CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: October 13, 2017 FILE REF:

TO: Eric Christiansen, C.M. Christiansen Co. Inc.

FROM: Chris Saari – DNR Ashland

SUBJECT: Review Comments – Site Investigation/Remedial Action Option Report
C.M. Christiansen Co. Inc. Former Pole Yard, Military Creek, Phelps, Wisconsin
WDNR BRRTS Activity #02-64-000068

The following summarizes Department of Natural Resources (DNR) review comments for the *Site Investigation/Remedial Action Option Report* (SI/RAOR) prepared for the above-named site by Natural Resources Technology and dated August 4, 2017. My understanding is that we will discuss these comments on our conference call scheduled for 9:00 AM on October 17, 2017.

Overall comments:

- Past studies of this site have all shown unacceptable risk to humans and the environment. The SI/RAOR information does not change the Department's opinion that contaminants at the site are a current risk and will be a risk for future uses of the site if not addressed.
- Given decades of study there is no information to show that specific site conditions are more protective than other sites and would significantly reduce the risk to people and wildlife of the contamination at this location compared to other sites with similar contaminants.
- Given the lack of substantive information to the contrary we believe that current standard screening values are valid and should be used to identify site soils and sediment that should be remediated to reduce the present and future risks.
- The SI/RAOR has offered incomplete elements of a risk assessment.
- The use of risk assessments for developing environmental standards that depart from promulgated standards is regulated under Wisconsin Administrative Code § NR 722.11.
- The Department doesn't believe that a departure from state standards is necessary, that the SI/RAOR has made a case for departing from the standards, nor that the contractors performing the SI/RAOR have followed the NR 722.11 process for authorization for departure from existing environmental standards.
- The impacts to North Twin Lake have not been evaluated sufficiently. As has been pointed out by members of the public and DNR staff, contaminants transported through Military Creek may eventually be deposited in the lake. The site has potentially contributed significant quantities of site contamination to North Twin Lake via streamflow. We remain concerned that the concentrations of contaminants in fish and lake sediment has not been quantified.
- The SI/RAOR as a whole is limited in terms of descriptive narrative, background and supportive documentation. In some instances, fairly complex technical issues related to risk evaluation were covered by just a few sentences, with little or no supporting material provided.
- Items such as toxic equivalency (TEQ) calculations were not included with the report. As I mentioned during our September 28 call, DNR expects you to "show your work", consistent with the requirements of Wis. Admin. Code §§ NR 716.15 and 716.17. The limited nature of the report makes it hard for DNR to fully evaluate the document's conclusions and recommendations.

- The chosen evaluation assumptions appear to have influenced the proposed extent of contamination that would be addressed under Remedial Action Option No. 3, potentially leading to an area insufficient to address the risks at the site.
- Issues with the risk evaluation process used in the report include:
    - The evaluation of human health risks related only to current site conditions (i.e., private property with restricted access and use), despite the fact that the stated plan is to transfer the property to the Town of Phelps to be redeveloped for public use.
    - The risk evaluation assumes that the existing road culvert under County Highway E will remain at its current configuration and elevation, and therefore will maintain existing sediment depositional patterns and contaminant distribution. The Department believes that this is an unrealistic assumption, as culvert replacements (both planned and unplanned) do occur. If the invert of a replacement culvert was set at a lower elevation, sediment deposits upstream of the culvert would be subject to downstream migration.
    - The risk evaluation was focused mainly on ecological receptors, and the evaluation of those receptors was limited (e.g., discussion of toxicity to benthic macroinvertebrates but not of the potential for bioaccumulation into higher trophic level organisms).
    - The evaluation appeared selective with regard to evaluation criteria.

Specific comments:

- Appendix C – All 10 photographs are labeled as "Photo Number 1"
- Section 4.3, top of page 7 – The modified assessment approach text references Tables 5 and 6; should this be Tables 6 and 7?
- TOC Normalization, Table 3 – The TEQs were computed by normalization to TOC outside of the range described in the CBSQG. The CBSQG recommends limiting TOC normalization to a range of 0.5-10%. The normalized values in Table 3 should be corrected.
- TOC and DRO appear to be correlated in the lab results. This indicates that the DROs are the source of the TOC. The CBSQG recommends against using TOC values from anthropogenic sources and using an un-impacted reference site TOC for normalization to predict the toxicity of the COC.
- Table 3 – The "U" and "L" flags are not defined in the table.
- Table 3 – The measured parameter of "moisture" should be defined in the table.
- The report has no discussion of the data quality and the degree that the laboratory analyses met the data quality objectives.
    - The Pace sample condition report from 10-20-16 noted that sample labels did not match the chain of custody form.
    - TOC analyses – All of the lab quality control tests for TOC were outside of the recovery limits. The report should disclose this situation and make a case to the reader why the TOC data are suitable for use in the site investigation.
- Sediment cores were collected "generally at the midpoint of Military Creek." The report does not detail whether these locations also held the greatest sediment thicknesses, and the most likely contaminant presence, within any given transect.

cc: Laurie Parsons – Natural Resource Technology
Judy Fassbender – DNR Madison RR/5
Bill Fitzpatrick – DNR Madison RR/5

Tom Aartila – DNR Park Falls
Rob Thiboldeaux – Department of Health Services

BRRTS Duplicate

Saari, Christopher A - DNR

From: Dusty Tazelaar <Dusty.Tazelaar@obg.com>
Sent: Tuesday, October 31, 2017 2:32 PM
To: Saari, Christopher A - DNR; Fassbender, Judy L - DNR; Fitzpatrick, William - DNR
Cc: CMC.Co.Inc@gmail.com; Parsons, Laurie
Subject: CMC Co. Phelps Site
Attachments: Appendix D_TEQ Backup Caclulations_171018.pdf

Good afternoon,

As requested, please see the attached PDF file for your review. This file includes the tables used to calculate summed TEQs for dioxins and furans (D/Fs) that were detailed in the Site Investigation/Remedial Action Option Report for C.M. Christiansen Co. Inc. Former Pole Yard, Military Creek, Phelps, Wisconsin (WDNR BRRTS Activity #02-64-000068). Pages 1-14 detail the normalization of D/Fs to TEQs using the USEPA 1989 toxic equivalency factors (TEFs). Pages 15-28 detail the normalization of D/Fs to TEQs using the WHO 1998-Fish TEFs. This file does not contain the calculations to normalize the data to 1% TOC, but was done so following the example in the Consensus-Based Sediment Quality Guidelines. Those values are located in Table 3 of the Site Investigation/Remedial Action Option Report.

Also, please use the link below to access many of the scientific literature resources referenced in the Site Investigation/Remedial Action Option Report.
https://naturalrt.sharefile.com/d-s1cc5cbdd8a24bb98

We will discuss the responses to the technical points raised in the October memo following your review of this supplemental information.

Thank you,

Dusty L. Tazelaar

Natural Resource Technology
AN OBG COMPANY

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Appendix D - Sediment TEQ Calculations with EPA 1989 TEFs
Military Creek Site Investigation / Remedial Action Options
C.M. Christiansen Co. Inc. Former Pole Yard, Phelps, Wisconsin
WDNR BRRTS Activity #02-64-000068

		Field Sample ID:	Toxic Equivalency Factors EPA 1989	102016035			102016036		
		Station Name:		SED-01					
		Station / Sample Name:		SED-01	ng TEQ/kg	% contribution	SED-01	ng TEQ/kg	% contribution
		Sample Depth (feet):		0-0.5			0.5-1.5		
		Sample Date:		10/20/2016			10/20/2016		
GEO	Percent Moisture	(%)		90.3			85.5		
Organic	Carbon, Total Organic	(mg/kg)		268,000			353,000		
Dioxin	1,2,3,4,6,7,8-HpCDD	(ng/Kg)	0.01	3.6	0.036	3.53	1	0.01	1.09
Dioxin	1,2,3,4,7,8-HxCDD	(ng/Kg)	0.1	0.27	0.027	2.65	0.32	0.032	3.49
Dioxin	1,2,3,6,7,8-HxCDD	(ng/Kg)	0.1	0.29	0.029	2.85	0.32	0.032	3.49
Dioxin	1,2,3,7,8,9-HxCDD	(ng/Kg)	0.1	0.26	0.026	2.55	0.25	0.025	2.73
Dioxin	1,2,3,7,8-PeCDD	(ng/Kg)	0.5	0.3	0.15	14.72	0.26	0.13	14.18
Dioxin	2,3,7,8-TCDD	(ng/Kg)	1	0.34	0.34	33.36	0.34	0.34	37.08
Dioxin	OCDD	(ng/Kg)	0.001	29	0.029	2.85	6.2	0.0062	0.68
Furan	1,2,3,4,6,7,8-HpCDF	(ng/Kg)	0.01	1	0.01	0.98	0.47	0.0047	0.51
Furan	1,2,3,4,7,8,9-HpCDF	(ng/Kg)	0.01	0.32	0.0032	0.31	0.24	0.0024	0.26
Furan	1,2,3,4,7,8-HxCDF	(ng/Kg)	0.1	0.21	0.021	2.06	0.16	0.016	1.74
Furan	1,2,3,6,7,8-HxCDF	(ng/Kg)	0.1	0.23	0.023	2.26	0.16	0.016	1.74
Furan	1,2,3,7,8,9-HxCDF	(ng/Kg)	0.1	0.27	0.027	2.65	0.23	0.023	2.51
Furan	1,2,3,7,8-PeCDF	(ng/Kg)	0.05	0.45	0.0225	2.21	0.34	0.017	1.85
Furan	2,3,4,6,7,8-HxCDF	(ng/Kg)	0.1	0.28	0.028	2.75	0.22	0.022	2.40
Furan	2,3,4,7,8-PeCDF	(ng/Kg)	0.5	0.25	0.125	12.26	0.22	0.11	12.00
Furan	2,3,7,8-TCDF	(ng/Kg)	0.1	1.2	0.12	11.77	1.3	0.13	14.18
Furan	OCDF	(ng/Kg)	0.001	2.6	0.0026	0.26	0.66	0.00066	0.07
	SUM OF TEQ				1.02			0.92	

Notes

1. TEQ = Total 2,3,7,8-TCDD Equivalence
2. ng/Kg = nanograms per kilogram
3. mg/Kg = miligram per kilogram
4. Concentrations reported as Non Detect by the laboratory were replaced with the method detection limit.

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WDNR BRRTS Activity #02-64-000068

		Field Sample ID:	Toxic Equivalency Factors EPA 1989	101916027			101916028		
		Station Name:		SED-02					
		Station / Sample Name:		SED-02	ng TEQ/kg	% contribution	SED-02	ng TEQ/kg	% contribution
		Sample Depth (feet):		0-0.5			0.5-1.5		
		Sample Date:		10/19/2016			10/19/2016		
GEO	Percent Moisture	(%)		91.9			87.2		
Organic	Carbon, Total Organic	(mg/kg)		317,000			216,000		
Dioxin	1,2,3,4,6,7,8-HpCDD	(ng/Kg)	0.01	6,500	65	21.12	470	4.7	19.88
Dioxin	1,2,3,4,7,8-HxCDD	(ng/Kg)	0.1	47	4.7	1.53	3.9	0.39	1.65
Dioxin	1,2,3,6,7,8-HxCDD	(ng/Kg)	0.1	260	26	8.45	18	1.8	7.61
Dioxin	1,2,3,7,8,9-HxCDD	(ng/Kg)	0.1	100	10	3.25	7.2	0.72	3.05
Dioxin	1,2,3,7,8-PeCDD	(ng/Kg)	0.5	11	5.5	1.79	1.1	0.55	2.33
Dioxin	2,3,7,8-TCDD	(ng/Kg)	1	2.3	2.3	0.75	0.65	0.65	2.75
Dioxin	OCDD	(ng/Kg)	0.001	72,000	72	23.39	5,700	5.7	24.11
Furan	1,2,3,4,6,7,8-HpCDF	(ng/Kg)	0.01	2,200	22	7.15	150	1.5	6.35
Furan	1,2,3,4,7,8,9-HpCDF	(ng/Kg)	0.01	200	2	0.65	14	0.14	0.59
Furan	1,2,3,4,7,8-HxCDF	(ng/Kg)	0.1	250	25	8.12	17	1.7	7.19
Furan	1,2,3,6,7,8-HxCDF	(ng/Kg)	0.1	110	11	3.57	9	0.9	3.81
Furan	1,2,3,7,8,9-HxCDF	(ng/Kg)	0.1	76	7.6	2.47	5.8	0.58	2.45
Furan	1,2,3,7,8-PeCDF	(ng/Kg)	0.05	29	1.45	0.47	2.2	0.11	0.47
Furan	2,3,4,6,7,8-HxCDF	(ng/Kg)	0.1	110	11	3.57	8.3	0.83	3.51
Furan	2,3,4,7,8-PeCDF	(ng/Kg)	0.5	67	33.5	10.88	5.3	2.65	11.21
Furan	2,3,7,8-TCDF	(ng/Kg)	0.1	7.2	0.72	0.23	1.8	0.18	0.76
Furan	OCDF	(ng/Kg)	0.001	8,000	8	2.60	540	0.54	2.28
	SUM OF TEQ				307.77			23.64	

Notes

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WDNR BRRTS Activity #02-64-000068

		Field Sample ID:	Toxic Equivalency Factors EPA 1989	101916024			101916025		
		Station Name:		SED-03					
		Station / Sample Name:		SED-03	ng TEQ/kg	% contribution	SED-03	ng TEQ/kg	% contribution
		Sample Depth (feet):		0-0.5			0.5-1.5		
		Sample Date:		10/19/2016			10/19/2016		
GEO	Percent Moisture	(%)		46.3			55.4		
Organic	Carbon, Total Organic	(mg/kg)		19,300			30,900		
Dioxin	1,2,3,4,6,7,8-HpCDD	(ng/Kg)	0.01	17,000	170	21.75	75,000	750	23.89
Dioxin	1,2,3,4,7,8-HxCDD	(ng/Kg)	0.1	100	10	1.28	370	37	1.18
Dioxin	1,2,3,6,7,8-HxCDD	(ng/Kg)	0.1	740	74	9.47	2,800	280	8.92
Dioxin	1,2,3,7,8,9-HxCDD	(ng/Kg)	0.1	230	23	2.94	780	78	2.48
Dioxin	1,2,3,7,8-PeCDD	(ng/Kg)	0.5	27	13.5	1.73	89	44.5	1.42
Dioxin	2,3,7,8-TCDD	(ng/Kg)	1	2.1	2.1	0.27	9.3	9.3	0.30
Dioxin	OCDD	(ng/Kg)	0.001	170,000	170	21.75	570,000	570	18.16
Furan	1,2,3,4,6,7,8-HpCDF	(ng/Kg)	0.01	5,700	57	7.29	27,000	270	8.60
Furan	1,2,3,4,7,8,9-HpCDF	(ng/Kg)	0.01	570	5.7	0.73	2,500	25	0.80
Furan	1,2,3,4,7,8-HxCDF	(ng/Kg)	0.1	620	62	7.93	2,500	250	7.96
Furan	1,2,3,6,7,8-HxCDF	(ng/Kg)	0.1	230	23	2.94	1,000	100	3.19
Furan	1,2,3,7,8,9-HxCDF	(ng/Kg)	0.1	250	25	3.20	1,100	110	3.50
Furan	1,2,3,7,8-PeCDF	(ng/Kg)	0.05	77	3.85	0.49	270	13.5	0.43
Furan	2,3,4,6,7,8-HxCDF	(ng/Kg)	0.1	280	28	3.58	1,200	120	3.82
Furan	2,3,4,7,8-PeCDF	(ng/Kg)	0.5	190	95	12.15	820	410	13.06
Furan	2,3,7,8-TCDF	(ng/Kg)	0.1	15	1.5	0.19	71	7.1	0.23
Furan	OCDF	(ng/Kg)	0.001	18,000	18	2.30	65,000	65	2.07
	SUM OF TEQ				781.65			3139.40	

Notes

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WDNR BRRTS Activity #02-64-000068

		Field Sample ID:	Toxic Equivalency Factors EPA 1989	101916021			101916022		
		Station Name:		SED-04					
		Station / Sample Name:		SED-04	ng TEQ/kg	% contribution	SED-04	ng TEQ/kg	% contribution
		Sample Depth (feet):		0-0.5			0.5-1.5		
		Sample Date:		10/19/2016			10/19/2016		
GEO	Percent Moisture	(%)		91.4			75.4		
Organic	Carbon, Total Organic	(mg/kg)		245,000			128,000		
Dioxin	1,2,3,4,6,7,8-HpCDD	(ng/Kg)	0.01	7,800	78	21.64	31,000	310	24.96
Dioxin	1,2,3,4,7,8-HxCDD	(ng/Kg)	0.1	48	4.8	1.33	160	16	1.29
Dioxin	1,2,3,6,7,8-HxCDD	(ng/Kg)	0.1	340	34	9.43	960	96	7.73
Dioxin	1,2,3,7,8,9-HxCDD	(ng/Kg)	0.1	110	11	3.05	310	31	2.50
Dioxin	1,2,3,7,8-PeCDD	(ng/Kg)	0.5	15	7.5	2.08	42	21	1.69
Dioxin	2,3,7,8-TCDD	(ng/Kg)	1	0.97	0.97	0.27	2.4	2.4	0.19
Dioxin	OCDD	(ng/Kg)	0.001	73,000	73	20.25	310,000	310	24.96
Furan	1,2,3,4,6,7,8-HpCDF	(ng/Kg)	0.01	2,600	26	7.21	12,000	120	9.66
Furan	1,2,3,4,7,8,9-HpCDF	(ng/Kg)	0.01	210	2.1	0.58	960	9.6	0.77
Furan	1,2,3,4,7,8-HxCDF	(ng/Kg)	0.1	290	29	8.04	890	89	7.17
Furan	1,2,3,6,7,8-HxCDF	(ng/Kg)	0.1	110	11	3.05	360	36	2.90
Furan	1,2,3,7,8,9-HxCDF	(ng/Kg)	0.1	110	11	3.05	190	19	1.53
Furan	1,2,3,7,8-PeCDF	(ng/Kg)	0.05	41	2.05	0.57	76	3.8	0.31
Furan	2,3,4,6,7,8-HxCDF	(ng/Kg)	0.1	130	13	3.61	390	39	3.14
Furan	2,3,4,7,8-PeCDF	(ng/Kg)	0.5	93	46.5	12.90	170	85	6.84
Furan	2,3,7,8-TCDF	(ng/Kg)	0.1	9.9	0.99	0.27	11	1.1	0.09
Furan	OCDF	(ng/Kg)	0.001	9,600	9.6	2.66	53,000	53	4.27
	SUM OF TEQ				360.51			1241.90	

Notes

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C.M. Christiansen Co. Inc. Former Pole Yard, Phelps, Wisconsin
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		Field Sample ID:	Toxic Equivalency Factors EPA 1989	101916018			101916019		
		Station Name:		SED-05					
		Station / Sample Name:		SED-05	ng TEQ/kg	% contribution	SED-05	ng TEQ/kg	% contribution
		Sample Depth (feet):		0-0.5			0.5-1.5		
		Sample Date:		10/19/2016			10/19/2016		
GEO	Percent Moisture	(%)		35.8			16.9		
Organic	Carbon, Total Organic	(mg/kg)		19,400			649		
Dioxin	1,2,3,4,6,7,8-HpCDD	(ng/Kg)	0.01	1,600	16	21.68	11	0.11	14.17
Dioxin	1,2,3,4,7,8-HxCDD	(ng/Kg)	0.1	10	1	1.35	0.16	0.016	2.06
Dioxin	1,2,3,6,7,8-HxCDD	(ng/Kg)	0.1	65	6.5	8.81	0.47	0.047	6.05
Dioxin	1,2,3,7,8,9-HxCDD	(ng/Kg)	0.1	25	2.5	3.39	0.21	0.021	2.71
Dioxin	1,2,3,7,8-PeCDD	(ng/Kg)	0.5	2.6	1.3	1.76	0.08	0.04	5.15
Dioxin	2,3,7,8-TCDD	(ng/Kg)	1	0.16	0.16	0.22	0.12	0.12	15.46
Dioxin	OCDD	(ng/Kg)	0.001	17,000	17	23.03	120	0.12	15.46
Furan	1,2,3,4,6,7,8-HpCDF	(ng/Kg)	0.01	580	5.8	7.86	4.6	0.046	5.93
Furan	1,2,3,4,7,8,9-HpCDF	(ng/Kg)	0.01	52	0.52	0.70	0.38	0.0038	0.49
Furan	1,2,3,4,7,8-HxCDF	(ng/Kg)	0.1	58	5.8	7.86	0.4	0.04	5.15
Furan	1,2,3,6,7,8-HxCDF	(ng/Kg)	0.1	24	2.4	3.25	0.23	0.023	2.96
Furan	1,2,3,7,8,9-HxCDF	(ng/Kg)	0.1	20	2	2.71	0.15	0.015	1.93
Furan	1,2,3,7,8-PeCDF	(ng/Kg)	0.05	8	0.4	0.54	0.11	0.0055	0.71
Furan	2,3,4,6,7,8-HxCDF	(ng/Kg)	0.1	25	2.5	3.39	0.21	0.021	2.71
Furan	2,3,4,7,8-PeCDF	(ng/Kg)	0.5	15	7.5	10.16	0.24	0.12	15.46
Furan	2,3,7,8-TCDF	(ng/Kg)	0.1	1.3	0.13	0.18	0.12	0.012	1.55
Furan	OCDF	(ng/Kg)	0.001	2,300	2.3	3.12	16	0.016	2.06
	SUM OF TEQ				73.81			0.78	

Notes

1. TEQ = Total 2,3,7,8-TCDD Equivalence
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WDNR BRRTS Activity #02-64-000068

		Field Sample ID:	Toxic Equivalency Factors EPA 1989	101816008			101816009		
		Station Name:		SED-06					
		Station / Sample Name:		SED-06	ng TEQ/kg	% contribution	SED-06	ng TEQ/kg	% contribution
		Sample Depth (feet):		0-0.5			0.5-1.5		
		Sample Date:		10/18/2016			10/18/2016		
GEO	Percent Moisture	(%)		92			77.3		
Organic	Carbon, Total Organic	(mg/kg)		350,000			95,900		
Dioxin	1,2,3,4,6,7,8-HpCDD	(ng/Kg)	0.01	18,000	180	22.44	25,000	250	24.71
Dioxin	1,2,3,4,7,8-HxCDD	(ng/Kg)	0.1	110	11	1.37	140	14	1.38
Dioxin	1,2,3,6,7,8-HxCDD	(ng/Kg)	0.1	690	69	8.60	810	81	8.01
Dioxin	1,2,3,7,8,9-HxCDD	(ng/Kg)	0.1	220	22	2.74	280	28	2.77
Dioxin	1,2,3,7,8-PeCDD	(ng/Kg)	0.5	26	13	1.62	33	16.5	1.63
Dioxin	2,3,7,8-TCDD	(ng/Kg)	1	2.1	2.1	0.26	2.1	2.1	0.21
Dioxin	OCDD	(ng/Kg)	0.001	190,000	190	23.69	270,000	270	26.69
Furan	1,2,3,4,6,7,8-HpCDF	(ng/Kg)	0.01	7,900	79	9.85	11,000	110	10.87
Furan	1,2,3,4,7,8,9-HpCDF	(ng/Kg)	0.01	680	6.8	0.85	920	9.2	0.91
Furan	1,2,3,4,7,8-HxCDF	(ng/Kg)	0.1	460	46	5.74	300	30	2.97
Furan	1,2,3,6,7,8-HxCDF	(ng/Kg)	0.1	300	30	3.74	400	40	3.95
Furan	1,2,3,7,8,9-HxCDF	(ng/Kg)	0.1	200	20	2.49	160	16	1.58
Furan	1,2,3,7,8-PeCDF	(ng/Kg)	0.05	63	3.15	0.39	67	3.35	0.33
Furan	2,3,4,6,7,8-HxCDF	(ng/Kg)	0.1	300	30	3.74	370	37	3.66
Furan	2,3,4,7,8-PeCDF	(ng/Kg)	0.5	130	65	8.10	110	55	5.44
Furan	2,3,7,8-TCDF	(ng/Kg)	0.1	9.9	0.99	0.12	5.6	0.56	0.06
Furan	OCDF	(ng/Kg)	0.001	34,000	34	4.24	49,000	49	4.84
	SUM OF TEQ				802.04			1011.71	

Notes

1. TEQ = Total 2,3,7,8-TCDD Equivalence
2. ng/Kg = nanograms per kilogram
3. mg/Kg = miligram per kilogram
4. Concentrations reported as Non Detect by the laboratory were replaced with the method detection limit.

Appendix D - Sediment TEQ Calculations with EPA 1989 TEFs
Military Creek Site Investigation / Remedial Action Options
C.M. Christiansen Co. Inc. Former Pole Yard, Phelps, Wisconsin
WDNR BRRTS Activity #02-64-000068

		Field Sample ID:	Toxic Equivalency Factors EPA 1989	102016032			102016033		
		Station Name:		SED-101					
		Station / Sample Name:		SED-101	ng TEQ/kg	% contribution	SED-101	ng TEQ/kg	% contribution
		Sample Depth (feet):		0-0.5			0.5-1.5		
		Sample Date:		10/20/2016			10/20/2016		
GEO	Percent Moisture	(%)		90.6			87.8		
Organic	Carbon, Total Organic	(mg/kg)		146,000			165,000		
Dioxin	1,2,3,4,6,7,8-HpCDD	(ng/Kg)	0.01	39	0.39	13.77	20	0.2	9.37
Dioxin	1,2,3,4,7,8-HxCDD	(ng/Kg)	0.1	0.46	0.046	1.62	0.24	0.024	1.12
Dioxin	1,2,3,6,7,8-HxCDD	(ng/Kg)	0.1	2.1	0.21	7.42	0.82	0.082	3.84
Dioxin	1,2,3,7,8,9-HxCDD	(ng/Kg)	0.1	0.92	0.092	3.25	0.4	0.04	1.87
Dioxin	1,2,3,7,8-PeCDD	(ng/Kg)	0.5	0.42	0.21	7.42	0.35	0.175	8.20
Dioxin	2,3,7,8-TCDD	(ng/Kg)	1	0.41	0.41	14.48	0.6	0.6	28.10
Dioxin	OCDD	(ng/Kg)	0.001	370	0.37	13.07	230	0.23	10.77
Furan	1,2,3,4,6,7,8-HpCDF	(ng/Kg)	0.01	12	0.12	4.24	7.1	0.071	3.33
Furan	1,2,3,4,7,8,9-HpCDF	(ng/Kg)	0.01	1.3	0.013	0.46	0.6	0.006	0.28
Furan	1,2,3,4,7,8-HxCDF	(ng/Kg)	0.1	1.5	0.15	5.30	0.87	0.087	4.07
Furan	1,2,3,6,7,8-HxCDF	(ng/Kg)	0.1	0.73	0.073	2.58	0.52	0.052	2.44
Furan	1,2,3,7,8,9-HxCDF	(ng/Kg)	0.1	0.71	0.071	2.51	0.26	0.026	1.22
Furan	1,2,3,7,8-PeCDF	(ng/Kg)	0.05	0.55	0.0275	0.97	0.48	0.024	1.12
Furan	2,3,4,6,7,8-HxCDF	(ng/Kg)	0.1	1.1	0.11	3.88	0.26	0.026	1.22
Furan	2,3,4,7,8-PeCDF	(ng/Kg)	0.5	0.73	0.365	12.89	0.65	0.325	15.22
Furan	2,3,7,8-TCDF	(ng/Kg)	0.1	1.4	0.14	4.94	1.4	0.14	6.56
Furan	OCDF	(ng/Kg)	0.001	34	0.034	1.20	27	0.027	1.26
	SUM OF TEQ				2.83			2.14	

Notes

1. TEQ = Total 2,3,7,8-TCDD Equivalence
2. ng/Kg = nanograms per kilogram
3. mg/Kg = miligram per kilogram
4. Concentrations reported as Non Detect by the laboratory were replaced with the method detection limit.

Appendix D - Sediment TEQ Calculations with EPA 1989 TEFs
Military Creek Site Investigation / Remedial Action Options
C.M. Christiansen Co. Inc. Former Pole Yard, Phelps, Wisconsin
WDNR BRRTS Activity #02-64-000068

		Field Sample ID:	Toxic Equivalency Factors EPA 1989	102016030			102016031		
		Station Name:		SED-102					
		Station / Sample Name:		SED-102	ng TEQ/kg	% contribution	SED-102	ng TEQ/kg	% contribution
		Sample Depth (feet):		0-0.5			0.5-1.5		
		Sample Date:		10/20/2016			10/20/2016		
GEO	Percent Moisture	(%)		92.2			88.2		
Organic	Carbon, Total Organic	(mg/kg)		279,000			226,000		
Dioxin	1,2,3,4,6,7,8-HpCDD	(ng/Kg)	0.01	27	0.27	11.90	2	0.02	2.34
Dioxin	1,2,3,4,7,8-HxCDD	(ng/Kg)	0.1	0.55	0.055	2.42	0.26	0.026	3.05
Dioxin	1,2,3,6,7,8-HxCDD	(ng/Kg)	0.1	1.4	0.14	6.17	0.29	0.029	3.40
Dioxin	1,2,3,7,8,9-HxCDD	(ng/Kg)	0.1	0.64	0.064	2.82	0.26	0.026	3.05
Dioxin	1,2,3,7,8-PeCDD	(ng/Kg)	0.5	0.45	0.225	9.91	0.23	0.115	13.48
Dioxin	2,3,7,8-TCDD	(ng/Kg)	1	0.36	0.36	15.86	0.28	0.28	32.82
Dioxin	OCDD	(ng/Kg)	0.001	230	0.23	10.13	13	0.013	1.52
Furan	1,2,3,4,6,7,8-HpCDF	(ng/Kg)	0.01	10	0.1	4.41	0.7	0.007	0.82
Furan	1,2,3,4,7,8,9-HpCDF	(ng/Kg)	0.01	1.1	0.011	0.48	0.29	0.0029	0.34
Furan	1,2,3,4,7,8-HxCDF	(ng/Kg)	0.1	1.4	0.14	6.17	0.23	0.023	2.70
Furan	1,2,3,6,7,8-HxCDF	(ng/Kg)	0.1	0.52	0.052	2.29	0.17	0.017	1.99
Furan	1,2,3,7,8,9-HxCDF	(ng/Kg)	0.1	0.47	0.047	2.07	0.16	0.016	1.88
Furan	1,2,3,7,8-PeCDF	(ng/Kg)	0.05	0.31	0.0155	0.68	0.49	0.0245	2.87
Furan	2,3,4,6,7,8-HxCDF	(ng/Kg)	0.1	0.71	0.071	3.13	0.22	0.022	2.58
Furan	2,3,4,7,8-PeCDF	(ng/Kg)	0.5	0.62	0.31	13.66	0.24	0.12	14.07
Furan	2,3,7,8-TCDF	(ng/Kg)	0.1	1.5	0.15	6.61	1.1	0.11	12.89
Furan	OCDF	(ng/Kg)	0.001	29	0.029	1.28	1.7	0.0017	0.20
	SUM OF TEQ				2.27			0.85	

Notes

1. TEQ = Total 2,3,7,8-TCDD Equivalence
2. ng/Kg = nanograms per kilogram
3. mg/Kg = miligram per kilogram
4. Concentrations reported as Non Detect by the laboratory were replaced with the method detection limit.

Appendix D - Sediment TEQ Calculations with EPA 1989 TEFs
Military Creek Site Investigation / Remedial Action Options
C.M. Christiansen Co. Inc. Former Pole Yard, Phelps, Wisconsin
WDNR BRRTS Activity #02-64-000068

		Field Sample ID:	Toxic Equivalency Factors EPA 1989	101816012			101816013		
		Station Name:		SED-103					
		Station / Sample Name:		SED-103	ng TEQ/kg	% contribution	SED-103	ng TEQ/kg	% contribution
		Sample Depth (feet):		0-0.5			0.5-1.5		
		Sample Date:		10/18/2016			10/18/2016		
GEO	Percent Moisture	(%)		28			21.6		
Organic	Carbon, Total Organic	(mg/kg)		17,800			38,300		
Dioxin	1,2,3,4,6,7,8-HpCDD	(ng/Kg)	0.01	950	9.5	20.93	5.8	0.058	13.44
Dioxin	1,2,3,4,7,8-HxCDD	(ng/Kg)	0.1	5.3	0.53	1.17	0.083	0.0083	1.92
Dioxin	1,2,3,6,7,8-HxCDD	(ng/Kg)	0.1	39	3.9	8.59	0.18	0.018	4.17
Dioxin	1,2,3,7,8,9-HxCDD	(ng/Kg)	0.1	11	1.1	2.42	0.091	0.0091	2.11
Dioxin	1,2,3,7,8-PeCDD	(ng/Kg)	0.5	1.5	0.75	1.65	0.078	0.039	9.04
Dioxin	2,3,7,8-TCDD	(ng/Kg)	1	0.16	0.16	0.35	0.083	0.083	19.23
Dioxin	OCDD	(ng/Kg)	0.001	11,000	11	24.23	65	0.065	15.06
Furan	1,2,3,4,6,7,8-HpCDF	(ng/Kg)	0.01	360	3.6	7.93	2.7	0.027	6.26
Furan	1,2,3,4,7,8,9-HpCDF	(ng/Kg)	0.01	35	0.35	0.77	0.21	0.0021	0.49
Furan	1,2,3,4,7,8-HxCDF	(ng/Kg)	0.1	35	3.5	7.71	0.14	0.014	3.24
Furan	1,2,3,6,7,8-HxCDF	(ng/Kg)	0.1	17	1.7	3.74	0.14	0.014	3.24
Furan	1,2,3,7,8,9-HxCDF	(ng/Kg)	0.1	16	1.6	3.52	0.084	0.0084	1.95
Furan	1,2,3,7,8-PeCDF	(ng/Kg)	0.05	5.4	0.27	0.59	0.085	0.00425	0.98
Furan	2,3,4,6,7,8-HxCDF	(ng/Kg)	0.1	6.4	0.64	1.41	0.17	0.017	3.94
Furan	2,3,4,7,8-PeCDF	(ng/Kg)	0.5	11	5.5	12.12	0.07	0.035	8.11
Furan	2,3,7,8-TCDF	(ng/Kg)	0.1	0.96	0.096	0.21	0.2	0.02	4.63
Furan	OCDF	(ng/Kg)	0.001	1,200	1.2	2.64	9.4	0.0094	2.18
	SUM OF TEQ				45.40			0.43	

Notes

1. TEQ = Total 2,3,7,8-TCDD Equivalence
2. ng/Kg = nanograms per kilogram
3. mg/Kg = miligram per kilogram
4. Concentrations reported as Non Detect by the laboratory were replaced with the method detection limit.

Appendix D - Sediment TEQ Calculations with EPA 1989 TEFs
Military Creek Site Investigation / Remedial Action Options
C.M. Christiansen Co. Inc. Former Pole Yard, Phelps, Wisconsin
WDNR BRRTS Activity #02-64-000068

		Field Sample ID:	Toxic Equivalency Factors EPA 1989	101816011		
		Station Name:		SED-104		
		Station / Sample Name:		SED-104	ng TEQ/kg	% contribution
		Sample Depth (feet):		0-0.4		
		Sample Date:		10/18/2016		
GEO	Percent Moisture	(%)		24.6		
Organic	Carbon, Total Organic	(mg/kg)		11,100		
Dioxin	1,2,3,4,6,7,8-HpCDD	(ng/Kg)	0.01	290	2.9	19.77
Dioxin	1,2,3,4,7,8-HxCDD	(ng/Kg)	0.1	2.8	0.28	1.91
Dioxin	1,2,3,6,7,8-HxCDD	(ng/Kg)	0.1	15	1.5	10.22
Dioxin	1,2,3,7,8,9-HxCDD	(ng/Kg)	0.1	5.8	0.58	3.95
Dioxin	1,2,3,7,8-PeCDD	(ng/Kg)	0.5	0.73	0.365	2.49
Dioxin	2,3,7,8-TCDD	(ng/Kg)	1	0.11	0.11	0.75
Dioxin	OCDD	(ng/Kg)	0.001	2,500	2.5	17.04
Furan	1,2,3,4,6,7,8-HpCDF	(ng/Kg)	0.01	100	1	6.82
Furan	1,2,3,4,7,8,9-HpCDF	(ng/Kg)	0.01	9.6	0.096	0.65
Furan	1,2,3,4,7,8-HxCDF	(ng/Kg)	0.1	12	1.2	8.18
Furan	1,2,3,6,7,8-HxCDF	(ng/Kg)	0.1	5	0.5	3.41
Furan	1,2,3,7,8,9-HxCDF	(ng/Kg)	0.1	5	0.5	3.41
Furan	1,2,3,7,8-PeCDF	(ng/Kg)	0.05	1.9	0.095	0.65
Furan	2,3,4,6,7,8-HxCDF	(ng/Kg)	0.1	6.3	0.63	4.29
Furan	2,3,4,7,8-PeCDF	(ng/Kg)	0.5	4.1	2.05	13.97
Furan	2,3,7,8-TCDF	(ng/Kg)	0.1	0.54	0.054	0.37
Furan	OCDF	(ng/Kg)	0.001	310	0.31	2.11
	SUM OF TEQ				14.67	

Notes

1. TEQ = Total 2,3,7,8-TCDD Equivalence
2. ng/Kg = nanograms per kilogram
3. mg/Kg = miligram per kilogram
4. Concentrations reported as Non Detect by the laboratory were replaced with the method detection limit.

Appendix D - Sediment TEQ Calculations with EPA 1989 TEFs
Military Creek Site Investigation / Remedial Action Options
C.M. Christiansen Co. Inc. Former Pole Yard, Phelps, Wisconsin
WDNR BRRTS Activity #02-64-000068

		Field Sample ID:	Toxic Equivalency Factors EPA 1989	101816015			101816016			101816017		
		Station Name:		SED-105								
		Station / Sample Name:		SED-105	ng TEQ/kg	% contribution	SED-105	ng TEQ/kg	% contribution	SED-105 Duplicate	ng TEQ/kg	% contribution
		Sample Depth (feet):		0-0.5			0.5-1.4			0.5-1.4		
		Sample Date:		10/18/2016			10/18/2016			10/18/2016		
GEO	Percent Moisture	(%)		8.6			58.7			38.7		
Organic	Carbon, Total Organic	(mg/kg)		5,310			76,100			43,500		
Dioxin	1,2,3,4,6,7,8-HpCDD	(ng/Kg)	0.01	110	1.1	20.43	45	0.45	19.48	38	0.38	19.72
Dioxin	1,2,3,4,7,8-HxCDD	(ng/Kg)	0.1	1.1	0.11	2.04	0.4	0.04	1.73	0.41	0.041	2.13
Dioxin	1,2,3,6,7,8-HxCDD	(ng/Kg)	0.1	5	0.5	9.29	1.7	0.17	7.36	1.6	0.16	8.30
Dioxin	1,2,3,7,8,9-HxCDD	(ng/Kg)	0.1	1.6	0.16	2.97	0.72	0.072	3.12	0.63	0.063	3.27
Dioxin	1,2,3,7,8-PeCDD	(ng/Kg)	0.5	0.32	0.16	2.97	0.11	0.055	2.38	0.092	0.046	2.39
Dioxin	2,3,7,8-TCDD	(ng/Kg)	1	0.091	0.091	1.69	0.2	0.2	8.66	0.12	0.12	6.23
Dioxin	OCDD	(ng/Kg)	0.001	970	0.97	18.02	510	0.51	22.08	360	0.36	18.68
Furan	1,2,3,4,6,7,8-HpCDF	(ng/Kg)	0.01	41	0.41	7.62	21	0.21	9.09	15	0.15	7.78
Furan	1,2,3,4,7,8,9-HpCDF	(ng/Kg)	0.01	3.7	0.037	0.69	1.6	0.016	0.69	1.2	0.012	0.62
Furan	1,2,3,4,7,8-HxCDF	(ng/Kg)	0.1	3.4	0.34	6.32	1.3	0.13	5.63	1.2	0.12	6.23
Furan	1,2,3,6,7,8-HxCDF	(ng/Kg)	0.1	1.6	0.16	2.97	0.56	0.056	2.42	0.46	0.046	2.39
Furan	1,2,3,7,8,9-HxCDF	(ng/Kg)	0.1	1.4	0.14	2.60	0.36	0.036	1.56	0.44	0.044	2.28
Furan	1,2,3,7,8-PeCDF	(ng/Kg)	0.05	0.61	0.0305	0.57	0.14	0.007	0.30	0.18	0.009	0.47
Furan	2,3,4,6,7,8-HxCDF	(ng/Kg)	0.1	2.2	0.22	4.09	0.78	0.078	3.38	0.6	0.06	3.11
Furan	2,3,4,7,8-PeCDF	(ng/Kg)	0.5	1.6	0.8	14.86	0.31	0.155	6.71	0.45	0.225	11.68
Furan	2,3,7,8-TCDF	(ng/Kg)	0.1	0.25	0.025	0.46	0.4	0.04	1.73	0.34	0.034	1.76
Furan	OCDF	(ng/Kg)	0.001	130	0.13	2.41	85	0.085	3.68	57	0.057	2.96
	SUM OF TEQ				5.38			2.31			1.93	

Notes

1. TEQ = Total 2,3,7,8-TCDD Equivalence
2. ng/Kg = nanograms per kilogram
3. mg/Kg = miligram per kilogram
4. Concentrations reported as Non Detect by the laboratory were replaced with the method detection limit.

Appendix D - Sediment TEQ Calculations with EPA 1989 TEFs
Military Creek Site Investigation / Remedial Action Options
C.M. Christiansen Co. Inc. Former Pole Yard, Phelps, Wisconsin
WDNR BRRTS Activity #02-64-000068

		Field Sample ID:	Toxic Equivalency Factors EPA 1989	101716001			101716002		
		Station Name:		SED-106					
		Station / Sample Name:		SED-106	ng TEQ/kg	% contribution	SED-106	ng TEQ/kg	% contribution
		Sample Depth (feet):		0-0.5			0.5-1.4		
		Sample Date:		10/17/2016			10/17/2016		
GEO	Percent Moisture	(%)		14.5			5.2		
Organic	Carbon, Total Organic	(mg/kg)		2,360			1,610		
Dioxin	1,2,3,4,6,7,8-HpCDD	(ng/Kg)	0.01	4	0.04	9.99	4.1	0.041	10.25
Dioxin	1,2,3,4,7,8-HxCDD	(ng/Kg)	0.1	0.16	0.016	3.99	0.16	0.016	4.00
Dioxin	1,2,3,6,7,8-HxCDD	(ng/Kg)	0.1	0.21	0.021	5.24	0.14	0.014	3.50
Dioxin	1,2,3,7,8,9-HxCDD	(ng/Kg)	0.1	0.17	0.017	4.24	0.21	0.021	5.25
Dioxin	1,2,3,7,8-PeCDD	(ng/Kg)	0.5	0.057	0.0285	7.12	0.052	0.026	6.50
Dioxin	2,3,7,8-TCDD	(ng/Kg)	1	0.095	0.095	23.72	0.1	0.1	24.99
Dioxin	OCDD	(ng/Kg)	0.001	38	0.038	9.49	51	0.051	12.75
Furan	1,2,3,4,6,7,8-HpCDF	(ng/Kg)	0.01	1.4	0.014	3.50	1.3	0.013	3.25
Furan	1,2,3,4,7,8,9-HpCDF	(ng/Kg)	0.01	0.15	0.0015	0.37	0.15	0.0015	0.37
Furan	1,2,3,4,7,8-HxCDF	(ng/Kg)	0.1	0.16	0.016	3.99	0.13	0.013	3.25
Furan	1,2,3,6,7,8-HxCDF	(ng/Kg)	0.1	0.13	0.013	3.25	0.13	0.013	3.25
Furan	1,2,3,7,8,9-HxCDF	(ng/Kg)	0.1	0.16	0.016	3.99	0.072	0.0072	1.80
Furan	1,2,3,7,8-PeCDF	(ng/Kg)	0.05	0.071	0.00355	0.89	0.054	0.0027	0.67
Furan	2,3,4,6,7,8-HxCDF	(ng/Kg)	0.1	0.13	0.013	3.25	0.086	0.0086	2.15
Furan	2,3,4,7,8-PeCDF	(ng/Kg)	0.5	0.093	0.0465	11.61	0.11	0.055	13.75
Furan	2,3,7,8-TCDF	(ng/Kg)	0.1	0.16	0.016	3.99	0.12	0.012	3.00
Furan	OCDF	(ng/Kg)	0.001	5.5	0.0055	1.37	5.1	0.0051	1.27
	SUM OF TEQ				0.40			0.40	

Notes

1. TEQ = Total 2,3,7,8-TCDD Equivalence
2. ng/Kg = nanograms per kilogram
3. mg/Kg = miligram per kilogram
4. Concentrations reported as Non Detect by the laboratory were replaced with the method detection limit.

Appendix D - Sediment TEQ Calculations with EPA 1989 TEFs
Military Creek Site Investigation / Remedial Action Options
C.M. Christiansen Co. Inc. Former Pole Yard, Phelps, Wisconsin
WDNR BRRTS Activity #02-64-000068

		Field Sample ID:	Toxic Equivalency Factors EPA 1989	101716003			101716004		
		Station Name:		SED-107					
		Station / Sample Name:		SED-107	ng TEQ/kg	% contribution	SED-107	ng TEQ/kg	% contribution
		Sample Depth (feet):		0-0.5			0.5-0.7		
		Sample Date:		10/17/2016			10/17/2016		
GEO	Percent Moisture	(%)		17.1			14.8		
Organic	Carbon, Total Organic	(mg/kg)		1,390			1,810		
Dioxin	1,2,3,4,6,7,8-HpCDD	(ng/Kg)	0.01	1.5	0.015	6.25	6.4	0.064	8.49
Dioxin	1,2,3,4,7,8-HxCDD	(ng/Kg)	0.1	0.059	0.0059	2.46	0.27	0.027	3.58
Dioxin	1,2,3,6,7,8-HxCDD	(ng/Kg)	0.1	0.077	0.0077	3.21	0.55	0.055	7.30
Dioxin	1,2,3,7,8,9-HxCDD	(ng/Kg)	0.1	0.06	0.006	2.50	0.2	0.02	2.65
Dioxin	1,2,3,7,8-PeCDD	(ng/Kg)	0.5	0.041	0.0205	8.55	0.14	0.07	9.29
Dioxin	2,3,7,8-TCDD	(ng/Kg)	1	0.085	0.085	35.43	0.26	0.26	34.49
Dioxin	OCDD	(ng/Kg)	0.001	11	0.011	4.59	30	0.03	3.98
Furan	1,2,3,4,6,7,8-HpCDF	(ng/Kg)	0.01	0.7	0.007	2.92	1.4	0.014	1.86
Furan	1,2,3,4,7,8,9-HpCDF	(ng/Kg)	0.01	0.14	0.0014	0.58	0.34	0.0034	0.45
Furan	1,2,3,4,7,8-HxCDF	(ng/Kg)	0.1	0.1	0.01	4.17	0.2	0.02	2.65
Furan	1,2,3,6,7,8-HxCDF	(ng/Kg)	0.1	0.088	0.0088	3.67	0.17	0.017	2.26
Furan	1,2,3,7,8,9-HxCDF	(ng/Kg)	0.1	0.097	0.0097	4.04	0.27	0.027	3.58
Furan	1,2,3,7,8-PeCDF	(ng/Kg)	0.05	0.05	0.0025	1.04	0.14	0.007	0.93
Furan	2,3,4,6,7,8-HxCDF	(ng/Kg)	0.1	0.077	0.0077	3.21	0.19	0.019	2.52
Furan	2,3,4,7,8-PeCDF	(ng/Kg)	0.5	0.04	0.02	8.34	0.17	0.085	11.28
Furan	2,3,7,8-TCDF	(ng/Kg)	0.1	0.2	0.02	8.34	0.33	0.033	4.38
Furan	OCDF	(ng/Kg)	0.001	1.7	0.0017	0.71	2.4	0.0024	0.32
	SUM OF TEQ				0.24			0.75	

Notes

1. TEQ = Total 2,3,7,8-TCDD Equivalence
2. ng/Kg = nanograms per kilogram
3. mg/Kg = miligram per kilogram
4. Concentrations reported as Non Detect by the laboratory were replaced with the method detection limit.

Appendix D - Sediment TEQ Calculations with EPA 1989 TEFs
Military Creek Site Investigation / Remedial Action Options
C.M. Christiansen Co. Inc. Former Pole Yard, Phelps, Wisconsin
WDNR BRRTS Activity #02-64-000068

		Field Sample ID:	Toxic Equivalency Factors EPA 1989	101716005			101716006			101716007		
		Station Name:		SED-108								
		Station / Sample Name:		SED-108	ng TEQ/kg	% contribution	SED-108	ng TEQ/kg	% contribution	SED-108 Duplicate	ng TEQ/kg	% contribution
		Sample Depth (feet):		0-0.5			0.5-1.4			0.5-1.4		
		Sample Date:		10/17/2016			10/17/2016			10/17/2016		
GEO	Percent Moisture	(%)		9			13.1			13.6		
Organic	Carbon, Total Organic	(mg/kg)		2,960			6,290			16,500		
Dioxin	1,2,3,4,6,7,8-HpCDD	(ng/Kg)	0.01	880	8.8	29.73	1.3	0.013	3.26	2.9	0.029	4.66
Dioxin	1,2,3,4,7,8-HxCDD	(ng/Kg)	0.1	0.48	0.048	0.16	0.12	0.012	3.01	0.11	0.011	1.77
Dioxin	1,2,3,6,7,8-HxCDD	(ng/Kg)	0.1	14	1.4	4.73	0.12	0.012	3.01	0.16	0.016	2.57
Dioxin	1,2,3,7,8,9-HxCDD	(ng/Kg)	0.1	1.4	0.14	0.47	0.12	0.012	3.01	0.11	0.011	1.77
Dioxin	1,2,3,7,8-PeCDD	(ng/Kg)	0.5	0.088	0.044	0.15	0.084	0.042	10.54	0.14	0.07	11.26
Dioxin	2,3,7,8-TCDD	(ng/Kg)	1	0.095	0.095	0.32	0.18	0.18	45.15	0.24	0.24	38.60
Dioxin	OCDD	(ng/Kg)	0.001	12,000	12	40.55	12	0.012	3.01	28	0.028	4.50
Furan	1,2,3,4,6,7,8-HpCDF	(ng/Kg)	0.01	360	3.6	12.16	0.6	0.006	1.51	1.4	0.014	2.25
Furan	1,2,3,4,7,8,9-HpCDF	(ng/Kg)	0.01	14	0.14	0.47	0.13	0.0013	0.33	0.2	0.002	0.32
Furan	1,2,3,4,7,8-HxCDF	(ng/Kg)	0.1	2.5	0.25	0.84	0.093	0.0093	2.33	0.18	0.018	2.89
Furan	1,2,3,6,7,8-HxCDF	(ng/Kg)	0.1	1.4	0.14	0.47	0.073	0.0073	1.83	0.15	0.015	2.41
Furan	1,2,3,7,8,9-HxCDF	(ng/Kg)	0.1	0.33	0.033	0.11	0.1	0.01	2.51	0.13	0.013	2.09
Furan	1,2,3,7,8-PeCDF	(ng/Kg)	0.05	0.1	0.005	0.02	0.079	0.00395	0.99	0.16	0.008	1.29
Furan	2,3,4,6,7,8-HxCDF	(ng/Kg)	0.1	2.4	0.24	0.81	0.069	0.0069	1.73	0.12	0.012	1.93
Furan	2,3,4,7,8-PeCDF	(ng/Kg)	0.5	0.27	0.135	0.46	0.09	0.045	11.29	0.22	0.11	17.69
Furan	2,3,7,8-TCDF	(ng/Kg)	0.1	0.26	0.026	0.09	0.24	0.024	6.02	0.19	0.019	3.06
Furan	OCDF	(ng/Kg)	0.001	2,500	2.5	8.45	1.9	0.0019	0.48	5.8	0.0058	0.93
	SUM OF TEQ				29.60			0.40			0.62	

Notes

1. TEQ = Total 2,3,7,8-TCDD Equivalence
2. ng/Kg = nanograms per kilogram
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4. Concentrations reported as Non Detect by the laboratory were replaced with the method detection limit.

Appendix D - Sediment TEQ Calculations with WHO 1998 TEFs
Military Creek Site Investigation / Remedial Action Options
C.M. Christiansen Co. Inc. Former Pole Yard, Phelps, Wisconsin
WDNR BRRTS Activity #02-64-000068

		Field Sample ID:	Toxic Equivalency Factors WHO 1998 (Fish)	102016035			102016036		
		Station Name:		SED-01					
		Station / Sample Name:		SED-01	ng TEQ/kg	% contribution	SED-01	ng TEQ/kg	% contribution
		Sample Depth (feet):		0-0.5			0.5-1.5		
		Sample Date:		10/20/2016			10/20/2016		
GEO	Percent Moisture	(%)		90.3			85.5		
Organic	Carbon, Total Organic	(mg/kg)		268,000			353,000		
Dioxin	1,2,3,4,6,7,8-HpCDD	(ng/Kg)	0.001	3.6	0.0036	0.33	1	0.001	0.10
Dioxin	1,2,3,4,7,8-HxCDD	(ng/Kg)	0.5	0.27	0.135	12.20	0.32	0.16	15.33
Dioxin	1,2,3,6,7,8-HxCDD	(ng/Kg)	0.01	0.29	0.0029	0.26	0.32	0.0032	0.31
Dioxin	1,2,3,7,8,9-HxCDD	(ng/Kg)	0.01	0.26	0.0026	0.23	0.25	0.0025	0.24
Dioxin	1,2,3,7,8-PeCDD	(ng/Kg)	1	0.3	0.3	27.10	0.26	0.26	24.92
Dioxin	2,3,7,8-TCDD	(ng/Kg)	1	0.34	0.34	30.71	0.34	0.34	32.58
Dioxin	OCDD	(ng/Kg)	0.0001	29	0.0029	0.26	6.2	0.00062	0.06
Furan	1,2,3,4,6,7,8-HpCDF	(ng/Kg)	0.01	1	0.01	0.90	0.47	0.0047	0.45
Furan	1,2,3,4,7,8,9-HpCDF	(ng/Kg)	0.01	0.32	0.0032	0.29	0.24	0.0024	0.23
Furan	1,2,3,4,7,8-HxCDF	(ng/Kg)	0.1	0.21	0.021	1.90	0.16	0.016	1.53
Furan	1,2,3,6,7,8-HxCDF	(ng/Kg)	0.1	0.23	0.023	2.08	0.16	0.016	1.53
Furan	1,2,3,7,8,9-HxCDF	(ng/Kg)	0.1	0.27	0.027	2.44	0.23	0.023	2.20
Furan	1,2,3,7,8-PeCDF	(ng/Kg)	0.05	0.45	0.0225	2.03	0.34	0.017	1.63
Furan	2,3,4,6,7,8-HxCDF	(ng/Kg)	0.1	0.28	0.028	2.53	0.22	0.022	2.11
Furan	2,3,4,7,8-PeCDF	(ng/Kg)	0.5	0.25	0.125	11.29	0.22	0.11	10.54
Furan	2,3,7,8-TCDF	(ng/Kg)	0.05	1.2	0.06	5.42	1.3	0.065	6.23
Furan	OCDF	(ng/Kg)	0.0001	2.6	0.00026	0.02	0.66	0.00007	0.01
	SUM OF TEQ				1.11			1.04	

Notes

1. TEQ = Total 2,3,7,8-TCDD Equivalence
2. ng/Kg = nanograms per kilogram
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4. Concentrations reported as Non Detect by the laboratory were replaced with the method detection limit.

Appendix D - Sediment TEQ Calculations with WHO 1998 TEFs
Military Creek Site Investigation / Remedial Action Options
C.M. Christiansen Co. Inc. Former Pole Yard, Phelps, Wisconsin
WDNR BRRTS Activity #02-64-000068

			Field Sample ID:	Toxic Equivalency Factors WHO 1998 (Fish)	101916027			101916028		
			Station Name:		SED-02					
			Station / Sample Name:		SED-02			SED-02		
			Sample Depth (feet):		0-0.5	ng TEQ/kg	% contribution	0.5-1.5	ng TEQ/kg	% contribution
			Sample Date:		10/19/2016			10/19/2016		
GEO	Percent Moisture	(%)			91.9			87.2		
Organic	Carbon, Total Organic	(mg/kg)			317,000			216,000		
Dioxin	1,2,3,4,6,7,8-HpCDD	(ng/Kg)		0.001	6,500	6.5	3.85	470	0.47	3.47
Dioxin	1,2,3,4,7,8-HxCDD	(ng/Kg)		0.5	47	23.5	13.92	3.9	1.95	14.40
Dioxin	1,2,3,6,7,8-HxCDD	(ng/Kg)		0.01	260	2.6	1.54	18	0.18	1.33
Dioxin	1,2,3,7,8,9-HxCDD	(ng/Kg)		0.01	100	1	0.59	7.2	0.072	0.53
Dioxin	1,2,3,7,8-PeCDD	(ng/Kg)		1	11	11	6.52	1.1	1.1	8.12
Dioxin	2,3,7,8-TCDD	(ng/Kg)		1	2.3	2.3	1.36	0.65	0.65	4.80
Dioxin	OCDD	(ng/Kg)		0.0001	72,000	7.2	4.27	5,700	0.57	4.21
Furan	1,2,3,4,6,7,8-HpCDF	(ng/Kg)		0.01	2,200	22	13.03	150	1.5	11.07
Furan	1,2,3,4,7,8,9-HpCDF	(ng/Kg)		0.01	200	2	1.18	14	0.14	1.03
Furan	1,2,3,4,7,8-HxCDF	(ng/Kg)		0.1	250	25	14.81	17	1.7	12.55
Furan	1,2,3,6,7,8-HxCDF	(ng/Kg)		0.1	110	11	6.52	9	0.9	6.64
Furan	1,2,3,7,8,9-HxCDF	(ng/Kg)		0.1	76	7.6	4.50	5.8	0.58	4.28
Furan	1,2,3,7,8-PeCDF	(ng/Kg)		0.05	29	1.45	0.86	2.2	0.11	0.81
Furan	2,3,4,6,7,8-HxCDF	(ng/Kg)		0.1	110	11	6.52	8.3	0.83	6.13
Furan	2,3,4,7,8-PeCDF	(ng/Kg)		0.5	67	33.5	19.84	5.3	2.65	19.56
Furan	2,3,7,8-TCDF	(ng/Kg)		0.05	7.2	0.36	0.21	1.8	0.09	0.66
Furan	OCDF	(ng/Kg)		0.0001	8,000	0.8	0.47	540	0.054	0.40
	SUM OF TEQ					168.81			13.55	

Notes

1. TEQ = Total 2,3,7,8-TCDD Equivalence
2. ng/Kg = nanograms per kilogram
3. mg/Kg = miligram per kilogram
4. Concentrations reported as Non Detect by the laboratory were replaced with the method detection limit.

Appendix D - Sediment TEQ Calculations with WHO 1998 TEFs
Military Creek Site Investigation / Remedial Action Options
C.M. Christiansen Co. Inc. Former Pole Yard, Phelps, Wisconsin
WDNR BRRTS Activity #02-64-000068

		Field Sample ID:	Toxic Equivalency Factors WHO 1998 (Fish)	101916024			101916025		
		Station Name:		SED-03					
		Station / Sample Name:		SED-03	ng TEQ/kg	% contribution	SED-03	ng TEQ/kg	% contribution
		Sample Depth (feet):		0-0.5			0.5-1.5		
		Sample Date:		10/19/2016			10/19/2016		
GEO	Percent Moisture	(%)		46.3			55.4		
Organic	Carbon, Total Organic	(mg/kg)		19,300			30,900		
Dioxin	1,2,3,4,6,7,8-HpCDD	(ng/Kg)	0.001	17,000	17	4.00	75,000	75	4.26
Dioxin	1,2,3,4,7,8-HxCDD	(ng/Kg)	0.5	100	50	11.77	370	185	10.51
Dioxin	1,2,3,6,7,8-HxCDD	(ng/Kg)	0.01	740	7.4	1.74	2,800	28	1.59
Dioxin	1,2,3,7,8,9-HxCDD	(ng/Kg)	0.01	230	2.3	0.54	780	7.8	0.44
Dioxin	1,2,3,7,8-PeCDD	(ng/Kg)	1	27	27	6.35	89	89	5.06
Dioxin	2,3,7,8-TCDD	(ng/Kg)	1	2.1	2.1	0.49	9.3	9.3	0.53
Dioxin	OCDD	(ng/Kg)	0.0001	170,000	17	4.00	570,000	57	3.24
Furan	1,2,3,4,6,7,8-HpCDF	(ng/Kg)	0.01	5,700	57	13.41	27,000	270	15.34
Furan	1,2,3,4,7,8,9-HpCDF	(ng/Kg)	0.01	570	5.7	1.34	2,500	25	1.42
Furan	1,2,3,4,7,8-HxCDF	(ng/Kg)	0.1	620	62	14.59	2,500	250	14.21
Furan	1,2,3,6,7,8-HxCDF	(ng/Kg)	0.1	230	23	5.41	1,000	100	5.68
Furan	1,2,3,7,8,9-HxCDF	(ng/Kg)	0.1	250	25	5.88	1,100	110	6.25
Furan	1,2,3,7,8-PeCDF	(ng/Kg)	0.05	77	3.85	0.91	270	13.5	0.77
Furan	2,3,4,6,7,8-HxCDF	(ng/Kg)	0.1	280	28	6.59	1,200	120	6.82
Furan	2,3,4,7,8-PeCDF	(ng/Kg)	0.5	190	95	22.36	820	410	23.30
Furan	2,3,7,8-TCDF	(ng/Kg)	0.05	15	0.75	0.18	71	3.55	0.20
Furan	OCDF	(ng/Kg)	0.0001	18,000	1.8	0.42	65,000	6.5	0.37
	SUM OF TEQ				424.90			1759.65	

Notes

1. TEQ = Total 2,3,7,8-TCDD Equivalence
2. ng/Kg = nanograms per kilogram
3. mg/Kg = miligram per kilogram
4. Concentrations reported as Non Detect by the laboratory were replaced with the method detection limit.

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Military Creek Site Investigation / Remedial Action Options
C.M. Christiansen Co. Inc. Former Pole Yard, Phelps, Wisconsin
WDNR BRRTS Activity #02-64-000068

		Field Sample ID:	Toxic Equivalency Factors WHO 1998 (Fish)	101916021			101916022		
		Station Name:		SED-04					
		Station / Sample Name:		SED-04	ng TEQ/kg	% contribution	SED-04	ng TEQ/kg	% contribution
		Sample Depth (feet):		0-0.5			0.5-1.5		
		Sample Date:		10/19/2016			10/19/2016		
GEO	Percent Moisture	(%)		91.4			75.4		
Organic	Carbon, Total Organic	(mg/kg)		245,000			128,000		
Dioxin	1,2,3,4,6,7,8-HpCDD	(ng/Kg)	0.001	7,800	7.8	3.87	31,000	31	5.11
Dioxin	1,2,3,4,7,8-HxCDD	(ng/Kg)	0.5	48	24	11.90	160	80	13.19
Dioxin	1,2,3,6,7,8-HxCDD	(ng/Kg)	0.01	340	3.4	1.69	960	9.6	1.58
Dioxin	1,2,3,7,8,9-HxCDD	(ng/Kg)	0.01	110	1.1	0.55	310	3.1	0.51
Dioxin	1,2,3,7,8-PeCDD	(ng/Kg)	1	15	15	7.44	42	42	6.93
Dioxin	2,3,7,8-TCDD	(ng/Kg)	1	0.97	0.97	0.48	2.4	2.4	0.40
Dioxin	OCDD	(ng/Kg)	0.0001	73,000	7.3	3.62	310,000	31	5.11
Furan	1,2,3,4,6,7,8-HpCDF	(ng/Kg)	0.01	2,600	26	12.89	12,000	120	19.79
Furan	1,2,3,4,7,8,9-HpCDF	(ng/Kg)	0.01	210	2.1	1.04	960	9.6	1.58
Furan	1,2,3,4,7,8-HxCDF	(ng/Kg)	0.1	290	29	14.38	890	89	14.68
Furan	1,2,3,6,7,8-HxCDF	(ng/Kg)	0.1	110	11	5.45	360	36	5.94
Furan	1,2,3,7,8,9-HxCDF	(ng/Kg)	0.1	110	11	5.45	190	19	3.13
Furan	1,2,3,7,8-PeCDF	(ng/Kg)	0.05	41	2.05	1.02	76	3.8	0.63
Furan	2,3,4,6,7,8-HxCDF	(ng/Kg)	0.1	130	13	6.45	390	39	6.43
Furan	2,3,4,7,8-PeCDF	(ng/Kg)	0.5	93	46.5	23.06	170	85	14.02
Furan	2,3,7,8-TCDF	(ng/Kg)	0.05	9.9	0.495	0.25	11	0.55	0.09
Furan	OCDF	(ng/Kg)	0.0001	9,600	0.96	0.48	53,000	5.3	0.87
	SUM OF TEQ				201.68			606.35	

Notes

1. TEQ = Total 2,3,7,8-TCDD Equivalence
2. ng/Kg = nanograms per kilogram
3. mg/Kg = miligram per kilogram
4. Concentrations reported as Non Detect by the laboratory were replaced with the method detection limit.

Appendix D - Sediment TEQ Calculations with WHO 1998 TEFs
Military Creek Site Investigation / Remedial Action Options
C.M. Christiansen Co. Inc. Former Pole Yard, Phelps, Wisconsin
WDNR BRRTS Activity #02-64-000068

		Field Sample ID:	Toxic Equivalency Factors WHO 1998 (Fish)	101916018			101916019		
		Station Name:		SED-05					
		Station / Sample Name:		SED-05	ng TEQ/kg	% contribution	SED-05	ng TEQ/kg	% contribution
		Sample Depth (feet):		0-0.5			0.5-1.5		
		Sample Date:		10/19/2016			10/19/2016		
GEO	Percent Moisture	(%)		35.8			16.9		
Organic	Carbon, Total Organic	(mg/kg)		19,400			649		
Dioxin	1,2,3,4,6,7,8-HpCDD	(ng/Kg)	0.001	1,600	1.6	4.08	11	0.011	1.86
Dioxin	1,2,3,4,7,8-HxCDD	(ng/Kg)	0.5	10	5	12.76	0.16	0.08	13.52
Dioxin	1,2,3,6,7,8-HxCDD	(ng/Kg)	0.01	65	0.65	1.66	0.47	0.0047	0.79
Dioxin	1,2,3,7,8,9-HxCDD	(ng/Kg)	0.01	25	0.25	0.64	0.21	0.0021	0.35
Dioxin	1,2,3,7,8-PeCDD	(ng/Kg)	1	2.6	2.6	6.64	0.08	0.08	13.52
Dioxin	2,3,7,8-TCDD	(ng/Kg)	1	0.16	0.16	0.41	0.12	0.12	20.28
Dioxin	OCDD	(ng/Kg)	0.0001	17,000	1.7	4.34	120	0.012	2.03
Furan	1,2,3,4,6,7,8-HpCDF	(ng/Kg)	0.01	580	5.8	14.81	4.6	0.046	7.77
Furan	1,2,3,4,7,8,9-HpCDF	(ng/Kg)	0.01	52	0.52	1.33	0.38	0.0038	0.64
Furan	1,2,3,4,7,8-HxCDF	(ng/Kg)	0.1	58	5.8	14.81	0.4	0.04	6.76
Furan	1,2,3,6,7,8-HxCDF	(ng/Kg)	0.1	24	2.4	6.13	0.23	0.023	3.89
Furan	1,2,3,7,8,9-HxCDF	(ng/Kg)	0.1	20	2	5.11	0.15	0.015	2.54
Furan	1,2,3,7,8-PeCDF	(ng/Kg)	0.05	8	0.4	1.02	0.11	0.0055	0.93
Furan	2,3,4,6,7,8-HxCDF	(ng/Kg)	0.1	25	2.5	6.38	0.21	0.021	3.55
Furan	2,3,4,7,8-PeCDF	(ng/Kg)	0.5	15	7.5	19.14	0.24	0.12	20.28
Furan	2,3,7,8-TCDF	(ng/Kg)	0.05	1.3	0.065	0.17	0.12	0.006	1.01
Furan	OCDF	(ng/Kg)	0.0001	2,300	0.23	0.59	16	0.0016	0.27
	SUM OF TEQ				39.18			0.59	

Notes

1. TEQ = Total 2,3,7,8-TCDD Equivalence
2. ng/Kg = nanograms per kilogram
3. mg/Kg = miligram per kilogram
4. Concentrations reported as Non Detect by the laboratory were replaced with the method detection limit.

Appendix D - Sediment TEQ Calculations with WHO 1998 TEFs
Military Creek Site Investigation / Remedial Action Options
C.M. Christiansen Co. Inc. Former Pole Yard, Phelps, Wisconsin
WDNR BRRTS Activity #02-64-000068

		Field Sample ID:	Toxic Equivalency Factors WHO 1998 (Fish)	101816008			101816009		
		Station Name:		SED-06					
		Station / Sample Name:		SED-06	ng TEQ/kg	% contribution	SED-06	ng TEQ/kg	% contribution
		Sample Depth (feet):		0-0.5			0.5-1.5		
		Sample Date:		10/18/2016			10/18/2016		
GEO	Percent Moisture	(%)		92			77.3		
Organic	Carbon, Total Organic	(mg/kg)		350,000			95,900		
Dioxin	1,2,3,4,6,7,8-HpCDD	(ng/Kg)	0.001	18,000	18	4.36	25,000	25	5.28
Dioxin	1,2,3,4,7,8-HxCDD	(ng/Kg)	0.5	110	55	13.32	140	70	14.78
Dioxin	1,2,3,6,7,8-HxCDD	(ng/Kg)	0.01	690	6.9	1.67	810	8.1	1.71
Dioxin	1,2,3,7,8,9-HxCDD	(ng/Kg)	0.01	220	2.2	0.53	280	2.8	0.59
Dioxin	1,2,3,7,8-PeCDD	(ng/Kg)	1	26	26	6.29	33	33	6.97
Dioxin	2,3,7,8-TCDD	(ng/Kg)	1	2.1	2.1	0.51	2.1	2.1	0.44
Dioxin	OCDD	(ng/Kg)	0.0001	190,000	19	4.60	270,000	27	5.70
Furan	1,2,3,4,6,7,8-HpCDF	(ng/Kg)	0.01	7,900	79	19.13	11,000	110	23.22
Furan	1,2,3,4,7,8,9-HpCDF	(ng/Kg)	0.01	680	6.8	1.65	920	9.2	1.94
Furan	1,2,3,4,7,8-HxCDF	(ng/Kg)	0.1	460	46	11.14	300	30	6.33
Furan	1,2,3,6,7,8-HxCDF	(ng/Kg)	0.1	300	30	7.26	400	40	8.44
Furan	1,2,3,7,8,9-HxCDF	(ng/Kg)	0.1	200	20	4.84	160	16	3.38
Furan	1,2,3,7,8-PeCDF	(ng/Kg)	0.05	63	3.15	0.76	67	3.35	0.71
Furan	2,3,4,6,7,8-HxCDF	(ng/Kg)	0.1	300	30	7.26	370	37	7.81
Furan	2,3,4,7,8-PeCDF	(ng/Kg)	0.5	130	65	15.74	110	55	11.61
Furan	2,3,7,8-TCDF	(ng/Kg)	0.05	9.9	0.495	0.12	5.6	0.28	0.06
Furan	OCDF	(ng/Kg)	0.0001	34,000	3.4	0.82	49,000	4.9	1.03
	SUM OF TEQ				413.05			473.73	

Notes

1. TEQ = Total 2,3,7,8-TCDD Equivalence
2. ng/Kg = nanograms per kilogram
3. mg/Kg = miligram per kilogram
4. Concentrations reported as Non Detect by the laboratory were replaced with the method detection limit.

Appendix D - Sediment TEQ Calculations with WHO 1998 TEFs
Military Creek Site Investigation / Remedial Action Options
C.M. Christiansen Co. Inc. Former Pole Yard, Phelps, Wisconsin
WDNR BRRTS Activity #02-64-000068

		Field Sample ID:	Toxic Equivalency Factors WHO 1998 (Fish)	102016032			102016033		
		Station Name:		SED-101					
		Station / Sample Name:		SED-101	ng TEQ/kg	% contribution	SED-101	ng TEQ/kg	% contribution
		Sample Depth (feet):		0-0.5			0.5-1.5		
		Sample Date:		10/20/2016			10/20/2016		
GEO	Percent Moisture	(%)		90.6			87.8		
Organic	Carbon, Total Organic	(mg/kg)		146,000			165,000		
Dioxin	1,2,3,4,6,7,8-HpCDD	(ng/Kg)	0.001	39	0.039	1.80	20	0.02	1.10
Dioxin	1,2,3,4,7,8-HxCDD	(ng/Kg)	0.5	0.46	0.23	10.60	0.24	0.12	6.61
Dioxin	1,2,3,6,7,8-HxCDD	(ng/Kg)	0.01	2.1	0.021	0.97	0.82	0.0082	0.45
Dioxin	1,2,3,7,8,9-HxCDD	(ng/Kg)	0.01	0.92	0.0092	0.42	0.4	0.004	0.22
Dioxin	1,2,3,7,8-PeCDD	(ng/Kg)	1	0.42	0.42	19.36	0.35	0.35	19.28
Dioxin	2,3,7,8-TCDD	(ng/Kg)	1	0.41	0.41	18.90	0.6	0.6	33.06
Dioxin	OCDD	(ng/Kg)	0.0001	370	0.037	1.71	230	0.023	1.27
Furan	1,2,3,4,6,7,8-HpCDF	(ng/Kg)	0.01	12	0.12	5.53	7.1	0.071	3.91
Furan	1,2,3,4,7,8,9-HpCDF	(ng/Kg)	0.01	1.3	0.013	0.60	0.6	0.006	0.33
Furan	1,2,3,4,7,8-HxCDF	(ng/Kg)	0.1	1.5	0.15	6.92	0.87	0.087	4.79
Furan	1,2,3,6,7,8-HxCDF	(ng/Kg)	0.1	0.73	0.073	3.37	0.52	0.052	2.87
Furan	1,2,3,7,8,9-HxCDF	(ng/Kg)	0.1	0.71	0.071	3.27	0.26	0.026	1.43
Furan	1,2,3,7,8-PeCDF	(ng/Kg)	0.05	0.55	0.0275	1.27	0.48	0.024	1.32
Furan	2,3,4,6,7,8-HxCDF	(ng/Kg)	0.1	1.1	0.11	5.07	0.26	0.026	1.43
Furan	2,3,4,7,8-PeCDF	(ng/Kg)	0.5	0.73	0.365	16.83	0.65	0.325	17.91
Furan	2,3,7,8-TCDF	(ng/Kg)	0.05	1.4	0.07	3.23	1.4	0.07	3.86
Furan	OCDF	(ng/Kg)	0.0001	34	0.0034	0.16	27	0.0027	0.15
	SUM OF TEQ				2.17			1.81	

Notes

1. TEQ = Total 2,3,7,8-TCDD Equivalence
2. ng/Kg = nanograms per kilogram
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4. Concentrations reported as Non Detect by the laboratory were replaced with the method detection limit.

Appendix D - Sediment TEQ Calculations with WHO 1998 TEFs
Military Creek Site Investigation / Remedial Action Options
C.M. Christiansen Co. Inc. Former Pole Yard, Phelps, Wisconsin
WDNR BRRTS Activity #02-64-000068

		Field Sample ID:	Toxic Equivalency Factors WHO 1998 (Fish)	102016030			102016031		
		Station Name:		SED-102					
		Station / Sample Name:		SED-102	ng TEQ/kg	% contribution	SED-102	ng TEQ/kg	% contribution
		Sample Depth (feet):		0-0.5			0.5-1.5		
		Sample Date:		10/20/2016			10/20/2016		
GEO	Percent Moisture	(%)		92.2			88.2		
Organic	Carbon, Total Organic	(mg/kg)		279,000			226,000		
Dioxin	1,2,3,4,6,7,8-HpCDD	(ng/Kg)	0.001	27	0.027	1.36	2	0.002	0.21
Dioxin	1,2,3,4,7,8-HxCDD	(ng/Kg)	0.5	0.55	0.275	13.89	0.26	0.13	13.88
Dioxin	1,2,3,6,7,8-HxCDD	(ng/Kg)	0.01	1.4	0.014	0.71	0.29	0.0029	0.31
Dioxin	1,2,3,7,8,9-HxCDD	(ng/Kg)	0.01	0.64	0.0064	0.32	0.26	0.0026	0.28
Dioxin	1,2,3,7,8-PeCDD	(ng/Kg)	1	0.45	0.45	22.73	0.23	0.23	24.56
Dioxin	2,3,7,8-TCDD	(ng/Kg)	1	0.36	0.36	18.18	0.28	0.28	29.90
Dioxin	OCDD	(ng/Kg)	0.0001	230	0.023	1.16	13	0.0013	0.14
Furan	1,2,3,4,6,7,8-HpCDF	(ng/Kg)	0.01	10	0.1	5.05	0.7	0.007	0.75
Furan	1,2,3,4,7,8,9-HpCDF	(ng/Kg)	0.01	1.1	0.011	0.56	0.29	0.0029	0.31
Furan	1,2,3,4,7,8-HxCDF	(ng/Kg)	0.1	1.4	0.14	7.07	0.23	0.023	2.46
Furan	1,2,3,6,7,8-HxCDF	(ng/Kg)	0.1	0.52	0.052	2.63	0.17	0.017	1.82
Furan	1,2,3,7,8,9-HxCDF	(ng/Kg)	0.1	0.47	0.047	2.37	0.16	0.016	1.71
Furan	1,2,3,7,8-PeCDF	(ng/Kg)	0.05	0.31	0.0155	0.78	0.49	0.0245	2.62
Furan	2,3,4,6,7,8-HxCDF	(ng/Kg)	0.1	0.71	0.071	3.59	0.22	0.022	2.35
Furan	2,3,4,7,8-PeCDF	(ng/Kg)	0.5	0.62	0.31	15.66	0.24	0.12	12.82
Furan	2,3,7,8-TCDF	(ng/Kg)	0.05	1.5	0.075	3.79	1.1	0.055	5.87
Furan	OCDF	(ng/Kg)	0.0001	29	0.0029	0.15	1.7	0.00017	0.02
	SUM OF TEQ				1.98			0.94	

Notes

1. TEQ = Total 2,3,7,8-TCDD Equivalence
2. ng/Kg = nanograms per kilogram
3. mg/Kg = miligram per kilogram
4. Concentrations reported as Non Detect by the laboratory were replaced with the method detection limit.

Appendix D - Sediment TEQ Calculations with WHO 1998 TEFs
Military Creek Site Investigation / Remedial Action Options
C.M. Christiansen Co. Inc. Former Pole Yard, Phelps, Wisconsin
WDNR BRRTS Activity #02-64-000068

		Field Sample ID:	Toxic Equivalency Factors WHO 1998 (Fish)	101816012			101816013		
		Station Name:		SED-103					
		Station / Sample Name:		SED-103	ng TEQ/kg	% contribution	SED-103	ng TEQ/kg	% contribution
		Sample Depth (feet):		0-0.5			0.5-1.5		
		Sample Date:		10/18/2016			10/18/2016		
GEO	Percent Moisture	(%)		28			21.6		
Organic	Carbon, Total Organic	(mg/kg)		17,800			38,300		
Dioxin	1,2,3,4,6,7,8-HpCDD	(ng/Kg)	0.001	950	0.95	3.93	5.8	0.0058	1.66
Dioxin	1,2,3,4,7,8-HxCDD	(ng/Kg)	0.5	5.3	2.65	10.96	0.083	0.0415	11.85
Dioxin	1,2,3,6,7,8-HxCDD	(ng/Kg)	0.01	39	0.39	1.61	0.18	0.0018	0.51
Dioxin	1,2,3,7,8,9-HxCDD	(ng/Kg)	0.01	11	0.11	0.45	0.091	0.00091	0.26
Dioxin	1,2,3,7,8-PeCDD	(ng/Kg)	1	1.5	1.5	6.20	0.078	0.078	22.27
Dioxin	2,3,7,8-TCDD	(ng/Kg)	1	0.16	0.16	0.66	0.083	0.083	23.70
Dioxin	OCDD	(ng/Kg)	0.0001	11,000	1.1	4.55	65	0.0065	1.86
Furan	1,2,3,4,6,7,8-HpCDF	(ng/Kg)	0.01	360	3.6	14.88	2.7	0.027	7.71
Furan	1,2,3,4,7,8,9-HpCDF	(ng/Kg)	0.01	35	0.35	1.45	0.21	0.0021	0.60
Furan	1,2,3,4,7,8-HxCDF	(ng/Kg)	0.1	35	3.5	14.47	0.14	0.014	4.00
Furan	1,2,3,6,7,8-HxCDF	(ng/Kg)	0.1	17	1.7	7.03	0.14	0.014	4.00
Furan	1,2,3,7,8,9-HxCDF	(ng/Kg)	0.1	16	1.6	6.61	0.084	0.0084	2.40
Furan	1,2,3,7,8-PeCDF	(ng/Kg)	0.05	5.4	0.27	1.12	0.085	0.00425	1.21
Furan	2,3,4,6,7,8-HxCDF	(ng/Kg)	0.1	6.4	0.64	2.65	0.17	0.017	4.85
Furan	2,3,4,7,8-PeCDF	(ng/Kg)	0.5	11	5.5	22.74	0.07	0.035	9.99
Furan	2,3,7,8-TCDF	(ng/Kg)	0.05	0.96	0.048	0.20	0.2	0.01	2.86
Furan	OCDF	(ng/Kg)	0.0001	1,200	0.12	0.50	9.4	0.00094	0.27
	SUM OF TEQ				24.19			0.35	

Notes

1. TEQ = Total 2,3,7,8-TCDD Equivalence
2. ng/Kg = nanograms per kilogram
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4. Concentrations reported as Non Detect by the laboratory were replaced with the method detection limit.

Appendix D - Sediment TEQ Calculations with WHO 1998 TEFs
Military Creek Site Investigation / Remedial Action Options
C.M. Christiansen Co. Inc. Former Pole Yard, Phelps, Wisconsin
WDNR BRRTS Activity #02-64-000068

		Field Sample ID:	Toxic Equivalency Factors WHO 1998 (Fish)	101816011		
		Station Name:		SED-104		
		Station / Sample Name:		SED-104	ng TEQ/kg	% contribution
		Sample Depth (feet):		0-0.4		
		Sample Date:		10/18/2016		
GEO	Percent Moisture	(%)		24.6		
Organic	Carbon, Total Organic	(mg/kg)		11,100		
Dioxin	1,2,3,4,6,7,8-HpCDD	(ng/Kg)	0.001	290	0.29	3.18
Dioxin	1,2,3,4,7,8-HxCDD	(ng/Kg)	0.5	2.8	1.4	15.36
Dioxin	1,2,3,6,7,8-HxCDD	(ng/Kg)	0.01	15	0.15	1.65
Dioxin	1,2,3,7,8,9-HxCDD	(ng/Kg)	0.01	5.8	0.058	0.64
Dioxin	1,2,3,7,8-PeCDD	(ng/Kg)	1	0.73	0.73	8.01
Dioxin	2,3,7,8-TCDD	(ng/Kg)	1	0.11	0.11	1.21
Dioxin	OCDD	(ng/Kg)	0.0001	2,500	0.25	2.74
Furan	1,2,3,4,6,7,8-HpCDF	(ng/Kg)	0.01	100	1	10.97
Furan	1,2,3,4,7,8,9-HpCDF	(ng/Kg)	0.01	9.6	0.096	1.05
Furan	1,2,3,4,7,8-HxCDF	(ng/Kg)	0.1	12	1.2	13.16
Furan	1,2,3,6,7,8-HxCDF	(ng/Kg)	0.1	5	0.5	5.48
Furan	1,2,3,7,8,9-HxCDF	(ng/Kg)	0.1	5	0.5	5.48
Furan	1,2,3,7,8-PeCDF	(ng/Kg)	0.05	1.9	0.095	1.04
Furan	2,3,4,6,7,8-HxCDF	(ng/Kg)	0.1	6.3	0.63	6.91
Furan	2,3,4,7,8-PeCDF	(ng/Kg)	0.5	4.1	2.05	22.49
Furan	2,3,7,8-TCDF	(ng/Kg)	0.05	0.54	0.027	0.30
Furan	OCDF	(ng/Kg)	0.0001	310	0.031	0.34
	SUM OF TEQ				9.12	

Notes

1. TEQ = Total 2,3,7,8-TCDD Equivalence
2. ng/Kg = nanograms per kilogram
3. mg/Kg = miligram per kilogram
4. Concentrations reported as Non Detect by the laboratory were replaced with the method detection limit.

Appendix D - Sediment TEQ Calculations with WHO 1998 TEFs
Military Creek Site Investigation / Remedial Action Options
C.M. Christiansen Co. Inc. Former Pole Yard, Phelps, Wisconsin
WDNR BRRTS Activity #02-64-000068

		Field Sample ID:	Toxic Equivalency Factors WHO 1998 (Fish)	101816015			101816016			101816017		
		Station Name:		SED-105								
		Station / Sample Name:		SED-105	ng TEQ/kg	% contribution	SED-105	ng TEQ/kg	% contribution	SED-105 Duplicate	ng TEQ/kg	% contribution
		Sample Depth (feet):		0-0.5			0.5-1.4			0.5-1.4		
		Sample Date:		10/18/2016			10/18/2016			10/18/2016		
GEO	Percent Moisture	(%)		8.6			58.7			38.7		
Organic	Carbon, Total Organic	(mg/kg)		5,310			76,100			43,500		
Dioxin	1,2,3,4,6,7,8-HpCDD	(ng/Kg)	0.001	110	0.11	3.24	45	0.045	3.34	38	0.038	3.16
Dioxin	1,2,3,4,7,8-HxCDD	(ng/Kg)	0.5	1.1	0.55	16.19	0.4	0.2	14.85	0.41	0.205	17.05
Dioxin	1,2,3,6,7,8-HxCDD	(ng/Kg)	0.01	5	0.05	1.47	1.7	0.017	1.26	1.6	0.016	1.33
Dioxin	1,2,3,7,8,9-HxCDD	(ng/Kg)	0.01	1.6	0.016	0.47	0.72	0.0072	0.53	0.63	0.0063	0.52
Dioxin	1,2,3,7,8-PeCDD	(ng/Kg)	1	0.32	0.32	9.42	0.11	0.11	8.17	0.092	0.092	7.65
Dioxin	2,3,7,8-TCDD	(ng/Kg)	1	0.091	0.091	2.68	0.2	0.2	14.85	0.12	0.12	9.98
Dioxin	OCDD	(ng/Kg)	0.0001	970	0.097	2.86	510	0.051	3.79	360	0.036	3.00
Furan	1,2,3,4,6,7,8-HpCDF	(ng/Kg)	0.01	41	0.41	12.07	21	0.21	15.59	15	0.15	12.48
Furan	1,2,3,4,7,8,9-HpCDF	(ng/Kg)	0.01	3.7	0.037	1.09	1.6	0.016	1.19	1.2	0.012	1.00
Furan	1,2,3,4,7,8-HxCDF	(ng/Kg)	0.1	3.4	0.34	10.01	1.3	0.13	9.65	1.2	0.12	9.98
Furan	1,2,3,6,7,8-HxCDF	(ng/Kg)	0.1	1.6	0.16	4.71	0.56	0.056	4.16	0.46	0.046	3.83
Furan	1,2,3,7,8,9-HxCDF	(ng/Kg)	0.1	1.4	0.14	4.12	0.36	0.036	2.67	0.44	0.044	3.66
Furan	1,2,3,7,8-PeCDF	(ng/Kg)	0.05	0.61	0.0305	0.90	0.14	0.007	0.52	0.18	0.009	0.75
Furan	2,3,4,6,7,8-HxCDF	(ng/Kg)	0.1	2.2	0.22	6.48	0.78	0.078	5.79	0.6	0.06	4.99
Furan	2,3,4,7,8-PeCDF	(ng/Kg)	0.5	1.6	0.8	23.55	0.31	0.155	11.51	0.45	0.225	18.72
Furan	2,3,7,8-TCDF	(ng/Kg)	0.05	0.25	0.0125	0.37	0.4	0.02	1.49	0.34	0.017	1.41
Furan	OCDF	(ng/Kg)	0.0001	130	0.013	0.38	85	0.0085	0.63	57	0.0057	0.47
	SUM OF TEQ				3.40			1.35			1.20	

Notes

1. TEQ = Total 2,3,7,8-TCDD Equivalence
2. ng/Kg = nanograms per kilogram
3. mg/Kg = miligram per kilogram
4. Concentrations reported as Non Detect by the laboratory were replaced with the method detection limit.

Appendix D - Sediment TEQ Calculations with WHO 1998 TEFs
Military Creek Site Investigation / Remedial Action Options
C.M. Christiansen Co. Inc. Former Pole Yard, Phelps, Wisconsin
WDNR BRRTS Activity #02-64-000068

		Field Sample ID:	Toxic Equivalency Factors WHO 1998 (Fish)	101716001			101716002		
		Station Name:		SED-106					
		Station / Sample Name:		SED-106	ng TEQ/kg	% contribution	SED-106	ng TEQ/kg	% contribution
		Sample Depth (feet):		0-0.5			0.5-1.4		
		Sample Date:		10/17/2016			10/17/2016		
GEO	Percent Moisture	(%)		14.5			5.2		
Organic	Carbon, Total Organic	(mg/kg)		2,360			1,610		
Dioxin	1,2,3,4,6,7,8-HpCDD	(ng/Kg)	0.001	4	0.004	1.06	4.1	0.0041	1.12
Dioxin	1,2,3,4,7,8-HxCDD	(ng/Kg)	0.5	0.16	0.08	21.29	0.16	0.08	21.91
Dioxin	1,2,3,6,7,8-HxCDD	(ng/Kg)	0.01	0.21	0.0021	0.56	0.14	0.0014	0.38
Dioxin	1,2,3,7,8,9-HxCDD	(ng/Kg)	0.01	0.17	0.0017	0.45	0.21	0.0021	0.58
Dioxin	1,2,3,7,8-PeCDD	(ng/Kg)	1	0.057	0.057	15.17	0.052	0.052	14.24
Dioxin	2,3,7,8-TCDD	(ng/Kg)	1	0.095	0.095	25.29	0.1	0.1	27.38
Dioxin	OCDD	(ng/Kg)	0.0001	38	0.0038	1.01	51	0.0051	1.40
Furan	1,2,3,4,6,7,8-HpCDF	(ng/Kg)	0.01	1.4	0.014	3.73	1.3	0.013	3.56
Furan	1,2,3,4,7,8,9-HpCDF	(ng/Kg)	0.01	0.15	0.0015	0.40	0.15	0.0015	0.41
Furan	1,2,3,4,7,8-HxCDF	(ng/Kg)	0.1	0.16	0.016	4.26	0.13	0.013	3.56
Furan	1,2,3,6,7,8-HxCDF	(ng/Kg)	0.1	0.13	0.013	3.46	0.13	0.013	3.56
Furan	1,2,3,7,8,9-HxCDF	(ng/Kg)	0.1	0.16	0.016	4.26	0.072	0.0072	1.97
Furan	1,2,3,7,8-PeCDF	(ng/Kg)	0.05	0.071	0.00355	0.94	0.054	0.0027	0.74
Furan	2,3,4,6,7,8-HxCDF	(ng/Kg)	0.1	0.13	0.013	3.46	0.086	0.0086	2.35
Furan	2,3,4,7,8-PeCDF	(ng/Kg)	0.5	0.093	0.0465	12.38	0.11	0.055	15.06
Furan	2,3,7,8-TCDF	(ng/Kg)	0.05	0.16	0.008	2.13	0.12	0.006	1.64
Furan	OCDF	(ng/Kg)	0.0001	5.5	0.00055	0.15	5.1	0.00051	0.14
	SUM OF TEQ				0.38			0.37	

Notes

1. TEQ = Total 2,3,7,8-TCDD Equivalence
2. ng/Kg = nanograms per kilogram
3. mg/Kg = miligram per kilogram
4. Concentrations reported as Non Detect by the laboratory were replaced with the method detection limit.

Appendix D - Sediment TEQ Calculations with WHO 1998 TEFs
Military Creek Site Investigation / Remedial Action Options
C.M. Christiansen Co. Inc. Former Pole Yard, Phelps, Wisconsin
WDNR BRRTS Activity #02-64-000068

		Field Sample ID:	Toxic Equivalency Factors WHO 1998 (Fish)	101716003			101716004		
		Station Name:		SED-107			SED-107		
		Station / Sample Name:		SED-107	ng TEQ/kg	% contribution	SED-107	ng TEQ/kg	% contribution
		Sample Depth (feet):		0-0.5			0.5-0.7		
		Sample Date:		10/17/2016			10/17/2016		
GEO	Percent Moisture	(%)		17.1			14.8		
Organic	Carbon, Total Organic	(mg/kg)		1,390			1,810		
Dioxin	1,2,3,4,6,7,8-HpCDD	(ng/Kg)	0.001	1.5	0.0015	0.63	6.4	0.0064	0.84
Dioxin	1,2,3,4,7,8-HxCDD	(ng/Kg)	0.5	0.059	0.0295	12.46	0.27	0.135	17.74
Dioxin	1,2,3,6,7,8-HxCDD	(ng/Kg)	0.01	0.077	0.00077	0.33	0.55	0.0055	0.72
Dioxin	1,2,3,7,8,9-HxCDD	(ng/Kg)	0.01	0.06	0.0006	0.25	0.2	0.002	0.26
Dioxin	1,2,3,7,8-PeCDD	(ng/Kg)	1	0.041	0.041	17.32	0.14	0.14	18.40
Dioxin	2,3,7,8-TCDD	(ng/Kg)	1	0.085	0.085	35.90	0.26	0.26	34.16
Dioxin	OCDD	(ng/Kg)	0.0001	11	0.0011	0.46	30	0.003	0.39
Furan	1,2,3,4,6,7,8-HpCDF	(ng/Kg)	0.01	0.7	0.007	2.96	1.4	0.014	1.84
Furan	1,2,3,4,7,8,9-HpCDF	(ng/Kg)	0.01	0.14	0.0014	0.59	0.34	0.0034	0.45
Furan	1,2,3,4,7,8-HxCDF	(ng/Kg)	0.1	0.1	0.01	4.22	0.2	0.02	2.63
Furan	1,2,3,6,7,8-HxCDF	(ng/Kg)	0.1	0.088	0.0088	3.72	0.17	0.017	2.23
Furan	1,2,3,7,8,9-HxCDF	(ng/Kg)	0.1	0.097	0.0097	4.10	0.27	0.027	3.55
Furan	1,2,3,7,8-PeCDF	(ng/Kg)	0.05	0.05	0.0025	1.06	0.14	0.007	0.92
Furan	2,3,4,6,7,8-HxCDF	(ng/Kg)	0.1	0.077	0.0077	3.25	0.19	0.019	2.50
Furan	2,3,4,7,8-PeCDF	(ng/Kg)	0.5	0.04	0.02	8.45	0.17	0.085	11.17
Furan	2,3,7,8-TCDF	(ng/Kg)	0.05	0.2	0.01	4.22	0.33	0.0165	2.17
Furan	OCDF	(ng/Kg)	0.0001	1.7	0.00017	0.07	2.4	0.00024	0.03
	SUM OF TEQ				0.24			0.76	

Notes

1. TEQ = Total 2,3,7,8-TCDD Equivalence
2. ng/Kg = nanograms per kilogram
3. mg/Kg = miligram per kilogram
4. Concentrations reported as Non Detect by the laboratory were replaced with the method detection limit.

Appendix D - Sediment TEQ Calculations with WHO 1998 TEFs
Military Creek Site Investigation / Remedial Action Options
C.M. Christiansen Co. Inc. Former Pole Yard, Phelps, Wisconsin
WDNR BRRTS Activity #02-64-000068

		Field Sample ID:	Toxic Equivalency Factors WHO 1998 (Fish)	101716005			101716006			101716007		
		Station Name:		SED-108								
		Station / Sample Name:		SED-108	ng TEQ/kg	% contribution	SED-108	ng TEQ/kg	% contribution	SED-108 Duplicate	ng TEQ/kg	% contribution
		Sample Depth (feet):		0-0.5			0.5-1.4			0.5-1.4		
		Sample Date:		10/17/2016			10/17/2016			10/17/2016		
GEO	Percent Moisture	(%)		9			13.1			13.6		
Organic	Carbon, Total Organic	(mg/kg)		2,960			6,290			16,500		
Dioxin	1,2,3,4,6,7,8-HpCDD	(ng/Kg)	0.001	880	0.88	11.79	1.3	0.0013	0.30	2.9	0.0029	0.45
Dioxin	1,2,3,4,7,8-HxCDD	(ng/Kg)	0.5	0.48	0.24	3.22	0.12	0.06	13.93	0.11	0.055	8.52
Dioxin	1,2,3,6,7,8-HxCDD	(ng/Kg)	0.01	14	0.14	1.88	0.12	0.0012	0.28	0.16	0.0016	0.25
Dioxin	1,2,3,7,8,9-HxCDD	(ng/Kg)	0.01	1.4	0.014	0.19	0.12	0.0012	0.28	0.11	0.0011	0.17
Dioxin	1,2,3,7,8-PeCDD	(ng/Kg)	1	0.088	0.088	1.18	0.084	0.084	19.50	0.14	0.14	21.69
Dioxin	2,3,7,8-TCDD	(ng/Kg)	1	0.095	0.095	1.27	0.18	0.18	41.78	0.24	0.24	37.18
Dioxin	OCDD	(ng/Kg)	0.0001	12,000	1.2	16.08	12	0.0012	0.28	28	0.0028	0.43
Furan	1,2,3,4,6,7,8-HpCDF	(ng/Kg)	0.01	360	3.6	48.24	0.6	0.006	1.39	1.4	0.014	2.17
Furan	1,2,3,4,7,8,9-HpCDF	(ng/Kg)	0.01	14	0.14	1.88	0.13	0.0013	0.30	0.2	0.002	0.31
Furan	1,2,3,4,7,8-HxCDF	(ng/Kg)	0.1	2.5	0.25	3.35	0.093	0.0093	2.16	0.18	0.018	2.79
Furan	1,2,3,6,7,8-HxCDF	(ng/Kg)	0.1	1.4	0.14	1.88	0.073	0.0073	1.69	0.15	0.015	2.32
Furan	1,2,3,7,8,9-HxCDF	(ng/Kg)	0.1	0.33	0.033	0.44	0.1	0.01	2.32	0.13	0.013	2.01
Furan	1,2,3,7,8-PeCDF	(ng/Kg)	0.05	0.1	0.005	0.07	0.079	0.00395	0.92	0.16	0.008	1.24
Furan	2,3,4,6,7,8-HxCDF	(ng/Kg)	0.1	2.4	0.24	3.22	0.069	0.0069	1.60	0.12	0.012	1.86
Furan	2,3,4,7,8-PeCDF	(ng/Kg)	0.5	0.27	0.135	1.81	0.09	0.045	10.44	0.22	0.11	17.04
Furan	2,3,7,8-TCDF	(ng/Kg)	0.05	0.26	0.013	0.17	0.24	0.012	2.79	0.19	0.0095	1.47
Furan	OCDF	(ng/Kg)	0.0001	2,500	0.25	3.35	1.9	0.00019	0.04	5.8	0.00058	0.09
	SUM OF TEQ				7.46			0.43			0.65	

Notes

1. TEQ = Total 2,3,7,8-TCDD Equivalence
2. ng/Kg = nanograms per kilogram
3. mg/Kg = miligram per kilogram
4. Concentrations reported as Non Detect by the laboratory were replaced with the method detection limit.

Saari, Christopher A - DNR

From: DNRRRNR700Reporting@wisconsin.gov
Sent: Saturday, July 08, 2017 10:34 AM
To: cmc.co.inc@gmail.com
Cc: Saari, Christopher A - DNR
Subject: WDNR NR700 Semi-Annual Report Confirmation

Thank you for submitting your NR700 semi-annual progress report. The DNR Project Manager for this site has been notified of your report submittal. If final case closure has not been granted for this Activity before the next reporting period, you will receive a system-generated email reminder and link to report for the next period.

The contents of your report is included below for your records:

Report ID: 170733009513206
BRRTS No.: 02-64-000068
PECFA No: 54554-9707-00
Activity Name: C M CHRISTIANSEN #1 - POLE DIP
Address: 2276 STH 17, PHELPS
Reporting Period: 1/1/2017 - 6/30/2017

Submitted On: 07/08/2017

Submitter Role: RP Contact

Status: Site Investigation: Report Preparation

Comments:
Additional site investigation activities occurred in Fall 2016. Report and follow-up documentation being prepared for submission to WDNR.

PECFA Eligible? No

Saari, Christopher A - DNR

From: Andrew Millspaugh <amillspaugh@naturalrt.com>
Sent: Monday, October 17, 2016 7:05 AM
To: Saari, Christopher A - DNR
Subject: RE: Military Creek Sampling

Chris,

See below for contact information of our field team leader. I am not sure how well cell service is at the site, but I assume it is not great. An email with the day and approximate time of your visit would help them keep an eye out or try to meet you. Let me know if you need anything else.

Steve Wiskes
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Health and Safety Manager
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234 W. Florida Street, Fifth Floor
Milwaukee, Wisconsin 53204
414.837.3614 direct | 608.770.0547 cell
414.837.3607 phone | 414.837.3608 fax
swiskes@naturalrt.com | www.naturalrt.com

Andrew M. Millspaugh, PE
Environmental Engineer
Natural Resource Technology, Inc.
414.837.3523 Direct | 518.573.4378 Cell

From: Saari, Christopher A - DNR [mailto:Christopher.Saari@wisconsin.gov]
Sent: Friday, October 14, 2016 12:57 PM
To: Andrew Millspaugh
Subject: Military Creek Sampling

Hi Andrew:

I got your message, thanks for the update. At this point, I'm thinking that I'll visit the site on Tuesday and/or Wednesday. If you could provide me with some contact info for your field team that would be great.

Thanks again, have a good weekend.

We are committed to service excellence.
Visit our survey at http://dnr.wi.gov/customersurvey to evaluate how I did.

Chris Saari
Hydrogeologist – Remediation and Redevelopment Program
Wisconsin Department of Natural Resources
Phone: (715) 685-2920
Fax: (715) 685-2909
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