

ATTACHMENT

SOIL BORING LOG

CAMP STANLEY STORAGE ACTIVITY

BORING LOCATION: BURN AREA 3 (B-3)	BORING NUMBER: B3-SB1
SITE: CAMP STANLEY STORAGE ACTIVITY	CONTRACTOR: PARSONS ENGINEERING SCIENCE
PROJECT: WELL 18 SOURCE CHARACTERIZATION	DRILLING CONTRACTOR: JEDI
LOGGED BY: M. TOWN	REF. LOGBOOK: 1
BORING DEPTH (ft-BGL): 30	DRILLER: T. STARIN
BORING ELEVATION (ft-MSL):	DRILLING RIG: MOBIL B-58
EAST COORDINATE:	DRILLING METHOD: SPLIT-SPOON/AIR CORE
NORTH COORDINATE:	SAMPLING METHOD: SPLIT-SPOON/CORE BARREL
BEGIN DRILLING: 7-MAR-95	END DRILLING: 7-MAR-95

DEPTH (feet)	SAMPLE RECOVERY	ANALYTICAL SAMPLE	HEAD SPACE (DDH)	LITHOLOGIC DESCRIPTION	GRAPHIC LOG	COMMENTS
0				Marly LIMESTONE (no recovery).		
5						
10	X		0	Marly LIMESTONE, very pale brown (10YR 8/3), highly weathered, friable, interbedded with fine grain LIMESTONE, marly, damp to wet.		
15				No recovery.		
20	X		0	Marly LIMESTONE, white (10YR 8/2), pale yellow, fine-grain, hard, weathered vugs, approx. 1/2 core was gravel size pieces.		
25	X		0	Marly LIMESTONE, light yellowish brown, hard, highly weathered, interbedded with lenses of vuggy, hard, fine grain LIMESTONE, damp. 23-24 ft. water, possibly sol. channel or very soft zone.		
30	X		0	LIMESTONE, light gray (2.5YR N7), fine grain weathered, approximately 0.5 ft. high angle fracture starting at 25 ft., dry to damp. Marly LIMESTONE, light gray (2.5Y, N7; N6 where wet), highly weathered, vuggy, wet. Fine-grained marly LIMESTONE, few fossil fragments, fairly hard, dry.		
35				TOTAL DEPTH = 30 FT.		

SOIL BORING LOG

CAMP STANLEY STORAGE ACTIVITY

BORING LOCATION: BURN AREA 3 (B-3)	BORING NUMBER: B3-SB3
SITE: CAMP STANLEY STORAGE ACTIVITY	CONTRACTOR: PARSONS ENGINEERING SCIENCE
PROJECT: WELL 18 SOURCE CHARACTERIZATION	DRILLING CONTRACTOR: JEDI
LOGGED BY: M. TOWN	REF. LOGBOOK: 1
BORING DEPTH (ft-BGL): 13	DRILLER: T. STARIN
BORING ELEVATION (ft-MSL):	DRILLING RIG: MOBIL B-58
EAST COORDINATE:	DRILLING METHOD: SPLIT-SPOON/ATR CORE
NORTH COORDINATE:	SAMPLING METHOD: SPLIT-SPOON/CORE BARREL
BEGIN DRILLING: 8-MAR-95	END DRILLING: 8-MAR-95

DEPTH (feet)	SAMPLE RECOVERY	ANALYTICAL SAMPLE	HEAD SPACE (ppm)	LITHOLOGIC DESCRIPTION	USCS GRAPHIC LOG	COMMENTS
70				CLAY with LIMESTONE fragments, trace SILT (medium-grained to gravel-sized, subangular to angular), dark brown (10YR 3/3). Marly LIMESTONE, very pale brown (10YR 8/4), highly weathered, friable, organic odor, damp. No recovery.		
5				Marly LIMESTONE, very pale brown (10YR 8/4), highly weathered, friable, organic odor, damp. CLAY with LIMESTONE fragments, medium-grained to gravel, subangular to angular, trace SILT. No recovery.	CL	
10						
120				Clay with black plastic, white plastic, clear plastic with fibers, gray putty-like substance, strong solvent odor, damp.		
				TOTAL DEPTH = 13 FT.		
15						
20						

SOIL BORING LOG

CAMP STANLEY STORAGE ACTIVITY

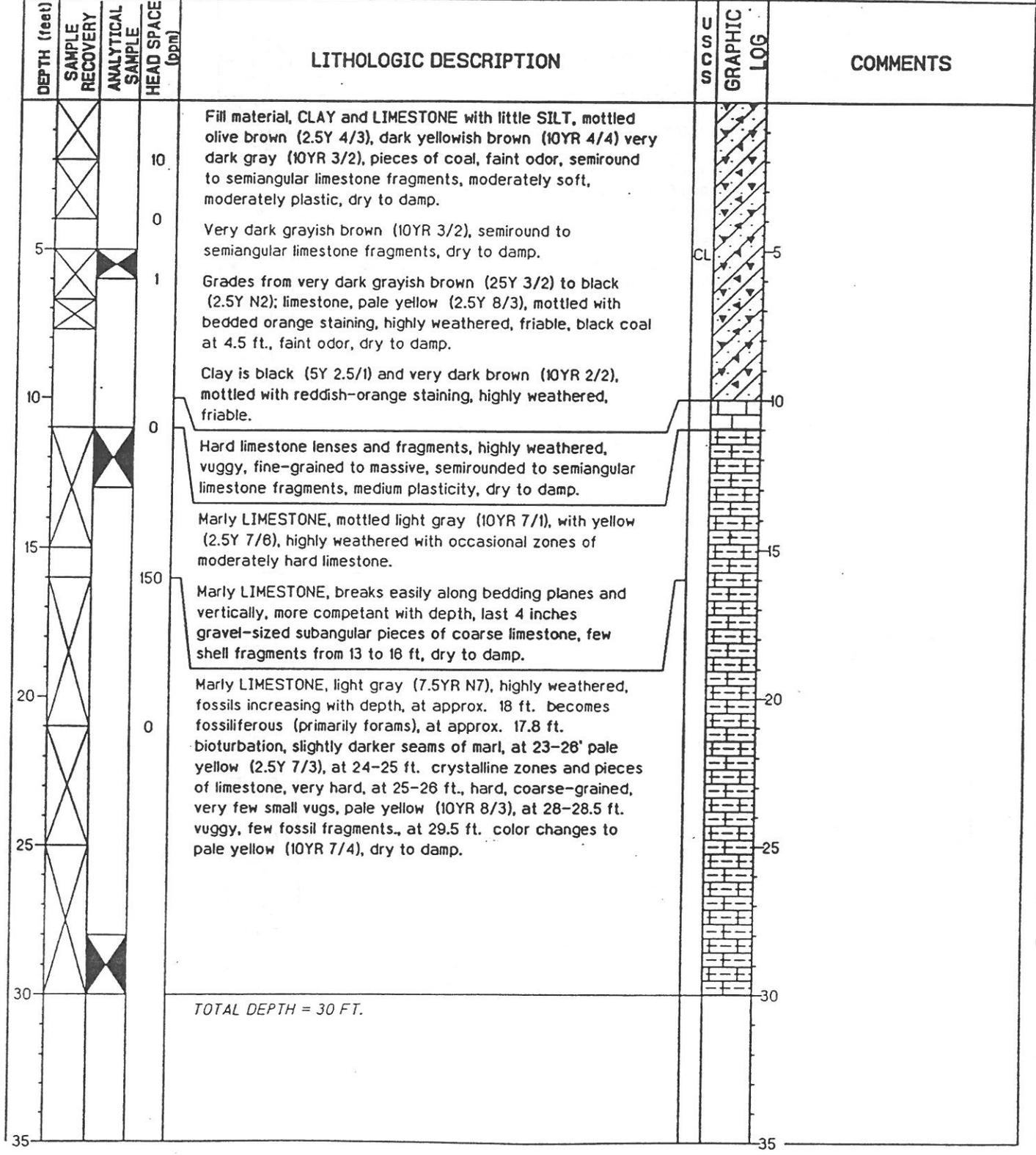
BORING LOCATION: BURN AREA 3 (B-3)	BORING NUMBER: B3-SB5
SITE: CAMP STANLEY STORAGE ACTIVITY	CONTRACTOR: PARSONS ENGINEERING SCIENCE
PROJECT: WELL 16 SOURCE CHARACTERIZATION	DRILLING CONTRACTOR: JEDI
LOGGED BY: M. HARDER	REF. LOGBOOK: 1
BORING DEPTH (ft-BGL): 30	DRILLER: T. STARIN
BORING ELEVATION (ft-MSL):	DRILLING RIG: MOBIL B-58
EAST COORDINATE:	DRILLING METHOD: SPLIT-SPOON/AIR CORE
NORTH COORDINATE:	SAMPLING METHOD: SPLIT-SPOON/CORE BARREL
BEGIN DRILLING: 16-MAR-95	END DRILLING: 16-MAR-95

DEPTH (feet)	SAMPLE RECOVERY	ANALYTICAL SAMPLE HEAD SPACE (gon)	LITHOLOGIC DESCRIPTION	GRAPHIC LOG	COMMENTS
0			CLAY, dark reddish brown (5YR 3/3), with white CALICHE and LIMESTONE fragments, mottled, damp.	CL	
5			Fill material, CALICHE, SAND (dark), fill material, trace plastic, trace fibrous cloth material, metal spring in cuttings, assorted metal, dry.		
5			Fill material, trace plastic, trace fibrous cloth material, metal spring in cuttings, assorted metal and plastic debris, large LIMESTONE fragments, wood material, black sand, CLAY, GRAVEL, damp.	CL	
10			Fill material with trace plastic, mottled, also CLAY (brown), SAND, GRAVEL (LIMESTONE fragments), damp to moist.		
10			CLAY, brownish-yellow (10YR 6/8) mixed with white LIMESTONE fragments, metal debris, damp.	CL	
15			Marley LIMESTONE, light olive gray (5Y 5/2), mottled with medium light gray, metal fragments, soft, dry.		
20			LIMESTONE, soft, light gray (N7), with hard, marly interbeds, dry.		
20			LIMESTONE, light to medium gray, hard, massive, dry.		
25			Marly LIMESTONE, very light gray to medium gray, with a few fossil fragments.		
30			LIMESTONE, pale to dark yellowish orange, very fossiliferous (forams and pelecypods), solution cavities, clay seams, iron staining, dry.		
			TOTAL DEPTH = 30 FT.		

SOIL BORING LOG

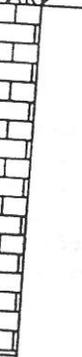
CAMP STANLEY STORAGE ACTIVITY

BORING LOCATION: BURN AREA 3 (B-3)	BORING NUMBER: B3-SB7
SITE: CAMP STANLEY STORAGE ACTIVITY	CONTRACTOR: PARSONS ENGINEERING SCIENCE
PROJECT: WELL 16 SOURCE CHARACTERIZATION	DRILLING CONTRACTOR: JEDI
LOGGED BY: M. TOWN	REF. LOGBOOK: 1
BORING DEPTH (ft-BGL): 30	DRILLER: T. STARIN
BORING ELEVATION (ft-MSL):	DRILLING RIG: MOBIL B-58
EAST COORDINATE:	DRILLING METHOD: SPLIT-SPOON/AIR CORE
NORTH COORDINATE:	SAMPLING METHOD: SPLIT-SPOON/CORE BARREL
BEGIN DRILLING: 9-MAR-95	END DRILLING: 9-MAR-95



Drilling Log - Camp Stanley Storage Activity

PROJECT: CSSA GROUNDWATER EVALUATION	LOCATION/BORING NO.: B-3, MPB
CLIENT: ARMSTRONG LABORATORY - CSSA	DRILLING METHOD: HOLLOW-STEM AUGER
LOGGED BY: B. VANDERGLAS	SAMPLING METHOD: SPLIT SPOON
DRILLING CONTRACTOR: JEDI	BOREHOLE DIAMETER: 8 IN.
DRILLER: TOM STARRIN	REF. LOGBOOK: B-3
DRILLING RIG: MOBILE B-61	TOTAL DEPTH (FT BGS): 14
DRILLING START: 2/20/96	WATER FOUND: NO
DRILLING END: 2/20/96	DATE COMPLETED: 2/20/96

DEPTH (FT BGL)	HNU SCAN (ppm)	RECOVERY	LITHOLOGIC DESCRIPTION	GRAPHIC LOG	ANALYTICAL SAMPLE	COMMENTS
0			SILTY CLAY with CALICHE PEBBLES, yellowish brown (10YR 5/8).			Drill to 8 ft bgl before pushing spoon. No odors; no VOCs picked up by TIP.
5						
0	0.6/1		CALICHE with LIMESTONE fragments, light gray, not enough recovery for sample.			Sample collected at 8-9 ft for VOCs, metals, moisture and geotech (from cuttings). No odors No odors
10			Weathered LIMESTONE, fine CLAY, yellow, dry.			
15			<i>Total depth = 14 feet.</i>			
20						

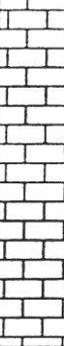
Drilling Log - Camp Stanley Storage Activity

PROJECT: CSSA GROUNDWATER EVALUATION	LOCATION/BORING NO.: B-3, MPD
CLIENT: ARMSTRONG LABORATORY - CSSA	DRILLING METHOD: HOLLOW-STEM AUGER
LOGGED BY: B. VANDERGLAS	SAMPLING METHOD: SPLIT SPOON
DRILLING CONTRACTOR: JEDI	BOREHOLE DIAMETER: 8 IN.
DRILLER: TOM STARRIN	REF. LOGBOOK: B-3
DRILLING RIG: MOBILE B-81	TOTAL DEPTH (FT BGS): 16
DRILLING START: 2/22/96	WATER FOUND: NO
DRILLING END: 2/22/96	DATE COMPLETED: 2/22/96

DEPTH (FT BGL)	HNU SCAN (ppm)	RECOVERY	LITHOLOGIC DESCRIPTION	GRAPHIC LOG	ANALYTICAL SAMPLE	COMMENTS
0	0	1.2/2	CLAYEY GRAVEL, many small caliche nodules, silt, light gray, non-plastic, some large limestone fragments, very dry, friable.			No odors
	0	1/2	Same as above, some pieces of metal trash and rusty metal also encountered.			No odors
5	0	0.4/2	CLAYEY GRAVEL, as above, SILTY CLAY, light yellow brown, mixed with gritty coarse-grained sand, reddish brown FILL with pieces of thin metal, dry.			Sample collected at 4-6 ft for VOCs & moisture; no odors.
	0	1.1/2	FILL, SILTY CLAY, dark red brown and yellow, very non-plastic, black ash chunks intermixed, some thin pieces of metal.			No odors
	0	1.1/2	FILL material, dark red brown, black, yellow, dark gray, with glass, metal pieces, ash chunks, etc.			Sample collected at 8-10 ft for VOCs, moisture, metals, & geotech; no odors.
10		0.5/2	SILTY CLAY, dark brown, with wire, small limestone fragments and weathered yellow limestone, driller encountered limestone near base of 10 to 12 ft interval, assume limestone at approx. 11.5 ft bgl.			No odors
		0/2	LIMESTONE dust in cuttings, powdery yellow limestone and fine clay.			
15	250	1/1	FINE SILTY CLAY, yellow, plastic, damp.			Sample collected at 14-15 ft for VOCs, moisture (dup-same interval & analyses); strong odors from 14 to 15 ft; odors continue to 15.5 ft, slight odors from 15.5 to 16 ft.
	200	0.8/1	Hard fragmented LIMESTONE and fine CLAY.			
			<i>Total depth = 16 feet.</i>			

Drilling Log - Camp Stanley Storage Activity

PROJECT: CSSA GROUNDWATER EVALUATION	LOCATION/BORING NO.: B-3, MPF
CLIENT: ARMSTRONG LABORATORY - CSSA	DRILLING METHOD: HOLLOW-STEM AUGER
LOGGED BY: B. VANDERGLAS	SAMPLING METHOD: SPLIT SPOON
DRILLING CONTRACTOR: JEDI	BOREHOLE DIAMETER: 8 IN.
DRILLER: TOM STARRIN	REF. LOGBOOK: B-3
DRILLING RIG: MOBILE B-61	TOTAL DEPTH (FT BGSL): 14
DRILLING START: 2/21/96	WATER FOUND: NO
DRILLING END: 2/21/96	DATE COMPLETED: 2/21/96

DEPTH (FT BGL)	HNU SCAN (ppm)	RECOVERY	LITHOLOGIC DESCRIPTION	GRAPHIC LOG	ANALYTICAL SAMPLE	COMMENTS
0			Reamed to 5 ft with hollow-stem auger.			Drill to 5 ft before sampling, see logs for MPE and VW-06.
5	0	2/2	CALICHE and GRAVEL mixed with plastic CLAY, dark brown, black and rust red (red brown) to 5.5 ft, dry.			Sample collected at 5-6 ft for VOCs, metals, moisture, & geotech; no odors.
8.5	0	0.7/2	LIMESTONE, clayey and weathered at 8.5-9 ft, very plastic, hard, no odors, damp.			
10			LIMESTONE, reamed to 14 ft with air core.			
15			<i>Total depth = 14 feet.</i>			
20						

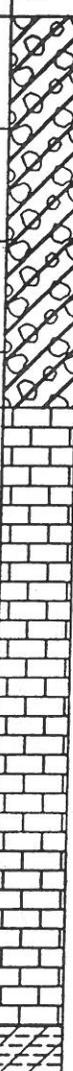
Drilling Log - Camp Stanley Storage Activity

PROJECT: CSSA GROUNDWATER EVALUATION	LOCATION/BORING NO.: B-3, VEW-02
CLIENT: ARMSTRONG LABORATORY - CSSA	DRILLING METHOD: HOLLOW-STEM AUGER
LOGGED BY: B. VANDERGLAS	SAMPLING METHOD: SPLIT SPOON
DRILLING CONTRACTOR: JEDI	BOREHOLE DIAMETER: 8 IN.
DRILLER: TOM STARRIN	REF. LOGBOOK: B-3
DRILLING RIG: MOBILE B-61	TOTAL DEPTH (FT BGL): 19.5
DRILLING START: 2/22/96	WATER FOUND: NO
DRILLING END: 2/22/96	DATE COMPLETED: 2/22/96

DEPTH (FT BGL)	HNU SCAN (ppm)	RECOVERY	LITHOLOGIC DESCRIPTION	GRAPHIC LOG	ANALYTICAL SAMPLE	COMMENTS
0						
8		1.7/2	Gravelly FILL MATERIAL with some CALICHE, small to large gravel fragments, little to no clay, dry, friable.	X		No odors
0		0.6/2	Same as above, nail found in spoon.	X		No odors
5		0.5/2	Gritty FILL (dark red brown) and GRAVEL intermixed with little CLAY (light brownish yellow), plastic, poor recovery.	X		No odors
0		0.6/2	FILL (dark red brown and dark brown) with ash material and trace clay, hard, dry, poor recovery.	X		No odors
35		1/2	Coarse FILL (dark brown), small pieces of metal, medium to coarse gravel, dry, nails, screws, burnt rocks, mixed with small fragments of yellow, weathered limestone.	X	X	Slight odor; geotech sample 8-10 ft.
10		.3/2	LIMESTONE fragments, yellow, weathered, some fine, powdery clay, dry.	X		
		0/2	Unable to push spoon (too hard), cuttings are limestone/clay mixed.	X		
15	300	1.2/1.5	SILTY CLAY, brownish yellow, yellow (10YR 7/8), very firm, damp, powdery caliche intermixed, refusal at 15.5' with split spoon.	X	X	Odors detected; analytical sample collected at 14-15 ft for VOCs, metals & moisture.
		0/3.5	No sample, too hard to push, cuttings consistent with 14 to 15.5 ft interval.	X		
20	42	.5/5	Weathered LIMESTONE, light gray (10YR 7/1), hard, some mudstone, medium gray, slight mottling.	X		Slight odor
			<i>Total depth = 19.5 feet.</i>			
25						

Drilling Log - Camp Stanley Storage Activity

PROJECT: CSSA GROUNDWATER EVALUATION	LOCATION/BORING NO.: B-3, VEW-04
CLIENT: ARMSTRONG LABORATORY - CSSA	DRILLING METHOD: AIR CORE/HOLLOW-STEM AUGER
LOGGED BY: B. VANDERGLAS	SAMPLING METHOD: SPLIT SPOON
DRILLING CONTRACTOR: JEDI	BOREHOLE DIAMETER: 8 IN.
DRILLER: TOM STARRIN	REF. LOGBOOK: B-3
DRILLING RIG: MOBILE B-81	TOTAL DEPTH (FT BGSL): 19
DRILLING START: 2/22/96	WATER FOUND: NO
DRILLING END: 2/22/96	DATE COMPLETED: 2/22/96

DEPTH (FT BGL)	HNU SCAN (ppm)	RECOVERY	LITHOLOGIC DESCRIPTION	GRAPHIC LOG	ANALYTICAL SAMPLE	COMMENTS
0	0	1.8/2	SILTY GRAVELLY CLAY with LIMESTONE fragments, yellow to very pale brown (10YR 7/4, 7/6), dry, hard, gravel is prevalent, small caliche nodules, non-plastic clay.			No odors
	0	.9/2	Similar to 0 to 2 ft interval, but smaller and fewer limestone fragments.			No odors; no samples collected; no sign of contamination.
5	0	1.1/2	Same as above, light yellow powdery limestone.			No odors
	0	0.5/1	Increasing LIMESTONE fragments, powdery CLAY.			No odors
		0/0	Weathered LIMESTONE, yellow, hard, unable to push spoon but able to drill very slowly through limestone with hollow-stem auger, cuttings include limestone fragments and powdery clay.			No odors
10		1/3	LIMESTONE, very pale brown (10YR 8/3), some dark brown (7.5YR 3/3), driller encountered softer layer at 14-15 ft bgl, then stiff again at approx. 15 ft bgl, hard, dense, MUDSTONE.			Switch to air core.
		1/3	LIMESTONE, very hard, small seams in fractures, moisture noticeable in fractures, numerous vertical fractures observed in top of rock core pieces.			
15		1/2	LIMESTONE, slightly darker, MUDSTONE, slightly less cohesive.			
		1/2	LIMESTONE, yellow (10YR 7/8), hard with numerous fractures, friable at fractures (almost clayey), weathered.			
20		1/2	LIMESTONE (mudstone), buff colored, angular to subangular, limestone clasts, poorly consolidated, small fractures. CLAY (brownish yellow) and SHALE (yellow) intermixed.			
			<i>Total depth = 19 feet.</i>			
25						

Drilling Log - Camp Stanley Storage Activity

PROJECT: CSSA GROUNDWATER EVALUATION	LOCATION/BORING NO.: B-3, VEW-06
CLIENT: ARMSTRONG LABORATORY - CSSA	DRILLING METHOD: AIR CORE
LOGGED BY: B. VANDERGLAS	SAMPLING METHOD: SPLIT SPOON/AIR CORE
DRILLING CONTRACTOR: JEDI	BOREHOLE DIAMETER: 8 IN.
DRILLER: TOM STARRIN	REF. LOGBOOK: B-3
DRILLING RIG: MOBILE B-61	TOTAL DEPTH (FT BGS): 20
DRILLING START: 2/20/96	WATER FOUND: NO
DRILLING END: 2/21/96	DATE COMPLETED: 2/21/96

DEPTH (FT BGL)	HNU SCAN (ppm)	RECOVERY	LITHOLOGIC DESCRIPTION	GRAPHIC LOG	ANALYTICAL SAMPLE	COMMENTS	
0	0	1.5/2	CALICHE and CLAY, yellow (10YR 8/8) and light gray (10YR 7/1), dry, non-plastic, some small gravel.	▨		No odors	
	0	1/2	Same as above, bottom 3 inches recovered in toe of spoon has very dark brown, black material, also some limestone fragments, medium to coarse, mixed.	▨		No odors	
5	0	.5/2	FILL, dark black, very soft, just below 4 ft, spoon drive easily to 6 ft bgl, poor recovery, gritty material, pieces of metal copper, burnt and rusty, intermixed.	◊		No odors	
	0	1.5/2	FILL, black moist tar-like material in toe of spoon, no odors, moist, same as above, gritty, very dark brown, black, and dark red (2.5YR 3/6), some gooey portions intermixed, some debris encountered including green metallic material.	◊	◼	No odors, sample collected at 7-8 ft for VOA, metals, moisture; geotech sample collected at 6-7 ft.	
		1/1	Same as above to 8.8 ft, fine powdered LIMESTONE from 8.8 to 9 ft bgl, yellow and light gray, dry.	◻		Switched over to air core.	
10		1/1	Encountered competent limestone at 9 ft. Cored to 11.9 (compressor failed), switched to hollow stem auger at VW-01.	◻			
		.8/1	LIMESTONE, light gray, very hard with some friable layers, core sample is 1/2 fragmented into many different shapes, ~1 ft is solid core broken into 4 pieces.	◻			
			LIMESTONE, very pale brown (10YR 7/4), some friable yellow (10YR 7/8).	◻			
15	0	1/7	Very poor recovery, unable to determine which interval, if any, from this cored interval recovery was from, sample was discarded.	◻			
20			<i>Total depth = 20 feet.</i>				