

March 22, 2006

Mr. William A. Hartman  
GW Partners, LLC  
P.O. Box 97  
Neenah, Wisconsin 54957-0097

Re: Results of Dewatering Pad Blinding Investigation, Fox River OU1, North Lake Street, Neenah,  
Wisconsin -- STS Project No. 4-29316A

Dear Mr. Hartman:

STS Consultants, Ltd. (STS) has prepared this letter-report documenting our observations of the 2006 dewatering pad blinding investigation at the Fox River OU1 project located in the town of Menasha, Wisconsin. The objective of the investigation is to assess the clogging/blinding of the gravel pore space and drain pipe due to dewatered river sediments and/or biological growth. Blinding of the surface gravel was first observed in the dewatering pad at locations that received the majority of the geotextile tube filtrate. Subsequent failures of five geotextile tubes released additional sediment onto the dewatering pad, which increased the magnitude and lateral extent of the pad blinding and potentially the depth of blinding. This letter-report provides background information on the dewatering pad, discusses the investigation, and provides recommendation to be implemented based on the investigation.

### **Background**

The dewatering pad area is approximately 510 feet by 410 feet surrounded by containment berms. The pad and berms are lined with a composite barrier layer consisting of compacted clay subgrade, a geosynthetic clay liner, 30-mil PVC geomembrane, and 20-ounce per square yard non-woven geotextile. A minimum 2-foot thickness of 2.5-inch crushed limestone drainage layer covers the liner to protect it from vehicle traffic and provides storage volume for flow equalization into the water treatment plant, stormwater retention, and spill containment. A 6-inch-thick layer of 0.75-inch gravel overlays the stone drainage layer -- providing a base suitable for supporting the geotextile tubes and acting as a filter for sediment solids. As designed, sediment solids associated with geotextile tube filtrate, spills, and load-out operation accumulate in the surface of the dewatering pad gravel and stone layers. An excessive accumulation of solids in the gravel and stone can inhibit the free passage of water through either or both layers. The objective of this investigation is to visually observe and assess the pad and pipe clogging/blinding.

### **Investigation**

The investigation consisted of excavating test pits into the stone drainage layer at various locations across the pad, jet cleaning the 18-inch drain pipe, and video inspecting the drain pipe. A total of 16 test pits were excavated by JF Brennan Company, Inc. on March 16, 2006. The original plan called for excavation of seven deep test pits to the base liner system and seven shallow test pits. The deep test pits were to be excavated to within 1 foot of the base liner with an excavator and the final foot of excavation conducted by hand. The goal was to observe the depth and volume of sediment that has accumulated on the base liner system in 2004 and 2005. The seven shallow test pits were to be excavated through the 0.75-inch gravel into the crushed stone layer to observe sediment that accumulated in the gravel layer and see if any has accumulated in the crushed stone layer.

Jet cleaning and video inspection services were completed by Green Bay Pipe & TV Contractors, LLC (Green Bay Pipe & TV) on March 16, 2006. The 18-inch diameter dewatering pad drain pipe was jetted and video-inspected as part of the dewatering pad investigation. The investigation plan called for STS to

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observe the jetting and attempt to assess the volume of sediment that has accumulated in the pipe by measuring the volume of sediment in the sump before and after the jetting operation. Although the original plan did not include video inspection of the dewatering pad drain pipe, it was completed following the jetting of the drain pipe.

STS personnel were on site to observe, log, and document the test pits, jet cleaning, and video inspection. Staff from the Wisconsin Department of Natural Resources, Boldt Technical Services, Natural Resource Technology, CH2M-Hill, Inc., and GW Partners, Inc. were also present at the site observing the test pit excavations, jet cleaning, and video inspection.

### **Observations**

In general, the investigation to assess the clogging/blinding of the dewatering pad showed that sediment solids associated with geotextile tube filtrate, spills, and load-out operation have accumulated in the 6-inch-thick, 0.75-inch gravel layer overlaying the stone drainage layer. The sediment solids have collected in the gravel layer, with the gravel layer acting as a filter trapping the sediment solids and preventing them from clogging the stone drainage layer.

Fines observed in the 2.5-inch stone drainage layer consist mainly of "quarry fines." However, these areas appear to be isolated rather than pervasive. It should be noted that these quarry fines, where observed, were within the coarse material with cleaner stone above and below. The fines have not been displaced to the lower portions of the dewatering pad, suggesting that although the particles are clearly silt to fine sand in size, they are not mobile and are not clogging the dewatering pad.

During test pit excavations, water was observed in the stone drainage layer. The depth of water ranged from 0 foot as observed in Test Pit 2S along the north berm to approximately 1.5 feet as observed in Test Pits 1D and 1D-A. In Test Pits 6D and 9D, the water level was observed to be at or slightly below the invert elevation. However, in Test Pit 1D-B at the end of the 18-inch diameter drain pipe, the water level was approximately 6 inches above the invert elevation of the pipe.

In the test pits, the water was observed to be cloudy due to the crusher dust in the stone. However, the material settled out quickly. In Test Pit 1D, the Green Bay Pipe & TV vacuum truck was used in an attempt to dewater the excavation. However, the vacuum truck was unable to keep up with the water flowing in the stone. In addition, the water flowing through the stone into the excavation was observed to be clear. The water elevation was measured at four locations along the approximate alignment of the drain pipe. From east to west the water elevation in the pad drops from approximately +741.50 feet at Test Pit 1D to +739.50 feet. Test Pits 6D and 9D were excavated along the pipe alignment on either side of the haul road and there was a significant difference in the water level. The water level in 6D was +741.28 feet and +740.48 feet in 9D.

Observation of the sump prior to jetting of the 18-inch drain pipe showed very little sediment in the bottom of the sump, less than 1/2 inch of sediment build-up in locations where there was sediment in the sump, and approximately 20% of the bottom of the sump did not have any sediment. Prior to jetting, water flowing into the sump was observed to be clear, with no visible sediment. During the jetting operation, the water entering the sump was also observed to be clear.

Following the jetting operation, Green Bay Pipe & TV was able to modify their video equipment and maneuver the camera around the two 45° bends in the pipe. They installed the smallest tracks they have for the camera and were able to steer around the bends. Video taping of the pipe confirmed the lack of sediment and showed clear water running through the pipe. In addition, the video also showed some biological growth on the top and sides of the interior of the pipe. However, the growth did not appear to



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impede water entering into or flowing in the pipe. The video shows that approximately the last 100 feet of the pipe (eastern end) slopes to the east, away from the collection sump. This was confirmed by the test pit data and pipe elevations. The top of pipe at the end cap is +742.29 feet and the top of pipe at Test Pit 6D is +742.47 feet.

### **Conclusions and Recommendations**

Based on our field observations, STS believes that the 0.75-inch gravel layer is functioning, as designed, as a gravel filter, preventing sediments from migrating into and clogging the stone drainage layer. We recommend a targeted removal of the 0.75-inch gravel layer that contains a significant fraction of sediment and does not allow for the free flow water. This gravel can either be washed on site to remove the sediments or replaced. If the gravel is replaced, the impacted gravel can be use on-site as the foundation material for the thickeners or improvements to the haul road within the dewatering pad. We estimate that up to 3,000 cubic yards of material may have to be washed or replaced.

Based on our field observations, there is concern over the difference in water level on the east and west sides of the haul road. Test Pits 6D and 9D were approximately 55 feet apart and there is a 0.8-foot head difference in the water elevation. We recommend that an additional test pit along the alignment of the pipe be excavated beneath the haul road to determine the cause of the water buildup to the east of the road.

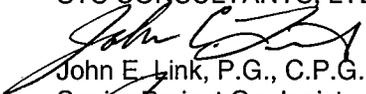
Based on our field observations, the dewatering pad drain pipe appears to be functioning as designed. Sediment was not observed in the pipe and the pipe freely flows water. There is some biological growth on the top surface of the inside of the pipe. However, we do not believe that the biological growth is clogging the pipe or impeding the flow of water into the pipe. We recommend that the water flowing into the sump be periodically monitored during the 2006 dredging season and, if it appears that biological growth is impacting the flow of water into the sump, that the pipe be re-jetted and cleaned, as necessary.

Based on the video inspection and survey measurements of the drain pipe, the last 100 feet of drain pipe slopes at a -0.18% slope. There is a high spot in the pipe that was likely created during the stone drainage layer placement. Although the pipe slopes in the wrong direction, the base grades of the dewatering pad are constructed correctly and drain to the west. We do not believe it is worth the risk to the base liner system or the cost to reset the pipe to its design grade.

If you have any questions regarding the observations, recommendations, or the project in general, please contact Mr. John Trast at STS.

Sincerely,

STS CONSULTANTS, LTD.



John E. Link, P.G., C.P.G.  
Senior Project Geologist



John M. Trast, P.E.  
Senior Project Engineer

JEL/tjs

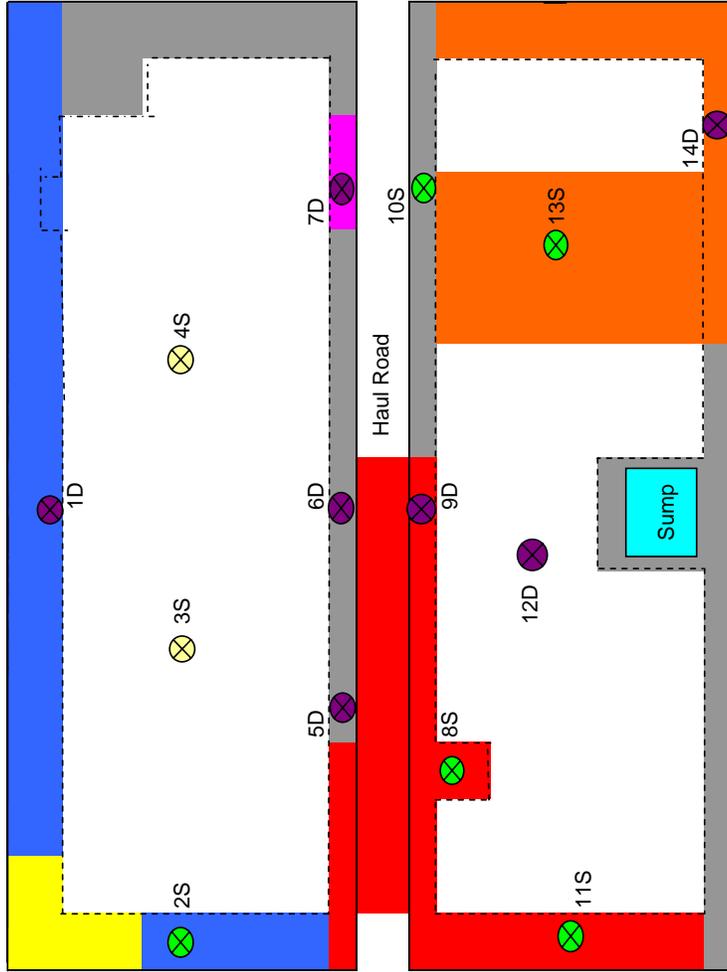
GW Partners, LLC.  
STS Project No. 4-29316A  
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Attachments:

Schematic Test Pit Map  
Soil Boring Log Information and Notes  
Elevation Spreadsheet  
Test Pit Photographic Log



Figure 6  
 Summary of Affected Areas and  
 Dewatering Pad Investigation Locations



- Shallow sampling location (depth = 1 foot minimum)
- Shallow sampling location (normally operated tube; depth = 1 ft min.)
- Deep sampling location (depth = liner or pipeline)
- Maximum geotextile tube footprint
- Affected Area - Bag 12
- Affected Area - Brad 1
- Affected Area - Bag B11
- Affected Area - Bag NEB-1
- Affected Area - Bag B-M6
- Areas affected by normal dewatering operations

Elevations  
 Fox River OU1  
 March 16, 2006

Instrument Height: 755.02

Location	Measurement #	Foreshot	Elevation
1D - Surface	1	8.95	746.07
1D - Water Level	1	13.47	741.55
	2	13.55	741.47
6D - Top of Pipe	1	12.55	742.47
6D - Water Level	1	13.74	741.28
9D - Top of Pipe	1	13.08	741.94
9D - Water Level	1	14.54	740.48
	2	14.55	740.47
Sump - Bottom	1	17.63	737.39
Sump - Top of Pipe <sup>1</sup>	1	2.4	739.79
Sump - Btm of Pipe <sup>2</sup>	1	1.5	738.29
Sump - Water Level <sup>3</sup>	1	15.58	739.44
	2	15.50	739.52
End of Drain Pipe	1	12.73	742.29
Water Level at North End Pipe	1	13.73	741.29

Notes:

- <sup>1</sup> - Top of pipe approximated from bottom of sump as 28" (~2.4 feet).
- <sup>2</sup> - Bottom of pipe approximated by subtracting 1.5 feet from calculated top of pipe.
- <sup>3</sup> - Sump water level measured with pumps shut off.

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

Facility/Project Name <b>Pad Blinding Investigation</b>			License/Permit/Monitoring Number		Boring Number <b>1D</b>	
Boring Drilled By: Name of crew chief (first, last) and Firm <b>STS Project No. 29316A</b>			Date Drilling Started <b>3/16/2006</b>		Date Drilling Completed <b>3/16/2006</b>	
Drilling Method <b>backhoe</b>			Final Static Water Level <b>Feet MSL</b>		Surface Elevation <b>746.1 Feet MSL</b>	
WI Unique Well No.		DNR Well ID No.	Common Well Name <b>1D</b>		Borehole Diameter <b>inches</b>	
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/> ) or Boring Location <input type="checkbox"/>			Local Grid Location			
State Plane <b>N, E S/C/N</b>			Lat _____ "			<input type="checkbox"/> N <input type="checkbox"/> E
1/4 of _____ 1/4 of Section _____, T _____ N, R _____			Long _____ "			Feet <input type="checkbox"/> S <input type="checkbox"/> W
Facility ID		County <b>Brown</b>		County Code <b>5</b>	Civil Town/City/ or Village <b>Green Bay</b>	

Sample Number and Type	Length Att. & 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	Plasticity Index	P 200		
			0.75	0.75-inch washed stone with trace fines											
			1.0	2.5-inch stone with trace fines											
			2.0												
			3.0												
			4.0												
			5.0												
			6.0	Liner encountered by hand excavation from 4.5 to 6.0 feet  End of Boring. Boring advanced from 0.0 feet to 5.0 feet by backhoe.											

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

Signature	Firm <b>STS Consultants</b> 1035 Kepler Drive Green Bay, Wisconsin 54311	Tel: 920-468-1978 Fax: 920-468-3312
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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.

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

Facility/Project Name <b>Pad Blinding Investigation</b>			License/Permit/Monitoring Number		Boring Number <b>1D-A</b>		
Boring Drilled By: Name of crew chief (first, last) and Firm <b>STS Project No. 29316A</b>			Date Drilling Started <b>3/16/2006</b>		Date Drilling Completed <b>3/16/2006</b>		
Drilling Method <b>backhoe</b>			Final Static Water Level <b>Feet MSL</b>		Surface Elevation <b>746.1 Feet MSL</b>		
WI Unique Well No.		DNR Well ID No.	Common Well Name <b>1D-A</b>		Borehole Diameter <b>inches</b>		
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/> ) or Boring Location <input type="checkbox"/>			Local Grid Location				
State Plane <b>N, E S/C/N</b>			Lat <b>_____</b> ° <b>_____</b> ' <b>_____</b> "				
1/4 of <b>_____</b> 1/4 of Section <b>_____</b> , T <b>_____</b> N, R <b>_____</b>			Long <b>_____</b> ° <b>_____</b> ' <b>_____</b> "				
Facility ID		County <b>Brown</b>		County Code <b>5</b>		Civil Town/City/ or Village <b>Green Bay</b>	

Sample Number and Type	Length Att. & 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	Plasticity Index	P 200		
			0.75	0.75-inch washed stone with trace fines											
			1.00	2.5-inch stone with trace fines											
			1.25												
			1.50												
			1.75												
			2.00												
			2.25												
			2.50												
			2.75												
			3.00												
			3.25												
			3.50												
			3.75												
			4.00												
			4.25												
			4.50												
			4.75												
			5.00	End of Boring. Boring advanced from 0.0 feet to 5.0 by backhoe.											

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Signature \_\_\_\_\_ Firm **STS Consultants** Tel: 920-468-1978  
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Route To: Watershed/Wastewater  Waste Management   
Remediation/Redevelopment  Other

Facility/Project Name <b>Pad Blinding Investigation</b>			License/Permit/Monitoring Number		Boring Number <b>1D-B</b>	
Boring Drilled By: Name of crew chief (first, last) and Firm <b>STS Project No. 29316A</b>			Date Drilling Started <b>3/16/2006</b>		Date Drilling Completed <b>3/16/2006</b>	
Drilling Method <b>backhoe</b>			Final Static Water Level <b>Feet MSL</b>		Surface Elevation <b>746.1 Feet MSL</b>	
WI Unique Well No.	DNR Well ID No.	Common Well Name <b>1D-B</b>	Borehole Diameter <b>inches</b>			
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/> ) or Boring Location <input type="checkbox"/>			Local Grid Location			
State Plane <b>N, E S/C/N</b>			Lat _____ "		<input type="checkbox"/> N <input type="checkbox"/> E	
1/4 of _____ 1/4 of Section _____, T _____ N, R _____			Long _____ "		Feet <input type="checkbox"/> S <input type="checkbox"/> W	
Facility ID		County <b>Brown</b>	County Code <b>5</b>	Civil Town/City/ or Village <b>Green Bay</b>		

Sample Number and Type	Length Att. & 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	Plasticity Index	P 200		
			0.75	0.75-inch washed stone with trace fines											
			1.00	2.5-inch stone with trace fines											
			1.00	18-inch perforated drain pipe (top) at 742.29 feet											
			5.00	End of Boring. Boring advanced from 0.0 feet to 5.0 feet by backhoe.											

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

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

Facility/Project Name <b>Pad Blinding Investigation</b>			License/Permit/Monitoring Number		Boring Number <b>2S</b>		
Boring Drilled By: Name of crew chief (first, last) and Firm <b>STS Project No. 29316A</b>			Date Drilling Started <b>3/16/2006</b>		Date Drilling Completed <b>3/16/2006</b>		
Drilling Method <b>backhoe</b>			Final Static Water Level <b>Feet MSL</b>		Surface Elevation <b>746.1 Feet MSL</b>		
WI Unique Well No.		DNR Well ID No.	Common Well Name <b>2S</b>		Borehole Diameter <b>inches</b>		
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/> ) or Boring Location <input type="checkbox"/>			Local Grid Location				
State Plane <b>N, E S/C/N</b>			Lat <b>_____ ° _____ ' _____ "</b>				
1/4 of _____ 1/4 of Section _____, T _____ N, R _____			Long <b>_____ ° _____ ' _____ "</b>				
Facility ID		County <b>Brown</b>		County Code <b>5</b>		Civil Town/City/ or Village <b>Green Bay</b>	

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties						RQD/ Comments
									Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200		
			0.75	0.75-inch washed stone with trace fines											
			1.00	2.5-inch stone with trace fines											
			2.50	Liner material damaged during excavation. Repairs completed March 21, 2006.  End of Boring. Boring advanced from 0.0 feet to 2.5 feet by backhoe.											

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

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

Facility/Project Name <b>Pad Blinding Investigation</b>			License/Permit/Monitoring Number		Boring Number <b>3S</b>		
Boring Drilled By: Name of crew chief (first, last) and Firm <b>STS Project No. 29316A</b>			Date Drilling Started <b>3/16/2006</b>		Date Drilling Completed <b>3/16/2006</b>		
Drilling Method <b>backhoe</b>		WI Unique Well No.		DNR Well ID No.		Common Well Name <b>3S</b>	
Final Static Water Level <b>Feet MSL</b>		Surface Elevation <b>746.1 Feet MSL</b>		Borehole Diameter <b>inches</b>			
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/> ) or Boring Location <input type="checkbox"/>		State Plane <b>N, E S/C/N</b>		Lat <u>    </u> ° <u>    </u> ' <u>    </u> "		Local Grid Location	
1/4 of <u>    </u> 1/4 of Section <u>    </u> , T <u>    </u> N, R		Long <u>    </u> ° <u>    </u> ' <u>    </u> "		Feet <input type="checkbox"/> N <input type="checkbox"/> E		Feet <input type="checkbox"/> S <input type="checkbox"/> W	
Facility ID		County <b>Brown</b>		County Code <b>5</b>		Civil Town/City/ or Village <b>Green Bay</b>	

Sample Number and Type	Length Att. & 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	Plasticity Index	P 200			
			0.75	0.75-inch washed stone with trace to some fines												
			1.00	2.5-inch stone with trace fines												
			2.00	End of Boring. Boring advanced from 0.0 feet to 2.0 feet by backhoe.												

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

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

Facility/Project Name <b>Pad Blinding Investigation</b>			License/Permit/Monitoring Number		Boring Number <b>4S</b>		
Boring Drilled By: Name of crew chief (first, last) and Firm <b>STS Project No. 29316A</b>			Date Drilling Started <b>3/16/2006</b>		Date Drilling Completed <b>3/16/2006</b>		
Drilling Method <b>backhoe</b>		WI Unique Well No.		DNR Well ID No.		Common Well Name <b>4S</b>	
Final Static Water Level <b>Feet MSL</b>		Surface Elevation <b>746.1 Feet MSL</b>		Borehole Diameter <b>inches</b>			
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/> ) or Boring Location <input type="checkbox"/>		State Plane <b>N, E S/C/N</b>		Lat _____ ' _____ "		Local Grid Location	
1/4 of _____ 1/4 of Section _____, T _____ N, R		Long _____ ' _____ "		Feet <input type="checkbox"/> N <input type="checkbox"/> E		Feet <input type="checkbox"/> S <input type="checkbox"/> W	
Facility ID		County <b>Brown</b>		County Code <b>5</b>		Civil Town/City/ or Village <b>Green Bay</b>	

Sample	Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments	
										Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200		
				1	0.75-inch washed stone with fines											
				2	2.5-inch stone with trace fines											
					End of Boring. Boring advanced from 0.0 feet to 2.0 feet by backhoe.											

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

Signature	Firm <b>STS Consultants</b> 1035 Kepler Drive Green Bay, Wisconsin 54311	Tel: 920-468-1978 Fax: 920-468-3312
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Route To: Watershed/Wastewater  Waste Management   
Remediation/Redevelopment  Other

Facility/Project Name <b>Pad Blinding Investigation</b>			License/Permit/Monitoring Number		Boring Number <b>5D</b>	
Boring Drilled By: Name of crew chief (first, last) and Firm <b>STS Project No. 29316A</b>			Date Drilling Started <b>3/16/2006</b>		Date Drilling Completed <b>3/16/2006</b>	
Drilling Method <b>backhoe</b>			Final Static Water Level <b>Feet MSL</b>		Surface Elevation <b>746.1 Feet MSL</b>	
WI Unique Well No.		DNR Well ID No. <b>5D</b>		Common Well Name		Borehole Diameter <b>inches</b>
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/> ) or Boring Location <input type="checkbox"/>			Local Grid Location			
State Plane <b>N, E S/C/N</b>			Lat _____"			<input type="checkbox"/> N <input type="checkbox"/> E
1/4 of _____ 1/4 of Section _____, T _____ N, R _____			Long _____"			Feet <input type="checkbox"/> S Feet <input type="checkbox"/> W
Facility ID		County <b>Brown</b>		County Code <b>5</b>		Civil Town/City/ or Village <b>Green Bay</b>

Sample Number and Type	Length Att. & 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	Plasticity Index	P 200		
			1	8 to 12 inches of crushed stone with significant fines due to spreading of haul road gravel											
			2	2.5-inch stone with trace fines											
				End of Boring. Boring advanced from 0.0 feet to 2.0 feet by backhoe.											

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

Signature	Firm <b>STS Consultants</b> 1035 Kepler Drive Green Bay, Wisconsin 54311	Tel: 920-468-1978 Fax: 920-468-3312
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Route To: Watershed/Wastewater  Waste Management   
Remediation/Redevelopment  Other

Facility/Project Name <b>Pad Blinding Investigation</b>			License/Permit/Monitoring Number		Boring Number <b>6D</b>		
Boring Drilled By: Name of crew chief (first, last) and Firm <b>STS Project No. 29316A</b>			Date Drilling Started <b>3/16/2006</b>		Date Drilling Completed <b>3/16/2006</b>		
Drilling Method <b>backhoe</b>			Final Static Water Level <b>Feet MSL</b>		Surface Elevation <b>746.1 Feet MSL</b>		
WI Unique Well No.		DNR Well ID No. <b>6D</b>	Common Well Name <b>6D</b>		Borehole Diameter <b>inches</b>		
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/> ) or Boring Location <input type="checkbox"/> State Plane <b>N, E S/C/N</b>			Lat _____ " _____ "		Local Grid Location		
1/4 of _____ 1/4 of Section _____, T _____ N, R _____			Long _____ " _____ "		Feet <input type="checkbox"/> N <input type="checkbox"/> E Feet <input type="checkbox"/> S <input type="checkbox"/> W		
Facility ID		County <b>Brown</b>		County Code <b>5</b>		Civil Town/City/ or Village <b>Green Bay</b>	

Sample Number and Type	Length Att. & 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	Plasticity Index	P 200		
			1	6 to 9 inches of crushed stone with significant fines due to spreading of haul road gravel											
			2	2.5-inch stone with trace fines											
			3												
			4												
			5	End of Boring. Boring advanced from 0.0 feet to 5.0 feet by backhoe.											

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

Facility/Project Name <b>Pad Blinding Investigation</b>			License/Permit/Monitoring Number		Boring Number <b>7D</b>		
Boring Drilled By: Name of crew chief (first, last) and Firm <b>STS Project No. 29316A</b>			Date Drilling Started <b>3/16/2006</b>		Date Drilling Completed <b>3/16/2006</b>		
Drilling Method <b>backhoe</b>		WI Unique Well No.		DNR Well ID No.		Common Well Name <b>7D</b>	
Final Static Water Level <b>Feet MSL</b>		Surface Elevation <b>746.1 Feet MSL</b>		Borehole Diameter <b>inches</b>			
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/> ) or Boring Location <input type="checkbox"/>		State Plane <b>N, E S/C/N</b>		Lat _____ "		Local Grid Location	
1/4 of _____		1/4 of Section _____, T _____ N, R _____		Long _____ "		Feet <input type="checkbox"/> N <input type="checkbox"/> E Feet <input type="checkbox"/> S <input type="checkbox"/> W	
Facility ID		County <b>Brown</b>		County Code <b>5</b>		Civil Town/City/ or Village <b>Green Bay</b>	

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties						RQD/ Comments	
									Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200			
			1	0.75-inch washed stone  *Initial layer of stone was removed to facilitate cleanup of sediment from ruptured geotube 2.5-inch stone with trace fines												
			2	End of Boring. Boring advanced from 0.0 feet to 2.0 feet by backhoe.												

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

Facility/Project Name <b>Pad Blinding Investigation</b>			License/Permit/Monitoring Number		Boring Number <b>8S</b>			
Boring Drilled By: Name of crew chief (first, last) and Firm <b>STS Project No. 29316A</b>			Date Drilling Started <b>3/16/2006</b>		Date Drilling Completed <b>3/16/2006</b>			
Drilling Method <b>backhoe</b>		WI Unique Well No.		DNR Well ID No.		Common Well Name <b>8S</b>		
Final Static Water Level <b>Feet MSL</b>		Surface Elevation <b>746.1 Feet MSL</b>		Borehole Diameter <b>inches</b>				
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/> ) or Boring Location <input type="checkbox"/> State Plane <b>N, E S/C/N</b>			Lat _____° _____' _____"		Local Grid Location			
1/4 of _____ 1/4 of Section _____, T _____ N, R _____			Long _____° _____' _____"		Feet <input type="checkbox"/> N <input type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W			
Facility ID		County <b>Brown</b>		County Code <b>5</b>		Civil Town/City/ or Village <b>Green Bay</b>		

Sample Number and Type	Length Att. & 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	Plasticity Index	P 200		
			1	6 to 12 inches of 0.75-inch washed stone with trace to some fine sediment											
			2	2.5-inch stone with trace sediment											
				End of Boring. Boring advanced from 0.0 feet to 2.0 feet by backhoe.											

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

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

Facility/Project Name <b>Pad Blinding Investigation</b>			License/Permit/Monitoring Number		Boring Number <b>9D</b>			
Boring Drilled By: Name of crew chief (first, last) and Firm <b>STS Project No. 29316A</b>			Date Drilling Started <b>3/16/2006</b>		Date Drilling Completed <b>3/16/2006</b>			
Drilling Method <b>backhoe</b>		WI Unique Well No.		DNR Well ID No.		Common Well Name <b>9D</b>		
Final Static Water Level <b>Feet MSL</b>		Surface Elevation <b>746.1 Feet MSL</b>		Borehole Diameter <b>inches</b>				
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/> ) or Boring Location <input type="checkbox"/> State Plane <b>N, E S/C/N</b>			Lat _____"		Local Grid Location			
1/4 of _____ 1/4 of Section _____, T _____ N, R			Long _____"		Feet <input type="checkbox"/> N <input type="checkbox"/> E Feet <input type="checkbox"/> S <input type="checkbox"/> W			
Facility ID		County <b>Brown</b>		County Code <b>5</b>		Civil Town/City/ or Village <b>Green Bay</b>		

Sample Number and Type	Length Att. & 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	Plasticity Index	P 200			
			1	0.75-inch crushed stone with significant fines due to spreading of road gravel												
			2	2.5-inch stone with trace fines												
			3													
			4													
				End of Boring. Boring advanced from 0.0 feet to 4.5 feet by backhoe.												

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

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

Facility/Project Name <b>Pad Blinding Investigation</b>			License/Permit/Monitoring Number		Boring Number <b>10S</b>	
Boring Drilled By: Name of crew chief (first, last) and Firm <b>STS Project No. 29316A</b>			Date Drilling Started <b>3/16/2006</b>		Date Drilling Completed <b>3/16/2006</b>	
Drilling Method <b>backhoe</b>			Final Static Water Level <b>Feet MSL</b>		Surface Elevation <b>746.1 Feet MSL</b>	
WI Unique Well No.		DNR Well ID No.		Common Well Name <b>10S</b>		Borehole Diameter <b>inches</b>
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/> ) or Boring Location <input type="checkbox"/>			Local Grid Location			
State Plane <b>N, E S/C/N</b>			Lat _____"			<input type="checkbox"/> N <input type="checkbox"/> E
1/4 of _____			1/4 of Section _____, T _____ N, R _____			Long _____" Feet <input type="checkbox"/> S <input type="checkbox"/> W
Facility ID		County <b>Brown</b>		County Code <b>5</b>		Civil Town/City/ or Village <b>Green Bay</b>

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties						RQD/ Comments
									Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200		
			1	8 to 12 inches of crushed stone with significant fines due to spreading of road gravel											
			2	2.5-inch stone with trace fines											
			3	End of Boring. Boring advanced from 0.0 feet to 3.0 feet by backhoe.											

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Signature	Firm <b>STS Consultants</b> 1035 Kepler Drive Green Bay, Wisconsin 54311	Tel: 920-468-1978 Fax: 920-468-3312
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Route To: Watershed/Wastewater  Waste Management   
Remediation/Redevelopment  Other

Facility/Project Name <b>Pad Blinding Investigation</b>			License/Permit/Monitoring Number		Boring Number <b>12D</b>	
Boring Drilled By: Name of crew chief (first, last) and Firm <b>STS Project No. 29316A</b>			Date Drilling Started <b>3/16/2006</b>		Date Drilling Completed <b>3/16/2006</b>	
Drilling Method <b>backhoe</b>			Final Static Water Level <b>Feet MSL</b>		Surface Elevation <b>746.1 Feet MSL</b>	
WI Unique Well No.		DNR Well ID No. <b>12D</b>		Common Well Name		Borehole Diameter <b>inches</b>
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/> ) or Boring Location <input type="checkbox"/> State Plane <b>N, E S/C/N</b>			Lat _____° _____' _____"		Local Grid Location <input type="checkbox"/> N <input type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W	
1/4 of _____ 1/4 of Section _____, T _____ N, R _____			Long _____° _____' _____"		Feet _____ Feet _____	
Facility ID		County <b>Brown</b>		County Code <b>5</b>		Civil Town/City/ or Village <b>Green Bay</b>

Sample Number and Type	Length Att. & 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	Plasticity Index	P 200		
			1	8 to 12 inches of washed stone with trace to some fines											
			2	2.5-inch stone with trace fines - some "quarry fines" (silt and clay sized material) observed coating some of the stone in one area - but not purvasive											
				End of Boring. Boring advanced from 0.0 feet to 2.5 feet by backhoe.											

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

Signature	Firm <b>STS Consultants</b> 1035 Kepler Drive Green Bay, Wisconsin 54311	Tel: 920-468-1978 Fax: 920-468-3312
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Route To: Watershed/Wastewater  Waste Management   
Remediation/Redevelopment  Other

Facility/Project Name <b>Pad Blinding Investigation</b>			License/Permit/Monitoring Number		Boring Number <b>13S</b>	
Boring Drilled By: Name of crew chief (first, last) and Firm <b>STS Project No. 29316A</b>			Date Drilling Started <b>3/16/2006</b>		Date Drilling Completed <b>3/16/2006</b>	
Drilling Method <b>backhoe</b>			Final Static Water Level <b>Feet MSL</b>		Surface Elevation <b>746.1 Feet MSL</b>	
WI Unique Well No.		DNR Well ID No. <b>13S</b>		Common Well Name		Borehole Diameter <b>inches</b>
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/> ) or Boring Location <input type="checkbox"/>			Local Grid Location			
State Plane <b>N, E S/C/N</b>			Lat _____ "			<input type="checkbox"/> N <input type="checkbox"/> E
1/4 of _____ 1/4 of Section _____, T _____ N, R _____			Long _____ "			Feet <input type="checkbox"/> S <input type="checkbox"/> W
Facility ID		County <b>Brown</b>		County Code <b>5</b>	Civil Town/City/ or Village <b>Green Bay</b>	

Sample Number and Type	Length Att. & 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	Plasticity Index	P 200		
			1	8 to 12 inches of washed stone with trace to some fines											
			2	2.5-inch stone with trace fines											
				End of Boring. Boring advanced from 0.0 feet to 2.5 feet by backhoe.											

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

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

Facility/Project Name <b>Pad Blinding Investigation</b>			License/Permit/Monitoring Number		Boring Number <b>14D</b>	
Boring Drilled By: Name of crew chief (first, last) and Firm <b>STS Project No. 29316A</b>			Date Drilling Started <b>3/16/2006</b>		Date Drilling Completed <b>3/16/2006</b>	
WI Unique Well No.		DNR Well ID No.	Common Well Name <b>14D</b>		Final Static Water Level <b>Feet MSL</b>	Surface Elevation <b>746.1 Feet MSL</b>
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/> ) or Boring Location <input type="checkbox"/>		State Plane <b>N, E S/C/N</b>		Lat _____ "		Local Grid Location <input type="checkbox"/> N <input type="checkbox"/> E
1/4 of _____		1/4 of Section _____, T _____ N, R _____		Long _____ "		Feet <input type="checkbox"/> S Feet <input type="checkbox"/> W
Facility ID		County <b>Brown</b>	County Code <b>5</b>	Civil Town/City/ or Village <b>Green Bay</b>		

Sample Number and Type	Length Att. & 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	Plasticity Index	P 200		
			1	4 to 6 inches of washed stone with trace fines and clay											
			2	2.5-inch stone with trace fines											
				End of Boring. Boring advanced from 0.0 feet to 2.0 feet by backhoe.											

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Test Pit 1D: Trace fine material in 0.75-inch washed stone over 2.5-inch coarse stone. View looking southwest.



Test Pit 1D: Water at base of test pit. Liner was encountered approximately 1.5 feet below water level. View looking southwest.



Test Pit 1D: Vacuum truck removal of water from test pit. Vac-truck was able to depress the water level, however, flow through the coarse stone was fast enough that the capacity of the vac truck was exceeded before the test pit could be vacuumed dry. No direct observation of the liner was made. View looking northeast.



Test Pit 1D-A: Following excavation of all test pits where water was encountered, the water cleared up within 15 minutes. Note clarity of water. View looking north.



Test Pit 1D-B: Final joint in the 18-inch perforated drain pipe. Note the bend in the pipe. Water level is approximately 6 inches above the bottom of the pipe at the eastern end, which is 20 feet to the east of the joint. View looking east.



Test Pit 2S: Approximately 6 inches of washed stone containing trace fine sediment over approximately 18 to 24 inches of clean 2.5-inch coarse stone. Liner damage prior to repair. View looking southeast.



Test Pit 3S: Approximately 6 inches of washed stone containing trace to some fine sediment over clean 2.5-inch coarse stone. Completed test pit is approximately 2 feet deep. View looking east.



Test Pit 4S: Approximately 6 inches of washed stone containing some fine sediment over clean 2.5-inch coarse stone. Completed test pit is approximately 2 feet deep. View looking east.



Test Pit 5D: Approximately 8 to 12 inches of crushed stone containing significant fines over clean coarse stone. The majority of the fine material observed appears to be a result of road gravel (crushed but not washed stone) being spread over this area. View looking north.



Test Pit 6D: Approximately 6 to 9 inches of crushed stone containing significant fines over clean coarse stone. The majority of the fine material observed appears to be a result of road gravel (crushed but not washed stone) being spread over this area. The 18-inch perforated pipe is not in contact with the liner material. Note that the water is only 1 to 2 inches above bottom of the pipe. Overall depth is approximately 4 feet. View looking southeast.



Test Pit 6D: Close-up of the perforations in the 18-inch pipe. Mechanical pencil is 5.5-inches-long and the body is 0.35 inch in diameter.



Test Pit 7D: Initial excavation shows sediment from ruptured geo-tube present on the surface of the crushed stone. Coarse stone beneath is clean. Overall depth is less than 2 feet. View looking east-northeast.



Test Pit 7D: Close-up of the fines on top of the crushed stone. View looking east.



Test Pit 8S: Approximately 6 to 12 inches of 0.75-inch washed stone containing trace to some fine sediment over clean coarse stone. Completed test pit is approximately 2 feet deep.  
View looking south.



Test Pit 9D: Approximately 6 inches of crushed stone containing significant fines over clean coarse stone. The majority of the fine material observed appears to be a result of road gravel (crushed but not washed stone) being spread over this area. View looking east.



Test Pit 9D: Exposed section of the 18-inch perforated pipe. Pipe is in good condition, and coarse stone surrounding the pipe is clean. Completed test pit was approximately 4.5 feet deep. View looking east.



Test Pit 10S: Approximately 8 to 12 inches of crushed stone containing significant fines over clean coarse stone. The majority of the fine material observed appears to be a result of road gravel (crushed but not washed stone) being spread over this area. View looking east.



Test Pit 12S: Approximately 8 to 12 inches of washed stone containing trace to some fines over mostly clean coarse stone. Some "quarry fines" observed (gray silt to clay sized coating) at east end of the test pit, but this appeared to be localized. Completed test pit was approximately 2.5 feet deep. View looking east.



Test Pit 13S: Approximately 8 to 12 inches of washed stone containing trace to some fines over mostly clean coarse stone. View looking east.



Test Pit 14D: Approximately 4 to 6 inches of washed stone containing trace to some fines including clay (in the vicinity of the yellow marker) over mostly clean coarse stone.  
View looking south.



Test Pit 14D: Close-up of clay in washed stone. View looking southwest.