WATER WELL RECORD Form WWC-5

Division of Water Resources App. No.

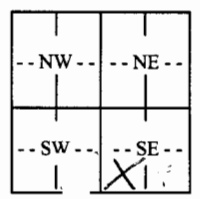
1 LOCATION OF WATER WELL: County: Seward | Fraction: SE ¼ SW ¼ SE ¼ ¼ | Section Number: 6 | Township No.: T 35 S | Range Number: R 33 ☐E ☒W

Street/Rural Address of Well Location; if unknown, distance & direction from nearest town or intersection: If at owner's address, check here ☐.
0.4 Miles SW of West 2nd Street Road and Western Avenue.

2 WATER WELL OWNER: TRC
RR#, Street Address, Box #: 10011 Meadowglen Lane. Suite 100
City, State, ZIP Code : Houston. Texas 77042

Global Positioning System (GPS) information:
Latitude: 37' 01. 621' (in decimal degrees)
Longitude: 100' 56. 718' (in decimal degrees)
Elevation: 2856.22' MSL
Datum: ☐ WGS 84, ☑ NAD 83, ☐ NAD 27
Collection Method:
☑ GPS unit (Make/Model: Garmin / Etrex)
☐ Digital Map/Photo, ☐ Topographic Map, ☐ Land Survey
Est. Accuracy: ☐ <3 m, ☐ 3-5 m, ☐ 5-15 m, ☐ >15 m

3 LOCATE WELL WITH AN "X" IN SECTION BOX:



4 DEPTH OF COMPLETED WELL 205 ft.
Depth(s) Groundwater Encountered (1) 186 ft. (2) ..... ft. (3) ..... ft.
WELL'S STATIC WATER LEVEL ..... ft. below land surface measured on mo/day/yr .....
Pump test data: Well water was ..... ft. after ..... hours pumping ..... gpm
EST. YIELD ..... gpm. Well water was ..... ft. after ..... hours pumping ..... gpm
Bore Hole Diameter ..... in. to ..... ft., and ..... in. to ..... ft.
WELL WATER TO BE USED AS: ☐ Public water supply ☐ Geothermal ☐ Injection well
☐ Domestic ☐ Feedlot ☐ Oil field water supply ☐ Dewatering ☐ Other (Specify below)
☐ Irrigation ☐ Industrial ☐ Domestic-lawn & garden ☑ Monitoring well ....Yellow-16.....
Was a chemical/bacteriological sample submitted to Department? ☐ Yes ☑ No
If yes, mo/day/yr sample was submitted .....
Water well disinfected? ☐ Yes ☒ No

DRL

5 TYPE OF CASING USED: ☐ Steel ☑ PVC ☐ Other .....
CASING JOINTS: ☐ Glued ☐ Clamped ☐ Welded ☑ Threaded
Casing diameter 4 in. to 175 ft., Diameter ..... in. to ..... ft., Diameter ..... in. to ..... ft.
Casing height above land surface 3' in., Weight ..... lbs./ft., Wall thickness or gauge No. SCH 40
TYPE OF SCREEN OR PERFORATION MATERIAL:
☐ Steel ☐ Stainless Steel ☑ PVC ☐ Other (Specify) .....
☐ Brass ☐ Galvanized Steel ☐ None used (open hole)
SCREEN OR PERFORATION OPENINGS ARE:
☐ Continuous slot ☑ Mill slot ☐ Gauze wrapped ☐ Torch cut ☐ Drilled holes ☐ None (open hole)
☐ Louvered shutter ☐ Key punched ☐ Wire wrapped ☐ Saw cut ☐ Other (specify) .....
SCREEN-PERFORATED INTERVALS: From 175 ft. to 205 ft., From ..... ft. to ..... ft.
From ..... ft. to ..... ft., From ..... ft. to ..... ft.
GRAVEL PACK INTERVALS: From 173 ft. to 205 ft., From ..... ft. to ..... ft.
From ..... ft. to ..... ft., From ..... ft. to ..... ft.

6 GROUT MATERIAL: ☐ Neat cement ☑ Cement grout ☐ Bentonite ☐ Other .....
Grout Intervals: From 0 ft. to 157 ft., From 157 ft. to 173 ft., From ..... ft. to ..... ft.
What is the nearest source of possible contamination:
☐ Septic tank ☐ Lateral lines ☐ Pit privy ☐ Livestock pens ☐ Insecticide storage ☐ Other (specify below)
☐ Sewer lines ☐ Cesspool ☐ Sewage lagoon ☐ Fuel storage ☐ Abandoned water well
☐ Watertight sewer lines ☐ Seepage pit ☐ Feedyard ☐ Fertilizer storage ☐ Oil well/gas well .....
Direction from well ..... Distance from well .....

FROM	TO	LITHOLOGIC LOG	FROM	TO	LITHO. LOG (cont.) or PLUGGING INTERVALS
0'	95'	Silty Sand, Grayish w/ Brown			
95'	176'	Clayey Silt, Dark Grayish Brown			
176'	186'	Silty Sand, Brown, Moist			
186'	197'	Unconsolidated Sand, Brown, Wet			
197'	205'	Sand, Grayish Brown, Very Wet			

Original Returned to Sender for Correction Date: 8/30/10

7 CONTRACTOR'S OR LANDOWNER'S CERTIFICATION: This water well was ☑ constructed, ☐ reconstructed, or ☐ plugged under my jurisdiction and was completed on (mo/day/year) 4/8/2010 and this record is true to the best of my knowledge and belief. Kansas Water Well Contractor's License No. 597 This Water Well Record was completed on (mo/day/year) 8/12/2010 under the business name of Boart Longyear Company by (signature) .....

INSTRUCTIONS: Use typewriter or ball point pen. *PLEASE PRESS FIRMLY* and *PRINT* clearly. Please fill in blanks and check the correct answers. Send three copies (white, blue, pink) to Kansas Department of Health and Environment, Bureau of Water, Geology Section, 1000 SW Jackson St., Suite 420, Topeka, Kansas 66612-1367. Telephone 785-296-5522. Send one copy to WATER WELL OWNER and retain one for your records. Include fee of $5.00 for each constructed well. Visit us at http://www.kdheks.gov/waterwell/index.html.

KSA 82a-1212 Check: ☑ White Copy, ☐ Blue Copy, ☐ Pink Copy

re MAINTENANCE FACILITY YELLOW 16 INSTALLATION

Liberal, KS Seward County
Water at 182'
INSTALLATION AT Yellow - 16

IAL	RECOVERY	PID	DESCRIPTION
	-	-	CLEARED WITH POST HOLE DIGGER, LOAM SOIL/FILL
3-5	2-2	-	Begin drilling, sandy silt, brown, moist
5-7	2-2	-	SAME AS ABOVE (SAA), INTERMITTANT SILT ~~like~~ LIKE $CACO_3$ ~~nodules~~ nodules
7-14	7-7	-	~~SAA~~, Caliche content increasing
		-	~~SAA~~, silt with ~10% sand and ~10% clay lenses of $CACO_3$ throughout interval
##		-	silty clay~~sand~~, light brown, ~10% clay no $CACO_3$ clay content increasing downward, ~~no $CACO_3$~~ dry
14-16 ~~15~~	7-7	-	silty clay~~sand~~, decreasing amounts of clay & silt, light brown color, intermittent $CACO_3$ layers, dry
~~15~~ 16-18		1.3	~~1.3 ppm~~ SAA, increased clay & silt content up to ~20% clean fine sand in 16½-17 interval
21			sandy silt, ~20% sand, grayish brown, decreasing downward to light grayish brown; at 19' presence of $CACO_3$ increasing downward, some moisture
21-24	7-7		very light grayish brown sand decreasing down to light brown sand w/ some silt ~~&~~ (less than 10%)
24-28			silty sand, brown, ~~dry~~ with increasing color downward, dry

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d & Understood by me.	Date	Invented by	Date

April 6, 2016 Project No. 165951

Book No. ____ TITLE Liberal Maintenance Facility Yellow 16 Installation

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Time	Interval	Recovery	PID	Description
1:40	28-32	4-~~5~~ 7	0	very fine ~~sand~~, clean sand, light grayish brown transitioning to light brown, dry, increasing color and moisture downward
	~~35~~ 35-37	6-7	0	silt w/ trace of sand, brown color de transitioning to light gray, dry ~~de~~ transitioning to wet; at 33½' very fine grayish brown sand, moist
	37-41		0	very fine sand, ~~moist~~ 85 light grayish brown transitioning to brown; trace silt at bottom of interval, moisture decreasing down to dry
	42-44	7-7	0	~~20~~ 85 sandy silt, grayish brown transitioning t very light grayish brown, dry, 20% sand
	44-46			SAA, light brown darkening downward, trace sand at bottom.
	46-48			clayey silt w/ trace sand, brown, some moisture, trace $CACO_3$ nodules
10	48-56	7-7	0	SAA
00	56-57			SAA
	57-58			SILTY SANDY, LIGHT BROWN, VERY FINE SAND, MOIST
	~~58~~ (PC)			
	58-62			SANDY SILT, LIGHT BROWN TRANSITIONING TO GRAYISH BROWN THROUGHOUT INTERVAL, INTERMINGLED $CACO_3$ NODULES, DRY

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tnessed & Understood by me.	Date	Invented by	Date	

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ME	INTERVAL	RECOVERY	PID	DESCRIPTION
NT.	62-64		0	FINE SAND, LIGHT GRAYISH BROWN, CLEAN SAND, DRY
0	64-71	7-7	0	SANDY SILT, BROWN, INTERMITENT $CaCO_3$, DRY
2	71-78	7-7	0	SAA
	73-75			@ 73-75 CEMENTED SANDS, HEAVY $CaCO_3$ SANDY SILT APPROXIMATELY 40% SAND, WHITISH GRAY, DRY
	77-78			@ 77-78, FINE SAND, LIGHT GRAYISH BROWN, CLEAN, MOIST
34	78-85	6-7	0	SILTY SAND, BROWN, INTERMITENT $CaCO_3$ NODULES, MOISTURE INCREASING DOWN NO INDICATION OF WATER/ SATURATION
50	85-92	5-7	0	FINE SAND, BROWN TRANSITIONING TO LIGHT GRAYISH BROWN AT 86', CLEAN MOIST W/ MOISTURE INCREASING TO DAMP, LIKELY TOP OF WATER, NO INDICATION OF IMPACTS
	Stopped 85			
1 7, 2010				
00	92-~~96~~ 95	7-7		clean fine sand, grayish brown, moist, layer of silt 93 1/2', ~~to~~ 85 sand transition to unconsolidated mixed sand increasing downward w/ trace gravel up to 1/2" fine at bottom of interval

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ssed & Understood by me,	Date	Invented by	Date

April 7, 2010

Project No. 105759

Book No.

TITLE Liberal Maintenance Facility Yellow 16 Install

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Time	Interval	Recovery	PID	Description
	95-99			clayey silt, dark brown, dense, moderate plasticity, damp, near water interval, ~~bottom~~
				@ 99 unconsolidated sand, brown mixed between fine and coarse sa w/ trace gravel, damp, maybe a water-bearing area w/ very low yield.
	99-106	7-2		@ 99' to 99.5' fine to medium sand, grayish brown, damp
				@ 99.5' clayey silt, grayish brown up to 40% clay decreasing downward, inter $CHCO_3$ increasing downward up to 50%, Moisture decreasing downward, high plast at 99.5 to 100.5 decreasing downward t crumbly
				@ ~~102~~ 102' clayey silt to silty clay, grayis brown, trace sand, trace $CHCO_3$ nodules, ve good plasticity, damp to wet
				@ 105' sandy silt w/ up to 20% sand, whitish gray transitioning to white, some cementation at 105.5', somewhat damp dry, low plasticity to ~~none~~ crumbly
	101 113	7-7		SAA, decreasing sand, moisture content inc somewhat, poor to crumbly plasticity
				@ 108' SAA, poor plasticity, transitioning from white to white grayish brown and somewhat yukish
				@ 109' SAA, moisture increasing downward
				@ 111' SAA, light grayish brown, increa sand content up to 20%, some plasticity Mositure increasing

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Witnessed & Understood by me.	Date	Invented by	Date

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...e	Interval	Recovery	PI	Description
	113-120	7-7		clayey silt, trace sand, intermittent CACO3, light grayish brown transitioning to dark brown, color indicative to % of CACO3 within silt lenses, some moisture @ ~~116'~~ BS some plasticity @ 116' SAA increasing amounts of CACO3, poor plasticity and crumbly, decreasing amounts of moisture to dry, color transitioning from light grayish brown to white @ 118' SAA, no moisture, dry, crumbly
00	120-130	7-10		clayey silt, trace CACO3, dark grayish brown, poor to crumbly plasticity, very little moisture @ 122' SAA, varying percentages of CACO3 up to 20%, some plasticity, some moisture @ 126' silt, trace sand and clay, poor ~~forest~~ BS plasticity, light brown, some moisture
20	130-1?1	7-7		~~SAA~~ BS clayey sandy silt, light brown, low plasticity, up to 30% clay, up to 20% sand, some moisture @ 132 ~~SAA~~ BS clayey silt, trace sand, light gray, strong presence of CACO3 up to 50 which causes distinctive color change ~~I~~ BS, some moisture, decreasing clay content downward, crumbly @ 135 SAA, color changing to pink

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essed & Understood by me,	Date	Invented by	Date

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Time	Interval	Recovery	PID	Description
	137-~~146~~ BS 147	~~5~~ BS 9-10		clayey silt, trace sand, very light grayish brown transitioning to very light gray, poor plasticity to crumbly, little moisture @ 139' ~~white~~ BS SAA, white, crumbly, ~~moist~~ BS up to 60% $CaCO_3$ @ 142' SAA
	147-~~154~~ BS 157	9-10		SAA, white, $CaCO_3$ up to 60%, trace cemented nodules @ 153' SAA, moisture content decreasing downward appears to be dry at bottom of interval
1530	157-~~168~~ 166	7-~~8~~ BS 9		SAA, pinkish to very light brown @ 160' ~~light brown~~ SAA, light brown, somewhat moist with decreasing moisture downward

April 8, 2010

0730	~~168~~ 166-176	7-10		clayey silt, trace sand, grayish brown, slow reaction, ~~up to 20%~~ as trace gravel no larger than 3/4", poor plasticity, moist @ 174' SAA, light gray, crumbly, little moisture
830	176-186	6-10		clayey silty sand, brown w/ iron staining, cementation throughout interval caused by $CaCO_3$, up to 20% clay and silt, wet, top of water unit.

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Lateral Maintenance Facility Yellow 16 Install

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e	Interval	Recovery	PID	Description
				@ 179' SAA, gray, cementation ~~to~~ caused by $CaCO_3$, up to 6% $CaCO_3$, ~~somewhat~~ BS, cement chunks up to 2" thick, somewhat moist @ 183' sandy silt, light gray, large amount of cementation due to heavy $CaCO_3$ content, sand ranging from fine to coarse grain, dry
	182-187			silty sand, ~~#~~ brown, fine to medium grain sand, $CaCO_3$ nodules, wet @ 185 clayey silt, dark gray, small amount of $CaCO_3$ nodules, high plasticity, wet @ 186 unconsolidated sand, alternating 4" intervals of fine to medium sand, ~~coarse~~ BS and coarse sand, 4" intervals of dark gray and light brown, wet throughout
	187-197			sand, unconsolidated fine and medium grains of sand, brown, wet @ 190 silty clay, gray brown, iron staining, trace sand found in silt lenses, wet, clay is very dense and highly plastic @ 192' silty sand with silt decreasing downward, iron staining, very moist
	197-205			~~silty~~ BS sand, grayish brown, unconsolidated fine to medium grain sand, very wet

GROUT: Portland cement w/ ~~5%~~ ~17-21% BS Bentonite powder
BENTONITE: 3/8 hole plug to ~~5' above sand (168' depth)~~ BS 15.4' above sand (~~157'~~ BS 172.6' depth)
SAND: 10/20 to 2½' above screen ~~(173' depth)~~ BS
WELL CASING: 4" Sch. 40 w/ centralizer approximately every 50'
WELL SCREEN: .020 slotted 50 ft
BOREHOLE SIZE: 9"

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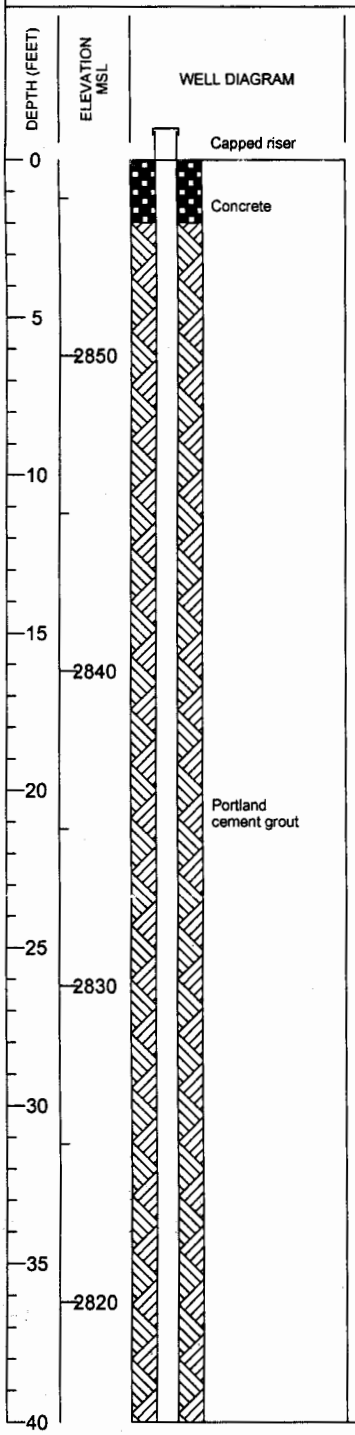
essed & Understood by me,	Date	Invented by	Date

TRC

BORING/MONITOR WELL DIAGRAM

WELL No. Yellow-16

PROJECT: Liberal Maintenance Facility and CS	DATE STARTED: 06 April 2010	GROUND ELEVATION: 2856.22' MSL
FIELD GEOLOGIST: B. Salas	DATE FINISHED: 08 April 2010	NORTHING: 1452907.34
DESIGNED BY: A. Lusk	BORING DEPTH: 205' BGS	EASTING: 598351.13
DRILLING COMPANY: Boart Longyear	BOREHOLE DIAMETER: 8" & 9"	DATE SAMPLED: 26 April 2010
DRILLING METHOD: Sonic	WELL DIAMETER: 4" PVC	LOCATION: East of DCP Fenceline in CRP
SAMPLING METHOD: Continuous core	TOP OF CASING ELEVATION: 2859.11' MSL	



OVM (ppm)	ANALYTICAL SAMPLE	GRAIN SIZE ANALYSIS	USCS CLASSIFICATION	GRAPHIC LOG	GEOLOGIC DESCRIPTION
			ML		Hand cleared with post hole digger, soil
			ML		Sandy silt, brown, moist
			ML		Intermittant silt like CaCO3 nodules
			SM		Silty sand with clay, light brown, approximately 10% clay, no CaCO3, clay content decreasing downward, dry
			ML		Silt with approximately 10% sand and 10% clay, lenses of CaCO3 throughout interval
			ML		Caliche content increasing
1.3			ML		Sandy silt, approximately 20% sand, light grayish brown to grayish brown, CaCO3 decreasing downward, some moisture Increased clay and silt content up to approximately 20% Clean fine sand lense
			SM		Silty sand with clay, increasing amounts of clay and silt, light brown color, intermittent CaCO3 layers, dry Decreased clay, brown with decreasing color downward, dry
0.0			SP		Sand, light brown to very light grayish brown, less than 10% silt Very fine, clean sand, light grayish brown to light brown, dry increasing color and moisture downward
0.0			SP		Dry Very fine, grayish brown, moist
			ML		Silt with trace sand, brown to light gray, wet to dry

Total Depth of Boring: 205 ft

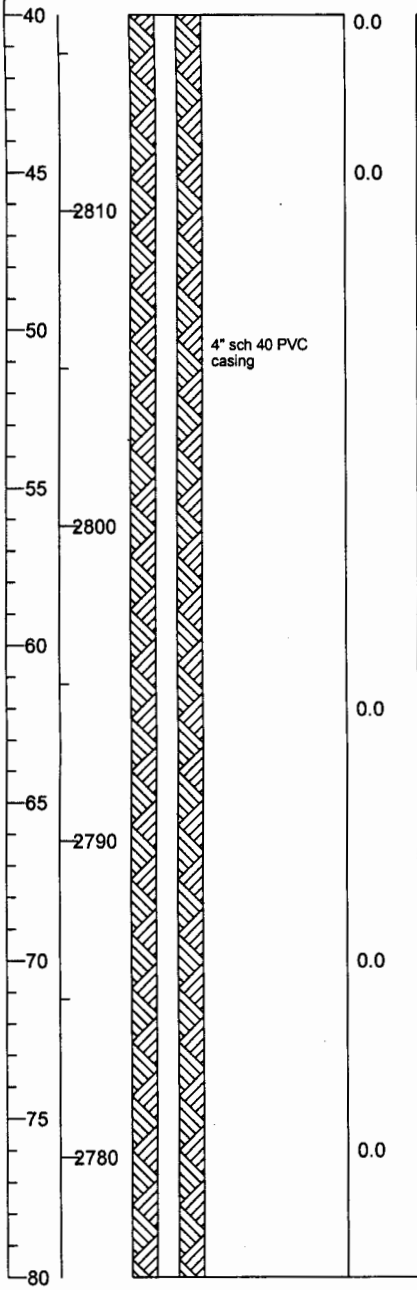
These logs should not be used separately from the original report.

TRC

BORING/MONITOR WELL DIAGRAM

WELL No. Yellow-16

PROJECT: Liberal Maintenance Facility and CS	DATE STARTED: 06 April 2010	GROUND ELEVATION: 2856.22' MSL
FIELD GEOLOGIST: B. Salas	DATE FINISHED: 08 April 2010	NORTHING: 1452907.34
DESIGNED BY: A. Lusk	BORING DEPTH: 205' BGS	EASTING: 598351.13
DRILLING COMPANY: Boart Longyear	BOREHOLE DIAMETER: 8" & 9"	DATE SAMPLED: 26 April 2010
DRILLING METHOD: Sonic	WELL DIAMETER: 4" PVC	LOCATION: East of DCP Fenceline in CRP
SAMPLING METHOD: Continuous core	TOP OF CASING ELEVATION: 2859.11' MSL	



USCS CLASSIFICATION	GEOLOGIC DESCRIPTION
	Silt with trace sand, brown to light gray, wet to dry *(Continued)*
MH	Clayey silt, trace sand, brown, some moisture, trace CaCO3 nodules
	Brown to light brown
ML	Sandy silt, very light grayish brown to grayish brown, dry
	Light brown, moist
	Light brown transitioning to grayish brown, intermingled CaCO3 nodules, dry
SP	Sand, fine grained, light grayish brown, clean, dry
ML	Sandy silt, brown, intermittent CaCO3, dry
	Cemented sands, heavy CaCO3, approximately 40% sand, whitish gray, dry
	Fine sand, light grayish brown, clean, moist
SP-SM	Silty sand, brown, intermittent CaCO3 nodules, moisture increasing down, no indication of water/saturation

Total Depth of Boring: 205 ft

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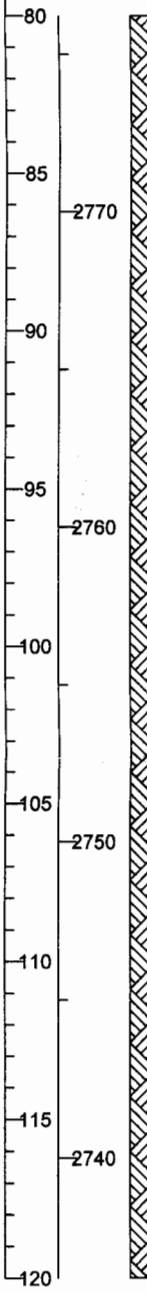

OVM (ppm)	ANALYTICAL SAMPLE	GRAIN SIZE ANALYSIS	USCS CLASSIFICATION	GRAPHIC LOG	GEOLOGIC DESCRIPTION
					Silty sand, brown, intermittent CaCO3 nodules, moisture increasing down, no indication of water/saturation *(Continued)*
0.0			SP		Fine sand, brown, clean moist with moisture increasing to damp, likely top of water, no indication of impacts Light grayish brown
0.0					Grayish brown Layer of silt, sand transitions to unconsolidated mixed sand increasing downward with trace gravel up to 1/2" diameter at bottom of interval
			MH		Clayey silt, dark brown, dense, moderate plasticity, damp, near water interval, PID quit working
			SP		Unconsolidated sand, brown, mixed between fine and course sand with trace gravel, damp, maye a water-bearing area with very low yield
			MH		Fine to medium sand, grayish brown, damp Clayey silt, grayish brown, up to 40% clay decreasing downward, intermittent CaCO3 increasing downward up to 50%, moisture decreasing downward, high plasticity transitioning to crumbly Increased clay, grayish brown, trace sand, trace CaCO3 nodules, high plasticity, damp to wet
			ML		Sandy silt with up to 20% sand, whitish gray transitioning to white, some cementation at 105.5, somewhat damp to dry, low to no plasticity Decreasing sand, moisture content increased, low to no plasticity Transitions from white to white grayish brown and somewhat pinkish Light grayish brown, increasing sand content up to 20%, some plasticity, moisture increasing
			MH		Clayey silt, trace sand, intermittent CaCO3, light grayish brown transitioning to dark brown, color indicative of percentage of CaCO3 within silt lenses, some moisture Increasing amounts of CaCO3, low to no plasticity, low moisture, light grayish brown to white Dry, no plasticity

Total Depth of Boring: 205 ft

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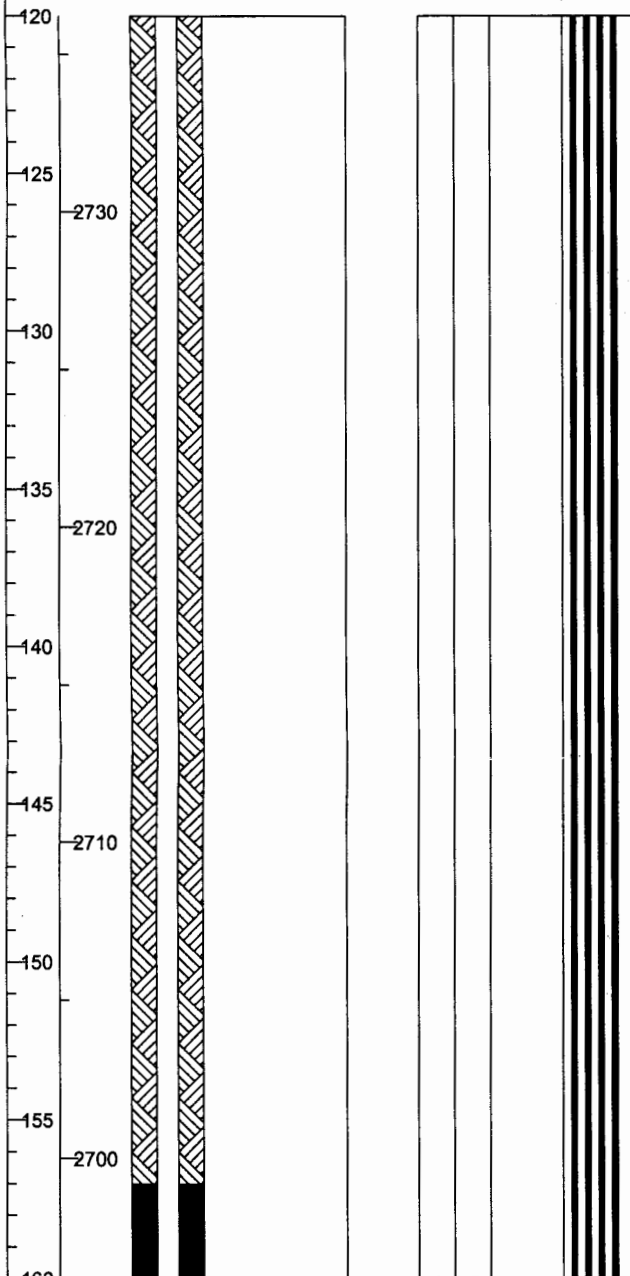

GEOLOGIC DESCRIPTION

Clayey silt, trace sand, intermittent CaCO3, light grayish brown transitioning to dark brown, color indicative of percentage of CaCO3 within silt lenses, some moisture *(Continued)*

Trace CaCO3, dark grayish brown, low to no plasticity, very little moisture

Varying percentages of CaCO3 up to 20%

Decreased clay, trace sand, low plasticity, light brown, some moisture

Up to 20% sand,

Trace sand, light gray, up to 50% CaCO3, decreasing clay content, low to no plasticity

Pink

Very light grayish brown to very light gray,

White, no plasticity, CaCO3 up to 60%

Trace cemented nodules

Moisture content decreasing

Dry, pinkish to very light brown

Total Depth of Boring: 205 ft

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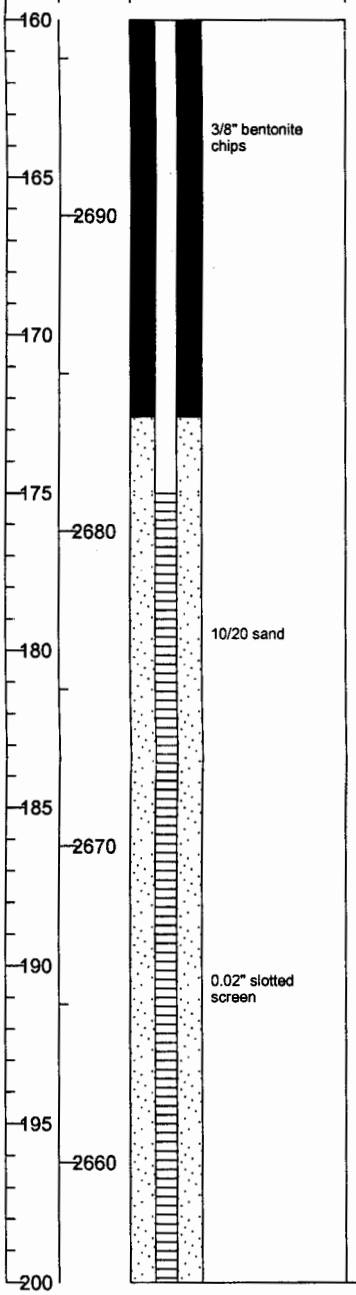

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					Clayey silt, trace sand, intermittent CaCO3, light grayish brown transitioning to dark brown, color indicative of percentage of CaCO3 within silt lenses, some moisture *(Continued)*
					Light brown, low moisture
					Trace sand, grayish brown, some cementation, trace gravel no larger than 3/4", low plasticity, low moisture
					Light gray, no plasticity, low moisture
			SM		Silty sand with clay, brown with iron staining, cementation throughout interval caused by CaCO3, up to 20% clay and silt, wet, top of water unit
					Up to 60% CaCO3, cemented chunks up to 2" thick, somewhat moist
					Light gray, dry
					Increasing clay, high plasticity, dark gray, small amount of CaCO3 nodules, wet
			SP		Unconsolidated sand, alternating 4" intervals of fine to medium, dark gray sand and course, light brown sand, wet throughout
					Silty clay lense, gray brown, iron staining, trace sand, wet, high density and plasticity
					Sand with silt. Silt decreases downward, iron staining, very moist
					Sand, grayish brown, unconsolidated fine to medium grain, very wet

Total Depth of Boring: 205 ft

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FIELD GEOLOGIST: B. Salas	DATE FINISHED: 08 April 2010	NORTHING: 1452907.34
DESIGNED BY: A. Lusk	BORING DEPTH: 205' BGS	EASTING: 598351.13
DRILLING COMPANY: Boart Longyear	BOREHOLE DIAMETER: 8" & 9"	DATE SAMPLED: 26 April 2010
DRILLING METHOD: Sonic	WELL DIAMETER: 4" PVC	LOCATION: East of DCP Fenceline in CRP
SAMPLING METHOD: Continuous core	TOP OF CASING ELEVATION: 2859.11' MSL	

DEPTH (FEET)	ELEVATION MSL	WELL DIAGRAM	OVM (ppm)	ANALYTICAL SAMPLE	GRAIN SIZE ANALYSIS	USCS CLASSIFICATION	GRAPHIC LOG	GEOLOGIC DESCRIPTION
200								Unconsolidated sand, alternating 4" intervals of fine to medium, dark gray sand and course, light brown sand, wet throughout *(Continued)*
205	2650							
210								
215	2640							
220								
225	2630							
230								
235	2620							
240								

Total Depth of Boring: 205 ft

These logs should not be used separately from the original report.