



April 29, 2013

Mr. Miles Bennett  
Project Manager  
WDEQ-LQD District III  
5<sup>th</sup> Avenue  
Sheridan, WY

Re: TFN 5 4/277 Technical Review Nichols Ranch Unit Production Area #1 (PA#1) Wellfield  
Data Package, Uranerz Energy Corporation, Permit No. 778

Dear Mr. Bennett,

Uranerz Energy Corporation (Uranerz) received the Land Quality Division (LQD) review comments, dated April 2, 2013, for the Wellfield Data Package for Production Area #1 (PA#1) in the Nichols Ranch Unit. Uranerz has addressed the comments in the attached document. Page revisions pertaining to the responses have been included along with an Index of Change.

If you have any questions regarding the provided information, please contact me at 307-265-8900 or by email at: [mthomas@uranerz.com](mailto:mthomas@uranerz.com).

Sincerely,

A handwritten signature in black ink, appearing to read "M. Thomas", is written over a horizontal line.

Michael P. Thomas  
Vice President Regulatory Affairs  
Uranerz Energy Corporation

MT/dk

Attachments

Nichols Ranch Unit PA#1 Wellfield Package Hydrologic Test Responses (2 copies)  
Revised Pages, CDs, and Index of Change

cc: Ron Linton, NRC Project Manager

**TFN 5 4/277 Technical Review Nichols Ranch Unit Production Area #1 (PA#1)  
Wellfield Data Package**

**Technical Review Comment Responses**

The following addresses LQD comments regarding the Wellfield Data Package:

1. Figures 2-1 through 2-12: Given there is an approved aquifer exemption boundary, I found the gray dashed line used to illustrate to extent of PA#1 area somewhat confusing. In future wellfield data packages, please consider using the aquifer exemption boundary to illustrate the extent of any future production area. (MT)

**Uranerz Response**

*Uranerz has taken the consideration under advisement for future wellfield data package submittals.*

2. Section 6, MRN-23 Test, Figure 6-4, pg. 6.6: I hand-corrected the legend on this figure to read "Well MON-12" rather than "Well MON-2". (MT)

**Uranerz Response**

*Figure 6-4, pg. 6.6 has been revised to read Well MON-12. The revised figure is enclosed.*

3. Section 7, MRN-29 Test, Figure 7-14, pg. 7.19: I hand corrected the legend on this figure to read "Well MRN-33" rather than "Well MRN-3". (MT)

**Uranerz Response**

*Figure 7-14, pg. 7.19 has been revised to read Well MRN-33. The revised figure is enclosed*

4. Section 12, UCLs & RTVs, Tables 12-1, 12-2, and 12-3: WQD performs a groundwater use suitability classification of the groundwater in and adjacent to Production Area #1 so that Uranerz has an established post-mining Class-of-Use reclamation. SAR (i.e., calculated Sodium Adsorption Ratio) is one of the parameters (see WQD R&R, Chapter 8, Table I) WQD utilizes in their establishment for the use suitability. WQD requests Uranerz to provide these SAR calculations on all tables to aid the groundwater classification process. In addition, it helps if the mean values are provided for the multiple sampling events.



### **Uranerz Response**

*The SAR parameter has been added to Tables 12-1, 12-2, and 12-3 and includes the mean value. The revised tables are enclosed and are intended to replace those originally submitted.*

5. Section 12, Table 12-2, MRN UCLs: Well MRN-02.1 is incorrectly names MRN-02.2 (pg.12-8). Well MRN-03.1 is incorrectly named MRN-03.2 (pg. 12-8). Well MRN-34.1 is incorrectly named MRN34.2 (pg. 12-18). Please correct.

### **Uranerz Response**

*Further review of this comment revealed that well names MRN-02.2 and MRN-02.1, MRN-03.1 and MRN-3.2, and MRN-34.1 and MRN-34.2 were used interchangeably in the document. The correct well names are MRN-2.2, MRN-3.2 and MRN-34.2 as shown in Table 12-2 of Section 12. Uranerz has revised pages to show the correct well name. The revisions are enclosed.*

6. Section 12, Table 12-4 RTVs: Well MPN-02 is incorrectly named MPN-02.1 (pg. 12-26). Well MPN-08.1 is incorrectly named MPN-08 (pg 12-28). Please correct.

### **Uranerz Response**

*The correct well names are MPN-2.1 and MPN-8 as shown in Table 12-4. Uranerz has revised the necessary pages to reflect the correct names. The revisions are enclosed.*

7. Please revise/update the UCL/RTV Data CD with correction and information requested above.

### **Uranerz Response**

*A new CD containing the documents as revised is enclosed. The CD therefore supersedes the CD initially submitted with the wellfield package document.*

Do not make corrections to this form after printing. Forms bearing strikeouts, ink changes, etc will not be accepted.

INDEX SHEET FOR MINE PERMIT AMENDMENTS OR REVISIONS

Page 1 of 2  
Date 4/30/13  
TFN 5 4/277  
PERMIT NO.: PA#1 Wellfield Data Package

MINE COMPANY NAME: Uranerz Energy Corporation  
MINE NAME: Nichols Ranch ISR Project

Statement: I, Michael P. Thomas, an authorized representative of Uranerz Energy Corporation declare that only the items listed on this and all consecutively numbered Index Sheets are intended as revisions to the current permit document. In the event that other changes inadvertently occurred due to this revision, those unintentional alterations will not be considered approved. Please initial and date. mp 4-30-13

NOTES:

- 1) Include all revision or change elements and a brief description of or reason for each revision element.
- 2) List all revision or change elements in sequence by volume number; number index sheets sequentially as needed.

Volume Number	Page, Map or other Permit Entry to be REMOVED	Page, Map or other Permit Entry to be ADDED	Description of Change
Wellfield Package PA#1 Binder	Table of Contents pgs. v, vi, vii,	Table of Contents pgs. v, vi, vii	Pages revised to include correct well names for MRN-2.2, MRN-3.2, MPN-8, MRN-34.2, MPN-2.1
Wellfield Package PA#1 Binder	Section 1 pg. 1-4	Section 1 pg. 1-4	Figure 1-2 has been revised to include correct well names MRN-2.2, MRN-3.2, MPN-8, MRN-34.2, MPN-2.1
Wellfield Package PA#1 Binder	Section 2 pg. 2-16	Section 2 pg. 2-16	Figure 2-13 has been revised to include correct well names MRN-2.2, MRN-3.2, MPN-8, MRN-34.2, MPN-2.1
Wellfield Package PA#1 Binder	Section 3 pg. 3-3	Section 3 pg. 3-3	Table 3-1 has been revised to include correct well names MRN-2.2, MRN-3.2, MPN-8, MRN-34.2, MPN-2.1
Wellfield Package PA#1 Binder	Section 4 pgs. 4-4, 4-5, 4-7, 4-12	Section 4 pgs. 4-4, 4-5, 4-7, 4-12	Tables 4-1 and 4-2, along with Figures 4-1 and 4-6 have been revised with correct well name MPN-8
Wellfield Package PA#1 Binder	Section 5 pgs. 5-4, 5-5, 5-21, 5-23, 5-25	Section 5 pgs. 5-4, 5-5, 5-21, 5-23, 5-25	Pages, Table 5-1 and Figures 5-1 and 5-21 revised with correct well name MPN-8
Wellfield Package PA#1 Binder	Section 6 pg. 6-6	Section 6 pg. 6-6	Figure 6-4 revised with corrected well name MON-12
Wellfield Package PA#1 Binder	Section 7 pgs. 7-3, 7-4, 7-6, 7-9, 7-11, 7-13, 7-16, 7-18, 7-19, 7-20	Section 7 pgs. 7-3, 7-4, 7-6, 7-9, 7-11, 7-13, 7-16, 7-18, 7-19, 7-20	Pages, Tables 7-1 and 7-2 along with Figures 7-1, 7-4, 7-6, 7-11, 7-13, 7-14, 7-15 revised with corrected well names MRN-2.2, MRN-3.2, MPN-8, MRN-34.2, MPN-2.1 as necessary.
Wellfield Package PA#1 Binder	Section 8 pgs. 8-2, 8-4, 8-5, 8-6, 8-11, 8-13, 8-16, 8-17, 8-20, 8-29, 8-30, 8-33, 8-34, 8-37, 8-38, 8-39, 8-42, 8-43	Section 8 pgs. 8-2, 8-4, 8-5, 8-6, 8-11, 8-13, 8-16, 8-17, 8-20, 8-29, 8-30, 8-33, 8-34, 8-37, 8-38, 8-39, 8-42, 8-43	Pages, and Table 8-1 along with Figures 8-1, 8-7, 8-13, 8-16, 8-29, 8-30, 8-33, 8-35, 8-38, 8-39 revised with corrected well names MRN-2.2, MRN-3.2, MPN-8, MRN-34.2, MPN-2.1 as necessary.
Wellfield Package PA#1 Binder	Section 12 Tables 12-1 pgs 12-2 thru 12-6	Section 12 Tables 12-1 pgs 12-2 thru 12-6	Table was revised to include SAR values as requested.
Wellfield Package PA#1 Binder	Section 12 Tables 12-2 pgs 12-8 thru 12-19	Section 12 Tables 12-2 pgs 12-8 thru 12-19	Table was revised to include SAR values as requested.

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INDEX SHEET FOR MINE PERMIT AMENDMENTS OR REVISIONS

Page 2 of 2  
Date 4/30/13  
TFN 5 4/277  
PERMIT NO.: PA#1 Wellfield Data Package

MINE COMPANY NAME: Uranerz Energy Corporation  
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- 2) List all revision or change elements in sequence by volume number; number index sheets sequentially as needed.

Volume Number	Page, Map or other Permit Entry to be REMOVED	Page, Map or other Permit Entry to be ADDED	Description of Change
Wellfield Package PA#1 Binder	Section 12 Tables 12-3 pgs. 12-21 thru 12-24	Section 12 Tables 12-3 pgs. 12-21 thru 12-24	Table was revised to include SAR values as requested.
Wellfield Package PA#1 Binder	Section 12 Tables 12-4 pgs. 12-26 thru 12-31	Section 12 Tables 12-4 pgs. 12-26 thru 12-31	Table was revised with corrected well names MPN-2.1 and MPN-8
Wellfield Package PA#1 Binder	Section 12 UCL/RTV CD	Section 12 UCL/RTV CD	The UCL/RTV CD enclosed supersedes the CD originally submitted with the wellfield package.
Wellfield Package PA#1 Binder	CD titled Production Area #1 Hydrologic Test	CD titled Production Area #1 Hydrologic Test	This CD replaces the one originally submitted with the wellfield package and contains a pdf of the wellfield package along with the appendices of data.

_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

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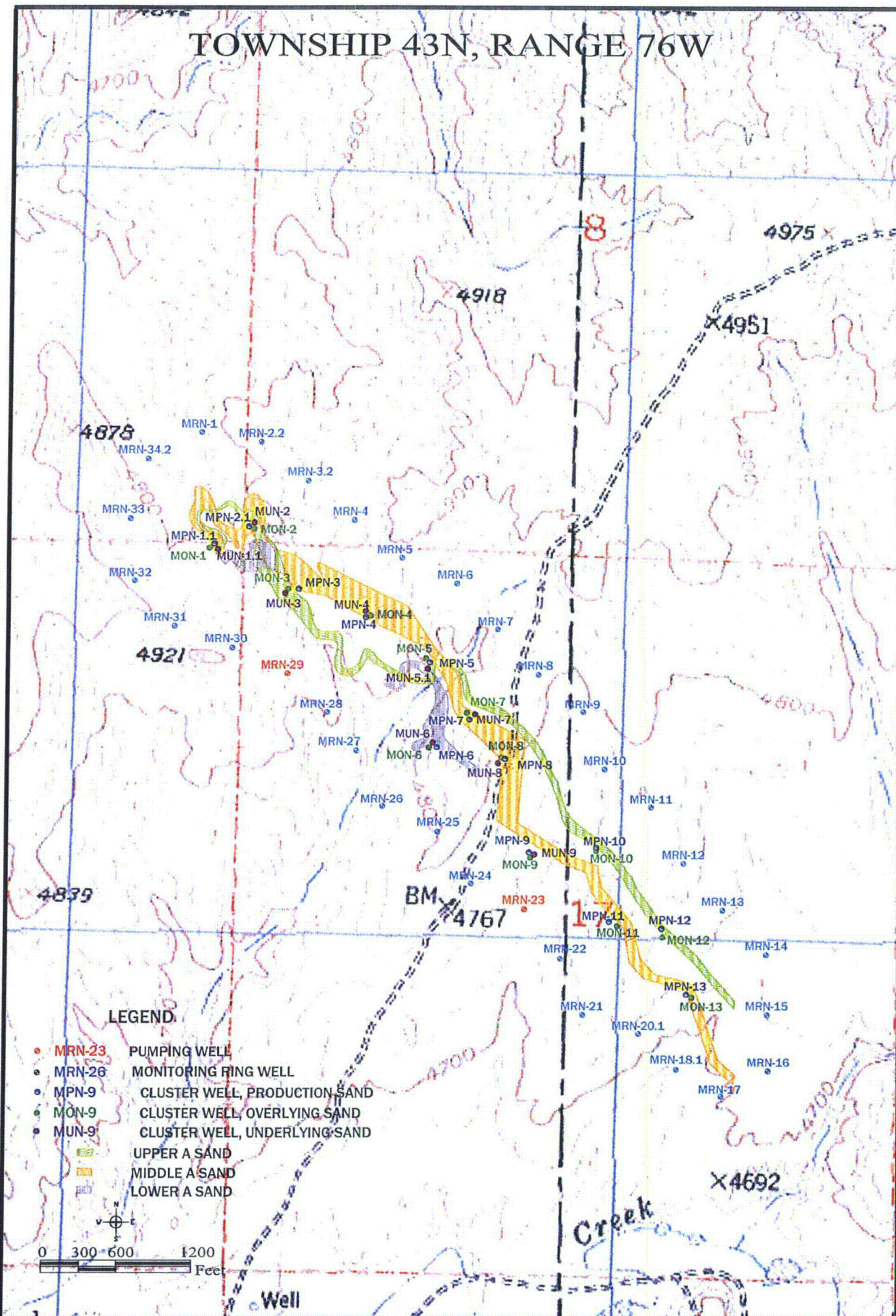
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# TOWNSHIP 43N, RANGE 76W



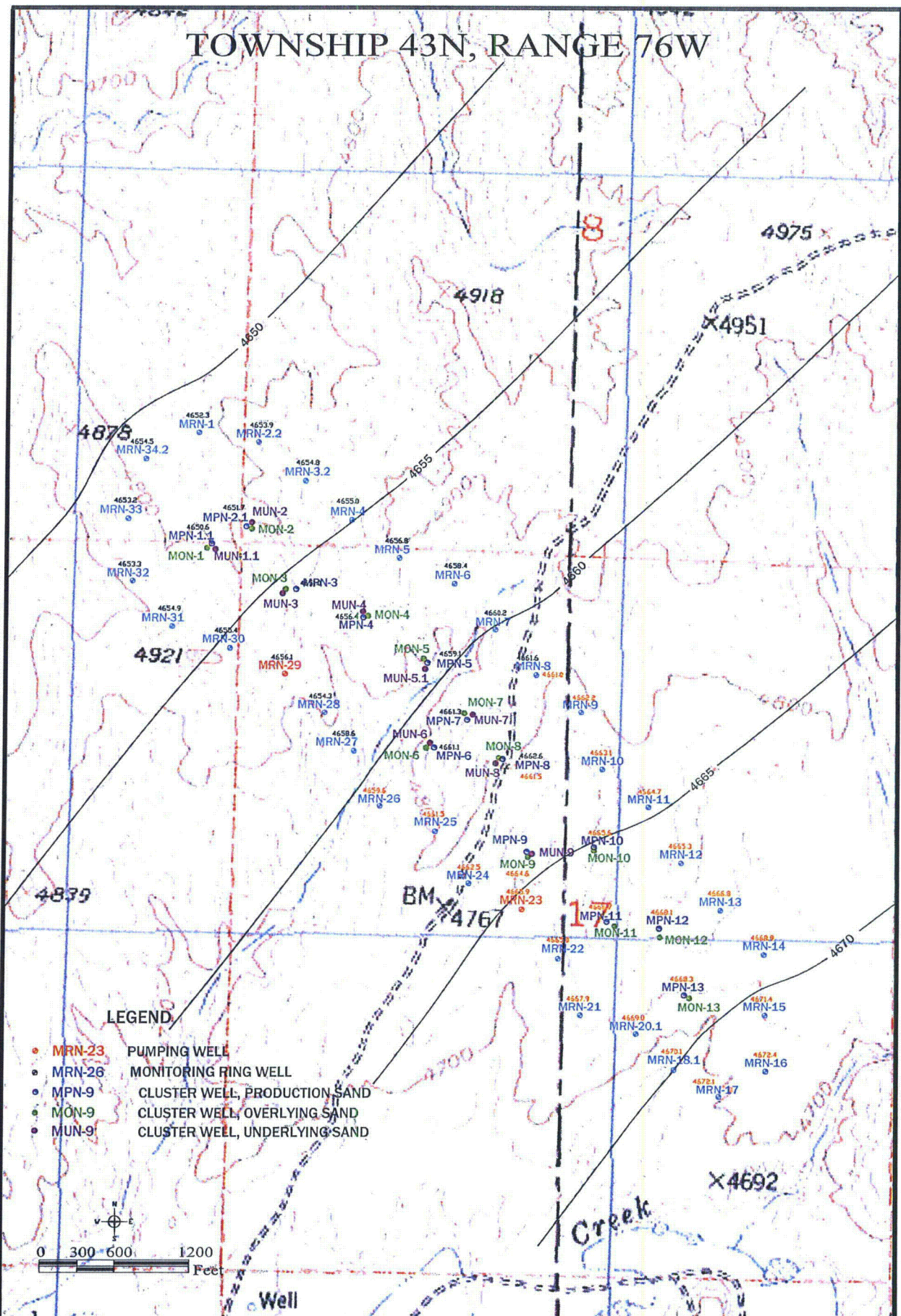
REVISIONS	No.	DATE	MADE BY	DESCRIPTION
	1			
	2			
	3			
	4			
HYDRO-ENGINEERING L.L.C.				
HYDRO-ENGINEERING L.L.C.				
4685 EAST MAGNOLIA				
CASPER, WYOMING, 82604				
FILE: C:\PROJECTS\2012-14\nrwellfield				
DATE	DRAWN BY	CHECKED	APPROVED	
8-2012	BMW			



Figure 1-2  
Nichols Ranch Unit Production Area #1  
Plan Map



# TOWNSHIP 43N, RANGE 76W



**LEGEND:** 1" = 700'

— WATER ELEVATION CONTOUR

4858.1 WATER ELEVATION PRIOR TO MRN-29 PUMPTEST

4865.9 WATER ELEVATION PRIOR TO MRN-23 PUMPTEST

REVISIONS	No.	DATE	MADE BY	DESCRIPTION
1				
2				
3				
4				

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ENERGY CORPORATION  
1701 East "E" Street  
P.O. Box 80850  
Casper, Wyoming  
82608-0850

**FIGURE 2-13**  
**INITIAL POTENTIOMETRIC SURFACE MAP:**  
A-SAND; FT-MSL

PAGE: 2-16



TABLE 3.1 PRODUCTION AREA #1 WELL INFORMATION

WELL	COORDINATES UTM13, NAD 27 METERS		SECTION	TOWNSHIP & RANGE	SURFACE ELEVATION (ft)	CASING STICKUP (ft)	STATIC DEPTH TO WATER (ft)	STATIC WATER ELEVATION (ft)	DRILLED DEPTH (ft:bgs)	CASING DEPTH (ft:bgs)	COMPLETION INTERVAL		COMPLETION LENGTH (ft)
	NORTHING	EASTING									TOP (ft:bgs)	BOTTOM (ft:bgs)	
MPN-1.1	4839798	417078	7	43, 76	4800.49	1.33	151.54	4650.55	610	585	559	570	11
MPN-2.1	4839835	417165	8	43, 76	4804.33	1.42	154.32	4651.71	620	605	561	570	9
MPN-3	4839668	417261	17	43, 76	4852.78	1.08	201.74	4651.03	645	740	628	636	8
MPN-4	4839620	417456	17	43, 76	4843.53	1.83	189.36	4658.37	670	666	629	640	11
MPN-5	4839521	417603	17	43, 76	4804.51	1.92	147.74	4659.07	640	605	581	590	9
MPN-6	4839307	417631	17	43, 76	4830.76	1.25	170.92	4661.34	660	658	629	635	6
SECOND COMPLETION INTERVAL											645	649	4
MPN-7	4839373	417710	17	43, 76	4850.62	1.00	190.73	4661.09	665	665	605	612	7
MPN-8	4839280	417798	17	43, 76	4806.80	1.25	146.84	4661.46	615	615	574	582	8
MPN-9	4839056	417858	17	43, 76	4755.33	2.17	93.31	4664.62	565	640	535	542	7
MPN-10	4839063	418022	17	43, 76	4764.38	1.92	101.04	4665.64	540	519	497.5	500.5	3
SECOND COMPLETION INTERVAL											506.5	511	4.5
MPN-11	4838886	418052	17	43, 76	4768.29	2.08	104.09	4666.70	600	600	560	568	8
MPN-12	4838872	418182	17	43, 76	4742.02	2.25	76.64	4668.08	520	520	482	487	5
SECOND COMPLETION INTERVAL											493	501	8
MPN-13	4838703.8	418240	17	43, 76	4714.79	1.33	48.10	4668.29	510	510	489	498	9
MON-1	4839793	417067	7	43, 76	4807.93	1.63	159.90	4649.99	465	350	342	465	123
MON-2	4839835	417177	7	43, 76	4809.47	1.92	157.14	4654.63	469	360	355	469	114
MON-3	4839685	417259	17	43, 76	4847.38	1.17	192.44	4654.92	501	501	396	496	100
MON-4	4839624	417645	7	43, 76	4848.35	2.17	190.38	4660.58	493	402	396	493	97
MON-5	4839521	417603	17	43, 76	4803.48	1.67	144.18	4661.30	450	350	344	450	106
MON-6	4839305	417608	17	43, 76	4821.82	1.83	162.15	4661.87	460	385	374	460	86
MON-7	4839390	417701	17	43, 76	4852.56	1.92	191.56	4663.30	486	396	386	486	100
MON-8	4839285	417793	17	43, 76	4808.07	2.17	145.13	4665.54	435	345	321	435	114
MON-9	4839041	417860	17	43, 76	4752.64	1.17	88.69	4662.10	392	293	286	392	106
MON-10	4839056	418020	17	43, 76	4764.38	1.92	98.82	4667.86	454	305	300	454	154
MON-11	4838877	418074	17	43, 76	4764.74	2.00	98.72	4617.67	462	304	296	462	166
MON-12	4838849	418186	17	43, 76	4737.51	1.75	70.51	4669.10	440	285	266	440	174
MON-13	4838702	418257	17	43, 76	4712.81	1.75	44.86	4750.84	395	235	226	395	169
MUN-1.1	4839784	417093	7	43, 76	4801.46	1.75	155.40	4647.40	707	665	657	707	50
MUN-2.2	4839850	417180	8	43, 76	4805.41	1.58	158.02	4647.39	730	682	681	730	49
MUN-3.2	4839678	417258	17	43, 76	4848.63	0.83	201.28	4647.35	761	740	733	761	28
MUN-4	4839635	417453	17	43, 76	4843.52	0.58	196.03	4647.49	770	730	722	770	48
MUN-5.1	4839524	417613	17	43, 76	4806.10	1.83	159.96	4646.14	730	695	695	730	35
MUN-6	4839317	417619	17	43, 76	4820.74	0.92	172.81	4647.93	736	700	691	736	45
MUN-7	4839385	417725	17	43, 76	4849.72	1.00	202.16	4647.56	765	715	707	765	58
MUN-8	4839271	417783	17	43, 76	4802.39	2.08	153.91	4650.98	699	699	657	699	42
MUN-9	4839051	417871	17	43, 76	4749.44	2.17	100.38	4669.15	630	576	576	628	52
MRN-1	4840068	417050	7	43, 76	4776.35	1.50	125.86	4652.29	607	510	503	607	104
MRN-2.2	4840044	417196	8	43, 76	4817.22	1.92	165.57	4653.95	626	530	522	626	104
MRN-3.2	4839950	417312	8	43, 76	4845.82	2.00	193.46	4654.76	667	565	558	667	109
MRN-4	4839864	417424	17	43, 76	4851.29	1.92	198.57	4655.02	578	575	567	678	111
MRN-5	4839763	417544	17	43, 76	4862.68	2.00	208.32	4656.76	680	567	576	680	104
MRN-6	4839706	417681	17	43, 76	4833.16	2.33	177.57	4658.39	648	555	543	648	105
MRN-7	4839593	417780	17	43, 76	4824.22	2.08	166.55	4660.17	636	545	536	636	100
MRN-8	4839482	417768	17	43, 76	4814.61	1.17	155.00	4661.01	620	527	523	620	97
MRN-9	4839392	417986	17	43, 76	4794.30	1.17	133.49	4662.21	600	505	496	600	104
MRN-10	4839252	418041	17	43, 76	4773.57	1.83	112.63	4663.14	580	500	481	580	99
MRN-11	4839163	418155	17	43, 76	4787.43	1.75	124.88	4664.65	600	515	497	600	103
MRN-12	4839028	418235	17	43, 76	4766.93	1.08	102.90	4665.33	580	492	474	580	106
MRN-13	4838916	418334	17	43, 76	4739.28	1.00	73.69	4666.79	565	465	457	565	108
MRN-14	4838808	418440	17	43, 76	4723.76	1.00	56.11	4668.85	542	455	450	542	92
MRN-15	4839027	417783	17	43, 76	4714.66	2.25	45.95	4671.41	540	430	422	542	120
MRN-16	4838524	418444	17	43, 76	4705.34	2.00	35.30	4672.44	517	421	413	517	104
MRN-17	4838459	418329	17	43, 76	4695.96	2.08	26.41	4672.05	502	412	405	502	97
MRN-18.1	4838526	418220	17	43, 76	4692.20	2.17	24.73	4670.07	502	407	401	502	101
MRN-20.1	4838614	418128	17	43, 76	4712.19	2.17	45.80	4668.99	543	438	401	502	101
MRN-21	4838663	417991	17	43, 76	4745.63	2.17	80.32	4667.91	560	463	452	560	108
MRN-22	4838796	417935	17	43, 76	4739.33	1.17	75.69	4665.04	557	463	458	557	99
MRN-23	4838913	417845	17	43, 76	4719.47	2.67	56.80	4665.87	527	439	415	527	112
MRN-24	4838978	417717	17	43, 76	4762.68	1.08	101.50	4662.48	557	475	458	557	99
MRN-25	4839097	417633	17	43, 76	4810.64	1.42	150.81	4661.53	622	515	518	622	104
MRN-26	4839164	417497	17	43, 76	4780.42	1.17	122.19	4659.63	605	539	531	605	74
MRN-27	4839296	417432	17	43, 76	4766.58	1.67	110.00	4658.59	600	506	499	600	101
MRN-28	4839390	417356	17	43, 76	4802.47	0.00	148.18	4654.29	640	550	542	640	98
MRN-29	4839487	417263	17	43, 76	4820.48	1.08	165.70	4656.08	667	565	557	667	110
MRN-30	4839549	417127	18	43, 76	4882.86	2.17	230.06	4655.39	725	620	612	725	113
MRN-31	4839601	416986	18	43, 76	4838.73	2.00	186.20	4654.94	660	560	554	660	106
MRN-32	4839710	416887	7	43, 76	4810.14	1.63	158.79	4653.30	633	536	527	633	106
MRN-33	4839860	416874	7	43, 76	4834.42	1.83	183.41	4653.21	656	555	549	656	107
MRN-34.2	4840002	416904	7	43, 76	4789.95	2.17	138.05	4654.50	595	505	493	595	102

Note: All Wells have a DIA of 5"  
All wells used screen in the completion section except MON-3 and MUN-5.1, which is open-hole.



**Table 4-1.**  
**MONITORING WELL DISTANCE AND MAXIMUM DRAWDOWN DURING THE MRN-23 TEST**

1st Start Date & Time	12/6/2011 10:40				
1st End Date & Time	12/9/2011 13:05				
Duration	4465 min.				
Avg. Pumping Rate	34.3 G.P.M.				
Pumping Well	MRN-23	Distance from Pumping Well	Depth to Water Before Test	Water Elevation Before Test	Maximum Drawdown During Test
Monitoring Wells		(ft)	(ft)	(ft)	(ft)
	MRN-23	0	56.80	4665.87	308.7
Ore Zone Completions	MPN-8	1169	146.84	4661.46	9.2
	MPN-9	449	93.31	4664.62	36.4
	MPN-10	756	101.04	4665.64	26.8
	MPN-11	686	104.09	4666.70	30 e
	MPN-12	1113	76.64	4668.08	17.7
	MPN-13	1476	48.10	4668.29	10.4
	MRN-8	1859	155.00	4661.01	5.0
	MRN-9	1631	133.49	4662.21	6.0
	MRN-10	1278	112.63	4663.14	8.9
	MRN-11	1291	124.88	4664.65	10.5
	MRN-12	1326	102.90	4665.33	11.7
	MRN-13	1593	73.69	4666.79	9.4
	MRN-14	1978	56.11	4668.85	6.8
	MRN-15	2123	45.95	4671.41	6.5
	MRN-16	2352	35.30	4672.44	4.9
	MRN-17	2181	26.41	4672.05	4.6
	MRN-18.1	1770	24.73	4670.07	7.0
	MRN-20.1	1359	45.80	4668.99	10.1
	MRN-21	970	80.32	4667.91	13.8
	MRN-22	494	75.69	4665.04	34.2
	MRN-24	472	101.50	4662.48	39.1
	MRN-25	928	150.81	4661.53	17.0
	MRN-26	1400	122.19	4659.63	8.3
Overlying Completions	MON-8	1216	145.13	4665.54	*
	MON-9	408	88.69	4682.10	*
	MON-10	739	98.82	4667.86	*
	MON-11	756	98.72	4617.67	*
	MON-12	1134	70.51	4669.10	*
	MON-13	1524	44.86	4750.84	*
Underlying Completions	MUN-8	1166	153.91	4650.98	*
	MUN-9	433	100.38	4689.15	*

Note: \* = No Drawdown Observed

e = estimated maximum drawdown because water level was below transducer

**TABLE 4-2.**  
**DATA LOGGER AND TRANSDUCER EQUIPMENT FOR**  
**MONITORING WELLS FOR THE MRN-23 TEST**

	Well Name	Transducer Number
Monitoring Wells		
	MRN-23	D01388 (Recovery Only)
Ore Zone Completions	MPN-8	B04092
	MPN-9	C01337
	MPN-10	B04166
	MPN-11	B04104
	MPN-12	B04168
	MPN-13	B04105
	MRN-8	B04094
	MRN-9	B04086
	MRN-10	B04152
	MRN-11	B04091
	MRN-12	B04084
	MRN-13	B04101
	MRN-14	B01338
	MRN-15	B04085
	MRN-16	B04109
	MRN-17	B04102
	MRN-18.1	B04106
	MRN-20.1	B04097
	MRN-21	B04154
	MRN-22	C04159
	MRN-24	D01388 (Pre-Test and Drawdown)
	MRN-25	B04132
	MRN-26	B04082
Overlying Completions	MON-8	B04128
	MON-9	B03589
	MON-10	B04093
	MON-11	B04099
	MON-12	B04090
	MON-13	B04108
Underlying Completions	MUN-8	B04164
	MUN-9	B03564

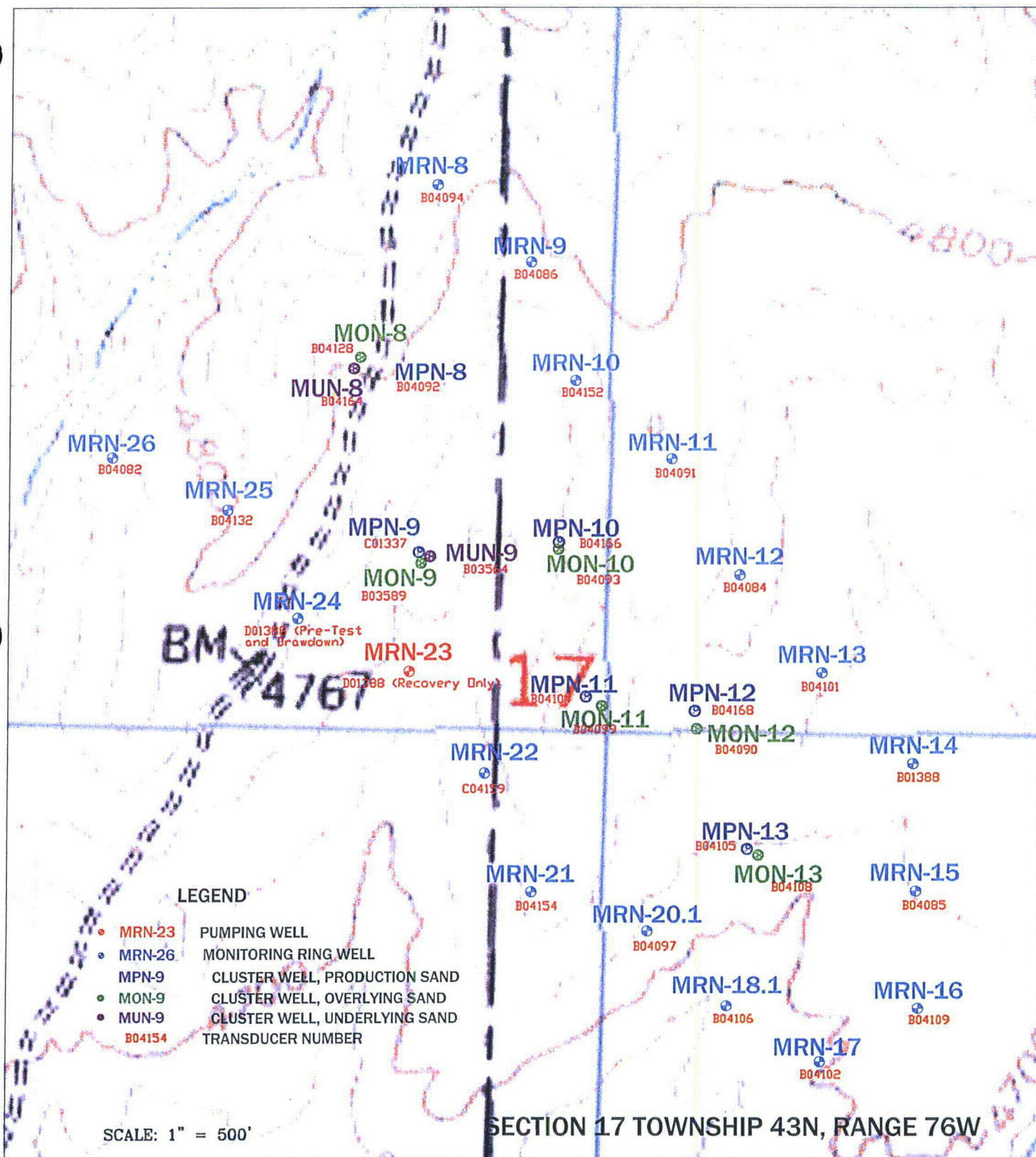
Note: Transducers have a max depth of measuring


B series = max of 35ft

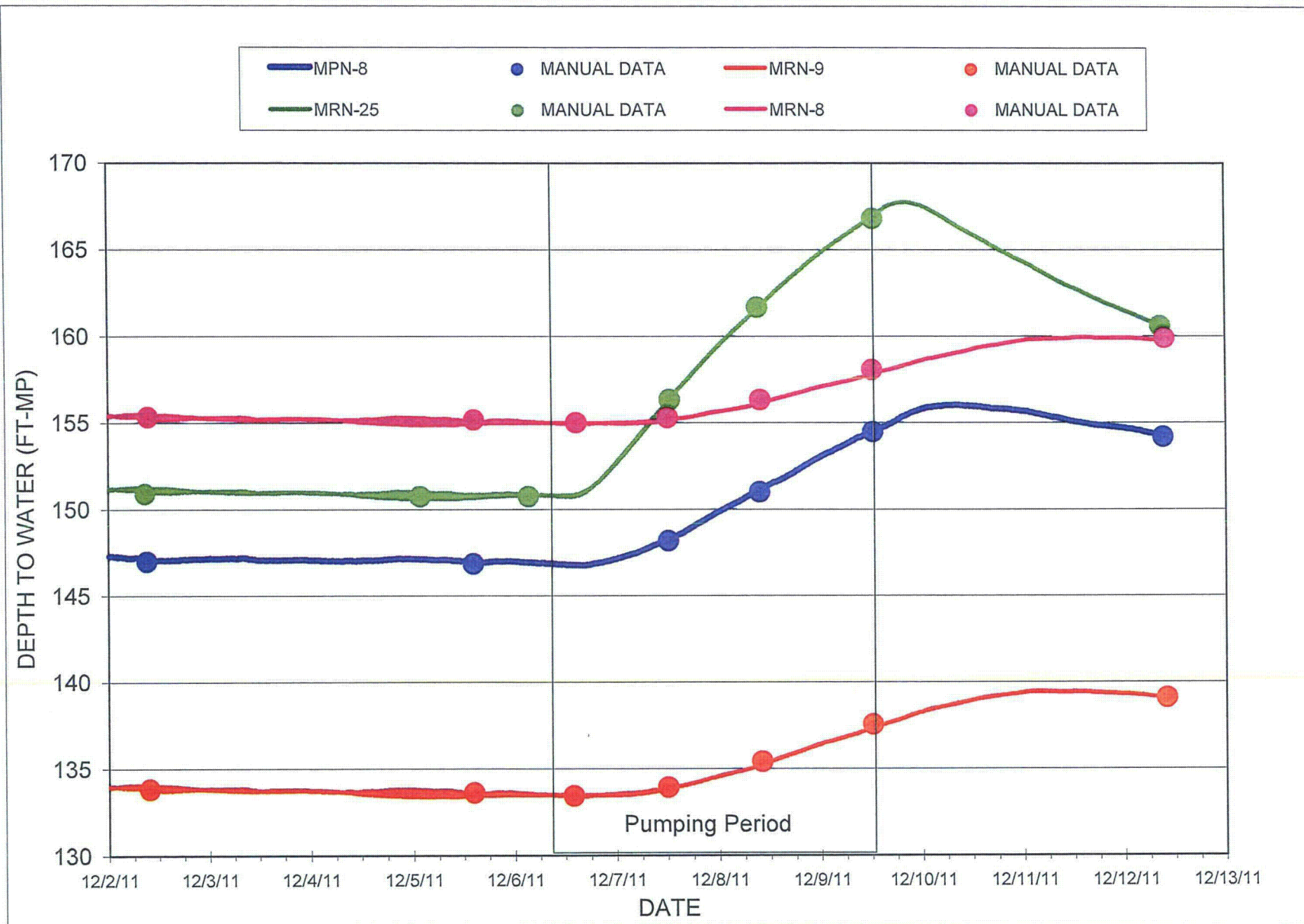
C series = max of 100ft

D series = max of 200ft





REVISIONS	No.	DATE	MADE BY	DESCRIPTION	HYDRO-ENGINEERING L.L.C.	 ENERGY CORPORATION 1701 East "E" Street P.O. Box 50850 Casper, Wyoming USA 82605-0850
	1					
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	3					
DATE	DRAWN BY	CHECKED	APPROVED	HYDRO-ENGINEERING L.L.C. 4885 EAST MAGNOLIA CASPER, WYOMING, 82604	Figure 4-1 MONITORING WELL LOCATIONS AND TRANSDUCER LAYOUT FOR THE MRN-23 TEST	PAGE: 4-7
3-2012	BMW			FILE: C:\PROJECTS\2012-14\nrwellfield		

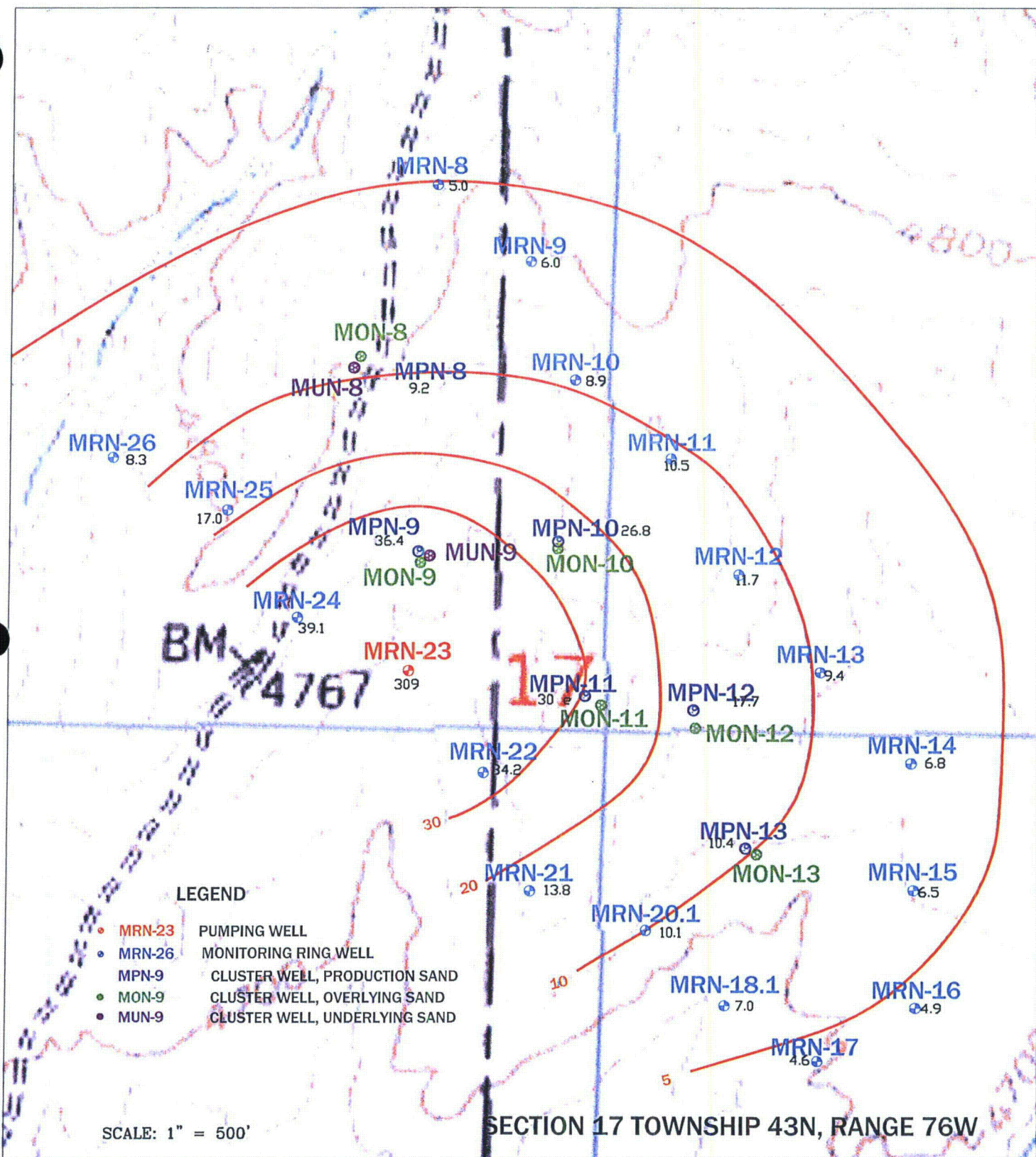



**FIGURE 4-6. DEPTH TO WATER VERSUS TIME FOR OBSERVATION WELLS MPN-8, MRN-9, MRN-25 AND MRN-8**



**Table 5-1.**  
**SUMMARY OF AQUIFER PROPERTIES FOR THE MRN-23 TEST**

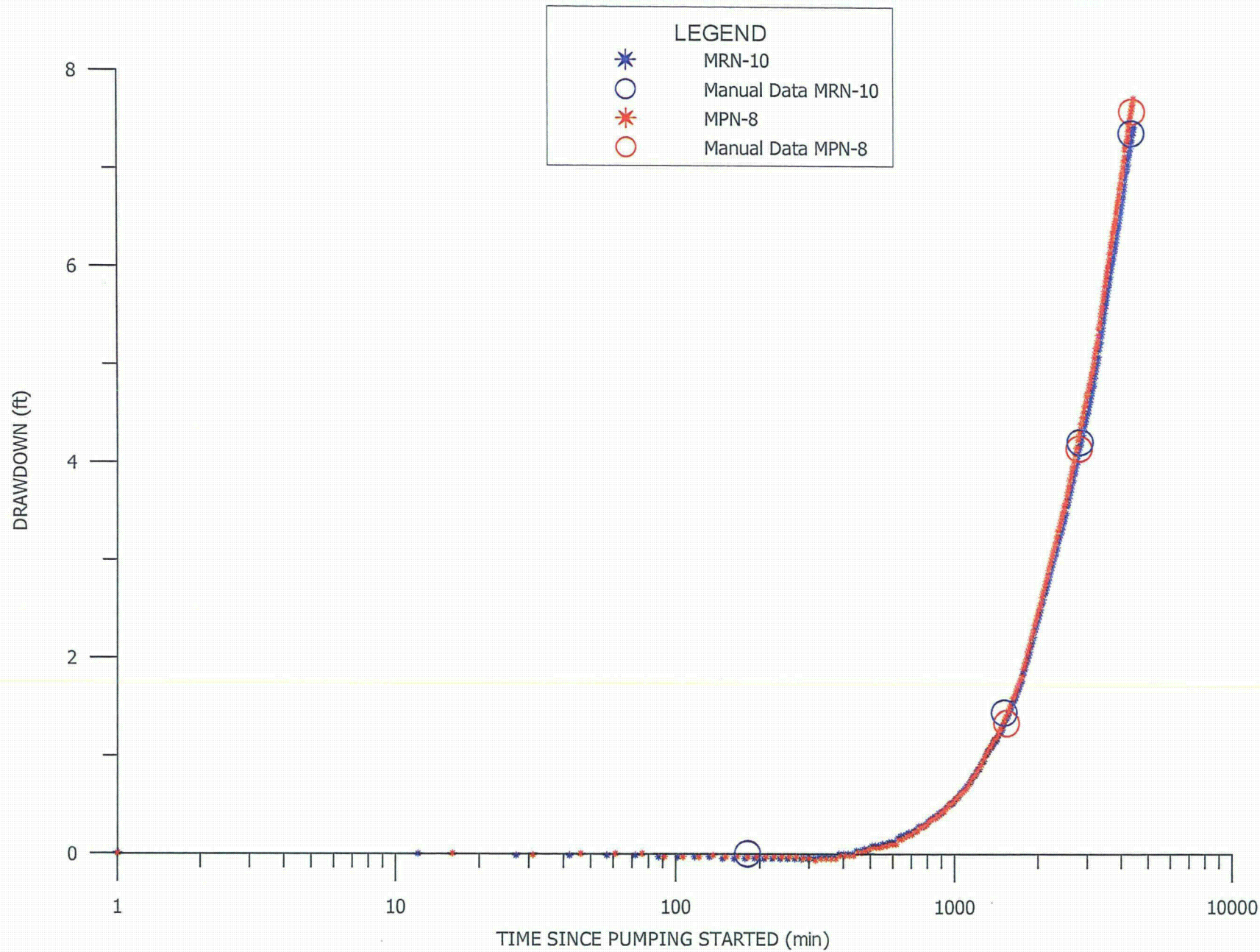
Well	Distance from Pumping Well (ft)	THEIS			COOPER & JACOB		
		Transmissivity		Storage Coefficient	Transmissivity		Storage Coefficient
		(gpd/ft)	(ft <sup>2</sup> /day)		(gpd/ft)	(ft <sup>2</sup> /day)	
MRN-23	-	-	-	-	266	36	-
MRN-23 (REC)	-	-	-	-	214	29	-
MPN-8	1169	273	36	1.8E-04			
MPN-9	449	136	18	2.0E-04	204	27	1.5E-04
MPN-10	756	247	33	8.5E-05	279	37	6.9E-05
MPN-11	686	248	33	7.5E-05	293	39	6.2E-05
MPN-12	1113	271	36	7.9E-05			
MPN-13	1476	246	33	1.0E-04			
MRN-8	1859	288	39	1.4E-04			
MRN-9	1631	271	36	1.4E-04			
MRN-10	1278	289	39	1.4E-04			
MRN-11	1291	281	38	1.1E-04			
MRN-12	1326	307	41	9.4E-05			
MRN-13	1593	265	35	9.3E-05			
MRN-14	1978	246	33	8.6E-05			
MRN-15	2123	246	33	8.1E-05			
MRN-16	2351	266	36	9.8E-05			
MRN-17	2181	342	46	1.3E-04			
MRN-18.1	1770	246	33	1.2E-04			
MRN-20.1	1359	243	32	1.2E-04			
MRN-21	970	269	36	1.5E-04			
MRN-22	494	240	32	1.3E-04	272	36	9.8E-05
MRN-24	472	246	33	9.0E-05	267	36	7.7E-05
MRN-25	928	246	33	1.0E-04			
MRN-26	1399	281	38	1.3E-04			
AVERAGE:		261	35	1.2E-04			



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	4									
DATE					DRAWN BY	CHECKED	APPROVED	HYDRO-ENGINEERING L.L.C. 4685 EAST MAGNOLIA CASPER, WYOMING, 82604	Figure 5-1 Maximum Drawdown in the A Sand For the MRN-23 Pump Test	
3-2012					BMW			FILE: C:\PROJECTS\2012-14\nrwellfield		
										PAGE: 5-5



5-25



**FIGURE 5-21. DRAWDOWN IN OBSERVATION WELL MRN-10 AND MPN-8**

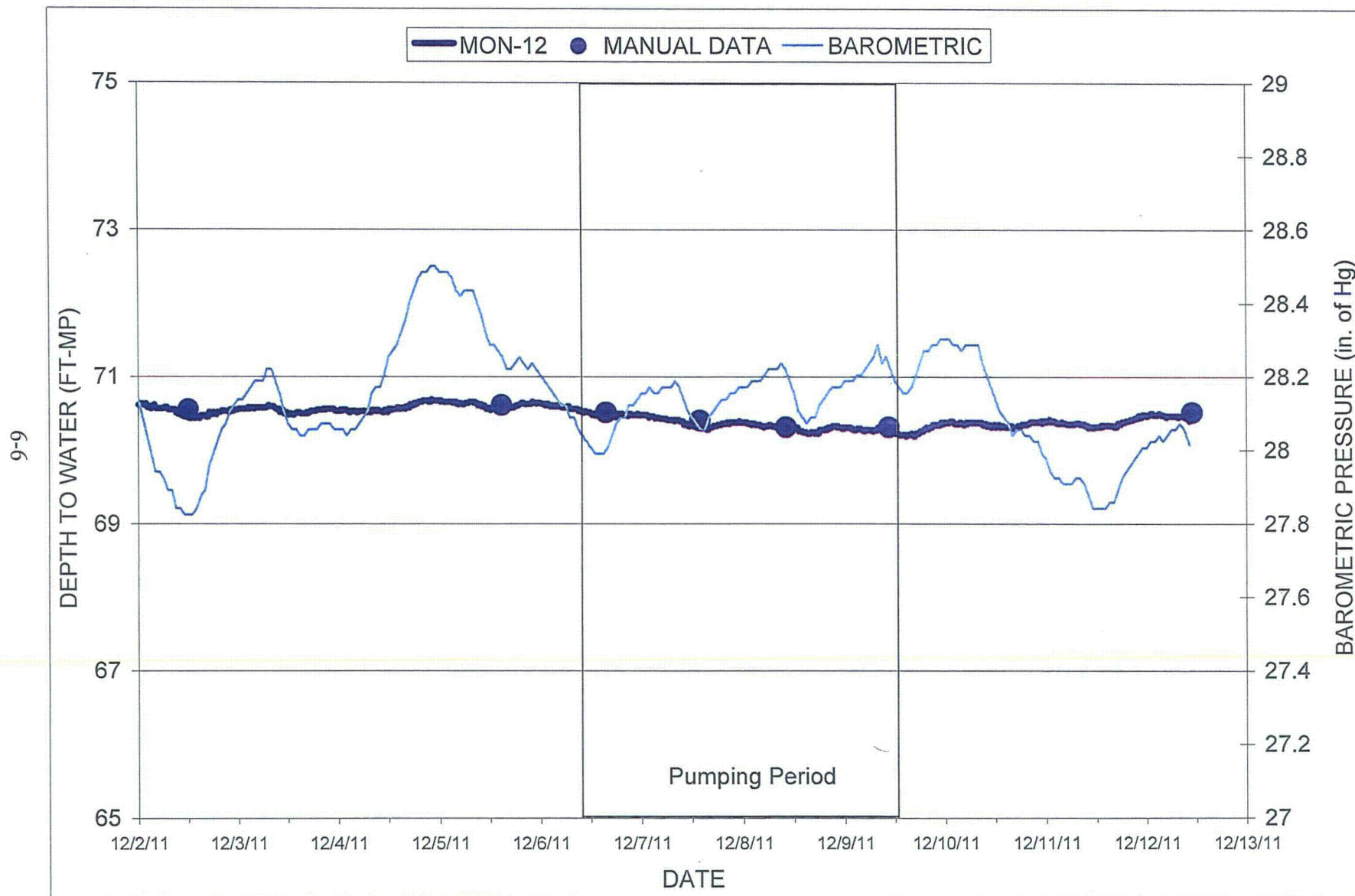


FIGURE 6-4. DEPTH TO WATER VERSUS TIME FOR OVERLYING AQUIFER WELL MON-12

**Table 7-1.**  
**MONITORING WELL DISTANCE, STATIC WATER-LEVEL BEFORE TEST AND MAXIMUM**  
**DRAWDOWN DURING THE MRN-29 TEST**

1st Start Date & Time	2/15/2012 10:40				
1st End Date & Time	2/17/2012 8:06				
2nd Start Date & Time	2/17/2012 9:40				
2nd End Date & Time	2/18/2012 13:00				
Duration	4366 min.				
Avg. Pumping Rate	33.3 G.P.M.				
Pumping Well	MRN-29	Distance from	Depth to Water	Water Elevation	Maximum Drawdown
Monitoring Wells		Pumping Well	Before Test	Before Test	During Test
		(ft)	(ft)	(ft)	(ft)
	MRN-29	0	165.70	4656.08	197.1
Ore Zone Completions	MPN-1.1	1190	151.54	4650.55	11.1
	MPN-2.1	1208	154.32	4651.71	11.9
	MPN-3	614	201.74	4651.03	20.3
	MPN-4	770	189.36	4656.37	20.4
	MPN-5	1148	147.74	4659.07	11.5
	MPN-6	1339	170.92	4661.34	7.0
	MPN-7	1510	190.73	4661.09	5.7
	MPN-8	1879	145.67	4662.63	3.4
	MRN-1	2038	125.86	4652.29	5.3
	MRN-2.2	1849	165.57	4653.95	6.2
	MRN-3.2	1534	193.46	4654.76	7.6
	MRN-4	1325	198.57	4655.02	9.2
	MRN-5	1294	208.32	4656.76	5.1
	MRN-6	1534	177.57	4658.39	9.1
	MRN-7	1724	166.55	4660.17	6.2
	MRN-8	2017	154.37	4661.63	3.8
	MRN-27	830	110.00	4658.59	18.2
	MRN-28	443	148.18	4654.29	36.0
	MRN-30	490	230.06	4655.39	27.4
	MRN-31	983	186.20	4654.94	14.3
	MRN-32	1434	158.79	4653.30	8.4
	MRN-33	1766	183.41	4653.21	5.9
	MRN-34.2	2042	138.05	4654.50	4.1
Overlying Completions	MON-1	1181	159.90	4649.99	*
	MON-2	1182	157.14	4654.63	*
	MON-3	808	192.44	4654.92	*
	MON-4	1280	190.38	4660.58	*
	MON-5	1119	144.18	4661.30	*
	MON-6	1280	162.15	4661.87	*
	MON-7	1476	191.56	4663.30	*
Underlying Completions	MUN-1.1	1136	155.40	4647.40	*
	MUN-2	1228	158.02	4647.39	*
	MUN-3	638	201.28	4647.35	*
	MUN-4	795	196.03	4647.49	*
	MUN-5.1	1127	159.96	4640.13	*
	MUN-6	1293	172.81	4647.93	*
	MUN-7	1545	202.16	4647.56	*

Note: \* = No Drawdown Observed  
e = estimated maximum drawdown because water level was



**TABLE 7-2.**  
**DATA LOGGER AND TRANSDUCER EQUIPMENT FOR**  
**MONITORING WELLS FOR THE MRN-29 TEST**

	Well Name	Transducer Number
Monitoring Wells		
	MRN-29	D01388
Ore Zone Completions	MPN-1.1	B04093
	MPN-2.1	B04085
	MPN-3	C04159
	MPN-4	B04097
	MPN-5	B04192
	MPN-6	B04183
	MPN-7	B04108
	MPN-8	B04128
	MRN-1	B04132
	MRN-2.2	B04082
	MRN-3.2	B04086
	MRN-4	B04101
	MRN-5	B04209
	MRN-6	B04091
	MRN-7	B04473
	MRN-8	B04094
	MRN-27	B04104
	MRN-28	C01337
	MRN-30	C04167
	MRN-31	B04105
	MRN-32	B01388
	MRN-33	B01349
	MRN-34.2	B04102
Overlying Completions	MON-1	B04106
	MON-2	B04152
	MON-3	B04109
	MON-4	B04154
	MON-5	B04164
	MON-6	B04099
	MON-7	B04166
Underlying Completions	MUN-1	B01348
	MUN-2	B04092
	MUN-3	B04084
	MUN-4	B03589
	MUN-5.1	B03564
	MUN-6	B04090
	MUN-7	B04168

Note: Transducers have a max depth of measuring

B series = max of 35ft

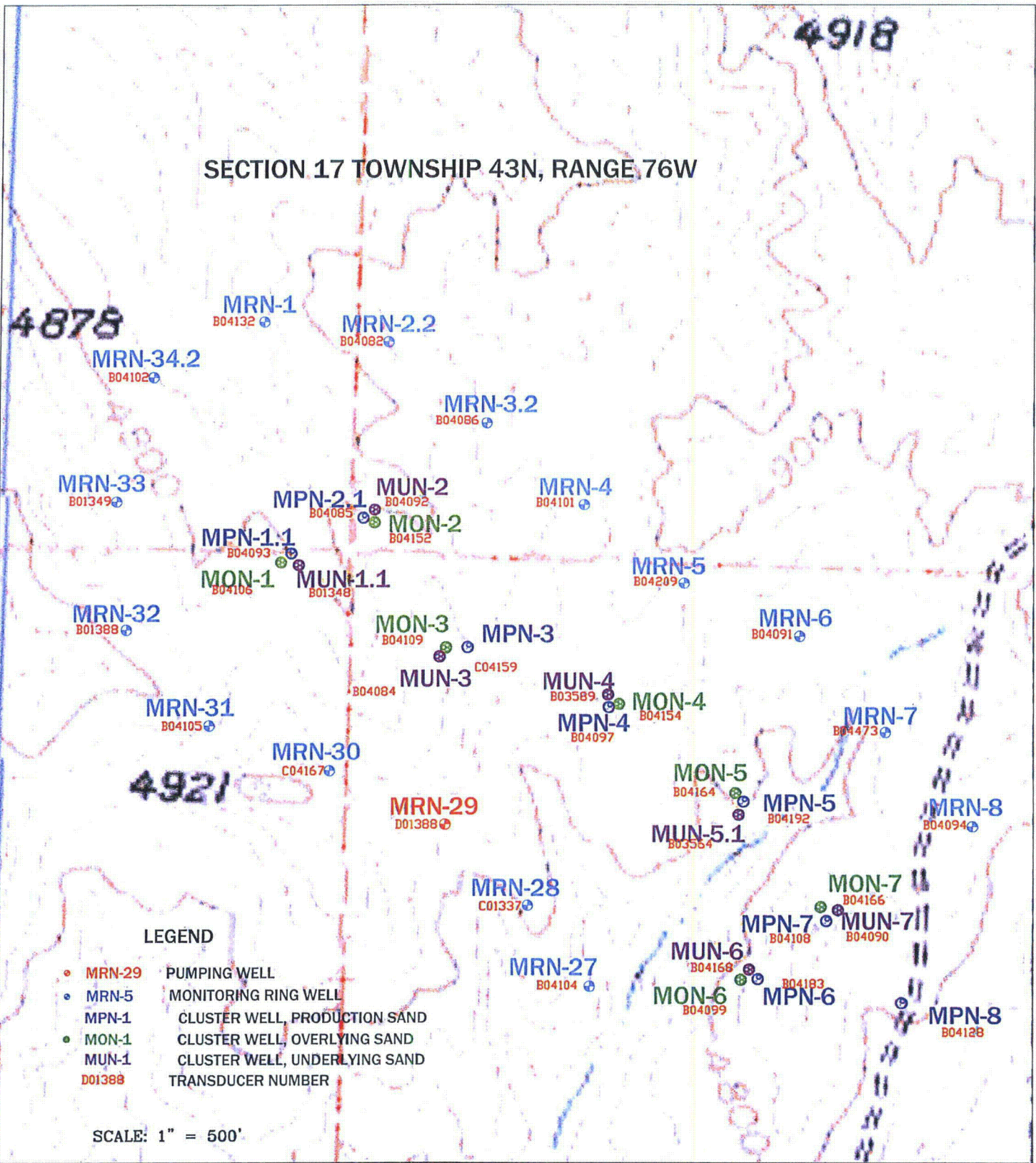
C series = max of 100ft

D series = max of 200ft

4918

# SECTION 17 TOWNSHIP 43N, RANGE 76W

4878



REVISIONS	No.	DATE	MADE BY	DESCRIPTION
	1			
	2			
	3			
	4			
DATE				
3-2012		RTS		
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HYDRO-ENGINEERING L.L.C.  
4685 EAST MAGNOLIA  
CASPER, WYOMING, 82604

FILE: C:\PROJECTS\2012-14\nrwellfield

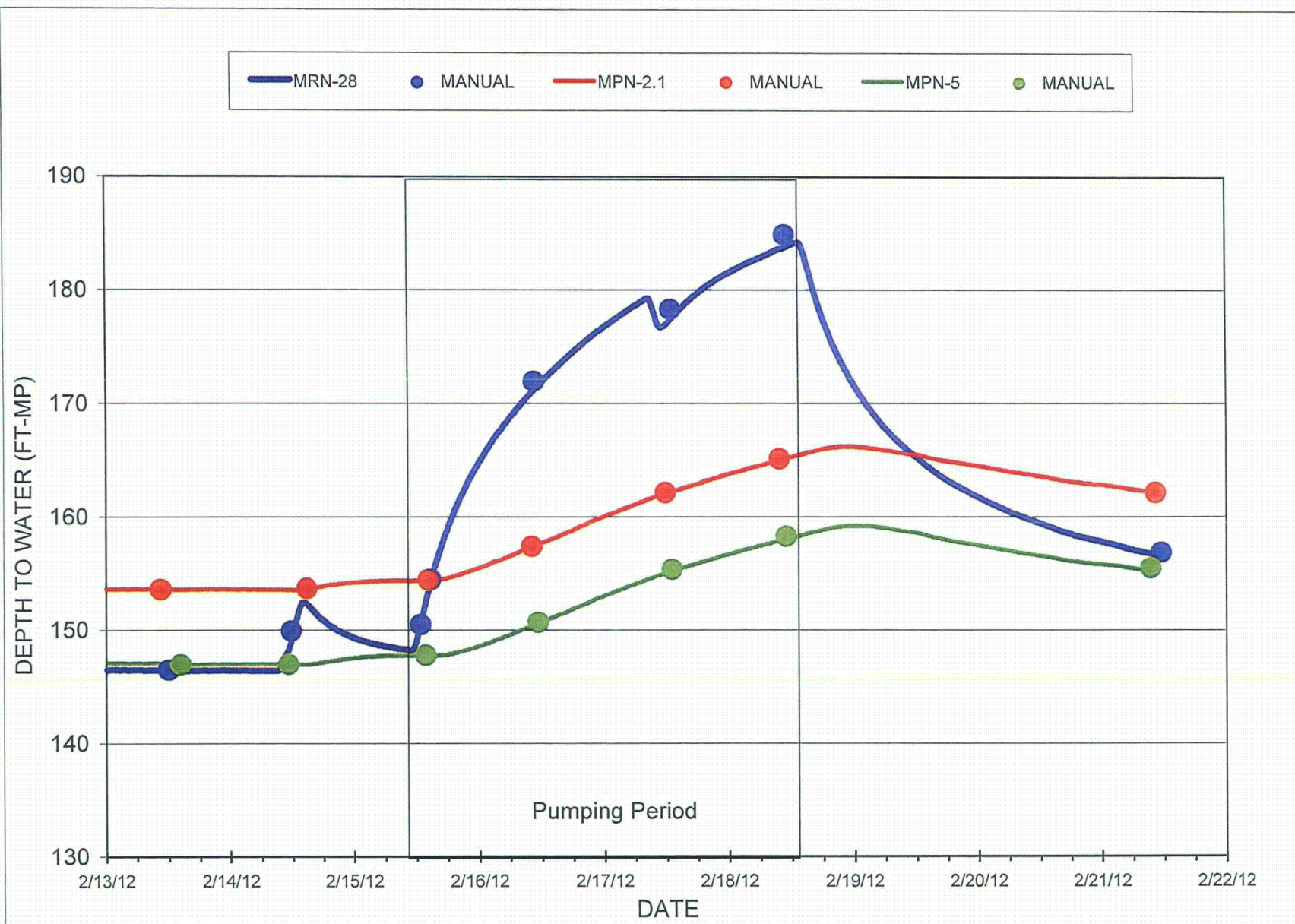


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1701 East "E" Street  
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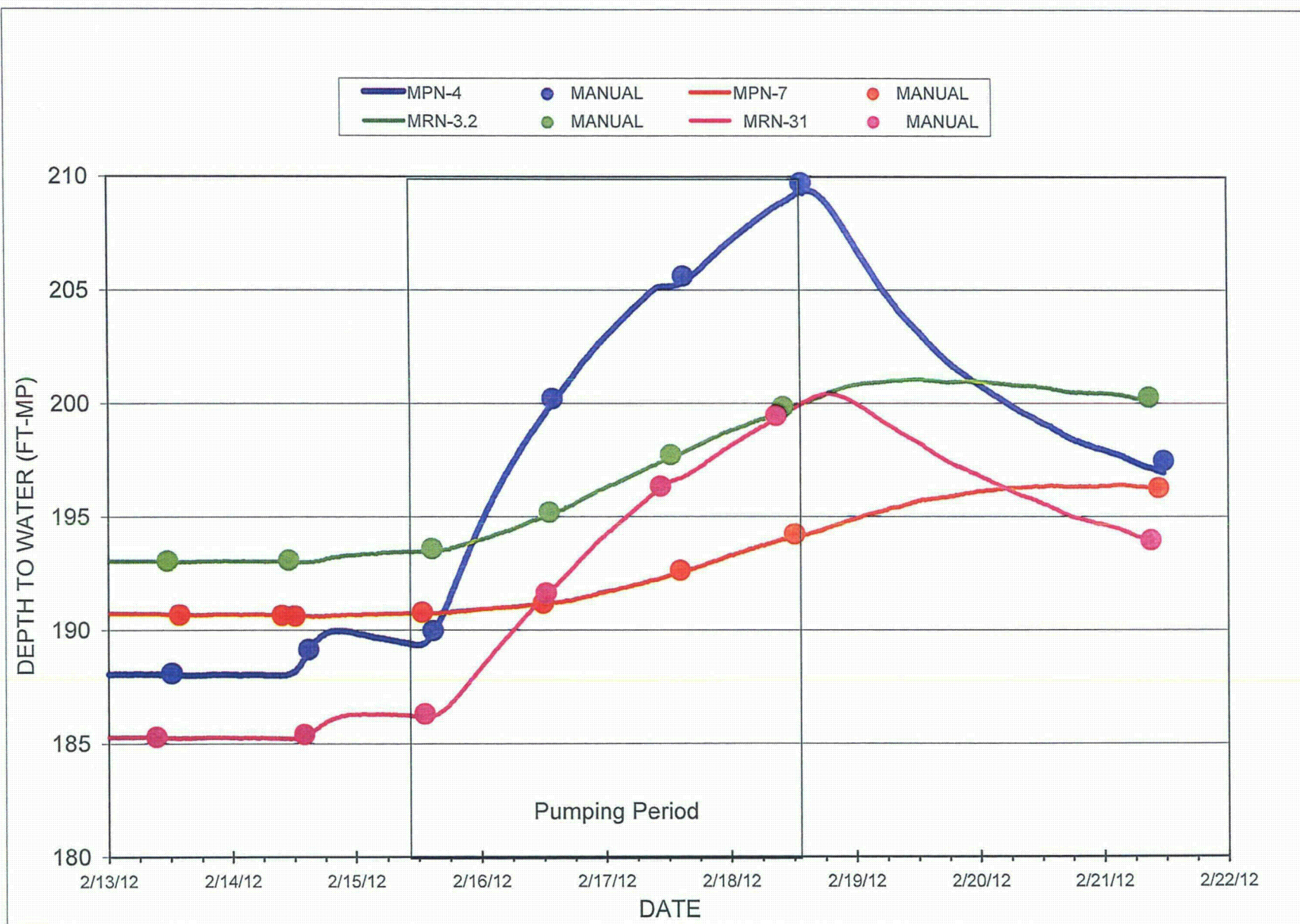
**Figure 7-1**  
**Monitoring Well Locations and Transducer Equipment Layout for the MRN-29 Test.**

PAGE: 7-6





**FIGURE 7-4. DEPTH TO WATER VERSUS TIME FOR OBSERVATION WELLS MRN-28, MPN-2.1 AND MPN-5**



**FIGURE 7-6. DEPTH TO WATER VERSUS TIME FOR OBSERVATION WELLS MPN-4, MPN-7, MRN-3.2 AND MRN-31**

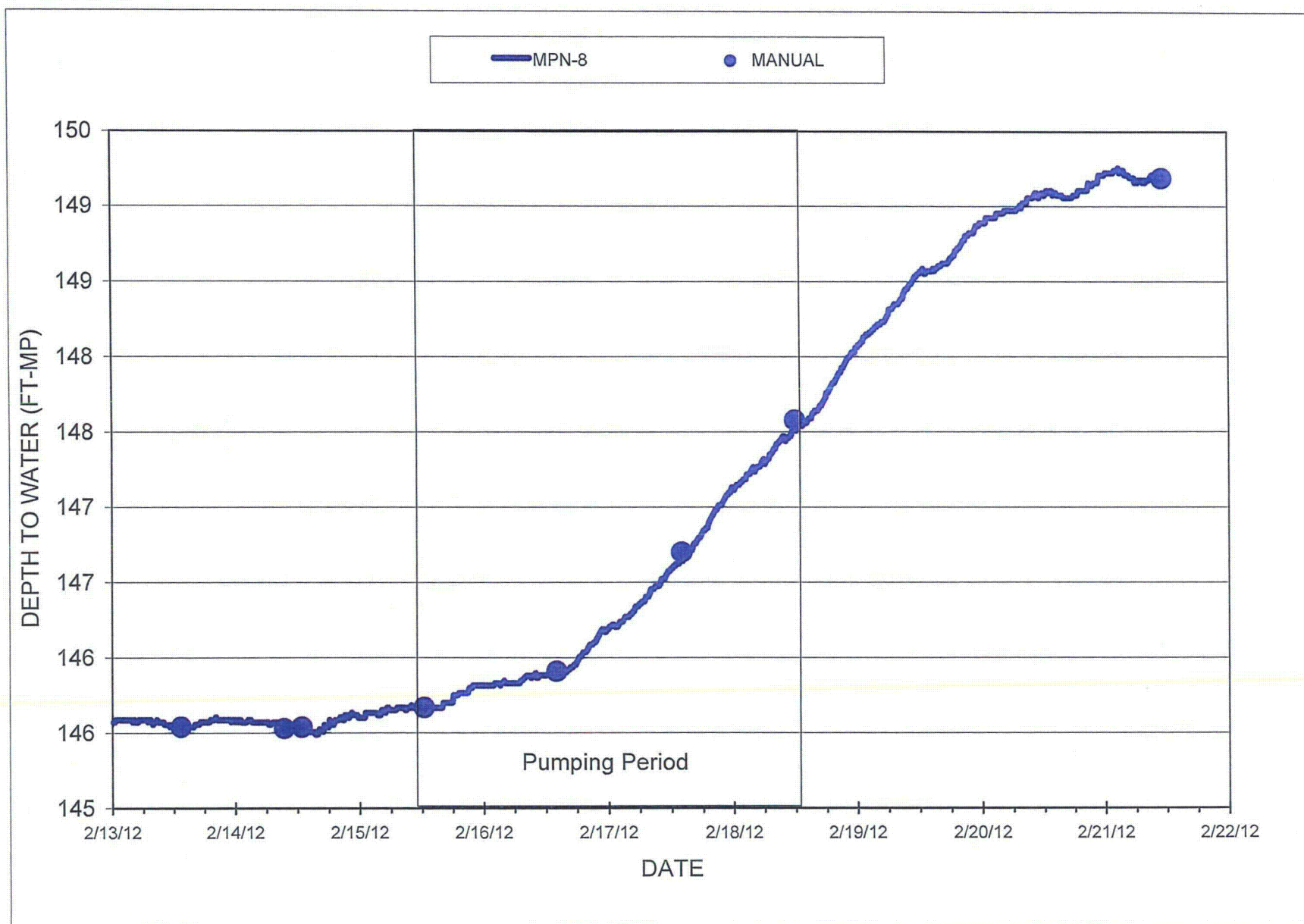
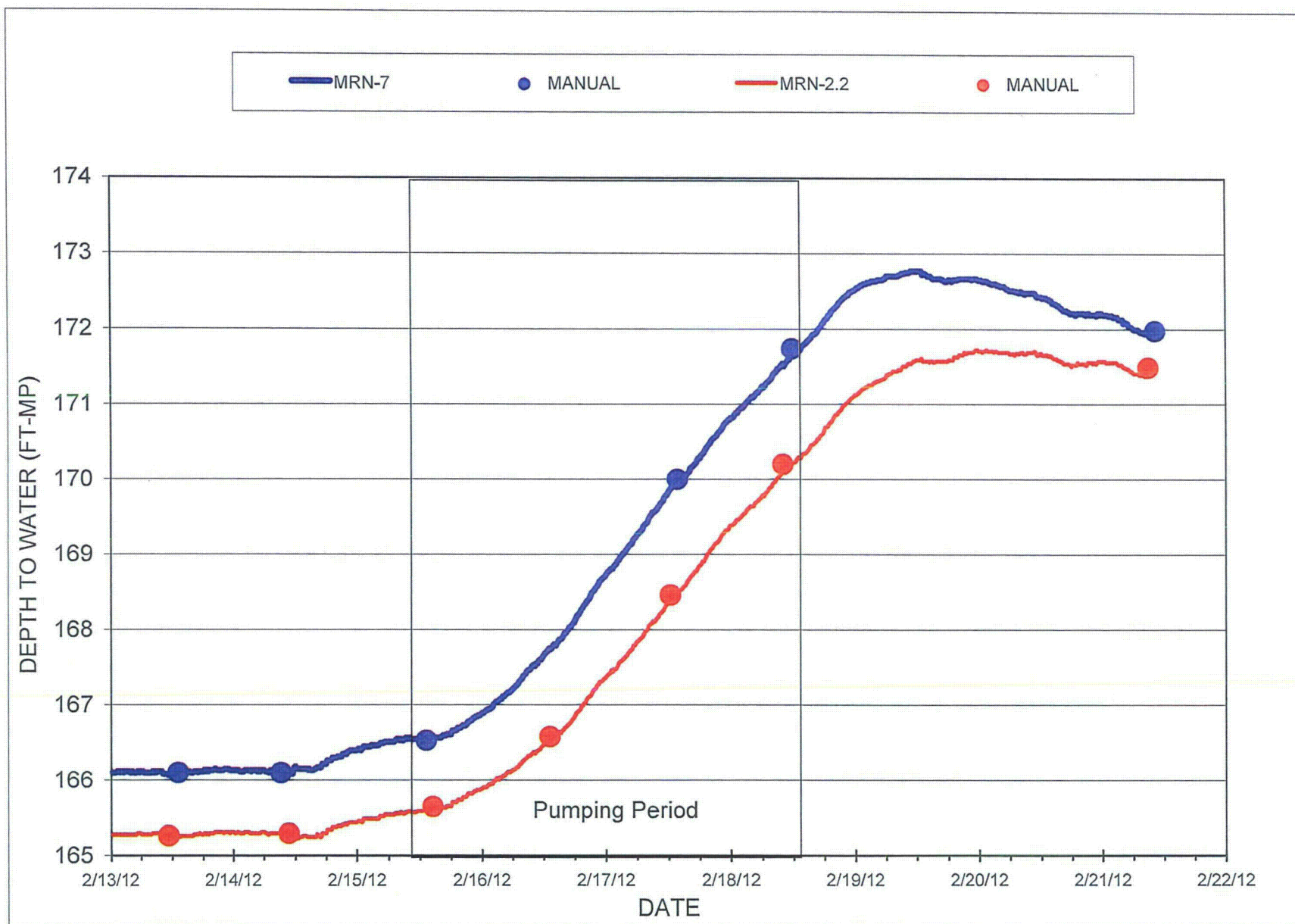


FIGURE 7-11. DEPTH TO WATER VERSUS TIME FOR OBSERVATION WELL MPN-8





**FIGURE 7-13. DEPTH TO WATER VERSUS TIME FOR OBSERVATION WELLS MRN-7 AND MRN-2.2**

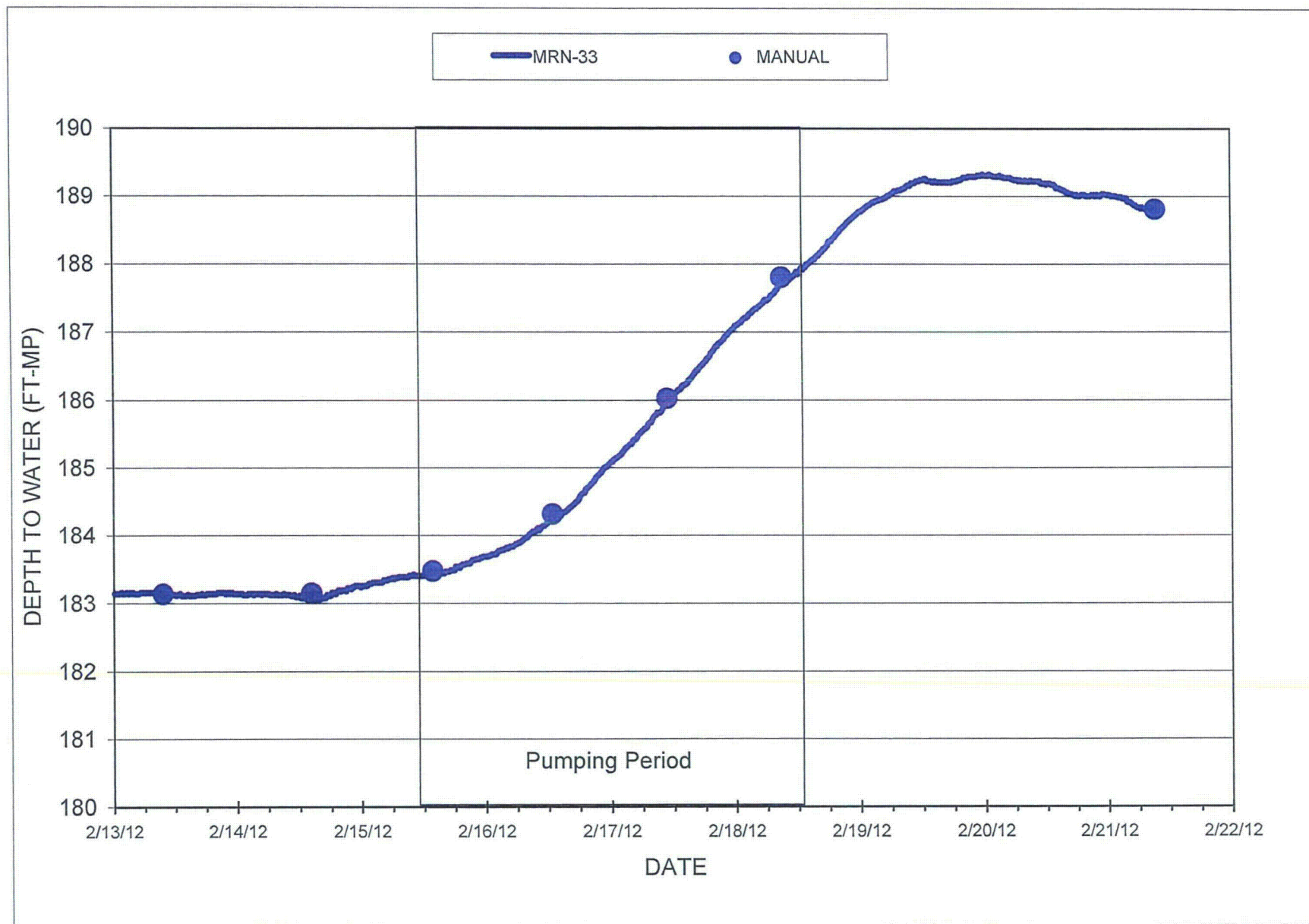


FIGURE 7-14. DEPTH TO WATER VERSUS TIME FOR OBSERVATION WELL MRN-33

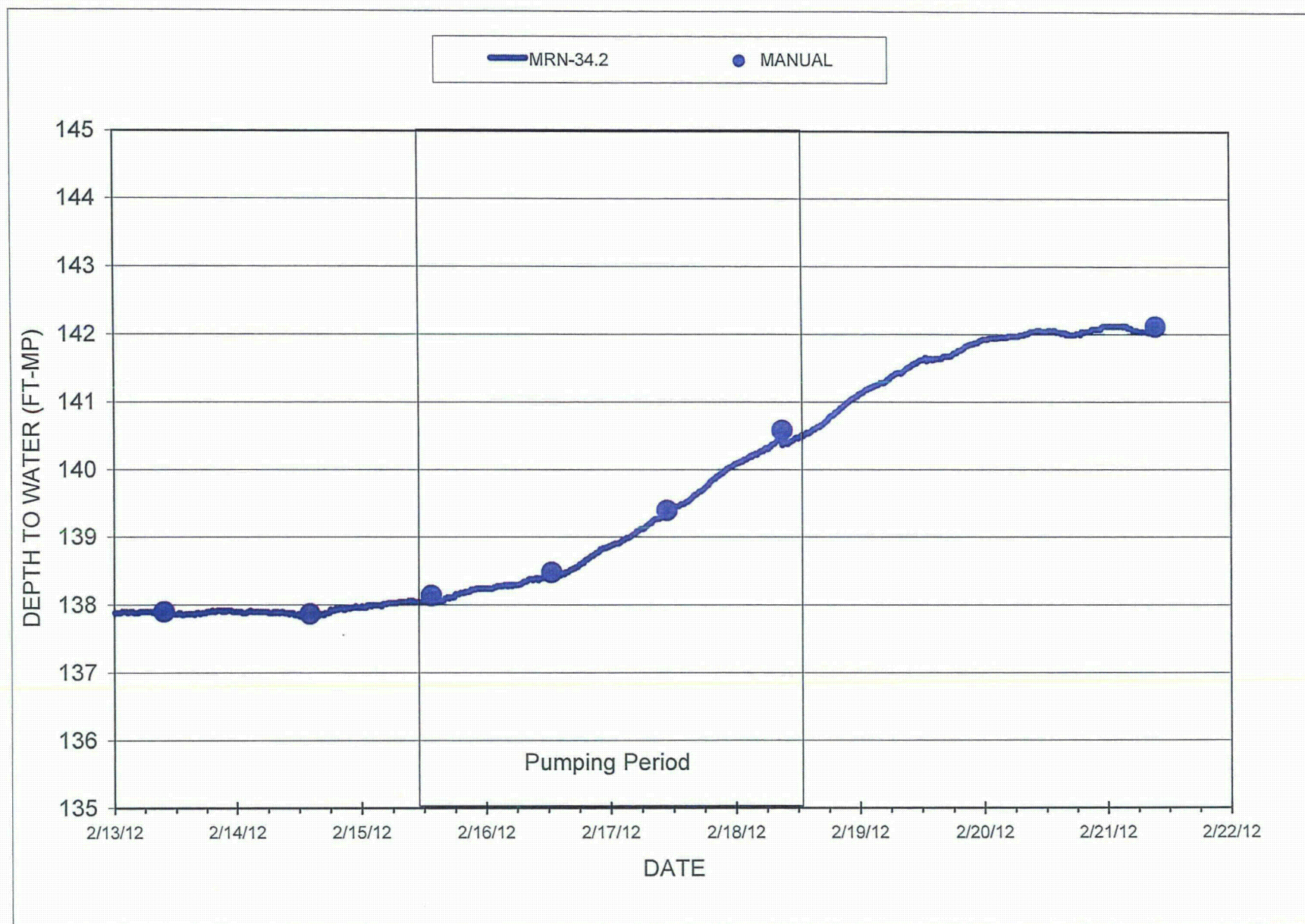


FIGURE 7-15. DEPTH TO WATER VERSUS TIME FOR OBSERVATION WELL MRN-34.2



## 8.2 BACKGROUND TRENDS

Water level stability data were collected prior to the start of the test. Plots of the background data for the pumping, MRN and MPN wells are shown in Figures 7-2 through 7-15. Water level stability data collected during the pre-test and post-test periods along with barometric pressure were used to assess the background trends. No significant recharge or trend corrections were warranted for any of the MRN-29 pump test wells. The barometric change during the pumping phase of the test was approximately 0.3 inches of Hg (see Section 9 plots for barometric pressure data) which did not require any adjustments in the A Sand water levels for barometric changes.

## 8.3 TEST RESULTS

### 8.3.1 DRAWDOWN

The drawdown achieved during the test is shown on Figure 8-1. A drawdown of 197.1 feet was developed in pumping wells MRN-29 while maximum drawdowns in the A Sand monitoring wells from this pumping were 3.4 to 36.0 feet. The five foot drawdown contour extended to roughly 1800 feet from the pumping well. Drawdown contours were fairly circular. Drawdown in A Sand wells MPN-8 and MRN-8 from both test demonstrates continuity between the two multi-well tests.

Figure 8-2 presents the semi-log plot of the drawdown data for pumping well MRN-29. The red data points are drawdown values collected prior to the generator failure and plotted against time since the pump first started. The straight line fit of this data produced a transmissivity of 311 gal/day/ft ( $42 \text{ ft}^2/\text{d}$ ). The blue data points are data after the re-start of the pump and are plotted versus  $t_1^* t_3 / t_2$  to account for the pump down time (see Section 10 for a discussion of the straight line adjusted theory). The straight line of the blue data was not used but would have produced a very similar transmissivity to the straight line of the red data. The pumping well recovery plot is presented in Figure 8-3 and the straight line fits yields a transmissivity of 286 gal/day/ft ( $38 \text{ ft}^2/\text{d}$ ).

Theis type curves matches and linear plots are presented in Figures 8-4 through 8-39 for the A Sand monitoring wells. Semi-log plots are presented for observation wells but a straight line fit was not used because they were not appropriate for these wells. A refined Theis type curve fit, which accounts for the off period, was used on the drawdown data of the observation wells. Each of these wells shows a good fit to the Theis type curve. The adjustment of the Theis type curve was minor for most of the observation wells and therefore non-adjusted type curve was used in most observation matches. The type curve fits do not indicate leaky or boundary conditions in this area of the A Sand.

The tabulation of the water level data for the test is included in Appendix D.

**Table 8-1.**  
**SUMMARY OF AQUIFER PROPERTIES FOR THE MRN-29 TEST**

Well	Distance from Pumping Well (ft)	THEIS			COOPER & JACOB		
		Transmissivity		Storage Coefficient	Transmissivity		Storage Coefficient
		(gpd/ft)	(ft <sup>2</sup> /day)		(gpd/ft)	(ft <sup>2</sup> /day)	
MRN-29	-	-	-	-	311	42	-
MRN-29 (REC)	-	-	-	-	286	38	-
MPN-1.1	1190	329	44	1.2E-04			
MPN-2.1	1208	347	46	1.0E-04			
MPN-3	614	185	25	2.5E-04			
MPN-4	770	313	42	1.0E-04			
MPN-5	1148	313	42	1.2E-04			
MPN-6	1339	347	46	1.7E-04			
MPN-7	1510	329	44	2.0E-04			
MPN-8	1879	477	64	2.1E-04			
MRN-1	2038	415	55	1.1E-04			
MRN-2.2	1849	424	57	1.1E-04			
MRN-3.2	1534	382	51	1.1E-04			
MRN-4	1325	460	61	1.1E-04			
MRN-5	1294	347	46	3.7E-04			
MRN-6	1534	334	45	9.0E-05			
MRN-7	1724	460	61	1.1E-04			
MRN-8	2017	636	85	1.6E-04			
MRN-27	830	294	39	1.1E-04			
MRN-28	443	303	41	8.0E-05			
MRN-30	490	267	36	1.3E-04			
MRN-31	983	341	46	1.2E-04			
MRN-32	1434	398	53	1.1E-04			
MRN-33	1766	398	53	1.1E-04			
MRN-34.2	2042	545	73	1.6E-04			
AVERAGE:		376	50	1.4E-04			



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SECTION 17 TOWNSHIP 43N, RANGE 76W

4878

4921

LEGEND

- MRN-29 PUMPING WELL
- MRN-5 MONITORING RING WELL
- MPN-1 CLUSTER WELL, PRODUCTION SAND
- MON-1 CLUSTER WELL, OVERLYING SAND
- MUN-1 CLUSTER WELL, UNDERLYING SAND

SCALE: 1" = 500'

REVISIONS	No.	DATE	MADE BY	DESCRIPTION
	1			
	2			
	3			
	4			
DATE		DRAWN BY	CHECKED	APPROVED
3-2012		RTS		

HYDRO-ENGINEERING L.L.C.

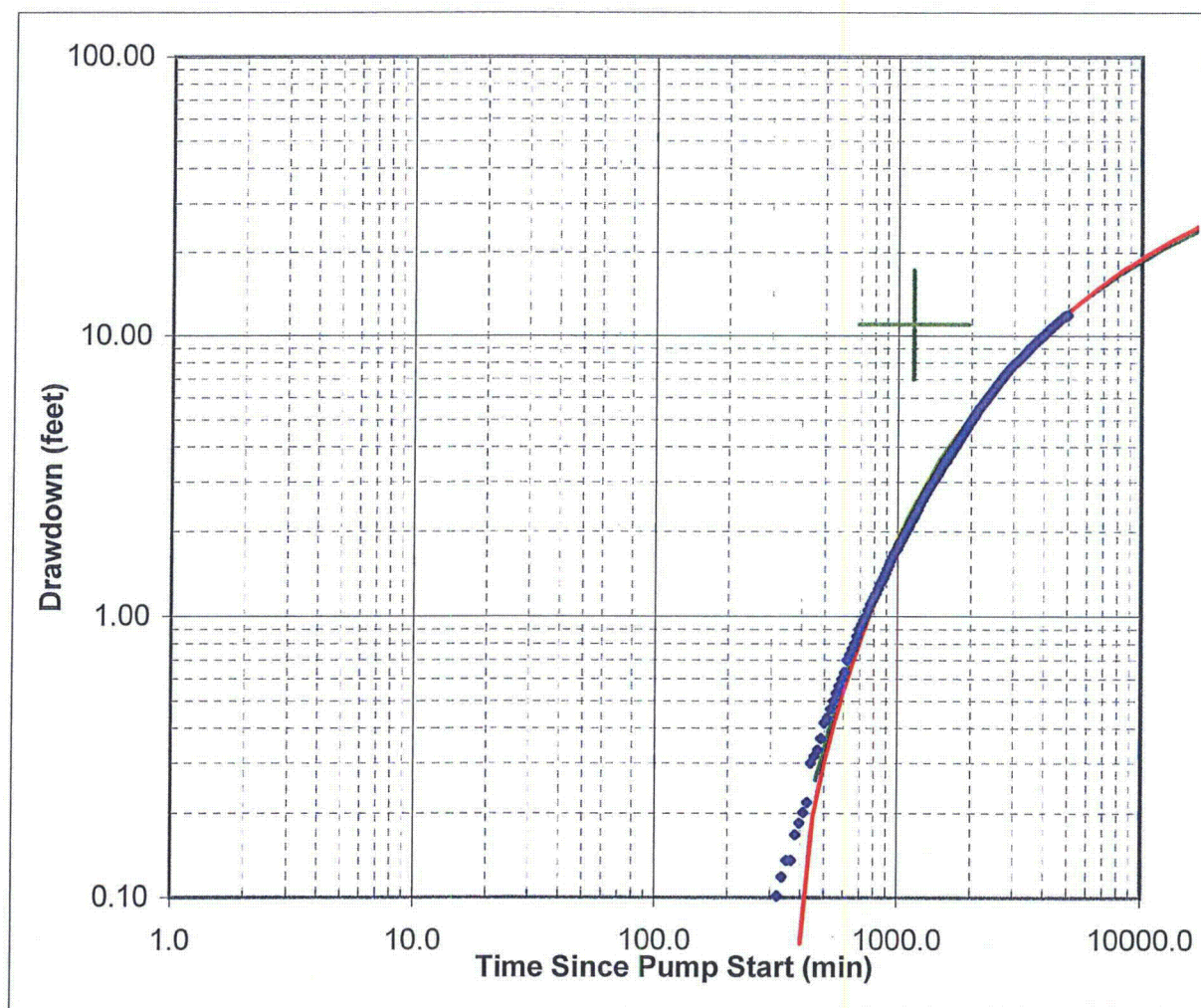
HYDRO-ENGINEERING L.L.C.  
4685 EAST MAGNOLIA  
CASPER, WYOMING, 82604

FILE: C:\PROJECTS\2012-14\nrwellfield



Figure 8-1  
Maximum Drawdown in the A Sand  
for the MRN-29 Pump Test





#### Theis Match Point

Initial Discharge (gpm)	33.3
Radius to Pumping Well (ft) (<1 indicates pumping well)	1208
Drawdown Match Point (ft)	11.00
Time Match Point (min)	1150.0
Calculated Transmissivity (gal/day/ft)	347
Calculated Storage Coefficient (ft/ft)	1.02E-04
<b>Refined Transmissivity Estimate (gal/day/ft)</b>	<b>327</b>
<b>Refined Storage Coefficient Estimate (ft/ft)</b>	<b>1.02E-04</b>

#### Test Interruption Data

Pump Off Time (minutes after initial pump start)	2726
Pump Restart Time (minutes after initial pump start)	2820
Pump Restart Rate (gpm)	33.3

**FIGURE 8-7. DRAWDOWN IN OBSERVATION WELL MPN-2.1, LOG-LOG**

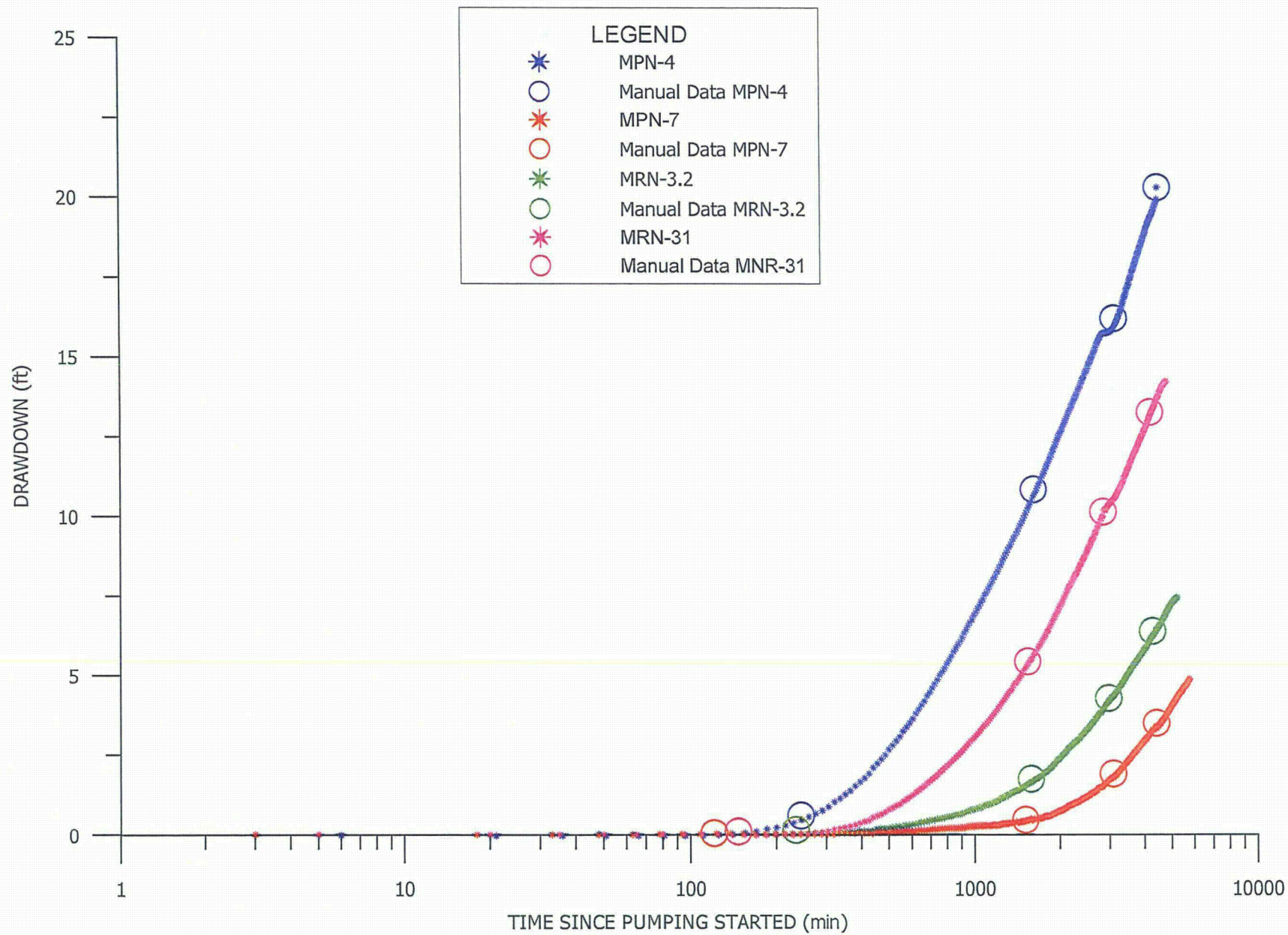
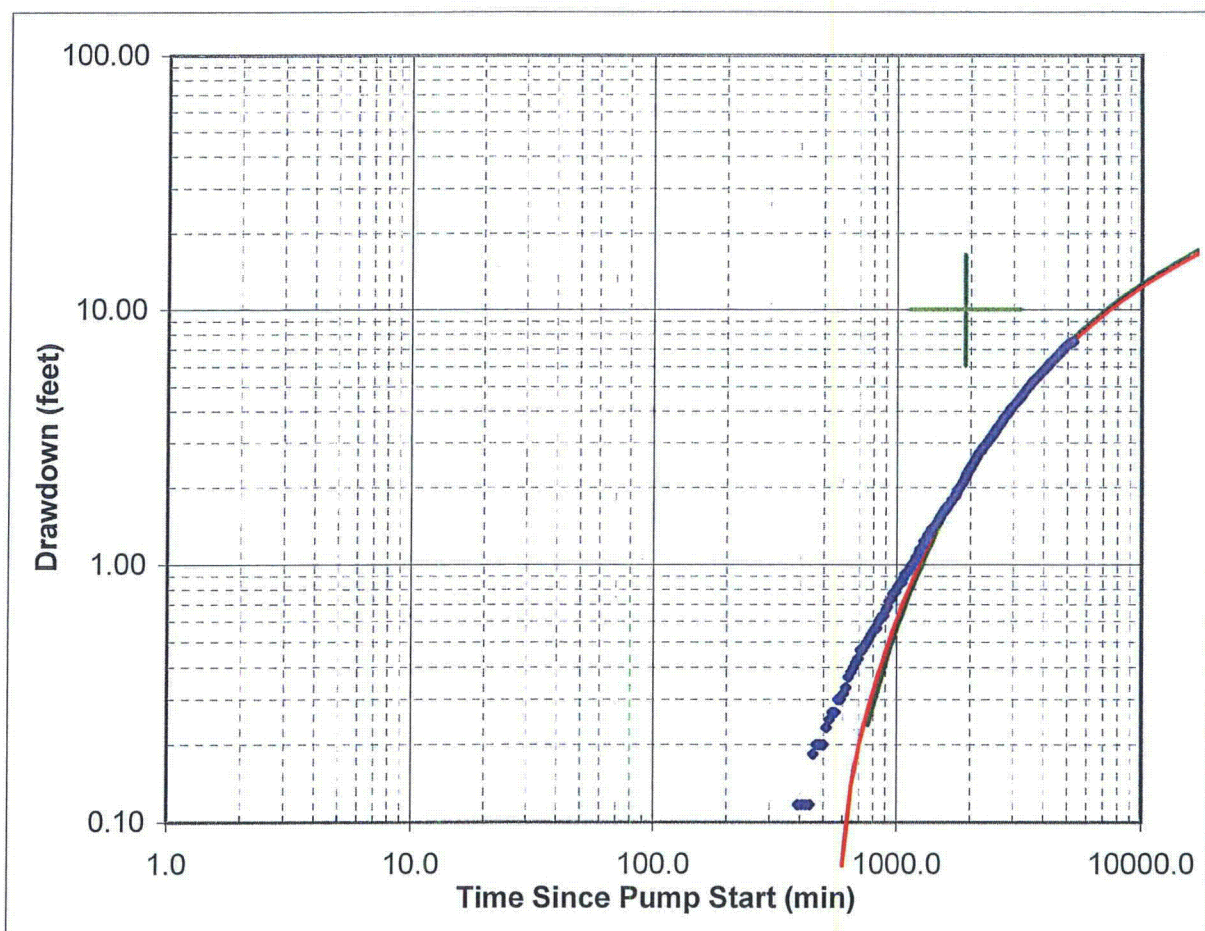


FIGURE 8-13. DRAWDOWN IN OBSERVATION WELL MPN-4, MPN-7, MRN-3.2 AND MRN-31





#### Theis Match Point

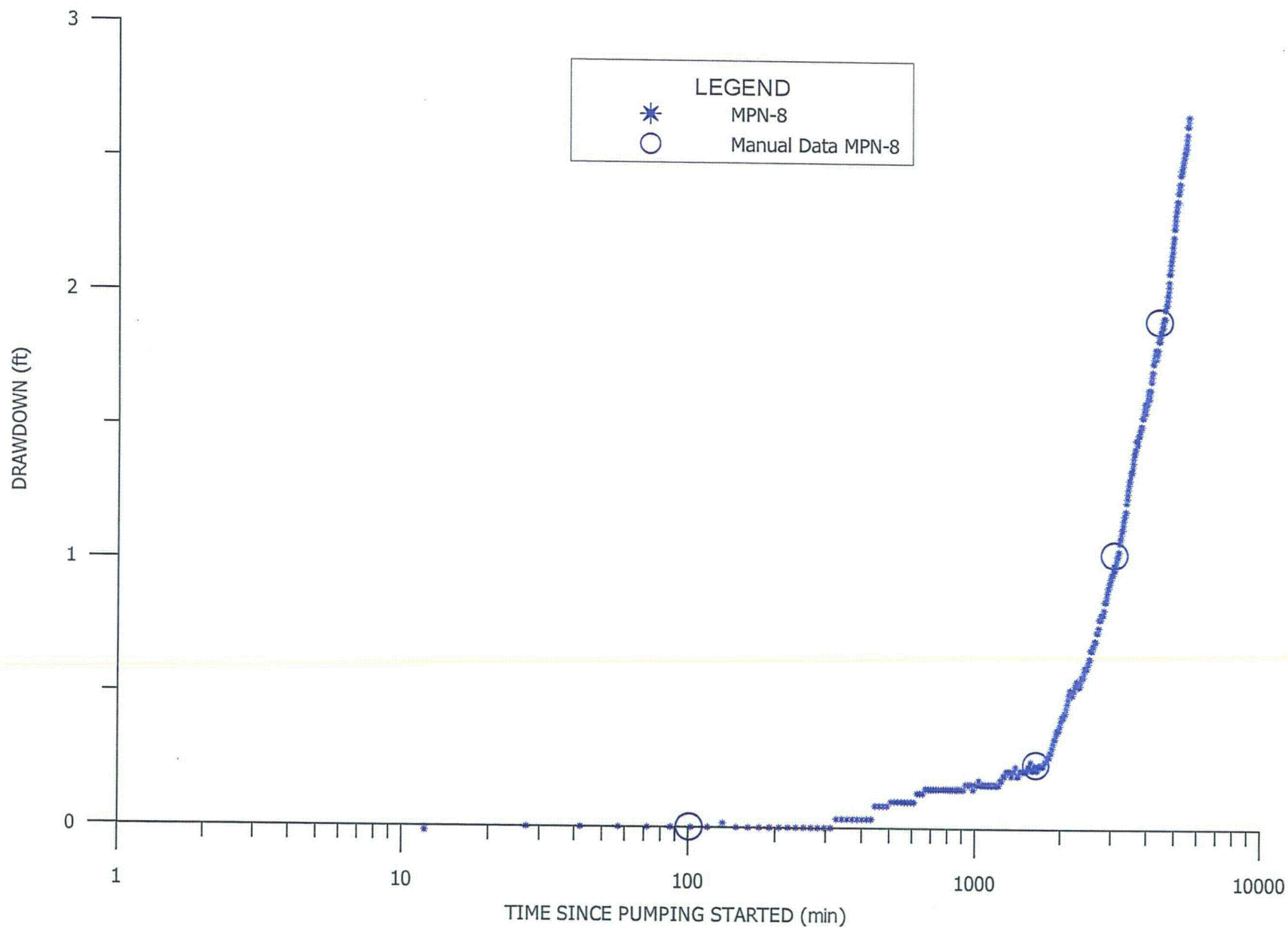
Initial Discharge (gpm)	33.3
Radius to Pumping Well (ft) (<1 indicates pumping well)	1534
Drawdown Match Point (ft)	10.00
Time Match Point (min)	1900.0
Calculated Transmissivity (gal/day/ft)	382
Calculated Storage Coefficient (ft/ft)	1.14E-04
<b>Refined Transmissivity Estimate (gal/day/ft)</b>	<b>401</b>
<b>Refined Storage Coefficient Estimate (ft/ft)</b>	<b>1.14E-04</b>

#### Test Interruption Data

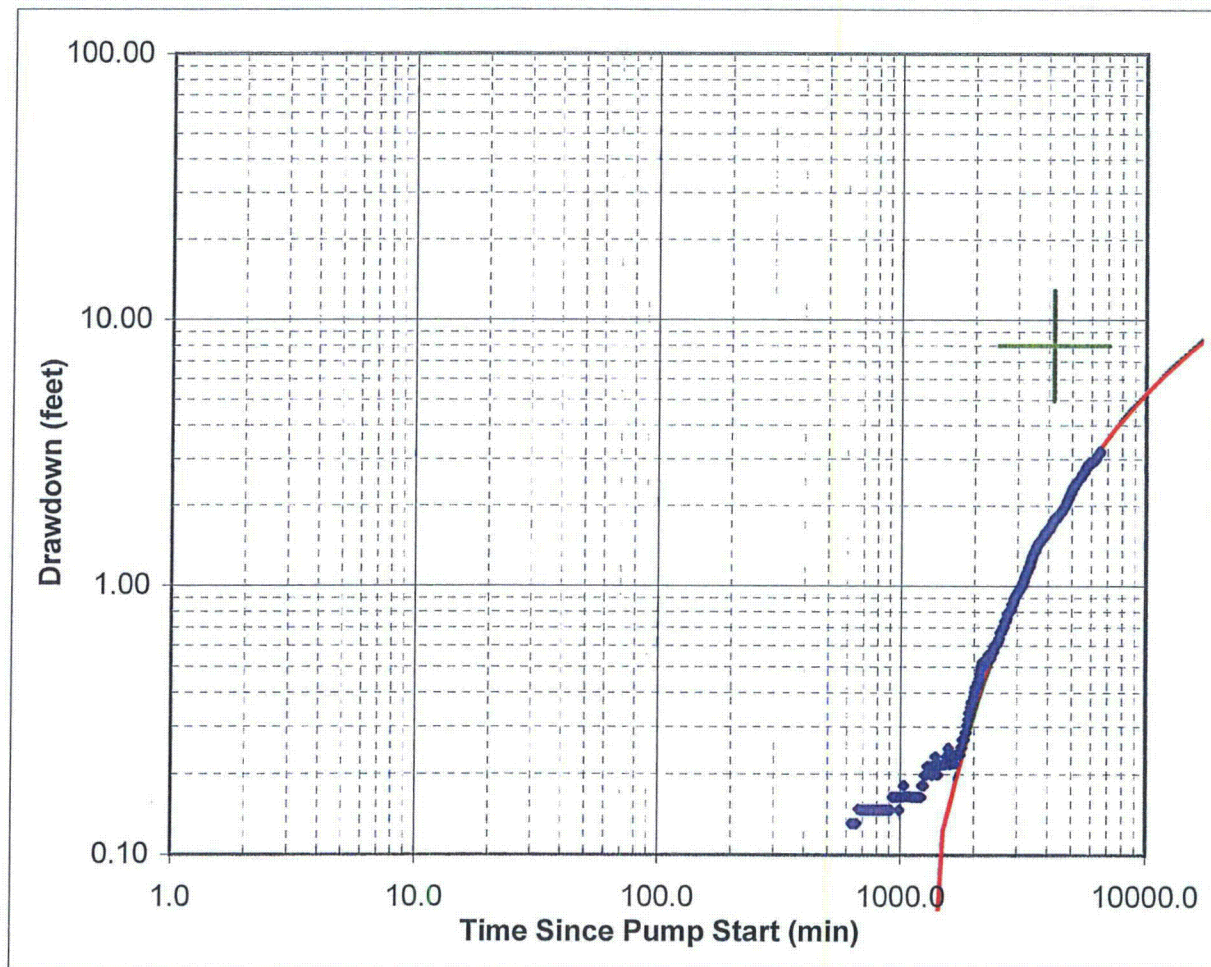
Pump Off Time (minutes after initial pump start)	2726
Pump Restart Time (minutes after initial pump start)	2820
Pump Restart Rate (gpm)	33.3

**FIGURE 8-16. DRAWDOWN IN OBSERVATION WELL MRN-3.2, LOG-LOG**

8-33



**FIGURE 8-29. DRAWDOWN IN OBSERVATION WELL MPN-8**



#### Theis Match Point

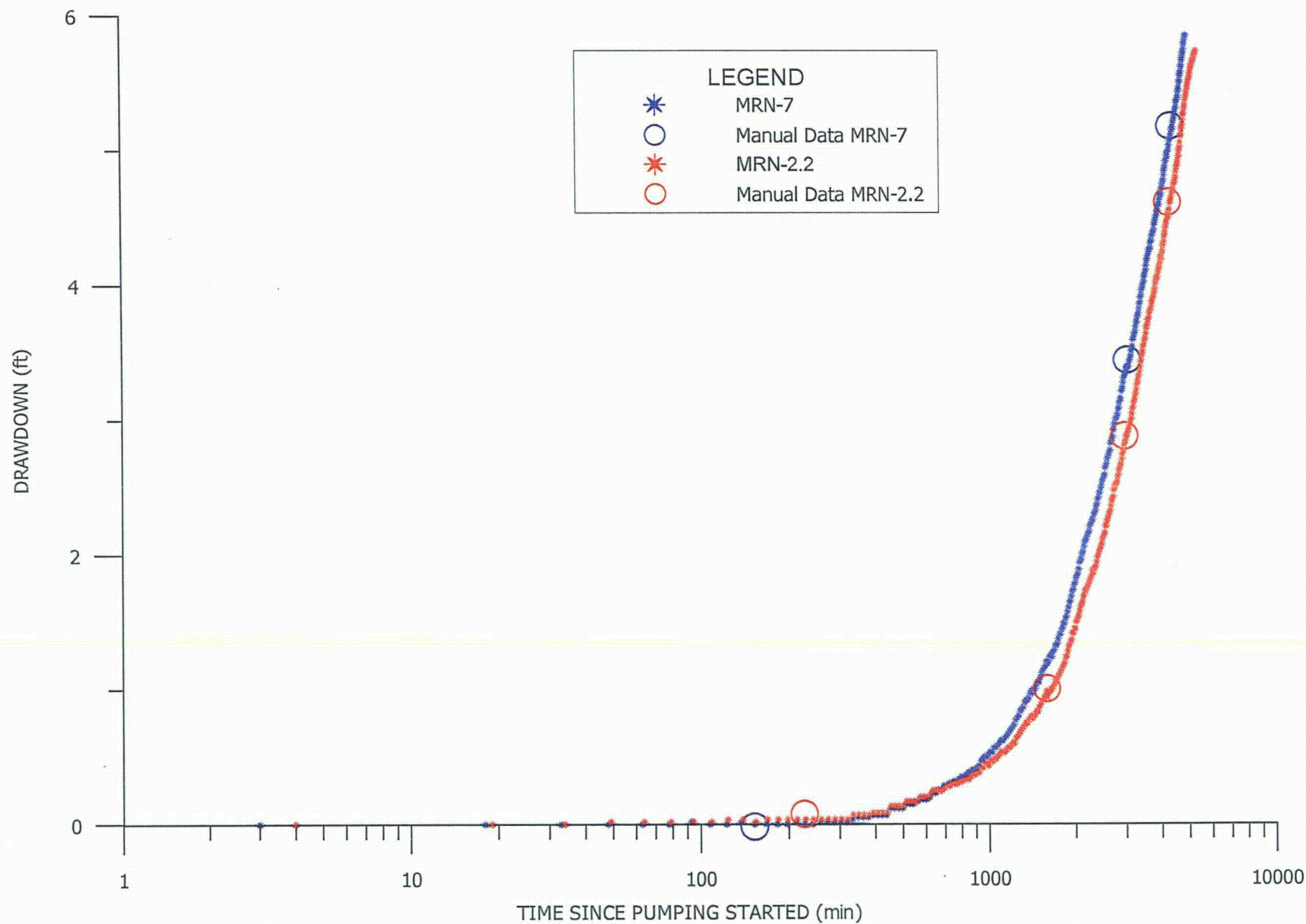
Initial Discharge (gpm)	33.3
Radius to Pumping Well (ft) (<1 indicates pumping well)	1879
Drawdown Match Point (ft)	8.00
Time Match Point (min)	4200.0
Calculated Transmissivity (gal/day/ft)	477
Calculated Storage Coefficient (ft/ft)	2.11E-04
<b>Refined Transmissivity Estimate (gal/day/ft)</b>	<b>487</b>
<b>Refined Storage Coefficient Estimate (ft/ft)</b>	<b>2.11E-04</b>

#### Test Interruption Data

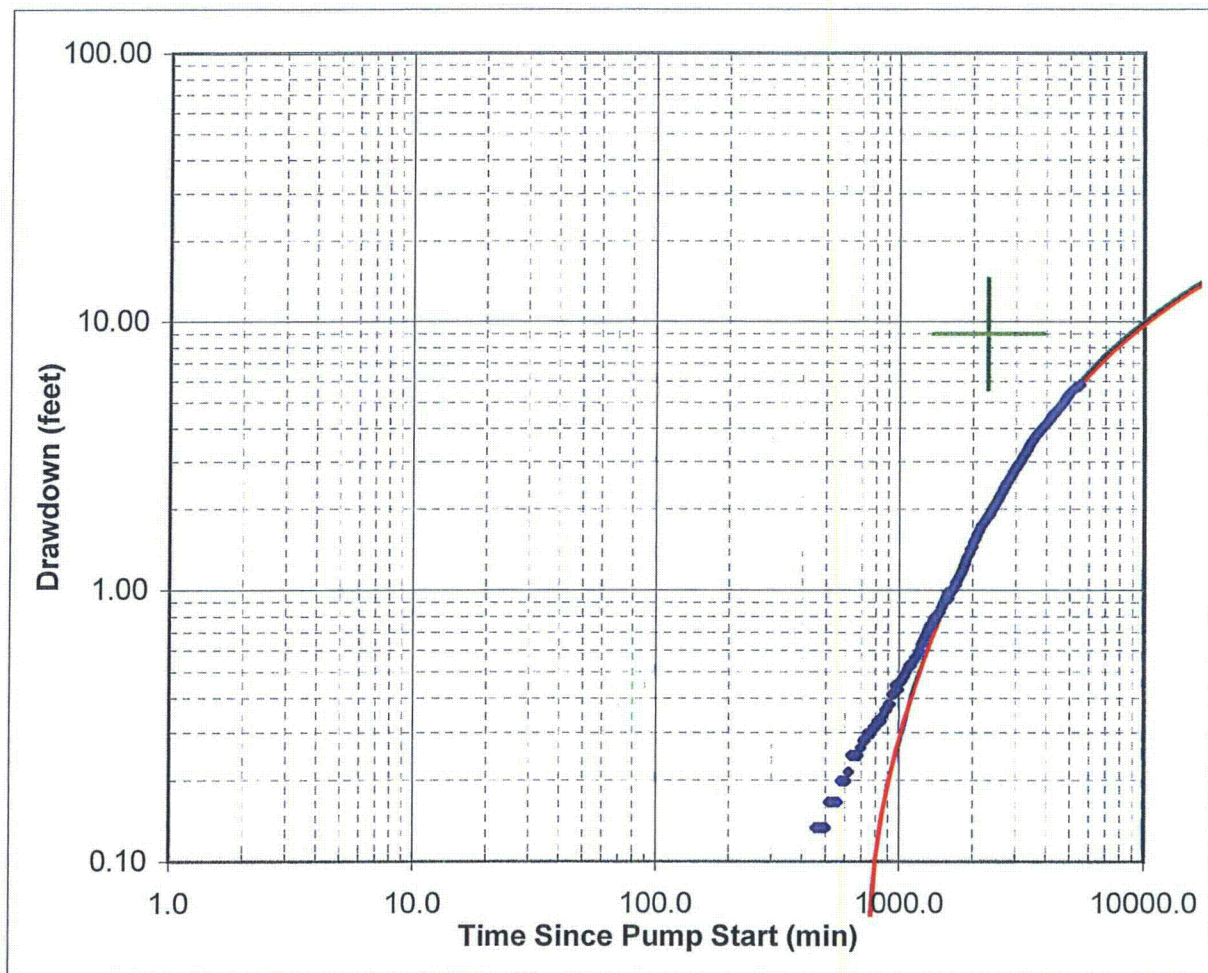
Pump Off Time (minutes after initial pump start)	2726
Pump Restart Time (minutes after initial pump start)	2820
Pump Restart Rate (gpm)	33.3

**FIGURE 8-30. DRAWDOWN IN OBSERVATION WELL MPN-8, LOG-LOG**





**FIGURE 8-33. DRAWDOWN IN OBSERVATION WELL MRN-7 AND MRN-2.2**



#### Theis Match Point

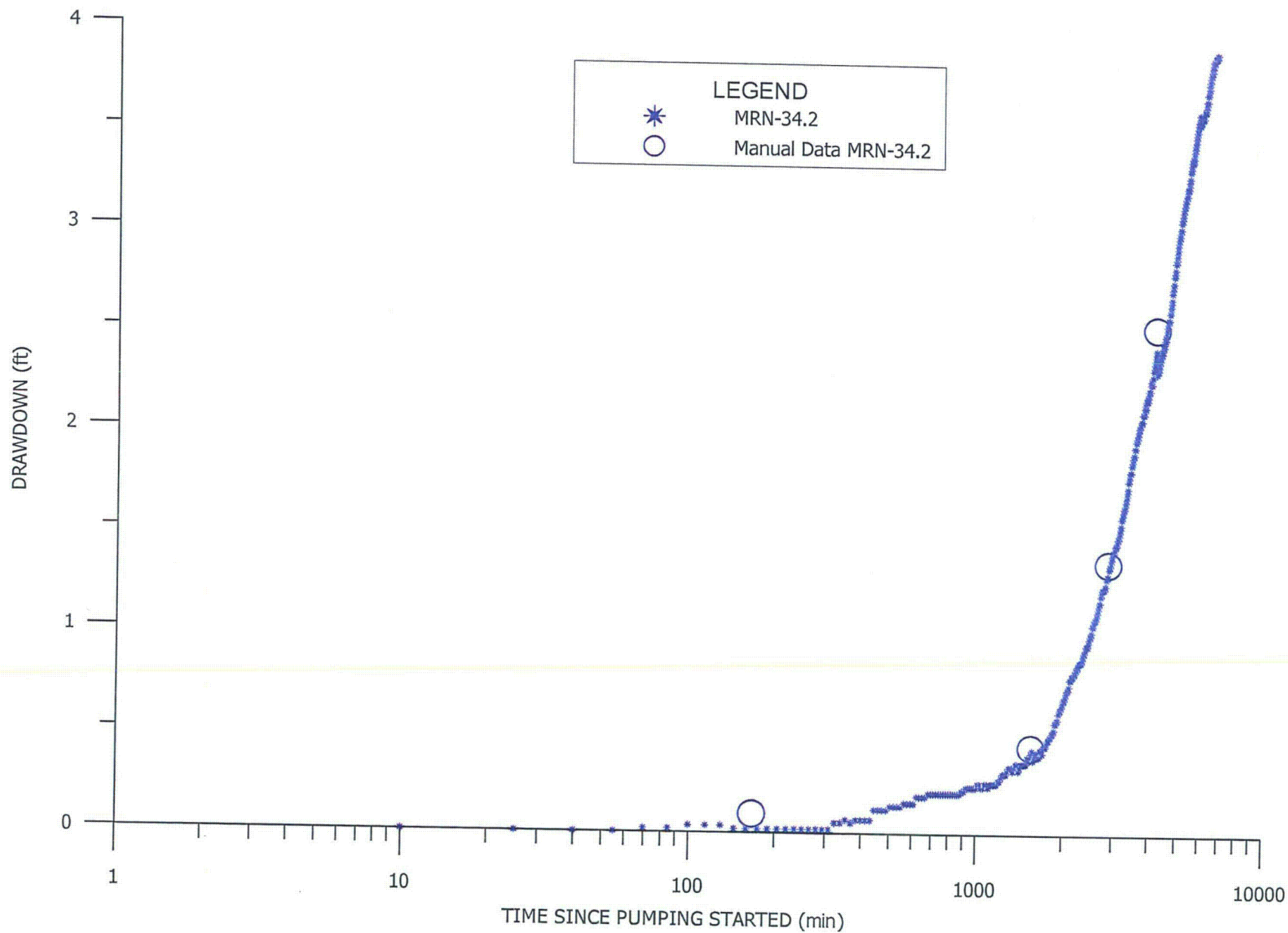
Initial Discharge (gpm)	33.3
Radius to Pumping Well (ft) (<1 indicates pumping well)	1849
Drawdown Match Point (ft)	9.00
Time Match Point (min)	2300.0
Calculated Transmissivity (gal/day/ft)	424
Calculated Storage Coefficient (ft/ft)	1.06E-04
<b>Refined Transmissivity Estimate (gal/day/ft)</b>	<b>433</b>
<b>Refined Storage Coefficient Estimate (ft/ft)</b>	<b>1.08E-04</b>

#### Test Interruption Data

Pump Off Time (minutes after initial pump start)	2726
Pump Restart Time (minutes after initial pump start)	2820
Pump Restart Rate (gpm)	33.3

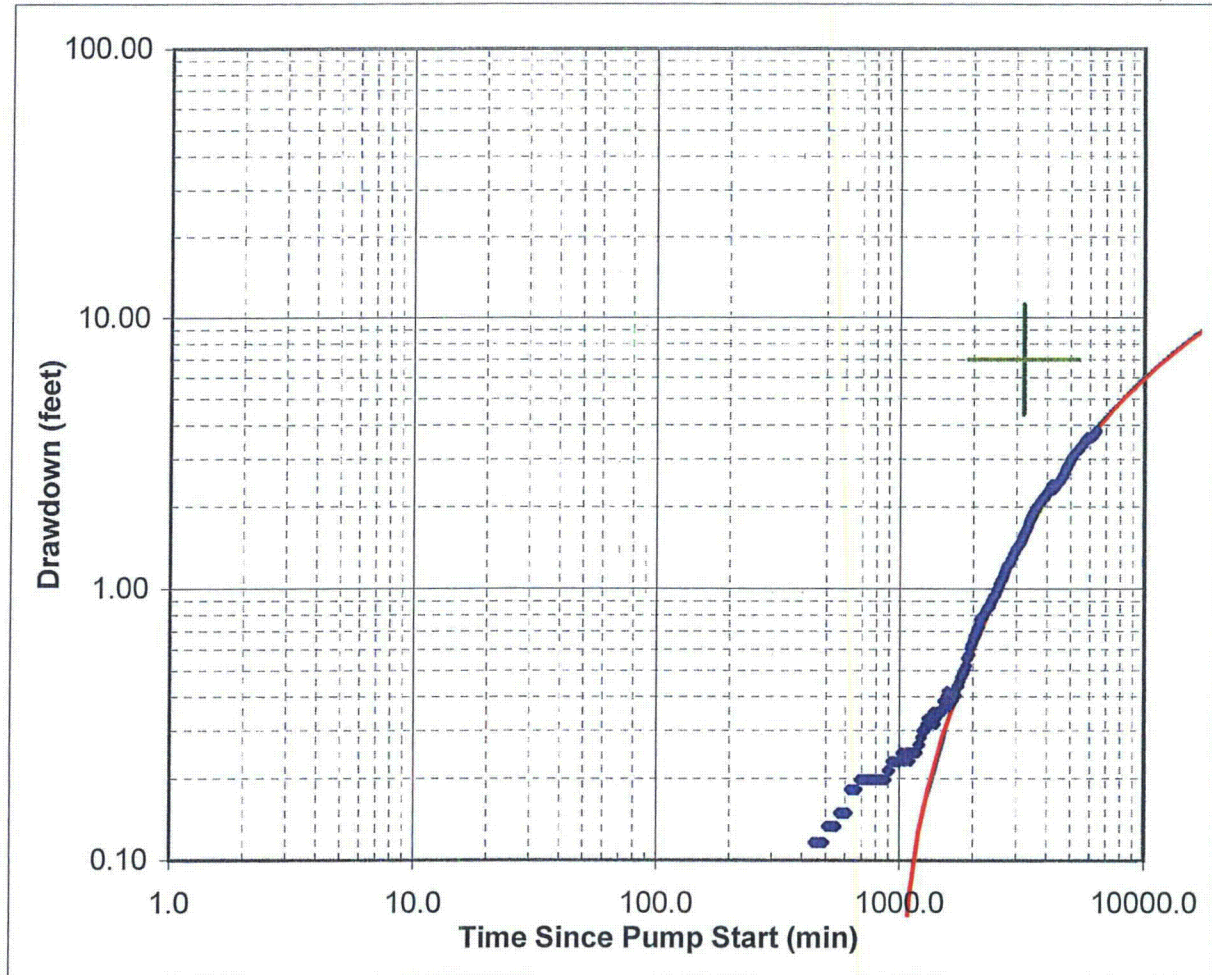
**FIGURE 8-35. DRAWDOWN IN OBSERVATION WELL MRN-2.2, LOG-LOG**

8-42



**FIGURE 8-38. DRAWDOWN IN OBSERVATION WELL MRN-34.2**





#### Theis Match Point

Initial Discharge (gpm)	33.3
Radius to Pumping Well (ft) (<1 indicates pumping well)	2042
Drawdown Match Point (ft)	7.00
Time Match Point (min)	3200.0
Calculated Transmissivity (gal/day/ft)	545
Calculated Storage Coefficient (ft/ft)	1.55E-04
<b>Refined Transmissivity Estimate (gal/day/ft)</b>	<b>545</b>
<b>Refined Storage Coefficient Estimate (ft/ft)</b>	<b>1.55E-04</b>

#### Test Interruption Data

Pump Off Time (minutes after initial pump start)	2726
Pump Restart Time (minutes after initial pump start)	2820
Pump Restart Rate (gpm)	33.3

**FIGURE 8-39. DRAWDOWN IN OBSERVATION WELL MRN-34.2, LOG-LOG**



T-1  
Water Quality Data Upper Control Limits  
Overlying Monitor Wells (MON Wells)

Production Area #1 Overlying Monitoring Wells (MON-1 thru MON-13)	Well ID Sampling Dates	MON-1	MON-1	MON-1	MON-1	MON-1	MON-1	MON-2	MON-2	MON-2	MON-2	MON-2	MON-2	MON-3	MON-3	MON-3	MON-3	MON-3	MON-3
Upper Control Limit Parameters	Laboratory RL	4/5/2012	5/17/2012	6/7/2012	7/11/2012	10/3/2012	11/1/2012	4/9/2012	5/1/2012	5/21/2012	7/12/2012	10/3/2012	11/1/2012	4/9/2012	5/17/2012	6/12/2012	7/10/2012	10/17/2012	10/31/2012
Alkalinity, Total as CaCO <sub>3</sub> mg/L	5.0	120	122	121	120	122	118	123	123	123	121	120	120	128	122	122	128	126	117
Chloride mg/L	1.0	6	6	6	7	6	6	6	6	6	7	5	6	6	6	6	7	5	6
Conductivity @ 25 C umhos/cm	5.0	517	535	547	556	555	539	539	518	548	548	549	543	551	534	558	558	566	537
Analytes/Units																			
Major Ions																			
Bicarbonate as HCO <sub>3</sub> mg/L	5.0	143	148			141	139	147	150			137	140	156	149			142	140
Calcium mg/L	1.0	6	7			7	7	6	7			6	7	8	8			7	8
Carbonate as CO <sub>3</sub> mg/L	5.0	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			6	ND
Fluoride mg/L	0.1	0.3	0.2			0.2	0.2	0.3	0.3			0.2	0.2	0.2	0.2			0.2	0.2
Magnesium mg/L	1.0	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Nitrogen, Ammonia as N mg/L	0.05	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Nitrogen, Nitrate+Nitrite as N mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Potassium mg/L	1.0	2	2			2	2	2	2			3	2	2	2			2	2
Silica mg/L	0.1	8.4	9.2			7.9	8.2	8.3	8.1			7.9	8.2	8.7	9			7.9	8.4
Sodium mg/L	1.0	113	102			113	115	108	110			114	115	115	118			102	115
Sulfate mg/L	2.0	124	123			114	120	116	123			113	116	127	129			114	128
Physical Properties																			
pH su	0.1	8.85	8.69			8.5	8.5	8.75	8.73			8.6	8.5	8.5	8.54			8.7	8.4
Solids, Total Dissolved TDS @ 180 C mg/L	10	333	331			360	350	340	357			340	360	358	338			350	350
Metals																			
Aluminum mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Arsenic mg/L	0.001	0.006	0.004			0.004	ND	0.006	0.006			0.006	0.004	0.003	0.002			0.002	0.002
Barium mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Boron mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Cadmium mg/L	0.005	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Chromium mg/L	0.05	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Copper mg/L	0.01	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Iron mg/L	0.05	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Lead mg/L	0.001	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Manganese mg/L	0.01	ND	ND			ND	ND	ND	ND			ND	0.01	0.01	0.01			0.01	0.01
Mercury mg/L	0.001	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Molybdenum mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Nickel mg/L	0.05	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Selenium mg/L	0.001	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Uranium mg/L	0.0003	0.0312	0.041			0.0292	0.0307	0.0281	0.0299			0.0295	0.0304	0.034	0.0316			0.0308	0.0310
Vanadium mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Zinc mg/L	0.01	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Radionuclides - Total																			
Gross Alpha pCi/L	2	35.9	36.4			29.5	28.7	42.2	36.8			24	29.2	43.8	31.8			29.3	29.7
Gross Beta pCi/L	3	6.4	7.9			9.3	5.9	3.9	7.4			8	7.1	2.9	6.4			7.2	7.2
Radium 226 pCi/L	0.2	-0.1	0.25			ND	ND	0.26	0.12			ND	ND	0.07	0.29			ND	ND
Radium 228 pCi/L	1	1.3	-0.2			ND	ND	0.3	2			ND	ND	1.2	0.2			ND	1.7
Sodium Adsorption Ratio (SAR)	0.1	11.8	10			11.9	11.9	11.3	10.8			12.5	11.7	10.5	10.3			10.4	11.4



T 1  
Water Quality Data Upper Control Limits  
Overlying Monitor Wells (MON Wells)

Production Area #1 Overlying Monitoring Wells (MON-1 thru MON-13)	Well ID Sampling Dates	MON-4	MON-4	MON-4	MON-4	MON-4	MON-4	MON-5	MON-5	MON-5	MON-5	MON-5	MON-5	MON-6	MON-6	MON-6	MON-6	MON-6	MON-6
Upper Control Limit Parameters	Laboratory RL	4/10/2012	5/15/2012	6/5/2012	6/18/2012	9/20/2012	10/5/2012	4/12/2012	5/8/2012	6/6/2012	9/26/2012	10/8/2012	10/22/2012	4/13/2012	5/10/2012	5/31/2012	6/19/2012	10/9/2012	10/23/2012
Alkalinity, Total as CaCO <sub>3</sub> mg/L	5.0	113	124	124	123	122	121	122	121	123	123	119	126	123	121	129	122	128	121
Chloride mg/L	1.0	6	6	6	6	7	6	6	7	6	7	6	6	6	6	6	6	6	6
Conductivity @ 25 C umhos/cm	5.0	521	550	551	551	556	563	572	580	578	571	556	578	583	577	572	571	557	577
Analytes/Units																			
Major Ions																			
Bicarbonate as HCO <sub>3</sub> mg/L	5.0	119	146			140	137	144	148			146	146	142	144			154	139
Calcium mg/L	1.0	4	7			6	8	9	9			8	8	8	9			8	8
Carbonate as CO <sub>3</sub> mg/L	5.0	9	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Fluoride mg/L	0.1	0.3	0.3			0.2	0.2	0.2	0.2			0.2	0.2	0.2	0.2			0.2	0.2
Magnesium mg/L	1.0	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Nitrogen, Ammonia as N mg/L	0.05	ND	ND			ND	ND	ND	ND			0.12	ND	ND	ND			0.13	ND
Nitrogen, Nitrate+Nitrite as N mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	0.1	ND	ND			ND	0.1
Potassium mg/L	1.0	5	3			3	3	3	3			3	3	2	2			2	2
Silica mg/L	0.1	7.7	9.3			8	8.1	9	9.3			8	8.0	7.9	8.2			8	8.2
Sodium mg/L	1.0	103	114			102	106	115	116			107	108	110	108			107	113
Sulfate mg/L	2.0	114	125			130	126	137	140			123	127	136	134			122	137
Physical Properties																			
pH su	0.1	9.3	8.8			8.6	8.6	8.7	8.65			8.3	8.6	8.88	8.59			8.3	8.6
Solids, Total Dissolved TDS @ 180 C mg/L	10	296	339			330	330	346	365			370	360	375	380			360	370
Metals																			
Aluminum mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Arsenic mg/L	0.001	0.006	0.005			ND	0.004	0.003	0.003			0.004	0.008	0.003	0.003			0.003	0.003
Barium mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Boron mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Cadmium mg/L	0.005	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Chromium mg/L	0.05	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Copper mg/L	0.01	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Iron mg/L	0.05	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Lead mg/L	0.001	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Manganese mg/L	0.01	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Mercury mg/L	0.001	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Molybdenum mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Nickel mg/L	0.05	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Selenium mg/L	0.001	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Uranium mg/L	0.0003	0.0163	0.0254			0.0222	0.0221	0.0338	0.0344			0.0349	0.0347	0.0318	0.0314			0.0301	0.0299
Vanadium mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Zinc mg/L	0.01	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Radionuclides - Total																			
Gross Alpha pCi/L	2	20.1	27.6			20.9	22.3	40.2	37			24.7	32.7	34.1	32.5			24.6	27.8
Gross Beta pCi/L	3	5.4	5.9			5.9	6.5	9.6	9			8.5	8.9	9.8	8			9.6	8.2
Radium 226 pCi/L	0.2	0.04	0.04			ND	ND	0.04	-0.03			ND	0.2	0.12	-0.02			ND	ND
Radium 228 pCi/L	1	0.7	-0.09			ND	ND	0.4	1.3			ND	ND	2.3	0.9			ND	1.1
Sodium Adsorption Ratio (SAR)	0.1	12.9	11.2			11	10.5	10.2	9.9			10.7	10.7	10.4	9.5			10.4	11.1



Tr  
Water Quality Data Upper Control Limits  
Overlying Monitor Wells (MON Wells)

Production Area #1 Overlying Monitoring Wells (MON-1 thru MON-13)	Well ID Sampling Dates	MON-7	MON-7	MON-7	MON-7	MON-7	MON-7	MON-8	MON-8	MON-8	MON-8	MON-8	MON-8	MON-9	MON-9	MON-9	MON-9	MON-9	MON-9
Upper Control Limit Parameters	Laboratory RL	4/16/2012	5/10/2012	6/1/2012	6/26/2012	9/25/2012	10/9/2012	4/25/2012	5/16/2012	6/1/2012	6/19/2012	10/11/2012	10/25/2012	3/2/2012	5/16/2012	6/1/2012	6/19/2012	10/11/2012	10/25/2012
Alkalinity, Total as CaCO <sub>3</sub> mg/L	5.0	116	120	122	135	120	120	122	122	128	125	118	137	142	129	123	122	121	121
Chloride mg/L	1.0	7	7	7	7	6	5	6	6	6	6	5	6	6	6	6	7	5	6
Conductivity @ 25 C umhos/cm	5.0	590	586	585	582	578	565	579	582	581	575	587	597	535	575	572	567	593	578
Analytes/Units																			
Major Ions																			
Bicarbonate as HCO <sub>3</sub> mg/L	5.0	125	144			141	142	143	145			135	119	163	157			143	139
Calcium mg/L	1.0	7	9			9	8	9	9			8	8	9	9			9	9
Carbonate as CO <sub>3</sub> mg/L	5.0	8	ND			ND	ND	ND	ND			ND	24	5	ND			ND	ND
Fluoride mg/L	0.1	0.2	0.2			0.2	0.2	0.2	0.2			0.2	0.2	0.2	0.2			0.2	0.2
Magnesium mg/L	1.0	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Nitrogen, Ammonia as N mg/L	0.05	ND	ND			ND	0.12	ND	ND			0.14	ND	ND	ND			0.1	ND
Nitrogen, Nitrate+Nitrite as N mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Potassium mg/L	1.0	5	2			3	3	2	2			3	3	2	2			3	3
Silica mg/L	0.1	7	7.9			8.4	8.2	8.5	10.1			8.1	8.5	9.6	9.9			8.2	8.6
Sodium mg/L	1.0	108	107			112	108	114	103			108	117	114	110			106	115
Sulfate mg/L	2.0	139	141			126	124	140	139			123	138	138	135			122	126
Physical Properties																			
pH su	0.1	9.18	8.63			8.5	8.4	8.92	8.8			8.6	9.4	8.55	8.54			8.5	8.6
Solids, Total Dissolved TDS @ 180 C mg/L	10	350	376			380	360	363	356			350	340	326	348			330	340
Metals																			
Aluminum mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Arsenic mg/L	0.001	0.003	0.002			0.003	0.003	0.003	0.003			0.003	0.003	0.003	0.003			0.003	0.002
Barium mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Boron mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Cadmium mg/L	0.005	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Chromium mg/L	0.05	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Copper mg/L	0.01	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Iron mg/L	0.05	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Lead mg/L	0.001	ND	ND			ND	ND	0.001	ND			ND	ND	ND	ND			ND	ND
Manganese mg/L	0.01	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Mercury mg/L	0.001	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Molybdenum mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Nickel mg/L	0.05	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Selenium mg/L	0.001	ND	0.001			ND	ND	0.008	ND			ND	ND	ND	ND			ND	ND
Uranium mg/L	0.0003	0.0326	0.0365			0.0392	0.0385	0.039	0.038			0.0378	0.0358	0.0343	0.0348			0.036	0.0339
Vanadium mg/L	0.1	ND	ND			ND	ND	ND	0.2			ND	ND	ND	0.2			ND	ND
Zinc mg/L	0.01	ND	ND			ND	ND	ND	0.01			ND	ND	ND	0.01			ND	ND
Radionuclides - Total																			
Gross Alpha pCi/L	2	37.8	36.4			28.7	30	53.7	37.3			28.9	32.8	43.9	40.1			23.8	36.1
Gross Beta pCi/L	3	8.2	11.6			9.2	11.8	10.1	8.7			9.6	8.8	8.8	2.6			10.4	8.7
Radium 226 pCi/L	0.2	0.12	0.02			0.2	ND	0.1	0.07			ND	0.2	-0.04	0.03			ND	ND
Radium 228 pCi/L	1	1.1	4.6			ND	ND	0.4	1.1			ND	ND	0.6	0.7			ND	ND
Sodium Adsorption Ratio (SAR)	0.1	10.4	9.4			10.4	10.3	10.1	8.7			10.4	11.1	10	9.5			10	10.6

Values in red boxes are outliers



T 1  
Water Quality Data - Upper Control Limits  
Overlying Monitor Wells (MON Wells)

Production Area #1 Overlying Monitoring Wells (MON-1 thru MON-13)	Well ID Sampling Dates	MON-10	MON-10	MON-10	MON-10	MON-10	MON-10	MON-11	MON-11	MON-11	MON-11	MON-11	MON-11	MON-12	MON-12	MON-12	MON-12	MON-12	MON-12
Upper Control Limit Parameters	Laboratory RL	3/1/2012	5/23/2012	6/21/2012	6/6/2012	10/15/2012	10/29/2012	3/1/2012	5/23/2012	6/6/2012	6/21/2012	10/16/2012	10/30/2012	2/29/2012	3/12/2012	5/18/2012	6/1/2012	9/20/2012	10/30/2012
Alkalinity, Total as CaCO3 mg/L	5.0	120	121	120	121	117	120	106	102	105	103	127	112	123	117	117	119	121	114
Chloride mg/L	1.0	7	6	6	6	6	6	6	6	6	6	9	5	7	6	6	6	6	6
Conductivity @ 25 C umhos/cm	5.0	558	586	566	584	590	588	592	663	681	682	732	711	609	601	618	641	620	629
Analytes/Units																			
Major Ions																			
Bicarbonate as HCO3 mg/L	5.0	138	147			138	140	111	121			130	131	150	142	143			134
Calcium mg/L	1.0	9	10			9	9	7	9			15	15	11	12	13			12
Carbonate as CO3 mg/L	5.0	ND	ND			ND	ND	9	ND			ND	ND	ND	ND	ND			ND
Fluoride mg/L	0.1	0.2	0.2			0.2	0.2	0.2	0.2			0.1	0.1	0.2	0.3	0.2			0.1
Magnesium mg/L	1.0	ND	ND			ND	ND	ND	ND			1	1	ND	ND	ND			ND
Nitrogen, Ammonia as N mg/L	0.05	ND	ND			0.14	ND	ND	ND			0.12	ND	ND	ND	ND			ND
Nitrogen, Nitrate+Nitrite as N mg/L	0.1	ND	ND			0.2	ND	ND	ND			0.2	ND	ND	ND	ND			ND
Potassium mg/L	1.0	2	2			2	3	4	5			4	4	3	3	3			3
Silica mg/L	0.1	9.7	10.1			8.8	8.7	9	9.6			8.4	8.7	9.9	7.6	9.1			8.6
Sodium mg/L	1.0	111	123			117	117	120	134			138	141	113	109	119			123
Sulfate mg/L	2.0	151	141			144	132	175	184			220	198	170	166	162			158
Physical Properties																			
pH su	0.1	8.49	8.52			8.5	8.5	8.93	8.82			8.6	8.5	8.46	8.45	8.4			8.5
Solids, Total Dissolved TDS @ 180 C mg/L	10	333	367			330	390	348	408			480	460	388	370	387			400
Metals																			
Aluminum mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND	ND			ND
Arsenic mg/L	0.001	0.003	0.004			0.01	0.006	0.006	0.005			ND	0.002	0.003	0.003	0.004			0.003
Barium mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND	ND			ND
Boron mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND	ND			ND
Cadmium mg/L	0.005	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND	ND			ND
Chromium mg/L	0.05	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND	ND			ND
Copper mg/L	0.01	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND	ND			ND
Iron mg/L	0.05	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND	ND			ND
Lead mg/L	0.001	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND	ND			ND
Manganese mg/L	0.01	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND	ND			ND
Mercury mg/L	0.001	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND	ND			ND
Molybdenum mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND	ND			ND
Nickel mg/L	0.05	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND	ND			ND
Selenium mg/L	0.001	ND	ND			ND	0.001	ND	ND			ND	ND	ND	ND	ND			ND
Uranium mg/L	0.0003	0.0403	0.041			0.0408	0.0399	0.0319	0.0379			0.0454	0.0421	0.0452	0.0322	0.0454			0.0435
Vanadium mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND	ND			ND
Zinc mg/L	0.01	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND	ND			ND
Radionuclides - Total																			
Gross Alpha pCi/L	2	53.6	42.3			29.4	32.1	43.4	37.1			38.9	36	74.5	82.5	54.3			34.3
Gross Beta pCi/L	3	8	10.9			10.2	8.4	10.8	15.3			11.5	8.2	11.3	10.3	9.2			7.2
Radium 226 pCi/L	0.2	0.01	0.05			ND	0.4	-0.05	-0.05			0.3	0.7	0.09	0.33	0.15			0.6
Radium 228 pCi/L	1	0.6	0.05			1.1	ND	0.7	0.1			ND	3.2	-0.03	0.3	-0.4			ND
Sodium Adsorption Ratio (SAR)	0.1	9.5	10.1			10.4	10.5	12.1	11.3			9.3	9.5	8.8	8.2	7.7			9.8

Values in red boxes are outliers



T-1  
Water Quality Data Upper Control Limits  
Overlying Monitor Wells (MON Wells)

Production Area #1 Overlying Monitoring Wells (MON-1 thru MON-13)	Well ID Sampling Dates	MON-13	MON-13	MON-13	MON-13	MON-13	MON-13	n Sample Events	Minimum Value	Maximum Value	MEAN	Standard Deviation	k Factor $\alpha=0.05/P=0.99, n=78$	Tolerance Minimum	Tolerance Maximum	Mean without Outliers	Standard Deviation without Outliers	Standard Deviation x 5	UCL
Upper Control Limit Parameters	Laboratory RL	2/27/2012	5/22/2012	6/7/2012	6/21/2012	10/16/2012	10/30/2012	LQD Guideline 4											
Alkalinity, Total as CaCO3 mg/L	5.0	121	121	121	121	119	118	78	102	142	121	6.12	2.9924	107	136	121	4.86	24	145
Chloride mg/L	1.0	6	7	6	6	6	6	78	5	9	6	0.60	NA					NA	21
Conductivity @ 25 C umhos/cm	5.0	567	592	593	586	593	590	78	517	732	579	39.03	2.9924	480	670	575	31.68	158	733
Analytes/Units																			
Major Ions																			
Bicarbonate as HCO3 mg/L	5.0	147	147			138	137												
Calcium mg/L	1.0	11	12			11	11												
Carbonate as CO3 mg/L	5.0	ND	ND			ND	ND												
Fluoride mg/L	0.1	0.2	0.2			0.2	0.2												
Magnesium mg/L	1.0	ND	ND			ND	ND												
Nitrogen, Ammonia as N mg/L	0.05	ND	ND			ND	ND												
Nitrogen, Nitrate+Nitrite as N mg/L	0.1	ND	ND			0.1	ND												
Potassium mg/L	1.0	3	3			3	3												
Silica mg/L	0.1	8.2	10.2			7.5	8.5												
Sodium mg/L	1.0	121	122			113	117												
Sulfate mg/L	2.0	148	147			135	137												
Physical Properties																			
pH su	0.1	8.85	8.44			8.6	8.5												
Solids, Total Dissolved TDS @ 180 C mg/L	10	336	384			410	370												
Metals																			
Aluminum mg/L	0.1	ND	ND			ND	ND												
Arsenic mg/L	0.001	0.002	0.003			0.002	0.002												
Barium mg/L	0.1	ND	ND			ND	ND												
Boron mg/L	0.1	ND	ND			0.2	ND												
Cadmium mg/L	0.005	ND	ND			ND	ND												
Chromium mg/L	0.05	ND	ND			ND	ND												
Copper mg/L	0.01	ND	ND			ND	ND												
Iron mg/L	0.05	0.11	ND			ND	ND												
Lead mg/L	0.001	0.002	ND			ND	ND												
Manganese mg/L	0.01	ND	ND			ND	ND												
Mercury mg/L	0.001	ND	ND			ND	ND												
Molybdenum mg/L	0.1	ND	ND			ND	ND												
Nickel mg/L	0.05	ND	ND			ND	ND												
Selenium mg/L	0.001	ND	ND			ND	ND												
Uranium mg/L	0.0003	0.0452	0.0419			0.0463	0.0408												
Vanadium mg/L	0.1	ND	ND			ND	ND												
Zinc mg/L	0.01	ND	0.01			ND	ND												
Radionuclides - Total																			
Gross Alpha pCi/L	2	53.7	38.4			43.3	33.2												
Gross Beta pCi/L	3	12.5	7.6			10	7.5												
Radium 226 pCi/L	0.2	0.17	0.14			ND	0.5												
Radium 228 pCi/L	1	1	1.4			ND	ND												
Sodium Adsorption Ratio (SAR)	0.1	9.5	9.3			9.5	9.9	78			10.4								



**Table 2**  
**Water Quality Data and Upper Control Limits**  
**Monitor Ring Wells (MRN Wells)**

Production Area #1 Ring Monitoring Wells (MRN-1 thru MRN-34.2)	Well ID Sampling Dates	MRN-1	MRN-1	MRN-1	MRN-1	MRN-1	MRN-1	MRN-2.2	MRN-2.2	MRN-2.2	MRN-2.2	MRN-2.2	MRN-2.2	MRN-3.2	MRN-3.2	MRN-3.2	MRN-3.2	MRN-3.2	MRN-3.2
<b>Upper Control Limit Parameters</b>	Laboratory RL	4/10/2012	5/2/2012	5/29/2012	6/14/2012	10/12/2012	10/26/2012	3/8/2012	5/2/2012	5/29/2012	6/14/2012	10/11/2012	10/25/2012	3/8/2012	5/2/2012	5/29/2012	6/13/2012	10/11/2012	10/26/2012
Alkalinity, Total as CaCO3 mg/L	5.0	129	125	131	125	121	124	111	124	121	121	140	138	115	119	117	119	118	118
Chloride mg/L	1.0	6	7	7	7	7	6	7	7	7	8	6	6	7	7	7	7	6	6
Conductivity @ 25 C umhos/cm	5.0	568	559	568	566	578	574	639	719	750	737	702	666	491	570	580	575	601	591
<b>Analytes/Units</b>																			
<b>Major Ions</b>																			
Bicarbonate as HCO3 mg/L	5.0	137	143			139	142	131	151			167	164	129	135			137	136
Calcium mg/L	1.0	7	6			7	6	10	14			14	13	6	6			6	6
Carbonate as CO3 mg/L	5.0	10	ND			ND	ND	ND	ND			ND	ND	6	ND			ND	ND
Fluoride mg/L	0.1	0.2	0.2			0.2	0.2	0.2	0.2			0.1	0.2	0.2	0.2			0.2	0.2
Magnesium mg/L	1.0	ND	ND			ND	ND	ND	1			1	1	ND	ND			ND	ND
Nitrogen, Ammonia as N mg/L	0.05	ND	0.06			0.1	ND	ND	ND			0.1	ND	0.05	0.06			0.1	ND
Nitrogen, Nitrate+Nitrite as N mg/L	0.1	ND	ND			0.2	ND	ND	ND			ND	ND	ND	ND			ND	ND
Potassium mg/L	1.0	3	3			3	3	2	2			3	3	2	2			2	2
Silica mg/L	0.1	9	9.4			9.1	9.5	7.9	8.9			10.1	10.4	7.9	8			9	9.6
Sodium mg/L	1.0	115	115			106	118	127	135			121	135	121	109			108	121
Sulfate mg/L	2.0	127	131			133	118	183	206			149	145	138	140			125	130
<b>Physical Properties</b>																			
pH su	0.1	9.03	8.94			8.6	8.6	8.88	8.61			8.4	8.4	7.7	8.91			8.5	8.6
Solids, Total Dissolved TDS @ 180 C mg/L	10	334	354			320	350	397	478			440	440	353	362			330	350
<b>Metals</b>																			
Aluminum mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Arsenic mg/L	0.001	0.002	0.002			ND	0.002	0.001	ND			0.001	ND	0.001	0.001			0.001	ND
Barium mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Boron mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Cadmium mg/L	0.005	ND	ND			ND	ND	ND	ND			0.002	ND	ND	ND			ND	ND
Chromium mg/L	0.05	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Copper mg/L	0.01	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Iron mg/L	0.05	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Lead mg/L	0.001	ND	ND			ND	ND	ND	ND			ND	ND	ND	0.002			ND	ND
Manganese mg/L	0.01	ND	ND			ND	ND	ND	0.01			0.02	0.02	ND	ND			ND	ND
Mercury mg/L	0.001	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Molybdenum mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Nickel mg/L	0.05	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Selenium mg/L	0.001	ND	ND			ND	ND	0.01	0.01			0.008	0.002	ND	ND			0.002	ND
Uranium mg/L	0.0003	ND	ND			ND	ND	ND	0.0004			0.0007	0.0004	ND	0.0004			0.0004	0.0003
Vanadium mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Zinc mg/L	0.01	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
<b>Radionuclides - Total</b>																			
Gross Alpha pCi/L	2	-1	-2			ND	ND	-0.6	-0.9			ND	ND	-1	-3			ND	ND
Gross Beta pCi/L	3	2.2	-1			ND	ND	-2	0.9			ND	ND	-2	0.9			ND	ND
Radium 226 pCi/L	0.2	0.07	0.23			0.6	ND	0.25	0.17			ND	0.3	0.08	0.06			ND	ND
Radium 228 pCi/L	1	3.5	0.2			ND	ND	0.6	1.3			ND	ND	0.6	0.8			ND	ND
Sodium Adsorption Rate (SAR)	0.1	11.3	11.4			11.3	13.2	10.2	9.2			8.3	9.6	13	11.9			12	13.1

Values in red boxes are outliers



Table 2  
Water Quality Data and Upper Control Limits  
Monitor Ring Wells (MRN Wells)

Production Area #1 Ring Monitoring Wells (MRN-1 thru MRN-34.2)	Well ID Sampling Dates	MRN-4	MRN-4	MRN-4	MRN-4	MRN-4	MRN-4	MRN-5	MRN-5	MRN-5	MRN-5	MRN-5	MRN-5	MRN-6	MRN-6	MRN-6	MRN-6	MRN-6	MRN-6
<b>Upper Control Limit Parameters</b>	Laboratory RL	4/12/2012	5/2/2012	5/29/2012	6/13/2012	10/11/2012	10/25/2012	4/17/2012	5/11/2012	5/31/2012	6/14/2012	10/11/2012	10/26/2012	4/18/2012	5/16/2012	5/31/2012	6/14/2012	10/10/2012	10/25/2012
Alkalinity, Total as CaCO <sub>3</sub> mg/L	5.0	122	123	122	122	124	122	120	121	121	120	118	119	118	119	118	119	114	116
Chloride mg/L	1.0	7	7	7	7	6	6	7	7	7	7	6	6	7	7	7	7	6	6
Conductivity @ 25 C umhos/cm	5.0	583	586	590	588	601	593	578	584	588	587	603	600	586	560	590	593	589	597
<b>Analytes/Units</b>																			
<b>Major Ions</b>																			
Bicarbonate as HCO <sub>3</sub> mg/L	5.0	139	141			131	137	139	133			135	137	136	136			134	133
Calcium mg/L	1.0	7	7			7	7	7	8			7	7	7	8			7	7
Carbonate as CO <sub>3</sub> mg/L	5.0	5	ND			10	6	ND	7			ND	ND	ND	ND			ND	ND
Fluoride mg/L	0.1	0.2	0.2			0.2	0.2	0.2	0.2			0.2	0.2	0.2	0.2			0.2	0.2
Magnesium mg/L	1.0	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Nitrogen, Ammonia as N mg/L	0.05	ND	0.05			0.1	ND	0.08	ND			0.2	ND	0.11	0.07			0.2	ND
Nitrogen, Nitrate+Nitrite as N mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Potassium mg/L	1.0	3	3			4	3	4	3			3	3	2	2			3	3
Silica mg/L	0.1	9.5	9.4			9	9.6	9.2	10.7			9.5	9.8	8.9	11.2			9	9.6
Sodium mg/L	1.0	117	116			111	123	116	111			109	120	112	119			112	121
Sulfate mg/L	2.0	139	143			125	129	141	145			126	130	146	144			130	134
<b>Physical Properties</b>																			
pH su	0.1	8.93	8.98			8.7	8.7	9.1	9.06			8.6	8.6	8.98	8.9			8.4	8.6
Solids, Total Dissolved TDS @ 180 C mg/L	10	354	370			340	350	370	367			330	360	382	365			370	390
<b>Metals</b>																			
Aluminum mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Arsenic mg/L	0.001	0.001	0.001			0.002	0.001	0.002	0.002			0.002	0.002	0.002	0.002			0.001	0.001
Barium mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Boron mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Cadmium mg/L	0.005	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Chromium mg/L	0.05	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Copper mg/L	0.01	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Iron mg/L	0.05	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Lead mg/L	0.001	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Manganese mg/L	0.01	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Mercury mg/L	0.001	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Molybdenum mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Nickel mg/L	0.05	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Selenium mg/L	0.001	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Uranium mg/L	0.0003	0.0004	0.0004			0.0004	0.0004	0.0004	0.0004			0.0004	0.0004	ND	ND			ND	ND
Vanadium mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	0.2			ND	ND
Zinc mg/L	0.01	ND	ND			ND	ND	ND	ND			ND	ND	ND	0.01			ND	ND
<b>Radionuclides - Total</b>																			
Gross Alpha pCi/L	2	-0.9	-0.7			ND	ND	-0.6	-0.7			ND	ND	-2	4.9			ND	ND
Gross Beta pCi/L	3	1.7	1.5			3.1	ND	4.6	3.5			ND	3.7	1	0.5			3.3	ND
Radium 226 pCi/L	0.2	0.23	0.08			ND	ND	0.23	-0.07			ND	ND	0.13	0.2			ND	ND
Radium 228 pCi/L	1	0.3	1.1			ND	ND	0.3	3.6			ND	ND	0.2	0.8			ND	ND
Sodium Adsorption Rate (SAR)	0.1	11	11.1			11.8	12.6	11.2	10.5			11.6	12.3	11.1	11.4			12.1	12.4



Tab  
Water Quality Data and Upper Control Limits  
Monitor Ring Wells (MRN Wells)

Production Area #1 Ring Monitoring Wells (MRN-1 thru MRN-34.2)	Well ID Sampling Dates	MRN-7	MRN-7	MRN-7	MRN-7	MRN-7	MRN-7	MRN-8	MRN-8	MRN-8	MRN-8	MRN-8	MRN-8	MRN-9	MRN-9	MRN-9	MRN-9	MRN-9	MRN-9
Upper Control Limit Parameters	Laboratory RL	4/18/2012	5/11/2012	5/31/2012	6/15/2012	10/10/2012	10/25/2012	3/9/2012	4/3/2012	5/29/2012	6/13/2012	10/8/2012	10/22/2012	2/27/2012	4/3/2012	5/24/2012	6/12/2012	10/5/2012	10/19/2012
Alkalinity, Total as CaCO <sub>3</sub> mg/L	5.0	120	120	126	120	117	119	106	108	117	123	114	118	113	115	117	123	116	115
Chloride mg/L	1.0	7	7	7	7	6	6	6	7	7	7	6	6	7	7	7	7	6	6
Conductivity @ 25 C umhos/cm	5.0	589	590	593	595	595	601	535	554	594	596	577	601	571	573	594	600	607	595
Analytes/Units																			
Major Ions																			
Bicarbonate as HCO <sub>3</sub> mg/L	5.0	142	137			137	137	119	124			136	139	134	141			133	134
Calcium mg/L	1.0	7	8			7	8	6	7			7	7	8	8			9	8
Carbonate as CO <sub>3</sub> mg/L	5.0	ND	ND			ND	ND	5	ND			ND	ND	ND	ND			ND	ND
Fluoride mg/L	0.1	0.2	0.2			0.2	0.2	0.2	0.2			0.2	0.2	0.2	0.2			0.2	0.2
Magnesium mg/L	1.0	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Nitrogen, Ammonia as N mg/L	0.05	ND	ND			0.2	ND	ND	ND			0.15	ND	ND	ND			ND	ND
Nitrogen, Nitrate+Nitrite as N mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Potassium mg/L	1.0	2	2			3	3	3	3			3	3	3	2			3	3
Silica mg/L	0.1	9	11.1			9.2	9.9	8.2	10.4			9.2	9.3	9	10.4			9.4	8.9
Sodium mg/L	1.0	117	117			111	122	107	119			110	119	122	121			112	109
Sulfate mg/L	2.0	143	148			133	133	144	146			131	148	158	153			149	138
Physical Properties																			
pH su	0.1	8.87	8.84			8.5	8.6	8.52	8.97			8.4	8.6	8.66	8.66			8.6	8.6
Solids, Total Dissolved TDS @ 180 C mg/L	10	394	384			380	390	364	358			380	390	349	389			360	390
Metals																			
Aluminum mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Arsenic mg/L	0.001	ND	0.001			0.001	ND	0.002	0.002			0.001	0.006	0.001	0.001			0.001	0.001
Barium mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Boron mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Cadmium mg/L	0.005	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Chromium mg/L	0.05	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Copper mg/L	0.01	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Iron mg/L	0.05	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Lead mg/L	0.001	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Manganese mg/L	0.01	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Mercury mg/L	0.001	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Molybdenum mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Nickel mg/L	0.05	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Selenium mg/L	0.001	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Uranium mg/L	0.0003	ND	ND			ND	ND	0.0005	ND			ND	ND	ND	ND			ND	ND
Vanadium mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Zinc mg/L	0.01	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Radionuclides - Total																			
Gross Alpha pCi/L	2	-2	-0.8			ND	ND	0.9	-1			ND	ND	-0.6	-0.9			ND	ND
Gross Beta pCi/L	3	1.4	3			ND	ND	0.5	3.4			ND	ND	-0.2	1			3.3	ND
Radium 226 pCi/L	0.2	-0.05	-0.03			ND	ND	0.18	0.16			ND	1.2	0.17	0.09			ND	0.2
Radium 228 pCi/L	1	0.03	0.4			ND	1.4	0.1	0.3			ND	ND	0.5	0.4			ND	ND
Sodium Adsorption Rate (SAR)	0.1	10.9	10.4			11.4	12	11.2	11.4			11.6	12.7	11	10.6			10.1	10.7

Values in red boxes are outliers



Table  
Water Quality Data and Upper Control Limits  
Monitor Ring Wells (MRN Wells)

Production Area #1 Ring Monitoring Wells (MRN-1 thru MRN-34.2)	Well ID Sampling Dates	MRN-10	MRN-10	MRN-10	MRN-10	MRN-10	MRN-10	MRN-11	MRN-11	MRN-11	MRN-11	MRN-11	MRN-11	MRN-12	MRN-12	MRN-12	MRN-12	MRN-12	MRN-12
Upper Control Limit Parameters	Laboratory RL	2/27/2012	4/3/2012	5/24/2012	6/6/2012	10/5/2012	10/19/2012	2/27/2012	4/4/2012	5/24/2012	6/14/2012	10/4/2012	10/18/2012	2/27/2012	4/4/2012	5/24/2012	6/12/2012	10/4/2012	10/18/2012
Alkalinity, Total as CaCO <sub>3</sub> mg/L	5.0	111	112	115	116	116	116	110	111	116	118	117	118	121	123	126	125	127	124
Chloride mg/L	1.0	7	7	7	7	6	7	7	7	7	7	6	7	6	6	6	6	5	6
Conductivity @ 25 C umhos/cm	5.0	562	564	589	593	602	591	570	567	592	593	604	601	532	566	592	597	603	600
Analytes/Units																			
Major Ions																			
Bicarbonate as HCO <sub>3</sub> mg/L	5.0	131	137			133	135	127	132			133	136	146	150			141	142
Calcium mg/L	1.0	7	7			9	7	7	8			9	8	8	8			10	9
Carbonate as CO <sub>3</sub> mg/L	5.0	ND	ND			ND	ND	ND	ND			5	ND	ND	ND			7	ND
Fluoride mg/L	0.1	0.2	0.2			0.2	0.2	0.2	0.2			0.2	0.2	0.2	0.2			0.2	0.2
Magnesium mg/L	1.0	ND	ND			ND	ND	ND	ND			ND	ND	ND	1			ND	ND
Nitrogen, Ammonia as N mg/L	0.05	ND	ND			ND	0.06	ND	ND			ND	ND	ND	ND			ND	ND
Nitrogen, Nitrate+Nitrite as N mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Potassium mg/L	1.0	3	3			3	3	3	3			3	3	2	2			3	3
Silica mg/L	0.1	8.9	10			9	8.6	9.2	9.3			9.5	9.1	9.3	10.4			9.5	9.2
Sodium mg/L	1.0	117	120			110	122	110	119			110	112	108	115			112	112
Sulfate mg/L	2.0	152	147			148	147	155	154			136	138	147	144			130	132
Physical Properties																			
pH su	0.1	8.74	8.73			8.6	8.6	8.84	8.82			8.6	8.6	8.54	8.65			8.7	8.6
Solids, Total Dissolved TDS @ 180 C mg/L	10	354	383			360	370	326	367			360	370	339	372			340	370
Metals																			
Aluminum mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Arsenic mg/L	0.001	0.002	0.002			0.001	0.001	0.002	0.002			0.001	0.002	0.001	0.001			0.001	0.001
Barium mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Boron mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Cadmium mg/L	0.005	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Chromium mg/L	0.05	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Copper mg/L	0.01	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Iron mg/L	0.05	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Lead mg/L	0.001	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Manganese mg/L	0.01	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Mercury mg/L	0.001	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Molybdenum mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Nickel mg/L	0.05	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Selenium mg/L	0.001	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Uranium mg/L	0.0003	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Vanadium mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Zinc mg/L	0.01	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Radionuclides - Total																			
Gross Alpha pCi/L	2	-2	-1			ND	ND	-0.9	0.5			ND	ND	-1	3.5			ND	ND
Gross Beta pCi/L	3	0.5	1.4			ND	ND	0.9	4.5			ND	3.7	-0.7	4			ND	ND
Radium 226 pCi/L	0.2	0.16	0.05			ND	0.2	0.41	-0.01			0.2	ND	0.24	0.06			ND	0.3
Radium 228 pCi/L	1	0.4	1.3			ND	ND	0.7	1			1.6	ND	0.6	1.5			ND	ND
Sodium Adsorption Rate (SAR)	0.1	11.2	11.2			10.4	12.7	10.3	10.9			9.9	10.8	9.7	10.1			9.9	10.4



Tab  
Water Quality Data and Upper Control Limits  
Monitor Ring Wells (MRN Wells)

Production Area #1 Ring Monitoring Wells (MRN-1 thru MRN-34.2)	Well ID Sampling Dates	MRN-13	MRN-13	MRN-13	MRN-13	MRN-13	MRN-13	MRN-14	MRN-14	MRN-14	MRN-14	MRN-14	MRN-14	MRN-15	MRN-15	MRN-15	MRN-15	MRN-15	MRN-15
Upper Control Limit Parameters	Laboratory RL	2/28/2012	4/4/2012	5/24/2012	6/7/2012	10/4/2012	10/18/2012	2/28/2012	4/4/2012	5/23/2012	6/7/2012	10/8/2012	10/22/2012	2/28/2012	4/4/2012	5/23/2012	6/7/2012	10/1/2012	10/17/2012
Alkalinity, Total as CaCO <sub>3</sub> mg/L	5.0	131	126	127	126	124	125	135	130	129	129	123	126	117	133	125	126	126	128
Chloride mg/L	1.0	6	7	6	6	6	6	6	6	6	6	5	6	6	6	6	6	6	7
Conductivity @ 25 C umhos/cm	5.0	582	574	598	600	606	604	593	583	607	610	584	607	553	555	586	588	589	609
Analytes/Units																			
Major Ions																			
Bicarbonate as HCO <sub>3</sub> mg/L	5.0	152	154			142	142	150	150			150	145	134	162			146	146
Calcium mg/L	1.0	8	8			10	8	10	9			8	9	7	7			8	8
Carbonate as CO <sub>3</sub> mg/L	5.0	ND	ND			ND	ND	7	ND			ND	ND	ND	ND			ND	5
Fluoride mg/L	0.1	0.2	0.2			0.2	0.2	0.2	0.2			0.1	0.2	0.2	0.2			0.2	0.1
Magnesium mg/L	1.0	1	1			ND	ND	1	1			ND	ND	ND	ND			ND	ND
Nitrogen, Ammonia as N mg/L	0.05	ND	ND			ND	ND	0.05	0.05			0.18	ND	ND	ND			ND	ND
Nitrogen, Nitrate+Nitrite as N mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	0.1	ND	ND			ND	ND
Potassium mg/L	1.0	3	3			3	3	3	3			3	3	3	3			3	3
Silica mg/L	0.1	8.9	10.2			9.3	8.9	9.2	10.3			9.1	9.2	9.4	9.8			9.1	8.9
Sodium mg/L	1.0	113	116			112	112	112	116			110	119	109	111			113	108
Sulfate mg/L	2.0	148	146			132	133	148	145	143		132	147	142	140	139		125	124
Physical Properties																			
pH su	0.1	8.6	8.65			8.6	8.6	8.83	8.89			8.3	8.7	8.74	8.75			8.6	8.7
Solids, Total Dissolved TDS @ 180 C mg/L	10	377	355			370	370	366	375			360	400	356	330			400	400
Metals																			
Aluminum mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Arsenic mg/L	0.001	0.001	ND			ND	0.001	ND	ND			ND	0.006	0.002	0.002			0.001	ND
Barium mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Boron mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Cadmium mg/L	0.005	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Chromium mg/L	0.05	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Copper mg/L	0.01	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Iron mg/L	0.05	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Lead mg/L	0.001	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Manganese mg/L	0.01	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Mercury mg/L	0.001	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Molybdenum mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Nickel mg/L	0.05	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Selenium mg/L	0.001	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Uranium mg/L	0.0003	ND	ND			ND	ND	ND	ND			ND	ND	0.001	0.0008			0.0008	0.0009
Vanadium mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Zinc mg/L	0.01	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Radionuclides - Total																			
Gross Alpha pCi/L	2	-0.04	0.9			ND	ND	-0.8	0.6			ND	ND	5.2	1.5			ND	2
Gross Beta pCi/L	3	0.8	3.3			ND	ND	-0.5	4			3.1	3.8	1.9	2.5			4	ND
Radium 226 pCi/L	0.2	0.03	0.03			0.2	0.2	0.21	0.09			0.3	0.2	0.15	0.07			0.4	0.4
Radium 228 pCi/L	1	0.7	0.8			ND	ND	1.1	0.6			ND	ND	1.5	0.9			ND	ND
Sodium Adsorption Rate (SAR)	0.1	10.2	10.4			9.9	10.8	9.1	9.7			10.5	10.9	10.2	10.5			10.8	10.5



**Table 2**  
**Water Quality Data and Upper Control Limits**  
**Monitor Ring Wells (MRN Wells)**

Production Area #1 Ring Monitoring Wells (MRN-1 thru MRN-34.2)	Well ID Sampling Dates	MRN-16	MRN-16	MRN-16	MRN-16	MRN-16	MRN-16	MRN-17	MRN-17	MRN-17	MRN-17	MRN-17	MRN-17	MRN-18.1	MRN-18.1	MRN-18.1	MRN-18.1	MRN-18.1	MRN-18.1
Upper Control Limit Parameters	Laboratory RL	2/28/2012	4/4/2012	5/23/2012	6/7/2012	10/1/2012	10/17/2012	3/1/2012	4/5/2012	5/23/2012	6/6/2012	10/1/2012	10/17/2012	2/29/2012	4/5/2012	5/23/2012	6/6/2012	10/1/2012	10/17/2012
Alkalinity, Total as CaCO <sub>3</sub> mg/L	5.0	122	126	128	128	127	127	144	128	129	131	129	128	124	127	137	128	128	128
Chloride mg/L	1.0	6	6	6	6	6	5	6	6	6	6	6	5	7	6	6	6	6	5
Conductivity @ 25 C umhos/cm	5.0	547	556	583	584	578	598	542	538	564	562	559	577	542	541	569	566	561	577
<b>Analytes/Units</b>																			
<i>Major Ions</i>																			
Bicarbonate as HCO <sub>3</sub> mg/L	5.0	145	154			148	145	173	156			149	145	150	155			146	145
Calcium mg/L	1.0	8	10			10	9	8	9			9	8	9	10			9	9
Carbonate as CO <sub>3</sub> mg/L	5.0	ND	ND			ND	ND	ND	ND			ND	5	ND	ND			ND	6
Fluoride mg/L	0.1	0.2	0.2			0.2	0.2	0.2	0.2			0.2	0.2	0.2	0.2			0.2	0.2
Magnesium mg/L	1.0	ND	1			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Nitrogen, Ammonia as N mg/L	0.05	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Nitrogen, Nitrate+Nitrite as N mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Potassium mg/L	1.0	2	3			3	3	2	2			3	3	2	2			3	3
Silica mg/L	0.1	9	8.8			8.8	8.9	10.1	9			8.6	8.5	9.7	8.8			8	8.0
Sodium mg/L	1.0	109	119			111	106	109	114			109	103	102	112			109	104
Sulfate mg/L	2.0	140	138	138		123	126	125	129	126		116	117	136	130	127		117	116
<i>Physical Properties</i>																			
pH su	0.1	8.52	8.57			8.5	8.6	8.48	8.53			8.5	8.6	8.49	8.51			8.6	8.7
Solids, Total Dissolved TDS @ 180 C mg/L	10	354	354			360	370	299	357			360	340	325	368			370	370
<i>Metals</i>																			
Aluminum mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Arsenic mg/L	0.001	0.002	0.002			0.002	0.002	0.003	0.002			0.003	0.002	0.003	0.003			0.002	0.002
Barium mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Boron mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Cadmium mg/L	0.005	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Chromium mg/L	0.05	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Copper mg/L	0.01	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Iron mg/L	0.05	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Lead mg/L	0.001	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Manganese mg/L	0.01	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			0.02	0.02
Mercury mg/L	0.001	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Molybdenum mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Nickel mg/L	0.05	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Selenium mg/L	0.001	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Uranium mg/L	0.0003	0.0177	0.0146			0.012	0.0126	0.0265	0.0264			0.0241	0.0226	0.032	0.0339			0.0288	0.0263
Vanadium mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Zinc mg/L	0.01	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
<i>Radionuclides - Total</i>																			
Gross Alpha pCi/L	2	90.2	62.4			35.4	56.9	41.9	37.2			26.4	34.2	48.3	38.1			27.5	31.5
Gross Beta pCi/L	3	53.8	38			80.1	67.9	9.6	5			8.3	9.9	10.7	4.3			10.3	10
Radium 226 pCi/L	0.2	10	10			11.7	12.1	0.7	0.68			0.8	0.8	0.08	0.13			ND	0.2
Radium 228 pCi/L	1	2.3	0.6			1.2	ND	1.6	0.1			ND	ND	0.2	0.7			ND	ND
Sodium Adsorption Rate (SAR)	0.1	9.8	9.8			9.9	9.5	9.7	9.6			10	9.8	9	9.4			9.8	9.6

Values in red boxes are outliers



Table 2  
Water Quality Data and Upper Control Limits  
Monitor Ring Wells (MRN Wells)

Production Area #1 Ring Monitoring Wells (MRN-1 thru MRN-34.2)	Well ID Sampling Dates	MRN-20.1	MRN-20.1	MRN-20.1	MRN-20.1	MRN-20.1	MRN-20.1	MRN-21	MRN-21	MRN-21	MRN-21	MRN-21	MRN-21	MRN-22	MRN-22	MRN-22	MRN-22	MRN-22	MRN-22
Upper Control Limit Parameters	Laboratory RL	2/29/2012	4/5/2012	5/23/2012	6/20/2012	7/6/2012	10/16/2012	2/28/2012	5/17/2012	6/4/2012	6/19/2012	10/12/2012	10/30/2012	2/28/2012	4/5/2012	5/29/2012	6/15/2012	10/15/2012	10/29/2012
Alkalinity, Total as CaCO <sub>3</sub> mg/L	5.0	126	130	127	138	133	128	129	127	129	132	126	126	120	129	123	122	122	120
Chloride mg/L	1.0	6	6	6	6	6	6	6	6	6	6	6	6	7	6	6	7	6	6
Conductivity @ 25 C umhos/cm	5.0	549	542	560	556	559	564	530	545	544	552	565	546	530	529	556	551	560	552
Analytes/Units																			
Major Ions																			
Bicarbonate as HCO <sub>3</sub> mg/L	5.0	117	145	139	151		142	157	153			146	146	140	155			141	140
Calcium mg/L	1.0	7	7	6	7		7	7	9			8	8	6	7			7	7
Carbonate as CO <sub>3</sub> mg/L	5.0	18	7	7	8		7	ND	ND			ND	ND	ND	ND			ND	ND
Fluoride mg/L	0.1	0.2	0.2	0.2	0.2		0.2	0.2	0.2			0.2	0.2	0.2	0.2			0.2	0.2
Magnesium mg/L	1.0	ND	ND	ND	ND		ND	ND	ND			ND	ND	ND	ND			ND	ND
Nitrogen, Ammonia as N mg/L	0.05	ND	ND	ND	ND		0.12	ND	ND			0.1	ND	ND	ND			0.11	ND
Nitrogen, Nitrate+Nitrite as N mg/L	0.1	ND	ND	ND	ND		0.2	ND	ND			0.2	ND	ND	ND			0.2	ND
Potassium mg/L	1.0	5	4	4	5		4	2	2			2	2	2	3			3	3
Silica mg/L	0.1	9.8	8.3	9.7	8.3		8.1	8.5	9.1			8.1	8.6	8.2	8.3			8.6	8.3
Sodium mg/L	1.0	104	116	117	119		107	103	114			101	111	104	115			115	113
Sulfate mg/L	2.0	128	125	123	110		117	128	122			127	114	131	128			125	115
Physical Properties																			
pH su	0.1	9.5	9.07	9.05	8.9		8.8	8.56	8.52			8.5	8.6	8.66	8.73			8.6	8.5
Solids, Total Dissolved TDS @ 180 C mg/L	10	311	340	345	350		320	331	336			320	330	319	342			340	360
Metals																			
Aluminum mg/L	0.1	ND	ND	ND	ND		ND	ND	ND			ND	ND	ND	ND			ND	ND
Arsenic mg/L	0.001	0.005	0.003	0.005	ND		0.003	0.004	0.002			0.002	0.002	0.005	0.004			0.018	0.007
Barium mg/L	0.1	ND	ND	ND	ND		ND	ND	ND			ND	ND	ND	ND			ND	ND
Boron mg/L	0.1	ND	ND	ND	ND		ND	ND	ND			ND	ND	ND	ND			ND	ND
Cadmium mg/L	0.005	ND	ND	ND	ND		ND	ND	ND			ND	ND	ND	ND			ND	ND
Chromium mg/L	0.05	ND	ND	ND	ND		ND	ND	ND			ND	ND	ND	ND			ND	ND
Copper mg/L	0.01	ND	ND	ND	ND		ND	ND	ND			ND	ND	ND	ND			ND	ND
Iron mg/L	0.05	ND	ND	ND	ND		ND	ND	ND			ND	ND	ND	ND			ND	ND
Lead mg/L	0.001	ND	0.001	ND	ND		ND	ND	ND			ND	ND	ND	ND			ND	ND
Manganese mg/L	0.01	ND	ND	ND	ND		ND	0.01	ND			ND	ND	0.01	0.01			0.02	0.02
Mercury mg/L	0.001	ND	ND	ND	ND		ND	ND	ND			ND	ND	ND	ND			ND	ND
Molybdenum mg/L	0.1	ND	ND	ND	ND		ND	ND	ND			ND	ND	ND	ND			ND	ND
Nickel mg/L	0.05	ND	ND	ND	ND		ND	ND	ND			ND	ND	ND	ND			ND	ND
Selenium mg/L	0.001	ND	ND	ND	ND		ND	ND	ND			0.002	ND	ND	ND			ND	0.003
Uranium mg/L	0.0003	0.0264	0.032	0.0281	0.0276		0.0344	0.0333	0.0288			0.028	0.0293	0.0253	0.025			0.0240	0.0247
Vanadium mg/L	0.1	ND	ND	ND	ND		ND	ND	ND			ND	ND	ND	ND			ND	ND
Zinc mg/L	0.01	ND	ND	ND	ND		ND	ND	0.01			0.01	ND	ND	ND			ND	ND
Radionuclides - Total																			
Gross Alpha pCi/L	2	46.9	45.1	35.4	29.5		28.6	59.4	43.7			42.3	33.6	36.8	34.7			20.9	32
Gross Beta pCi/L	3	12	8.8	12.7	8.4		11.8	11	5			8.3	7	5.3	3.3			5.9	6.8
Radium 226 pCi/L	0.2	0.21	0.04	0.24	0.4		0.4	0.12	0.2			ND	0.4	0.09	0.31			ND	0.3
Radium 228 pCi/L	1	0.1	1	0.4	1.8		ND	38.8	0.07			ND	1.3	0.7	0.4			ND	1.4
Sodium Adsorption Rate (SAR)	0.1	10.9	11.5	12.2	12.7		10.9	10.2	9.9			9.7	10.8	10.7	10.9			11.9	11.6



Table 2  
Water Quality Data - Upper Control Limits  
Monitor Ring Wells (MRN Wells)

Production Area #1 Ring Monitoring Wells (MRN-1 thru MRN-34.2)	Well ID Sampling Dates	MRN-23	MRN-23	MRN-23	MRN-23	MRN-23	MRN-23	MRN-24	MRN-24	MRN-24	MRN-24	MRN-24	MRN-24	MRN-25	MRN-25	MRN-25	MRN-25	MRN-25	MRN-25
<b>Upper Control Limit Parameters</b>	Laboratory RL	3/9/2012	4/5/2012	5/29/2012	6/15/2012	10/12/2012	10/26/2012	3/1/2012	4/5/2012	5/29/2012	6/15/2012	10/11/2012	10/25/2012	4/17/2012	5/22/2012	6/20/2012	7/5/2012	10/12/2012	10/26/2012
Alkalinity, Total as CaCO <sub>3</sub> mg/L	5.0	125	128	126	126	124	126	119	125	125	126	123	134	121	127	133	126	125	127
Chloride mg/L	1.0	6	6	6	6	6	6	6	6	6	7	5	6	6	7	6	6	6	6
Conductivity @ 25 C umhos/cm	5.0	553	530	561	553	567	565	529	529	556	553	563	560	549	572	562	568	577	574
<b>Analytes/Units</b>																			
<b>Major Ions</b>																			
Bicarbonate as HCO <sub>3</sub> mg/L	5.0	152	156			144	146	137	148			142	155	127	138	145		145	143
Calcium mg/L	1.0	8	8			8	8	6	7			6	7	4	4	4		5	5
Carbonate as CO <sub>3</sub> mg/L	5.0	ND	ND			ND	ND	ND	ND			ND	ND	10	9	8		ND	6
Fluoride mg/L	0.1	0.2	0.2			0.2	0.2	0.2	0.2			0.2	0.2	0.2	0.2	0.2		0.2	0.2
Magnesium mg/L	1.0	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND	ND		ND	ND
Nitrogen, Ammonia as N mg/L	0.05	ND	ND			0.1	ND	ND	ND			0.1	ND	ND	ND	ND		0.1	ND
Nitrogen, Nitrate+Nitrite as N mg/L	0.1	ND	ND			0.2	ND	ND	ND			ND	ND	ND	ND	ND		0.3	ND
Potassium mg/L	1.0	2	2			2	2	2	2			3	3	3	3	3		3	3
Silica mg/L	0.1	7.7	8.5			8.3	8.6	9.6	8			8.3	8.7	7.3	9.2	8.5		8.6	8.9
Sodium mg/L	1.0	108	113			105	114	103	113			103	114	114	125	123		111	119
Sulfate mg/L	2.0	128	124			129	113	125	123			109	113	123	131	114		129	114
<b>Physical Properties</b>																			
pH su	0.1	9.11	8.58			8.5	8.6	8.67	8.72			8.6	8.6	9.38	9.14	8.9		8.6	8.7
Solids, Total Dissolved TDS @ 180 C mg/L	10	352	360			330	350	292	345			330	320	350	365	360		330	350
<b>Metals</b>																			
Aluminum mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND	ND		ND	ND
Arsenic mg/L	0.001	0.003	0.003			0.002	0.002	0.004	0.003			0.004	0.003	0.007	0.005	0.003		0.003	0.003
Barium mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND	ND		ND	ND
Boron mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND	ND		ND	ND
Cadmium mg/L	0.005	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND	ND		ND	ND
Chromium mg/L	0.05	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND	ND		ND	ND
Copper mg/L	0.01	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND	ND		ND	ND
Iron mg/L	0.05	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND	ND		ND	ND
Lead mg/L	0.001	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND	ND		ND	ND
Manganese mg/L	0.01	ND	ND			0.01	0.01	ND	ND			ND	ND	ND	ND	ND		ND	ND
Mercury mg/L	0.001	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND	ND		ND	ND
Molybdenum mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND	ND		ND	ND
Nickel mg/L	0.05	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND	ND		ND	ND
Selenium mg/L	0.001	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND	ND		ND	ND
Uranium mg/L	0.0003	0.014	0.0239			0.0216	0.0226	0.0179	0.0204			0.0193	0.0195	0.0108	0.0146	0.0145		0.0157	0.0187
Vanadium mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND	ND		ND	ND
Zinc mg/L	0.01	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND	ND		ND	ND
<b>Radionuclides - Total</b>																			
Gross Alpha pCi/L	2	37.4	37.6			36.5	28.1	37	35.5			23.7	29.3	19.6	21.5	19.1		17.2	24.8
Gross Beta pCi/L	3	7.4	6.7			4.6	8.7	2.9	4.6			9.6	6.4	5.1	3.6	5.6		6.9	5.2
Radium 226 pCi/L	0.2	0.75	0.81			0.2	0.8	0.2	0.23			0.3	0.4	0.05	0.09	0.4		1	0.3
Radium 228 pCi/L	1	0.002	0.9			ND	ND	0.9	-0.4			ND	ND	-1	-0.1	ND		ND	2.2
Sodium Adsorption Rate (SAR)	0.1	10.3	10.3			10.3	11.5	11.3	11.4			11.6	12	16.4	17.8	17.6		13.5	15.2



Table  
Water Quality Data and Upper Control Limits  
Monitor Ring Wells (MRN Wells)

Production Area #1 Ring Monitoring Wells (MRN-1 thru MRN-34.2)	Well ID Sampling Dates	MRN-26	MRN-26	MRN-26	MRN-26	MRN-26	MRN-26	MRN-27	MRN-27	MRN-27	MRN-27	MRN-27	MRN-27	MRN-28	MRN-28	MRN-28	MRN-28	MRN-28	MRN-28
Upper Control Limit Parameters	Laboratory RL	4/17/2012	5/16/2012	6/19/2012	7/5/2012	10/12/2012	10/26/2012	4/12/2012	5/16/2012	5/31/2012	6/15/2012	10/18/2012	11/1/2012	4/12/2012	5/16/2012	5/31/2012	6/15/2012	10/16/2012	10/30/2012
Alkalinity, Total as CaCO3 mg/L	5.0	133	133	137	129	128	130	123	125	125	124	126	122	124	121	124	129	119	124
Chloride mg/L	1.0	6	6	6	6	6	6	6	6	6	7	6	6	6	6	6	7	7	6
Conductivity @ 25 C umhos/cm	5.0	530	547	537	542	559	554	542	518	547	547	550	536	543	547	546	548	542	540
<b>Analytes/Units</b>																			
<b>Major Ions</b>																			
Bicarbonate as HCO3 mg/L	5.0	152	152	155		148	148	143	147			141	141	144	142			134	142
Calcium mg/L	1.0	7	6	7		7	7	6	6			5	6	5	5			5	5
Carbonate as CO3 mg/L	5.0	ND	5	6		ND	5	ND	ND			6	ND	ND	ND			5	5
Fluoride mg/L	0.1	0.2	0.2	0.2		0.2	0.2	0.2	0.2			0.2	0.2	0.2	0.2			0.2	0.2
Magnesium mg/L	1.0	ND	ND	ND		ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Nitrogen, Ammonia as N mg/L	0.05	0.05	ND	ND		0.2	ND	ND	ND			ND	ND	ND	ND			ND	ND
Nitrogen, Nitrate+Nitrite as N mg/L	0.1	ND	ND	ND		0.3	ND	ND	ND			ND	ND	ND	ND			0.2	ND
Potassium mg/L	1.0	3	2	3		2	2	2	2			2	2	2	2			3	3
Silica mg/L	0.1	8.6	10	8.8		8.6	8.8	8.8	10.1			8.1	8.4	8.7	10.1			8.4	8.6
Sodium mg/L	1.0	112	111	117		105	114	111	110			105	117	112	108			109	113
Sulfate mg/L	2.0	111	112	101		118	115	120	123			110	110	123	123			114	111
<b>Physical Properties</b>																			
pH su	0.1	8.97	8.88	8.7		8.5	8.7	8.83	8.76			8.7	8.7	8.85	8.78			8.7	8.7
Solids, Total Dissolved TDS @ 180 C mg/L	10	344	334	320		330	340	327	331			340	340	331	328			320	340
<b>Metals</b>																			
Aluminum mg/L	0.1	ND	ND	ND		ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Arsenic mg/L	0.001	0.003	0.003	0.002		0.002	0.002	0.005	0.005			0.004	0.003	0.004	0.004			0.003	0.003
Barium mg/L	0.1	ND	ND	ND		ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Boron mg/L	0.1	ND	ND	ND		ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Cadmium mg/L	0.005	ND	ND	ND		ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Chromium mg/L	0.05	ND	ND	ND		ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Copper mg/L	0.01	ND	ND	ND		ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Iron mg/L	0.05	ND	ND	ND		ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Lead mg/L	0.001	ND	ND	ND		ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Manganese mg/L	0.01	ND	ND	ND		ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Mercury mg/L	0.001	ND	ND	ND		ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Molybdenum mg/L	0.1	ND	ND	ND		ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Nickel mg/L	0.05	ND	ND	ND		ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Selenium mg/L	0.001	ND	ND	ND		0.001	ND	ND	ND			ND	ND	ND	ND			ND	ND
Uranium mg/L	0.0003	0.0119	0.0117	0.0109		0.0131	0.0116	0.0122	0.0129			0.0116	0.0109	0.01	0.0093			0.0091	0.0100
Vanadium mg/L	0.1	ND	ND	ND		ND	ND	ND	0.2			ND	ND	ND	0.2			ND	ND
Zinc mg/L	0.01	ND	0.01	ND		ND	ND	ND	0.01			ND	ND	ND	0.02			ND	ND
<b>Radionuclides - Total</b>																			
Gross Alpha pCi/L	2	20.2	27.9	18.3		21.2	18.5	21.2	23.5			18.1	20.9	16.7	16.5			13.8	18
Gross Beta pCi/L	3	6.1	4.5	6.5		8.3	6.2	4.2	2.8			5.8	5.4	4.5	2.8			5.1	5.3
Radium 226 pCi/L	0.2	0.27	0.1	0.5		0.4	0.3	0.06	0.03			ND	ND	0.21	0.07			0.2	0.3
Radium 228 pCi/L	1	0.2	0.5	ND		ND	ND	0.6	0.4			ND	ND	1.3	1			ND	1.9
Sodium Adsorption Rate (SAR)	0.1	11.5	11.3	12.3		10.9	12.3	11.7	11.4			12.4	12.8	12.6	11.9			13.7	13.5



Tab 1  
Water Quality Data and Upper Control Limits  
Monitor Ring Wells (MRN Wells)

Production Area #1 Ring Monitoring Wells (MRN-1 thru MRN-34.2)	Well ID Sampling Dates	MRN-29	MRN-29	MRN-29	MRN-29	MRN-29	MRN-29	MRN-30	MRN-30	MRN-30	MRN-30	MRN-30	MRN-30	MRN-31	MRN-31	MRN-31	MRN-31	MRN-31	MRN-31
Upper Control Limit Parameters	Laboratory RL	11/21/2011	2/17/2012	5/31/2012	6/15/2012	10/16/2012	10/30/2012	4/13/2012	5/14/2012	5/30/2012	6/14/2012	10/15/2012	10/30/2012	4/11/2012	5/4/2012	5/30/2012	6/14/2012	10/15/2012	10/30/2012
Alkalinity, Total as CaCO3 mg/L	5.0	120	124	125	125	125	133	125	125	126	132	122	123	127	129	127	128	127	129
Chloride mg/L	1.0	6	7	6	7	6	6	6	6	6	7	6	6	6	6	6	7	6	6
Conductivity @ 25 C umhos/cm	5.0	547	524	543	542	545	537	540	542	542	542	543	533	528	513	536	534	544	523
Analytes/Units																			
Major Ions																			
Bicarbonate as HCO3 mg/L	5.0	132	146			141	154	147	145			141	140	144	148			144	141
Calcium mg/L	1.0	6	7			6	6	6	5			5	5	6	6			5	6
Carbonate as CO3 mg/L	5.0	7	ND			5	ND	ND	ND			ND	5	5	ND			6	8
Fluoride mg/L	0.1	0.2	0.2			0.2	0.2	0.2	0.2			0.2	0.2	0.2	0.2			0.2	0.2
Magnesium mg/L	1.0	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Nitrogen, Ammonia as N mg/L	0.05	ND	ND			0.11	ND	ND	ND			0.2	ND	ND	ND			0.16	ND
Nitrogen, Nitrate+Nitrite as N mg/L	0.1	ND	ND			0.3	ND	ND	ND			0.2	ND	ND	ND			0.2	ND
Potassium mg/L	1.0	2	2			3	2	2	2			2	3	2	2			2	2
Silica mg/L	0.1	9	10.2			8.4	8.7	8.9	9.8			8.9	8.7	9.6	9.9			10.1	9.6
Sodium mg/L	1.0	116	110			107	110	109	102			113	112	108	110			113	110
Sulfate mg/L	2.0	122	126			120	110	118	121			118	118	113	116			111	113
Physical Properties																			
pH su	0.1	8.57	8.61			8.7	8.6	8.76	8.83			8.6	8.7	8.93	8.87			8.7	8.9
Solids, Total Dissolved TDS @ 180 C mg/L	10	315	339			310	360	343	343			340	350	309	338			280	330
Metals																			
Aluminum mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Arsenic mg/L	0.001	0.004	0.003			0.001	0.002	0.002	0.002			0.011	0.002	0.001	0.001			0.006	0.002
Barium mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Boron mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Cadmium mg/L	0.005	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Chromium mg/L	0.05	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Copper mg/L	0.01	ND	ND			ND	ND	ND	0.01			ND	ND	ND	ND			ND	ND
Iron mg/L	0.05	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Lead mg/L	0.001	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Manganese mg/L	0.01	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Mercury mg/L	0.001	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Molybdenum mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Nickel mg/L	0.05	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Selenium mg/L	0.001	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Uranium mg/L	0.0003	0.024	0.0117			0.0150	0.0122	0.0122	0.0133			0.0109	0.0105	0.0058	0.0061			0.0057	0.0058
Vanadium mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Zinc mg/L	0.01	ND	0.04			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Radionuclides - Total																			
Gross Alpha pCi/L	2	47.7	26.9			23.2	21.2	55.3	40.5			31.6	33.8	8.1	12.1			8.2	9.8
Gross Beta pCi/L	3	11.8	14.5			6.4	5.7	55.8	45.7			31.5	18.4	2.8	1.3			ND	4
Radium 226 pCi/L	0.2	0.77	1.3			1.0	1.4	9.8	7.6			8.3	10.8	0.3	0.23			0.4	0.8
Radium 228 pCi/L	1	0.8	0.57			ND	ND	2.3	0.5			ND	ND	0.7	0.6			ND	ND
Sodium Adsorption Rate (SAR)	0.1	12.1	10.7			12	12.4	11.6	11.5			14	13.7	11.3	11.3			13.3	12.6



Tab  
Water Quality Data and Upper Control Limits  
Monitor Ring Wells (MRN Wells)

Production Area #1 Ring Monitoring Wells (MRN-1 thru MRN-34.2)	Well ID Sampling Dates	MRN-32	MRN-32	MRN-32	MRN-32	MRN-32	MRN-32	MRN-33	MRN-33	MRN-33	MRN-33	MRN-33	MRN-33	MRN-34.2	MRN-34.2	MRN-34.2	MRN-34.2	MRN-34.2	MRN-34.2
<b>Upper Control Limit Parameters</b>	Laboratory RL	4/11/2012	5/4/2012	5/30/2012	6/27/2012	10/15/2012	10/30/2012	4/10/2012	5/2/2012	5/30/2012	6/13/2012	10/15/2012	10/29/2012	4/10/2012	5/2/2012	5/30/2012	6/13/2012	10/15/2012	10/29/2012
Alkalinity, Total as CaCO <sub>3</sub> mg/L	5.0	124	123	123	126	119	125	125	125	124	125	124	122	125	124	124	124	122	121
Chloride mg/L	1.0	6	6	6	6	6	6	6	7	7	7	6	6	6	7	7	7	7	6
Conductivity @ 25 C umhos/cm	5.0	522	506	534	532	533	521	541	536	590	540	546	539	560	559	560	555	563	550
<b>Analytes/Units</b>																			
<b>Major Ions</b>																			
Bicarbonate as HCO <sub>3</sub> mg/L	5.0	135	132			136	140	134	142			144	141	143	148			141	142
Calcium mg/L	1.0	4	4			4	5	5	5			5	5	7	7			6	6
Carbonate as CO <sub>3</sub> mg/L	5.0	8	9			ND	6	9	5			ND	ND	ND	ND			ND	ND
Fluoride mg/L	0.1	0.2	0.2			0.2	0.2	0.2	0.2			0.2	0.2	0.2	0.2			0.2	0.2
Magnesium mg/L	1.0	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Nitrogen, Ammonia as N mg/L	0.05	ND	ND			0.18	ND	ND	0.05			0.14	ND	ND	0.05			0.17	ND
Nitrogen, Nitrate+Nitrite as N mg/L	0.1	ND	3.4			0.2	ND	ND	ND			0.1	ND	ND	ND			0.1	ND
Potassium mg/L	1.0	2	2			2	2	2	2			2	2	2	2			2	2
Silica mg/L	0.1	9.2	9.5			10.2	9.8	8.8	8.9			10.1	9.6	9	9.6			10.3	9.4
Sodium mg/L	1.0	109	106			111	111	112	105			116	111	115	112			117	114
Sulfate mg/L	2.0	113	114			113	113	117	124			117	116	129	133			126	114
<b>Physical Properties</b>																			
pH su	0.1	9.19	9.15			8.7	8.8	9.22	8.99			8.6	8.6	8.8	8.73			8.6	8.5
Solids, Total Dissolved TDS @ 180 C mg/L	10	323	326			290	320	326	350			320	360	342	359			330	370
<b>Metals</b>																			
Aluminum mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Arsenic mg/L	0.001	0.002	0.002			0.008	0.002	0.002	0.002			0.012	0.004	0.003	0.002			0.022	0.004
Barium mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Boron mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Cadmium mg/L	0.005	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Chromium mg/L	0.05	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Copper mg/L	0.01	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Iron mg/L	0.05	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Lead mg/L	0.001	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Manganese mg/L	0.01	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Mercury mg/L	0.001	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Molybdenum mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Nickel mg/L	0.05	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Selenium mg/L	0.001	ND	ND			ND	ND	ND	ND			ND	0.002	ND	ND			ND	0.001
Uranium mg/L	0.0003	0.0006	0.0005			0.0007	0.0008	0.0004	0.0004			0.0005	0.0005	ND	ND			ND	0.0003
Vanadium mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Zinc mg/L	0.01	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
<b>Radionuclides - Total</b>																			
Gross Alpha pCi/L	2	-1	0.8			ND	ND	-0.9	-2			ND	ND	-0.5	-0.4			ND	ND
Gross Beta pCi/L	3	2	2.8			ND	ND	0.9	1.3			ND	ND	0.9	-1			ND	ND
Radium 226 pCi/L	0.2	-0.06	-0.002			ND	0.3	0.004	-0.09			ND	ND	0.11	-0.03			0.3	0.3
Radium 228 pCi/L	1	0.7	-0.09			ND	ND	2.2	2.3			1.1	ND	2.7	1.1			ND	ND
Sodium Adsorption Rate (SAR)	0.1	13.6	13.4			14.7	14.1	13.2	12.7			14.3	14.3	10.7	10.9			13.2	12.8



Table 2  
Water Quality Data and Upper Control Limits  
Monitor Ring Wells (MRN Wells)

Production Area #1 Ring Monitoring Wells (MRN-1 thru MRN-34.2)	Well ID Sampling Dates	n Sample Events	Minimum Value	Maximum Value	MEAN	Standard Deviation	k Factor α=0.05/P= 0.99, n=78	Tolerance Minimum	Tolerance Maximum	Mean without Outliers	Standard Deviation without Outliers	Standard Deviation x 5	UCL
Upper Control Limit Parameters	Laboratory RL	LOD Guideline 4											
Alkalinity, Total as CaCO3 mg/L	5.0	198	106	144	124	5.83	2.81772	108	139	124	5.53	28	152
Chloride mg/L	1.0	198	5	8	6	0.53	NA					NA	21
Conductivity @ 25 C umhos/cm	5.0	198	491	750	569	34.91	2.81772	476	659	568	32.51	163	731
Analytes/Units													
Major Ions													
Bicarbonate as HCO3 mg/L	5.0												
Calcium mg/L	1.0												
Carbonate as CO3 mg/L	5.0												
Fluoride mg/L	0.1												
Magnesium mg/L	1.0												
Nitrogen, Ammonia as N mg/L	0.05												
Nitrogen, Nitrate+Nitrite as N mg/L	0.1												
Potassium mg/L	1.0												
Silica mg/L	0.1												
Sodium mg/L	1.0												
Sulfate mg/L	2.0												
Physical Properties													
pH su	0.1												
Solids, Total Dissolved TDS @ 180 C mg/L	10												
Metals													
Aluminum mg/L	0.1												
Arsenic mg/L	0.001												
Barium mg/L	0.1												
Boron mg/L	0.1												
Cadmium mg/L	0.005												
Chromium mg/L	0.05												
Copper mg/L	0.01												
Iron mg/L	0.05												
Lead mg/L	0.001												
Manganese mg/L	0.01												
Mercury mg/L	0.001												
Molybdenum mg/L	0.1												
Nickel mg/L	0.05												
Selenium mg/L	0.001												
Uranium mg/L	0.0003												
Vanadium mg/L	0.1												
Zinc mg/L	0.01												
Radionuclides - Total													
Gross Alpha pCi/L	2												
Gross Beta pCi/L	3												
Radium 226 pCi/L	0.2												
Radium 228 pCi/L	1												
Sodium Adsorption Rate (SAR)	0.1	198	11.5										



T-2-3  
Water Quality Data - Upper Control Limits  
Underlying Monitor Wells (MUN Wells)

Production Area #1 Overlying Monitoring Wells (MUN-1.1 thru MON-09)	Well ID Sampling Dates	MUN-1.1	MUN-1.1	MUN-1.1	MUN-1.1	MUN-1.1	MUN-1.1	MUN-2	MUN-2	MUN-2	MUN-2	MUN-2	MUN-2	MUN-3	MUN-3	MUN-3	MUN-3	MUN-3	MUN-3
Upper Control Limit Parameters	Laboratory RL	4/5/2012	5/17/2012	6/7/2012	7/11/2012	10/8/2012	11/1/2012	4/9/2012	5/1/2012	5/24/2012	7/12/2012	10/8/2012	11/1/2012	4/20/2012	5/17/2012	6/12/2012	7/10/2012	10/17/2012	11/1/2012
Alkalinity, Total as CaCO <sub>3</sub> mg/L	5.0	211	212	221	208	204	203	212	212	214	213	208	210	208	210	210	208	210	205
Chloride mg/L	1.0	5	5	5	5	4	4	5	5	5	5	4	4	5	5	5	5	5	5
Conductivity @ 25 C umhos/cm	5.0	388	406	406	406	391	397	417	391	405	415	395	397	396	404	408	405	407	391
Analytes/Units																			
Major Ions																			
Bicarbonate as HCO <sub>3</sub> mg/L	5.0	235	239			239	231	238	246			238	235	234	232			224	225
Calcium mg/L	1.0	4	3			3	4	3	4			4	4	4	4			4	4
Carbonate as CO <sub>3</sub> mg/L	5.0	11	10			ND	8	10	7			8	10	10	12			16	12
Fluoride mg/L	0.1	0.5	0.6			0.4	0.4	0.6	0.6			0.4	0.4	0.5	0.5			0.4	0.4
Magnesium mg/L	1.0	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Nitrogen, Ammonia as N mg/L	0.05	0.11	0.09			0.19	0.12	0.08	0.09			0.17	0.1	0.07	0.06			ND	0.08
Nitrogen, Nitrate+Nitrite as N mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Potassium mg/L	1.0	3	2			2	2	2	2			2	2	3	3			2	2
Silica mg/L	0.1	8.7	10.3			8.9	9.2	8.6	8.2			8.8	9.2	9.8	10.3			9.2	9.6
Sodium mg/L	1.0	99	91			87	96	97	87			87	98	89	99			84	95
Sulfate mg/L	2.0	2	1			ND	ND	4	ND			ND	ND	ND	ND			ND	ND
Physical Properties																			
pH su	0.1	9.09	9			8.5	8.7	8.85	8.95			8.7	8.8	9.04	9.04			9.0	8.9
Solids, Total Dissolved TDS @ 180 C mg/L	10	241	250			260	240	267	253			240	250	241	241			260	260
Metals																			
Aluminum mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Arsenic mg/L	0.001	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Barium mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Boron mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Cadmium mg/L	0.005	ND	0.005			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Chromium mg/L	0.05	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Copper mg/L	0.01	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Iron mg/L	0.05	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Lead mg/L	0.001	ND	0.001			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Manganese mg/L	0.01	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Mercury mg/L	0.001	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Molybdenum mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Nickel mg/L	0.05	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Selenium mg/L	0.001	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			0.002	ND
Uranium mg/L	0.0003	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Vanadium mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Zinc mg/L	0.01	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Radionuclides - Total																			
Gross Alpha pCi/L	2	-0.2	-2			ND	ND	-0.9	3			ND	ND	-2	-1			ND	ND
Gross Beta pCi/L	3	2.7	1.5			ND	ND	2.6	0.6			ND	ND	-1	0.8			ND	ND
Radium 226 pCi/L	0.2	0.08	-0.02			ND	ND	0.17	0.08			ND	ND	0.02	0.08			ND	ND
Radium 228 pCi/L	1	0.6	-0.7			ND	ND	-0.01	4.7			ND	ND	-0.3	0.2			ND	ND
Sodium Adsorption Rate (SAR)	0.1	13.6	13.2			13.1	13.6	14.8	11.7			12.8	13.6	12.1	12.7			12.1	13.2



T-2-3  
Water Quality Data and Upper Control Limits  
Underlying Monitor Wells (MUN Wells)

Production Area #1 Overlying Monitoring Wells (MUN-1.1 thru MON-09)	Well ID Sampling Dates	MUN-4	MUN-4	MUN-4	MUN-4	MUN-4	MUN-4	MUN-5.1	MUN-5.1	MUN-5.1	MUN-5.1	MUN-5.1	MUN-6	MUN-6	MUN-6	MUN-6	MUN-6	MUN-6
Upper Control Limit Parameters	Laboratory RL	4/10/2012	5/1/2012	5/15/2012	6/5/2012	10/5/2012	10/19/2012	4/12/2012	5/8/2012	6/6/2012	10/8/2012	10/22/2012	4/13/2012	5/10/2012	5/30/2012	6/19/2012	10/9/2012	10/23/2012
Alkalinity, Total as CaCO <sub>3</sub> mg/L	5.0	235	236	234	235	230	231	205	204	207	202	206	206	211	207	206	204	207
Chloride mg/L	1.0	4	4	4	4	3	4	5	5	5	4	4	5	5	5	5	4	4
Conductivity @ 25 C umhos/cm	5.0	441	420	440	436	450	434	394	396	398	378	387	406	400	395	395	383	397
Analytes/Units																		
Major Ions																		
Bicarbonate as HCO <sub>3</sub> mg/L	5.0	261	272	269		255	259	233	239		234	229	234	239			234	225
Calcium mg/L	1.0	4	4	5		5	3	5	4		3	3	3	4			3	3
Carbonate as CO <sub>3</sub> mg/L	5.0	12	8	8		12	11	8	ND		6	11	9	9			7	13
Fluoride mg/L	0.1	0.6	0.6	0.6		0.4	0.4	0.5	0.5		0.4	0.4	0.5	0.5			0.4	0.4
Magnesium mg/L	1.0	ND	ND	ND		ND	ND	ND	ND		ND	ND	ND	ND			ND	ND
Nitrogen, Ammonia as N mg/L	0.05	0.08	0.08	0.07		ND	0.09	0.07	0.08		0.18	ND	0.08	0.05			0.19	ND
Nitrogen, Nitrate+Nitrite as N mg/L	0.1	ND	ND	ND		ND	ND	ND	ND		ND	ND	ND	ND			ND	ND
Potassium mg/L	1.0	3	3	2		2	2	2	2		3	3	2	2			2	2
Silica mg/L	0.1	9.4	9.1	10.9		9.2	8.7	9.6	8.4		8.7	8.8	9.3	8.3			8.9	9.0
Sodium mg/L	1.0	102	95	101		96	106	90	85		84	88	89	85			86	90
Sulfate mg/L	2.0	1	1	ND		ND	ND	1	ND		ND	ND	2	ND			ND	ND
Physical Properties																		
pH su	0.1	8.96	8.88	8.7		8.8	8.8	8.87	8.89		8.6	8.8	8.96	8.84			8.6	8.8
Solids, Total Dissolved TDS @ 180 C mg/L	10	270	281	265		250	270	241	244		250	250	250	262			230	240
Metals																		
Aluminum mg/L	0.1	ND	ND	ND		ND	ND	ND	ND		ND	ND	ND	ND			ND	ND
Arsenic mg/L	0.001	ND	ND	ND		ND	ND	ND	ND		ND	0.004	ND	ND			ND	ND
Barium mg/L	0.1	ND	ND	ND		ND	ND	ND	ND		ND	ND	ND	ND			ND	ND
Boron mg/L	0.1	ND	ND	ND		ND	ND	ND	ND		ND	ND	ND	ND			ND	ND
Cadmium mg/L	0.005	ND	ND	ND		ND	ND	ND	ND		ND	ND	ND	ND			ND	ND
Chromium mg/L	0.05	ND	ND	ND		ND	ND	ND	ND		ND	ND	ND	ND			ND	ND
Copper mg/L	0.01	ND	ND	ND		ND	ND	ND	ND		ND	ND	ND	ND			ND	ND
Iron mg/L	0.05	ND	ND	ND		ND	ND	ND	ND		ND	ND	ND	ND			ND	ND
Lead mg/L	0.001	ND	ND	ND		ND	ND	ND	ND		ND	ND	ND	ND			ND	ND
Manganese mg/L	0.01	ND	ND	ND		ND	ND	ND	ND		ND	ND	ND	ND			ND	ND
Mercury mg/L	0.001	ND	ND	ND		ND	ND	ND	ND		ND	ND	ND	ND			ND	ND
Molybdenum mg/L	0.1	ND	ND	ND		ND	ND	ND	ND		ND	ND	ND	ND			ND	ND
Nickel mg/L	0.05	ND	ND	ND		ND	ND	ND	ND		ND	ND	ND	ND			ND	ND
Selenium mg/L	0.001	ND	ND	ND		ND	ND	ND	ND		ND	ND	ND	ND			ND	ND
Uranium mg/L	0.0003	ND	ND	0.0008		ND	ND	ND	ND		ND	ND	ND	ND			ND	0.0004
Vanadium mg/L	0.1	ND	ND	ND		ND	ND	ND	ND		ND	ND	ND	ND			ND	ND
Zinc mg/L	0.01	ND	ND	ND		ND	ND	ND	ND		ND	ND	ND	ND			ND	ND
Radionuclides - Total																		
Gross Alpha pCi/L	2	-2	5.1	2.6		ND	ND	0.3	-0.7		ND	ND	-1	0.5			ND	ND
Gross Beta pCi/L	3	-0.7	-1	0.09		ND	ND	0.8	0.01		ND	ND	2.3	0.8			ND	ND
Radium 226 pCi/L	0.2	0.07	-0.1	0.07		ND	ND	-0.02	-0.02		0.2	ND	0.02	0.04			ND	ND
Radium 228 pCi/L	1	1.3	2.7	0.7		1.4	ND	1.1	0.7		ND	ND	1.9	0.2			ND	ND
Sodium Adsorption Rate (SAR)	0.1	13.3	12.3	11.9		11.3	16.3	10.5	11.1		13.4	13.7	12.8	11.5			12.8	13.5



T 2-3  
Water Quality Data and Upper Control Limits  
Underlying Monitor Wells (MUN Wells)

Production Area #1 Overlying Monitoring Wells (MUN-1.1 thru MON-09)	Well ID Sampling Dates	MUN-7	MUN-7	MUN-7	MUN-7	MUN-7	MUN-7	MUN-8	MUN-8	MUN-8	MUN-8	MUN-8	MUN-8	MUN-8	MUN-9	MUN-9	MUN-9	MUN-9	MUN-9
Upper Control Limit Parameters	Laboratory RL	4/16/2012	5/10/2012	6/1/2012	6/26/2012	10/9/2012	10/23/2012	4/25/2012	5/16/2012	6/1/2012	7/3/2012	10/11/2012	10/25/2012	4/25/2012	5/16/2012	6/1/2012	6/21/2012	10/11/2012	10/25/2012
Alkalinity, Total as CaCO <sub>3</sub> mg/L	5.0	188	186	189	185	185	185	188	189	190	185	186	187	203	196	200	200	193	196
Chloride mg/L	1.0	5	5	5	5	4	5	5	5	5	5	4	4	5	5	6	5	5	5
Conductivity @ 25 C umhos/cm	5.0	405	390	390	386	374	389	373	376	375	371	369	375	406	407	409	398	405	405
Analytes/Units																			
Major Ions																			
Bicarbonate as HCO <sub>3</sub> mg/L	5.0	204	210			213	205	215	217			212	208	230	225			220	214
Calcium mg/L	1.0	4	4			3	3	3	4			3	3	4	4			4	4
Carbonate as CO <sub>3</sub> mg/L	5.0	12	9			6	10	7	7			7	10	9	7			8	12
Fluoride mg/L	0.1	0.5	0.6			0.4	0.4	0.5	0.5			0.4	0.4	0.6	0.6			0.4	0.5
Magnesium mg/L	1.0	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Nitrogen, Ammonia as N mg/L	0.05	0.13	0.08			0.18	ND	ND	ND			0.19	ND	0.05	ND			0.16	ND
Nitrogen, Nitrate+Nitrite as N mg/L	0.1	ND	ND			ND	0.1	ND	ND			ND	ND	ND	ND			ND	ND
Potassium mg/L	1.0	4	2			2	2	2	2			2	2	2	2			2	2
Silica mg/L	0.1	8	8.1			8.9	9.0	8.7	11.2			9.4	9.6	9.6	11			8.9	9.2
Sodium mg/L	1.0	83	80			83	84	85	83			80	85	92	93			85	92
Sulfate mg/L	2.0	11	10			9	9	4	4			3	3	10	10			9	9
Physical Properties																			
pH su	0.1	9.16	8.9			8.6	8.9	8.98	8.9			8.6	8.8	9.02	8.9			8.7	8.9
Solids, Total Dissolved TDS @ 180 C mg/L	10	246	276			240	230	227	220			220	200	237	242			240	220
Metals																			
Aluminum mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Arsenic mg/L	0.001	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Barium mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Boron mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Cadmium mg/L	0.005	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Chromium mg/L	0.05	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Copper mg/L	0.01	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Iron mg/L	0.05	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Lead mg/L	0.001	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Manganese mg/L	0.01	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Mercury mg/L	0.001	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Molybdenum mg/L	0.1	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Nickel mg/L	0.05	ND	ND			ND	ND	ND	ND			ND	ND	ND	ND			ND	ND
Selenium mg/L	0.001	ND	0.001			ND	ND	0.005	ND			ND	ND	0.016	ND			ND	ND
Uranium mg/L	0.0003	ND	ND			ND	0.0004	ND	ND			ND	ND	ND	ND			ND	ND
Vanadium mg/L	0.1	ND	ND			ND	ND	ND	0.1			ND	ND	ND	ND			ND	ND
Zinc mg/L	0.01	ND	ND			ND	ND	ND	0.01			ND	ND	ND	0.01			ND	ND
Radionuclides - Total																			
Gross Alpha pCi/L	2	-3	0.9			ND	ND	3.7	3.4			ND	ND	3.5	1.9			ND	ND
Gross Beta pCi/L	3	3.1	1.8			ND	ND	-0.3	-2			ND	ND	1.1	-0.4			ND	ND
Radium 226 pCi/L	0.2	0.03	0.14			ND	ND	0.02	-0.1			ND	ND	0.006	-0.06			ND	ND
Radium 228 pCi/L	1	1.7	1.2			ND	ND	0.6	-0.4			ND	1.5	1.1	-0.2			ND	ND
Sodium Adsorption Rate (SAR)	0.1	11.2	10.4			12.5	12.6	12.1	11.3			11.9	12.8	12.4	11.6			11.4	12.2



Table 3  
Water Quality Data - Upper Control Limits  
Underlying Monitor Wells (MUN Wells)

Production Area #1 Overlying Monitoring Wells (MUN-1.1 thru MON-09)	Well ID Sampling Dates	n Sample Events	Minimum Value	Maximum Value	MEAN	Standard Deviation	k Factor $\alpha=0.05/P=0.99$ , n=78	Tolerance Minimum	Tolerance Maximum	Mean without Outliers	Standard Deviation without Outliers	Standard Deviation x 5	UCL
<b>Upper Control Limit Parameters</b>	Laboratory RL	LGD Guideline 4											
Alkalinity, Total as CaCO <sub>3</sub> mg/L	5.0	53	185	236	205	13.87	3.1068	162	248	NA	NA	69.37	274
Chloride mg/L	1.0	53	3	6	5	0.55	NA					NA	20
Conductivity @ 25 C umhos/cm	5.0	53	369	450	400	17.95	3.1068	344	455	NA	NA	89.76	490
<b>Analytes/Units</b>													
<b>Major Ions</b>													
Bicarbonate as HCO <sub>3</sub> mg/L	5.0												
Calcium mg/L	1.0												
Carbonate as CO <sub>3</sub> mg/L	5.0												
Fluoride mg/L	0.1												
Magnesium mg/L	1.0												
Nitrogen, Ammonia as N mg/L	0.05												
Nitrogen, Nitrate+Nitrite as N mg/L	0.1												
Potassium mg/L	1.0												
Silica mg/L	0.1												
Sodium mg/L	1.0												
Sulfate mg/L	2.0												
<b>Physical Properties</b>													
pH su	0.1												
Solids, Total Dissolved TDS @ 180 C mg/L	10												
<b>Metals</b>													
Aluminum mg/L	0.1												
Arsenic mg/L	0.001												
Barium mg/L	0.1												
Boron mg/L	0.1												
Cadmium mg/L	0.005												
Chromium mg/L	0.05												
Copper mg/L	0.01												
Iron mg/L	0.05												
Lead mg/L	0.001												
Manganese mg/L	0.01												
Mercury mg/L	0.001												
Molybdenum mg/L	0.1												
Nickel mg/L	0.05												
Selenium mg/L	0.001												
Uranium mg/L	0.0003												
Vanadium mg/L	0.1												
Zinc mg/L	0.01												
<b>Radionuclides - Total</b>													
Gross Alpha pCi/L	2												
Gross Beta pCi/L	3												
Radium 226 pCi/L	0.2												
Radium 228 pCi/L	1												
Sodium Adsorption Rate (SAR)	0.1	53	12.5										



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Restoration Target Values  
Production Monitor Well (MPN Wells)

Analyte	Units	Laboratory RL	MPN-1.1	MPN-1.1	MPN-1.1	MPN-1.1	MPN-2.1	MPN-2.1	MPN-2.1	MPN-2.1	MPN-3	MPN-3	MPN-3	MPN-3
Sample Date			4/27/2012	5/17/2012	6/7/2012	7/11/2012	4/9/2012	5/8/2012	5/24/2012	7/12/2012	6/14/2012	7/10/2012	7/26/2012	8/9/2012
Alkalinity	mg/L CaCO3	5	125	138	133	131	123	133	127	123	116	121	123	118
Aluminum	mg/L	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic*	mg/L	0.001	0.003	0.003	0.003	0.003	0.008	0.007	0.006	0.006	0.002	0.002	0.002	0.002
Barium*	mg/L	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bicarbonate	mg/L	5	142	161	156	149	127	151	141	136	122	134	131	131
Boron	mg/L	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cadmium*	mg/L	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Calcium	mg/L	1	6	6	6	6	7	7	7	5	7	7	7	7
Carbonate	mg/L	5	5	ND	ND	5	11	5	7	7	9	7	9	6
Chloride	mg/L	1	6	6	6	6	7	8	7	6	6	7	7	8
Chromium*	mg/L	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Conductivity	umhos/cm	5	518	537	527	561	579	569	561	596	539	566	535	549
Copper	mg/L	0.01	ND	ND	ND	ND	ND	ND	ND	0.02	ND	ND	ND	ND
Fluoride	mg/L	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Gross Alpha	pCi/L	2	463	347	202	191	387	504	509	210	10.7	9.6	10.2	9.9
Gross Beta	pCi/L	3	355	419	123	96.1	190	646	664	383	6.4	6.9	9	1.8
Iron	mg/L	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Lead*	mg/L	0.001	ND	ND	ND	ND	ND	ND	ND	0.002	ND	ND	ND	ND
Magnesium	mg/L	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Manganese	mg/L	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Mercury*	mg/L	0.001	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Molybdenum	mg/L	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel	mg/L	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ammonia as N	mg/L	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.1	ND
Nitrate+Nitrite as N	mg/L	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
pH	s.u.	0.1	8.93	8.87	8.6	8.7	9.12	9.07	8.96	8.9	8.9	8.9	9	8.93
Potassium	mg/L	1	3	3	2	3	4	2	3	3	3	3	3	3
Radium 226	pCi/L	0.2	65	93	70.3	66.7	96	92	103	80.5	0.8	1.1	0.9	0.3
Radium 228	pCi/L	1	2.8	1.7	ND	ND	0.3	1.1	0.8	ND	ND	ND	ND	ND
Selenium*	mg/L	0.001	ND	ND	0.004	0.004	0.005	0.001	ND	ND	ND	ND	ND	ND
Silica	mg/L	0.1	7.9	9.9	9.2	8.9	9.3	8.1	10.3	8.8	10	10	10.2	12.2
Sodium	mg/L	1	114	113	111	110	111	108	119	113	113	109	110	112
TDS @ 180 C	mg/L	10	330	328	340	330	357	356	360	340	340	330	320	347
Sulfate	mg/L	2	120	120	108	119	135	133	127	133	114	125	123	130
Uranium	mg/L	0.0003	0.047	0.0337	0.0377	0.0303	0.0239	0.0477	0.0439	0.0218	0.0078	0.007	0.0059	0.0072
Vanadium	mg/L	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Zinc	mg/L	0.01	ND	ND	ND	ND	ND	ND	ND	0.01	ND	ND	ND	ND

Values in red boxes are outliers



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Restoration Target Values  
Production Monitor Well (MPN Wells)

Analyte	Units	Laboratory RL	MPN-4	MPN-4	MPN-4	MPN-4	MPN-5	MPN-5	MPN-5	MPN-5	MPN-6	MPN-6	MPN-6	MPN-6
Sample Date			6/5/2012	6/18/2012	6/27/2012	7/3/2012	4/12/2012	5/8/2012	5/23/2012	6/6/2012	4/25/2012	5/10/2012	5/31/2012	6/19/2012
Alkalinity	mg/L CaCO3	5	132	135	130	137	123	122	123	115	134	131	133	136
Aluminum	mg/L	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic*	mg/L	0.001	0.003	0.004	0.004	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.002	0.002
Barium*	mg/L	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bicarbonate	mg/L	5	143	145	143	148	138	148	146	126	151	147	154	153
Boron	mg/L	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cadmium*	mg/L	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Calcium	mg/L	1	8	8	8	8	8	8	9	8	7	7	9	8
Carbonate	mg/L	5	9	10	8	9	6	ND	ND	7	6	6	ND	7
Chloride	mg/L	1	6	6	7	6	7	8	6	6	6	6	6	6
Chromium*	mg/L	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Conductivity	umhos/cm	5	640	585	575	576	559	586	578	565	577	577	568	562
Copper	mg/L	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluoride	mg/L	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2
Gross Alpha	pCi/L	2	278	304	427	232	181	157	183	75.4	68	65.9	52.7	32.9
Gross Beta	pCi/L	3	155	177	221	224	196	167	204	45.4	50.9	45.9	40.5	23.6
Iron	mg/L	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Lead*	mg/L	0.001	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Magnesium	mg/L	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Manganese	mg/L	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Mercury*	mg/L	0.001	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Molybdenum	mg/L	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel	mg/L	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ammonia as N	mg/L	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nitrate+Nitrite as N	mg/L	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
pH	s.u.	0.1	8.7	9	9.1	8.9	8.95	8.78	8.71	8.8	9.07	8.9	8.94	8.8
Potassium	mg/L	1	3	4	3	3	2	2	2	2	3	3	3	3
Radium 226	pCi/L	0.2	91.5	84.9	91	90.6	28	33	33	30	4.7	5.9	5	5.6
Radium 228	pCi/L	1	ND	ND	ND	ND	ND	1.7	ND	ND	ND	1.1	ND	ND
Selenium*	mg/L	0.001	ND	ND	ND	ND	ND	ND	ND	ND	0.005	0.001	ND	ND
Silica	mg/L	0.1	9	9.1	10.2	9	9.4	8.9	10.7	8.9	8.9	8.6	8.8	8.9
Sodium	mg/L	1	120	122	128	116	116	114	121	117	111	111	117	119
TDS @ 180 C	mg/L	10	380	370	363	360	356	362	356	380	365	371	356	380
Sulfate	mg/L	2	120	130	138	120	137	139	135	125	132	126	125	113
Uranium	mg/L	0.0003	0.0524	0.082	0.129	0.0781	0.0118	0.0129	0.0108	0.0102	0.0221	0.0182	0.0178	0.0164
Vanadium	mg/L	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Zinc	mg/L	0.01	ND	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND

Values in red boxes are outliers



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**Restoration Target Values**  
**Production Monitor Well (MPN Wells)**

Analyte	Units	Laboratory RL	MPN-7	MPN-7	MPN-7	MPN-7	MPN-8	MPN-8	MPN-8	MPN-8	MPN-9	MPN-9	MPN-9	MPN-9
<b>Sample Date</b>			6/12/2012	7/3/2012	7/24/2012	8/9/2012	4/4/2012	5/16/2012	6/1/2012	6/19/2012	6/6/2012	6/20/2012	7/5/2012	7/27/2012
Alkalinity	mg/L CaCO3	5	119	131	128	125	127	126	129	131	120	131	134	132
Aluminum	mg/L	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic*	mg/L	0.001	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.003	0.003	0.002	0.003
Barium*	mg/L	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bicarbonate	mg/L	5	127	140	144	140	150	154	150	152	133	151	153	150
Boron	mg/L	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cadmium*	mg/L	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Calcium	mg/L	1	8	7	8	8	8	9	8	9	8	8	8	8
Carbonate	mg/L	5	9	10	6	6	ND	ND	ND	ND	7	ND	ND	5
Chloride	mg/L	1	7	7	6	7	6	6	6	6	6	6	6	6
Chromium*	mg/L	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Conductivity	umhos/cm	5	583	586	576	590	557	573	579	571	564	569	575	565
Copper	mg/L	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluoride	mg/L	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Gross Alpha	pCi/L	2	61.6	47.4	56.5	50.7	1050	825	1080	509	40.9	38.5	36.4	30.2
Gross Beta	pCi/L	3	21.9	27.7	52.8	18.5	439	670	706	370	7.9	8.3	11.8	8.5
Iron	mg/L	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Lead*	mg/L	0.001	ND	ND	ND	ND	ND	ND	ND	ND	0.001	ND	ND	ND
Magnesium	mg/L	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Manganese	mg/L	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Mercury*	mg/L	0.001	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Molybdenum	mg/L	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel	mg/L	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ammonia as N	mg/L	0.05	ND	ND	0.14	ND	ND	ND	ND	ND	ND	ND	ND	0.05
Nitrate+Nitrite as N	mg/L	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
pH	s.u.	0.1	9	9	8.8	8.96	8.81	8.61	8.58	8.6	8.8	8.6	8.7	8.7
Potassium	mg/L	1	5	5	5	3	3	2	1	3	4	4	3	4
Radium 226	pCi/L	0.2	1.8	2.1	1.5	1.4	163	210	195	201	0.3	0.3	0.7	0.3
Radium 228	pCi/L	1	ND	ND	ND	ND	1.7	3	1.4	ND	ND	1.8	ND	ND
Selenium*	mg/L	0.001	0.002	0.002	ND	ND	ND	ND	ND	ND	ND	ND	0.003	ND
Silica	mg/L	0.1	8.2	8.6	8.8	10	8.5	10.6	10	8.8	8.5	8.8	9.1	8.9
Sodium	mg/L	1	121	117	119	115	121	114	112	123	118	123	116	116
TDS @ 180 C	mg/L	10	380	360	360	374	355	354	364	380	370	370	360	360
Sulfate	mg/L	2	129	127	139	143	137	136	136	122	124	123	122	133
Uranium	mg/L	0.0003	0.0619	0.0425	0.0394	0.0446	0.136	0.0647	0.0539	0.0504	0.0293	0.0383	0.0342	0.0322
Vanadium	mg/L	0.1	ND	ND	ND	ND	ND	0.2	ND	ND	ND	ND	ND	ND
Zinc	mg/L	0.01	ND	ND	ND	ND	ND	0.02	0.02	ND	ND	ND	ND	ND

Values in red boxes are outliers



12-4  
Restoration Target Values  
Production Monitor Well (MPN Wells)

Analyte	Units	Laboratory RL	MPN-10	MPN-10	MPN-10	MPN-10	MPN-11	MPN-11	MPN-11	MPN-11	MPN-12	MPN-12	MPN-12	MPN-12
Sample Date			5/22/2012	6/5/2012	6/21/2012	7/6/2012	5/22/2012	6/5/2012	6/21/2012	7/6/2012	3/12/2012	5/18/2012	6/1/2012	7/6/2012
Alkalinity	mg/L CaCO3	5	122	124	122	128	128	127	128	148	122	125	131	133
Aluminum	mg/L	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic*	mg/L	0.001	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
Barium*	mg/L	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bicarbonate	mg/L	5	132	135	142	142	144	144	149	172	128	141	152	151
Boron	mg/L	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cadmium*	mg/L	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Calcium	mg/L	1	9	8	9	9	8	8	9	8	8	9	8	9
Carbonate	mg/L	5	8	8	ND	7	6	ND	ND	ND	10	6	ND	6
Chloride	mg/L	1	6	6	7	6	6	6	6	6	6	6	6	6
Chromium*	mg/L	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Conductivity	umhos/cm	5	600	660	596	591	583	635	573	576	568	582	595	593
Copper	mg/L	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluoride	mg/L	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Gross Alpha	pCi/L	2	118	67.4	108	65.7	37.3	39	43.3	34.2	90.4	60.9	64.1	38.2
Gross Beta	pCi/L	3	46	26.8	42.8	44.3	34.7	20.3	29.4	34.4	29.1	38.6	34.1	25.5
Iron	mg/L	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Lead*	mg/L	0.001	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Magnesium	mg/L	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Manganese	mg/L	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Mercury*	mg/L	0.001	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Molybdenum	mg/L	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel	mg/L	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ammonia as N	mg/L	0.05	ND	ND	ND	ND	ND	ND	0.06	ND	ND	ND	ND	ND
Nitrate+Nitrite as N	mg/L	0.1	ND	ND	0.5	ND	ND	ND	ND	ND	ND	ND	ND	ND
pH	s.u.	0.1	9.11	8.8	8.88	8.8	8.96	8.6	8.87	8.6	9.23	9.01	9.1	8.7
Potassium	mg/L	1	6	6	4	5	4	5	4	4	5	4	6	4
Radium 226	pCi/L	0.2	18	19.8	28	19.4	1.4	2.1	1.4	1.3	15	17	12	15.8
Radium 228	pCi/L	1	ND	ND	ND	ND	ND	ND	ND	1.1	ND	ND	ND	1.3
Selenium*	mg/L	0.001	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silica	mg/L	0.1	10.8	9.2	10.7	9.4	10.6	9.1	10.7	9.3	8	9.8	10.3	9.4
Sodium	mg/L	1	123	121	124	116	113	118	121	114	105	117	121	117
TDS @ 180 C	mg/L	10	384	400	368	370	376	380	363	350	356	359	368	370
Sulfate	mg/L	2	142	128	138	130	134	118	128	121	141	136	141	129
Uranium	mg/L	0.0003	0.0241	0.0219	0.0202	0.0177	0.0202	0.0206	0.0202	0.0199	0.0075	0.0109	0.0115	0.0071
Vanadium	mg/L	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Zinc	mg/L	0.01	ND	ND	ND	ND	0.01	ND	ND	ND	ND	ND	0.01	ND

Values in red boxes are outliers



T-12-4  
Restoration Target Values  
Production Monitor Well (MPN Wells)

Analyte	Units	Laboratory RL	MPN-13 2/27/2012	MPN-13 5/22/2012	MPN-13 6/7/2012	MPN-13 6/21/2012	Total Number Samples	Excluding Outliers	Minimum Value	Maximum Value	k factor $\alpha=0.05, p=0.99$	Mean	Standard Deviation
Sample Date			2/27/2012	5/22/2012	6/7/2012	6/21/2012							
Alkalinity	mg/L CaCO <sub>3</sub>	5	134	127	137	128	52	52	115	148	3.1132	128	6.3
Aluminum	mg/L	0.1	ND	ND	ND	ND	52	NA	NA	NA	3.1132		
Arsenic*	mg/L	0.001	0.002	0.002	0.002	0.002	52	52	0.002	0.008	3.1132	0.003	0.001
Barium*	mg/L	0.1	ND	ND	ND	ND	52	NA	NA	NA	3.1132		
Bicarbonate	mg/L	5	155	150	159	153	52	52	122	172	3.1132	145	10.0
Boron	mg/L	0.1	ND	ND	ND	ND	52	NA	NA	NA	3.1132		
Cadmium*	mg/L	0.005	ND	ND	ND	ND	52	NA	NA	NA	3.1132		
Calcium	mg/L	1	8	11	11	11	52	52	5	11	3.1132	8.0	1.2
Carbonate	mg/L	5	ND	ND	ND	ND	52	52	5	11	3.1132	7.3	1.7
Chloride	mg/L	1	6	6	6	6	52	52	6	8	3.1132	6.3	0.6
Chromium*	mg/L	0.05	ND	ND	ND	ND	52	NA	NA	NA	3.1132		
Conductivity	umhos/cm	5	567	618	630	618	52	52	518	660	3.1132	578	26.9
Copper	mg/L	0.01	ND	ND	ND	ND	52	51	NA	NA	3.1132		
Fluoride	mg/L	0.1	0.2	0.2	0.2	0.2	52	52	0.1	0.2	3.1132	0.2	0.01
Gross Alpha	pCi/L	2	782	865	441	855	52	52	9.6	1080	3.1132	239	288
Gross Beta	pCi/L	3	474	383	394	410	52	52	1.8	706	3.1132	170	204
Iron	mg/L	0.05	ND	ND	ND	ND	52	NA	NA	NA	3.1132		
Lead*	mg/L	0.001	ND	ND	ND	ND	52	50	NA	NA	3.1132		
Magnesium	mg/L	1	ND	1	1	1	52	49	NA	NA	3.1132		
Manganese	mg/L	0.01	ND	ND	ND	ND	52	NA	NA	NA	3.1132		
Mercury*	mg/L	0.001	ND	ND	ND	ND	52	NA	NA	NA	3.1132		
Molybdenum	mg/L	0.1	ND	ND	ND	ND	52	NA	NA	NA	3.1132		
Nickel	mg/L	0.05	ND	ND	ND	ND	52	NA	NA	NA	3.1132		
Ammonia as N	mg/L	0.05	ND	ND	ND	ND	52	48	NA	NA	3.1132		
Nitrate+Nitrite as N	mg/L	0.1	ND	ND	ND	ND	52	51	NA	NA	3.1132		
pH	s.u.	0.1	8.85	8.75	8.7	8.71	52	52	8.58	9.23	3.1132	8.85	0.2
Potassium	mg/L	1	5	4	5	3	52	52	1	6	3.1132	3.5	1.1
Radium 226	pCi/L	0.2	166	198	215	254	52	52	0.3	254	3.1132	56.4	71.0
Radium 228	pCi/L	1	1.6	1.8	ND	2.3	52	16	0.3	3	3.1132	1.6	0.7
Selenium*	mg/L	0.001	ND	ND	ND	ND	52	52	0.001	0.005	3.1132	0.003	0.002
Silica	mg/L	0.1	9	11	9.7	11.3	52	52	7.9	12.2	3.1132	9.5	0.9
Sodium	mg/L	1	120	128	128	116	52	52	105	128	3.1132	117	5.2
TDS @ 180 C	mg/L	10	348	403	400	389	52	52	320	403	3.1132	362	18.2
Sulfate	mg/L	2	144	151	145	149	52	52	108	151	3.1132	130	9.4
Uranium	mg/L	0.0003	0.011	0.0111	0.0105	0.0111	52	52	0.0059	0.136	3.1132	0.0317	0.0277
Vanadium	mg/L	0.1	ND	ND	ND	ND	52	51	0.2	0.2	3.1132		
Zinc	mg/L	0.01	ND	0.02	ND	0.02	52	47	NA	NA	3.1132		

Values in red boxes are outliers

Grey boxes i



12-4  
Restoration Target Values  
Production Monitor Well (MPN Wells)

Analyte	Units	Laboratory RL	Tolerance Minimum	Tolerance Maximum	Mean without Outliers	Standard Deviation without Outliers	Restoration Target Value (Mean + 2σ)
<b>Sample Date</b>							
Alkalinity	mg/L CaCO <sub>3</sub>	5	109	148	NA	NA	141
Aluminum	mg/L	0.1					
Arsenic*	mg/L	0.001	-0.001	0.007	NA	NA	*
Barium*	mg/L	0.1					*
Bicarbonate	mg/L	5	113.3	176	NA	NA	165
Boron	mg/L	0.1					
Cadmium*	mg/L	0.005					*
Calcium	mg/L	1	4.3	11.7	NA	NA	10
Carbonate	mg/L	5	2.0	12.5	NA	NA	11
Chloride	mg/L	1	4.5	8.1	NA	NA	7
Chromium*	mg/L	0.05					*
Conductivity	umhos/cm	5	494.2	662	NA	NA	632
Copper	mg/L	0.01					
Fluoride	mg/L	0.1	0.2	0.2	NA	NA	0.2
Gross Alpha	pCi/L	2	-656.7	1135	NA	NA	815
Gross Beta	pCi/L	3	-464.3	805	NA	NA	578
Iron	mg/L	0.05					
Lead*	mg/L	0.001					*
Magnesium	mg/L	1					
Manganese	mg/L	0.01					
Mercury*	mg/L	0.001					*
Molybdenum	mg/L	0.1					
Nickel	mg/L	0.05					
Ammonia as N	mg/L	0.05					
Nitrate+Nitrite as N	mg/L	0.1					
pH	s.u.	0.1	8.35	9.36	NA	NA	9
Potassium	mg/L	1	0.0	7.1	NA	NA	6
Radium 226	pCi/L	0.2	-165	277	NA	NA	198
Radium 228	pCi/L	1	-1	4	NA	NA	3
Selenium*	mg/L	0.001	-0.002	0.008	NA	NA	*
Silica	mg/L	0.1	6.6	12.3	NA	NA	11
Sodium	mg/L	1	101	133	NA	NA	127
TDS @ 180 C	mg/L	10	306	419	NA	NA	399
Sulfate	mg/L	2	100.9	160	NA	NA	149
Uranium	mg/L	0.0003	-0.0545	0.1179	0.0291	0.0237	0.08
Vanadium	mg/L	0.1					
Zinc	mg/L	0.01					

\* represent non detectable constituents

\*10 CFR Part 40, Appendix A, Criterion 5(B)(5) lists three standards, one of which each hazardous constituent in groundwater must meet at the point of compliance. The standards are:

- a) The commission approved background concentration of that constituent in the ground water;
- b) The respective value given in the table in paragraph 5 C if the constituent is listed in the table and if the background level of the constituent is below the value listed; or
- c) An alternate concentration limit established by the Commission



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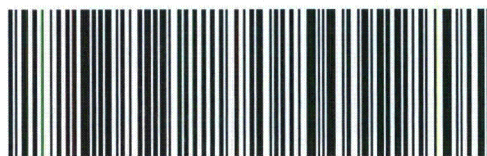
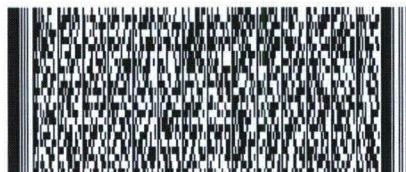
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