

Table 2.4S.12-14 Representative Properties of Hydrogeologic Units

Hydrogeologic Unit	Property	Units	Representative Value	Range	Source
Upper Shallow Aquifer Confining Layer	Thickness	ft	20	10 – 30	Figure 2.4S.12-20
	Vertical Hydraulic Conductivity	gpd/ft ²	0.004	0.05 – 0.0005	Table 2.4S.12-13
	Bulk (dry) Density	pcf	101	96.4 – 114.9	Table 2.4S.12-12
	Total Porosity	%	40	31.8 – 42.8	Table 2.4S.12-12
Upper Shallow Aquifer	Thickness	ft	25	20 – 30	Figure 2.4S.12-20
	Horizontal Hydraulic Conductivity	gpd/ft ²	492 165	39 561-65 – 420	Table 2.4S.12-44 10
	Horizontal Hydraulic Gradient	ft/ft	0.002	0.0005 – 0.002	Section 2.4S.12.2.2
	Bulk (dry) Density	pcf	99	97.2 – 100.2	Table 2.4S.12-12
	Total Porosity	%	41	39.5 – 47.7	Table 2.4S.12-12
	Effective Porosity	%	33	31.6 – 33.4	Table 2.4S.12-12
Lower Shallow Aquifer Confining Layer	Thickness	ft	20	15 – 25	Figure 2.4S.12-20
	Vertical Hydraulic Gradient (downward)	ft/ft	0.29	0.05 0.02 – 0.29	Table 2.4S.12-8
	Vertical Hydraulic Conductivity	gpd/ft ²	0.004	0.05 – 0.0005	Table 2.4S.12-13
	Bulk (dry) Density	pcf	99	87.3 – 107.7	Table 2.4S.12-12
	Total Porosity	%	42	36.1 – 47.2	Table 2.4S.12-12
Lower Shallow Aquifer	Thickness	ft	40	25 – 50	Figure 2.4S.12-20
	Horizontal Hydraulic Conductivity	gpd/ft ²	543	410 – 651	Table 2.4S.12-10
	Horizontal Hydraulic Gradient	ft/ft	0.0005 0.0007	0.0004 – 0.00057	Section 2.4S.12.2.2
	Bulk (dry) Density	pcf	102	94.5 – 120.0	Table 2.4S.12-12
	Total Porosity	%	39	28.8 – 43.9	Table 2.4S.12-12
	Effective Porosity	%	31	23.0 – 35.1	Table 2.4S.12-12
Deep Aquifer Confining Layer	Thickness	ft	100	100 – 150	Section 2.4S.12.3.1
	Vertical Hydraulic Conductivity	gpd/ft ²	0.004	0.05 – 0.0005	Table 2.4S.12-13
	Bulk (dry) Density	pcf	101	82.1 – 111.4	Table 2.4S.12-12
	Total Porosity	%	41	33.4 – 51.8	Table 2.4S.12-12
Deep Aquifer	Horizontal Hydraulic Conductivity	gpd/ft ²	420	103 – 3,950	Table 2.4S.12-9
	Horizontal Hydraulic Gradient	ft/ft	0.002	0.0006 – 0.002	Section 2.4S.12.2.2
	Bulk (dry) Density	pcf	102	94.5 – 120.0	Lower Shallow Aquifer
	Total Porosity	%	39	28.8 – 43.9	Lower Shallow Aquifer
	Effective Porosity	%	31	23.0 – 35.1	Lower Shallow Aquifer

Table 2.4S.12-17 Estimated Average Linear Velocity and Travel Time

Property		Hydrogeologic Unit/Pathway						
		Pathway 1		Pathway 2		Pathway 3		Pathway 4
		Upper Shallow Aquifer Discharge at east site boundary	Lower Shallow Aquifer at east site boundary	Upper Shallow Aquifer Discharge at Well 2004120846	Lower Shallow Aquifer Discharge at Well 2004120846	Upper Shallow Aquifer Discharge at Colorado River	Lower Shallow Aquifer Discharge at Colorado River	Upper Shallow Aquifer Discharge at west site boundary
Hydraulic Conductivity	Representative Value (gpd/ft ²)	192 165	543	192 165	543	192 165	543	192 165
	Range (gpd/ft ²)	39-564 65-420	410 - 651	39-564 65-420	410 - 651	39-564 65-420	410 - 651	39-564 65-420
	Representative Value (ft/day)	22	72	22	72	22	72	22
	Range (ft/day)	5-75 9 - 56	55 - 87	5-75 9 - 56	55 - 87	5-75 9 - 56	55 - 87	5-75 9 - 56
Hydraulic Gradient	Representative Value (ft/ft)	0.002	0.0005 0.0007	0.002	0.0005 0.0007	0.002	0.0005 0.0007	0.0008
	Range (ft/ft)	0.0007 - 0.002	0.0004 - 0.00057	0.0007 - 0.002	0.0004 - 0.00057	0.0007 - 0.002	0.0004 - 0.00057	0.0005 - 0.0008
Effective Porosity	Representative Value (decimal)	0.33	0.31	0.33	0.31	0.33	0.31	0.33
	Range (decimal)	0.316 - 0.334	0.23 - 0.351	0.316 - 0.334	0.23 - 0.351	0.316 - 0.334	0.23 - 0.351	0.316 - 0.334
Average Linear Velocity	Representative Value (ft/day)	0.20.13	0.4 0.16	0.20.13	0.4 0.16	0.20.13	0.4 0.16	0.05
	Range (ft/day)	0.03-0.5 0.05 - 0.35	0.08-0.2 0.11 - 0.26	0.03-0.5 0.05 - 0.35	0.08-0.2 0.11 - 0.26	0.03-0.5 0.05 - 0.35	0.08-0.2 0.11 - 0.26	0.02 - 0.14
Distance	Distance to Receptor (ft)	7,300	7,300	9,000	9,000	17,800	17,800	6,000
Travel Time	Representative Value (day)	36500 56,154	73,000 45,625	45,000 69,231	90,00056,250	89,000 136,923	478,000111,250	120,000
	Range (day)	14,600-243,300 20,857 - 146,000	36,500-91,250 28,077 - 66,364	18,000-300,000 25,714 - 180,000	45,000-112,500 34,615 - 81,818	35,600-593,300 50,857 - 356,000	89,000-222,500 68,462 - 161,818	42,857 - 300,000

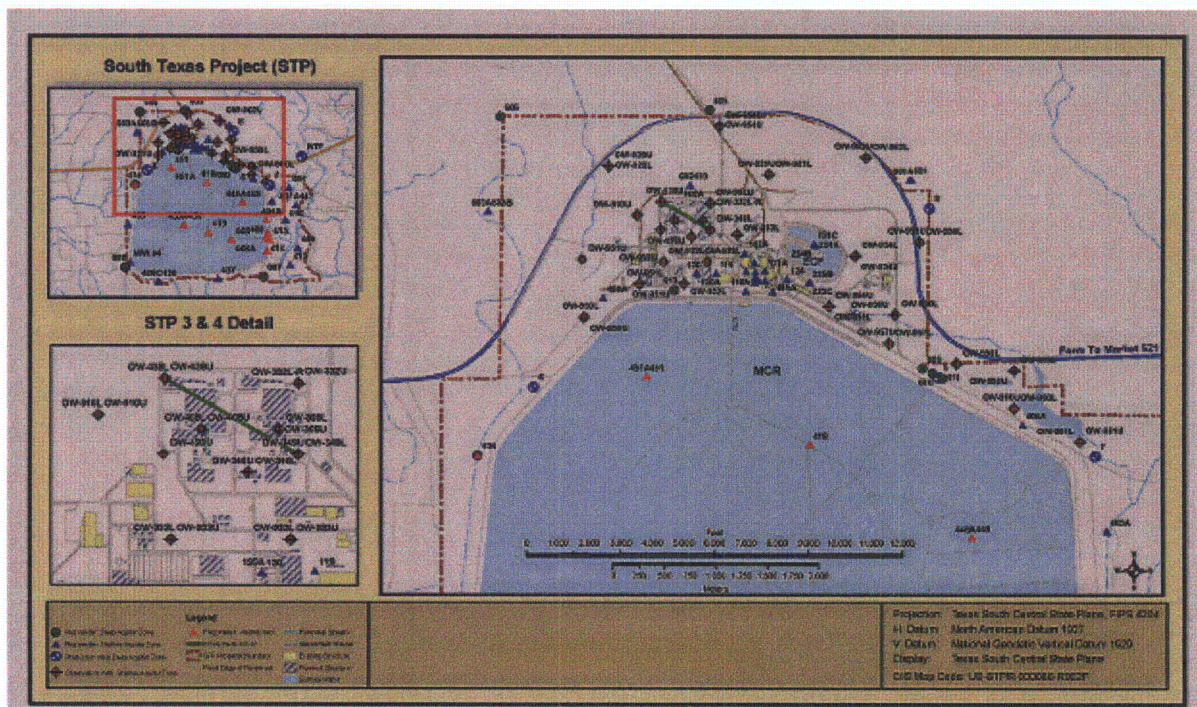
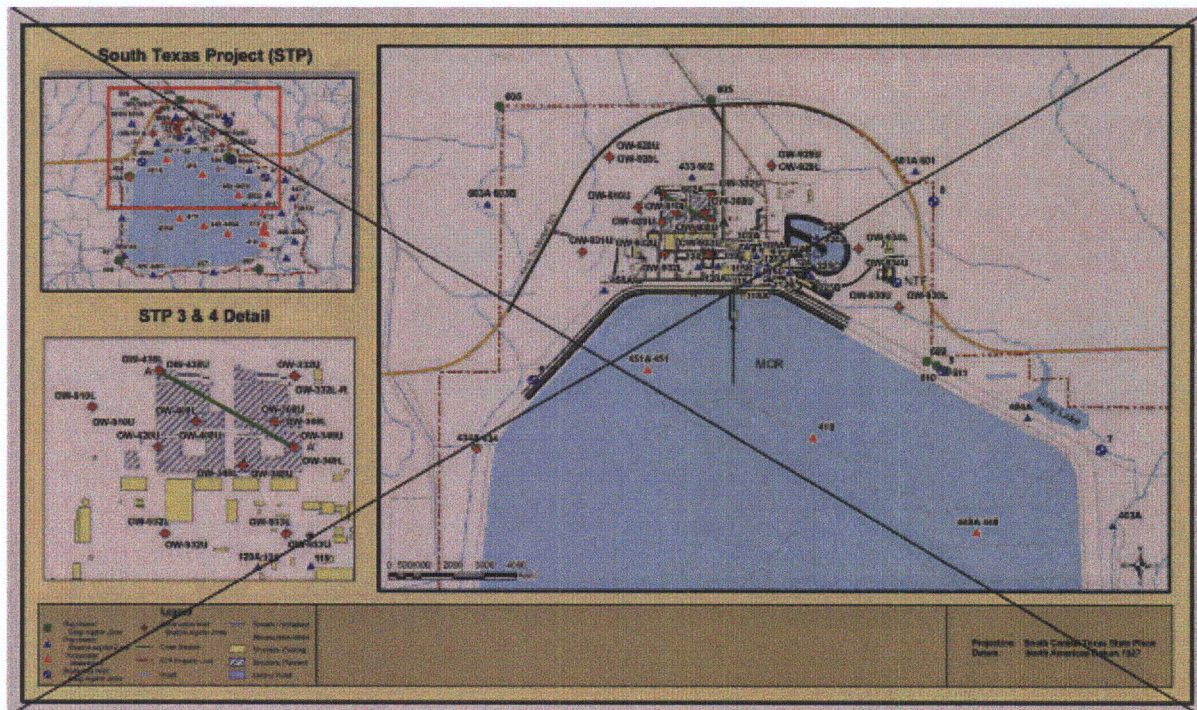


Figure 2.4S.12-10 STP Site Well Locations





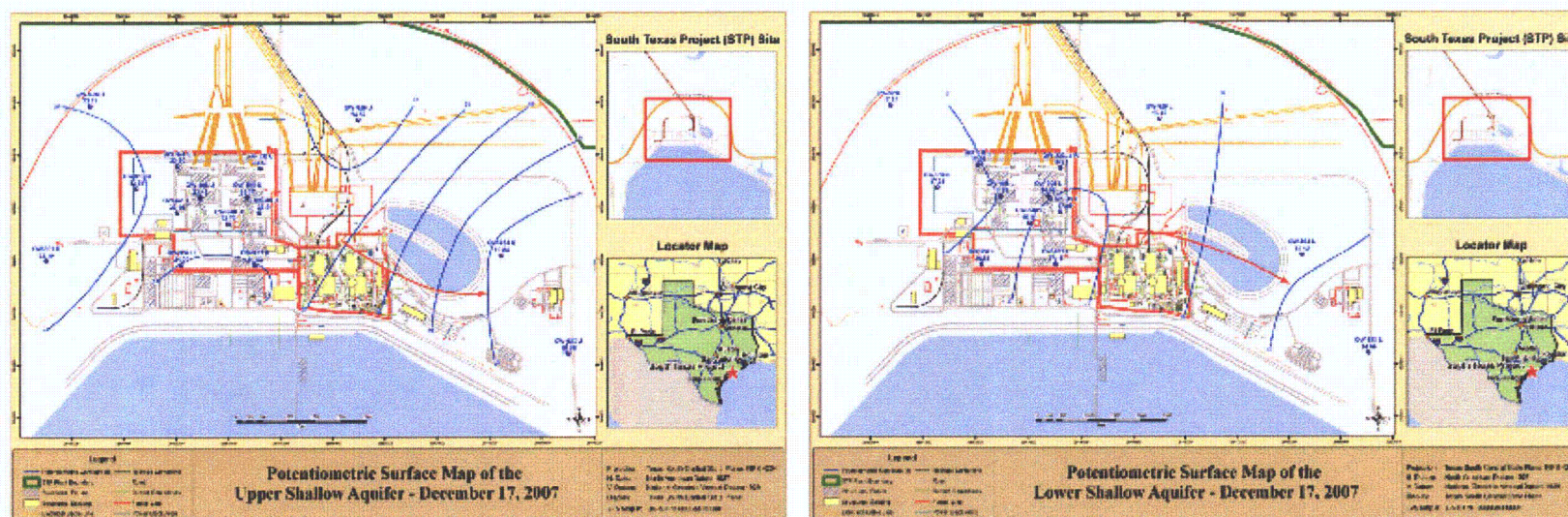


Figure 2.4S.12-19e Quarterly Potentiometric Surface Maps in the STP 3 & 4 Areas (Sheet 3 of 11)

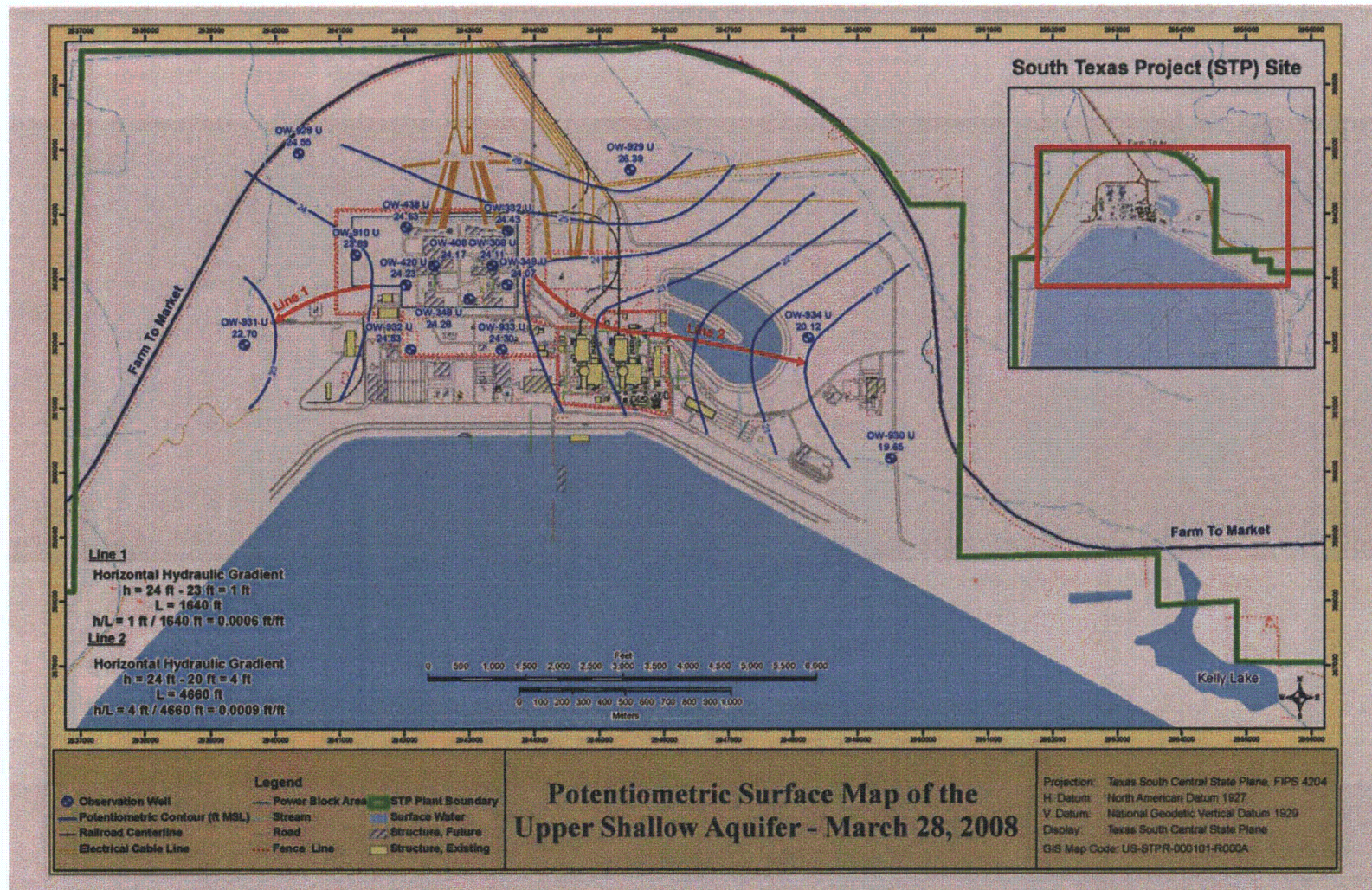


Figure 2.4S.12-19 Quarterly Potentiometric Surface Maps in the STP 3 & 4 Areas (Sheet 4 of 11)

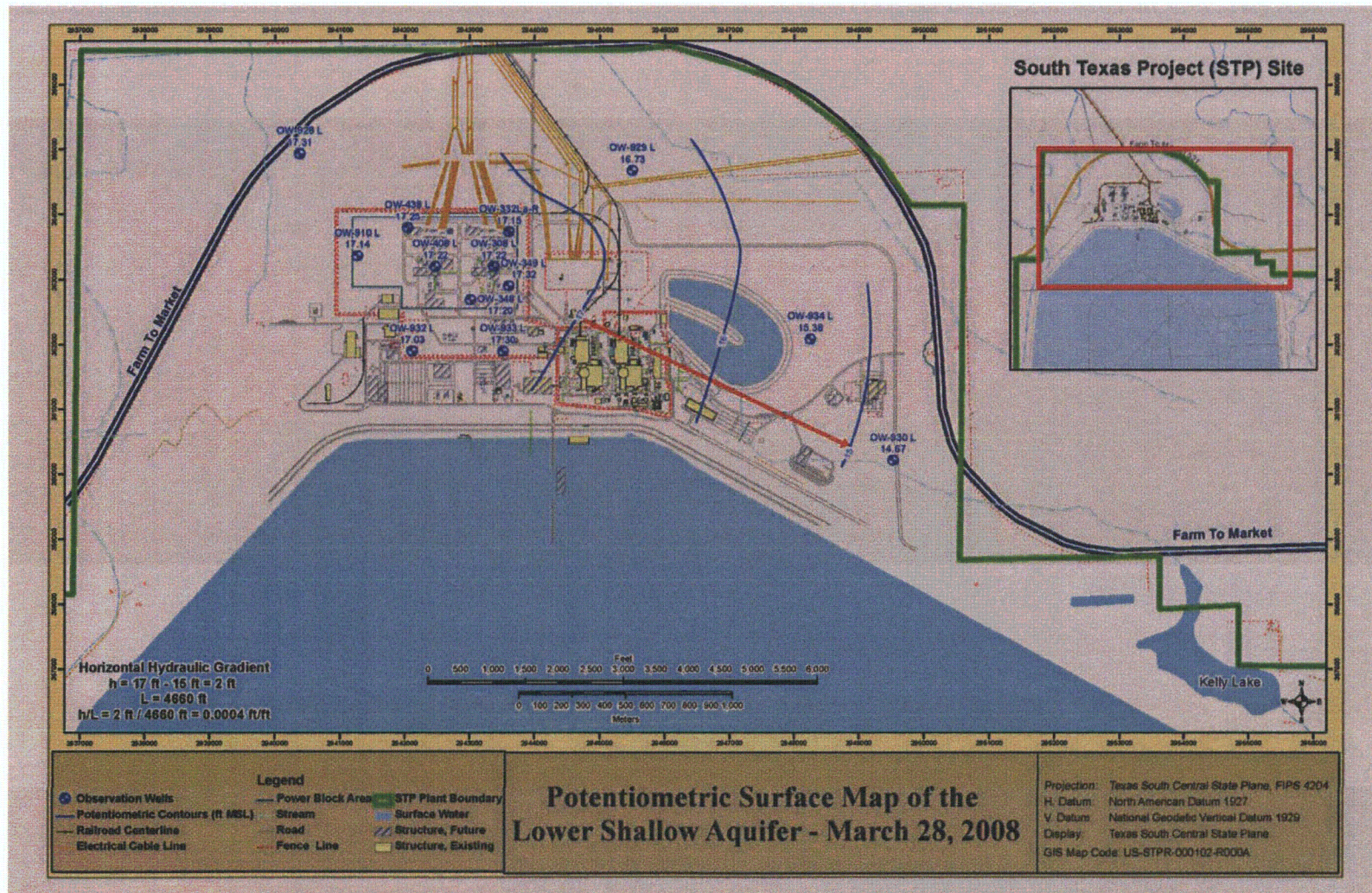


Figure 2.4S.12-19 Quarterly Potentiometric Surface Maps in the STP 3 & 4 Areas (Sheet 5 of 11)

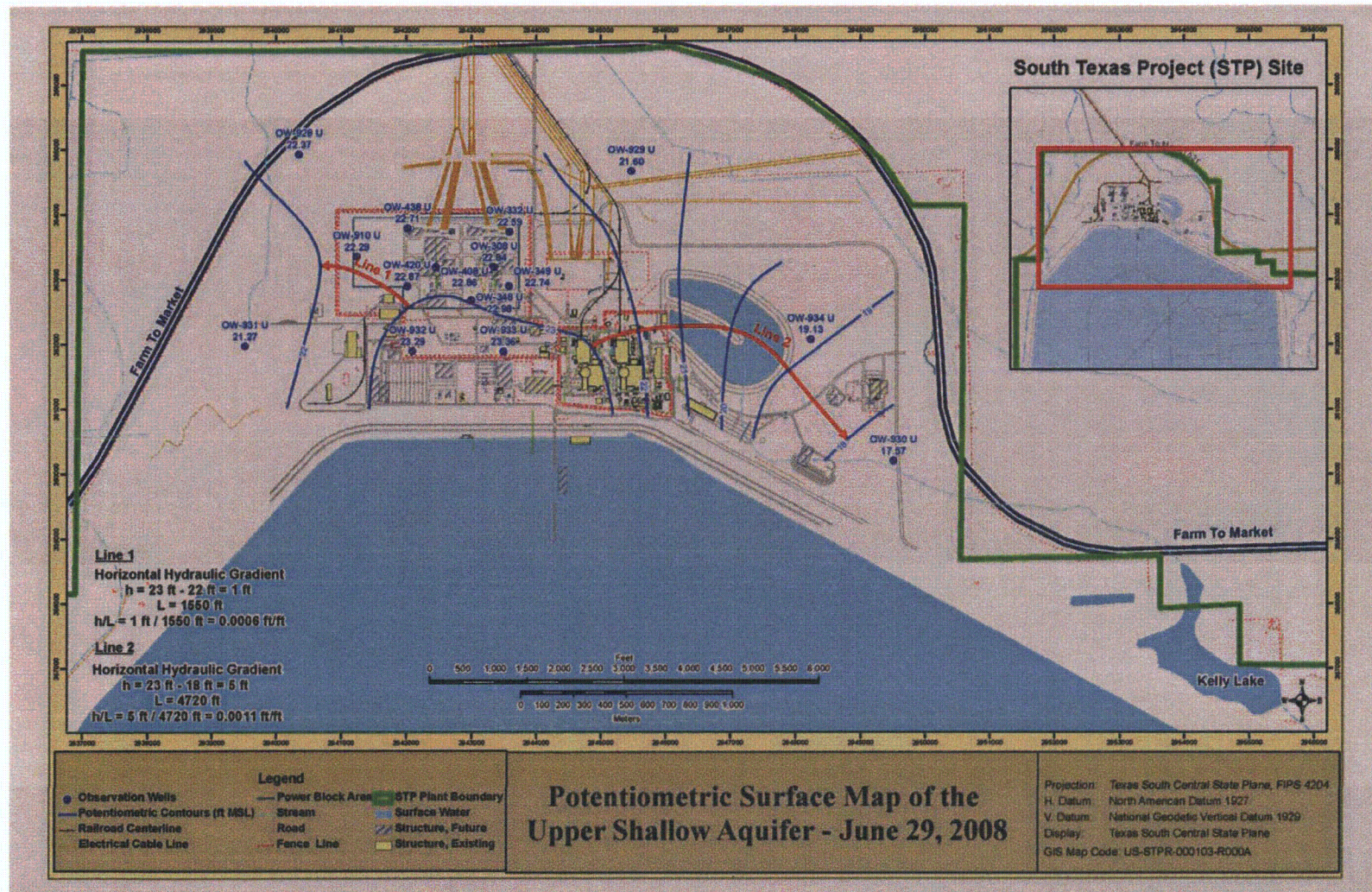


Figure 2.4S.12-19 Quarterly Potentiometric Surface Maps in the STP 3 & 4 Areas (Sheet 6 of 11)

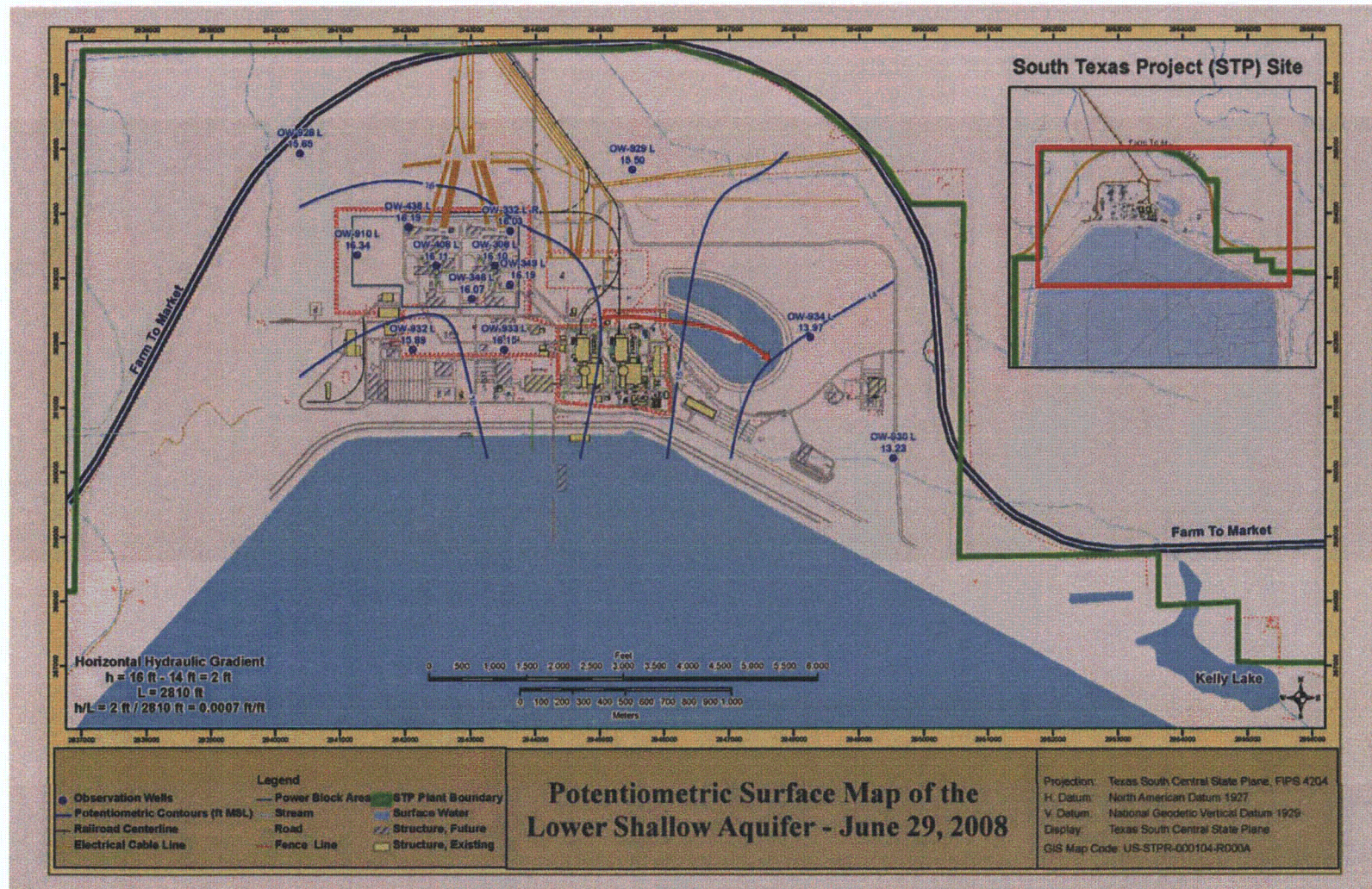


Figure 2.4S.12-19 Quarterly Potentiometric Surface Maps in the STP 3 & 4 Areas (Sheet 7 of 11)

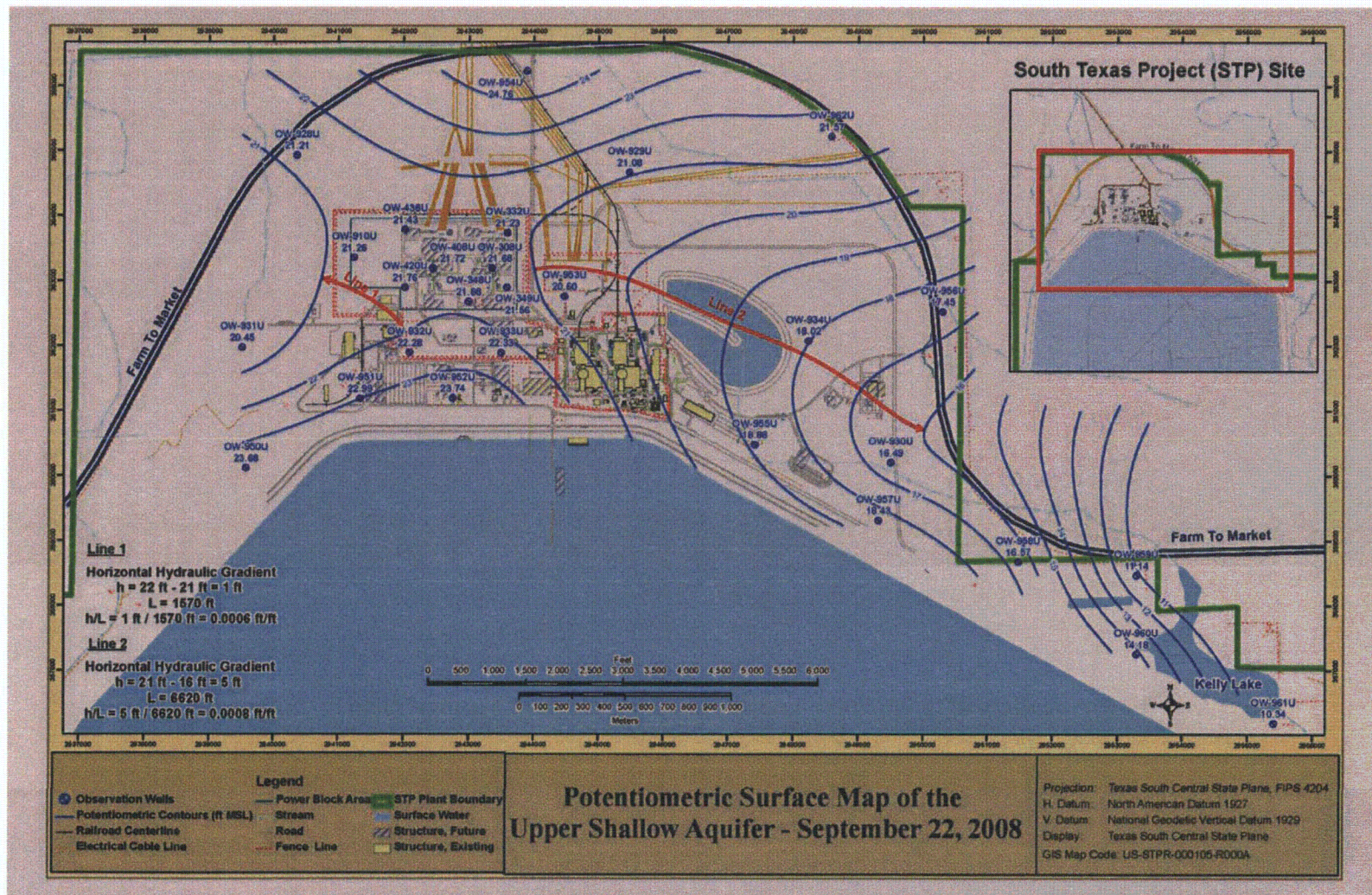


Figure 2.4S.12-19 Quarterly Potentiometric Surface Maps in the STP 3 & 4 Areas (Sheet 8 of 11)

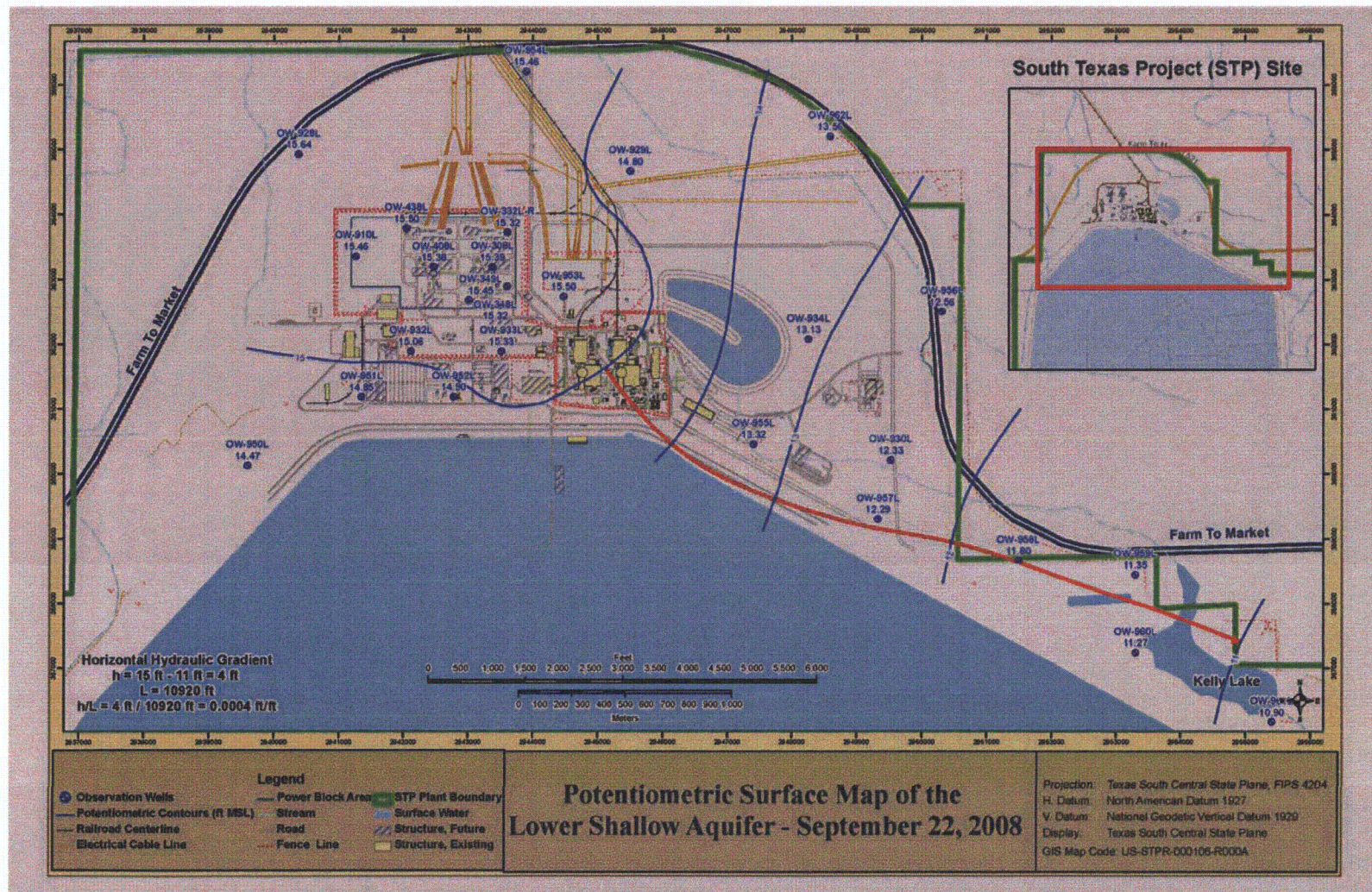


Figure 2.4S.12-19 Quarterly Potentiometric Surface Maps in the STP 3 & 4 Areas (Sheet 9 of 11)

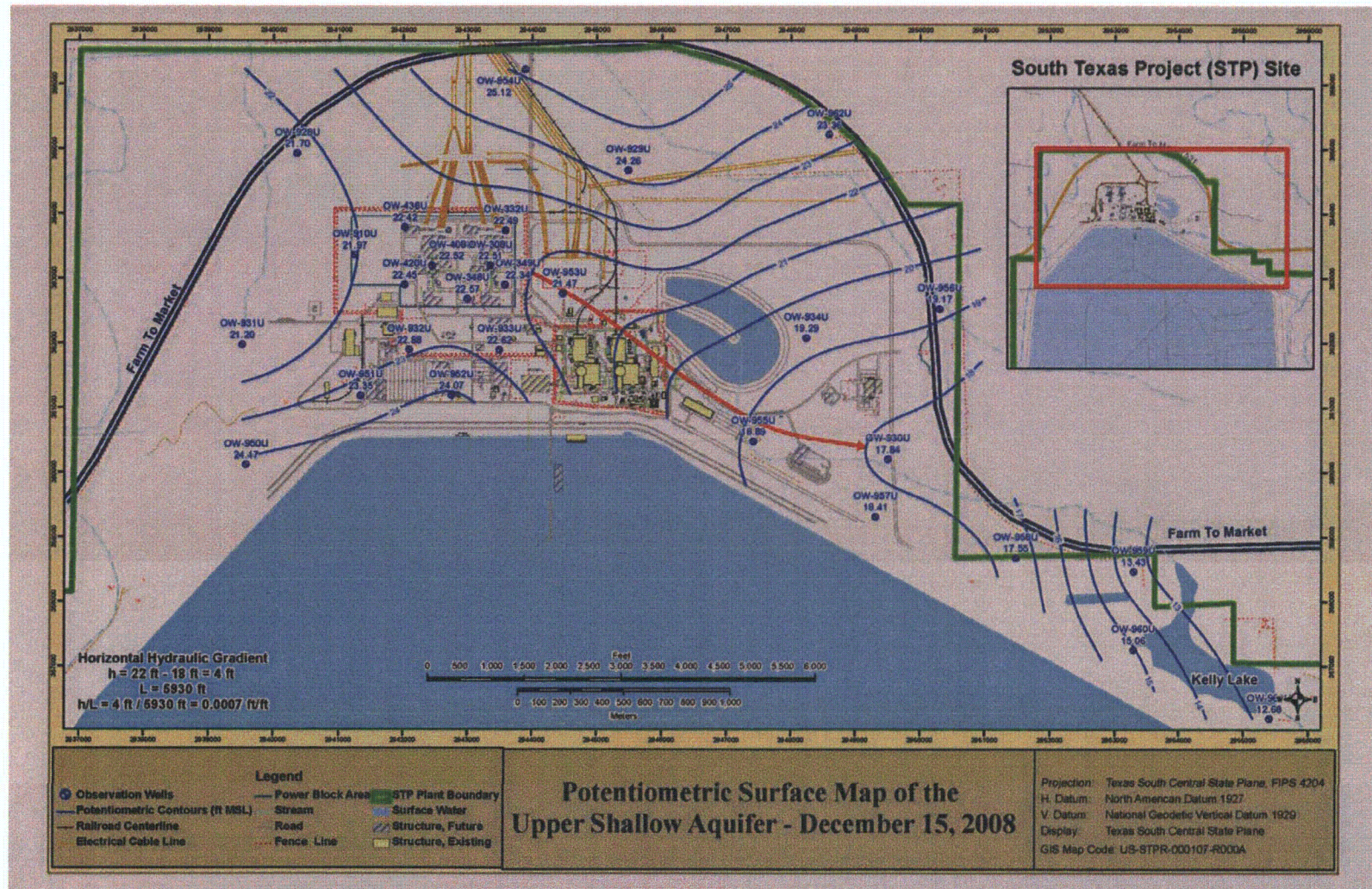


Figure 2.4S.12-19 Quarterly Potentiometric Surface Maps in the STP 3 & 4 Areas (Sheet 10 of 11)

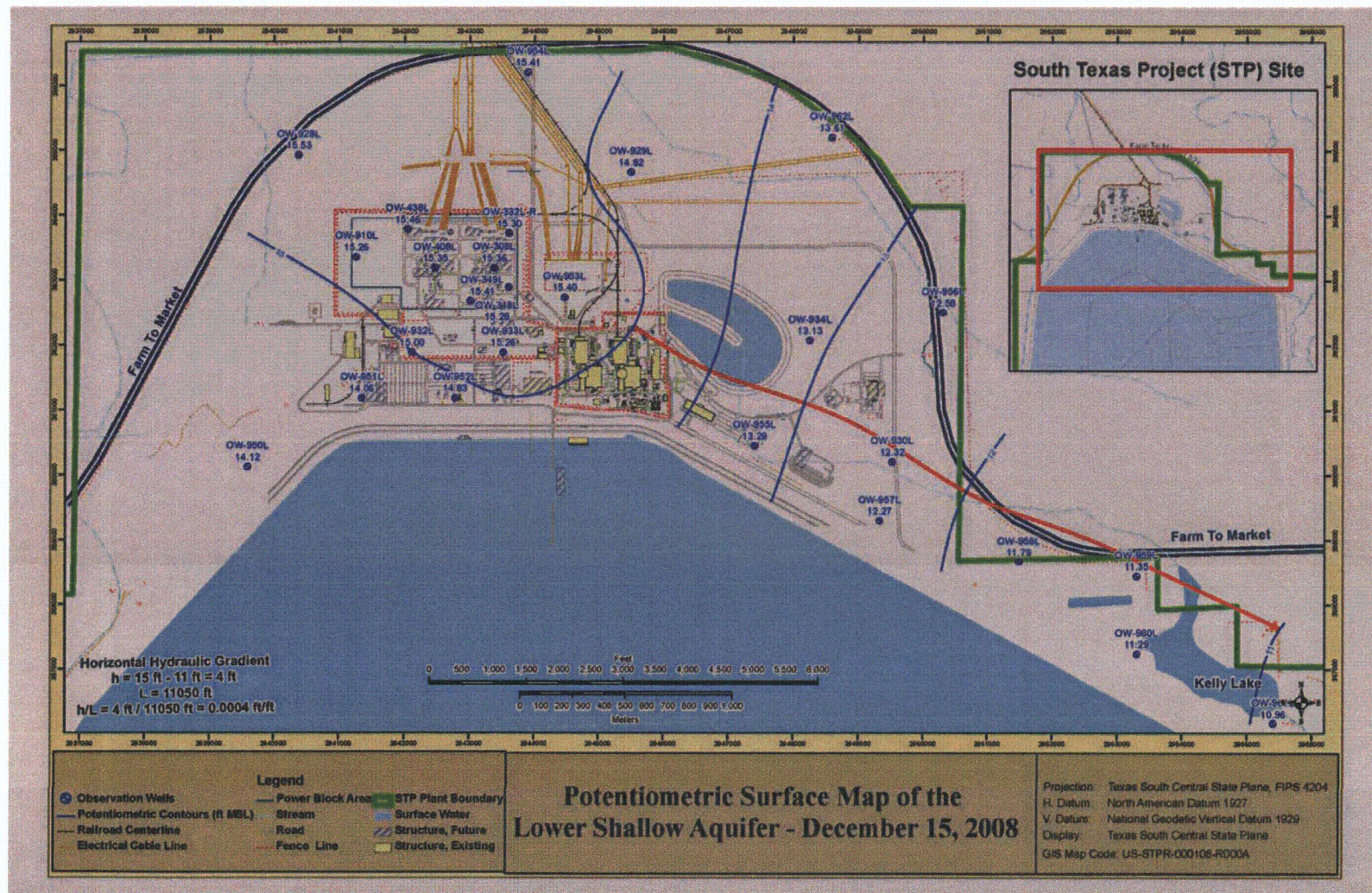


Figure 2.4S.12-19 Quarterly Potentiometric Surface Maps in the STP 3 & 4 Areas (Sheet 11 of 11)

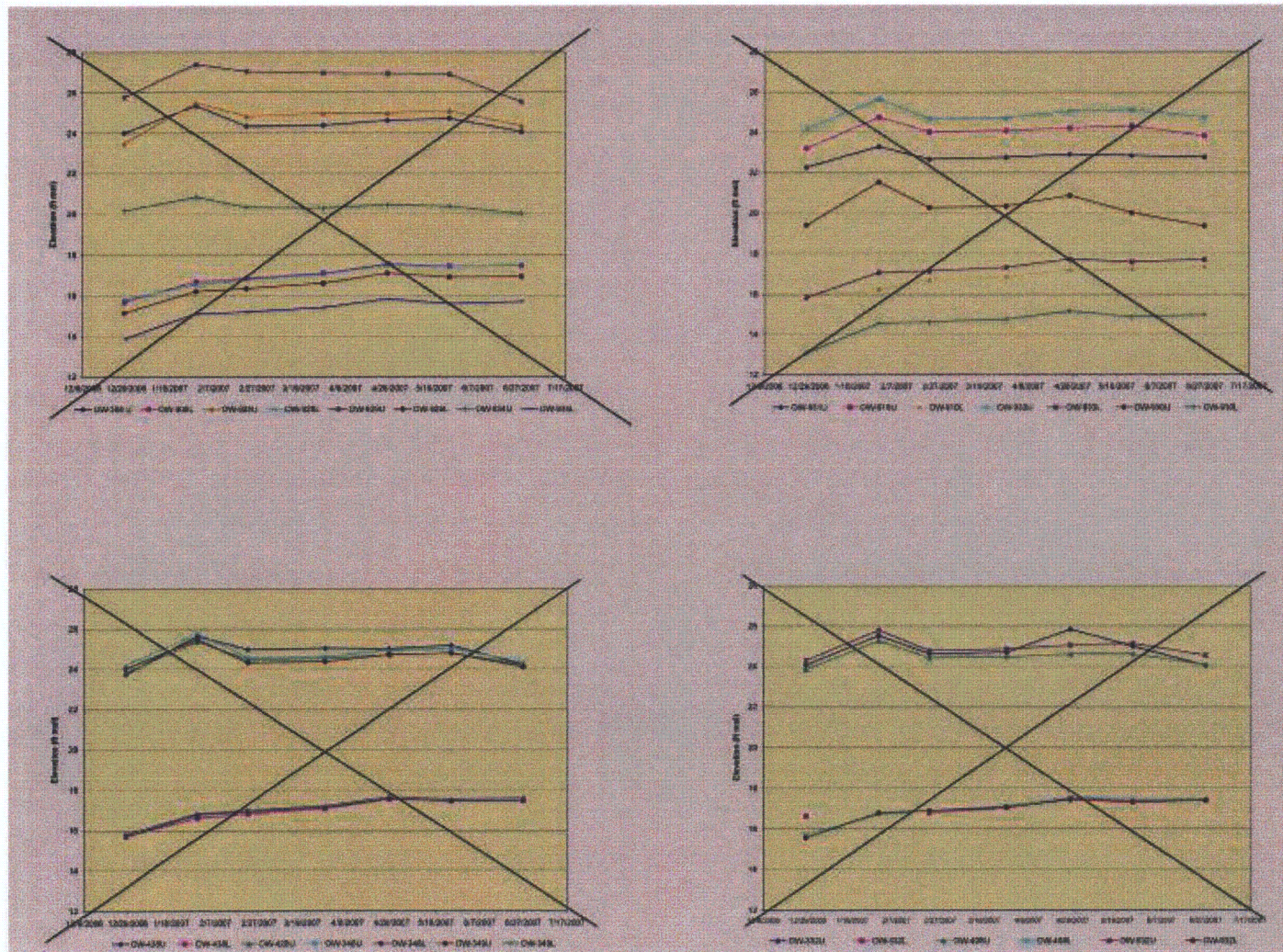


Figure 2.4S.12-24 Hydrographs of Wells in the STP 3 & 4 Area

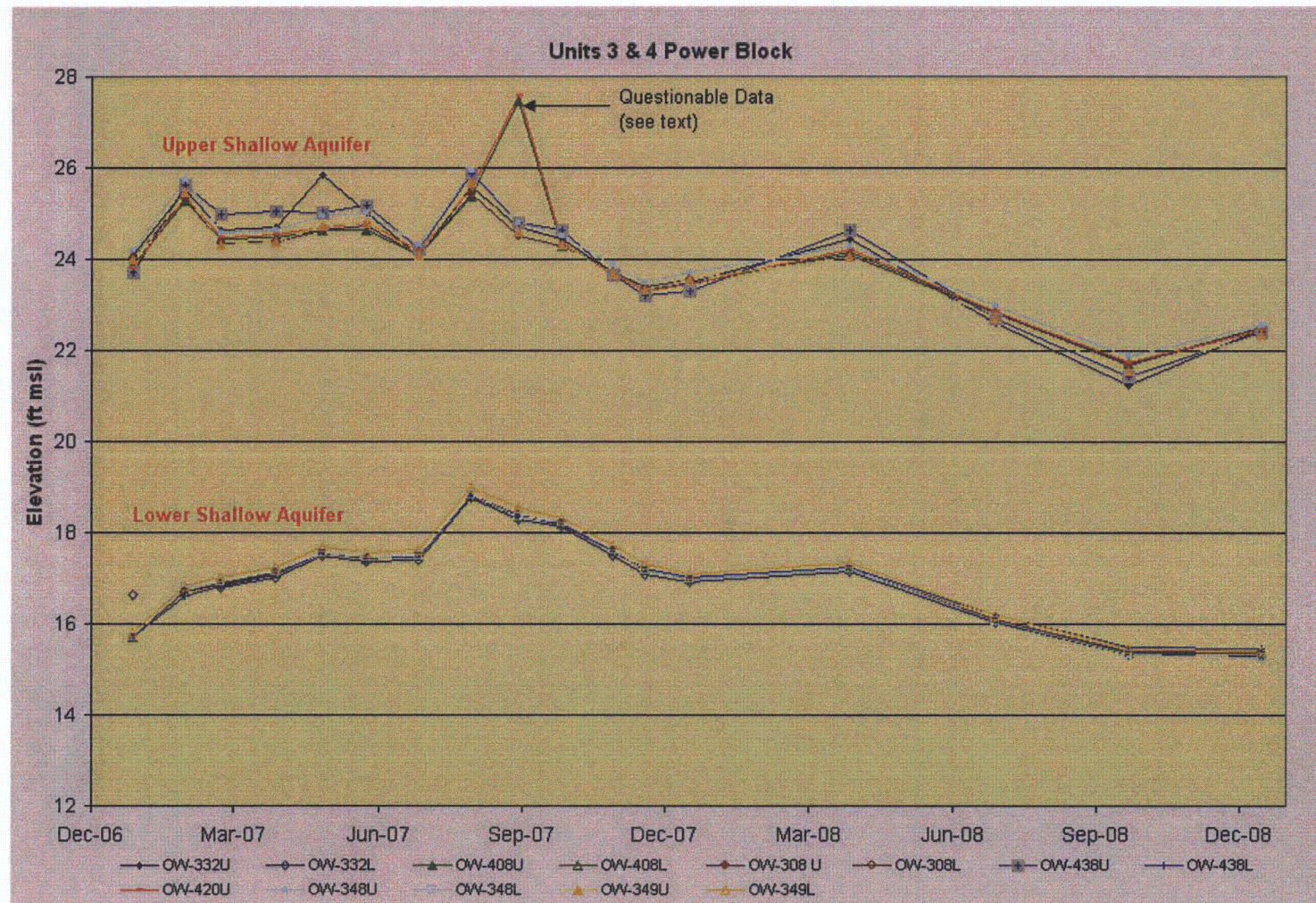


Figure 2.4S.12-24 Hydrographs of Wells in the STP 3 & 4 Area (Sheet 1 of 4)

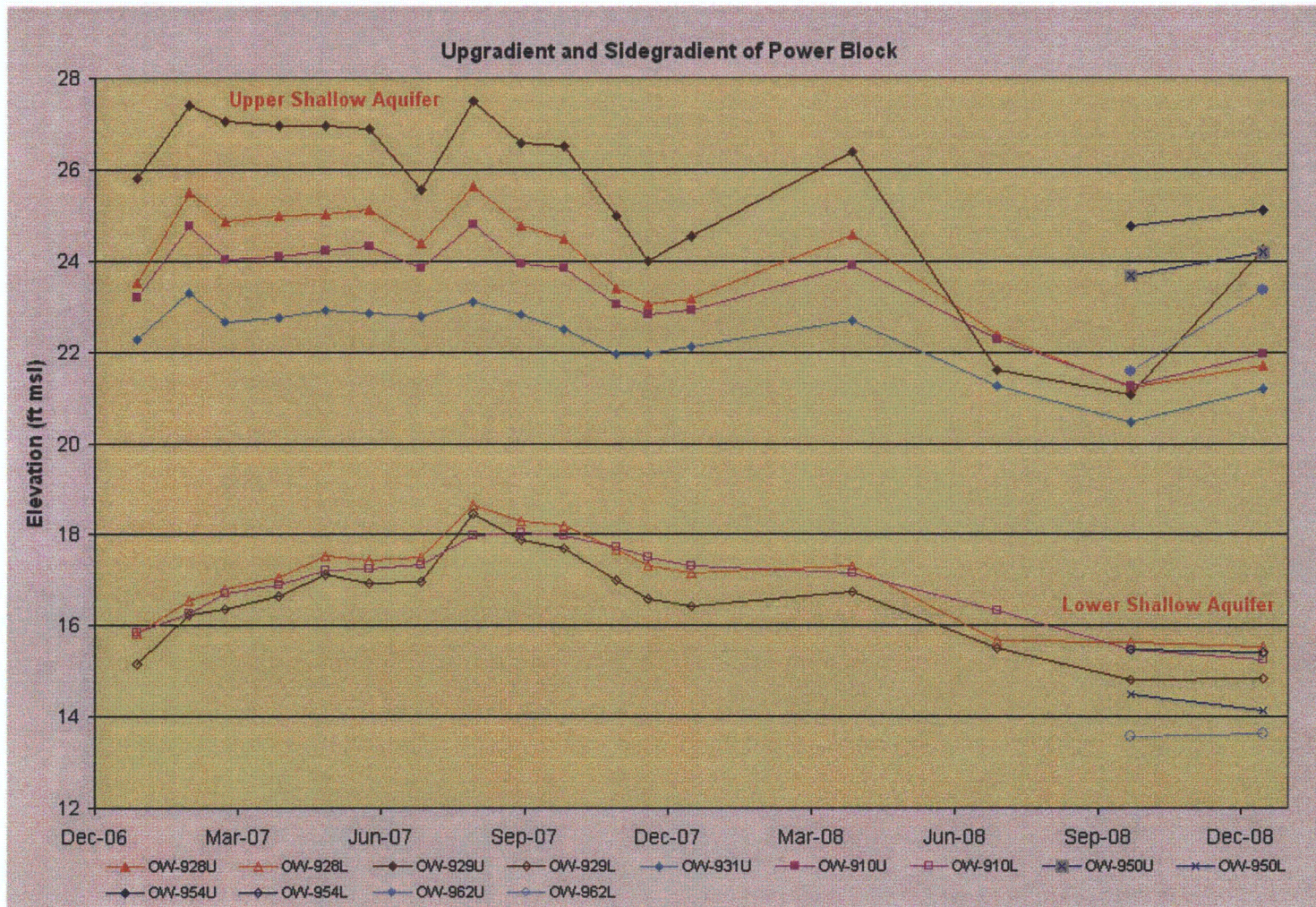


Figure 2.4S.12-24 Hydrographs of Wells in the STP 3 & 4 Area (Sheet 2 of 4)

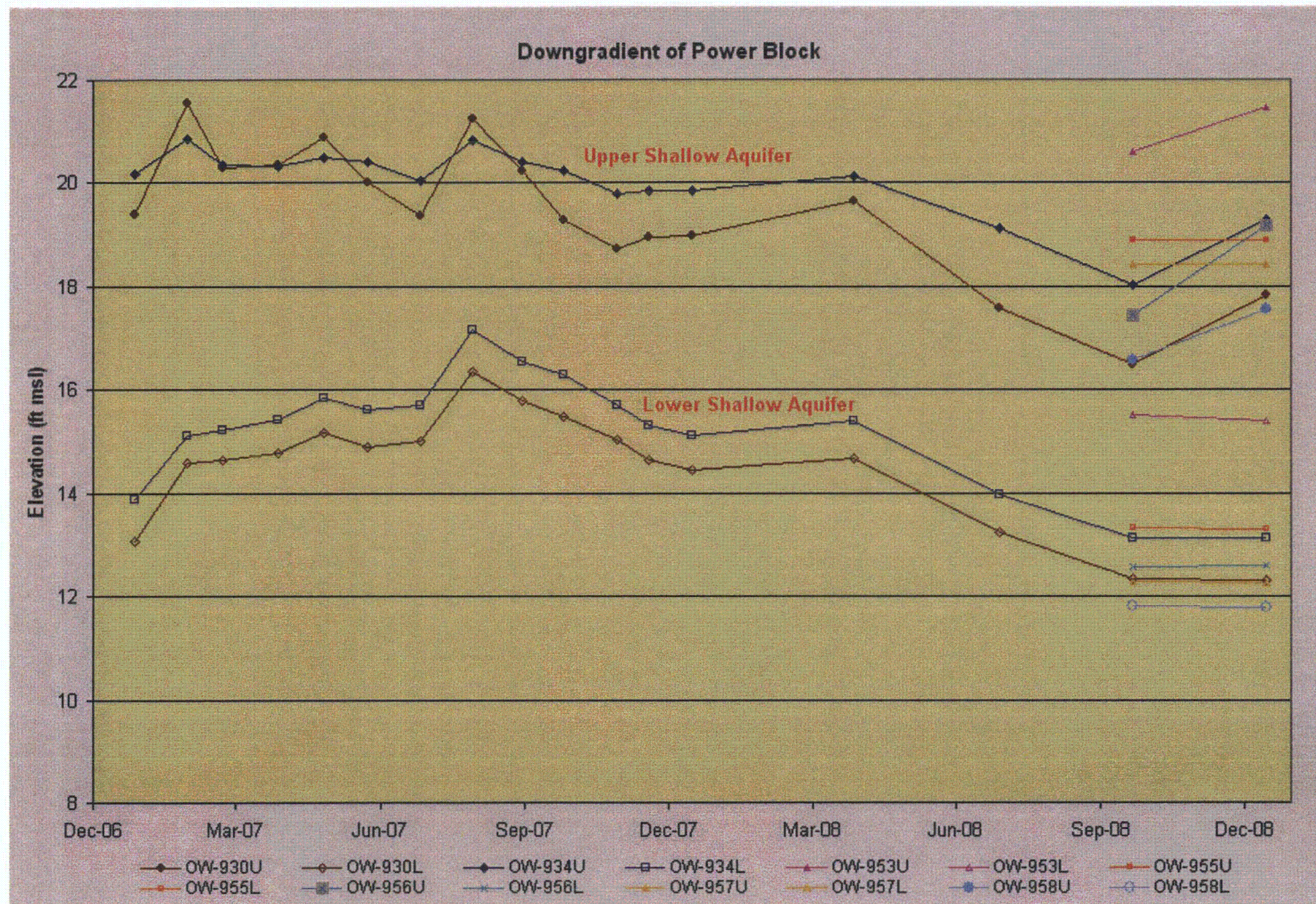


Figure 2.4S.12-24 Hydrographs of Wells in the STP 3 & 4 Area (Sheet 3 of 4)

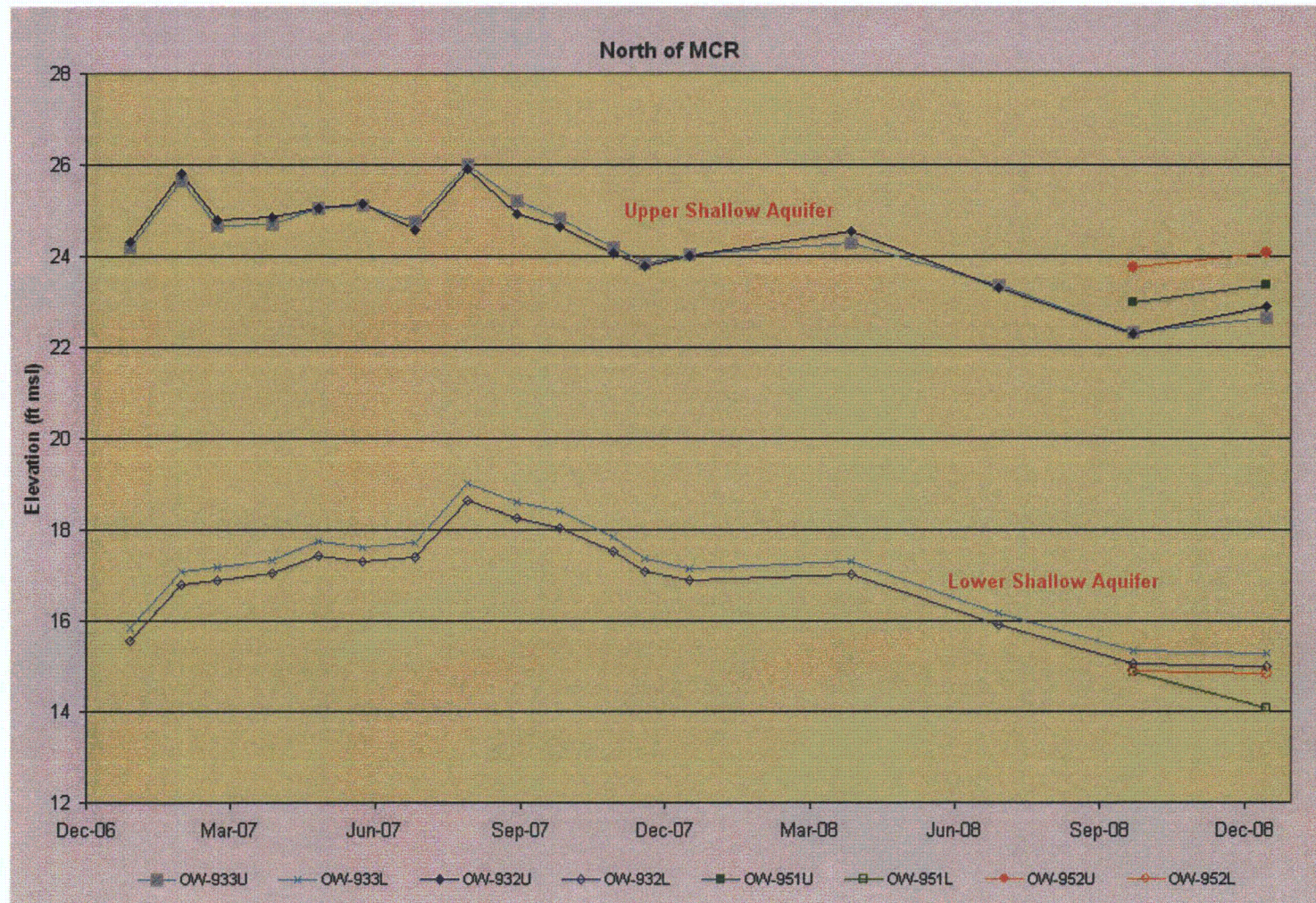


Figure 2.4S.12-24 Hydrographs of Wells in the STP 3 & 4 Area (Sheet 4 of 4)

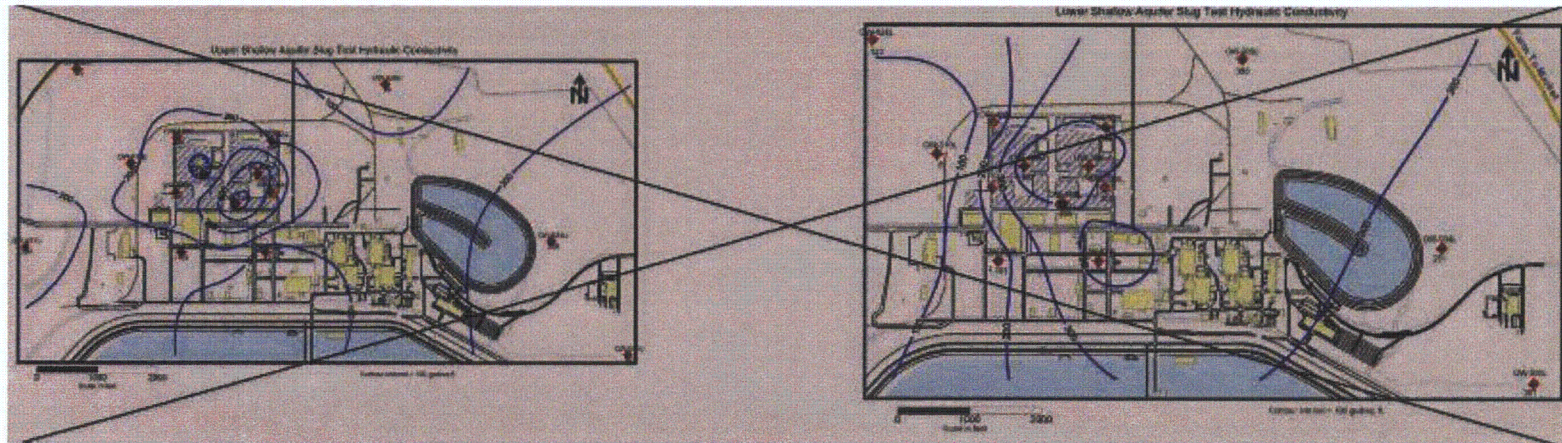
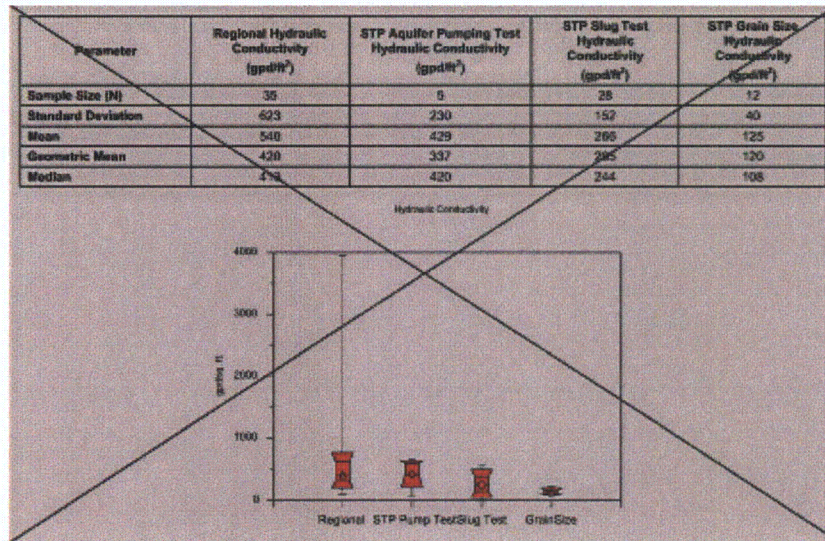


Figure 2.4S.12-26 Contour Maps of Hydraulic Conductivity from Slug Tests in the Shallow Aquifer







Statistic	Regional Hydraulic Conductivity (gpd/ft ²)	STP Aquifer Pumping Test Hydraulic Conductivity (gpd/ft ²)	STP Slug Test Hydraulic Conductivity (gpd/ft ²)	STP Grain Size Hydraulic Conductivity (gpd/ft ²)
Sample Size (N)	35	5	52	12
Standard Deviation	623	230	227	403
Mean	539	429	222	1,249
Geometric Mean	420	337	126	1,278
Median	413	420	159	1,086

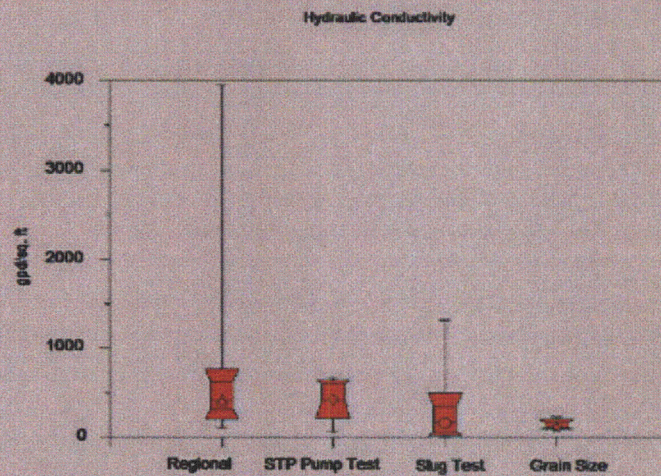


Figure 2.4S.12-27 Summary of Hydraulic Conductivity from Aquifer Pumping Tests, Slug Tests, and Grain Size

Table 2.3.1-16 STP Slug Test Results

Well	Test Type						Arithmetic Mean of Tests		
	Rising Head Test Method			Falling Head Test Method			ft/day	gpd/ft ²	cm/s
	Butler	KGS	B-R	Butler	KGS	B-R			
OW-308L	64	67	65	72	73	56	66	495	2.33E-02
OW-308U	70	64	63	64	62	68	65	488	2.30E-02
OW-332L	53	54	P	49	49	55	52	388	1.83E-02
OW-332U	37	36	27	19	18	11	25	184	8.70E-03
OW-348L	58	46	44	76	61	39	54	404	1.90E-02
OW-348U	P	83	88	68	71	65	75	561	2.65E-02
OW-349L	63	51	35	43	40	52	47	354	1.67E-02
OW-349U	P	P	43	P	P	53	48	359	1.69E-02
OW-408L	P	72	P	70	68	50	65	486	2.29E-02
OW-408U	17	11	11	22	32	28	20	151	7.11E-03
OW-420U	P	33	45	ND	ND	ND	39	292	1.38E-02
OW-438L	17	27	10	15	28	14	18	138	6.53E-03
OW-438U	38	39	26	P	P	24	32	236	1.12E-02
OW-910L	3	0.3	0.6	2	0.9	0.5	1	9	4.29E-04
OW-910U	26	29	21	P	P	P	25	190	8.94E-03
OW-928L	19	11	7	P	24	21	16	123	5.79E-03
OW-928U	19	P	8	19	16	16	16	117	5.50E-03
OW-929L	56	54	29	59	P	59	51	384	1.81E-02
OW-929U	P	3	4	P	12	2	5	39	1.85E-03
OW-930L	40	37	27	24	15	19	27	202	9.52E-03
OW-930U	P	23	32	P	47	48	38	280	1.32E-02
OW-931U	34	23	20	P	P	49	32	236	1.11E-02
OW-932L	24	23	18	22	22	26	22	167	7.88E-03
OW-932U	21	13	14	P	16	22	17	129	6.07E-03
OW-933L	P	81	63	P	P	64	59	444	2.09E-02
OW-933U	P	10	3	8	5	3	6	43	2.05E-03
OW-934L	P	P	35	P	P	32	34	251	1.18E-02
OW-934U	P	32	33	49	P	40	38	288	1.36E-02
Geometric Mean all tests							27	205	9.66E-03
Geometric Mean Upper Shallow Aquifer							26	192	9.04E-03
Geometric Mean Lower Shallow Aquifer							30	221	1.04E-02

P = Poor curve match or questionable data

Test Methods:

KGS = Kansas Geological Survey

B-R = Bouwer and Rice

ND = No data - data not recovered from data logger

Table 2.3.1-16 STP Slug Test Results

Well	Test Type								Arithmetic Mean of Tests		
	Rising Head Test Method					Falling Head Test Method			ft/d	gpd/ft ²	cm/s
	Butler	KGS	B-R	M-Z	S-G	Butler	KGS	B-R			
OW-308L	64	67	65	NA	NA	72	73	56	66	495	2.33E-02
OW-308U	70	64	63	NA	NA	64	62	68	65	487	2.30E-02
OW-332L	53	54	P	NA	NA	49	49	55	52	389	1.83E-02
OW-332U	37	36	27	NA	NA	19	18	11	25	185	8.70E-03
OW-348L	58	46	44	NA	NA	76	61	39	54	404	1.91E-02
OW-348U	P	83	88	NA	NA	68	71	65	75	561	2.65E-02
OW-349L	63	51	35	NA	NA	43	40	52	47	354	1.67E-02
OW-349U	P	P	43	NA	NA	P	P	53	48	359	1.69E-02
OW-408L	P	72	P	NA	NA	70	68	50	65	486	2.29E-02
OW-408U	17	11	11	NA	NA	22	32	28	20	151	7.11E-03
OW-420U	P	33	45	NA	NA	ND	ND	ND	39	292	1.38E-02
OW-438L	17	27	10	NA	NA	15	28	14	19	138	6.53E-03
OW-438U	38	39	26	NA	NA	P	P	24	32	238	1.12E-02
OW-910L	3	0.3	0.6	NA	NA	2	0.9	0.5	1	9	4.29E-04
OW-910U	26	29	21	NA	NA	P	P	P	25	190	8.94E-03
OW-928L	19	11	7	NA	NA	P	24	21	16	123	5.79E-03
OW-928U	19	P	8	NA	NA	19	16	16	16	117	5.50E-03
OW-929L	56	54	29	NA	NA	59	P	59	51	384	1.81E-02
OW-929U	P	3	4	NA	NA	P	12	2	5	39	1.85E-03
OW-930L	40	37	27	NA	NA	24	15	19	27	202	9.53E-03
OW-930U	P	23	32	NA	NA	P	47	48	38	281	1.32E-02
OW-931U	34	23	20	NA	NA	P	P	49	32	236	1.11E-02
OW-932L	24	23	18	NA	NA	22	22	25	22	167	7.88E-03
OW-932U	21	13	14	NA	NA	P	16	22	17	129	6.07E-03
OW-933L	P	51	63	NA	NA	P	P	64	59	444	2.09E-02
OW-933U	P	10	3	NA	NA	8	5	3	6	43	2.05E-03
OW-934L	P	P	35	NA	NA	P	P	32	34	251	1.18E-02
OW-934U	P	32	33	NA	NA	49	P	40	39	288	1.36E-02
OW-950L	2	3	NA	2	NA	NA	NA	NA	2	16	7.66E-04
OW-950U	P	3	NA	P	NA	NA	NA	NA	3	20	9.53E-04
OW-951L	4	11	NA	4	NA	NA	NA	NA	6	47	2.20E-03
OW-951U	8	16	NA	8	NA	NA	NA	NA	11	80	3.76E-03
OW-952L	14	23	NA	14	NA	NA	NA	NA	17	127	6.00E-03
OW-952U	7	6	NA	7	NA	NA	NA	NA	7	52	2.45E-03
OW-953L	P	39	NA	P	NA	NA	NA	NA	39	292	1.38E-02
OW-953U	P	29	NA	P	NA	NA	NA	NA	29	215	1.02E-02
OW-954L	3	3	NA	3	NA	NA	NA	NA	3	23	1.08E-03
OW-954U	12	15	NA	12	NA	NA	NA	NA	13	97	4.57E-03
OW-955L	24	23	NA	24	NA	NA	NA	NA	24	177	8.35E-03

Table 2.3.1-16 STP Slug Test Results (continued)

Well	Test Type								Arithmetic Mean of Tests		
	Rising Head Test Method					Falling Head Test Method			ft/d	gpd/ft ²	cm/s
	Butler	KGS	B-R	M-Z	S-G	Butler	KGS	B-R			
OW-955U	P	4	NA	P	NA	NA	NA	NA	4	29	1.37E-03
OW-956L	P	P	NA	96	NA	NA	NA	NA	96	715	3.37E-02
OW-956U	6	11	NA	6	NA	NA	NA	NA	8	57	2.68E-03
OW-957L	P	1	NA	P	NA	NA	NA	NA	1	7	3.28E-04
OW-957U	P	2	NA	NA	P	NA	NA	NA	2	14	6.48E-04
OW-958La	P	P	NA	P	NA	NA	NA	NA	NR	NR	NR
OW-958U	NA	47	NA	NA	P	NA	NA	NA	47	349	1.65E-02
OW-959L	19	P	NA	19	NA	NA	NA	NA	19	139	6.58E-03
OW-959U	NA	16	NA	NA	17	NA	NA	NA	16	123	5.81E-03
OW-960L	P	P	NA	P	NA	NA	NA	NA	NR	NR	NR
OW-960U	NA	1	NA	NA	P	NA	NA	NA	1	8	3.84E-04
OW-961L	179	P	NA	173	NA	NA	NA	NA	176	1316	6.21E-02
OW-961U	3	6	NA	3	NA	NA	NA	NA	4	31	1.46E-03
OW-962L	9	11	NA	9	NA	NA	NA	NA	10	72	3.39E-03
OW-962U	13	9	NA	13	NA	NA	NA	NA	12	86	4.06E-03
Geometric Mean all tests									17	126	5.93E-03
Geometric Mean Upper Shallow Aquifer									14	107	5.04E-03
Geometric Mean Lower Shallow Aquifer									20	152	7.16E-03

P = Poor curve match or questionable data

Test Methods: KGS = Kansas Geological Survey, B-R = Bouwer and Rice, M-Z = McElwee-Zenner, S-G = Springer-Gelhar

ND = No Data – data not recovered from data logger

NA = Method Not Analyzed

NR = No Result