Meridian Environmental Consulting, LLC

January 7, 2015

Carrie Stoltz
Wisconsin Department of Natural Resources
107 Sutliff Ave
Rhinelander, WI 54501

Subject: **2014 Progress Report**
Former Wild Card Bar
301 N. Pine St
Turtle Lake, WI 54889
DNR BRRTS No. 03-03-110339
PECFA No. 54889-8000-01
Meridian No. 05F750

Dear Carrie:

This Letter Report documents recent work at the above referenced site.

This work included:

- install four water table wells (PZ-12, PZ-13, PZ-14, PZ-15)
- collect soil samples from borings
- survey the wells' elevation relative to USGS datum
- sample the monitoring well network twice (July and October, 2014)
- conduct hydraulic conductivity tests in PZ-12, -13, -14, -15
- prepare this report

The results indicate the extent of impacted ground water is defined. There is some uncertainty as to the source(s) of the ground water contamination. There are two other sites in the vicinity of the former Wild Card Bar site, i.e., Davis Autobody (DNR Closed Site) and Pizza Place restaurant. The results from PZ-14 suggest the Pizza Place restaurant property (which was a former gas station) may have contributed to the ground water impacts.

Based on the findings of this work, we recommend the monitoring well network be sampled twice more (quarterly). Assuming the results are consistent with current data, the site should then be submitted for Closure with GIS Registry for Soil and Ground Water.

2711 N. Elco Road • Fall Creek, WI 54742 • (715) 832-6608 • Fax (715) 832-6797

RECENT WORK

NOTE:
The reader is reminded that wells labeled "PZ" are really monitoring wells screened across the regional water table, not piezometers which typically are screened below the water table. The "PZ" label developed because the initial investigation encountered a perched ground water table; wells screened in the perched ground water were labeled "MW". Further site investigation determined the regional ground water table is about 55 – 60 feet below grade. Wells screened across the regional water table are labeled "PZ" to differentiate them from perched ground water wells (MW).

- Install four water table wells (PZ-12, -13, -14, -15)

Four monitoring wells (PZ-12, -13, -14, -15) were installed in the locations shown on Figure 2. The wells were screened across the water table interface (about 55 feet below grade). The boring logs and well forms are provided in Appendix A.

The well elevations were surveyed relative to USGS datum utilizing a benchmark at the Village Well No. 2 (benchmark #10 established by Short Elliot Hendrickson – contractor for the Village of Turtle Lake).

- Soil Sampling

Soil samples were collected during the drilling of the new wells (PZ-12, -13, -14, -15). Samples were collected from 5-feet intervals to a depth of 20 feet and analyzed for PVOC+Naphthalene. The analytical report is provided in Appendix B and the results are summarized in Table 1.

Petroleum impacts were measured in the boring PZ-14 which was installed adjacent to the Pizza Place restaurant where former tank(s) were buried.

- Ground Water Sampling

Monitoring wells PZ-1 thru PZ-15 were sampled July and October 2014. The analytical reports are provided in Appendix B and summarized in Table 2.

The water levels were measured during each sampling event (Table 3). Ground water was measured about 60 feet below grade.

- Hydraulic Conductivity Testing

Hydraulic conductivity tests (slug tests) were conducted in the four new wells (PZ-12, -13, -14, -15). The results are summarized in Appendix C and Table 4.

- Investigative Waste

Drill cuttings were disposed at Advance landfill in Eau Claire. Development and purge water were disposed at the Bloomer Wastewater Treatment Plant.

INTERPRETATION OF RESULTS

Site Hydrogeology

The site hydrogeology consists of two main units: approximately 60 feet of fine-grained glacial sediments overlying sand and sedimentary bedrock. Figure 3 is a cross-section of the site geology based on well logs and soil boring data.

- Shallow Ground Water Unit

The upper 60 feet of soil consists of about 10 feet of gray, sandy clay overlying 50 feet of reddish brown silty sand.

Wood fragments were found within the first 10 feet in several borings (e.g., MW-2, GP-3, -5, -6, -14). The wood fragments are interpreted to be peat. A dark clay layer was encountered beneath the wood fragments.

A thin layer of perched water is found on top of the peat and clay layer. This perched water is referred to as the "shallow" ground water unit. Monitoring wells MW-1 through MW-6 were installed to sample the perched ground water. Most of the shallow wells (e.g.,MW-3, MW-5, MW-6, and TMW-9) are dry and the remaining shallow monitoring wells have little water in them. Horizontal ground water flow within the shallow, perched ground water appears to be northerly mimicking topography.

No further work is recommended with respect to the shallow ground water unit.

- Deeper Ground Water Unit (Sand Aquifer)

The piezometers and the former onsite well encountered a coarse sand layer about 60 feet below grade to about 100 feet below grade where a competent limestone is encountered (Figure 3). The regional water table is found within this sand.

The ground water levels were measured in the monitoring wells (labeled 'PZ')(Table 3). The measurements suggest flow is northwesterly (Figure 4). However, the difference in hydraulic head between the wells is slight (inches) within the measurement error of the equipment used.

Ground water levels have fluctuated almost 8 feet over the past two years (Figure 5). The region experienced drought a few years ago. Since then, ground water levels have risen and submerged the screens in PZ-1, PZ-2, and PZ-3.

The data from PZ-9A and PZ-9B indicate a slight downward vertical hydraulic gradient (Table 3)

Extent of Impacted Soil

Based on the soil data collected to date, petroleum impacted soil appears to be limited to the former tank basin and pump island areas (see earlier reports). We do not recommend further investigation or remediation of impacted soil at this time.

Petroleum impacts (Table 1) were measured in the PZ-14 boring which is adjacent to the Pizza Place restaurant (former gas station).

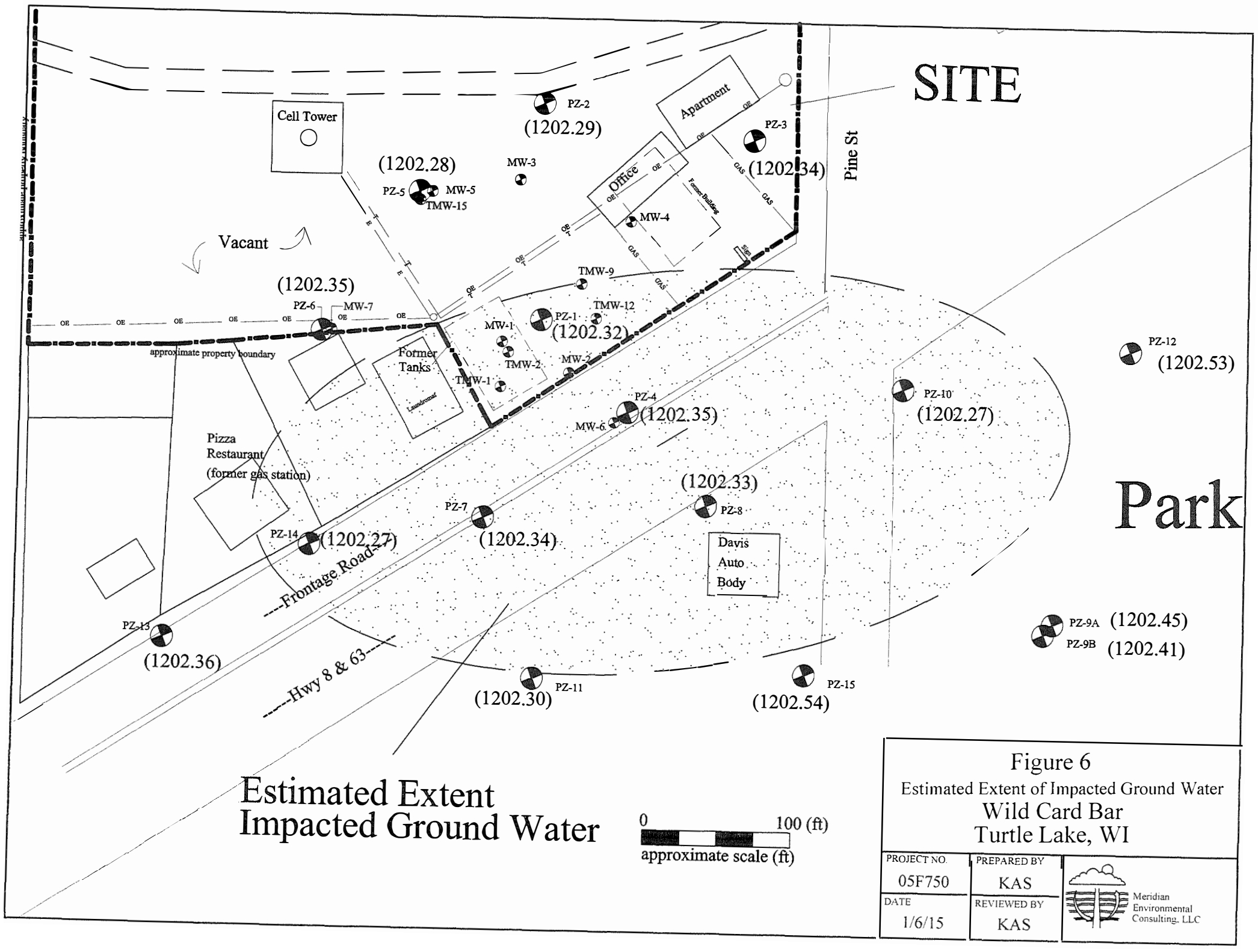


Figure 6

Estimated Extent of Impacted Ground Water

Wild Card Bar

Turtle Lake, WI

PROJECT NO.	PREPARED BY
05F750	KAS
DATE	REVIEWED BY
1/6/15	KAS

Meridian Environmental Consulting, LLC

Extent of Impacted Ground Water

Both ground water units have been impacted with petroleum and are discussed separately below.

- Shallow Ground Water Unit

The shallow ground water has been impacted by the former petroleum operations at this site. However, as described in previous correspondence, we do not recommend further investigation or remediation of the shallow ground water impacts.

- Deeper Ground Water Unit (Sand aquifer)

The extent of impacted ground water in the sand aquifer appears to be as shown in Figure 6. NR140 Enforcement Standards were consistently exceeded in ground water samples from PZ-1, PZ-4, PZ-7, PZ-8, and PZ-14 (Table 1 and Figure 6).

The ground water flow gradient is essentially flat thus making it difficult to determine the plume geometry. This is also compounded by the presence (or former presence) of other gasoline storage tanks/systems in the vicinity of the site and including the site. For example, the Davis Auto Body site may have contributed to the ground water impacts. In addition, there reportedly was a gas station at the pizza restaurant west of the site. And it is known the Wild Card Bar site did have petroleum releases.

CONCLUSIONS AND RECOMMENDATIONS

In our opinion, the extent of impacted soil and ground water has been defined at this site. The current monitoring well network adequately defines the extent of ground water impacted from the former Wild Card Bar site.

We do not recommend any soil remediation other than GIS Registry for Soil.

We recommend two more rounds (quarterly) of ground water samples be collected. If the results are consistent with current data, we recommend this site be submitted for Closure with GIS Registry for Soil and Ground Water.

Sincerely,
MERIDIAN ENVIRONMENTAL CONSULTING, LLC

Kenneth Shimko, PG
Project Manager

Table 1: Soil Data

Wild Card Bar
Turtle Lake, Wisconsin
Meridian No. 05F750

Sample	1,2,4-TMB	1,3,5-TMB	Benzene	Ethylbenzene	m&p-xylene	o-xylene	Total Xylenes	MTBE	Naphthalene	Toluene	DRO
Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
September 24, 2008											
GP-1: 0-4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GP-1: 4-8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GP-2: 3-4	0.473	0.671	0.044	0.05	0.086	ND	*0.086*	*ND*	*ND*	*ND*	*155*
GP-2 7-8	1.13	1.84	ND	0.147	0.103	ND	*0.103*	*0.067*	*1.76*	*0.075*	*1060*
GP-3 3-4	ND	0.038	ND	ND	ND	ND	*ND*	*ND*	*ND*	*0.039*	*274*
GP-3 7-8	0.591	0.625	ND	ND	0.075	ND	*0.075*	*0.075*	*0.728*	*0.055*	*678*
GP-4 3-4	ND	ND	ND	ND	ND	ND	*ND*	*ND*	*ND*	*0.045*	*16.1*
GP-5 3-4	ND	ND	ND	ND	ND	ND	*ND*	*0.04*	*ND*	*0.042*	*15*
GP-5 7-8	ND	ND	ND	ND	ND	ND	*ND*	*ND*	*ND*	*ND*	*26.8*
GP-6 3-4	ND	ND	ND	ND	ND	ND	*ND*	*ND*	*ND*	*0.047*	*ND*
GP-6 7-8	ND	ND	ND	ND	ND	ND	*ND*	*ND*	*ND*	*0.042*	*ND*
GP-7 3-4	ND	0.043	ND	ND	0.06	ND	*0.06*	*ND*	*ND*	*ND*	*6.88*
GP-7 7-8	0.046	0.087	ND	ND	0.098	0.09	*0.188*	*ND*	*ND*	*0.048*	*ND*
GP-7 15-16	46.8	22.9	ND	3.78	17.9	8.21	*26.11*	*2.16*	19.5	*ND*	2440
GP-10 3-4	ND	ND	ND	ND	ND	ND	*ND*	*ND*	*0.043*	*0.043*	*ND*
GP-12 7-8	ND	ND	ND	ND	0.055	ND	0.055	ND	ND	0.054	13.2
March 8, 2010											
SB-1: 3'	<.013	<.018	<.016	<.018	<.021	<.016	<.021	<.011	<.018	<.017	<5.13
SB-1: 8'	<.013	<.018	<.016	<.018	<.021	<.016	<.021	<.011	<.018	<.017	<5.00
SB-1: 13'	<.013	<.018	<.016	<.018	<.021	<.016	<.021	<.011	<.018	<.017	<4.79
SB-2: 3'	<.013	<.018	<.016	<.018	<.021	<.016	<.021	<.011	<.018	<.017	<5.29
SB-2: 7'	<.014	<.02	<.018	<.02	<.023	<.012	<.023	<.02	<.018	<.019	<4.91
SB-2: 15'	<.014	<.02	<.018	<.02	<.023	<.012	<.023	<.02	<.018	<.019	<4.89
SB-3: 3'	<.013	<.018	<.016	<.018	<.021	<.016	<.021	<.011	<.018	<.017	<4.67
SB-3: 7'	<.014	<.02	<.018	<.02	<.023	<.012	<.023	<.02	<.018	<.019	<5.00
SB-3: 15'	<.015	<.021	<.018	<.021	<.024	<.018	<.024	<.013	<.021	<.019	<4.62
May 11, 2011											
PZ-4: 5-7	<.013	<.018	<.016	<.018	<.022	<.016	<.022	<.024	<.018	<.021	NA
PZ-4: 20 - 22	<.013	<.018	<.016	<.018	<.022	<.016	<.022	<.024	<.018	<.021	NA
PZ-4: 30 - 32	<.013	<.019	<.017	<.019	<.023	<.017	<.023	<.025	<.019	<.022	NA
July 2014											
12: 2-4	<.025	<.025	<.025	<.025	<.05	<.025	<.075	<.025	<.025	<.025	NA
12:6-8	<.025	<.025	<.025	<.025	<.05	<.025	<.075	<.025	<.025	<.025	NA
12:10-12	<.025	<.025	<.025	<.025	<.05	<.025	<.075	<.025	<.025	<.025	NA
12: 15-17	<.025	<.025	<.025	<.025	<.05	<.025	<.075	<.025	<.025	<.025	NA
12: 40-42	<.025	<.025	<.025	<.025	<.05	<.025	<.075	<.025	<.025	<.025	NA
13:2-4	<.025	<.025	<.025	<.025	<.05	<.025	<.075	<.025	<.025	<.025	NA
13:6-8	<.025	<.025	<.025	<.025	<.05	<.025	<.075	<.025	<.025	<.025	NA
13:15-17	<.025	<.025	<.025	<.025	<.05	<.025	<.075	<.025	<.025	<.025	NA
13:30-32	<.025	<.025	<.025	<.025	<.05	<.025	<.075	<.025	<.025	<.025	NA
14: 4-6	<.025	<.025	<.025	<.025	<.05	<.025	<.075	<.025	<.025	<.025	NA
14:6-8	<.025	<.025	<.025	<.025	<.05	<.025	<.075	<.025	<.025	<.025	NA
14:10-12	0.254	0.073	<.025	0.176	0.116	0.0984	0.214	<.025	0.0767	<.025	NA
14:15-17	0.108	0.0529	<.025	0.0511	0.172	0.0491	0.221	<.025	0.0306	<.025	NA
14:30-32	0.0579	<.025	<.025	<.025	<.05	<.025	<.075	<.025	0.034	<.025	NA
15:2-4	<.025	<.025	<.025	<.025	<.05	<.025	<.075	<.025	<.025	<.025	NA
15:6-8	<.025	<.025	<.025	<.025	<.05	<.025	<.075	<.025	<.025	<.025	NA
15:12-14	<.025	<.025	<.025	<.025	<.05	<.025	<.075	<.025	<.025	<.025	NA
15:15-17	<.025	<.025	<.025	<.025	<.05	<.025	<.075	<.025	<.025	<.025	NA
15:30-32	<.025	<.025	<.025	<.025	<.05	<.025	<.075	<.025	<.025	<.025	NA

PZ-12
PZ-13
PZ-14
PZ-15

Regulatory Standards - Soil

NTEDC*	89.8	182	1.49	7.47			258	59.4	5.15	818	
*Not To Exceed Direct Contact Limit from DNR Webpage											

Bold concentration is greater than method detection limit
10 Concentration exceeds regulatory standard
Note: GP-1, GP-2, GP-12 converted to Temporary Monitoring Wells (TMW-1, TMW-2, TMW-12)

Table 2: Ground Water Analytical Data

Wild Card Bar
Turtle Lake, Wisconsin
Meridian No. 05F750

Bold Concentration is above Method Detection Limit
10 Concentration is above NR140 Enforcement Standard
NA Parameter not analyzed for

Sample	Screen Interval (depth - ft)	Depth to Water (ft)	Date	1,2,4-TMB	1,3,5-TMB	Total TMB	Benzene	Ethylbenzene	m&p-xylene	o-xylene	Total Xylenes	MTBE	Naphthalene	Toluene	DRO
Units				ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
NR140 Enforcement Standard						480	5	700			2000	60	100	800	-
TMW-1	11-16														
		10.1	10/1/2008	<.4	<.31	<.4	<.31	<.5	<.62	<.36	<.62	<.3	<.8	<.3	**378**
		11.71	7/20/2009	<.4	<.44	<.44	<.31	<.5	<.62	<.77	<.77	<.3	NA	<.37	NA
		10.2	10/22/2009	<.4	<.44	<.44	<.31	<.5	<.62	<.77	<.77	<.3	<.116	<.37	NA
TMW-2	10-20														
		10.75	10/1/2008	**166**	<6.2	**166**	**17.4**	**112**	**120**	**123**	**243**	<6	**103**	<6	**7750**
		15.24	2/5/2009	**388**	<15.5	**388**	<15.5	**311**	**371**	**453**	**824**	<15	**192**	<15	NA
		12.65	7/20/2009	**236**	<4.4	**236**	<3.1	**77.8**	**82.2**	**70.4**	**152.6**	<3.	<.22	<3.7	NA
			10/22/2009	INACCESSIBLE - HOUSE OVER WELL											
TMW-12	6-16														
		8.14	10/1/2008	<.4	<.31	<.4	<.31	<.5	<.62	<.36	<.62	<.3	<.8	<.3	**6780**
		15.37	2/5/2009	Insufficient water to collect sample											
		8.55	7/20/2009	<.4	<.44	<.44	<.31	<.5	<.62	<.77	<.77	<.3	<.647	<.37	NA
		6.9	10/22/2009	<.4	<.44	<.44	<.31	<.5	<.62	<.77	<.77	<.3	<.8	<.37	NA
TMW-15	5-15														
		13.31	2/5/2009	<.4	<.31	<.4	<.31	<.5	<.62	<.36	<.62	<.3	**27.1**	**0.819**	NA
		11.45	7/20/2009	<4.	<4.4	<4.4	<3.1	<5.0	<6.2	<7.7	<7.7	<3.	NA	<3.7	NA
		11.32	10/22/2009	<4	<4.4	<4.4	<3.1	<5	<6.2	<7.7	<7.7	<3.	**714**	<3.7	NA
		NM	7/29/2010	<4	<4.4	<4.4	<3.1	<5	<6.2	<7.7	<7.7	<3	**589**	3.8	NA
		9.65	6/10/2011	<4	<4.4	<4.4	<3.1	<5	<6.2	<7.7	<7.7	<3	**535**	<3.7	NA
		11.73	9/23/2011	<4	<4.4	<4.4	<3.1	<5	<6.2	<7.7	<7.7	<3	**498**	<3.7	NA
MW-1	5-15														
		11.33	2/5/2009	**1350**	<31	**1350**	<31	<50	**150**	**151**	**301**	<30	**802**	<30	NA
		9.58	7/20/2009	**142**	<4.4	**142**	<3.1	**31.3**	**27**	**8.39**	**35.39**	<3	**41.7**	<3.7	NA
		8.01	10/22/2009	**55.6**	<.44	**55.6**	**1.23**	**22.7**	**10.3**	**9.26**	**19.56**	<.3	**22**	**1.53**	NA
		8.85	4/12/2010	**47.9**	<.44	**47.9**	**0.926**	**17.1**	**7.93**	**2.64**	**10.57**	<.3	**53.2**	<.37	NA
		6.05	7/29/2010	**33.7**	<.44	**33.7**	**1.02**	**17**	**5.92**	**2.31**	**8.23**	<.3	**55.2**	**0.536**	NA
		4.23	6/10/2011	**70.4**	**2.73**	**73.13**	<1.55	**15.9**	**14.2**	<3.85	**14.2**	<1.5	**87.8**	<1.85	NA
		6.75	9/23/2011	**75.3**	**2.76**	**78.06**	<1.55	**16.5**	**13.8**	<3.85	**13.8**	<1.5	**92.6**	<1.85	NA
MW-2	5-15														
		13.4	2/5/2009	**189**	**76.3**	**265.3**	**14**	**41.4**	**175**	**107**	**282**	<3	**65.4**	<3	NA
		13	7/20/2009	**83.1**	**32.7**	**115.8**	**14.8**	**25.1**	**103**	**57.3**	**160.3**	<1.5	**6.23**	**4.57**	NA
		13.03	10/22/2009	**128**	**54.6**	**182.6**	**18.3**	**41**	**128**	**88.4**	**216.4**	<.3	**7.8**	**2.65**	NA
		14.25	4/12/2010	**134**	**52.2**	**186.2**	**18.3**	**72.8**	**157**	**93.4**	**250.4**	<.3	**37.4**	**5**	NA
		11.62	7/29/2010	**176**	**91.6**	**267.6**	**28.5**	**93.2**	**247**	**143**	**390**	<.3	**104**	**2.93**	NA
		8.05	6/10/2011	**35.3**	**9.57**	**44.87**	**2.14**	**7.92**	**17.2**	**2.04**	**19.24**	<.3	**19**	<.37	NA
		9.71	9/23/2011	**159**	**59.1**	**218.1**	**17.1**	**65.6**	**192**	**51.6**	**243.6**	<3	**101**	<3.7	NA
MW-3	5-15	(well is dry: 7/20/09 sample collected from well tip)													
			2/5/2009	DRY											
		15.02	7/20/2009	<.4	<.44	<.44	<.31	<.5	<.62	<.77	<.77	<.3	NA	<.37	NA
		DRY	10/22/2009	DRY											
		DRY	4/12/2009	DRY											
		DRY	7/29/2010	DRY											
		DRY	6/10/2011	DRY											
		DRY	9/23/2011	DRY											
MW-4	5-15														
		13.31	2/5/2009	**1.72**	<.31	**1.72**	<.31	**0.608**	**3.81**	**1.55**	**5.36**	<.3	<.8	<.3	NA
		13.25	7/20/2009	<.4	<.44	<.44	<.31	**0.859**	**1.14**	<.77	**1.14**	<.3	<.116	<.37	NA
		14.13	10/22/2009	<.4	<.44	<.44	<.31	<.5	<.62	<.77	<.77	<.3	<.157	<.37	NA
		14.4	4/12/2010	<.4	<.44	<.44	<.31	<.5	<.62	<.77	<.77	<.3	<.8	<.37	NA
		13.78	7/29/2010	<.4	<.44	<.44	<.31	<.5	**0.635**	<.77	**0.635**	<.3	**2.05**	<.37	NA
		12.54	6/10/2011	<.4	<.44	<.44	<.31	<.5	<.62	<.77	<.77	<.3	<2.0	<.37	NA
		14.33	9/23/2011	<.4	<.44	<.44	<.31	<.5	<.62	<.77	<.77	<.3	<2.0	<.37	NA
MW-5	10-20	(well is dry: 4/12/10 sample collected from well tip)													
		19.18	4/12/2010	**0.631**	**0.486**	**1.117**	<.31	**0.591**	**0.867**	<.77	**0.867**	<.3	**3.38**	**0.433**	NA
		DRY	7/29/2010	DRY											
		DRY	6/10/2011	DRY											
		DRY	9/23/2011	DRY											
MW-6	5-15		(Installed 5/11/11)												
		DRY	6/10/2011	DRY											
		DRY	9/23/2011	DRY											
MW-7	5-15		(Installed 6/6/11)												
		DRY	6/10/2011	DRY											
		16.17	9/23/2011	<.4	<.44	<.44	<.31	<.5	<.62	<.77	<.77	<.3	**2.73**	<.37	NA

Table 2: Ground Water Analytical Data (Page Two)

Sample	Screen Interval (depth - ft)	Depth to Water (ft)	Date	1,2,4-TMB	1,3,5-TMB	Total TMB	Benzene	Ethylbenzene	m&p-xylene	o-xylene	Total Xylenes	MTBE	Naphthalene	Toluene	DRO
Units				ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
NR140 Enforcement Standard						480	5	700			2000	60	100	800	-
PZ-1	60-70		(installed 6/10/2009)												
		60.6	7/20/2009	1.51	0.85	2.36	74.7	0.522	7.75	7.82	15.57	1.65	NA	0.792	NA
		61.05	10/22/2009	<.4	<.44	<.44	5.29	<.5	<.62	<.77	<.77	2.09	<.138	<.37	NA
		61.29	4/12/2010	<.4	<.44	<.44	33.1	0.969	0.747	<.77	0.747	<.3	<.8	<.37	NA
		61.2	7/29/2010	<.4	<.44	<.44	6.68	<.5	0.665	<.77	<.77	0.84	2.09	0.477	NA
		58.41	6/10/2011	<.4	<.44	<.44	4.37	<.5	<.62	<.77	<.77	<.3	<2.	<.37	NA
		56.45	9/23/2011	<.4	<.44	<.44	11.4	0.525	0.843	<.77	<.77	<.3	<2.	0.378	NA
		54.19	6/22/2012	<.43	<.40	<.43	14.6	0.68			<1.3	<.38	<.4	<.42	NA
		54.11	9/24/2012	<.43	<.40	<.43	13.6	0.69			<1.3	<.38	<.4	<.42	NA
		56.45	7/1/2013	0.33	<.36	0.33	12.3	0.73			<1	<.37	<.37	<.34	NA
		56.45	10/10/2013	0.5	<.36	0.5	12.1	0.72			1.5	<.37	0.46	<.34	NA
		56.41	7/24/2014	<.42	<.42	<.42	8.9	0.62			<1.2	<.48	<.42	<.39	NA
		55.31	10/8/2014	<.42	<.42	<.42	9.2	0.59			<1.2	<.48	<.42	<.39	NA
PZ-2	58-68		(installed 3/4/10)												
		56.66	4/12/2010	1.05	0.481	1.531	1.35	0.715	1.32	<.77	1.32	<.3	3.03	6.65	NA
		56.55	7/29/2010	0.701	<.44	0.701	<.31	<.5	0.939	<.77	0.939	<.3	<.8	0.481	NA
		53.78	6/10/2011	<.4	<.44	<.44	<.31	<.5	<.62	<.77	<.77	<.3	<2	<.37	NA
		51.8	9/23/2011	<.4	<.44	<.44	<.31	<.5	<.62	<.77	<.77	<.3	<2	<.37	NA
		49.64	6/22/2012	<.43	<.4	<.43	<.39	<.41			<1.3	<.38	<.4	<.42	NA
		49.58	9/24/2012	<.43	<.4	<.43	<.39	<.41			<1.3	<.38	<.4	<.42	NA
		51.88	7/1/2013	<.33	<.36	<.36	<.34	<.34			<1	<.37	<.37	<.34	
		51.91	10/10/2013	<.33	<.36	<.36	<.34	<.34			<1	<.37	<.37	<.34	
		51.87	7/24/2014	<.42	<.42	<.42	<.4	<.39			<1.2	<.48	<.42	<.39	NA
		50.72	10/8/2014	<.42	<.42	<.42	<.4	<.39			<1.2	<.48	<.42	<.39	NA
PZ-3	65-80		(installed 3/5/10)												
		64.12	4/12/2010	<.4	<.44	<.44	<.31	<.5	<.62	<.77	<.77	<.3	<.8	<.37	NA
		64	7/29/2010	<.4	<.44	<.44	<.31	<.5	<.62	<.77	<.77	<.3	<.8	<.37	NA
		61.33	6/10/2011	<.4	<.44	<.44	<.31	<.5	<.62	<.77	<.77	<.3	<.8	<.37	NA
		59.41	9/23/2011	<.4	<.44	<.44	<.31	<.5	<.62	<.77	<.77	<.3	<.8	<.37	NA
		57.04	6/22/2012	<.43	<.4	<.43	<.39	<.41			<1.3	<.38	<.4	<.42	NA
		57	9/24/2012	<.43	<.4	<.43	<.39	<.41			<1.3	<.38	<.4	<.42	NA
		59.23	7/1/2013	<.33	<.36	<.36	<.34	<.34			<1	<.37	<.37	<.34	
		59.28	10/10/2013	<.33	<.36	<.36	<.34	<.34			<1	<.37	<.37	<.34	
		59.3	7/24/2014	<.42	<.42	<.42	<.4	<.39			<1.2	<.48	<.42	<.39	NA
		58.23	10/8/2014	<.42	<.42	<.42	<.4	<.39			<1.2	<.48	<.42	<.39	NA
PZ-4	55-70		(installed 5/11/11)												
		60.74	6/10/2011	433	138	571	4560	502	2200	805	3005	73.5	161	1290	NA
		58.8	9/23/2011	397	152	549	4870	451	2120	730	2850	<30	262	960	NA
		56.41	6/22/2012	<10.8	<9.9	<10.8	2320	143			37.2	35.6	25.1	44	NA
		56.32	9/24/2012	<2.2	3.1	3.1	1110	57.3			14.8	23.1	7.5	20.7	NA
		58.65	7/1/2013	<3.3	<3.6	<3.6	913	119			16.2	28.5	12.9	35	
		58.64	10/10/2013	<1.7	2	2	574	72.6			7.5	18.9	3.7	23.2	
		58.65	7/24/2014	<2.1	<2.1	<2.1	895	209			<6.2	51.7	5.7	14.3	NA
		57.59	10/8/2014	<4.2	<4.2	<4.2	773	198			<12.5	55	6.2	13.2	NA
PZ-5	50-65		(Installed 5/12/11)												
		53.39	6/10/2011	0.713	<.44	0.713	<.31	<.5	<.62	<.77	<.77	<.3	3.18	<.37	NA
		51.4	9/23/2011	<.4	<.44	<.44	<.31	<.5	<.62	<.77	<.77	<.3	<.8	<.37	NA
		49.25	6/22/2012	<.43	<.4	<.43	<.39	<.41			<1.3	<.38	<.4	<.42	NA
		49.21	9/24/2012	<.43	<.4	<.43	<.39	<.41			<1.3	<.38	<.4	<.42	NA
		51.53	7/1/2013	<.33	<.36	<.36	<.34	<.34			<1	<.37	<.37	<.34	
		51.54	10/10/2013	<.33	<.36	<.36	<.34	<.34			<1	<.37	<.37	<.34	
		51.48	7/24/2014	<.42	<.42	<.42	<.4	<.39			<1.2	<.48	<.42	<.39	NA
		50.28	10/8/2014	<.42	<.42	<.42	<.4	<.39			<1.2	<.48	<.42	<.39	NA
PZ-6	50-65		(Installed 6/6/11)												
		57.89	6/10/2011	7.25	<.44	7.25	48.3	1.02	12.3	29	41.3	<.3	3.07	0.657	NA
		55.9	9/23/2011	<.4	<.44	<.44	2.31	<.5	0.844	0.8	1.644	<.3	<2	<.37	NA
		53.65	6/22/2012	<.43	<.4	<.43	<.39	<.41			<1.3	<.38	<.4	<.42	NA
		53.62	9/24/2012	<.43	<.4	<.43	<.39	<.41			<1.3	<.38	<.4	<.42	NA
		55.82	7/1/2013	<.33	<.36	<.36	<.34	<.34			<1	<.37	<.37	<.34	
		55.91	10/10/2013	<.33	<.36	<.36	<.34	<.34			<1	<.37	<.37	<.34	
		55.91	7/24/2014	<.42	<.42	<.42	<.4	<.39			<1.2	<.48	<.42	<.39	NA
		54.71	10/8/2014	<.42	<.42	<.42	<.4	<.39			<1.2	<.48	<.42	<.39	NA
PZ-7	50-65		(installed 6/13/12)												
		52.51	6/22/2012	394	123	517	345	144			1920	4	41.6	494	NA
		52.5	9/24/2012	261	90.4	351.4	351	340			1240	14.5	8	1120	NA
		54.85	7/1/2013	308	87.8	395.8	762	611			2040	9.8	46.8	612	
		54.86	10/10/2013	390	119	509	790	629			2240	5.5	53.8	642	
		54.85	7/24/2014	81.9	44.7	126.6	647	598			744	6.8	34.9	469	NA
		53.77	10/8/2014	38.8	45	83.8	399	342			435	5.3	10.7	284	NA

Table 2: Ground Water Analytical Data (Page Three)

Sample	Screen Interval (depth - ft)	Depth to Water (ft)	Date	1,2,4-TMB	1,3,5-TMB	Total TMB	Benzene	Ethylbenzene	m&p-xylene	o-xylene	Total Xylenes	MTBE	Naphthalene	Toluene	DRO
Units				ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
NR140 Enforcement Standard						480	5	700			2000	60	100	800	-
PZ-8	55-70		(Installed 6/13/12)												
		57.08	6/22/2012	16.7	6.1	22.8	325	48.8			162	5.7	11.6	262	NA
		56.99	9/24/2012	85.8	35.7	121.5	1200	85.6			703	20.9	26.5	206	NA
		59.3	7/1/2013	<.83	<.89	<.89	234	4.2			3.9	10.2	4.6	10.3	
		59.33	10/10/2013	2	1.1	3.1	218	17.5			47.1	9	1.9	158	
		59.36	7/24/2014	9.3	3.3	12.6	267	34.3			59.6	6.9	2.4	177	NA
		58.32	10/8/2014	11.2	6	17.2	528	53.9			65.5	11.7	6.2	275	NA
PZ-9A	54-69	installed June 2013													
		61.2	7/1/2013	<.57	<2.5	<2.5	3.1	<.5	<.82	<.5	<.82	<.49	<2.5	<.44	
		61.3	10/10/2013	<.33	<.36	<.36	0.95	<.34			<1	<.37	<.37	<.34	
		61.47	7/24/2014	<.42	<.42	<.42	<.4	<.39			<1.2	<.48	<.42	<.39	NA
		60.41	10/8/2014	<.42	<.42	<.42	<.4	<.39			<1.2	<.48	<.42	<.39	NA
PZ-9B	80-85	installed June 2013													
		61.26	7/1/2013	<.57	<2.5	<2.5	<.5	<.5	<.82	<.5	<.82	<.49	<2.5	<.44	
		61.35	10/10/2013	<.33	<.36	<.36	<.34	<.34			<1	<.37	<.37	<.34	
		61.49	7/24/2014	<.42	<.42	<.42	<.4	<.39			<1.2	<.48	<.42	<.39	NA
		60.46	10/8/2014	<.42	<.42	<.42	<.4	<.39			<1.2	<.48	<.42	<.39	NA
PZ-10	54.5-69.5	installed June 2013													
		61.72	7/1/2013	<1.4	<6.2	<6.2	321	<1.2	<2	<1.2	<2	<1.2	<6.2	<1.1	
		61.84	10/10/2013	<.33	<.36	<.36	114	<.34			<1	<.37	<.37	<.34	
		61.93	7/24/2014	<.42	<.42	<.42	<.4	<.39			<1.2	<.48	<.42	<.39	NA
		60.82	10/8/2014	<.42	<.42	<.42	<.4	<.39			<1.2	<.48	<.42	<.39	NA
PZ-11	52-67	installed June 2013													
		56.04	7/1/2013	<.57	<2.5	<2.5	5.6	2.4	23.4	<.5	23.4	<.49	3.8	0.62	
		56.05	10/10/2013	<.33	12.7	12.7	6.3	33.6			104	<.37	27.1	2.4	
		55.98	7/24/2014	<.42	2.1	2.1	<.4	0.72			3.1	<.48	1.2	<.39	NA
		54.91	10/8/2014	<.42	0.71	0.71	<.4	<.39			2.7	<.48	0.94	<.39	NA
PZ-12	54-69	installed 7/9/14													
		62.02	7/24/2014	<.5	<.5	<.5	<.5	<.5	<1	<.5	<1.2	<.17	<2.5	<.5	NA
		61.01	10/8/2014	<.5	<.5	<.5	<.5	<.5	<1	<.5	<1.2	<.17	<2.5	<.5	NA
PZ-13	47-62	installed 7/10/14													
		52.58	7/24/2014	<.5	<.5	<.5	<.5	<.5	<1	<.5	<1.2	<.17	<2.5	<.5	NA
		51.41	10/8/2014	<.5	<.5	<.5	<.5	<.5	<1	<.5	<1.2	<.17	<2.5	<.5	NA
PZ-14	47-62	installed 7/11/14													
		53.47	7/24/2014	2950	733	3683	6230	3070	12700	5920		20.8	719	8360	NA
		52.33	10/8/2014	2800	758	3558	6740	3260				31.1	749	8220	NA
PZ-15	55-70	installed 7/14/14													
		63.21	8/26/2014	<.5	<.5	<.5	<.5	<.5	<1	<.5	<1.2	<.17	<2.5	<.5	NA
		62.58	10/8/2014	<.42	<.42	<.42	<.4	<.39			<1.2	<.48	<.42	<.39	NA

Table 3: Ground Water Elevation Data (page one of three)
Wild Card Bar
Turtle Lake, Wisconsin
Meridian No. 05F750

MW-1			MW-2			MW-3		
Surface Elevation (ft)		100.5	Surface Elevation (ft)		102	Surface Elevation (ft)		98.5
Top of Casing elevation (ft)		100	Top of Casing elevation (ft)		101.98	Top of Casing elevation (ft)		98.06
Top of Screen Elevation (ft)		95	Top of Screen Elevation (ft)		96.97	Top of Screen Elevation (ft)		93.2
Bottom of Screen Elevation (ft)		85	Bottom of Screen Elevation (ft)		86.97	Bottom of Screen Elevation (ft)		83.2
Meas. Date	DTW (ft)	GW Elev (ft)	Meas. Date	DTW (ft)	GW Elev (ft)	Meas. Date	DTW (ft)	GW Elev (ft)
installed 2/20/08			installed 2/20/08			installed 2/20/08		
2/5/2009	11.33	88.67	2/5/2009	13.4	88.58	2/5/2009	dry	dry
7/20/2009	9.58	90.42	7/20/2009	13	88.98	7/20/2009	15.02	83.04
10/22/2009	8.01	91.99	10/22/2009	13.03	88.95	10/22/2009	dry	dry
4/12/2010	8.85	91.15	4/12/2010	14.25	87.73	4/12/2010	dry	
7/29/2010	6.05	93.95	7/29/2010	11.62	90.36	7/29/2010	dry	
6/10/2011	4.23	95.77	6/10/2011	8.05	93.93	6/10/2011	dry	
9/23/2011	6.75	93.25	9/23/2011	9.71	92.27	9/23/2011	14.82	83.24
6/22/2012		NM	6/22/2012		NM	6/22/2012		NM
9/24/2012		NM	9/24/2012		NM	9/24/2012		NM

MW-4			MW-5			MW 6		
Surface Elevation (ft)		103	Surface Elevation (ft)		95.75	Surface Elevation (ft)		102.75
Top of Casing elevation (ft)		102.96	Top of Casing elevation (ft)		95.67	Top of Casing elevation (ft)		102.58
Top of Screen Elevation (ft)		97.86	Top of Screen Elevation (ft)		85.67	Top of Screen Elevation (ft)		97.58
Bottom of Screen Elevation (ft)		87.86	Bottom of Screen Elevation (ft)		75.67	Bottom of Screen Elevation (ft)		87.58
Meas. Date	DTW (ft)	GW Elev (ft)	Meas. Date	DTW (ft)	GW Elev (ft)	Meas. Date	DTW (ft)	GW Elev (ft)
installed 2/20/08			installed 3/8/2010			installed 5/11/11		
2/5/2009	13.31	89.65						
7/20/2009	13.25	89.71						
10/22/2009	14.13	88.83						
4/12/2010	14.4	88.56	4/12/2010	19.18	76.49			
7/29/2010	13.78	89.18	7/29/2010	dry				
6/10/2011	12.54	90.42	6/10/2011	dry		6/10/2011	dry	
9/23/2011	14.33	88.63	9/23/2011	dry		9/23/2011	dry	
6/22/2012		NM	6/22/2012		NM	6/22/2012		NM
9/24/2012		NM	9/24/2012		NM	9/24/2012		NM

MW-7			TMW-1			TMW-2		
Surface Elevation (ft)		98	Surface Elevation (ft)		101	Surface Elevation (ft)		100
Top of Casing elevation (ft)		99.99	Top of Casing elevation (ft)		102.87	Top of Casing elevation (ft)		101.22
Top of Screen Elevation (ft)		93	Top of Screen Elevation (ft)		90	Top of Screen Elevation (ft)		90
Bottom of Screen Elevation (ft)		83	Bottom of Screen Elevation (ft)		85	Bottom of Screen Elevation (ft)		80
Meas. Date	DTW (ft)	GW Elev (ft)	Meas. Date	DTW (ft)	GW Elev (ft)	Meas. Date	DTW (ft)	GW Elev (ft)
installed 6/6/11			installed 9/24/08			installed 9/24/08		
			10/1/2008	10.1	92.77	10/1/2008	10.75	90.47
			2/5/2009	NM	NM	2/5/2009	15.24	85.98
6/10/2011	17.07	82.92	7/20/2009	11.71	91.16	7/20/2009	12.65	88.57
9/23/2011	16.17	83.82	10/22/2009	10.2	92.67	10/22/2009	inaccessible - house	
6/22/2012		NM	6/22/2012		NM	6/22/2012		NM
9/24/2012		NM	9/24/2012		NM	9/24/2012		NM
			casing cut					

TMW-9			TMW-12			TMW-15		
Surface Elevation (ft)		102	Surface Elevation (ft)		102	Surface Elevation (ft)		96.5
Top of Casing elevation (ft)		101.8	Top of Casing elevation (ft)		104.00	Top of Casing elevation (ft)		96.24
Top of Screen Elevation (ft)		96.8	Top of Screen Elevation (ft)		97	Top of Screen Elevation (ft)		91.5
Bottom of Screen Elevation (ft)		86.8	Bottom of Screen Elevation (ft)		87	Bottom of Screen Elevation (ft)		81.5
Meas. Date	DTW (ft)	GW Elev (ft)	Meas. Date	DTW (ft)	GW Elev (ft)	Meas. Date	DTW (ft)	GW Elev (ft)
installed 1/19/09			installed 9/24/08			installed 1/20/09		
			10/1/2008	8.14	95.86			
2/5/2009	dry	dry	2/5/2009	15.37	88.63	2/5/2009	13.31	82.93
7/20/2009	14.39	87.41	7/20/2009	8.55	95.45	7/20/2009	11.45	84.79
10/22/2009	inaccessible - truck		10/22/2009	6.9	casing cut	10/22/2009	11.32	84.92
6/22/2012		NM	6/22/2012		NM	6/22/2012		NM
9/24/2012		NM	9/24/2012		NM	9/24/2012		NM

Table 3: Ground Water Elevation Data (page three of three)

PZ-9A			PZ-9B			
Surface Elevation (ft)		1262.9	Surface Elevation (ft)		1263	
Top of Casing elevation (ft)		1262.86	Top of Casing elevation (ft)		1262.87	
Top of Screen Elevation (ft)		1209	Top of Screen Elevation (ft)		1183	
Bottom of Screen Elevation (ft)		1194	Bottom of Screen Elevation (ft)		1178	
Meas. Date	DTW (ft)	GW Elev (ft)	Meas. Date	DTW (ft)	GW Elev (ft)	**Vertical Gradient** (positive downward)
installed 6/3/13			installed 6/3/13			
7/1/2013	61.2	1201.66	7/1/2013	61.26	1201.61	0.002
10/10/2013	61.3	1201.56	10/10/2013	61.35	1201.52	0.002
7/24/2014	61.47	1201.39	7/24/2014	61.49	1201.38	0.000
10/8/2014	60.41	1202.45	10/8/2014	60.46	1202.41	0.002

PZ-10			PZ-11			PZ-12		
Surface Elevation (ft)		1263.2	Surface Elevation (ft)		1257.5	Surface Elevation (ft)		1263.75
Top of Casing elevation (ft)		1263.09	Top of Casing elevation (ft)		1257.21	Top of Casing elevation (ft)		1263.54
Top of Screen Elevation (ft)		1209	Top of Screen Elevation (ft)		1205.5	Top of Screen Elevation (ft)		1209.75
Bottom of Screen Elevation (ft)		1194	Bottom of Screen Elevation (ft)		1190.5	Bottom of Screen Elevation (ft)		1194.75
Meas. Date	DTW (ft)	GW Elev (ft)	Meas. Date	DTW (ft)	GW Elev (ft)	Meas. Date	DTW (ft)	GW Elev (ft)
installed 6/3/13			installed 6/3/13			installed July 2014		
7/1/2013	61.72	1201.37	7/1/2013	56.04	1201.17			
10/10/2013	61.84	1201.25	10/10/2013	56.05	1201.16			
7/24/2014	61.93	1201.16	7/24/2014	55.98	1201.23	7/24/2014	62.02	1201.52
10/8/2014	60.82	1202.27	10/8/2014	54.91	1202.3	10/8/2014	61.01	1202.53

PZ-13			PZ-14			PZ-15		
Surface Elevation (ft)		1254	Surface Elevation (ft)		1254.8	Surface Elevation (ft)		1265.25
Top of Casing elevation (ft)		1253.77	Top of Casing elevation (ft)		1254.6	Top of Casing elevation (ft)		1265.12
Top of Screen Elevation (ft)		1207.5	Top of Screen Elevation (ft)		1208	Top of Screen Elevation (ft)		1210
Bottom of Screen Elevation (ft)		1192.5	Bottom of Screen Elevation (ft)		1193	Bottom of Screen Elevation (ft)		1195
Meas. Date	DTW (ft)	GW Elev (ft)	Meas. Date	DTW (ft)	GW Elev (ft)	Meas. Date	DTW (ft)	GW Elev (ft)
installed July 2014			installed July 2014			installed July 2014		
7/24/2014	52.58	1201.19	7/24/2014	53.47	1201.13	8/26/2014	63.21	1201.91
10/8/2014	51.41	1202.36	10/8/2014	52.33	1202.27	10/8/2014	62.58	1202.54

Table 3: Ground Water Elevation Data (page two of three)

PZ-1			PZ-2			PZ-3		
Surface Elevation (ft)		1257.75	Surface Elevation (ft)		1253.2	Surface Elevation (ft)		1260.7
Top of Casing elevation (ft)		1257.63	Top of Casing elevation (ft)		1253.01	Top of Casing elevation (ft)		1260.57
Top of Screen Elevation (ft)		1198	Top of Screen Elevation (ft)		1195	Top of Screen Elevation (ft)		1196
Bottom of Screen Elevation (ft)		1188	Bottom of Screen Elevation (ft)		1185	Bottom of Screen Elevation (ft)		1181
Meas. Date	DTW (ft)	GW Elev (ft)	Meas. Date	DTW (ft)	GW Elev (ft)	Meas. Date	DTW (ft)	GW Elev (ft)
installed 6/10/2009								
7/20/2009	60.6	1197.03						
10/22/2009	61.05	1196.58	Installed 3/4/2010			installed 3/5/2010		
4/12/2010	61.29	1196.34	4/12/2010	56.66	1196.35	4/12/2010	64.12	1196.45
7/29/2010	61.2	1196.43	7/29/2010	56.55	1196.46	7/29/2010	64	1196.57
6/10/2011	58.41	1199.22	6/10/2011	53.78	1199.23	6/10/2011	61.33	1199.24
9/23/2011	56.45	1201.18	9/23/2011	51.8	1201.21	9/23/2011	59.41	1201.16
6/22/2012	54.19	1203.44	6/22/2012	49.64	1203.37	6/22/2012	57.04	1203.53
9/24/2012	54.11	1203.52	9/24/2012	49.58	1203.43	9/24/2012	57	1203.57
7/1/2013	56.45	1201.18	7/1/2013	51.88	1201.13	7/1/2013	59.23	1201.34
10/10/2013	56.45	1201.18	10/10/2013	51.91	1201.1	10/10/2013	59.28	1201.29
7/24/2014	56.41	1201.22	7/24/2014	51.87	1201.14	7/24/2014	59.3	1201.27
10/8/2014	55.31	1202.32	10/8/2014	50.72	1202.29	10/8/2014	58.23	1202.34

PZ-4			PZ-5			PZ-6		
Surface Elevation (ft)		1260	Surface Elevation (ft)		1252.7	Surface Elevation (ft)		1255
Top of Casing elevation (ft)		1259.94	Top of Casing elevation (ft)		1252.56	Top of Casing elevation (ft)		1257.06
Top of Screen Elevation (ft)		1205	Top of Screen Elevation (ft)		1202	Top of Screen Elevation (ft)		1205
Bottom of Screen Elevation (ft)		1190	Bottom of Screen Elevation (ft)		1188	Bottom of Screen Elevation (ft)		1190
Meas. Date	DTW (ft)	GW Elev (ft)	Meas. Date	DTW (ft)	GW Elev (ft)	Meas. Date	DTW (ft)	GW Elev (ft)
installed 5/11/11			installed 5/12/11			installed 6/6/11		
6/10/2011	60.74	1199.2	6/10/2011	53.39	1199.17	6/10/2011	57.89	1199.17
9/23/2011	58.8	1201.14	9/23/2011	51.4	1201.16	9/23/2011	55.9	1201.16
6/22/2012	56.41	1203.53	6/22/2012	49.25	1203.31	6/22/2012	53.65	1203.41
9/24/2012	56.32	1203.62	9/24/2012	49.21	1203.35	9/24/2012	53.62	1203.44
7/1/2013	58.65	1201.29	7/1/2013	51.53	1201.03	7/1/2013	55.82	1201.24
10/10/2013	58.64	1201.3	10/10/2013	51.54	1201.02	10/10/2013	55.91	1201.15
7/24/2014	58.65	1201.29	7/24/2014	51.48	1201.08	7/24/2014	55.91	1201.15
10/8/2014	57.59	1202.35	10/8/2014	50.28	1202.28	10/8/2014	54.71	1202.35

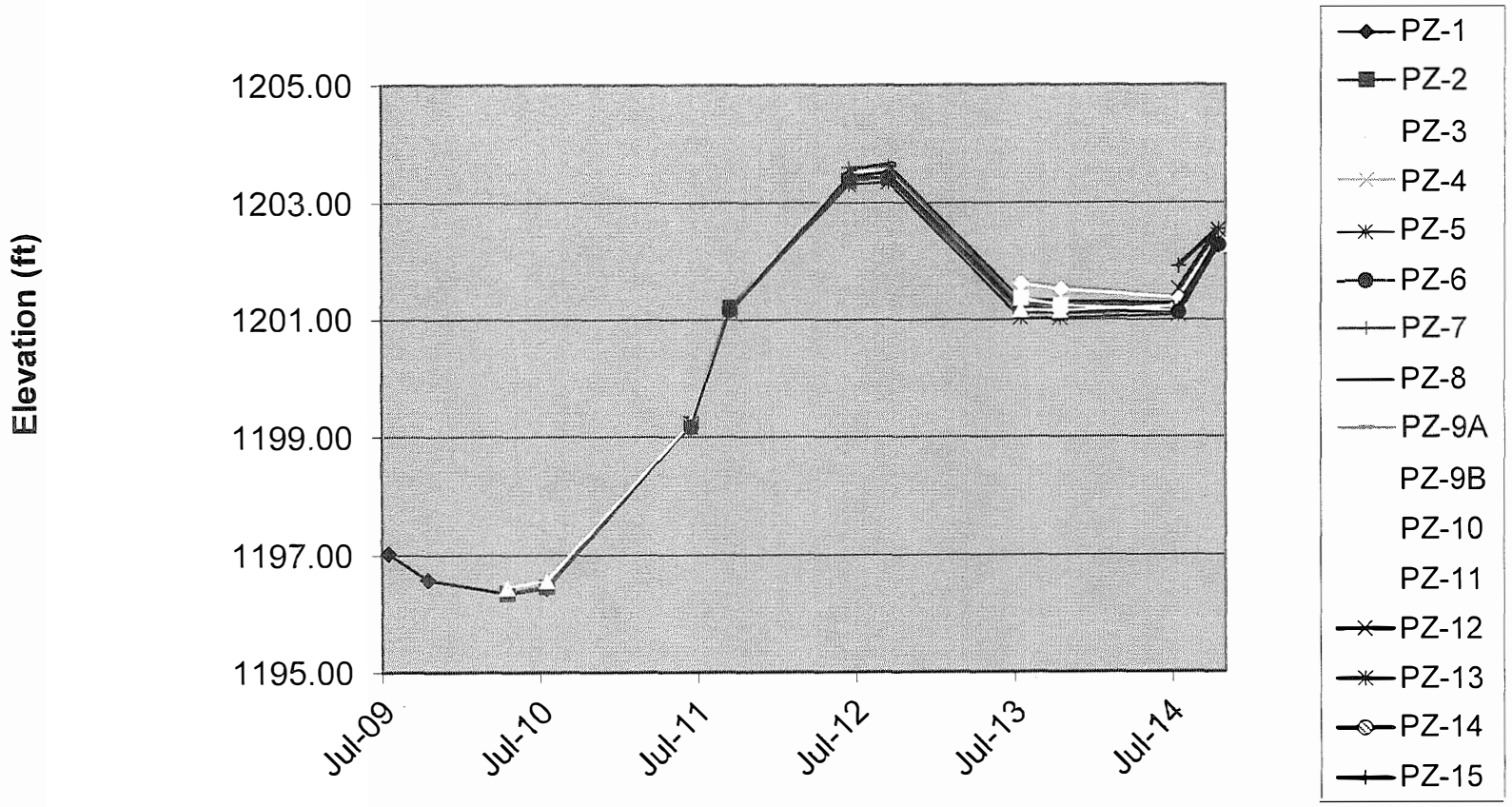
PZ-7			PZ-8		
Surface Elevation (ft)		1256.7	Surface Elevation (ft)		1260.7
Top of Casing elevation (ft)		1256.11	Top of Casing elevation (ft)		1260.65
Top of Screen Elevation (ft)		1206	Top of Screen Elevation (ft)		1206
Bottom of Screen Elevation (ft)		1191	Bottom of Screen Elevation (ft)		1191
Meas. Date	DTW (ft)	GW Elev (ft)	Meas. Date	DTW (ft)	GW Elev (ft)
installed 6/13/12			installed 6/13/12		
6/22/2012	52.51	1203.6	6/22/2012	57.08	1203.57
9/24/2012	52.5	1203.61	9/24/2012	56.99	1203.66
7/1/2013	54.85	1201.26	7/1/2013	59.3	1201.35
10/10/2013	54.86	1201.25	10/10/2013	59.33	1201.32
7/24/2014	54.85	1201.26	7/24/2014	59.36	1201.29
10/8/2014	53.77	1202.34	10/8/2014	58.32	1202.33

Table 4: Hydraulic Conductivity Tests

Wild Card Bar
Turtle Lake, Wisconsin
Meridian No. 05F750

Well	Date	K (cm/sec)	Soils at Screened Intervall
PZ-1	9/26/2013	1.6×10^{-3}	medium sand
PZ-9A	9/26/2013	7.5×10^{-4}	fine - medium sand
PZ-9B	9/26/2013	3.4×10^{-3}	(no soil samples)
PZ-12	9/17/2014	3.3×10^{-2}	fine sand
PZ-13	9/17/2014	4.5×10^{-3}	fine sand
PZ-14	9/17/2014	2.0×10^{-2}	fine sand silt (layers)
PZ-15	9/17/2014	9.9×10^{-2}	fine sand

Figure 5: Hydrograph



Bouwer and Rice Automatic Parameter Estimation

PZ-14

Site Name:	Wild Card Bar
Location:	Turtle Lake
Test Date:	9/17/14

Well Label:	PZ-14
Aquifer Thickness:	50. meters
Screen Length:	15. meters
Casing Radius:	8.e-002 meters
Effective Radius:	0.33 meters
Gravel Pack Porosity:	30. %
Corrected Casing Radius:	0.1927 meters
Bouwer and Rice Parameter A	2.309
Bouwer and Rice Parameter B	0.4338
Radius of Influence of Test	3.441 meters

Trial	Adjusted Time (minutes)	Head (meters)	Head Ratio	Hyd. Con. (meters/day)	Flow to Well (meters3/day)
2	0.	0.35	1.	--	
3	0.18	0.31	0.8857	4.561	56.84
4	0.68	0.26	0.7429	2.957	30.91
5	1.18	0.21	0.6	2.928	24.72
6	1.68	0.19	0.5429	2.46	18.79
7	2.18	0.16	0.4571	2.429	15.62
8	3.18	0.13	0.3714	2.107	11.01
9	4.18	0.1	0.2857	2.027	8.15
10	5.18	8.e-002	0.2286	1.927	6.199
11	6.18	7.e-002	0.2	1.762	4.958
12	7.18	5.e-002	0.1429	1.833	3.685
13	8.18	4.e-002	0.1143	1.794	2.884
14	9.18	3.e-002	8.571e-002	1.81	2.183

Arithmetic Means:

Hydraulic Conductivity	2.383 meters/day
Transmissivity	119.1 meters2/day

Geometric Means:

Hydraulic Conductivity	2.286 meters/day
Transmissivity	114.3 meters2/day

Sensitivity Analysis:

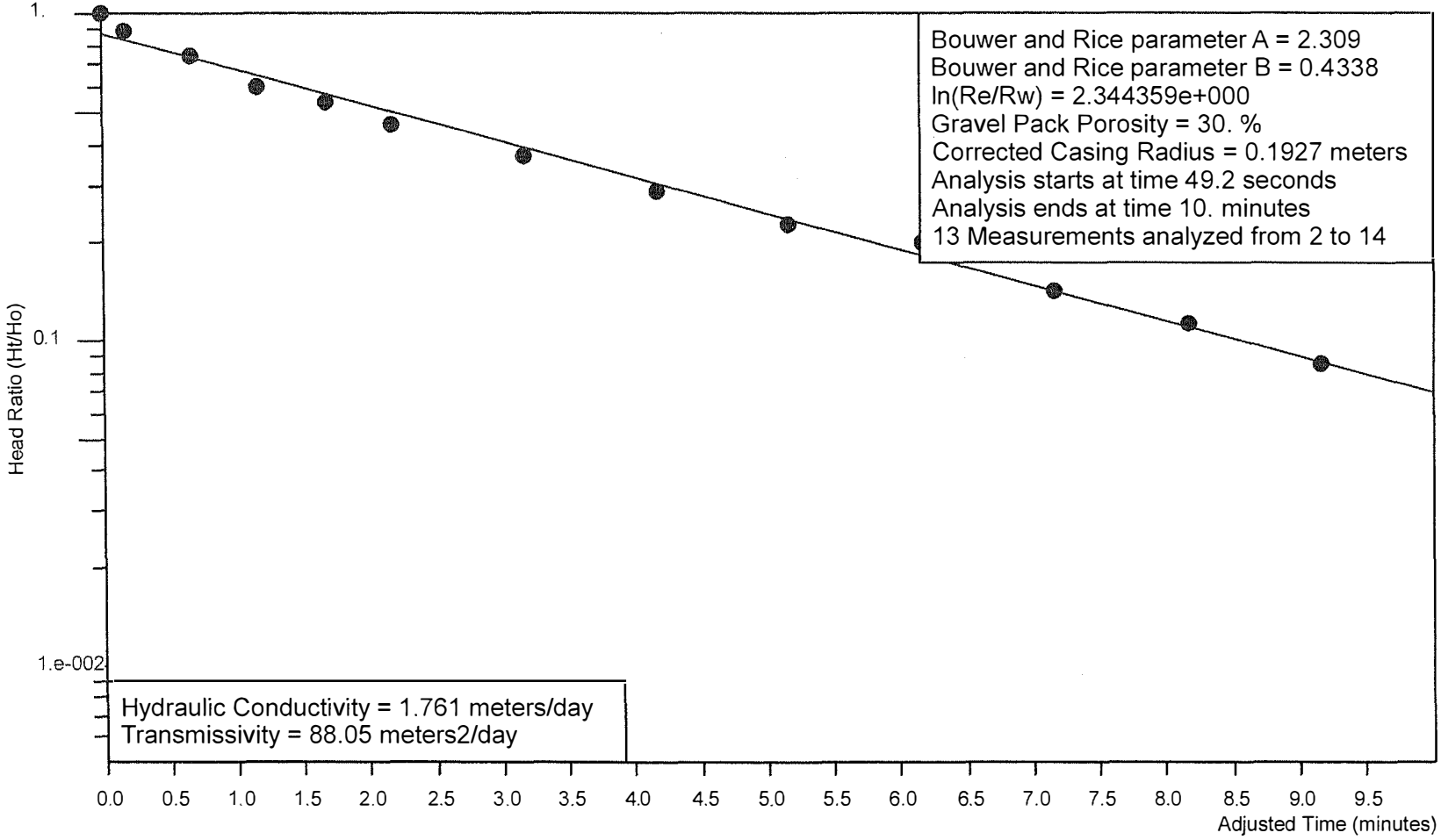
Hydraulic Conductivity	2.164 meters/day
Transmissivity	108.2 meters2/day

PZ-14 9/17/14

Wild Card Bar Turtle Lake

Bouwer and Rice Graph

PZ-14



Analysis by Starpoint Software

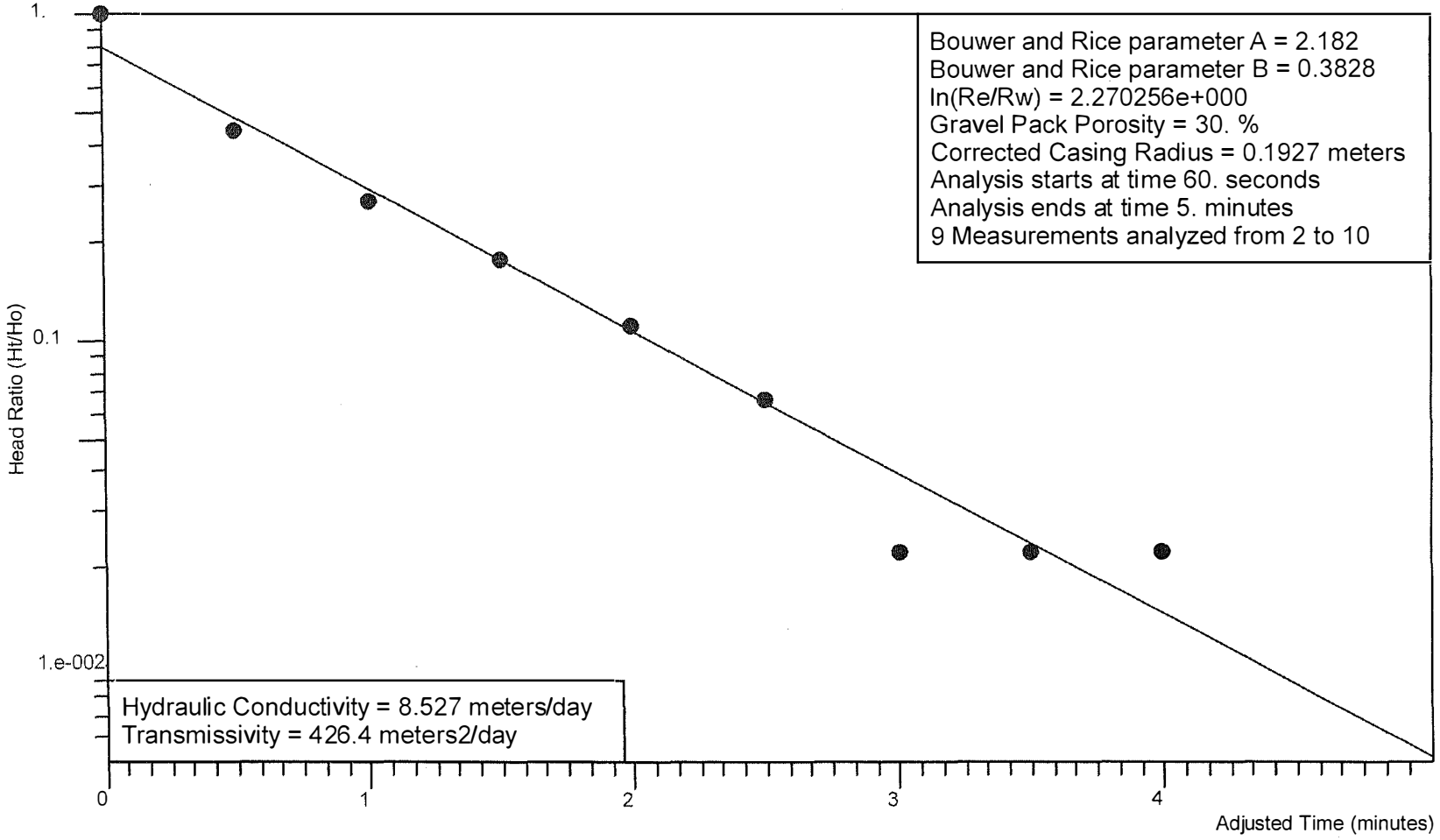
Ho is 0.35 meters at 49.2 seconds

PZ-15 9/17/14

Wild Card Bar Turtle Lake

Bouwer and Rice Graph

PZ-15



Analysis by Starpoint Software

Ho is 0.45 meters at 60. seconds

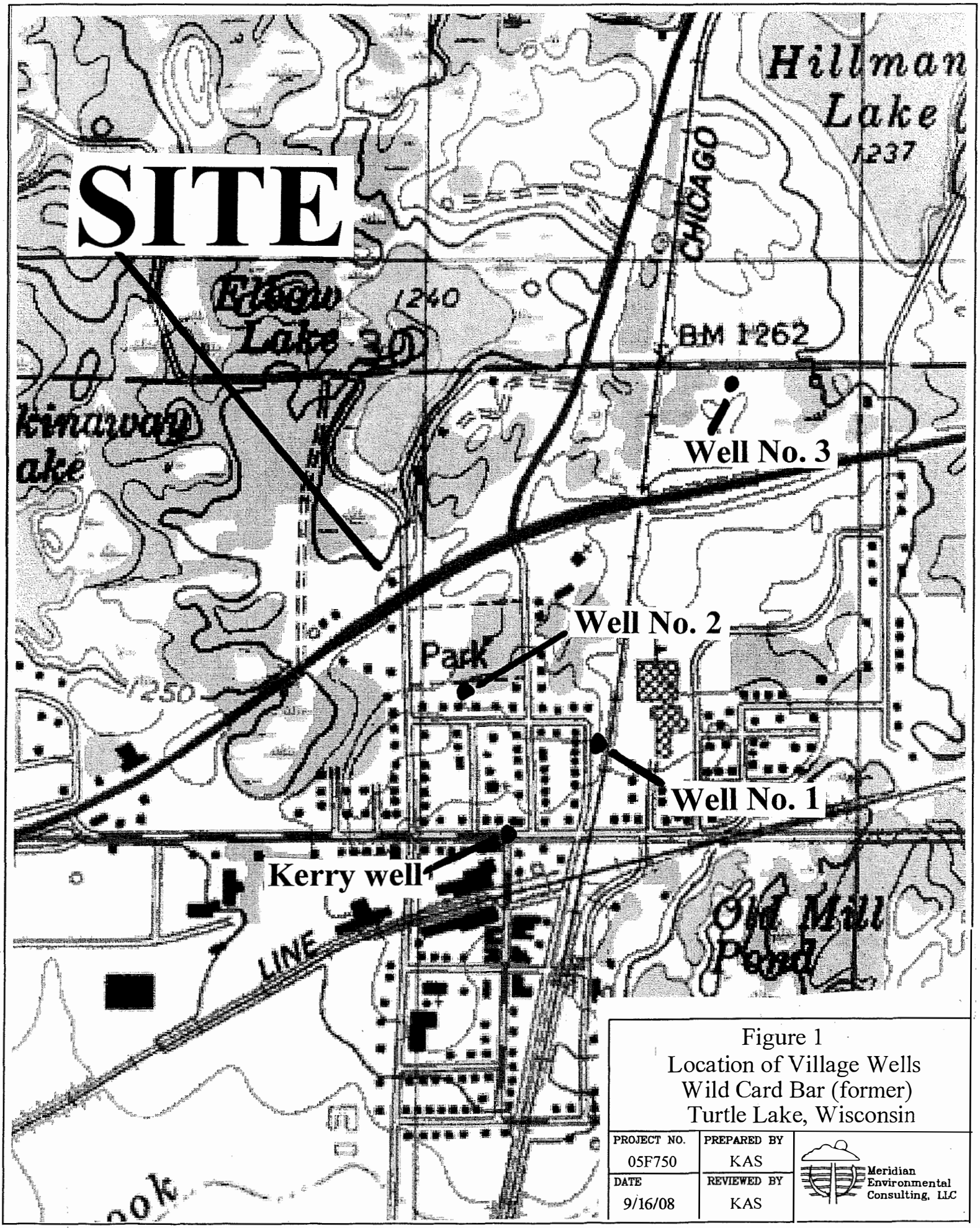


Figure 1
Location of Village Wells
Wild Card Bar (former)
Turtle Lake, Wisconsin

PROJECT NO.	PREPARED BY
05F750	KAS
DATE	REVIEWED BY
9/16/08	KAS

Meridian Environmental Consulting, LLC

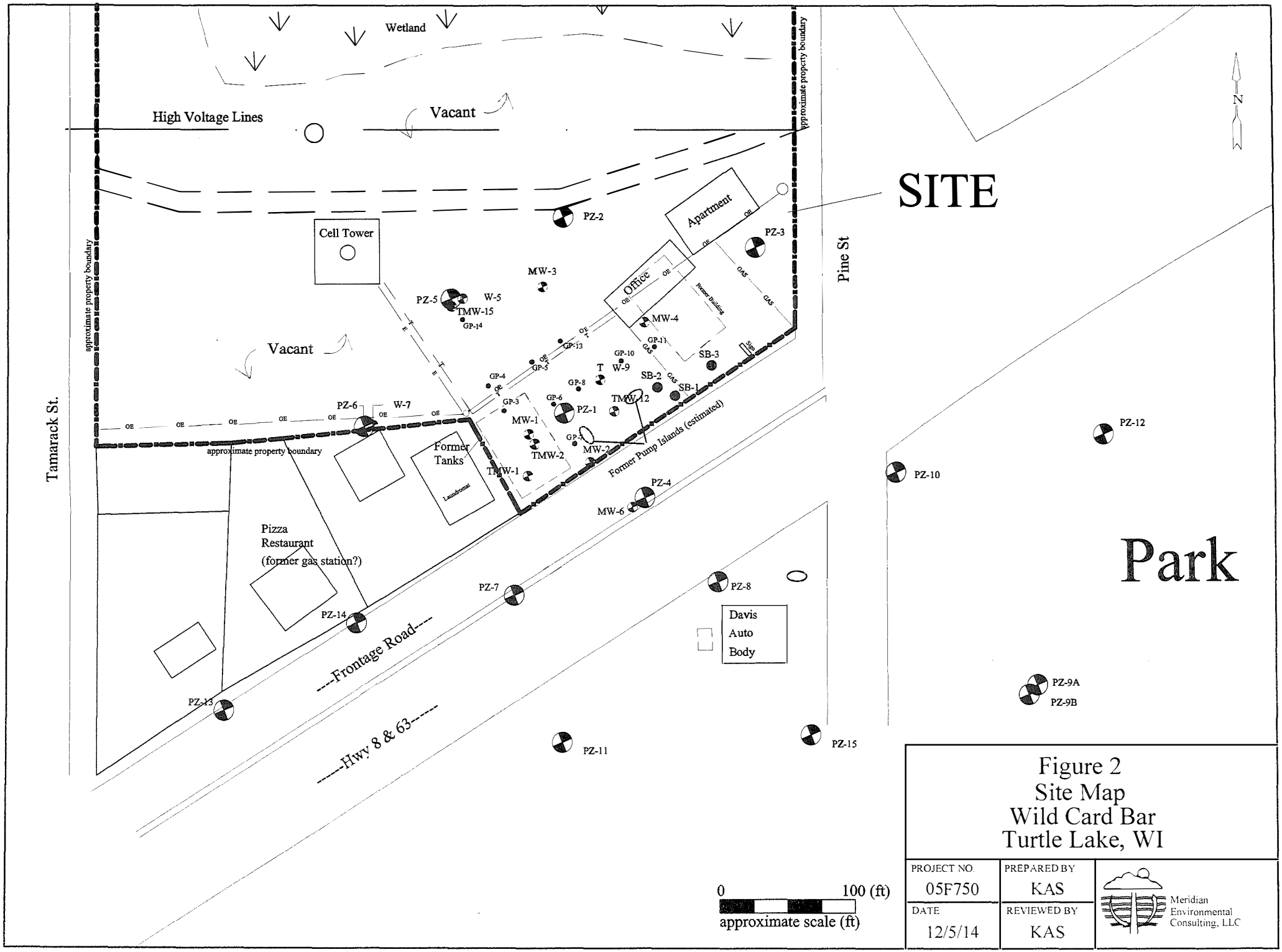


Figure 2
Site Map
Wild Card Bar
Turtle Lake, WI

PROJECT NO.	PREPARED BY
05F750	KAS
DATE	REVIEWED BY
12/5/14	KAS

Meridian Environmental Consulting, LLC

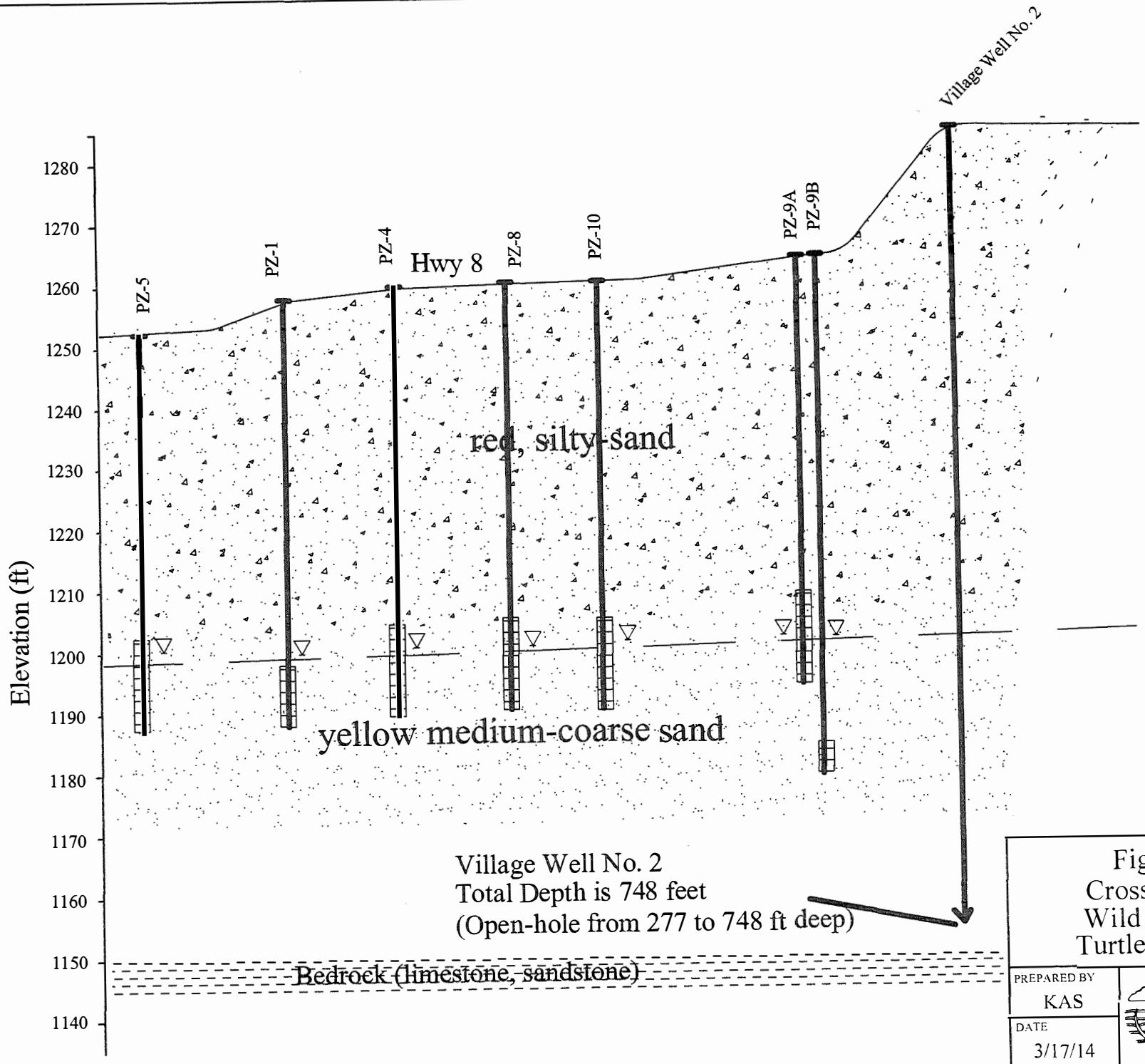


Figure 3
Cross Section
Wild Card Bar
Turtle Lake, WI

PREPARED BY
KAS

DATE
3/17/14

Meridian Environmental Consulting, LLC

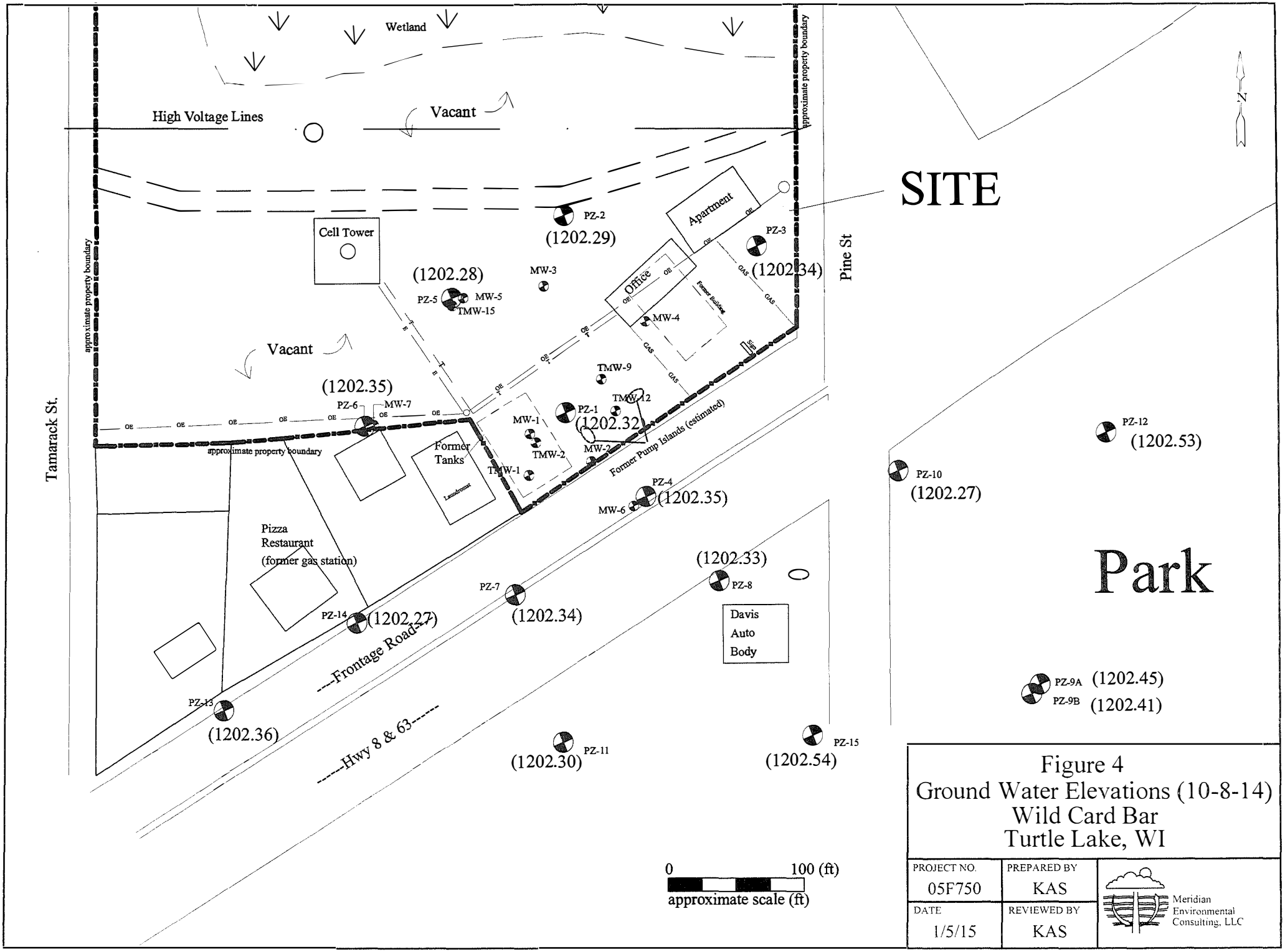


Figure 4
Ground Water Elevations (10-8-14)
Wild Card Bar
Turtle Lake, WI

PROJECT NO.	PREPARED BY
05F750	KAS
DATE	REVIEWED BY
1/5/15	KAS

Meridian Environmental Consulting, LLC

APPENDIX C

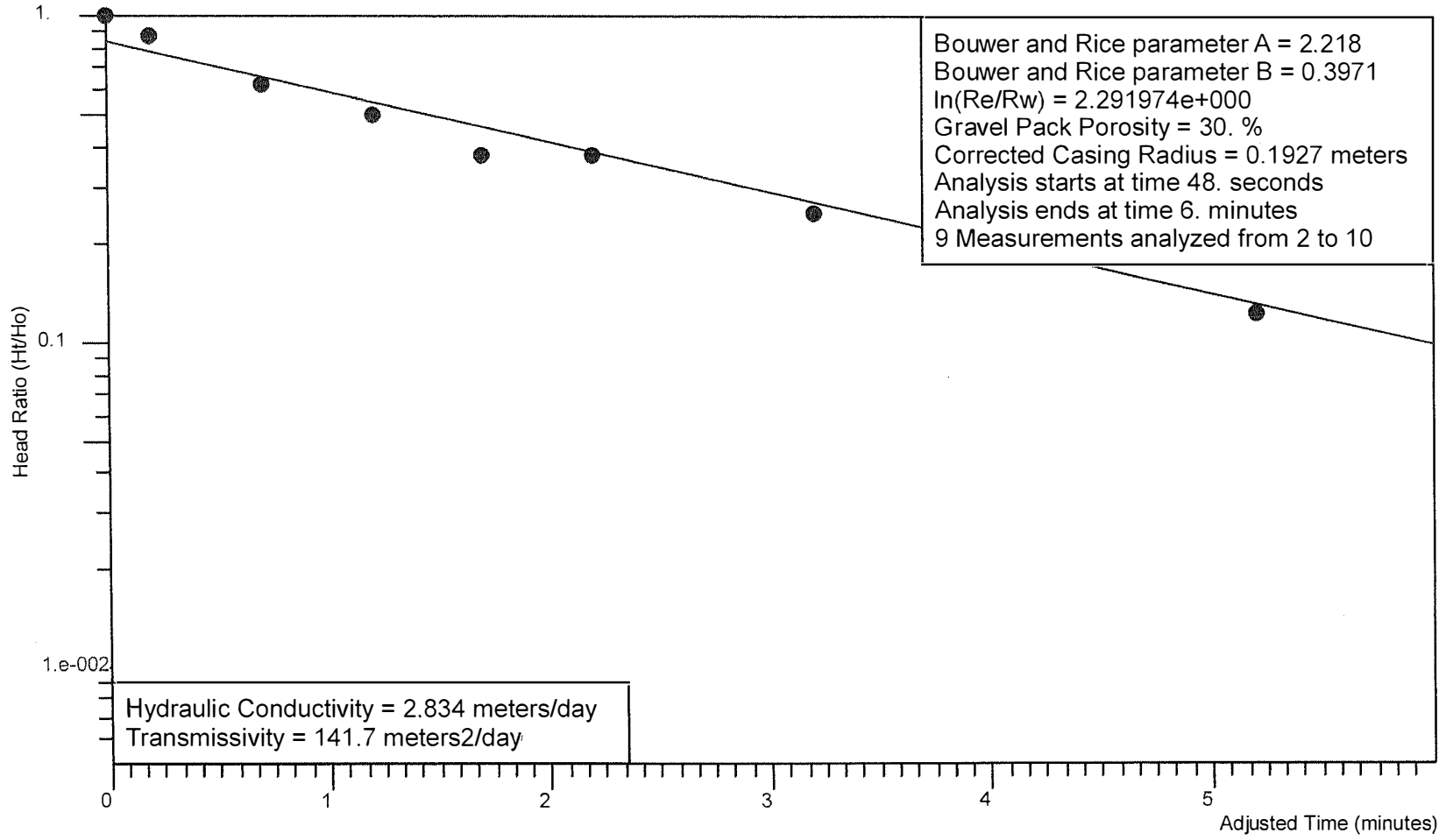
HYDRAULIC CONDUCTIVITY TESTS

PZ-12 9/17/14

Wild Card Bar Turtle Lake

Bouwer and Rice Graph

PZ-12



Analysis by Starpoint Software

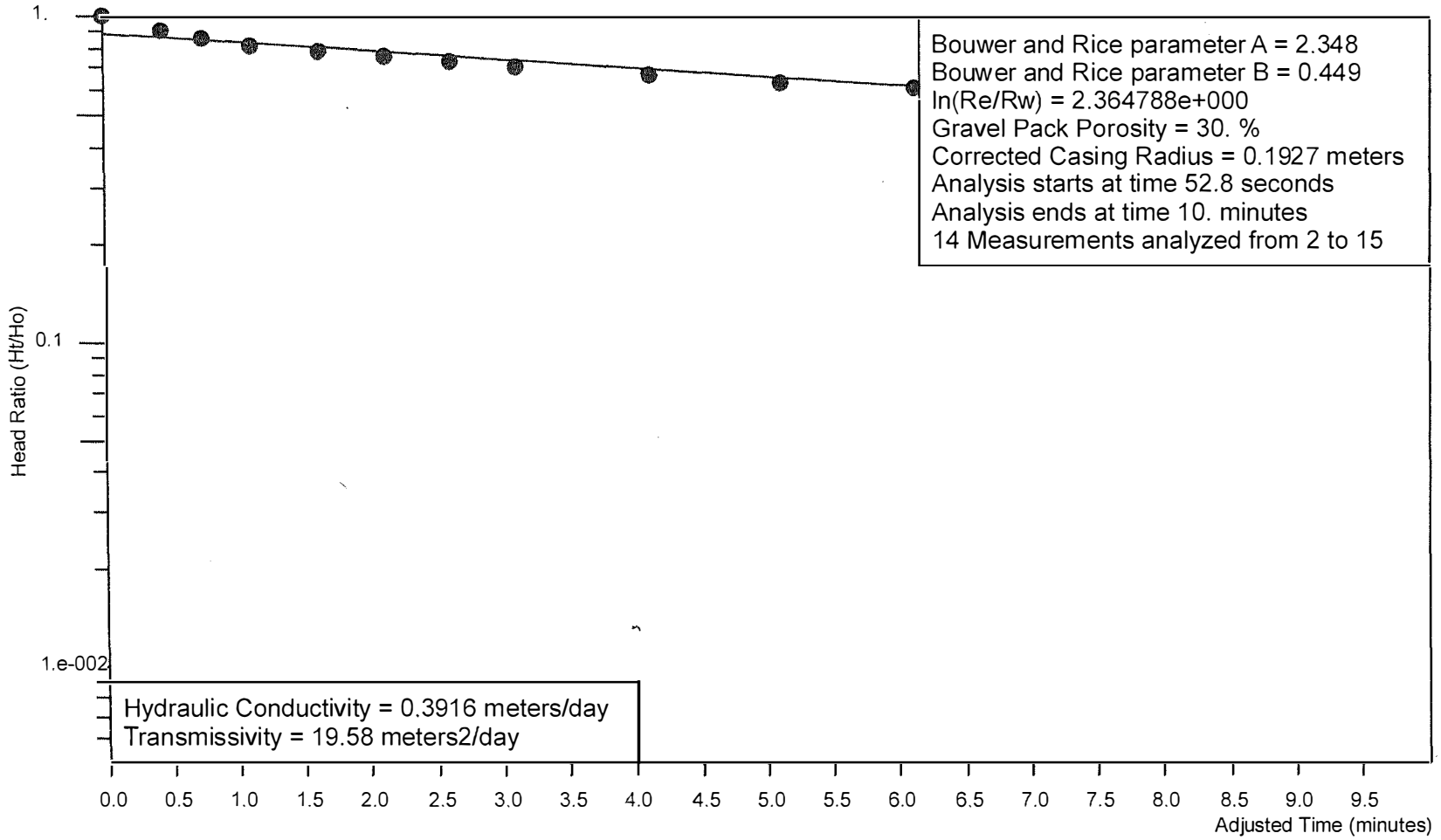
Ho is 8.e-002 meters at 48. seconds

PZ-13 9/17/14

Wild Card Bar Turtle Lake

Bouwer and Rice Graph

PZ-13



Analysis by Starpoint Software

Ho is 0.69 meters at 52.8 seconds

PZ-13

Site Name:	Wild Card Bar
Location:	Turtle Lake
Test Date:	9/17/14

Well Label:	PZ-13
Aquifer Thickness:	50. meters
Screen Length:	15. meters
Casing Radius:	8.e-002 meters
Effective Radius:	0.33 meters
Gravel Pack Porosity:	30. %
Corrected Casing Radius:	0.1927 meters
Static Water Level:	51.49 meters
Water Table to Screen Bottom:	9.86 meters
Anisotropy Ratio:	1.
Time Adjustment:	52.8 Seconds

Test starts with trial 1
There are 15 time and drawdown measurements
Maximum head is 0.69 meters
Minimum head is 0. meters

Trial	Time (minutes)	Adjusted Time (minutes)	Drawdown (meters)	Head (meters)	Head Ratio
1	0.	-0.88	51.49	0.	0.
2	0.88	0.	52.18	0.69	1.
3	1.33	0.45	52.11	0.62	0.8986
4	1.63	0.75	52.08	0.59	0.8551
5	2.	1.12	52.05	0.56	0.8116
6	2.5	1.62	52.03	0.54	0.7826
7	3.	2.12	52.01	0.52	0.7536
8	3.5	2.62	51.99	0.5	0.7246
9	4.	3.12	51.98	0.49	0.7101
10	5.	4.12	51.95	0.46	0.6667
11	6.	5.12	51.93	0.44	0.6377
12	7.	6.12	51.91	0.42	0.6087
13	8.	7.12	51.9	0.41	0.5942
14	9.	8.12	51.88	0.39	0.5652
15	10.	9.12	51.86	0.37	0.5362

Bouwer and Rice Automatic Parameter Estimation

PZ-15

Site Name:	Wild Card Bar
Location:	Turtle Lake
Test Date:	9/17/14

Well Label:	PZ-15
Aquifer Thickness:	50. meters
Screen Length:	15. meters
Casing Radius:	8.e-002 meters
Effective Radius:	0.33 meters
Gravel Pack Porosity:	30. %
Corrected Casing Radius:	0.1927 meters
Bouwer and Rice Parameter A	2.182
Bouwer and Rice Parameter B	0.3828
Radius of Influence of Test	3.195 meters

Trial	Adjusted Time (minutes)	Head (meters)	Head Ratio	Hyd. Con. (meters/day)	Flow to Well (meters3/day)
2	0.	0.45	1.	--	
3	0.5	0.2	0.4444	13.06	108.5
4	1.	0.12	0.2667	10.65	53.03
5	1.5	8.e-002	0.1778	9.274	30.8
6	2.	5.e-002	0.1111	8.848	18.37
7	2.5	3.e-002	6.667e-002	8.724	10.86
8	3.	1.e-002	2.222e-002	10.22	4.242
9	3.5	1.e-002	2.222e-002	8.759	3.636
10	4.	1.e-002	2.222e-002	7.664	3.182

Arithmetic Means:

Hydraulic Conductivity	9.649 meters/day
Transmissivity	482.5 meters2/day

Geometric Means:

Hydraulic Conductivity	9.534 meters/day
Transmissivity	476.7 meters2/day

Sensitivity Analysis:

Hydraulic Conductivity	10.68 meters/day
Transmissivity	534.2 meters2/day