APPENDIX E

WELL DEVELOPMENT LOGS

Well Development Data Sheet

Site Name: AVM Job Number: 2184 Date: 6/2/04 Well ID: MW-1

On Site Personnel: Sean Pepling

Weather Conditions: Seelgbook

18.35
5.44
12.91
.16
7746
291
20656

Static water level before development: 5.44

Bottom of well: 18.35

2.1 gal/vol

Development Technique

- (bailing)
- peristaltic pump
- air lift
- other
- ~~12 volt submersible~~
- (surge block)
- trash pump w/foot valve

Date	Water Removal Start	Stop	Elapsed Time (min)	Flow Rate	Approx Vol. Removed	pH	Cond.	Turb	Temp	Observations/Comments
6/2/04	1500				Ø	6.99	0.450	582 ~~7999~~	12.4	Initial, then surge
	1512				2.5	6.54	0.471	>999	10.5	
	1515				5.0	6.41	0.449	7999	10.1	
	1520				7.5	6.40	0.454	444	9.9	
	1525				10.0	6.41	0.452	7999	9.9	
	1535				12.5	6.34	0.452	382	10.3	
	1541				15.0	6.35	0.451	328	9.9	
	1550				17.5	6.35	0.450	297	9.8	
	1600				20.0	6.35	0.452	170	9.9	

Well Development Data Sheet

Site Name: AVM Job Number: 2184 Date: 6/14/04 Well ID: MW-02

On Site Personnel: Sean Pepling / Mark Arrigo

Weather Conditions: See logbook

Static water level before development: 6.12

Bottom of well: 18.97

18.97
6.12
12.85
.16
77 10
128 5
2.0560

Development Technique

bailing
peristaltic pump
air lift
other

12 volt submersible
surge block
trash pump w/foot valve

Date	Water Removal Start	Stop	Elapsed Time (min)	Flow Rate	Approx Vol. Removed	pH	Cond.	Turb	Temp	Observations/Comments
6/14/04	1456	1456	—	—	—	6.45	0.526	792	14.2	Initiated, then surge
	1502	1504			2.5	6.63	0.530	7999	13.4	
	1504	1506			5.0	6.66	0.533	7999	13.5	
	~~1500~~ 1506	1510			7.5	6.66	0.539	7999	12.3	
	1510	1513			10.0	6.64	0.542	921	12.5	
	1513	1517			12.5	6.65	0.544	796	12.2	
	1517	1520			15.0	6.64	0.545	571	12.1	
	1520	1523			17.5	6.61	0.537	468	12.1	
	1523	1526			20.0	6.58	0.544	323	12.2	
	1526	1529			22.5	6.60	0.533	356	12.1	
	1529	1532			25.0	6.56	0.544	266	12.1	
	1532	1536			27.5	6.59	0.527	233	12.2	
	1536	1539			30.0	6.59	.542	228	11.8	

Well Development Data Sheet

Site Name: AVM Job Number: 2184 Date: 6/15/04 Well ID: MW3

On Site Personnel: Sean Pepling/Mark Arrigo

Weather Conditions: see logbook

Static water level before development: 6.22

Bottom of well: 21.60

21.60
6.22
15.38
.16
9228
1538
24608

2.5 gal/vol

Development Technique

- bailing
- peristaltic pump
- air lift
- other

12 volt submersible
surge block
~~trash pump~~ w/foot valve

Date	Water Removal Start	Stop	Elapsed Time (min)	Flow Rate	Approx Vol. Removed	pH	Cond.	Turb	Temp	Observations/Comments
6/15/04	1028	1028			—	6.90	0.619	421	14.2	Initial, then Surge
	1033	1035			2.5	6.84	0.625	>999	12.8	
	1035	1037			5.0	6.78	0.613	>999	13.4	DTW = 7.2
	1037	1042			7.5	6.81	.635	>999	12.8	DTW = 7.2
	1042	1045			10.0	6.72	.633	>999	12.1	DTW = 7.4
	1045	1048			12.5	6.67	.627	>999	12.1	DTW = 7.4
	1048	1052			15.0	6.65	.625	7999	12.9	DTW = 7.4
	1052	1054			17.5	6.65	.626	~~7999~~ 7941	12.2	DTW = 7.4
	1054	1057			20.0	6.64	.626	7999	11.9	DTW = 7.4
	1057	1059			22.5	6.61	0.634	851	12.2	DTW = 7.4
	1059	1101			25.0	6.61	0.633	763	12.0	DTW = 7.4
	1101	1104			27.5	6.59	0.633	706	11.7	DTW = 7.4
	1104	1106			30.0	6.61	0.633	555	11.9	DTW = 7.4

Well Development Data Sheet

Site Name: AVM Job Number: 2184 Date: 6/15/04 Well ID: MW4

On Site Personnel: Sean Popling/Mark Arrigo

Weather Conditions: see logbook

21.60
6.08
15.52
.16
93 12
155 2
2.48 32

2.5 gal/vol

Static water level before development: 6.08

Bottom of well: 21.60

Development Technique

- bailing
- peristaltic pump
- air lift
- other
- (12 volt submersible)
- ~~surge block~~
- trash pump w/foot valve

Date	Water Removal Start	Water Removal Stop	Elapsed Time (min)	Flow Rate	Approx Vol. Removed	pH	Cond.	Turb	Temp	Observations/Comments
6/15/04	0926	0926	—	—	0	6.78	0.622	>999	14.9	Initial, then purge
	0933	0935			2.5	6.68	0.620	>999	12.3	
	0936	0939			5.0	6.69	0.620	>999	~~11.6~~	
	0940	0941	—	—	7.5	6.66	0.608	>999	11.8	
	0941	0944	—	—	10.0	6.66	0.607	>999	11.6	
	0944	0946	—	—	12.5	6.64	0.609	>999	11.6	
	0946	0948			15.0	6.63	0.613	935	11.5	
	0948	0950			17.5	6.64	0.617	659	11.4	
	0950	0952			20.0	6.64	0.619	498	11.3	
	0952	0954			22.5	6.65	0.621	405	11.5	
	0958	~~0900~~			25.0	6.69	0.618	438	12.2	
	~~0100~~ 1000	~~1002~~ 1003			27.5	6.64	0.618	417	11.6	
	1002	1003			30.0	6.65	0.611	310	11.8	

Well Development Data Sheet

Site Name: AVM Job Number: 2184 Date: 6/15/04 Well ID: MW5

On Site Personnel: Sea Tepling / Mark Arrigo

Weather Conditions: See logbook

17.45
8.84
8.61
.16
5166
8 61
13776 1.4 gal/vol

Static water level before development: 8.84

Bottom of well: 17.45

Development Technique

bailing — (12 volt submersible)
peristaltic pump — (surge block)
air lift — trash pump w/foot valve
other

Date	Water Removal Start	Stop	Elapsed Time (min)	Flow Rate	Approx Vol. Removed	pH	Cond.	Turb	Temp	Observations/Comments
6/15/04	0759	0759	—	—	—	6.65	.849	560	14.4	Initialized pumps
	0806	0811	—	—	2.5	6.61	0.93	7999	13.1	
	0811	0814	—	—	5.0	6.50	0.92	7999	12.8	
	0814	0819			7.5	6.49	0.94	7999	12.5	
	0821	0823			10.0	6.48	0.94	7999	12.4	
	0824	0827			12.5	6.42	0.95	758	12.3	
	0839	0842			15.0	6.47	0.96	558	12.4	
	0843	0845			17.5	6.47	0.95	398	12.6	
	0846	0849			20.0	6.49	.901	415	12.4	
	0849	0851			22.5	6.44	0.914	139	12.6	
	0852	0854			25.0	6.45	0.904	226	12.6	
	0855	0858			27.5	6.47	0.893	224	12.5	

Well Development Data Sheet

Site Name: AVM Job Number: 2184 Date: 6/14/04 Well ID: MW-6

On Site Personnel: Sean Pepling / Mark Arrigo

Weather Conditions: see logbook

9.65
6.08
3.57
.16
21.43
3.57
5.713

Static water level before development: 6.08

Bottom of well: 9.65

0.578 gal/vol

Development Technique

- bailing
- peristaltic pump
- air lift
- other
- (12 volt submersible)
- (surge block)
- trash pump w/foot valve

Date	Water Removal Start	Stop	Elapsed Time (min)	Flow Rate	Approx Vol. Removed	pH	Cond.	Turb	Temp	Observations/Comments
6/14/04	1658				—	6.50	0.448	>999	14.2	Initial, then surge
	1719				2.5	6.28	0.438	>999	13.8	
	1726				5.0	6.30	0.439	>999	14.1	
	1734				7.5	6.22	0.433	>999	14.2	Stop to empty poly containers to drums
	1802				10.0	6.65	0.436	>999	14.0	
	1807				12.5	6.49	0.437	>999	13.1	
	1809				15.0	6.44	.439	>999	12.9	
	1817				17.5	6.42	0.438	528	13.0	
	1823				20.0	6.40	0.434	142	13.4	

Well Development Data Sheet

Site Name: AVM Job Number: 2184 Date: 6/14/04 Well ID: MW-07

On Site Personnel: Sean Pegling / Mark Arrigo

Weather Conditions: see logbook

Development Technique

bailing — 12 volt submersible (circled)
peristaltic pump — surge block (circled)
air lift — trash pump w/foot valve
other

Static water level before development: 11.96
Bottom of well: 18.55

Date	Water Removal Start	Stop	Elapsed Time (min)	Flow Rate	Approx Vol. Removed	pH	Cond.	Turb	Temp	Observations/Comments
6/14/04	1538	1538	—	—	—	6.80 / 7.	0.624	792	12.5	
	1604	1607			2.5	6.39	0.638	7999	11.7	
	1607	1610			5.0	6.29	0.650	7999	11.3	
	~~1610~~ 1610	1612			7.5	6.23	0.650	7999	11.1	
	1612	1614			10.0	6.27	0.649	7999	11.1	
	1614	1618			12.5	6.28	0.653	7999	10.9	
	1618	1620			15.0	6.27	0.652	7999	11.6	
	1620	1624			17.5	6.34	0.654	774	11.1	
	1624	1627			20.00	6.47	0.654	431	11.5	
	1627	1632			22.5	6.36	0.652	328	11.2	
	1632	1635			25.0	6.30	0.652	274	10.7	
	1635	1638			27.5	6.17	0.654	310	10.6	
	1638	1640			30.0	6.20	0.654	580	10.7	

Well Development Data Sheet

Site Name: AVM Job Number: 2184 Date: 6/14/04 Well ID: MW8

On Site Personnel: Sean Popling/Mark Arrago

Weather Conditions: See logbook

Static water level before development: 5.61

Bottom of well: 10.05

10.05
5.61
4.44
.16
2664
444
.7104 0.71 gal/vol

Development Technique

- bailing
- peristaltic pump
- air lift
- other
- 12 volt submersible (circled)
- surge block (circled)
- trash pump w/foot valve

Date	Water Removal Start	Stop	Elapsed Time (min)	Flow Rate	Approx Vol. Removed	pH	Cond.	Turb	Temp	Observations/Comments
6/14/02	1707	1707	—	—	—	6.66	0.415	399	14.7	Initial, then surge
	1709	1711			2.5	6.44	0.409	>999	15.1	
	1711	1715			5.0	6.38	0.416	>999	14.2	
	1716	1719			7.5	6.34	0.419	>999	14.3	
	1720	1723			10.0	6.40	0.423	>999	14.0	
	1725	1728			12.5	6.40	0.421	>999	15.4	
	1728	1731			15.0	6.35	0.423	904	14.4	
	1732	1737			17.5	6.39	0.421	824	14.9	
	1738	1741			20.0	6.61	0.424	504	15.2	
	1741	1743			22.5	6.38	0.423	320	14.2	
	1743	1745			25.0	6.32	0.422	208	13.9	
	1745	1748			27.5	6.34	0.423	193	14.1	

Well Development Data Sheet

Site Name: AVM Job Number: 2184 Date: 6/3/04 Well ID: MW9

On Site Personnel: Sean Pepling

Weather Conditions: see logbook

Static water level before development: 4.27

Bottom of well: 18.08

18.80
4.27
14.53
.16
87.18
14.53
2,324
2.3 gal/vol

Development Technique

- (bailing)
- peristaltic pump
- air lift
- 12 volt submersible
- (surge) block
- trash pump w/foot valve
- other

Date	Water Removal Start	Stop	Elapsed Time (min)	Flow Rate	Approx Vol. Removed	pH	Cond.	Turb	Temp	Observations/Comments
6/3/04	1535				Ø	7.04	0.391	159	14.3	Initial, then surged
	1544				2.5	6.08	0.434	>999	12.9	
	1548				5.0	6.08	0.442	>999	12.5	
	1554				7.5	6.06	0.453	>999	12.5	
	1558				10.0	6.09	0.453	>999	12.3	
	1602				12.5	6.09	0.454	>999	12.3	
	1604				15.0	6.11	0.453	>999	12.3	
	1611				17.5	6.11	0.455	>999	12.1	
	1615				20.0	6.10	0.459	>999	12.1	
	1620				22.5	6.11	0.458	7999	12.2	
	1624				25.0	6.11	0.459	>999	11.9	

Well Development Data Sheet

Site Name: AVM Job Number: 2184 Date: 6/15/04 Well ID: MW10

On Site Personnel: Sean Pepling / Mark Arrigo

Weather Conditions: see logbook

13.80
8.36
5.44
.16
32.64
5.44
8.704
0.87 gal/vol

Static water level before development: 8.36

Bottom of well: 13.80

Development Technique

- bailing
- peristaltic pump
- air lift
- other
- 12 volt submersible
- surge block
- trash pump w/foot valve

Date	Water Removal Start	Stop	Elapsed Time (min)	Flow Rate	Approx Vol. Removed	pH	Cond.	Turb	Temp	Observations/Comments
6-15-04	1128	1128	—	—	0	7.05	0.257	395	12.8	Initial, then surge
	1133	1135	—	—	2.5	6.23	0.278	>999	11.7	DTW = 8.50
	1135	1138	—	—	5.0	6.30	0.271	>999	11.3	DTW = 8.5
	1138	1141			7.5	6.29	0.268	>999	11.1	DTW = 8.6
	1141	1143			10.0	6.23	0.268	>999	11.0	DTW = 8.6, valve open more
	1143	1145			12.5	6.21	0.266	>999	10.9	DTW = 8.6, valve wide open
	1145	1146^{30}			15.0	6.23	0.267	>999	11.1	DTW = 8.6
	1146^{30}	1148			17.5	6.14	0.267	>999	10.8	DTW = 8.7
	1148	1149^{30}			20.0	6.20	0.266	7999	11.1	DTW = 88
	1149^{30}	1151			22.5	6.14	0.267	>999	10.9	DTW = 8.9

Well Development Data Sheet

Site Name: AVM Job Number: 2184 Date: 6/14/04 Well ID: MW-11

On Site Personnel: Sean Pepling/Mark Arriaga

Weather Conditions: See logbook

Static water level before development: 6.57

Bottom of well: 14.25

14.25
6.57
7.68
.16
4708
768
12388

Development Technique

bailing — 12 volt submersible
peristaltic pump — surge block
air lift — trash pump w/foot valve
other

Date	Water Removal Start	Water Removal Stop	Elapsed Time (min)	Flow Rate	Approx Vol. Removed	pH	Cond.	Turb	Temp	Observations/Comments
6/14/04	1407	1407	—	—	—	6.51	0.519	7999	14.3	Initial, then surge
	1415	1419			2.5	6.53	0.500	7999	13.7	
	1419	1422			5.0	6.49	0.502	7999	13.2	
	1422	1427			7.5	6.46	0.507	7999	13.3	
	1427	1429			10.0	6.42	0.505	859	13.3	
	1429	1433			12.5	6.41	0.505	7999	13.8	
	1433	1436			15.0	6.37	0.508	773	13.6	
	1436	1439			17.5	6.41	0.507	655	13.1	
	1442	1445			20.0	6.39	0.508	330	13.4	
	1445	1446			21.0	6.40	0.505	322	12.6	

Well Development Data Sheet

Site Name: AVM Job Number: 2184 Date: 6/14/04 Well ID: MW12

On Site Personnel: Sean Pepling / Mark Arrigo

Weather Conditions: see logbook

Static water level before development: 6.28

Bottom of well: ~~11.47~~ 14.55

11.47
6.28
5.19
.16 gal/ft
3 1 4
5 1 9
8.304

Development Technique

- bailing
- peristaltic pump
- air lift
- other
- (12 volt submersible)
- (surge block)
- trash pump w/foot valve

Date	Water Removal Start	Water Removal Stop	Elapsed Time (min)	Flow Rate	Approx Vol. Removed	pH	mS/cm Cond.	NTU Turb	°C Temp	Observations/Comments
6/14/04	1328	1328	0	0	0	5.62	0.625	715	17.8	Initial
	1334	1336			1 gal	5.86	0.524	>999	16.0	
	1336	1338			2.5	6.03	0.515	>999	15.4	
	1338	1340			3.5	6.11	0.515	>999	14.6	
	1340	1342			5.0	6.34	0.515	>999	15.5	
	1342	1346			7.5	6.54	0.528	7999	15.0	
	1346	1349			10.0	6.44	0.526	777	14.3	
	1349	1354			12.5	6.44	0.537	799	13.8	
	1354	1357			~~14~~ 15.0	6.45	0.530	425	14.5	
	1357	1400			17.5	6.48	0.531	540	13.9	
	1400	1403			20.0	6.47	0.535	121	13.8	

Well Development Data Sheet

Site Name: AUM Job Number: 2184 Date: 6/15/04 Well ID: TW2

On Site Personnel: Sean Pepling/Mark Arrigo

Weather Conditions: See logbook

Static water level before development: 9.04

Bottom of well: 25.95

25.95
9.04
16.91
.16
10146
1691
27056
2.75 gal/vol

Development Technique

bailing — (12 volt submersible)
peristaltic pump — (surge block)
air lift — trash pump w/foot valve
other

Date	Water Removal Start	Stop	Elapsed Time (min)	Flow Rate	Approx Vol. Removed	pH	Cond.	Turb	Temp	Observations/Comments
6/15/04	0759	0759	–	–	–	6.53	1.12	106	14.5	Initial sample grab
	0806	0813			2.5	6.51	1.02	>999	12.2	DTW=16.2
		0816			5.0	6.53	1.04	>999	12.4	DTW=17.4
		0821			7.5	6.50	1.01	>999	12.3	DTW=18.4
		0825			10.0	6.51	0.97	>999	12.5	DTW=18.9
		0831			12.5	6.51	0.97	>999	11.8	DTW=20.1
		0836			15.0	6.47	0.94	7999	12.1	DTW=20.5
		0842			17.5	6.52	0.91	>999	12.6	DTW=20.55
		0847			20.0	6.53	0.852	7999	12.8	DTW=20.45 12V battery sitting weak or pump
		0864			22.5	6.49	0.854	>999	12.5	DTW=18.55
		0900			25.0	6.43	0.858	661	12.5	DTW=18.5 switched batteries, still slow

Well Development Data Sheet

Site Name: AUM Job Number: 2184 Date: 6/15/04 Well ID: TW3

On Site Personnel: Sean Pepling/Mark Arrigo

Weather Conditions: see logbook

20.75
6.25
14.50
.16
87 00
145 0
2,32 00
2.3 gal/min

Development Technique

- bailing
- peristaltic pump
- air lift
- other
- 12 volt submersible
- surge block
- ~~trash pump~~ w/foot valve

Static water level before development: 6.25

Bottom of well: 20.75

Date	Water Removal Start	Water Removal Stop	Elapsed Time (min)	Flow Rate	Approx Vol. Removed	pH	Cond.	Turb	Temp	Observations/Comments
6/15/04	0933	0933	—	—	Ø	6.69	0.588	331	14.6	Initial, then surge
	0936	0938	—	—	2.5	6.65	0.627	>999	12.8	DTW = 6.9
	0938	0941	—	—	5.0	6.63	.645	>999	12.7	DTW = 7.0
	0941	0944	—	—	7.5	6.62	.640	>999	12.6	DTW = 7.8
	0944	0946	—	—	10.0	6.61	.643	>999	12.6	DTW = 7.8, stop to transfer water
	0957	1000	—	—	12.5	6.64	.636	>999	12.7	DTW = 7.6
	1000	1002	—	—	15.0	6.61	.646	>999	12.9	DTW = 7.65
	1002	1004	—	—	17.5	6.61	.644	>999	12.4	DTW = 7.63
	1004	1006	—	—	20.0	6.59	0.641	>999	12.2	DTW = 7.60
	1006	1008			22.5	6.59	0.647	7999	12.4	DTW = 7.50
	1008	1011			25.0	6.59	0.649	7999	12.2	DTW = 7.50
	1011	1013			27.5	6.59	6.643	7999	12.0	DTW = 7.66
	1013	1015			30.0	6.58	0.637	7999	12.2	DTW = 7.70