



MCGINTY CREEK WATER QUALITY CHARACTERIZATION

MAY 2009 – DECEMBER 2015

FINAL

July 2016

Prepared for:



MINTO EXPLORATIONS LTD.

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1 INTRODUCTION

Minto Explorations Ltd. (a wholly owned subsidiary of Capstone Mining Corp.) owns and operates the Minto Mine, a high-grade copper mine located approximately 240 km northwest of Whitehorse, Yukon (see Figure 1-1).

Access Consulting Group (ACG) and Minnow Environmental Inc. have worked in conjunction to prepare an initial baseline water quality characterization report for McGinty Creek in 2013, which included water quality data collected between May 2009 and July 2012. The present report, prepared by Alexco Environmental Group Inc. (formerly Access Consulting Group), is an update to the initial baseline characterization report, with the inclusion of additional water quality data collected between July 2012 and December 2015.

Activity within the upper McGinty watershed consisted of surface exploration between 2008 and 2009. Road construction and pit stripping started on August 5th, 2015, when water use license QZ14-031 was issued, allowing mining of the Minto North open pit. Mine water runoff from Minto North mine area is collected and pumped to the Main Pit Tailings Management Facility (MPTMF) within the Minto Creek catchment area, and managed appropriately with the mine water management systems from that point forward. Water quality monitoring in the McGinty Creek catchment is ongoing as required under WUL QZ14-031.

This report summarizes methods used in the evaluation of water quality data (Section 2), identification of elevated parameters (Section 3), characterization of elevated parameter concentrations (Section 4), and a summary of findings (Section 5). Where relevant, data are analyzed for the pre-operations period (May 2009 – July 2015 inclusively) and operations period (August 2015 to December 2015 inclusively).



MINTO MINE



**MINTO MINE
MCGINTY CREEK WATER QUALITY
CHARACTERIZATION**

**FIGURE 1-1
PROJECT LOCATION**

2 METHODS

Section 2 presents the methodological steps followed for water quality data collection, handling and summarization as well as for data interpretation.

2.1 WATER QUALITY DATA COLLECTION, HANDLING AND SUMMARIZATION

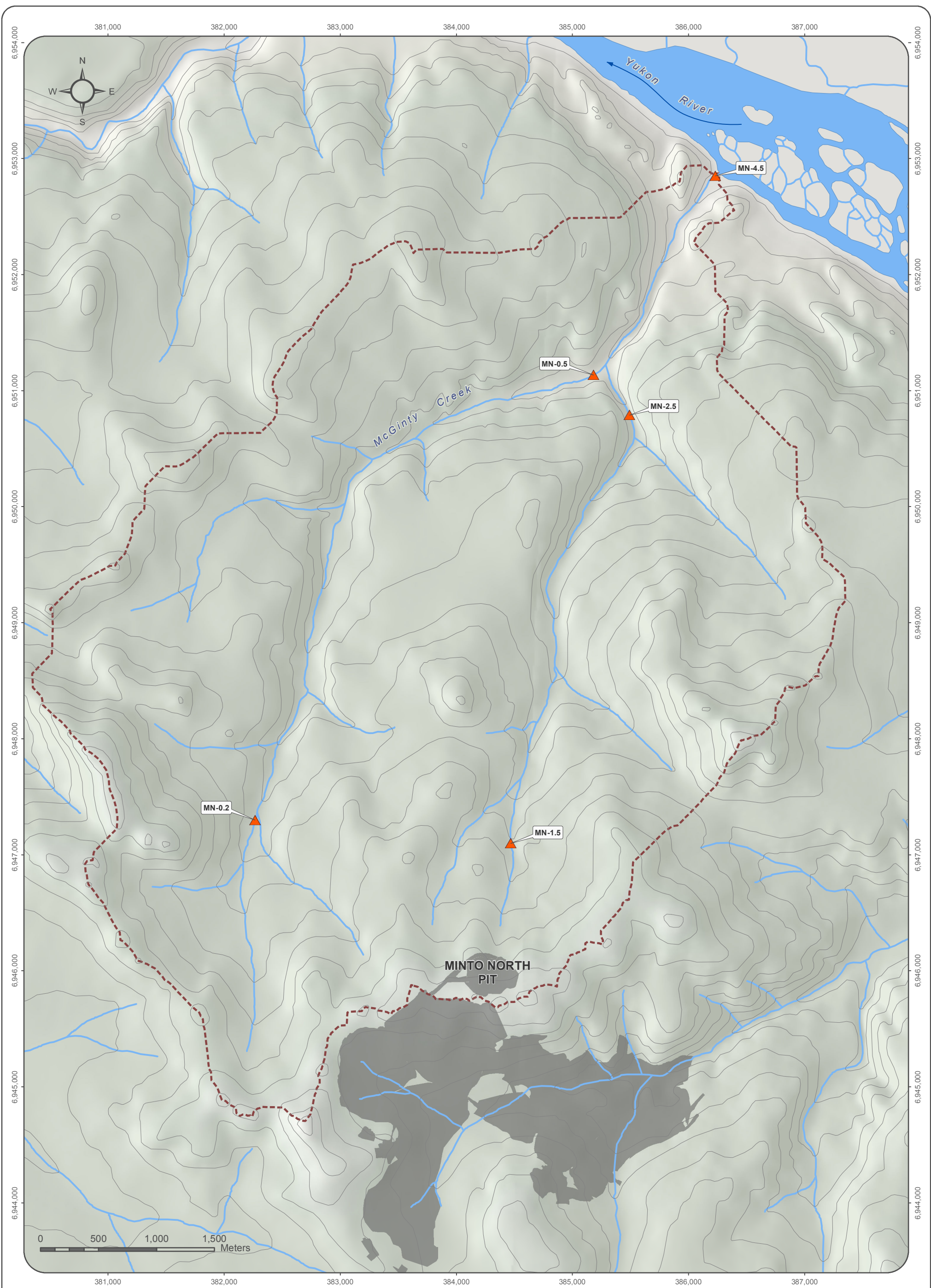
McGinty Creek water quality has been monitored on a monthly basis by ACG from May 2009, until July 2012 and by Minto Mine Environment Department staff since August 2012. In situ data are recorded by field staff in their field notes and entered into a digital database upon return from the field. Results of laboratory analyses are provided in digital format by the lab and are managed in EQWin data management software by Minto Environment Department staff. This report was prepared using an EQWin file passed on to AEG by Minto in early 2016 and considers water quality results from samples collected between May 2009 and December 2015 (complete data tables provided in Appendix A). Water quality data obtained from Minto Mine were assumed to have been subject to appropriate quality assurance and quality control procedures so that they may be used in the characterization of McGinty Creek.

Water quality is monitored at five stations in the McGinty Creek watershed, described in Table 2-1 and shown in Figure 2-1.

Table 2-1: McGinty Creek Monitoring Station Locations

Station	Description / Location
MN-0.2	Upper west arm of McGinty Creek (Reference Station)
MN-0.5	West arm of McGinty Creek just upstream of the confluence with the east arm
MN-1.5	Upper east arm of McGinty Creek downstream of the Minto North deposit
MN-2.5	East arm of McGinty Creek just upstream of confluence with the west arm
MN-4.5	Lower mainstem McGinty Creek near confluence with Yukon River

The east arm of McGinty Creek is considered the ‘exposure tributary’ as it originates downgradient of the Minto North deposit where the Minto North pit is located, while the west arm of McGinty Creek is considered the ‘reference tributary’.



- ▲ Monitoring Station
- Mine Footprint
- McGinty Creek Catchment
- Contour (100 ft interval)



MCGINTY CREEK WATER QUALITY CHARACTERIZATION

FIGURE 5-2

SURFACE WATER SURVEILLANCE PROGRAM

MCGINTY CREEK MONITORING STATION LOCATION



National topographic Data Base (NTDB) compiled by Natural Resources Canada at a scale of 1:50,000. Reproduced under license from Her Majesty the Queen, as represented by the Minister of Natural Resources Canada. All rights reserved.
 Datum: NAD 83, Projection: UTM Zone 8N

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For the most part, monthly sampling occurred during the open water season between April and October. Table 2-2 outlines sample frequency by station and quarter, though does not necessarily reflect the number of times a site was visited if conditions were not conducive to sample collection.

Table 2-2: McGinty Creek Sample Frequency by Station per Quarter

	MN-0.2	MN-0.5	MN-1.5	MN-2.5	MN-4.5	Total Samples per Quarter	% Samples per Quarter
Quarter 1	0	2	1	2	0	5	2%
Quarter 2	15	21	21	21	20	98	41%
Quarter 3	14	19	20	20	19	92	38%
Quarter 4	6	10	9	12	8	45	19%
Total Samples per Station	35	52	51	55	47	240	

Monitoring at the upper reference station MN-0.2 was suspended between June 2009 and April 2011 due to limited accessibility and helicopter landing issues, which explains in part the reduced number of samples collected at this station.

2.1.1 Data QA/QC

Although appropriate data quality assurance and quality control procedures are assumed to be conducted by Minto environmental staff on an ongoing basis, an outlier assessment was conducted on the database provided by Minto to AEG prior to compiling summary statistics.

Every parameter analyzed at each station was assessed to identify outliers in the data, which were defined as concentrations exceeding the average concentration +/- 3 standard deviations. No outliers have been removed from the water quality tables and summary statistics provided in Appendix A. Dates with samples returning dataset outliers include:

- January 25, 2010 – at MN-1.5 winter sampling event with samples collected from nearly standing water or overflow. MN-4.5 was frozen, MN, 0.2 not sampled, MN 0.5 normal;
- May 22, 2010 – many outliers and elevated TOC at MN 4.5. MN-0.2 not sampled, MN-0.5 normal, MN-1.5 & MN-2.5 sampled May 28, both normal;
- August 18, 2010 – recent rain event resulting in high flows and TSS at MN-1.5;
- April 29, 2011 – a few total and dissolved metals outliers at MN-0.2
- July 15, 2011 – conditions noted as turbid with elevated flows, high TSS at all stations monitored, all stations with numerous outliers.
- November 25, 2011 - Many outliers at MN-2.5. TDS is very high, TSS normal. Outliers found for both dissolved and total metals. Sample comment: pooled water, no flow.

- June 14, 2012 – elevated TSS, numerous total metals outliers at MN-4.5
- March 2, 2015 – High TDS at MN-0.5. Duplicate confirms values. Total and dissolved metals outliers.
- June 12, 2015 - Both TDS and TSS are normal, outliers found for both total and dissolved metal at MN-0.2. Nitrate, Hard T, Cond-L, some pair up (D vs T), sample comment: chipped through 25cm ice. Water cloudy at first then cleared. Low DO%
- August 30, 2015 – High TSS and numerous total metals outliers at MN-2.5

2.1.2 Data Analysis

This report focuses mainly on those parameters with Canadian Water Quality Guidelines (CWQG) for the protection of freshwater aquatic life (CCME 1999). This set of guidelines is being used in the analysis of McGinty Creek water quality primarily to guide discussion since documented fisheries use in McGinty Creek is limited to the area of influence of the Yukon River exclusively, as noted in the *Aquatic Resources Baseline Report* (ACG, Minnow 2012). Parameters reviewed include total and dissolved aluminum, arsenic, cadmium, chromium, copper, iron, lead, mercury, molybdenum, nickel, selenium, silver, thallium, zinc, as well as pH, nitrate, nitrite, ammonia, and fluoride. Additional parameter results are presented in the detailed tables in Appendix A. Total suspended solids (TSS) concentrations and the relationship with parameters of interest has also been considered.

The following statistical analysis and calculations were conducted for each parameter (undetected concentrations in water samples were substituted with $\frac{1}{2}$ the reportable detection limit (RDL)):

- Average concentration;
- Count (number of results for a particular parameter);
- Minimum concentration;
- Maximum concentration;
- Geometric mean;
- Number of results below detection limit;
- Standard deviation;
- 1st quartile;
- Median;
- 3rd quartile;
- 95th percentile;
- Number of results above the CWQG; and
- Percent of results above the CWQG.

2.2 INTERPRETATION OF WATER QUALITY DATA

McGinty Creek water quality data were interpreted using five steps:

1. Average water quality was compared to the respective CWQG for freshwater aquatic life (CCME, 1999), which helps to identify parameters with naturally high concentrations (e.g., regularly exceeding guidelines);
2. Concentrations of water quality parameters were examined in individual samples and the percentage of samples exceeding the guideline determined;
3. Concentrations were plotted over time and examined for trends;
4. Boxplots depict summary statistics for parameters of interest; and
5. Average and 95th percentile concentrations at McGinty Creek stations during the pre-operations period are compiled to delineate background levels of key parameters.

3 IDENTIFICATION OF ELEVATED PARAMETERS

Average, mean and individual concentrations of parameters with CWQGs were examined for all sample stations, per operational period (Table 3-1 through Table 3-10), to identify parameters with naturally elevated concentration and focus the discussion on those. Where the CWQG is hardness dependent, the average concentration at a site is compared to the guideline value calculated from the average hardness at that site. When looking at guideline exceedance frequency, individual results are compared to the guideline values calculated from the hardness value measured at that same site on that same date. For ammonia, a conservative guideline of 0.343 mg/L NH₃ (equivalent to 0.282 mg/L NH₃-N) was used. Because the CWQG is for unionized ammonia (0.019 mg/L) and the fraction of total ammonia that is unionized is temperature and pH dependant, using a guideline value of 0.343 mg/L ensures that the guideline is protective at pH values less than or equal to 8.5 and water temperatures less than or equal to 10°C. A review of all data collected since 2009 shows that water temperature never exceeded 10°C during sampling events and that pH exceeded a value of 8.5 only 2.8% of the time.

During the pre-operations phase at reference station MN-0.2 on the west arm of McGinty Creek, (n = 30, see Table 3) average total aluminum, copper and iron were found to exceed the guideline or calculated average CWQGs. Except in the case of copper, the geometric mean (measurement of central tendency) for these parameters is significantly lower than the average; however, the geometric means still exceed the respective guideline. Copper exceeded the CWQG in 91% of samples, followed by iron at 72%, aluminum at 41%. Additionally, individual sample exceedances were observed for fluoride (7% of samples), aluminum (37%), cadmium (13%), chromium (7%), copper (90%), iron (70%) and lead (3%). Out of the 18 field measurements of pH, two fall outside of the guideline. The dataset for the operations period only comprises two samples (Table 4), but exceedances are generally observed for the same parameters as during the pre-operations period (total aluminum, chromium, copper and iron). One total arsenic exceedance was also observed during the operation phase.

Downstream of MN-0.2 on the west arm of McGinty Creek at MN-0.5 (see Figure 2 and Table 5), average total aluminum, chromium, copper, iron and fluoride exceed the CWQG (or calculated average guideline based on average pH and hardness) during the pre-operations period; however, the geometric mean for chromium does not exceed the associated CWQG. Of the 48 samples collected at MN-0.5, fluoride exceeded the CWQG 92% of the time, followed by copper at 69%, aluminum at 60%, iron at 54%, chromium at 29% and cadmium at 10%. Additionally, lead and zinc exceeded the CWQG four times (8% of the time), while pH exceeded the guideline twice (6% of the time). The ammonia and arsenic guidelines were exceeded once. During the operations period (n=4, Table 6), guideline exceedances were observed for fluoride, total aluminum, chromium, copper and iron.

Average concentrations at station MN-1.5 (n = 48, see Table 7), located on the upper east exposure tributary of McGinty Creek and downgradient of the Minto North deposit, exceeded the guidelines for average total aluminum, cadmium, chromium, copper, iron and lead during the pre-operations period. Geometric means are significantly lower than the average, though all but cadmium and lead still exceed the guidelines. Copper exceeded the CWQG in 100% of samples followed by aluminum at 94%, iron at 83%, chromium at 46%, cadmium at 25% and lead at 23%. Field pH did not meet the guideline 17% of the time and zinc exceeded the CWQG 13% of the time. Lab measured pH, fluoride, ammonia, total arsenic, nickel and silver exceed the CWQG less than 10% of the time. During the operations period (n=3, Table 8), guideline exceedances were observed for total aluminum, chromium, copper, iron and lead.

During the pre-operations period, station MN-2.5 (n = 48, Table 9) located downstream of MN-1.5 on the exposure tributary has average concentrations of total aluminum, chromium, copper, iron and fluoride exceeding the respective CWQG. With the exception of cadmium, these are the same parameters whose average concentrations at MN-0.5 located downstream on the reference tributary also exceed the guidelines. Geometric means for total aluminum and chromium do not exceed the CWQG at MN-1.5. Fluoride exceeds the CWQG in 84% of samples, followed by iron at 58%, copper at 56%, aluminum at 38% and chromium at 14%. Additionally, cadmium exceeded the guideline for long term exposure 4 times (8%), field pH did not meet the guideline three times (9%), lead exceeded the guideline twice (4%) and zinc and ammonia had one exceedance each (~2%). During the operations period (n=5, Table 10), guideline exceedences were observed for total aluminum, chromium, copper and iron as well as fluoride.

In lower McGinty Creek near the confluence with the Yukon River, station MN-4.5 (n = 44, Table 11) the same parameters as MN-0.5 and MN-2.5 have average concentrations exceeding the CWQG during the pre-operations period: total aluminum, chromium, copper, iron and fluoride. However, the geometric mean for chromium does not exceed its guideline. Fluoride exceeds the CWQG in 91% of samples, followed by copper at 68%, aluminum at 55%, iron at 52%, and chromium at 18%. Total zinc exceeded the guideline on three occasions (7%), cadmium and lead exceeded twice (5%), while arsenic exceeded once (2%). During the operations period (n=3, Table 12), guideline exceedences were observed for the same parameter as at station MN-2.5 (total aluminum, chromium, copper and iron as well as fluoride).

Of note is the fact that CCME issued revised guidelines for cadmium (for short and long term exposure) in 2014, resulting in a significant reduction in the number and magnitude of guideline exceedences in McGinty Creek, when compared to results presented in the initial baseline water quality characterization report prepared in 2013, where comparisons were made with the more stringent CCME interim guideline.

Table 3-1: McGinty Creek Monitoring Station MN-0.2 Summary of Water Quality Data May 2009 – July 2015 (Pre-operations)

	Hard-T	Hard-D	pH-F	pH-L	TSS	Fluoride	N-NH3	N-NO2	N-NO3	Al-T	Al-D	As-T	As-D	Cd-T	Cd-D	Cr-T	Cr-D	Cu-T	Cu-D	Fe-T	Fe-D	Pb-T	Pb-D	Hg-T	Hg-D	Mo-T	Mo-D	Ni-T	Ni-D	Se-T	Se-D	Ag-T	Ag-D	Tl-T	Tl-D	Zn-T	Zn-D	
	mg/L	mg/L	pH units	pH units	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	
CCME-PAL			6.5-9	6.5-9		0.12	0.282	0.06	3	100*		5		0.06*		1		2*		300		1*		0.026		73		25*		1		0.25		0.8		30		
Average	29.9	28.6	6.99	7.31	24.3	0.104	0.0235	0.0056	0.026	337.5	64.6	0.713	0.447	0.0228	0.0137	0.89	0.45	3.72	2.76	995	309	0.2196	0.0749	0.00493	0.006	0.338	0.349	2.15	1.67	0.066	0.054	0.0094	0.0071	0.0159	0.013	3.49	2.81	
Count	30	30	18	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
Minimum	19.8	19.6	6.23	6.55	0.5	0.057	0.0025	0.001	0.001	40	33.7	0.26	0.25	0.0025	0.0025	0.2	0.2	1.73	1.78	102	84	0.011	0.009	5E-06	0.005	0.025	0.025	1.06	1.04	0.04	0.02	0.0025	0.0025	0.001	0.001	0.5	0.1	
Maximum	42.6	43	7.8	7.69	300	0.13	0.07	0.025	0.23	6460	199	2.86	0.78	0.118	0.053	12.3	0.9	16.5	5.27	9220	858	2.82	0.271	0.01	0.02	0.5	0.664	10.3	2.72	0.2	0.09	0.048	0.011	0.061	0.025	19	13.1	
Geometric Mean	29.2	28	6.98	7.3	3.9	0.102	0.0167	0.0034	0.0129	107.2	56.7	0.57	0.426	0.0116	0.0091	0.51	0.43	3.25	2.66	541	255	0.0918	0.0535	0.00393	0.005	0.268	0.27	1.9	1.63	0.061	0.052	0.0069	0.006	0.007	0.005	2.57	2	
Count <DL	0	0	0	0	6	0	4	29	29	0	0	0	0	15	16	15	15	0	0	0	0	15	15	26	24	16	16	0	0	13	16	23	25	29	30	15	15	
Standard Deviation	6.3	6.3	0.41	0.28	61.7	0.02	0.0173	0.0078	0.0474	1170.6	39.9	0.587	0.143	0.03	0.0131	2.18	0.13	2.75	0.83	1698	205	0.5226	0.0561	0.00141	0.003	0.179	0.195	1.66	0.37	0.032	0.012	0.009	0.0035	0.0143	0.0122	3.58	2.66	
1st Quartile	25.4	23.9	6.75	7.23	1.1	0.097	0.0112	0.0025	0.01	65.6	39.5	0.383	0.335	0.005	0.005	0.4	0.37	2.6	2.29	286	180	0.0488	0.0243	0.005	0.005	0.175	0.145	1.6	1.4	0.05	0.05	0.0025	0.0025	0.001	0.001	2.5	1.58	
Median	28.7	27.6	7	7.39	2.4	0.11	0.021	0.0025	0.01	89.8	47.9	0.534	0.435	0.0075	0.005	0.5	0.5	3.01	2.53	420	242	0.1	0.1	0.005	0.005	0.445	0.5	1.73	1.67	0.05	0.05	0.01	0.01	0.025	0.013	2.5	2.5	
3rd Quartile	34.5	33.2	7.23	7.52	10.1	0.12	0.0328	0.0025	0.01	125	71.5	0.804	0.502	0.025	0.018	0.5	0.5	3.46	2.9	983	370	0.1	0.1	0.005	0.005	0.5	0.5	2.02	1.83	0.07	0.057	0.01	0.01	0.025	0.025	2.71	2.5	
Count Over Standard	0	0	2	0	0	2	0	0	0	11	0	0	0	4	0	2	0	27	0	21	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
% Over Standard	0	0	11.1	0	0	6.7	0	0	0	36.7	0	0	0	13.3	0	6.7	0	90	0	70	0	3.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0		

Table 3-2: McGinty Creek Monitoring Station MN-0.2 Summary of Water Quality August 2015 – December 2015 (Operations)

	Hard-T	Hard-D	pH-F	pH-L	TSS	Fluoride	N-NH3	N-NO2	N-NO3	Al-T	Al-D	As-T	As-D	Cd-T	Cd-D	Cr-T	Cr-D	Cu-T	Cu-D	Fe-T	Fe-D	Pb-T	Pb-D	Hg-T	Hg-D	Mo-T	Mo-D	Ni-T	Ni-D	Se-T	Se-D	Ag-T	Ag-D	Tl-T	Tl-D	Zn-T	Zn-D	
	mg/L	mg/L	pH units	pH units	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	
CCME-PAL			6.5-9	6.5-9		0.12	0.282	0.06	3	100*		5		0.09*		1		2*		300		1*		0.026		73		25*		1		0.25		0.8		30		
Average	53	44	8	7.5	30.6	0.101	0.07	0.0138	0.055	462	117.8	3.96	2.15	0.022	0.005	1.8	0.8	3.58	1.85	8800	5408	0.28	0.1	0.005	0.005	0.5	0.5	2.2	1.5	0.1	0.08	0.01	0.01	0.025	0.025	2.5	2.5	
Count	2	2	4	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Minimum	42.8	38	7.57	7.32	1.2	0.092	0.03	0.0025	0.01	106	98.5	0.5	0.42	0.005	0.005	0.5	0.5	2.52	1.68	800	515	0.1	0.1	0.005	0.005	0.5	0.5	1.2	1.2	0.05	0.05	0.01	0.01	0.025	0.025	2.5	2.5	
Maximum	63.3	49.9	8.57	7.67	60	0.11	0.11	0.025	0.1	817	137	7.42	3.88	0.04	0.005	3.1	1.1	4.63	2.02	16800	10300	0.45	0.1	0.005	0.005	0.5	0.5	3.3	1.9	0.15	0.1	0.01	0.01	0.025	0.025	2.5	2.5	
Geometric Mean	52.1	43.5	8	7.49	8.5	0.101	0.06	0.0079	0.032	294	116.2	1.93	1.28	0.014	0.005	1.2	0.7	3.42	1.84	3666	2303	0.21	0.1	0.005	0.005	0.5	0.5	2	1.5	0.09	0.07	0.01	0.01	0.025	0.025	2.5	2.5	
Count <DL	0	0	0	0	0	0	2	2	0	0	0	0	0	1	2	1	1	0	0	0	0	1	2	2	2	2	2	0	0	1	1	2	2	2	2	2	2	
Standard Deviation	14.5	8.4	0.43	0.25	41.6	0.013	0.06	0.0159	0.064	503	27.2	4.89	2.45	0.025	0	1.8	0.4	1.49	0.24	11314	6919	0.25	0	0	0	0	0	1.5	0.5	0.07	0.04	0	0	0	0	0	0	
1st Quartile	47.9	41	7.75	7.41	15.9	0.097	0.05	0.0081	0.033	284	108.1	2.23	1.28	0.014	0.005	1.1	0.7	3.05	1.76	4800	2961	0.19	0.1	0.005	0.005	0.5	0.5	1.7	1.4	0.07	0.06	0.01	0.01	0.025	0.025	2.5	2.5	
Median	53	44	7.94	7.5	30.6	0.101	0.07	0.0138	0.055	462	117.8	3.96	2.15	0.022	0.005	1.8	0.8	3.58	1.85	8800	5408	0.28	0.1	0.005	0.005	0.5	0.5	2.2	1.5	0.1	0.08	0.01	0.01	0.025	0.025	2.5	2.5	
3rd Quartile	58.2	46.9	8.2	7.58	45.3	0.105	0.09	0.0194	0.077	639	127.4	5.69	3.02	0.031	0.005	2.5	1	4.1	1.94	12800	7854	0.36	0.1	0.005	0.005	0.5	0.5	2.8	1.7	0.12	0.09	0.01	0.01	0.025	0.025	2.5	2.5	
Count Over Standard	0	0	0	0	0	0	0	0	0	2	0	1	0	0	0	1	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
% Over Standard	0	0	0	0	0	0	0	0	0	100	0	50	0	0	0	50	0	100	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		

Notes: Duplicates are omitted

Where result is less than laboratory detection limits, a value of half the reported detection limit (RDL) is used to calculate statistics

Water quality results are compared to CCME – Protection of Aquatic Life (PAL) Guidelines, exceedences are shown in red

Where CCME guideline is hardness or pH dependent (*), the guideline value shown in the table was calculated with the average hardness or pH value for this station. Average, minimum, maximum and geometric mean are compared to the guideline value shown in table. Individual exceedences (count over standard) is obtained by comparing individual results to guideline value for that particular date. Equation are as follows:

Aluminum: 5 µg/L if pH < 6.5 and 100 µg/L if pH ≥ 6.5

Cadmium (long-term exposure): 0.04 µg/L if hardness (as CaCO₃) < 17 mg/L; $10^{[0.83(\log[\text{hardness}]) - 2.46]}$ if hardness ≥ 17 mg/L and ≤ 280 mg/L; 0.37 µg/L if hardness > 280 mg/L

Copper: 2 µg/L if hardness (as CaCO₃) ≤ 82 mg/L or unknown; $0.2 * e^{[0.8545(\ln[\text{hardness}]) - 1.465]}$ if hardness ≥ 82 mg/L and ≤ 180 mg/L; 4 µg/L if hardness > 180 mg/L

Lead: 1 µg/L if hardness (as CaCO₃) ≤ 60 mg/L or unknown; $e^{[1.273(\ln[\text{hardness}]) - 4.705]}$ if hardness > 60 mg/L and ≤ 180 mg/L; 7 µg/L if hardness > 180 mg/L

Nickel: 25 µg/L if hardness (as CaCO₃) ≤ 60 mg/L or unknown; $e^{[0.76(\ln[\text{hardness}]) + 1.06]}$ if hardness > 60 mg/L and ≤ 180 mg/L; 150 µg/L if hardness > 180 mg/L

Ammonia guideline is given for N-NH₃ and is based on pH and temperatures not typically rising above 8.5 and 10°C respectively

Table 3-3: McGinty Creek Monitoring Station MN-0.5 Summary of Water Quality Data May 2009 – July 2015 (Pre-operations)

	Hard-T	Hard-D	pH-F	pH-L	TSS	Fluoride	N-NH3	N-NO2	N-NO3	Al-T	Al-D	As-T	As-D	Cd-T	Cd-D	Cr-T	Cr-D	Cu-T	Cu-D	Fe-T	Fe-D	Pb-T	Pb-D	Hg-T	Hg-D	Mo-T	Mo-D	Ni-T	Ni-D	Se-T	Se-D	Ag-T	Ag-D	Tl-T	Tl-D	Zn-T	Zn-D	
	mg/L	mg/L	pH units	pH units	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	
CCME-PAL			6.5-9	6.5-9		0.12	0.282	0.06	3	100*		5		0.14*		1		2.12*		300		2.70*		0.026		73		86.6*		1		0.25		0.8		30		
Average	87.8	82.4	7.58	7.81	81.8	0.3	0.0355	0.0052	0.0874	991.5	39.2	0.985	0.449	0.0418	0.0132	1.93	0.38	5.13	1.93	1702	186.5	0.7134	0.0679	0.00563	0.007	0.798	0.773	3.43	1.11	0.205	0.186	0.013	0.0056	0.0152	0.0095	7.33	2.23	
Count	48	48	35	48	48	47	48	47	47	48	48	48	48	48	48	48	48	48	48	48	48	48	48	43	37	48	48	48	48	48	48	48	48	48	48	48	48	48
Minimum	25.8	26.3	5.36	7.1	0.5	0.06	0.0025	0.002	0.01	3.9	1.5	0.27	0.26	0.0025	0.0025	0.05	0.05	0.49	0.71	8	6.2	0.0025	0.006	5E-06	0.005	0.16	0.11	0.24	0.48	0.07	0.05	0.0025	0.0025	0.001	0.001	0.05	0.16	
Maximum	198	184	8.67	8.25	732	0.89	0.33	0.025	1.69	16100	191	7.84	0.713	0.3	0.076	26.9	0.6	31.7	3.95	22700	716	6.73	0.198	0.026	0.02	1.7	1.43	26.1	2	0.66	0.63	0.082	0.01	0.132	0.025	49.7	7.1	
Geometric Mean	81	75.9	7.54	7.81	14.9	0.27	0.0162	0.0035	0.0377	193.2	23.1	0.658	0.434	0.0194	0.0084	0.67	0.33	3.2	1.77	438	116.7	0.1859	0.0506	0.00447	0.006	0.686	0.671	1.89	1	0.186	0.172	0.0072	0.0045	0.0051	0.0032	3.28	1.73	
Count <DL	0	0	0	0	6	0	12	42	21	0	1	0	0	8	24	11	20	0	0	0	0	7	17	39	30	7	9	1	9	0	0	33	43	38	47	11	17	
Standard Deviation	33.9	32.5	0.69	0.3	173.3	0.14	0.059	0.0067	0.2422	2548.6	46	1.32	0.12	0.0674	0.0151	4.32	0.16	6.63	0.81	3761	159.5	1.4511	0.0447	0.00359	0.004	0.397	0.367	5.19	0.49	0.104	0.088	0.0182	0.0035	0.0218	0.0116	11.17	1.51	
1st Quartile	64.7	58.1	7.28	7.76	4	0.21	0.0083	0.0025	0.01	64.5	12.1	0.388	0.37	0.0097	0.005	0.38	0.29	1.8	1.36	166	56.1	0.0777	0.028	0.005	0.005	0.5	0.5	1.1	0.62	0.158	0.14	0.0025	0.0025	0.001	0.001	2.15	1.23	
Median	89	85.1	7.77	7.9	20.5	0.29	0.0195	0.0025	0.057	180	22.1	0.52	0.41	0.019	0.005	0.5	0.41	2.91	1.79	357	145	0.143	0.077	0.005	0.005	0.745	0.785	1.6	1.1	0.2	0.18	0.0085	0.0025	0.003	0.001	2.5	2.5	
3rd Quartile	105.5	98.1	7.93	8	50.2	0.34	0.0372	0.0025	0.0865	601.5	45.6	0.815	0.514	0.0307	0.0173	1.27	0.5	4.4	2.56	1225	266.5	0.4525	0.1	0.005	0.005	1.1	1.04	2.67	1.43	0.22	0.21	0.01	0.01	0.025	0.025	6.35	2.5	
Count Over Standard	0	0	2	0	0	43	1	0	0	29	0	1	0	5	0	14	0	33	0	26	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	
% Over Standard	0	0	5.7	0	0	91.5	2.1	0	0	60.4	0	2.1	0	10.4	0	29.2	0	68.8	0	54.2	0	8.3	0	0	0	0	0	0	0	0	0	0	0	0	0	8.3	0	

Table 3-4: McGinty Creek Monitoring Station MN-0.5 Summary of Water Quality Data August 2015 – December 2015 (Operations)

	Hard-T	Hard-D	pH-F	pH-L	TSS	Fluoride	N-NH3	N-NO2	N-NO3	Al-T	Al-D	As-T	As-D	Cd-T	Cd-D	Cr-T	Cr-D	Cu-T	Cu-D	Fe-T	Fe-D	Pb-T	Pb-D	Hg-T	Hg-D	Mo-T	Mo-D	Ni-T	Ni-D	Se-T	Se-D	Ag-T	Ag-D	Tl-T	Tl-D	Zn-T	Zn-D	
	mg/L	mg/L	pH units	pH units	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	
CCME-PAL			6.5-9	6.5-9		0.12	0.282	0.06	3	100*		5		0.15*		1		2.22*		300		2.90*		0.026		73		90.5*		1		0.25		0.8		30		
Average	93	87.6	8.04	7.88	34.4	0.27	0.024	0.0025	0.051	320.6	28.9	0.62	0.44	0.014	0.006	1	0.5	3.02	2.84	799	148	0.26	0.1	0.005	0.005	0.5	0.8	2	0.9	0.18	0.12	0.01	0.01	0.025	0.025	2.5	2.5	
Count	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Minimum	75.5	57.7	7.75	7.73	4.1	0.18	0.011	0.0025	0.021	24.9	10.1	0.4	0.37	0.005	0.005	0.5	0.5	1.22	1.39	130	104	0.1	0.1	0.005	0.005	0.5	0.5	0.5	0.5	0.05	0.05	0.01	0.01	0.025	0.025	2.5	2.5	
Maximum	110	112	8.5	8.06	106	0.33	0.043	0.0025	0.082	1070	65.2	1.17	0.61	0.043	0.01	2.5	0.5	6.25	4.41	2410	254	0.73	0.1	0.005	0.005	0.5	1.1	3.7	1.7	0.26	0.21	0.01	0.01	0.025	0.025	2.5	2.5	
Geometric Mean	92.2	85.2	8.03	7.88	16.9	0.26	0.021	0.0025	0.046	105.6	22.7	0.55	0.43	0.009	0.006	0.7	0.5	2.51	2.48	392	137	0.16	0.1	0.005	0.005	0.5	0.7	1.5	0.8	0.15	0.09	0.01	0.01	0.025	0.025	2.5	2.5	
Count <DL	0	0	0	0	0	0	0	4	0	0	0	0	0	3	3	3	4	0	0	0	0	3	4	4	4	4	2	1	2	1	2	4	4	4	4	4	4	
Standard Deviation	14.1	22.7	0.35	0.16	48	0.08	0.014	0	0.025	503.4	24.7	0.37	0.11	0.019	0.003	1	0	2.23	1.6	1088	72	0.32	0	0	0	0.3	1.5	0.6	0.09	0.08	0	0	0	0	0	0		
1st Quartile	88.3	78.8	7.78	7.75	10.8	0.21	0.015	0.0025	0.041	28.4	17.1	0.44	0.38	0.005	0.005	0.5	0.5	1.8	1.5	144	104	0.1	0.1	0.005	0.005	0.5	0.5	0.9	0.5	0.17	0.05	0.01	0.01	0.025	0.025	2.5	2.5	
Median	93.2	90.3	7.95	7.86	13.8	0.28	0.021	0.0025	0.051	93.8	20.1	0.45	0.39	0.005	0.005	0.5	0.5	2.3	2.79	328	116	0.1	0.1	0.005	0.005	0.5	0.8	1.8	0.8	0.21	0.1	0.01	0.01	0.025	0.025	2.5	2.5	
3rd Quartile	97.9	99.2	8.21	7.99	37.4	0.33	0.029	0.0025	0.06	386	32	0.63	0.45	0.014	0.006	1	0.5	3.52	4.12	984	160	0.26	0.1	0.005	0.005	0.5	1	2.9	1.2	0.22	0.16	0.01	0.01	0.025	0.025	2.5	2.5	
Count Over Standard	0	0	0	0	0	4	0	0	0	2	0	0	0	0	0	1	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
% Over Standard	0	0	0	0	0	100	0	0	0	50	0	0	0	0	0	25	0	50	0	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Notes: Duplicates are omitted

Where result is less than laboratory detection limits, a value of half the reported detection limit (RDL) is used to calculate statistics

Water quality results are compared to CCME – Protection of Aquatic Life (PAL) Guidelines, exceedences are shown in red

Where CCME guideline is hardness or pH dependent (*), the guideline value shown in the table was calculated with the average hardness or pH value for this station. Average, minimum, maximum and geometric mean are compared to the guideline value shown in table. Individual exceedences (count over standard) is obtained by comparing individual results to guideline value for that particular date. Equation are as follows:

Aluminum: 5 µg/L if pH < 6.5 and 100 µg/L if pH ≥ 6.5

Cadmium (long-term exposure): 0.04 µg/L if hardness (as CaCO₃) < 17 mg/L; 1^{0.83[log(hardness)] - 2.46} if hardness ≥ 17 mg/L and ≤ 280 mg/L; 0.37 µg/L if hardness > 280 mg/L

Copper: 2 µg/L if hardness (as CaCO₃) ≤ 82 mg/L or unknown; 0.2 * e^{[0.8545[ln(hardness)] - 1.465]} if hardness ≥ 82 mg/L and ≤ 180 mg/L; 4 µg/L if hardness > 180 mg/L

Lead: 1 µg/L if hardness (as CaCO₃) ≤ 60 mg/L or unknown; e^{[1.273[ln(hardness)] - 4.705]} if hardness > 60 mg/L and ≤ 180 mg/L; 7 µg/L if hardness > 180 mg/L

Nickel: 25 µg/L if hardness (as CaCO₃) ≤ 60 mg/L or unknown; e^{[0.76[ln(hardness)] + 1.06]} if hardness > 60 mg/L and ≤ 180 mg/L; 150 µg/L if hardness > 180 mg/L

Ammonia guideline is given for N-NH₃ and is based on pH and temperatures not typically rising above 8.5 and 10°C respectively

Table 3-5: McGinty Creek Monitoring Station MN-1.5 Summary of Water Quality Data May 2009 – July 2015 (Pre-operations)

	Hard-T	Hard-D	pH-F	pH-L	TSS	Fluoride	N-NH3	N-NO2	N-NO3	Al-T	Al-D	As-T	As-D	Cd-T	Cd-D	Cr-T	Cr-D	Cu-T	Cu-D	Fe-T	Fe-D	Pb-T	Pb-D	Hg-T	Hg-D	Mo-T	Mo-D	Ni-T	Ni-D	Se-T	Se-D	Ag-T	Ag-D	Tl-T	Tl-D	Zn-T	Zn-D	
	mg/L	mg/L	pH units	pH units	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	
CCME-PAL			6.5-9	6.5-9		0.12	0.282	0.06	3	100*		5		0.08*		1		2*		300		1*		0.026		73		25*		1		0.25		0.8		30		
Average	49.5	38.2	6.98	7.31	333.8	0.106	0.0644	0.0058	0.041	2966.6	111.4	1.581	0.474	0.0926	0.02	4.65	0.5	27.24	6.17	5964	590	1.5966	0.0779	0.00707	0.006	0.407	0.393	5.37	1.27	0.116	0.07	0.0273	0.0066	0.0213	0.0091	17.11	3.17	
Count	48	48	35	48	48	47	48	47	47	48	48	48	48	48	48	48	48	48	48	48	48	48	48	43	36	48	48	48	48	48	48	48	48	48	48	48	48	48
Minimum	12	12.5	4.41	6	0.5	0.05	0.0025	0.0025	0.01	35.2	34.2	0.19	0.15	0.0025	0.0025	0.2	0.2	3.05	3.02	168	126	0.01	0.008	5E-06	0.005	0.08	0.08	0.75	0.78	0.02	0.02	0.0025	0.0025	0.001	0.001	0.5	0.3	
Maximum	223	206	8.3	8.1	8200	0.19	0.66	0.027	0.2	41400	220	16.4	1.06	1.07	0.106	68	0.9	316	8.66	67400	1620	20.3	0.527	0.03	0.02	2.2	0.924	63.7	2.33	0.9	0.15	0.34	0.018	0.27	0.025	225	12	
Geometric Mean	41.4	33.5	6.92	7.3	31.7	0.104	0.026	0.0037	0.026	539.7	103.5	0.798	0.43	0.031	0.0122	1.3	0.48	12.03	6.01	1506	471	0.2645	0.0515	0.00502	0.006	0.327	0.345	2.38	1.24	0.089	0.066	0.0112	0.0053	0.00692	0.0031	5.55	2.4	
Count <DL	0	0	0	0	1	0	11	42	25	0	0	0	0	6	18	4	16	0	0	0	0	8	16	38	33	17	16	0	0	9	15	24	36	32	45	12	16	
Standard Deviation	39.2	27.6	0.87	0.43	1200.1	0.022	0.1073	0.0074	0.044	7678.2	42	2.759	0.207	0.1931	0.0215	11.37	0.14	57.7	1.34	13561	387	3.9347	0.0864	0.00625	0.004	0.327	0.18	11.4	0.29	0.129	0.025	0.0571	0.0042	0.04054	0.0114	40.37	2.64	
1st Quartile	32.2	26.2	6.76	7.18	7.5	0.1	0.0075	0.0025	0.01	161	86.3	0.367	0.302	0.012	0.005	0.5	0.4	6.99	5.42	396	286	0.0798	0.0238	0.005	0.005	0.215	0.265	1.24	1.1	0.05	0.05	0.006	0.0025	0.001	0.001	2.5	1.5	
Median	40.5	35.5	7.15	7.43	39.5	0.11	0.0405	0.0025	0.031	287.5	107	0.665	0.435	0.032	0.011	0.95	0.5	8.21	6.41	1390	454	0.21	0.0811	0.005	0.005	0.352	0.43	1.7	1.2	0.08	0.07	0.01	0.006	0.0145	0.001	4.99	2.5	
3rd Quartile	49.2	43	7.46	7.6	172.8	0.115	0.0625	0.0025	0.049	1655	129.8	1.185	0.64	0.062	0.0243	3.15	0.6	15.53	7.08	3255	910	0.7925	0.1	0.005	0.005	0.5	0.5	3.15	1.42	0.14	0.08	0.0185	0.01	0.025	0.025	10.88	3.08	
Count Over Standard	0	0	6	3	0	4	2	0	0	45	0	4	0	12	0	22	0	48	0	40	0	11	0	3	0	0	0	2	0	0	0	1	0	0	0	6	0	
% Over Standard	0	0	17.1	6.2	0	8.5	4.2	0	0	93.8	0	8.3	0	25	0	45.8	0	100	0	83.3	0	22.9	0	7	0	0	0	4.2	0	0	0	2.1	0	0	0	12.5	0	

Table 3-6: McGinty Creek Monitoring Station MN-1.5 Summary of Water Quality Data August 2015 – December 2015 (Operations)

	Hard-T	Hard-D	pH-F	pH-L	TSS	Fluoride	N-NH3	N-NO2	N-NO3	Al-T	Al-D	As-T	As-D	Cd-T	Cd-D	Cr-T	Cr-D	Cu-T	Cu-D	Fe-T	Fe-D	Pb-T	Pb-D	Hg-T	Hg-D	Mo-T	Mo-D	Ni-T	Ni-D	Se-T	Se-D	Ag-T	Ag-D	Tl-T	Tl-D	Zn-T	Zn-D	
	mg/L	mg/L	pH units	pH units	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
CCME-PAL			6.5-9	6.5-9		0.12	0.282	0.06	3	100*		5		0.08*		1		2*		300		1*		0.026		73		25*		1		0.25		0.8		30		
Average	43.4	34.2	7.63	7.55	64.5	0.106	0.063	0.0183	0.045	2441	140.5	1.66	0.71	0.019	0.007	2.7	0.5	30.77	6.72	4750	836	0.79	0.1	0.005	0.005	0.5	0.5	2.4	1.1	0.14	0.05	0.014	0.01	0.025	0.025	9	2.5	
Count	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Minimum	41.6	24.7	7.32	7.19	9.6	0.098	0.051	0.0025	0.01	153	83.5	0.6	0.37	0.005	0.005	0.5	0.5	5.55	4.68	1220	560	0.1	0.1	0.005	0.005	0.5	0.5	0.5	0.5	0.05	0.05	0.01	0.01	0.025	0.025	2.5	2.5	
Maximum	44.7	41.8	7.96	7.78	157	0.11	0.081	0.05	0.1	6940	236	3.66	1.13	0.047	0.011	7.2	0.5	79.5	9.38	11700	1180	2.16	0.1	0.005	0.005	0.5	0.5	5.3	1.4	0.33	0.05	0.022	0.01	0.025	0.025	22	2.5	
Geometric Mean	43.4	33.4	7.62	7.54	34.3	0.106	0.062	0.0068	0.029	626	126.2	1.16	0.64	0.011	0.007	1.2	0.5	14.73	6.44	2668	798	0.28	0.1	0.005	0.005	0.5	0.5	1.5	1	0.09	0.05	0.013	0.01	0.025	0.025	5.2	2.5	
Count <DL	0	0	0	0	0	0	2	2	2	0	0	0	0	2	2	2	3	0	0	0	0	2	3	3	3	3	3	1	1	2	3	2	3	3	3	2	3	
Standard Deviation	1.6	8.7	0.32	0.31	80.6	0.007	0.016	0.0274	0.048	3896	83.2	1.74	0.39	0.024	0.003	3.9	0	42.21	2.41	6019	315	1.19	0	0	0	0	0	2.6	0.5	0.16	0	0.007	0	0	0	11.3	0	
1st Quartile	42.8	30.4	7.46	7.43	18.2	0.104	0.054	0.0025	0.017	192	92.8	0.66	0.51	0.005	0.005	0.5	0.5	6.4	5.38	1275	664	0.1	0.1	0.005	0.005	0.5	0.5	0.9	0.9	0.05	0.05	0.01	0.01	0.025	0.025	2.5	2.5	
Median	43.9	36	7.6	7.67	26.8	0.11	0.058	0.0025	0.024	231	102	0.71	0.64	0.005	0.005	0.5	0.5	7.25	6.09	1330	769	0.1	0.1	0.005	0.005	0.5	0.5	1.3	1.3	0.05	0.05	0.01	0.01	0.025	0.025	2.5	2.5	
3rd Quartile	44.3	38.9	7.78	7.72	91.9	0.11	0.07	0.0263	0.062	3586	169	2.19	0.89	0.026	0.008	3.9	0.5	43.38	7.74	6515	974	1.13	0.1	0.005	0.005	0.5	0.5	3.3	1.4	0.19	0.05	0.016	0.01	0.025	0.025	12.2	2.5	
Count Over Standard	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	1	0	3	0	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
% Over Standard	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	33.3	0	100	0	100	0	33.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Notes: Duplicates are omitted

Where result is less than laboratory detection limits, a value of half the reported detection limit (RDL) is used to calculate statistics

Water quality results are compared to CCME – Protection of Aquatic Life (PAL) Guidelines, exceedences are shown in red

Where CCME guideline is hardness or pH dependent (*), the guideline value shown in the table was calculated with the average hardness or pH value for this station. Average, minimum, maximum and geometric mean are compared to the guideline value shown in table. Individual exceedences (count over standard) is obtained by comparing individual results to guideline value for that particular date. Equation are as follows:

Aluminum: 5 µg/L if pH < 6.5 and 100 µg/L if pH ≥ 6.5

Cadmium (long-term exposure): 0.04 µg/L if hardness (as CaCO₃) < 17 mg/L; $10^{[0.83(\log[\text{hardness}]) - 2.46]}$ if hardness ≥ 17 mg/L and ≤ 280 mg/L; 0.37 µg/L if hardness > 280 mg/L

Copper: 2 µg/L if hardness (as CaCO₃) ≤ 82 mg/L or unknown; $0.2 * e^{[0.8545(\ln[\text{hardness}]) - 1.465]}$ if hardness ≥ 82 mg/L and ≤ 180 mg/L; 4 µg/L if hardness > 180 mg/L

Lead: 1 µg/L if hardness (as CaCO₃) ≤ 60 mg/L or unknown; $e^{[1.273(\ln[\text{hardness}]) - 4.705]}$ if hardness > 60 mg/L and ≤ 180 mg/L; 7 µg/L if hardness > 180 mg/L

Nickel: 25 µg/L if hardness (as CaCO₃) ≤ 60 mg/L or unknown; $e^{[0.76(\ln[\text{hardness}]) + 1.06]}$ if hardness > 60 mg/L and ≤ 180 mg/L; 150 µg/L if hardness > 180 mg/L

Ammonia guideline is given for N-NH₃ and is based on pH and temperatures not typically rising above 8.5 and 10°C respectively

Table 3-7: McGinty Creek Monitoring Station MN-2.5 Summary of Water Quality Data May 2009 – July 2015 (Pre-operations)

	Hard-T	Hard-D	pH-F	pH-L	TSS	Fluoride	N-NH3	N-NO2	N-NO3	Al-T	Al-D	As-T	As-D	Cd-T	Cd-D	Cr-T	Cr-D	Cu-T	Cu-D	Fe-T	Fe-D	Pb-T	Pb-D	Hg-T	Hg-D	Mo-T	Mo-D	Ni-T	Ni-D	Se-T	Se-D	Ag-T	Ag-D	Tl-T	Tl-D	Zn-T	Zn-D	
	mg/L	mg/L	pH units	pH units	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	
CCME-PAL			6.5-9	6.5-9		0.12	0.282	0.06	3	100*		5		0.13*		1		2*		300		2.44*		0.026		73		81.7*		1		0.25		0.8		30		
Average	81.3	79.7	7.45	7.82	33.2	0.17	0.0358	0.0047	0.0315	458	27.5	0.684	0.437	0.0287	0.0136	1.11	0.36	4.36	2.22	1060	233	0.4029	0.0783	0.00556	0.006	0.555	0.559	2.124	1.274	0.09	0.078	0.0099	0.0058	0.0115	0.0092	4.47	2.21	
Count	50	50	35	50	50	49	50	49	49	50	50	50	50	50	50	50	50	50	50	50	50	50	50	45	38	50	50	50	50	50	50	50	50	50	50	50	50	50
Minimum	23.7	23.2	4.1	7.1	0.5	0.06	0.0025	0.001	0.01	10.4	6.5	0.25	0.2	0.0025	0.0025	0.05	0.05	1.22	1.07	40	23	0.006	0.0025	5E-06	0.005	0.12	0.11	0.5	0.5	0.02	0.04	0.0025	0.0025	0.001	0.001	0.3	0.4	
Maximum	448	479	8.24	8.5	350	1.13	0.3	0.025	0.1	7560	112	3.9	1.49	0.16	0.075	15	0.7	35	4.63	11700	867	4	0.822	0.025	0.02	1.1	1.17	13.3	3.76	0.33	0.38	0.08	0.013	0.07	0.025	32	6.1	
Geometric Mean	72.5	70.1	7.4	7.81	5.1	0.16	0.017	0.0032	0.022	85.9	20	0.534	0.406	0.0141	0.009	0.51	0.32	2.95	2.09	387	161.5	0.1239	0.047	0.00458	0.005	0.499	0.505	1.635	1.198	0.079	0.071	0.0062	0.0047	0.004	0.003	2.6	1.81	
Count <DL	0	0	0	0	11	0	12	47	29	0	0	0	0	16	21	15	19	0	0	0	0	13	18	44	34	15	15	1	3	11	15	38	42	43	49	13	17	
Standard Deviation	57.2	61.6	0.76	0.26	78.7	0.14	0.0532	0.0064	0.0279	1239.3	26.2	0.668	0.203	0.0389	0.0156	2.38	0.15	5.95	0.85	2102	199.2	0.7581	0.1178	0.00324	0.003	0.233	0.224	2.245	0.489	0.057	0.049	0.0129	0.0036	0.0142	0.0115	5.74	1.34	
1st Quartile	60	59.1	7.45	7.71	1.1	0.15	0.008	0.0025	0.01	25.4	10.2	0.34	0.305	0.005	0.005	0.3	0.2	1.8	1.6	150	84.6	0.057	0.0232	0.005	0.005	0.477	0.5	1.11	1.042	0.06	0.05	0.0025	0.0025	0.001	0.001	1.4	1.02	
Median	78.2	79.8	7.64	7.88	3.6	0.17	0.0205	0.0025	0.022	64.3	18.2	0.465	0.385	0.0135	0.006	0.5	0.38	2.27	1.92	354	189.5	0.1	0.0635	0.005	0.005	0.5	0.515	1.455	1.235	0.07	0.07	0.009	0.0037	0.001	0.001	2.5	2.5	
3rd Quartile	88.7	86.2	7.81	7.96	15.1	0.18	0.0367	0.0025	0.041	174	28.9	0.733	0.48	0.028	0.017	0.5	0.5	3.99	2.75	812	320.2	0.227	0.1	0.005	0.005	0.722	0.688	1.8	1.48	0.1	0.087	0.01	0.01	0.025	0.025	4.4	2.5	
Count Over Standard	0	0	3	0	0	41	1	0	0	19	0	0	0	4	0	7	0	28	0	29	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	
% Over Standard	0	0	8.6	0	0	83.7	2	0	0	38	0	0	0	8	0	14	0	56	0	58	0	4	0	0	0	0	0	0	0	0	0	0	0	0	2	0		

Table 3-8: McGinty Creek Monitoring Station MN-2.5 Summary of Water Quality Data August 2015 – December 2015 (Operations)

	Hard-T	Hard-D	pH-F	pH-L	TSS	Fluoride	N-NH3	N-NO2	N-NO3	Al-T	Al-D	As-T	As-D	Cd-T	Cd-D	Cr-T	Cr-D	Cu-T	Cu-D	Fe-T	Fe-D	Pb-T	Pb-D	Hg-T	Hg-D	Mo-T	Mo-D	Ni-T	Ni-D	Se-T	Se-D	Ag-T	Ag-D	Tl-T	Tl-D	Zn-T	Zn-D
	mg/L	mg/L	pH units	pH units	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
CCME-PAL			6.5-9	6.5-9		0.12	0.282	0.06	3	100*		5		0.16*		1		2.46*		300		3.36*		0.026		73		98.8*		1		0.25		0.8		30	
Average	104.5	99.8	7.94	8.02	80.1	0.22	0.0218	0.0025	0.044	1256.9	17.6	0.84	0.38	0.016	0.006	2.7	0.5	4.57	1.93	2099	142.9	0.63	0.1	0.005	0.005	0.6	0.6	3.1	0.9	0.12	0.08	0.013	0.01	0.025	0.025	6.7	2.5
Count	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Minimum	77	68.8	7.36	7.77	2.3	0.17	0.0098	0.0025	0.01	19.3	9.1	0.28	0.3	0.005	0.005	0.5	0.5	1.08	0.71	62	22.5	0.1	0.1	0.005	0.005	0.5	0.5	0.5	0.5	0.05	0.05	0.01	0.01	0.025	0.025	2.5	2.5
Maximum	134	135	8.6	8.28	341	0.39	0.04	0.0025	0.122	5530	35.1	2.54	0.49	0.062	0.01	10.8	0.5	13.6	3.38	8390	288	2.55	0.1	0.005	0.005	1.1	1.1	11	1.5	0.27	0.19	0.024	0.01	0.025	0.025	18.9	2.5
Geometric Mean	102.1	96.7	7.92	8.02	15.5	0.21	0.0193	0.0025	0.029	244.1	15.8	0.56	0.37	0.008	0.006	1.1	0.5	3.08	1.72	617	88.3	0.24	0.1	0.005	0.005	0.6	0.6	1.7	0.9	0.09	0.07	0.012	0.01	0.025	0.025	4.6	2.5
Count <DL	0	0	0	0	0	0	0	5	2	0	0	0	0	4	4	3	5	0	0	0	0	3	5	5	5	4	4	1	2	3	4	4	5	5	5	3	5
Standard Deviation	25.6	27.9	0.6	0.18	146.9	0.09	0.0119	0	0.046	2394.6	10.2	0.97	0.08	0.025	0.002	4.5	0	5.12	0.97	3548	116.8	1.08	0	0	0	0.3	0.3	4.4	0.4	0.1	0.06	0.006	0	0	0	7.1	0
1st Quartile	86.2	84	7.52	7.97	2.5	0.17	0.013	0.0025	0.01	106	12.1	0.31	0.32	0.005	0.005	0.5	0.5	2.05	1.59	302	22.8	0.1	0.1	0.005	0.005	0.5	0.5	1	0.5	0.05	0.05	0.01	0.01	0.025	0.025	2.5	2.5
Median	96.5	88.3	7.63	8.04	10.1	0.18	0.021	0.0025	0.034	165	14.7	0.36	0.39	0.005	0.005	0.5	0.5	2.68	1.91	439	187	0.1	0.1	0.005	0.005	0.5	0.5	1.4	1	0.05	0.05	0.01	0.01	0.025	0.025	2.5	2.5
3rd Quartile	129	123	8.58	8.04	44.7	0.21	0.025	0.0025	0.046	464	17.1	0.71	0.4	0.005	0.005	1.2	0.5	3.42	2.08	1300	194	0.31	0.1	0.005	0.005	0.5	0.5	1.7	1.2	0.2	0.05	0.01	0.01	0.025	0.025	7.1	2.5
Count Over Standard	0	0	0	0	0	5	0	0	0	4	0	0	0	0	0	2	0	3	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Over Standard	0	0	0	0	0	100	0	0	0	80	0	0	0	0	0	40	0	60	0	80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Notes: Duplicates are omitted

Where result is less than laboratory detection limits, a value of half the reported detection limit (RDL) is used to calculate statistics

Water quality results are compared to CCME – Protection of Aquatic Life (PAL) Guidelines, exceedences are shown in red

Where CCME guideline is hardness or pH dependent (*), the guideline value shown in the table was calculated with the average hardness or pH value for this station. Average, minimum, maximum and geometric mean are compared to the guideline value shown in table. Individual exceedences (count over standard) is obtained by comparing individual results to guideline value for that particular date. Equation are as follows:

Aluminum: 5 µg/L if pH < 6.5 and 100 µg/L if pH ≥ 6.5

Cadmium (long-term exposure): 0.04 µg/L if hardness (as CaCO₃) < 17 mg/L; $10^{[0.83(\log[\text{hardness}]) - 2.46]}$ if hardness ≥ 17 mg/L and ≤ 280 mg/L; 0.37 µg/L if hardness > 280 mg/L

Copper: 2 µg/L if hardness (as CaCO₃) ≤ 82 mg/L or unknown; $0.2 * e^{[0.8545(\ln[\text{hardness}]) - 1.465]}$ if hardness ≥ 82 mg/L and ≤ 180 mg/L; 4 µg/L if hardness > 180 mg/L

Lead: 1 µg/L if hardness (as CaCO₃) ≤ 60 mg/L or unknown; $e^{[1.273(\ln[\text{hardness}]) - 4.705]}$ if hardness > 60 mg/L and ≤ 180 mg/L; 7 µg/L if hardness > 180 mg/L

Nickel: 25 µg/L if hardness (as CaCO₃) ≤ 60 mg/L or unknown; $e^{[0.76(\ln[\text{hardness}]) + 1.06]}$ if hardness > 60 mg/L and ≤ 180 mg/L; 150 µg/L if hardness > 180 mg/L

Ammonia guideline is given for N-NH₃ and is based on pH and temperatures not typically rising above 8.5 and 10°C respectively

Table 3-9: McGinty Creek Monitoring Station MN-4.5 Summary of Water Quality Data May 2009 – July 2015 (Pre-operations)

	Hard-T	Hard-D	pH-F	pH-L	TSS	Fluoride	N-NH3	N-NO2	N-NO3	Al-T	Al-D	As-T	As-D	Cd-T	Cd-D	Cr-T	Cr-D	Cu-T	Cu-D	Fe-T	Fe-D	Pb-T	Pb-D	Hg-T	Hg-D	Mo-T	Mo-D	Ni-T	Ni-D	Se-T	Se-D	Ag-T	Ag-D	Tl-T	Tl-D	Zn-T	Zn-D	
	mg/L	mg/L	pH units	pH units	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	
CCME-PAL			6.5-9	6.5-9		0.12	0.282	0.06	3	100*		5		0.13*		1		2*		300		2.41*		0.026		73		80.9*		1		0.25		0.8		30		
Average	80.3	77.2	7.79	7.84	49.6	0.25	0.03	0.0053	0.0693	635.9	32.6	0.784	0.422	0.0327	0.0138	1.33	0.37	4.27	2.15	1237	173.5	0.4873	0.0793	0.00538	0.006	0.67	0.663	2.62	1.122	0.156	0.14	0.0148	0.0053	0.01275	0.0092	6.71	2.38	
Count	44	44	31	44	44	43	44	43	43	44	44	44	44	44	44	44	44	44	44	44	44	44	44	40	33	44	44	44	44	44	44	44	44	44	44	44	44	44
Minimum	28.2	25.8	7.26	7.1	0.5	0.08	0.0025	0.001	0.01	7.9	6.7	0.24	0.26	0.0025	0.0025	0.05	0.05	1.31	1.13	12	12	0.007	0.0025	5E-06	0.005	0.14	0.17	0.5	0.5	0.05	0.05	0.0025	0.0025	0.001	0.001	0.3	0.2	
Maximum	113	110	8.43	8.18	570	0.35	0.27	0.025	0.3	12600	174	6.5	0.65	0.31	0.135	23	0.6	37	4.71	20100	562	7.4	0.467	0.025	0.02	1.2	1.22	24.8	1.88	0.4	0.21	0.231	0.011	0.09	0.025	63.1	14.4	
Geometric Mean	76.7	73.3	7.79	7.84	8.9	0.23	0.0141	0.0034	0.0441	127	22.1	0.561	0.409	0.0145	0.0081	0.53	0.34	2.95	2.04	313	110.6	0.1385	0.0506	0.00438	0.005	0.602	0.608	1.62	1.038	0.147	0.135	0.0068	0.0042	0.00468	0.003	2.98	1.78	
Count <DL	0	0	0	0	6	0	12	40	16	0	0	0	0	14	22	15	16	0	0	0	0	12	18	40	30	10	13	4	7	1	1	30	42	35	44	12	15	
Standard Deviation	21.8	22.3	0.28	0.25	124	0.07	0.0487	0.007	0.0644	1977.3	37	1.08	0.108	0.0625	0.0216	3.57	0.14	6.26	0.73	3289	145.7	1.2864	0.0753	0.00328	0.003	0.282	0.26	4.19	0.415	0.057	0.034	0.0358	0.0037	0.01643	0.0115	13.34	2.25	
1st Quartile	65.8	60.2	7.62	7.8	2	0.2	0.0062	0.0025	0.015	43.1	12	0.398	0.34	0.005	0.005	0.3	0.28	1.9	1.65	137	56.8	0.0765	0.031	0.005	0.005	0.5	0.5	1.04	0.847	0.128	0.129	0.0025	0.0025	0.001	0.001	1.95	1.06	
Median	85.7	82.5	7.83	7.92	8.2	0.26	0.017	0.0025	0.061	136	19.8	0.46	0.385	0.0105	0.0055	0.5	0.4	2.57	1.92	310	131.5	0.1	0.073	0.005	0.005	0.61	0.57	1.6	1.15	0.15	0.14	0.0095	0.0025	0.00315	0.001	2.5	2.5	
3rd Quartile	99	93.9	7.98	8	33.4	0.29	0.029	0.0025	0.095	299.5	32.3	0.712	0.49	0.0323	0.0132	0.55	0.5	3.67	2.58	712	256.2	0.221	0.1	0.005	0.005	0.903	0.865	2.17	1.455	0.17	0.17	0.01	0.01	0.025	0.025	4.42	2.5	
Count Over Standard	0	0	0	0	0	39	0	0	0	24	0	1	0	2	0	8	0	30	0	23	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0
% Over Standard	0	0	0	0	0	90.7	0	0	0	54.5	0	2.3	0	4.5	0	18.2	0	68.2	0	52.3	0	4.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6.8	0

Table 3-10: McGinty Creek Monitoring Station MN-4.5 Summary of Water Quality Data August 2015 – December 2015 (Operations)

	Hard-T	Hard-D	pH-F	pH-L	TSS	Fluoride	N-NH3	N-NO2	N-NO3	Al-T	Al-D	As-T	As-D	Cd-T	Cd-D	Cr-T	Cr-D	Cu-T	Cu-D	Fe-T	Fe-D	Pb-T	Pb-D	Hg-T	Hg-D	Mo-T	Mo-D	Ni-T	Ni-D	Se-T	Se-D	Ag-T	Ag-D	Tl-T	Tl-D	Zn-T	Zn-D	
	mg/L	mg/L	pH units	pH units	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	
CCME-PAL			6.5-9	6.5-9		0.12	0.282	0.06	3	100*		5		0.09*		1		2.15*		300		2.77*		0.026		73		87.9*		1		0.25		0.8		30		
Average	89.6	82.9	7.93	7.96	32.3	0.28	0.02	0.0025	0.046	554.1	27.3	0.59	0.41	0.014	0.008	1.5	0.5	3.6	2.32	1080	129.1	0.36	0.1	0.005	0.005	0.7	0.7	1.7	0.9	0.22	0.17	0.01	0.01	0.025	0.025	3.9	2.5	
Count	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Minimum	80.4	62.2	7.8	7.85	0.5	0.22	0.011	0.0025	0.027	18.8	16.2	0.29	0.3	0.005	0.005	0.5	0.5	1.4	1.42	89	68.1	0.1	0.1	0.005	0.005	0.5	0.5	0.5	0.5	0.17	0.12	0.01	0.01	0.025	0.025	2.5	2.5	
Maximum	94.6	96.7	8.04	8.04	94.6	0.31	0.037	0.0025	0.081	1610	49.4	1.11	0.6	0.032	0.013	3.6	0.5	7.02	3.77	3030	234	0.88	0.1	0.005	0.005	1	1.1	4	1.7	0.29	0.23	0.01	0.01	0.025	0.025	6.6	2.5	
Geometric Mean	89.4	81.5	7.93	7.96	4.5	0.27	0.017	0.0025	0.041	100.6	23.5	0.49	0.39	0.009	0.007	1	0.5	2.86	2.12	319	110.8	0.21	0.1	0.005	0.005	0.6	0.7	1	0.8	0.21	0.16	0.01	0.01	0.025	0.025	3.5	2.5	
Count <DL	0	0	0	0	1	0	0	3	0	0	0	0	0	2	2	2	3	0	0	0	0	2	3	3	2	2	2	2	0	0	3	3	4	3	2	3		
Standard Deviation	8	18.3	0.12	0.1	53.9	0.05	0.014	0	0.03	914.4	19.1	0.45	0.16	0.016	0.005	1.8	0	3	1.27	1689	91.2	0.45	0	0	0.3	0.3	2	0.7	0.06	0.06	0	0	0	0	2.4	0		
1st Quartile	87.2	76.1	7.88	7.92	1.2	0.26	0.012	0.0025	0.029	26.2	16.2	0.32	0.32	0.005	0.005	0.5	0.5	1.89	1.59	104	76.7	0.1	0.1	0.005	0.005	0.5	0.5	0.5	0.5	0.18	0.14	0.01	0.01	0.025	0.025	2.5	2.5	
Median	93.9	89.9	7.96	8	1.9	0.3	0.013	0.0025	0.031	33.6	16.3	0.36	0.34	0.005	0.005	0.5	0.5	2.38	1.77	120	85.3	0.1	0.1	0.005	0.005	0.5	0.5	0.5	0.5	0.2	0.15	0.01	0.01	0.025	0.025	2.5	2.5	
3rd Quartile	94.2	93.3	8	8.02	48.2	0.3	0.025	0.0025	0.056	821.8	32.9	0.74	0.47	0.018	0.009	2	0.5	4.7	2.77	1575	159.7	0.49	0.1	0.005	0.005	0.8	0.8	2.2	1.1	0.24	0.19	0.01	0.01	0.025	0.025	4.5	2.5	
Count Over Standard	0	0	0	0	0	3	0	0	0	1	0	0	0	0	0	1	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
% Over Standard	0	0	0	0	0	100	0	0	0	33.3	0	0	0	0	0	33.3	0	66.7	0	33.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Notes: Duplicates are omitted

Where result is less than laboratory detection limits, a value of half the reported detection limit (RDL) is used to calculate statistics

Water quality results are compared to CCME – Protection of Aquatic Life (PAL) Guidelines, exceedences are shown in red

Where CCME guideline is hardness or pH dependent (*), the guideline value shown in the table was calculated with the average hardness or pH value for this station. Average, minimum, maximum and geometric mean are compared to the guideline value shown in table. Individual exceedences (count over standard) is obtained by comparing individual results to guideline value for that particular date. Equation are as follows:

Aluminum: 5 µg/L if pH < 6.5 and 100 µg/L if pH ≥ 6.5

Cadmium (long-term exposure): 0.04 µg/L if hardness (as CaCO₃) < 17 mg/L; $10^{[0.83(\log[\text{hardness}]) - 2.46]}$ if hardness ≥ 17 mg/L and ≤ 280 mg/L; 0.37 µg/L if hardness > 280 mg/L

Copper: 2 µg/L if hardness (as CaCO₃) ≤ 82 mg/L or unknown; $0.2 * e^{[0.8545(\ln[\text{hardness}]) - 1.465]}$ if hardness ≥ 82 mg/L and ≤ 180 mg/L; 4 µg/L if hardness > 180 mg/L

Lead: 1 µg/L if hardness (as CaCO₃) ≤ 60 mg/L or unknown; $e^{[1.273(\ln[\text{hardness}]) - 4.705]}$ if hardness > 60 mg/L and ≤ 180 mg/L; 7 µg/L if hardness > 180 mg/L

Nickel: 25 µg/L if hardness (as CaCO₃) ≤ 60 mg/L or unknown; $e^{[0.76(\ln[\text{hardness}]) + 1.06]}$ if hardness > 60 mg/L and ≤ 180 mg/L; 150 µg/L if hardness > 180 mg/L

Ammonia guideline is given for N-NH3 and is based on pH and temperatures not typically rising above 8.5 and 10°C respectively

4 CHARACTERIZATION OF ELEVATED PARAMETER CONCENTRATIONS

4.1 CONCENTRATIONS OVER TIME

For parameters that exceeded respective CWQGs in at least one sample, data were plotted over time for each station (Figure 4-1 to Figure 4-23). Thirteen parameters met this criteria including aluminum, arsenic, cadmium, chromium, copper, iron, lead, mercury, silver, zinc, ammonia, fluoride and pH (in situ measurement). Both total and dissolved metals are graphed (except in the case of dissolved mercury and silver since the majority of results were <RDL) as well as total suspended solids and total dissolved solids. For results below laboratory detection levels, ½ the RDL has been plotted. In addition to depicting the CWQGs on the graphs, 95th percentile for results from all stations is shown (on total metals graphs only).

Most parameters show spikes in concentrations in the summers of 2010 (August), 2011 (July) and 2012 (June), and a decreasing trend in maximum values since. The majority of spikes correlates with spikes in TSS resulting from precipitation events. When TSS is elevated due to heavy rains or freshet, some TSS associated metals may naturally exceed CWQG (Minnow, 2010a). Most parameters also display a seasonal pattern showing higher values during the summer months.

The CWQG for hardness dependent parameters (cadmium, copper and lead) shown on the figures was calculated using the average hardness value for all stations. Of the parameters plotted, several show the CWQG below the 95th percentile concentration calculated from results for all stations for the pre-operations period, such as: total aluminum, cadmium, chromium, copper, iron, lead, zinc and fluoride. The 95th percentile concentrations for total arsenic, mercury, silver, ammonia and pH are below the CWQG, although the 5th percentile for pH is below the guideline lower bound

Most parameters do not appear to show a significant change in concentration during the operations period compared to pre-operations, however, this comparison is made using a limited dataset for the operation period (n=2 to 5 depending on stations). Further analyses will be made when a larger dataset is available for the operation period.

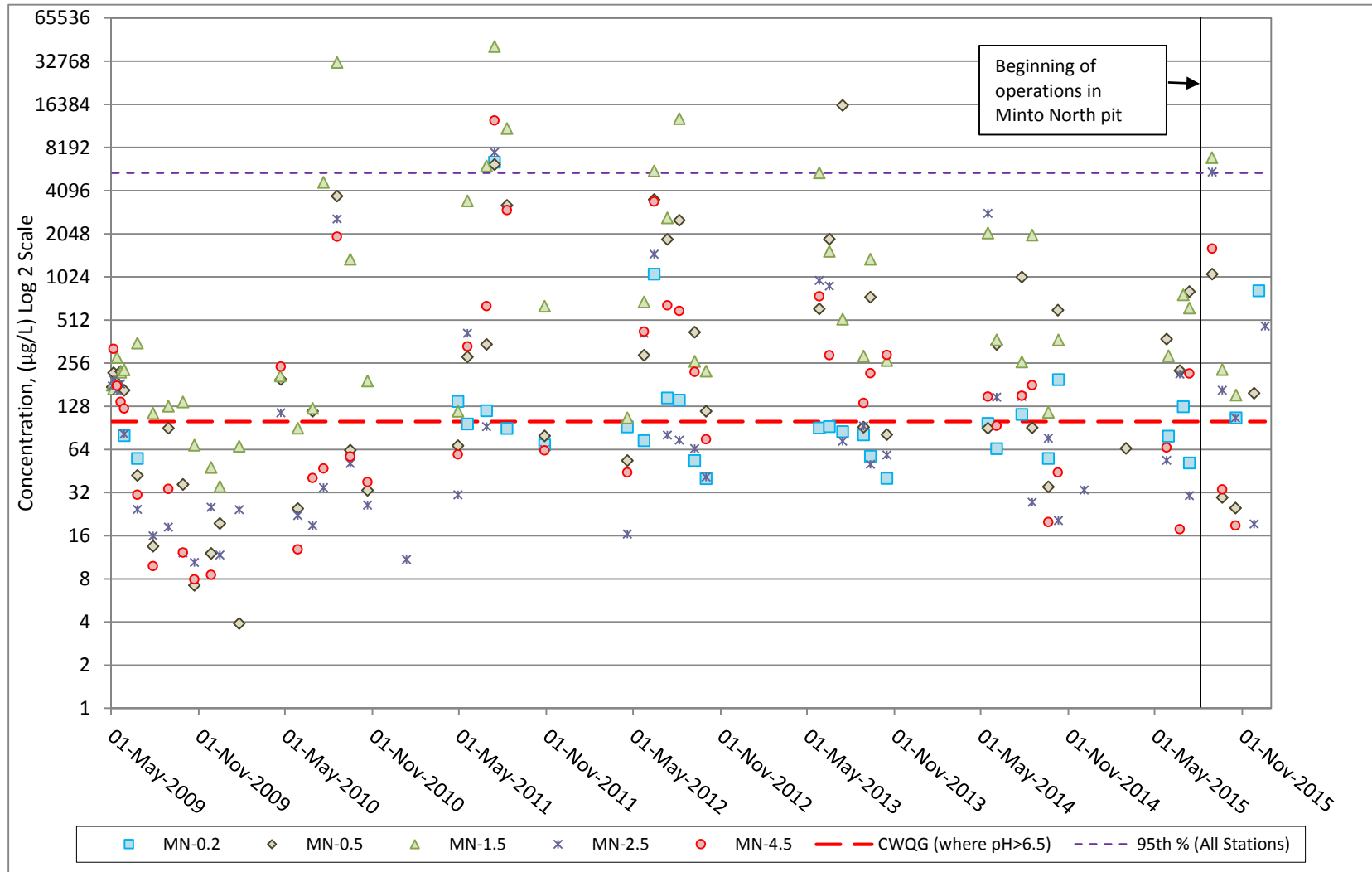


Figure 4-1: Concentrations of Total Aluminum in McGinty Creek

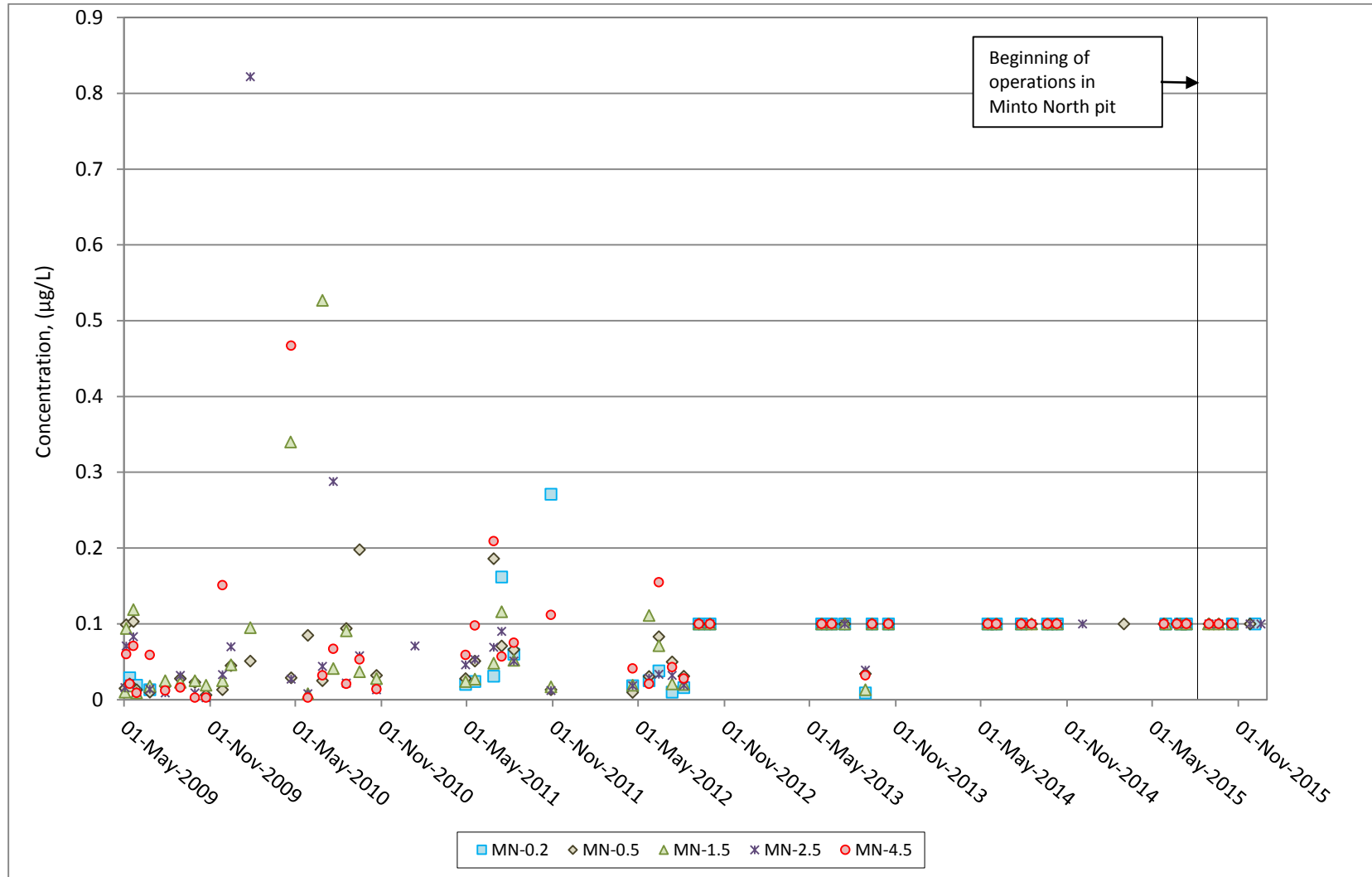


Figure 4-2: Concentrations of Dissolved Aluminum in McGinty Creek

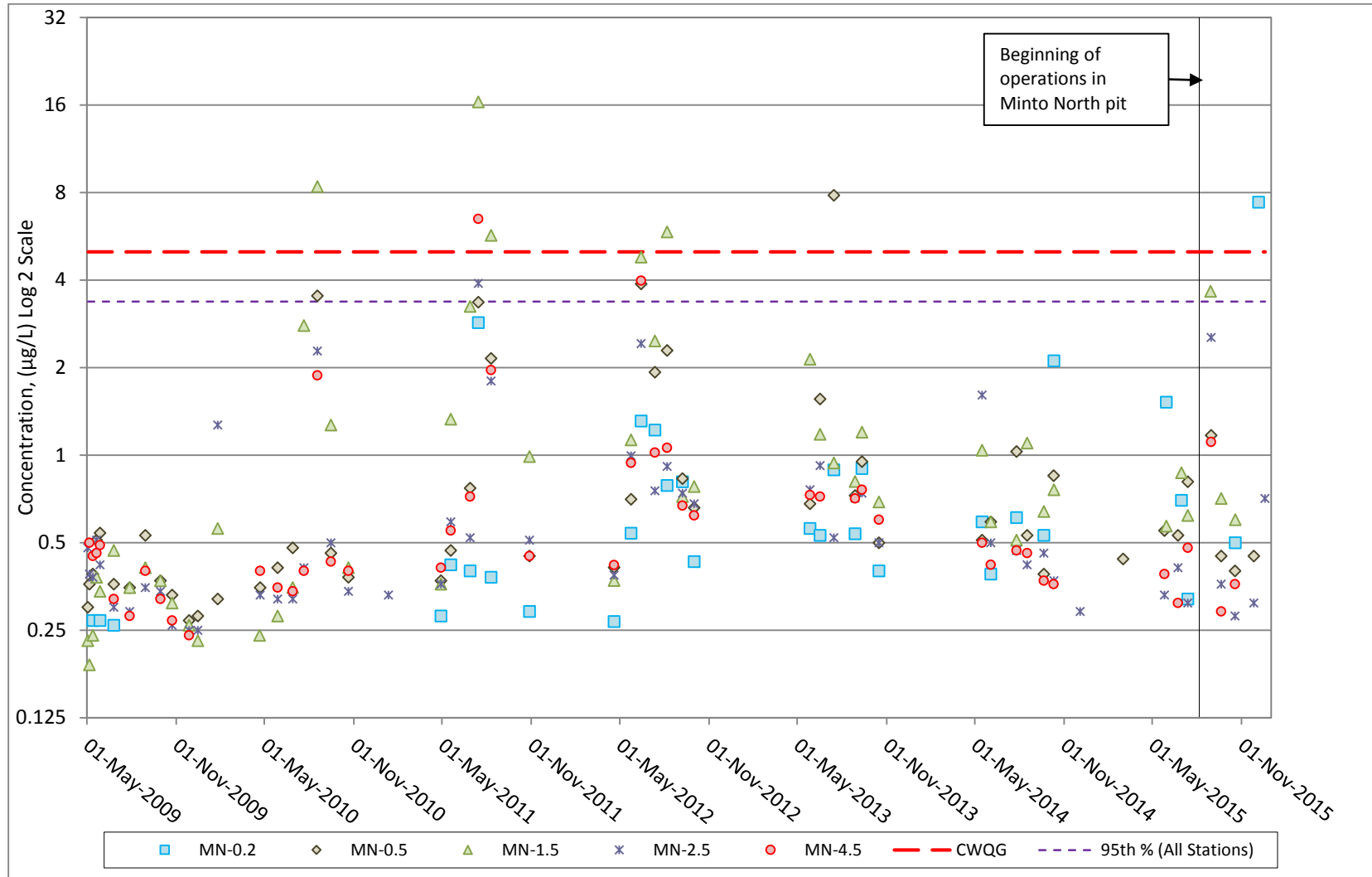


Figure 4-3: Concentrations of Total Arsenic in McGinty Creek

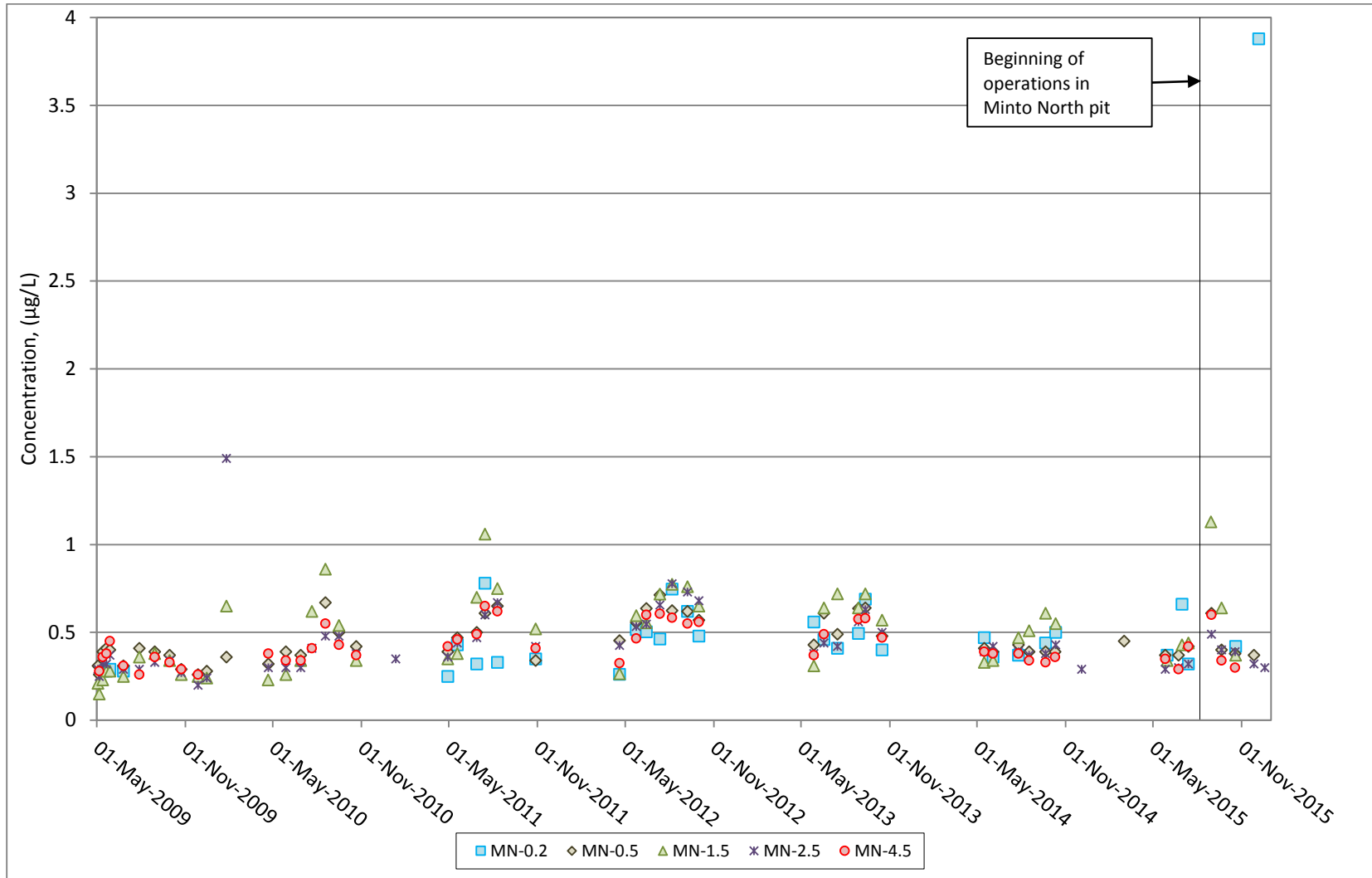


Figure 4-4: Concentrations of Dissolved Arsenic in McGinty Creek

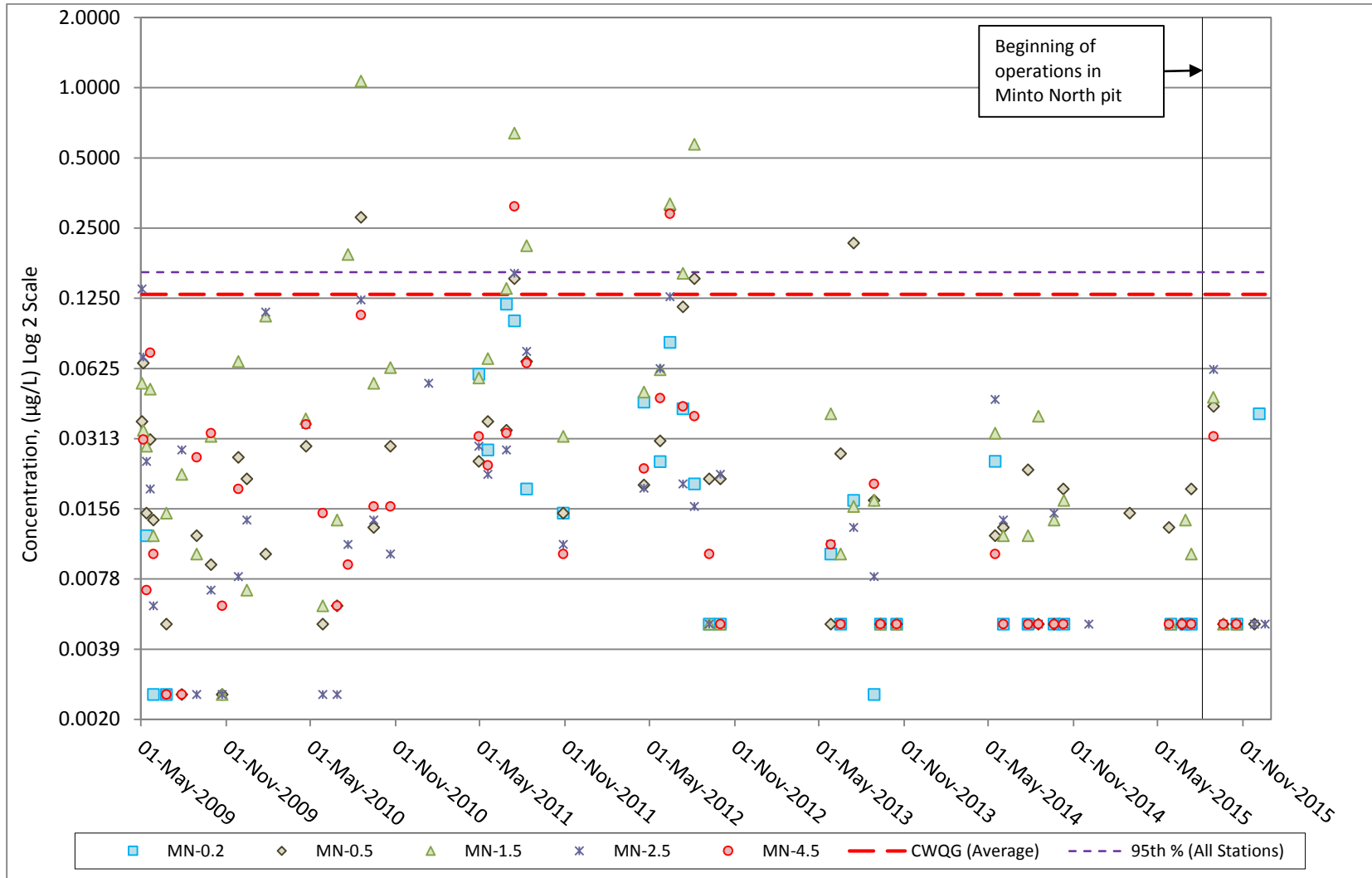


Figure 4-5: Concentrations of Total Cadmium in McGinty Creek

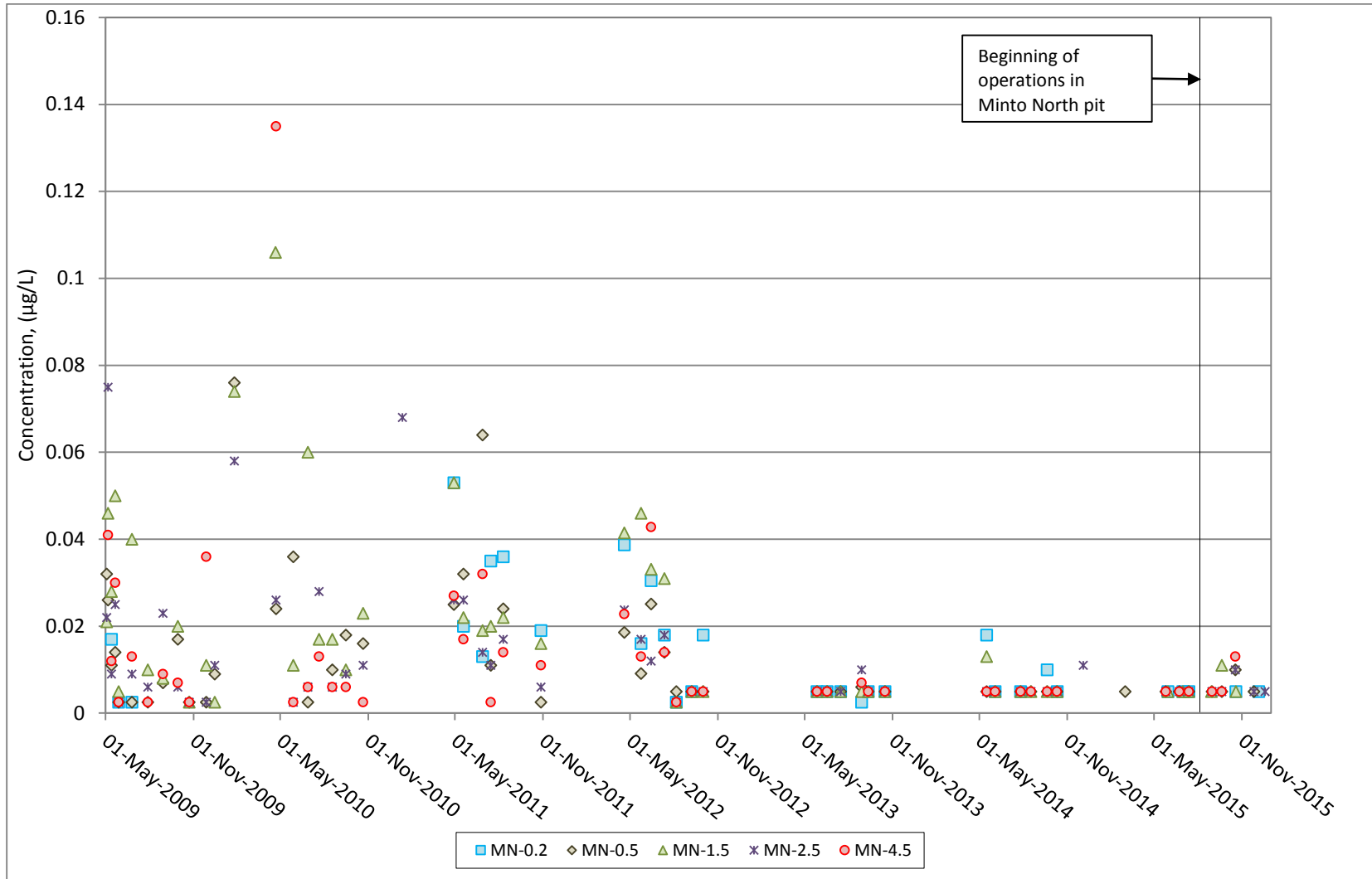


Figure 4-6: Concentrations of Dissolved Cadmium in McGinty Creek

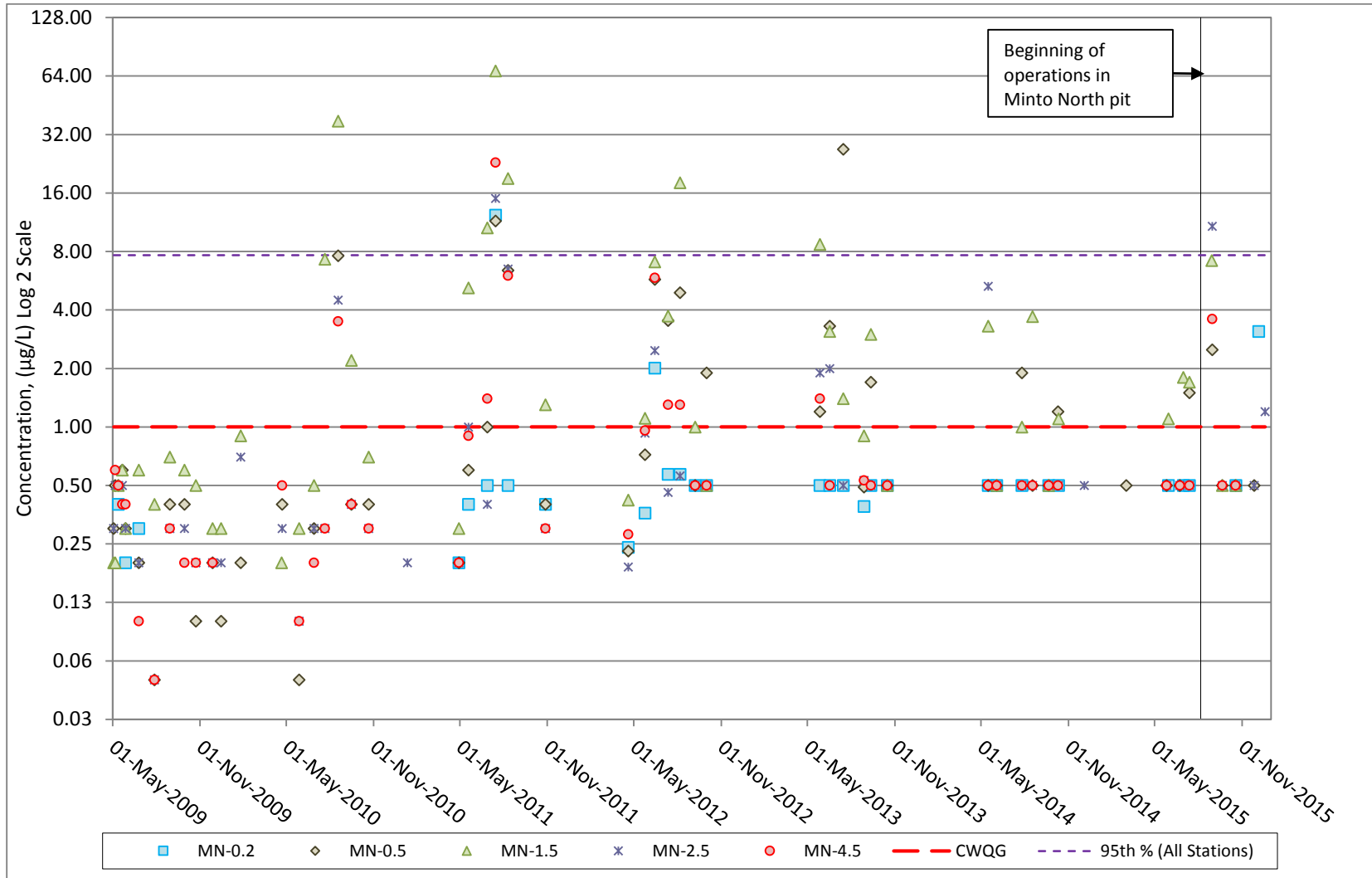


Figure 4-7: Concentrations of Total Chromium in McGinty Creek

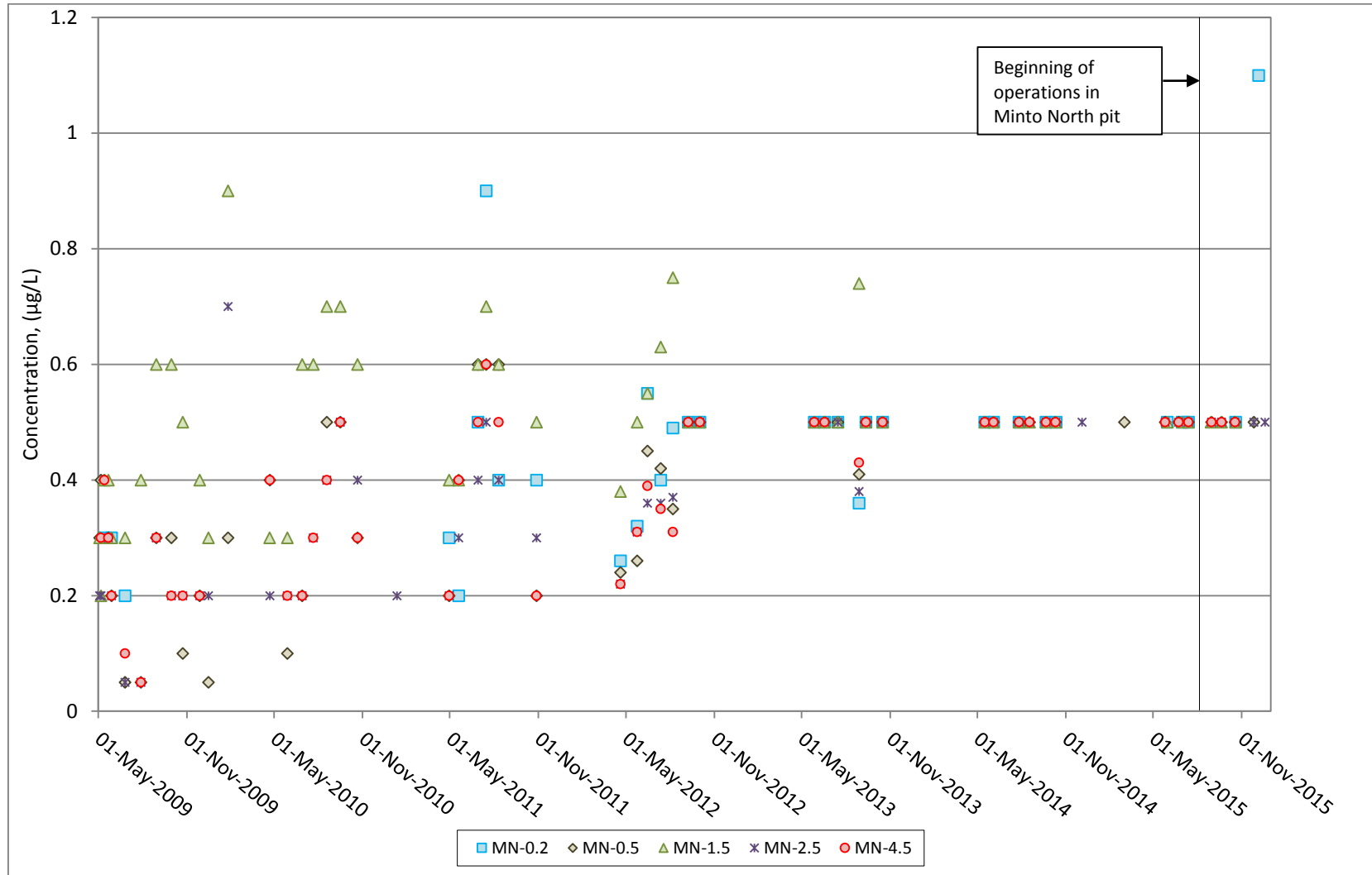


Figure 4-8: Concentrations of Dissolved Chromium in McGinty Creek

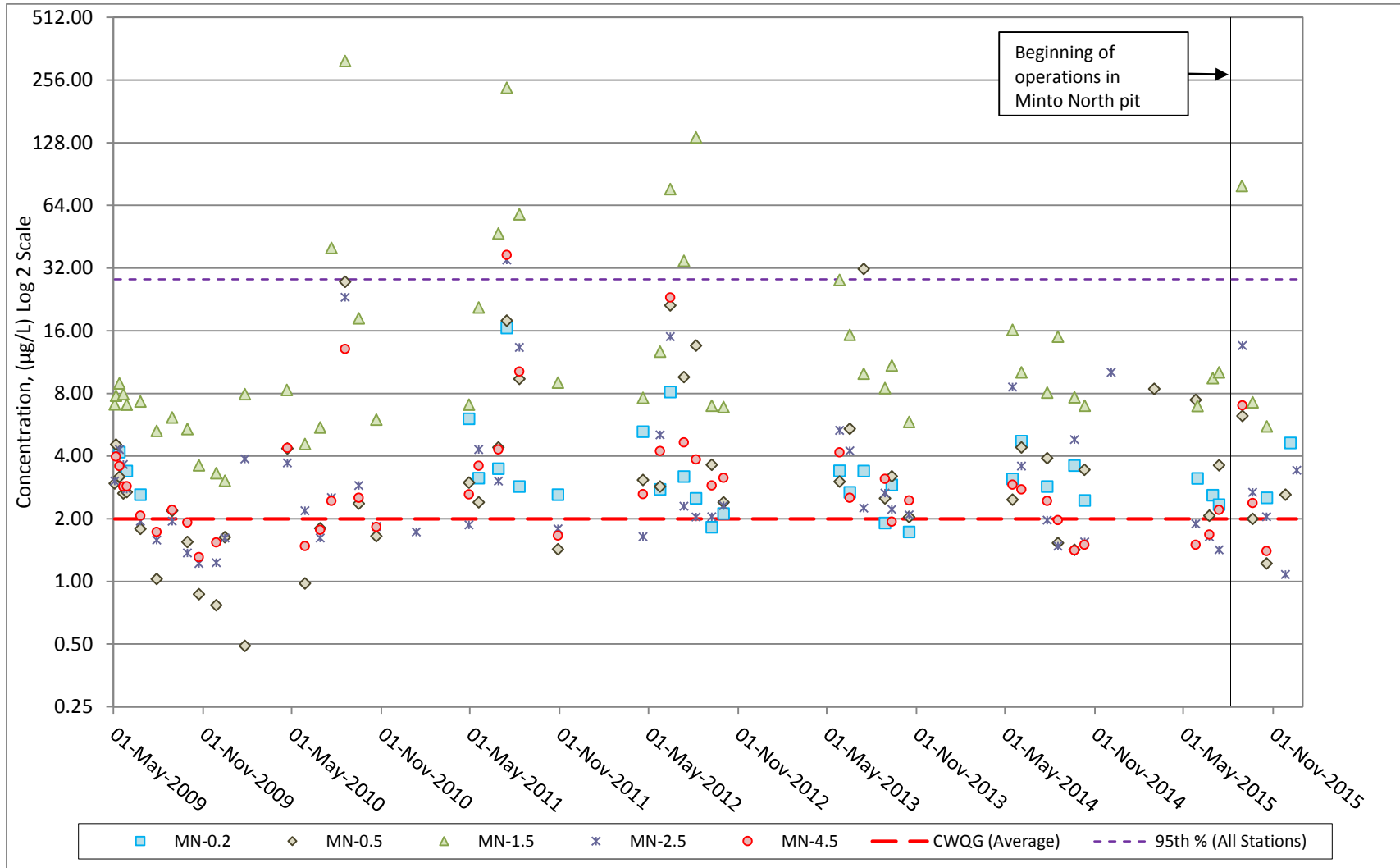


Figure 4-9: Concentrations of Total Copper in McGinty Creek

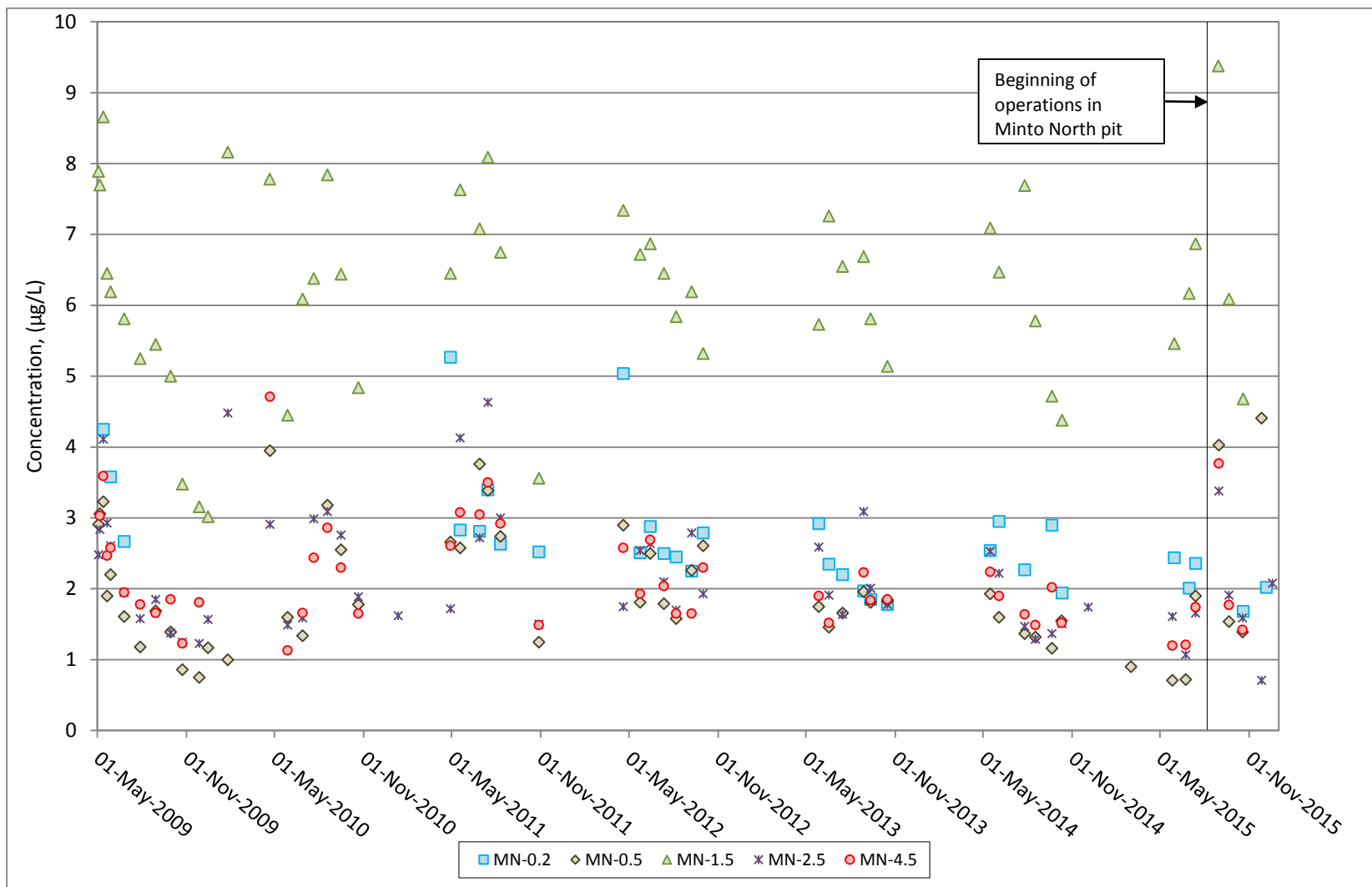


Figure 4-10: Concentrations of Dissolved Copper in McGinty Creek

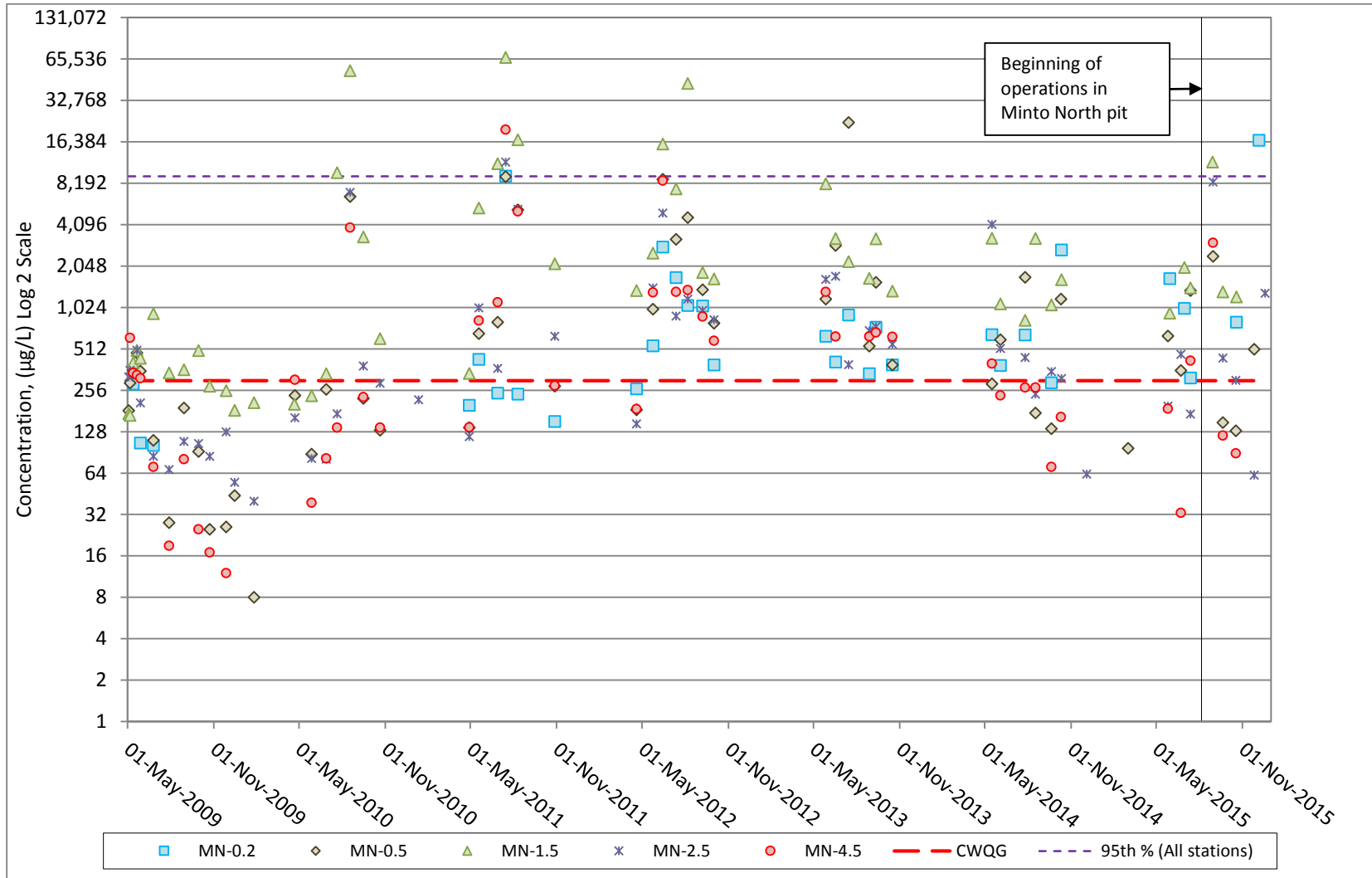


Figure 4-11: Concentrations of Total Iron in McGinty Creek

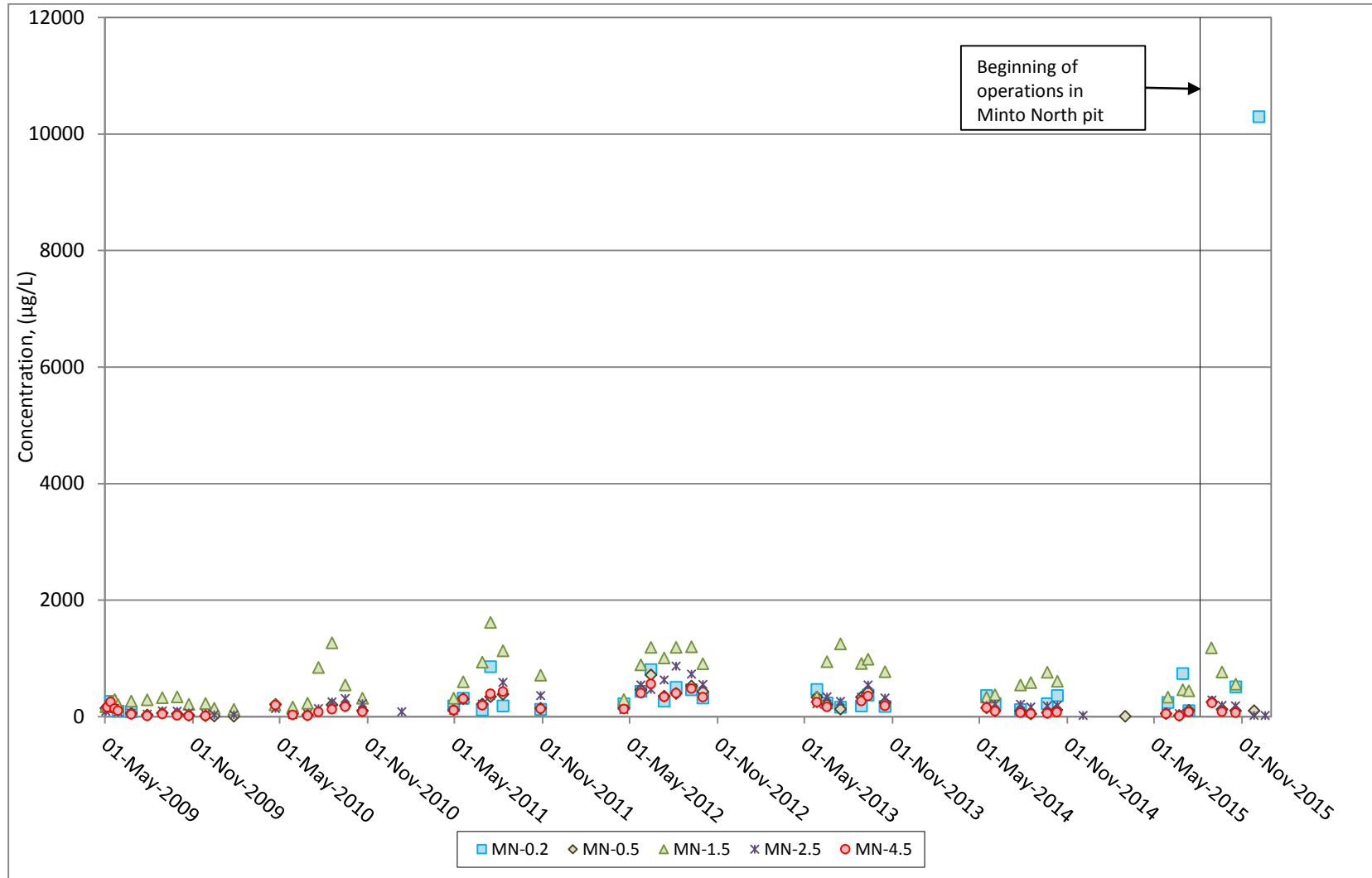


Figure 4-12: Concentrations of Dissolved Iron in McGinty Creek

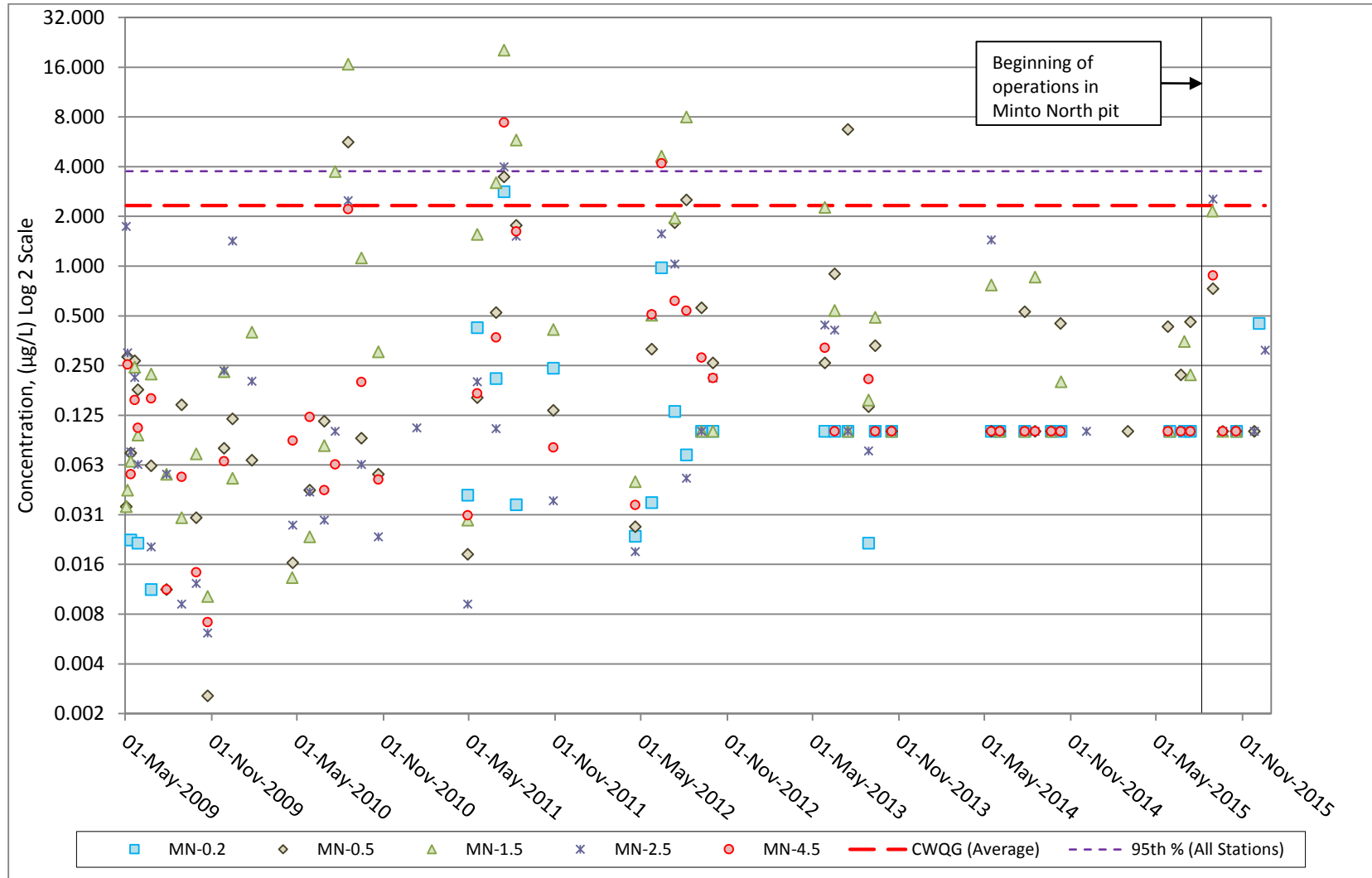


Figure 4-13: Concentrations of Total Lead in McGinty Creek

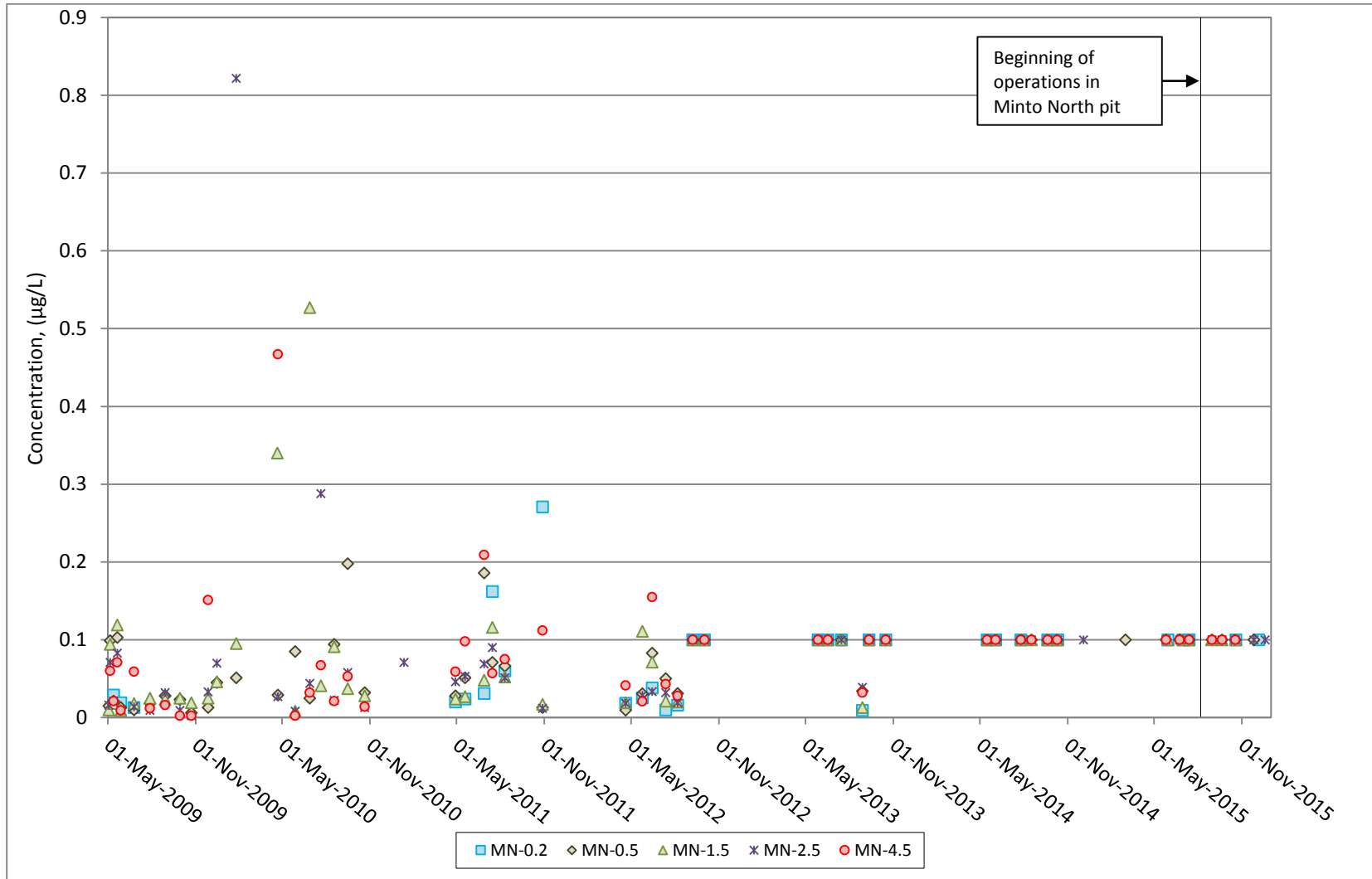


Figure 4-14: Concentrations of Dissolved Lead in McGinty Creek

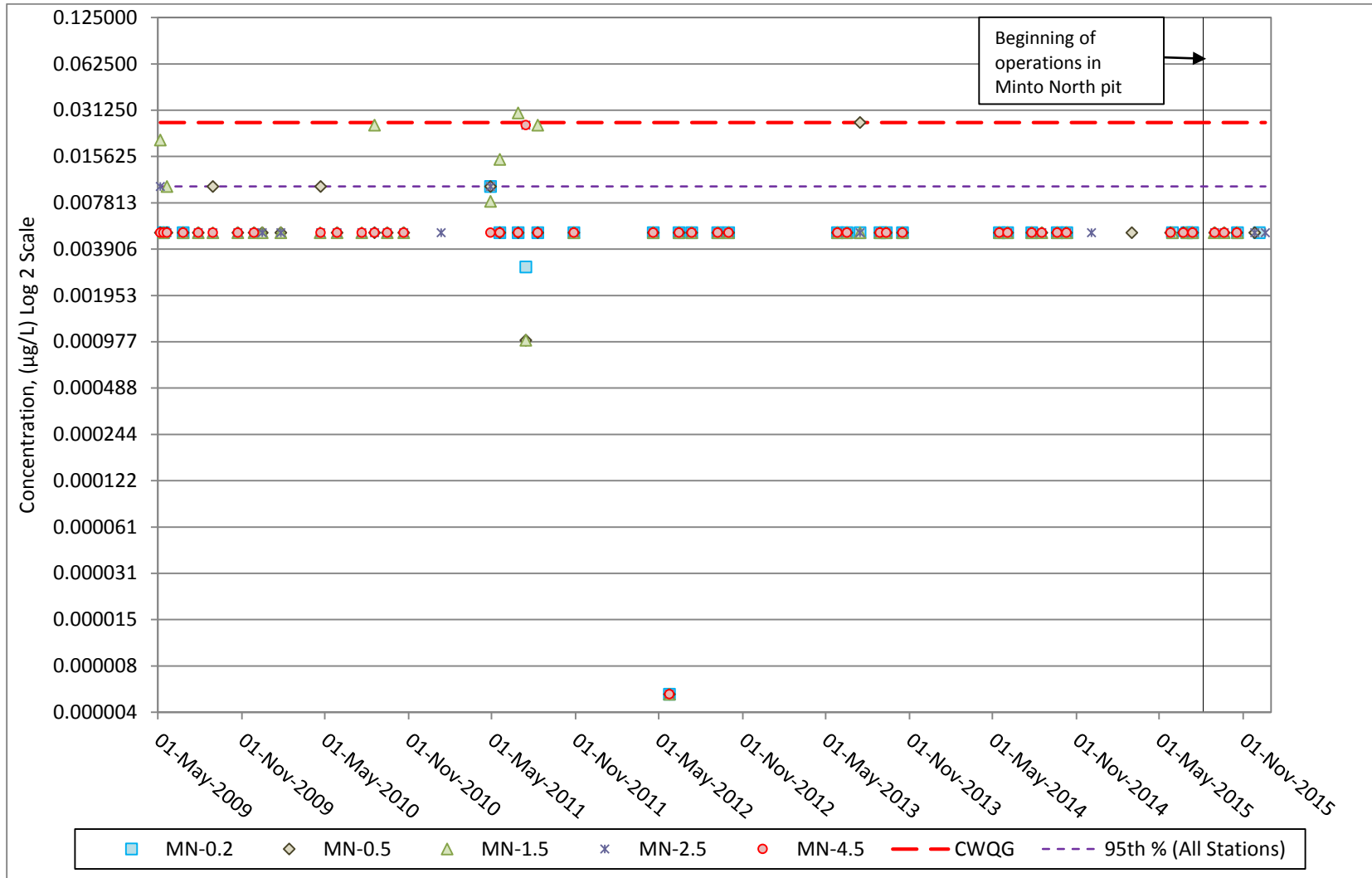


Figure 4-15: Concentrations of Total Mercury in McGinty Creek

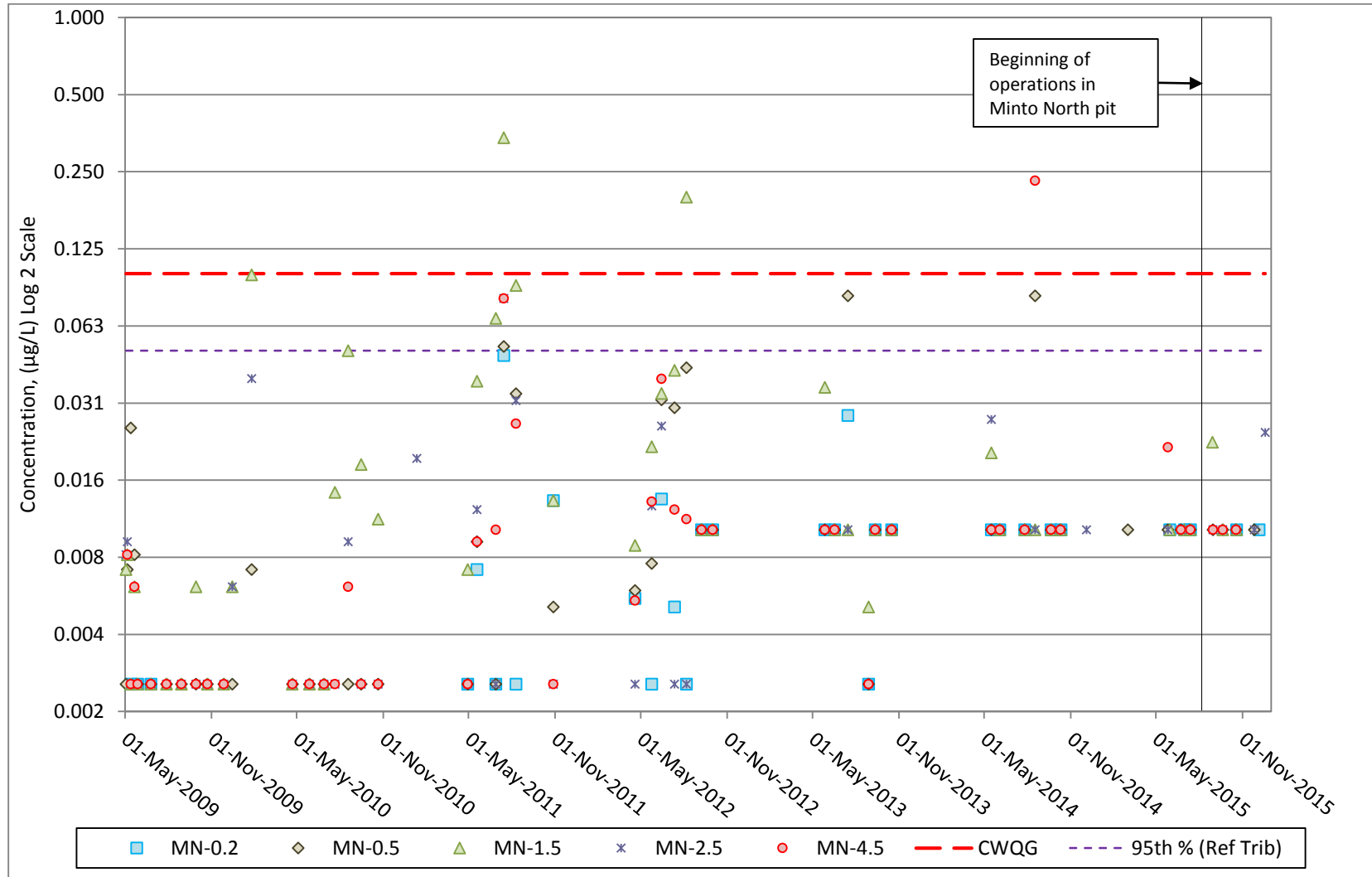


Figure 4-16: Concentrations of Total Silver in McGinty Creek

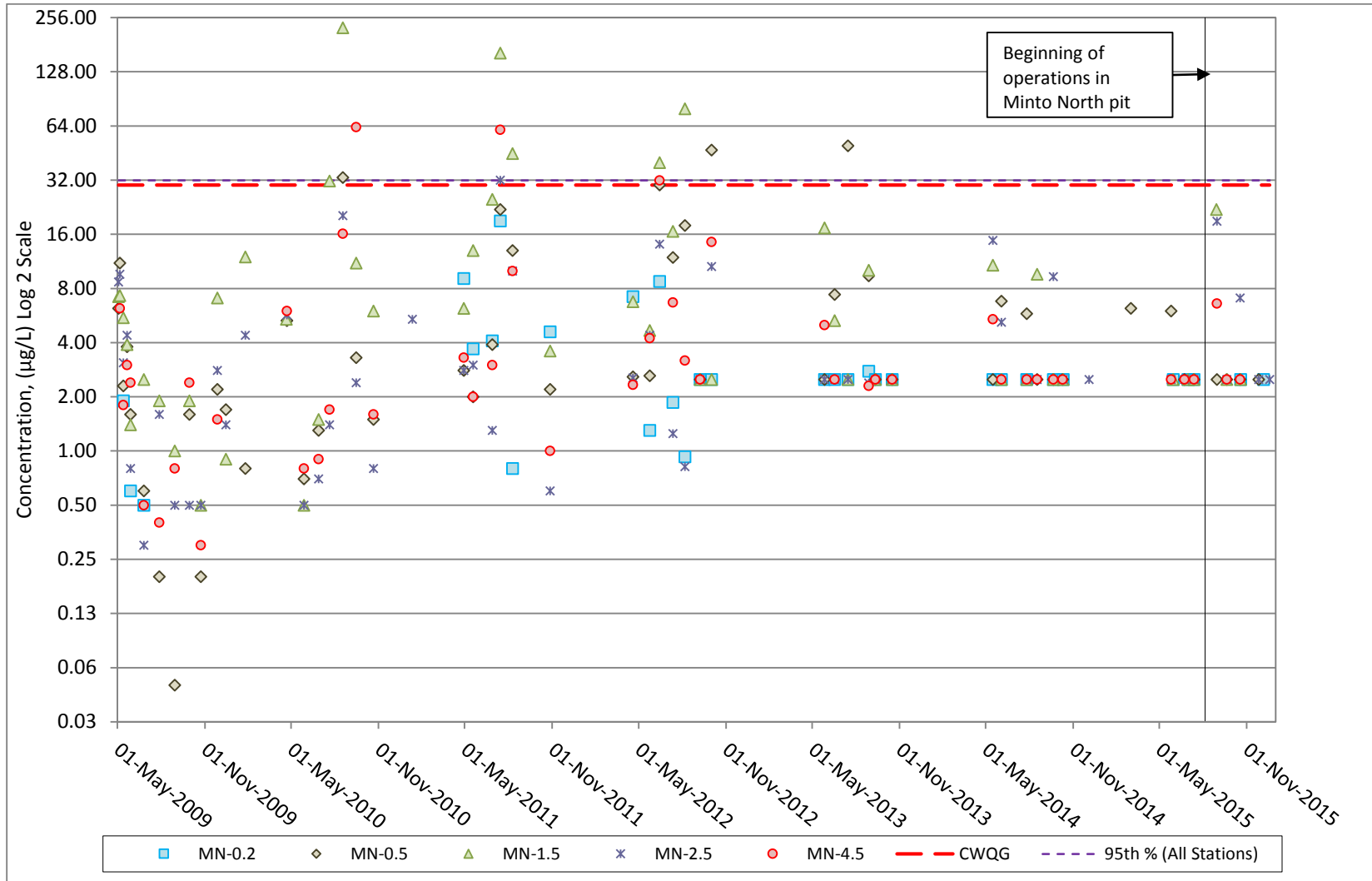


Figure 4-17: Concentrations of Total Zinc in McGinty Creek

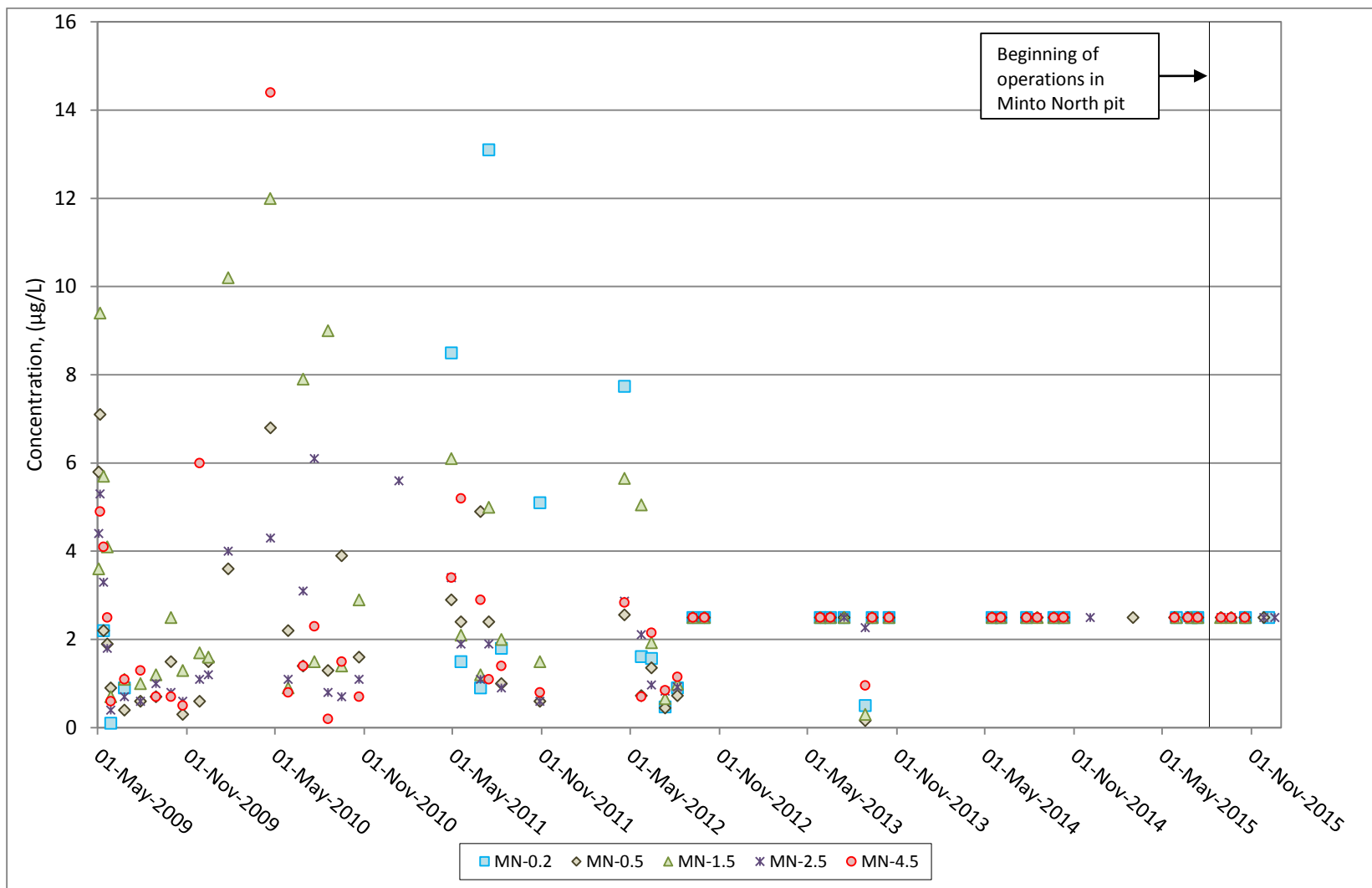


Figure 4-18: Concentrations of Dissolved Zinc in McGinty Creek

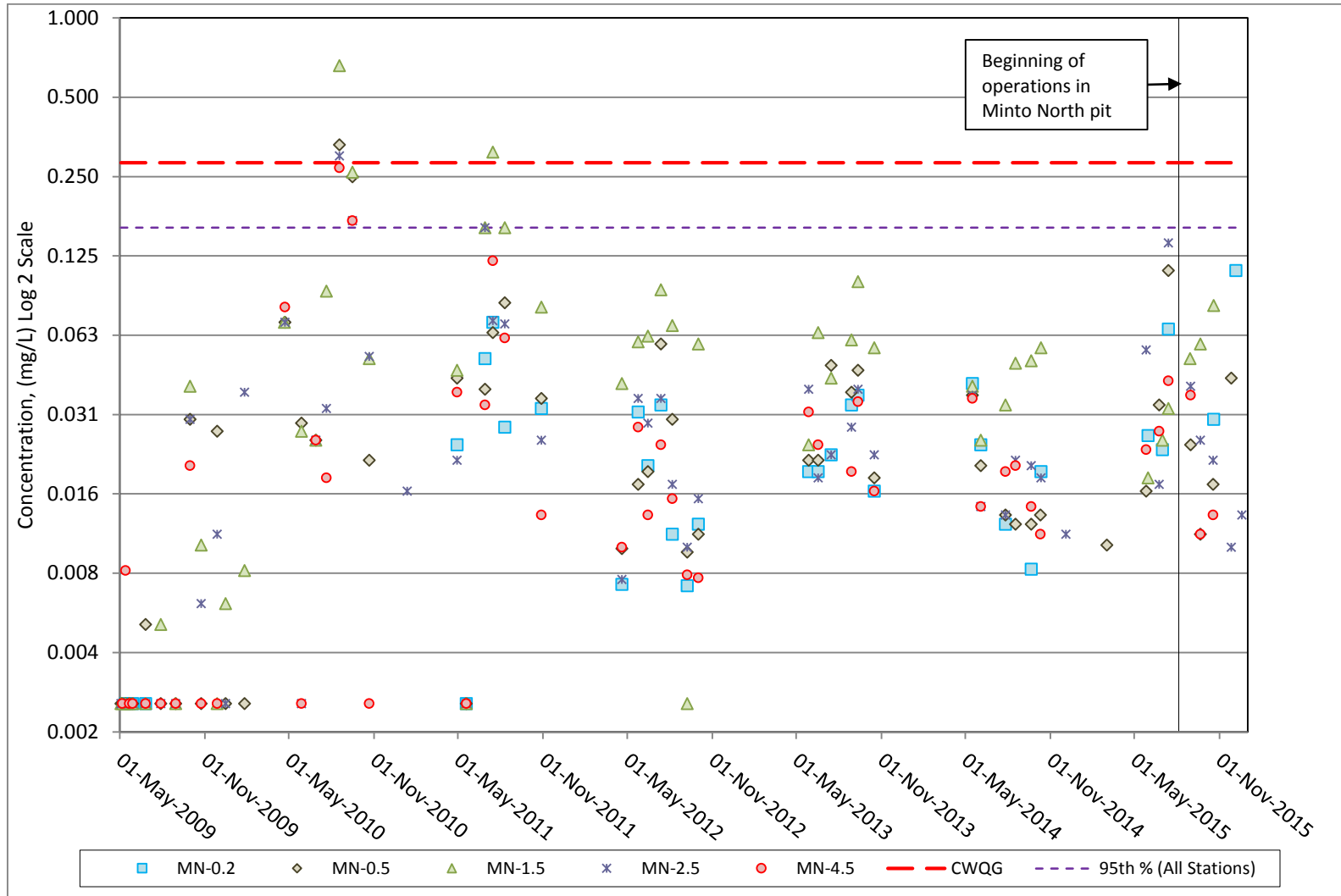


Figure 4-19: Concentrations of Ammonia in McGinty Creek

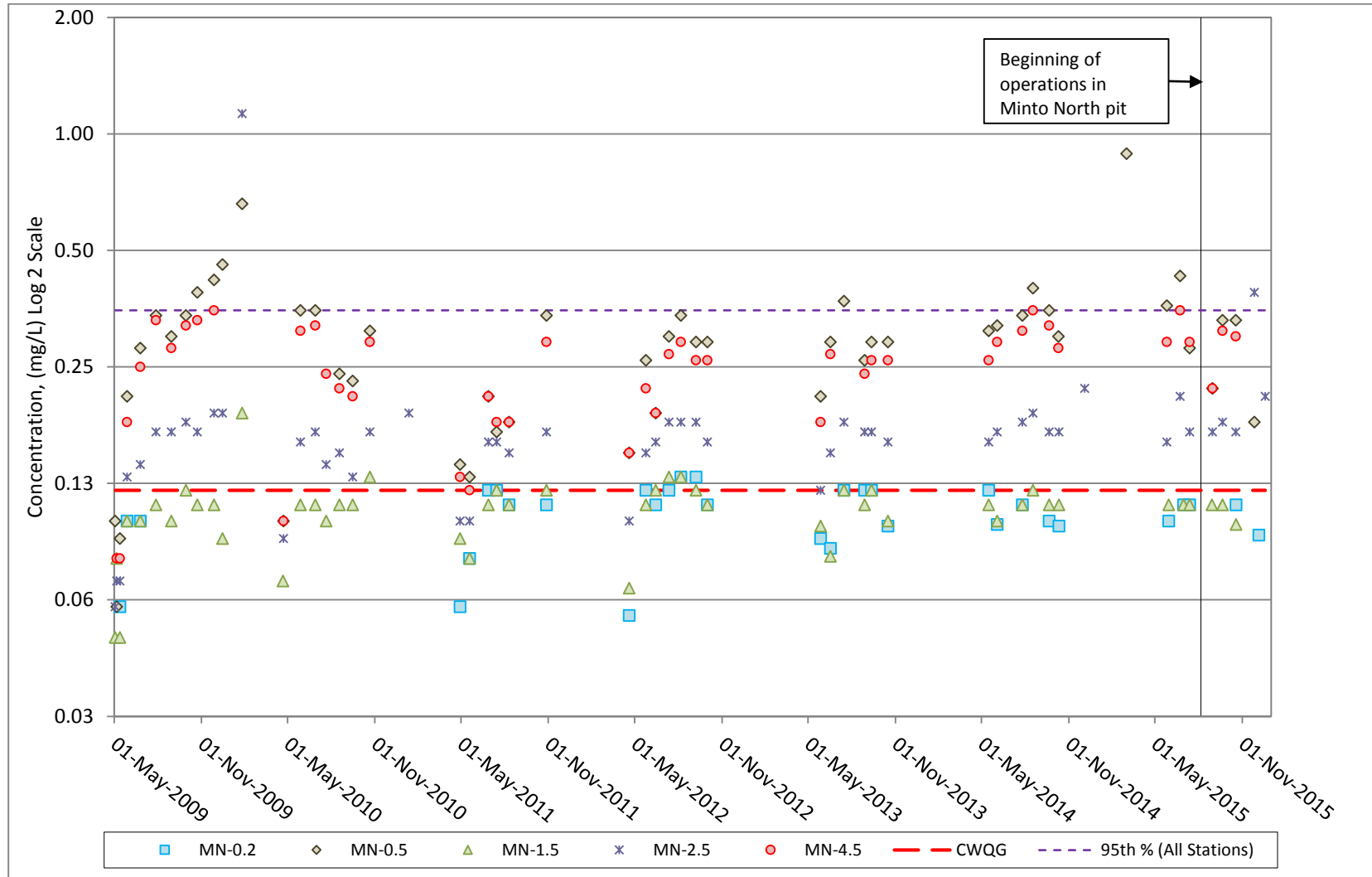


Figure 4-20: Concentrations of Fluoride in McGinty Creek

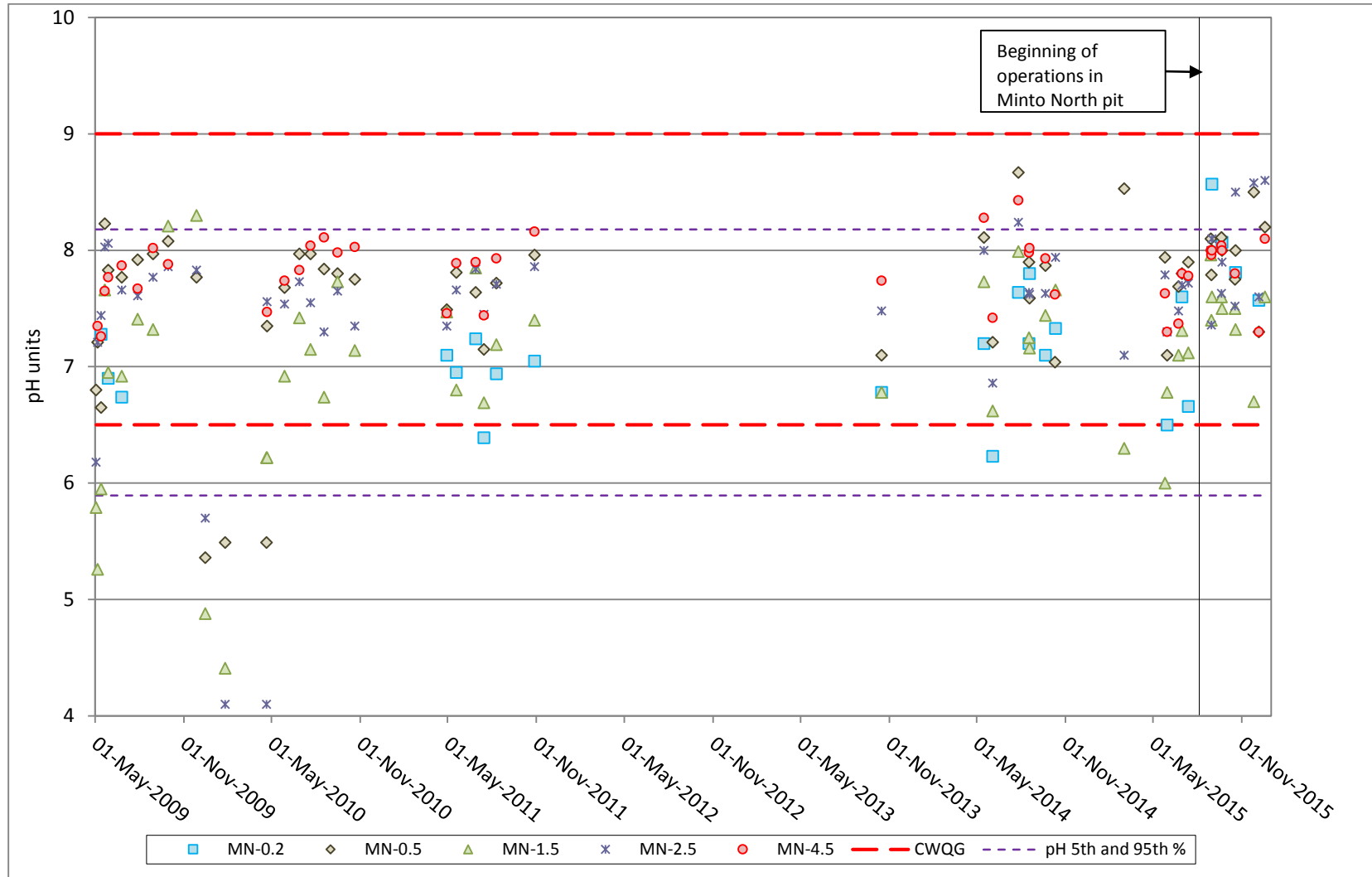


Figure 4-21: Field pH Measurements in McGinty Creek

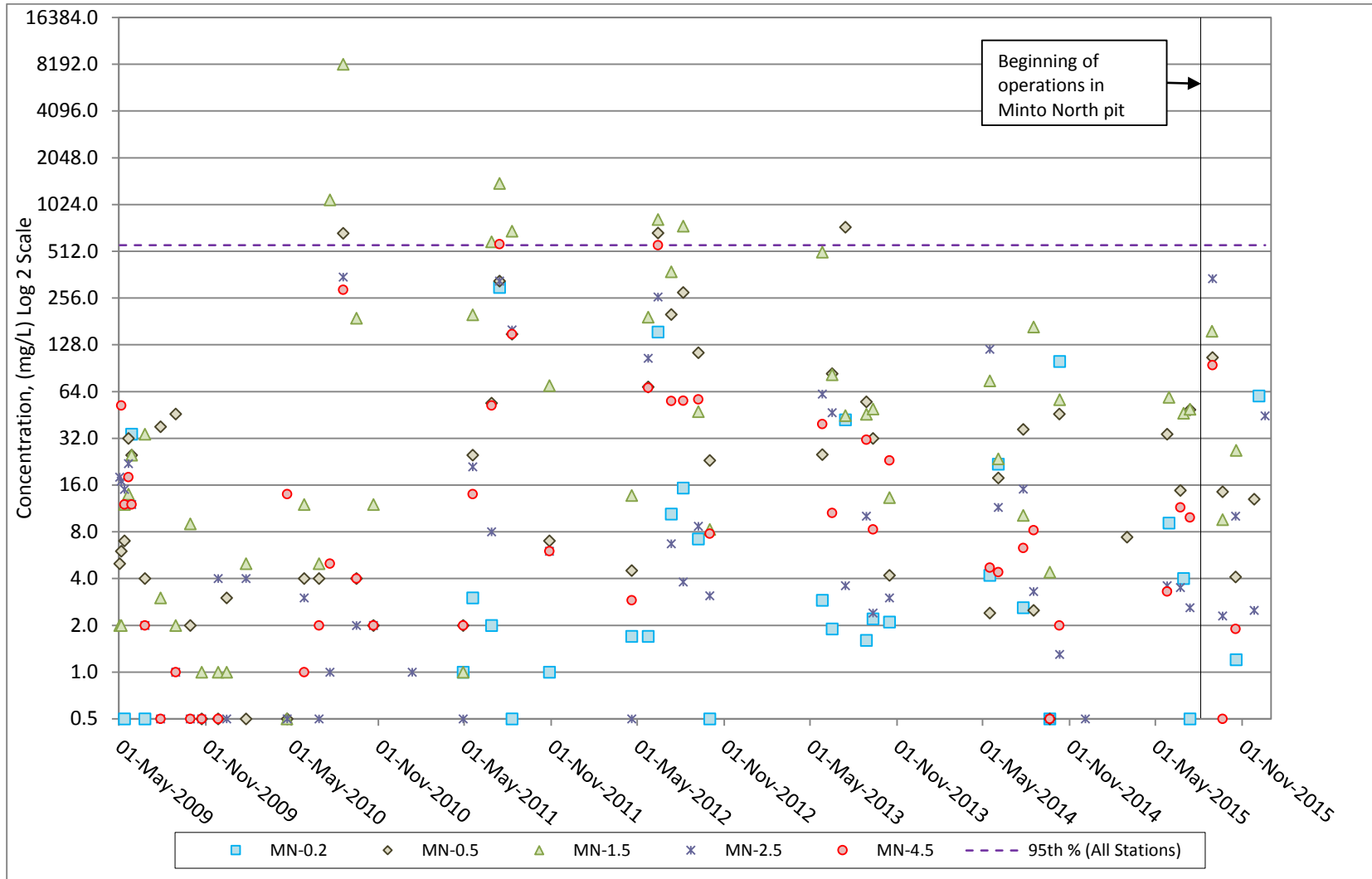


Figure 4-22: Concentrations of Total Suspended Solids in McGinty Creek

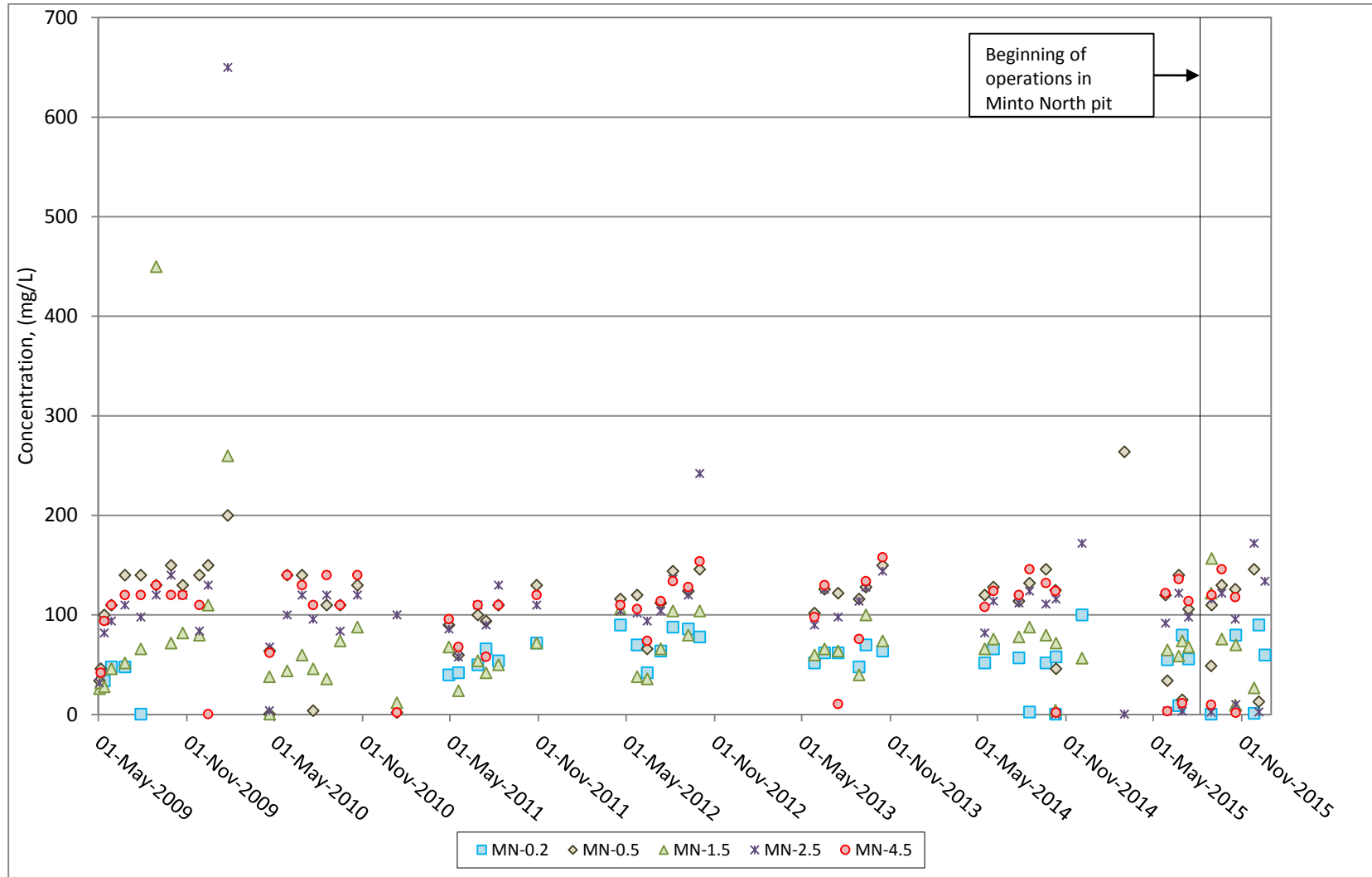


Figure 4-23: Concentrations of Total Dissolved Solids in McGinty Creek

4.2 BOXPLOTS AND MEAN CONCENTRATIONS

Boxplots depicting minimum, maximum, median, 1st and 3rd quartile values from May 2009 to July 2015 (pre-operations period) are provided for previously graphed parameters that show the 95th percentile concentration, calculated from results for all stations for the pre-operations period, above the CWQG (Figure 4-24 to Figure 4-32). Parameters that show regular exceedances of the CWQG include total aluminum, cadmium, chromium, copper, iron, lead, zinc and fluoride and are further examined below, along with TSS. To give further perspective, the boxplots are accompanied by summary tables with annual average concentrations at each station as well as average values for each month that samples were collected (Table 4-1 to Table 4-9). Parameters that have been shown to infrequently exceed the CWQG include arsenic, mercury, silver, ammonia and pH, and have been omitted from the following section.

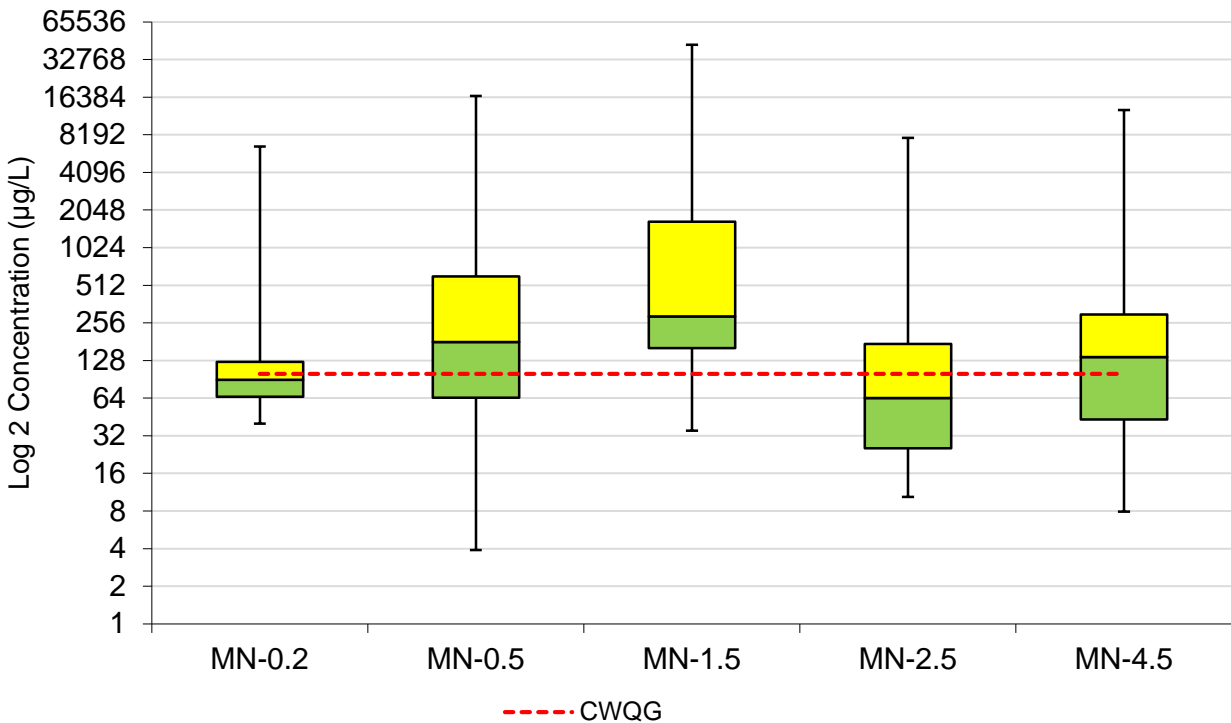


Figure 4-24: Total Aluminum Boxplot, May 2009 – July 2015

Table 4-1: McGinty Creek Annual and Monthly Mean Total Aluminum (µg/L) May 2009 – July 2015

Sample Station	Annual (all data)			January		March		April		May		June		July		August		September		October		November		December			
	n	mean	95th percentile	n	mean	n	mean	n	mean	n	mean	n	mean	n	mean	n	mean	n	mean	n	mean	n	mean	n	mean		
MN-0.2	30	337.5	676.7					2	115.0	7	98.9			6	254.7	5	1370.9	3	103.7	3	55.2	4	86.2				
MN-0.5	48	991.5	3676.5	1	3.9	1	65.0	3	106.1	11	240.4	7	928.3	6	4338.3	6	1632.1	5	258.7	6	152.8	1	12.0	1	19.5		
MN-1.5	48	2966.6	12335.0	1	67.3			3	144.0	11	1192.8	7	2120.9	7	7176.0	6	9769.2	5	647.2	6	293.9	1	47.9	1	35.2		
MN-2.5	50	458.0	2732.0	2	17.6			3	54.1	11	501.0	7	406.9	7	1134.9	6	975.5	5	50.9	6	36.7	1	25.2	2	22.5		
MN-4.5	44	635.9	2834.0					3	115.0	10	249.6	7	647.2	6	2278.6	6	979.8	5	105.6	6	86.6	1	8.5				

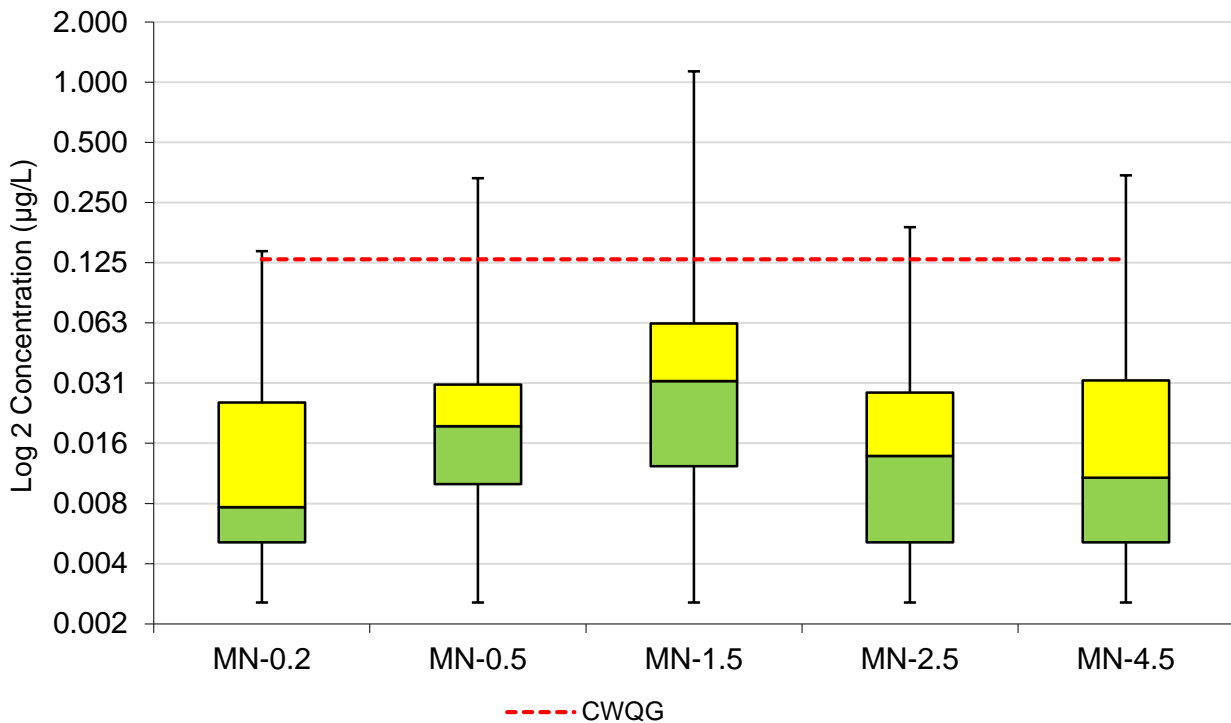


Figure 4-25: Total Cadmium Boxplot, May 2009 – July 2015

Table 4-2: McGinty Creek Annual and Monthly Mean Total Cadmium (µg/L) May 2009 – July 2015

Sample Station	Annual (all data)		January		March		April		May		June		July		August		September		October		November		December		
	n	mean	95th percentile	n	mean	n	mean	n	mean	n	mean	n	mean	n	mean	n	mean	n	mean	n	mean	n	mean		
MN-0.2	30	0.023	0.091					2	0.052	7	0.015	6	0.036	5	0.034	3	0.014	3	0.005	4	0.008				
MN-0.5	48	0.042	0.194	1	0.010	1	0.02	3	0.025	11	0.024	7	0.056	6	0.088	6	0.089	5	0.011	6	0.015	1	0.026	1	0.021
MN-1.5	48	0.093	0.483	1	0.105			3	0.048	11	0.036	7	0.074	7	0.150	6	0.320	5	0.022	6	0.021	1	0.067	1	0.007
MN-2.5	50	0.029	0.125	2	0.082			3	0.028	11	0.037	7	0.026	7	0.035	6	0.038	5	0.009	6	0.009	1	0.008	2	0.010
MN-4.5	44	0.033	0.101					3	0.030	10	0.023	7	0.049	6	0.062	6	0.044	5	0.014	6	0.008	1	0.019		

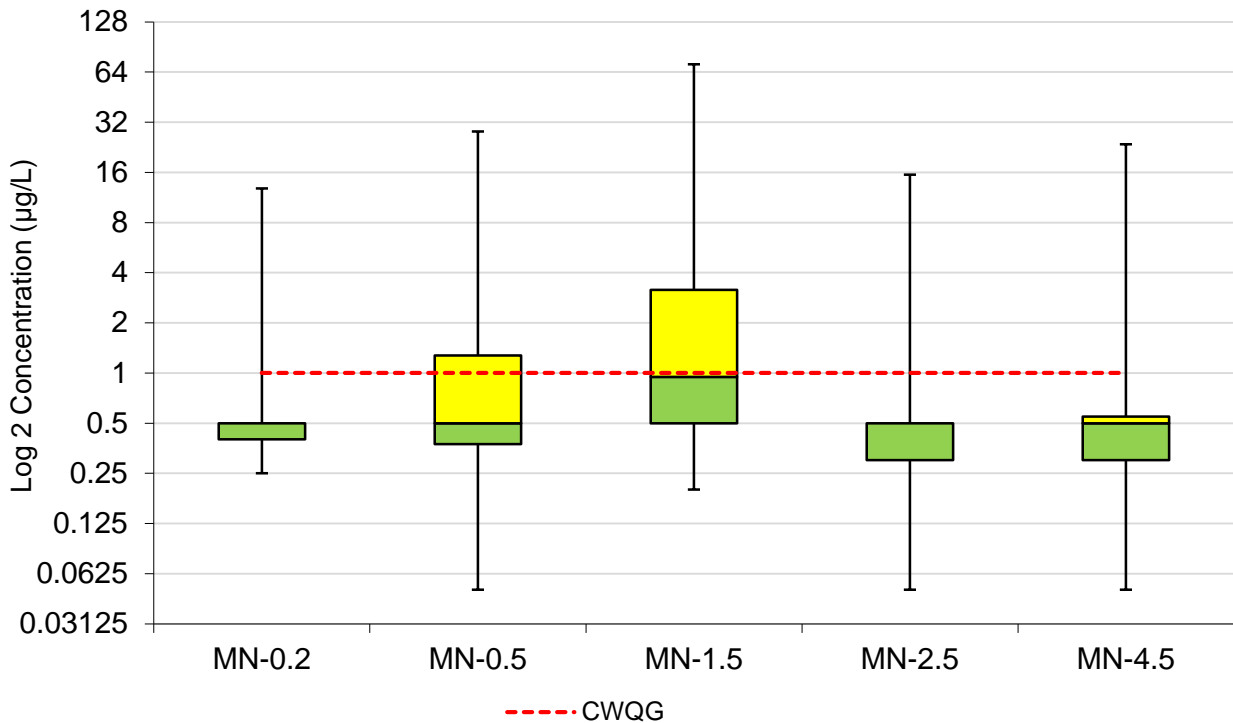


Figure 4-26: Total Chromium Boxplot, May 2009 – July 2015

Table 4-3: McGinty Creek Annual and Monthly Mean Total Chromium (µg/L) May 2009 – July 2015

Sample Station	Annual (all data)			January		March		April		May		June		July		August		September		October		November		December		
	n	mean	95th percentile	n	mean	n	mean	n	mean	n	mean	n	mean	n	mean	n	mean	n	mean	n	mean	n	mean	n	mean	
MN-0.2	30	0.9	1.4					2	0.2	7	0.4	6	0.7	5	2.9	3	0.5	3	0.5	4	0.5					
MN-0.5	48	1.9	7.2	1	0.2	1	0.50	3	0.3	11	0.5	7	1.7	6	7.6	6	3.4	5	0.7	6	0.8	1	0.2	1	0.1	
MN-1.5	48	4.7	18.7	1	0.9			3	0.3	11	2.0	7	3.5	7	11.9	6	13.3	5	1.5	6	0.8	1	0.3	1	0.3	
MN-2.5	50	1.1	4.9	2	0.5			3	0.2	11	1.1	7	0.9	7	2.5	6	2.1	5	0.4	6	0.4	1	0.2	2	0.4	
MN-4.5	44	1.3	5.5					3	0.3	10	0.6	7	1.3	6	4.3	6	2.0	5	0.4	6	0.4	1	0.2			

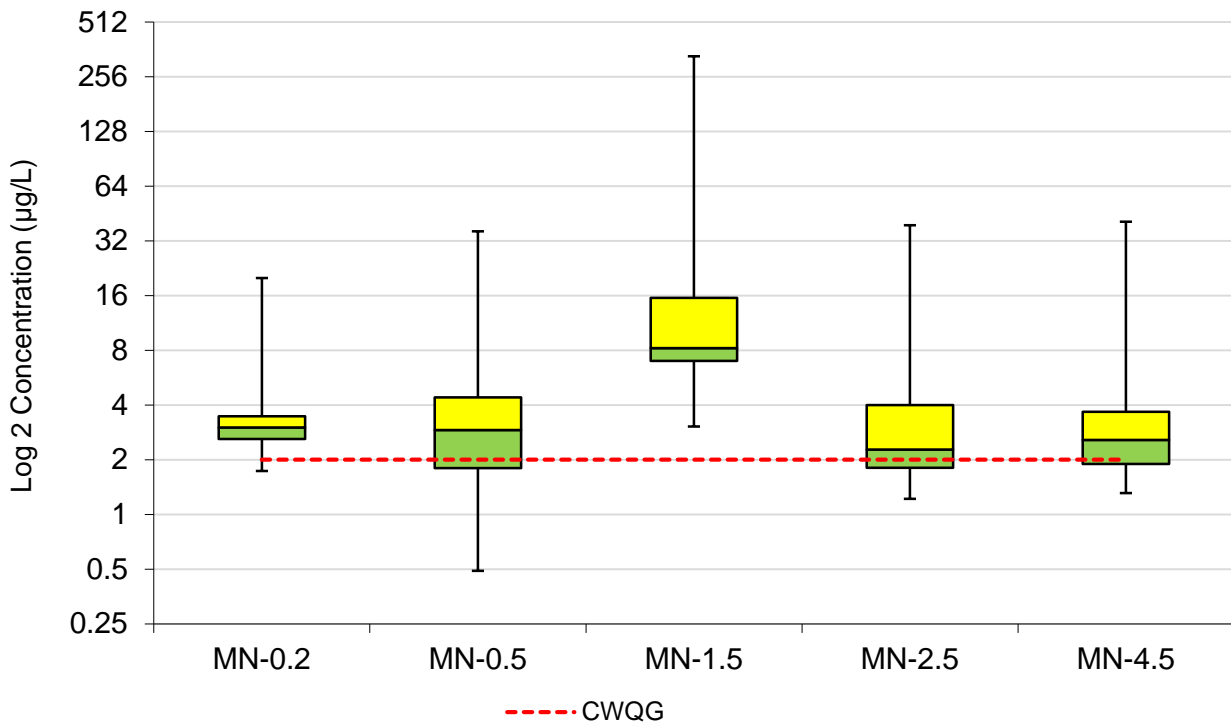


Figure 4-27: Total Copper Boxplot, May 2009 – July 2015

Table 4-4: McGinty Creek Annual and Monthly Mean Total Copper (µg/L) May 2009 – July 2015

Sample Station	Annual (all data)			January		March		April		May		June		July		August		September		October		November		December		
	n	mean	95th percentile	n	mean	n	mean	n	mean	n	mean	n	mean	n	mean	n	mean	n	mean	n	mean	n	mean	n	mean	
MN-0.2	30	3.72	7.20					2	5.65	7	3.30	6	4.04	5	5.66	3	2.43	3	2.78	4	2.23					
MN-0.5	48	5.14	20.05	1	0.49	1	8.41	3	3.47	11	3.20	7	5.87	6	11.29	6	9.46	5	2.44	6	1.97	1	0.77	1	1.63	
MN-1.5	48	27.24	115.25	1	7.94			3	7.67	11	11.65	7	24.48	7	49.02	6	89.94	5	9.87	6	6.40	1	3.31	1	3.05	
MN-2.5	50	4.36	14.24	2	2.81			3	2.41	11	4.10	7	4.44	7	6.72	6	7.44	5	2.67	6	1.80	1	1.23	2	5.86	
MN-4.5	44	4.27	12.67					3	3.21	10	3.12	7	5.46	6	8.41	6	5.74	5	2.14	6	1.98	1	1.54			

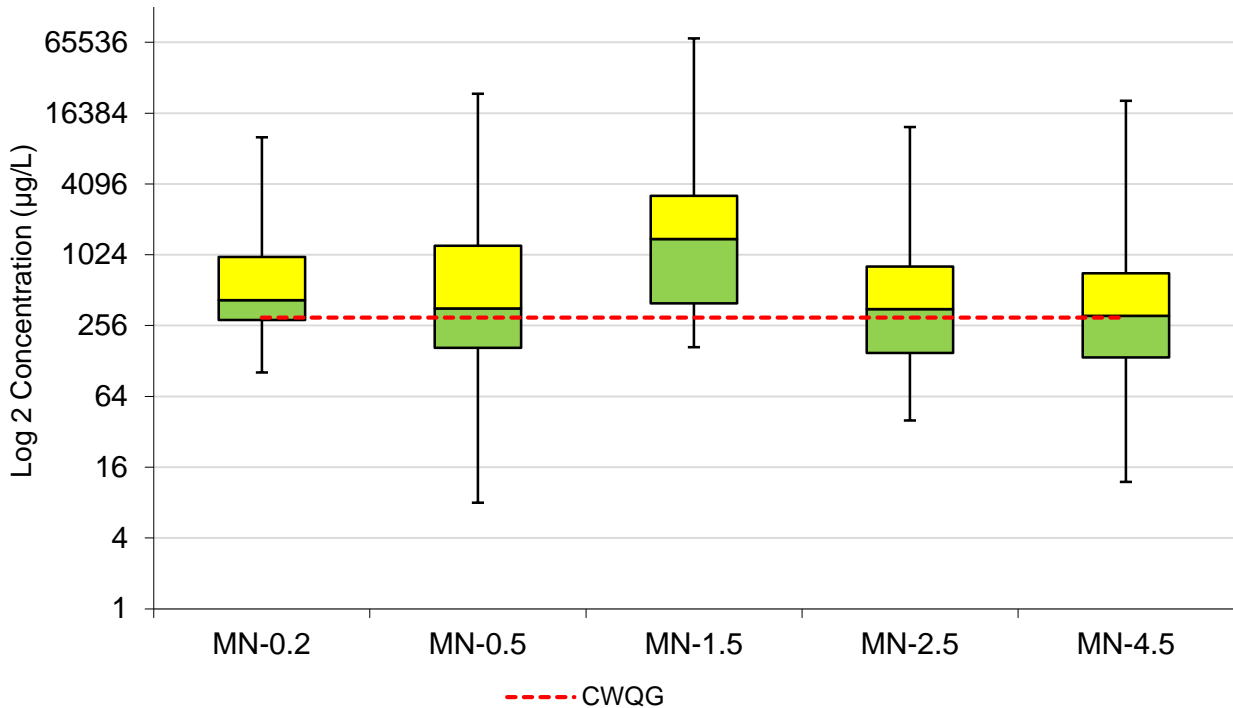


Figure 4-28: Total Iron Boxplot, May 2009 – July 2015

Table 4-5: McGinty Creek Annual and Monthly Mean Total Iron (µg/L) May 2009 – July 2015

Sample Station	Annual (all data)			January		March		April		May		June		July		August		September		October		November		December		
	n	mean	95th percentile	n	mean	n	mean	n	mean	n	mean	n	mean	n	mean	n	mean	n	mean	n	mean	n	mean	n	mean	
MN-0.2	30	995	2757					2	231	7	615	6	829	5	2555	3	546	3	693	4	904					
MN-0.5	48	1702	7997	1	8	1	97	3	186	11	501	7	1969	6	6361	6	2887	5	678	6	465	1	26	1	44	
MN-1.5	48	5964	34290	1	208			3	634	11	2019	7	4971	7	12774	6	19947	5	1996	6	1274	1	254	1	183	
MN-2.5	50	1060	5146	2	130			3	142	11	926	7	1174	7	1977	6	2424	5	512	6	451	1	128	2	59	
MN-4.5	44	1237	4937					3	210	10	571	7	1534	6	3713	6	1895	5	376	6	302	1	12			

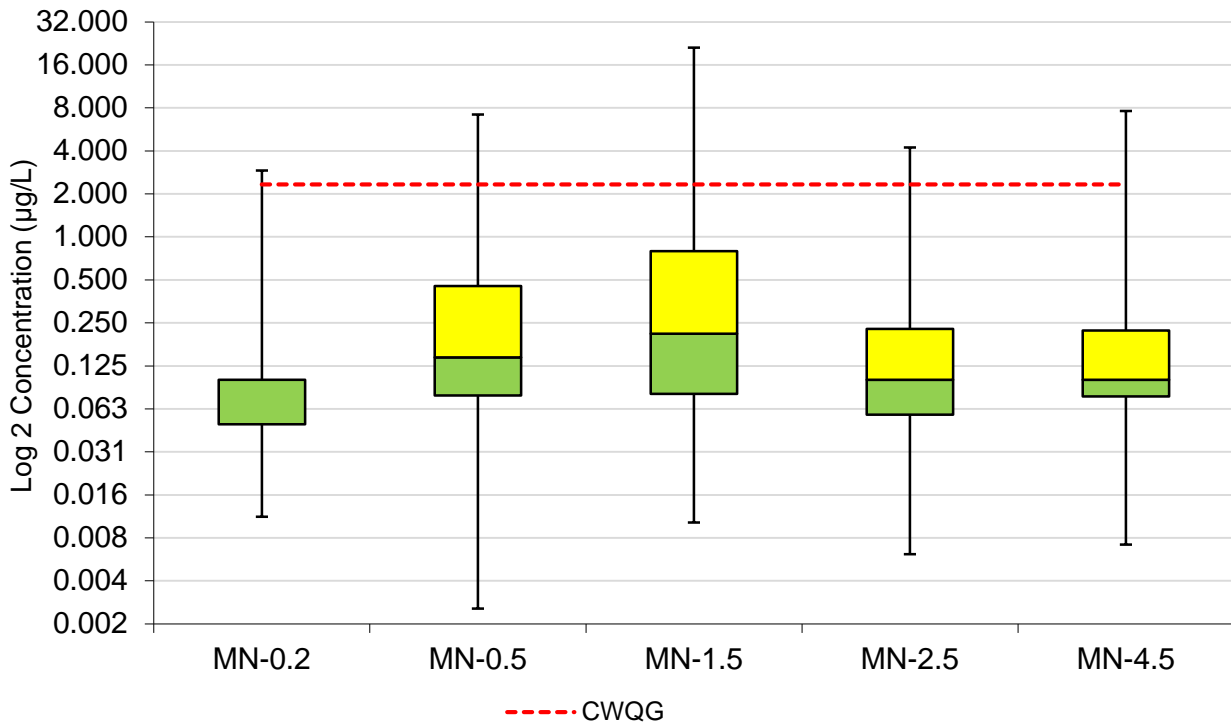


Figure 4-29: Total Lead Boxplot, May 2009 – July 2015

Table 4-6: McGinty Creek Annual and Monthly Mean Total Lead (µg/L) May 2009 – July 2015

Sample Station	Annual (all data)		January	March	April	May	June	July	August	September	October	November	December												
	n	mean	n	mean	n	mean	n	mean	n	mean	n	mean	n	mean											
MN-0.2	30	0.220			2	0.032	7	0.115	6	0.250	5	0.650	3	0.043	3	0.100	4	0.135							
MN-0.5	48	0.713	4.007	1	0.067	1	0.100	3	0.020	11	0.195	7	0.887	6	2.174	6	1.718	5	0.222	6	0.167	1	0.079	1	0.119
MN-1.5	48	1.597	7.230	1	0.398			3	0.031	11	0.519	7	1.303	7	3.782	6	5.258	5	0.377	6	0.188	1	0.230	1	0.052
MN-2.5	50	0.403	1.664	2	0.153			3	0.018	8	0.392	4	0.431	4	1.296	3	1.340	2	0.038	3	0.022	1	0.232	1	1.420
MN-4.5	44	0.487	2.122					3	0.018	11	0.465	7	0.333	7	0.784	6	0.708	5	0.075	6	0.080	1	0.232	2	0.760

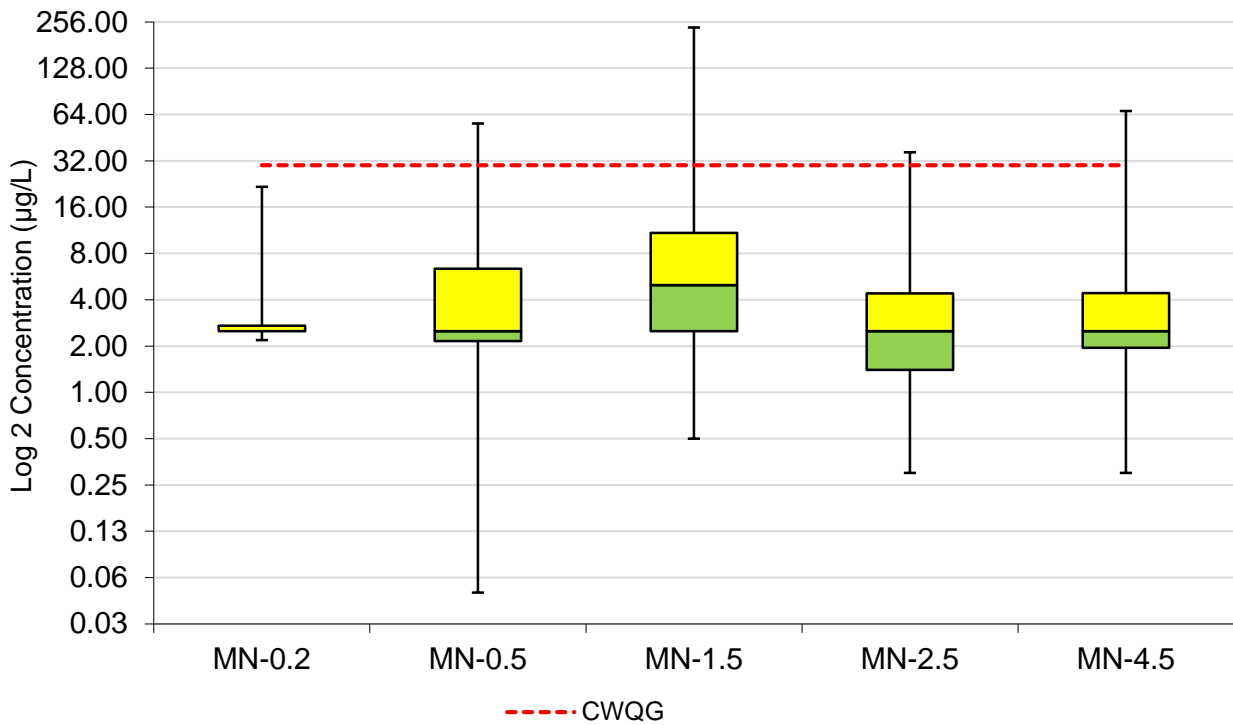


Figure 4-30: Total Zinc Boxplot, May 2009 – July 2015

Table 4-7: McGinty Creek Annual and Monthly Mean Total Zinc (µg/L) May 2009 – July 2015

Sample Station	Annual (all data)			January		March		April		May		June		July		August		September		October		November		December		
	n	mean	95th percentile	n	mean	n	mean	n	mean	n	mean	n	mean	n	mean	n	mean	n	mean	n	mean	n	mean	n	mean	
MN-0.2	30	3.5	8.9					2	8.2	7	2.1	6	3.5	5	5.7	3	1.5	3	2.5	4	3.0					
MN-0.5	48	7.3	32.1	1	0.8	1	6.2	3	3.6	11	3.8	7	7.5	6	15.4	6	12.7	5	2.5	6	9.3	1	2.2	1	1.7	
MN-1.5	48	17.1	67.6	1	12.0			3	6.1	11	6.7	7	11.3	7	31.5	6	61.8	5	4.1	6	2.9	1	7.1	1	0.9	
MN-2.5	50	4.5	14.5	2	4.9			3	3.7	11	4.9	7	3.8	7	6.3	6	6.1	5	3.4	6	2.9	1	2.8	2	2.0	
MN-4.5	44	6.7	29.5					3	3.9	10	3.3	7	6.3	6	12.5	6	5.8	5	14.6	6	3.7	1	1.5			

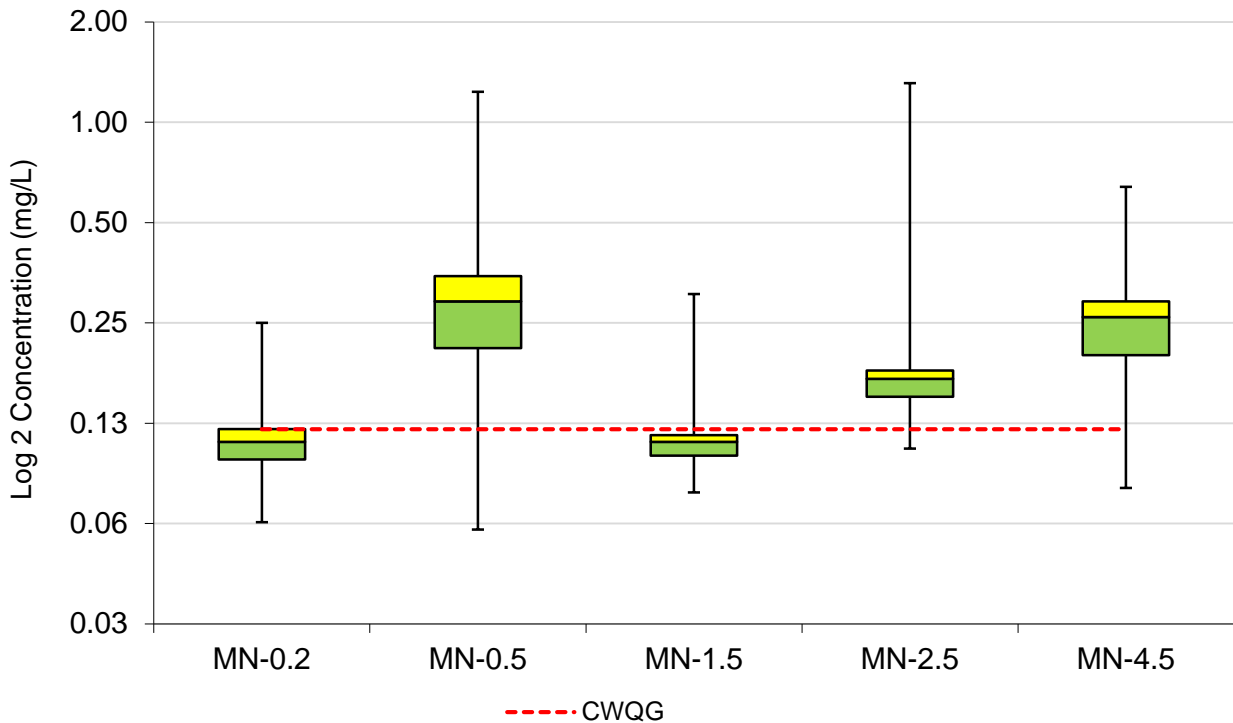


Figure 4-31: Fluoride Boxplot, May 2009 – July 2015

Table 4-8: McGinty Creek Frequency Distribution of Fluoride (mg/L) May 2009 – July 2015

Sample Station	Annual (all data)			January		March		April		May		June		July		August		September		October		November		December		
	n	mean	95th percentile	n	mean	n	mean	n	mean	n	mean	n	mean	n	mean	n	mean	n	mean	n	mean	n	mean	n	mean	
MN-0.2	30	0.10	0.13					2	0.06	7	0.10	6	0.10	5	0.12	3	0.12	3	0.12	4	0.10					
MN-0.5	47	0.30	0.45	1	0.66	1	0.89	3	0.13	10	0.21	7	0.30	6	0.30	6	0.29	5	0.30	6	0.32	1	0.42	1	0.46	
MN-1.5	47	0.11	0.13	1	0.19			3	0.08	10	0.09	7	0.10	7	0.11	6	0.11	5	0.12	6	0.11	1	0.11	1	0.09	
MN-2.5	49	0.17	0.20	2	0.66			3	0.10	10	0.12	7	0.17	7	0.17	6	0.17	5	0.17	6	0.17	1	0.19	2	0.21	
MN-4.5	43	0.25	0.35					3	0.13	9	0.19	7	0.27	6	0.27	6	0.26	5	0.27	6	0.29	1	0.35			

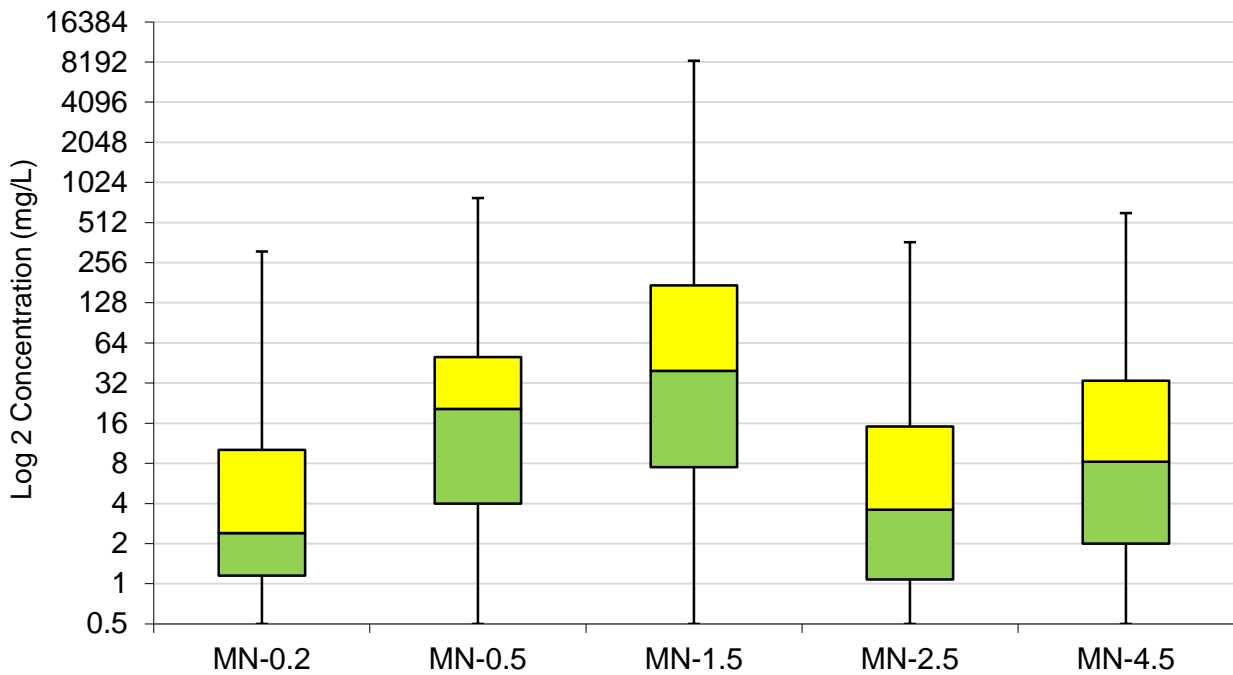


Figure 4-32: Total Suspended Solids (TSS) Boxplot, May 2009 – July 2015

Table 4-9: McGinty Creek Frequency Distribution of TSS May 2009 – July 2015

Sample Station	Annual (all data)			January		March		April		May		June		July		August		September		October		November		December		
	n	mean	95th percentile	n	mean	n	mean	n	mean	n	mean	n	mean	n	mean	n	mean	n	mean	n	mean	n	mean	n	mean	
MN-0.2	30	24.3	130.3					2	1.4	7	7.9	6	30.9	5	71.1	3	5.8	3	3.3	4	25.9					
MN-0.5	48	81.8	551.0	1	0.5	1	7.4	3	2.3	11	21.3	7	121.6	6	231.1	6	200.3	5	30.5	6	13.8	1	0.5	1	3.0	
MN-1.5	48	333.8	1002.7	1	5.0			3	5.1	11	100.0	7	229.0	7	426.6	6	1641.3	5	60.1	6	26.9	1	1.0	1	1.0	
MN-2.5	50	33.2	215.0	2	2.5			3	0.5	11	36.2	7	47.5	7	51.4	6	88.0	5	2.8	6	2.7	1	4.0	2	0.5	
MN-4.5	44	49.6	269.0					3	6.3	10	22.4	7	91.8	6	107.9	6	89.4	5	14.1	6	6.9	1	0.5			

4.3 BACKGROUND CONCENTRATIONS

Average background concentrations at each station have been calculated and provided within the previous Tables 3, 5, 7, 9 and 11. The 95th percentile for all McGinty Creek stations is also depicted for comparison on the graphs shown in Figure 4-1 through Figure 4-23 that also show the CWQG. Average and 95th percentile concentrations of select parameters at each station are summarized below in Table 4-10. Table 4-11 shows average and 95th percentile for groupings of stations on the reference tributary of McGinty Creek, the exposure tributary, and the entire McGinty Creek dataset. Except for pH and fluoride, averages and 95th percentiles are substantially higher for the exposure tributary than for the reference tributary, consistent with the expected influence of the natural mineralization in the upper exposure catchment area.

Table 4-10: Background Concentrations at McGinty Creek Stations, May 2009 – July 2015

Parameter	Units	MN-0.2		MN-0.5		MN-1.5		MN-2.5		MN-4.5	
		Average	95th percentile	Average	95th percentile	Average	95th percentile	Average	95th percentile	Average	95th percentile
pH (field)	pH units	6.9	7.3	7.5	8.0	6.9	8.1	7.4	8.0	7.8	8.1
TSS (mg/L)	mg/L	24.3	130.3	81.8	551.0	333.8	1002.7	33.2	215.0	49.6	269.0
Total Aluminum	µg/L	337.5	676.7	991.5	3676.5	2966.6	12335.0	458.0	2732.0	635.9	2834.0
Total Arsenic	µg/L	0.71	1.84	0.99	3.47	1.58	5.80	0.68	2.06	0.78	1.95
Total Cadmium	µg/L	0.023	0.091	0.042	0.194	0.093	0.483	0.029	0.125	0.033	0.101
Total Chromium	µg/L	0.9	1.4	1.9	7.2	4.7	18.7	1.1	4.9	1.3	5.5
Total Copper	µg/L	3.72	7.20	5.14	20.05	27.24	115.25	4.36	14.24	4.27	12.67
Total Iron	µg/L	995	2757	1702	7997	5964	34290	1060	5146	1237	4937
Total Lead	µg/L	0.220	0.729	0.713	4.007	1.597	7.230	0.403	1.664	0.487	2.122
Total Mercury	µg/L	0.005	0.005	0.006	0.01	0.007	0.025	0.006	0.009	0.005	0.005
Total Silver	µg/L	0.008	0.027	0.009	0.033	0.030	0.095	0.010	0.036	0.009	0.035
Total Zinc	µg/L	3.5	8.9	7.3	32.1	17.1	67.6	4.5	14.5	6.7	29.5
Ammonia	mg/L	0.024	0.059	0.041	0.183	0.076	0.288	0.040	0.165	0.036	0.155
Fluoride	mg/L	0.10	0.13	0.30	0.45	0.11	0.13	0.17	0.20	0.25	0.35

Table 4-11: Background Concentrations of McGinty Creek Watershed, May 2009 – July 2015

Parameter	Units	Reference Tributary (MN-0.2 & MN-0.5)		Exposure Tributary (MN-1.5 & MN-2.5)		All Stations	
		Average	95th percentile	Average	95th percentile	Average	95th percentile
pH (field)	pH units	7.4	8.2	7.2	8.0	7.4	8.2
TSS (mg/L)	mg/L	59.7	304.5	180.4	698.0	111.5	560.5
Total Aluminum	µg/L	740.0	3571.5	1686.7	6302.0	1140.9	5448.5
Total Arsenic	µg/L	0.88	2.94	1.12	4.03	0.97	3.37
Total Cadmium	µg/L	0.034	0.152	0.060	0.196	0.045	0.162
Total Chromium	µg/L	1.5	6.6	2.8	11.3	2.1	7.7
Total Copper	µg/L	4.59	16.71	15.56	48.65	9.41	28.28
Total Iron	µg/L	1430	6891	3462	12315	2297	9173
Total Lead	µg/L	0.523	2.919	0.988	4.094	0.723	3.753
Total Mercury	µg/L	0.005	0.010	0.006	0.02	0.006	0.010
Total Silver	µg/L	0.012	0.044	0.018	0.069	0.015	0.050
Total Zinc	µg/L	5.9	23.2	10.7	33.2	8.2	31.9
Ammonia	mg/L	0.031	0.072	0.050	0.162	0.039	0.160
Fluoride	mg/L	0.22	0.42	0.14	0.19	0.19	0.35

5 SUMMARY OF FINDINGS

Parameters that show regular exceedances of the CWQG include total aluminum, cadmium, chromium, copper, iron, lead, zinc and fluoride. Concentrations are typically highest at station MN-1.5, which is located on the upper east arm of McGinty Creek, just downstream of the Minto North deposit. This finding is consistent the expected influence of the natural mineralization in the area.

Parameter concentrations appear lowest in the winter, rising again in the spring with peak levels recorded in July and August during precipitation/runoff events. Most parameters do not appear to show a significant change in concentration during the operations period compared to pre-operations, however, this comparison is made using a limited dataset for the operation period (n=2 to 5 depending on stations). Further analyses will be made when a larger dataset is available for the operation period.

6 CLOSING STATEMENT

Alexco Environmental Group Inc. of Whitehorse, Yukon has prepared this McGinty Creek Water Quality Characterization for the Minto Project for the exclusive use of Minto Explorations Ltd., and is based on data and information collected by both AEG and Minto Explorations Limited. AEG is not responsible for the quality or integrity of the data collected by third parties, and this report provides only data reporting and analysis for those data (identified within the report). Alexco Environmental Group Inc. has followed standard professional procedures in conducting the investigations and in preparing the contents of this report. The material in this report reflects Alexco Environmental Group's best judgment in light of the information available at the time of the preparation of this report. Any use that a third party makes of this report, or any reliance on decisions to be made based on it, is the responsibility of the third parties. Alexco Environmental Group Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report. Alexco Environmental Group Inc. believes that the contents of this report are substantively correct.

The information and data contained in this report, including without limitation, the results of any sampling and analyses conducted by Alexco Environmental Group, are based solely on the conditions observed at the time of the field assessment and have been developed or obtained through the exercise of Alexco Environmental Group's professional judgment and are set to the best of Alexco Environmental's knowledge, information, and belief. Although every effort has been made to confirm that all such information and data is factual, complete and accurate, Alexco Environmental Group Inc. offers no guarantees or warranties, either expressed or implied, with respect to such information or data.

Alexco Environmental Group Inc. shall not by the act of issuing this report be deemed to have represented that any sampling and analyses conducted by it have been exhaustive or will identify all pertinent conditions at the site, and persons relying on the results thereof do so at their own risk.

7 REFERENCES

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- CCME (Canadian Council of Ministers of the Environment). 1999. Canadian Environmental Quality Guidelines. Canadian Council of Ministers of the Environment, Winnipeg. With Updates.
- Minnow Environmental Inc. 2010a. Relationship between metals and total suspended solids. Prepared for Minto Explorations Ltd. May 21, 2010.
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APPENDIX A

MCGINTY CREEK WATER QUALITY DATA TABLES

McGinty Creek Surface Water Quality, MN-0.5, May 2009 - December 2015

Sample Date	pH (field)	pH (lab)	Conductivity (field)	Specific Conductivity (field)	Conductivity (lab)	Temperature (field)	Dissolved Oxygen (field)	Dissolved Oxygen (lab)	ORP (field)	Discharge (Flow)	Total Suspended Solids	Total Dissolved Solids (field)	Total Dissolved Solids (lab)	Hardness (from total)	Hardness (from dissolved)	Alkalinity, total	Alkalinity, bicarbonate HCO3	Chloride	Fluoride	Sulphate, dissolved	Cyanide, total	Cyanide, Weak Acid Dissociable	Ion Balance	Ammonia (N)	Nitrite (N)	Nitrate (N)	Nitrite & Nitrate, as N	Dissolved Organic Carbon	Total Organic Carbon	Aluminum (Al), total	Antimony (Sb), total	Arsenic (As), total	Barium (Ba), total
	pH units	pH units	µS/cm	µS/cm	µS/cm	C	mg/L	%	mV	m3/s	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	ratio	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L
	6.5-9	6.5-9															120	0.12			0.005		0.282	0.06	3			*		5			
1-Oct-12		8.04			187						23.2	138	91	89.9	88.9	109	0.84	0.29	5.69	<0.00050	<0.00050		0.011	<0.0050	0.077	0.077	12.4	13	101	<0.50	0.57	49.3	
1-Oct-12		8.01			187						23.1	146	94.4	90.7	88.3	108	1.1	0.29	6.17	<0.00050	<0.00050		0.011	<0.0050	0.077	0.077	12.2	13	118	<0.50	0.66	51.9	
27-May-13		7.78			116						25.5	100	59.2	56.4	52	63.4	1.2	0.21	<0.50	<0.00050		0.035	<0.0050	<0.020	<0.020	15.3	15.4	591	<0.50	0.69	43.6		
27-May-13		7.81			117						25.2	102	59.5	57.4	52.9	64.6	1.2	0.21	<0.50	<0.00050		0.021	<0.0050	<0.020	<0.020	13	15.2	612	<0.50	0.68	43.9		
17-Jun-13		7.89			171						83.4	126	91.1	79.9	78.4	95.6	1.1	0.29	7.27	0.00114	0.00075		0.021	<0.0050	0.058	0.058	9.15	11.5	1880	<0.50	1.56	80.9	
15-Jul-13		7.94			203						737	118	160	96.5	95.3	116	1.4	0.37	8.25	0.00082		0.048	0.0051	0.081	0.086	9.03	10.4	####	0.63	7.97	310		
15-Jul-13		7.98			203						732	122	150	97.9	93.6	114	1.1	0.37	8.28	0.00092		0.048	<0.0050	0.14	0.14	9.2	10.3	####	0.68	7.84	319		
28-Aug-13		7.87			162						55	116	83.5	76.8	73.5	89.7	0.8	0.26	4.11	0.00109	0.00125	1.1	0.038	0.002	0.0576	0.0596	12	14.2	91.6	0.091	0.726	48.7	
11-Sep-13		7.91			185						30	118	93.2	85.3	84.4	103	0.9	0.29	7.43		0.00066		0.044	<0.050	<0.20	<0.20	11.4	12	708	<0.50	0.92	57.4	
11-Sep-13		7.78			183						32	128	96.1	87.2	82.7	101	0.81	0.29	7.55		0.00067		0.046	<0.050	<0.20	<0.20	12.3	12.3	739	<0.50	0.95	63.3	
16-Oct-13		7.92			184						4.2	150	91.8	88.6	85.4	104	1.3	0.29	8.17		0.00086		0.018	<0.0050	0.087	0.087	11.3	11.6	81.1	<0.50	0.5	45.8	
16-Oct-13	7.1			153.3		0	14.18	96.9	-16.6																								
16-May-14	8.11	7.95	96.1	184	155	0.1	14.03	96.2	173.1		2.4	120	82.4	74.6	70.3	85.8	1	0.31	5.43		0.00127		0.037	<0.0050	<0.020	<0.020	14.5	16.8	89.9	<0.50	0.51	41.9	
3-Jun-14	7.21	8.03	108.3	204.8	175	0.3	16.61	115	81.2		17.8	128	86.1	80.8	80.1	97.8	1	0.32	7.59		0.00123		0.02	<0.0050	0.063	0.063	11.2	12.5	345	<0.50	0.59	48.6	
26-Jul-14		8.01			198						49.2	126	107	92.9	88.8	108	0.74	0.34	8.62		0.00079		0.019	<0.0050	0.064	0.064	11.7	11.3	910	<0.50	0.84	67	
26-Jul-14	8.67	7.99	124.5	205.7	198	4.3	12.31	94.6	125.5		36.6	114	102	90.6	89.2	109	0.85	0.34	8.9		0.00076		0.013	<0.0050	0.071	0.071	11.9	11.1	1020	<0.50	1.03	71.5	
17-Aug-14	7.9	8.13	158.6	267.5	239	3.7	13.04	98.9	94		2.5	132	131	114	110	134	1.7	0.4	12		<0.00050		0.012	<0.0050	0.086	0.086	7.89		90.7	<0.50	0.53	59.8	
20-Sep-14		8.04			216						1.2	138	104	100	102	125	0.59	0.35	10.2		0.00091		0.012	<0.0050	0.048	0.048	9	10.7	34.1	<0.50	0.46	48.5	
20-Sep-14	7.87	8.09	134.9	245.9	214	1.4	13.29	94.7	215.1		<1.0	146	103	101	97.9	119	1.4	0.35	10.1		0.0008		0.012	<0.0050	0.046	0.046	9.23	10.8	35.1	<0.50	0.39	47	
10-Oct-14	7.04	7.76	108.7	219.1	190	-1.4	14.38	94.7	179.8		46	125	90.5	92.4	82	100	1	0.3	9.62		0.00091		0.013	<0.0050	0.076	0.076	11.4	10.9	598	<0.50	0.85	60.2	
2-Mar-15	8.53	8.13	207.2	397.7	425	-0.1	4.99	34	184.2		7.4	264	198	184	196	239	1.8	0.89	31.5				0.01	<0.0050	<0.020	<0.020	5.67		65	<0.50	0.44	76.9	
2-Mar-15		8.13			425						3	254	207	190	186	227	2	0.88	31.4				0.038	<0.0050	<0.020	<0.020	5.45		43.7	<0.50	0.52	79	
26-May-15		7.97			215						39.5	130	112	102	93	114	<0.50	0.36	11.5							7.37	6.79	374	<0.50	0.59	60.8		
26-May-15	7.94	7.96	112	214	214	0	14.34	98.1	116.4		34	120	109	102	92	112	1.1	0.36	12.4		0.00062		0.016	<0.0050	<0.020	<0.020	6.54	7.43	377	<0.50	0.55	62.4	
23-Jun-15	7.69	8.25	132.1	233.3	235	2.3	12.68	92.4	140.5		14.8	140	119	116	107	131	0.87	0.43	13.6				0.034	<0.0050	0.112	0.112			227	<0.50	0.53	61.1	
13-Jul-15	7.9	7.82	91.2	145.8	150	5.4	11.96	94.4	139.2		48.9	106	77.2	69.2	68.6	83.6	0.69	0.28	4.4				0.11	<0.0050	0.032	0.032			806	<0.50	0.81	54.9	
30-Aug-15	7.79	7.73	64.3	113.8	120	2.3	12.9	93.9	125.7		106	110	75.5	57.7	51.4	62.7	1.2	0.22	<0.50			0.024	<0.0050	0.021	0.021	23		1070	<0.50	1.17	71.5		
20-Sep-15	8.11	8.06	103.2	184.2	183	2	13.29	96.6	162.5		14.5	130	92.6	85.8	83.7	102	1.2	0.33	9.08				0.011	<0.0050	0.048	0.048	14		29.5	<0.50	0.45	41.5	
18-Oct-15		7.98			194						3	140	96.7	96.6	85.5	104	1.1	0.32	8.02				0.021	<0.0050	0.084	0.084	11.3		39.4	<0.50	0.31	42.9	
18-Oct-15	7.75	7.97	100.8	193.8	194	0	13.26	90.6	79.3		4.1	126	93.9	94.9	86.5	106	1.2	0.33	8.16				0.017	<0.0050	0.082	0.082	11		24.9	<0.50	0.4	38	
26-Nov-15	8.5	7.75	142.6	273.5	226	-0.1	8	54.7	112.4		13	146	110	112	105	128	1	0.18	5.43				0.043	<0.0050	0.053	0.053	9.38		158	<0.50	0.45	51.4	

* Results in red exceed their respective guideline

McGinty Creek Surface Water Quality, MN-0.5, May 2009 - December 2015

Sample Date	Barium (Ba), dissolved Beryllium (Be), dissolved Bismuth (Bi), dissolved Boron (B), dissolved Cadmium (Cd), dissolved Calcium (Ca), dissolved Chromium (Cr), dissolved Cobalt (Co), dissolved Copper (Cu), dissolved Iron (Fe), dissolved Lead (Pb), dissolved Lithium (Li), dissolved Magnesium (Mg), dissolved Manganese (Mn), dissolved Mercury (Hg), dissolved Molybdenum (Mo), dissolved Nickel (Ni), dissolved Phosphorous (P), dissolved Potassium (K), dissolved Selenium (Se), dissolved Silicon (Si), dissolved Silver (Ag), dissolved Sodium (Na), dissolved Strontium (Sr), dissolved Sulphur (S), dissolved Thallium (Tl), dissolved Tin (Sn), dissolved Titanium (Ti), dissolved Uranium (U), dissolved Vanadium (V), dissolved Zinc (Zn), dissolved Zirconium (Zr), dissolved																																
	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
1-Oct-12	45.1	<0.10	<1.0	<50	<0.010	24.7	1.6	<0.50	1.91	419	<0.20	<5.0	6.86	38.6	<0.010	<1.0	1.5	17	0.626	0.21	6230	<0.020	4.86	176	3.1	<0.050	<5.0	<5.0	0.39	<5.0	<5.0	<0.50	
1-Oct-12	45.7	<0.10	<1.0	<50	<0.010	25.5	<1.0	<0.50	2.61	433	<0.20	<5.0	6.54	39.3	<0.010	<1.0	1.6	17	0.616	0.17	6270	<0.020	4.59	176	<3.0	<0.050	<5.0	<5.0	0.39	<5.0	<5.0	<0.50	
27-May-13	33	<0.10	<1.0	<50	<0.010	16	<1.0	<0.50	1.8	329	<0.20	<5.0	4.03	51	<0.010	<1.0	<1.0	18	0.849	0.12	3590	<0.020	2.9	121	<3.0	<0.050	<5.0	<5.0	0.19	<5.0	<5.0	<0.50	
27-May-13	33.2	<0.10	<1.0	<50	<0.010	16.3	<1.0	<0.50	1.75	335	<0.20	<5.0	4.06	50.7	<0.010	<1.0	1	19	0.868	0.13	3760	<0.020	2.96	120	<3.0	<0.050	<5.0	<5.0	0.19	<5.0	<5.0	<0.50	
17-Jun-13	44.6	<0.10	<1.0	<50	<0.010	22.6	<1.0	<0.50	1.46	212	<0.20	<5.0	5.71	57.3	<0.010	1.1	<1.0	12	0.722	0.16	5360	<0.020	4.38	158	<3.0	<0.050	<5.0	<5.0	0.41	<5.0	<5.0	<0.50	
15-Jul-13	40.7	<0.10	<1.0	<50	<0.010	27.7	<1.0	<0.50	1.31	126	<0.20	<5.0	6.63	34.7	<0.010	1.2	1.1	12	0.694	0.21	6420	<0.020	5.13	178	<3.0	<0.050	<5.0	<5.0	0.58	<5.0	<5.0	<0.50	
15-Jul-13	41.5	<0.10	<1.0	<50	<0.010	28.4	<1.0	<0.50	1.66	133	<0.20	<5.0	6.55	35.7	<0.010	1.2	1.2	12	0.72	0.21	6590	<0.020	5.14	180	3.6	<0.050	<5.0	<5.0	0.58	<5.0	<5.0	<0.50	
28-Aug-13	44.8	0.012	<0.0050	<50	0.006	21.4	0.41	0.08	1.96	338	0.034	0.59	5.68	1.79	<0.010	0.895	1.5	11.2	0.506	0.192	5900	0.007	4.34	151	<3.0	0.002	<0.20	1.07	0.315	1.33	0.16	0.43	
11-Sep-13	46.7	<0.10	<1.0	<50	<0.010	23.1	<1.0	<0.50	1.72	420	<0.20	<5.0	6.68	26.1	<0.010	<1.0	1.4	14	0.644	0.19	5610	<0.020	4.83	170	<3.0	<0.050	<5.0	<5.0	0.4	<5.0	<5.0	<0.50	
11-Sep-13	45.3	<0.10	<1.0	<50	<0.010	23.8	<1.0	<0.50	1.81	429	<0.20	<5.0	6.75	26.4	<0.010	1	1.2	15	0.645	0.23	5680	<0.020	4.73	169	<3.0	<0.050	<5.0	<5.0	0.39	<5.0	<5.0	<0.50	
16-Oct-13	44.6	<0.10	<1.0	<50	<0.010	25.2	<1.0	<0.50	1.83	239	<0.20	<5.0	6.22	22.3	<0.010	<1.0	1.1	<10	0.571	0.19	6610	<0.020	4.63	172	3.3	<0.050	<5.0	<5.0	0.38	<5.0	<5.0	<0.50	
16-Oct-13																																	
16-May-14	39.5	<0.10	<1.0	<50	<0.010	20.5	<1.0	<0.50	1.93	154	<0.20	<5.0	5.69	11	<0.010	<1.0	1.2	14	0.82	0.23	4360	<0.020	4.13	158	3.4	<0.050	<5.0	<5.0	0.35	<5.0	<5.0	<0.50	
3-Jun-14	41.7	<0.10	<1.0	<50	<0.010	22.5	<1.0	<0.50	1.6	104	<0.20	<5.0	5.97	33	<0.010	1	<1.0	10	0.7	0.2	4620	<0.020	4.65	175	<3.0	<0.050	<5.0	<5.0	0.49	<5.0	<5.0	<0.50	
26-Jul-14	43.5	<0.10	<1.0	<50	<0.010	26.1	<1.0	<0.50	1.44	102	<0.20	<5.0	6.72	5.2	<0.010	1	<1.0	10	0.665	0.19	5600	<0.020	5.17	182	<3.0	<0.050	<5.0	<5.0	0.37	<5.0	<5.0	<0.50	
26-Jul-14	43.8	<0.10	<1.0	<50	<0.010	25	<1.0	<0.50	1.37	100	<0.20	<5.0	6.85	4.9	<0.010	1	<1.0	11	0.669	0.16	5580	<0.020	5.09	185	<3.0	<0.050	<5.0	<5.0	0.39	<5.0	<5.0	<0.50	
17-Aug-14	52.8	<0.10	<1.0	<50	<0.010	32.6	<1.0	<0.50	1.32	48.8	<0.20	<5.0	8.04	7.9	<0.010	1.2	<1.0	<10	0.881	0.18	6220	<0.020	6.07	227	5	<0.050	<5.0	<5.0	0.59	<5.0	<5.0	<0.50	
20-Sep-14	46.6	<0.10	<1.0	<50	<0.010	28.1	<1.0	<0.50	1.15	64.3	<0.20	<5.0	7.33	10.6	<0.010	1	<1.0	<10	0.808	0.18	6030	<0.020	5.26	202	3.7	<0.050	<5.0	<5.0	0.47	<5.0	<5.0	<0.50	
20-Sep-14	47.6	<0.10	<1.0	<50	<0.010	28.5	<1.0	<0.50	1.16	73.6	<0.20	<5.0	7.33	10.6	0.011	1.1	<1.0	11	0.811	0.17	5950	<0.020	5.4	205	3.3	<0.050	<5.0	<5.0	0.46	<5.0	<5.0	<0.50	
10-Oct-14	41.8	<0.10	<1.0	<50	<0.010	25.5	<1.0	<0.50	1.55	119	<0.20	<5.0	6.96	9.7	<0.010	<1.0	<1.0	10	0.631	0.17	5990	<0.020	4.98	180	3.5	<0.050	<5.0	<5.0	0.37	<5.0	<5.0	<0.50	
2-Mar-15	68.9	<0.10	<1.0	<50	<0.010	49.8	<1.0	<0.50	0.9	6.2	<0.20	<5.0	14.5	1.8	<0.010	<1.0	<1.0	14	2.96	0.63	9220	<0.020	16	354	11.9	<0.050	<5.0	<5.0	1.12	<5.0	<5.0	<0.50	
2-Mar-15	72.3	<0.10	<1.0	<50	<0.010	51.5	<1.0	<0.50	0.94	6.4	<0.20	<5.0	15	1.9	<0.010	1.2	<1.0	21	3.06	0.63	9430	<0.020	16.8	376	11.3	<0.050	<5.0	<5.0	1.15	<5.0	<5.0	<0.50	
26-May-15	49.9	<0.10	<1.0	<50	<0.010	29.1	<1.0	<0.50	0.74	47.1	<0.20	<5.0	7.24	40.3	<0.010	1	<1.0	<10	1.06	0.28	4720	<0.020	5.49	261	4.5	<0.050	<5.0	<5.0	0.76	<5.0	<5.0	<0.50	
26-May-15	50.4	<0.10	<1.0	<50	<0.010	29	<1.0	<0.50	0.71	53.3	<0.20	<5.0	7.1	41.1	<0.010	<1.0	<1.0	10	1.07	0.28	4780	<0.020	5.37	256	3.4	<0.050	<5.0	<5.0	0.74	<5.0	<5.0	<0.50	
23-Jun-15	53.7	<0.10	<1.0	<50	<0.010	33.6	<1.0	<0.50	0.72	20.4	<0.20	<5.0	7.69	10.3	<0.010	1.4	<1.0	10	0.995	0.21	6030	<0.020	5.81	243	6	<0.050	<5.0	<5.0	0.83	<5.0	<5.0	<0.50	
13-Jul-15	37	<0.10	<1.0	<50	<0.010	19.2	<1.0	<0.50	1.9	107	<0.20	<5.0	5.18	3.6	<0.010	<1.0	1.1	11	0.543	0.15	5640	<0.020	4.23	149	<3.0	<0.050	<5.0	<5.0	0.2	<5.0	<5.0	<0.50	
30-Aug-15	33	<0.10	<1.0	<50	<0.010	16	<1.0	<0.50	4.03	254	<0.20	<5.0	4.29	8.1	<0.010	<1.0	1.7	24	0.39	<0.10	6270	<0.020	3.58	109	<3.0	<0.050	<5.0	<5.0	0.13	<5.0	<5.0	<0.50	
20-Sep-15	41	<0.10	<1.0	<50	<0.010	24.4	<1.0	<0.50	1.54	128	<0.20	<5.0	6.05	6.7	<0.010	1.1	<1.0	<10	0.6	0.21	5860	<0.020	4.68	174	<3.0	<0.050	<5.0	<5.0	0.35	<5.0	<5.0	<0.50	
18-Oct-15	40	<0.10	<1.0	<50	0.014	27.4	<1.0	<0.50	1.55	104	<0.20	<5.0	6.86	6.3	<0.010	<1.0	<1.0	11	0.641	0.17	6550	<0.020	5.14	182	4.8	<0.050	<5.0	<5.0	0.38	<5.0	<5.0	<0.50	
18-Oct-15	43.6	<0.10	<1.0	<50	0.01	26.8	<1.0	<0.50	1.39	104	<0.20	<5.0	6.78	6.5	<0.010	<1.0	<1.0	12	0.668	0.15	6570	<0.020	5.25	197	3.4	<0.050	<5.0	<5.0	0.4	<5.0	<5.0	<0.50	
26-Nov-15	52.8	<0.10	<1.0	<50	<0.010	30.1	<1.0	<0.50	4.41	104	<0.20	<5.0	8.92	128	<0.010	1	1	<10	0.995	<0.10	7460	<0.020	5.45	151	<3.0	<0.050	<5.0	<5.0	0.25	<5.0	<5.0	<0.50	

* Results in red exceed their respective guideline

McGinty Creek Surface Water Quality, MN-1.5, May 2009 - December 2015

Sample Date	pH (field)	pH (lab)	Conductivity (field)	Specific Conductivity (field)	Conductivity (lab)	Temperature (field)	Dissolved Oxygen (field)	Dissolved Oxygen (lab)	ORP (field)	Discharge (Flow)	Total Suspended Solids	Total Dissolved Solids (field)	Total Dissolved Solids (lab)	Hardness (from total)	Hardness (from dissolved)	Alkalinity, total	Alkalinity, bicarbonate HCO3	Chloride	Fluoride	Sulphate, dissolved	Cyanide, total	Cyanide, Weak Acid Dissociable	Ion Balance	Ammonia (N)	Nitrite (N)	Nitrate (N)	Nitrite & Nitrate, as N	Dissolved Organic Carbon	Total Organic Carbon	Aluminum (Al), total	Antimony (Sb), total	Arsenic (As), total	Barium (Ba), total
	pH units	pH units	µS/cm	µS/cm	µS/cm	C	mg/L	%	mV	m3/s	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	ratio	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	
	6.5-9	6.5-9															120	0.12			0.005		0.282	0.06	3		*				5		
14-Jun-12		6.86			50.2						822	36	57.6	25.3	20.1	24.5	1.1	0.12	<0.50	0.00161	0.00166	NC	0.062	<0.050	<0.20	<0.20	18.8	23.9	5610	0.137	4.8	333	
12-Jul-12		7.36			76.7						379	66	48.7	36.8	30.4	37	0.96	0.13	<0.50	0.00137	0.00159	NC	0.093	<0.050	<0.20	<0.20	16.3	18.8	2640	0.106	2.47	158	
6-Aug-12		7.62			92.3						743	104	111	50.8	43.8	53.5	0.8	0.13	<0.50	0.00223	0.00211	NC	0.068	0.0147	0.041	0.056	14.6	19.3	####	0.285	5.86	614	
7-Sep-12		7.72			96.6						47.5	80	45	50.3	47.6	58	1.3	0.12	5.2	0.00053	<0.00050		<0.0050	<0.0050	0.049	0.049	17.2	17.2	263	<0.50	0.72	47.6	
1-Oct-12		7.77			97.3						8.3	104	47.5	47.6	47.4	57.8	0.9	0.11	<0.50	<0.00050	<0.00050		0.058	<0.0050	0.051	0.051	13.6	15.2	225	<0.50	0.78	45.6	
27-May-13		7.13			39.3						506	60	32.1	26.5	14	17	1	0.097	<0.50	<0.00050			0.024	<0.0050	<0.020	<0.020	18.2	19.7	5440	<0.50	2.14	115	
17-Jun-13		7.36			62.6						82.1	66	33.2	29.4	26.5	32.3	1.1	0.081	<0.50	0.00168	0.001		0.064	<0.0050	0.063	0.063	14.7	17.6	1540	<0.50	1.18	57.6	
15-Jul-13		7.48			73.9						44.9	64	36.7	35.7	32.5	39.6	0.75	0.12	<0.50	0.00112			0.043	0.0053	0.078	0.083	15.5	15.8	518	<0.50	0.94	43.6	
28-Aug-13		7.49			77.3						45.7	40	37.7	35.4	35.9	43.9	0.67	0.11	<0.50	0.00151	0.00152	1.2	0.06	<0.020	0.049	0.049	17.5	18.5	287	0.074	0.812	45.3	
11-Sep-13		7.59			88.8						49.4	100	49.1	42.4	40.5	49.4	0.81	0.12	<0.50		0.00092		0.1	<0.050	<0.20	<0.20	14.8	15.4	1360	<0.50	1.2	61	
16-Oct-13		7.47			89.5						13.3	74	45.5	43.3	42	51.2	0.82	0.1	<0.50		0.00102		0.056	<0.0050	0.049	0.049	12.5	12.7	267	<0.50	0.69	39.4	
16-Oct-13	6.78			76.6		0	13.25	90.5	-7.1																								
16-May-14	7.73	7.46	48.5	91	59.2	0.6	12.88	89.4	86.9		75	66	34.6	29.3	26	31.7	1.1	0.11	<5.0		0.00141		0.04	<0.0050	<0.020	<0.020	18.6	18.4	2070	<0.50	1.04	60.5	
3-Jun-14	6.62	7.61	99.1	187.1	97.6	0.4	17.52	120	75.9		23.6	76	36.8	33.7	36	43.9	0.88	0.1	<0.50		0.0011		0.025	<0.0050	0.045	0.045	16.9	18.8	372	<0.50	0.59	38.3	
26-Jul-14	7.99	7.63	78.6	130.2	87.1	4.2	11.6	89.3	35.7		10.2	78	45.1	39.7	40.1	48.9	0.59	0.11	<0.50		0.00085		0.034	<0.0050	<0.020	<0.020	19.2	17.6	261	<0.50	0.51	40.4	
17-Aug-14	7.25	7.65	87.9	143.9	105	4.6	12.02	93.3	28.1		167	88	58	53.3	51.2	62.5	0.54	0.12	<0.50		0.00089		0.049	<0.0050	0.034	0.034	15.6		2000	<0.50	1.1	74.4	
20-Sep-14	7.44	7.67	76.3	135.7	95.6	2.1	12.44	90.3	19.2		4.4	80	49.6	46.1	45.8	55.9	0.63	0.11	<0.50		0.00112		0.05	<0.0050	0.036	0.036	20.4	15.6	116	<0.50	0.64	35.9	
11-Oct-14		7.58			89.5						122	78	41.5	42.9	43	52.4	1.4	0.1	<0.50		0.00108		0.049	<0.0050	0.03	0.03	15.1	15.2	327	<0.50	0.81	39.8	
11-Oct-14	7.66	7.66	69.5	139.9	89.9	-1.4	12.80	84.5	35.9		56.8	72	41.5	42.9	42.7	52.1	1.3	0.11	<0.50		0.00087		0.056	<0.0050	0.031	0.031	15.6	15.3	372	<0.50	0.76	38.8	
30-May-15	6.78	7.72	51.1	87.4	87.9	3.2	11.98	89.7	133.9		58.9	65	46.8	41.3	43.6	53.2	1.4	0.11	<0.50		0.00102		0.018	<0.0050	0.039	0.039	13.3	13	288	<0.50	0.57	42.4	
30-Jun-15	7.31	7.6	46.2	77.5	76.4	4	12.77	97.4	54.4		46.5	74	39.6	37.7	37.1	45.3	0.64	0.11	<0.50				0.025	<0.0050	<0.020	<0.020			767	<0.50	0.87	44.2	
13-Jul-15	7.12	7.39	41.8	66.7	71.1	5.7	10.17	81.6	52		49.3	68	37.2	35.7	32.7	39.9	<0.50	0.11	<0.50				0.033	<0.0050	<0.020	<0.020			619	<0.50	0.62	39.8	
29-Aug-15		7.19			51.1						165	106	43.8	25.1	20	24.4	3.5	0.11	2.57				0.081	0.053	<0.20	<0.20	24		6760	<0.50	3.81	142	
29-Aug-15	7.96	7.19	29.7	52.7	51.1	2.2	13.79	100	3.9		157	122	43.9	24.7	16.8	20.4	3	0.11	2.34				0.051	0.05	<0.20	<0.20	22		6940	<0.50	3.66	142	
20-Sep-15	7.6	7.67	38.9	69.4	76.5	2	12.23	88.7	22.3		9.6	76	41.6	36	34.4	41.9	1.2	0.11	<0.50				0.058	<0.0050	0.024	0.024	18		231	<0.50	0.71	37.1	
19-Oct-15	7.32	7.78	47.4	90.9	94	0	12.57	85.9	16.5		26.8	70	44.7	41.8	42.4	51.7	0.63	0.098	<0.50				0.081	<0.0050	<0.020	<0.020	13.8		153	<0.50	0.6	33.1	

* Results in red exceed their respective guideline

McGinty Creek Surface Water Quality, MN-1.5, May 2009 - December 2015

Sample Date	Beryllium (Be), total	Bismuth (Bi), total	Boron (B), total	Cadmium (Cd), total	Calcium (Ca), total	Chromium (Cr), total	Cobalt (Co), total	Copper (Cu), total	Iron (Fe), total	Lead (Pb), total	Lithium (Li), total	Magnesium (Mg), total	Manganese (Mn), total	Mercury (Hg), total	Molybdenum (Mo), total	Nickel (Ni), total	Phosphorous (P), total	Potassium (K), total	Selenium (Se), total	Silicon (Si), total	Silver (Ag), total	Sodium (Na), total	Strontium (Sr), total	Sulphur (S), total	Thallium (Tl), total	Tin (Sn), total	Titanium (Ti), total	Uranium (U), total	Vanadium (V), total	Zinc (Zn), total	Zirconium (Zr), total	Aluminum (Al), dissolved	Antimony (Sb), dissolved	Arsenic (As), dissolved	
	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
	1500	*	1	*	300	*	0.026	73	*	1	0.25	0.8	30																						
14-Jun-12	0.465	0.0071	<50	0.318	14.7	7.08	9.52	76.7	15800	4.63	2.91	5.1	535	<0.010	0.199	11.6	1040	0.671	0.189	9890	0.0341	2.34	82.9	<10	0.0203	<0.20	106	1.01	50.7	40.1	2.02	136	0.08	0.555	
12-Jul-12	0.17	0.007	<50	0.16	12.8	3.72	3.91	34.7	7450	1.96	1.31	4.09	260	<0.010	0.324	5.23	312	0.481	0.097	8210	0.042	2.94	69.7	<10	0.015	<0.20	79.9	0.415	21.5	16.6	1.24	115	0.069	0.718	
6-Aug-12	0.789	0.012	<50	0.572	27.9	18.1	21.1	136	43600	8	6.71	9.98	1230	0.271	23		0.785	0.24	18700	0.199	3.4	176	<10	0.05	<0.20	170	1.85	102	79.8	3.08	103	0.085	0.774		
7-Sep-12	<0.10	<1.0	<50	<0.010	12.4	1	1.36	6.99	1840	<0.20	<5.0	3.42	167	<0.010	<1.0	1.7	58	0.349	<0.10	6480	<0.020	2.74	62.1	<3.0	<0.050	<5.0	9.5	<0.10	<5.0	<5.0	0.68	121	<0.50	0.76	
1-Oct-12	<0.10	<1.0	<50	<0.010	13.3	<1.0	1.05	6.89	1650	<0.20	<5.0	3.45	133	<0.010	<1.0	1.7	46	0.371	<0.10	6220	<0.020	2.6	65.1	<3.0	<0.050	<5.0	10.3	<0.10	<5.0	<5.0	0.75	91.1	<0.50	0.65	
27-May-13	0.16	<1.0	<50	0.04	7.62	8.7	3.67	28.1	8130	2.27	<5.0	3.18	246	<0.010	<1.0	6.5	362	1.45	0.23	11300	0.036	1.8	48.6	<3.0	<0.050	<5.0	256	0.3	17.8	17.4	0.82	86.7	<0.50	0.31	
17-Jun-13	<0.10	<1.0	<50	0.01	8.65	3.1	1.7	15.3	3250	0.54	<5.0	2.81	136	<0.010	<1.0	2.5	93	0.675	0.19	7210	<0.020	2.54	47.6	<3.0	<0.050	<5.0	70.2	0.12	6.5	5.3	0.74	121	<0.50	0.64	
15-Jul-13	<0.10	<1.0	<50	0.016	9.75	1.4	1.21	9.96	2210	<0.20	<5.0	3.01	146	<0.010	<1.0	1.8	51	0.362	<0.10	6600	<0.020	2.94	54.3	<3.0	<0.050	<5.0	21.9	<0.10	<5.0	<5.0	0.97	111	<0.50	0.72	
28-Aug-13	0.029	<0.0050	<50	0.017	10.3	0.9	0.816	8.48	1670	0.155	<0.50	2.87	97.3	<0.010	0.619	1.93	40.6	0.331	0.111	6200	0.005	2.86	57.6	<3.0	0.002	<0.20	8.3	0.072	2.5	10.1	0.89	101	0.075	0.64	
11-Sep-13	<0.10	<1.0	<50	<0.010	13.1	3	2.02	10.9	3240	0.49	<5.0	3.97	198	<0.010	<1.0	2.9	93	0.518	0.19	8720	<0.020	3.56	67.1	<3.0	<0.050	<5.0	71.6	0.11	5.6	<5.0	0.74	111	<0.50	0.72	
16-Oct-13	<0.10	<1.0	<50	<0.010	12.2	<1.0	0.84	5.84	1350	<0.20	<5.0	3.67	101	<0.010	<1.0	1.4	48	0.337	0.11	7740	<0.020	2.97	62.4	<3.0	<0.050	<5.0	10.3	<0.10	<5.0	<5.0	0.59	85.3	<0.50	0.57	
16-Oct-13																																			
16-May-14	<0.10	<1.0	<50	0.033	8.77	3.3	1.73	16.2	3270	0.77	<5.0	3.08	141	<0.010	<1.0	3.1	152	0.925	0.11	6780	0.02	2.1	45.5	<3.0	<0.050	<5.0	97.8	0.15	8.1	10.8	<0.50	96.6	<0.50	0.33	
3-Jun-14	<0.10	<1.0	<50	0.012	9.65	<1.0	0.6	10.1	1090	<0.20	<5.0	3.09	46.2	<0.010	<1.0	1.5	41	0.466	<0.10	5150	<0.020	2.6	49.5	<3.0	<0.050	<5.0	15.3	<0.10	<5.0	<5.0	<0.50	92.2	<0.50	0.34	
26-Jul-14	<0.10	<1.0	<50	0.012	12.4	1	0.51	8.09	828	<0.20	<5.0	3.45	50.7	<0.010	<1.0	1.5	28	0.303	0.14	6690	<0.020	2.87	60.4	<3.0	<0.050	<5.0	8.8	<0.10	<5.0	<5.0	0.65	116	<0.50	0.47	
17-Aug-14	<0.10	<1.0	<50	0.039	15.6	3.7	1.34	15	3250	0.86	<5.0	4.62	91.3	<0.010	<1.0	3.3	148	0.599	0.15	10100	<0.020	5.45	78.9	10.8	<0.050	<5.0	97.2	0.15	7.3	9.6	0.8	81.2	<0.50	0.51	
20-Sep-14	<0.10	<1.0	<50	0.014	13.3	<1.0	0.52	7.66	1070	<0.20	<5.0	3.96	75.9	<0.010	<1.0	1.6	44	0.388	0.14	6830	<0.020	3.71	67	<3.0	<0.050	<5.0	5.1	<0.10	<5.0	<5.0	0.51	78.2	<0.50	0.61	
11-Oct-14	<0.10	<1.0	<50	<0.010	10.8	<1.0	0.76	6.63	1700	0.21	<5.0	3.52	63.4	<0.010	<1.0	1.4	103	0.292	<0.10	5440	<0.020	2.8	57.7	<3.0	<0.050	<5.0	15.8	<0.10	<5.0	<5.0	<0.50	75.5	<0.50	0.52	
11-Oct-14	<0.10	<1.0	<50	0.017	10.7	1.1	0.63	7	1630	0.2	<5.0	3.58	65.2	<0.010	<1.0	1.9	96	0.307	<0.10	5520	<0.020	2.81	59.8	<3.0	<0.050	<5.0	17.7	<0.10	<5.0	<5.0	0.57	73.3	<0.50	0.55	
30-May-15	<0.10	<1.0	<50	<0.010	12.4	1.1	<0.50	6.98	930	<0.20	<5.0	3.86	49.9	<0.010	<1.0	1.4	69	0.447	<0.10	6170	<0.020	2.81	65.4	<3.0	<0.050	<5.0	12.1	<0.10	<5.0	<5.0	0.54	69.1	<0.50	0.34	
30-Jun-15	<0.10	<1.0	<50	0.014	10.7	1.8	0.79	9.47	2000	0.35	<5.0	3.17	69.1	<0.010	<1.0	2	83	0.333	<0.10	7110	<0.020	2.85	53.5	<3.0	<0.050	<5.0	33.9	<0.10	<5.0	<5.0	0.54	88.8	<0.50	0.43	
13-Jul-15	<0.10	<1.0	<50	0.01	10.2	1.7	0.55	10.1	1420	0.22	<5.0	2.87	47.5	<0.010	<1.0	1.7	46	0.226	<0.10	6920	<0.020	2.71	52.7	<3.0	<0.050	<5.0	23.8	<0.10	<5.0	<5.0	0.66	111	<0.50	0.44	
29-Aug-15	0.23	<1.0	<50	0.041	10.2	7.8	3.84	74.8	11600	2.11	<5.0	4.44	244	<0.010	<1.0	5.3	261	1.19	0.29	19500	0.021	3.01	55.7	<3.0	0.051	<5.0	320	0.31	24.2	22.2	1.01	259	<0.50	0.98	
29-Aug-15	0.2	<1.0	<50	0.047	10.2	7.2	3.72	79.5	11700	2.16	<5.0	4.49	237	<0.010	<1.0	5.3	252	1.19	0.33	19600	0.022	3.02	55.8	<3.0	<0.050	<5.0	318	0.32	24.2	22	1.14	236	<0.50	1.13	
20-Sep-15	<0.10	<1.0	<50	<0.010	11.4	<1.0	0.59	7.25	1330	<0.20	<5.0	3.17	76.1	<0.010	<1.0	1.3	50	0.302	<0.10	8080	<0.020	2.95	52.8	<3.0	<0.050	<5.0	7.5	<0.10	<5.0	<5.0	0.61	102	<0.50	0.64	
19-Oct-15	<0.10	<1.0	<50	<0.010	12.4	<1.0	<0.50	5.55	1220	<0.20	<5.0	3.33	52.5	<0.010	<1.0	<1.0	43	0.221	<0.10	7520	<0.020	3.04	59.3	<3.0	<0.050	<5.0	5.8	<0.10	<5.0	<5.0	0.59	83.5	<0.50	0.37	

* Results in red exceed their respective guideline

McGinty Creek Surface Water Quality, MN-1.5, May 2009 - December 2015

Sample Date	Barium (Ba), dissolved	Beryllium (Be), dissolved	Bismuth (Bi), dissolved	Boron (B), dissolved	Cadmium (Cd), dissolved	Calcium (Ca), dissolved	Chromium (Cr), dissolved	Cobalt (Co), dissolved	Copper (Cu), dissolved	Iron (Fe), dissolved	Lead (Pb), dissolved	Lithium (Li), dissolved	Magnesium (Mg), dissolved	Manganese (Mn), dissolved	Mercury (Hg), dissolved	Molybdenum (Mo), dissolved	Nickel (Ni), dissolved	Phosphorous (P), dissolved	Potassium (K), dissolved	Selenium (Se), dissolved	Silicon (Si), dissolved	Silver (Ag), dissolved	Sodium (Na), dissolved	Strontium (Sr), dissolved	Sulphur (S), dissolved	Thallium (Tl), dissolved	Tin (Sn), dissolved	Titanium (Ti), dissolved	Uranium (U), dissolved	Vanadium (V), dissolved	Zinc (Zn), dissolved	Zirconium (Zr), dissolved		
	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L		
3-May-09	17.2	0.02	<0.005	<50	0.021	4.29	0.3	0.266	7.89	173	0.01	<0.5	1.32	64.9		0.14	0.91		2.06	0.06	1470	0.007	0.84	21.4	<3	<0.002	0.01	2.1	0.027	0.4	3.6	0.3		
6-May-09	14.3	0.02	<0.005	<50	0.046	3.32	0.2	0.296	7.7	176	0.094	<0.5	1.03	65.1	0.01	0.12	0.95		1.91	<0.04	1260	0.006	0.68	17.1	<3	<0.002	0.01	1.9	0.018	0.8	9.4	0.3		
6-May-09																																		
13-May-09	19.7	0.02	<0.005	<50	0.028	3.8	0.4	0.564	8.66	263	0.018	<0.5	1.17	71	0.02	0.09	1.14		1.73	0.06	2310	<0.005	0.94	20.2	<3	<0.002	<0.01	1.7	0.031	1	5.7	0.4		
13-May-09																																		
21-May-09	20.9	0.02	<0.005	<50	0.05	4.81	0.4	0.526	6.45	296	0.119	<0.5	1.52	70.9	0.01	0.14	1.13		1.38	0.04	2590	<0.005	1.41	25.7	<3	<0.002	0.02	1.1	0.031	1	4.1	0.4		
21-May-09																																		
28-May-09	22.9	0.02	<0.005	<50	0.005	6.43	0.3	0.079	6.19	210	0.009	<0.5	2.01	0.28	<0.01	0.17	1.1		0.99	0.07	3540	<0.005	1.85	33.5	<3	<0.002	<0.01	1.5	0.034	0.6	0.7	0.4		
25-Jun-09	24.7	<0.01	<0.005	<50	0.04	6.13	0.3	0.125	5.81	266	0.018	<0.5	1.78	3.99	<0.01	0.16	1		0.42	0.08	4320	<0.005	2.06	36	<3	<0.002	<0.01	0.9	0.034	0.5	1.1	0.5		
28-Jul-09	32.1	0.01	<0.005	<50	0.01	9.99	0.4	0.205	5.25	292	0.025	<0.5	2.93	15.1	<0.01	0.24	1.15		0.37	0.07	6250	<0.005	2.96	51.9	<3	<0.002	<0.01	1.6	0.028	0.6	1	0.6		
29-Aug-09	27.4	0.02	<0.005	<50	0.008	8.29	0.6	0.189	5.45	327	0.023	<0.5	2.39	13.4	<0.01	0.27	1.18		0.37	0.08	5850	<0.005	2.64	43.8	<3	<0.002	<0.01	1.5	0.032	0.6	1.2	0.6		
29-Sep-09	26.6	0.01	<0.005	<50	0.02	9.48	0.6	0.214	5	340	0.025	<0.5	2.88	15.9		0.29	1.15		0.36	0.07	7100	<0.005	2.76	46.3	<3	<0.002	<0.01	1	0.025	0.5	2.5	0.6		
23-Oct-09	30.6	0.01	<0.005	<50	<0.005	12.6	0.5	0.157	3.48	215	0.019	<0.5	3.86	9.67	<0.01	0.27	0.96		0.34	0.07	7020	<0.005	2.99	58.4	<3	<0.002	<0.01	0.7	0.023	0.4	1.3	0.5		
27-Nov-09	38.1	<0.01	<0.005	<50	0.011	15.1	0.4	0.166	3.16	227	0.025	<0.5	4.5	17.1	<0.01	0.29	0.91		0.37	0.06	7840	<0.005	3.1	74.4	<3	<0.002	<0.01	0.8	0.019	0.4	1.7	0.4		
15-Dec-09	47.8	<0.01	<0.005	<50	<0.005	17.5	0.3	0.209	3.02	145	0.046	<0.5	5.4	25.1	<0.01	0.29	0.78		0.45	0.05	6690	<0.005	3.38	91.2	<3	<0.002	<0.01	<0.5	0.018	0.2	1.6	0.3		
25-Jan-10	123	0.01	<0.005	<50	0.074	49.2	0.9	0.405	8.16	126	0.095	1.1	20.3	45.6	<0.01	0.76	2.33		2.54	0.15	18900	0.018	12.5	247	3	<0.002	0.03	1	0.055	0.7	10.2	0.6		
23-Feb-10																																		
22-Mar-10																																		
21-Apr-10	20.2	0.02	<0.005	<50	0.106	5.93	0.3	0.186	7.78	206	0.34	<0.5	1.71	34.9	0.02	0.54	1.17		1.68	0.07	2180	0.018	3.6	29.4	14	0.003	0.57	1.6	0.035	0.5	12	0.3		
28-May-10																																		
28-May-10	25.4	0.02	<0.005	<50	0.011	7.39	0.3	0.133	4.45	169	0.008	<0.5	2.32	7.55		0.21	1.04		0.55	0.07	4150	<0.005	2.17	39.8	<10	<0.002	<0.01	0.8	0.024	0.5	0.9	0.4		
28-Jun-10	29.3	0.01	<0.005	<50	0.06	8.65	0.6	0.231	6.09	232	0.527	<0.5	2.62	14.9		0.27	1.58		0.5	0.07	5420	<0.005	3.16	47.7	<10	<0.002	0.09	1	0.027	0.4	7.9	0.5		
21-Jul-10	30.1	0.03	<0.005	<50	0.017	6.61	0.6	1.25	6.38	844	0.041	<0.5	1.92	143		0.25	1.69		0.29	0.08	5410	<0.005	2.41	37.5	<10	<0.002	<0.01	3.4	0.046	1.4	1.5	0.9		
18-Aug-10	32.1	0.02	<0.005	<50	0.017	5.23	0.7	1.73	7.84	1270	0.091	<0.5	1.61	166		0.37	1.88		0.3	0.09	5370	<0.005	2.32	31.7	<10	<0.002	<0.01	2.9	0.061	2.2	9	0.8		
15-Sep-10	36.4	0.02	<0.005	<50	0.01	10.4	0.7	0.725	6.44	547	0.037	<0.5	3	82.1		0.44	1.43		0.43	0.09	7080	<0.005	2.63	51.3	<10	<0.002	<0.01	2	0.057	1.2	1.4	0.7		
21-Oct-10	41.1	0.01	<0.005	<50	0.023	12.9	0.6	0.435	4.84	317	0.028	<0.5	3.91	50.1		0.34	1.2		0.42	0.07	7270	<0.005	2.7	64.9	<10	<0.002	<0.01	0.7	0.057	0.7	2.9	0.6		
11-Jan-11																																		
29-Apr-11	25.9	0.01	<0.005	<50	0.053	9.32	0.4	0.434	6.45	320	0.024	0.6	2.91	97.4	<0.01	0.08	1.01		2.16	0.06	4570	0.008	2.29	45.3	<10	<0.002	<0.01	1.1	0.024	0.4	6.1	0.2		
19-May-11																																		
19-May-11	24.6	0.02	<0.005	<50	0.022	3.91	0.4	0.913	7.63	599	0.027	<0.5	1.2	121		0.25	1.08		1.03	0.06	1930	0.006	0.98	22.6	<10	<0.002	<0.01	1.6	0.036	1.4	2.1	0.3		
28-Jun-11	34.2	0.02	<0.005	<50	0.019	7.32	0.6	0.913	7.08	937	0.048	<0.5	2.25	101	<0.01	0.38	1.36		0.46	0.09	5970	0.006	2.5	38.7	<10	<0.002	0.01	2.4	0.04	1.7	1.2	0.6		
15-Jul-11	32.1	0.03	<0.005	<50	0.02	5.01	0.7	1.21	8.09	1620	0.116	<0.5	1.53	98.2		0.44	1.61		0.32	0.08	5330	0.006	2.1	30.6	<10	<0.002	<0.01	4.4	0.044	2.5	5	0.7		
10-Aug-11	38.1	0.03	<0.005	<50	0.025	8.09	0.6	1	6.84	1060	0.081	<0.5	2.25	111		0.55	1.4	18	0.37	0.07	5690	<0.005	2.21	44.7	<10	<0.002	<0.01	2	0.046	1.8	2.3	0.6		
10-Aug-11	38.3	0.02	<0.005	<50	0.022	8.3	0.6	0.997	6.75	1130	0.052	<0.5	2.29	110		0.56	1.43	15	0.37	0.08	5780	<0.005	2.27	44.7	<10	<0.002	<0.01	2.4	0.052	1.9	2	0.6		
28-Oct-11	44.5	<0.01	<0.005	<50	0.016	15.6	0.5	0.587	3.56	714	0.017	<0.5	4.13	95.7	<0.01	0.37	1.14	15	0.41	0.08	7680	<0.005	2.78	72.9	<10	<0.002	<0.01	1.2	0.061	1	1.5	0.4		
19-Apr-12	28.7	0.012	<0.0050	<50	0.0415	10.2	0.38	0.482	7.34	296	0.0191	0.51	3.24	93.8	<0.010	0.145	1.06	32.7	1.97	0.05	4270	<0.0050	2.03	51	<10	<0.0020	<0.20	0.95	0.0179	0.44	5.65	0.29		
24-May-12	32.3	0.02	<0.0050	<50	0.046	7.5	0.5	0.673	6.72	891	0.111	<0.50	2.16	97.4	<0.010	0.354	1.24	27.1	0.828	0.103	4250	0.0141	1.9	38.9	<10	<0.0020	<0.20	2.42	0.0359	1.35	5.05	0.45		

* Results in red exceed their respective guideline

McGinty Creek Surface Water Quality, MN-1.5, May 2009 - December 2015

Sample Date	<div style="display: flex; justify-content: space-between; text-align: center;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Barium (Ba), dissolved</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Beryllium (Be), dissolved</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Bismuth (Bi), dissolved</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Boron (B), dissolved</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Cadmium (Cd), dissolved</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Calcium (Ca), dissolved</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Chromium (Cr), dissolved</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Cobalt (Co), dissolved</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Copper (Cu), dissolved</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Iron (Fe), dissolved</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Lead (Pb), dissolved</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Lithium (Li), dissolved</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Magnesium (Mg), dissolved</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Manganese (Mn), dissolved</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Mercury (Hg), dissolved</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Molybdenum (Mo), dissolved</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Nickel (Ni), dissolved</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Phosphorous (P), dissolved</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Potassium (K), dissolved</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Selenium (Se), dissolved</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Silicon (Si), dissolved</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Silver (Ag), dissolved</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Sodium (Na), dissolved</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Strontium (Sr), dissolved</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Sulphur (S), dissolved</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Thallium (Tl), dissolved</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Tin (Sn), dissolved</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Titanium (Ti), dissolved</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Uranium (U), dissolved</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Vanadium (V), dissolved</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Zinc (Zn), dissolved</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Zirconium (Zr), dissolved</div> </div>																																
	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
14-Jun-12	35	0.021	<0.0050	<50	0.0331	6.84	0.55	1.16	6.87	1190	0.0712	<0.50	1.99	121	<0.010	0.421	1.41	18.1	0.507	0.092	5280	0.0063	2.22	36.2	<10	<0.0020	<0.20	2.23	0.0294	1.46	1.93	0.59	
12-Jul-12	44	0.013	<0.0050	<50	0.031	9.94	0.63	1.33	6.45	1010	0.021	<0.50	2.9	155	<0.010	0.619	1.43	20.8	0.39	0.093	5790	0.005	2.92	53.4	<10	0.002	<0.20	2.28	0.047	1.57	0.66	0.57	
6-Aug-12	48	0.02	<0.0050	<50	<0.0050	13.8	0.75	1.43	5.84	1190	0.02	<0.50	3.97	206		0.924	1.55		0.43	0.078	6500	<0.0050	3.17	69.7	<10	0.002	<0.20	2.18	0.061	1.58	0.99	0.65	
7-Sep-12	44	<0.10	<1.0	<50	<0.010	13.5	<1.0	1.38	6.19	1200	<0.20	<5.0	4.03	181	<0.010	<1.0	1.7	30	0.425	<0.10	6970	<0.020	3.26	71.6	<3.0	<0.050	<5.0	<5.0	<0.10	<5.0	<5.0	0.72	
1-Oct-12	39	<0.10	<1.0	<50	<0.010	12.7	<1.0	0.95	5.32	908	<0.20	<5.0	3.84	129	<0.010	<1.0	1.8	29	0.396	<0.10	6620	<0.020	2.98	66.5	<3.0	<0.050	<5.0	<5.0	<0.10	<5.0	<5.0	0.61	
27-May-13	22.9	<0.10	<1.0	<50	<0.010	6.94	<1.0	0.57	5.73	340	<0.20	<5.0	2.22	91.9	<0.010	<1.0	1	18	1.05	<0.10	3060	<0.020	1.65	37.1	<3.0	<0.050	<5.0	<5.0	<0.10	<5.0	<5.0	<0.50	
17-Jun-13	33.4	<0.10	<1.0	<50	<0.010	8.02	<1.0	0.85	7.26	947	<0.20	<5.0	2.27	99.7	<0.010	<1.0	1.3	24	0.513	<0.10	5320	<0.020	2.47	43.3	<3.0	<0.050	<5.0	<5.0	<0.10	<5.0	<5.0	0.6	
15-Jul-13	37.6	<0.10	<1.0	<50	<0.010	9.95	<1.0	1.04	6.55	1250	<0.20	<5.0	2.63	137	<0.010	<1.0	1.4	25	0.329	<0.10	6550	<0.020	2.93	52.1	<3.0	<0.050	<5.0	<5.0	<0.10	<5.0	<5.0	0.69	
28-Aug-13	34.3	0.02	<0.0050	<50	0.005	9.53	0.74	0.091	6.69	914	0.013	<0.50	2.82	3.22	<0.010	0.669	1.38	16.9	0.321	0.132	5860	0.007	2.85	54.2	<3.0	<0.0020	<0.20	2.25	0.047	1.58	0.3	0.7	
11-Sep-13	41	<0.10	<1.0	<50	<0.010	11	<1.0	1.25	5.81	985	<0.20	<5.0	3.6	159	<0.010	<1.0	1.5	26	0.39	0.12	5870	<0.020	3.14	59.8	<3.0	<0.050	<5.0	<5.0	<0.10	<5.0	<5.0	0.83	
16-Oct-13	34.2	<0.10	<1.0	<50	<0.010	11.9	<1.0	0.64	5.14	771	<0.20	<5.0	3.3	85	<0.010	<1.0	1.2	22	0.303	<0.10	7250	<0.020	2.83	59.9	<3.0	<0.050	<5.0	<5.0	<0.10	<5.0	<5.0	0.67	
16-Oct-13																																	
16-May-14	27.3	<0.10	<1.0	<50	0.013	7.73	<1.0	0.58	7.09	338	<0.20	<5.0	2.43	91.5	<0.010	<1.0	1.3	18	0.753	<0.10	3360	<0.020	1.85	40.3	<3.0	<0.050	<5.0	<5.0	<0.10	<5.0	<5.0	<0.50	
3-Jun-14	29.8	<0.10	<1.0	<50	<0.010	9.1	<1.0	<0.50	6.47	376	<0.20	<5.0	2.66	29.7	<0.010	<1.0	1.1	12	0.455	0.11	4730	<0.020	2.32	48	<3.0	<0.050	<5.0	<5.0	<0.10	<5.0	<5.0	<0.50	
26-Jul-14	33.6	<0.10	<1.0	<50	<0.010	10.8	<1.0	<0.50	7.69	543	<0.20	<5.0	3.13	43.8	<0.010	<1.0	1.2	43	0.29	<0.10	5980	<0.020	2.66	54.8	<3.0	<0.050	<5.0	<5.0	<0.10	<5.0	<5.0	0.71	
17-Aug-14	43.8	<0.10	<1.0	<50	<0.010	14.9	<1.0	<0.50	5.78	587	<0.20	<5.0	3.92	63.5	<0.010	<1.0	1.4	18	0.287	<0.10	7110	<0.020	3.19	72	<3.0	<0.050	<5.0	<5.0	<0.10	<5.0	<5.0	0.66	
20-Sep-14	35.1	<0.10	<1.0	<50	<0.010	12.7	<1.0	<0.50	4.72	764	<0.20	<5.0	3.49	67.2	<0.010	<1.0	1.2	30	0.324	<0.10	6730	<0.020	3.01	61.5	<3.0	<0.050	<5.0	<5.0	<0.10	<5.0	<5.0	0.61	
11-Oct-14	30.1	<0.10	<1.0	<50	<0.010	11.3	<1.0	<0.50	4.41	591	<0.20	<5.0	3.56	46.9	<0.010	<1.0	1.1	29	0.255	<0.10	6610	<0.020	2.86	59	<3.0	<0.050	<5.0	<5.0	<0.10	<5.0	<5.0	0.6	
11-Oct-14	28.4	<0.10	<1.0	<50	<0.010	11.6	<1.0	<0.50	4.38	608	<0.20	<5.0	3.4	46.5	<0.010	<1.0	1	24	0.256	<0.10	6740	<0.020	2.88	56.1	<3.0	<0.050	<5.0	<5.0	<0.10	<5.0	<5.0	0.51	
30-May-15	31	<0.10	<1.0	<50	<0.010	10.9	<1.0	<0.50	5.46	335	<0.20	<5.0	3.4	33.1	<0.010	<1.0	1.1	12	0.4	<0.10	4780	<0.020	2.54	55.3	<3.0	<0.050	<5.0	<5.0	<0.10	<5.0	<5.0	<0.50	
30-Jun-15	30.2	<0.10	<1.0	<50	<0.010	10.2	<1.0	<0.50	6.17	462	<0.20	<5.0	2.97	38.1	<0.010	<1.0	1.2	16	0.217	<0.10	5700	<0.020	3.16	51	<3.0	<0.050	<5.0	<5.0	<0.10	<5.0	<5.0	0.56	
13-Jul-15	30.3	<0.10	<1.0	<50	<0.010	9.81	<1.0	<0.50	6.87	445	<0.20	<5.0	2.72	33.3	<0.010	<1.0	1.2	16	0.177	<0.10	5930	<0.020	2.69	51.8	<3.0	<0.050	<5.0	<5.0	<0.10	<5.0	<5.0	0.69	
29-Aug-15	29.6	<0.10	<1.0	<50	<0.010	7	<1.0	0.81	9.58	1190	<0.20	<5.0	2	83.9	<0.010	<1.0	1.3	36	0.273	<0.10	6290	<0.020	2.63	36.4	<3.0	<0.050	<5.0	10.6	<0.10	<5.0	<5.0	0.73	
29-Aug-15	29.6	<0.10	<1.0	<50	<0.010	6.7	<1.0	0.81	9.38	1180	<0.20	<5.0	1.94	83	<0.010	<1.0	1.3	30	0.249	<0.10	6200	<0.020	2.53	35.1	<3.0	<0.050	<5.0	11.6	<0.10	<5.0	<5.0	1.04	
20-Sep-15	29.8	<0.10	<1.0	<50	0.011	9.7	<1.0	0.61	6.09	769	<0.20	<5.0	2.85	70.5	<0.010	<1.0	1.4	26	0.272	<0.10	6340	<0.020	3.05	49.8	<3.0	<0.050	<5.0	<5.0	<0.10	<5.0	<5.0	0.58	
19-Oct-15	30.8	<0.10	<1.0	<50	<0.010	11.2	<1.0	<0.50	4.68	560	<0.20	<5.0	3.34	45.8	<0.010	<1.0	<1.0	26	0.218	<0.10	6990	<0.020	2.67	57.1	<3.0	<0.050	<5.0	<5.0	<0.10	<5.0	<5.0	<0.50	

* Results in red exceed their respective guideline

McGinty Creek Surface Water Quality, MN-2.5, May 2009 - December 2015

	pH (field)	pH (lab)	Conductivity (field)	Specific Conductivity (field)	Conductivity (lab)	Temperature (field)	Dissolved Oxygen (field)	Dissolved Oxygen (lab)	ORP (field)	Discharge (Flow)	Total Suspended Solids	Total Dissolved Solids (field)	Total Dissolved Solids (lab)	Hardness (from total)	Hardness (from dissolved)	Alkalinity, total	Alkalinity, bicarbonate HCO3	Chloride	Fluoride	Sulphate, dissolved	Cyanide, total	Cyanide, Weak Acid Dissociable	Ion Balance	Ammonia (N)	Nitrite (N)	Nitrate (N)	Nitrite & Nitrate, as N	Dissolved Organic Carbon	Total Organic Carbon	Aluminum (Al), total	Antimony (Sb), total	Arsenic (As), total	Barium (Ba), total
Sample Date	pH units	pH units	µS/cm	µS/cm	µS/cm	C	mg/L	%	mV	m3/s	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	ratio	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	
	6.5-9	6.5-9															120	0.12			0.005		0.282	0.06	3		*				5		
14-Jun-12		7.74			116						260	94	68.3	60.1	56.9	69.4	<5.0	0.16	<5.0	0.00099	0.0011	NC	0.029	<0.050	<0.20	<0.20	13.7	17.7	1470	0.125	2.42	127	
12-Jul-12		7.93			163						6.7	104	81.9	81.3	80	97.5	1.1	0.18	<0.50	<0.00050	<0.00050	NC	0.036	<0.050	<0.20	<0.20	12.3	12.9	80.5	0.085	0.754	42.1	
6-Aug-12		8.05			185						4	134	94.6	92.2	94	115	1.1	0.18	<0.50	0.00071	<0.00050	NC	0.015	<0.0050	0.032	0.032	11.5	11.5	72	0.074	0.918	48.4	
6-Aug-12		8.09			186						3.8	136	94.5	93.2	94.3	115	1.3	0.18	<0.50	0.00057	<0.00050	NC	0.017	<0.0050	0.034	0.034	11.4	11.7	74.2	0.068	0.916	47.1	
7-Sep-12		8.08			180						8.7	120	87.2	93	92.1	112	1.5	0.18	<0.50	<0.00050	<0.00050		0.0098	<0.0050	0.032	0.032	12.3	13.6	64.6	<0.50	0.74	43.5	
1-Oct-12		8.03			177						3.1	242	91.6	86.5	89	109	1.2	0.16	<0.50	<0.00050	<0.00050		0.015	<0.0050	0.033	0.033	11.3	12.4	41	<0.50	0.68	43.3	
27-May-13		7.68			90.7						61.7	90	49.3	45.5	43.4	53	1.3	0.12	<0.50	0.00051			0.039	<0.0050	<0.020	<0.020	15.5	16.1	966	<0.50	0.76	43.4	
17-Jun-13		7.85			141						21.4	114	74.8	68.8	70.2	85.7	1.1	0.15	<0.50	0.00096	0.00054		0.02	<0.0050	0.022	0.022	11.3	11.5	787	<0.50	0.85	49.1	
17-Jun-13		7.81			140						46.9	126	75.7	68.9	70.2	85.6	0.98	0.15	<0.50	0.00094	0.00054		0.018	<0.0050	0.022	0.022	11	12.4	881	<0.50	0.92	53.1	
15-Jul-13		7.94			171						3.6	98	87.4	84.9	85.3	104	1	0.18	0.63	0.00072			0.022	<0.0050	0.036	0.036	9.47	10.2	73	<0.50	0.52	41.5	
28-Aug-13		7.88			161						10.1	114	78.5	80.4	78.5	95.8	1.1	0.17	<0.50	<0.00050	0.00167	1.1	0.028	<0.0020	0.0299	0.0299	13.5	14.6	93.1	0.082	0.713	43.8	
11-Sep-13		7.96			171						2.4	128	90.7	82.5	85.3	104	1.3	0.17	1.04		0.00083		0.039	<0.050	<0.20	<0.20	11.9	12.3	50.4	<0.50	0.74	42.2	
16-Oct-13		7.84			167						3	144	86.7	80.9	82.7	101	1.4	0.16	0.93		0.00113		0.022	<0.0050	0.041	0.041	9.79	10.3	58.4	<0.50	0.5	40	
16-Oct-13	7.48			140.3		0	13.86	94.7	12.5																								
16-May-14	8.00	7.8	67.7	129.3	112	0.0	14.04	96.2	64.5		120	82	68.9	54.3	52.5	64.1	0.98	0.16	<0.50		0.00116		0.037	<0.0050	<0.020	<0.020	15	15.6	2840	<0.50	1.61	81	
3-Jun-14	6.86	8.01	88.9	167	136	0.5	17.13	117.9	41.3		11.5	114	68.9	66.6	66.3	80.9	1	0.17	<0.50		0.00117		0.014	<0.0050	0.036	0.036	13.5	14.3	148	<0.50	0.5	36.5	
26-Jul-14	8.24	8	113.5	192.2	177	3.6	12.27	92.7	24.2		15.1	112	86.6	82.6	85.4	104	0.78	0.18	<0.50		0.00073		0.013	<0.0050	0.035	0.035	11.9	10.4	150	<0.50	0.47	41.9	
17-Aug-14	7.64	8.03	124.2	212.1	182	3.3	12.58	94.3	37.3		3.3	124	97.8	90.4	90	110	0.95	0.19	1.7		<0.00050		0.021	<0.0050	0.043	0.043	8.92		27.4	<0.50	0.42	41.5	
20-Sep-14	7.63	7.94	116.4	210.5	181	1.6	12.86	92	57.5		<1.0	111	92	86.2	91.8	112	0.95	0.17	0.92		0.00083		0.02	<0.0050	<0.020	<0.020	10	10.7	76.6	<0.50	0.46	39.2	
11-Oct-14	7.94	7.91	120.6	242.8	175	-1.3	13.87	81.4	67.8		1.3	116	77.9	84.7	84.4	103	1.6	0.17	1.17		0.00084		0.018	<0.0050	0.045	0.045	12.1	11.9	20.4	<0.50	0.37	34	
4-Dec-14		8.07			255						<1.0	172	132	129	129	157	1.6	0.22	3.8		0.00066		0.011	<0.0050	0.079	0.079	11.5	10.1	33.3	<0.50	0.29	60.2	
26-May-15	7.79	7.82	74.2	137.8	137	0.8	13.82	96.7	138.4		3.6	92	70.7	67.1	64.5	78.7	1.5	0.16	<0.50		0.00078		0.055	<0.0050	<0.020	<0.020	7.6	8.89	53.6	<0.50	0.33	30	
23-Jun-15		8.12			199						<1.0	128	100	102	99.8	122	0.77	0.22	3.87				0.045	<0.0050	0.044	0.044			14.6	<0.50	0.33	40.3	
23-Jun-15	7.48	8.13	119.4	198	200	4.2	11.17	85.7	78		3.5	122	101	98.5	100	122	1	0.21	3.78				0.017	<0.0050	0.041	0.041			214	<0.50	0.41	48.9	
13-Jul-15	7.72	7.83	98	158.9	165	4.9	11.75	91.8	112.8		2.6	98	81.5	80.2	82.1	100	0.68	0.17	0.87				0.14	<0.0050	0.025	0.025			30.4	<0.50	0.31	31.9	
30-Aug-15	7.36	7.77	76.8	136.5	136	2.1	12.54	91	51.9		341	116	96.5	68.8	63.5	77.5	1.5	0.17	<0.50				0.04	<0.0050	<0.020	<0.020	18		5530	<0.50	2.54	151	
20-Sep-15	7.63	8.04	92.6	166.3	173	1.8	12.54	90.1	44.3		2.3	122	86.2	84	86	105	1.4	0.18	0.58				0.025	<0.0050	<0.020	<0.020	12		165	<0.50	0.36	39	
18-Oct-15	7.52	8.04	91.2	174.1	176	0	12.92	88.5	-0.2		10.1	96	77	88.3	85.5	104	1.4	0.17	0.58				0.021	<0.0050	0.034	0.034	11.5		106	<0.50	0.28	31.3	
26-Nov-15	8.58	7.97	113.7	218.1	277	-0.1	0.96	6.6	98.6		2.5	172	134	135	121	148	0.57	0.39	15			0.0098	<0.0050	0.122	0.122	6.58		19.3	<0.50	0.31	63.2		
19-Dec-15	8.6	8.28	112.3	216.6	253	-0.1	0.72	4.9			44.7	134	129	123	129	158	1.3	0.21	5.04				0.013	<0.0050	0.046	0.046	7.8		464	<0.50	0.71	80.2	

* Results in red exceed their respective guideline

McGinty Creek Surface Water Quality, MN-2.5, May 2009 - December 2015

Sample Date	Barium (Ba), dissolved	Beryllium (Be), dissolved	Bismuth (Bi), dissolved	Boron (B), dissolved	Cadmium (Cd), dissolved	Calcium (Ca), dissolved	Chromium (Cr), dissolved	Cobalt (Co), dissolved	Copper (Cu), dissolved	Iron (Fe), dissolved	Lead (Pb), dissolved	Lithium (Li), dissolved	Magnesium (Mg), dissolved	Manganese (Mn), dissolved	Mercury (Hg), dissolved	Molybdenum (Mo), dissolved	Nickel (Ni), dissolved	Phosphorous (P), dissolved	Potassium (K), dissolved	Selenium (Se), dissolved	Silicon (Si), dissolved	Silver (Ag), dissolved	Sodium (Na), dissolved	Strontium (Sr), dissolved	Sulphur (S), dissolved	Thallium (Tl), dissolved	Tin (Sn), dissolved	Titanium (Ti), dissolved	Uranium (U), dissolved	Vanadium (V), dissolved	Zinc (Zn), dissolved	Zirconium (Zr), dissolved	
	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	
3-May-09	17.2	0.01	<0.005	<50	0.022	6.21	0.2	0.139	2.48	96	0.016	<0.5	1.87	20.1		0.11	0.91		1.67	0.07	1990	0.008	0.74	26.7	<3	<0.002	<0.01	0.9	0.024	0.3	4.4	0.3	
3-May-09																																	
6-May-09	17.9	0.01	<0.005	<50	0.075	6.23	0.2	0.221	2.84	134	0.071	<0.5	1.9	34.1	0.01	0.14	1.04		1.51	0.04	1850	0.006	0.78	27.5	<3	<0.002	0.01	0.9	0.025	0.5	5.3	0.3	
13-May-09	21.5	0.02	<0.005	<50	0.009	8.36	0.3	0.173	4.11	192	0.021	<0.5	2.45	23	0.01	0.17	1.58		1.19	0.08	3380	<0.005	1.21	36.2	<3	<0.002	<0.01	1.2	0.042	0.7	3.3	0.5	
21-May-09	22.6	0.01	<0.005	<50	0.025	10.2	0.3	0.145	2.93	145	0.083	<0.5	3.04	42	<0.01	0.35	1.35		0.89	0.08	3950	<0.005	1.96	48.5	<3	<0.002	<0.01	0.9	0.042	0.5	1.8	0.3	
28-May-09	26.2	0.01	<0.005	<50	<0.005	14.2	0.2	0.067	2.61	79	0.01	0.5	4.1	0.35	<0.01	0.38	1.56		0.68	0.07	4510	<0.005	2.56	63.1	<3	<0.002	<0.01	0.6	0.052	0.5	0.4	0.3	
25-Jun-09	28	0.01	<0.005	<50	0.009	16.3	<0.1	0.081	1.95	61	0.014	0.7	4.39	6.77	<0.01	0.53	1.05		0.45	0.08	4990	<0.005	3.02	82.4	<3	<0.002	<0.01	0.8	0.064	0.3	0.7	0.3	
28-Jul-09	38.1	<0.01	<0.005	<50	0.006	26.1	<0.1	0.065	1.58	46	0.009	0.9	6.32	13.5	<0.01	0.83	0.9		0.72	0.06	5980	<0.005	3.86	120	<3	<0.002	<0.01	<0.5	0.146	0.3	0.6	0.2	
28-Jul-09																																	
29-Aug-09	33.5	0.01	<0.005	<50	0.023	21.2	0.3	0.09	1.85	100	0.032	0.8	5.49	23.7	<0.01	0.63	1.17		0.54	0.08	6400	<0.005	4.35	101	<3	<0.002	<0.01	0.5	0.085	0.2	1	0.3	
29-Aug-09																																	
29-Sep-09	34.5	<0.01	<0.005	<50	0.006	23.7	0.2	0.119	1.38	95	0.009	0.7	6.36	28.6		0.68	1.16		0.54	0.06	6550	<0.005	4.03	105	<3	<0.002	<0.01	<0.5	0.118	<0.2	0.8	0.2	
23-Oct-09	33.6	<0.01	<0.005	<50	<0.005	23.7	0.2	0.066	1.25	67	<0.005	1	6.5	24.4	<0.01	0.75	0.96		0.67	0.08	6170	<0.005	4.06	107	<3	<0.002	<0.01	<0.5	0.11	<0.2	0.6	0.2	
27-Nov-09	38.6	<0.01	<0.005	<50	<0.005	25.7	0.2	0.059	1.23	48	0.033	1.1	6.49	14.9	<0.01	0.94	0.73		0.92	0.07	7070	<0.005	3.69	126	<3	<0.002	<0.01	<0.5	0.147	<0.2	1.1	0.2	
15-Dec-09	49.9	<0.01	<0.005	<50	0.011	27.8	0.2	0.054	1.57	36	0.07	1.1	7.58	9.54	<0.01	0.79	0.77		1.07	0.06	5960	<0.005	4.27	143	<3	<0.002	<0.01	<0.5	0.131	<0.2	1.2	0.2	
25-Jan-10	156	0.02	0.016	<50	0.058	116	0.7	0.314	4.48	36	0.822	7.8	46.3	47.6	0.01	1.17	3.76		8.78	0.38	38800	0.013	29.5	591	14	<0.002	0.02	0.7	0.458	0.5	4	0.6	
23-Feb-10																																	
22-Mar-10																																	
22-Apr-10	21.8	0.01	<0.005	<50	0.026	10	0.2	0.092	2.91	141	0.027	<0.5	2.94	8.86	0.02	0.22	1.14		1.55	0.07	2990	<0.005	1.61	44.3	<10	0.002	0.03	1.1	0.035	0.3	4.3	0.4	
28-May-10	29.8	0.01	<0.005	<50	<0.005	17.2	0.2	0.069	1.49	35	0.008	0.5	4.99	9.8		0.62	1.08		0.64	0.07	4420	<0.005	3.21	81.9	<10	<0.002	<0.01	<0.5	0.105	0.3	1.1	0.2	
28-Jun-10	34.2	<0.01	<0.005	<50	0.006	22	0.2	0.061	1.59	49	0.044	0.7	5.92	6.52		0.7	1.14		0.6	0.07	5870	<0.005	3.75	106	<10	<0.002	<0.01	<0.5	0.099	0.3	3.1	0.2	
21-Jul-10	33.6	<0.01	<0.005	<50	0.028	16.9	0.3	0.117	2.99	141	0.288	0.7	4.61	13.9		0.54	1.5		0.42	0.07	5740	<0.005	3.08	83.9	<10	<0.002	0.01	0.8	0.071	0.5	6.1	0.4	
18-Aug-10	43.3	0.02	<0.005	<50	0.006	20.8	0.4	0.157	3.09	256	0.022	0.6	5.56	16.8		0.54	1.47		0.49	0.1	6400	<0.005	3.61	91.1	<10	<0.002	<0.01	1.5	0.13	1	0.8	0.4	
15-Sep-10																																	
15-Sep-10	39.4	0.01	<0.005	<50	0.009	21.8	0.5	0.184	2.76	315	0.058	0.6	5.88	60.3		0.59	1.48		0.47	0.1	7240	<0.005	3.56	93.7	<10	<0.002	<0.01	1	0.117	0.6	0.7	0.4	
21-Oct-10	40.9	<0.01	<0.005	<50	0.011	22.7	0.4	0.165	1.89	226	0.013	0.7	6.69	75.7		0.67	1.35		0.51	0.07	6980	<0.005	3.84	103	<10	<0.002	<0.01	<0.5	0.126	0.4	1.1	0.3	
11-Jan-11	50.8	<0.01	<0.005	<50	0.034	25.5	0.1	0.203	1.62	88	0.048	1.2	7.4	78.5	<0.01	0.71	0.98		1.07	0.06	6120	<0.005	4.44	130	<10	<0.002	<0.01	<0.5	0.094	<0.2	4.2	0.3	
11-Jan-11	50.8	<0.01	<0.005	<50	0.068	25.9	0.2	0.213	1.62	87	0.071	1.2	7.35	77.4	<0.01	0.69	0.92		1.08	0.06	6200	0.009	4.6	132	<10	<0.002	<0.01	<0.5	0.089	<0.2	5.6	0.4	
29-Apr-11	22.3	<0.01	<0.005	<50	0.023	12	0.2	0.084	1.88	108	0.033	<0.5	3.6	14.9	<0.01	0.17	0.9		2.35	0.07	4390	0.005	1.88	53.9	<10	<0.002	<0.01	<0.5	0.028	0.2	3.1	0.2	
29-Apr-11	23.1	<0.01	<0.005	<50	0.026	11.9	0.2	0.085	1.72	107	0.046	<0.5	3.62	14.8	<0.01	0.16	0.9		2.34	0.06	4250	0.006	1.81	54.5	<10	<0.002	<0.01	0.5	0.029	0.2	3.4	0.2	
19-May-11	23.4	0.01	<0.005	<50	0.026	8.76	0.3	0.193	4.13	282	0.053	<0.5	2.37	54.2		0.31	1.45		0.87	0.08	3360	<0.005	1.37	40.5	<10	<0.002	<0.01	1.1	0.048	0.8	1.9	0.4	
28-Jun-11	38.6	0.01	<0.005	<50	0.014	22.7	0.4	0.114	2.72	218	0.069	<0.5	6.29	19	<0.01	0.53	1.88		0.44	0.11	5900	0.005	3.68	94.2	<10	<0.002	0.04	1	0.093	0.3	1.1	0.3	
15-Jul-11	40.5	0.02	<0.005	<50	0.011	15	0.5	0.31	4.63	361	0.09	<0.5	4.22	37.4		0.43	1.7		0.27	0.09	6110	<0.005	3	69.9	<10	<0.002	0.01	2.5	0.07	1.4	1.9	0.5	
10-Aug-11	42.6	0.01	<0.005	<50	0.017	17.3	0.4	0.329	3	592	0.051	0.5	4.78	78.9		0.58	1.48	13	0.32	0.08	5930	<0.005	3.11	82	<10	<0.002	<0.01	1.4	0.131	1.6	0.9	0.5	
28-Oct-11	44	<0.01	<0.005	<50	0.006	24.3	0.3	0.307	1.5	365	0.012	0.7	6.39	193	<0.01	0.7	1.13	12	0.54	0.09	6920	<0.005	3.8	113	<10	<0.002	<0.01	<0.5	0.158	0.5	0.6	0.2	
19-Apr-12	25.4	<0.010	<0.0050	<50	0.0238	14.8	0.22	0.077	1.75	120	0.0183	0.52	4.62	19.2	<0.010	0.221	0.78	63.8	2.18	0.06	4680	0.006	2.46	66.5	<10	<0.0020	<0.20	<0.50	0.0203	0.2	2.87	0.12	
24-May-12	35.2	0.012	<0.0050	<50	0.017	16.5	0.31	0.202	2.54	543	0.0286	<0.50	4.67	54.2	<0.010	0.54	1.47	16.6	0.709	0.128	5530	<0.0050	2.78	72.9	<10	<0.0020	<0.20	1.15	0.0886	0.89	2.11	0.3	

* Results in red exceed their respective guideline

McGinty Creek Surface Water Quality, MN-2.5, May 2009 - December 2015

Sample Date	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
	Barium (Ba), dissolved	Beryllium (Be), dissolved	Bismuth (Bi), dissolved	Boron (B), dissolved	Cadmium (Cd), dissolved	Calcium (Ca), dissolved	Chromium (Cr), dissolved	Cobalt (Co), dissolved	Copper (Cu), dissolved	Iron (Fe), dissolved	Lead (Pb), dissolved	Lithium (Li), dissolved	Magnesium (Mg), dissolved	Manganese (Mn), dissolved	Mercury (Hg), dissolved	Molybdenum (Mo), dissolved	Nickel (Ni), dissolved	Phosphorous (P), dissolved	Potassium (K), dissolved	Selenium (Se), dissolved	Silicon (Si), dissolved	Silver (Ag), dissolved	Sodium (Na), dissolved	Strontium (Sr), dissolved	Sulphur (S), dissolved	Thallium (Tl), dissolved	Tin (Sn), dissolved	Titanium (Ti), dissolved	Uranium (U), dissolved	Vanadium (V), dissolved	Zinc (Zn), dissolved	Zirconium (Zr), dissolved		
14-Jun-12	35	<0.010	<0.0050	<50	0.012	16.3	0.36	0.209	2.64	469	0.0335	<0.50	4.7	36.5	<0.010	0.585	1.47	16.3	0.453	0.094	5780	<0.0050	3.1	73.6	<10	<0.0020	<0.20	0.61	0.0747	0.99	0.97	0.34		
12-Jul-12	39.2	<0.010	<0.0050	<50	0.018	22.1	0.36	0.224	2.1	632	0.032	0.56	6.33	93.7	<0.010	0.759	1.32	16.9	0.466	0.102	6270	<0.0050	3.97	105	<10	<0.0020	<0.20	0.86	0.117	0.82	0.83	0.32		
6-Aug-12	45	0.011	<0.0050	<50	<0.0050	25.2	0.4	0.31	1.8	832	0.017	0.72	7.1	180		0.916	1.53		0.58	0.077	6750	<0.0050	4.29	116	<10	<0.0020	<0.20	0.65	0.153	0.86	0.88	0.3		
6-Aug-12	45	0.012	<0.0050	<50	<0.0050	25.8	0.37	0.31	1.7	867	0.019	0.69	6.99	174		0.859	1.55		0.55	0.13	6850	<0.0050	4.21	119	<10	<0.0020	0.38	0.88	0.149	0.87	0.92	0.32		
7-Sep-12	45.4	<0.10	<1.0	<50	<0.010	25.1	<1.0	<0.50	2.79	733	<0.20	<5.0	7.35	157	<0.010	<1.0	1.5	20	0.508	<0.10	6820	<0.020	4.63	116	<3.0	<0.050	<5.0	<5.0	0.17	<5.0	<5.0	<0.50		
1-Oct-12	40.5	<0.10	<1.0	<50	<0.010	23.2	<1.0	<0.50	1.93	553	<0.20	<5.0	6.91	146	<0.010	<1.0	1.6	17	0.496	<0.10	6420	<0.020	4.2	113	<3.0	<0.050	<5.0	<5.0	0.18	<5.0	<5.0	<0.50		
27-May-13	26.4	<0.10	<1.0	<50	<0.010	12.3	<1.0	<0.50	2.59	223	<0.20	<5.0	3.6	81.3	<0.010	<1.0	1.1	22	1.13	<0.10	3470	<0.020	2.13	60.8	<3.0	<0.050	<5.0	<5.0	<0.10	<5.0	<5.0	<0.50		
17-Jun-13	35.3	<0.10	<1.0	<50	<0.010	18.7	<1.0	<0.50	1.82	343	<0.20	<5.0	5.38	33	<0.010	<1.0	1.2	14	0.653	<0.10	5760	<0.020	3.51	88.7	<3.0	<0.050	<5.0	<5.0	0.11	<5.0	<5.0	<0.50		
17-Jun-13	35.3	<0.10	<1.0	<50	<0.010	18.7	<1.0	<0.50	1.91	341	<0.20	<5.0	5.36	32.7	<0.010	<1.0	1.3	13	0.648	<0.10	5700	<0.020	3.48	88.7	<3.0	<0.050	<5.0	<5.0	0.1	<5.0	<5.0	<0.50		
15-Jul-13	38.7	<0.10	<1.0	<50	<0.010	23.7	<1.0	<0.50	1.64	262	<0.20	<5.0	6.26	48.8	<0.010	<1.0	1.9	12	0.661	<0.10	6960	<0.020	3.81	110	<3.0	<0.050	<5.0	<5.0	0.13	<5.0	<5.0	<0.50		
28-Aug-13	39.2	<0.010	<0.0050	<50	0.01	22.2	0.38	0.055	3.09	334	0.039	0.57	6.04	1.31	<0.010	0.741	1.64	10.7	0.477	0.099	6570	0.005	3.91	105	<3.0	<0.0020	<0.20	1.07	0.134	0.83	2.27	0.38		
11-Sep-13	41.8	<0.10	<1.0	<50	<0.010	22.3	<1.0	<0.50	2.01	543	<0.20	<5.0	6.53	115	<0.010	<1.0	1.5	15	0.582	0.1	5970	<0.020	3.96	108	<3.0	<0.050	<5.0	<5.0	0.15	<5.0	<5.0	<0.50		
16-Oct-13	36.1	<0.10	<1.0	<50	<0.010	22.4	<1.0	<0.50	1.78	322	<0.20	<5.0	6.08	105	<0.010	<1.0	1.3	11	0.488	<0.10	6490	<0.020	3.94	103	<3.0	<0.050	<5.0	<5.0	0.15	<5.0	<5.0	<0.50		
16-Oct-13																																		
16-May-14	31.4	<0.10	<1.0	<50	<0.010	14.5	<1.0	<0.50	2.53	194	<0.20	<5.0	4.38	57	<0.010	<1.0	1.4	17	0.891	0.12	4100	<0.020	2.67	72.2	<3.0	<0.050	<5.0	<5.0	<0.10	<5.0	<5.0	<0.50		
3-Jun-14	30.2	<0.10	<1.0	<50	<0.010	17.9	<1.0	<0.50	2.22	218	<0.20	<5.0	5.32	26	<0.010	<1.0	1.4	14	0.592	<0.10	4980	<0.020	3.54	83.9	<3.0	<0.050	<5.0	<5.0	0.1	<5.0	<5.0	<0.50		
26-Jul-14	36	<0.10	<1.0	<50	<0.010	21.9	<1.0	<0.50	1.47	214	<0.20	<5.0	6.77	48	<0.010	<1.0	1.1	11	0.611	<0.10	5990	<0.020	4.05	105	<3.0	<0.050	<5.0	<5.0	0.12	<5.0	<5.0	<0.50		
17-Aug-14	39.4	<0.10	<1.0	<50	<0.010	25.3	<1.0	<0.50	1.29	166	<0.20	<5.0	6.61	68.3	<0.010	<1.0	1	<10	0.841	<0.10	6720	<0.020	3.81	123	<3.0	<0.050	<5.0	<5.0	0.17	<5.0	<5.0	<0.50		
20-Sep-14	37.5	<0.10	<1.0	<50	<0.010	23.5	<1.0	<0.50	1.37	187	<0.20	<5.0	6.69	72.8	<0.010	<1.0	1.1	<10	0.757	<0.10	6280	<0.020	4.13	115	<3.0	<0.050	<5.0	<5.0	0.15	<5.0	<5.0	<0.50		
11-Oct-14	34.7	<0.10	<1.0	<50	<0.010	22.9	<1.0	<0.50	1.51	193	<0.20	<5.0	6.7	67.2	<0.010	<1.0	1.1	<10	0.542	<0.10	6070	<0.020	4.17	109	<3.0	<0.050	<5.0	<5.0	0.15	<5.0	<5.0	<0.50		
4-Dec-14	62.9	<0.10	<1.0	<50	0.011	35.1	<1.0	<0.50	1.74	23	<0.20	<5.0	10.1	15.5	<0.010	1	<1.0	18	1.84	<0.10	8320	<0.020	5.86	194	<3.0	<0.050	<5.0	<5.0	0.3	<5.0	<5.0	<0.50		
26-May-15	29.5	<0.10	<1.0	<50	<0.010	18.6	<1.0	<0.50	1.61	66.5	<0.20	<5.0	4.99	53.2	<0.010	<1.0	1.1	10	0.865	<0.10	4590	<0.020	3.48	86.2	<3.0	<0.050	<5.0	<5.0	0.13	<5.0	<5.0	<0.50		
23-Jun-15	41.6	<0.10	<1.0	<50	<0.010	28.3	<1.0	<0.50	1.01	51.1	<0.20	<5.0	7.49	18.8	<0.010	1.1	<1.0	<10	0.871	<0.10	6940	<0.020	4.04	133	<3.0	<0.050	<5.0	<5.0	0.25	<5.0	<5.0	<0.50		
23-Jun-15	42.6	<0.10	<1.0	<50	<0.010	27.9	<1.0	<0.50	1.07	54	<0.20	<5.0	7.02	18.6	<0.010	1	<1.0	<10	0.889	<0.10	6930	<0.020	3.92	133	<3.0	<0.050	<5.0	<5.0	0.25	<5.0	<5.0	<0.50		
13-Jul-15	32.4	<0.10	<1.0	<50	<0.010	22.1	<1.0	<0.50	1.66	83.8	<0.20	<5.0	6.07	20.7	<0.010	<1.0	<1.0	<10	0.65	<0.10	6320	<0.020	3.88	103	<3.0	<0.050	<5.0	<5.0	0.12	<5.0	<5.0	<0.50		
30-Aug-15	37.6	<0.10	<1.0	<50	<0.010	18.3	<1.0	<0.50	3.38	288	<0.20	<5.0	5.6	86.2	<0.010	<1.0	1.5	13	0.363	<0.10	6290	<0.020	3.95	84.4	<3.0	<0.050	<5.0	<5.0	0.1	<5.0	<5.0	<0.50		
20-Sep-15	34.1	<0.10	<1.0	<50	<0.010	22.8	<1.0	<0.50	1.91	194	<0.20	<5.0	6.55	62.1	<0.010	<1.0	1.2	<10	0.578	<0.10	6280	<0.020	4.14	107	<3.0	<0.050	<5.0	<5.0	0.14	<5.0	<5.0	<0.50		
18-Oct-15	34.4	<0.10	<1.0	<50	0.01	24.6	<1.0	<0.50	1.59	187	<0.20	<5.0	6.5	64.9	<0.010	<1.0	1	11	0.57	<0.10	6900	<0.020	4.24	109	<3.0	<0.050	<5.0	<5.0	0.17	<5.0	<5.0	<0.50		
26-Nov-15	62.2	<0.10	<1.0	<50	<0.010	37.9	<1.0	<0.50	0.71	22.5	<0.20	<5.0	9.73	5.4	<0.010	1.1	<1.0	<10	0.98	0.19	7000	<0.020	7.53	275	3.6	<0.050	<5.0	<5.0	0.7	<5.0	<5.0	<0.50		
19-Dec-15	61.8	<0.10	<1.0	<50	<0.010	32.8	<1.0	<0.50	2.08	22.8	<0.20	<5.0	9.96	7.1	<0.010	<1.0	<1.0	<10	1.22	<0.10	7700	<0.020	5.76	162	<3.0	<0.050	<5.0	<5.0	0.14	<5.0	<5.0	<0.50		

* Results in red exceed their respective guideline

McGinty Creek Surface Water Quality, MN-4.5, May 2009 - December 2015

Sample Date	pH (field)	pH (lab)	Conductivity (field)	Specific Conductivity (field)	Conductivity (lab)	Temperature (field)	Dissolved Oxygen (field)	Dissolved Oxygen (lab)	ORP (field)	Discharge (Flow)	Total Suspended Solids	Total Dissolved Solids (field)	Total Dissolved Solids (lab)	Hardness (from total)	Hardness (from dissolved)	Alkalinity, total	Alkalinity, bicarbonate HCO3	Chloride	Fluoride	Sulphate, dissolved	Cyanide, total	Cyanide, Weak Acid Dissociable	Ion Balance	Ammonia (N)	Nitrite (N)	Nitrate (N)	Nitrite & Nitrate, as N	Dissolved Organic Carbon	Total Organic Carbon	Aluminum (Al), total	Antimony (Sb), total	Arsenic (As), total	Barium (Ba), total		
	pH units	pH units	µS/cm	µS/cm	µS/cm	C	mg/L	%	mV	m3/s	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	ratio	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L			
	6.5-9	6.5-9															120	0.12				0.005		0.282	0.06	3		*				5			
6-May-09	7.35	7.1	47.0		44	-1.5				1.23039	52	29.1	42	28.2	25.8	15	18	1.5	0.08	<0.5	0.0009		NC	<0.005	0.005	<0.02	<0.02	27.5	30.4	322	0.06	0.5	33.8		
13-May-09	7.26	7.3	76.6		57	-1.5				0.4572	12	37.3	94	32.9	33.8	25	30	<5	0.08	<0.5	0.0009		NC	0.008	0.017	0.11	0.13	29.8	32.8	178	0.05	0.45	26.1		
21-May-09	7.65	7.8	124.5		96	0.8	9.59	81.8		0.21054	18	62.1		44.3	47.6					<0.5				<0.005			17.1	18	137	0.07	0.46	30.4			
28-May-09	7.77	7.8	143.9		115	0.0	10.34	89.2		0.11848	12	74.4	110	59.6	60.4	53	64	1.7	0.18	<0.5	0.0014		NC	<0.005	<0.005	<0.02	<0.02	19.1	19.1	123	0.07	0.49	34.4		
25-Jun-09	7.87	7.9	90.8		150	3.8	13.77	104	134		2		120	67.3	66.7	70	85	0.6	0.25	6.5	0.0007		NC	<0.005	<0.005	0.05	0.05	13.4	12.7	30.9	0.11	0.32	34.6		
28-Jul-09	7.67	8	129.3		210	5	10.95	85.8	163.7	0.00173	<1		120	98.8	99.4	99	120	0.6	0.33	8.5	0.0007		NC	<0.005	<0.005	0.12	0.12	9	9	9.8	0.08	0.28	45.3		
29-Aug-09	8.02	7.9			177	4.1	11.4	87.7	75.9	0.03445	1		130	84.8	86.5	85	100	<0.5	0.28	6.2	0.0008		NC	<0.005	<0.005	0.24	0.24	12.7	12.7	33.9	0.1	0.4	41.1		
29-Sep-09	7.88	8	109.6		196	1	12.34	86.6	104.5	0.007	<1		120	86.2	93.2	94	110	0.6	0.32	7.6	<0.0005		NC	0.02	<0.005	0.07	0.07	10	9.4	12.2	0.09	0.32	39.9		
23-Oct-09		8.1			206					0.00864	<1		120	103	107	100	120	1	0.33	9.9	<0.0005			<0.005	<0.005	0.09	0.09	8	7.9	7.9	0.07	0.27	44.4		
23-Oct-09														46.8				1.1	0.32	9.5				<0.005	<0.005	0.09	0.09			68.9	0.07	0.28	31		
27-Nov-09		8			224						<1		110	105	108	110	130	1	0.35	9.1	<0.0005		NC	<0.005	<0.005	0.3	0.3	6.7	7.2	8.5	0.07	0.24	47.5		
27-Nov-09														104																	8.8	0.07	0.22	45.5	
15-Dec-09										0																									
25-Jan-10										0																									
23-Feb-10										0																									
22-Mar-10										0																									
22-Apr-10														40.2																		109	0.03	0.33	23.4
22-Apr-10	7.47	7.3	41.5		68	0.0	12.30	90.0	326.0	0.79598	14		62	41.8	39.8	30	36	1.9	0.1	<5	<0.0005			0.08	<0.03	<0.1	<0.1	44.7	44.6	242	0.03	0.4	31.8		
28-May-10	7.74	8.1	110.3		182	4.0	12.96	98.9	333.8	0.02599	1		140	78.2	82.5	88	110	<0.5	0.31	8.1	0.0008			<0.005	<0.005	0.02	0.02	8.1	8.1	12.8	0.07	0.35	37.7		
28-Jun-10	7.83	7.83	112.4		198	4.5	11.4	93.00	97.3	0.00874	2		130	84.6	88.5	89	110	<0.5	0.32	8	<0.0005			<0.05	<0.005	<0.02	<0.02	12.5	12.7	40.3	0.08	0.34	41.8		
21-Jul-10														67.3	69.6																46.1	0.09	0.41	39.1	
21-Jul-10	8.04	7.98	95.2		154	6.6	11.86	102.9	71.4	0.04059	5		110	66.3	69.4	75	92	1	0.24	1.4	0.0012			0.018	<0.005	0.02	0.02	17.2	16.4	47	0.09	0.4	39.5		
18-Aug-10														70.9	76.6																115	0.11	0.71	49.9	
18-Aug-10	8.11	7.84	147.5		153	6.4	10.9	94.10	53.0		290		140	91.2	75.5	73	89	0.7	0.22	1.1	<0.0005			0.27	<0.005	<0.02	<0.02	3.2	16	1950	0.13	1.88	130		
15-Sep-10														66.3																	52.7	0.09	0.45	39.6	
15-Sep-10	7.98	7.95	88.4		154	2.4	13.59	99.4	286.3	0.12723	4		110	69.4	77.2	74	91	<0.5	0.21	3.3	0.0014			0.17	<0.005	0.05	0.05	17	17.1	56.9	0.09	0.43	39.8		
21-Oct-10														89	92.6																53.1	0.09	0.35	45.9	
21-Oct-10	8.03	8.03	69.3		191	-0.1			336.3	0.02303	<4		140	95.8	94.3	91	110	0.5	0.29	6.4	<0.0005	<0.0005		<0.005	<0.005	0.11	0.11	12.5	12.8	37.8	0.09	0.4	47.1		
11-Jan-11										0																									
29-Apr-11	7.46	7.48	54		101	0	14.33	103.5	124.2	0.21544	2		96	55.7	52.7	46	56	1.9	0.13	<0.5	0.0008	0.001		0.038	<0.005	<0.02	<0.02	29	30	58.9	0.04	0.41	34.1		
19-May-11	7.89	7.37	37.9		71	1.1	14.86	102.6	169.3	0.27373	14		68	40.6	36.1	33	40	2.4	0.12	<5	0.0015	0.0013		<0.005	<0.005	0.09	0.09	26.8	27.8	334	0.07	0.55	33		
28-Jun-11	7.9	7.74	83.9		132	5.1	12.3	104.2	63.9	0.22529	52		110	62.9	72.9	61	74	1.7	0.21	<0.5	0.0018	0.0016		0.034	<0.005	0.07	0.07	20.5	21.9	638	0.1	0.72	46		
15-Jul-11	7.44	7.51		97.1	97	6.5	10.7	94	318.1	0.667	570		58	101	48.4	44	54	1.7	0.18	<0.5	0.0018	0.0021		0.12	0.006	0.02	0.03	24.6	26.7	#####	0.5	6.5	317		
10-Aug-11	7.93	7.43		118.8	120	5.9	12.69	101.5	277.3	0.2461	150		110	73.8	59.5	56	68	1.6	0.18	<0.5	0.0006	0.0012	NC	0.061	<0.005	<0.02	<0.02	20	20.4	2990	0.21	1.96	98.6		
28-Oct-11		7.81			208						5		120	110	102	91	110	1.1	0.29	7	<0.0005	<0.0005	NC	0.018	<0.005	0.13	0.13	10.3	10.4	58.4	0.07	0.47	50.5		
28-Oct-11	8.16	7.89		19	209	0.2				0.016	6		120	109	98.3	92	110	1	0.29	6.6	<0.0005	<0.0005	NC	0.013	<0.005	0.13	0.13	9.7	10	62.7	0.07	0.45	48.6		
19-Apr-12		7.59			111						2.9		110	59.2	55.2	49.5	60.4	1.4	0.15	<0.50	0.00136	<0.00050	NC	0.0098	<0.0050	<0.020	<0.020	27.8	27.4	44.2	0.034	0.419	31.7		

* Results in red exceed their respective guideline

McGinty Creek Surface Water Quality, MN-4.5, May 2009 - December 2015

Sample Date	pH (field)	pH (lab)	Conductivity (field)	Specific Conductivity (field)	Conductivity (lab)	Temperature (field)	Dissolved Oxygen (field)	Dissolved Oxygen (lab)	ORP (field)	Discharge (Flow)	Total Suspended Solids	Total Dissolved Solids (field)	Total Dissolved Solids (lab)	Hardness (from total)	Hardness (from dissolved)	Alkalinity, total	Alkalinity, bicarbonate HCO3	Chloride	Fluoride	Sulphate, dissolved	Cyanide, total	Cyanide, Weak Acid Dissociable	Ion Balance	Ammonia (N)	Nitrite (N)	Nitrate (N)	Nitrite & Nitrate, as N	Dissolved Organic Carbon	Total Organic Carbon	Aluminum (Al), total	Antimony (Sb), total	Arsenic (As), total	Barium (Ba), total
	pH units	pH units	µS/cm	µS/cm	µS/cm	C	mg/L	%	mV	m3/s	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	ratio	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	
	6.5-9	6.5-9															120	0.12			0.005		0.282	0.06	3		*				5		
24-May-12		7.91			133						67.7	106	64.4	61.8	61.3	74.8	1.2	0.22	<0.50	<0.00050	<0.00050	NC	0.028	<0.050	<0.20	<0.20	13.5	13.7	425	0.081	0.94	55.6	
14-Jun-12		7.62			101						560	74	80.1	51.3	45.3	55.3	<5.0	0.19	<5.0	0.00128	0.00106	NC	0.013	<0.050	<0.20	<0.20	17.1	23.6	3420	0.159	3.98	224	
12-Jul-12		7.97			173						55.7	114	86.9	83.1	81.2	99.1	1.2	0.27	1.24	<0.00050	<0.00050	NC	0.024	<0.050	<0.20	<0.20	13.7	13.1	648	0.098	1.02	66.2	
6-Aug-12		8.05			201						55.9	134	103	99	98.7	120	1.1	0.29	3.41	<0.00050	<0.00050	NC	0.015	<0.0050	0.065	0.065	10.8	12.4	591	0.1	1.06	66.5	
7-Sep-12		8.07			190						57.1	128	86.5	99.9	93	113	1.4	0.26	2.61	<0.00050	<0.00050		0.0077	<0.0050	0.033	0.033	13.4	13.9	222	<0.50	0.67	52.9	
1-Oct-12		8			190						7.8	154	100	93.7	91.7	112	1	0.26	4.04	<0.00050	<0.00050		0.0075	<0.0050	0.067	0.067	11.6	11.5	75	<0.50	0.62	50	
27-May-13		7.83			109						39.5	98	54.9	53.3	51.6	62.9	1.2	0.18	<0.50	<0.00050		0.032	<0.0050	<0.020	<0.020	14.1	14.3	749	<0.50	0.73	43.8		
17-Jun-13		7.83			171						10.6	130	88.2	80.7	80.4	98	1.2	0.27	4.46	0.00084	0.00072		0.024	<0.0050	0.037	0.037	10.3	12.5	290	<0.50	0.72	48.6	
28-Aug-13		7.89			169						31.3	76	87	82.7	78.4	95.6	0.83	0.24	2.1	0.00124	0.00153	1.1	0.019	<0.0020	0.0581	0.0581	12.9	14.5	135	0.09	0.709	48.9	
11-Sep-13		7.93			188						8.3	134	91.8	89.3	87.7	107	1	0.26	5.4		0.00065		0.035	<0.050	<0.20	<0.20	11	11.7	217	<0.50	0.76	47	
16-Oct-13		7.95			188						23.1	158	94.1	91.3	88.5	108	1.4	0.26	6.92		0.00094		0.016	<0.0050	0.089	0.089	9.71	9.83	292	<0.50	0.6	50.3	
16-Oct-13	7.74			157.3		0	14.52	99.3	-17.5																								
16-May-14		7.95			147						5.7	104	73.1	70	68.6	83.7	1.1	0.26	0.6		0.00136		0.034	<0.0050	<0.020	<0.020	16.1	16.5	148	<0.50	0.49	37.9	
16-May-14	8.28	7.92	151.6	282.5	147	0.6	14.37	100.0	210.4		4.7	108	75.5	69.4	67.4	82.3	0.99	0.26	0.76		0.00109		0.036	<0.0050	<0.020	<0.020	15.7	17.3	149	<0.50	0.5	38.8	
3-Jun-14		8.06			175						4.7	136	85.4	81.1	81.2	99.1	1	0.29	6.34		0.00117		0.017	<0.0050	0.073	0.073	11.7	13.5	73.3	<0.50	0.43	41.4	
3-Jun-14	7.42	8.05	118.3	204.9	175	2.9	14.86	109.9	112.1		4.4	124	86.8	82.4	80.9	98.6	0.69	0.29	5.88		0.0012		0.014	<0.0050	0.072	0.072	12.6	12	93.3	<0.50	0.42	41.5	
26-Jul-14	8.43	8.07	167.6	277.9	201	4.2	12.76	98.8	92.2		6.3	120	102	92.7	94	115	0.79	0.31	6.94		0.00069		0.019	<0.0050	0.061	0.061	11.4	9.7	151	<0.50	0.47	50	
17-Aug-14	7.98	8.18	177.9	296.1	227	4.1	12.89	98.3	118.4		8.2	146	113	110	107	131	0.77	0.35	9.38		<0.00050		0.02	<0.0050	0.09	0.09	7.86		179	<0.50	0.46	53.4	
20-Sep-14	7.93	7.92	194.3	348.7	212	2	13.29	96.1	200.1		<1.0	132	108	101	96.1	117	0.72	0.32	8.07		0.00088		0.014	<0.0050	<0.020	<0.020	20.5	9.56	19.9	<0.50	0.37	47.5	
10-Oct-14	7.62	8.07	126.6	252.9	192	-1.2	14.72	97.5	185.5		2	124	85.1	93.8	87.9	107	1.3	0.28	8.03		0.00079		0.011	<0.0050	0.076	0.076	11.2	11.9	44.1	<0.50	0.36	40.2	
26-May-15	7.63	7.95	108.2	195.4	196	1.6	14.01	100.3	133.6		3.3	122	99.4	95.2	85.3	104	1.8	0.29	9.81		0.00057		0.023	<0.0050	<0.020	<0.020	7.4	8.31	65.9	<0.50	0.39	46.5	
23-Jun-15	7.37	8.1	129.8	217.3	220	3.9	10.94	83.4	169.8		11.5	136	105	107	102	125	0.98	0.35	10.6				0.027	<0.0050	0.232	0.232			17.7	<0.50	0.31	49.3	
13-Jul-15	7.78	7.85	100.2	163	167	4.8	11.64	90.3	143.2		9.9	114	81.3	79.9	77.7	94.8	0.56	0.29	5.07				0.042	<0.0050	0.048	0.048			216	<0.50	0.48	41.7	
30-Aug-15	7.96	7.85	72.8	128.6	130	2.3	13.14	95.7	115.9		94.6	120	80.4	62.2	59.4	72.5	1.7	0.22	<0.50			0.037	<0.0050	0.027	0.027	18		1610	<0.50	1.11	71.9		
20-Sep-15	8.04	8.04	105.9	188.4	186	2	13.15	95.1	133.1		<1.0	146	93.9	89.9	87.4	107	1.2	0.31	6.85				0.011	<0.0050	0.031	0.031	12		33.6	<0.50	0.29	45.1	
18-Oct-15	7.80	8	101.1	193.9	195	0.1	13.30	91.2	36.0		1.9	118	94.6	96.7	88.5	108	1.2	0.3	6.29				0.013	<0.0050	0.081	0.081	10.3		18.8	<0.50	0.36	38.3	

* Results in red exceed their respective guideline

McGinty Creek Surface Water Quality, MN-4.5, May 2009 - December 2015

	<div style="display: flex; justify-content: space-between; text-align: left; padding: 5px;"> Beryllium (Be), total Bismuth (Bi), total Boron (B), total Cadmium (Cd), total Calcium (Ca), total Chromium (Cr), total Cobalt (Co), total Copper (Cu), total Iron (Fe), total Lead (Pb), total Lithium (Li), total Magnesium (Mg), total Manganese (Mn), total Mercury (Hg), total Molybdenum (Mo), total Nickel (Ni), total Phosphorous (P), total Potassium (K), total Selenium (Se), total Silicon (Si), total Silver (Ag), total Sodium (Na), total Strontium (Sr), total Sulphur (S), total Thallium (Tl), total Tin (Sn), total Titanium (Ti), total Uranium (U), total Vanadium (V), total Zinc (Zn), total Zirconium (Zr), total Aluminum (Al), dissolved Antimony (Sb), dissolved Arsenic (As), dissolved </div>																																		
Sample Date	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L			
	1500	*		1		*	300	*		0.026	73	*		1	0.25		0.8		30																
6-May-09	0.03	<0.005	<50	0.031	7.63	0.6	0.532	3.98	617	0.254	<0.5	2.22	62.3	<0.01	0.14	1.93		1.35	0.06	2090	0.008	0.93	39.6	<3	<0.002	<0.01	9.3	0.082	1.5	6.2	0.5	138	0.07	0.28	
13-May-09	0.02	<0.005	<50	0.007	8.98	0.5	0.19	3.58	342	0.055	<0.5	2.55	15.1	<0.01	0.22	1.9		1.01	0.13	3460	<0.005	1.44	47.1	<3	<0.002	<0.01	3.5	0.087	0.8	1.8	0.6	144	0.06	0.36	
21-May-09	0.02	<0.005	<50	0.073	12.1	0.4	0.261	2.86	331	0.155	0.6	3.42	34.7	<0.01	0.43	1.6		0.81	0.12	3810	0.006	2.39	78.6	<3	<0.002	<0.01	3.8	0.2	1.1	3	0.4	46	0.07	0.38	
28-May-09	0.02	<0.005	<50	0.01	16.7	0.4	0.22	2.87	314	0.105	0.5	4.34	25.4		0.5	1.8		0.74	0.11	4550	<0.005	3.04	97.5	<3	0.002	<0.01	4.6	0.183	1.1	2.4	0.4	29.7	0.08	0.45	
25-Jun-09	<0.01	<0.005	<50	<0.005	18.9	0.1	0.08	2.07	71	0.158	0.9	4.9	2.8	<0.01	0.87	1.09		0.54	0.16	4740	<0.005	3.84	132	<3	<0.002	<0.01	0.9	0.296	0.5	0.5	0.3	17.3	0.1	0.31	
28-Jul-09	<0.01	<0.005	<50	<0.005	28.6	<0.1	0.043	1.73	19	0.011	1	6.65	1.68	<0.01	0.99	0.61		0.83	0.18	6200	<0.005	4.92	171	4	<0.002	<0.01	<0.5	1.15	0.5	0.4	0.2	7.6	0.08	0.26	
29-Aug-09	<0.01	<0.005	<50	0.026	24	0.3	0.085	2.21	81	0.053	1	6.06	4.23	<0.01	0.89	1.11		0.66	0.15	6320	<0.005	4.51	148	<3	<0.002	<0.01	1.2	0.351	0.5	0.8	0.3	14.3	0.09	0.36	
29-Sep-09	<0.01	<0.005	<50	0.033	24.4	0.2	0.055	1.92	25	0.014	1	6.15	1.97		0.91	0.88		0.83	0.21	5920	<0.005	4.59	147	3	<0.002	<0.01	<0.5	0.766	0.2	2.4	0.2	9.7	0.08	0.33	
23-Oct-09	<0.01	<0.005	<50	0.006	29.2	0.2	0.043	1.31	17	0.007	1.1	7.27	0.65	<0.01	1.03	0.72		0.8	0.16	6180	<0.005	5.31	177	4	<0.002	<0.01	<0.5	0.807	0.3	0.3	0.2	6.9	0.07	0.29	
23-Oct-09	0.01	<0.005	<50	<0.005	12.4	0.5	0.143	3.62	284	0.013	<0.5	3.83	10	<0.01	0.29	0.87		0.34	0.07	7650	<0.005	3.01	59.4	<3	<0.002	<0.01	0.8	0.022	0.4	0.4	0.5				
27-Nov-09	<0.01	<0.005	<50	0.019	31.2	0.2	0.034	1.54	12	0.066	1	6.68	0.5	<0.01	1.03	0.53		0.8	0.17	6080	<0.005	4.48	183	4	<0.002	0.02	<0.5	1.73	0.2	1.5	0.2	9.9	0.09	0.26	
27-Nov-09	<0.01	<0.005	<50	0.017	30.9	0.2	0.038	1.65	14	0.111	1.1	6.58	0.66	<0.01	0.98	0.51		0.79	0.17	6090	<0.005	4.37	182	5	<0.002	<0.01	<0.5	1.75	0.2	2.1	0.2				
15-Dec-09																																			
25-Jan-10																																			
23-Feb-10																																			
22-Mar-10																																			
22-Apr-10	0.02	<0.005	<50	0.039	10.6	0.3	0.116	3.66	160	0.028	0.6	3.32	11	<0.01	0.16	1.41		1.68	0.06	3280	<0.005	1.79	44.1	<10	<0.002	<0.01	1.5	0.033	<0.2	5.2	0.4				
22-Apr-10	0.03	<0.005	<50	0.036	11.3	0.5	0.236	4.38	305	0.088	0.6	3.3	22.1	<0.01	0.18	1.73		1.48	0.07	2710	<0.005	1.8	63.4	<10	<0.002	<0.01	5.1	0.092	0.6	6	0.5	174	0.11	0.38	
28-May-10	<0.01	<0.005	<50	0.015	22.3	0.1	0.046	1.48	39	0.122	0.7	5.51	3.54	<0.01	1	0.84		0.79	0.15	4500	<0.005	4.27	150	<10	<0.002	0.01	<0.5	0.532	0.4	0.8	0.1	9.1	0.07	0.34	
28-Jun-10	<0.01	<0.005	<50	0.006	23.7	0.2	0.098	1.77	82	0.044	0.8	6.15	10.4		0.93	0.98		0.82	0.14	4950	<0.005	4.59	161	<10	<0.002	<0.01	1.2	0.847	0.6	0.9	0.2	8.7	0.09	0.34	
21-Jul-10	0.01	<0.005	<50	0.015	19.3	0.3	0.09	2.33	141	0.087	0.8	4.68	5.46	<0.01	0.74	1.19		0.51	0.13	5550	<0.005	3.46	120	<10	<0.002	<0.01	1.8	0.239	0.7	1.3	0.4	23.8	0.09	0.4	
21-Jul-10	0.01	<0.005	<50	0.009	18.9	0.3	0.098	2.44	137	0.063	0.9	4.66	5.92	<0.01	0.77	1.2		0.5	0.15	5410	<0.005	3.45	121	<10	<0.002	<0.01	1.9	0.244	0.8	1.7	0.4	23.1	0.1	0.41	
18-Aug-10	0.02	<0.005	<50	0.024	19.7	0.5	0.192	3.63	347	0.187	0.8	5.29	17.8	<0.01	0.68	1.73		0.54	0.14	5890	<0.005	3.8	117	<10	<0.002	<0.01	3.2	0.198	1.9	1.3	0.5	38.9	0.1	0.48	
18-Aug-10	0.17	0.005	<50	0.106	24.7	3.5	2.96	13.1	3900	2.21	1.9	7.15	286	<0.01	0.31	8.21		0.73	0.13	8600	0.006	4.04	147	<10	0.01	<0.01	33.2	0.592	11.3	16.1	1	31.8	0.11	0.55	
15-Sep-10	0.01	<0.005	<50	0.011	17.5	0.4	0.112	2.44	207	0.082	<0.5	5.48	9.77	<0.01	0.62	1.98		0.51	0.12	5300	<0.005	3.78	119	<10	<0.002	<0.01	1	0.219	0.8	3.4	0.4				
15-Sep-10	0.01	<0.005	<50	0.016	18.8	0.4	0.122	2.52	229	0.199	0.6	5.43	11.5	<0.01	0.64	4.03		0.51	0.13	5720	<0.005	3.84	119	<10	<0.002	0.04	1.2	0.227	0.7	63.1	0.4	33.7	0.1	0.43	
21-Oct-10	<0.01	<0.005	<50	0.007	24.1	0.3	0.083	1.78	145	0.022	0.9	7.01	5.65	<0.01	0.85	1.06		0.69	0.18	6270	<0.005	4.53	159	<10	<0.002	<0.01	2.6	0.436	0.4	0.6	0.3	20.9	0.08	0.41	
21-Oct-10	<0.01	<0.005	<50	0.016	27	0.3	0.076	1.83	137	0.051	0.9	6.87	5.31	<0.01	0.85	1.17		0.69	0.17	7080	<0.005	4.52	160	<10	<0.002	<0.01	1	0.425	0.4	1.6	0.3	18.1	0.08	0.37	
11-Jan-11																																			
29-Apr-11	<0.01	<0.005	<50	0.032	15.9	0.2	0.094	2.62	138	0.031	0.6	3.91	9.76	<0.01	0.28	1.12		2.66	0.1	4300	<0.005	2.03	83.5	<10	<0.002	<0.01	1.1	0.101	0.3	3.3	0.2	41.1	0.05	0.42	
19-May-11	0.03	<0.02	<50	0.024	11.3	0.9	0.34	3.6	824	0.17	0.6	3	41.5	<0.01	0.41	1.9		0.9	0.12	4170	0.009	1.8	63.8	<50	0.004	<0.2	14	0.124	1.6	2	0.5	71.3	0.05	0.46	
28-Jun-11	0.04	<0.02	<50	0.033	17.2	1.4	0.58	4.3	1120	0.37	0.9	4.8	49.9	<0.01	0.58	2.8		0.5	0.13	5760	0.01	3.2	106	<50	0.008	<0.2	26	0.253	3	3	0.6	49	0.12	0.49	
15-Jul-11	0.53	<0.1	<300	0.31	24	23	10.2	37	20100	7.4	8	10	670	<0.05	0.9	24.8		2	0.4	27200	0.08	4	167	<300	0.09	<1	480	1.14	46	61	1.8	77.4	0.13	0.65	
10-Aug-11	0.12	0.03	<50	0.066	20	6	2.37	10.2	5120	1.62	2.5	5.8	134	<0.01	0.72	6.6	160	0.7	0.17	11300	0.026	3.5	113	<50	0.027	<0.2	131	0.441	11.7	10	1	65.9	0.12	0.62	
28-Oct-11	<0.01	<0.005	<50	0.017	31	0.3	0.141	1.76	271	0.064	0.9	7.82	31.4	<0.01	0.77	1.1	16	0.71	0.17	7440	<0.005	5.28	168	<10	<0.002	0.05	2.6	0.45	0.8	0.9	0.2	17.7	0.07	0.39	
28-Oct-11	<0.01	<0.005	<50	0.01	31.1	0.3	0.138	1.66	277	0.08	0.9	7.59	30.9	<0.01	0.81	1.05	14	0.72	0.2	7450	<0.005	5.08	169	<10	<0.002	<0.01	2.2	0.471	0.7	1	0.2	16.8	0.08	0.41	
19-Apr-12	0.012	<0.0050	<50	0.0233	17.3	0.28	0.109	2.63	187	0.0358	0.59	3.86	10.7	<0.010	0.41	1	84.4	2.23	0.141	4280	0.0053	2.29	99.1	<10	<0.0020	<0.20	1.84	0.121	0.48	2.33	0.2	28.8	0.043	0.325	

* Results in red exceed their respective guideline

McGinty Creek Surface Water Quality, MN-4.5, May 2009 - December 2015

Sample Date	Beryllium (Be), total	Bismuth (Bi), total	Boron (B), total	Cadmium (Cd), total	Calcium (Ca), total	Chromium (Cr), total	Cobalt (Co), total	Copper (Cu), total	Iron (Fe), total	Lead (Pb), total	Lithium (Li), total	Magnesium (Mg), total	Manganese (Mn), total	Mercury (Hg), total	Molybdenum (Mo), total	Nickel (Ni), total	Phosphorous (P), total	Potassium (K), total	Selenium (Se), total	Silicon (Si), total	Silver (Ag), total	Sodium (Na), total	Strontium (Sr), total	Sulphur (S), total	Thallium (Tl), total	Tin (Sn), total	Titanium (Ti), total	Uranium (U), total	Vanadium (V), total	Zinc (Zn), total	Zirconium (Zr), total	Aluminum (Al), dissolved	Antimony (Sb), dissolved	Arsenic (As), dissolved	
	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
			1500	*		1	*	300	*				0.026	73	*		1		0.25				0.8							30					
24-May-12	0.044	<0.0050	<50	0.0467	17.7	0.96	0.689	4.23	1320	0.51	0.75	4.92	104	<0.000010	0.535	2.57	68.2	0.797	0.142	5180	0.0129	3.16	107	<10	0.0023	<0.20	16.6	0.326	3.13	4.23	0.49	24.5	0.07	0.465	
14-Jun-12	0.317	0.0065	<50	0.288	21.6	5.85	6.36	23.1	8570	4.2	2.52	6.32	715	<0.010	0.37	14.6	635	0.684	0.188	8930	0.0389	3.08	135	<10	0.0179	3.55	61.9	0.853	23.8	31.9	1.31	44.8	0.112	0.601	
12-Jul-12	0.042	0.005	<50	0.043	24.2	1.3	0.715	4.66	1330	0.617	1.05	6.43	47.6	<0.010	0.642	3.03	50.4	0.62	0.171	6910	0.012	4.44	144	<10	0.005	<0.20	21.5	0.327	3.44	6.69	0.55	21.6	0.087	0.607	
6-Aug-12	0.041	0.005	<50	0.039	28.6	1.3	0.697	3.86	1370	0.537	1.25	7.58	58.2		0.812	2.88		0.804	0.17	7460	0.011	4.97	174	<10	0.005	<0.20	20.6	0.456	3.08	3.18	0.55	17.8	0.077	0.584	
7-Sep-12	<0.10	<1.0	<50	0.01	23.8	<1.0	<0.50	2.89	879	0.28	<5.0	6.57	56.1	<0.010	<1.0	2.7	49	0.587	0.21	6070	<0.020	4.37	147	<3.0	<0.050	<5.0	9	0.31	<5.0	<5.0	<0.50	21.3	<0.50	0.55	
1-Oct-12	<0.10	<1.0	<50	<0.010	28.2	<1.0	<0.50	3.15	588	0.21	<5.0	7.23	43.2	<0.010	<1.0	2.1	23	0.701	0.12	6280	<0.020	5.19	180	<3.0	<0.050	<5.0	<5.0	0.4	<5.0	14.5	<0.50	20.8	<0.50	0.56	
27-May-13	<0.10	<1.0	<50	0.011	15.3	1.4	0.68	4.17	1330	0.32	<5.0	4.06	90.4	<0.010	<1.0	2.4	67	1.07	0.22	5050	<0.020	2.62	97	<3.0	<0.050	<5.0	34.4	0.21	<5.0	5	<0.50	26	<0.50	0.37	
17-Jun-13	<0.10	<1.0	<50	<0.010	24.6	<1.0	<0.50	2.52	629	<0.20	<5.0	6.5	40.1	<0.010	1.1	1.6	26	0.864	0.19	5850	<0.020	4.93	164	<3.0	<0.050	<5.0	16.1	0.44	<5.0	<5.0	<0.50	12.4	<0.50	0.49	
28-Aug-13	0.021	<0.0050	<50	0.02	24.7	0.53	0.249	3.11	630	0.207	0.72	6.15	28.1	<0.010	0.837	1.8	31.5	0.593	0.152	6980	<0.0050	4.66	140	<3.0	<0.0020	<0.20	5.72	0.316	1.61	2.3	0.42	25.7	0.092	0.576	
11-Sep-13	<0.10	<1.0	<50	<0.010	25.2	<1.0	<0.50	1.94	674	<0.20	<5.0	7.03	20.7	<0.010	<1.0	1.8	25	0.692	0.17	6470	<0.020	4.83	159	<3.0	<0.050	<5.0	9.7	0.34	<5.0	<5.0	<0.50	19.3	<0.50	0.58	
16-Oct-13	<0.10	<1.0	<50	<0.010	25.9	<1.0	<0.50	2.45	626	<0.20	<5.0	7.14	24.7	<0.010	<1.0	2	31	0.658	0.16	7040	<0.020	4.92	172	3.5	<0.050	<5.0	16.2	0.41	<5.0	<5.0	<0.50	16.1	<0.50	0.47	
16-Oct-13																																			
16-May-14	<0.10	<1.0	<50	0.01	20.2	<1.0	<0.50	2.87	402	<0.20	<5.0	5.48	15.6	<0.010	<1.0	1.4	27	0.873	0.14	5320	<0.020	3.74	131	<3.0	<0.050	<5.0	7.1	0.29	<5.0	<5.0	<0.50	19.8	<0.50	0.4	
16-May-14	<0.10	<1.0	<50	0.01	20.8	<1.0	<0.50	2.92	401	<0.20	<5.0	5.69	16	<0.010	<1.0	1.7	28	0.928	0.14	5430	<0.020	3.79	132	<3.0	<0.050	<5.0	7.7	0.31	<5.0	5.4	<0.50	20.3	<0.50	0.39	
3-Jun-14	<0.10	<1.0	<50	<0.010	23.6	<1.0	<0.50	2.19	221	<0.20	<5.0	6.44	12	<0.010	1	1.2	18	0.745	0.2	5210	<0.020	4.78	156	4.4	<0.050	<5.0	<5.0	0.47	<5.0	<5.0	<0.50	13.4	<0.50	0.36	
3-Jun-14	<0.10	<1.0	<50	<0.010	24.3	<1.0	<0.50	2.77	235	<0.20	<5.0	6.31	12.7	<0.010	<1.0	1.1	16	0.753	0.21	5510	<0.020	4.76	157	3.1	<0.050	<5.0	<5.0	0.45	<5.0	<5.0	<0.50	13.7	<0.50	0.38	
26-Jul-14	<0.10	<1.0	<50	<0.010	29	<1.0	<0.50	2.44	269	<0.20	<5.0	7.29	9	<0.010	1.1	1.2	38	0.853	0.15	6590	<0.020	5.26	182	<3.0	<0.050	<5.0	6.4	0.48	<5.0	<5.0	<0.50	9.4	<0.50	0.38	
17-Aug-14	<0.10	<1.0	79	<0.010	31.5	<1.0	<0.50	1.97	269	<0.20	<5.0	8.35	9.5	<0.010	1.2	1.1	20	1.06	0.1	6520	0.231	5.94	197	4	<0.050	<5.0	11.5	0.77	<5.0	<5.0	<0.50	16.8	<0.50	0.34	
20-Sep-14	<0.10	<1.0	<50	<0.010	29.5	<1.0	<0.50	1.41	71	<0.20	<5.0	8.33	3.3	<0.010	1.1	<1.0	<10	0.94	0.12	6000	<0.020	5.95	193	3.3	<0.050	<5.0	<5.0	0.58	<5.0	<5.0	<0.50	10.7	<0.50	0.33	
10-Oct-14	<0.10	<1.0	<50	<0.010	23.1	<1.0	<0.50	1.5	164	<0.20	<5.0	6.67	5.2	<0.010	<1.0	<1.0	<10	0.668	<0.10	4830	<0.020	4.54	163	<3.0	<0.050	<5.0	<5.0	0.4	<5.0	<5.0	<0.50	10.5	<0.50	0.36	
26-May-15	<0.10	<1.0	<50	<0.010	27.4	<1.0	<0.50	1.5	188	<0.20	<5.0	7.54	11.3	<0.010	<1.0	<1.0	27	1.05	0.27	5300	0.021	5.55	207	<3.0	<0.050	<5.0	<5.0	0.57	<5.0	<5.0	<0.50	8.1	<0.50	0.35	
23-Jun-15	<0.10	<1.0	<50	<0.010	30.5	<1.0	<0.50	1.68	33	<0.20	<5.0	7.08	4	<0.010	1	<1.0	13	0.867	0.16	6150	<0.020	4.85	198	6.6	<0.050	<5.0	<5.0	1.06	<5.0	<5.0	<0.50	6.7	<0.50	0.29	
13-Jul-15	<0.10	<1.0	<50	<0.010	22.9	<1.0	<0.50	2.21	421	<0.20	<5.0	5.87	22.1	<0.010	<1.0	1.3	25	0.662	0.12	6310	<0.020	4.35	160	<3.0	<0.050	<5.0	7.7	0.34	<5.0	<5.0	<0.50	15.2	<0.50	0.42	
30-Aug-15	<0.10	<1.0	<50	0.032	22	3.6	1.31	7.02	3030	0.88	<5.0	6.19	116	<0.010	<1.0	4	102	0.688	0.29	10500	<0.020	4.26	121	<3.0	<0.050	<5.0	70.9	0.3	5.3	6.6	0.79	49.4	<0.50	0.6	
20-Sep-15	<0.10	<1.0	<50	<0.010	26.8	<1.0	<0.50	2.38	120	<0.20	<5.0	6.55	3.9	<0.010	1	<1.0	19	0.815	0.17	6430	<0.020	6.27	160	<3.0	<0.050	<5.0	<5.0	0.44	<5.0	<5.0	<0.50	16.2	<0.50	0.34	
18-Oct-15	<0.10	<1.0	<50	<0.010	26.5	<1.0	<0.50	1.4	89	<0.20	<5.0	6.89	2.6	<0.010	<1.0	<1.0	<10	0.681	0.2	6800	<0.020	4.99	161	<3.0	<0.050	<5.0	<5.0	0.41	<5.0	<5.0	<0.50	16.3	<0.50	0.3	

* Results in red exceed their respective guideline

McGinty Creek Surface Water Quality, MN-4.5, May 2009 - December 2015

Sample Date	<div style="display: flex; justify-content: space-between; padding: 0 5px;"> Barium (Ba), dissolved Beryllium (Be), dissolved Bismuth (Bi), dissolved Boron (B), dissolved Cadmium (Cd), dissolved Calcium (Ca), dissolved Chromium (Cr), dissolved Cobalt (Co), dissolved Copper (Cu), dissolved Iron (Fe), dissolved Lead (Pb), dissolved Lithium (Li), dissolved Magnesium (Mg), dissolved Manganese (Mn), dissolved Mercury (Hg), dissolved Molybdenum (Mo), dissolved Nickel (Ni), dissolved Phosphorous (P), dissolved Potassium (K), dissolved Selenium (Se), dissolved Silicon (Si), dissolved Silver (Ag), dissolved Sodium (Na), dissolved Strontium (Sr), dissolved Sulphur (S), dissolved Thallium (Tl), dissolved Tin (Sn), dissolved Titanium (Ti), dissolved Uranium (U), dissolved Vanadium (V), dissolved Zinc (Zn), dissolved Zirconium (Zr), dissolved </div>																																	
	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
24-May-12	36.2	<0.010	<0.0050	<50	0.013	17.1	0.31	0.137	1.93	403	0.0209	0.56	4.62	28.2	<0.010	0.667	1.14	15.9	0.74	0.131	4810	<0.0050	3.09	102	<10	<0.0020	<0.20	0.57	0.237	0.99	0.7	0.27		
14-Jun-12	31.1	0.015	<0.0050	<50	0.0428	14.2	0.39	0.143	2.69	562	0.155	<0.50	3.86	13.2	<0.010	0.57	1.65	19.2	0.516	0.139	5430	0.0063	3.12	82.4	<10	<0.0020	<0.20	1.92	0.109	1.32	2.15	0.45		
12-Jul-12	42.9	<0.010	<0.0050	<50	0.014	23.2	0.35	0.119	2.04	340	0.043	0.63	6.08	14.9	<0.010	0.873	1.3	14.1	0.572	0.15	6020	<0.0050	4.35	138	<10	<0.0020	<0.20	0.97	0.297	1.04	0.85	0.35		
6-Aug-12	47.6	0.011	<0.0050	<50	<0.0050	27.9	0.31	0.121	1.65	404	0.028	0.86	7.14	20.4		0.994	1.23		0.71	0.183	6370	<0.0050	4.89	162	<10	<0.0020	0.22	0.53	0.412	0.96	1.15	0.29		
7-Sep-12	45	<0.10	<1.0	<50	<0.010	28.2	<1.0	<0.50	1.65	482	<0.20	<5.0	7.18	32.5	<0.010	<1.0	1.2	13	0.634	0.16	6350	<0.020	4.72	169	<3.0	<0.050	<5.0	<5.0	0.33	<5.0	<5.0	<0.50		
1-Oct-12	44.2	<0.10	<1.0	<50	<0.010	25.7	<1.0	<0.50	2.3	338	<0.20	<5.0	7.14	27.5	<0.010	<1.0	1.4	14	0.658	0.17	6290	<0.020	4.81	161	<3.0	<0.050	<5.0	<5.0	0.37	<5.0	<5.0	<0.50		
27-May-13	30	<0.10	<1.0	<50	<0.010	15.1	<1.0	<0.50	1.9	249	<0.20	<5.0	3.81	45.8	<0.010	<1.0	1	18	0.954	<0.10	3540	<0.020	2.58	98.9	<3.0	<0.050	<5.0	<5.0	0.14	<5.0	<5.0	<0.50		
17-Jun-13	41.4	<0.10	<1.0	<50	<0.010	22.5	<1.0	<0.50	1.52	168	<0.20	<5.0	5.92	16.3	<0.010	<1.0	1	10	0.745	0.17	5520	<0.020	4.3	142	3.1	<0.050	<5.0	<5.0	0.4	<5.0	<5.0	<0.50		
28-Aug-13	43.4	0.012	<0.0050	<50	0.007	23.3	0.43	0.062	2.23	269	0.032	0.6	5.96	0.72	<0.010	0.862	1.45	9.7	0.592	0.126	6320	<0.0050	4.49	145	<3.0	<0.0020	<0.20	1.15	0.299	1.15	0.96	0.38		
11-Sep-13	43.8	<0.10	<1.0	<50	<0.010	24.2	<1.0	<0.50	1.84	354	<0.20	<5.0	6.99	14.6	<0.010	<1.0	1.3	13	0.747	0.16	5840	<0.020	4.89	154	<3.0	<0.050	<5.0	<5.0	0.39	<5.0	<5.0	<0.50		
16-Oct-13	43.2	<0.10	<1.0	<50	<0.010	25.4	<1.0	<0.50	1.85	186	<0.20	<5.0	6.79	10.1	<0.010	<1.0	1.2	<10	0.648	0.13	6570	<0.020	4.9	155	3.3	<0.050	<5.0	<5.0	0.36	<5.0	<5.0	<0.50		
16-Oct-13																																		
16-May-14	36.2	<0.10	<1.0	<50	<0.010	19.1	<1.0	<0.50	2.24	159	<0.20	<5.0	5.42	6.8	<0.010	<1.0	1.3	15	0.862	0.2	4290	<0.020	3.76	131	<3.0	<0.050	<5.0	<5.0	0.3	<5.0	<5.0	<0.50		
16-May-14	35.9	<0.10	<1.0	<50	<0.010	19	<1.0	<0.50	2.24	155	<0.20	<5.0	5.33	6.5	<0.010	<1.0	1.2	12	0.877	0.17	4230	<0.020	3.75	131	<3.0	<0.050	<5.0	<5.0	0.29	<5.0	<5.0	<0.50		
3-Jun-14	39.8	<0.10	<1.0	<50	0.012	22.8	<1.0	<0.50	1.97	93	<0.20	<5.0	5.89	2.9	<0.010	<1.0	1.1	<10	0.703	0.19	4910	<0.020	4.63	153	<3.0	<0.050	<5.0	<5.0	0.45	<5.0	<5.0	<0.50		
3-Jun-14	39.4	<0.10	<1.0	<50	<0.010	22.9	<1.0	<0.50	1.9	97	<0.20	<5.0	6.1	3.5	<0.010	1	1	19	0.758	0.2	5010	<0.020	4.61	153	<3.0	<0.050	<5.0	<5.0	0.46	<5.0	<5.0	<0.50		
26-Jul-14	44	<0.10	<1.0	<50	<0.010	25.7	<1.0	<0.50	1.64	67	<0.20	<5.0	6.95	1.6	<0.010	<1.0	<1.0	<10	0.769	0.14	5610	<0.020	4.96	170	<3.0	<0.050	<5.0	<5.0	0.43	<5.0	<5.0	<0.50		
17-Aug-14	51	<0.10	<1.0	<50	<0.010	31.4	<1.0	<0.50	1.49	47.2	<0.20	<5.0	7.67	3.1	<0.010	1.1	<1.0	<10	0.893	0.15	6340	<0.020	5.45	199	3	<0.050	<5.0	<5.0	0.67	<5.0	<5.0	<0.50		
20-Sep-14	45.9	<0.10	<1.0	<50	<0.010	28.7	<1.0	<0.50	2.02	58.8	<0.20	<5.0	7.18	3.8	<0.010	<1.0	<1.0	<10	0.911	0.12	6090	<0.020	5.06	178	3.3	<0.050	<5.0	<5.0	0.53	<5.0	<5.0	<0.50		
10-Oct-14	40.4	<0.10	<1.0	<50	<0.010	26	<1.0	<0.50	1.52	76.5	<0.20	<5.0	7.04	2.4	<0.010	<1.0	<1.0	<10	0.705	0.15	5700	<0.020	4.74	166	<3.0	<0.050	<5.0	<5.0	0.4	<5.0	<5.0	<0.50		
26-May-15	43.4	<0.10	<1.0	<50	<0.010	26.7	<1.0	<0.50	1.2	50.7	<0.20	<5.0	6.89	3.5	<0.010	<1.0	<1.0	<10	1.04	0.21	4900	<0.020	5.13	193	3.3	<0.050	<5.0	<5.0	0.59	<5.0	<5.0	<0.50		
23-Jun-15	52.4	<0.10	<1.0	<50	<0.010	31.2	<1.0	<0.50	1.21	13.3	<0.20	<5.0	6.97	1.8	<0.010	<1.0	<1.0	<10	0.919	0.17	6200	<0.020	4.99	199	4.6	<0.050	<5.0	<5.0	1.05	<5.0	<5.0	<0.50		
13-Jul-15	38.1	<0.10	<1.0	<50	<0.010	22.2	<1.0	<0.50	1.74	82	<0.20	<5.0	5.96	1.4	<0.010	<1.0	<1.0	11	0.668	0.13	5800	<0.020	4.55	149	<3.0	<0.050	<5.0	<5.0	0.3	<5.0	<5.0	<0.50		
30-Aug-15	33.9	<0.10	<1.0	<50	<0.010	16.9	<1.0	<0.50	3.77	234	<0.20	<5.0	4.86	11.3	<0.010	<1.0	1.7	21	0.403	0.12	5940	<0.020	3.89	109	<3.0	<0.050	<5.0	<5.0	0.15	<5.0	<5.0	<0.50		
20-Sep-15	41.6	<0.10	<1.0	<50	<0.010	25.1	<1.0	<0.50	1.77	85.3	<0.20	<5.0	6.62	2.6	<0.010	1.1	<1.0	<10	0.699	0.23	6100	<0.020	5.11	166	<3.0	<0.050	<5.0	<5.0	0.36	<5.0	<5.0	<0.50		
18-Oct-15	39.9	<0.10	<1.0	<50	0.013	27.6	<1.0	<0.50	1.42	68.1	<0.20	<5.0	6.77	1.2	<0.010	<1.0	<1.0	16	0.744	0.15	6550	<0.020	4.8	171	<3.0	<0.050	<5.0	<5.0	0.41	<5.0	<5.0	<0.50		

* Results in red exceed their respective guideline