Appendix B

MV-4 Data

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Table B−1. MV-4 Chronology

Date	Time	Depth (ft bgs)	Activity
04/16/09 through 04/22/09	NA	NA	Mobilization to CNTA and rig-up to drill
04/22/09	15:45	0	Rig inspection and drill pad walk through inspection, continue with preparations for drilling.
04/22/09	21:50	0	Begin drilling 31-inch diameter conductor casing borehole
04/23/09	10:10	100	Advanced 31-inch borehole to completion depth
04/24/09	00:15	100	Completed tripping out of hole, setting, and cementing 24-inch diameter CS surface casing with 210 ft^3 cement.
04/24/09	13:00	100	Begin drilling 12.25-inch borehole using conventional mud rotary method, switch to flooded reverse circulation method at about 265 ft.
04/24/09	14:40	130	Sampling of drill fluid for tritium and bromide begins.
04/27/09	19:00	1,405	From 1,405 to 1,418 ft, drilling rate slows, change in torque curves on geolograph, lithology change, change in deviation all indicate that fault probably encountered at 1,405 to 1,418 ft.
04/29/09	05:15	2,223	TD of borehole reached.
04/29/09	17:55	NA	Circulate fluids in borehole and tripped out drill string.
04/29/09	19:50	NA	COLOG arrives and begins first phase of logging.
05/01/09	00:30	NA	COLOG completes first phase of logging and leaves site.
05/01/09	09:45	NA	Finish tripping in BQ and NQ tremie pipe and piezometer to 1,000 ft.
05/01/09	23:14	NA	Finish tripping in 5.5-inch well casing and complete pipe tally - 2,066.68 ft is landed.
05/02/09	11:10	NA	Finish mixing and placing cement through NQ tremie pipe and tagged depth at 2,098 ft.
05/03/09	04:05	NA	Completed placing 1/8 to 1/4 inch gravel to depth of 1,701 ft.
05/03/09	13:15	NA	Completed placing No. 6 sand to depth of 1,640 ft.
05/04/09	05:15	NA	Problems with placing bentonite; completed placing cement between well and piezometer, tagged top of cement at 1,032 ft.
05/04/09	14:00	NA	Completed installation of gravel, sand, and bentonite for piezometer; COLOG completes final phase of logging and leaves site.
05/05/09	05:00	NA	Completed cementing well and piezometer casing to surface.
05/05/09	22:00	NA	Completed tripping in HQ eductor and AQ airline and start air lift development of well.
05/07/09	03:30	NA	Completed air lift development of well and tripped out HQ eductor and AQ airline.
05/07/09	19:30	NA	Completed tripping in airline to piezometer and completed air lift development and tripped out airline.
05/08/09	02:00	NA	Completed tripping in HQ eductor and AQ airline for another 12-hour period of development for well.
05/09/09	02:00	NA	Completed a second round of air lift development of well and tripped out HQ eductor and AQ airline.
05/18/09	17:30	NA	COLOG completed NAIL for MV-4.
05/25/09	10:30	NA	Pump crew begins installing Grundfos® 10S50-58DS stainless-steel pump in MV-4.
05/26/09	13:15	NA	Pump crew completes Grundfos® pump installation, intake set at 1,711 ft.
05/27/09	11:06	NA	Start final development and sampling from MV-4 pump.

Table B−1 (continued). MV-4 Chronology

Date	Time	Depth (ft bgs)	Activity
05/27/09	18:00	NA	Continued final development of MV-4 well and started rising head recovery test.
05/28/09	08:53	NA	Continued final development of MV-4 well and start pump drawdown test.
05/28/09	19:15	NA	Completed final development of MV-4 well for the day and turned off pump − rising/falling head tests completed.
05/29/09	08:00	NA	Begin pumping and sampling, final development.
05/29/09	20:00	NA	End pumping and sampling.
05/30/09	08:00	NA	Begin pumping and sampling, final development.
05/30/09	20:00	NA	End pumping and sampling.
05/31/09	08:00	NA	Begin pumping and sampling, final development.
05/31/09	20:00	NA	End pumping and sampling.
06/01/09	08:00	NA	Begin pumping and sampling, final development.
06/01/09	20:00	NA	End pumping and sampling.
06/03/09	07:00	NA	Begin pumping and sampling, final development.
06/03/09	16:00	NA	End pumping and sampling.

NA = Not applicable

Table B−2. CNTA MV-4 Well Construction Materials

Construction	Material	Type	Interval (ft)	Stemming Material	Volume (ft^3)	Interval (ft)
Surface Casing	24-in. CS Casing	Blank	0.0 – 100.0	Cement Seal	210	0.0 – 100.0
Piezometer Casing	2.375-in. CS Flush Joint Tubing	Blank	+0.7 – 918.25	3/8-in. Bentonite Chips	12.5	843.0 – 863.0
		Screen	918.25 – 978.25	No. 6 Sand Pack	11.2	863.0 – 881.0
		Blank w/end cap	978.25 – 998.40	1/8-1/4-in. Gravel Pack	95.1	881.0 – 1,032.0
Bottom Seal	NA			Cement Seal	397.3	1,032.0 – 1,640.0
Monitor Well Casing	5.5-in. CS Casing (Internal Ceramic Coated)	Blank	+ 0.6 – 1,719.33	Cement Seal	783.2	0.0 – 843.0
		Screen	1,719.33 – 2,023.43	No. 6 Sand Pack	39.8	1,640.0 – 1,701.0
		Blank w/end cap	2,023.43 – 2,064.18	1/8-1/4-in. Gravel Pack	265	1,701.0 – 2,098.0
Bottom Seal	NA			Cement Seal	102.3	2,098.0 – 2,223.0
Submersible pump	Grundfos® 10S50-58DS Pump	Top	1,706.0	NA		
		Intake	1,711.0	NA		
		Bottom	1,713.0	NA		
Pump Riser Pipe	1.0-in. CS EUE	Blank	+0.9 – 1,706.0	NA		
Water Access Tubing	1.25-in. Flush Joint Schedule 80 PVC	Blank	+0.9 – 1,666.0	NA		
		Screen w/end cap	1,666.0 – 1,706.0	NA		

CS = Carbon steel
ft = Feet
ft^3 = Cubic feet
in. = Inch
NA = Not applicable
PVC = Polyvinyl chloride
EUE = External upset ends

Table B−3. MV-4 Tritium Results

Sample Identification	Date	Time	Depth (ft)	MDA (dpm)	Tritium (pCi/L)	MDC (pCi/L)
Well Drilling						
MV-4; 100 ft	04/23/09	1058	100	38.65	-2072	3482
MV-4; 130 ft	04/24/09	1450	130	37.72	-1981	3398
MV-4; 145 ft	04/24/09	1825	145	38.73	-1711	3489
MV-4; 175 ft	04/24/09	2000	175	35.47	-3063	3195
MV-4; 200 ft	04/24/09	2110	200	39.57	-360	3565
MV-4; 225 ft	04/24/09	2230	225	37.88	-2072	3412
MV-4; 250 ft	04/25/09	0204	250	36.84	-2252	3319
MV-4; 280 ft	04/25/09	0621	280	37.02	-180	3335
MV-4; 320 ft	04/25/09	0710	320	37.95	-1261	3419
MV-4; 370 ft	04/25/09	0855	370	36.32	-270	3272
MV-4; 420 ft	04/25/09	0955	420	37.58	-2882	3386
MV-4; 490 ft	04/25/09	1100	490	36.11	-3783	3253
MV-4; 545 ft	04/25/09	1245	545	36.38	-5045	3277
MV-4; 595 ft	04/25/09	1345	595	38.15	-360	3437
MV-4; 625 ft	04/25/09	1445	625	38.96	-2432	3510
MV-4; 670 ft	04/25/09	1545	670	36.75	-2702	3311
MV-4; 690 ft	04/25/09	1715	690	36.86	-3783	3321
MV-4; 740 ft	04/25/09	1815	740	38.25	-90	3446
MV-4; 770 ft	04/25/09	1915	770	38.16	-4144	3438
MV-4; 810 ft	04/25/09	2015	810	40.96	-4144	3690
MV-4; 855 ft	04/25/09	2115	855	39.10	-2342	3523
MV-4; 885 ft	04/25/09	2215	885	38.90	-3693	3504
MV-4; 910 ft	04/25/09	2315	910	38.59	-1261	3477
MV-4; 950 ft	04/26/09	0120	950	37.56	-900	3384
MV-4; 980 ft	04/26/09	0215	980	39.68	-450	3574
MV-4; 1010 ft	04/26/09	0315	1010	36.77	-2792	3312
MV-4; 1040 ft	04/26/09	0415	1040	38.21	-450	3442
MV-4; 1060 ft	04/26/09	0509	1060	38.53	-1621	3471
MV-4; 1090 ft	04/26/09	0609	1090	36.16	-4324	3257
MV-4; 1130 ft	04/26/09	0812	1130	35.97	-3693	3241
MV-4; 1170 ft	04/26/09	0930	1170	35.31	-5225	3181
MV-4; 1190 ft	04/26/09	1005	1190	38.71	-360	3488
MV-4; 1230 ft	04/26/09	1222	1230	37.11	-4684	3343
MV-4; 1265 ft	04/26/09	1320	1265	37.17	-720	3348
MV-4; 1300 ft	04/26/09	1420	1300	36.51	-1621	3290
MV-4; 1325 ft	04/26/09	1520	1325	37.73	-360	3399
MV-4; 1350 ft	04/26/09	1620	1350	37.69	810	3395
MV-4; 1370 ft	04/26/09	1720	1370	35.66	-2072	3212
MV-4; 1390 ft	04/26/09	1820	1390	36.19	180	3261
MV-4; 1410 ft	04/26/09	1920	1410	35.84	-630	3229
MV-4; 1430 ft	04/26/09	2030	1430	37.35	-1261	3365
MV-4; 1450 ft	04/26/09	2130	1450	37.15	-1711	3347
MV-4; 1470 ft	04/26/09	2300	1470	37.29	540	3359
MV-4; 1500 ft	04/27/09	0030	1500	36.57	0	3295
MV-4; 1520 ft	04/27/09	0214	1520	37.47	-1351	3376

Table B−3 (continued). MV-4 Tritium Results

Sample Identification	Date	Time	Depth (ft)	MDA (dpm)	Tritium (pCi/L)	MDC (pCi/L)
MV-4; 1550 ft	04/27/09	0351	1550	37.08	-270	3341
MV-4; 1570 ft	04/27/09	0530	1570	35.20	-2612	3172
MV-4; 1600 ft	04/27/09	0630	1600	35.52	-2972	3200
MV-4; 1610 ft	04/27/09	0823	1610	37.89	-90	3413
MV-4; 1630 ft	04/27/09	0930	1630	37.42	-990	3371
MV-4; 1650 ft	04/27/09	1030	1650	36.56	180	3293
MV-4; 1665 ft	04/27/09	1115	1665	37.30	-900	3361
MV-4; 1685 ft	04/27/09	1335	1685	35.93	-2162	3237
MV-4; 1710 ft	04/27/09	1430	1710	35.62	-1981	3209
MV-4; 1730 ft	04/27/09	1535	1730	37.15	-3153	3347
MV-4; 1755 ft	04/27/09	1700	1755	37.93	-1081	3417
MV-4; 1780 ft	04/27/09	1810	1780	36.26	-990	3266
MV-4; 1800 ft	04/27/09	1915	1800	36.77	-450	3313
MV-4; 1820 ft	04/27/09	2015	1820	38.61	-1261	3478
MV-4; 1840 ft	04/27/09	2125	1840	36.07	-540	3250
MV-4; 1855 ft	04/27/09	2315	1855	36.55	-2342	3293
MV-4; 1880 ft	04/28/09	0200	1880	35.51	-3873	3199
MV-4; 1900 ft	04/28/09	0333	1900	35.67	-3963	3213
MV-4; 1910 ft	04/28/09	0500	1910	36.43	-2522	3282
MV-4; 1927 ft	04/28/09	0700	1927	37.19	-2612	3351
MV-4; 1950 ft	04/28/09	0849	1950	38.96	990	3510
MV-4; 1970 ft	04/28/09	1023	1970	37.27	-990	3357
MV-4; 1980 ft	04/28/09	1105	1980	38.49	-1171	3468
MV-4; 2005 ft	04/28/09	1330	2005	36.74	810	3310
MV-4; 2028 ft	04/28/09	1435	2028	37.89	-900	3414
MV-4; 2040 ft	04/28/09	1530	2040	36.56	-90	3294
MV-4; 2070 ft	04/28/09	1715	2070	37.27	180	3358
MV-4; 2095 ft	04/28/09	1840	2095	36.49	-720	3287
MV-4; 2112 ft	04/28/09	2010	2112	36.84	90	3319
MV-4; 2132 ft	04/28/09	2145	2132	37.00	0	3333
MV-4; 2157 ft	04/28/09	2305	2157	36.34	-2882	3274
MV-4; 2170 ft	04/29/09	0130	2170	37.67	-1981	3393
MV-4; 2190 ft	04/29/09	0304	2190	37.79	270	3405
MV-4; 2210 ft	04/29/09	0447	2210	36.97	-3063	3331
Well Development - Air						
MV-4; Well Dev.	05/06/09	0045	WD	35.97	-180	3241
MV-4; Well Dev.	05/06/09	0240	WD	36.56	360	3294
MV-4; Well Dev.	05/06/09	0435	WD	36.64	-720	3301
MV-4; Well Dev.	05/06/09	0645	WD	36.13	-900	3255
MV-4; Well Dev.	05/06/09	0905	WD	36.87	-1171	3322
MV-4; Well Dev.	05/06/09	1050	WD	35.10	-990	3162
MV-4; Well Dev.	05/06/09	1400	WD	37.76	-450	3402
MV-4; Well Dev.	05/06/09	1640	WD	38.94	360	3508
MV-4; Well Dev.	05/06/09	1910	WD	35.08	-1351	3161
MV-4; Well Dev.	05/06/09	2145	WD	36.74	-4234	3310

Table B−3 (continued). MV-4 Tritium Results

Sample Identification	Date	Time	Depth (ft)	MDA (dpm)	Tritium (pCi/L)	MDC (pCi/L)
Piezometer Development - Air						
MV-4; Well Dev.	05/07/09	0725	WD	36.20	-810	3261
MV-4; Well Dev.	05/07/09	0825	WD	37.40	-1441	3369
MV-4; Well Dev.	05/07/09	0943	WD	34.97	-90	3151
MV-4; Well Dev.	05/07/09	1100	WD	37.06	630	3339
MV-4; Well Dev.	05/07/09	1415	WD	36.13	-1441	3255
MV-4; Well Dev.	05/07/09	1620	WD	35.69	-180	3215
MV-4; Well Dev.	05/07/09	1805	WD	36.20	-810	3261
Well Development - Air						
MV-4; Well Dev.	05/08/09	0205	WD	36.91	270	3325
MV-4; Well Dev.	05/08/09	0325	WD	34.84	-3423	3139
MV-4; Well Dev.	05/08/09	0500	WD	36.42	-1441	3281
MV-4; Well Dev.	05/08/09	0630	WD	37.14	-360	3346
MV-4; Well Dev.	05/08/09	0800	WD	36.24	0	3265
MV-4; Well Dev.	05/08/09	0930	WD	35.74	-360	3219
MV-4; Well Dev.	05/08/09	1100	WD	36.44	-1621	3283
MV-4; Well Dev.	05/08/09	1217	WD	36.25	-2072	3266
MV-4; Well Dev.	05/08/09	1410	WD	37.50	-1081	3378
MV-4; Well Dev.	05/08/09	1520	WD	34.34	-720	3093
MV-4; Well Dev.	05/08/09	1643	WD	37.30	-810	3360
MV-4; Well Dev.	05/08/09	1744	WD	36.00	-1081	3243
MV-4; Well Dev.	05/08/09	1900	WD	38.30	-360	3450
MV-4; Well Dev.	05/08/09	2000	WD	35.86	-1171	3231
MV-4; Well Dev.	05/08/09	2115	WD	36.73	0	3309
MV-4; Well Dev.	05/08/09	2215	WD	36.27	-900	3267
Well Development - Pump						
MV-4; Well Dev.	05/27/09	1330	WD	36.84	-2342	3319
MV-4; Well Dev.	05/27/09	1345	WD	36.78	-270	3314
MV-4; Well Dev.	05/27/09	1420	WD	36.34	-1531	3416
MV-4; Well Dev.	05/27/09	1515	WD	36.62	-1531	3274
MV-4; Well Dev.	05/27/09	1615	WD	34.22	-2432	3299
MV-4; Well Dev.	05/27/09	1720	WD	36.93	-360	3082
MV-4; Well Dev.	05/27/09	1810	WD	36.96	-2072	3327
MV-4; Well Dev.	05/28/09	1225	WD	39.46	-810	3330
MV-4; Well Dev.	05/28/09	1255	WD	38.14	-3063	3436
MV-4; Well Dev.	05/28/09	1310	WD	38.33	-2162	3453
MV-4; Well Dev.	05/28/09	1410	WD	37.14	-1441	3346
MV-4; Well Dev.	05/28/09	1515	WD	37.98	-2972	3422
MV-4; Well Dev.	05/28/09	1610	WD	36.35	-4954	3275
MV-4; Well Dev.	05/28/09	1700	WD	38.79	-2252	3494
MV-4; Well Dev.	05/28/09	1800	WD	39.30	-720	3540
MV-4; Well Dev.	05/28/09	1900	WD	38.44	-720	3463
MV-4; Well Dev.	05/29/09	0800	WD	34.72	270	3128
MV-4; Well Dev.	05/29/09	0900	WD	35.10	180	3162
MV-4; Well Dev.	05/29/09	1000	WD	35.98	630	3241
MV-4; Well Dev.	05/29/09	1100	WD	33.98	-630	3061
MV-4; Well Dev.	05/29/09	1230	WD	36.44	-270	3283

Table B−3 (continued). MV-4 Tritium Results

Sample Identification	Date	Time	Depth (ft)	MDA (dpm)	Tritium (pCi/L)	MDC (pCi/L)
MV-4; Well Dev.	05/29/09	1330	WD	36.35	-900	3275
MV-4; Well Dev.	05/29/09	1430	WD	36.09	-1261	3251
MV-4; Well Dev.	05/29/09	1530	WD	37.39	-1171	3369
MV-4; Well Dev.	05/29/09	1700	WD	35.25	-540	3175
MV-4; Well Dev.	05/29/09	1800	WD	35.65	-630	3211
MV-4; Well Dev.	05/29/09	1910	WD	35.27	-1621	3178
MV-4; Well Dev.	05/29/09	2000	WD	36.34	-720	3273
MV-4; Well Dev.	05/30/09	0800	WD	35.36	-90	3185
MV-4; Well Dev.	05/30/09	0900	WD	35.59	450	3206
MV-4; Well Dev.	05/30/09	1000	WD	36.47	-270	3285
MV-4; Well Dev.	05/30/09	1100	WD	34.23	-1801	3084
MV-4; Well Dev.	05/30/09	1245	WD	36.30	-2072	3270
MV-4; Well Dev.	05/30/09	1400	WD	37.60	-810	3388
MV-4; Well Dev.	05/30/09	1500	WD	36.39	-900	3278
MV-4; Well Dev.	05/30/09	1600	WD	38.81	-2162	3496
MV-4; Well Dev.	05/30/09	1700	WD	38.08	-1261	3431
MV-4; Well Dev.	05/30/09	1800	WD	38.45	-1801	3464
MV-4; Well Dev.	05/30/09	1900	WD	37.55	-1801	3383
MV-4; Well Dev.	05/30/09	2000	WD	38.04	-900	3427
MV-4; Well Dev.	05/31/09	0800	WD	37.11	540	3344
MV-4; Well Dev.	05/31/09	0900	WD	35.61	-450	3208
MV-4; Well Dev.	05/31/09	1000	WD	34.60	540	3117
MV-4; Well Dev.	05/31/09	1100	WD	35.18	-360	3169
MV-4; Well Dev.	05/31/09	1240	WD	36.17	-1801	3258
MV-4; Well Dev.	05/31/09	1300	WD	35.68	-3063	3215
MV-4; Well Dev.	05/31/09	1400	WD	35.69	-3243	3215
MV-4; Well Dev.	05/31/09	1500	WD	35.94	-2702	3238
MV-4; Well Dev.	05/31/09	1600	WD	36.29	-1531	3269
MV-4; Well Dev.	05/31/09	1700	WD	36.37	-2792	3277
MV-4; Well Dev.	05/31/09	1800	WD	37.47	-900	3376
MV-4; Well Dev.	05/31/09	1900	WD	37.21	-1081	3353
MV-4; Well Dev.	05/31/09	2000	WD	38.88	270	3503
MV-4; Well Dev.	06/01/09	0800	WD	37.51	720	3379
MV-4; Well Dev.	06/01/09	0900	WD	37.32	-1351	3362
MV-4; Well Dev.	06/01/09	1000	WD	35.77	90	3222
MV-4; Well Dev.	06/01/09	1100	WD	37.21	900	3352
MV-4; Well Dev.	06/01/09	1232	WD	35.12	180	3164
MV-4; Well Dev.	06/01/09	1300	WD	34.87	-180	3141
MV-4; Well Dev.	06/01/09	1400	WD	35.59	-810	3207
MV-4; Well Dev.	06/01/09	1500	WD	35.73	-720	3219
MV-4; Well Dev.	06/01/09	1600	WD	35.00	-90	3153
MV-4; Well Dev.	06/01/09	1700	WD	34.75	-630	3131
MV-4; Well Dev.	06/01/09	1800	WD	33.96	-630	3060
MV-4; Well Dev.	06/01/09	1900	WD	36.31	-720	3271
MV-4; Well Dev.	06/01/09	2000	WD	36.48	360	3286
MV-4; Well Dev.	06/03/09	0700	WD	35.82	-180	3227
MV-4; Well Dev.	06/03/09	0800	WD	35.15	-450	3166

Table B−3 (continued). MV-4 Tritium Results

Sample Identification	Date	Time	Depth (ft)	MDA (dpm)	Tritium (pCi/L)	MDC (pCi/L)
MV-4; Well Dev.	06/03/09	0900	WD	36.75	450	3310
MV-4; Well Dev.	06/03/09	1000	WD	35.82	-180	3227
MV-4; Well Dev.	06/03/09	1100	WD	35.86	810	3231
MV-4; Well Dev.	06/03/09	1228	WD	35.54	270	3202
MV-4; Well Dev.	06/03/09	1300	WD	34.95	-1081	3149
MV-4; Well Dev.	06/03/09	1400	WD	34.91	-540	3145
MV-4; Well Dev.	06/03/09	1500	WD	34.21	-90	3082
MV-4; Well Dev.	06/03/09	1600	WD	34.24	-990	3085

ft = Feet
dpm = Disintegrations per minute
MDA = Minimum detectable activity
pCi/L = Picocuries per liter
MDC = Minimum detectable concentration
WD = Well development

Table B−4. MV-4 Water Quality Parameter Results

Date	Time	Depth (ft)	pH (SU)	Temperature (°C)	Conductivity (µS/cm)	Br^- (mg/L)	Turbidity (NTU)
Well Drilling							
04/25/09	0204	250	NA	NA	NA	15	NA
04/25/09	0621	280	7.56	17.93	1577	25	NA
04/25/09	0710	320	7.78	19.08	1585	21	NA
04/25/09	0855	370	7.83	18.5	1483	24	NA
04/25/09	0955	420	7.42	17.84	1488	19	NA
04/25/09	1100	490	7.73	17.98	1429	17	NA
04/25/09	1245	545	7.02	15.94	1324	16	NA
04/25/09	1345	595	8.35	16.69	1188	15	NA
04/25/09	1445	625	7.65	17.23	1285	14	NA
04/25/09	1545	670	8.16	15.37	1137	15	NA
04/25/09	1715	690	8.25	14.95	1081	17	NA
04/25/09	1815	740	8.28	15.83	1079	17	NA
04/25/09	1915	770	8.23	16.02	1090	17	NA
04/25/09	2015	810	8.26	16.96	1046	15	NA
04/25/09	2115	855	7.8	15.8	1049	16	NA
04/25/09	2215	885	8.2	16.49	997	14	NA
04/26/09	0120	950	7.5	16.52	1087	17	NA
04/26/09	0215	980	7.58	16.26	1007	15	NA
04/26/09	0315	1010	7.93	16.19	1048	15	NA
04/26/09	0415	1040	7.45	16.23	1007	17	NA
04/26/09	0509	1060	7.76	15.98	1044	15	NA
04/26/09	0609	1090	7.5	16.2	983	11	NA
04/26/09	0812	1130	7.57	16.61	984	17	NA
04/26/09	0930	1170	7.29	16.57	967	14	NA
04/26/09	1005	1190	7.37	17.16	966	15	NA
04/26/09	1220	1230	7.4	17.83	955	14	NA
04/26/09	1320	1265	7.94	17.35	830	21	NA
04/26/09	1420	1300	7.94	17.98	831	18	NA
04/26/09	1520	1325	8.06	18.09	828	17	NA
04/26/09	1620	1350	8.1	17.9	826	22	NA
04/26/09	1720	1370	8.01	18.25	814	19	NA
04/26/09	1820	1390	7.95	18.19	804	18	NA
04/26/09	1920	1410	8.14	17.18	795	18	NA
04/26/09	2030	1430	7.94	17	833	17	NA
04/26/09	2130	1450	8.08	15.37	793	19	NA
04/26/09	2300	1470	8.05	16.63	785	20	NA
04/27/09	0030	1500	7.46	16.51	881	19	NA
04/27/09	0214	1520	7.35	16.41	871	18	NA
04/27/09	0351	1550	7.74	16.36	898	22	NA
04/27/09	0530	1570	7.6	16.16	872	19	NA
04/27/09	0630	1600	7.36	16.28	865	15	NA
04/27/09	0823	1610	7.7	16.89	869	15	NA
04/27/09	0930	1630	7.65	17.06	843	16	NA
04/27/09	1030	1650	7.6	17.48	852	18	NA

Table B−4 (continued). MV-4 Water Quality Parameter Results

Date	Time	Depth (ft)	pH (SU)	Temperature (°C)	Conductivity (µS/cm)	Br^- (mg/L)	Turbidity (NTU)
04/27/09	1115	1665	7.65	17.29	845	12	NA
04/27/09	1330	1685	7.82	18.92	856	21	NA
04/27/09	1430	1710	7.67	19.19	835	16	NA
04/27/09	1515	1730	7.83	19.94	871	13	NA
04/27/09	1700	NA	NA	NA	NA	15	NA
04/27/09	1810	1780	7.8	20.22	835	14	NA
04/27/09	1915	1800	7.81	20.09	842	17	NA
04/27/09	2015	1820	7.8	19.46	829	15	NA
04/27/09	2125	1840	7.83	19.62	836	13	NA
04/27/09	2315	1855	7.84	19.36	824	16	NA
04/28/09	0200	1880	8.16	19.43	754	18	NA
04/28/09	0333	1900	8.1	18.8	754	17	NA
04/28/09	0500	1910	8.09	19.27	759	14	NA
04/28/09	0700	1927	8.05	19.37	780	18	NA
04/28/09	0849	1950	8.24	19.35	773	16	NA
04/28/09	1023	1970	8.15	19.95	776	18	NA
04/28/09	1105	1980	8.16	19.94	767	16	NA
04/28/09	1330	2005	8.09	20.66	767	21	NA
04/28/09	1435	2028	8.16	21.02	774	17	NA
04/28/09	1530	2040	8	20.98	765	12	NA
04/28/09	1715	2070	8.2	21.64	790	16	NA
04/28/09	1840	2095	8.11	21.58	779	15	NA
04/28/09	2010	2112	8.09	21.31	782	14	NA
04/28/09	2145	2132	8.07	20.9	770	15	NA
04/28/09	2305	2157	8.09	20.25	798	16	NA
04/29/09	0130	2170	8.12	20.24	812	18	NA
04/29/09	0304	2190	8.07	19.97	828	14	NA
04/29/09	0447	2210	8.13	20.21	835	20	NA
Well Development - Air							
05/06/09	0045	WD	7.65	16.91	730	12	NA
05/06/09	0240	WD	8.23	14.74	471	7.9	NA
05/06/09	0435	WD	8.3	14.13	465	7.2	NA
05/06/09	0645	WD	8.25	14.66	449	6.6	NA
05/06/09	0900	WD	9.11	20.71	541	12	NA
05/06/09	1050	WD	8.32	17.1	477	7.7	NA
05/06/09	1400	WD	8.6	21.54	611	12	NA
05/06/09	1640	WD	9.49	25.09	495	8.8	NA
05/06/09	1910	WD	8.77	23.04	471	6.1	NA
05/06/09	2145	WD	8.42	20.47	436	5.7	NA
Piezometer Development - Air							
05/07/09	0725	WD	11.12	22.56	1485	27	NA
05/07/09	0825	WD	10.77	21.75	512	8.9	NA
05/07/09	0940	WD	9.95	21.58	300	5.4	NA
05/07/09	1100	WD	9.86	21.39	250	3.8	NA
05/07/09	1416	WD	9.6	22.32	232	2.3	NA
05/07/09	1620	WD	9.33	21.96	222	3.8	NA
05/07/09	1805	WD	9.28	21.74	216	NA	NA

Table B−4 (continued). MV-4 Water Quality Parameter Results

Date	Time	Depth (ft)	pH (SU)	Temperature (°C)	Conductivity (µS/cm)	Br^- (mg/L)	Turbidity (NTU)
Well Development - Air							
05/08/09	0225	WD	8.57	19.22	731	6.4	NA
05/08/09	0325	WD	8.4	13.71	522	5	NA
05/08/09	0500	WD	8.52	12.14	498	5.6	NA
05/08/09	0625	WD	8.38	12.11	492	4.4	NA
05/08/09	0800	WD	8.37	12.94	510	4.5	NA
05/08/09	0930	WD	8.26	13.54	570	4.6	NA
05/08/09	1100	WD	8.47	14.42	508	4.4	NA
05/08/09	1217	WD	8.44	16.19	472	3.4	NA
05/08/09	1410	WD	9.68	21.67	389	3.8	NA
05/08/09	1520	WD	8.35	17.68	390	3.5	NA
05/08/09	1643	WD	9	22.97	336	2.9	NA
05/08/09	1744	WD	8.44	16.37	386	2.1	NA
05/08/09	1900	WD	8.88	20.34	322	2.8	NA
05/08/09	2000	WD	8.44	12.75	371	1.7	NA
05/08/09	2111	WD	8.78	18.56	305	2.6	NA
05/08/09	2211	WD	8.52	15.02	355	1.8	NA
Well Development - Pump							
05/27/09	1120	WD	9.69	24.79	391	4.6	43.8
05/27/09	1300	WD	10.21	25.9	430	5.8	37
05/27/09	1405	WD	10.63	26.95	640	8.1	36.2
05/27/09	1500	WD	10.42	27.11	566	6.2	32.6
05/27/09	1600	WD	10.25	27.5	515	5	38.3
05/27/09	1706	WD	10.2	27.71	491	5	24.6
05/27/09	1800	WD	10.08	25.9	472	5	21
05/28/09	1154	WD	9.98	28.4	430	5.9	21.4
05/28/09	1224	WD	9.94	27.6	2081	4	15.9
05/28/09	1300	WD	10	27.09	452	6.9	68.6
05/28/09	1400	WD	9.94	27.82	412	8.2	33
05/28/09	1500	WD	9.87	27.6	426	7.1	25.3
05/28/09	1600	WD	9.92	26.54	406	2.8	15.5
05/28/09	1700	WD	9.9	27.49	399	3.2	25.4
05/28/09	1800	WD	9.82	26.73	385	2.7	12.9
05/28/09	1900	WD	9.79	26.8	378	2.6	8.87
05/29/09	0800	WD	9.9	21.35	370	5.8	164
05/29/09	0900	WD	9.75	26.27	342	1.9	15.5
05/29/09	1000	WD	9.69	27.27	362	1.9	9.47
05/29/09	1100	WD	9.84	27.47	382	1.7	9.87
05/29/09	1230	WD	9.82	27.77	380	3.1	10.8
05/29/09	1330	WD	9.82	27.46	376	2.3	11.3
05/29/09	1430	WD	9.74	27.43	365	1.7	8.53
05/29/09	1530	WD	9.77	27.61	362	1.4	8.83
05/29/09	1700	WD	9.77	26.38	365	1.5	9.92
05/29/09	1800	WD	9.8	26.21	359	1.5	14
05/29/09	1900	WD	9.77	25.98	354	1.3	10.3
05/29/09	2000	WD	9.77	25.6	354	1.2	6.09

Table B−4 (continued). MV-4 Water Quality Parameter Results

Date	Time	Depth (ft)	pH (SU)	Temperature (°C)	Conductivity (µS/cm)	Br^- (mg/L)	Turbidity (NTU)
05/30/09	0800	WD	9.64	24.66	314	2.1	41.7
05/30/09	0900	WD	9.64	25.98	324	1.7	16.5
05/30/09	1000	WD	9.52	26.86	315	1.4	8.88
05/30/09	1100	WD	9.74	27.74	354	1.3	9.28
05/30/09	1245	WD	9.76	27.38	366	2.3	7.43
05/30/09	1400	WD	9.82	26.98	355	1.6	6.33
05/30/09	1500	WD	9.74	26.81	346	1.2	8.01
05/30/09	1600	WD	9.68	27.59	346	1.2	5.44
05/30/09	1700	WD	9.74	27.55	350	1.3	4.47
05/30/09	1800	WD	9.77	26.57	350	1.3	4.91
05/30/09	1900	WD	9.72	27.04	348	1.3	5.38
05/30/09	2000	WD	9.7	26.86	345	1.3	9.48
05/31/09	0800	WD	9.5	24.46	313	0.86	18.4
05/31/09	0900	WD	9.59	26.62	319	0.81	7.31
05/31/09	1000	WD	9.46	27.83	307	0.56	6.75
05/31/09	1100	WD	9.69	27.93	343	0.71	5.37
05/31/09	1200	WD	9.67	27.3	343	0.73	7.59
05/31/09	1300	WD	9.77	27.65	349	0.8	5.23
05/31/09	1400	WD	9.72	26.2	343	0.96	6.45
05/31/09	1500	WD	9.72	27.57	342	0.96	4.41
05/31/09	1600	WD	9.7	27.44	338	0.91	3.3
05/31/09	1700	WD	9.72	27.5	339	0.92	6.42
05/31/09	1800	WD	9.71	26.21	340	0.94	5.51
05/31/09	1900	WD	9.71	26.58	337	0.88	4.6
05/31/09	2000	WD	9.72	25.84	337	0.95	7.61
06/01/09	0800	WD	9.72	17.28	333	3.9	17.4
06/01/09	0900	WD	9.6	25.25	332	1.3	6.3
06/01/09	1000	WD	9.38	26.77	303	1.2	4.94
06/01/09	1100	WD	9.6	27.19	334	1.5	5.11
06/01/09	1200	WD	9.68	27.38	335	1.2	6.07
06/01/09	1300	WD	9.74	27.26	340	1.3	4.83
06/01/09	1400	WD	9.75	27.03	340	1.3	4.26
06/01/09	1500	WD	9.62	26.36	333	1.1	3.38
06/01/09	1600	WD	9.66	27.06	332	1.2	3.21
06/01/09	1700	WD	9.63	26.34	332	1.1	4.43
06/01/09	1800	WD	9.69	26.41	334	0.92	4.49
06/01/09	1900	WD	9.67	26.18	332	0.82	3.7
06/01/09	2000	WD	9.70	25.87	353	0.89	4.08
06/03/09	0700	WD	9.48	17.58	324	4.5	15.5
06/03/09	0800	WD	9.53	24.65	299	1.3	8.72
06/03/09	0900	WD	9.36	25.68	294	0.83	4.11
06/03/09	1000	WD	9.59	26.18	320	0.99	4.44
06/03/09	1100	WD	9.66	25.42	340	0.83	3.84
06/03/09	1200	WD	9.77	26.92	344	0.97	12
06/03/09	1300	WD	9.72	27.35	337	0.86	7.98
06/03/09	1400	WD	9.63	26.79	337	0.81	3.68
06/03/09	1500	WD	9.59	27.18	337	0.84	3.48
06/03/09	1600	WD	9.7	26.86	336	0.94	3.05

Br–	=	Bromide
°C	=	Degrees Celsius
ft	=	Feet
mg/L	=	Milligrams per liter
NA	=	Not analyzed
NTU	=	Nephelometric turbidity unit
SU	=	Standard unit
WD	=	Well development
µS/cm	=	Microsiemens per centimeter

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MONITORING WELL COMPLETION LOG CNT01-MV-4

PROJECT	Offsites	WELL NUMBER	CNT01-MV-4	DATE DRILLED	4/22/2009 to 5/9/2009
LOCATION	Nevada	NORTH COORD. (FT)	1413815.31	SURFACE ELEV. (FT NGVD)	6019.05
SITE	Central Nevada Test Area	EAST COORD. (FT)	630571.37	TOP OF CASING (FT)	6019.65
DRILLING METHOD	Reverse Circulation	HOLE DEPTH (FT)	2223.00	MEAS. PT. ELEV. (FT)	6019.65
DRILL COMPANY	Boart Longyear	WELL DEPTH (FT)	2064.18	SLOT SIZE (IN)	0.078
RIG TYPE	LM 300E Tophead Rotary	WATER LEVEL (FT BGS)		BIT SIZE(S) (IN)	31.0 / 12.25

WATER LEVEL DATE	
DRILLER	Jacobo, L.
LOGGED BY	Dickerson, B., Goodknight, C., Hill, R.
SAMPLING METHOD	PUMP
DATE DEVELOPED	5/9/2009

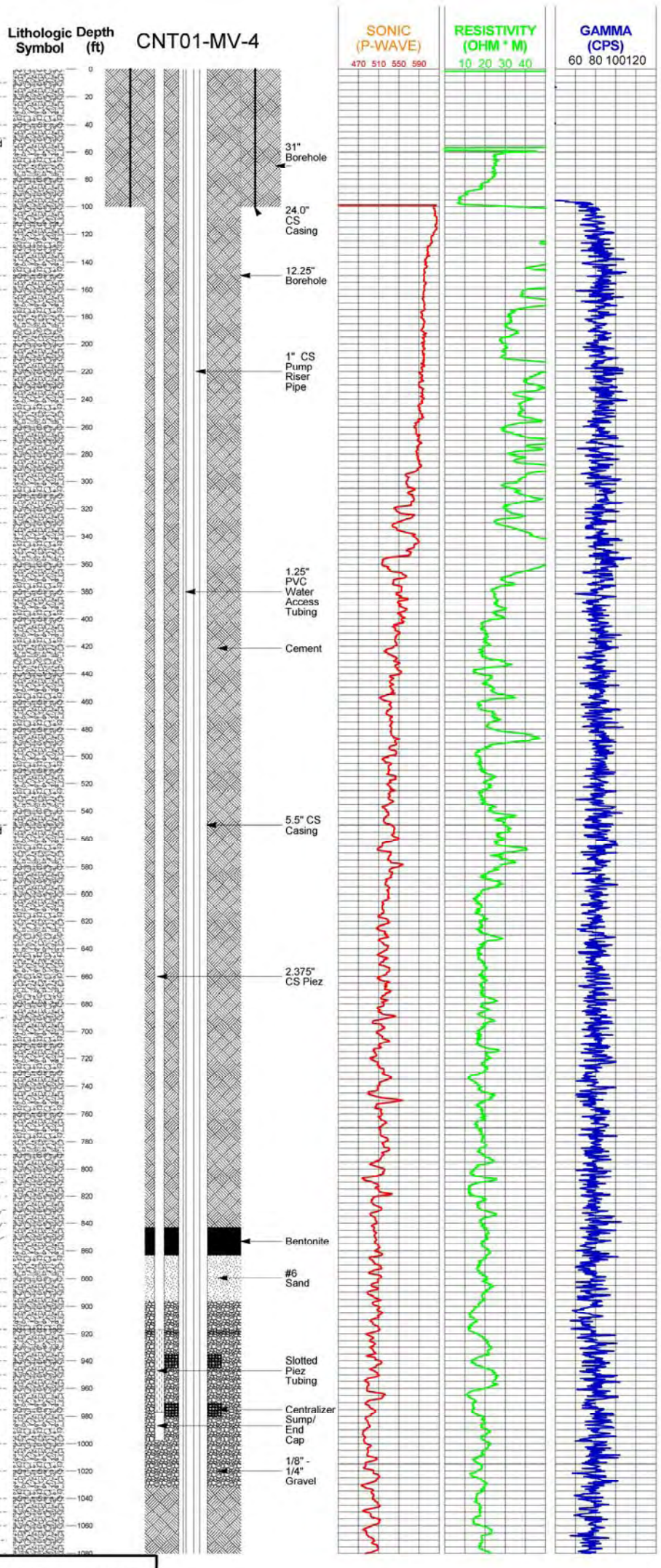
	WELL INSTALLATION	INTERVAL (FT)		
BLANK CASING:	5.5 in. Carbon Steel (CS)	-0.61	to	1719.33
WELL SCREEN:	5.5 in. Slotted CS	1719.33	to	2023.43
SUMP/END CAP:	5.5 in. C S	2023.43	to	2064.18
SEAL:	Cement	1032.0	to	1640.0
UPPER PACK:	#6 Sand	1640.0	to	1701.0
WELL PACK	1/8" - 1/4" Gravel	1701.0	to	2098.0

	PIEZOMETER INSTALLATION	INTERVAL (FT)		
BLANK CASING:	2.375 in. Carbon Steel (CS)	-0.7	to	918.25
WELL SCREEN:	2.375 in. Slotted CS	918.25	to	978.25
SUMP/END CAP:	2.375 in. C S	978.25	to	978.4
SEAL:	Bentonite	843.0	to	863.0
UPPER PACK:	#6 Sand	863.0	to	881.0
WELL PACK	1/8" - 1/4" Gravel	881.0	to	1032.0

REMARKS

Lithological Description

0-10 Alluvium, reddish brown (5YR 4/3), fine to coarse sand, some gravel, some silt and clay.
10 - 20 Alluvium, reddish brown (5YR 4/3), fine to coarse sand, some gravel and silt and clay.
20 - 40 Alluvium, reddish brown (5YR 4/3), coarse sand to fine gravel, some silt and clay.
40 - 50 Alluvium, reddish brown (5YR 4/3), coarse sand to fine gravel, some silt and clay.
50 - 80 Alluvium, reddish brown (5YR 4/3), fine to coarse sand and fine gravel, some coarse gravel, some silt and clay
80 - 90 Alluvium, reddish brown (5YR 4/3), coarse sand and gravel, some fine sand and silt.
90 - 100 Alluvium, reddish brown (5YR 4/3), fine to coarse sand, some silt and clay, minor gravel.
100 - 112 Alluvium, light reddish brown (5YR 6/2), fine to coarse gravel, some sand, minor silt and clay.
112 - 130 Alluvium, light reddish brown (5YR 6/2), fine to coarse sand, fine gravel, minor silt and clay.
130 - 150 Alluvium, reddish gray (5YR 5/2), fine to coarse sand, some fine gravel, minor silt and clay.
150 - 160 Alluvium, dark reddish brown (5YR 3/3), fine to coarse sand, minor gravel, minor silt and clay.
160 - 200 Alluvium, reddish brown (5YR 4/3), fine to coarse sand, minor gravel, minor silt and clay.
200 - 210 Alluvium, brown (7.5YR 5/3), fine to coarse sand, minor gravel, minor silt and clay.
210 - 220 Alluvium, brown (7.5YR 5/3), coarse sand to fine gravel.
220 - 230 Alluvium, brown (7.5YR 5/3), fine gravel.
230 - 260 Alluvium, brown (7.5YR 5/3), medium to coarse sand and silt, some clay.
260 - 270 Alluvium, light brown (7.5YR 6/4), fine to coarse sand and silt, some clay.
270 - 280 Alluvium, pinkish white (7.5YR 8/2), medium to coarse sand and gravel, minor fine sand, silt, and clay.
280 - 290 Alluvium, light brown (7.5YR 6/4), silt and clay, some fine to medium sand.
290 - 310 Alluvium, pinkish white (7.5YR 8/2), medium to coarse sand, some gravel.
310 - 320 Alluvium, pinkish gray (7.5YR 6/2), medium to coarse sand, some gravel.
320 - 330 Alluvium, pinkish gray (7.5YR 6/2), fine to coarse sand, silt, and clay.
330 - 360 Alluvium, pinkish gray (7.5YR 6/2), medium to coarse sand and fine gravel, minor silt and clay.
360 - 380 Alluvium, pinkish gray (7.5YR 6/2), silt and clay, sand and gravel in equal measure.
380 - 400 Alluvium, pinkish white (7.5YR 8/2), silt and clay, coarse sand and fine gravel.
400 - 440 Alluvium, pinkish white (7.5YR 8/2), silt and clay, coarse sand, minor gravel.
440 - 460 Alluvium, pinkish white (7.5YR 8/2), coarse sand, some silt and clay, some gravel.
460 - 480 Alluvium, pinkish white (7.5YR 8/2), silt and clay, medium to coarse sand, some fine gravel.
480 - 490 Alluvium, pinkish gray (5YR 6/2), medium to coarse sand, some silt and clay, minor gravel.
490 - 510 Alluvium, pinkish white (7.5YR 8/2) to pink (7.5YR 8/3), medium to coarse sand, some silt and clay, minor gravel.
510 - 540 Alluvium, pinkish white (7.5YR 8/2) to pink (7.5YR 8/3), medium to coarse sand, minor silt and clay.
540 - 550 Alluvium, pinkish white (7.5YR 8/2) to pink (7.5YR 8/3), silt and clay, minor sand and gravel.
550 - 580 Alluvium, pinkish white (7.5YR 8/2) to pink (7.5YR 8/3), gravel, some fine to coarse sand, minor silt and clay.
580 - 590 Alluvium, pinkish white (7.5YR 8/2) to pink (7.5YR 8/3), silt and clay, gravel, minor sand.
590 - 600 Alluvium, pinkish white (7.5YR 8/2) to pink (7.5YR 8/3), fine to coarse sand, minor silt and clay.
600 - 680 Alluvium, pinkish white (7.5YR 8/2) to pink (7.5YR 8/3), gravel, silt and clay, some fine to coarse sand.
680 - 690 Alluvium, varicolored clasts in several shades of gray and reddish brown, gravel, silt and clay, some fine to coarse sand.
690 - 710 Alluvium, very pale brown (10YR 8/4), silt and clay, some fine to coarse sand.
710 - 730 Alluvium, varicolored clasts in several shades of gray and reddish brown, gravel and fine to coarse sand, minor silt.
730 - 740 Alluvium, very pale brown (10YR 7/3), silt and clay, some fine to coarse sand.
740 - 760 Alluvium, very pale brown (10YR 7/3), silt and clay, fine to coarse sand, minor gravel.
760 - 790 Alluvium, very pale brown (10YR 7/3), silt and clay, gravel, some fine to coarse sand.
790 - 800 Alluvium, very pale brown (10YR 7/3), silt and clay, some fine to coarse sand, some gravel.
800 - 810 Alluvium, varicolored clasts in several shades of gray and reddish brown, gravel, medium to coarse sand, some silt and clay.
810 - 820 Alluvium, very pale brown (10YR 8/3), silt and clay, some fine to coarse sand, minor gravel.
820 - 830 Alluvium, very pale brown (10YR 8/3), coarse sand and gravel, some fine to medium sand, minor silt and clay.
830 - 840 Alluvium, very pale brown (10YR 8/3), silt and clay, some sand and gravel.
840 - 850 Alluvium, very pale brown (10YR 8/3), fine to coarse sand, some silt and clay, minor gravel.
850 - 880 Alluvium, very pale brown (10YR 8/3), fine to coarse sand, gravel, some silt and clay.
880 - 890 Alluvium, very pale brown (10YR 8/3), silt and clay, some fine to coarse sand, minor gravel.
890 - 900 Alluvium, very pale brown (10YR 8/3), coarse sand and gravel, some fine sand, some silt and clay.
900 - 917 Alluvium, very pale brown (10YR 8/3), silt and clay, minor fine to coarse sand.
917 - 930 Alluvium, very pale brown (10YR 8/3), silt and clay, some fine to coarse sand.
930 - 940 Alluvium, very pale brown (10YR 8/3), fine to coarse sand, some silt and clay.
940 - 950 Alluvium, very pale brown (10YR 8/3), fine to coarse sand, minor silt and clay, minor gravel.
950 - 960 Alluvium, very pale brown (10YR 8/3), medium to coarse sand, gravel, minor silt and clay.
960 - 975 Alluvium, very pale brown (10YR 8/3), silt and clay, some medium to coarse sand, minor gravel.
975 - 990 Alluvium, light gray (10YR 7/2) to light brownish gray (10YR 6/2), fine to coarse sand, minor silt and clay.
1000 - 1020 Alluvium, light gray (10YR 7/2) to light brownish gray (10YR 6/2), medium to coarse sand, minor silt and clay, minor gravel.
1020 - 1040 Alluvium, light gray (10YR 7/2) to light brownish gray (10YR 6/2), medium to coarse sand, some silt and clay, some gravel.
1040 - 1050 Alluvium, light gray (10YR 7/2) to light brownish gray (10YR 6/2), fine to coarse sand, some gravel.
1050 - 1060 Alluvium, light gray (10YR 7/2) to light brownish gray (10YR 6/2), silt and clay, fine to coarse sand.
1060 - 1070 Alluvium, light gray (10YR 7/2) to light brownish gray (10YR 6/2), fine to coarse sand, some silt and clay.

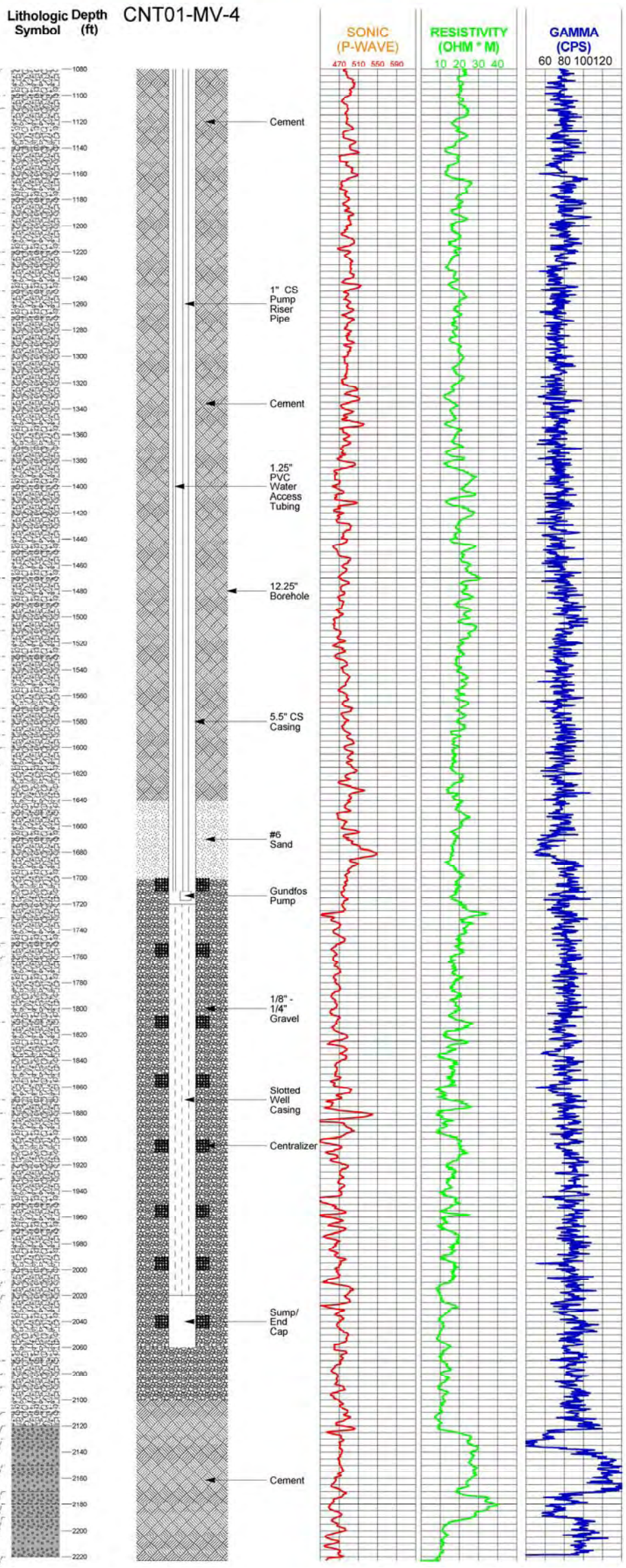


Stoller | U.S. DEPARTMENT OF ENERGY GRAND JUNCTION, COLORADO | PAGE 1 OF 2 | 11/19/2009

MONITORING WELL COMPLETION LOG CNT01-MV-4

Lithological Description

1070 - 1080 Alluvium, light gray (10YR 7/2) to light brownish gray (10YR 6/2), silt and clay, some gravel.
1080 - 1100 Alluvium, very pale brown (10YR 8/3), silt and clay decreasing in abundance upward, some gravel increasing in abundance upward.
1100 - 1110 Alluvium, very pale brown (10YR 8/3), silt and clay, fine to coarse sand, minor gravel.
1110 - 1140 Alluvium, very pale brown (10YR 8/3), fine to coarse sand, some gravel, minor silt and clay.
1140 - 1150 Alluvium, very pale brown (10YR 8/3), silt and clay, fine to coarse sand, minor gravel.
1150 - 1160 Alluvium, very pale brown (10YR 8/3), silt and clay, minor coarse sand and gravel.
1160 - 1180 Alluvium, very pale brown (10YR 8/3), medium to coarse sand, some silt and clay, some gravel.
1180 - 1190 Alluvium, light brownish gray (10YR 6/2), medium to coarse sand and gravel, some silt and clay.
1190 - 1200 Alluvium, light brownish gray (10YR 6/2), medium to coarse sand, some gravel, minor silt and clay.
1200 - 1220 Alluvium, light brownish gray (10YR 6/2), fine to coarse sand, some gravel, some silt and clay.
1220 - 1230 Alluvium, light brownish gray (10YR 6/2), medium to coarse sand and gravel, some silt and clay.
1230 - 1250 Alluvium, light brownish gray (10YR 6/2), fine to coarse sand, silt and clay, minor gravel.
1250 - 1270 Alluvium, very pale brown (10YR 7/3), gravel, some sand, minor silt and clay.
1270 - 1280 Alluvium, very pale brown (10YR 7/3), fine to coarse sand, some silt and clay, minor gravel.
1280 - 1290 Alluvium, very pale brown (10YR 7/3), silt and clay, minor sand and gravel.
1290 - 1300 Alluvium, very pale brown (10YR 7/3), fine to coarse sand, silt and clay, gravel.
1300 - 1310 Alluvium, light gray (10YR 7/1 - 7/2), fine to coarse sand ,silt and clay, minor gravel.
1310 - 1320 Alluvium, light gray (10YR 7/1 - 7/2), silt and clay, medium to coarse sand, some gravel.
1320 - 1330 Alluvium, light gray (10YR 7/1 - 7/2), silt and clay, some gravel, some medium to coarse sand.
1330 - 1340 Alluvium, light gray (10YR 7/1 - 7/2), fine to coarse sand, some silt and clay.
1340 - 1370 Alluvium, light gray (10YR 7/1 - 7/2), silt and clay, medium to coarse sand, gravel.
1370 - 1380 Alluvium, light gray (10YR 7/1 - 7/2), silt and clay, minor sand and gravel. This zone is possibly a fault splay.
1380 - 1400 Alluvium, light gray (10YR 7/1 - 7/2), fine to coarse sand, some gravel, some silt and clay.
1400 - 1410 Alluvium, very pale brown (10YR 7/3), clay and silt, minor sand. This zone is a fault.
1410 - 1420 Alluvium, very pale brown (10YR 7/3), fine to coarse sand, some gravel, some silt and clay.
1420 - 1430 Alluvium, very pale brown (10YR 7/3), silt and clay, fine to coarse sand, minor gravel.
1430 - 1450 Alluvium, very pale brown (10YR 7/3), fine to coarse sand, silt and clay, some gravel.
1450 - 1470 Alluvium, very pale brown (10YR 7/3), fine to coarse sand, some gravel, some silt and clay.
1470 - 1490 Alluvium, very pale brown (10YR 7/3), silt and clay, fine to coarse sand, minor gravel.
1490 - 1500 Alluvium, light gray (10YR 7/1 - 7/2), fine to coarse sand, some gravel, some silt and clay.
1500 - 1510 Alluvium, light gray (10YR 7/1 - 7/2), medium to coarse sand, gravel, minor silt and clay.
1510 - 1530 Alluvium, light gray (10YR 7/1 - 7/2), fine to coarse sand, silt and clay.
1530 - 1540 Alluvium, light gray (10YR 7/1 - 7/2), fine to coarse sand, minor gravel, minor silt and clay.
1540 - 1570 Alluvium, light gray (10YR 7/1 - 7/2), fine to coarse sand, some gravel, minor silt and clay.
1570 - 1580 Alluvium, light gray (10YR 7/1 - 7/2), medium to coarse sand, gravel, minor silt and clay.
1580 - 1590 Alluvium, light gray (10YR 7/1 - 7/2), fine to coarse sand, some silt and clay.
1590 - 1600 Welded tuff, very pale brown (10YR 8/2), devitrified, 20 percent phenocrysts, 1 to 3 mm in size of alkali feldspar, quartz, and biotite, and with flattened yellowish brown (10YR 5/8) pumice clasts.
1600 - 1650 Volcaniclastic sediment, very pale brown (10YR 8/2) to light gray (10YR 7/2), angular to subrounded, sand and gravel size clasts of pinkish gray (5YR 7/2) welded rhyolite tuff, yellowish brown (10YR 5/8) welded rhyolite tuff, gray (N6) welded rhyolite tuff, and clasts of light greenish gray (5GY 8/1) siltstone and shale within a matrix of ash argillically altered to clay.
1650 - 1670 Volcaniclastic sediment, very pale brown (10YR 8/2) to light gray (10YR 7/2), composed predominantly of argillically altered ash with subordinate amounts of angular to subrounded, sand and gravel size clasts of welded rhyolite tuff as above.
1670 - 1680 Nonwelded tuff, very pale brown (10YR 8/2) to light gray (10YR 7/2), ash-rich, argillically altered.
1680 - 1720 Volcaniclastic sediment, very pale brown (10YR 8/2) to light gray (10YR 7/2), angular to subangular gravel size clasts of partly to moderately welded rhyolite tuff similar to those above, and abundant sand size xenocrysts of euhedral to subhedral quartz in a matrix of argillically altered ash.
1720 - 1730 Welded tuff, light gray (N7) to gray (N6), devitrified, 25-28 percent phenocrysts of alkali feldspar, quartz, and sparse biotite, no pumice clasts.
1730 - 1750 Volcaniclastic sediment, very pale brown (10YR 8/2), angular to subangular gravel clasts of welded rhyolite tuff and sand composed of euhedral to subhedral xenocrysts of quartz in a matrix composed of argillically altered ash.
1750 - 1760 Volcanic ash, very pale brown (10YR 8/2), composed predominantly of argillically altered ash with minor amounts of sand size clasts of welded rhyolite tuff.
1760 - 1810 Volcaniclastic sediment, very pale brown (10YR 8/2), predominantly sand and gravel composed of welded rhyolite tuff, with minor argillically altered ash.
1810 - 1870 Volcaniclastic sediment, very pale brown (10YR 8/2), predominantly argillically altered ash, with subordinate amounts of sand and gravel size clasts of welded rhyolite tuff.
1870 - 1880 Nonwelded tuff, very pale brown (10YR 8/2), argillically altered, ash-rich, with minor black lithic fragments.
1880 - 1920 Volcaniclastic sediment, very pale brown (10YR 8/2), composed of angular to subangular sand and gravel size clasts of welded rhyolitic tuff in a matrix of argillically altered ash.
1920 - 1930 Welded tuff, white (2.5Y 8/1), moderately welded, devitrified, 12-15 percent phenocrysts up to 1 mm in size of alkali feldspar, quartz, and biotite.
1930 - 1950 Volcaniclastic sediment, very pale brown (10YR 8/2) to light gray (10YR 7/2), angular to subangular clasts, predominantly sand but with some gravel composed of welded rhyolite tuff in a matrix of argillically altered ash.
1950 - 1970 Volcanic ash, very pale brown (10YR 8/2) to light gray (10YR 7/2), composed predominately of argillically altered ash, with minor amounts of sand composed of welded tuff.
1970 - 2000 Volcaniclastic sediment, very pale brown (10YR 8/2) to light gray (10YR 7/2), angular to subangular clasts, predominantly sand but with some gravel composed of welded rhyolite tuff and euhedral to subhedral xenocrysts within a matrix composed of argillically altered ash.
2000 - 2010 Volcanic ash, very pale brown (10YR 8/2) to light gray (10YR 7/2), predominately composed of argillically altered ash, with minor amounts of sand composed of welded rhyolitic tuff and euhedral to subhedral xenocrysts.
2010 - 2020 Volcaniclastic sediment, very pale brown (10YR 8/2) to light gray (10YR 7/2), subangular sand with minor gravel composed of welded rhyolite tuff, and minor argillically altered ash.
2020 - 2070 Volcaniclastic sediment, very pale brown (10YR 8/2) to light gray (10YR 7/2), predominantly composed of argillically altered ash, with minor amounts of sand and gravel composed of welded rhyolite tuff.
2070 - 2080 Volcaniclastic sediment, very pale brown (10YR 8/2) to light gray (10YR 7/2), subangular sand and gravel composed of welded rhyolite tuff in a matrix of argillically altered ash.
2080 - 2090 Nonwelded tuff, very pale brown (10YR 8/2) to light gray (10YR 7/2), argillically altered, with lithic fragments composed of very dark gray (N3) densely welded tuff and brownish yellow (10YR 6/8) chert.
2090 - 2110 Volcaniclastic sediment, very pale brown (10YR 8/2) to light gray (10YR 7/2), composed predominantly of argillically altered ash, with some sand and gravel clasts of welded rhyolite tuff.
2110 - 2120 Nonwelded tuff, very pale brown (10YR 8/2) to light gray (10YR 7/2), argillically altered, with lithic fragments of light greenish gray (5G 7/1) welded tuff.
2120 - 2130 Nonwelded tuff, light gray (10YR 7/2), argillically altered, with fragments of brownish yellow (10YR 6/6) welded tuff. Monolithologic nature of these clasts suggests a thin moderately welded tuff enveloped top and bottom by altered nonwelded tuff.
2130 - 2150 Lacustrine mudstone, yellow (10YR 7/6) to light gray (10YR 7/2), extremely well indurated, with incipient silicic alteration.
2150 - 2170 Lacustrine mudstone, very pale brown (10YR 7/4), extremely well indurated, with incipient silicic alteration.
2170 - 2180 Nonwelded to moderately welded tuff, very pale brown (10YR 7/4), nonwelded portion is argillically altered, welded part is devitrified, 35-40 percent phenocrysts of alkali feldspar, quartz, and biotite.
2180 - 2190 Volcaniclastic sediment, very pale brown (10YR 8/2), composed of angular to subangular sand and gravel size clasts of various types of welded rhyolite tuff.
2190 - 2223 Nonwelded tuff, very pale brown (10YR 8/2), argillically altered, with lithic fragments of welded rhyolite tuff.



Stoller | U.S. DEPARTMENT OF ENERGY GRAND JUNCTION, COLORADO | PAGE 2 OF 2 | 11/19/2009