APPENDIX C

WELL DEVELOPMENT LOGS

ENTERED 9/23/99 by sm

Groundwater Well Development Log

Fort McClellan , Alabama

COMPLETED 9-9-99

Project Number: 780567
Form Completed by: Jason Brown
Well Developed by (firm): Jason Brown / E.

Parcel No.: CDTF-126Q
Well No.: MW-1
Date Started: 07/12/99, 07/15/99

Monitoring Well Information

Development Method: pump, bail
Development Equipment: whale pump, PE bailer, Peristaltic pump, Horiba, Turbidity meter
Casing Diameter: 2"

Beginning Measurments
Depth to Water (ft): 5.92 (From Top of Casing)
Total depth of Well (ft): 21.1 (From Top of Casing)

Time 24hr	Purge Volume (gal)	Water Level (ft) (TOC)	pH (std units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved oxygen (mg/L)	Temperature (°C)	Clarity (color)	Comments
14:52	1.5	13.11	8.02	0.321	>1000	3.53	23.7	Beaded	Using Whale pump
15:00	Pump	has	stopped.						
07/15/99 10:55	4.0	11.06	6.14	0.151	>1000	2.45	19.9	Beaded	Using PE bailer
11:07	6.5	13.20	6.10	0.202	>1000	2.50	19.4		
11:14	9.0	14.6	6.02	0.172	>1000	2.75	19.4		
11:21	11.5	15.65	6.01	0.175	>1000	3.00	19.4		
11:31	14.0	17.50	5.88	0.144	>1000	2.36	19.2		
11:41	16.5	~~19.3~~ 18.50	5.92	0.156	>1000	1.82	19.6		

Parcel No.: CDTF-126Q
Well ID: MW-1
Date: 07/15/99

Time 24hr	Purge Volume (gal)	Water Level (ft) (TOC)	pH (std units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved oxygen (mg/L)	Temperature (°C)	Clarity (color)	Comments
11:52	19.0	19.3	5.84	0.125	>1000	2.82	19.6	Brn,red	
12:03	21.5	19.6	5.67	0.108	>1000	2.71	19.2		Water level rising fast
12:14	24.0	20.1	5.62	0.088	>1000	3.69	19.4		
12:58	34.0	20.8	5.76	0.110	>1000	3.82	19.5		
14:04	36.5	NOT TAKEN	5.72	0.086	246	5.65	21.9		
14:22	40.5	20.15	5.50	0.065	110	5.03	21.5		
14:44	43.5	20.88	5.46	0.059	104	3.40	21.8		
15:03	46.5	20.95	5.19	0.062	235	3.15	20.5	tan,red	
15:27	50.5	NOT TAKEN	5.52	0.065	362	3.62	20.6		
15:39	53.5	NOT TAKEN	5.27	0.064	335	3.60	20.2		
15:42	Has gone dry.								
16:12	Restart development.								
16:13	54.5	NOT TAKEN	5.59	0.070	86	4.52	20.7	tan	Much clearer

Parcel No.: 126Q
Well ID: MW-1
Date: 07/12/99
07/15/99

Time 24hr	Purge Volume (gal)	Water Level (ft) (TOC)	pH (std units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved oxygen (mg/L)	Temperature (°C)	Clarity (color)	Comments
16 : 32	57.5	NOT TAKEN	5.40	0.057	32	4.37	20.5	tan	
16 : 49	59.5	NOT TAKEN	5.19	0.047	189	4.19	20.3	"	
17 : 04	62.5	NOT TAKEN	5.27	0.056	220	3.23	20.2	"	
17 : 04	Well has gone dry								
07/15/99 09 : 56	62.5	NOT TAKEN	5.37	0.145	412	3.78	20.5	rd/bra	
10 : 14	65.5	NOT TAKEN	5.37	0.125	52	3.96	20.3	"	
10 : 30	66.5	NOT TAKEN	5.74	0.111	273	4.21	21.4	"	
10 : 52	71.5	NOT TAKEN	5.62	0.081	199	4.20	21.7	"	
:	Finished. Eight hours requirement met.								Developed well for eight hours.
:									
:									
:									
:									

Completed by

07/22/99

Same as first 3 pages.
(Transcribed on 7/29/99 in order to remain consistent between logs. 9/3 7/29/99)

Well Development Log

Project Number: 780567
Project Name: Fort McClellan
Form Completed by: Jason Brown
Well Developed by/firm: I.I

Site No.: CDTF
Well No.: MW-1
Date Started: 07/12/99
07/15/99

Monitoring Well Information

Development Method: ~~Bailer Bailer~~
Development Equipment: Peristaltic pump and PE bailer

Screen Height (ft):
Filter pack lenght (ft):
Casing Diameter (in): 2"

Begining Measurements
Depth to Water (ft): 5.92
Total depth of Well (ft): 21.1

Monitoring Well Purge Calculations

DTW on 7/15 = 06.55
Notice

Volume of Water in Casing: Gallons/foot = 0.041 x d^2, where casing diameter in inches = (0.041 x (_____)^2) = _____ gal/ft.
Well Volume (gallons) = Water Column (ft) x Gal/ft = 15.18 ft x 0.16 gal/ft = 2.43 gallons

Volume of Water in Filter Pack: (if required)
Gallons/foot = 0.041 x (D^2 - d^2), where D is total borehole diameter in inches & d is casing diameter in inches = 0.041 x ((_____)^2- (_____)^2) = 0.16 gal/ft.
Filter Pack Volume (gal) = (the less of the filter pack lenght or water column) x gal/ft x porosity (0.3) = (_____)ft x (_____) gal/ft x 0.3 = NA gal

Purge Well Volume: Purge well Volume = Filter pack volume + Well Volume = NA gal + NA gal = NA gal.

1 x Purge Well Volume	2 x Purge Well Volume	3 x Purge Well Volume	4 x Purge Well Volume	5 x Purge Well Volume
2.43	4.86	7.29	9.72	12.15

Development Record

Time (24 hrs)	Purge Volume (gal)	Water Level (ft) (TOC)	Turbidity (NTU)	Clarity (color)	Temp. (C)	pH (Std Units)	Conductivity (mS/cm)	DO mg/L	Comments
1452	1.5	13.11	>1000	Brn, red	23.7	8.02	0.321	3.53	
1500	Pump has	stopped							
07/15/99									
1055	~~2~~ 4.0	11.06	>1000	Brn, red	19.9°C	6.14	0.151	2.45	
1107	6.5	13.20	>1000		19.4	6.10	0.202	2.50	
1114	9.0	14.60	>1000		19.4	6.02	0.172	2.75	
1121	11.50	15.65	>1000		19.4	6.01	0.175	3.00	
1131	14.00	17.50	>1000		19.2	5.88	0.144	2.36	
1141	16.50	18.50	>1000		19.6	5.92	0.156	1.82	
1152	19.~~00~~	19.30	>1000		19.6	5.84	0.125	2.82	
1203	21.50	19.60	>1000	↓	19.2	5.67	0.108	2.71	Water level Rising fast

Well Development Log

Parcel No: CDTF
FTMC Site No.:
Well No.: MW-1
Date Started: 07/12/99

Development Record (continuation)

Time (24 hrs)	Purge Volume (gal)	Water Level (ft) (TOC)	Turbidity (NTU)	Clarity (color)	Temp. (C)	pH (Std Units)	Conductivity (mS/cm)	mg/L DO	Comments
1214	24.0	20.1	>1000	Brownish	19.4	5.62	0.88	3.69	
1258	34.0	20.8	>1000	"	19.5	5.76	0.110	3.82	
1404	36.5	Not Taken	246	"	21.9	5.72	0.086	5.65	
1422	40.5	20.15	110	"	21.5	5.50	0.065	5.03	
1444	43.5	20.88	104	"	21.8	5.46	0.059	3.40	
1503	46.5	20.95	235	tan/red	20.5	5.19	0.062	3.15	Much lighter in color
1527	50.5	~~20~~	362	"	20.6	5.52	0.065	3.62	
1539	53.5	—	335		20.2	5.27	0.064	3.60	
1542	Has gone dry								
1612	Recharge								
1613	54.5	~~20~~	86	tan	20.7	5.59	0.070	4.52	Much clearer
1632	57.5	Not Taken	32	"	20.5	5.40	0.057	4.37	
1649	59.5	Not taken	189	"	20.3	5.19	0.047	4.19	
1704	62.5	Not Taken	220	"	20.2	5.27	0.056	3.23	
1704	well has gone dry.								

Range and Average Discharge Rate:
Maximum Drawdown during Development: at gpm.
Disposition of Development Water: Drums Baker Tank Other
Number of Containers for Development Water:

Comments:

Final Measurements

Total depth of Well (ft):

Date Completed:

Hours Developed:

Well Development Log

Parcel No: CD7F
FTMC Site No.:
Well No.: MW-1
Date Started:

07/15/99

Development Record (continuation)

Time (24 hrs)	Purge Volume (gal)	Water Level (ft) (TOC)	Turbidity (NTU)	Clarity (color)	Temp. (C)	pH (Std Units)	Conductivity (mS/cm)	PO4 mg/L	Comments
0956		Not taken	412	rd, brn	20.5	5.37	0.145	3.78	
1014	3	"	52	"	20.3	5.37	0.125	3.96	
1030	6	"	273	"	21.4	5.74	0.111	4.21	
1052	9	"	199	"	21.7	5.62	0.086	4.20	
Finished.	Eight	hour	requirement		met.				

Range and Average Discharge Rate:
Maximum Drawdown during Development: at gpm.
Disposition of Development Water: Drums Baker Tank Other
Number of Containers for Development Water:

Comments:

Final Measurements

Total depth of Well (ft):

Date Completed:

Hours Developed:

ENTERED 9/23/99 by jm

Groundwater Well Development Log

Fort McClellan , Alabama

Project Number: 780567
Form Completed by: Jason Brown
Well Developed by (firm): Jeff Tacc / FT, Jason Brown / FT

Parcel No.: CDTF-126Q
Well No.: MW02
Date Started: 07/15/99

COMPLETED

COMPLETED 9-9-99

Monitoring Well Information

Development Method: Pump
Development Equipment: Whale and Filtz pumps, Turbidity meter, Horiba
Casing Diameter: 2"

Beginning Measurments
Depth to Water (ft): 16.00 (TOC)
Total depth of Well (ft): 64.01 (TOC)

TOC = Top of Casing

Time 24hr	Purge Volume (gal)	Water Level (ft) (TOC)	pH (std units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved oxygen (mg/L)	Temperature (°C)	Clarity (color)	Comments
09:30	0	—	—	—	—	—	—	Muddy	Pump rate = 0.75gpm
09:40	7.5	42.42	8.77	0.221	>999	4.81	21.4	Muddy	
09:50	15	44.04	8.83	0.244	>999	3.49	21.2	Muddy	
10:00	22.5	44.95	7.97	0.166	>999	3.65	21.4	Brown	
10:30	31.5	—							Pump stopped
10:55	31.5	44.55	6.47	0.120	>999	4.10	24.0	Brown	Restart pump @ 0.2gpm
11:15	35.5	48.20	5.77	0.055	>999	4.21	22.5	Brown	
11:20	—							→	Stop pump

Parcel No.: CDTF-126Q
Well ID: MW-02
Date: 07/15/99

Time 24hr	Purge Volume (gal)	Water Level (ft) (TOC)	pH (std units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved oxygen (mg/L)	Temperature (°C)	Clarity (color)	Comments
11:30	36	NOT TAKEN	—	—	—	—	—	→	Restart pump @ 0.5gpm
11:40	41	>51'	5.80	0.091	>999	2.20	27.6	Brown	Allowing well to recharge → 913
14:03	43	22.60	NOT TAKEN	0.058	>999	6.96	24.6	Brown	Recharge = 8 min/ft → 918
14:20	47	47.95	4.90	0.042	>999	5.60	24.2	Brown	
14:45	51	44.90	4.25	0.040	>999	5.11	23.8	Brown	
15:00	53	49.12	4.74	0.040	>999	5.51	24.3	Brown	
15:15	57	>50	4.98	0.058	>999	4.20	24.4	Brown	
15:20	—	—	—	—	—	—	—	—	Pumped dry
16:00	—	—	—	—	—	—	—	—	Approx. 1.5' H_2O in sump
16:15	—	40.50	—	—	—	—	—	—	
16:22	—	—	—	—	—	—	—	—	Start pump
16:30	61	47.27	5.79	0.060	>999	6.14	24.6	Brown	
16:38	63.5	49.80	5.71	0.041	>999	6.60	24.9	Brown	

Parcel No.: CDTF-126Q
Well ID: MW02
Date: ~~07/15/99~~, 07/22/99

Time 24hr	Purge Volume (gal)	Water Level (ft) (TOC)	pH (std units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved oxygen (mg/L)	Temperature (°C)	Clarity (color)	Comments
11:52	66.5	53.50	5.42	0.039	999	5.81	23.6	Brown	
07/22/99 09:48	—	17.92							
10:00	68.0	22.30	6.20	0.068	111	NOT TAKEN	24.2	clear	Using Whale pump
10:16	70.0	32.80	5.80	0.052	500	3.95	24.1	tan	
10:35	74.0	37.15	5.72	0.047	947	4.94	23.3	tan	
10:56	77.0	43.72	5.76	0.057	722	4.85	24.5	tan	
11:11									Output has slowed to a trickle. Allowing to recharge
11:29	~~46.5~~ 80.5	41.21	5.58	0.036	>999	4.61	25.3	tan	
11:50	~~48.5~~ 82.5	44.00	5.61	0.042	>999	4.72	23.5	tan,red	Using Fultz pump, Fultz reel
12:16	~~51.0~~ 85.0	45.7	5.48	0.033	770	4.76	23.6	tan red	
12:32	~~54.0~~ 88.0	49.76	5.52	0.038	>999	4.70	22.8	tan, red	
12:52	~~57.0~~ 91.0	51.50	5.57	0.053	>999	4.72	23.3	tan, red	
13:01	~~59.5~~ 93.5	53.10	5.53	0.042	>999	4.30	22.1	tan,red	
13 15	~~62.5~~ (96.5	55.10	5.56	0.053	>999	4.18	22.2	tan,red	

Completed by:

07/29/99

Deep Well

Well Development Log

Project Number:
Project Name: Fort McClellan
Form Completed by: Jeff TARR
Well Developed by/firm: Fultz Pumping

Site No.: CDTF
Well No.: CDTF-1260-MW02
Date Started: 7-15-99

Monitoring Well Information

Development Method: Pumping
Development Equipment:

Screen Height (ft):
Filter pack lenght (ft):
Casing Diameter (in):

Begining Measurements
Depth to Water (ft): 16.00' (TOC)
Total depth of Well (ft): 64.01' (TOC)
TOC = Top of Casing

Monitoring Well Purge Calculations

Volume of Water in Casing: Gallons/foot = 0.041 x d^2, where casing diameter in inches = (0.041 x (_____)^2) = _____ gal/ft.
Well Volume (gallons) = Water Column (ft) x Gal/ft = 48.01 ft x 0.16 gal/ft = 7.68 gallons

Volume of Water in Filter Pack: (if required)
Gallons/foot = 0.041 x (D^2 - d^2), where D is total borehole diameter in inches & d is casing diameter in inches = 0.041 x ((_____)^2- (_____)^2) = 0.16 gal/ft.
Filter Pack Volume (gal) = (the less of the filter pack lenght or water column) x gal/ft x porosity (0.3) = (_____)ft x (_____) gal/ft x 0.3 = _____ gal

Purge Well Volume: Purge well Volume = Filter pack volume + Well Volume = NA gal + NA gal = NA gal.

1 x Purge Well Volume	2 x Purge Well Volume	3 x Purge Well Volume	4 x Purge Well Volume	5 x Purge Well Volume
7.68	15.36	23.04	30.72	38.40

Development Record

Time (24 hrs)	Purge Volume (gal)	Water Level (ft) (TOC)	Turbidity (NTU)	Clarity (color)	Temp. (C)	pH (Std Units)	Conductivity (mS/cm)	Comments
930	0	—	—	muddy	—	—	—	Pumping RATE = 0.75 gpm
940	7.5	42.42	>999	muddy	21.4	8.77	0.221	4.81 mg/L DO
950	15	44.04	>999	muddy	21.2	8.83	0.244	3.49 mg/L DO
1000	22.5	44.95	>999	Brown	21.4	7.97	0.166	3.65 mg/L DO
1030	31.5							Pump stopped.
1055	31.5	44.55	>999	Brown	24.0	6.47	0.120	Restart Pump 0.2 gpm 4.10 mg/L
1115	35.5	48.20	>999	Brown	22.5	5.77	0.055	DO = 4.21 mg/L
1120								Stop Pump
1130	36							Restart Pump 0.5 gpm.
1140	41	>51'	>999	Brown	27.6	5.80	0.091	DO = 2.20
1403	43	22.60	>999	Brown	24.6		0.058	DO = 6.96 / Purge started @ 1400

Pump RATE = 0.75 gpm
1000 Pump RATE = 0.2 gpm
1020 Pump Rate = 0.5 gpm
1130

Well Development Log

Parcel No: CDTF-1260
FTMC Site No.:
Well No.: MW-2
Date Started:

Development Record (continuation)

Time (24 hrs)	Purge Volume (gal)	Water Level (ft) (TOC)	Turbidity (NTU)	Clarity (color)	Temp. (C)	pH (Std Units)	Conductivity (mS/cm)	DO mg/L	Comments
1420	47	47.95	999	Brown	24.2	4.90	0.042	5.60	Allowing well to recharge
1445	51	44.90	999	Brown	23.8	4.25	0.040	5.11	Recharging @ 8 minutes/ft
1500	53	49.12	999	Brown.	24.3	4.74	0.040	5.51	
1515	57	>50'	999	Brown.	24.4	4.98	0.058	4.20	
1520									Pumped DRY
1600									Approx 1.5' H_2O in sump.
1615		40.50'							
1622									START Pump
1630	61	47.27'	999	Brown	24.6	5.79	0.060	6.14	
1638	63.5	49.80'	999	Brown	24.9	5.71	0.041	6.60	
1652	66.5	53.50'	999	Brown	23.6	5.42	0.039	5.81	
07/22/99									
0948	—	17.92							Measure water depth only
1000	68.0	22.30	111	clear	24.2	6.20	0.068	NOT TAKEN	Using whole pump
1016	70.0	32.80	500	tan	24.1	5.80	0.052	3.95	
1035	74.0	37.15	947	tan	23.3	5.72	0.047	4.99	
1056	77.0	43.72	722	tan	24.5	5.76	0.057	4.85	
1114									Output has slowed to a trickle allowing to increase

Range and Average Discharge Rate:
Maximum Drawdown during Development: at gpm.
Disposition of Development Water: Drums Baker Tank Other
Number of Containers for Development Water:

Comments:

Final Measurements

Total depth of Well (ft):

Date Completed:

Hours Developed:

Parcel No.: CDTF-126Q
Well ID: MW-2
Date: 07/22/99

Time 24hr	Purge Volume (gal)	Water Level (ft) (TOC)	pH (std units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved oxygen (mg/L)	Temperature (°C)	Clarity (color)	Comments
11:29	46.5	41.21	5.58	0.036	>999	4.61	25.3	tan	
11:50	48.5	44.00	5.61	0.042	>999	4.72	23.5	tan, rd	Using Fultz pump, Fultz reel
12:16	51.0	~~55.7~~	5.48	0.033	770	4.76	23.6	tan/rd	
12:32	54.0	49.76	5.52	0.038	>999	4.70	22.8°	tan, red	
12:52	57.0	51.50	5.57	0.053	>999	4.72	23.3	tan, red	
13:01	59.5	53.10	5.53	0.042	>999	4.30	22.1	tan, red	
13:15	62.5	55.10	5.56	0.053	>999	4.18	22.2	tan, red	
:									
:									
:									
:									
:									
:									

ENTERED 9/23/99 by sm

COMPLETED 9/9/99

Groundwater Well Development Log

Fort McClellan , Alabama

Project Number: 78056 7
Form Completed by: Jason Brown
Well Developed by (firm): Tetra Tech

Parcel No.: CDTF 126a
Well No.: MW-3
Date Started: 07/20/99

Monitoring Well Information

Development Method: PE Bailer
Development Equipment: PE bailer

Casing Diameter: 2"

Beginning Measurments
Depth to Water (ft): 9.72
Total depth of Well (ft): 18.0 very soft bottom

Started @ 15:00

Time 24hr	Purge Volume (gal)	Water Level (ft) (TOC)	pH (std units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved oxygen (mg/L)	Temperature (°C)	Clarity (color)	Comments
15:25	2.5	17.63	5.56	0.114	>999	4.46	24.2	tan mod	Consistency of mud
:	—	17.63, i.e. DRY			—				Allowing to recharge for 10 minutes
15:35	—	16.10	—	—	—	—	—	—	Recharge = 1.5 ft/10 mins
09:40	—	—	—	—	—	—	—	—	Started developing w/ peristaltic pump.
07/21/99 11:40	—	—	—	—	—	—	—	—	Pump had removed ≈ 4 gallons. Well is dry
13:44	6.5	14.46	5.79	0.166	>999	3.89	24.4	tan	Pumping very slowly <0.2 gpm
13:49	7.5	Well has been purged to dryness. ≈ 1 more gallon removed							
15:08	7.5	15.20	5.71	0.152	≈100*	4.22	NOT TAKEN	tan	NONE

15:20 Dry again. Removing the peristaltic pump tubing

*Turbidity function not responding properly.

ENTERED 9/23/99 by SM

Groundwater Well Development Log

Fort McClellan , Alabama

Project Number: 780567
Form Completed by: Jason Brown
Well Developed by (firm): Jason Brown/IT, Ken Gobbell/MDC

Parcel No.: CDTF
Well No.: CDTF-126Q-MW04
Date Started: 7-15-99

Monitoring Well Information

Development Method: Bailing and Pumping
Development Equipment: PE Bailer, Honda, Turbidity Meter, Whale Pump
Casing Diameter: 2"

Beginning Measurments
Depth to Water (ft): 23.38 (TOC)
Total depth of Well (ft): 39.92 (TOC)

COMPLETED J. Brown 9-9-99

TOC = Top of Casing

Time 24hr	Purge Volume (gal)	Water Level (ft) (TOC)	pH (std units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved oxygen (mg/L)	Temperature (°C)	Clarity (color)	Comments
10:05	12.75	NOT TAKEN	5.33	0.293	>999	5.94	19.8	TAN	Ken Gobbell, MDC, using bailer
11:32	15.0	↓	5.91	0.251	>999	6.47	21.8	TAN	"
15:15	20.0	↓	5.09	0.249	>999	5.58	22.5	TAN	Jason Brown using Whale pump
:	Well is dry at 20 gallons. Allowing well to recharge								
07/20/99	as per Jason Brown		9/22/99						
10:09	20.25	21.85	5.79	0.284	74	6.69	19.4	TAN	Using PE bailer
10:15	21.25	22.98	5.81	0.327	>999	6.36	18.2	TAN	NONE
10:23	22.50	23.90	5.62	0.355	>999	5.85	18.7	TAN	NONE
10:27	23.75	25.30	5.59	0.322	>999	5.64	18.4	TAN	NONE

Parcel No.: CDTF-126Q
Well ID: CDTF-126Q-MW04
Date: 07/ /99

Time 24hr	Purge Volume (gal)	Water Level (ft) (TOC)	pH (std units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved oxygen (mg/L)	Temperature (°C)	Clarity (color)	Comments
10:35	25.00	27.08	5.52	0.310	>999	5.48	18.0	TAN	NONE
10:40	26.25	28.95	5.58	0.323	>999	5.84	18.1	TAN	NONE
10:47	28.25	31.30	5.58	0.307	>999	5.67	17.8	TAN	NONE
10:54	30.25	33.0	5.61	0.292	>999	6.08	18.0	TAN	NONE
11:15	32.25	33.92	5.91	0.259	>999	5.32	18.8	TAN	
11:23	34.25	37.60	6.06	0.287	>999	5.11	18.3	TAN	
11:30	34.75	DRY	6.06	0.241	>999	4.36	18.7	TAN	
11:40	—	>37' (Bailer left in well :. >37')						~~TAN~~ 98	
07/21/99 14:05	35.0	26.88	5.93	0.238	>999	5.31	19.5	TAN	
14:13	37.0	29.85	5.81	0.244	>999	6.37	18.4	TAN	
14:21	39.0	32.45	5.75	0.211	>999	6.33	18.4	TAN	
14:28	41.0	33.98	5.68	0.201	>999	5.89	18.0	TAN	
14:38	43.0	36.65	5.61	0.197	>999	5.61	18.3	TAN	

1444 44.5 — Well has gone dry.

Completed by:

ORIGINAL - Rewritten to keep consistent format.

Well Development Log

JB 07/27/99

Project Number: 780567
Project Name: Fort McClellan
Form Completed by: Jason Brown
Well Developed by/firm: IT

Site No.: CDTF
Well No.: CDTF-126Q-MW04
Date Started: 7-15-99

Monitoring Well Information

Development Method: Bailing & Pumping
Development Equipment: Bailer, pump, Horiba Turbidity meter

Screen Height (ft): _____
Filter pack lenght (ft): _____
Casing Diameter (in): 2 Inches

Begining Measurements
Depth to Water (ft): 23.38
Total depth of Well (ft): 39.92

Monitoring Well Purge Calculations

Volume of Water in Casing: Gallons/foot = 0.041 x d^2, where casing diameter in inches = (0.041 x (_____)^2) = _____ gal/ft.
Well Volume (gallons) = Water Column (ft) x Gal/ft = 16.54 ft x 0.16 gal/ft = 2.64 gallons

Volume of Water in Filter Pack: (if required)
Gallons/foot = 0.041 x (D^2 - d^2), where D is total borehole diameter in inches & d is casing diameter in inches = 0.041 x ((_____)^2- (_____)^2) = _____ gal/ft.
Filter Pack Volume (gal) = (the less of the filter pack lenght or water column) x gal/ft x porosity (0.3) = (_____)ft x (_____) gal/ft x 0.3 = _____ gal

Purge Well Volume: Purge well Volume = Filter pack volume + Well Volume = NA gal + NA gal = NA gal.

1 x Purge Well Volume	2 x Purge Well Volume	3 x Purge Well Volume	4 x Purge Well Volume	5 x Purge Well Volume

Development Record

Time (24 hrs)	Purge Volume (gal)	Water Level (ft) (TOC)	Turbidity (NTU)	Clarity (color)	Temp. (C)	pH (Std Units)	Conductivity (mS/cm)	DO mg/L	Comments
1005	12.75	Not Taken	999	tan	19.8	5.33	0.293	5.94	Tim Gobbell using PE bailer
1132	15.0	"	999	tan	21.8	5.91	0.251	6.47	"
1515	20.0	"	999	TAN	20.5	5.09	0.249	5.52	Jason Brown using whale pump
Well went dry at 20 gallons. Allowing well to recharge									

Groundwater Well Development Log

Fort McClellan , Alabama

Project Number: 780567
Form Completed by: Jason Brown
Well Developed by (firm): IT Corp.

Site No.: CDTF
Well No.: MW-4
Date Started: 7-15-99

Monitoring Well Information

Development Method: Bailer
Development Equipment: PE bailer, Horiba, Turbidity meter, etc.
Casing Diameter: 2"

Beginning Measurments: N/A
Depth to Water (ft): 23.38 (TOC)
Total depth of Well (ft): 39.92 (TOC)

TOC = Top of Casing

Time 24hr	Purge Volume (gal)	Water Level (ft) (TOC)	pH (std units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved oxygen (mg/L)	Temperature (°C)	Clarity (color)	Comments
10:09	0.25	21.85	5.79	0.284	74	6.69	19.4	tan	1st Bailer
10:15	1.25	22.98	5.81	0.327	>999	6.36	18.2	tan	NONE
10:23	2.50	23.90	5.62	0.355	>999	5.85	18.7	tan	NONE
10:27	3.75	25.30	5.59	0.322	>999	5.64	18.4	tan	NONE
10:35	5.00	27.08	5.52	0.310	>999	5.48	18.0	tan	NONE
10:40	6.25	28.95	5.58	0.323	>999	5.84	18.1	tan	NONE
10:47	8.25	31.30	5.58	0.307	>999	5.67	17.8	tan	NONE
10:54	10.25	33.0	5.61	0.292	>999	6.08	18.0	tan	NONE

CDTF
MW-4

Time 24hr	Purge Volume (gal)	Water Level (ft) (TOC)	pH (std units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved oxygen (mg/L)	Temperature (°C)	Clarity (color)	Comments
11:15	12.25	~~33.8~~ 33.92	5.91	0.259	>999	5.32	18.8	tan	NONC
11:23	14.25	37.60	6.06	0.287	>999	5.11	18.3	tan	None
11:30	14.75	DRY	6.06	0.241	>999	4.36	18.7	tan	well is dry. Will allow to recharge for 10 minutes
11:40	—	>37	—	—	—	—	—	—	Bailer at bottom of well. Did not remove for DTW measurement
07/21/99 ~~26~~:	—							—	
07/21/99 14:05	15.0	26.88	5.93	0.238	>999	5.31	19.5	tan	
14:13	17.0	29.85	5.81	0.244	>999	6.37	18.4	tan	
14:21	19.0	32.45	5.75	0.211	>999	6.33	18.4	tan	
14:28	21.0	33.98	5.68	0.201	>999	5.89	18.0	tan	
14:38	23.0	36.65	5.61	0.197	>999	5.61	18.3	tan	
14:44	24.5	Well has gone dry							
:									
:									
:									
:									

ENTERED 9/23/99

Groundwater Well Development Log

Fort McClellan , Alabama

Project Number: 780567
Form Completed by: Jasuir Brown
Well Developed by (firm): Jeff Tarr, Jason Brown

Parcel No.: 126Q
Well No.: ~~July 9, 1999~~ CDTF-126Q-MW05
Date Started: July 9, 1999

Monitoring Well Information

Development Method: Submersible Pump
Development Equipment: Grundfos and Whale pumps, HORIBA, TURBIDITY METER, etc.
Casing Diameter: 2"

Beginning Measurments
Depth to Water (ft): 8.25' TOC
Total depth of Well (ft): 35.25 TOC

COMPLETED 9-9-99

TOC = TOP OF CASING

Time 24hr	Purge Volume (gal)	Water Level (ft) (TOC)	pH (std units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved oxygen (mg/L)	Temperature (°C)	Clarity (color)	Comments
08:00	0	18.50	6.16	0.241	>999	0.57	20.4	Brown	
08:30	6	23.40	6.22	0.206	>999	6.73	22.0	Brown	
08:48	9.6	27.50	6.31	0.215	>999	1.96	20.8	Brown	
08:54	Development stopped. Well has gone dry. 3.5 minutes for 1' recharge								
09:11	≈ 10.6	23.55	5.96	0.123	>999	2.87	20.9	Brown	
09:30	≈ 14.4	25.82	6.20	0.120	>999	3.22	23.3	Brown	
09:38	~~≈ 16.8~~	Stop development. Well dry. 7 minutes to recharge 2ft							0954 start pump DTW-24.70
10:06	~~≈ 17.0~~ ≈16.8	(STOP PUMP)		No reading Taken.					

Parcel No.: 126Q
Well ID: CDTF-126Q-MW05
Date: July 9, 1999

Time 24hr	Purge Volume (gal)	Water Level (ft) (TOC)	pH (std units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved oxygen (mg/L)	Temperature (°C)	Clarity (color)	Comments
10:20	17.0	24.0	5.92	0.117	>999	NOT TAKEN	21.9	Brown (Lt)	Restart pump @ 1019. DTW 24.0'
10:30	19.0	NOT TAKEN	5.70	0.139	>999	4.07	24.2	—	
10:35	STOP	Purge Well dry.	6 minutes to recharge 1 foot. Restart pump @ 1047 DTW 24.0'						
10:50	Stop. Well dry.	—							
11:05	≈ 19.0	28.20	5.70	0.139	>999	NOT TAKEN	24.2	BROWN	Dropped pump to 33' below TOC. Restart pump 1103.
11:11	≈ 20.5	28.51	6.07	0.123	>999	5.01	23.7	BROWN	
11:27	≈ 23.5	29.20	5.79	0.104	>999	4.64	24.0	BROWN	
11:42	≈ 26.5	32.25	5.55	0.090	>999	5.00	23.5	Brown	
11:55	≈ 29.2	Pump Stopped. Well Went Dry.							
12:10	—	26.71	-						
:									
:									
:									

Total depth from TOC after pumping = 37.90'

Parcel No.: CDTF-126Q
Well ID: MW-5
Date: 07/20/99

13.45' DTW and rising when started. ← Notice

Time 24hr	Purge Volume (gal)	Water Level (ft) (TOC)	pH (std units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved oxygen (mg/L)	Temperature (°C)	Clarity (color)	Comments
16:30	30 total	13.65	5.87	0.153	>1000	4.01	25.8	rd,brn	Using Whale Pump
16:39	32.5	19.10	5.74	0.142	>1000	4.62	23.5	rd,brn	
16:58	35.0	19.45	5.59	0.151	780	3.87	23.5	rd,brn	
17:11	36.5	21.8	5.49	0.139	790	3.80	22.5	rd,brown	
17:25	39.0	23.90	5.50	0.142	>999	~~4~~ 3.73	22.4	rd,brn	
17:30	40	24.30	5.39	0.132	>999	3.30	21.3	rd brn	Stopping for the day. Will return tomorrow 7/21/99
07/21/199 09:58	9.	9.40	Starting DTW.						
10:02	39.5	15.0	5.95	0.125	858	3.44	25.1	rd,brn	
10:11	42.5	20.20	5.99	0.123	>999	4.15	22.2	rd,brn	
10:32	47.0	24.30	5.97	0.131	651	3.63	21.7	rd,brn	
10:54	50.0	26.08	5.96	0.112	358	3.85	22.3	"	
11:23	53.5	26.43	5.91	0.108	832	3.50	23.2	rd,brn	
12:02	57.5	26.20	5.84	0.089	367	3.63	23.4		

Parcel No.: CDTF-126Q
Well ID: MW-5
Date: 07/21/99

Time 24hr	Purge Volume (gal)	Water Level (ft) (TOC)	pH (std units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved oxygen (mg/L)	Temperature (°C)	Clarity (color)	Comments
12:52	63.5	25.55	5.82	0.088	790	3.60	25.3°C	rdbrown	NONE
13:10	66.5	26.93	5.72	0.074	943		23.5°C	rdbrown	NONE
: 8 hour requirement met. JP									Purged (developed) well for 8 hours.
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:									

Completed by:

Well Development Log

Project Number: 780567
Project Name: Fort McClellan
Form Completed by: Jeff Tarr
Well Developed by/firm: Miller Drilling / IT Group.

Site No.: Parcel 126Q
Well No.: CDTF-126Q-MW05
Date Started: July 9, 1999

Monitoring Well Information

Development Method: Submersible Pump
Development Equipment: Grundfos submersible Pump.

Screen Height (ft): 20'
Filter pack lenght (ft):
Casing Diameter (in): 2"

Begining Measurements

Depth to Water (ft): 8.25'
Total depth of Well (ft): 35.25' (Top of Casing)

Monitoring Well Purge Calculations

Volume of Water in Casing: Gallons/foot = 0.041 x d^2, where casing diameter in inches = (0.041 x (_____)^2) = _____ gal/ft.
Well Volume (gallons) = Water Column (ft) x Gal/ft = 27 ft x .16 gal/ft = 4.32 gallons

Volume of Water in Filter Pack: (if required)
Gallons/foot = 0.041 x (D^2 - d^2), where D is total borehole diameter in inches & d is casing diameter in inches = 0.041 x ((_____)^2- (_____)^2) = _____ gal/ft.
Filter Pack Volume (gal) = (the less of the filter pack lenght or water column) x gal/ft x porosity (0.3) = (_____)ft x (_____) gal/ft x 0.3 = _____ gal

Purge Well Volume: Purge well Volume = Filter pack volume + Well Volume = NA gal + NA gal = NA gal.

1 x Purge Well Volume	2 x Purge Well Volume	3 x Purge Well Volume	4 x Purge Well Volume	5 x Purge Well Volume
4.32	8.64	12.96	17.28	21.60

Development Record

Time (24 hrs)	Purge Volume (gal)	Water Level (ft) (TOC)	Turbidity (NTU)	Clarity (color)	Temp. (C)	pH (Std Units)	Conductivity (mS/cm)	Comments	Amount Removed
800	0	18.50	>999	Brown	20.4°	6.16	0.241	Initial Reading DO 0.57	mg/L 0
830	6	23.40	>999	Brown	22.0°	6.22	0.206	Pump rate 0.2gpm DO 0.73	
0848	9.6	27.50	>999	Brown	20.8	6.31	0.215	DO 1.96	
0854	Stop purge. Well dry.		3.5 minutes to recharge 1 ft.						
911	≈ 10.6	23.55	>999	Brown	20.9°	5.96	0.123	DO 2.87	
930	≈ 14.4	25.82	>999	Brown	23.3°	6.20	0.120	DO 3.22	
938	STOP Purge. Well dry.		7 minutes to Recharge 2FT				954 START	Pump. D.T.W: 24.70	
1006	≈ 16.8	(STOP Pump)	NO READING TAKEN.						
1020	≈ 17.0	24.0'	>999	Brown (cl)	21.9	5.92	0.117	Restart Pump at 1019 D.T.W 24.0'	
1030	≈ 19.0		7999		24.2	5.70	0.139	DO 4.07	
1035	STOP Purge. Well dry.		6 minutes to Recharge 1 Foot.					Restart Pump at 1047 D.T.W 29.0'	

* approximately 0.5' of sediment in sump at begining of purge

Stopped at 1050 (Dry)

Well Development Log

Parcel No: 126Q
FTMC Site No.:
Well No.: CDTF-126Q-MW05
Date Started: 7/9/99

Development Record (continuation)

Time (24 hrs)	Purge Volume (gal)	Water Level (ft) (TOC)	Turbidity (NTU)	Clarity (color)	Temp. (C)	pH (Std Units)	Conductivity (mS/cm)	Comments
1105	≈19.0	28.20'	>999	Brown.	24.2	5.70	0.139	Dropped Pump to 33' below TOC. Restart Pump 1118
1111	≈20.5	28.51'	>999	Brown.	23.7	6.07	0.123	DO = 5.01 mg/L
1127	≈23.5	29.20'	>999	Brown.	24.0	5.79	0.104	DO = 4.64 mg/L
1142	≈26.5	32.25'	>999	Brown	23.5	5.55	0.090	DO = 5.00 mg/L
1155	≈29.2	Pump stopped; Well went Dry.						
1210		26.71						

Range and Average Discharge Rate:
Maximum Drawdown during Development: at gpm.
Disposition of Development Water: Drums Baker Tank Other
Number of Containers for Development Water:

Comments:

Final Measurements

Total depth of Well (ft):

Date Completed:

Hours Developed:

Total Depth from TOC after Pumping 37.90'

ENTERED 9/23/99

Groundwater Well Development Log

Fort McClellan , Alabama

COMPLETED 9/9/99

Project Number: 780567
Form Completed by: Jason Brown
Well Developed by (firm): Jeff Inc / IT

Parcel No.: CDTF-126Q
Well No.: MW06
Date Started: 07/14/99

Monitoring Well Information

Development Method: Bail, pump
Development Equipment: Whale pump, PE bailer, HORIBA TURBIDITY meter.
Casing Diameter: 2"

Beginning Measurments
Depth to Water (ft): 12.74
Total depth of Well (ft): 24.95

Time 24hr	Purge Volume (gal)	Water Level (ft) (TOC)	pH (std units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved oxygen (mg/L)	Temperature (°C)	Clarity (color)	Comments
14:45	10	NOT TAKEN							Bailed due to high silt content.
14:55	20	NOT TAKEN	5.00	0.113	>999	1.27	21.5	Brown	
15:05	30	NOT TAKEN	4.75	0.090	>999	3.11	21.4	Brown	
15:15	40	NOT TAKEN						Murky	Pumped Dry
15:20	45	21.01	5.12	0.081	>999	3.70	21.5	Murky	
15:30	55	20.74	4.85	0.078	>999	2.00	21.7	Murky	
15:40	65	20.51	4.72	0.075	>999	2.00	23.0	Murky	
—	Switch	pump							

Parcel No.: CDTF-126Q
Well ID: MW06
Date: 07/14/99

Time 24hr	Purge Volume (gal)	Water Level (ft) (TOC)	pH (std units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved oxygen (mg/L)	Temperature (°C)	Clarity (color)	Comments
16:10	67.5	20.51	5.07	0.068	139	3.02	22.8	TAN	
16:21	70	20.69	4.53	0.057	112	1.59	22.5	TAN	
16:45	76	21.01	4.78	0.056	3	1.89	22.8	Clear	
17:00	80	21.05	4.72	0.054	3	2.15	21.9	Clear	
17:15	84	21.06	4.91	0.052	1	2.22	22.7	Clear	⊕ Pumped well for 2 1/2 hours.
:									
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:									
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:									

Transcribed 07/29/99 in order to remain consistent in the development log used.

Well Development Log

Project Number: 780567
Project Name: Fort McClellan
Form Completed by: Jeff Tarr / Jason Brown
Well Developed by/firm: IT

Site No.:
Well No.: CDTF-1268-MW06
Date Started: 7-14-99

Monitoring Well Information

Development Method: Bail / Pump
Development Equipment: Whale pump, PE bailer

Screen Height (ft):
Filter pack lenght (ft):
Casing Diameter (in):

Begining Measurements
Depth to Water (ft): 12.74 (TOC)
Total depth of Well (ft): 29.95 (TOC)

Monitoring Well Purge Calculations

Volume of Water in Casing: Gallons/foot = 0.041 x d^2, where casing diameter in inches = (0.041 x (_____)^2) = _____ gal/ft.
Well Volume (gallons) = Water Column (ft) x Gal/ft = 12.21 ft x 0.16 gal/ft = 1.95 gallons

Volume of Water in Filter Pack: (if required)
Gallons/foot = 0.041 x (D^2 - d^2), where D is total borehole diameter in inches & d is casing diameter in inches = 0.041 x ((_____)^2- (_____)^2) = _____ gal/ft.
Filter Pack Volume (gal) = (the less of the filter pack lenght or water column) x gal/ft x porosity (0.3) = (_____)ft x (_____) gal/ft x 0.3 = _____ gal

Purge Well Volume: Purge well Volume = Filter pack volume + Well Volume = NA gal + NA gal = NA gal.

1 x Purge Well Volume	2 x Purge Well Volume	3 x Purge Well Volume	4 x Purge Well Volume	5 x Purge Well Volume
1.95	3.90	5.85	7.80	9.75

Development Record

Time (24 hrs)	Purge Volume (gal)	Water Level (ft) (TOC)	Turbidity (NTU)	Clarity (color)	Temp. (C)	pH (Std Units)	Conductivity (mS/cm)	Comments
1445	10							BAILED DUE TO high SIT CONT.
1455	20		999	BROWN	21.5°	5.00	0.113	DO 1.27 mg/L
1505	30		999	BROWN	21.4°	4.75	0.090	DO 3.11 mg/L
1515	40			MUIKY				PUMPED DRY
1520	45	21.01'	999	MUIKY	21.5°	5.12	0.081	DO 3.70 mg/L
1530	55	20.74'	999	MUIKY	21.7°	4.85	0.078	DO 2.00 mg/L
1540	65	20.51'	999	MUIKY	23.0°	4.72	0.075	DO 2.00
SWITCH	PUMP				~~22.8~~	~~5.07~~	~~0.068~~	93
1610	~~75~~ 67.5	20.51	139	tan	22.8	5.07	0.068	DO 3.02 mg/L
1621	70	20.69	112	TAN	22.5	4.53	0.057	DO 1.59
1645	76	21.01	3	CLEAR	22.8	4.78	0.050	DO 1.89

① PURGED BAILED 10 GALLONS prior TO PUMPING
PUMP RATE 1 gpm
RESTART NEW FULL PUMP AT 1600 PUMP RATE 0.25 gpm

Well Development Log

Project Number: 780567
Project Name: Fort McClellan
Form Completed by: JEFF MAY
Well Developed by/firm: JT / JT Corp.

Site No.:
Well No.: CDTF-1260-MW06
Date Started: 7-14-99

Monitoring Well Information

Development Method: BAIL/PUMP
Development Equipment: WHALE PUMP, PE BAILER, HORIBA TURBIDITY METER.

Screen Height (ft):
Filter pack lenght (ft):
Casing Diameter (in):

Begining Measurements
Depth to Water (ft):
Total depth of Well (ft):

Monitoring Well Purge Calculations

Volume of Water in Casing: Gallons/foot = 0.041 x d^2, where casing diameter in inches = (0.041 x (_____)^2) = _____ gal/ft.
Well Volume (gallons) = Water Column (ft) x Gal/ft = _____ ft x _____ gal/ft = _____ gallons

Volume of Water in Filter Pack: (if required)
Gallons/foot = 0.041 x (D^2 - d^2), where D is total borehole diameter in inches & d is casing diameter in inches = 0.041 x ((_____)^2- (_____)^2) = _____ gal/ft.
Filter Pack Volume (gal) = (the less of the filter pack lenght or water column) x gal/ft x porosity (0.3) = (_____)ft x (_____) gal/ft x 0.3 = _____ gal

Purge Well Volume: Purge well Volume = Filter pack volume + Well Volume = _____ gal + _____ gal = _____ gal.

1 x Purge Well Volume	2 x Purge Well Volume	3 x Purge Well Volume	4 x Purge Well Volume	5 x Purge Well Volume

Development Record

Time (24 hrs)	Purge Volume (gal)	Water Level (ft) (TOC)	Turbidity (NTU)	Clarity (color)	Temp. (C)	pH (Std Units)	Conductivity (mS/cm)	Comments
1700	80	21.05	3	CLEAR	21.9	4.72	.054	DO = 2.15 mg/L
1715	84	21.06	1	CLEAR	22.7	4.91	.052	DO = 2.22 mg/L