APPENDIX D

C & SH SHAFT
GEOLOGIC LOGS AND MAPS

CONTENTS

BECHTEL

GEOLOGIC DRILL LOG

PROJECT	JOB NO.	SHEET NO.	HOLE NO.
WIPP	12484	1 OF 11	EXPLORATORY SHAFT (SPDV)

SITE	COORDINATES	ANGLE FROM HORIZ.	BEARING
WIPP EDDY CO., NEW MEXICO	(PLANT GRID) N 9687.23 E 6894.89	90°	N. A.

BEGUN	COMPLETED	DRILLER	DRILL MAKE AND MODEL	HOLE SIZE	OVERBURDEN (FT.)	ROCK (FT.)	TOTAL DEPTH
7-4-81	10-24-81	CHALLENGER DRILLING CO.	NATIONAL 125	142 IN.	16	2282	(FROM G.S.) 2298 FT.

CORE RECOVERY (FT./%)	CORE BOXES	SAMPLES	EL. TOP OF CASING	GROUND EL.	DEPTH/EL. GROUND WATER	DEPTH/EL. TOP OF ROCK
N. A.	N. A.	172	N.A.	3410.5	NOT DETERMINED	(FROM GROUND SURFACE) 16 FT./3394.5

SAMPLE HAMMER WEIGHT/FALL	CASING LEFT IN HOLE: DIA./LENGTH	LOGGED BY:
N. A.	180 IN./11FT. 144 IN./93.4 FT. 120 IN./843FT.	R.M. BEATHARD, R.C. KISER, J.L. MATTHEWS

SAMPLER TYPE AND DIAMETER	SAMPLER ADVANCE / LENGTH CORE RUN	SAMPLE RECOVERY / CORE RECOVERY	SAMPLE BLOWS "N" / PERCENT CORE RECOVERY	WATER PRESSURE TESTS: LOSS IN G.P.M.	WATER PRESSURE TESTS: PRESSURE P.S.I.	WATER PRESSURE TESTS: TIME IN MINUTES	ELEVATION	DEPTH (FT.) BELOW K. B.	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
							3417.5	0			Rig depths measured from kelly bushing approx. 7 ft. above ground surface.	
							3410.5				GROUND SURFACE	
BACKHOE								10			0-11' DUNE SAND, Reddish brown	NOTES: 1. Stratigraphic description from 0 to 103 ft. based on geologic log of boring B-25.
							3399.5	20			11-16' CALICHE, White	2. 168 in. dia. pilot hole augered from 0-97.5 ft. by Meredith Drilling Co. prior to setting and cementing 144 in. dia. surface casing.
							3394.5				16-36.5' GATUNA FORMATION, Sandstone, reddish brown, fine to medium grained	3. All depths given are from ground surface except for those shown in depth column.
								30				
								40				
							3374.0				36.5-46.5' SANTA ROSA FORMATION, Sandstone, gray and reddish brown, fine grained	CASING: 0-11 ft. = 180 in. dia CMP 0-93.4 ft. = 144 in. dia. surface casing 0-843 ft. = 120 in. dia. steel liner (installed after completion of shaft drilling)
								50				
							3364.0				46.5-538' DEWEY LAKE FORMATION, Siltstone and sandstone, reddish brown, whitish veins of gypsum interspersed throughout	
								60				
							3347.5	70				

168 IN. DIA. AUGER FROM 11 TO 97.5 FT

NO SAMPLES TAKEN FROM GROUND SURFACE TO 103 FT.

SS = SPLIT SPOON; ST = SHELBY TUBE; D = DENNISON; P = PITCHER; O = OTHER

SITE: WIPP - EDDY CO., N. M.

HOLE NO.: EXPLORATORY SHAFT

H&CF 19-1

BECHTEL

GEOLOGIC DRILL LOG

PROJECT	JOB NO.	SHEET NO.	HOLE NO
WIPP	12484	2 OF 11	EXPLORATORY SHAFT (SPDV)

SAMPLER TYPE AND DIAMETER	SAMPLER ADVANCE / LENGTH CORE RUN	SAMPLE RECOVERY / CORE RECOVERY	SAMPLE BLOWS "N" / PERCENT CORE RECOVERY	WATER PRESSURE TESTS: LOSS IN G.P.M.	WATER PRESSURE TESTS: PRESSURE P.S.I.	WATER PRESSURE TESTS: TIME IN MINUTES	ELEVATION	DEPTH (FT.) BELOW K.B.	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
168 IN. DIA. AUGER		NO SAMPLES TAKEN					3347.5	70			DEWEY LAKE FORMATION, Siltstone and sandstone, reddish brown, whitish veins of gypsum interspersed throughout	
								80				
								90				
								100				
								110		1	Siltstone, dark reddish brown, moderately weak, thinly bedded	← Horizontal displacement at 99 ft. was 0.01 ft. S27°06'W
								120		2	Sandstone, dark reddish brown, fine grained, well sorted, sub-rounded grains, weakly cemented	Cuttings samples collected from discharge end of blooie-line unless otherwise indicated. Sample depths shown are approximate
142 IN. DIA. ROTARY CUTTER BIT FROM 97.5 TO 2298 FT.		CUTTINGS SAMPLES TAKEN FROM 103 TO 2298 FT.						130		3	Sandstone, silty, very fine grained, grading into siltstone in places	Drilling rate from 122 to 148 ft. was 1.4 ft/hr
								140		4	As above	
							3267.5	150		5	Siltstone, sandy, dark reddish brown	

SS = SPLIT SPOON; ST = SHELBY TUBE; D = DENNISON; P = PITCHER; O = OTHER

SITE: WIPP - EDDY CO., N. M.

HOLE NO.: EXPLORATORY SHAFT

H&CF 19-2

BECHTEL

GEOLOGIC DRILL LOG

PROJECT	JOB NO.	SHEET NO.	HOLE NO.
WIPP	12484	3 OF 11	EXPLORATORY SHAFT (SPDV)

SAMPLER TYPE AND DIAMETER	SAMPLER ADVANCE / LENGTH CORE RUN	SAMPLE RECOVERY / CORE RECOVERY	SAMPLE BLOWS "N" / PERCENT CORE RECOVERY	WATER PRESSURE TESTS: LOSS IN G.P.M.	WATER PRESSURE TESTS: PRESSURE P.S.I.	WATER PRESSURE TESTS: TIME IN MINUTES	ELEVATION	DEPTH (FT.) BELOW E.R.	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
142 IN. DIA. ROTARY CUTTER BIT		CUTTINGS SAMPLES					3267.5	150			Siltstone, sandy, dark reddish brown, moderately weak, thin bedded, grading into sandstone in places	Horizontal displacement at 143 ft. was 0.02 ft. S 04°07'W
								160		6	Clay, dark reddish brown, some siltstone (dark reddish brown and greenish gray, moderately weak), clay probably occurs as claystone interbedded with siltstone	Drilling rate from 148 to 158 ft. was 3.3ft./hr.
								170		7	Siltstone, sandy, dark reddish brown, moderately weak, little clay	Drilling rate from 158 to 194 ft. was 12 ft./hr.
								180		8	As above	
								190		9	Clay and Siltstone, dark reddish brown	Horizontal displacement at 183 ft. was 0.01 ft. S17°47'W
								200		10	Sandstone, dark reddish brown, moderately weak, very fine grained, subrounded, well sorted	Drilling rate from 194 to 203 ft. was 1.3 ft./hr.
								210		11	Siltstone, dark reddish brown, moderately weak, gypsum fragments	Drilling rate from 203 to 217 ft. was 1.2 ft./hr.
								220		12	Sandstone, silty, dark reddish brown, moderately weak, very fine grained, subrounded, well sorted	Drilling rate from 217 to 245 ft. was 1.4 ft./hr.
							3187.5	230		13	Siltstone, dark reddish brown	

SS = SPLIT SPOON; ST = SHELBY TUBE; D = DENNISON; P = PITCHER; O = OTHER

SITE: WIPP - EDDY CO., N. M.

HOLE NO.: EXPLORATORY SHAFT

H&CF 19-2

BECHTEL

GEOLOGIC DRILL LOG

PROJECT	JOB NO.	SHEET NO.	HOLE NO.
WIPP	12484	4 OF 11	EXPLORATORY SHAFT (SPDV)

SAMPLER TYPE AND DIAMETER	SAMPLER ADVANCE / LENGTH CORE RUN	SAMPLE RECOVERY / CORE RECOVERY	SAMPLE BLOWS "N" / PERCENT CORE RECOVERY	WATER PRESSURE TESTS: LOSS IN G.P.M.	WATER PRESSURE TESTS: PRESSURE P.S.I.	WATER PRESSURE TESTS: TIME IN MINUTES	ELEVATION	DEPTH (FT.) BELOW K.B.	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
142 IN. DIA. ROTARY CUTTER BIT		CUTTINGS SAMPLES					3187.5	230			Siltstone, dark reddish brown, moderately weak, gypsum fragments, little clay	← Horizontal displacement at 229 ft. was 0.02 ft. S43°30'W
								240		14	Sandstone, silty, dark reddish brown, moderately weak, very fine grained, subrounded, well sorted, some siltstone, abundant gypsum fragments	
								250		15	As above, much less gypsum	
										16		S#16 taken from drill bit - no formal description
								260		17	As above (sample No. 14)	Drilling rate from 245 to 262 ft. was 1.0 ft./hr.
								270		18	As above, abundant gypsum and greenish sandstone fragments	Drilling rate from 262 to 276 ft. was 0.6 ft./hr.
								280		19	As above	← Horizontal displacement at 271 ft. was 0.03 ft. S19°29'W
								290		20	As above	Drilling rate from 276 to 299 ft. was 1.2 ft./hr.
								300		21	Sandstone, silty, dark reddish brown, moderately weak, very fine grained, well sorted, and Siltstone, dark reddish brown, moderately weak, some gypsum fragments	Drilling rate from 299 to 309 ft. was 1.3 ft./hr.
							3107.5	310		22	Sandstone, as above, some lt. green color	

SS = SPLIT SPOON; ST = SHELBY TUBE; D = DENNISON; P = PITCHER; O = OTHER

SITE: WIPP - EDDY CO., N. M.

HOLE NO.: EXPLORATORY SHAFT

H&CF 19-2

BECHTEL

GEOLOGIC DRILL LOG

PROJECT: WIPP | JOB NO.: 12484 | SHEET NO.: 5 OF 11 | HOLE NO.: EXPLORATORY SHAFT (SPDV)

SAMPLER TYPE AND DIAMETER	SAMPLER ADVANCE / LENGTH CORE RUN	SAMPLE RECOVERY / CORE RECOVERY	SAMPLE BLOWS "N" / PERCENT CORE RECOVERY	WATER PRESSURE TESTS: LOSS IN G.P.M.	WATER PRESSURE TESTS: PRESSURE P.S.I.	WATER PRESSURE TESTS: TIME IN MINUTES	ELEVATION	DEPTH (FT.) BELOW K.B.	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
142 IN. DIA. ROTARY CUTTER BIT		CUTTINGS SAMPLES					3107.5	310		23		S# 23 taken from drill bit - no formal description
								320		24	Sandstone, silty, dark reddish brown, moderately weak, very fine grained, well sorted, and Siltstone, dark reddish brown, moderately weak	← Horizontal displacement at 313 ft. was 0.04 ft. S 0° 03'E Drilling rate from 309 to 322 ft. was 1.9 ft./hr.
								330		25	Sandstone, silty, dark reddish brown, moderately weak, very fine grained, subrounded, well sorted, some gypsum fragments	Drilling rate from 322 to 336 ft. was 1.6 ft./hr.
								340		26	Siltstone, clayey, dark reddish brown, moderately weak, and Sandstone, dark reddish brown, moderately weak, very fine grained, trace of clay	Drilling rate from 336 to 375 ft. was 2.1 ft./hr.
								350		27	Siltstone, sandy, dark reddish brown and greenish gray, moderately weak	
								360		28	Siltstone, sandy, dark reddish brown, moderately weak, grades into Sandstone, dark reddish brown, moderately weak, very fine grained	← Horizontal displacement at 357 ft. was 0.06 ft. S01° 10'E
								370		29	Sandstone, silty, dark reddish brown, moderately weak, very fine grained, subrounded, well sorted	
								380		30	As above, with gypsum fragments	Drilling rate from 375 to 433 ft. was 2.0 ft./hr.
							3027.5	390		31	Sandstone, as above, and Siltstone	

SS = SPLIT SPOON; ST = SHELBY TUBE; D = DENNISON; P = PITCHER; O = OTHER

SITE: WIPP - EDDY CO., N. M.

HOLE NO.: EXPLORATORY SHAFT

H&CF 19-2

BECHTEL

GEOLOGIC DRILL LOG

PROJECT	JOB NO.	SHEET NO.	HOLE NO.
WIPP	12484	6 OF 11	EXPLORATORY SHAFT (SPDV)

SAMPLER TYPE AND DIAMETER	SAMPLER ADVANCE LENGTH CORE RUN	SAMPLE RECOVERY CORE RECOVERY	SAMPLE BLOWS "N" PERCENT CORE RECOVERY	WATER PRESSURE TESTS: LOSS IN G.P.M.	WATER PRESSURE TESTS: PRESSURE P.S.I.	WATER PRESSURE TESTS: TIME IN MINUTES	ELEVATION	DEPTH (FT.) BELOW K.B.	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
142 IN. DIA. ROTARY CUTTER BIT		CUTTINGS SAMPLES					3027.5	390			Sandstone, as above, and Siltstone, sandy, dark reddish brown, some greenish gray frags., moderately weak, abundant gypsum fragments	
								400		32	As above	
								410		33	Sandstone, as sample No. 29, abundant gypsum fragments	← Horizontal displacement at 401 ft. was 0.08 ft. S08° 13'W
								420		34	As above	
								430		35	As above	
								440		36	As above, some gray green color	Drilling rate from 433 to 464 ft. was 1.6 ft./hr.
								450		37	Sandstone and Siltstone, as sample No. 32	← Horizontal displacement at 445 ft. was 0.10 ft. S18° 50'W
								460		38	As above	
							2947.5	470		39	Sandstone, as sample No. 29	

SS = SPLIT SPOON; ST = SHELBY TUBE; D = DENNISON; P = PITCHER; O = OTHER

SITE: WIPP - EDDY CO., N. M.

HOLE NO.: EXPLORATORY SHAFT

H&CF 19-2

BECHTEL

GEOLOGIC DRILL LOG

PROJECT	JOB NO.	SHEET NO.	HOLE NO.
WIPP	12484	7 OF 11	EXPLORATORY SHAFT (SPDV)

SAMPLER TYPE AND DIAMETER	SAMPLER ADVANCE LENGTH CORE RUN	SAMPLE RECOVERY CORE RECOVERY	SAMPLE BLOWS "N" PERCENT CORE RECOVERY	WATER PRESSURE TESTS: LOSS IN G.P.M.	WATER PRESSURE TESTS: PRESSURE P.S.I.	WATER PRESSURE TESTS: TIME IN MINUTES	ELEVATION	DEPTH (FT. BELOW K.B.)	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
142 IN. DIA. ROTARY CUTTER BIT		CUTTINGS SAMPLES					2947.5	470				Drilling rates: 464-490 ft. = 1.5 ft./hr. 490 - 502 ft. = 0.8 ft./hr. 502 - 506 ft. = 0.7 ft./hr.
								480		40	Siltstone, dark reddish brown, moderately weak, gypsum fragments, trace of sandstone	
								490		41	Sandstone, silty, dark reddish brown, moderately strong to moderately weak, very fine grained, abundant greenish gray reduction spots	← Horizontal displacement at 489 ft. was 0.14 ft. S28°17'W
								500		42	As above	
								510		43	As above, subrounded, well sorted, gypsum fragments	Drilling rates: 506 - 510 ft. = 1.3 ft./hr. 510 - 513 ft. = 0.5 ft./hr. 513 - 527 ft. = 0.6 ft./hr. 527 - 538 ft. = 0.5 ft./hr. 538 - 548 ft. = 0.4 ft./hr.
								520		44	As above	
								530		45	As above, moderately weak, some greenish gray reduction spots	
								540		46	As above	← Horizontal displacement at 533 ft. was 0.18 ft. S35°10'W
										47	As above	
							2872.5			48	As above	
											538 - 850' RUSTLER FORMATION, primarily anhydrite, dolomite, and mudstone	
							2867.5	550		49	Anhydrite, white to light brownish gray	

SS = SPLIT SPOON; ST = SHELBY TUBE; D = DENNISON; P = PITCHER; O = OTHER

SITE: WIPP - EDDY CO., N. M.

HOLE NO.: EXPLORATORY SHAFT

H&CF 19-2

BECHTEL

GEOLOGIC DRILL LOG

PROJECT	JOB NO.	SHEET NO.	HOLE NO.
WIPP	12484	8 OF 11	EXPLORATORY SHAFT (SPDV)

SAMPLER TYPE AND DIAMETER	SAMPLER ADVANCE LENGTH CORE RUN	SAMPLE RECOVERY CORE RECOVERY	SAMPLE BLOWS "N" / PERCENT CORE RECOVERY	WATER PRESSURE TESTS: LOSS IN G.P.M.	WATER PRESSURE TESTS: PRESSURE P.S.I.	WATER PRESSURE TESTS: TIME IN MINUTES	ELEVATION	DEPTH (FT.) BELOW K.B.	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
142 IN. DIA. ROTARY CUTTER BIT		CUTTINGS SAMPLES					2867.5	550			Anhydrite, white to light brownish gray, hard, finely crystalline, some gypsum fragments	Drilling rates: 548–554 ft. = 0.5 ft./hr. 554–561 ft. = 0.7 ft./hr.
								560		50	As above	
								570		51	As above, light gray to light brownish gray	
								580		52	Clay, dark brown, high plasticity, some silt	
								590		53	Siltstone, medium gray, moderately weak, some very fine sand and minor clay	← Horizontal displacement at 577 ft. was 0.24 ft. S40° 12'W
							2817.5	600		54	Anhydrite, very lt. gray to med. dk. gray, moderately hard	
											593 – 628' MAGENTA DOLOMITE MEMBER	
								610		55	Siltstone, calcareous, med. olive gray to olive gray, strong, mod. hard, mod. to well cemented, sparse gypsum crystals	
								620		56	As above	
							2795.5				? – – – – – – – – – – – – – – – ?	
							2787.5	630		57	Dolomite, olive gray	

SS = SPLIT SPOON; ST = SHELBY TUBE; D = DENNISON; P = PITCHER; O = OTHER

SITE: WIPP – EDDY CO., N. M.

HOLE NO.: EXPLORATORY SHAFT

H&CF 19-2

BECHTEL

GEOLOGIC DRILL LOG

PROJECT	JOB NO.	SHEET NO.	HOLE NO.
WIPP	12484	9 OF 11	EXPLORATORY SHAFT (SPDV)

SAMPLER TYPE AND DIAMETER	SAMPLER ADVANCE / LENGTH CORE RUN	SAMPLE RECOVERY / CORE RECOVERY	SAMPLE BLOWS "N" / PERCENT CORE RECOVERY	WATER PRESSURE TESTS: LOSS IN G.P.M.	WATER PRESSURE TESTS: PRESSURE P.S.I.	WATER PRESSURE TESTS: TIME IN MINUTES	ELEVATION	DEPTH (FT.) BELOW K.B.	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
142 IN. DIA. ROTARY CUTTER BIT		CUTTINGS SAMPLES					2787.5	630				
							2782.5				Dolomite, olive gray, mod. strong, mod. hard, sugary texture w/small silver blebs (mica?), evidence of lamella, powdered sample reacts slightly w/HCl acid	
								640		58	Anhydrite, very light gray to brownish gray, mod. strong, mod. hard, well cemented, possibly gypsiferous	
								650		59	As above	
								660		60	As above	
								670		61	As above, contains minor amt. of small black grains w/resinous luster, pulverized grains have earthy to sandy appearance & small reaction w/HCl acid	
								680		62	As above (sample No. 58), lighter in overall color and larger fragments	
								690		63	As above, lighter in overall color, smaller fragments than above	
								700		64	Anhydrite, mot. pale yellow brn. overall, some pale reddish brn. frags. (polyhalite), stronger and harder than previous samples, trace translucent to white, fibrous satinspar gypsum, trace gray clay frags.	
							2707.5	710		65	Anhydrite, slightly mot. med. to lt. gray	

SS = SPLIT SPOON; ST = SHELBY TUBE; O = DENNISON; P = PITCHER; O = OTHER

SITE: WIPP - EDDY CO., N. M.

HOLE NO.: EXPLORATORY SHAFT

H&CF 19-2

BECHTEL

GEOLOGIC DRILL LOG

PROJECT: WIPP | JOB NO.: 12484 | SHEET NO.: 10 OF 11 | HOLE NO.: EXPLORATORY SHAFT (SPDV)

SAMPLER TYPE AND DIAMETER	SAMPLER ADVANCE / LENGTH CORE RUN	SAMPLE RECOVERY / CORE RECOVERY	SAMPLE BLOWS "N" / PERCENT CORE RECOVERY	WATER PRESSURE TESTS: LOSS IN G.P.M.	WATER PRESSURE TESTS: PRESSURE P.S.I.	WATER PRESSURE TESTS: TIME IN MINUTES	ELEVATION	DEPTH (FT.) BELOW K.B.	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
							2707.5	710			Anhydrite, slightly mot. med. to lt. gray overall, trace gypsum	
							2699.5					
								720		66	711-740' CULEBRA DOLOMITE MEMBER Dolomite, crystalline, lt. olive gray, mod. strong, well cemented, sugary texture, powdered sample reacts slightly w/HCl acid, trace transparent gypsum crystals	
								730		67		
								740		68	As above	
							2670.5					
								750		69	Anhydrite, crystalline, variegated color (primarily grayish pink, pale red, and light gray), strong, hard, sugary texture, blebs of grayish red (polyhalite?)	
							2658.5					
								760		70	Halite, pale reddish brn., strong, hard, dissolves slowly in hot water, few transparent frags. exhibiting cleavage faces, trace argillaceous material	← Horizontal displacement at 753 ft. was 0.49 ft. S51° 15'W
								770		71	As above, more abundant crystals, some mudstone (clay to fine sand particles, grayish red, poor to mod. cementation, crumbles easily)	
								780		72	As above, trace anhydrite (yellow gray, strong, mod. hard)	
							2627.5	790		73	Mudstone, moderate brown	

142 IN. DIA. ROTARY CUTTER BIT

CUTTINGS SAMPLES

SS = SPLIT SPOON; ST = SHELBY TUBE; D = DENNISON; P = PITCHER; O = OTHER

SITE: WIPP - EDDY CO., N. M.

HOLE NO.: EXPLORATORY SHAFT

H&CF 19-2

BECHTEL

GEOLOGIC DRILL LOG

PROJECT	JOB NO.	SHEET NO.	HOLE NO.
WIPP	12484	11 OF 11	EXPLORATORY SHAFT (SPDV)

SAMPLER TYPE AND DIAMETER	SAMPLER ADVANCE LENGTH CORE RUN	SAMPLE RECOVERY CORE RECOVERY	SAMPLE BLOWS "N" / PERCENT CORE RECOVERY	WATER PRESSURE TESTS: LOSS IN G.P.M.	WATER PRESSURE TESTS: PRESSURE P.S.I.	WATER PRESSURE TESTS: TIME IN MINUTES	ELEVATION	DEPTH (FT.) BELOW K.B.	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
142 IN. DIA. ROTARY CUTTER BIT		CUTTINGS SAMPLES					2627.5	790			Mudstone, primarily silt w/clay and fine sand particles, mod. brn., strong, hard, well cemented, trace transparent halite crystals	
								800		74	As above, less halite, trace anhydrite	
								810		75	Mudstone, primarily silt w/fine sand & minor clay particles, olive gray, strong, hard, mod. cemented, mica flakes present	
								820		76	As above (sample No. 73), trace gypsum crystals and olive gray mudstone	
								830		77	As above (sample No. 75), trace brn. mudstone	
								840		78	As above	
								850		79	As above, larger frags.	← Horizontal displacement at 841 ft. was 0.59 ft. S54°18'W
										80	As above, brown and olive gray, trace anhydrite	
							2560.5				850-2298' SALADO FORMATION	
								860		81	Note: For description of Salado Formation stratigraphy and lithology see geologic map of shaft	
							2547.5	870		82		

SS = SPLIT SPOON; ST = SHELBY TUBE; D = DENNISON; P = PITCHER; O = OTHER

SITE: WIPP - EDDY CO., N. M.

HOLE NO.: EXPLORATORY SHAFT

H&CF 19-2

NOTES:

1) ELEVATIONS REFER TO BOTTOM OF CONCRETE AT ELEVATION OF 2530.38 WHICH WAS TIED TO CWI BENCHMARK NO. CW-1 (BRASS CAP OUTSIDE THE C & SH SHAFT) AT ELEVATION 3410.080 ON DECEMBER 2, 1982.

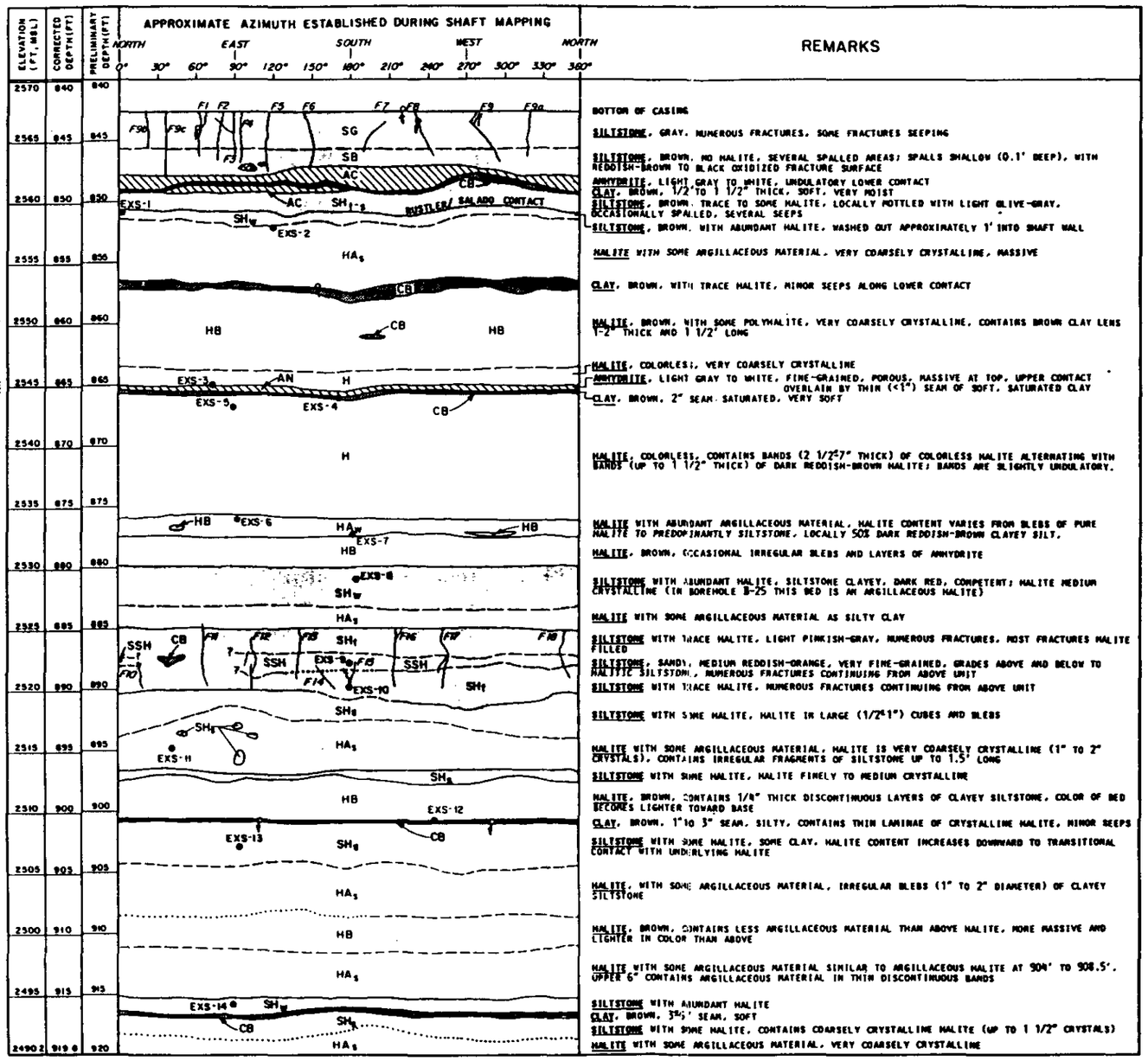
2) DEPTHS ARE RELATED TO THE TOP OF FIRST BUNTON AT ELEVATION 3410.0 FT. MSL.

3) PRELIMINARY DEPTHS WERE CORRECTED BY THE ADDITION OF A -0.2 FT. CORRECTION FACTOR.

4) STANDARD GEOLOGIC SYMBOL FOR HALITE IS NOT USED IN ORDER TO ENHANCE THE CLARITY OF THE LOG COLUMN.

REFERENCE:

GEOTECHNICAL ACTIVITIES IN THE EXPLORATORY SHAFT-SELECTION OF THE FACILITY INTERVAL, MARCH 1983, TME 3178.



SCALE
5 0 5 10 FT

FRACTURE NOTES:

FRACTURES DESIGNATED F1 TO F9C REFER TO THOSE IN A SILTSTONE BED AT DEPTHS 842.5 TO 847 FEET. FRACTURES F10 TO F18 ARE IN A SILTSTONE BED AT DEPTHS 875 TO 880 FEET.

F1 OPEN TO 1/8-INCH WIDE ABOVE CONTACT, CLOSED BELOW CONTACT; VERY MINOR SEEPAGE.

F2 FILLED WITH WHITE PRECIPITATE (SALT?); 1/8-INCH WIDE IN UPPER EXTENT, CLOSED IN LOWER EXTENT.

F3 BIFURCATION FORMS POTENTIAL SPALL AREA.

F4 VERY MINOR SEEPAGE; OPEN.

F5 OXIDIZED MATERIAL IN FRACTURE BELOW CONTACT; 1/8-INCH MAXIMUM WIDTH.

F6 TRENDS N20°E; 1/4-INCH WIDE; OPEN.

F7 CLOSED ABOVE CONTACT, OPEN TO 1/4-INCH WIDE BELOW CONTACT.

F8 OPEN 1/16- TO 1/2-INCH WIDE ABOVE CONTACT, CLOSED BELOW CONTACT; PARTIALLY FILLED WITH SILT; MINOR SEEPAGE.

F9 1/8- TO 1/4-INCH WIDE.

F9a ESTIMATED STRIKE N60°W.

F9b OPEN 1/4-INCH WIDE.

F9c CLOSED TO OPEN 1/4-INCH WIDE.

F10 HALITE FILLED, STRIKE E-W.

F11 VERTICAL FRACTURE WITH MAXIMUM WIDTH OF 1 INCH; HALITE FILLED; MODERATE REDDISH-BROWN COLOR; ESTIMATED STRIKE N30°E; MATCHES WITH F15.

F12 FRACTURE PARTIALLY FILLED WITH HALITE; STRIKE N88°E; MATCHES WITH F17.

F13 NO SPECIFIC DATA.

F14 ESTIMATED STRIKE N60°W, DIPPING 40°SW.

F15 POSSIBLY MATCHES F11?; STRIKE N30°E.

F16 VERTICAL FRACTURE 3/8-INCH WIDE; HALITE FILLED; PROBABLY MATCHES F18; STRIKE N11°E.

F17 VERTICAL FRACTURE 1/2-INCH WIDE; HALITE FILLED; MATCHES F12; STRIKE N88°E.

F18 ESTIMATED STRIKE N10 TO 20°E; FRACTURE F18 MATCHES F16; HALITE FILLED.

EXPLANATION

ROCK TYPE

SILTSTONE — HALITE (See note 4) — ANHYDRITE

CONTACTS

SHARP (identifiable within 0.05 feet) — GRADATIONAL (identifiable within 0.05 to 0.2 feet) — DIFFUSE (identifiable within 0.2 to 0.5 feet)

F1 FRACTURE — EXS-5 ROCK SAMPLE LOCATION AND NUMBER

SEEP — CLAY LAYER (See note 5)

SPALLED AREA

GEOLOGIC UNIT SYMBOLS AND DESCRIPTIONS *

A ARGILLACEOUS MATERIAL, GENERALLY FOUND AS AN INTERGRANULAR ACCESSORY CONSTITUENT, LIGHT GRAY (N7) TO MODERATE REDDISH-BROWN (10R 4/6), SLIGHTLY MOIST TO MOIST, TRACE TO SOME SILT.

AN ANHYDRITE, LIGHT GRAY (N7) TO WHITE (N9), MODERATE ORANGE-PINK (10R 7/4) TO PALE REDDISH-BROWN (10R 5/4), FINELY CRYSTALLINE.

AC ANHYDRITE, LIGHT GRAY (N7) TO GRAYISH-ORANGE (10YR 7/4) TO WHITE (N9), WITH SEVERAL SOFT 1/2- TO 1 1/2-INCH CLAY STRINGERS WITH TRACE OF SILT.

CB CLAY, DARK REDDISH-BROWN (10R 3/4) TO MODERATE REDDISH-BROWN (10R 4/6) WITH TRACE TO SOME SILT, TRACE TO SOME HALITE.

HA** HALITE, DARK REDDISH-BROWN (10R 3/4) TO MODERATE REDDISH-BROWN (10R 4/6) TO MODERATE REDDISH-ORANGE (10R 6/6), LOCALLY MEDIUM LIGHT GRAY (N7), MEDIUM TO COARSELY CRYSTALLINE, ARGILLACEOUS.

HB HALITE, DARK REDDISH-BROWN (10R 3/4) TO MODERATE REDDISH-BROWN (10R 4/6), SLIGHTLY TRANSLUCENT, MEDIUM TO COARSELY CRYSTALLINE.

H HALITE, COLORLESS (TRANSPARENT TO TRANSLUCENT) TO GRAYISH-ORANGE-PINK (5YR 7/2), MEDIUM TO COARSELY CRYSTALLINE, MAY BE BANDED.

SB SILTSTONE, DARK REDDISH-BROWN (10R 3/4), TRACE TO NO HALITE, TRACE FINE-GRAINED SAND.

SG SILTSTONE, LIGHT OLIVE-GRAY (5Y 6/1), TRACE FINE-GRAINED SAND, TRACE TO NO HALITE.

SH** SILTSTONE, DARK REDDISH-BROWN (10R 3/4) TO MODERATE REDDISH-BROWN (10R 4/6), HALITIC, TRACE TO SOME CLAY, LOCALLY CONTAINS VERY FINE TO FINE-GRAINED SAND.

SSH SILTSTONE, MODERATE REDDISH-ORANGE (10R 6/6), WITH VERY FINE-GRAINED SAND, TRACE HALITE; LOCALLY GRADES TO A VERY FINE TO FINE-GRAINED SANDSTONE, MODERATE REDDISH-BROWN (10R 4/6) TO MEDIUM LIGHT GRAY (N7), TRACE TO SOME SILT.

* SLIGHT VARIATIONS FROM THESE GENERAL DESCRIPTIONS MAY EXIST. THE EXCEPTIONS ARE NOTED IN THE REMARKS COLUMN.

** ESTIMATED CONTENT OF ACCESSORY CONSTITUENTS IS INDICATED BY A MODIFIER: T = TRACE, S = SOME, W = WITH OR ABUNDANT

FIGURE D-2
C & SH SHAFT
KEY AREA GEOLOGY
BOTTOM CASING TO 920 FEET

NOTES:

1) ELEVATIONS REFER TO BOTTOM OF CONCRETE AT ELEVATION OF 2530.38 WHICH WAS TIED TO CWI BENCHMARK NO. CW-1 (BRASS CAP OUTSIDE THE C & SH SHAFT) AT ELEVATION 3410.080 ON DECEMBER 2, 1982.

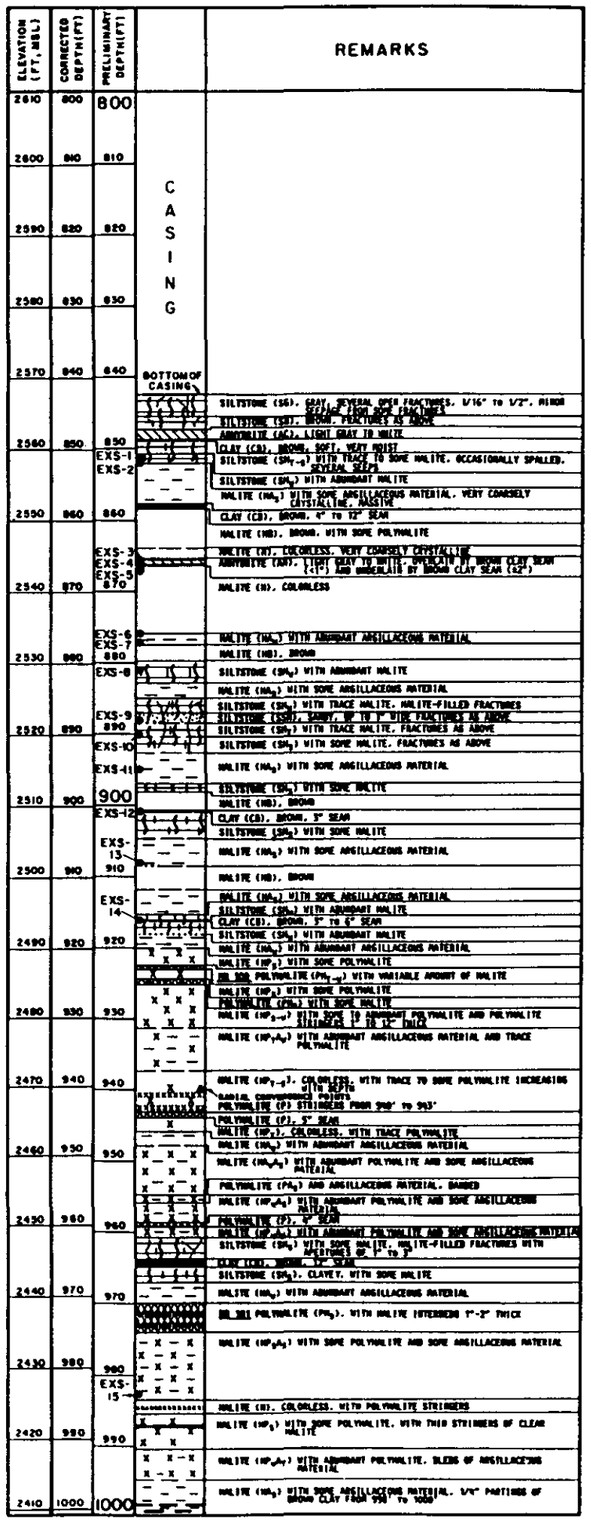
2) DEPTHS ARE RELATED TO THE TOP OF FIRST BUNTON AT ELEVATION 3410.0 FT. MSL.

3) PRELIMINARY DEPTHS WERE CORRECTED BY THE ADDITION OF A CORRECTION FACTOR.

4) STANDARD GEOLOGIC SYMBOL FOR HALITE IS NOT USED IN ORDER TO ENHANCE THE CLARITY OF THE LOG COLUMN.

REFERENCE:

GEOTECHNICAL ACTIVITIES IN THE EXPLORATORY SHAFT SELECTION OF THE FACILITY INTERVAL. MARCH 1983, TME 3178.



GEOLOGIC UNIT SYMBOLS AND DESCRIPTIONS*

A — ARGILLACEOUS MATERIAL, GENERALLY FOUND AS AN INTERGRANULAR ACCESSORY CONSTITUENT, LIGHT GRAY (N7) TO MODERATE REDDISH-BROWN (10R 4/6), SLIGHTLY MOIST TO MOIST, TRACE TO SOME SILT.

AC — ANHYDRITE, LIGHT GRAY (N7) TO WHITE (N9) TO GRAYISH-ORANGE (10YR 7/4), FINELY CRYSTALLINE TO MICROCRYSTALLINE, SEVERAL SOFT 1/2- TO 1 1/2-INCH CLAY STRINGERS WITH TRACE SILT.

AH — ANHYDRITE, MEDIUM DARK GRAY (N4) TO LIGHT GRAY (N7) TO WHITE (N9), MODERATE ORANGE-PINK (10R 7/4) TO PALE REDDISH-BROWN (10R 5/4), FINELY CRYSTALLINE TO MICROCRYSTALLINE.

CB — CLAY, DARK REDDISH-BROWN (10R 3/4), TRACE TO SOME SILT, TRACE TO SOME HALITE.

CG — CLAY, MEDIUM LIGHT GRAY (N6) TO MEDIUM DARK GRAY (N4) TO LIGHT OLIVE-GRAY (5Y 6/1), TRACE TO SOME SILT, TRACE TO SOME HALITE.

H — HALITE, COLORLESS (TRANSPARENT TO TRANSLUCENT) TO GRAYISH-ORANGE-PINK (5YR 7/2), MEDIUM TO COARSELY CRYSTALLINE, MAY BE BANDED.

HA** — HALITE, DARK REDDISH-BROWN (10R 3/4) TO MODERATE REDDISH-BROWN (10R 4/6), MEDIUM TO COARSELY CRYSTALLINE, ARGILLACEOUS.

HB — HALITE, DARK REDDISH-BROWN (10R 3/4) TO MODERATE REDDISH-BROWN (10R 4/6), SLIGHTLY TRANSLUCENT.

HP** — HALITE, TRANSLUCENT TO MODERATE REDDISH-ORANGE (10R 6/6) TO MODERATE REDDISH-BROWN (10R 4/6), POLYHALITIC.

HPA** — HALITE, MODERATE REDDISH-ORANGE (10R 6/6) TO MODERATE REDDISH-BROWN (10R 4/6), POLYHALITIC AND ARGILLACEOUS.

P — POLYHALITE, MODERATE REDDISH-BROWN (10R 4/6) TO MODERATE REDDISH-ORANGE (10R 6/6), FINELY CRYSTALLINE TO MICROCRYSTALLINE.

PA** — POLYHALITE, MODERATE REDDISH-BROWN (10R 4/6), FINELY CRYSTALLINE TO MICROCRYSTALLINE, ARGILLACEOUS.

PH** — POLYHALITE, MODERATE REDDISH-BROWN (10R 4/6) TO MODERATE REDDISH-ORANGE (10R 6/6), FINELY CRYSTALLINE TO MICROCRYSTALLINE, HALITIC.

SB — SILTSTONE, DARK REDDISH-BROWN (10R 3/4), TRACE HALITE, TRACE FINE SAND.

SG — SILTSTONE, LIGHT OLIVE-GRAY (5Y 6/1), TRACE HALITE, TRACE FINE-GRAINED SAND.

SH** — SILTSTONE, DARK REDDISH-BROWN (10R 3/4) TO MODERATE REDDISH-BROWN (10R 4/6), HALITIC, TRACE TO SOME CLAY, LOCALLY CONTAINS VERY FINE-GRAINED SAND.

SSH — SILTSTONE, MODERATE REDDISH-ORANGE (10R 6/6), WITH VERY FINE-GRAINED SAND, TRACE HALITE; LOCALLY GRADES TO VERY FINE TO FINE-GRAINED SANDSTONE, MODERATE REDDISH-BROWN (10R 4/6) TO MEDIUM LIGHT GRAY (N6) TRACE TO SOME SILT.

* SLIGHT VARIATIONS FROM THESE GENERAL DESCRIPTIONS MAY EXIST. THE EXCEPTIONS ARE NOTED IN THE REMARKS COLUMN.

**ESTIMATED CONTENT OF ACCESSORY CONSTITUENTS IS INDICATED BY A MODIFER:
T = TRACE
S = SOME
W = WITH OR ABUNDANT

EXPLANATION

ROCK TYPE

SILTSTONE — HALITE (See note 4) — ANHYDRITE — POLYHALITE

ACCESSORY CONSTITUENTS

ESTIMATED PERCENTAGE OF ACCESSORY CONSTITUENTS INDICATED AS FOLLOWS:

	TRACE	SOME	ABUNDANT
Argillaceous			
Halitic			
Anhydritic			
Polyhalitic			
Sandy			

LAMINAR FEATURES

	SEAM >1/4" thick	PARTING Between 1/4"-1/16" thick	BREAK <1/16" thick	DISCONTINUOUS PARTINGS AND BREAKS
Clayey				

STRINGERS

Halite — Anhydrite — Polyhalite

CONTACTS

SHARP (Identifiable within 0.05 foot) — GRADATIONAL (Identifiable within 0.05 to 0.2 foot) — DIFFUSE (Identifiable within 0.2 to 0.5 foot)

FRACTURES

EXS-6 ● ROCK SAMPLE LOCATION AND NUMBER

▲ INSTRUMENT LOCATION

FIGURE D-3

C & SH SHAFT
LITHOLOGIC LOG SHOWING
SAMPLE AND INSTRUMENT LOCATIONS
BOTTOM OF CASING TO 2200 FEET

SHEET 1 OF 3

FIGURE D-3
C & SH SHAFT
LITHOLOGIC LOG SHOWING
SAMPLE AND INSTRUMENT LOCATIONS
BOTTOM OF CASING TO 2200 FEET

SHEET 2 OF 3

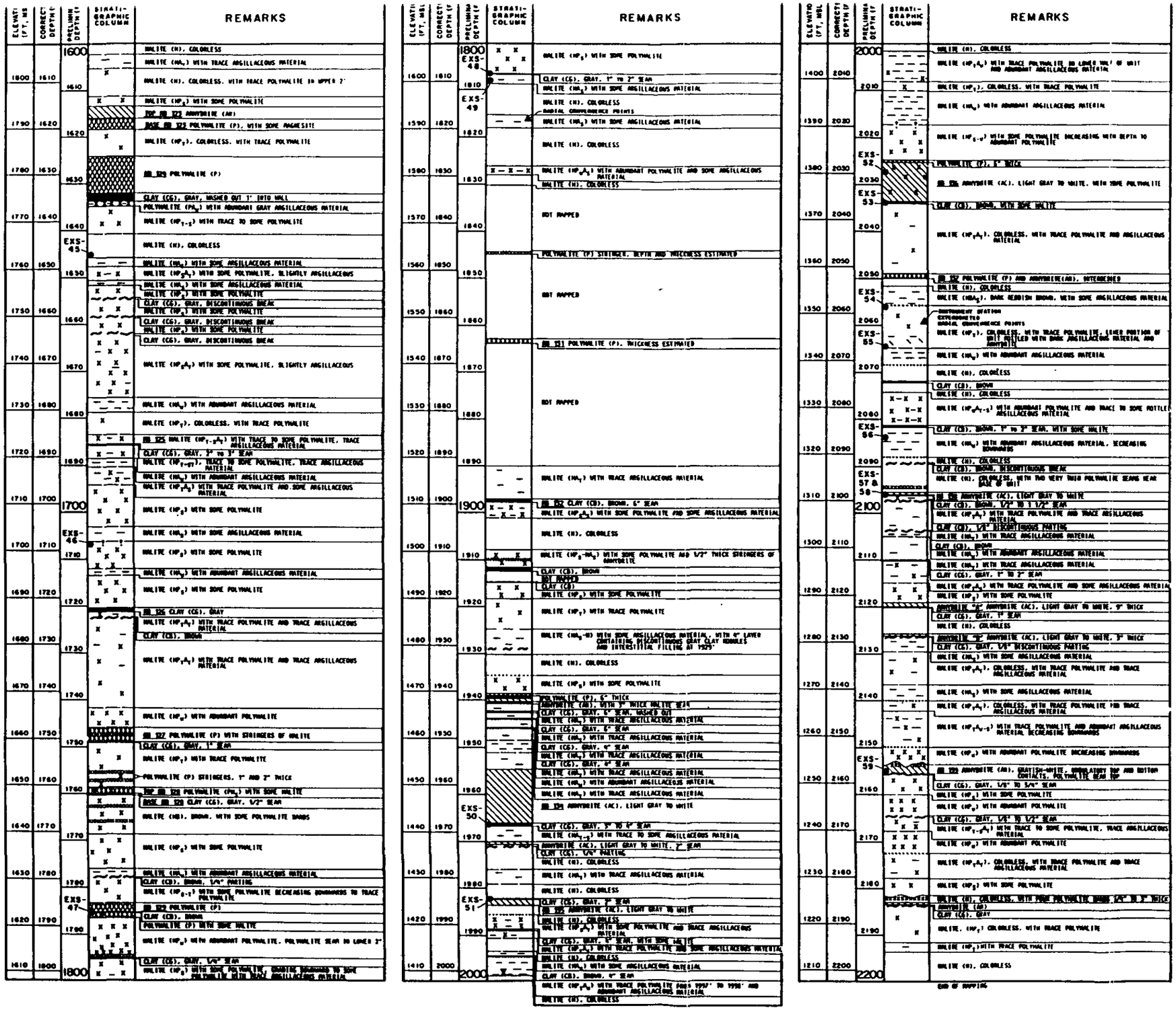


FIGURE D-3

C & SH SHAFT
LITHOLOGIC LOG SHOWING
SAMPLE AND INSTRUMENT LOCATIONS
BOTTOM OF CASING TO 2200 FEET

SHEET 3 OF 3

NOTES:

1) ELEVATIONS REFER TO CWI BENCHMARK NO. 82-D (BRASS CAP ON N.W. CORNER OF THE UNDERGROUND POWER CENTER FOUNDATION) AT ELEVATION 1258.58 WHICH WAS TIED TO CWI BENCHMARK NO. CWI (BRASS CAP OUTSIDE THE C & SH SHAFT) AT ELEVATION 3410.080 ON DECEMBER 2, 1982. BENCHMARK NO. 82-D IS WITHIN THE ZONE OF DEFORMATION OF THE STATION AND CANNOT BE CONSIDERED STABLE.

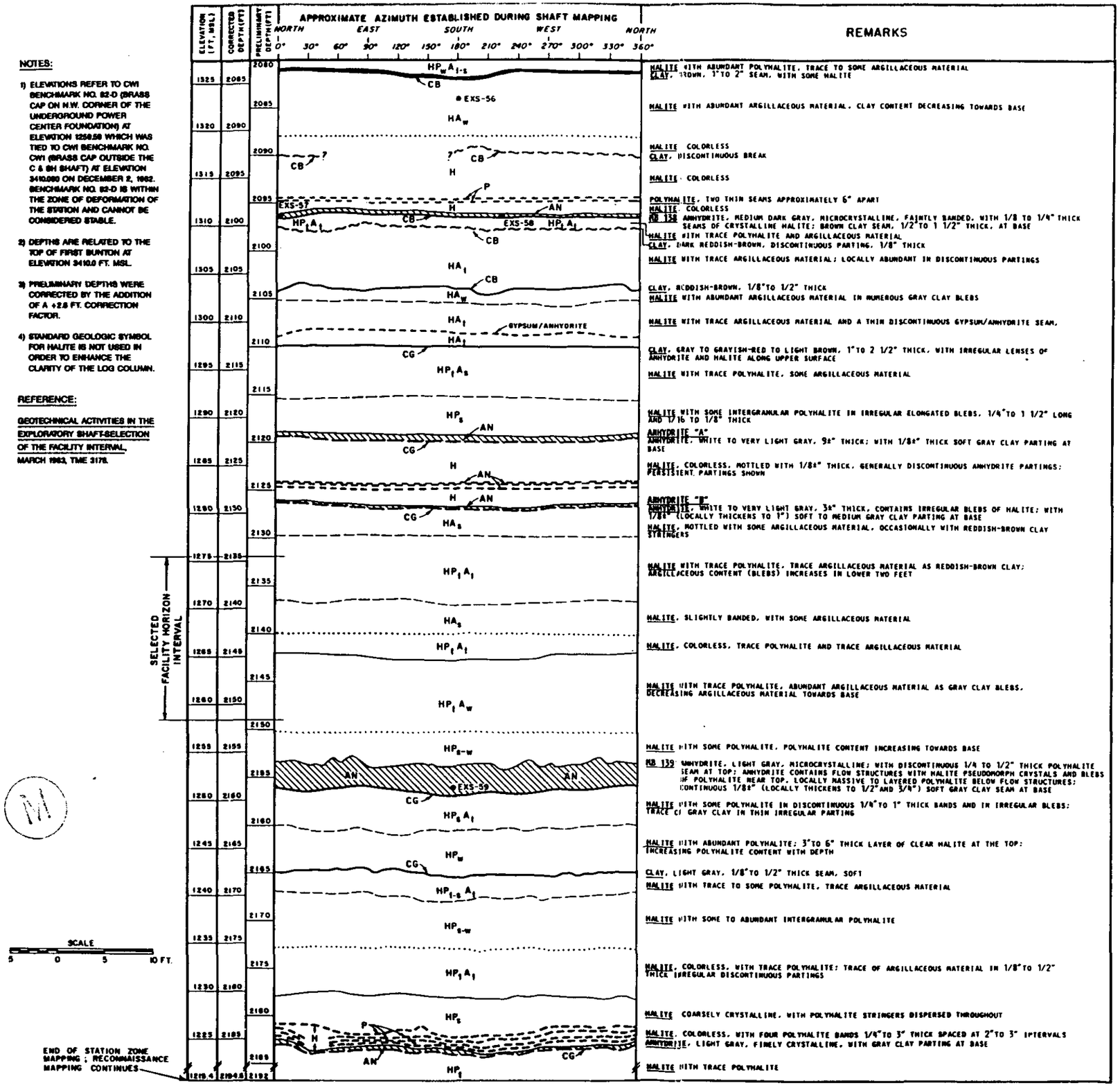
2) DEPTHS ARE RELATED TO THE TOP OF FIRST BUNTON AT ELEVATION 3410.0 FT. MSL.

3) PRELIMINARY DEPTHS WERE CORRECTED BY THE ADDITION OF A +2.8 FT. CORRECTION FACTOR.

4) STANDARD GEOLOGIC SYMBOL FOR HALITE IS NOT USED IN ORDER TO ENHANCE THE CLARITY OF THE LOG COLUMN.

REFERENCE:

GEOTECHNICAL ACTIVITIES IN THE EXPLORATORY SHAFT-SELECTION OF THE FACILITY INTERVAL, MARCH 1983, TME 3178.



HALITE WITH ABUNDANT POLYHALITE, TRACE TO SOME ARGILLACEOUS MATERIAL
CLAY, BROWN, 1" TO 2" SEAM, WITH SOME HALITE

HALITE WITH ABUNDANT ARGILLACEOUS MATERIAL, CLAY CONTENT DECREASING TOWARDS BASE

HALITE COLORLESS
CLAY, DISCONTINUOUS BREAK

HALITE, COLORLESS

POLYHALITE, TWO THIN SEAMS APPROXIMATELY 6" APART
HALITE, COLORLESS
NB 138 ANHYDRITE, MEDIUM DARK GRAY, MICROCRYSTALLINE, FAINTLY BANDED, WITH 1/8 TO 1/4" THICK SEAMS OF CRYSTALLINE HALITE; BROWN CLAY SEAM, 1/2 TO 1 1/2" THICK, AT BASE
HALITE WITH TRACE POLYHALITE AND ARGILLACEOUS MATERIAL
CLAY, DARK REDDISH-BROWN, DISCONTINUOUS PARTING, 1/8" THICK

HALITE WITH TRACE ARGILLACEOUS MATERIAL; LOCALLY ABUNDANT IN DISCONTINUOUS PARTINGS

CLAY, REDDISH-BROWN, 1/8"TO 1/2" THICK
HALITE WITH ABUNDANT ARGILLACEOUS MATERIAL IN NUMEROUS GRAY CLAY BLEBS

HALITE WITH TRACE ARGILLACEOUS MATERIAL AND A THIN DISCONTINUOUS GYPSUM/ANHYDRITE SEAM.

CLAY, GRAY TO GRAYISH-RED TO LIGHT BROWN, 1"TO 2 1/2" THICK, WITH IRREGULAR LENSES OF ANHYDRITE AND HALITE ALONG UPPER SURFACE

HALITE WITH TRACE POLYHALITE, SOME ARGILLACEOUS MATERIAL

HALITE WITH SOME INTERGRANULAR POLYHALITE IN IRREGULAR ELONGATED BLEBS, 1/4"TO 1 1/2" LONG AND 1/16 TO 1/8" THICK

ANHYDRITE "A"
ANHYDRITE, WHITE TO VERY LIGHT GRAY, 9±" THICK; WITH 1/8±" THICK SOFT GRAY CLAY PARTING AT BASE

HALITE, COLORLESS, MOTTLED WITH 1/8±" THICK, GENERALLY DISCONTINUOUS ANHYDRITE PARTINGS; PERSISTENT PARTINGS SHOWN

ANHYDRITE "B"
ANHYDRITE, WHITE TO VERY LIGHT GRAY, 3±" THICK, CONTAINS IRREGULAR BLEBS OF HALITE; WITH 1/8±" (LOCALLY THICKENS TO 1") SOFT TO MEDIUM GRAY CLAY PARTING AT BASE
HALITE, MOTTLED WITH SOME ARGILLACEOUS MATERIAL, OCCASIONALLY WITH REDDISH-BROWN CLAY STRINGERS

HALITE WITH TRACE POLYHALITE, TRACE ARGILLACEOUS MATERIAL AS REDDISH-BROWN CLAY; ARGILLACEOUS CONTENT (BLEBS) INCREASES IN LOWER TWO FEET

HALITE, SLIGHTLY BANDED, WITH SOME ARGILLACEOUS MATERIAL

HALITE, COLORLESS, TRACE POLYHALITE AND TRACE ARGILLACEOUS MATERIAL

HALITE WITH TRACE POLYHALITE, ABUNDANT ARGILLACEOUS MATERIAL AS GRAY CLAY BLEBS, DECREASING ARGILLACEOUS MATERIAL TOWARDS BASE

HALITE WITH SOME POLYHALITE, POLYHALITE CONTENT INCREASING TOWARDS BASE

NB 139 ANHYDRITE, LIGHT GRAY, MICROCRYSTALLINE; WITH DISCONTINUOUS 1/4 TO 1/2" THICK POLYHALITE SEAM AT TOP; ANHYDRITE CONTAINS FLOW STRUCTURES WITH HALITE PSEUDOMORPH CRYSTALS AND BLEBS OF POLYHALITE NEAR TOP, LOCALLY MASSIVE TO LAYERED POLYHALITE BELOW FLOW STRUCTURES; CONTINUOUS 1/8±" (LOCALLY THICKENS TO 1/2"AND 3/4") SOFT GRAY CLAY SEAM AT BASE

HALITE WITH SOME POLYHALITE IN DISCONTINUOUS 1/4"TO 1" THICK BANDS AND IN IRREGULAR BLEBS; TRACE OF GRAY CLAY IN THIN IRREGULAR PARTING

HALITE WITH ABUNDANT POLYHALITE; 3"TO 6" THICK LAYER OF CLEAR HALITE AT THE TOP; INCREASING POLYHALITE CONTENT WITH DEPTH

CLAY, LIGHT GRAY, 1/8"TO 1/2" THICK SEAM, SOFT
HALITE WITH TRACE TO SOME POLYHALITE, TRACE ARGILLACEOUS MATERIAL

HALITE WITH SOME TO ABUNDANT INTERGRANULAR POLYHALITE

HALITE, COLORLESS, WITH TRACE POLYHALITE; TRACE OF ARGILLACEOUS MATERIAL IN 1/8"TO 1/2" THICK IRREGULAR DISCONTINUOUS PARTINGS

HALITE COARSELY CRYSTALLINE, WITH POLYHALITE STRINGERS DISPERSED THROUGHOUT

HALITE, COLORLESS, WITH FOUR POLYHALITE BANDS 1/4"TO 3" THICK SPACED AT 2"TO 3" IPTERVALS
ANHYDRITE, LIGHT GRAY, FINELY CRYSTALLINE, WITH GRAY CLAY PARTING AT BASE

HALITE WITH TRACE POLYHALITE

EXPLANATION

ROCK TYPE

HALITE — See note 4

ANHYDRITE

LAMINAR FEATURES

MISCELLANEOUS (AS LABELED)

CLAY: SEAM >1/4" thick; PARTING Between1/4" & 1/16" thick; BREAK <1/16" thick; DISCONTINUOUS PARTINGS AND BREAKS

CONTACTS

SHARP (Identifiable within 0.05 feet)

GRADATIONAL (Identifiable within 0.05 to 0.2 feet)

DIFFUSE (Identifiable within 0.2 to 0.5 feet)

EXS-56 ROCK SAMPLE LOCATION AND NUMBER

CLAY LAYER

GEOLOGIC UNIT SYMBOLS AND DESCRIPTIONS *

A** ARGILLACEOUS MATERIAL, GENERALLY FOUND AS AN INTERGRANULAR ACCESSORY CONSTITUENT, LIGHT GRAY (N7) TO MODERATE REDDISH-BROWN (10R 4/6), SLIGHTLY MOIST TO MOIST, TRACE TO SOME SILT.

AN ANHYDRITE, MEDIUM DARK GRAY (N4) TO LIGHT GRAY (N7) TO WHITE (N9), MODERATE ORANGE-PINK (10R 7/4) TO PALE REDDISH-BROWN (10R 5/4), FINELY CRYSTALLINE TO MICROCRYSTALLINE.

CB CLAY, DARK REDDISH-BROWN (10R 3/4), TRACE TO SOME SILT, TRACE TO SOME HALITE.

CG CLAY, MEDIUM LIGHT GRAY (N6) TO MEDIUM DARK GRAY (N4) TO LIGHT OLIVE-GRAY (5Y 6/1), TRACE TO SOME SILT, TRACE TO SOME HALITE.

HA** HALITE, DARK REDDISH-BROWN (10R 3/4) TO MODERATE REDDISH-BROWN (10R 4/6), MEDIUM TO COARSELY CRYSTALLINE, ARGILLACEOUS.

H HALITE, COLORLESS (TRANSPARENT TO TRANSLUCENT) TO GRAYISH-ORANGE-PINK (5YR 7/2), MEDIUM TO COARSELY CRYSTALLINE, MAY BE BANDED.

HP** HALITE, TRANSLUCENT TO MODERATE REDDISH-ORANGE (10R 6/6) TO MODERATE REDDISH-BROWN (10R 4/6), POLYHALITIC.

HPA** HALITE, MODERATE REDDISH-ORANGE (10R 6/6) TO MODERATE REDDISH-BROWN (10R 4/6), POLYHALITIC AND ARGILLACEOUS.

P POLYHALITE, MODERATE REDDISH-BROWN (10R 4/6) TO MODERATE REDDISH-ORANGE (10R 6/6), FINELY CRYSTALLINE TO MICROCRYSTALLINE.

* SLIGHT VARIATIONS FROM THESE GENERAL DESCRIPTIONS MAY EXIST. THE EXCEPTIONS ARE NOTED IN THE REMARKS COLUMN.

** ESTIMATED CONTENT OF ACCESSORY CONSTITUENTS IS INDICATED BY A MODIFIER: T = TRACE; S = SOME; W = WITH OR ABUNDANT

FIGURE D-4

C & SH SHAFT
FACILITY LEVEL AREA GEOLOGY
2080 TO 2192 FEET