

Appendix B

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- Groundwater data used for PAL calculations
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- PAL Calculations
 - o Total alkalinity (filtered)
 - o Total hardness (filtered)
 - o Sodium (dissolved)
 - o Total filterable residue
 - o Specific conductance – field
- ACL Exemption request for fluoride, Monitoring Well B-25

B4 -- Groundwater Sampling

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B7 -- Well Inspection Form

B8 -- Landfill Site Survey Benchmark Inspection Form

B9 -- Deed Notice of Past Disposal Activities

B1 - Waupaca Foundry Inc. Landfill No. 2638 Photographs

★ Private water supply well (within 0.25 mile of Landfill No. 2638)

Photo 1

Photograph number

→ Arrow points to location where photograph was taken





Photo 1: Gate and access road into the facility.
Looking east; southwest corner of Landfill No. 3171 on
left side of photograph.

September 2021

Photo 2: South side of Landfill No. 2638.
Looking north at Section 5, sedimentation
in the foreground.

September 2021



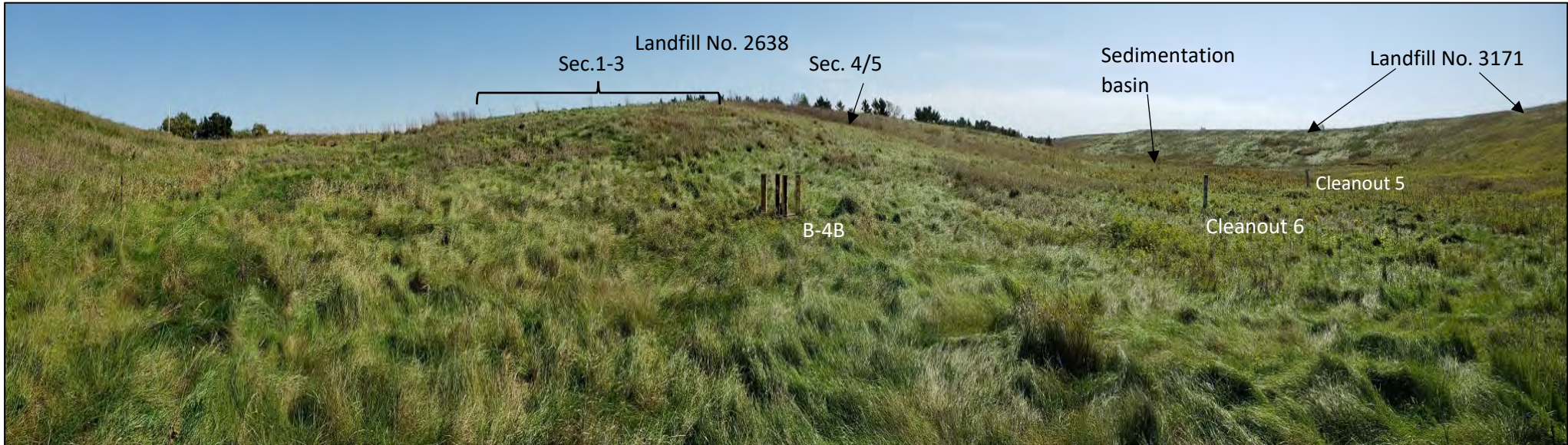


Photo 3: Panoramic photograph, west side of Landfill No. 2638. Looking east.

September 2021

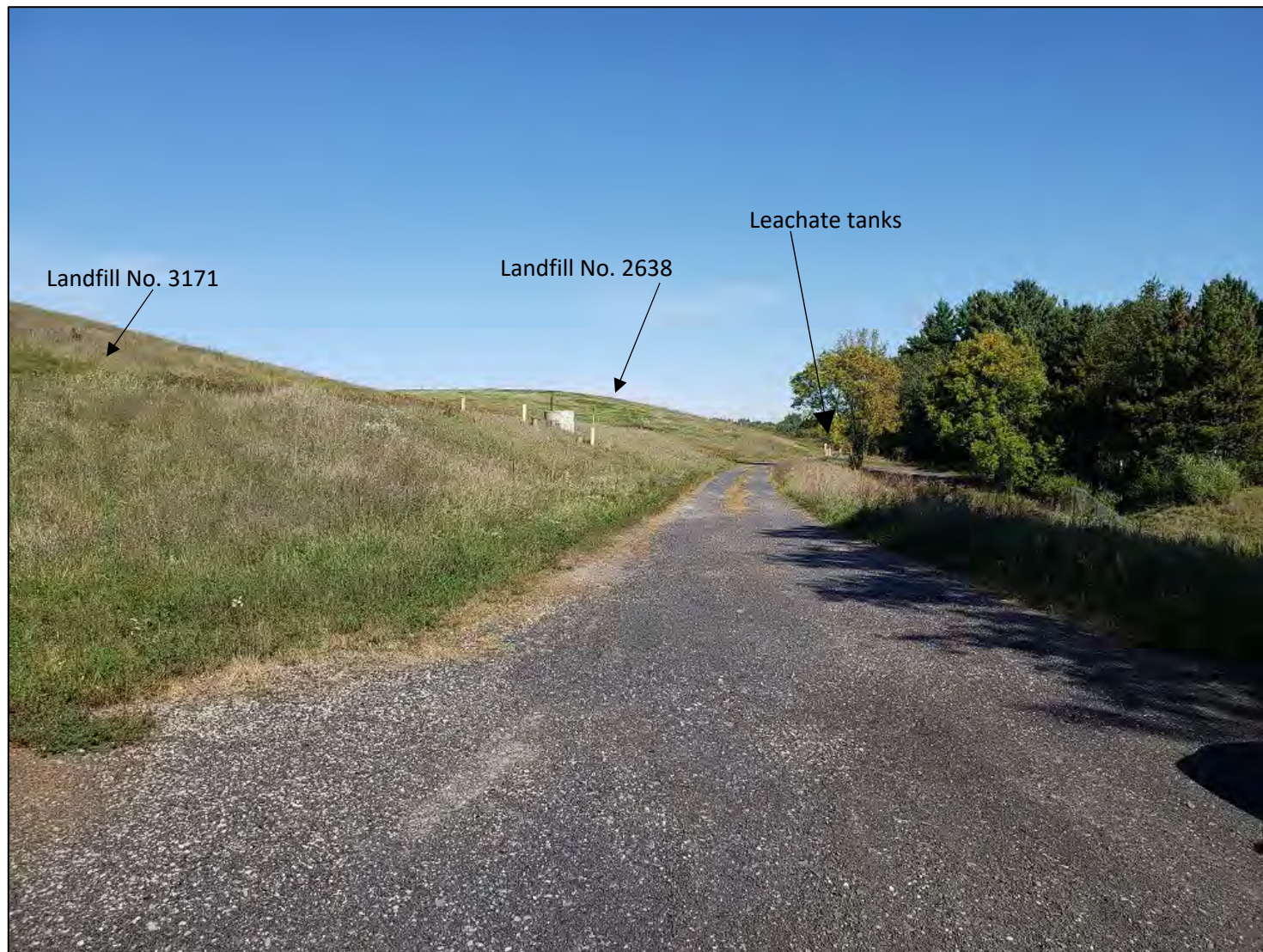


Photo 4: Access road to Landfill No. 2638 and leachate tanks, looking north. Leachate manhole shown on the east side of Landfill No. 3171.

September 2021



Photo 5: East and West leachate tanks, looking southeast. The East Tank collects leachate from Landfill No. 2638, and the West Tank collects leachate from Landfill No. 3171. Tanks are pumped via 6-inch pipe as shown.

October 2021



Photo 6: On top and at the approximate center of Landfill No. 2638. Looking west. North end of Landfill No. 3171 in background.

September 2021



Photo 7: On top and at the approximate center of Landfill No. 2638. Looking north.

September 2021



Photo 8: On top and at the approximate center of Landfill No. 2638. Looking east.

September 2021

Photo 9: On top and at the approximate center of Landfill No. 2638. Looking south at the south end Landfill No. 3171.

September 2021



B2 - Seepage Velocity Calculations

Seepage Velocity Calculations
WFI Landfill No. 2638

Appendix B2 Pg. 2/2

Well	Screened Interval Elevation (ft., MSL)	Lithology of Screened Interval	Estimated Field Conductivity (cm/sec)	Estimated Porosity (Freeze & Cherry, 1979)	Historic High -- June 1993 Water table elevation (ft., MSL)	Historic Low -- Nov. 2007 Water table elevation (ft., MSL)
B-4B	857.8' - 867.8'	SP	3×10^{-4}	25%	896.4	891.3
B-14	881.5' - 891.5'	SM and SP	1.4×10^{-3}	25%	889.6	884.3
B-28	866.8' - 881.8'	SP	7×10^{-3}	25%	889.3	884.2
B-29	865' - 880'	SP	7×10^{-3}	25%	889.2	884.3
B-31R	885.4' - 900.4'	SM	1.4×10^{-3}	35%	896.1	891.1
B-34	882.6' - 897.6'	SP	7×10^{-3}	35%	894.3	889.5

Horizontal Gradient (i) Calculations					
Flow Between Wells	Distance Between Wells (ft.)	Historic High -- June 1993		Historic Low -- Nov. 2007	
		Change in Head (ft.)	Horizontal Gradient (I) (dimensionless)	Change in Head	Horizontal Gradient (I) (dimensionless)
W E					
B-34 to B-28	820'	5.0	6.1×10^{-3}	5.3	6.5×10^{-3}
B-4B to B-29	850'	7.2	8.5×10^{-3}	7.0	8.2×10^{-3}
B-31R to B-14	750'	6.4	8.6×10^{-3}	6.7	8.9×10^{-3}

$i = \frac{\text{Change in head}}{\text{Distance between wells}}$

Seepage Velocity (V_{gw}) Calculations					
Flow Between Wells	Historic High -- June 1993 V_{gw} (cm/sec)	Historic Low -- Nov. 2007 V_{gw} (cm/sec)	Seepage Velocity (V_{gw}) = $\frac{(K)}{n} i$	Estimated Field Hydraulic Conductivity (K) (cm/sec)	Mean Estimated Porosity (n)
W E					
B-34 to B-28	1.6×10^{-4}	1.5×10^{-4}		7.1×10^{-3}	30%
B-4B to B-29	1.1×10^{-4}	1.2×10^{-4}		3.6×10^{-3}	25%
B-31R to B-14	4.0×10^{-5}	4.2×10^{-5}		1.4×10^{-3}	30%

Notes:

Freeze, R.A., and Cherry, J.A., 1979, Groundwater; Prentice Hall, Inc., 604 p.

B3 -- PAL Calculations and ACL Exemption Request

- Groundwater data used for PAL calculations
- Error log -- Data not used for PAL calculations
- PAL Calculations
 - o Total alkalinity (filtered)
 - o Total hardness (filtered)
 - o Sodium (dissolved)
 - o Total filterable residue
 - o Specific conductance – field
- ACL Exemption request for fluoride, Monitor Well B-25

Groundwater data used for PAL calculations

Note

As documented in Section 2.3 of the WFI Landfill 2638 Long-Term Care Plan, foundry sand had been stockpiled on Section 4 of Landfill No. 2638 until the construction documentation approval was granted for Section 5. Stormwater runoff from these stockpiles impacted groundwater quality in downgradient monitoring wells west of the landfill. Groundwater quality has gradually improved since the stockpiles were removed and a final cover was installed on Sections 4 and 5. A review of all historical groundwater results from 1975 to 2021 indicates that downgradient groundwater quality has stabilized, although remains elevated in comparison to early monitoring results.

To reflect the current stabilized groundwater quality, data from the last ten years of monitoring (2012-2022) was used to calculate PALS for the parameters specific conductance (field), sodium (dissolved), total hardness (filtered), total alkalinity (filtered), and total filterable residue.

Waupaca Foundry, Inc. -- Landfill Lic. No. 2638

Data used for PAL calculations

Notes:

Blank date/result indicates value was not used for calculation. See error log for details.

No analytical results available for B-7A from May 2015, November 2015, and November 2016 due to insufficient sample.

	SPECIFIC CONDUCTANCE-FIELD (UMHOS/CM @ 25C) [Ana. Code 94]		RESIDUE, TOTAL FILTERABLE (TDS) DRIED AT 180C [Ana. Code 70300]		SODIUM, DISSOLVED (MG/L AS NA) [Ana. Code 930]		HARDNESS, TOTAL, FILTERED (MG/L AS CACO3) [Ana. Code 22413]		ALKALINITY, TOTAL, FILTERED (MG/L AS CACO3) [Ana. Code 39036]	
	Date	Result	Date	Result	Date	Result	Date	Result	Date	Result
Monitoring Well B-1 (WDNR ID No. 401)	05/23/12	488	05/23/12	370	05/23/12	4.1	05/23/12	280	05/23/12	230
	11/06/12	467	11/06/12	250	11/06/12	4.3	11/06/12	270	11/06/12	240
	05/15/13	544			05/15/13	4.1	05/15/13	270	05/15/13	250
	11/19/13	534	11/19/13	330	11/19/13	3.8	11/19/13	270	11/19/13	230
	05/20/14	546	05/20/14	250	05/20/14	4.3	05/20/14	280	05/20/14	250
	11/10/14	526	11/10/14	300	11/10/14	4.1	11/10/14	270	11/10/14	230
	05/19/15	514	05/19/15	280	05/19/15	4.5				
	11/10/15	506	11/10/15	300	11/10/15	4.2	11/10/15	260	11/10/15	250
	05/17/16	530	05/17/16	330	05/17/16	4.4	05/17/16	280	05/17/16	250
	11/08/16	553	11/08/16	330	11/08/16	3.9	11/08/16	290	11/08/16	240
	05/09/17	533	05/09/17	350	05/09/17	4.2	05/09/17	280	05/09/17	250
	11/13/17	504	11/13/17	310	11/13/17	4.4	11/13/17	270	11/13/17	250
	05/08/18	548	05/08/18	290	05/08/18	4.5	05/08/18	290	05/08/18	250
	11/12/18	522			11/12/18	4.3	11/12/18	280	11/12/18	250
	05/14/19	533	05/14/19	320	05/14/19	4.7	05/14/19	300	05/14/19	250
	11/04/19	541	11/04/19	310	11/04/19	4.2	11/04/19	290	11/04/19	260
	05/12/20	562	05/12/20	340	05/12/20	4.5	05/12/20	290	05/12/20	240
	11/09/20	526	11/09/20	300	11/09/20	4.7	11/09/20	290	11/09/20	250
	05/11/21	537	05/11/21	320	05/11/21	4.4	05/11/21	310	05/11/21	250
	11/08/21	551	11/08/21	360	11/08/21	4.6	11/08/21	300	11/08/21	250
Mean		528			4.3		283		246	
Standard deviation		23			0.2		13		8	

	SPECIFIC CONDUCTANCE-FIELD (UMHOS/CM @ 25C) [Ana. Code 94]		RESIDUE, TOTAL FILTERABLE (TDS) DRIED AT 180C [Ana. Code 70300]		SODIUM, DISSOLVED (MG/L AS NA) [Ana. Code 930]		HARDNESS, TOTAL, FILTERED (MG/L AS CACO3) [Ana. Code 22413]		ALKALINITY, TOTAL, FILTERED (MG/L AS CACO3) [Ana. Code 39036]	
	Date	Result	Date	Result	Date	Result	Date	Result	Date	Result
Monitoring Well B-1A (WDNR ID No. 402)	05/23/12	497	05/23/12	360	05/23/12	3.8	05/23/12	290	05/23/12	250
	11/06/12	472	11/06/12	250	11/06/12	3.9	11/06/12	280	11/06/12	250
	05/15/13	537			05/15/13	3.7	05/15/13	270	05/15/13	250
	11/19/13	533	11/19/13	300	11/19/13	3.3	11/19/13	270	11/19/13	240
	05/20/14	544	05/20/14	280	05/20/14	4	05/20/14	290	05/20/14	250
	11/10/14	523	11/10/14	290	11/10/14	3.5	11/10/14	270	11/10/14	240
	05/19/15	511	05/19/15	300	05/19/15	4				
	11/10/15	503	11/10/15	280	11/10/15	3.6	11/10/15	270	11/10/15	260
	05/17/16	521	05/17/16	300	05/17/16	3.7	05/17/16	270	05/17/16	240
	11/08/16	556	11/08/16	340	11/08/16	3.7	11/08/16	300	11/08/16	250
	05/09/17	541	05/09/17	330	05/09/17	4.2	05/09/17	280	05/09/17	250
	11/13/17	528	11/13/17	330	11/13/17	4.6	11/13/17	280	11/13/17	260
	05/08/18	673	05/08/18	340			05/08/18	280	05/08/18	360
	11/12/18	532			11/12/18	4.6	11/12/18	280	11/12/18	250
	05/14/19	552	05/14/19	340	05/14/19	5.2	05/14/19	300	05/14/19	260
	11/04/19	566	11/04/19	340	11/04/19	5	11/04/19	300	11/04/19	280
	05/12/20	580	05/12/20	280	05/12/20	5.2	05/12/20	300	05/12/20	250
	11/09/20	552	11/09/20	300	11/09/20	5.2	11/09/20	300	11/09/20	240
	05/11/21	557	05/11/21	280	05/11/21	5.3	05/11/21	310	05/11/21	270
	11/08/21	560	11/08/21	300	11/08/21	5.2	11/08/21	310	11/08/21	260
Mean		542			4.3		287		258	
Standard deviation		40			0.7		14		27	

Waupaca Foundry, Inc. -- Landfill Lic. No. 2638

Data used for PAL calculations

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No analytical results available for B-7A from May 2015, November 2015, and November 2016 due to insufficient sample.

	SPECIFIC CONDUCTANCE-FIELD (UMHOS/CM @ 25C) [Ana. Code 94]		RESIDUE, TOTAL FILTERABLE (TDS) DRIED AT 180C [Ana. Code 70300]		SODIUM, DISSOLVED (MG/L AS NA) [Ana. Code 930]		HARDNESS, TOTAL, FILTERED (MG/L AS CACO3) [Ana. Code 22413]		ALKALINITY, TOTAL, FILTERED (MG/L AS CACO3) [Ana. Code 39036]	
	Date	Result	Date	Result	Date	Result	Date	Result	Date	Result
Monitoring Well B-1B (WDNR ID No. 403)	05/23/12	572	05/23/12	430	05/23/12	31	05/23/12	280	05/23/12	320
	11/07/12	561	11/07/12	310	11/07/12	28	11/07/12	290	11/07/12	310
	05/15/13	629			05/15/13	26	05/15/13	260	05/15/13	300
	11/19/13	616	11/19/13	340	11/19/13	24	11/19/13	280	11/19/13	280
	05/21/14	581	05/21/14	260	05/21/14	18	05/21/14	260	05/21/14	280
	11/11/14	640	11/11/14	370	11/11/14	29	11/11/14	280	11/11/14	300
	05/20/15	649	05/20/15	370	05/20/15	54				
	11/11/15	634	11/11/15	390	11/11/15	43	11/11/15	270	11/11/15	340
	05/18/16	587	05/18/16	350	05/18/16	26	05/18/16	290	05/18/16	300
	11/08/16	699	11/08/16	370	11/08/16	45	11/08/16	290	11/08/16	340
	05/09/17	562	05/09/17	320	05/09/17	22	05/09/17	270	05/09/17	320
	11/14/17	657	11/14/17	420	11/14/17	36	11/14/17	300	11/14/17	350
	05/09/18	567	05/09/18	390			05/09/18	290	05/09/18	260
	11/13/18	641			11/13/18	40	11/13/18	280	11/13/18	340
	05/14/19	675	05/14/19	350	05/14/19	47	05/14/19	290	05/14/19	350
	11/05/19	649	11/05/19	360	11/05/19	15	11/05/19	330	11/05/19	330
	05/12/20	679	05/12/20	400	05/12/20	15	05/12/20	350	05/12/20	350
	11/10/20	662	11/10/20	400	11/10/20	23	11/10/20	360	11/10/20	370
	05/11/21	648	05/11/21	360	05/11/21	24	05/11/21	340	05/11/21	370
	11/08/21	654	11/08/21	370	11/08/21	18	11/08/21	340	11/08/21	360
Mean		628			30		297		325	
Standard deviation		42			11		31		32	

	SPECIFIC CONDUCTANCE-FIELD (UMHOS/CM @ 25C) [Ana. Code 94]		RESIDUE, TOTAL FILTERABLE (TDS) DRIED AT 180C [Ana. Code 70300]		SODIUM, DISSOLVED (MG/L AS NA) [Ana. Code 930]		HARDNESS, TOTAL, FILTERED (MG/L AS CACO3) [Ana. Code 22413]		ALKALINITY, TOTAL, FILTERED (MG/L AS CACO3) [Ana. Code 39036]	
	Date	Result	Date	Result	Date	Result	Date	Result	Date	Result
Monitoring Well B-7 (WDNR ID No. 408)	05/23/12	537	05/23/12	380	05/23/12	5.4	05/23/12	310	05/23/12	260
	11/07/12	508	11/07/12	270	11/07/12	5	11/07/12	300	11/07/12	270
	05/15/13	596			05/15/13	5.5	05/15/13	290	05/15/13	280
	11/19/13	567	11/19/13	310	11/19/13	4.3	11/19/13	290	11/19/13	280
	05/21/14	579	05/21/14	250	05/21/14	5.7	05/21/14	310	05/21/14	280
	11/10/14	580	11/10/14	290	11/10/14	5.3	11/10/14	300	11/10/14	280
	05/20/15	557	05/20/15	330	05/20/15	5.3				
	11/11/15	549	11/11/15	320	11/11/15	5.4	11/11/15	290	11/11/15	290
	05/18/16	573	05/18/16	320	05/18/16	6.6	05/18/16	300	05/18/16	290
	11/08/16	588	11/08/16	330	11/08/16	5.5	11/08/16	310	11/08/16	290
	05/09/17	581	05/09/17	380	05/09/17	6	05/09/17	310	05/09/17	280
	11/14/17	541	11/14/17	350	11/14/17	5.6	11/14/17	290	11/14/17	280
	05/09/18	552	05/09/18	350	05/09/18	5.9	05/09/18	280	05/09/18	270
	11/13/18	547			11/13/18	5.3	11/13/18	290	11/13/18	270
	05/14/19	413	05/14/19	260	05/14/19	4.8	05/14/19	230	05/14/19	200
	11/05/19	574	11/05/19	310	11/05/19	5	11/05/19	300	11/05/19	280
	05/12/20	544	05/12/20	370	05/12/20	5.6	05/12/20	290	05/12/20	250
	11/10/20	535	11/10/20	320	11/10/20	5.1	11/10/20	300	11/10/20	260
	05/11/21	527	05/11/21	340	05/11/21	5.3	05/11/21	300	05/11/21	260
	11/08/21	516	11/08/21	340	11/08/21	5.1	11/08/21	280	11/08/21	260
Mean		548			5.4		293		270	
Standard deviation		40			0.5		18		21	

Waupaca Foundry, Inc. -- Landfill Lic. No. 2638

Data used for PAL calculations

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	SPECIFIC CONDUCTANCE-FIELD (UMHOS/CM @ 25C) [Ana. Code 94]		RESIDUE, TOTAL FILTERABLE (TDS) DRIED AT 180C [Ana. Code 70300]		SODIUM, DISSOLVED (MG/L AS NA) [Ana. Code 930]		HARDNESS, TOTAL, FILTERED (MG/L AS CACO3) [Ana. Code 22413]		ALKALINITY, TOTAL, FILTERED (MG/L AS CACO3) [Ana. Code 39036]	
	Date	Result	Date	Result	Date	Result	Date	Result	Date	Result
Monitoring Well B-7A (WDNR ID No. 409)	05/23/12	545	05/23/12	420	05/23/12	3.9	05/23/12	330	05/23/12	280
	11/07/12	458	11/07/12	230	11/07/12	5.7	11/07/12	260	11/07/12	260
	05/15/13	600			05/15/13	4.5	05/15/13	300	05/15/13	320
	11/19/13	518	11/19/13	290	11/19/13	6	11/19/13	260	11/19/13	270
	05/21/14	597	05/21/14	320	05/21/14	4	05/21/14	320	05/21/14	320
	11/10/14	500	11/10/14	290	11/10/14	4.8	11/10/14	290	11/10/14	280
	05/18/16	550	05/18/16	310	05/18/16	2.7	05/18/16	300	05/18/16	300
	05/09/17	590	05/09/17	360	05/09/17	4.6	05/09/17	320	05/09/17	320
	11/14/17	518	11/14/17	350	11/14/17	4	11/14/17	280	11/14/17	280
	05/09/18	533	05/09/18	290	05/09/18	4.9	05/09/18	280	05/09/18	270
	11/13/18	401			11/13/18	2.3	11/13/18	220	11/13/18	220
	05/14/19	552	05/14/19	390	05/14/19	4.2	05/14/19	320	05/14/19	300
	11/05/19	529	11/05/19	330	11/05/19	2.5	11/05/19	290	11/05/19	280
	05/12/20	586	05/12/20	340	05/12/20	4.3	05/12/20	320	05/12/20	290
	11/10/20	539	11/10/20	300	11/10/20	4	11/10/20	300	11/10/20	270
	05/11/21	553	05/11/21	350	05/11/21	4.6	05/11/21	310	05/11/21	290
	11/08/21	517	11/08/21	400	11/08/21	4.3	11/08/21	290	11/08/21	270
Mean		534			4.2		294		284	
Standard deviation		50			1.0		28		25	

	SPECIFIC CONDUCTANCE-FIELD (UMHOS/CM @ 25C) [Ana. Code 94]		RESIDUE, TOTAL FILTERABLE (TDS) DRIED AT 180C [Ana. Code 70300]		SODIUM, DISSOLVED (MG/L AS NA) [Ana. Code 930]		HARDNESS, TOTAL, FILTERED (MG/L AS CACO3) [Ana. Code 22413]		ALKALINITY, TOTAL, FILTERED (MG/L AS CACO3) [Ana. Code 39036]	
	Date	Result	Date	Result	Date	Result	Date	Result	Date	Result
Monitoring Well B-28 (WDNR ID No. 420)	05/23/12	643	05/23/12	480	05/23/12	110	05/23/12	130	05/23/12	270
	11/07/12	644	11/07/12	400	11/07/12	130	11/07/12	140	11/07/12	280
	05/15/13	558			05/15/13	88	05/15/13	110	05/15/13	230
	11/19/13	640	11/19/13	420	11/19/13	99	11/19/13	110	11/19/13	260
	05/21/14	686	05/21/14	340	05/21/14	100	05/21/14	140	05/21/14	260
	11/11/14	641	11/11/14	340	11/11/14	92	11/11/14	150	11/11/14	270
	05/20/15	632	05/20/15	340	05/20/15	92				
	11/11/15	604	11/11/15	410	11/11/15	79	11/11/15	180	11/11/15	280
	05/18/16	456	05/18/16	210	05/18/16	41	05/18/16	160	05/18/16	200
	11/08/16	592	11/08/16	380	11/08/16	83	11/08/16	110	11/08/16	260
	05/09/17	624	05/09/17	400	05/09/17	92	05/09/17	150	05/09/17	280
	11/14/17	558	11/14/17	340	11/14/17	90	11/14/17	120	11/14/17	260
	05/09/18	293	05/09/18	160	05/09/18	34	05/09/18	83	05/09/18	130
	11/13/18	587			11/13/18	100	11/13/18	110	11/13/18	260
	05/14/19	562	05/14/19	330	05/14/19	67	05/14/19	190	05/14/19	270
	11/05/19	735	11/05/19	480	11/05/19	93	11/05/19	190	11/05/19	300
	05/12/20	695	05/12/20	370	05/12/20	88	05/12/20	190	05/12/20	310
	11/10/20	638	11/10/20	380	11/10/20	98	11/10/20	170	11/10/20	260
	05/11/21	631	05/11/21	380	05/11/21	120	05/11/21	120	05/11/21	260
	11/08/21	610	11/08/21	390	11/08/21	90	11/08/21	130	11/08/21	290
Mean		601			89.3		141		259	
Standard deviation		93			22		32		39	

Waupaca Foundry, Inc. -- Landfill Lic. No. 2638

Data used for PAL calculations

Notes:

Blank date/result indicates value was not used for calculation. See error log for details.

No analytical results available for B-7A from May 2015, November 2015, and November 2016 due to insufficient sample.

	SPECIFIC CONDUCTANCE- FIELD (UMHOS/CM @ 25C) [Ana. Code 94]		RESIDUE, TOTAL FILTERABLE (TDS) DRIED AT 180C [Ana. Code 70300]		SODIUM, DISSOLVED (MG/L AS NA) [Ana. Code 930]		HARDNESS, TOTAL, FILTERED (MG/L AS CACO3) [Ana. Code 22413]		ALKALINITY, TOTAL FILTERED (MG/L AS CACO3) [Ana. Code 39036]	
	Date	Result	Date	Result	Date	Result	Date	Result	Date	Result
Monitoring Well B-29 (WDNR ID No. 421)	05/23/12	654	05/23/12	410	05/23/12	73	05/23/12	240	05/23/12	300
	11/07/12	680	11/07/12	400	11/07/12	49	11/07/12	320	11/07/12	330
	05/15/13	815			05/15/13	51	05/15/13	330	05/15/13	340
	11/19/13	839	11/19/13	490	11/19/13	36	11/19/13	350	11/19/13	340
	05/21/14	869	05/21/14	470	05/21/14	61	05/21/14	340	05/21/14	370
	11/11/14	832	11/11/14	460	11/11/14	49	11/11/14	350	11/11/14	350
	05/20/15	809	05/20/15	500	05/20/15	62				
	11/11/15	774	11/11/15	450	11/11/15	55	11/11/15	320	11/11/15	340
	05/18/16	859	05/18/16	530	05/18/16	95	05/18/16	280	05/18/16	380
	11/08/16	809	11/08/16	450	11/08/16	53	11/08/16	320	11/08/16	340
	05/09/17	723	05/09/17	460	05/09/17	61	05/09/17	270	05/09/17	330
	11/14/17	679	11/14/17	430	11/14/17	36	11/14/17	300	11/14/17	310
	05/09/18	223	05/09/18	130	05/09/18	10	05/09/18	92	05/09/18	90
	11/13/18	703			11/13/18	37	11/13/18	300	11/13/18	320
	05/14/19	508	05/14/19	430	05/14/19	26	05/14/19	230	05/14/19	210
	11/05/19	665	11/05/19	430	11/05/19	30	11/05/19	290	11/05/19	320
	05/12/20	664	05/12/20	340	05/12/20	41	05/12/20	280	05/12/20	300
	11/10/20	602	11/10/20	320	11/10/20	17	11/10/20	310	11/10/20	290
	05/11/21	615	05/11/21	310	05/11/21	23	05/11/21	320	05/11/21	310
	11/08/21	651	11/08/21	390	11/08/21	26	11/08/21	310	11/08/21	300
Mean		699	411		44.6		292		309	
Standard deviation		149	92		21		59		64	

	SPECIFIC CONDUCTANCE- FIELD (UMHOS/CM @ 25C) [Ana. Code 94]		RESIDUE, TOTAL FILTERABLE (TDS) DRIED AT 180C [Ana. Code 70300]		SODIUM, DISSOLVED (MG/L AS NA) [Ana. Code 930]		HARDNESS, TOTAL, FILTERED (MG/L AS CACO3) [Ana. Code 22413]		ALKALINITY, TOTAL FILTERED (MG/L AS CACO3) [Ana. Code 39036]	
	Date	Result	Date	Result	Date	Result	Date	Result	Date	Result
Monitoring Well B-25 (WDNR ID No. 428)	05/23/12	472	05/23/12	380	05/23/12	2.9	05/23/12	280	05/23/12	240
	11/06/12	448	11/06/12	220	11/06/12	2.8	11/06/12	260	11/06/12	250
	05/15/13	514	11/19/13	260	05/15/13	2.8	05/15/13	260	05/15/13	240
	11/19/13	503	05/20/14	250	11/19/13	2.6	11/19/13	260	11/19/13	250
	05/20/14	509	11/10/14	230	05/20/14	2.9	05/20/14	280	05/20/14	230
	11/10/14	506			11/10/14	2.8	11/10/14	270	11/10/14	230
	05/19/15	490	05/19/15	280	05/19/15	2.8				
	11/10/15	473	11/10/15	260	11/10/15	3	11/10/15	260	11/10/15	240
	05/17/16	498	05/17/16	290	05/17/16	3	05/17/16	270	05/17/16	250
	11/08/16	505	11/08/16	330	11/08/16	2.7	11/08/16	280	11/08/16	240
	05/09/17	512	05/09/17	410	05/09/17	2.9	05/09/17	280	05/09/17	240
	11/13/17	509	11/13/17	310	11/13/17	3	11/13/17	260	11/13/17	240
	05/08/18	522	05/08/18	360	05/08/18	3	05/08/18	280	05/08/18	250
	11/12/18	527			11/12/18	3.5	11/12/18	270	11/12/18	240
	05/14/19	513	05/14/19	380	05/14/19	3.7	05/14/19	280	05/14/19	250
	11/04/19	486	11/04/19	330	11/04/19	3.5	11/04/19	280	11/04/19	250
	05/12/20	530	05/12/20	280	05/12/20	4.3	05/12/20	280	05/12/20	260
	11/09/20	518	11/09/20	320	11/09/20	3.5	11/09/20	290	11/09/20	240
	05/11/21	516	05/11/21	260	05/11/21	3.3	05/11/21	280	05/11/21	250
	11/08/21	511	11/08/21	300	11/08/21	3.1	11/08/21	260	11/08/21	250
Mean		503	303		3.1		273		244	
Standard deviation		20	54		0.4		10		8	

Waupaca Foundry, Inc. -- Landfill Lic. No. 2638

Data used for PAL calculations

Notes:

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No analytical results available for B-7A from May 2015, November 2015, and November 2016 due to insufficient sample.

	SPECIFIC CONDUCTANCE-FIELD (UMHOS/CM @ 25C) [Ana. Code 94]		RESIDUE, TOTAL FILTERABLE (TDS) DRIED AT 180C [Ana. Code 70300]		SODIUM, DISSOLVED (MG/L AS NA) [Ana. Code 930]		HARDNESS, TOTAL, FILTERED (MG/L AS CACO3) [Ana. Code 22413]		ALKALINITY, TOTAL, FILTERED (MG/L AS CACO3) [Ana. Code 39036]	
	Date	Result	Date	Result	Date	Result	Date	Result	Date	Result
Monitoring Well B-25A (WDNR ID No. 429)	05/23/12	537	05/23/12	420	05/23/12	7.3	05/23/12	310	05/23/12	250
	11/06/12	544	11/06/12	270	11/06/12	6.8	11/06/12	310	11/06/12	290
	05/15/13	596			05/15/13	6.6	05/15/13	300	05/15/13	270
	11/19/13	581	11/19/13	320	11/19/13	5.5	11/19/13	300	11/19/13	270
	05/20/14	572	05/20/14	280	05/20/14	6.2	05/20/14	310	05/20/14	270
	11/10/14	578	11/10/14	260	11/10/14	5.1	11/10/14	300	11/10/14	260
	05/19/15	546	05/19/15	330	05/19/15	5				
	11/10/15	536	11/10/15	310	11/10/15	5.2	11/10/15	280	11/10/15	270
	05/17/16	567	05/17/16	340	05/17/16	5.7	05/17/16	300	05/17/16	280
	11/08/16	580	11/08/16	310	11/08/16	4.8	11/08/16	310	11/08/16	280
	05/09/17	581	05/09/17	330	05/09/17	5.3	05/09/17	310	05/09/17	280
	11/13/17	610	11/13/17	370	11/13/17	5.1	11/13/17	310	11/13/17	290
	05/08/18	644	05/08/18	490	05/08/18	5	05/08/18	330	05/08/18	280
	11/12/18	626			11/12/18	4.5	11/12/18	320	11/12/18	270
	05/14/19	632	05/14/19	450	05/14/19	5.1	05/14/19	340	05/14/19	260
	11/04/19	611	11/04/19	410	11/04/19	4.3	11/04/19	330	11/04/19	270
	05/12/20	640	05/12/20	320	05/12/20	4.7	05/12/20	320	05/12/20	270
	11/09/20	631	11/09/20	370	11/09/20	4.4	11/09/20	340	11/09/20	270
	05/11/21	619	05/11/21	410	05/11/21	4.5	05/11/21	340	05/11/21	270
	11/08/21	641	11/08/21	390	11/08/21	4.4	11/08/21	340	11/08/21	270
Mean		594			5.3		316		272	
Standard deviation		36			0.9		17		10	

	SPECIFIC CONDUCTANCE-FIELD (UMHOS/CM @ 25C) [Ana. Code 94]		RESIDUE, TOTAL FILTERABLE (TDS) DRIED AT 180C [Ana. Code 70300]		SODIUM, DISSOLVED (MG/L AS NA) [Ana. Code 930]		HARDNESS, TOTAL, FILTERED (MG/L AS CACO3) [Ana. Code 22413]		ALKALINITY, TOTAL, FILTERED (MG/L AS CACO3) [Ana. Code 39036]	
	Date	Result	Date	Result	Date	Result	Date	Result	Date	Result
Monitoring Well B-25B (WDNR ID No. 430)	05/23/12	461	05/23/12	240	05/23/12	4.2	05/23/12	270	05/23/12	260
	11/06/12	449	11/06/12	200	11/06/12	4.9	11/06/12	260	11/06/12	240
	05/15/13	553			05/15/13	5.9	05/15/13	290	05/15/13	250
	11/19/13	504	11/19/13	270	11/19/13	4.8	11/19/13	260	11/19/13	250
	05/20/14	479	05/20/14	230	05/20/14	4	05/20/14	260	05/20/14	220
	11/10/14	486	11/10/14	200	11/10/14	5.3	11/10/14	260	11/10/14	230
	05/19/15	507	05/19/15	280	05/19/15	4.1				
	11/10/15	453	11/10/15	260	11/10/15	4.2	11/10/15	240	11/10/15	250
	05/17/16	477	05/17/16	290	05/17/16	4.5	05/17/16	250	05/17/16	240
	11/08/16	496	11/08/16	280	11/08/16	7.7	11/08/16	270	11/08/16	260
	05/09/17	535	05/09/17	390	05/09/17	5.2	05/09/17	290	05/09/17	270
	11/13/17	511	11/13/17	330	11/13/17	4.3	11/13/17	270	11/13/17	250
	05/08/18	553	05/08/18	390	05/08/18	4.3	05/08/18	290	05/08/18	280
	11/12/18	521			11/12/18	4.4	11/12/18	270	11/12/18	260
	05/14/19	555	05/14/19	350	05/14/19	4.9	05/14/19	310	05/14/19	280
	11/04/19	501	11/04/19	330	11/04/19	4.1	11/04/19	290	11/04/19	290
	05/12/20	590	05/12/20	330	05/12/20	4.6	05/12/20	310	05/12/20	280
	11/09/20	605	11/09/20	370	11/09/20	3.7	11/09/20	330	11/09/20	290
	05/11/21	593	05/11/21	330	05/11/21	3.5	05/11/21	340	05/11/21	310
	11/08/21	622	11/08/21	410	11/08/21	3.8	11/08/21	360	11/08/21	320
Mean		523			4.6		285		265	
Standard deviation		52			0.9		32		26	

Waupaca Foundry, Inc. -- Landfill Lic. No. 2638

Data used for PAL calculations

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No analytical results available for B-7A from May 2015, November 2015, and November 2016 due to insufficient sample.

	SPECIFIC CONDUCTANCE-FIELD (UMHOS/CM @ 25C) [Ana. Code 94]		RESIDUE, TOTAL FILTERABLE (TDS) DRIED AT 180C [Ana. Code 70300]		SODIUM, DISSOLVED (MG/L AS NA) [Ana. Code 930]		HARDNESS, TOTAL, FILTERED (MG/L AS CaCO3) [Ana. Code 22413]		ALKALINITY, TOTAL, FILTERED (MG/L AS CaCO3) [Ana. Code 39036]	
	Date	Result	Date	Result	Date	Result	Date	Result	Date	Result
Monitoring Well B-30 (WDNR ID No. 431)	05/23/12	557	05/23/12	400	05/23/12	7.5	05/23/12	330	05/23/12	290
	11/06/12	528	11/06/12	310	11/06/12	6.8	11/06/12	310	11/06/12	310
	05/15/13	614			05/15/13	6.2	05/15/13	310	05/15/13	300
	11/19/13	587	11/19/13	350	11/19/13	5.7	11/19/13	310	11/19/13	310
	05/20/14	579	05/20/14	270	05/20/14	7.6	05/20/14	310	05/20/14	290
	11/10/14	595	11/10/14	300	11/10/14	6	11/10/14	310	11/10/14	290
	05/19/15	543	05/19/15	310	05/19/15	8.1				
	11/10/15	553	11/10/15	310	11/10/15	7.5	11/10/15	290	11/10/15	290
	05/17/16	614	05/17/16	350	05/17/16	6.3	05/17/16	330	05/17/16	340
	11/08/16	617	11/08/16	360	11/08/16	5.6	11/08/16	330	11/08/16	340
	05/09/17	608	05/09/17	380	05/09/17	4.3	05/09/17	330	05/09/17	330
	11/13/17	572	11/13/17	340	11/13/17	5	11/13/17	300	11/13/17	320
	05/08/18	616	05/08/18	420	05/08/18	3.6	05/08/18	330	05/08/18	330
	11/12/18	568			11/12/18	4.6	11/12/18	300	11/12/18	310
	05/14/19	597	05/14/19	430	05/14/19	4.8	05/14/19	330	05/14/19	320
	11/04/19	564	11/04/19	400	11/04/19	4.2	11/04/19	340	11/04/19	350
	05/12/20	599	05/12/20	370	05/12/20	3.9	05/12/20	330	05/12/20	330
	11/09/20	594	11/09/20	350	11/09/20	3.4	11/09/20	340	11/09/20	320
	05/11/21	581	05/11/21	340	05/11/21	3.4	05/11/21	340	05/11/21	330
	11/08/21	567	11/08/21	340	11/08/21	3.5	11/08/21	350	11/08/21	310
Mean		583			5.4		322		316	
Standard deviation		26			1.6		17		19	

	SPECIFIC CONDUCTANCE-FIELD (UMHOS/CM @ 25C) [Ana. Code 94]		RESIDUE, TOTAL FILTERABLE (TDS) DRIED AT 180C [Ana. Code 70300]		SODIUM, DISSOLVED (MG/L AS NA) [Ana. Code 930]		HARDNESS, TOTAL, FILTERED (MG/L AS CaCO3) [Ana. Code 22413]		ALKALINITY, TOTAL, FILTERED (MG/L AS CaCO3) [Ana. Code 39036]	
	Date	Result	Date	Result	Date	Result	Date	Result	Date	Result
Monitoring Well B-28A (WDNR ID No. 444)	05/23/12	604	05/23/12	430	05/23/12	11	05/23/12	340	05/23/12	270
	11/07/12	582	11/07/12	320	11/07/12	11	11/07/12	330	11/07/12	290
	05/15/13	667					05/15/13	310		
	11/19/13	662	11/19/13	390	11/19/13	9.7	11/19/13	320	11/19/13	300
	05/21/14	661	05/21/14	330	05/21/14	11	05/21/14	340	05/21/14	290
	11/11/14	659	11/11/14	350	11/11/14	11	11/11/14	330	11/11/14	290
	05/20/15	641	05/20/15	370	05/20/15	12				
	11/11/15	633	11/11/15	350	11/11/15	12	11/11/15	320	11/11/15	310
	05/18/16	656	05/18/16	370	05/18/16	13	05/18/16	330	05/18/16	290
	11/08/16	690	11/08/16	390	11/08/16	13	11/08/16	350	11/08/16	320
	05/09/17	677	05/09/17	480	05/09/17	13	05/09/17	350	05/09/17	300
	11/14/17	661	11/14/17	410	11/14/17	13	11/14/17	330	11/14/17	300
	05/09/18	690	05/09/18	400	05/09/18	14	05/09/18	340	05/09/18	300
	11/13/18	656			11/13/18	16	11/13/18	320	11/13/18	290
	05/14/19	741	05/14/19	380	05/14/19	26	05/14/19	360	05/14/19	320
	11/05/19	774	11/05/19	450	11/05/19	33	11/05/19	350	11/05/19	340
	05/12/20	779	05/12/20	420	05/12/20	43	05/12/20	330	05/12/20	310
	11/10/20	703	11/10/20	430	11/10/20	34	11/10/20	330	11/10/20	310
	05/11/21	728	05/11/21	420	05/11/21	39	05/11/21	350	05/11/21	330
	11/08/21	751	11/08/21	460	11/08/21	40	11/08/21	350	11/08/21	330
Mean		681			20		336		305	
Standard deviation		52			12		13		18	

Error log -- Data not used for PAL calculations

Waupaca Foundry, Inc. -- Landfill Lic. No. 2638

Error log -- Data not used for PAL calculations

Well Number	Parameter	Sample Date	Sample Result	Comments
B-1 (WDNR ID No. 401)	RESIDUE, TOTAL FILTERABLE (TDS) [Ana. Code 70300]	05/15/13	300	QC Flag I (F)
B-1 (WDNR ID No. 401)	RESIDUE, TOTAL FILTERABLE (TDS) [Ana. Code 70300]	11/12/18	280	QC Flag I (F)
B-1 (WDNR ID No. 401)	HARDNESS, TOTAL, FILTERED [Ana. Code 22413]	05/19/15	270	QC Flag I (F)
B-1 (WDNR ID No. 401)	ALKALINITY, TOTAL FILTERED [Ana. Code 39036]	05/19/15	230	QC Flag I (F)
B-1A (WDNR ID No. 402)	RESIDUE, TOTAL FILTERABLE (TDS) [Ana. Code 70300]	05/15/13	310	QC Flag I (F)
B-1A (WDNR ID No. 402)	RESIDUE, TOTAL FILTERABLE (TDS) [Ana. Code 70300]	11/12/18	320	QC Flag I (F)
B-1A (WDNR ID No. 402)	SODIUM, DISSOLVED (MG/L AS NA) [Ana. Code 930]	05/09/18	49	Outlier
B-1A (WDNR ID No. 402)	HARDNESS, TOTAL, FILTERED [Ana. Code 22413]	05/19/15	280	QC Flag I (F)
B-1A (WDNR ID No. 402)	ALKALINITY, TOTAL FILTERED [Ana. Code 39036]	05/19/15	250	QC Flag I (F)
B-1B (WDNR ID No. 403)	RESIDUE, TOTAL FILTERABLE (TDS) [Ana. Code 70300]	05/15/13	340	QC Flag I (F)
B-1B (WDNR ID No. 403)	RESIDUE, TOTAL FILTERABLE (TDS) [Ana. Code 70300]	11/13/18	380	QC Flag I (F)
B-1B (WDNR ID No. 402)	SODIUM, DISSOLVED (MG/L AS NA) [Ana. Code 930]	05/09/18	4.9	Outlier
B-1B (WDNR ID No. 403)	HARDNESS, TOTAL, FILTERED [Ana. Code 22413]	05/20/15	270	QC Flag I (F)
B-1B (WDNR ID No. 403)	ALKALINITY, TOTAL FILTERED [Ana. Code 39036]	05/20/15	360	QC Flag I (F)
B-7 (WDNR ID No. 408)	RESIDUE, TOTAL FILTERABLE (TDS) [Ana. Code 70300]	05/15/13	340	QC Flag I (F)
B-7 (WDNR ID No. 408)	RESIDUE, TOTAL FILTERABLE (TDS) [Ana. Code 70300]	11/13/18	340	QC Flag I (F)
B-7 (WDNR ID No. 408)	HARDNESS, TOTAL, FILTERED [Ana. Code 22413]	05/20/15	300	QC Flag I (F)
B-7 (WDNR ID No. 408)	ALKALINITY, TOTAL FILTERED [Ana. Code 39036]	05/20/15	290	QC Flag I (F)
B-7A (WDNR ID No. 409)	RESIDUE, TOTAL FILTERABLE (TDS) [Ana. Code 70300]	05/15/13	330	QC Flag I (F)
B-7A (WDNR ID No. 409)	RESIDUE, TOTAL FILTERABLE (TDS) [Ana. Code 70300]	11/13/18	200	QC Flag I (F)
B-28 (WDNR ID No. 420)	RESIDUE, TOTAL FILTERABLE (TDS) [Ana. Code 70300]	05/15/13	330	QC Flag I (F)
B-28 (WDNR ID No. 420)	RESIDUE, TOTAL FILTERABLE (TDS) [Ana. Code 70300]	11/13/18	370	QC Flag I (F)
B-28 (WDNR ID No. 420)	HARDNESS, TOTAL, FILTERED [Ana. Code 22413]	05/20/15	170	QC Flag I (F)
B-28 (WDNR ID No. 420)	ALKALINITY, TOTAL FILTERED [Ana. Code 39036]	05/20/15	280	QC Flag I (F)
B-29 (WDNR ID No. 421)	RESIDUE, TOTAL FILTERABLE (TDS) [Ana. Code 70300]	05/15/13	510	QC Flag I (F)
B-29 (WDNR ID No. 421)	RESIDUE, TOTAL FILTERABLE (TDS) [Ana. Code 70300]	11/13/18	400	QC Flag I (F)
B-29 (WDNR ID No. 421)	HARDNESS, TOTAL, FILTERED [Ana. Code 22413]	05/20/15	330	QC Flag I (F)
B-29 (WDNR ID No. 421)	ALKALINITY, TOTAL FILTERED [Ana. Code 39036]	05/20/15	360	QC Flag I (F)
B-25 (WDNR ID No. 428)	RESIDUE, TOTAL FILTERABLE (TDS) [Ana. Code 70300]	05/15/13	270	QC Flag I (F)
B-25 (WDNR ID No. 428)	RESIDUE, TOTAL FILTERABLE (TDS) [Ana. Code 70300]	11/12/18	320	QC Flag I (F)
B-25 (WDNR ID No. 428)	HARDNESS, TOTAL, FILTERED [Ana. Code 22413]	05/19/15	270	QC Flag I (F)
B-25 (WDNR ID No. 428)	ALKALINITY, TOTAL FILTERED [Ana. Code 39036]	05/19/15	240	QC Flag I (F)
B-25A (WDNR ID No. 429)	RESIDUE, TOTAL FILTERABLE (TDS) [Ana. Code 70300]	05/15/13	360	QC Flag I (F)
B-25A (WDNR ID No. 429)	RESIDUE, TOTAL FILTERABLE (TDS) [Ana. Code 70300]	11/12/18	350	QC Flag I (F)
B-25A (WDNR ID No. 429)	HARDNESS, TOTAL, FILTERED [Ana. Code 22413]	05/19/15	290	QC Flag I (F)
B-25A (WDNR ID No. 429)	ALKALINITY, TOTAL FILTERED [Ana. Code 39036]	05/19/15	280	QC Flag I (F)
B-25B (WDNR ID No. 430)	RESIDUE, TOTAL FILTERABLE (TDS) [Ana. Code 70300]	05/15/13	330	QC Flag I (F)
B-25B (WDNR ID No. 430)	RESIDUE, TOTAL FILTERABLE (TDS) [Ana. Code 70300]	11/12/18	270	QC Flag I (F)
B-25B (WDNR ID No. 430)	HARDNESS, TOTAL, FILTERED [Ana. Code 22413]	05/19/15	250	QC Flag I (F)
B-25B (WDNR ID No. 430)	ALKALINITY, TOTAL FILTERED [Ana. Code 39036]	05/19/15	250	QC Flag I (F)
B-30 (WDNR ID No. 431)	RESIDUE, TOTAL FILTERABLE (TDS) [Ana. Code 70300]	05/15/13	340	QC Flag I (F)
B-30 (WDNR ID No. 431)	RESIDUE, TOTAL FILTERABLE (TDS) [Ana. Code 70300]	11/12/18	290	QC Flag I (F)
B-30 (WDNR ID No. 431)	HARDNESS, TOTAL, FILTERED [Ana. Code 22413]	05/19/15	290	QC Flag I (F)
B-30 (WDNR ID No. 431)	ALKALINITY, TOTAL FILTERED [Ana. Code 39036]	05/19/15	260	QC Flag I (F)
B-28A (WDNR ID No. 444)	RESIDUE, TOTAL FILTERABLE (TDS) [Ana. Code 70300]	05/15/13	400	QC Flag I (F)
B-28A (WDNR ID No. 444)	ALKALINITY, TOTAL FILTERED [Ana. Code 39036]	05/15/13	No results in GEMS	
B-28A (WDNR ID No. 444)	SODIUM, DISSOLVED (MG/L AS NA) [Ana. Code 930]	05/15/13	No results in GEMS	
B-28A (WDNR ID No. 444)	RESIDUE, TOTAL FILTERABLE (TDS) [Ana. Code 70300]	11/13/18	390	QC Flag I (F)
B-28A (WDNR ID No. 444)	HARDNESS, TOTAL, FILTERED [Ana. Code 22413]	05/20/15	340	QC Flag I (F)
B-28A (WDNR ID No. 444)	ALKALINITY, TOTAL FILTERED [Ana. Code 39036]	05/20/15	290	QC Flag I (F)

PAL Calculations

- Total alkalinity (filtered)
- Total hardness (filtered)
- Sodium (dissolved)
- Total filterable residue
- Specific conductance – field

Waupaca Foundry, Inc. -- Landfill Lic. No. 2638

PAL calculations

Parameter: Total alkalinity (filtered)

NR140, Table 3 (June 2021) minimum increase: 100 mg/L

Well Name	Location relative to landfill / Type of well	WDNR ID#	No. of Samples	Mean	Std. Dev.	3 X Std. Dev.	Mean + 3 Std. Dev.	Mean + Minimum Increase	PAL
B-1	Downgradient / deep piezometer	401	19	246	8	24	270	346	350
B-1A	Downgradient / mid. piezometer	402	19	258	27	81	339	358	360
B-1B	Downgradient / water table	403	19	325	32	96	421	425	430
B-7	Downgradient / piezometer	408	19	270	21	63	333	370	370
B-7A	Downgradient / water table	409	20	284	25	75	359	384	390
B-25	Upgradient / deep piezometer	428	19	244	8	24	268	344	350
B-25A	Upgradient / mid. piezometer	429	19	272	10	30	302	372	380
B-25B	Upgradient / water table	430	19	265	26	78	343	365	370
B-28	Downgradient / water table	420	19	259	39	117	376	359	380
B-28A	Downgradient / piezometer	444	18	305	18	54	359	405	410
B-29	Downgradient / water table	421	19	309	64	192	501	409	510
B-30	Upgradient / water table	431	19	316	19	57	373	416	420

Waupaca Foundry, Inc. -- Landfill Lic. No. 2638

PAL calculations

Parameter: Total hardness (filtered)

NR140, Table 3 (June 2021) minimum increase: 100 mg/L

Well Name	Location relative to landfill / Type of well	WDNR ID#	No. of Samples	Mean	Std. Dev.	3 X Std. Dev.	Mean + 3 Std. Dev.	Mean + Minimum Increase	PAL
B-1	Downgradient / deep piezometer	401	19	283	13	39	322	383	390
B-1A	Downgradient / mid. piezometer	402	19	287	14	42	329	387	390
B-1B	Downgradient / water table	403	19	297	31	93	390	397	400
B-7	Downgradient / piezometer	408	19	293	18	54	347	393	400
B-7A	Downgradient / water table	409	20	294	28	84	378	394	400
B-25	Upgradient / deep piezometer	428	19	273	10	30	303	373	380
B-25A	Upgradient / mid. piezometer	429	19	316	17	51	367	416	420
B-25B	Upgradient / water table	430	19	285	32	96	381	385	390
B-28	Downgradient / water table	420	19	141	32	96	237	241	250
B-28A	Downgradient / piezometer	444	19	336	13	39	375	436	440
B-29	Downgradient / water table	421	19	292	59	177	469	392	470
B-30	Upgradient / water table	431	19	322	17	51	373	422	430

Waupaca Foundry, Inc. -- Landfill Lic. No. 2638

PAL calculations

Parameter: Sodium (dissolved)

NR140, Table 3 (June 2021) minimum increase: 10 mg/L

Well Name	Location relative to landfill / Type of well	WDNR ID#	No. of Samples	Mean	Std. Dev.	3 X Std. Dev.	Mean + 3 Std. Dev.	Mean + Minimum Increase	PAL
B-1	Downgradient / deep piezometer	401	20	4.3	0.2	0.6	4.9	14.3	15
B-1A	Downgradient / mid. piezometer	402	19	4.3	0.7	2.1	6.4	14.3	15
B-1B	Downgradient / water table	403	19	30	11	33	63	40	63
B-7	Downgradient / piezometer	408	20	5.4	0.5	1.5	6.9	15.4	16
B-7A	Downgradient / water table	409	20	4.2	1	3	7.2	14.2	15
B-25	Upgradient / deep piezometer	428	20	3.1	0.4	1.2	4.3	13.1	14
B-25A	Upgradient / mid. piezometer	429	20	5.3	0.9	2.7	8	15.3	16
B-25B	Upgradient / water table	430	20	4.6	0.9	2.7	7.3	14.6	15
B-28	Downgradient / water table	420	20	89.3	22	66	155.3	99.3	160
B-28A	Downgradient / piezometer	444	19	20	12	36	56	30	56
B-29	Downgradient / water table	421	20	44.6	21	63	107.6	54.6	110
B-30	Upgradient / water table	431	20	5.4	1.6	4.8	10.2	15.4	16

Waupaca Foundry, Inc. -- Landfill Lic. No. 2638

PAL calculations

Parameter: Total filterable residue (dried, 180°C)

NR140, Table 3 (June 2021) minimum increase: 200 mg/L

Well Name	Location relative to landfill / Type of well	WDNR ID#	No. of Samples	Mean	Std. Dev.	3 X Std. Dev.	Mean + 3 Std. Dev.	Mean + Minimum Increase	PAL
B-1	Downgradient / deep piezometer	401	18	313	33	99	412	513	520
B-1A	Downgradient / mid. piezometer	402	18	308	30	90	398	508	510
B-1B	Downgradient / water table	403	18	364	41	123	487	564	570
B-7	Downgradient / piezometer	408	18	323	38	114	437	523	530
B-7A	Downgradient / water table	409	18	331	50	150	481	531	540
B-25	Upgradient / deep piezometer	428	18	303	54	162	465	503	510
B-25A	Upgradient / mid. piezometer	429	18	354	64	192	546	554	560
B-25B	Upgradient / water table	430	18	304	65	195	499	504	510
B-28	Downgradient / water table	420	18	364	79	237	601	564	610
B-28A	Downgradient / piezometer	444	18	397	45	135	532	597	600
B-29	Downgradient / water table	421	18	411	92	276	687	611	690
B-30	Upgradient / water table	431	18	352	43	129	481	552	560

Waupaca Foundry, Inc. -- Landfill Lic. No. 2638

PAL calculations

Parameter: Specific conductance - field

NR140, Table 3 (June 2021) minimum increase: 200 umhos/cm @25°C

Well Name	Location relative to landfill / Type of well	WDNR ID#	No. of Samples	Mean	Std. Dev.	3 X Std. Dev.	Mean + 3 Std. Dev.	Mean + Minimum Increase	PAL
B-1	Downgradient / deep piezometer	401	20	528	23	69	597	728	730
B-1A	Downgradient / mid. piezometer	402	20	542	40	120	662	742	750
B-1B	Downgradient / water table	403	20	628	42	126	754	828	830
B-7	Downgradient / piezometer	408	20	548	40	120	668	748	750
B-7A	Downgradient / water table	409	20	534	50	150	684	734	740
B-25	Upgradient / deep piezometer	428	20	503	20	60	563	703	710
B-25A	Upgradient / mid. piezometer	429	20	594	36	108	702	794	800
B-25B	Upgradient / water table	430	20	523	52	156	679	723	730
B-28	Downgradient / water table	420	20	601	93	279	880	801	890
B-28A	Downgradient / piezometer	444	20	681	52	156	837	881	890
B-29	Downgradient / water table	421	20	699	149	447	1146	899	1200
B-30	Upgradient / water table	431	20	583	26	78	661	783	790

ACL Exemption request for fluoride, Monitor Well B-25

HydroGeo Solutions LLC

May 16, 2022

Ms. Jackie Marciulionis
Wisconsin Department of Natural Resources
2984 Shawano Avenue
Green Bay, WI 54313

Re: Exemption Request and Approval of Fluoride (dissolved) ACL for Monitor Well B-25
Waupaca Foundry, Inc., Landfill, Waupaca County, Wisconsin
(WDNR License No. 2638; EPA ID WID981093248)

Dear Ms. Marciulionis:

HydroGeo Solutions LLC has prepared this request on behalf of Waupaca Foundry, Inc. (WFI) for the exemption of the Preventive Action Limit (PAL) for fluoride (dissolved) and approval of an Alternate Concentration Limit (ACL) at Monitor Well B-25. This well is part of the groundwater monitoring program for WFI Landfill License No. 2638. Monitor Well B-25 is one of three wells in a well nest monitoring upgradient groundwater quality at WFI Landfill 2638. Monitor Well B-25 is the deep piezometer in the well nest (93.1 feet from the top of the PVC [TPVC]) with the other wells B-25A (middle piezometer, 61.3 feet TPVC) and B-25B (water table well, 40.8 feet TPVC).

Geology and Hydrogeology

The glacial sediments around Landfill 2638 are sand and gravel deposited directly by meltwater streams flowing east to west, originating from the margin of the Green Bay Lobe (Mode et al., 2015). These sediments are predominately fine to medium sand to silty sand, including discrete lenses of gravel and occasional cobbles and boulders; silts; and silty clays, reflecting deposition by shallow braided channels continually shifting positions.

In general, groundwater flow is from west to east across the site. A water map from May 1996 (Sheet No. 18382XF-110) shows the typical groundwater flow direction. Given the relative homogeneity of the uppermost aquifer, horizontal flow predominates, with slight to no vertical gradients measured in wells monitoring groundwater quality in the vicinity of Landfill 2638. Figure 1 shows water elevations measured from 1982-2021 in all the wells that are part of the monitoring program for Landfill 2638. Figure 1 indicates that even during seasonal fluctuations in groundwater elevation, groundwater flow remains from west to east.

Exemption Request

Dissolved fluoride is part of the groundwater monitoring program for WFI Landfill No. 2638 and has been monitored at B-25 since September 1989. Of the 77 dissolved fluoride results available for Monitor Well B-25 from 1989 to 2021 (Table 1), 70 analyses have been above the PAL for that parameter (0.8 mg/L). In contrast, during that same period, the PAL was exceeded once at B-25A and twice at B-25B. No dissolved fluoride analyses have exceeded the Enforcement Standard (ES) for that parameter (4 mg/L) in any of the three wells. No impacts to groundwater quality for any of the monitored parameters have been noted at the three wells at this location since monitoring was initiated in 1989. This is the case even during 1989 through 1997, when groundwater quality was impacted at Landfill 2638 downgradient monitor well locations.

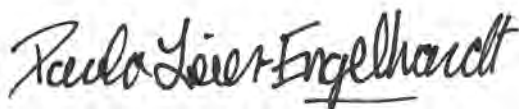
HydroGeo Solutions LLC

Based on the historical analytical data, the background value for dissolved fluoride in the deeper part of the aquifer monitored at B-25 is naturally higher than that observed in B-25A and B-25B, the shallower wells monitoring groundwater quality at that location. Therefore, an exemption to the PAL for dissolved fluoride at Monitor Well B-25 is requested. An ACL has been calculated, 1.2 mg/L (Table 2) and the approval of this ACL is requested. It is proposed, and approval is requested, for this ACL to replace the PAL for dissolved fluoride at Monitor Well B-25.

Table 2 summarizes the data used to calculate the dissolved fluoride ACL, as well as the ACL calculations. To be consistent with PAL calculations completed for indicator parameters monitored at all the groundwater wells that are part of the WFI Landfill No. 2638 monitoring program, the last 10 years of data was used (2012 to 2021). ACL calculations were completed per NR 140 and NR 507 Wis. Adm. Code, using the guidance document *How to Calculate Preventive Action Limits (PALs) and Alternative Concentration Limits (ACLs) for Solid Waste Facilities* (PUB-WA-1105, revised 2007).

Please contact Bryant Esch, Waupaca Foundry, Inc. (715-258-6674), or Ms. Paula Leier-Engelhardt, HydroGeo Solutions LLC, (920 737 9811) if you have questions.

Sincerely,



Paula Leier-Engelhardt, P.G., CPG
Principal Geologist

I, Paula Leier-Engelhardt, P.G., hereby certify that I am a licensed Professional Geologist in the State of Wisconsin in accordance with the requirements of ch. GHSS 2, Wis. Adm. Code; that the preparation of this document has not involved any unprofessional conduct as detailed in ch. GHSS 5, Wis. Adm. Code; and that, to the best of my knowledge, all information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 500 to 538 Wis. Adm. Code.


 Paula Leier-Engelhardt, P.G.
Principal Geologist
**Distribution List**

Mr. Bryant Esch
Waupaca Foundry, Inc.
P.O. Box 249
Waupaca, WI 54981

electronically

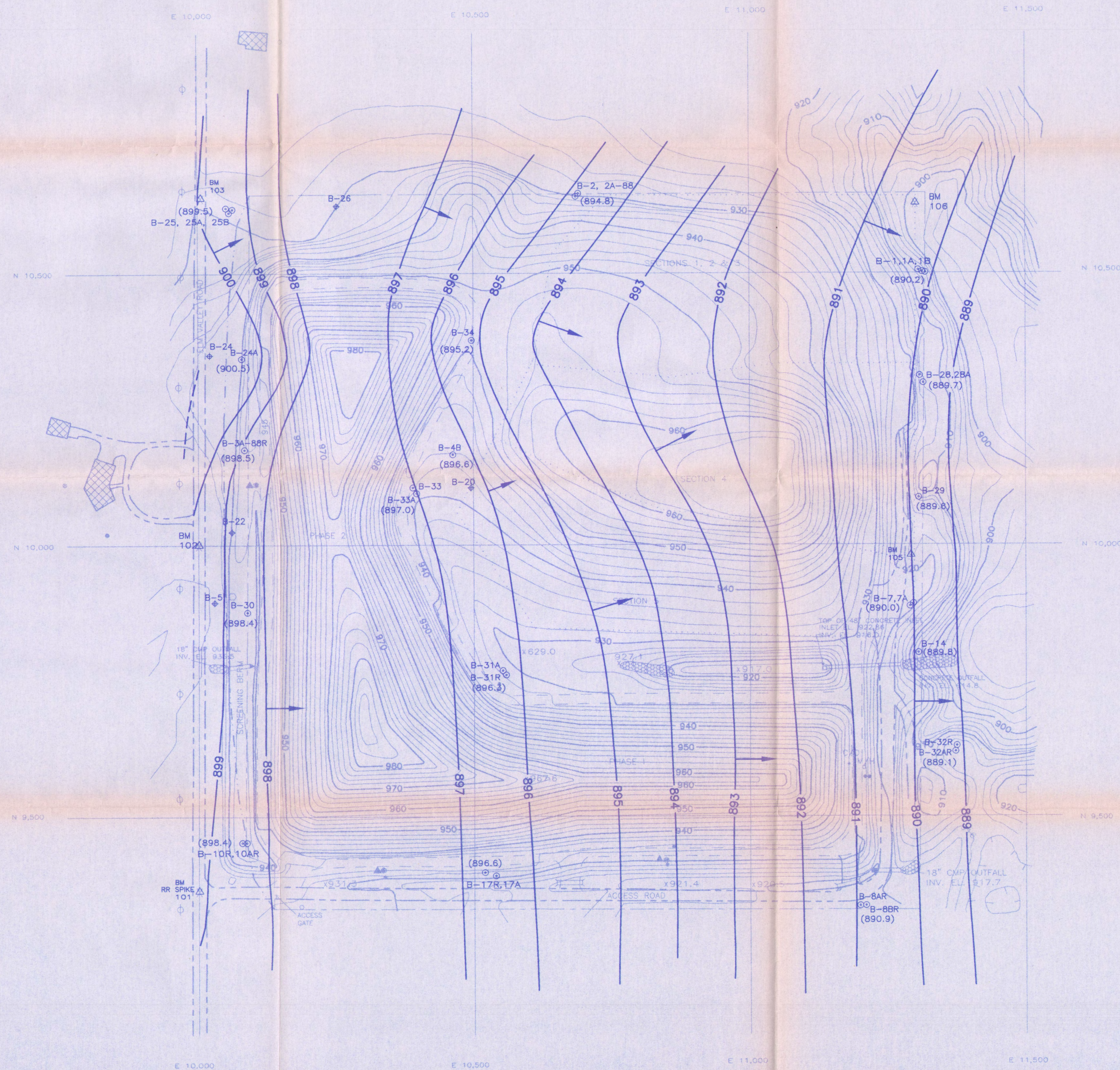
HydroGeo Solutions LLC

References

Mode, W.N., Hooyer, T.S., Attig, J.W., 2015, Preliminary Quaternary Geology of Waupaca County, Wisconsin: Wisconsin Geological and Natural History Survey Open-File Report 2015-03, Plate 1.

Attachments

Sheet No. 18382XF-110	Water Table Map, May 1996 (from <i>1996 Site Operation and Groundwater Monitoring Report, Waupaca Foundry Landfill Secs. 1, 2, 3, 4 and 5</i>)
Figure 1	Groundwater Elevations
Table 1	B-25 – Fluoride (dissolved)
Table 2	ACL Calculations



LEGEND

- PROPERTY LINE
- PRIVATE WATER SUPPLY WELL
- ▣ RESIDENCE / BUILDING
- IRRIGATION WELL - WAUPACA FOUNDRY
- POWER LINE
- △ SURVEYING BENCHMARK
- FENCELINE
- BOUNDARY BETWEEN SECTION 1 THROUGH 5
- 18" CMP CULVERT PIPE
- 18" CMP STAND PIPE
- CLEANOUT WITH PROTECTOR PIPE
- LYSIMETER STAND PIPE
- ROCK OUTFALL
- LEACHATE HEAD MONITORING POINT
- EXISTING MONITORING WELL
- ⊕ SOIL BORING
- (889.6) GROUNDWATER ELEVATION (FT.)
- 890 GROUNDWATER CONTOUR
- APPROXIMATE FLOW DIRECTION



STS Consultants Ltd.
Consulting Engineers

**1996 SITE OPERATION AND
GROUNDWATER MONITORING REPORT
WAUPACA FOUNDRY LANDFILL
SECTIONS 1, 2, 3, 4 & 5
WAUPACA, WISCONSIN**

WATER TABLE MAP, MAY 1996

DRAWN BY	DATE	SCALE	STS PROJECT NO.
J.R.L.	12-17-96	1"=100'	19285XF
REVIEWED BY	DATE	SHEET NO.	
C.D.T.	12-17-96	18382XF-110	

NO.	DESCRIPTION	DATE	BY

W:\DWG96\19285\XF\18382XF\SH110.DWG

**FIGURE 1 -- GROUNDWATER ELEVATIONS (FEET ABOVE MSL)
Waupaca Foundry Landfill #2638**

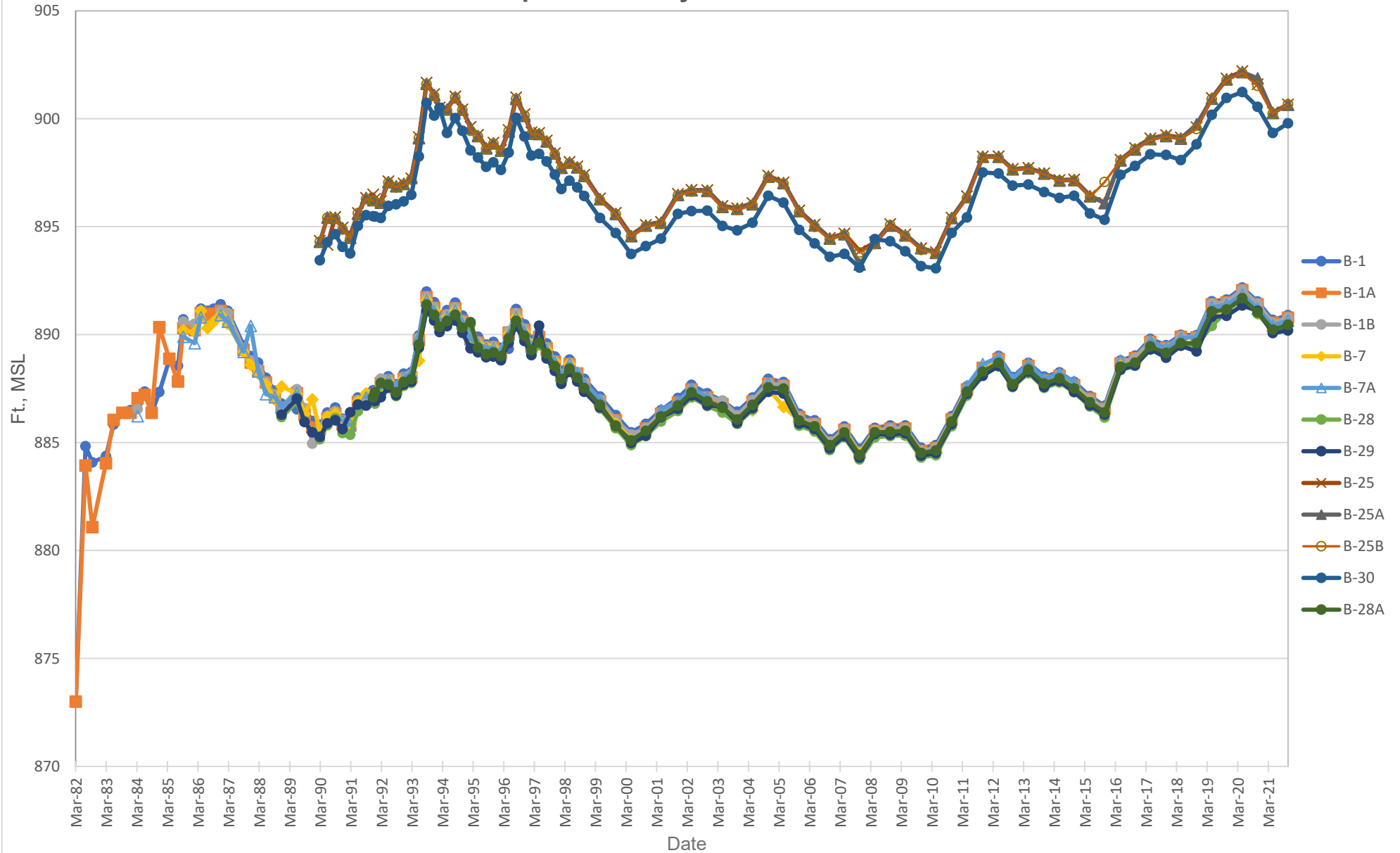


TABLE 1
B-25 -- Fluoride (diss.)
Waupaca Foundry, Inc. -- Landfill Lic. No. 2638

DNR PNT ID	WELL ID	ANAL CODE	PARAM NAME	RESULT	S DATE
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	0.91	09/11/89
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	0.97	10/11/89
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	0.82	11/14/89
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	0.91	12/14/89
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	0.92	03/13/90
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	0.99	06/10/90
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	1.2	09/10/90
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	0.92	12/10/90
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	0.95	03/10/91
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	1	06/10/91
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	1.1	12/07/93
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	1	02/10/94
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	1	05/10/94
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	1.8	08/16/94
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	1	11/09/94
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	0.96	02/15/95
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	1.5	05/16/95
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	1	08/22/95
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	0.94	11/15/95
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	1.1	02/14/96
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	1	05/15/96
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	0.98	08/13/96
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	1	11/20/96
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	1	02/11/97
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	1.1	05/13/97
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	0.91	08/11/97
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	0.97	11/18/97
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	0.98	02/04/98
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	1	05/12/98
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	0.91	08/12/98
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	0.86	11/04/98
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	0.83	05/11/99
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	0.7	11/15/99
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	0.86	05/17/00
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	0.92	11/08/00
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	1	05/08/01
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	0.92	11/26/01
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	0.74	05/08/02
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	1	11/11/02
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	1	05/13/03
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	0.85	11/04/03
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	0.81	05/05/04
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	0.55	11/08/04
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	0.76	05/10/05
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	0.77	11/14/05
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	0.79	05/18/06
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	1.1	11/13/06
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	1.1	05/08/07
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	1.1	11/05/07
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	1.1	05/07/08
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	0.92	11/04/08
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	0.97	05/05/09
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	0.9	11/09/09
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	0.92	05/05/10
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	0.79	11/08/10
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	0.93	05/11/11
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	0.84	11/15/11
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	1	05/23/12
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	0.9	11/06/12
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	0.98	05/15/13
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	0.89	11/19/13
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	0.9	05/20/14
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	0.9	11/10/14
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	0.91	05/19/15
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	0.92	11/10/15
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	0.94	05/17/16
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	1	11/08/16
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	1	05/09/17
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	1.1	11/13/17
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	1.1	05/08/18
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	0.93	11/12/18
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	1.1	05/14/19
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	0.98	11/04/19
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	1	05/12/20
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	1.1	11/09/20
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	1	05/11/21
428	B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	0.91	11/08/21

Notes:

1) Values range from 0.55 mg/L (Nov. 2004) to 1.8 mg/L (Aug. 1994)

2) Mean of all data: 0.97

3) Mean of data above NR 140 PAL (0.8 mg/L): 0.99

TABLE 2
 ACL Calculations
 B-25 -- Fluoride, dissolved
 Waupaca Foundry, Inc. -- Landfill Lic. No. 2638

WELL_ID	ANAL_CODE	PARAM_NAME	RESULT	S_DATE	QCF1	QCF2	QCF3	LOD	LOQ
B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	1	5/23/2012	M	M	M	0.05	0.1
B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	0.9	11/6/2012	M	M	M	0.05	0.1
B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	0.98	5/15/2013	M	M	M	0.05	0.1
B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	0.89	11/19/2013	M	M	M	0.05	0.1
B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	0.9	5/20/2014	M	M	M	0.05	0.1
B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	0.9	11/10/2014	M	M	M	0.05	0.1
B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	0.91	5/19/2015	M	M	M	0.05	0.1
B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	0.92	11/10/2015	M	M	M	0.05	0.1
B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	0.94	5/17/2016	M	M	M	0.05	0.1
B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	1	11/8/2016	M	M	M	0.05	0.1
B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	1	5/9/2017	M	M	M	0.05	0.1
B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	1.1	11/13/2017	M	M	M	0.05	0.1
B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	1.1	5/8/2018	M	M	M	0.05	0.1
B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	0.93	11/12/2018	M	M	M	0.05	0.1
B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	1.1	5/14/2019	M	M	M	0.046	0.16
B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	0.98	11/4/2019	M	M	M	0.046	0.16
B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	1	5/12/2020	M	M	M	0.046	0.16
B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	1.1	11/9/2020	M	M	M	0.046	0.16
B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	1	5/11/2021	M	M	M	0.046	0.16
B-25	950	FLUORIDE, DISSOLVED (MG/L AS F)	0.91	11/8/2021	M	M	M	0.027	0.1

Mean 0.98

Standard deviation 0.07

Well Name	Location relative to landfill / Type of well	PARAM_NAME	No. of Samples	Mean	Std. Dev.	2 X Std. Dev.	Mean + 2 Std. Dev.	ACL
B-25	Upgradient / deep piezometer	FLUORIDE, DISSOLVED (MG/L AS F)	20	0.98	0.07	0.14	1.12	1.2

B4 – Groundwater Sampling

- Northern Lake Service Groundwater Monitoring Standard Operating Procedures
- Northern Lake Service Field Quality Assurance Record Form
- Northern Lake Service Field Groundwater Monitoring Record and Chain of Custody

Northern Lakes Service
Groundwater Monitoring
Standard Operating
Procedures

NORTHERN LAKE SERVICE, INC.

GROUNDWATER MONITORING STANDARD OPERATING PROCEDURE

This document describes the field methods and protocol that will be utilized to purge and sample monitoring wells associated with Waupaca Foundry landfills. The standard operating procedures also describe methods and equipment used to conduct field analyses, as well as methods and equipment used to purge and sample wells.

PURGING/SAMPLING SEQUENCE

Purging and sampling sequence for the wells will be listed in order on the field data sheets. The sequence will be established based on groundwater gradient, historical water chemistry of the wells and location of the well. Generally, the sequence proceeds from upgradient wells to the downgradient wells, which are most likely to be impacted by the facility.

PURGING/SAMPLING EQUIPMENT

Each well will be purged and sampled using a dedicated PVC bailer, usually six feet in length with a 1.66" outside diameter. The bailer for each well has a dedicated 6-foot leader. The bailer and leader are stored in the well, attached to a stainless-steel hook connected to the well cap on the well. The leader attached to a bailer consists of polyethylene rope. The rope which is attached to the leader during bailing operations also consists of polyethylene rope.

PRE-SAMPLING PREPARATION

Field meters are calibrated and recorded on the appropriate calibration log. Upon arrival at the site, the site is inspected for potential contaminant sources. A description of any unusual site conditions is included on the field record, and includes extreme temperatures, windy, dusty, recent heavy rain and any other conditions or circumstances that could affect the quality of data.

STATIC WATER LEVEL MEASUREMENT

The following procedures are utilized to determine static water level to the nearest hundredth of a foot utilizing a Solinst Electronic Water Level Tape.

1. Plastic sheeting is placed on ground surface adjacent to well *if* conditions require.
2. Unlock well and remove cap and dedicated bailer. Note any obvious odors emanating from well.
3. Slowly lower the water level probe into the well by pulling cable from the hand-held reel until the indicator light on the reel is illuminated and the alarm sounds indicating that the groundwater interface has been encountered.
4. Using the permanently established point on the top of the well casing as a reference point, read from the cable the depth to water, to the nearest hundredth of a foot.
5. Record this data on the field log sheet.
6. Rinse the probe and exposed cable with reagent-grade water.

DETERMINATION OF WATER COLUMN DEPTH (VOLUME)

Upon determination of depth to water and using the depth to bottom measured during the previous sampling event, the static water elevation and water volume in the well can be calculated as follows:

1. Static water elevation is calculated by subtracting the measured depth to water from the known top-of-pipe elevation of the well.
2. The water column height in the well is determined by subtracting the measured depth to water from the depth to bottom. The water column height (feet) is recorded on the log sheet.
3. With the aid of Appendix A, the standing water volume and the purge volume can be determined and recorded on the log sheet.
4. Four well volumes, if achievable, is required for all monitoring wells. Landfill No. 2638 requires only three volumes, as years of historical data have already been established with three volumes.

PURGING

Upon determination of the purge volume required, the purging activity is conducted as follows.

1. Place calibrated purge water graduated measuring vessel on level surface.
2. Securely connect bailer rope to the dedicated bailer leader.
3. Slowly lower the bailer down the well into the standing water column, and then retrieve the bailer. Bailing must be done carefully to avoid unnecessary turbulence and aeration of the water column.
4. Empty the water from the bailer into the interim purge-measuring vessel.
5. This process is continued until four well volumes (or three as previously described) are purged from the well. For wells which draw down during purging but do not purge dry, the field technician will purge enough water to ensure that a minimum of four (or three) times the remaining volume is removed. For a well that can be purged dry, it will be allowed to recover for at least 2 hours, but no longer than 24 hours, in order to achieve approximately 75% recovery.
6. During purging, a qualitative assessment of turbidity is made and recorded on the field log sheet.
7. Purge water will be broadcast on the ground surface away from the well unless otherwise instructed.
8. Upon completion of the purging process, the purge volume, date, and time will be recorded on the field log sheet.

SAMPLING

Upon completion of the purging activity the well is sampled as follows:

1. Sampling is conducted in the same order as purging. Samples are collected immediately after purging for flowing wells and after recharge for non-flowing wells. Sample date and time is entered on the field log sheet.

2. The bailer is slowly lowered into the water column to the screened area to obtain a sample.
3. Upon retrieval of the bailer, a bottom draw device is attached to the bailer and any sample bottles, which require unfiltered samples for analysis, specifically VOCs and other organics, are filled at this time. VOC sample collection details are outlined in the proceeding section. The assembly is then transported to the mobile laboratory van.
4. Utilizing the bottom draw device, unfiltered samples are dispensed into two, 60 ml, insulated vials for subsequent determination of field conductivity and pH (see description under In-Field Measurements).
5. For filtered samples the bottom draw device is attached to a GeoTech peristaltic pump for filtration through a 0.45-micron filter.
6. When conducting the sample filtration (Appendix B), sample bottles should be filled in the following order: non-preserved, sulfuric preserved and nitric preserved.
7. Labeling information is entered on the sample bottles prior to filling. After filling, bottles are placed on ice in a cooler for temperature maintenance at or below 4 degrees Celsius during transit.
8. The bailer, leader, and bailing rope are rinsed with reagent-grade water after completion of purging and sampling.

DETERMINATION OF DEPTH TO BOTTOM OF WELL

1. Utilizing the water level tape, lower the probe to the bottom of the well and read the tape at reference point at the top of the well. Add 0.06 ft. to compensate for the distance from the bottom of the probe to the water sensor. This is the depth to well bottom.
2. Record this data on the field log sheet.
3. Rinse the probe and exposed cable with reagent-grade

SAMPLE CUSTODY

The samples are always in the custody of the sampling crew. The cooler must remain in sight of at least one member of the crew or all the doors of the van must be locked. When overnight stays are required, samples will remain in a locked van or taken to a locked motel room if warranted by cold temperatures. Otherwise, the samples will be taken to the laboratory at the end of each day and the crew chief must fill out the appropriate chain-of-custody forms.

SAMPLE COLLECTION PROCEDURE FOR VOCs

The procedure below will be followed to collect samples from monitoring wells for laboratory VOC analyses.

1. After the well is purged and the desired recharge has occurred, sample the well using the PVC bailer with a bottom discharge device.
2. Fill a 40-ml sample vial immediately by allowing water to gently stream out of the bottom discharge nozzle into the vial. Allow water to overflow producing a positive meniscus at the brim of the vial. Make sure that no air bubbles remain inside the vial.
3. Replace the cap with the Teflon-coated septum by gently setting it on the positive water meniscus and tightening it firmly. The Teflon-coated side (shiny white side) of the cap liner should be placed toward the sample. The silicon side should point away from the sample.
4. Invert the vial and tap it gently to determine if any bubbles remain inside.
5. If bubbles are present, empty the vial and collect the sample again in a different vial. Extremely effervescent samples where collection with no air bubbles is impossible are noted on the back of the Field Groundwater Monitoring Record.

PRIVATE WELL SAMPLING

Private well samples are taken from a faucet near the well and always prior to any treatment system (i.e. softeners, filters). The system must be flushed by running the cold water for five minutes. Sample bottles are filled in the same order as the groundwater wells but these are not filtered.

IN-FIELD MEASUREMENTS

Conductivity and pH are measured in unfiltered groundwater samples which have been placed in two separate, insulated vials. To measure conductivity, the probe is placed in a vial 1 and allowed to temperature compensate. The probe is then transferred to vial 2 to obtain a temperature compensated reading. The pH of the sample is then determined in vial 1. The temperature is most accurate when taken directly from the purge water during purging.

The conductivity of the water samples obtained from the monitoring wells and piezometers will be measured using the Amber Science Inc. Model 2052 conductivity meter or approved equivalent. The pH of water samples will be measured to the temperature of the samples using an Oakton 11 Series pH meter or approved equivalent. The temperature will be measured to the nearest 0.1 degree Celsius using a Hanna HI-9063 or NIST traceable digital thermometer.

QUALITATIVE OBSERVATIONS

In addition to the in-field measurements, qualitative observations of the water samples will be recorded, such as color, odor and turbidity. The color reported is "True Color", determined after filtration. Odor is also determined after filtration by smelling the non-preserved bottle. The turbidity observation is made by examining the filter residue. (Appendix C)

SAMPLE PRESERVATION

Samples requiring chemical preservation are transferred directly to bottles in which the preservative has been pre-dispensed. All samples are then immediately put on ice in the cooler.

PREVENTING CROSS CONTAMINATION

The bailer bottom-draw device is thoroughly rinsed with reagent-grade water between wells to prevent cross contamination.

Nitrile gloves are worn by the field technician during sampling activities. The gloves replaced if they become grossly contaminated, and are replaced with new ones after each well.

Before filtering, new cellulose acetate filters are installed in the filtering apparatus and 500 to 1000 ml of reagent-grade water is run through the new filter. In addition, the first 50-ml of the next filtered sample is discarded to minimize dilutional effects of the rinse water.

INSTRUMENT CALIBRATION

Field instrument calibrations are conducted at the beginning of the sample day, at mid-day, and immediately after the last sample has been processed. Calibration documentation is maintained on the NLS fieldwork Quality Assurance Record.

Conductivity standards must read within five percent of the actual concentration and pH standards within 0.1 s.u. of the actual value or all of the samples from the last acceptable meter check to the unacceptable one will be reanalyzed.

QUALITY CONTROL SAMPLES

Assessment of field sampling precision and accuracy is maintained through the collection and evaluation of quality control (QC) samples. A description of QC samples that may be collected during particular sampling events is given below. Collection frequencies for field QC samples are also outlined.

A *trip blank* is a reagent-grade water sample obtained from the analytical laboratory (Northern Lake Service, Inc.), which accompanies the sample containers to the field and back to the laboratory. Trip blanks are used only when sampling for VOCs, and one trip blank will be included in each cooler used for VOC samples. The purpose of the trip blank is to determine if any sample bottles or collected samples have been contaminated with VOCs before or during sample shipping. The trip blank will be analyzed to determine if the contamination could have been the result of shipping or sampling interferences.

A *field blank* is a sample of reagent-grade water, which is processed through the sampling equipment in the same manner as the actual samples after the equipment has been decontaminated. The purpose of these blanks is to determine if field-cleaning procedures are adequate to prevent cross contamination of samples from consecutive sampling points. A field blank will be collected for every 20 samples, or when a new container of reagent-grade water is used.

A *field duplicate* is a duplicate well sample collected in the same manner as the original. One field duplicate is collected for every ten samples.

All wells can be assumed in good condition unless noted in the row labeled Well Condition on the field form. See Appendix D for field abbreviation key.

Appendix A

WELL PURGE VOLUMES

The preferred method for determining purged volumes from monitoring wells is to bail or pump directly into a graduated container.

NLS GROUNDWATER CALCULATIONS

Standing water column (ft.) = depth to bottom minus depth to water

Water volume in well (gal) = standing water column (ft.) X

.075 for 1 ¼" wells
.103 for 1 ½" wells
.171 for 2.00" wells
.377 for 3.00" wells
.652 for 4.00" wells
1.483 for 6.00" wells

Total volume to be purged = water volume in well X 3.0 or 4.0 site specific volumes to be purged (rounded to the nearest 0.1 gallons)

Schedule 40 PVC pipe volumes

1 ¼" (1.36" ID) =	.075 gal / ft
1 ½" (1.59" ID) =	.103 gal / ft
2" (2.05" ID) =	.171 gal / ft
3" (3.042" ID) =	.377 gal / ft
4" (3.998" ID) =	.652 gal / ft
6" (6.031" ID) =	1.483 gal / ft

Appendix B

FILTRATION UNIT

Samples collected for dissolved metal analysis will be filtered in the field immediately after collecting the sample. The filtering process is designed to remove suspended sediment from the sample. Such suspended material can react with a sample and may change the concentration of certain dissolved constituents. Following the filtering process, samples will be preserved using appropriate chemical preservatives.

Field filtering procedures are as follows:

1. The filtering apparatus will consist of a GeoTech peristaltic pump and a filter mount. The filters used are Geofilter 142 millimeter, 0.45-micron cellulose acetate or an approved, quality equivalent.
2. A minimum of 500-1000 milliliters of reagent-grade water will be flushed through the filtering apparatus before sample filtration.
3. After flushing with reagent-grade water, approximately 50 milliliters of sample will be pumped through the filter and discarded.
4. Next, the proper sample volume required by the analytical laboratory will be collected.
5. After the sample is collected, the membrane filter will be removed and discarded. Filter paper will not be reused to filter another sample.
6. The filtering apparatus will then be thoroughly rinsed with reagent-grade water and reassembled.
7. Steps 2 through 6 will be repeated for each observation well location.

Appendix C

NLS FIELD SAMPLE CHARACTERISTICS

ODOR

Observe filtered, non-preserved sample immediately after filtering

Intensity:

Not detected (ND)
Slight (slt.)
Moderate (mod.)
Strong

Description:

Musty
Sulfide
Smokey
Lignin
Oily
Sour
Sweet
Putrid
Mineral
Other (specify)

COLOR

Intensity:

Not detected (ND)
Light (lt.)
Medium (med.)
Dark (dk.)

Description:

Reddish brown (red br.)
Yellow
Gray
Black
Amber
Rusty
Green
Tan or Natural
Other (specify)

TURBIDITY

Observe filter after sample filtration is complete

Quantity:

Not detected (ND)
Slight (slt.)
Moderate (mod.)
Extreme (ext.)

Texture:

Not detected (ND)
Fine
Mixed

Color:

Not detected (ND)
Brown (lt., dk.)
Yellow (lt., dk.)
Gray (lt., dk.)
Rusty
Black
Tan or Natural
Other (specify)

Examples:

ODOR: slt sour or strong sulfide

COLOR: dk amber or lt yellow

TURBIDITY: slt, fine, tan or ext, mixed, brown

Appendix D

NLS FIELD ABBREVIATION KEY

Purging Method:

HB = hand bailed
PB = power bailed
DP = deep well pump
G = guzzler pump
O = other

Well Condition:

WD = well damaged
NL = well not locked
NC = no cap on inner casing
SEE BACK = longer explanation on back of field sheet
OK = well in good condition

Purging Information:

P-X = purged the standard volume
P-Dry = purged dry
P-DD(X) = level drew down, purged (X) volumes of remaining column
PO = other (explain)

Filtered:

Y = yes
N = no

Filterability:

G = good
M = moderately good
P = poor
DISPO = high capacity filter cartridge used

Northern Lake Service
Field Quality Assurance
Record Form

NLS FIELD QUALITY ASSURANCE RECORD

CLIENT / SITE: Waupaca Foundry, Inc. / Landfill 2638

Date(s): _____

Initials / Signature: _____ / _____ & _____ / _____

Bottles Prepared By: _____

Thermometer – NLS #: _____

Instruments Checked By: _____

Geotech .45 micron filter lot #: _____

STDs & Buffers, Date Made: _____

QED .45 Dispo Filter lot #: _____

Reagent Grade Water, Jug #: _____

GWV 1.0 Dispo Filter lot #: _____

Reagent Water Date Filled: _____

Bracket test samples using the appropriate pH buffers. Use pH buffer 4.01 with pH buffer 7.00 for low pH samples and pH buffer 10.01 with pH buffer 7.00 for samples having a high pH. On a routine basis use pH buffers 4.01 and 7.00.

pH METER NUMBER _____

DATE:									
TIME:									
STD BY:									
SLOPE:									
BUFFER 4.01									
(R/S)									
BUFFER <u>7.00</u>									
(R/S)									
BUFFER <u>10.01</u>									
(R/S)									

CONDUCTIVITY METER NUMBER _____

DATE:									
TIME:									
STD BY:									
718 umho @ 25° C									
(R/S)									

R = Initial Reading; S = Standardized Reading

Comments:

Northern Lake Service
Field Groundwater
Monitoring Record and
Chain of Custody

NORTHERN LAKE SERVICE, INC. FIELD GROUNDWATER MONITORING RECORD

Appendix B4 Pg. 17/21

NLS Laboratory Number												
Facility: Waupaca Foundry, Inc.	2638	2638	2638	3171	3171	2638	3171	L	3171	3171	3171	3171
Landfill 2638/3171 pg 1 of 4	L B25	L B25A	L B25B	L B24A	LB3A-88R	L B30	L B10R	RWQA1	L B10AR	L B2	L B2AR	L B34
DNR ID#	428	429	430	434	422	431	423	997	424	404	418	443
Well Condition (see key)								May Only				
Pipetop Elevation (ft. MSL)	928.98	929.30	929.30	948.40	946.56	944.61	944.34	-----	944.55	932.33	932.80	956.96
Depth to Water (ft.)								---				
STATIC WATER ELEVATION								---				
Depth to Well Bottom (ft.)	92	61	40	56.5	55	55	55.3	---	110.0	76.9	48.3	73.3
Standing Water Column (ft.)								---				
Standing Water Volume (gal.)								---				
Purging Methods (see key)								---				
Purge Info. (see key) (3 vol.)								---				
Volume Purged (gal.)								---				
Appearance During Purging								---				
FIELD COLOR (describe)								---				
FIELD CONDUCTIVITY (umho @ 25C)								---				
Field Filtered (Y/N describe)	Y	Y	Y	NO	Y	Y	NO	NO	NO	NO	NO	Y
FIELD ODOR (describe)								---				
FIELD pH (standard units)								---				
FIELD TEMPERATURE (degree C)								---				
FIELD TURBIDITY	Quantity							---				
	Texture							---				
	Color							---				
Purge Time-if not immed.												
TIME SAMPLED												
DATE SAMPLED												

NORTHERN LAKE SERVICE, INC. FIELD GROUNDWATER MONITORING RECORD

Appendix B4 Pg. 18/21

NLS Laboratory Number												
Facility: Waupaca Foundry, Inc.	L	L	L	L	L	L FB	L	L	L	L	L	L
Landfill 3171 pg 2 of 4	B4B	B33	B33A	B31R	B31A	QA 2	B17R	B17A	B8AR	B8BR	B32R	B32AR
DNR ID#	407	441	442	439	438	997-2	450	427	411	412	439	440
Well Condition (see key)						---						
Pipetop Elevation (ft. MSL)	944.44	943.40	943.21	933.50	933.52	-----	934.23	929.90	922.50	922.41	918.33	918.09
Depth to Water (ft.)						---						
STATIC WATER ELEVATION						---						
Depth to Well Bottom (ft.)	75.9	55.8	76.3	47.6	72.5	---	70.4	41.2	65.9	41.9	40.0	63.1
Standing Water Column (ft.)						---						
Standing Water Volume (gal.)						---						
Purging Methods (see key)						---						
Purge Info. (see key) (3 vol.)						---						
Volume Purged (gal.)						---						
Appearance During Purging						---						
FIELD COLOR (describe)												
FIELD CONDUCTIVITY (umho @ 25C)												
Field Filtered (Y/N describe)	NO	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
FIELD ODOR (describe)												
FIELD pH (standard units)												
FIELD TEMPERATURE (degree C)												
FIELD TURBIDITY	Quantity											
	Texture											
	Color											
Purge Time-if not immed.												
TIME SAMPLED												
DATE SAMPLED												

NORTHERN LAKE SERVICE, INC. FIELD GROUNDWATER MONITORING RECORD

Appendix B4 Pg. 19/21

NLS Laboratory Number												
Facility: Waupaca Foundry, Inc.	L	L	L	L	L	L	L	L	L FB	L		
Landfill 2638 pg 3 of 4	B14	B7	B7A	B29	B28A	B28	B1	B1A	QA 3	B1B		
DNR ID#	425	408	409	421	444	420	401	402	997-3	403		
Well Condition (see key)									---			
Pipetop Elevation (ft. MSL)	908.05	922.79	922.90	909.70	913.13	913.00	908.06	908.11	-----	908.44		
Depth to Water (ft.)									---			
STATIC WATER ELEVATION									---			
Depth to Well Bottom (ft.)	26.6	60	37	30	46	31	71	48	---	32		
Standing Water Column (ft.)									---			
Standing Water Volume (gal.)									---			
Purging Methods (see key)									---			
Purge Info. (see key) (3 vol.)									---			
Volume Purged (gal.)									---			
Appearance During Purging									---			
FIELD COLOR (describe)												
FIELD CONDUCTIVITY (umho @ 25C)												
Field Filtered (Y/N describe)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
FIELD ODOR (describe)												
FIELD pH (standard units)												
FIELD TEMPERATURE (degree C)												
FIELD TURBIDITY	Quantity											
	Texture											
	Color											
Purge Time-if not immed.												
TIME SAMPLED												
DATE SAMPLED												

NORTHERN LAKE SERVICE, INC. FIELD GROUNDWATER MONITORING RECORD

Appendix B4 Pg. 20/21

NLS Laboratory Number												
Facility: Waupaca Foundry, Inc.	Irrigation	Lysimeter	Lysimeter	Lysimeter	East	West	T.B.					
Landfill 2638 pg 4 of 4	Well	1	2	3	Leachate	Leachate						
DNR ID#	452	432	433	451	417	436	999					
Well Condition (see key)							---					
Pipetop Elevation (ft. MSL)	-----	-----	-----	-----	-----	-----	-----					
Depth to Water (ft.)	---	Y	Y	Y	---	---	---					
STATIC WATER ELEVATION	---	---	---	---	---	---	---					
Depth to Well Bottom (ft.)	---	Y	Y	Y	---	---	---					
Standing Water Column (ft.)	---	---	---	---	---	---	---					
Standing Water Volume (gal.)	---	---	---	---	---	---	---					
Purging Methods (see key)	---	---	---	---	---	---	---					
Purge Info. (see key) (- vol.)	Time Ran	---	---	---	---	---	---					
Volume Purged (gal.)	---	---	---	---	---	---	---					
Appearance During Purging	---	---	---	---	---	---	---					
FIELD COLOR (describe)							---					
FIELD CONDUCTIVITY (umho @ 25C)							---					
Field Filtered (Y/N describe)	Y	NO	NO	NO	NO	NO	---					
FIELD ODOR (describe)							---					
FIELD pH (standard units)							---					
FIELD TEMPERATURE (degree C)							---					
FIELD TURBIDITY	Quantity						---					
	Texture						---					
	Color						---					
Purge Time-if not immed.							---					
TIME SAMPLED							---					
DATE SAMPLED												

NLS Comments/Chain of Custody form

Appendix B4 Pg. 21/21

The following information applies to samples on the reverse side of this sheet.

Date_____Date_____

Crew Chief_____Crew Chief_____

Crew_____Crew_____

Weather/Comments:_____

_____**SAMPLE COLLECTION COMMENTS****SAMPLE CUSTODY**

RELINQUISHED BY (signature)	RECEIVED BY (signature)	DATE/TIME
---	---	------------------

RECEIVED AT NLS BY (signature)	DATE/TIME	CONDITION	TEMP.
--	------------------	------------------	--------------

REMARKS & OTHER INFORMATION
--

KEY OF ABBREVIATIONS

Purging Method:	HB	hand bailed	Purging Info:	P-X	purged (X) volumes	
	PB	power bailer			Dry	purged dry
	DP	deep well pump			DD(x)	level drew down; purged (x) volume of remaining column
	PP	peristaltic pump			O	other (explain)
	BW	bailing wheel				
Well Condition:	WD	well damaged (explain)				
	NL	well not locked				
	NC	no cap on inner casing				
	SD	seal damaged (explain)				
	O	other problems (i.e. bent casing, ants in well)				
	OK	well in good condition				

Purging Appearances: description (i.e. sandy, cloudy, clear, dark, red, etc)

Filtered: Y or N

Filterability: G=good, M=moderately good, P=poor, D=difficult,
special procedures (explain)

B5 – Landfill Site Inspection Form

LANDFILL 2638 SITE INSPECTION REPORT

Date: _____

Site: _____

Inspector: _____

Appendix B5 Pg. 2/2

Item	Condition (OK-Poor)	Describe	Sketch Attached?	Follow-Up Actions
GW Monitor wells / Leachate cleanouts Note: Monitor wells locked, labels secure and legible, drainage away from well. Cleanouts intact, note any damage				
Fencing Note: Condition of gate at (locked when personnel are not on site); condition of perimeter fence (any breaks/gaps); 'No Trespassing' signs posted; signs of trespassing				
Cover / Perimeter berm Note: Areas lacking vegetation; vehicle ruts or animal damage; stormwater erosion gullies; signs of extended ponding; woody vegetation; staining or leachate seeps.				
Sedimentation Basin / Discharge structure Note: Vehicle ruts or damage; stormwater erosion gullies; excessive sediment buildup; condition of culvert and riprap				

B6 – Landfill Leachate Monitoring Record Form

WAUPACA FOUNDRY, INC. - LANDFILL LEACHATE MONITORING RECORDS
LANDFILL 1 (2638) AND LANDFILL 2 (3171) PAGE _____

LANDFILL 2 (3171)												
LEACHATE HEAD MONITORING WELLS												
DATE	LYSIMETER 1 DTW (FEET)	LYSIMETER 2 DTW (FEET)	LYSIMETER 3 DTW (FEET)	A (FEET)	B (FEET)	C (FEET)	D (FEET)	IIA (FEET)	WEST TANK (FEET)	VALVE MANWAY (FEET)	EAST TANK (FEET)	TANK EXCAVATION WELL (FEET)

NOTES:
Measurements are depth of liquid at a monitoring location. If no measureable liquid is present, enter 'dry' . Total depth of tank excavation well 21.9 feet, TPVC.
Use back of sheet to document conditions noted during inspections, including corrections/repairs.

WAUPACA FOUNDRY, INC. - LANDFILL LEACHATE MONITORING RECORDS
LANDFILL 1 (2638) AND LANDFILL 2 (3171)

PAGE _____

DATE	COMMENTS

Note:

Signs of leachate spills; secondary containment available/used during leachate transfer: area is accessible for tanker truck with no obstructions and is in all-weather condition; access ports/manholes secured; condition of tank vent pipes; depth of liquid in tank excavation monitoring well < 3 feet.

B7 – Well Inspection Form

NLS WELL INSPECTION FORM

pg. 1 of 4

Site: **Waupaca Foundry, Inc. / Landfills 2638/3171** Date(s): _____

Inspectors: _____

Well: LB25 Both	Well: LB25A Both	Well: LB25B Both
ID Tag:	ID Tag:	ID Tag:
Locked:	Locked:	Locked:
Collision:	Collision:	Collision:
Surface Seal:	Surface Seal:	Surface Seal:
Bailer/Leader:	Bailer/Leader:	Bailer/Leader:
Meas. Mark:	Meas. Mark:	Meas. Mark:
Comments:	Comments:	Comments:
Well: LB24A 3171	Well: LB3A-88R Both	Well: LB30 Both
ID Tag:	ID Tag:	ID Tag:
Locked:	Locked:	Locked:
Collision:	Collision:	Collision:
Surface Seal:	Surface Seal:	Surface Seal:
Bailer/Leader:	Bailer/Leader:	Bailer/Leader:
Meas. Mark:	Meas. Mark:	Meas. Mark:
Comments:	Comments:	Comments:
Well: LB10R 3171	Well: LB10AR 3171	Well: LB2 3171
ID Tag:	ID Tag:	ID Tag:
Locked:	Locked:	Locked:
Collision:	Collision:	Collision:
Surface Seal:	Surface Seal:	Surface Seal:
Bailer/Leader:	Bailer/Leader:	Bailer/Leader:
Meas. Mark:	Meas. Mark:	Meas. Mark:
Comments:	Comments:	Comments:

NLS WELL INSPECTION FORM

pg. 2 of 4

Site: **Waupaca Foundry, Inc. / Landfills 2638/3171** Date(s): _____

Inspectors: _____

Well: 3171 LB2AR	Well: 3171 LB34	Well: 3171 LB4B
ID Tag:	ID Tag:	ID Tag:
Locked:	Locked:	Locked:
Collision:	Collision:	Collision:
Surface Seal:	Surface Seal:	Surface Seal:
Bailer/Leader:	Bailer/Leader:	Bailer/Leader:
Meas. Mark:	Meas. Mark:	Meas. Mark:
Comments:	Comments:	Comments:
Well: 3171 LB33	Well: 3171 LB33A	Well: 3171 LB31R
ID Tag:	ID Tag:	ID Tag:
Locked:	Locked:	Locked:
Collision:	Collision:	Collision:
Surface Seal:	Surface Seal:	Surface Seal:
Bailer/Leader:	Bailer/Leader:	Bailer/Leader:
Meas. Mark:	Meas. Mark:	Meas. Mark:
Comments:	Comments:	Comments:
Well: 3171 LB31A	Well: 3171 LB17R	Well: 3171 LB17A
ID Tag:	ID Tag:	ID Tag:
Locked:	Locked:	Locked:
Collision:	Collision:	Collision:
Surface Seal:	Surface Seal:	Surface Seal:
Bailer/Leader:	Bailer/Leader:	Bailer/Leader:
Meas. Mark:	Meas. Mark:	Meas. Mark:
Comments:	Comments:	Comments:

NLS WELL INSPECTION FORM

pg. 3 of 4

Site: **Waupaca Foundry, Inc. / Landfills 2638/3171** Date(s): _____

Inspectors: _____

Well: 3171 LB8AR	Well: 3171 LB8BR	Well: 3171 LB32R
ID Tag:	ID Tag:	ID Tag:
Locked:	Locked:	Locked:
Collision:	Collision:	Collision:
Surface Seal:	Surface Seal:	Surface Seal:
Bailer/Leader:	Bailer/Leader:	Bailer/Leader:
Meas. Mark:	Meas. Mark:	Meas. Mark:
Comments:	Comments:	Comments:
Well: 3171 LB32AR	Well: 3171 LB14	Well: 2638 LB7
ID Tag:	ID Tag:	ID Tag:
Locked:	Locked:	Locked:
Collision:	Collision:	Collision:
Surface Seal:	Surface Seal:	Surface Seal:
Bailer/Leader:	Bailer/Leader:	Bailer/Leader:
Meas. Mark:	Meas. Mark:	Meas. Mark:
Comments:	Comments:	Comments:
Well: 2638 LB7A	Well: 2638 LB29	Well: 2638 LB28A
ID Tag:	ID Tag:	ID Tag:
Locked:	Locked:	Locked:
Collision:	Collision:	Collision:
Surface Seal:	Surface Seal:	Surface Seal:
Bailer/Leader:	Bailer/Leader:	Bailer/Leader:
Meas. Mark:	Meas. Mark:	Meas. Mark:
Comments:	Comments:	Comments:

NLS WELL INSPECTION FORM

pg. 4 of 4

Site: **Waupaca Foundry, Inc. / Landfills 2638/3171** Date(s): _____

Inspectors: _____

Well: 2638 LB28	Well: 2638 LB1	Well: 2638 LB1A
ID Tag:	ID Tag:	ID Tag:
Locked:	Locked:	Locked:
Collision:	Collision:	Collision:
Surface Seal:	Surface Seal:	Surface Seal:
Bailer/Leader:	Bailer/Leader:	Bailer/Leader:
Meas. Mark:	Meas. Mark:	Meas. Mark:
Comments:	Comments:	Comments:
Well: 2638 LB1B	Well:	Well:
ID Tag:	ID Tag:	ID Tag:
Locked:	Locked:	Locked:
Collision:	Collision:	Collision:
Surface Seal:	Surface Seal:	Surface Seal:
Bailer/Leader:	Bailer/Leader:	Bailer/Leader:
Meas. Mark:	Meas. Mark:	Meas. Mark:
Comments:	Comments:	Comments:
Well:	Well:	Well:
ID Tag:	ID Tag:	ID Tag:
Locked:	Locked:	Locked:
Collision:	Collision:	Collision:
Surface Seal:	Surface Seal:	Surface Seal:
Bailer/Leader:	Bailer/Leader:	Bailer/Leader:
Meas. Mark:	Meas. Mark:	Meas. Mark:
Comments:	Comments:	Comments:

B8 -- Landfill Site Survey Benchmark Inspection Form

LANDFILL SITE SURVEY BENCHMARK INSPECTION REPORT

Date: _____

Inspector: _____

Benchmark ID *	Condition ** (OK-Poor)	Follow-Up Actions	Comments
BM NO. 101			
BM Manhole			
BM NO. 56			
BM NO. 102			

* As depicted by the existing site conditions layout. Site benchmarks are subject to modification during construction progression.

** Confirm existing monument/marker location identifiable, clear of vegetation and stable for continued use.

BM 101 (Concrete Mark)



BM Manhole (Concrete Mark)



BM 56 (Rebar)



BM 102 (Concrete Mark)



B9 – Deed Notice of Past Disposal Activities

RECEIVED

MAY 19 2022

Waste & Materials
Management

NOTICE OF PAST DISPOSAL ACTIVITIES

Appendix B9 Pg. 2 of 2

DOC# 906079

Recorded on
May 13, 2022 10:51 AM

MICHAEL MAZEMKE
WAUPACA COUNTY
REGISTER OF DEEDS
Fee Amount: \$30.00
Pages: 1

IN RE: The past licensed disposal of hazardous waste by Waupaca Foundry, Inc., 1955 Brunner Drive, Waupaca, Wisconsin 54981 ("Waupaca Foundry").

Bryant Esch, being first duly sworn on oath deposes and says:

1. That he is the person currently and primarily responsible for environmental compliance at Waupaca Foundry.
2. That in the scope of his employment as a Director of Environmental Engineering at Waupaca Foundry, he has reviewed the reports and records of the past hazardous waste disposal activities at Waupaca Foundry.
3. On information and belief, he verily believes all of the following:
 - a. From at least September 20, 1976 until sometime in the month of October 1989, Waupaca Foundry disposed of solid and hazardous waste generated from Waupaca Foundry's activities at a landfill located at the SW ¼ of the SE ¼ of Section 6, Town 22 N., Range 12 E. ("Waupaca Foundry Landfill"), located in the Town of Waupaca, County of Waupaca, State of Wisconsin.
 - b. This disposal was regulated under Department of Natural Resources (DNR) Hazardous Waste License No. 2638.
 - c. That, as of March 29, 1991, the DNR certified closure of the Waupaca Foundry Landfill.
4. That this affidavit is being given for the purpose of recording a notation on the deed to the properties that will notify any potential purchases in perpetuity of the existence of the former landfill, satisfying s. NR 664.0119(2), Wis. Admin. Code.

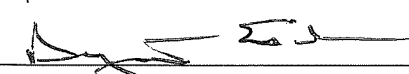
Recording Area

Return: Department of Natural Resources
Waste and Materials Management
Program - WA/5
P.O. Box 7921
Madison, Wisconsin 53707-7921
Attn: Doug Coenen

Parcel Identification Number (PIN):

20 06 43

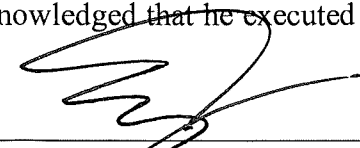
Dated this 12th day of May, 2022


Bryant Esch

STATE OF WISCONSIN)
) ss.
WAUPACA COUNTY)

Personally came before me this 12th day of May, 2022, the above named Bryant Esch, to me known to be the person who executed the foregoing instrument, acknowledged that he executed and delivered the same as for the act and deed of said Waupaca Foundry, Inc.

Erik B. Ellingson
Notary Public
State of Wisconsin


Erik B. Ellingson
Notary Public, State of Wisconsin
My Commission is permanent.