.	BIOTITE	KAOL.	HY. MICA.	ORTHO.	SER.	SIL.		STAGE NO.	ROCK TYPE	SECTION	$CuSFeS_4$	$CuFeS_2$	FeS_2	Cu_2S	CuS	MoS_2				OXIDE ZONE: LEACHED CAVITIES-COLOR ETC. / SULPHIDE ZONE-CHAR OF MIN. DISS. VEIN, ETC.	< INCL.	FRACTURING	GEOLOGY	LOG BY
491.0 501.0													Bx Mag											Pyrite, MoS_2		50°	Ag stain - Very rich MoS_2 - Minute pyrite	
501.0 516.5													"											" MoS_2		40°	-do-	
516.5 526.1													"											" MoS_2		60°	-do- Intensely altered.	
526.1 534.0													"											" cp "		60°	-do- Euhedral altered feldspar xls.	
534.0 541.4													"											" " "		60°	-do-	
541.4 550.7													"											" "		30°-60°	-do- small calcite stringers	
550.7 560.5													"											" "		70°	-do- " "	
560.5 573.2													"											" "		60°-80°	-do- weak sulphides.	
573.2 580.3													"											" "		50°	-do- " " disseminations	
580.3 590.3													"											" "		40°	-do-	
590.3 608.7													"											"		70°, 40°	-do-	
608.7 614.3													"											"		50°	-do-	
614.3 623.0													"											"		60°	-do-	
623.0 678.0													"											"		60°	-do-	
633.0 638.0													"											"		Vert. 45°	-do- Vertical fracture lined w/ calcite xls.	
638.0 648.0													"											"		50°	-do- 1" Sandy phase of mong.	
648.0 658.0													"											"		40°	-do- Moderate pyrite.	
658.0 666.1													"											" cp		40°	-do- Increase in pyrite - weak cp.	
666.1 675.9													"											" v		40°	-do-	
675.9 685.9													"											"		50°	-do-	
685.9 695.9													"											"		70°	-do-	
695.9 705.9													"											"		30°-70°	-do-	
705.9 715.9													"											"		30°	-do-	
715.9 720.5													"											"		30°	-do-	
720.5 734.9													"											" " Pb		40°	-do- Fine blebs of Pb. - weak	
734.9 743.8													"											"		30°	-do-	
748.8 753.8													"											"		30°	-do-	
753.8 763.8													"											"		30°	-do-	
763.8 779.6													"											"		30°	-do- Large euhedral feldspar xls.	
779.6 789.6													"											"		30°	-do- Weak to moderate pyrite	
789.6 799.6													"											"		40°	-do-	
799.6 809.6													"											"		Vert 30°	-do-	
809.6 819.7													"											"		Vert 40°	-do-	
819.7 827.8													"											"		50°	-do-	
827.8 836.6													"											"		50	-do- Dense pyrite stringers	
836.6 846.6													"											"		Vert. 60°	-do- Moderate pyrite	
846.6 856.6													"											"		60°	-do-	
856.6 866.6													THIN SECTION 860.6											" Zn.		50°	-do- Black jack stringer 1/2" wide.	
866.6 880.8													"											"		50°	-do-	
880.8 889.8													"											"		40°	-do-	
889.8 899.8													THIN SECTION 891.9											"		40°	-do- Tetrahedrite (?)	
899.8 909.8													"											"		40°	-do- Weak pyrite disseminations	
909.8 919.8													"											"		50°	-do- Brecciation begins @ 918'	
919.8 929.8													"											" Pb Zn		30°	-do- Brecciated, sphalerite, galena, pyrite ground fragments, pyrite cube. Fault gouge at 923' & 925. Brecciated stone at 927.	
939.8 949.8													THIN SECTION 932'											" "		30	-do- Slightly finer grained than above.	
949.8 959.8													"											" "		60°-40°	-do-	
959.8 969.3													"											" "		70°	-do- Sulphides along 70° fracture w/ calcite	
969.3 979.3													"											" "		40°-70°	-do-	
979.3 989.3													"											" " "		50°	-do- Rock is moderately altered - clay.	
989.3 999.3													"											" " "		40°	-do- Calcite-lined cavities - Rock brecciated	
999.3 1009.3													"											" " "		60°	-do- Sulphide along calcite stringers.	
1009.3 1015.2													"											" "		70°	-do- Leaf & pyrite disseminations	
1015.2 1024.0													"											" " "			-do- Rock brecciated w/ sulphides filling between fragments. - Moderately sulphides, continue mod. to 1024.0'	

DDH NO.

STATE ____ MINING DISTRICT ____
COUNTY ____ PROJECT ____

COORDINATES ____ N ____ E
COLLAR ELEVATION ____
INCLINATION ____ BEARING ____

DATE STARTED ____ DRILLING CO. ____
DATE COMPLETED ____
FINAL DEPTH ____

FOOTAGE		L1	L2	CORE % REC. BY FT.	CORE LBS. REC.	CORE % REC. BY WT.	CORE TOT. CU.	CORE OX CU	CORE MO S2	CORE ASSAY Pb	CORE ASSAY Zn	CORE ASSAY Au	CORE ASSAY Ag	CORE SIZE	CORE SAMP. NO.	SLUDGE SAMP. NO.	SLUDGE LBS. REC.	SLUDGE % REC. BY WT.	SLUDGE SPLIT	SLUDGE ASSAY TOT. CU.	SLUDGE ASSAY OX CU	SLUDGE ASSAY MO S2	COMBINED ASSAY PERCENT 0.1 0.5 1.0	COMBINED ASSAY TOT. CU
		10 0	10 0	100										NX										
		15 5	15 5	100																				
		9 5	9 6	101																				
		8 9	8 1	91																				
		7 4	7 0	94																				
		9 3	9 6	103																				
		9 8	9 8	100																				
		12 7	14 0	110																				
		7 1	7 1	100																				
		10 0	9 9	99																				
		14 4	14 5	101																				
		10 0	9 8	98																				
		9 3	8 5	91																				
		10 0	10 0	100																				
		5 0	5 0	100																				
		10 0	10 1	101																				
		10 0	9 8	98																				
		8 1	8 1	100																				
		9 8	10 1	103																				
		10 0	10 0	100																				
		10 0	10 2	102																				
		10 0	10 0	100																				
		10 0	10 0	100																				
		4 6	4 4	95																				
		14 4	15 7	109										BX										
		8 8	8 9	100																				
		10 0	10 0	100																				
		10 0	9 9	99																				
		15 8	15 8	100																				
		10 0	10 0	100																				
		10 0	10 0	100																				
		10 0	10 1	101																				
		10 1	10 0	99																				
		8 1	8 1	100																				
		8 8	8 6	98																				
		10 0	10 1	101																				
		10 0	10 0	100																				
		10 0	10 1	101						01	110	Tr	03											
		14 2	13 8	97																				
		9 0	8 2	91																				
		10 0	10 1	101																				
		10 0	10 1	101																				
		10 0	9 7	97																				
		10 0	9 9	99						01	065	0005	02											
		10 0	9 8	98																				
		10 0	10 2	102																				
		10 0	10 0	100						Tr	05	0005	03											
		9 5	9 6	101																				
		10 0	10 0	100						Tr	06	Tr	01											
		10 0	9 9	99						Tr	035	Tr	01											
		10 0	10 1	101						01	02	Tr	01											
		10 0	10 0	100						01	005	0005	02											
		5 9	5 9	100						01	02	Tr	02											
1015 2	1024 0	8 8	8 9	101						0.8	5.7	0.005	21											

DDH NO. 5H-5

STATE Arizona MINING DISTRICT Amole
COUNTY Pima PROJECT Sugarman Hill
SEC 12 T15S R12E

COORDINATES 11.50 N 59 E
COLLAR ELEVATION
INCLINATION Vert. BEARING

DATE STARTED 11-3-60 DRILLING CO. Jory
DATE COMPLETED 11-30-60
FINAL DEPTH 1130.0

FOOTAGE	UNALT	CHLOR.	EPIDOTE	MONTMOR.	BIOTITE	KAOL.	HY. MICA.	ORTHO.	SER.	SIL.		STAGE NO.	ROCK TYPE	SECTION	CU5FES4	CUFES2	FES2	CU2S	CUS	MOS2				OXIDE ZONE: LEACHED CAVITIES-COLOR ETC. / SULPHIDE ZONE-CHAR OF MIN. DISS. VEIN, ETC.	< INCL.	FRACTURING	GEOLOGY	LOG BY
1024 0 / 1029 3													Eq. Mon											Cp, py, Zn, Pb		40°	-do- ~~Sulphides continue intermittently to 1024~~	
1029 3 / 1039 3													"											"		40°	-do- Weak mineralization	
1039 3 / 1049 3													"											"		30°	-do- " "	
1049 3 / 1059 3													"											"		40°	-do- " "	
1059 3 / 1069 3													"											" " " "		40°	-do- Lenses & small stringers of Pb-Zn.	
1069 3 / 1079 3													"											" " " "		40°	-do- Sphalerite blebs along fractures.	
1079 3 / 1089 3													"											" " "		30°	-do- Sphalerite along fractures.	
1089 3 / 1101 6													"											" "			-do- Zones at 1093.9 & 1097.5 - Cu broken.	
1101 6 / 1112 3													"											"		40°	-do- Core quite broken & sandy.	
1112 3 / 1121 6													"											"		Vert 60°	-do- Calcite lined cavities - sandy.	
1121 6 / 1130.0													"											"		50°	-do- Very weak mineralization.	

DDH NO. SH-5

STATE _____ MINING DISTRICT _____ COORDINATES _____ N _____ E DATE STARTED _____ DRILLING CO.

COUNTY _____ PROJECT _____ COLLAR ELEVATION _____ DATE COMPLETED _____

INCLINATION _____ BEARING _____ FINAL DEPTH _____

FOOTAGE				L1	L2	CORE: % REC. BY FT.	LBS. REC.	% REC. BY WT.	TOT. CU.	OX CU	MO S2	ASSAY Pb	Zn	Au	Ag	CORE SIZE	SAMP. NO.	SLUDGE: SAMP. NO.	LBS. REC.	% REC. BY WT.	SPLIT	ASSAY TOT. CU.	OX CU	MO S2	COMBINED ASSAY: PERCENT 0.1 0.5 1.0	TOT. CU
1024	0	1028	3	5 3	5 4	102			0 11			~~#~~				BX	9628									
1028	3	1038	3	10 0	9 9	99			0 02								29									
1038	3	1049	3	10 0	10 0	100			0 05								30									
1049	3	1059	3	10 0	10 0	100			Tr								31									
1059	3	1069	3	10 0	10 0	100			0 02			Tr	0 55	Tr	0 2		32									
1069	3	1079	3	10 0	10 0	100			Tr			Tr	0 25	Tr	0 1		33									
1079	3	1089	3	10 0	10 0	100			0 02			Tr	0 70	Tr	0 2		34									
1089	3	1101	6	12 3	9 9	81			Tr			Tr	0 30	Tr	0 1		35									
1101	6	1112	3	10 7	7 3	68																				
1112	3	1121	6	10 3	6 3	61																				
1121	6	1130	0	8 4	4 4	52																				

DDH NO. 5H-5

STATE Arizona
COUNTY Pima
MINING DISTRICT Amole
PROJECT Saginaw Hill
Sec 12 T15S R12E

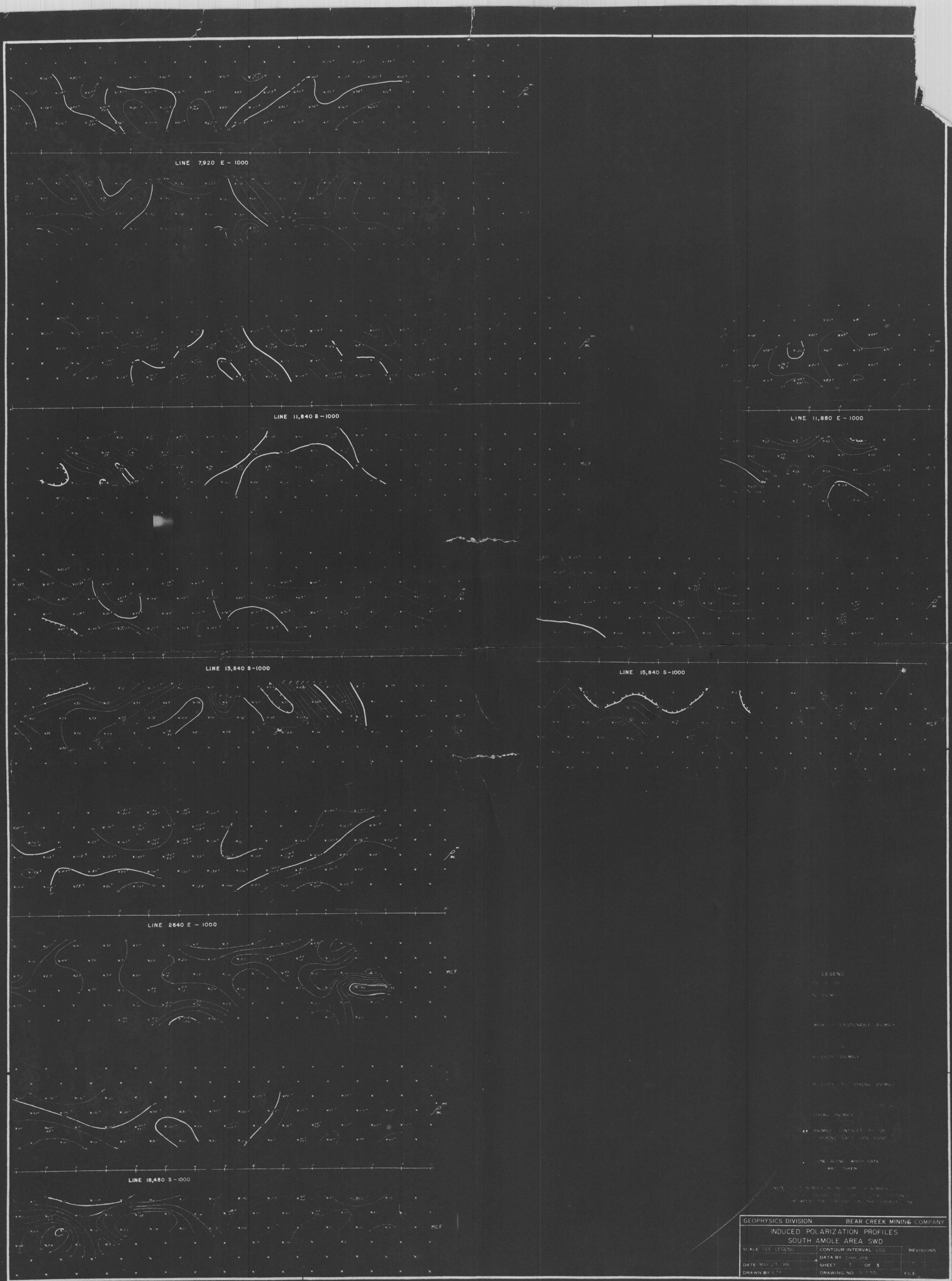
COORDINATES H,50N 59 E
COLLAR ELEVATION
INCLINATION Vert
BEARING

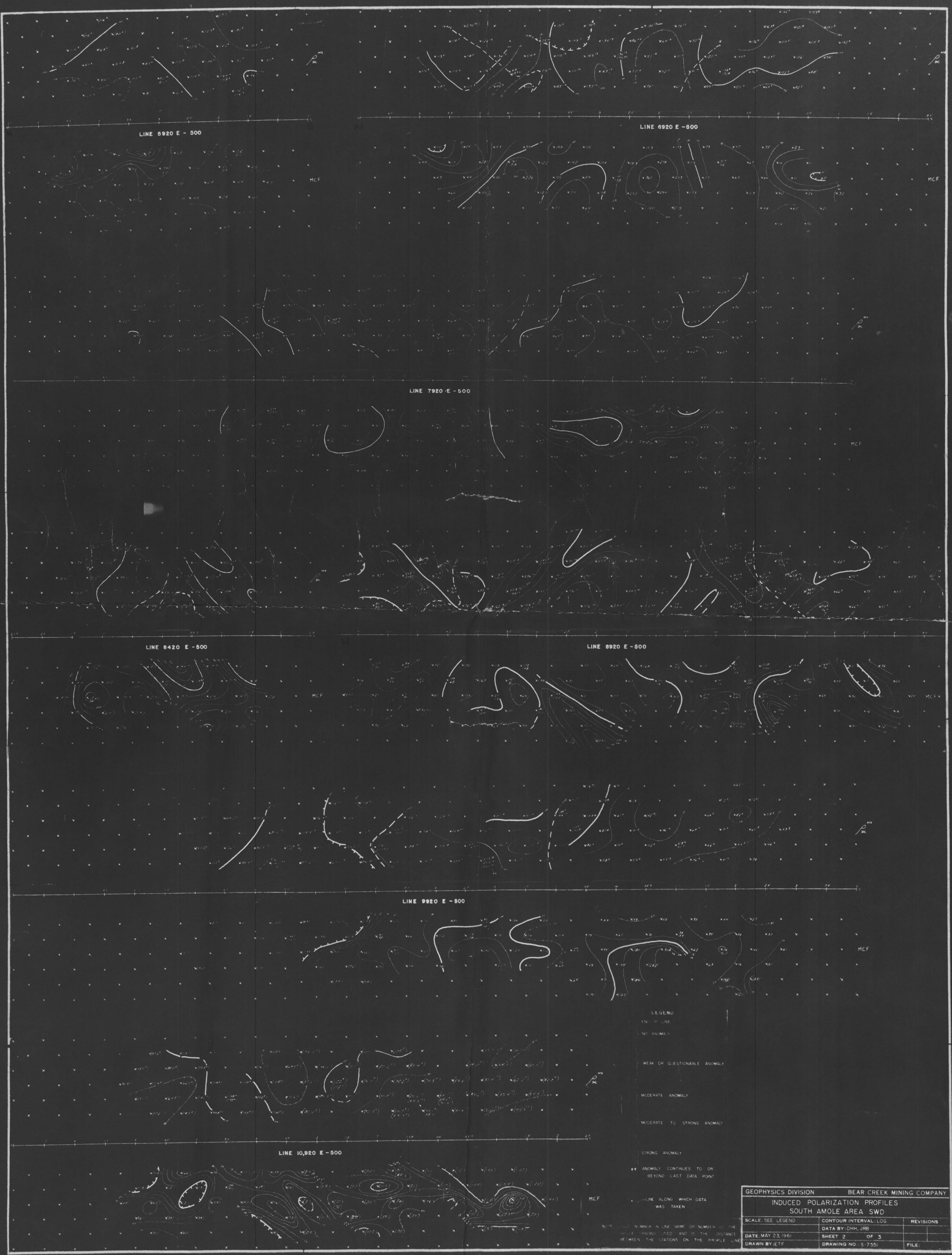
DATE STARTED 11-3-60
DATE COMPLETED 11-30-60
FINAL DEPTH 1130.0

DRILLING CO. Joy

FOOTAGE	UNALT	CHLOR.	EPIDOTE	MONTMOR.	BIOTITE	KAOL.	HY. MICA.	ORTHO.	SER.	SIL.		STAGE NO.	ROCK TYPE	SECTION	CU5FES4	CUFES2	FES2	CU2S	CUS	MOS2			OXIDE ZONE: LEACHED CAVITIES-COLOR ETC. / SULPHIDE ZONE-CHAR OF MIN. DISS. VEIN, ETC.	< INCL.	FRACTURING	GEOLOGY	LOG BY

5H-5


LINE 7,920 E - 1000
LINE 11,840 S - 1000
LINE 11,880 E - 1000
LINE 13,840 S-1000
LINE 15,840 S-1000
LINE 2640 E - 1000
LINE 18,480 S - 1000
MCF
LEGEND
GEOPHYSICS DIVISION
BEAR CREEK MINING COMPANY
INDUCED POLARIZATION PROFILES
SOUTH AMOLE AREA SWD
SCALE: SEE LEGEND
CONTOUR INTERVAL: LOG
REVISIONS
DATA BY: DHH, JRB
DATE: MAY 23, 1961
SHEET 3 OF 3
DRAWN BY: E.T.F.
DRAWING NO. S 7 55
FILE


LINE 5920 E - 500
LINE 6920 E - 500
LINE 7920 E - 500
LINE 8420 E - 500
LINE 8920 E - 500
LINE 9920 E - 500
LINE 10,920 E - 500
MCF
LEGEND
END OF LINE
NO ANOMALY
WEAK OR QUESTIONABLE ANOMALY
MODERATE ANOMALY
MODERATE TO STRONG ANOMALY
STRONG ANOMALY
ANOMALY CONTINUES TO OR BEYOND LAST DATA POINT
LINE ALONG WHICH DATA WAS TAKEN
NOTE: LAST NUMBER IN LINE NAME OR NUMBER IS THE GAGGLE SPACING USED AND IS THE DISTANCE BETWEEN THE STATIONS ON THE PROFILE LINE
GEOPHYSICS DIVISION
BEAR CREEK MINING COMPANY
INDUCED POLARIZATION PROFILES
SOUTH AMOLE AREA SWD
SCALE: SEE LEGEND
CONTOUR INTERVAL: LOG
DATA BY: DHH, JRB
REVISIONS
DATE: MAY 23, 1961
SHEET 2 OF 3
DRAWN BY: ETF
DRAWING NO.: S-7551
FILE:

DDH NO. SH-1

STATE _____ MINING DISTRICT _____ COORDINATES _____ N _____ E DATE STARTED _____ DRILLING CO.

COUNTY _____ PROJECT _____ COLLAR ELEVATION _____ DATE COMPLETED _____

INCLINATION _____ BEARING _____ FINAL DEPTH _____

FOOTAGE	L1	L2	CORE: % REC. BY FT.	CORE: LBS. REC.	CORE: % REC. BY WT.	CORE: TOT. CU.	CORE: OX CU	CORE: MO S2	CORE: ASSAY Zn	CORE SIZE	SAMP. NO.	SLUDGE: SAMP. NO.	SLUDGE: LBS. REC.	SLUDGE: % REC. BY WT.	SLUDGE: SPLIT	SLUDGE: ASSAY TOT. CU.	SLUDGE: ASSAY OX CU	SLUDGE: ASSAY MO S2	COMBINED ASSAY: PERCENT 0.1 0.5 1.0	COMBINED ASSAY: TOT. CU
73 1 83 1	10 0	9 8	98			Tr			Tr	NX	8601									
~~[illegible]~~																				
93 1 103 1	10 0	9 9	99			Tr			0 05		8602									
113 2 123 3	10 1	10 1	100			0 02			0 05		8603									
128 0 138 0	10 0	9 7	97			0 02			Tr		8604									

DDH NO. Sagmaw #1

STATE Arizona MINING DISTRICT Amole
COUNTY Pima PROJECT Sagmaw Hill
Sec 12 T15S R12E

COORDINATES K.50 N 43 E
COLLAR ELEVATION
INCLINATION vert. BEARING

DATE STARTED 20 May 60 DRILLING CO.
DATE COMPLETED 21 June 60 JOY
FINAL DEPTH 1010.0

FOOTAGE	UNALT	CHLOR.	EPIDOTE	MONTMOR.	BIOTITE	KAOL.	HY. MICA.	ORTHO.	SER.	SIL.	Talc	STAGE NO.	ROCK TYPE	SECTION	CU5FES4	CUFES2	FE S2	CU2S	CUS	MOS2	OXIDE ZONE: LEACHED CAVITIES-COLOR ETC. / SULPHIDE ZONE-CHAR OF MIN. DISS. VEIN, ETC.	< INCL.	FRACTURING	GEOLOGY	LOG BY
8 0 – 18 3						1							arkose								limonite from pyrite		Fine - 50° (major) 5° (minor)	Ferric Fe stain. Calcareous along fractures, well cemented. Bedding dip 5°. Fine to medium grained. Limonite is yellowish brown. Disseminated to coarse (in fractures).	JMB
18 3 – 28 5						1							arkose								limonite from pyrite		50° & 5° (minor)	Limonite stain red to yellow. Disseminated and coarse blebs up to 1/4". Fe staining along fractures. Malachite rare very rare. 50% medium & 50% fine grained. Indistinct bedding.	JMB
28 5 – 40 0						1							arkose										5°-10°	Fine to medium grained. Reddish brown to yellow limonite largely along fractures, but also coarse to fine dissemination. Bedding indistinct. Mn "leaves" along fractures.	JMB
40 0 – 52 5						1							arkose										20° (major) 50° (minor)	Limonite from yellow to brown to red, limonite largely along fractures but also disseminated blebs up to 1/2". Mn along fractures. Some slickwork, Brecciated locally.	JMB
52 5 – 60 1						1							arkose											Limonite largely along fractures; some disseminated. Medium grained on upper 1/2, to fine grained lower 1/2. Limonite yellow to brown to red. Highly fractured locally. Manganese "leaves" on fractures.	JMB
60 1 – 63 1													arkose										15°, 50°	Fine grained. Limonite yellow to brown to red, largely along fractures; also disseminated blebs. Limonite extended into wall rock from fracture (bedding) up to 2 mm. Bedding 50° (Parallel to fractures). Mn "leaved" along some fractures.	
63 1 – 73 1													arkose										60°	Fine to medium grained. Limonite from yellow to red along fractures, and finely disseminated in the coarser parts of rock. Limonite in fractures extend into wall rock up to 2 mm. Zones of brecciation throughout. Mn along fractures. Dip of bedding is 10°.	
73 1 – 83 1						1 1							arkose Siltstone								limonite and pyrite		Vertical, 10°, 50°	Contact between arkose & Calcareous siltstone is about 78' (unconformably) Arkose is limonite yellow to brown to red. Fine grained. Limonite largely along fractures, extending into wall rock up to 2 mm. Bedding dips 10°. Pyrite bodies completely altered to limonite. Limonite fills bodies. Calcareous siltstone – Pyrite along fractures and disseminated as large blebs up to 30 mm. Limonite halo surrounding some pyrite grains. Clay along fractures. Sphalerite (marmatite) rare as small disseminations. Fractures have been sheared. Traces of galena (?). Bedding indistinct.	
83 1 – 93 1						1					1		Siltstone								limonite & pyrite		50°	Calcareous. Pyrite throughout (5% of total rock). Talc (?) along fracture. Shearing along fractures, as indicated by black pyrite. Yellow to brown limonite along fractures. Sphalerite rare.	
93 1 – 103 1						1				3			siltstone arkose								limonite & pyrite		15°, 60°, Vertical	Alteration and pyrite (1-2%) follows fractures. Some limonite after pyrite. Limonite yellow to red along fracture, (sheared). Brecciated in lower part. Calcareous (weakly). Sericite (?) along fractures. Medium grained arkose. Calcareous along fractures. Limonite yellow to red along fractures. Becomes arkosic about 102'. Calcite along fractures. Siliceous.	
103 1 – 113 2													arkose siltstone								limonite & pyrite		50°, 10°, vertical	Arkose is medium to fine grained. Pyrite as disseminated blebs (1-2 cm). Alteration of pyrite to limonite along fractures. $CaCO_3$ along fractures. Rock is hard, dense & siliceous. Shearing along fractures.	
113 2 – 123 3													Siltstone								limonite & pyrite		Vertical, 50°, 80°	Finely fractured. Bedding dip of 25°. Hard, siliceous, dense. Pyrite only along fractures. Calcareous on fractures. Limonite red to yellow, and largely along fractures. Locally brecciated with much limonite (Red).	
123 3 – 128 0		1									1		Siltstone								limonite & pyrite		5°, 80°	Hard, dense, & siliceous. Finely fractured in multiple directions. Shearing along fracture. Talc (?) alteration on fractures. Pyrite along fracture & disseminated (3% of total rock). Limonite is red. $CaCO_3$ along fractures.	
128 0 – 138 0													Siltstone								limonite & pyrite		10°, 50°	Talc on shearing along fractures. $CaCO_3$ only in fractures. Limonite halos around pyrite masses. Multiple minute fracture directions. Bedding indistinct. Dense, hard siliceous rock. Limonite yellow to red. Rock is brecciated locally.	

1 = weak 2 = medium 3 = strong

54-1

DDH NO. SH-1

STATE _____ MINING DISTRICT _____
COUNTY _____ PROJECT _____

COORDINATES _____ N _____ E
COLLAR ELEVATION _____
INCLINATION _____ BEARING _____

DATE STARTED _____ DRILLING CO. _____
DATE COMPLETED _____
FINAL DEPTH _____

FOOTAGE		L1	L2	CORE: % REC. BY FT.	CORE: LBS. REC.	CORE: % REC. BY WT.	CORE: TOT. CU.	CORE: OX CU	CORE: MO S2	CORE: ASSAY Zn	CORE SIZE	SAMP. NO.	SLUDGE: SAMP. NO.	SLUDGE: LBS. REC.	SLUDGE: % REC. BY WT.	SLUDGE: SPLIT	SLUDGE: ASSAY TOT. CU.	SLUDGE: ASSAY OX CU	SLUDGE: ASSAY MO S2	COMBINED ASSAY: PERCENT 0.1 0.5 1.0	COMBINED ASSAY: TOT. CU
144.4	153.1	87	86	99			Tr			Tr		8605									
160.1	170.1	100	95	95			Tr			Tr		8606									
178.3	188.3	100	102	102			Tr			Tr		8607									
197.4	209.7	123	119	97			002			Tr		8608									
220.1	231.6	115	112	98			Tr			005		8609									
238.0	248.4	104	100	96			Tr			005		8610									

DDH NO. Saginaw #1

STATE Arizona
COUNTY Pima
Sec 12 T15S R12E
MINING DISTRICT Amole
PROJECT Saginaw Hill
COORDINATES K.50 N 43 E
COLLAR ELEVATION
INCLINATION vert.
BEARING
DATE STARTED 20 May 60
DATE COMPLETED 21 June 60
FINAL DEPTH 1010.0
DRILLING CO. [illegible]

FOOTAGE				UNALT	CHLOR.	EPIDOTE	MONTMOR.	BIOTITE	KAOL.	HY. MICA.	ORTHO.	SER.	SIL.	STAGE NO.	ROCK TYPE	SECTION	CU5FeS4	CUFeS2	FeS2	CU2S	CUS	MoS2	OXIDE ZONE: LEACHED CAVITIES-COLOR ETC. / SULPHIDE ZONE-CHAR OF MIN. DISS. VEIN, ETC.	< INCL.	FRACTURING	GEOLOGY	LOG BY
138	0	144	4												Siltstone								Limonite & pyrite		35°	Hard, dense, siliceous. Calcareous locally along fractures. Pyrite along small, long fractures, and alters locally to limonite. Limonite extends into wall rock up to 2 mm. Fractures are small and run in multiple directions. Limonite red, brown to yellow in color. Multiple minute fractures with black alteration material.	
144	4	153	1		?										Siltstone arkose								Limonite & pyrite		45° (major) 10° (minor)	Hard, dense and siliceous. Brecciated with limonite along minute fracture, for first foot. Pyrite altering to limonite along some fractures. Talc and calcite locally along fractures. Arkosic locally which is fine to medium grained. The bottom 0.3 feet is brecciated, friable, and grayish black in color. Rare pyrite scattered throughout. Limonite yellow to red.	
153	1	160	1												Arkosic siltstone								Limonite & pyrite.		Vertical, 50°	Fine to medium grained. Limonite & calcareous along the fractures. Pyrite along fractures, altering to limonite. Clay alteration and shearing along fractures. Hard & siliceous. Locally brecciated with much alteration (154.5'–155.3').	
160	1	170	1												Arkosic Siltstone								Limonite & pyrite		35°, 15°.	Hard, dense & siliceous. Slightly calcareous, with $CaCO_3$ along fractures. Pyrite locally altering to limonite along fractures. Clay alteration particularly on fractures and in the coarser portions of the rock. Brecciated from 167' to 171.0. Zones of complete pyrite alteration to zones of no pyrite alteration.	James M Evans
170	1	178	3						2						Arkose										25°, 50°	Slightly calcareous. Strongly calcareous along fractures. Sheared pyrite along major fractures. Much of rock is brecciated. Pyrite disseminated throughout. Some feldspar has gone to clay. Limonite stain in lower 0.6', otherwise rare.	
178	3	188	3						2						Arkose										10°, 25°	Lower 3' — slightly calcareous. Fractures are calcareous. Pyrite disseminated throughout. Brecciated with some kaolin. Upper 7' — Pyrite along fractures altered to limonite. Limonite yellow to brown to red in color. Highly fractured & brecciated.	
188	3	197	4						1						Arkose								Sphalerite rare.		40°, 10°, Vertical.	Pyrite altering to limonite along fractures. Disseminated blobs of pyrite unaltered. Limonite yellow to brown to red. Offsetting of limonite filled fractures. Sphalerite is rare. Calcareous on some fractures. Clay alteration where brecciated. About 10% brecciated. Bedding indistinct. Unaltered rock is dense & siliceous	
197	4	209	7						1						Arkosic Siltstone								Sulphide zone		Horizontal, vertical, 60°, 15°.	Zones of brecciation (5% of rock). Clay in breccia. Black pyrite in sheared fractures. Sphalerite as disseminations. Pyrite in fractures & zones of brecciation & alteration. Pyrite is not altered. Fractures may follow bedding (60°). Unaltered rock is dense & siliceous. Sulphide disseminated in the coarser material.	
209	7	220	1												Arkosic siltstone										85°, 50°, 10°	High angle fractures. Calcite crystals in fractures. Pyrite along fractures, also as disseminations. Pyrite not altered. Clay (?) in the zones of brecciation. Bedding indistinct. Generally hard & siliceous.	
220	1	231	6						1						Arkosic Siltstone										50°, 80°, 10°.	Unaltered pyrite localized along fractures, with calcite. Finer grained parts (80%) is hard, dense, & siliceous. Coarser parts are more porous & show more clay alteration. Sulphide weakly disseminated in the coarser material. Shearing along fractures.	
231	6	238	0						1						Siltstone										40°, 10°	Bedding 40°. Unaltered pyrite and calcite along fractures. Fractures offset fractures. Clay along shear zones. Sulphide scattered through the more permeable zones.	
238	0	248	4												Siltstone										30°	Dense, hard & siliceous. Finely fractured with unaltered pyrite or calcite along fractures. Pyrite locally disseminated. Sulphide mineralization along bedding. Bedding dips at 45°. Clay alteration along sheared zones. Fractures often follow bedding.	

DDH NO. Sagamaw Hill #1

STATE Arizona
COUNTY Pima
MINING DISTRICT Amole
PROJECT Sagamaw Hill
Sec 13 T15S, R12E

COORDINATES K.50 N 43 E
COLLAR ELEVATION
INCLINATION Vert
BEARING

DATE STARTED 20 May 60
DATE COMPLETED 21 June 60
DRILLING CO. Jay
FINAL DEPTH 1010.6

FOOTAGE				UNALT	CHLOR.	EPIDOTE	MONTMOR.	BIOTITE	KAOL.	HY. MICA.	ORTHO.	SER.	SIL.	Talc	STAGE NO.	ROCK TYPE	SECTION	CuSFeS4	CuFeS2	FeS2	Cu2S	CuS	MoS2		OXIDE ZONE: LEACHED CAVITIES-COLOR ETC. / SULPHIDE ZONE-CHAR OF MIN. DISS. VEIN, ETC.	< INCL.	FRACTURING	GEOLOGY	LOG BY
248	4	257	4													Siltstone											60°, 85°, 10°	Unaltered pyrite along fractures. Calcite in fractures & cavities. Hard, dense, siliceous. Disseminated sulphides along bedding (50°). Sphalerite locally with pyrite. Pyrite altering to limonite is rare. Local brecciation.	
257	4	270	5						1							Siltstone									Sphalerite rare		50°, 20°	Pyrite along bedding. Hard, siliceous, and dense. Calcareous along fractures. Pyrite altering to limonite very rare. Sphalerite very rare. Bedding dips at 50°. Clay alteration on some fractures.	
270	5	278	7											1		Arkosic siltstone									Sphalerite dissemination		10°, 40°	Dense, hard & siliceous. Talc alteration on some fractures. Fractures show movement. Sphalerite associated with pyrite, very rare. Pyrite disseminated and massive along fractures. Slightly calcareous along some fractures.	
278	7	288	7						1					1		Siltstone											Vertical, 15°	Hard, dense & siliceous. Fractures follow bedding which at 15°. Pyrite and calcite follow fractures. Pyrite is unaltered, about 287' is a brecciated zone, with clay & talc alteration. Block pyrite on shear zones. Calcareous throughout zone of brecciation.	
288	7	298	3													Siltstone									Galena dissemination. Bornite & chalcopyrite disseminations rare.		15°, 70°	Hard, dense, & siliceous. Locally quartz crystals in open space filling. Bedding dips at 15°. Pyrite mostly as dissemination, but also as veins along fractures. Calcite crystals in open space, as massive along fractures.	
298	3	306	5													Siltstone											15°, 75°	Hard, dense & siliceous. Pyrite as disseminations, and along fractures. Bedding dips at 15°. Calcareous on fractures.	
306	5	315	5						?							Siltstone									Sphalerite disseminations very rare.		15°, Vertical	Bedding dips at 15°. Unaltered pyrite smoothly along fractures, but also as disseminations. Veins of vertical calcite, containing some pyrite. Hard, dense, & siliceous. Possibly some clay alteration along fractures.	
315	5	325	5													Arkosic Siltstone									Sphalerite disseminations locally.		15°, 85°,	Hard, dense & siliceous in the finer parts. Calcareous in the medium grained parts. Pyrite and sphalerite on in the medium grained parts along the 15° dip bedding. Calcareous along fractures.	
325	5	334	8													Arkosic Siltstone									Sphalerite disseminations rare		15°, 45°, 75°.	Calcareous along fractures. Slightly calcareous, but generally hard dense & siliceous. Unaltered pyrite along fractures and as disseminations. Clay alteration locally on some fractures.	
334	8	344	8													Siltstone									Sphalerite disseminations		15°, 75°,	Clay alteration in the coarser parts. Generally hard dense and siliceous, and slightly calcareous. Pyrite and sphalerite disseminated in the coarser parts of the rock. Pyrite and calcite along fractures.	
344	8	354	8													Siltstone											15°, 85°, 50°	Dip of bedding is 15°. Calcite crystals as open space filling. Unaltered pyrite and calcite along fractures. Minute fractures with sulphide present. Hard dense & siliceous. About 348' is a zone of clay alteration and brecciation.	
354	8	363	9													Siltstone											15° 85°	Pyrite along bedding, and at set key fractures with pyrite. Pyrite along multiple minute fractures. Hard, dense & siliceous. Coarser parts are slightly calcareous. Calcareous open-space filling. Calcareous in the coarser parts of rock.	
363	9	370	1													Siltstone									Sphalerite disseminated locally.		15°, 75°	Calcareous in the coarser parts of rock, multiple minute fractures with unaltered pyrite. Bedding dips at 15°. Pyrite locally on bedding planes, and on cross fractures. Calcareous on fractures, with open space filling and crystals of calcite locally. Hard dense & siliceous.	
370	1	380	1													Siltstone									Sphalerite disseminations			Cross & Crossing fractures with unaltered pyrite. Extremely mineralized from 373 – 377, with massive pyrite and sphalerite disseminations. Bedding dips at 30°. Calcareous, in zones of intense mineralization. Clay alteration locally on fractures. From 377 - 378' is banding of pyrite along bedding planes. Generally strongly siliceous and hard.	

Lewis, M.

DDH NO. SH-1

STATE ____ MINING DISTRICT ____ COORDINATES ____ N ____ E DATE STARTED ____ DRILLING CO. ____

COUNTY ____ PROJECT ____ COLLAR ELEVATION ____ DATE COMPLETED ____

INCLINATION ____ BEARING ____ FINAL DEPTH ____

FOOTAGE		L1	L2	CORE % REC. BY FT.	CORE LBS. REC.	CORE % REC. BY WT.	CORE ASSAY TOT. CU.	CORE ASSAY OX CU	CORE ASSAY MO S2	CORE ASSAY ZN	CORE SIZE	CORE SAMP. NO.	SLUDGE SAMP. NO.	SLUDGE LBS. REC.	SLUDGE % REC. BY WT.	SLUDGE SPLIT	SLUDGE ASSAY TOT. CU.	SLUDGE ASSAY OX CU	SLUDGE ASSAY MO S2	COMBINED ASSAY PERCENT 0.1 0.5 1.0	COMBINED ASSAY TOT. CU
257.4	270.5	13.1	12.7	98			Tr			Tr		8611									
278.7	288.7	10.0	10.0	100			Tr			Tr		8612									
298.3	306.5	8.2	8.1	99			0.02			Tr		8613									
315.5	325.5	10.0	9.7	97			002			005		8614									
334.8	344.8	10.0	9.8	98			Tr			010		8615									
354.8	363.9	9.1	9.5	104			Tr			015		8616									
370.1	380.1	10.0	10.0	100			003			060		8617									

DDH NO. SH-#1

STATE Arizona MINING DISTRICT Amole
COUNTY Pima PROJECT Sagenaw Hill
Sec 12 T15S R12E

COORDINATES K 150 N 43 E
COLLAR ELEVATION
INCLINATION Vert BEARING

DATE STARTED 20 May 60 DRILLING CO.
DATE COMPLETED 21 June 60 Fry
FINAL DEPTH 1010.0

FOOTAGE	UNALT	CHLOR.	EPIDOTE	MONTMOR.	BIOTITE	KAOL.	HY. MICA.	ORTHO.	SER.	SIL.	Talc	STAGE NO.	ROCK TYPE	SECTION	CU5FES4	CUFES2	FE S2	CU2S	CUS	MOS2	OXIDE ZONE: LEACHED CAVITIES-COLOR ETC. / SULPHIDE ZONE-CHAR OF MIN. DISS. VEIN, ETC.	< INCL.	FRACTURING	GEOLOGY	LOG BY
380.1 – 388.0													Arkose siltstone to Breccia								Sphalerite dissemination very rare.		10°, 60°,	Alteration more intense from 380.1 – 382'. Black pyrite along fractures indicate shearing. Locally hard, dense & siliceous. From 383.7 to 385 is a breccia, with lt. siltstone & arkose fragments. Multiple minute fractures locally with pyrite veinlets. Pyrite also as dissemination. Clay alteration along many fractures. Bedding indistinct.	Jones & Barker
388.0 – 398.0													Arkose siltstone to quartz mon Porphyry								Sphalerite & galena disseminated in the Quartz Mon Porphyry.		50°, 10°	Highly brecciated in arkose siltstone. Bedding indistinct. Calcareous in brecciated zone, and along fractures with open space filling. Pyrite disseminated in the siltstone and in Q mon Porphyry. Pyrite locally along fracture (bedding?). Contact at about 394' between ark siltstone & Q mon Por.	
398.0 – 408.0													Quartz Mon Porphyry & Siltstone								Sphalerite & Chalcopyrite (?) disseminated in the QMP. Galena dissemination very rare.		85°, 10°, 70°.	Contact between Q Mon Porphyry & Siltstone is about 406.5'. Intimate contact. QMP – Pyrite, Chalcopyrite (?) and sphalerite disseminated throughout. Calcareous along fractures. Generally fine grained with quartz phenocrysts. Siltstone – Hard, dense, & siliceous. Slightly calcareous. Sulphides as veinlets. Clay alteration along fractures in both rock types (Slight).	
408.0 – 418.0													Siltstone								Sphalerite dissemination rare.		50°, 70°	Hard, dense, & siliceous. Increase of grain size (all small) increase of calcite. Pyrite generally disseminated, but locally as veinlets along fractures. Calcite in open space filling.	
418.0 – 428.0													siltstone								Sphalerite with pyrite along fractures and disseminated.			Hard, dense & siliceous. Increasingly calcareous with increase of grain size. Pyrite disseminated and along fractures. Calcareous along fractures. Clay alteration locally on some fractures.	
428.0 – 437.3													Arkose siltstone								Sphalerite dissemination very rare.		40°, 85°	Hard, dense & siliceous. Locally calcareous, especially along fractures. Pyrite disseminated and along some fractures. Pyrite as thin bands along bedding planes. More calcareous in coarser sections.	
437.3 – 445.6													Siltstone to Quartz mon Por								Sphalerite dissemination with pyrite are rare.		20°, 75°, 50°	Contact between siltstone & Q Mon Por is about 444'. Siltstone – Hard, dense, & siliceous, but with increasing calcite. Thin bands of pyrite along fractures, and as disseminations. Bedding dips at 70°. Locally brecciated. QMP – Pyrite as disseminations. Slightly calcareous. Zones of brecciation.	
445.6 – 455.5							1			1			Quartz Mon Porphyry								Sphalerite on fractures.		50°, vertical.	Slightly calcareous, particularly on local zones of brecciation. Pyrite & sphalerite on fractures, also as disseminations. Clay alteration on some fractures. Sericite alteration (Thin section)	
455.5 – 465.5										1			Quartz Mon Porphyry										70°, Vertical	Black pyrite along fracture at 463'. Slightly calcareous. Sericite alteration. Pyrite as dissemination and along fractures. Clay alteration along fractures.	
465.5 – 473.8										1			Quartz Mon Porphyry								Galena & sphalerite vein at 465.5.		30°, 50°	Slightly calcareous, particularly where brecciated. Some pyrite disseminations. Clay alteration along fractures. Sericite alteration.	
473.8 – 485.2							1			1			Quartz Mon Porphyry										25°, 85°,	Slightly calcareous. With calcite vein filling. Pyrite along fractures and as disseminations. Clay along fractures.	
485.2 – 496.0							1			1			QMP										40°, 10°,	Clay along fractures. Slightly calcareous, particularly along fracture. Pyrite along fractures and as disseminations. Locally brecciated.	
496.0 – 506.0							1			1			QMP to Siltstone								Sphalerite disseminated with the pyrite.		50°	Contact between QMP and siltstone is at 503'. Contact dips at 40°. QMP – Pyrite sparsely disseminated. Clay alteration along fracture. Slightly calcareous, particularly along fractures.	
506.0 – 518.0												2	Siltstone								Sphalerite in altered zones & disseminated with pyrite. Galena very rare.		40°, 80°	Siltstone – Intensely mineralized, altered and fractured. Bedding indistinct. Zones of intense alteration. Pyrite & sphalerite abundant. Slightly calcareous except in zones of alteration, where it is strongly calcareous. Talc alteration minerals. Bedding indistinct. Highly fractured.	
518.0 – 530.0													Siltstone								Sphalerite with pyrite. Intensely mineralized		50°	Highly fractured with zones of intense talc alteration. Pyrite and sphalerite as disseminations throughout. Slightly calcareous to strongly calcareous in fractured and altered zones. Bedding indistinct.	

DDH NO. SH-1

STATE ____ MINING DISTRICT ____
COUNTY ____ PROJECT ____

COORDINATES ____ N ____ E
COLLAR ELEVATION ____
INCLINATION ____ BEARING ____

DATE STARTED ____ DRILLING CO. ____
DATE COMPLETED ____
FINAL DEPTH ____

FOOTAGE		L1	L2	CORE % REC. BY FT.	CORE LBS. REC.	CORE % REC. BY WT.	CORE TOT. CU.	CORE OX CU	CORE MO S2	CORE ASSAY	CORE ZINC	CORE CORE SIZE	CORE SAMP. NO.	SLUDGE SAMP. NO.	SLUDGE LBS. REC.	SLUDGE % REC. BY WT.	SLUDGE SPLIT	SLUDGE ASSAY TOT. CU.	SLUDGE ASSAY OX CU	SLUDGE ASSAY MO S2	COMBINED ASSAY PERCENT 0.1 0.5 1.0	COMBINED ASSAY TOT. CU
388 0	398 0	10 0	9 9	99			Tr				0.10		8618									
408 0	418 0	10 0	10 0	100			Trace				0.05		8619									
428 0	439 3	9 3	9 1	98			0.02				Trace		8620									
445 6	455 5	9.9	9.9	100			0.02				Trace		8621									
465 5	473 8	8.3	8.3	100			Trace				Trace		8622									
485 2	496 0	10.8	10.5	97			Trace				Trace		8623									
506 0	518 0	12.0	10.9	92			0.03				0.10		8624									

DDH NO. SH #1

STATE Arizona MINING DISTRICT Amole
COUNTY Pima PROJECT Saginaw Hill
Sec 12 T15S R12E

COORDINATES K.50 N 43 E
COLLAR ELEVATION
INCLINATION Vert BEARING

DATE STARTED 20 May 60 DRILLING CO.
DATE COMPLETED 21 June 60 Jay
FINAL DEPTH 1010.0

FOOTAGE	UNALT	CHLOR.	EPIDOTE	MONTMOR.	BIOTITE	KAOL.	HY. MICA.	ORTHO.	SER.	SIL.	Talc	STAGE NO.	ROCK TYPE	SECTION	CuSFeS4	CuFeS2	FeS2	Cu2S	CuS	MoS2			OXIDE ZONE: LEACHED CAVITIES-COLOR ETC. / SULPHIDE ZONE-CHAR OF MIN. DISS. VEIN, ETC.	< INCL.	FRACTURING	GEOLOGY	LOG BY
530.0 – 542.0						1					1		Siltstone + QMP												50°, 65°	Talc along fractures. Rock highly brecciated & fractured. Bedding indistinct. Black pyrite along a fracture showing movement. open vug with calcite crystals. Slightly calcareous locally to strongly calcareous in zones of brecciation and along fractures. Pyrite disseminations. Contact between siltstone & QMP is 542'. QMP in lower 2 ft.	Jay
542.0 – 553.9						1					1		Siltstone										Sphalerite locally with pyrite.		50°, 75°	Slightly calcareous only along fractures. Pyrite common. Rock is highly fractured, brecciated & altered. Bedding is indistinct. Talc along fractures.	
553.9 – 565.4						1					1		Siltstone										Sphalerite intense locally.		80°, 30°	Highly fractured & altered. Bedding is indistinct (50°). Talc and clay alteration. Calcite only along fractures. Pyrite & sphalerite following bedding (?) & fractures.	
565.4 – 573.9						1					1		Siltstone										Sphalerite with pyrite.		30°	Pyrite & sphalerite as disseminations, and along fractures. Calcareous locally along fractures. Talc & clay alteration along fractures. Siltstone grades into a fine arkose. Brecciated.	
573.9 – 583.1						1					1		Siltstone to fine arkose QMP(?)												vertical, 60°	Talc & clay alteration along fractures. Pyrite as disseminations. Calcareous along fractures, and slightly calcareous in the arkose. Coarse pyrite crystals. Quartz mo. Porphyry from 574.5' to 575'	
583.1 – 594.6													Fine arkose to siltstone												15°, 60°	Calcareous in the coarser grained parts & along fractures. The fine siltstone is essentially barren of sulphide, and is hard dense & siliceous. Pyrite disseminations in the fine arkose. Clay alteration along fractures, highly brecciated locally.	Jay
594.6 – 604.7						1							Siltstone												50°, vertical.	Bedding dips at 50°. Hard, dense & siliceous. Locally highly fractured with clay alteration. Calcareous along fractures. Sulphide mineralization sparse to barren. Pyrite along fractures, particularly at 602.8'.	
604.7 – 613.7						1					1		Siltstone												50°, 85°	Hard, dense & siliceous. Locally brecciated. Slightly calcareous along fractures. Bedding dips at 50°. Talc and clay alteration along some fractures. Pyrite along bedding.	
613.7 – 619.4						1							Siltstone to fine arkose												50°, 10°	Clay alteration along fractures. Hard, dense & siliceous. Slightly calcareous. Bedding dips at 50°, and pyrite follows bedding planes. Locally brecciated.	
619.4 – 628.5													Siltstone												50°, 15°	Hard, dense, siliceous. Slightly calcareous in the coarser parts. Bedding dips at 50°. The pyrite generally follows bedding planes, and fractures.	
628.5 – 639.4						1					1		Siltstone												70°, 25°, 50°	Hard, dense & siliceous. Locally brecciated with clay alteration. Pyrite in the coarser portions along the bedding planes & fractures. Bedding dips at 70°. Locally calcareous along the coarser portions and along fractures. Slight talc alteration along some fractures.	
639.4 – 651.1						1					1		Siltstone to arkose												70°, 85°	Hard, Dense & siliceous. Slightly calcareous in the coarser part of rock. Dip of rock is 60°. Pyrite as fine disseminations and sparsely along bedding planes & fractures. Talc & clay alteration along some fractures.	
651.1 – 660.6						1							Arkose												20°, 55°	Fine to medium grained. Bedding dips at 55°. Slightly calcareous to strongly calcareous on fractures. Black pyrite along fractures, showing movement. Hard, dense, & siliceous.	
660.6 – 669.5						1							Arkose										Sphalerite disseminated with pyrite.		30°, 65°, 80°	Fine to medium grained. Pyrite & sphalerite along fractures and as disseminations. Clay alteration along fractures. Slightly calcareous. Strongly calcareous along fractures. In coarser parts is yellow limonite staining. Hard, dense, & siliceous.	
669.5 – 679.5						1					1		Arkose										Sphalerite disseminations		45°, 30°	Slightly to strongly calcareous. Fine to medium grained. Lower 3 feet in coarser part is fine disseminations of pyrite & sphalerite with yellow limonite staining. Hard, dense, & siliceous. Talc alteration in vugs. Bedding dips at 45° (?). Local brecci zones.	

DDH NO. SH-1

STATE ____ MINING DISTRICT ____ COORDINATES ____ N ____ E DATE STARTED ____ DRILLING CO. ____

COUNTY ____ PROJECT ____ COLLAR ELEVATION ____ DATE COMPLETED ____

INCLINATION ____ BEARING ____ FINAL DEPTH ____

FOOTAGE		CORE % REC. BY FT.	CORE LBS. REC.	CORE % REC. BY WT.	CORE ASSAY TOT. CU.	CORE ASSAY OX CU	CORE ASSAY MO S2	CORE ASSAY	CORE	CORE SIZE	CORE SAMP. NO.	SLUDGE SAMP. NO.	SLUDGE LBS. REC.	SLUDGE % REC. BY WT.	SLUDGE SPLIT	SLUDGE ASSAY TOT. CU.	SLUDGE ASSAY OX CU	SLUDGE ASSAY MO S2	COMBINED ASSAY PERCENT 0.1 0.5 1.0	COMBINED ASSAY TOT. CU
530.0	542.0	12.0	10.7	90				0.03			0.10	NX	8625							
542												BX								
553.9	565.4	11.5	10.8	95				Trace			0.05		8626							
573.9	585.1	9.2	8.9	96				Trace			0.05		8627							
594.6	604.7	10.1	10.2	101				Trace			Trace		8628							
613.7	619.4	5.7	5.7	100				Trace			Trace		8629							
628.5	639.4	10.9	10.5	97				Trace			Trace		8630							
651.1	660.6	9.5	9.5	100				0.02			Trace		8631							
669.5	679.5	10.0	10.0	100				Trace			Trace		8632							

DDH NO. SH #1

STATE Arizona MINING DISTRICT Amole
COUNTY Pima PROJECT Saginaw Hill
Sec 12 T15S R12E

COORDINATES K.50 N 43 E
COLLAR ELEVATION
INCLINATION Vert BEARING

DATE STARTED 20 May 60 DRILLING CO.
DATE COMPLETED 21 June 60 Jay
FINAL DEPTH 1010.0

FOOTAGE				UNALT	CHLOR.	EPIDOTE	MONTMOR.	BIOTITE	KAOL.	HY. MICA.	ORTHO.	SER.	SIL.	Talc	STAGE NO.	ROCK TYPE	SECTION	CU5FES4	CUFESZ	FE S2	CU2S	CUS	MOS2	OXIDE ZONE: LEACHED CAVITIES-COLOR ETC. / SULPHIDE ZONE-CHAR OF MIN. DISS. VEIN, ETC.	< INCL.	FRACTURING	GEOLOGY	LOG BY
679	5	688	2						1							arkose								Sphalerite disseminations very rare.		50°, vertical,	Fine to medium grained. Hard, dense, & siliceous. Locally brecciated. Slightly calcareous, particularly along fractures. Fault zone with gouge at 686.5'. Sulphide mineralization spare with pyrite along bedding planes. Bedding dips at 50°. Calcite crystals in some fractures. Carbonaceous shale at about 687.5'	
688	2	697	3						1					1		Siltstone										30°, 35°	Pyrite along fracture and bedding, locally disseminated. Hard, dense, & siliceous. Locally calcareous, particularly along fractures. A 4" breccia zone at 690'. Mineralized fractures offset by other fractures. Bedding dips at about 35°	
697	3	707	3													Siltstone								Sphalerite disseminations are sparse as is galena.		25°, 35°	Sample taken for thin section. Hard, dense, & siliceous. Locally calcareous particularly along fractures. Locally chocolate brown in color (from 702-704'). Pyrite along fine fractures in small zones of brecciation. Bedding dips at 65°.	
707	3	714	7						1							Siltstone to arkose								Galena & sphalerite disseminated in the coarser arkose.		65°,	Arkose is fine to medium grained with pyrite disseminations, and along fractures. Slightly calcareous throughout except in chocolate brown material. Contact between siltstone & arkose is about 710'. Bedding dips at 65°. Calcite crystals in fractures.	
714	7	724	7						1							arkose to siltstone								Sphalerite very rare.		10°, 50°	Lower 2 feet is arkose. From 716-730 is a dark colored siltstone. Pyrite along fractures, rarely as disseminations. Slightly calcareous particularly along fractures. Hard, dense and siliceous.	
724	7	734	7						1					1		Siltstone to arkose										50°, 30°	Lower 4' is arkose, and is locally intensely mineralized with pyrite. Upper few inches is more calcareous than rest of rock. Bedding dips at 50°. Calcareous along fractures. Hard, dense, & siliceous.	
734	7	746	3						1					1		arkose								Sphalerite very rare		60°, 85°, 15°.	Fine to medium grained. Pyrite disseminated throughout. Sphalerite disseminations very local. Brecciated (Fault zone?) from 736'-746'. Hard, dense & siliceous. Moderately calcareous throughout, particularly in brecciated zones. Bedding dips at 65°. Intense alteration in some brecciated zones.	
746	3	755	3						1					1		arkose								Sphalerite locally.		55°, 85°,	Fine to coarse grained. Dense & fairly siliceous. Increasingly calcareous with depth. Pyrite disseminated in varying quantities throughout, with sphalerite locally. Some carbonaceous (?) material along bedding planes. Bedding dips at 55°.	
755	3	760	3						1					1		arkose								Sphalerite rare.			Medium to coarse grained. Pyrite disseminations rare. Calcareous, dense, slightly siliceous. Clay and talc alteration.	
760	3	770	3													arkose										85, 15, 60	Fine to coarse grained. Locally silty. Calcareous particularly along fractures and in the coarser parts of rock. Sparse pyrite as disseminations and along fractures. Bedding indistinct (80°?) Hard, & dense.	
770	3	778	9						1					1		arkose										50°, 90°, 10°	Locally strongly altered (771.5'). Calcareous, particularly along fractures, and in zones of brecciation. Sparse pyrite as disseminations in zones of brecciation.	
778	9	788	9						2					2		Siltstone										65°, 75°, vertical	From 779.5' - 783' is a highly carbonaceous shale, which is non calcareous. Calcareous particularly in the upper 2 feet where it is essentially a pure limestone, which open cavities, and more intense pyrite mineralization. Bedding dips at 65°. Locally strong talc & clay alteration. Locally brecciated & highly fractured.	
788	9	799	7						2					2		Limestone to arkose								Sphalerite with pyrite.		Vertical, 10°, 30°.	Generally highly altered, calcareous, and brecciated. Pyrite mostly in calcareous & brecciated zones, 594'-595' is a siltstone. Calcite crystals in some fractures.	

James M. Gressen

DDH NO. SH-1

STATE
COUNTY
MINING DISTRICT
PROJECT
COORDINATES N E
COLLAR ELEVATION
INCLINATION BEARING
DATE STARTED
DRILLING CO.
DATE COMPLETED
FINAL DEPTH

FOOTAGE		L1	L2	CORE % REC. BY FT.	CORE LBS. REC.	CORE % REC. BY WT.	CORE ASSAY TOT. CU.	CORE ASSAY OX CU	CORE ASSAY MO S2	CORE ASSAY ZINC	CORE SIZE	CORE SAMP. NO.	SLUDGE SAMP. NO.	SLUDGE LBS. REC.	SLUDGE % REC. BY WT.	SLUDGE SPLIT	SLUDGE ASSAY TOT. CU.	SLUDGE ASSAY OX CU	SLUDGE ASSAY MO S2	COMBINED ASSAY PERCENT 0.1 0.5 1.0	COMBINED ASSAY TOT. CU
688.2	697.3	91	90	99			0.03			0.05		8633									
707.3	714.7	7.4	7.3	99			0.02			0.05		8634									
724.7	734.7	10.0	10.0	100			Trace			0.05		8635									
746.3	755.3	9.0	8.8	98			0.02			Trace		8636									
760.3	770.3	10.0	10.0	100			Tr			0.05		8637									
778.9	788.9	10.0	8.5	85			Tr			Tr		8638									

DDH NO. SH #1

STATE Arizona MINING DISTRICT Amole
COUNTY Pima PROJECT Sagenow Hill
Sec 12 T15S R12E

COORDINATES K 50 N 43 E
COLLAR ELEVATION
INCLINATION vert BEARING

DATE STARTED 20 May 60 DRILLING CO.
DATE COMPLETED 21 June 60 Jay
FINAL DEPTH 1010.0

FOOTAGE	Unalt	Chlor.	Epidote	Montmor.	Biotite	Kaol.	Hy. Mica.	Ortho.	Ser.	Sil.	Talc	Stage No.	Rock Type	Section	$CuSFeS_4$	$CuFeS_2$	FeS_2	CuS_2S	CuS	MoS_2	Oxide Zone: Leached Cavities-Color Etc. / Sulphide Zone-Char of Min. Diss. Vein, Etc.	< Incl.	Fracturing	Geology	Log By
799.7 – 808.3						1					1		Arkose								Sphalerite disseminations		50°, vertical.	Sulphides along minute fractures. Fine grained black material along fractures. Pyrite & sphalerite disseminated throughout. Calcareous throughout particularly along fractures. Fine to medium grained. Bedding is indistinct. Hard, dense & siliceous.	
808.3 – 815.8						1					1		Arkose								Sphalerite disseminations		15°, 40°	Local patches of siltstone. Calcareous throughout. Hard, dense & siliceous. Pyrite & sphalerite disseminated throughout. Fine to medium grained. Talc & clay alteration along fractures.	
815.8 – 827.7						1					1		Siltstone to arkose								Sphalerite locally intense		50°, 5°.	Generally very fine grained. Locally intensely altered, with talc & clay. Medium grained arkose with intense sphalerite & pyrite in the lower 2 feet (815.8 – 818). Calcareous only in the coarser grained rock & along fractures. Hard, dense, & siliceous particularly in finer grained rock.	
827.7 – 840.5						1					1		Siltstone to arkose								Sphalerite disseminations		50°, 5°.	Generally fine grained. Calcareous only in the coarser portions of the rock, and along fractures. Bedding dips at 80°. Sphalerite & pyrite locally as dissemination, and along fractures. Talc & clay alteration along fractures.	
840.5 – 848.1													Arkose								Chalcopyrite (?) & sphalerite disseminations rare.		50°, 5°.	Fine to medium grained. Calcareous throughout. Small blobs (1 – 2 Cm) of siltstone within the arkose. Chalcopyrite & sphalerite as rare disseminations. Talc & clay alteration less abundant along fractures.	
848.1 – 857.9						1					1		Arkosic siltstone								Sphalerite disseminations rare.		10°	Carbonaceous siltstone at about 849'. In the coarser part of rock is fine disseminations of sulphides. Calcareous particularly in the coarser parts of the rock. Surface of core is pitted in the coarser part of the rock. Siltstone is hard, dense & siliceous. Talc & clay alteration rare.	
857.9 – 862.3						1					1		Arkose								Sphalerite disseminations		10°	Pitted surface on core in the coarser parts. Bedding dips at 65°. From 860' – 862.3' it is intensely mineralized. Slightly calcareous particularly in the coarser parts of the rock. Alteration along bedding at about 859.5'.	
862.3 – 872.3						1					1		Arkosic siltstone								Sphalerite disseminations. Chalcopyrite (?) very rare.		10°, 50°.	About 75% arkose & 25% siltstone. Pitted in the coarser parts of the rock. Pyrite & sphalerite as disseminations, and along fractures. Calcareous in the coarser part of rock & along fractures. Clay & talc alteration along fractures.	
872.3 – 881.6						1					1		Siltstone to arkose								Sphalerite disseminated at 879' – 880.5'		15°, 45°, 85°	Calcareous throughout particularly in the coarser parts of the rock. About 876' is a soft dark gray siltstone. Hard, dense & slightly siliceous. Chlorite veinlets in lower 2 feet of core. Bedding indistinct. Talc & clay alteration along some fractures.	
881.6 – 891.6													Siltstone										55°, 10°	Hard, dense, & siliceous. Slightly calcareous throughout. From 889' – 891.6 the pyrite is along very fine fractures. Bedding dips at 65°. Rock is essentially unaltered except along a very few fractures. Slightly coarser grained from 889' – 891.6.	
891.6 – 900.7													Arkosic siltstone										10°	Hard, dense & siliceous. Locally slightly calcareous. Black siltstone from 895' – 897'. Bedding dips at 75°. Pyrite disseminations along bedding, particularly in coarser parts of the rock. Pyrite veins, as disseminations.	
900.7 – 908.4						1					1		Siltstone to arkose										70°, 10°	Hard, dense & siliceous. Slightly calcareous. Pyrite disseminated along fractures, and as intense blobs particularly at about 908'. Alteration slight along fractures. Bedding dips at 70°.	
908.4 – 918.1													Siltstone								Sphalerite as fine disseminations.		15°,	Hard, dense, & siliceous. Slightly calcareous. Bedding dips at 65°. Pyrite & sphalerite as fine disseminations along fractures & bedding. Appearance of chalcopyrite, but is pyrite.	

DDH NO. SH-1

STATE ______ MINING DISTRICT ______ COORDINATES ______ N ______ E ______ DATE STARTED ______ DRILLING CO.

COUNTY ______ PROJECT ______ COLLAR ELEVATION ______ DATE COMPLETED ______

INCLINATION ______ BEARING ______ FINAL DEPTH ______

CORE

FOOTAGE		L1	L2	% REC. BY FT.	LBS. REC.	% REC. BY WT.	TOT. CU.	OX CU	MO S2	ASSAY Zn				CORE SIZE	SAMP. NO.
799 7	808 3	8 6	8 6	100			0 03			0 05					8639
815 8	827 7	11 9	11 3	96			0 02			0 10					8640
840 5	848 1	7 6	7 5	98			0 02			Tr					8641
857 9	862 3	4 4	4 4	100			0 03			0 55					8642
872 3	881 6	9 3	10 2	110			Tr			0 10					8643
891 6	900 7	9 1	9 4	103			Tr			0 05					8644
908 4	918 1	9 7	8 8	91			0 02			0 05					8645

SLUDGE

SAMP. NO.	LBS. REC.	% REC. BY WT.	SPLIT	ASSAY TOT. CU.	OX CU	MO S2		

COMBINED ASSAY

PERCENT 0.1 0.5 1.0	TOT. CU		

DDH NO. SH-1

STATE Arizona
COUNTY Pima
MINING DISTRICT Arivale
PROJECT Sagenaw Hill
Sec 12 T15S R12E

COORDINATES K 50 N 43 E
COLLAR ELEVATION
INCLINATION Vert
BEARING

DATE STARTED 20 May 60
DATE COMPLETED 21 June 60
FINAL DEPTH 1010.0
DRILLING CO. Joy

FOOTAGE	UNALT	CHLOR.	EPIDOTE	MONTMOR.	BIOTITE	KAOL.	HY. MICA.	ORTHO.	SER.	SIL.	Fe	STAGE NO.	ROCK TYPE	SECTION	CU5FES4	CUFES2	FE S2	CU2S	CUS	MOS2	OXIDE ZONE: LEACHED CAVITIES-COLOR ETC. / SULPHIDE ZONE-CHAR OF MIN. DISS. VEIN, ETC.	< INCL.	FRACTURING	GEOLOGY	LOG BY
918 1 927 6						1			?		1		Siltstone								Fine sphalerite on fractures.		Vertical, 10°, 45°	Hard, dense & siliceous. Slightly calcareous, particularly in coarser parts of rock & along fractures. Tends toward a fine arkose in the lower 3 feet. Pyrite & sphalerite (Fine dissemination) along fractures. Slight clay & talc & sericite (?) alteration on fractures.	
927 6 937 6						1			?				Arkose								Chalcopyrite & sphalerite as rare disseminations		Vertical, 65°, 10°	Hard, dense & siliceous, Slight to highly calcareous particularly along fractures. Fine to coarse grained. Lower 3' is intensely mineralized. Heavy alteration in the coarser parts of the rock. Pyrite, Chalcopyrite & sphalerite along fractures & as disseminations in the coarser grained rock	
937 6 947 6													Arkose to siltstone								Chalcopyrite & sphalerite, Bornite		Vertical, 15°.	Upper 3 feet is arkose (Coarse) with disseminated pyrite chalcopyrite, & sphalerite. Pyrite in the siltstone along fractures. Clay & talc alteration along fractures. Generally hard, dense & siliceous. Calcareous particularly in the fractures & the coarser material. Sulphides locally as fine disseminations along fine fractures.	
947 6 957 6													Arkose Siltstone								Sphalerite as fine disseminations locally		10°, 60°.	Hard, dense & siliceous. Slightly calcareous, particularly along fractures. Sphalerite & pyrite as fine disseminations along bedding & fractures. Generally fine grained, Talc & Clay alteration along fractures. Bedding dips at 65°.	
957 6 964 6									?				Siltstone to arkose								Chalcopyrite (?) in lower 6"		50°, 20°	Generally hard, dense & siliceous. Calcareous, particularly along fractures. Talc & clay alteration along fractures. Lower 6" is arkose with entire pyrite & chalcopyrite (?) mineralization. Much alteration in this lower 6" zone with clay & sericite (?).	
964 6 974 6						1			1		1		Arkose										Vertical, 10°, 30°.	Fine to medium grained. Calcareous throughout, particularly along fractures. Locally brecciated & highly altered. Pyrite throughout, particularly in the coarser grained parts, and along fractures.	
974 6 984 6													Arkose Siltstone								Chalcopyrite (?) & sphalerite disseminations		10°, 60°	Generally hard, dense & siliceous. In the fine grained parts, the rock is softer. Calcareous except in finer grained parts. Pyrite & sphalerite along fine fractures as fine disseminations. Locally, altered along fracture with pyrite.	
984 6 993 5						1			1		?		Arkose Siltstone								Sphalerite as disseminations.		75°, 10°	Hard dense & siliceous generally. In the upper 2' is a dark siltstone that is softer & non calcareous. Slightly calcareous in the coarser parts of rock. Fine pyrite and sphalerite along fine fractures as disseminations. Sericite & clay alteration along some fractures. Bedding dips at 70°.	
993 5 1003 5													Arkose Siltstone								Chalcopyrite coated with covellite. Sphalerite.		20°, 30°	Hard dense & siliceous in the coarser parts of the rock. The arkose is fine to medium grained. Calcareous in the coarser material and along fractures. Chalcopyrite, sphalerite & pyrite disseminations in the more calcareous material. Local zones of alteration particularly along fractures. The siltstone is softer non calcareous. Clay & talc alteration along fractures. Bedding dips at 30°.	
1003 5 1010 0													Arkose Siltstone								Sphalerite as disseminations and along fractures. Chalcopyrite (?)		20°, 30°	Bedding dips at 25°. Fine grained. Slightly calcareous. Strongly calcareous along fractures. Talc & clay alteration along fractures. Fractures show shear. Pyrite, sphalerite & chalcopyrite (?) as fine dissemination along fractures.	

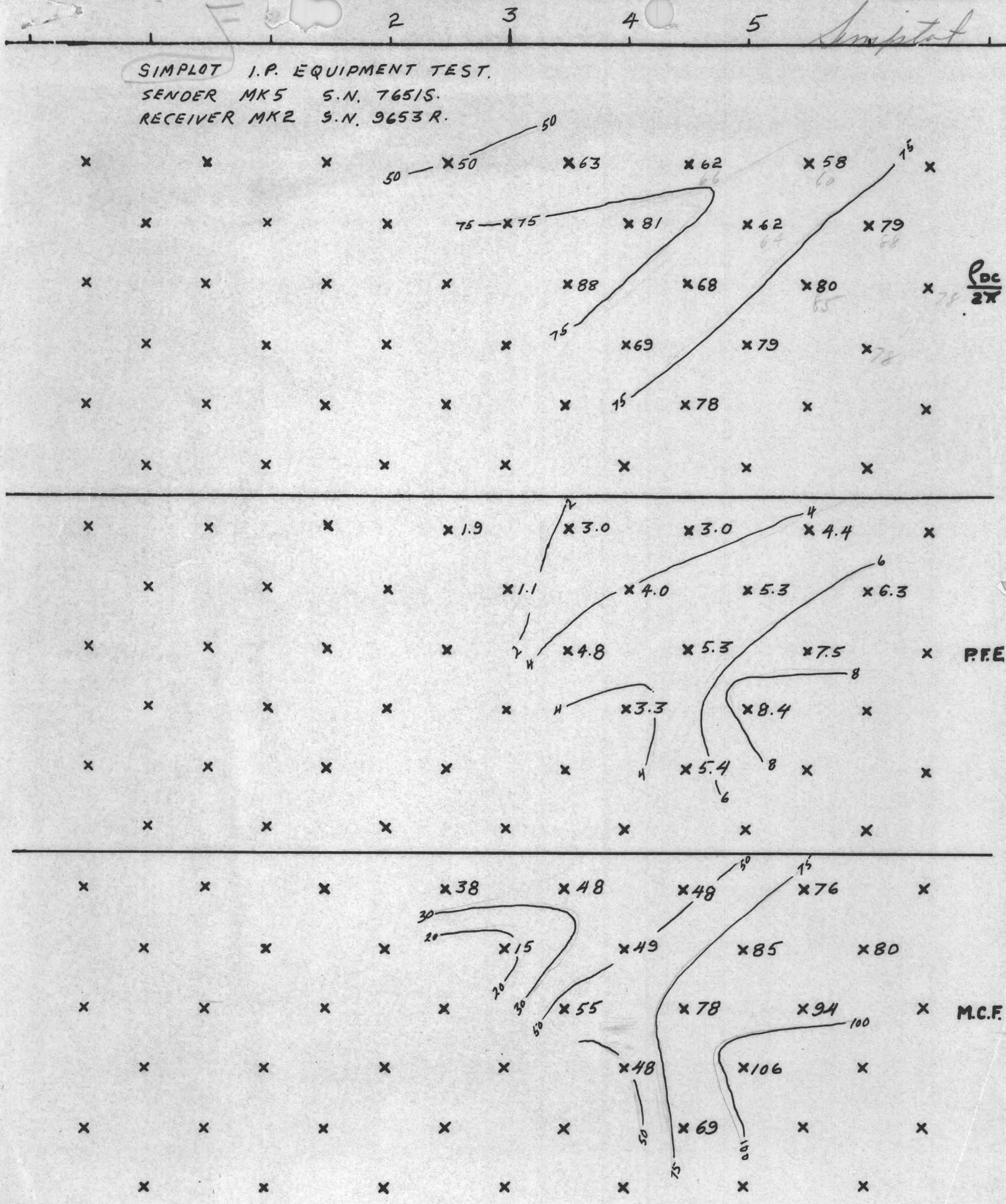
Bottom of hole.

DDH NO.

STATE
COUNTY
MINING DISTRICT
PROJECT
COORDINATES N E
COLLAR ELEVATION
INCLINATION BEARING
DATE STARTED DRILLING CO.
DATE COMPLETED
FINAL DEPTH

FOOTAGE		L1	L2	CORE % REC. BY FT.	CORE LBS. REC.	CORE % REC. BY WT.	CORE TOT. CU.	CORE OX CU	CORE ~~MO S2~~ Mo	CORE ASSAY Zn	CORE SIZE	CORE SAMP. NO.	SLUDGE SAMP. NO.	SLUDGE LBS. REC.	SLUDGE % REC. BY WT.	SLUDGE SPLIT	SLUDGE ASSAY TOT. CU.	SLUDGE ASSAY OX CU	SLUDGE ASSAY MO S2	COMBINED ASSAY PERCENT 0.1 0.5 1.0	COMBINED ASSAY TOT. CU
927.6	937.6	10.0	10.0	100			002			Tr		8646									
937.6	947.6	10.0	9.9	99			Tr			Tr		8647									
947.6	957.6	10.0	9.4	94			Tr			Tr		8647									
964	974.6	10.0	10.0	100			002			Tr		8648									
974	993.5	8.9	9.6	109			002			005		8649									
1003.5	1010.0	6.5	6.9	106			Tr			Tr		8650									

HEINRICHS GEOEX. INDUCED POLARIZATION SECTIONAL DATA PLOT, LOOKING N



SAGINAW HILL

AREA PIMA CO., ARIZ. LINE 1 a = 200' SCALE: 1" = 200' DATE: 3/9/66

E½

.05 .2 x 600 120

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page 1

Project Saguiaro Hill Line test Field date 4-14-67 Data page 1 Comp. date 4-14-67. Comp by JPM

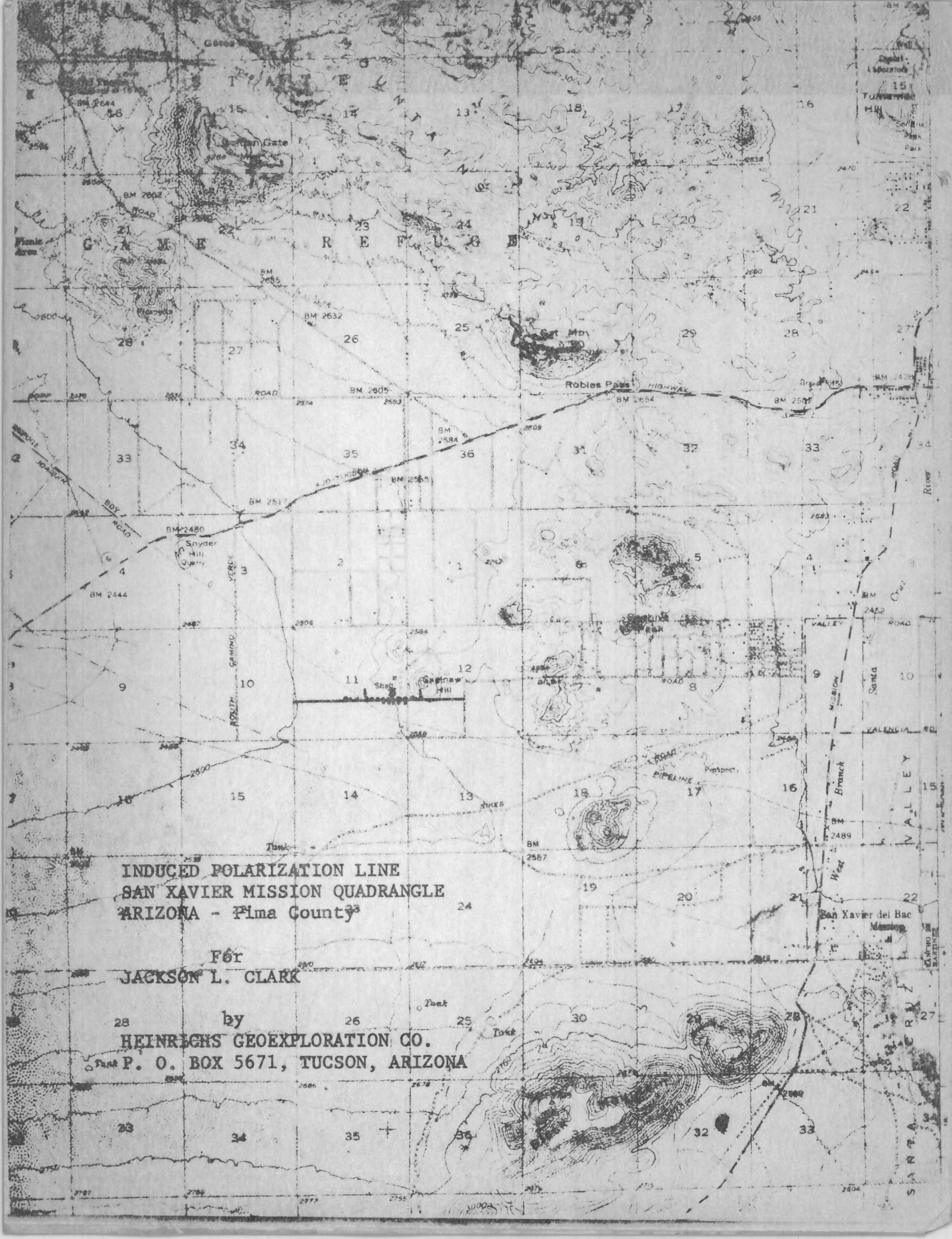
(A) Send	1-2	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2		
(B) Receive	0-200	200-400	→	400-600	→	→	600-800	→	→	→		
(C) n separation	1	1	2	1	2	3	1	2	3	4		
(D) I				2000			2000	2000				
(E) Vdc (avg)				433.0			396.75	105.0				
(F) DCcal	.5075	→	→	→	→	→	→	→	→	→		
(G) Kn x 10^{-3}	.6	.6	2.4	.6	2.4	6.0	.6	2.4	6.0	12.0		
(H) ρ dc=ExFxGx10^3/D				125 65.8			60.2	64.0				
(I) Vac Σ				415.0			361.5	99.2				
(J) AC noise ~~x 2~~				0.13	→	→	0.11					
(K) Vac(corr) = $\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	.99	→	→	→	→	→	→	→	→	→		
(M) ρ dc/ρac=ExL/K				7								
(N) PFE=(M-1)(10^2)				~~1.23~~ 3.3			9.7	4.8				
(O) MCF=(M-1)(10^5)/H				50			161	75				
S.P.				+2.3	→	→	-15.2	→	→	→		

Project _____ Line _____ Field date _____ Data page _____ Comp. date _____ Comp by _____

(A) Send	4-5	3-4	2-3	1-2	4-5	3-4	2-3	1-2			CAL	
(B) Receive	800-1000	→	→	→	1000-1200	→	→	→			200-400	
(C) n separation	1	3	4	5	3	4	5	6				
(D) I	2000	2000			2000	2000					1000	
(E) Vdc (avg)	144.8	56.0			51.0	25.20					197.0	
(F) DCcal	.5075	→	→	→	→	→	→	→			.5075	
(G) Kn x 10^{-3}	2.4	6.0	12.0	21.0	6.0	12.0	21.0	33.6				
(H) ρ dc=ExFxGx10^3/D	88	85.1			77.5	77.6						
(I) Vac Σ	135.8	51.9			45.2	21.8					195.0	
(J) AC noise ~~x 2~~	0.15	→	→	→	0.15	→	→	→				
(K) Vac (corr) = $\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	.99	→	→	→	→	→	→	→			.99	
(M) ρdc/ρac =ExL/K												
(N) PFE=(M-1)(10^2)	8.0	6.9			11.9	14.5						
(O) MCF=(M-1)(10^5)/H	91.0	81.3			154	187						
S.P.	+11.1	→	→	→	+11.1	→	→	→				

.035 .012

If noise is 10% of signal use correction

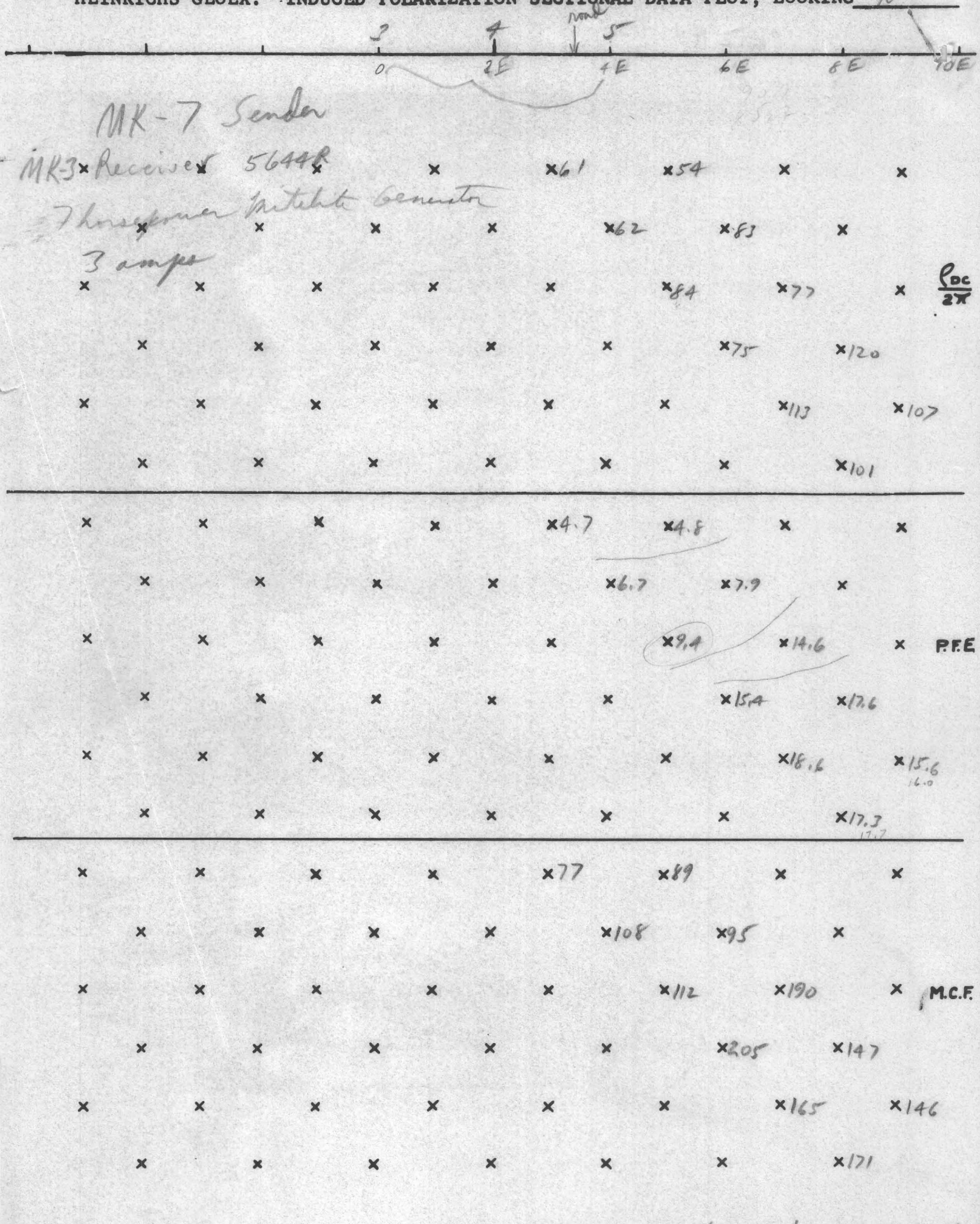


INDUCED POLARIZATION LINE
SAN XAVIER MISSION QUADRANGLE
ARIZONA - Pima County

For
JACKSON L. CLARK

by
HEINRICHS GEOEXPLORATION CO.
P. O. BOX 5671, TUCSON, ARIZONA

HEINRICHS GEOEX. INDUCED POLARIZATION SECTIONAL DATA PLOT, LOOKING N



AREA Saginaw LINE 1 a = 200' SCALE: 1" = 200' DATE: 3/17/67

PAGE

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT _____

LINE ____ HALF ____ SP. ____ DATE ____

SEND	3-4	3-4	3-4	3-4	3-4	3-4	3-4	3-4	3-4	3-4
RECEIVE										
RANGE	Hi	Hi	Hi	Hi	Hi	Hi	Hi	Hi	Hi	Hi
VOLTAGE	320	320	320	320	320	320	320	320	320	320
CURRENT	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
SEND	4.5	4.5	4.5	4-5	4.5	4-5	4.5	4-5	4.5	4.5
RECEIVE	Cal									
RANGE	Hi	Hi	Hi	Hi	Hi	Hi	Hi	Hi		
VOLTAGE	280	245	245	245	245	245	245	245	245	245
CURRENT	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0

FREQUENCIES .05 3.0

SENDER NO. 106635

OPERATOR [illegible]

RECEIVER NO.

OPERATOR

COMMENTS: 20V DROP LINE

VOLTAGE BETWEEN NO + FULL LOAD

ALSO GEN QUIT FOR LACK OF FUEL

PAGE

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT _____

LINE ____ HALF ____ SP. ____ DATE ____

SEND	3-4	3-4	3-4							
RECEIVE										
RANGE	Hi	Hi	Hi							
VOLTAGE	320	320	320							
CURRENT	3.0	3.0	3.0							
SEND	4-5	4-5	4-5							
RECEIVE										
RANGE	Hi									
VOLTAGE	240	240	240							
CURRENT	3.0	3.0	3.0							

FREQUENCIES .05 3.0

SENDER NO. 106635

OPERATOR [illegible]

RECEIVER NO.

OPERATOR

COMMENTS:

2.35

PAGE

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT Saginaw Test
LINE ____ HALF W SP. ____ DATE 3/17/67

SEND	3-4	4-5	3-4	4-5	3-4	4-5	3-4	4-5	3-4	CAL
RECEIVE	4-6W	6-8W	→	8-10W	→	10-12W	→	12-14W	→	4-5
RANGE	1000	1000	100	300	100	100	30	100	30	300
DC 1	310	269	78.2	103	41.7	37.7	18.4	29.6	15.2	201
DC 2	308	269	78.0	106	43.0	40.1	19.4	30.9	17.3	202
DC 3	310	269	78.0	103	41.7	37.4	18.3	29.4	15.1	201
DC 4	308	270	78.1	106	43.0	40.1	19.4	30.9	17.5	202
DC 5			78.0			37.3	18.3	29.2	15.0	
DC 6						40.1		31.1		
DC 7										
DC 8										
DC AVG.	309	269.2	78.1	104.5	42.35	38.7	18.85	30.15	16.25	201.5
AC 1	292	254	72.4	96	38.3	33.4	16.15	25.4	13.55	204
AC 2	292	254	72.4	95.5	38.3	33.4	16.15	25.3	13.55	202 ~~202~~
AC AVG.	292			95.75				25.35		202
S.P.	-12	+9	→	-3	→	-5	→	-27	→	
AC NOISE	.07	.07	→	.06	→	.06	→	.06	→	
POT RES.	o.k.									

PAGE

HEINRICHS GEOEXPLORATION CO.

I.P. RECEIVER NOTES Int Cal 90

PROJECT _____

LINE _____ HALF _____ SP. _____ DATE _____

SEND	4-5	3-4		CAL	Int Cal					
RECEIVE	14-16W	→		3-4						
RANGE	30	10		300	195					
DC 1	15.4	9.17		201	195					
DC 2	15.5	8.97		201						
DC 3	15.4	9.14		201						
DC 4	15.4	8.96								
DC 5	15.5	9.19								
DC 6		8.97								
DC 7										
DC 8										
DC AVG.	15.43	9.07		201						
AC 1	13.2	7.65		196	188.5					
AC 2	13.2	7.65		196	188.5					
AC AVG.				196						
S.P.	+4 →									
AC NOISE	.05 →									
POT RES.										

all w go to E

HEINRICHS GEOEXPLORATION COMPANY

INDUCED POLARIZATION SURVEY COMPUTATION SHEET

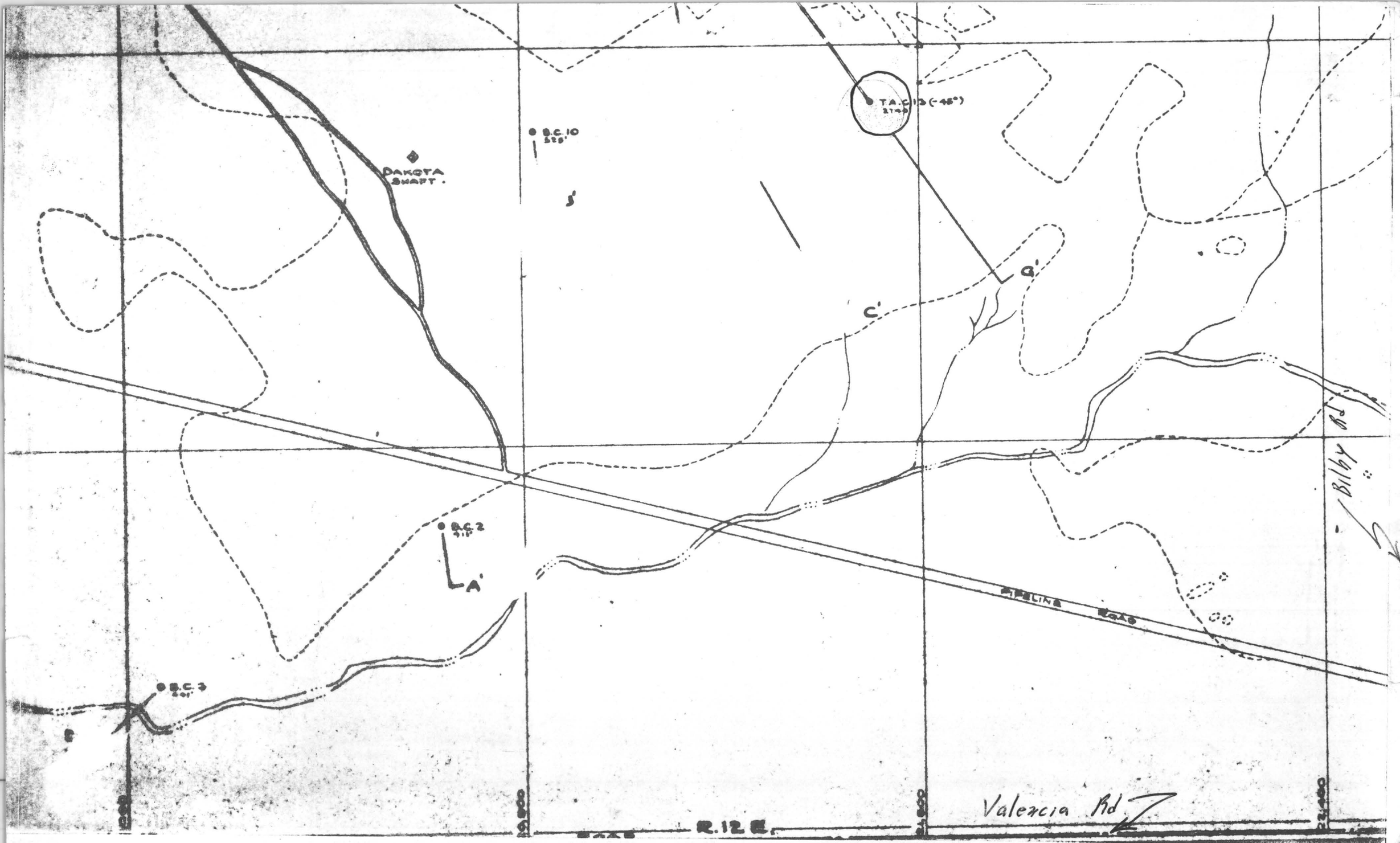
Page_____

Project Saginaw Test Line_____ Field date 3/17/67 Data page_____ Comp. date_____. Comp by C.S.L. J.W.M.

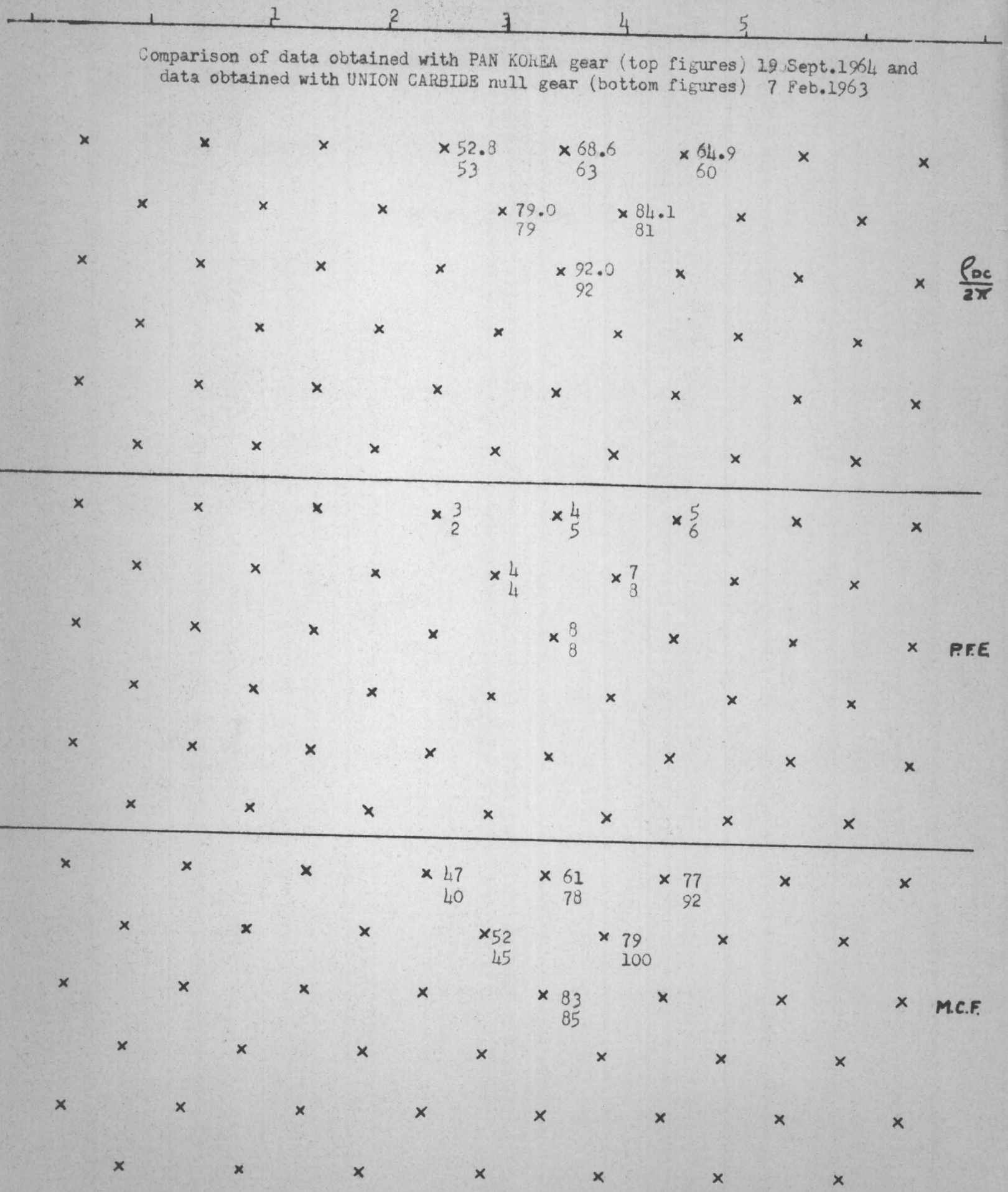
(A) Send	3-4	4-5	3-4	4-5	3-4	4-5	3-4	4-5	3-4	4-5	3-4	
(B) Receive	4-6W	6-8W	→	8-10W	→	10-12W	→	12-14W	→	14-16W	→	
(C) n separation	1	1	2	2	3	3	4	4	5	5	6	
(D) I	3	→										
(E) Vdc (avg)	309	269.2	78.1	104.5	42.35	38.7	18.85	30.15	16.25	15.43	9.07	
(F) DCcal	.994	→										
(G) Kn x 10^{-3}	.6	.6	2.4	2.4	6.0	6.0	12.0	12.0	21	21	33.6	
(H) ρ dc=ExFxGx10^3/D	61	54	62	83	84	77	75	120	113	107	101	
(I) Vac Σ	292	254	72.4	95.75	38.3	33.4	16.15	25.35	13.55	13.2	7.65	
(J) AC noise x 2												
(K) Vac(corr) $=\sqrt{I^2 - J^2}$												
(L) AC-DC cal. USE AVE .989	→											
(M) ρ dc/ρac=ExL/K												
(N) PFE=(M-1)(10^2)	4.7	4.8	6.7	7.9	9.4	14.6	15.4	17.6	18.6	15.6	17.3	
(O) MCF=(M-1)(10^5)/H	77	89	108	95	112	190	205	147	165	146	171	

Project_____ Line_____ Field date_____ Data page_____ Comp. date_____ Comp by_____

(A) Send	CAL											
(B) Receive	4-5											
(C) n separation												
(D) I	2	2										
(E) Vdc (avg)	201.5	201										
(F) DCcal	.993	.995										
(G) Kn x 10^{-3}												
(H) ρ dc=ExFxGx10^3/D												
(I) Vac Σ	202	196										
(J) AC noise x 2												
(K) Vac (corr) $=\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	1.002	.975										
(M) ρdc/ρac =ExL/K	.989											
(N) PFE=(M-1)(10^2)												
(O) MCF=(M-1)(10^5)/H												


DAKOTA SHAFT.
B.C. 10
B.C. 2
B.C. 3
T.A.C. 13 (-45°)
A'
B'
C'
PIPELINE ROAD
Valencia Rd
R. 12 E.

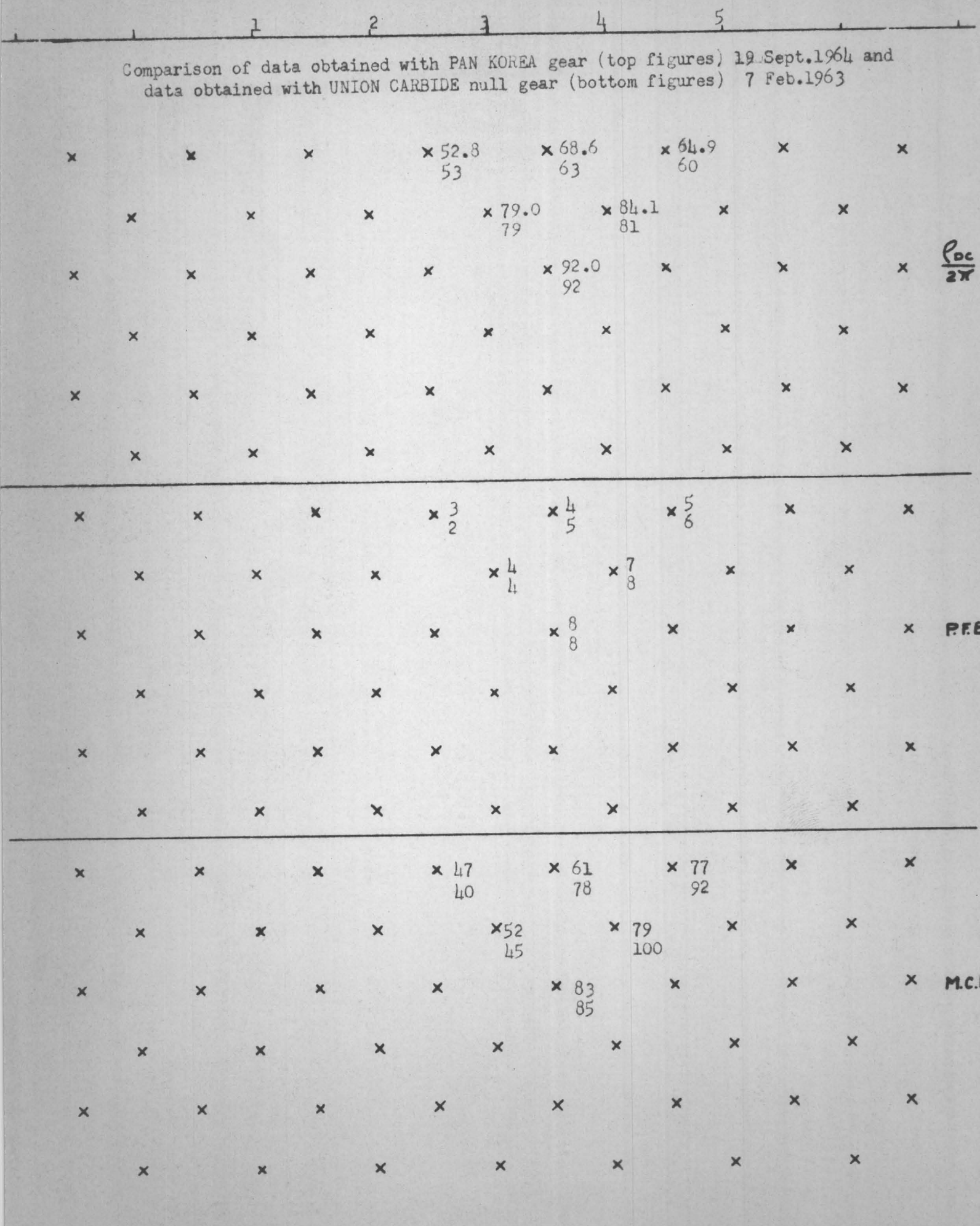
HEINRICHS GEOEX. INDUCED POLARIZATION SECTIONAL DATA PLOT, LOOKING NORTH



Comparison of data obtained with PAN KOREA gear (top figures) 19 Sept.1964 and data obtained with UNION CARBIDE null gear (bottom figures) 7 Feb.1963

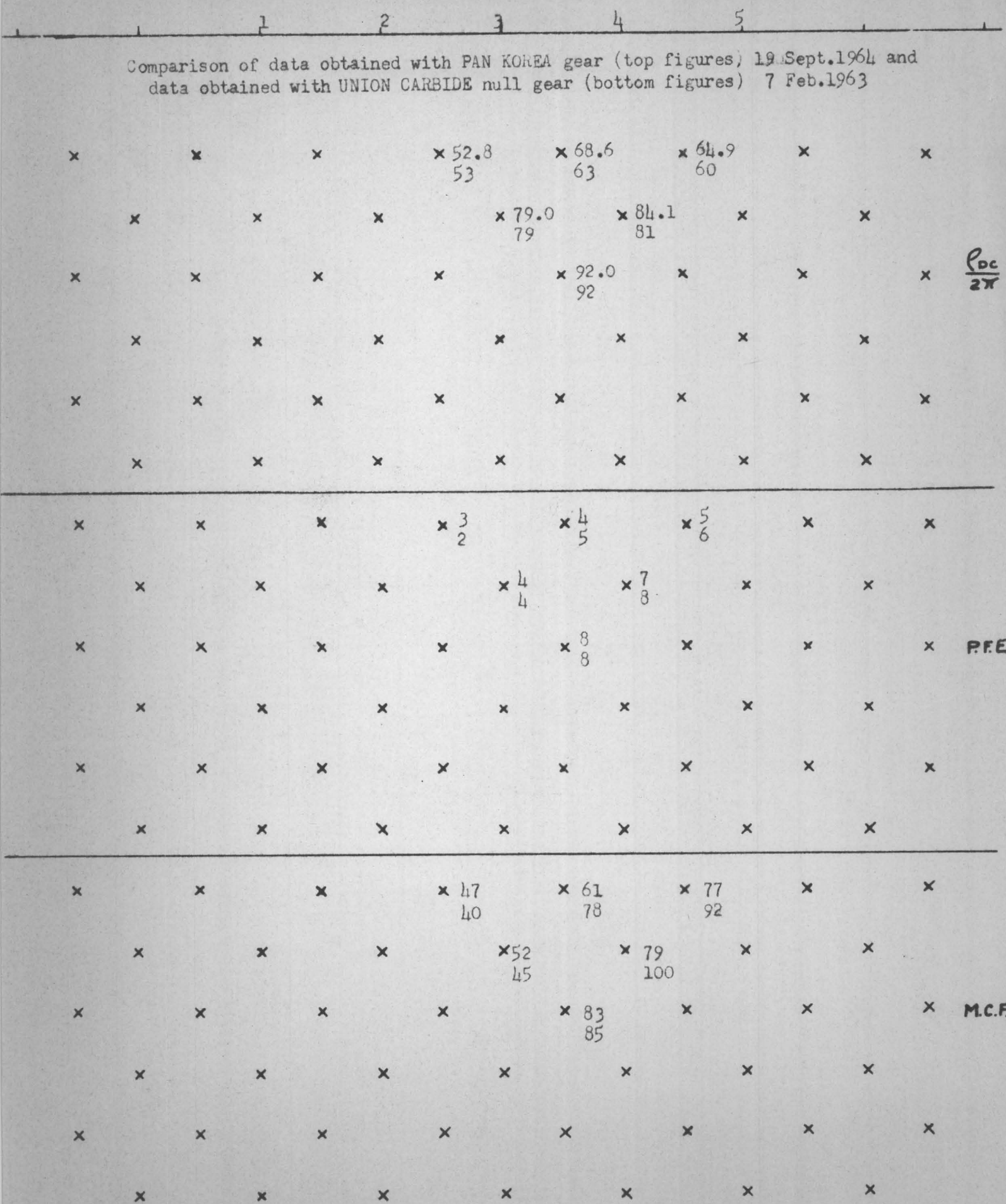
AREA SAGINAW HILL LINE 1C a = 200 ' SCALE: 1"-200' DATE:

HEINRICHS GEOEX. INDUCED POLARIZATION SECTIONAL DATA PLOT, LOOKING NORTH



AREA SAGINAW HILL LINE 1 C a = 200 ' SCALE: 1"-200' DATE:

HEINRICHS GEOEX. INDUCED POLARIZATION SECTIONAL DATA PLOT, LOOKING NORTH



AREA SAGINAW HILL LINE 1 C a = 200 ' SCALE: 1"-200' DATE:

AGREEMENT

HEINRICHS GEOEXPLORATION COMPANY performed $500.00 worth of induced polarization surveys and furnished results of same surveys to Mr. Jackson L. Clark during the assessment year from September 1, 1963 to September 1, 1964.

In return, as payment for performing said surveys, the AGUILA COPPER CO. owners of the unpatented mining claims herein described:

CLAIM NAME	DOCKET	PAGE
Gold Hill No. 8		
Gold Hill No. 18		
Gold Hill No. 16		
Gold Hill No. 35		
Gold Hill No. 3		

hereby agrees to allow Heinrichs Geoexploration Co. personnel and equipment on the above described claims for the purpose of conducting experimental geophysical surveys the results of which will be available to the claim owners upon request.

This agreement is for a period of two years and may be terminated by mutual agreement at any time.

HEINRICHS GEOEXPLORATION CO.

by E. Jones Heinrichs

title:_____

AGUILA COPPER CO.

by_____

title:_____

October 5, 1964
P. O. Box 5671
Tucson, Arizona

996
967
29

3
12
30
60

996
979
22

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page_____

Project Saginaw Line / Field date 9-19-69 Data page / Comp. date 9-22-69 Comp by J.P.M.

(A) Send	1-2	2-3	1-2	3-4	2-3	1-2		CAL				
(B) Receive	0-200	200-900	→	400-600	→	→		3-4				
(C) n separation	300	300	100	300	100	30						
(D) I	2200	→	→	→	→	→						
(E) Vdc (avg)	185.0	240	69.0	227	73.5	32.2		95.4				
(F) DCcal	1.048	→	→	→	→	→						
(G) Kn x 10^{-3}	.6	.6	2.4	.6	2.4	6						
(H) ρ dc=ExFxGx10^3/D	52.8	68.6	79.0	64.9	84.1	9.2						
(I) Vac Σ	177.0	226.0	67.0	212	69.6	29.6		96.4				
(J) AC noise x 2	→	→	→	→	→	→						
(K) Vac(corr) $=\sqrt{I^2 - J^2}$	→	→	→	→	→	→						
(L) AC-DC cal.	.981	.981	1.010	.981	1.010	.988		1.010				
(M) ρ dc/ρac=ExL/K	1.025	1.041	1.041	1.05	1.066	1.076		24				
(N) PFE=(M-1)(10^2)	2.5	4.1	4.1	5.0	6.6	7.6		.988				
(O) MCF=(M-1)(10^5)/H	47	61	52	77	79	83						

Project_____ Line_____ Field date_____ Data page_____ Comp. date_____ Comp by_____

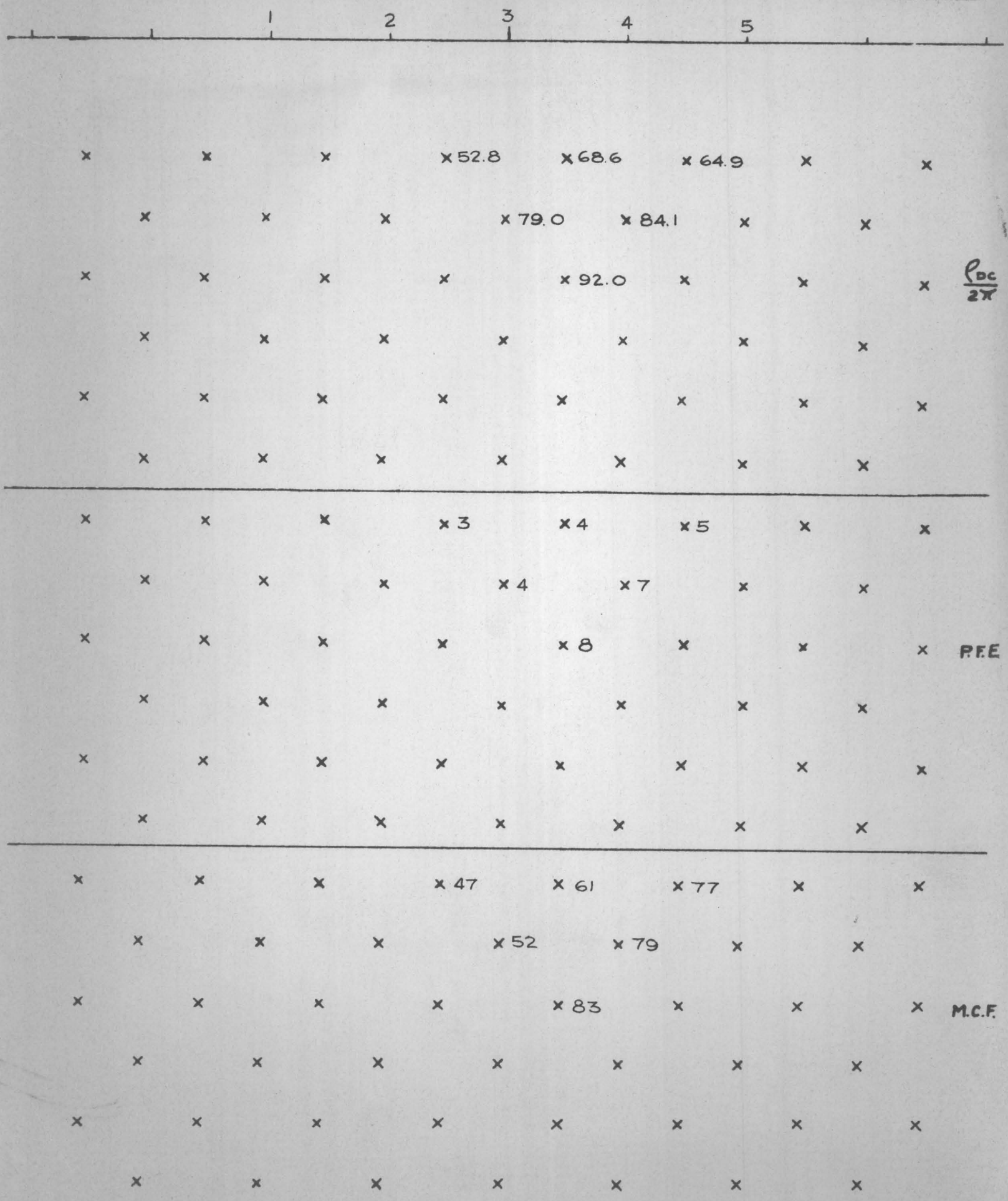
(A) Send												
(B) Receive												
(C) n separation												
(D) I												
(E) Vdc (avg)												
(F) DCcal												
(G) Kn x 10^{-3}												
(H) ρ dc=ExFxGx10^3/D												
(I) Vac Σ												
(J) AC noise x 2												
(K) Vac (corr) $=\sqrt{I^2 - J^2}$												
(L) AC-DC cal.												
(M) ρdc/ρac =ExL/K												
(N) PFE=(M-1)(10^2)												
(O) MCF=(M-1)(10^5)/H												

SAGANAW Hill 2-1-66

Took Mr. Gilbert to Saganaw hill area for Geologic recon, appeared to be quite interested in amount & grade of quartz. Only mildly interested in cu stains. May need further data if samples prove venture profitable.

Dan

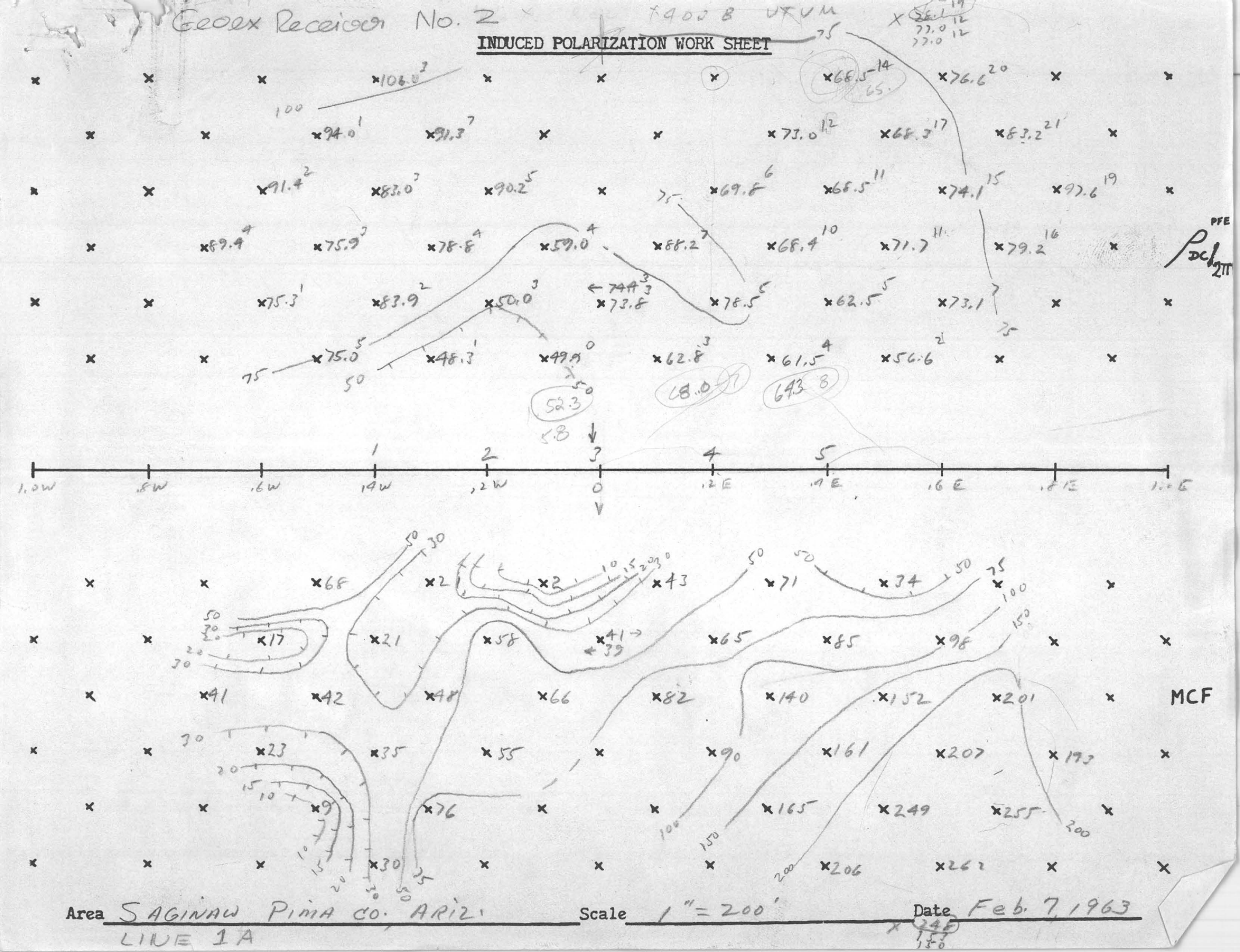
HEINRICHS GEOEX. INDUCED POLARIZATION SECTIONAL DATA PLOT, LOOKING NORTH



AREA SAGINAW HILL LINE 1 C a = 200' SCALE: 1" = 200' DATE: SEPT. 64

Geoex Receiver No. 2

INDUCED POLARIZATION WORK SHEET



Area SAGINAW PIMA CO. ARIZ.
LINE 1A

Scale 1" = 200'

Date Feb. 7, 1963

75.0 48.3 49.9 62.8 61.5 56.6

75.3 83.9 50.0 73.8 74.9 78.5 62.5 73.1

89.4 75.9 78.8 59.0 88.2 68.4 71.7 79.2

91.4 83.0 90.2 69.8 68.5 74.1 97.7

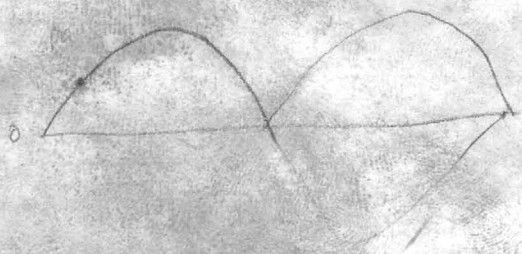
94.0 91.3 73.0 68.3 83.2

106.0 68.5 76.6

INDUCED POLARIZATION - RECEIVER NOTES PAGE _____ Geoex No 2

Dayes Re: Project: Test Line: 1 - E 1/2 Int.Cal 43.0 Date: 5/Feb

Send	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2	4-5	3-4	2-3
Rec.	.2-.4E		.4E-.6E			.6E-.8E						
Time	30 100	100 30	100 300	100 30	30	100	30	30	100			
DC-1	84.0 84.0	24.6 24.8	82.0 82.5	26.2 26.4	11.8	76	21.1	9.3	4.70			
DC-2	84.0 84.0	24.6 24.8	81.8 82.5	26.2 26.2	11.8	75.8	21.2	9.3	4.72			
Σ	168.0 168.0	49.2 49.6	163.8 168.0	52.4 52.6	23.6	151.8	42.3	18.6	9.42			
DC-3	84.0 84.0	24.6 24.7	82.0 82.5	26.2 26.4	11.8	76	21.0	9.2	4.68			
Dc-4	84.0 84.0	24.6 24.9	81.8 82.5	26.2 26.2	11.8	75.8	21.2	9.4	4.75			
Σ	168.0 168.0	49.2 49.6	163.8 165.0	52.4 52.6	23.6	151.8	42.2	18.6	9.43			
DC-AV	168.0 168.0	49.2 49.6	163.8 165.0	52.4 52.6	23.6	151.8	42.25	18.6	9.42			
AC-1	84.0 84.0	25.2 24.6	82.5 81	26.2 25.6	11.5	76.7	20.6	8.8	4.57			
AC-2	85.6 84.0	25.3 24.7	82.5 81	26.2 25.7	11.5	76.7	20.6	8.8	4.58			
Σ	171.4 168.0	50.5 49.3	165.0 162.0	52.4 51.3	23.0	153.4	41.2	17.6	9.15			
S. P.		417.7	-9.8			-2.0						
AC-N												



$$
\begin{array}{r}
.06 \\
17.6\overline{)18.60} \\
176 \\
\hline
1000 \\
1056
\end{array}
$$

INDUCED POLARIZATION - RECEIVER NOTES PAGE _____ Geoex No 2

Project: Test SAGINAW Line: 1 MO 3-B Geoex Rec Int.Cal 43.0 Date: 6/Feb/63

Send	4-5	→				→	4-5.	4-5	3-4	2-3	1-2	4-5.
Rec.	CAL	→				→	.6E-.8E	→			→	.8-1.0E
Time	100	30	30	100	30	100	100	300	30	30	10	30
DC-1	18.0	17.9	22.2	22.2	26.6	26.8	76.0	75	20.6	9.0	4.60	24.6
DC-2	18.0	17.9	22.2	22.2	26.6	26.8	75.5	76	20.8	9.0	4.65	24.3
Σ	36.0	35.8	44.4	44.4	53.2	53.6	151.5	151	41.4	18.0	9.25	48.9
DC-3	18.0	17.9	22.2	22.2	26.6	26.8	76.0	75	20.6	9.0	4.61	24.6
Dc-4	18.0	17.9	22.2	22.2	26.6	26.8	75.5	76	20.8	9.0	4.65	24.3
Σ	36.0	35.8	44.4	44.4	53.2	53.6	151.5	151	41.4	18.0	9.26	48.9
DC-AV	36.0	35.8	44.4	44.4	53.2	53.6	151.5	151	41.4	18.0	9.26	48.9
AC-1	19.2	18.6	23.2	23.5	27.7	28.2	76.2	74.0	20.4	8.75	4.52	23.4
AC-2	19.2	18.7	23.1	23.8	27.7	28.1	76.2	74.0	20.4	8.75	4.55	23.4
Σ	38.4	37.3	46.3	47.3	55.4	56.3	152.4	148	40.8	17.5	9.07	46.8
S. P.									+ 11.2	→	810.6	
AC-N												

INDUCED POLARIZATION - RECEIVER NOTES PAGE _____ Geoex No 1

Daves Rec. TEST

Project: SAGINAW Line: _____ Int.Cal _____ Date: 2/6/63

Send	4-5	→	→	→	→	4-5						
Rec.	2nd	Cal				CAL						
Time	100	30.	30	100		100	30	30	100	100	30	
DC-1	18.0	17.8	22.1	22.1		18.2	18.2	22.6	22.6	26.9	26.9	
DC-2	18.0	17.8	22.1	22.1		18.2	18.2	22.6	22.6	26.9	26.9	
Σ	36.0	35.6	44.2	44.2		36.4	36.4	45.2	45.2	53.8	53.8	
DC-3	18.0	17.8	22.1	22.1		18.2	18.2	22.6	22.6	26.9	26.9	
Dc-4	18.0	17.8	22.1	22.1		18.2	18.2	22.6	22.6	26.9	26.9	
Σ	36.0	35.6	44.2	44.2		36.4	36.4	45.2	45.2	53.8	53.8	
DC-AV	36.0	35.6	44.2	44.2		36.4	36.4	45.2	45.2	53.8	53.8	
AC-1	18.9	18.3	23.0	23.5		19.3	18.6	23.3	24.0	28.2	27.6	
AC-2	19.0	18.4	22.8	23.5		19.3	18.7	23.1	23.8	28.3	27.7	
Σ	37.9	36.7	45.8	47.0		38.6	37.3	46.4	47.8	56.5	55.3	
S. P.												
AC-N												

INDUCED POLARIZATION - RECEIVER NOTES

PAGE _____ Geoex No.1

Daves Rec

Project: Saginaw Test Line: 1 W ½ Int.Cal 42.7 Date: 2/6/63

Send	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5	1-2	2-3	3-4
Rec.	.2-.4W	→	.4-.6W	→	→	.6-.8W	→	→	→	.8-1.0W	→	→
Time Range	100	30 100	100	30	10	300	100	30	10	30	30	10
DC-1	66.3 66.2	26.1 26.1	64.8	16.4	8.41	100.5	28.0	10.6	6.00	25.1	10.1	5.38
DC-2	67.4 67.4	23.6 23.5	64.5	17.2	7.40	100	28.1	10.5	6.11	25.3	10.2	5.74
Σ	133.6 133.6	49.7 49.6	129.3	33.6	15.81	200.5	56.1	21.1	12.11	50.4	20.3	11.12
DC-3	66.2	26.1 26.1	64.8	16.3	8.42	100.5	28.0	10.6	6.00	25.1	10.1	5.33
Dc-4	67.4	23.6 23.5	64.5	17.2	7.40	100	28.1	10.5	6.09	25.3	10.2	5.78
Σ	133.6	49.7 49.6	129.3	33.5	15.82	200.5	56.1	21.1	12.09	50.4	20.3	11.11
DC-AV	133.6	49.7 49.6	129.3	33.55	15.82	200.5	56.1	21.1	12.10	50.4	20.3	11.11
AC-1	68.7	24.8 25.4	66.2	16.9	7.83	100.0	29.0	10.6	5.98	25.5	10.3	5.60
AC-2	68.7	24.8 25.2	66.1	16.9	7.83	100.0	29.0	10.7	5.96	25.4	10.3	5.60
Σ	137.4	49.6 50.6	132.3	33.8	15.66	200.0	58.0	21.3	11.94	50.9	20.6	11.20
S. P.	-12.7	→	-6.8	→	→	-21.6	→	→	→	17.0	→	→
AC-N	.005	→	.01	→	→	0	→	→	→	0	→	→

INDUCED POLARIZATION - RECEIVER NOTES PAGE Geoex No 2

Project: Sug Line: 1 - W ½ Int.Cal 42.7 Date: 2/6/67

Send	4-5	1-2	2-3	3-4	4-5		CAL					
Rec.	→	1.0-1.2W	→	→	→		1-2					
~~Time~~ Range	10	30	10	10	3		100	30	100	30	100	30
DC-1	3.21 3.25	12.4	6.03 6.01	3.57 3.58	2.59 2.57		17.9	17.8	22.2	22.3	26.6	26.7
DC-2	3.78 3.74	11.5	6.19 6.22	3.60 3.60	2.49 2.50		17.9	17.7	22.3	22.4	26.6	26.8
Σ	6.99 6.99	23.9	12.22 12.23	7.17 7.18	5.08 5.07		35.8	35.5	44.5	44.7	53.2	53.5
DC-3	3.21	12.4	6.00	3.59	2.51 2.50		17.9	17.8	22.2	22.3	26.6	26.7
Dc-4	3.77	11.5	6.20	3.62	2.56 2.56		17.9	17.7	22.3	22.4	26.6	26.8
Σ	6.98	23.9	12.20	7.21	5.07 5.06		35.8	35.5	44.5	44.7	53.2	53.5
DC-AV-	6.99	23.9	12.22	7.19	5.07		35.8	35.5	44.5	44.7	53.2	53.5
AC-1	3.42	12.0	6.20	3.73	2.51		18.6	18.2	23.3	22.9	27.9	27.3
AC-2	3.43	12.1	6.20	3.73	2.52		18.7	18.3	23.4	22.8	27.9	27.3
Σ	6.85	24.1	12.40	7.46	5.03		37.3	36.5	46.7	45.7	55.8	54.6
S. P.	→	-19.8	→	→	→							
AC-N	→	0	→	→	→							

INDUCED POLARIZATION - RECEIVER NOTES PAGE _____ Geoex No2

Project: _____ Line: _____ Int.Cal _____ Date: _____

Send	~~3-4~~	2-3	1-2	4-5	3-4	2-3	1-2	4-5	3-4	2-3	1-2	
Rec.	8~1.0	→										
Time	30	10	10	30	10	10	3	10	10	3	3	1
DC-1	9.6	4.55	2.81	10.3 10.4	4.98	2.61	1.60 1.64	6.50 6.45	3.42	1.78	1.25 1.20	.59 ~~.57~~
DC-2	9.6	4.62	2.75	10.9 10.7	4.95	2.60	1.70 1.61	6.61 6.62	3.32	1.90	1.20 1.26	.78 ~~.79~~
Σ	19.2	9.17	5.56	21.1 21.2	9.93	5.21	3.30 3.25	13.11 13.07	6.74	3.68	2.45 2.46	1.37
DC-3	9.6	4.56	2.80	10.2 10.4	4.98	2.60	1.64 1.74	6.45 6.50	3.40	1.71 1.74	1.31 1.16	.58 .58
Dc-4	9.6	4.60	2.77	10.9 10.9	4.95	2.62	1.60 1.56	6.60 6.20	3.33	1.94 1.92	1.23 1.34	.76 .78
Σ	19.2	9.16	5.57	21.1 21.3	9.93	5.22	3.24 3.30	13.05 13.10	6.73	3.63 3.66	2.54 2.50	1.34 1.36
DC-AV	19.2	9.17	5.57	21.2	9.93	5.22	3.27	13.08	6.74	3.66	2.49	1.36
AC-1	9.1	4.32	2.62	9.6	4.48	2.35	1.49	5.70	2.92	1.575	1.09	.63
AC-2	9.1	4.32	2.62	9.6	4.50	2.35	1.49	5.72	2.92	1.58	1.09	.63
Σ	18.2	8.64	5.24	19.2	8.98	4.70	2.98	11.42	5.84	3.16	2.18	1.26
S. P.												
AC-N												

AC		DC			
.320		.36			
.32		.30	.34		.37
		.403	.35	.37	.29
		.3	.36	.35	
			.28		
.66	.69				
.71	.64				
.72	.66				

AC .64

DCAV .68

Dawes Rec
403 B VTVM

CALIBRATIONS
Geoex Receiver No. 2

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page_____

Project Saginaw Test Line 1 E & W ½ Field date 2/5,6/63 Data page_____ Comp. date 2/7/63 Comp by C.S.L.

	9.5.D.	19	62	77	24	92	28	19	61	23	76	28	91
(A) Send												
(B) Receive												
(C) n separation												
(D) I		400	400	500	500	600	600	400	400	500	500	600	600
(E) Vdc (avg)		36.0	35.8	44.4	44.4	53.2	53.6	35.8	35.5	44.5	44.7	53.2	53.5
(F) DCcal		1.110	1.117	1.127	1.127	1.127	1.119	1.117	1.126	1.124	1.120	1.127	1.120
(G) Kn x 10^{-3}													
(H) ρ dc=ExFxGx10^3/D													
(I) Vac Σ		38.4	37.3	46.3	47.3	55.4	56.3	37.3	36.5	46.7	45.7	55.8	54.6
(J) AC noise x 2													
(K) Vac(corr) $=\sqrt{I^2 - J^2}$													
(L) AC-DC cal.		1.068	1.041	1.043	1.066	1.041	1.050	1.041	1.029	1.050	1.022	1.049	1.021
(M) ρ dc/ρac=ExL/K													
(N) PFE=(M-1)(10^2)													
(O) MCF=(M-1)(10^5)/H													

Project_____ Line 19 61 76 24 19 62 77 24 28 92 Field date_____ Data page_____ Comp. date_____ Comp by_____

(A) Send												
(B) Receive												
(C) n separation												
(D) I	400	400	500	500	400	400	500	500	600	600		
(E) Vdc (avg)	36.0	35.6	44.2	44.2	36.4	36.4	45.2	45.2	53.8	53.8		
(F) DCcal	1.110	1.122	1.130	1.130	1.100	1.100	1.107	1.107	1.115	1.115	~	1.114
(G) Kn x 10^{-3}												
(H) ρ dc=ExFxGx10^3/D												
(I) Vac Σ	37.9	36.7	45.8	47.0	38.6	37.3	46.4	47.8	56.5	55.3		
(J) AC noise x 2												
(K) Vac (corr) $=\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	1.052	1.030	1.036	1.062	1.060	1.025	1.027	1.057	1.050	1.029		
(M) ρdc/ρac =ExL/K												
(N) PFE=(M-1)(10^2)												
(O) MCF=(M-1)(10^5)/H												

Geoex Receiver No. 2

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page_____

Project Saginaw Test Line 1 E ½ Field date 2/5, 6/63 Data page_____ Comp. date 5/7/63. Comp by C.S.L.

% S.D.	29 64	25 82	83 27	26 86	38	77 76/25	69 68	29 29	46 45	78	30	43
(A) Send	2 -3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2	4-5	3-4	2-3
(B) Receive	.2-.4 E	→	.4-.6 E	→	→	.6-.8 E	→	→	→	.8-1.0 E	→	→
(C) n separation	1	2	1	2	3	1	2	3	4	2	3	4
(D) I	1800	→	→	→	→	→	→	→	→	→	→	→
(E) Vdc (avg) %	168.0 168.0	49.2 49.6	163.8 165.0	52.4 52.6	23.6	151.8 151.5 151	42.25 41.4	18.6 18.0	9.42 9.26	48.9	19.2	9.17
(F) DCcal USED	1.120	→	→	→	→	→	→	→	→	→	→	→
(G) Kn x 10^{-3}	.6	2.4	.6	2.4	6	.6	2.4	6	12	2.4	6	12
(H) ρ dc=ExFxGx10^3/D	62.8	73.8	61.5	78.5	88.2	56.6	62.5	68.4	69.8	73.1	71.7	68.5
(I) Vac Σ %	171.4 168.0	50.5 49.3	165.0 162.0	52.4 51.3	23.0	153.4 152.4 148	41.2 40.8	17.6 17.5	9.15 9.07	46.8	18.2	8.64
(J) AC noise x 2	0.1%	→	→	→	→	→	→	→	→	→	→	→
(K) Vac(corr) = $\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	1.051 1.024	1.053 1.025	1.052 1.027	1.052 1.023	1.046	1.027 1.027 1.053 1.020	1.031 1.032	1.051	1.043	1.027	1.050	1.044
(M) ρ dc/ρac=ExL/K	1.030 1.024	1.028 1.032	1.045 1.043	1.052 1.050	1.072	1.017	1.058 1.048	1.111 1.081	1.060 1.066	1.072	1.109	1.110
(N) PFE=(M-1)(10^2)	3 3 2	3 3 3	5 4 4	5 5 5	7	2	5 5	11 8	6 6 7	7	11	11
(O) MCF=(M-1)(10^5)/H	43	41	71	65	82	34	85	140	90	98	152	161

Project_____	Line 26	32	Field date 45	24	50	Data page 57	29	Comp. date 53	36	63	Comp by 32	
(A) Send	1-2	4-5	3-4	2-3	1-2	4-5	3-4	2-3	1-2	→	→	
(B) Receive	→	1.0-1.2 E	→	→	→	1.2-1.4 E	→	→	→	→	→	
(C) n separation	5	3	4	5	6	4	5	6	7	7	7	
(D) I	→	→	→	→	→	→	→	→	→	1000	500	
(E) Vdc (avg)	5.57	21.2	9.93	5.22	3.27	13.08	6.74	3.66	2.49	1.36	.68	
(F) DCcal	→	→	→	→	→	→	→	→	→	→	→	
(G) Kn x 10^{-3}	21	6	12	21	33.6	12	21	33.6	50.4	50.4	50.4	
(H) ρ dc=ExFxGx10^3/D	73.0	79.2	74.1	68.3	68.5	97.6	83.2	76.6	78.1	77.0	77.0	
(I) Vac Σ	5.24	19.2	8.98	4.70	2.98	11.42	5.84	3.16	2.18	1.26	.64	
(J) AC noise x 2												
(K) Vac (corr) = $\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	1.052	1.049	1.043	1.053	1.041	1.037	1.051	1.039	1.047	1.034	1.049	
(M) ρdc/ρac =ExL/K	1.120	1.159	1.153	1.170	1.141	1.188	1.212	1.201	1.194	1.118	1.115	
(N) PFE=(M-1)(10^2)	12	16	15	17	14	19	21	20	19	12	12	
(O) MCF=(M-1)(10^5)/H	165	201	207	249	206	193	255	262	248	153	150	

Daves Rec 402B VTVM Geoex Receiver No. 2

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

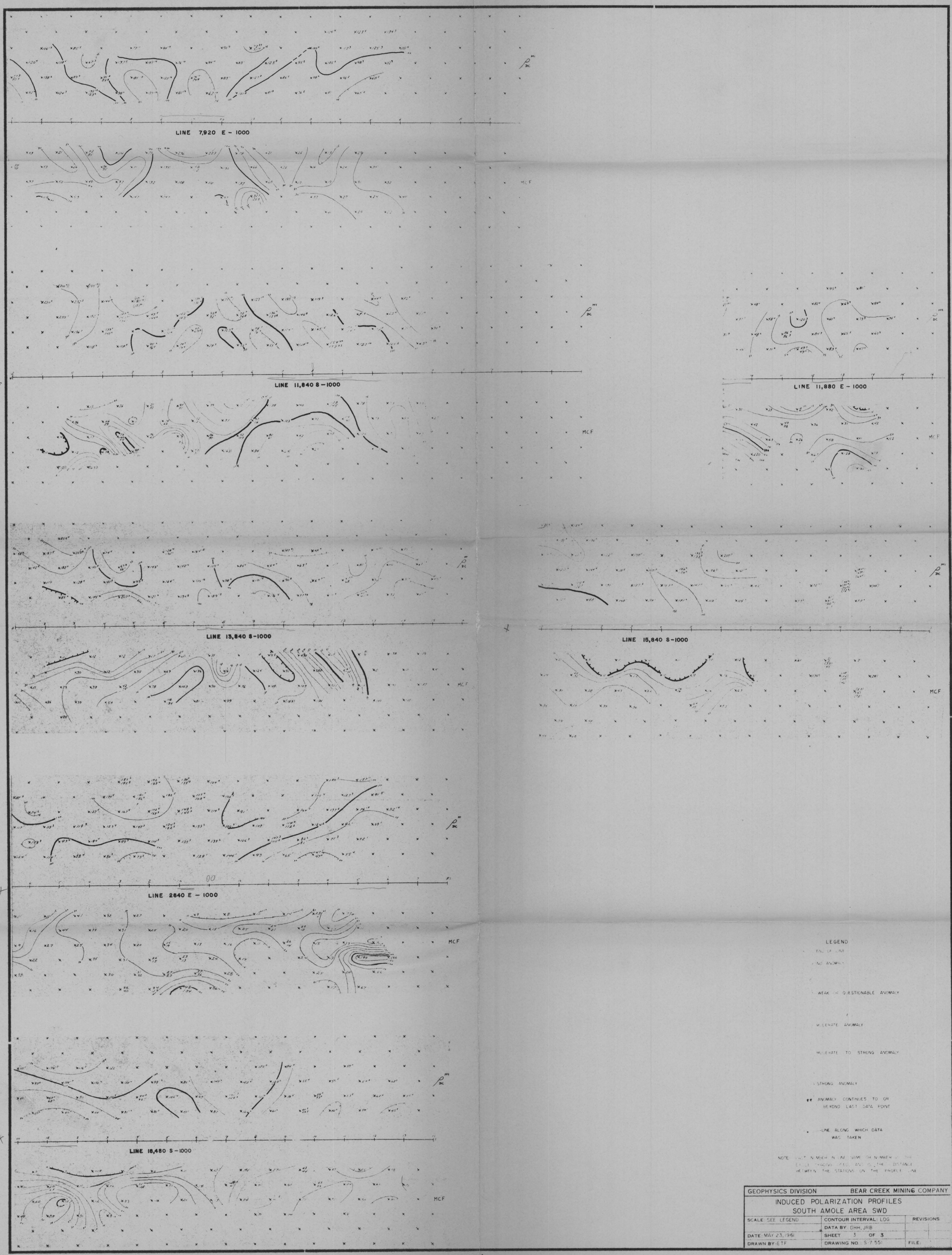
Page_____

Project Saginaw Test Line 1 W½ Field date 2/6/63 Data page_____ Comp. date 2/7/63 Comp by [illegible]

a. S.O.	69	83 25	66	56	78	33	29	35	60	85	34	56
(A) Send	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5	1-2	2-3	3-4
(B) Receive	.2-.4W	→	.4-.6W	→	→	.6-.8W	→	→	→	.8-1.0W	→	→
(C) n separation	1	2	1	2	3	1	2	3	4	2	3	4
(D) I	1800	→	→	→	→	→	→	→	→	→	→	→
(E) Vdc (avg) 2	133.6	49.7 49.6	129.3	33.55	15.82	200.5	56.1	21.1	12.10	50.4	20.3	11.11
(F) DCcal USED	1.120	→	→	→	→	→	→	→	→	→	→	→
(G) Kn x 10^{-3}	.6	2.4	.6	2.4	6	.6	2.4	6	12	2.4	6	12
(H) ρ dc=ExFxGx10^3/D	49.9	47.4 4	48.3	50.0	59.0	75.0	83.9	78.8	90.2	75.3	75.9	83.0
(I) Vac Σ	137.4	49.6 50.6	132.3	33.8	15.66	200.0	58.0	21.3	11.94	50.9	20.6	11.20
(J) AC noise x 2												
(K) Vac(corr) = $\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	1.031	1.024 1.053	1.033	1.037	1.027	1.049	1.051	1.048	1.036	1.023	1.048	1.038
(M) ρ dc/ρac=ExL/K	1.001	1.026 1.032	1.010	1.029	1.039	1.051	1.018	1.038	1.050	1.013	1.032	1.029
(N) PFE=(M-1)(10^2)	0	3 3	1	3	4	5	2	4	5	1	3	3
(O) MCF=(M-1)(10^5)/H	2	39	21	58	66	68	21	48	55	17	42	35

Project_____ Line_____ Field date_____ Data page_____ Comp. date_____ Comp by_____

	34	40	62	37	84							
(A) Send	4-5	1-2	2-3	3-4	4-5							
(B) Receive	→	1.0-1.2W	→	→	→							
(C) n separation	5	3	4	5	6							
(D) I	→	→	→	→	→							
(E) Vdc (avg) 2	6.99	23.9	12.22	7.19	5.07							
(F) DCcal	→	→	→	→	→							
(G) Kn x 10^{-3}	21	6	12	21	33.6							
(H) ρ dc=ExFxGx10^3/D	91.3	89.4	91.4	94.0	106.0							
(I) Vac Σ 3	6.85	24.1	12.40	7.46	5.03							
(J) AC noise x 2												
(K) Vac (corr) = $\sqrt{I^2 - J^2}$												
(L) AC-DC cal. 1	1.048	1.046	1.035	1.047	1.024							
(M) ρdc/ρac =ExL/K	1.069	1.037	1.021	1.008	1.032							
(N) PFE=(M-1)(10^2)	7	4	2	1	3							
(O) MCF=(M-1)(10^5)/H	76	41	23	9	30							



LEGEND

FAIL OF LINE

NO ANOMALY

WEAK OR QUESTIONABLE ANOMALY

MODERATE ANOMALY

MODERATE TO STRONG ANOMALY

STRONG ANOMALY

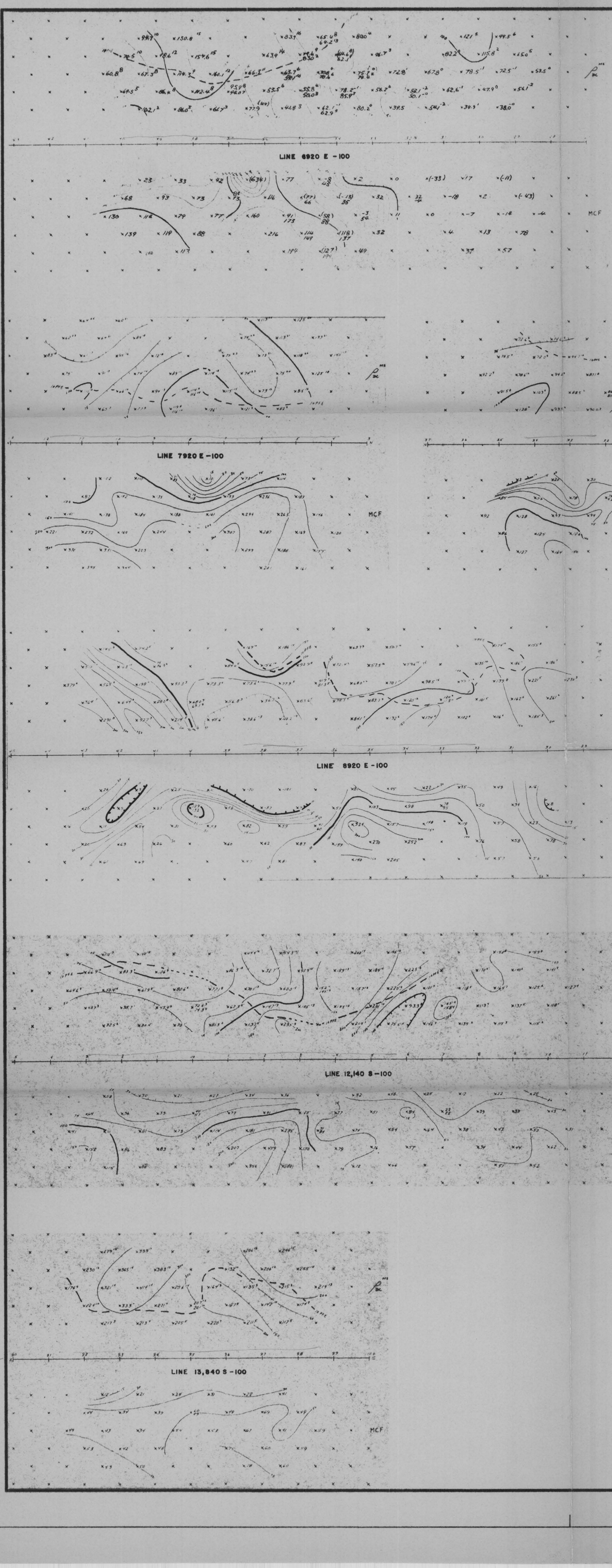
ANOMALY CONTINUES TO OR BEYOND LAST DATA POINT

LINE ALONG WHICH DATA WAS TAKEN

NOTE: LAST NUMBER IN LINE NAME OR NUMBER IS THE DISTANCE BETWEEN THE STATIONS ON THE PROFILE LINE

GEOPHYSICS DIVISION	BEAR CREEK MINING COMPANY	
INDUCED POLARIZATION PROFILES SOUTH AMOLE AREA SWD		
SCALE: SEE LEGEND	CONTOUR INTERVAL: LOG	REVISIONS
	DATA BY: DHH, JRB	
DATE: MAY 23, 1961	SHEET 3 OF 3	
DRAWN BY: ETF	DRAWING NO.: S-7 551	FILE:

19C



LEGEND

- END OF LINE
- NO ANOMALY
- WEAK OR QUESTIONABLE ANOMALY
- MODERATE ANOMALY
- MODERATE TO STRONG ANOMALY
- STRONG ANOMALY
- ANOMALY CONTINUES TO OR BEYOND LAST DATA POINT
- LINE ALONG WHICH DATA WAS TAKEN

NOTE. LAST NUMBER IN LINE NAME OR NUMBER IS THE DIPOLE SPACING USED, AND IS THE DISTANCE BETWEEN THE STATIONS ON THE PROFILE LINE

GEOPHYSICS DIVISION	BEAR CREEK MINING COMPANY	
INDUCED POLARIZATION PROFILES SOUTH AMOLE AREA SWD		
SCALE: SEE LEGEND	CONTOUR INTERVAL: LOG	REVISIONS
	DATA BY: DHH, JRB	
DATE: MAY 23, 1961	SHEET 1 OF 3	
DRAWN BY: ETF	DRAWING NO.: S-7 551	FILE:

Robles Pass
HIGHWAY
Snyder Hill
Well
Valencia Road
Valencia Road
Tanks
Tank
Tank
Tank
Tank
San Xavier de
MISSION
ROAD
E R I N D I A N R E S E R V A T I O N
14
13
24
23
2610
2617
13

DDH NO. SH-7

STATE Arizona
COUNTY Yuma
Sec 12 T15S R12E
MINING DISTRICT Apache
PROJECT Sugarloaf Hill
COORDINATES K.50 N.55 E
COLLAR ELEVATION
INCLINATION Vert BEARING
DATE STARTED 11-30-60
DATE COMPLETED 12-23-60
DRILLING CO. Jory
FINAL DEPTH 846.3

<1 - Less than 1% sulphides in rock.

FOOTAGE		UNALT	CHLOR.	EPIDOTE	MONTMOR.	BIOTITE	KAOL.	HY. MICA.	ORTHO.	SER.	SIL.	STAGE NO.	ROCK TYPE	SECTION	CU5FES4	CUFES2	FE S2	CU2S	CUS	MOS2	[illegible]	OXIDE ZONE: LEACHED CAVITIES-COLOR ETC. / SULPHIDE ZONE-CHAR OF MIN. DISS. VEIN, ETC.	< INCL.	FRACTURING	GEOLOGY	LOG BY
0.0	10.0												—												ROCK BIT	
10.0	22.8	THIN SECTION							17.5				QM.								1	Py, cp		40°	Monzonite is medium grained, light gray to light brown. Quartz is anhedral to subhedral and shattered. Feldspars are locally altered to clay & sericite. Manganese stain, Hematite	
22.8	28.9												"								<1	Py, MoS2(?)		40°	-do-	
28.9	38.9												"								0	Hem. (spec)		40°-60°	-do- Hematite often pyrite.	
38.9	50.6					SAMPLE 52'							"								0	"		50°	-do- Zoned feldspar xls.	
50.6	57.9												"								0	"		Vert. 40°	-do-	
57.9	67.9												"								0	"		60	-do-	
67.9	77.0												"								0	"		30°	-do-	
77.0	89.6												"								0	"		70°	-do-	
89.6	98.7												"								4	Pyrite.		70°	-do- Locally only slightly altered. Pyrite occurs here in small disseminations	
98.7	114.1												"								<1	Pyrite - Cp.		Vert. 30°	-do- Chalcopyrite as small disseminations	
114.1	129.1												"								<1	" " (Co)		80°	-do- Rock not too altered.	
129.1	134.1												"								<1	" "		30°	-do-	
134.1	143.9												"								<1	" "		70°	-do-	
143.9	154.2												"								1	" " (Co(?))		Vert.	-do- Weak chalcopyrite. Sulphides in stringers.	
154.2	163.2												"								<1	" "		" 50°	-do- Hematite around pyrite.	
163.2	173.2												"								<1	" "		" 50°	-do-	
173.2	180.8												"								<1	" " Pb		50'	-do-	
180.8	190.8												"								1	" "		50°	-do- Chalcopyrite (weak) along small fractures.	
190.8	201.6												"								1	" "		Vert 40°	-do- Weak to moderate chalcopyrite.	
201.6	215.2												"								1	" "		30°	-do- Sulphides mostly confined to fractures	
215.2	227.6												"								<1	" "		50°	-do- Weak sulphides	
227.6	237.6												"								<1	" "		30°	-do-	
237.6	243.0												"								<1	" "		70°-30°	-do-	
243.0	257.7												"								<1	" "		70°-60°	-do-	
257.7	264.4												"								<1	" "		70°	-do-	
264.4	278.8												"								<1	" "		Vert - 70°	-do-	
278.8	286.7												"								<1	" "		40°	-do-	
286.7	297.1												"								<1	" "		Vert - 60°	-do-	
297.1	306.9												"								<1	" "		" -60°	-do-	
306.9	316.3												"								<1	" "		50	-do- Few large orthoclase xls	
316.3	324.5												"								<1	" "			-do-	
324.5	333.8	THIN SECTION	334.2										"								<1	" "		50	-do-	
333.8	340.5												"								<1	" "		50°	-do- Contact at 334.2 (Chert rock type)	
340.5	349.7												"								<1	" "		45°	-do-	
Bx 349.7	357.9												"								<1	" "		40°	-do- Weak chalcopyrite	
357.9	369.2												"								<1	" "		45-70°	-do-	
369.2	378.8												"								<1	" "		40	-do-	
378.0	388.8												"								<1	" "		40°	-do-	
388.8	397.2												"								<1	" "		Vert. 40°	-do-	
397.2	408.6												"								<1	" "		40°	-do-	
408.6	418.0												"								<1	" " Zn.		50°	-do- Small zinc stringers	
418.0	429.0												"								<1	" "		45°	-do-	
429.0	437.8												"								<1	" "		45°	-do-	
437.8	447.6												"								<1	" "		30°	-do-	
447.6	454.3												"								<1	" "		50°	-do-	
454.3	463.8												"								<1	" "		45°	-do-	
463.8	474.3												"								1	Pb " " Zn		40°	-do-	
474.3	484.3												"								<1	" " " "		30°	-do-	
484.3	493.3												"								<1	" " " "		30°	-do- 489'-495' QM. is moderately altered	
493.3	502.0												"								<1	" " " "		60°-80°	-do-	

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