



Infrastructure, buildings, environment, communications

Gina Keenan
Remediation and Redevelopment
Wisconsin Department of Natural Resources
2300 North Dr. Martin Luther King Drive
Milwaukee, Wisconsin 53212

Subject:

Results of Pilot Test Activities, Former Norge Dry Cleaner Facility, 6854 West Beloit Road, West Allis, Wisconsin, BRRTS# 02-41-271535.

Dear Ms. Keenan:

The purpose of this letter is to provide a project status report on the results of the pilot study for remediation at the above referenced site. As you are aware, the Wisconsin Department of Natural Resources (WDNR) approved the pilot study and remedial action plan for the former Norge Dry Cleaner (the Site) in a letter dated February 26, 2003.

ARCADIS was retained by Norman Getz in March 2003 to complete remedial action activities to address a chlorinated solvent release at the Site. As part of the remedial action plan, ARCADIS conducted an enhanced bioremediation pilot test. The pilot test activities were completed between May and December 2003. Based on the results of the pilot test, ARCADIS will implement the full-scale remedial action activities at the Site as outlined in the remedial action plan. A summary of the pilot test activities and results is presented below.

Site Location and Background

The Site is located on the southeast corner of the intersection of West Lincoln Avenue and South 69th Street in West Allis, Wisconsin. The Site layout and features are presented on Figure 1. There is one building located on the property that is currently vacant. The Site is understood to have operated as a dry cleaning facility, and perchloroethene (PCE) was used and stored within the Site building.

Site investigation activities completed from 2001 through 2003 indicated PCE and associated chlorinated volatile organic compounds (VOCs) were detected in soil and groundwater at the Site. The highest PCE concentrations were detected in Monitoring Wells MW-2, MW-3 and MW-10. The historical groundwater results obtained from Site wells and piezometers are summarized in Table 1.

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ENVIRONMENT

Date:

26 January 2004

Contact:

Dawn Gabardi
Jim Bannantine

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414 276 7742

Email:

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Our ref:

WI001027.0001

Enhanced Biodegradation Pilot Test

Installation of Pilot Test Injection and Groundwater Monitoring Wells

On May 29, 2003, three injection wells (IW-1, IW-2, and IW-3) were installed near the northwest corner of the building around Monitoring Well MW-3. Each of the injection wells was located approximately 8 to 10 feet from MW-3. The location of the injection wells and the existing Site monitoring wells and piezometer are presented on Figure 1.

The injection wells were installed with a drill rig using hollow stem auger drilling techniques. The injection wells were constructed with 2-inch diameter Schedule 40 polyvinyl chloride riser and screen. Each injection well was screened from approximately 5 to 15 feet below land surface, installed in accordance with Chapter NR 141 of the Wisconsin Administrative Code, and completed with a flush mount well vault. The soil boring logs and well construction forms prepared for the injection wells are included as Appendix A.

Permitting Issues

The pilot test was conducted to evaluate the feasibility of enhanced biodegradation for remediating impacted groundwater. Because this process involves injecting remedial material into the waters of the state, a temporary exemption under Chapter NR 140.28(5) and a Wisconsin Pollutant Discharge Elimination System (WPDES) permit were required. Prior to initiating injection activities, ARCADIS submitted a request for the NR 140.28 exemption request to you, and the required WPDES permit request to Corey Heckel of the WDNR, on May 29, 2003. Approval for the NR 140.28 exemption request was received in an electronic message from you dated August 12, 2003. The WPDES permit was approved in a letter from Cory Heckel of the WDNR on August 21, 2003.

Baseline Groundwater Sampling

Groundwater samples were collected from MW-3 and MW-4 on September 4, 2003 to evaluate groundwater quality and provide background constituent concentrations prior to the start of the pilot test. Groundwater samples were collected using low-flow sampling techniques. Groundwater samples were submitted for analysis of VOCs, dissolved organic carbon, and dissolved light hydrocarbon gases. Field parameters, including temperature, pH, dissolved oxygen, specific conductance, and oxidation reduction potential (ORP) were also measured.

Concentrations of 13,000 micrograms per liter ($\mu\text{g/L}$) and 15 $\mu\text{g/L}$ PCE were detected in the groundwater samples collected from MW-3 and MW-4, respectively. Degradation products of PCE, including trichloroethene (TCE) and cis-1,2-

dichloroethene (DCE) were detected in both of the sampled locations. The September 2003 VOC concentrations were consistent with data collected in 2001 and 2002 during the site investigation. Results of the pre-injection groundwater analytical testing for MW-3 and MW-4 are presented in Table 2.

Carbon Injection and Groundwater Monitoring Program

Following the collection of baseline groundwater samples, a carbon amendment solution was introduced to the aquifer on November 7, 2003, using Injection Wells IW-1, IW-2, and IW-3. Approximately 60 gallons of carbon amendment solution were gravity-fed into Injection Wells IW-1 and IW-2 (30 gallons per well), and 13.4 gallons of solution were fed into IW-3.

One month after the injection process was completed, groundwater samples were collected from MW-3 and MW-4 on December 3, 2003. Groundwater samples were collected using low-flow sampling methods, as previously described, and analyzed for VOCs and dissolved gases. Field parameters were also measured. Post-injection sampling results are presented on Table 2.

As expected, concentrations of PCE decreased substantially in MW-3, from a pre-injection concentration of 13,000 µg/L to a post-injection concentration of 2,900 µg/L. Also, concentrations of TCE, cis-1,2-DCE, and trans-1,2-DCE (the degradation products of PCE) increased at MW-3, which is also to be expected during reductive dechlorination of PCE. Vinyl chloride was not detected at concentrations above the method detection level (MDL), although it was noted that the vinyl chloride MDL was elevated for MW-3 due to the high concentrations of the other chlorinated VOCs. The concentration of ethene, one of the final degradation products of PCE, increased in MW-3. Methane concentrations also increased slightly in MW-3. The increased methane concentrations, in conjunction with the decreased levels of dissolved oxygen and ORP values, provide indirect indicators that microbial activity has increased following the carbon injections. Greater increases in ethene and methane concentrations, and reduction of TCE and cis-1,2-DCE concentrations, will likely occur as the frequency and distribution of the carbon amendment injections increase during implementation of the full-scale remedial system.

Conclusions

The post-injection monitoring results indicate that the injection of the carbon amendment solution increased the rate of biodegradation to a significant extent during the two-month pilot study, considering PCE concentrations had remained above 13,000 µg/L for the 2 years prior to the injection event. As such, ARCADIS recommends implementation of the full-scale carbon amendment system. The full-scale system will be implemented at the Site in accordance with ARCADIS'

remedial action plan, dated January 15, 2003, and approved by the WDNR on February 26, 2003.

Closing

Should you have any questions relating to the information presented herein, please feel free to call on us at your convenience.

Sincerely,

ARCADIS G&M, Inc.



Dawn M. Gabardi
Staff Hydrogeologist



James E. Bannantine
Senior Hydrogeologist

copies:

Donald P. Gallo – Reinhart, Boerner, Van Deuren, S.C.
Kristi Laine – City of West Allis

Table 1. Groundwater VOC Analytical Results, Norman Getz Property, West Allis, Wisconsin.

Well Identification	NR 140		MW-1			MW-2			MW-3		
	ES	PAL	11/28/01	2/1/02	7/26/02	11/28/01	2/1/02	7/26/02	11/28/01	2/1/02	7/26/02
Benzene	5	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
cis-1,2-Dichloroethene	70	7	<0.5	<0.5	<0.5	<0.5	8.23	6.32	121	185	229
trans-1,2-Dichorethene	100	20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.95	3.44	2.7
Tetrachlorethene	5	0.5	<0.5	<0.5	<0.5	5,910	7,260	2,870	16,500	17,800	14,300
Trichloroethene	5	0.5	<0.5	<0.5	<0.5	1.25	3.31	<0.5	35.6	46.6	65.4
Vinly chloride	0.2	0.02	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	0.17	18.5	5.45

Concentrations reported in micrograms per liter.

100 Constituent concentration exceeds Chapter NR 140 Preventative Action Limit (PAL).

100 Constituent concentration exceeds Chapter NR 140 Enforcement Standard (ES).

VOC Volatile organic compound.

Table 1. Groundwater VOC Analytical Results, Norman Getz Property, West Allis, Wisconsin.

Well Identification	MW-4			MW-5			MW-6			MW-7	
	11/28/01	2/1/02	7/26/02	11/28/01	2/1/02	7/26/02	11/28/01	2/1/02	7/26/02	2/1/02	7/26/02
Benzene	<0.5	<0.5	<0.5	<0.5	5.82	15.7	<0.5	<0.5	<0.5	<0.5	<0.5
cis-1,2-Dichloroethene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
trans-1,2-Dichloroethene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Tetrachloroethene	3.97	3.90	4.34	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Trichloroethene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17

Concentrations reported in micrograms per liter.

100 Constituent concentration exceeds Chapter NR 140 Preventative Action Limit (PAL).

100 Constituent concentration exceeds Chapter NR 140 Enforcement Standard (ES).

VOC Volatile organic compound.

Table 1. Groundwater VOC Analytical Results, Norman Getz Property, West Allis, Wisconsin.

Well Identification	MW-8		MW-9		MW-10	PZ-1	
	2/1/02	7/26/02	2/1/02	7/26/02	7/26/02	2/1/02	7/26/02
Benzene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
cis-1,2-Dichloroethene	<0.5	<0.5	<0.5	<0.5	3.7	<0.5	<0.5
trans-1,2-Dichloroethene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Tetrachloroethene	<0.5	<0.5	<0.5	<0.5	1,070	<0.5	4.30
Trichloroethene	<0.5	<0.5	<0.5	<0.5	5.19	<0.5	<0.5
Vinyl chloride	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17

Concentrations reported in micrograms per liter.

100 Constituent concentration exceeds Chapter NR 140 Preventative Action Limit (PAL).

1,070 Constituent concentration exceeds Chapter NR 140 Enforcement Standard (ES).

VOC Volatile organic compound.

Table 2. Pilot Test Groundwater Analytical Results, Norman Getz Property, West Allis, Wisconsin.

Well Identification Sample Date	NR 140	NR 140	MW-3 (Pre-Injection)				MW-3 (Post-Injection)
	ES	PAL	11/28/01	2/1/02	7/26/02	9/4/03	12/3/03
VOCs							
Benzene	5	0.5	<0.5	<0.5	<0.5	<25	<64
cis-1,2-Dichloroethene	70	7	121	185	229	230	24,000
trans-1,2-Dichloroethene	100	20	1.95	3.44	2.7	<50	610
Tetrachlorethene	5	0.5	16,500	17,800	14,300	13,000	2,900
Trichloroethene	5	0.5	35.6	46.6	65.4	100	2,200
Vinly chloride	0.2	0.02	0.17	18.5	5.45	<25	<64
Dissolved Gases							
Ethane (ng/L)	NA	NA	NM	NM	NM	3200	1600
Ethene (ng/L)	NA	NA	NM	NM	NM	2600	3800
Methane	NA	NA	NM	NM	NM	0.75	81
Field Parameters							
Dissolved Oxygen (mg/L)	NA	NA	NM	NM	NM	0.08	0.07
ORP (mV)	NA	NA	NM	NM	NM	-34	-304.7

All units reported in micrograms per liter (µg/L) unless otherwise indicated.

100 Constituent concentration exceeds Chapter NR 140 Preventative Action Limit (PAL).

24,000 Constituent concentration exceeds Chapter NR 140 Enforcement Standard (ES).

- mg/L Milligrams per liter.
- mV Millivolts.
- ng/L Nanograms per liter.
- NA Not applicable.
- NM Not measured.
- ORP Oxidation-reduction potential.

Table 2. Pilot Test Groundwater Analytical Results, Norman Getz Property, West Allis, Wisconsin.

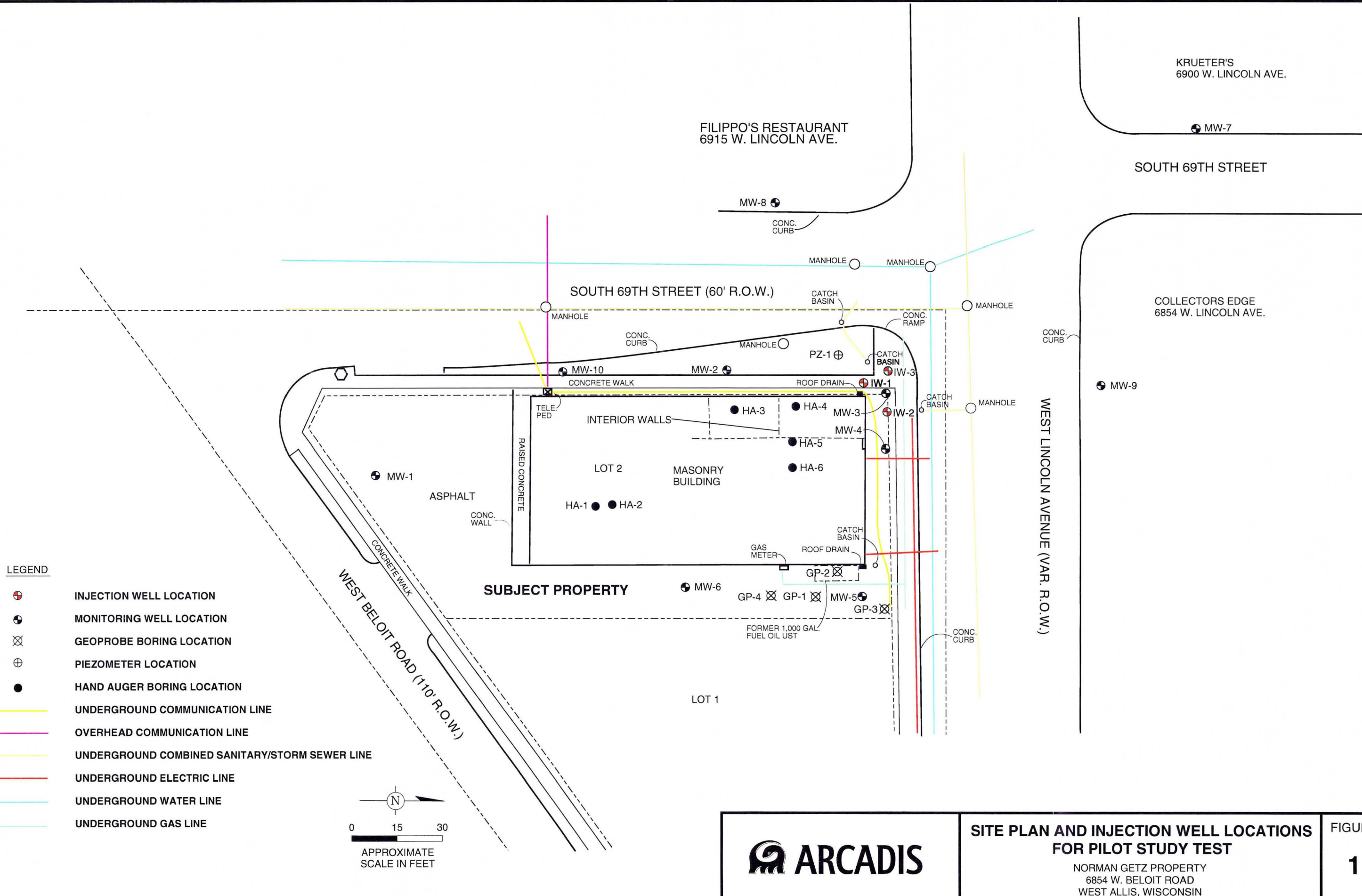
Well Identification Sample Date	MW-4 (Pre-Injection)				MW-4 (Post-Injection)
	11/28/01	2/1/02	7/26/02	9/4/03	12/3/03
VOCs					
Benzene	<0.5	<0.5	<0.5	<0.25	0.58
cis-1,2-Dichloroethene	<0.5	<0.5	<0.5	0.72	0.74
trans-1,2-Dichloroethene	<0.5	<0.5	<0.5	<0.5	<0.5
Tetrachlorethene	3.97	3.90	4.34	15	6.2
Trichloroethene	<0.5	<0.5	<0.5	0.47	0.44
Vinyl chloride	<0.17	<0.17	<0.17	<0.25	<0.2
Dissolved Gases					
Ethane (ng/L)	NM	NM	NM	14	68
Ethene (ng/L)	NM	NM	NM	15	48
Methane	NM	NM	NM	2.7	15
Field Parameters					
Dissolved Oxygen (mg/L)	NM	NM	NM	0.05	0.31
ORP (mV)	NM	NM	NM	-116.2	-34

All units reported in micrograms per liter (µg/L) unless otherwise indicated.

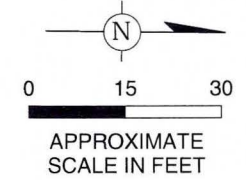
100 Constituent concentration exceeds Chapter NR 140 Preventative Action Limit (PAL).

15 Constituent concentration exceeds Chapter NR 140 Enforcement Standard (ES).

- mg/L Milligrams per liter.
- mV Millivolts.
- ng/L Nanograms per liter.
- NA Not applicable.
- NM Not measured.
- ORP Oxidation-reduction potential.



- LEGEND**
- INJECTION WELL LOCATION
 - MONITORING WELL LOCATION
 - GEOPROBE BORING LOCATION
 - PIEZOMETER LOCATION
 - HAND AUGER BORING LOCATION
 - UNDERGROUND COMMUNICATION LINE
 - OVERHEAD COMMUNICATION LINE
 - UNDERGROUND COMBINED SANITARY/STORM SEWER LINE
 - UNDERGROUND ELECTRIC LINE
 - UNDERGROUND WATER LINE
 - UNDERGROUND GAS LINE



	<p>SITE PLAN AND INJECTION WELL LOCATIONS FOR PILOT STUDY TEST</p> <p>NORMAN GETZ PROPERTY 6854 W. BELOIT ROAD WEST ALLIS, WISCONSIN</p>	<p>FIGURE 1</p>
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Route to: Watershed/Wastewater Waste Management
Remediation/Redevelopment Other

Facility/Project Name Norman Getz/WI001027.0001			License/Permit/Monitoring Number		Boring Number IW-1
Boring Drilled By: Name of crew chief (first, last) and Firm First Name B. J. and James Last Name Firm Giles Engineering			Date Drilling Started 5/29/03	Date Drilling Completed 5/29/03	Drilling Method Hollow Stem Auger
WI Unique Well No.	DNR Well ID No.	Well Name IW-1	Final Static Water Level _____ Feet	Surface Elevation NE Feet MSL	Borehole Diameter 8.25 inches
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/>) or Boring Location <input type="checkbox"/> State Plane _____ N, _____ E S <input type="checkbox"/> /C <input type="checkbox"/> /N <input type="checkbox"/> Lat _____ <input type="checkbox"/> N <input type="checkbox"/> E			Local Grid Location _____ Feet <input type="checkbox"/> S _____ Feet <input type="checkbox"/> W		
NE 1/4 of NW 1/4 of Section 10 , T 6 N, R 21 <input checked="" type="checkbox"/> E <input type="checkbox"/> W			Long _____		

Facility ID	County Milwaukee	County Code 41	Civil Town/City/or Village West Allis
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Sample Number and Type	Length All. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
									Compressive Strength	Moisture Content	Liquid Limit	Plastic Limit	P 200	
1			0	Blind drill.										
2	0	3,3	2	No recovery, probable rock.										
3	0	3,5,6	4	No recovery, little concrete, probable rock.										
4	5	3,4,5	6	1.5": Fine to medium sand, wet, 3" clay, brown to gray.										
5	1.5	2,2,3 5	8	1.5": Clay, brown to gray.										
			10	Clay with seam, gray with coarse gravel.										

I hereby certify that the information on this form is true and correct to the best of my knowledge.


Signature *James Bannante* Firm **ARCADIS**
126 N. Jefferson St. Suite 400
Milwaukee, Wisconsin 53202 (414-276-7742)

This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between \$10 and \$25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

Route to: Watershed/Wastewater Waste Management
Remediation/Redevelopment Other

Facility/Project Name Norman Getz/WI001027.0001			License/Permit/Monitoring Number		Boring Number IW-2
Boring Drilled By: Name of crew chief (first, last) and Firm First Name B.J. and James Last Name Firm Giles Engineering			Date Drilling Started 5/29/03	Date Drilling Completed 5/29/03	Drilling Method Hollow Stem Auger
WI Unique Well No.	DNR Well ID No.	Well Name IW-2	Final Static Water Level _____ Feet	Surface Elevation NE Feet MSL	Borehole Diameter 8.25 inches
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/>) or Boring Location <input type="checkbox"/> State Plane _____ N, _____ E S <input type="checkbox"/> /C <input type="checkbox"/> /N <input type="checkbox"/> Lat _____ NE 1/4 of NW 1/4 of Section 10 , T 5 N,R 21 <input checked="" type="checkbox"/> E <input type="checkbox"/> W Long _____			Local Grid Location _____ Feet <input type="checkbox"/> N _____ Feet <input type="checkbox"/> E _____ Feet <input type="checkbox"/> S _____ Feet <input type="checkbox"/> W		

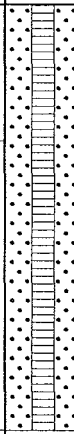
Facility ID	County Milwaukee	County Code 41	Civil Town/City/or Village West Allis
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Sample Number and Type	Length All. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties						RQD/ Comments
									Compressive Strength	Moisture Content	Liquid Limit	Plastic Limit	P 200		
1	24	2,4,4 6	0	2" topsoil; 4" black fine and medium sand with organic and trace clay; 6" sand mixed with clay and fine to medium gravel; 3" clay mixed coarse gravel.											
2	12	3,5,5,6	2	4" Sandy clay mixed with organics; 4" black and brown clay with fine sand; 4" orangish to brown clay mixed with fine to medium coarse sand, base is gray.											
3	12	3,3,4 5	4	2" fine gray sand mixed coarse gravel; fine sand; trace clay.											
4	9	3,7,5 6	6	Fine, medium, and coarse sand, trace silt, gray clay, trace shale rock.											
5	12	2,3,5 7	8	Brown to gray clay, silt, mixed with fine sand and gravel.											
			10	Same as above, wet.											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature: *James E. Bannantone* Firm: **ARCADIS**
126 N. Jefferson St. Suite 400
Milwaukee, Wisconsin 53202 (414-276-7742)

This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between \$10 and \$25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

Sample		Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length All. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plastic Limit	P 200	
6	24	2,5,7,7	12	Same as above, wet.										
7	24	4,6,7,7	14											
				15	END OF BORING AT 15'									
				16										
				18										
				20										
				22										
				24										
				26										
				28										

Route to: Watershed/Wastewater Waste Management
Remediation/Redevelopment Other

Facility/Project Name Norman Getz/WI001027.0001			License/Permit/Monitoring Number		Boring Number IW-3
Boring Drilled By: Name of crew chief (first, last) and Firm First Name B. J. and James Last Name Firm Giles Engineering			Date Drilling Started 5/29/03	Date Drilling Completed 5/29/03	Drilling Method Hollow Stem Auger
WI Unique Well No.	DNR Well ID No.	Well Name IW-3	Final Static Water Level _____ Feet	Surface Elevation NE Feet MSL	Borehole Diameter 8.25 inches
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/>) or Boring Location <input type="checkbox"/> State Plane _____ N, _____ E S <input type="checkbox"/> /C <input type="checkbox"/> /N <input type="checkbox"/> Lat _____ NE 1/4 of NW 1/4 of Section 10 , T 6 N, R 21 <input checked="" type="checkbox"/> E <input type="checkbox"/> W Long _____			Local Grid Location _____ Feet <input type="checkbox"/> N _____ Feet <input type="checkbox"/> E _____ Feet <input type="checkbox"/> S _____ Feet <input type="checkbox"/> W		

Facility ID	County Milwaukee	County Code 41	Civil Town/City/or Village West Allis
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Sample Number and Type	Length All. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/Comments
									Compressive Strength	Moisture Content	Liquid Limit	Plastic Limit	P 200	
1	5	2,3	0	Coarse to fine grain sand with clay.										
2	5	1,2,4	2	Dark brown clay mixed with fine and coarse sand with light brown silty clay.										
3	5	2,2,5,4	4	Silt, brown sand with trace clay.										
4	18	2,3,4,4	6	6" Coarse to fine sand, wet, 6" gray clay with silt to coarse sand.										
5	21	1,2,2,5	8	8" coarse to fine sand with clay, 6" brown gray clay with sand, wet.										
			10	Brown, gray clay with trace sand.										

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature <i>James E. Barwantine</i>	Firm ARCADIS 126 N. Jefferson St. Suite 400 Milwaukee, Wisconsin 53202 (414-276-7742)
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This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between \$10 and \$25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

Facility/Project Name Norman Getz/WI001027.0001		Local Grid Location of Well _____ ft. <input type="checkbox"/> N. _____ ft. <input type="checkbox"/> E. _____ ft. <input type="checkbox"/> S. _____ ft. <input type="checkbox"/> W.		Well Name IW-1	
Facility License, Permit or Monitoring Number		Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/>) or Well Location <input type="checkbox"/>		Wis. Unique Well Number	
Facility ID		Lat. _____ Long. _____ or St. Plane _____ ft. N, _____ ft. E		DNR Well Number	
Type of Well		Section Location of Waste/Source NE 1/4 of NW 1/4 of Sec. 10 T. 6 N, R. 21 <input checked="" type="checkbox"/> E. <input type="checkbox"/> W.		Date Well Installed 5/29/03	
Well Code		Location of Well Relative to Waste/Source u <input type="checkbox"/> Upgradient s <input type="checkbox"/> Sidegradient d <input checked="" type="checkbox"/> Downgradient n <input type="checkbox"/> Not Known		Well Installed By: Name (first, last) and Firm Gile Engineering	
Distance from Waste/ Source _____ ft.	Enf. Stds. Apply <input type="checkbox"/>	Gov. Lot #			

- A. Protective pipe, top elevation _____ ft. MSL
- B. Well casing, top elevation _____ ft. MSL
- C. Land surface elevation **NE** ft. MSL
- D. Surface seal, bottom _____ ft MSL or **1.0** ft.

12. USCS classification of soil near screen:
 GP GM GC GW SW SP
 SM SC ML MH CL CH
 Bedrock

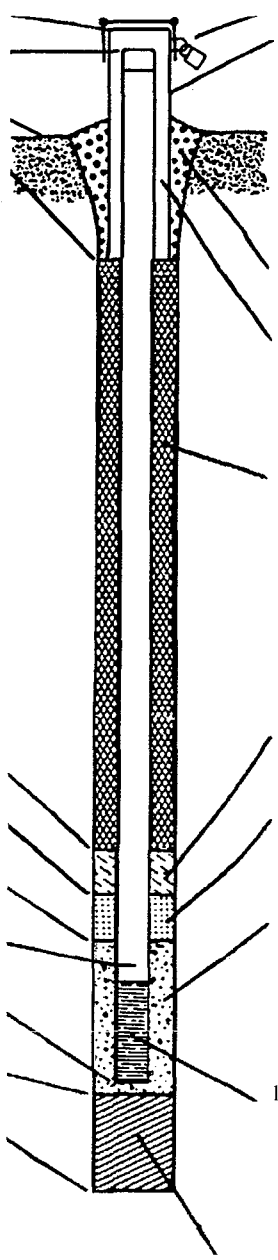
13. Sieve analysis attached? Yes No

14. Drilling method used: Rotary 50
 Hollow Stem Auger 41
 Other

15. Drilling fluid used: Water 02 Air 01
 Drilling Mud 03 None 99

16. Drilling additives used? Yes No
 Describe _____

17. Source of Water (attach analysis if required):



- 1. Cap and lock? Yes No
- 2. Protective cover pipe:
 - a. Inside diameter: **4.2** in.
 - b. Length: **1** ft.
 - c. Material: Steel 04
Other
 - d. Additional protection? Yes No
If yes, describe: _____
- 3. Surface seal: Bentonite 30
Concrete 01
Other
- 4. Material between well casing and protective pipe: Bentonite 30
Annular space seal
None Other
- 5. Annular space seal: a. Granular Bentonite 33
b. _____ Lbs/gal mud weight... Bentonite-sand slurry 35
c. _____ Lbs/gal mud weight.... Bentonite slurry 31
d. _____ % Bentonite..... Bentonite-cement grout 50
e. _____ Ft³ volume added for any of the above
- f. How installed: Tremie 01
Tremie pumped 02
Gravity 08
- 6. Bentonite seal: a. Bentonite granules 33
b. 1/4 in. 3/8 in. 1/2 in. Bentonite pellets 32
c. Other
- 7. Fine sand Material: Manufacturer, product name & mesh size
a. **Red Flint**
b. Volume added _____ ft³
- 8. Filter pack material: Manufacturer, product name and mesh size
a. **Red Flint**
b. Volume added _____ ft³
- 9. Well casing: Flush threaded PVC schedule 40 23
Flush threaded PVC schedule 80 24
Other
- 10. Screen material: **PVC**
a. Screen type: Factory cut 11
Continuous slot 01
Other
b. Manufacturer _____
c. Slot size: **.10** in.
d. Slotted length: **10** ft.
- 11. Backfill material (below filter pack): None 14
Other

- E. Bentonite seal, top _____ ft. MSL or _____ ft.
- F. Fine sand, top _____ ft. MSL or **3.0** ft.
- G. Filter pack, top _____ ft. MSL or **4.0** ft.
- H. Screen joint, top _____ ft. MSL or **5.0** ft.
- I. Well bottom _____ ft. MSL or **15.0** ft.
- J. Filter pack, bottom _____ ft. MSL or **15.0** ft.
- K. Borehole bottom _____ ft. MSL or **15.0** ft.
- L. Borehole diameter **8.25** in.
- M. O.D. well casing **2.37** in.
- N. I.D. well casing **1.87** in.

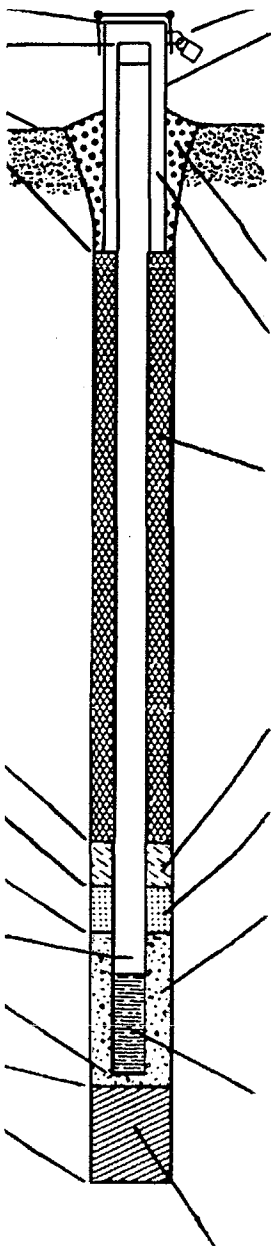
I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature *James E. Banuantine* Firm **ARCADIS**
126 N. Jefferson St. Suite 400
Milwaukee, WI 53202 414-276-7742

Please complete both Forms 4400-113A and 4400-113B and return them to the appropriate DNR office and bureau. Completion of these reports is required by chs. 160, 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with chs. 281, 289, 291, 292, 293, 295, and 299, Wis. Stats., failure to file these forms may result in a forfeiture of between \$10 and \$25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on these forms is not intended to be used for any other purpose. NOTE: See the instructions for more information, including where the completed forms should be sent.

Facility/Project Name Norman Getz/WI001027.0001		Local Grid Location of Well _____ ft. <input type="checkbox"/> N. _____ ft. <input type="checkbox"/> E. <input type="checkbox"/> S. _____ ft. <input type="checkbox"/> W.		Well Name IW-2	
Facility License, Permit or Monitoring Number		Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/>) or Well Location <input type="checkbox"/>		Wis. Unique Well Number	
Facility ID		Lat. _____ Long. _____ or St. Plane _____ ft. N, _____ ft. E		DNR Well Number	
Type of Well		Section Location of Waste/Source NE 1/4 of NW 1/4 of Sec. 10 T. 5 N.R. 21 <input checked="" type="checkbox"/> E. <input type="checkbox"/> W.		Date Well Installed 5/29/03	
Well Code _____		Location of Well Relative to Waste/Source u <input type="checkbox"/> Upgradient s <input type="checkbox"/> Sidegradient d <input checked="" type="checkbox"/> Downgradient n <input type="checkbox"/> Not Known		Well Installed By: Name (first, last) and Firm Giles Engineering	
Distance from Waste/ Source _____ ft.	Enf. Stds. Apply <input type="checkbox"/>	Gov. Lot # _____			

- A. Protective pipe, top elevation _____ ft. MSL
- B. Well casing, top elevation _____ ft. MSL
- C. Land surface elevation _____ **NE** ft. MSL
- D. Surface seal, bottom _____ ft MSL or **1.0** ft.



1. Cap and lock? Yes No
2. Protective cover pipe:
a. Inside diameter: **4.2** in.
b. Length: **1.0** ft.
c. Material: Steel 04
Other _____
d. Additional protection? Yes No
If yes, describe: _____
3. Surface seal: Bentonite 30
Concrete 01
Other _____
4. Material between well casing and protective pipe:
Bentonite 30
Annular space seal _____
None Other _____
5. Annular space seal:
a. Granular Bentonite 33
b. _____ Lbs/gal mud weight... Bentonite-sand slurry 35
c. _____ Lbs/gal mud weight... Bentonite slurry 31
d. _____ % Bentonite..... Bentonite-cement grout 50
e. _____ Ft³ volume added for any of the above
- f. How installed: Tremie 01
Tremie pumped 02
Gravity 08
6. Bentonite seal: a. Bentonite granules 33
b. 1/4 in. 3/8 in. 1/2 in. Bentonite pellets 32
c. _____ Other _____
7. Fine sand Material: Manufacturer, product name & mesh size
a. **Red Flint**
b. Volume added _____ ft³
8. Filter pack material: Manufacturer, product name and mesh size
a. **Red Flint Sand**
b. Volume added **.83** ft³
9. Well casing: Flush threaded PVC schedule 40 23
Flush threaded PVC schedule 80 24
Other _____
10. Screen material: **PVC**
a. Screen type: Factory cut 11
Continuous slot 01
Other _____
b. Manufacturer _____
c. Slot size: **.10** in.
d. Slotted length: **10** ft.
11. Backfill material (below filter pack): None 14
Other _____

12. USCS classification of soil near screen:
GP GM GC GW SW SP
SM SC ML MH CL CH
Bedrock

13. Sieve analysis attached? Yes No

14. Drilling method used: Rotary 50
Hollow Stem Auger 41
Other _____

15. Drilling fluid used: Water 02 Air 01
Drilling Mud 03 None 99

16. Drilling additives used? Yes No
Describe _____

17. Source of Water (attach analysis if required):

- E. Bentonite seal, top _____ ft. MSL or _____ ft.
- F. Fine sand, top _____ ft. MSL or **3** ft.
- G. Filter pack, top _____ ft. MSL or **4** ft.
- H. Screen joint, top _____ ft. MSL or **5** ft.
- I. Well bottom _____ ft. MSL or **15** ft.
- J. Filter pack, bottom _____ ft. MSL or **15** ft.
- K. Borehole bottom _____ ft. MSL or **15** ft.
- L. Borehole diameter **8.25** in.
- M. O.D. well casing **2.37** in.
- N. I.D. well casing **1.87** in.

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature
James E Bannanture

Firm **ARCADIS**
126 N. Jefferson St. Suite 400
Milwaukee, WI 53202 414-276-7742

Facility/Project Name Norman Getz/WI001027.0001		Local Grid Location of Well ft. <input type="checkbox"/> N. <input type="checkbox"/> E. <input type="checkbox"/> S. <input type="checkbox"/> W.		Well Name IW-3	
Facility License, Permit or Monitoring Number		Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/>) or Well Location <input type="checkbox"/>		Wis. Unique Well Number	
Facility ID		Lat. _____ Long. _____ or		DNR Well Number	
Type of Well		St. Plane _____ ft. N, _____ ft. E		Date Well Installed 5/29/03	
Well Code _____		Section Location of Waste/Source NE 1/4 of NW 1/4 of Sec. 10 T. 6 N.R. 21 <input checked="" type="checkbox"/> E. <input type="checkbox"/> W.		Well Installed By: Name (first, last) and Firm Giles Engineering	
Distance from Waste/ Source _____ ft.		Enf. Stds. Apply <input type="checkbox"/>		Location of Well Relative to Waste/Source u <input type="checkbox"/> Upgradient s <input type="checkbox"/> Sidegradient d <input checked="" type="checkbox"/> Downgradient n <input type="checkbox"/> Not Known	

- A. Protective pipe, top elevation _____ ft. MSL
- B. Well casing, top elevation _____ ft. MSL
- C. Land surface elevation **NE** ft. MSL
- D. Surface seal, bottom _____ ft MSL or **1.0** ft.

12. USCS classification of soil near screen:
 GP GM GC GW SW SP
 SM SC ML MH CL CH
 Bedrock

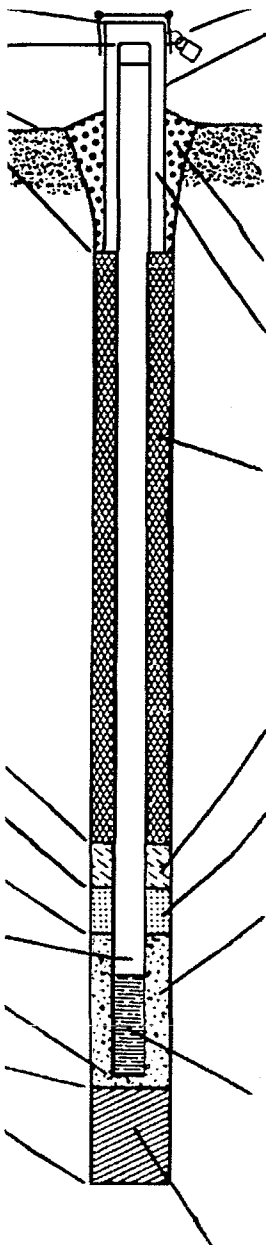
13. Sieve analysis attached? Yes No

14. Drilling method used: Rotary 50
 Hollow Stem Auger 41
 Other

15. Drilling fluid used: Water 02 Air 01
 Drilling Mud 03 None 99

16. Drilling additives used? Yes No
 Describe _____

17. Source of Water (attach analysis if required):



- 1. Cap and lock? Yes No
- 2. Protective cover pipe:
 - a. Inside diameter: **4.2** in.
 - b. Length: **1.0** ft.
 - c. Material: Steel 04
Other
 - d. Additional protection? Yes No
If yes, describe: _____
- 3. Surface seal: Bentonite 30
Concrete 01
Other
- 4. Material between well casing and protective pipe: Bentonite 30
Annular space seal
None Other
- 5. Annular space seal: a. Granular Bentonite 33
b. _____ Lbs/gal mud weight... Bentonite-sand slurry 35
c. _____ Lbs/gal mud weight... Bentonite slurry 31
d. _____ % Bentonite..... Bentonite-cement grout 50
e. _____ Ft³ volume added for any of the above
- f. How installed: Tremie 01
Tremie pumped 02
Gravity 08
- 6. Bentonite seal: a. Bentonite granules 33
b. 1/4 in. 3/8 in. 1/2 in. Bentonite pellets 32
c. _____ Other
- 7. Fine sand Material: Manufacturer, product name & mesh size
a. **Red Flint**
b. Volume added _____ ft³
- 8. Filter pack material: Manufacturer, product name and mesh size
a. **Red Flint**
b. Volume added _____ ft³
- 9. Well casing: Flush threaded PVC schedule 40 23
Flush threaded PVC schedule 80 24
Other
- 10. Screen material: **PVC**
a. Screen type: Factory cut 11
Continuous slot 01
Other
b. Manufacturer _____
c. Slot size: **.10** in.
d. Slotted length: **10** ft.
- 11. Backfill material (below filter pack): None 14
Other

- E. Bentonite seal, top _____ ft. MSL or _____ ft.
- F. Fine sand, top _____ ft. MSL or **2.5** ft.
- G. Filter pack, top _____ ft. MSL or **3.0** ft.
- H. Screen joint, top _____ ft. MSL or **4.5** ft.
- I. Well bottom _____ ft. MSL or **14.5** ft.
- J. Filter pack, bottom _____ ft. MSL or **14.5** ft.
- K. Borehole bottom _____ ft. MSL or **14.5** ft.
- L. Borehole diameter **8.25** in.
- M. O.D. well casing **2.37** in.
- N. I.D. well casing **1.87** in.

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature <i>James E. Bannantine</i>	Firm ARCADIS 126 N. Jefferson St. Suite 400 Milwaukee, WI 53202 414-276-7742
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