EA Engineering, Science, and Technology, Inc.

EA Engineering, Science, and Technology, Inc.

LOG OF SOIL/ROCK BORING

Coordinates: _____
Surface Elevation: _____
Casing Below Surface: _____
Reference Elevation: _____
Reference Desc: _____

Job. No.	Client:	Location: 14A
Drilling Method: HSA / Air Hammer		Boring No. MW-14A
Sampling Method: Continuous Split Spoon		Sheet 1 of
		Drilling

Water Level				Start	Finish
Time	-			8/1/11	8/1/11
Date					
Reference					

Sample Type	Inches Drvn/In. Recvrd	Dpth. Csg.	Sample No.	PID ppm	Blows per 6 in.	Depth in Feet	USCS Log	Surface Conditions: Asphalt
				0.0		1		FILL - Asphalt (0-6" Bgs), 10YR 4/4 Sandy SILT, lit. gravel, tr clay
						2		
						3		
						4		
						5		
	2'/1.5			0.0	3 3	6		SAME (10YR 4/4) Sandy SILT, etc.
				0.0	4 4	7		
	2'/1.5			0.0	2 2	8		10YR 4/4 SILT, lit clay, tr. - lit f. Sand, Well sorted, dry
				0.0	4 6	9		
	2'/1.5'			0.0	2 2	10		10YR 4/4 SAME
				0.0	3 3	11		10YR 8/1 f-m SAND, tr.-lit silt, moist, poorly sorted, mod. loose
	2'/1.5			0.0	2 4	12		10YR 4/4 SILT, lit - some clay, tr. f. sand, moist, mod. stiff, well sorted
				0.0	5 5	13		
	2'/1.8'			0.0	3 4	14		↳ 10YR 8/1 Sand lens, loose, poorly sorted
				0.0	7 9	15		
	2'/1.8			0.0	3 3	16		SAME
				0.0	4 6	17		10YR 5/2 / 4/3 SILT lit - some C. Sand, tr. - lit. f. gravel, dry, poorly sorted
	2'/2'			0.0	3 5	18		10YR 4/3 SILT, lit - some clay, tr. f-m Sand, dry - moist, poorly sorted
				0.0	7 10	19		
	2'/2'			0.0	3 5	20		SAME, dry
				0.0	7 9	21		

Logged by: Steven Wickes Date: 8/1/11

Drilling Contractor: Summit Driller: Summit / Chad Chism

EA Engineering, Science, and Technology, Inc.

EA Engineering, Science, and Technology, Inc.

LOG OF SOIL/ROCK BORING

Coordinates:
Surface Elevation:
Casing Below Surface:
Reference Elevation:
Reference Desc:

Job. No.	Client:	Location:
Drilling Method: HSA / Air Hammer		Boring No. MW-14A
Sampling Method: Cont. split spoon		Sheet 2 of
		Drilling

Water Level				Start	Finish
Time	-			8/1/11	
Date					
Reference					

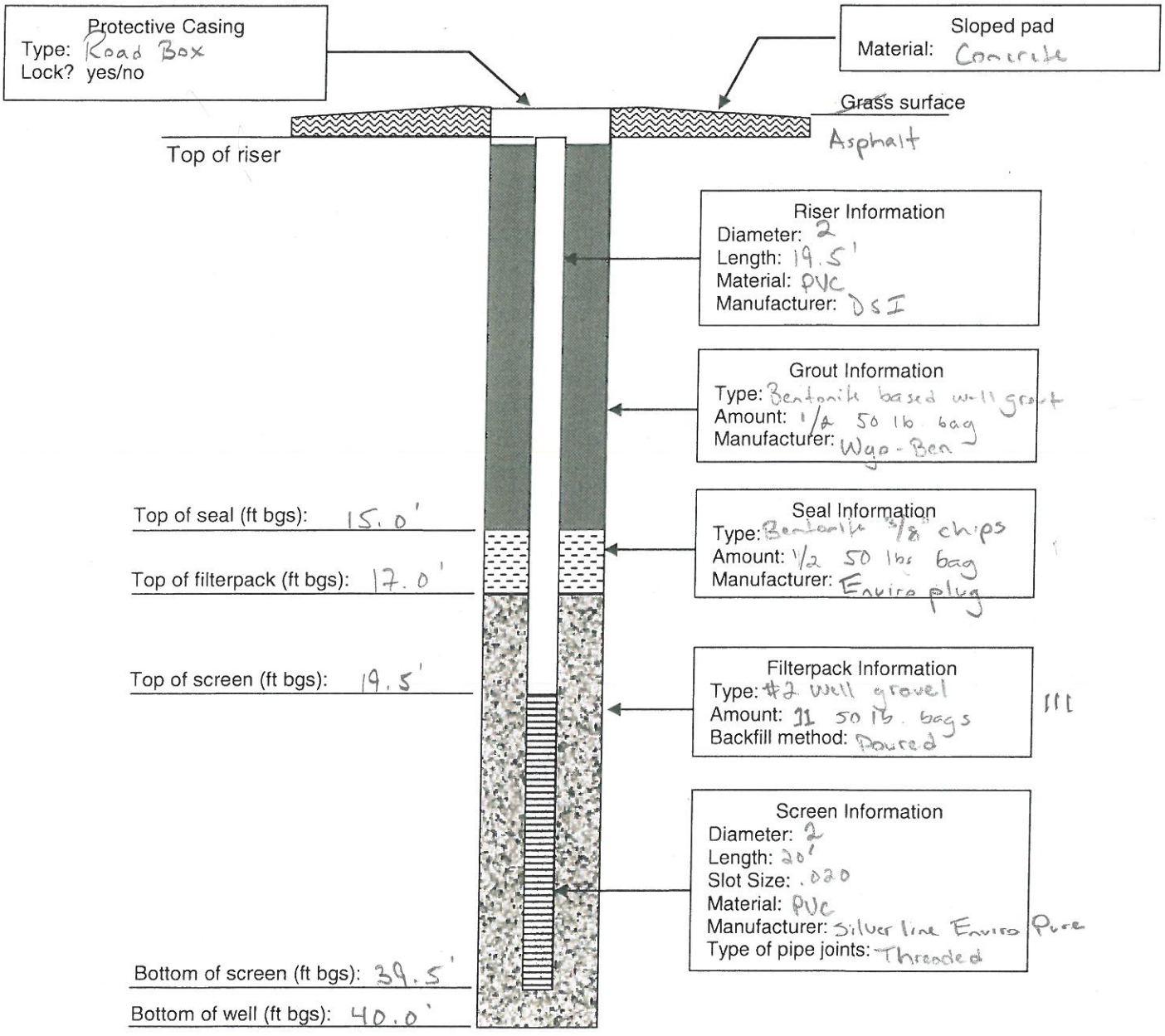
Sample Type	Inches Drvn/In. Recvrd	Dpth. Csg.	Sample No.	PID ppm	Blows per 6 in.	Depth in Feet	USCS Log	Surface Conditions:
	2'/1.5'			0.0	5	21		10YR 5/4 SILT, lit - some clay, tr. f sand, moist, poorly sorted,
					9			
				0.0	9	22		
	2'/2'				5			
				0.0	7	23		
					10			10YR 5/3 CLAY, lit - some silt, tr f sand (mottled 10YR 7/1 - rust ring?), well sorted, stiff, moist
				0.0	15	24		
	2'/2'				7			
				0.0	10	25		
					15			SAME
				0.0	12	26		
	2'/2'				6			
					10	27		SAME (mottled 10YR 3/1), dry
					14			
					15	28		
	2'/2'				5			10YR 5/3 SILT, some clay (mottled 10YR 6/1), tr - lit f sand, well sorted, dry - moist, mod. stiff
					9	29		
					10			
					12	30		
	2'/1.8'				6			SAME
					7	31		
					9			→ Sand lns 10YR 7/1 @ 31' bgs
▼					12	32		
	2'/2'				4			10YR 4/3 SILT, tr - lit clay, wet, mod. soft, well sorted, apparent GW at 32' Bgs while drilling
					6	33		
					10			
					14	34		
	2'/2'				3			10YR 4/1 SILT, some V f sand, sand lens throughout (10YR 7/1), wet, mod stiff, poorly sorted (sand increasing w/ depth),
					5	35		
					7			
					9	36		
	2'/2'				6			10YR 4/1 Apparent weathered bed rock, SILT, some f sand, 10YR 7/1 sand veins, stiff, well sorted, wet.
					10	37		
					14			
					18	38		
	2'/2'				7			
					8	39		SAME
					9			
					11	40		
						41		Boring terminated at 40' Bgs

Logged by: SGW Date: 8/1/11

Drilling Contractor: Cascade / MW-14B Driller: Chad Chinn

RECORD OF MONITORING WELL CONSTRUCTION
(FLUSH MOUNT)

EA Engineering, Science, and Technology, Inc.	Monitoring Well/Soil Boring ID No.: MW-14A
Project Title/ Project No.: Grude Landfill	Date/Time Installed: 8/1/2011/1145 Time Finished:
Location: Grude Landfill (Bentendorff CT)	Depth to Water: ~32' during drilling
Site Geologist: Steven Wicker	Drilling Method: HSA



Note: All features not to scale

ags – Above Ground Surface
bgs – Below Ground Surface

EA Engineering, Science, and Technology, Inc.

EA Engineering, Science, and Technology, Inc.

LOG OF SOIL/ROCK BORING

Coordinates: _____
Surface Elevation: _____
Casing Below Surface: _____
Reference Elevation: _____
Reference Desc: _____

Job. No.	Client:	Location: 14B
Drilling Method: HSA / Air Hammer		Boring No. MW-14B
Sampling Method: Cont split spoon		Sheet 1 of 5
		Drilling

Water Level				Start	Finish
Time	-			8/1/11	8/2/11
Date					
Reference					

Sample Type	Inches Drvn/In. Recvrd	Dpth. Csg.	Sample No.	PID ppm	Blows per 6 in.	Depth in Feet	USCS Log	Surface Conditions: Asphalt
Remolded				0.0		1		FILL - Asphalt (0-6" Bgs)
						2		FILL - 10YR 4/4 Sandy SILT, lit gravel, tr. clay
						3		
						4		
						5		
	2'/1.8'				2 3	6		10YR 4/4 Sandy SILT, lit gravel, tr - lit clay, dry, sand - mod V stiff, poorly sorted
					4 4	7		
	2'/1.5'				3 3	8		10YR 4/4 SILT, lit clay, lit f. sand, well sorted, dry, mod stiff
					4 5	9		
	2/1.8'				3 3	10		SAME - sand lens (10YR 7/1) at 10'
					4 5	11		
	2'/1.5'				4 5	12		SAME, slightly moist
					5 7	13		
	2'/2'				4 7	14		10YR 4/4 SILT, lit clay, tr. f sand, moist, poorly sorted, mod stiff ↳ 10YR 8/2 Sand lens
					9 10	15		
	2'/2'				5 7	16		SAME
					9 11	17		
	2'/2'				3 6	18		10YR 5/2 / 4/3 SILT, lit - some m-c Sand, tr - lit f gravel, dry, moist, poorly sorted
					10 14	19		10YR 4/3 SILT, some clay, tr f-m Sand, dry
	2/2				5 6	20		
					9 12	21		SAME - Apparent rust ring around 21' Bgs

Logged by: Steven Wicker Date: 8/1/2011

Drilling Contractor: Summit Driller: Chad Chism

EA Engineering, Science, and Technology, Inc.

LOG OF SOIL/ROCK BORING

Coordinates: _____
Surface Elevation: _____
Casing Below Surface: _____
Reference Elevation: _____
Reference Desc: _____

Job. No.	Client:	Location: 14B
Drilling Method: HSA / Air Hammer		Boring No. MW-14B
Sampling Method: Cont. split spoon		Sheet 2 of 5
		Drilling

Water Level				Start	Finish
Time	-			8/1/11	8/2/11
Date					
Reference					

Sample Type	Inches Drvn/In. Recvrd	Dpth. Csg.	Sample No.	PID ppm	Blows per 6 in.	Depth in Feet		USCS Log	Surface Conditions:
	2/1.8'			0.0	6 9	21			10YR 5/4 SILT, lit - some clay, tr - lit f sand, moist, poorly sorted to 10YR 8/1, sand lens, increasing clay w/ depth
				0.0	10 15	22			
	2'/2'			0.0	4 7	23			10YR 5/3 Clayey SILT, tr f sand, moist, well sorted (mottled 10YR 2/1), stiff
				0.0	7 9	24			
	2'/2'			0.0	3 6	25			SAME (mottled 10YR 2/1), clay decreasing w/ depth
				0.0	7 9	26			
	2'/2			0.0	6 8	27			SAME, tr - lit f sand
				0.0	12 12	28			Sand lens 10YR 8/1
	2/2			0.0	5 7	29			10YR 5/3 SILT, lit - some clay, (mottled 10YR 5/1) tr - lit f sand, mod. soft - mod stiff, moist, poorly sorted
				0.0	10 10	30			
	2'/1.8'			0.0	6 9	31			SAME, moist - wet
▼				0.0	9 10	32			
	2/2			0.0	5 6	33			10YR 4/3 SILT, lit clay, tr - lit f sand, wet, apparent GW @ 32' bgs
				0.0	8 10	34			10YR 8/1 f. SAND, lit silt, wet, mod. loose, poorly sorted
	2/1.5			0.0	9 9	35			
				0.0	10 15	36			SAME f-m SANDS
	2'/2.0'			0.0	5 7	37			SAME (wet on spoon)
					9 10	38			
	2'/1.5'				5 7	39			SAME, tr. C. Sand
					10 12	40			
				↓	14 21	41			

Logged by: S(AW) Date: 8/1/11

Drilling Contractor: Summit Driller: Chad Chism

EA Engineering, Science, and Technology, Inc.

LOG OF SOIL/ROCK BORING

Coordinates: _____
Surface Elevation: _____
Casing Below Surface: _____
Reference Elevation: _____
Reference Desc: _____

Job. No.	Client:	Location:
		14B
Drilling Method:		Boring No.
HSA / Air Hammer		MW-14B
Sampling Method:		Sheet 3 of 5
Cont. split spoon		Drilling

Water Level				Start	Finish
Time	-			8/1/11	8/2/11
Date					
Reference					

Sample Type	Inches Drvn/In. Recvrd	Dpth. Csg.	Sample No.	PID ppm	Blows per 6 in.	Depth in Feet	USCS Log
	2'/2'				41 53	41	
						42	
						43	
						44	
						45	
						46	
						47	
						48	
						49	
						50	
						51	
						52	
						53	
	2'/2'			0.0	27 38	54	
				0.0	45 56	55	
						56	
						57	
						58	
	2/1.8'			0.0	30 40	59	
				0.0	43 51	60	
						61	

Surface Conditions:

Apparent weathered bed rock, SILT, sand / quartz veins, very stiff, angular - wet boring terminated 8/1 - will resume 8/2

END 8/1/2011

Begin 8/2/2011

Ls will cont. spinning augers through weathered bed rock until Air hammer is needed

SAME

SAME - wet, Saprolite? very weathered, evidence of bedding exists

Logged by: SCHW Date: 8/1/11 / 8/2/11

Drilling Contractor: " Driller: "

EA Engineering, Science, and Technology, Inc.

EA Engineering, Science, and Technology, Inc.

LOG OF SOIL/ROCK BORING

Coordinates: _____
Surface Elevation: _____
Casing Below Surface: _____
Reference Elevation: _____
Reference Desc: _____

Job. No.	Client:	Location: 14B
Drilling Method: HSA / Air Hammer		Boring No. MW-14B
Sampling Method: Cont. split spoon		Sheet 4 of 5
		Drilling Start: 8/1/11 Finish: 8/2/11

Water Level			
Time	-		
Date			
Reference			

Sample Type	Inches Drvn/In. Recvrd	Dpth. Csg.	Sample No.	PID ppm	Blows per 6 in.	Depth in Feet		USCS Log
						61		
						62		
						63		
	2/2			0.0	28 37 49	64		
				0.0	53	65		
	NA			NA	NA	66		
						67		
						68		
						69		
						70		
						71		
						72		
						73		
						74		
						75		
						76		
						77		
						78		
						79		
						80		
						81		

Surface Conditions:

SAME, Rig chatter → approaching solid bed rock, Saprolite

Apparent bed rock at approx 74' bgs, change bit to use 'Air hammer' down to 100' bgs

Bedrock down to 100' BGS

Logged by: SGW

Drilling Contractor: Summit

Date: 8/1/11 / 8/2/11

Driller: Chad Chism

EA Engineering, Science, and Technology, Inc.

EA Engineering, Science, and Technology, Inc.

LOG OF SOIL/ROCK BORING

Coordinates: _____
Surface Elevation: _____
Casing Below Surface: _____
Reference Elevation: _____
Reference Desc: _____

Job. No.	Client:	Location: MW-14B
Drilling Method: HSA / Air Hammer		Boring No. MW-14B
Sampling Method: Cont. Split Spoon		Sheet 5 of 5
		Drilling

Water Level				Start	Finish
Time	-			8/1/11	8/2/11
Date					
Reference					

Sample Type	Inches Drvn/In. Recvrd	Dpth. Csg.	Sample No.	PID ppm	Blows per 6 in.	Depth in Feet	USCS Log	Surface Conditions:
	NA			NA	NA			
						82		Bedrock - cuttings are saturated and pulverized
						83		
						84		
						85		
						86		
						87		
						88		
						89		
						90		
						91		Bedrock
						92		
						93		
						94		
						95		
						96		
						97		
						98		
						99		
						100		Terminate boring at 100' BGS - apparent bedrock 8/2/2011
						21		

Logged by: Steven Wickes

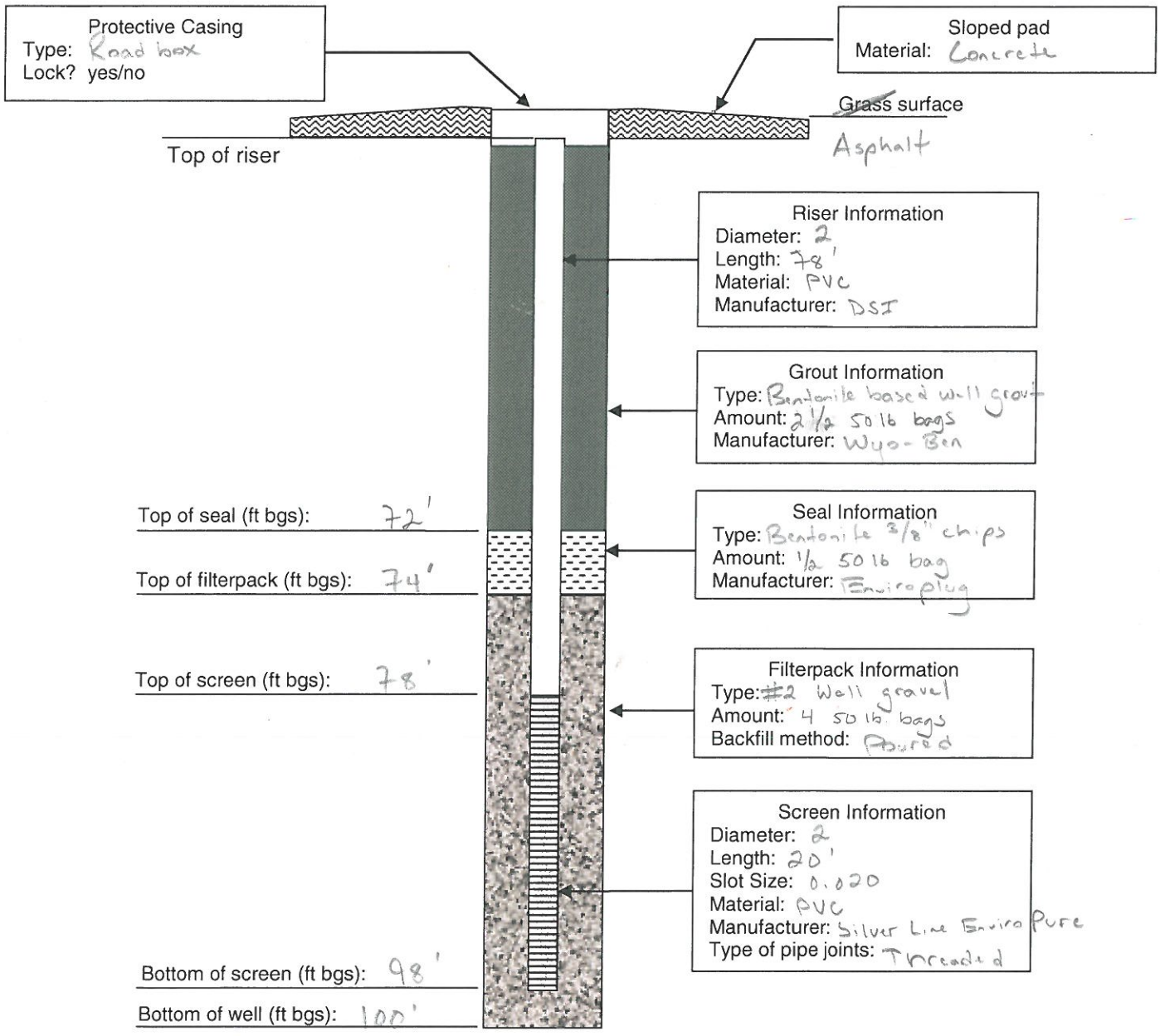
Date: 8/1/2011 / 8/2/2011

Drilling Contractor: Summit

Driller: Chad Chism

RECORD OF MONITORING WELL CONSTRUCTION
(FLUSH MOUNT)

EA Engineering, Science, and Technology, Inc.	Monitoring Well/Soil Boring ID No.: MW-14B
Project Title/ Project No.:	Date/Time Installed: 8/2/11 Time Finished:
Location: Cude Landfill	Depth to Water:
Site Geologist: Steven Wicker	Drilling Method: HSA/Air Hammer



Note: All features not to scale

ags – Above Ground Surface
bgs – Below Ground Surface

EA Engineering, Science, and Technology, Inc.

EA Engineering, Science, and Technology, Inc.

LOG OF SOIL/ROCK BORING

Coordinates: _____
Surface Elevation: _____
Casing Below Surface: _____
Reference Elevation: _____
Reference Desc: _____

Job. No.	Client:	Location: MW-15
Drilling Method: HSA		Boring No. MW15
Sampling Method: Cont. Split Spoon		Sheet 1 of
		Drilling

Water Level				Start	Finish
Time	-			8/3/11	8/3/11
Date					
Reference					

Sample Type	Inches Drvn/In. Recvrd	Dpth. Csg.	Sample No.	PID ppm	Blows per 6 in.	Depth in Feet	USCS Log	Surface Conditions:
Sampled						1		FILL - Asphalt (0-6")
						2		10YR 4/4 Sandy SILT, lit gravel, tr. clay FILL
						3		
						4		
						5		
	2/1.8			0.0	3 3	6		10YR 5/3 CLAY, some silt, tr-lit f sand, dry, stiff, well sorted
				0.0	3 4	7		
	2/2'			0.0	3 4	8		SAME, mottled 10YR 6/1, tr. gravel
				0.0	4 5	9		
	2/1.5'			0.0	3 4	10		SAME
				0.0	4 5	11		
	2/2'			0.0	4 5	12		10YR 5/3 clayey SILT, tr-lit f sand, tr. gravel, dry, med stiff, well sorted (mottled 10YR 7/1, 3/3)
				0.0	6 8	13		
	2/1.8			0.0	5 6	14		10YR 4/4 SILT, some f. sand, tr. gravel, tr clay, med stiff - med loose, dry, well sorted
				0.0	8 8	15		
	2/1.5			0.0	6 8	16		SAME, increasing clay w/depth
				0.0	12 13	17		
	2/2			0.0	11 13	18		
				0.0	16 18	19		
	2/1.5			0.0	11 13	20		SAME, loose pieces of gravel at ± 20' bgs
				0.0	23 18	21		

Logged by: Steven Wicker Date: 8/3/11

Drilling Contractor: Summit Driller: Chad Chism

EA Engineering, Science, and Technology, Inc.

EA Engineering, Science, and Technology, Inc.

LOG OF SOIL/ROCK BORING

Coordinates:
Surface Elevation:
Casing Below Surface:
Reference Elevation:
Reference Desc:

Job. No.	Client:	Location:
		MW-15
Drilling Method: HSA		Boring No. MW-15
Sampling Method: Cont. split spoon		Sheet 2 of 2
		Drilling

Water Level				Start	Finish
Time	-			8/3/11	8/3/11
Date					
Reference					

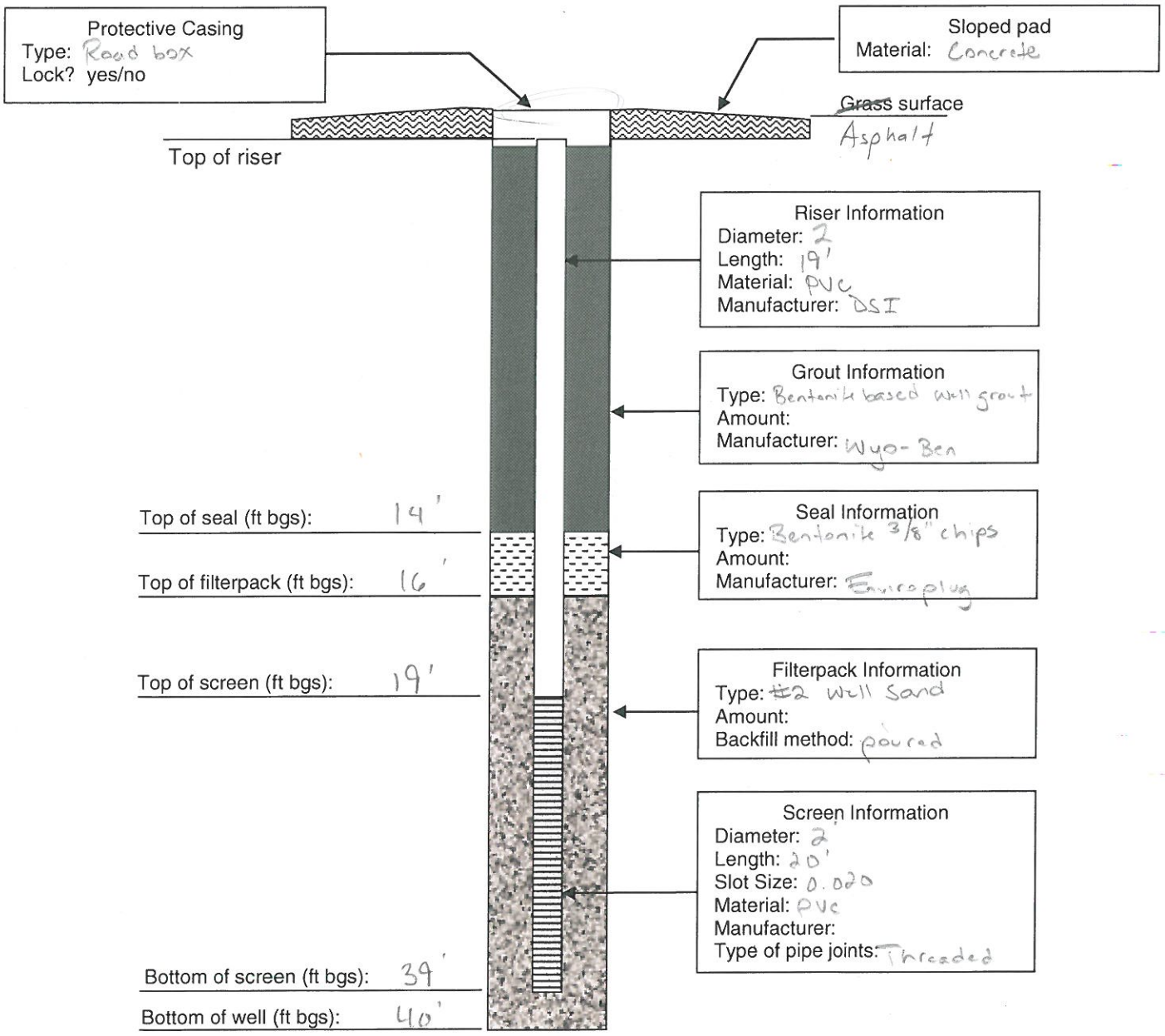
Sample Type	Inches Drvn/In. Recvrd	Dpth. Csg.	Sample No.	PID ppm	Blows per 6 in.	Depth in Feet	USCS Log	Surface Conditions:
	2/1.8			0.0	6 8	21		10YR 5/3 SILT, some f Sand, tr.-lit clay, moist, med soft, well sorted, apparent rust stng
				0.0	4 4	22		
▼	2/2			0.0	5 6	23		SAME, moist - wet (wet on spoon), G.W @ ~ 23'
				0.0	8 9	24		
	2/2			0.0	3 4	25		10YR 5/4 SILT, lit-some clay, tr-lit f. Sand, moist, soft, well sorted
				0.0	4 5	26		
	2/2			1.0	3 5	27		SAME
				0.0	5 6	28		
	2/1.5			0.0	7 8	29		MULTI (10YR 5/3, 7/1, 3/3) SILT, lit-some f-m Sand, tr-lit clay, tr. gravel, Wet, med loose, well sorted
				0.0	12 14	30		
	2/1.8			0.0	6 9	31		SAME, SANDY SILT, silt
				0.0	12 14	32		MULTI (10YR 5/3, 7/1, 3/3) Sandy SILT, tr clay, tr. gravel, med stiff - lit apparent weathered bed rock
	2/1.8			16.0	10 27	33		
				0.0	50/2	34		
	2/2			0.0	16 27	35		SAME, increasing firmness
					50/3	36		
	2/1.6				16 28	37		SAME, advance HSA down to 41' through apparent weathered bedrock
					50/5	38		
						39		
						40		
						41		

Logged by: SAW Date: 8/3/11

Drilling Contractor: Summit Driller: Chad Chism

RECORD OF MONITORING WELL CONSTRUCTION
(FLUSH MOUNT)

EA Engineering, Science, and Technology, Inc.	Monitoring Well/Soil Boring ID No.: MW-15
Project Title/ Project No.: Crude Landfill	Date/Time Installed: 8/3/11 / Time Finished:
Location: Rockville, MD	Depth to Water:
Site Geologist: Steven Wicker	Drilling Method: HSA



Note: All features not to scale

ags – Above Ground Surface
bgs – Below Ground Surface

C 1 6256 — SEQUENCE NO. (MDE USE ONLY)

(THIS NUMBER IS TO BE PUNCHED IN COLS. 3-6 ON ALL CARDS)

STATE OF MARYLAND
WELL COMPLETION REPORT
FILL IN THIS FORM COMPLETELY
PLEASE TYPE

THIS REPORT MUST BE SUBMITTED WITHIN 45 DAYS AFTER WELL IS COMPLETED.

COUNTY NUMBER 574458

ST/CO USE ONLY
DATE Received MM DD YY

DATE WELL COMPLETED MM 9 DD 7 YY 11

Depth of Well 40 (TO NEAREST FOOT) — MW2

PERMIT NO. FROM "PERMIT TO DRILL WELL" 10 - 10 - 015 7

OWNER Code Landfill (last name / first name)

STREET OR RFD 600 East Gude Dr. TOWN Rockville

SUBDIVISION ____ SECTION ____ LOT ____

WELL LOG
MW2
Not required for driven wells

STATE THE KIND OF FORMATIONS PENETRATED, THEIR COLOR, DEPTH, THICKNESS AND IF WATER BEARING

DESCRIPTION (Use additional sheets if needed)	FEET FROM	FEET TO	check if water bearing
Asphalt + Fill	0	2	
Brown Silt + F sand	2	40	

NUMBER OF UNSUCCESSFUL WELLS: 0

WELL HYDROFRACTURED yes [Y] no [N]

CIRCLE APPROPRIATE LETTER
- A — A WELL WAS ABANDONED AND SEALED WHEN THIS WELL WAS COMPLETED
- E — ELECTRIC LOG OBTAINED
- P — TEST WELL CONVERTED TO PRODUCTION WELL

I HEREBY CERTIFY THAT THIS WELL HAS BEEN CONSTRUCTED IN ACCORDANCE WITH COMAR 26.04.04 "WELL CONSTRUCTION" AND IN CONFORMANCE WITH ALL CONDITIONS STATED IN THE ABOVE CAPTIONED PERMIT, AND THAT THE INFORMATION PRESENTED HEREIN IS ACCURATE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.

DRILLERS LIC. NO.: M D 063

DRILLERS SIGNATURE (MUST MATCH SIGNATURE ON APPLICATION)

LIC. NO.: MD 946

SITE SUPERVISOR (sign. of driller or journeyman responsible for sitework if different from permittee)

GROUTING RECORD
WELL HAS BEEN GROUTED (Circle Appropriate Box) yes [Y] no [N]

TYPE OF GROUTING MATERIAL (Circle one)

CEMENT [CM] BENTONITE CLAY [BC]

NO. OF BAGS 2 NO. OF POUNDS 200

GALLONS OF WATER 14

DEPTH OF GROUT SEAL (to nearest foot)

from 0 (TOP) ft. to 35 (BOTTOM) ft.

(enter 0 if from surface)

CASING RECORD
casing types insert appropriate code below

[ST] STEEL [CO] CONCRETE [PL] PLASTIC [OT] OTHER

MAIN CASING TYPE	Nominal diameter top (main) casing (nearest inch)!	Total depth of main casing (nearest foot)
PL	2"	30

OTHER CASING (if used)

EACH CASING	diameter inch	depth (feet) from	to

SCREEN RECORD
screen type or open hole — insert appropriate code below

[ST] STEEL [BR] BRASS BRONZE [PL] PLASTIC [HO] OPEN HOLE [OT] OTHER

C 2

DEPTH (nearest ft.)

EACH SCREEN		from	to
1	PL	30	40
2			
3			

SLOT SIZE 1 0 2 1 3 0

DIAMETER OF SCREEN 2" (NEAREST INCH)

GRAVEL PACK IF WELL DRILLED WAS FLOWING WELL INSERT F IN BOX 68 — from 27 to 40

MDE USE ONLY (NOT TO BE FILLED IN BY DRILLER)

T ____ (E.R.O.S.) ____ W Q ____

TELESCOPE CASING ____ LOG INDICATOR ____ OTHER DATA ____

C 3

PUMPING TEST
HOURS PUMPED (nearest hour) ____

PUMPING RATE (gal. per min.) ____

METHOD USED TO MEASURE PUMPING RATE ____

WATER LEVEL (distance from land surface)

BEFORE PUMPING ____ ft.

WHEN PUMPING ____ ft.

TYPE OF PUMP USED (for test)

[A] air [P] piston [T] turbine other (describe below)

[C] centrifugal [R] rotary [O]

[J] jet [S] submersible

PUMP INSTALLED
DRILLER INSTALLED PUMP (CIRCLE) (YES or NO) YES NO

IF DRILLER INSTALLS PUMP, THIS SECTION MUST BE COMPLETED FOR ALL WELLS.

TYPE OF PUMP INSTALLED PLACE (A,C,J,P,R,S,T,O) IN BOX 29. ____

CAPACITY: GALLONS PER MINUTE (to nearest gallon) ____

PUMP HORSE POWER ____

PUMP COLUMN LENGTH (nearest ft.) ____

CASING HEIGHT (circle appropriate box and enter casing height)

[+] above [−] below LAND SURFACE

-1 (nearest foot)

LOCATION OF WELL ON LOT
SHOW PERMANENT STRUCTURE SUCH AS BUILDING, SEPTIC TANKS, AND /OR LANDMARKS AND INDICATE NOT LESS THAN TWO DISTANCES (MEASUREMENTS TO WELL)

N

Emerald Boulevard

DRILLER

DENV-CR00

C 1 6255 — SEQUENCE NO. (MDE USE ONLY)

1 2 3 6 (THIS NUMBER IS TO BE PUNCHED IN COLS. 3-6 ON ALL CARDS)

STATE OF MARYLAND
WELL COMPLETION REPORT
FILL IN THIS FORM COMPLETELY
PLEASE TYPE

THIS REPORT MUST BE SUBMITTED WITHIN 45 DAYS AFTER WELL IS COMPLETED.

COUNTY NUMBER

ST/CO USE ONLY
DATE Received MM DD YY (8–13)

DATE WELL COMPLETED: MM 8 DD 2 YY 11 (15–20)

Depth of Well 98 (TO NEAREST FOOT) (22–26) MW3

PERMIT NO. FROM "PERMIT TO DRILL WELL": MO-10-0149 (28–37)

OWNER Gude Land Gill (last name / first name)

STREET OR RFD 600 east Gude Rd TOWN Rockville

SUBDIVISION ____ SECTION ____ LOT ____

WELL LOG

MW3 Not required for driven wells

STATE THE KIND OF FORMATIONS PENETRATED, THEIR COLOR, DEPTH, THICKNESS AND IF WATER BEARING

DESCRIPTION (Use additional sheets if needed)	FEET FROM	FEET TO	check if water bearing
Asphalt Fill	0	2	
Brown silty Fsand	2'	40'	
Weathered rock	40'	70'	
Rock	70'	100'	
T.D.	100'		

NUMBER OF UNSUCCESSFUL WELLS: 4

WELL HYDROFRACTURED: yes Y / no N

CIRCLE APPROPRIATE LETTER
- A A WELL WAS ABANDONED AND SEALED WHEN THIS WELL WAS COMPLETED
- E ELECTRIC LOG OBTAINED
- P TEST WELL CONVERTED TO PRODUCTION WELL

I HEREBY CERTIFY THAT THIS WELL HAS BEEN CONSTRUCTED IN ACCORDANCE WITH COMAR 26.04.04 "WELL CONSTRUCTION" AND IN CONFORMANCE WITH ALL CONDITIONS STATED IN THE ABOVE CAPTIONED PERMIT, AND THAT THE INFORMATION PRESENTED HEREIN IS ACCURATE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.

DRILLERS LIC. NO.: MGD063

DRILLERS SIGNATURE (MUST MATCH SIGNATURE ON APPLICATION)

LIC. NO.: 56D066

SITE SUPERVISOR (sign. of driller or journeyman responsible for sitework if different from permittee)

GROUTING RECORD

WELL HAS BEEN GROUTED (Circle Appropriate Box): yes Y / no N (44)

TYPE OF GROUTING MATERIAL (Circle one)

CEMENT CM (45 46) BENTONITE CLAY BC

NO. OF BAGS 8 NO. OF POUNDS 800 (47–48)

GALLONS OF WATER 56

DEPTH OF GROUT SEAL (to nearest foot) from 0 (48–52) ft. to 82 (54–58) ft. (enter 0 if from surface)

CASING RECORD

casing types insert appropriate code below: ST STEEL; CO CONCRETE; PL PLASTIC; OT OTHER

MAIN CASING TYPE: PL (60 61)

Nominal diameter top (main) casing (nearest inch)!: 2" (63 64)

Total depth of main casing (nearest foot): 80' (66–70)

OTHER CASING (if used)

EACH CASING	diameter inch	depth (feet) from	to

SCREEN RECORD

screen type or open hole — insert appropriate code below: ST STEEL; BR BRASS; BRONZE; PL PLASTIC; HO OPEN HOLE; OT OTHER

C 2

EACH SCREEN	DEPTH (nearest ft.)		
1	PL (8 9)	80 (11–15)	98 (17–21)
2	(23 24)	(26–30)	(32–36)
3	(38 39)	(41–45)	(47–51)

SLOT SIZE 1 0 2 1 3 0

DIAMETER OF SCREEN 2" (56 60) (NEAREST INCH)

GRAVEL PACK IF WELL DRILLED WAS FLOWING WELL INSERT F IN BOX 68

from	to
85	98

(68)

MDE USE ONLY (NOT TO BE FILLED IN BY DRILLER)

T (70) (E.R.O.S.) (72) W Q (74 75 76)

TELESCOPE CASING — LOG INDICATOR — OTHER DATA

C 3

PUMPING TEST

HOURS PUMPED (nearest hour) (8 9)

PUMPING RATE (gal. per min.) (11–15)

METHOD USED TO MEASURE PUMPING RATE

WATER LEVEL (distance from land surface)

BEFORE PUMPING (17–20) ft.

WHEN PUMPING (22–25) ft.

TYPE OF PUMP USED (for test)

A air (27) — P piston (27) — T turbine (27)

C centrifugal (27) — R rotary (27) — O other (describe below) (27)

J jet (27) — S submersible (27)

PUMP INSTALLED

DRILLER INSTALLED PUMP (CIRCLE) (YES or NO): YES NO

IF DRILLER INSTALLS PUMP, THIS SECTION MUST BE COMPLETED FOR ALL WELLS.

TYPE OF PUMP INSTALLED PLACE (A,C,J,P,R,S,T,O) IN BOX 29. (29)

CAPACITY: GALLONS PER MINUTE (to nearest gallon) (31–35)

PUMP HORSE POWER (37–41)

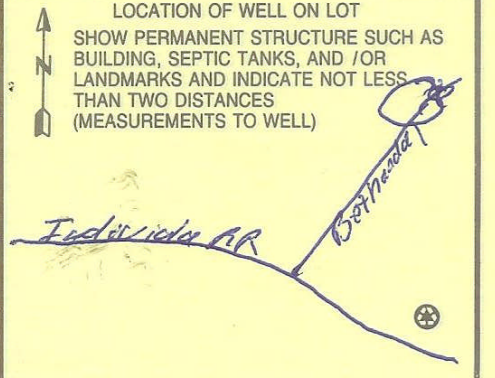
PUMP COLUMN LENGTH (nearest ft.) (43–47)

CASING HEIGHT (circle appropriate box and enter casing height): + above (49) / − below (49) LAND SURFACE

-.5 (nearest foot) (50 51)

LOCATION OF WELL ON LOT

SHOW PERMANENT STRUCTURE SUCH AS BUILDING, SEPTIC TANKS, AND /OR LANDMARKS AND INDICATE NOT LESS THAN TWO DISTANCES (MEASUREMENTS TO WELL)



ORIGINAL

DENV-CR00

C 1 6258 — SEQUENCE NO. (MDE USE ONLY)

(THIS NUMBER IS TO BE PUNCHED IN COLS. 3-6 ON ALL CARDS)

STATE OF MARYLAND
WELL COMPLETION REPORT
FILL IN THIS FORM COMPLETELY
PLEASE TYPE

THIS REPORT MUST BE SUBMITTED WITHIN 45 DAYS AFTER WELL IS COMPLETED.

COUNTY NUMBER 574458

ST/CO USE ONLY
DATE Received MM DD YY

DATE WELL COMPLETED: MM 8 DD 3 YY 11

Depth of Well: 40 (TO NEAREST FOOT)

PERMIT NO. FROM "PERMIT TO DRILL WELL": MO-10-0150

OWNER Crude Sand & Gil (last name) (first name)

STREET OR RFD 600 East Gude Rd. TOWN Rockville

SUBDIVISION _____ SECTION _____ LOT _____

WELL LOG
Not required for driven wells

Mud

STATE THE KIND OF FORMATIONS PENETRATED, THEIR COLOR, DEPTH, THICKNESS AND IF WATER BEARING

DESCRIPTION (Use additional sheets if needed)	FEET FROM	FEET TO	check if water bearing
Asphalt Fill	0	2	
Brown Silt & Fsand	2'	40'	

NUMBER OF UNSUCCESSFUL WELLS: 0

WELL HYDROFRACTURED: yes [Y] no [N]

CIRCLE APPROPRIATE LETTER
- A A WELL WAS ABANDONED AND SEALED WHEN THIS WELL WAS COMPLETED
- E ELECTRIC LOG OBTAINED
- P TEST WELL CONVERTED TO PRODUCTION WELL

I HEREBY CERTIFY THAT THIS WELL HAS BEEN CONSTRUCTED IN ACCORDANCE WITH COMAR 26.04.04 "WELL CONSTRUCTION" AND IN CONFORMANCE WITH ALL CONDITIONS STATED IN THE ABOVE CAPTIONED PERMIT, AND THAT THE INFORMATION PRESENTED HEREIN IS ACCURATE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.

DRILLERS LIC. NO. MGD063

DRILLERS SIGNATURE (MUST MATCH SIGNATURE ON APPLICATION)

LIC. NO. MGD066

SITE SUPERVISOR (sign. of driller or journeyman responsible for sitework if different from permittee)

GROUTING RECORD
WELL HAS BEEN GROUTED (Circle Appropriate Box): yes [Y] no [N]

TYPE OF GROUTING MATERIAL (Circle one)

CEMENT [C M] BENTONITE CLAY [B C]

NO. OF BAGS 2 NO. OF POUNDS 200

GALLONS OF WATER 14

DEPTH OF GROUT SEAL (to nearest foot)

from 0 ft. (TOP) to 35 ft. (BOTTOM)

(enter 0 if from surface)

CASING RECORD
casing types insert appropriate code below

[S T] STEEL [C O] CONCRETE [P L] PLASTIC [O T] OTHER

MAIN CASING TYPE	Nominal diameter top (main) casing (nearest inch)!	Total depth of main casing (nearest foot)
PL	2"	30

OTHER CASING (if used)

EACH CASING	diameter inch	depth (feet) from	depth (feet) to

SCREEN RECORD
screen type or open hole — insert appropriate code below

[S T] STEEL [B R] BRASS BRONZE [H O] OPEN HOLE [P L] PLASTIC [O T] OTHER

C 2

DEPTH (nearest ft.)

EACH SCREEN		from	to
1	PL	30	40
2			
3			

SLOT SIZE 1 0 2 1 3 0

DIAMETER OF SCREEN 2" (NEAREST INCH)

GRAVEL PACK IF WELL DRILLED WAS FLOWING WELL INSERT F IN BOX 68	from	to
	27	40

MDE USE ONLY (NOT TO BE FILLED IN BY DRILLER)

T (E.R.O.S.) W Q

70 72 74 75 76

TELESCOPE CASING | LOG INDICATOR | OTHER DATA

C 3

PUMPING TEST
HOURS PUMPED (nearest hour) ____

PUMPING RATE (gal. per min.) ____

METHOD USED TO MEASURE PUMPING RATE ____

WATER LEVEL (distance from land surface)

BEFORE PUMPING ____ ft.

WHEN PUMPING ____ ft.

TYPE OF PUMP USED (for test)

[A] air [P] piston [T] turbine [O] other (describe below) [C] centrifugal [R] rotary [J] jet [S] submersible

PUMP INSTALLED
DRILLER INSTALLED PUMP (CIRCLE) (YES or NO) YES NO

IF DRILLER INSTALLS PUMP, THIS SECTION MUST BE COMPLETED FOR ALL WELLS.

TYPE OF PUMP INSTALLED PLACE (A,C,J,P,R,S,T,O) IN BOX 29. ____

CAPACITY: GALLONS PER MINUTE (to nearest gallon) ____

PUMP HORSE POWER ____

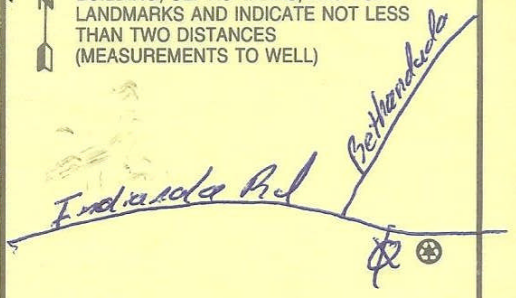
PUMP COLUMN LENGTH (nearest ft.) ____

CASING HEIGHT (circle appropriate box and enter casing height)

[+] above [−] below LAND SURFACE

-.5 (nearest foot)

LOCATION OF WELL ON LOT
SHOW PERMANENT STRUCTURE SUCH AS BUILDING, SEPTIC TANKS, AND /OR LANDMARKS AND INDICATE NOT LESS THAN TWO DISTANCES (MEASUREMENTS TO WELL)



DENV-CR00

ORIGINAL

EA Engineering, Science, and Technology, Inc.

FIELD RECORD OF WELL DEVELOPMENT

Start 1140
STOP

Well Designation	MW-14A	Project Name	Linde
Condition	Flush	Project Location	Rockville
Well Grout Date	8/1/2011	Developer Initials	SCW
Well Installation Date	8/1/2011	Well Development Date	8/4/2011
Gauge Date	8/4/2011	Gauge Time	1135
Sounding Method	water level indicator	Measurement Ref.	Top of PVC
Stick up/down (ft)	Flush	Well Diameter	2 4 in.
Static Water Level		Screen Length	20'
Development Time			
Surge Device	Whale pump		
Weather	clear, 80s		

Well Volume Determination:

A. Well Depth	38.65
B. Depth to Water	19.99
C. Liquid Depth (A-B) (ft)	18.66
D. Well Volume/ft	3.04
E. Liquid screen length (ft)	

	Beginning	1	2	3	4	5
Surge Time (min)	0	5*	5*	0	0	0
Pump Rate (gpm)	5	→	→	→	→	→
Volume purged	~3.0	~3.0	~3.0	~3.0	~6.0	~6.0
Turbidity (NTU)	921.2	2645.7	2662.7	2637.1	2640.1	2045.7
Temp °C	18.21	16.01	15.88	15.82	15.83	16.04
cond. (us/cm)	823	933	605	513	464	420
ORP	169.3	189.2	177.3	170.4	169.8	175.6
DO (mg/L)	39.89	42.04	34.92	36.94	35.70	33.18

Total volume of water removed (gal): _____

Estimated Recharge Rate: _____

Depth to sediment before development: _____ Depth to sediment after development: _____

Total Surging Time: _____

Development Description: * Surge block not available, over pump + surge with whale pump, well is very turbid, visibly clearing after 6 WVs

EA Engineering, Science, and Technology, Inc.

FIELD RECORD OF WELL DEVELOPMENT

Well Designation	MW-14A	Project Name	Gude
Condition	Flush	Project Location	Rockville
Well Grout Date	8/1/11	Developer Initials	SGW
Well Installation Date	8/1/11	Well Development Date	
Gauge Date	8/4/11	Gauge Time	
Sounding Method	water level indicator	Measurement Ref.	Top of PVC
Stick up/down (ft)	Flush	Well Diameter	2 in.
Static Water Level		Screen Length	
Development Time			
Surge Device	Whale pump		
Weather	Clear, 80s		

Well Volume Determination:

A. Well Depth _____
B. Depth to Water _____
C. Liquid Depth (A-B) (ft) _____
D. Well Volume/ft _____
E. Liquid screen length (ft) _____

	Beginning	1	2	3	4	5
Surge Time (min)	0	—	—	—	—	—
Pump Rate (gpm)	5 gpm	→	→	→	→	→
Volume purged	~6.0	~6.0	~6.0	~6.0	~6.0	~6.0
Turbidity (NTU)	1409.1	1212.3	485.2	151.1	75.1	100.3
Temp °C	16.01	16.12	16.03	16.13	16.25	16.20
Cond (us/cm)	404	398	353	375	396	327
ORP	183.8	189.7	205.9	205.7	215.0	211.8
DO (mg/L)	31.86	30.14	27.02	29.12	20.90	20.13

Total volume of water removed (gal): _____
Estimated Recharge Rate: _____
Depth to sediment before development: 38.65 Depth to sediment after development: 39.10

Total Surging Time: _____

Development Description: Well went dry after ~12WVs, allow well to recharge for ~5 minutes (1222), well went dry after 16 WVs, allow well to recharge for 10 minutes (1235) Turbidity stable around 100 NTU (does not appear to be dropping), stop development after 20 WVs

EA Engineering, Science, and Technology, Inc.

Start 1330
Stop 1415

FIELD RECORD OF WELL DEVELOPMENT

Well Designation	MW-14B	Project Name	Gude
Condition	Flush	Project Location	Rockville
Well Grout Date	8/3/11	Developer Initials	SAW
Well Installation Date	8/3/11	Well Development Date	8/4/11
Gauge Date	8/4/11	Gauge Time	1320
Sounding Method	water level indicator	Measurement Ref.	Top of PVC
Stick up/down (ft)	Flush	Well Diameter	2 in.
Static Water Level	21.60	Screen Length	20
Development Time	45 mins		
Surge Device	Whale pump		
Weather	Clear, 80s		

Well Volume Determination:

A. Well Depth 98.00
B. Depth to Water 21.60
C. Liquid Depth (A-B) (ft) 76.40
D. Well Volume/ft 12.45
E. Liquid screen length (ft) _____

	Beginning	1	2	3	4	5	6
Surge Time (min)	0	5*	5*	0	0	0	0
Pump Rate (gpm)	5 gpm	5				→	5
Volume purged	~12.50	~12.50	~12.50	~12.50	~12.50	~12.50	
Turbidity (NTU)	550.2	330.3	72.0	51.3	26.3	25.4	25.7
Temp °C	15.98	15.09	14.89	14.94	15.00	15.44	15.26
Cond (ms/cm)	97	92	89	89	89	92	91
ORP	201.0	200.0	200.3	201.2	200.9	204.9	203.7
DO (mg/L)	12.32	12.73	12.71	12.44	12.58	12.21	12.38

Total volume of water removed (gal): _____
Estimated Recharge Rate: 74.0 gpm
Depth to sediment before development: 98.00 Depth to sediment after development: 98.00

Total Surging Time: 10 min

Development Description: * No surge block available, over pump + surge with whale pump, Very clear after 3 WVs, reading have stabilized after 7 WVs, turbidity steady around 25 NTU, stop development after 7 WVs

EA Engineering, Science, and Technology, Inc.

FIELD RECORD OF WELL DEVELOPMENT

Start 0950
STOP 1050

Well Designation	MW-15	Project Name	Crude
Condition	Flush	Project Location	Rockville
Well Grout Date	8/3/11	Developer Initials	SAW
Well Installation Date	8/3/11	Well Development Date	8/4/11
Gauge Date	8/4/11	Gauge Time	0950
Sounding Method	water level indicator	Measurement Ref.	Top of PVC
Stick up/down (ft)	Flush	Well Diameter	2 in.
Static Water Level	15.05	Screen Length	20'
Development Time			
Surge Device	Pump		
Weather	Clear, 80's		

15.05

39.40

Well Volume Determination:

A. Well Depth	39.40
B. Depth to Water	15.05
C. Liquid Depth (A-B) (ft)	24.35
D. Well Volume/ft	3.96
E. Liquid screen length (ft)	

	Beginning	1	2	3	4	5
Surge Time (min)	0	0	5*	5*	0	
Pump Rate (gpm)	5 gpm	→	→	→	→	→
Volume purged	~3.96	~3.96	~3.96	~3.96	~3.96	~3.96
Turbidity (NTU)	2691.7	2675.3	2659.7	2665.4	2634.5	2013.3
Cond. (us/cm)	268	181	148	149	136	132
Temp. °C	17.87	17.29°	16.64	16.87	16.40	16.28
ORP	140.3	78.1	63.1	60.1	67.0	73.9
DO (mg/L)	27.08	26.63	25.13	25.60	25.49	25.00

Total volume of water removed (gal): _____

Estimated Recharge Rate: _____

Depth to sediment before development: _____ Depth to sediment after development: _____

Total Surging Time: _____

Development Description: *Surge block not available, will over pump and surge with pump, no sediment on water level indicator

0950

EA Engineering, Science, and Technology, Inc.

FIELD RECORD OF WELL DEVELOPMENT

Well Designation	MW-15	Project Name	Gude
Condition	Flush	Project Location	Rockville
Well Grout Date	8/3/11	Developer Initials	SAW
Well Installation Date	8/3/11	Well Development Date	8/4/11
Gauge Date	8/4/11	Gauge Time	0950
Sounding Method	water level indicator	Measurement Ref.	Top of PVC
Stick up/down (ft)	Flush	Well Diameter	2 in.
Static Water Level	15.05	Screen Length	20
Development Time			
Surge Device	Pump		
Weather	Clear, 80s		

Well Volume Determination:

A. Well Depth _____
B. Depth to Water _____
C. Liquid Depth (A-B) (ft) _____
D. Well Volume/ft _____
E. Liquid screen length (ft) _____

	Beginning	1	2	3	4	5
Surge Time (min)	0	0	0	0	0	
Pump Rate (gpm)	5 gpm	5 gpm	5 gpm	5 gpm	5 gpm	5 gpm
Volume purged	~3.96	~10	~4.0	~4.0	~4.0	~4.0
Turbidity (NTU)	1880.2	457.2	127.9	145.4	120.2	137.7
Cond. (µs/cm)	129	107	106	107	112	109
Temp °C	16.29	16.16	16.28	16.35	16.81	16.72
ORP	77.3	85.9	92.9	124.7	113.4	112.8
DO (mg/L	26.65	24.14	23.90	26.61	25.43	26.97

Total volume of water removed (gal): ~54
Estimated Recharge Rate: >4.0 gpm
Depth to sediment before development: 39.40 Depth to sediment after development: 39.40

Total Surging Time: 10 min

Development Description: Clear to the unaided eye at 10 WVs, Well is very clear at 11 WVs, Turbidity appears to be steady around 140~120 NTUs (silty aquifer), all other readings have stabilized, Stop development after approx. 1 hr. of purging