

**Phase II  
Addendum  
Project Report  
to the MPCA:**

Clearwater River,  
Grass Lake to the  
Mississippi River  
DO TMDL



**Prepared for**

**Clearwater  
River  
Watershed  
District**

**January 2008**

# **Clearwater River Watershed District**

## **Phase II Addendum Project Report to the MPCA: Clearwater River, Grass Lake to the Mississippi River DO TMDL**



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# Acronyms

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BOD	Biochemical Oxygen Demand
CAFO	Confined Animal Feeding Operation
Carlson TSI	Carlson Trophic Status Index
CBOD	Carbonaceous BOD
CBOD-5	5-Day Biochemical Oxygen Demand
CBOD-20	20-Day Biochemical Oxygen Demand
CBOD-u	Ultimate Biochemical Oxygen Demand
CFR	Code of Federal Regulations
cfs	cubic feet per second
CFU/100 mL	colony forming units per 100 milliliters
CWA	Clear Water Act
CRWD	Clearwater River Watershed District
DO	Dissolved oxygen
EPA	Environmental Protection Agency
FC	Fecal Coliform
Lbs	Pounds
MDNR	Minnesota Department of Natural Resources
µg/L	micrograms per liter
mg/L	milligrams per liter
mi <sup>2</sup>	square miles
MOS	Margin of Safety
MPCA	Minnesota Pollution Control Agency
NCHF	North Central Hardwood Forest
NH <sub>3</sub>	Total Ammonia-Nitrogen
NO <sub>2</sub> / NO <sub>3</sub> -N	Nitrate/ Nitrite- Nitrogen
NPS	non-point source
QA	Quality Assurance

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## Acronyms

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QC	Quality Control
SOD	Sediment Oxygen Demand
STORET	EPA's "STOrage and RETreival" System
TKN	Total Kjeldahl Nitrogen
TMDL	Total Maximum Daily Load
TN	Total Nitrogen
TP	Total phosphorus
TSS	Total Suspended Solids
USGS	United States Geological Survey
WWTP	Wastewater Treatment Plant
USDA	United States Department of Agriculture

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## 1.0 Executive Summary

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Section 303(d) of the Federal Clean Water Act (CWA) requires the Minnesota Pollution Control Agency (MPCA) to identify water bodies that do not meet water quality standards and to develop total maximum daily pollutant loads for those water bodies. A total maximum daily load (TMDL) is the amount of a pollutant that a water body can assimilate without exceeding the established water quality standard for that pollutant. Through a TMDL, pollutant loads can be distributed or allocated to point and non-point sources within the watershed that discharge to the water body.

This report prepared by Wenck Associates, Inc. (Wenck) on behalf of the Clearwater River Watershed District (CRWD), presents Phase I and II of the TMDL process for the listed segment of the Clearwater River between Grass Lake and the Mississippi River (Segment 07010203-511). The listed segment is in the CRWD located in central Minnesota on the border of Stearns and Wright Counties. The segment is listed because monitoring data have revealed that dissolved oxygen (DO) concentrations at times fall below the 5-milligram per liter (mg/L) water quality standard, which could impact fisheries and aquatic life.

The impaired segment of the Clearwater River between Grass Lake and the Mississippi River addressed in this report was added to the impaired waters list for dissolved oxygen in 2006. Phase I and II for this reach will be addressed in this report, Phase III for this reach will be combined with Phase III for the two other listed segments for which TMDL studies are under way:

- Lake Louisa (MnDNR Lake ID 86-0282-00), and
- Clearwater River between Clear Lake and Lake Betsy in Meeker County (stream segment 07010203-549)

The TMDL studies are broken into four phases described below:

- **Phase I** consisted of a review of existing information to better define existing conditions, identify data gaps, and develop plans for collecting and analyzing necessary additional information in subsequent phases.
- **Phase II** consisted of data collection and evaluation. Phases I and II are presented herein.
- **Phase III** will consist of setting the TMDL. Water quality models will help the CRWD quantify the TMDL and allocate loads to point sources and non point sources. An implementation plan to meet the load reductions will also be prepared. A work plan for Phase III was submitted to the MPCA in July 2007.
- **Phase IV** will consist of implementation of the load reductions established in Phase III.

Historical data evaluated for this report along with data collected in 2007 show:

- Water quality in the Clearwater River between Grass Lake and the Mississippi River is quite similar to or even better than water quality observed in minimally impacted streams in the same Ecoregion. This is because the reach has a small direct watershed, and water from the remaining tributary watershed is filtered through the Clearwater Chain of Lakes.
- There are no point sources of oxygen demand to the listed reach, all the sources are non-point in nature.
- Historically, late summer and early fall DO concentrations sometimes fall below the 5 mg/L standard in the lower reach at river mile 4.0 (at County Road 40). Nine of 35 measurements collected in 2002 and 2003 were below the state standard.
- Discrete DO measurements were collected in 2007 across a range of flows from 6 cfs to 183 cfs and were consistently above the state standard of 5 mg/L.
- In 2007, Continuous DO concentrations were recorded at two locations during the 7Q10 flow of 0 cfs, the two DO violations observed occurred during this condition. The impairment is likely limited low flow conditions, <10 cfs, where



direct watershed runoff comprises all or most of the in stream flow, i.e. there is no discharge from Grass Lake.

- In 2007, DO and nitrogenous and biochemical oxygen demands were consistent along the reach indicating that non point sources of oxygen demand are fairly constant along the reach and the reach is generally in equilibrium.

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## 2.0 Introduction

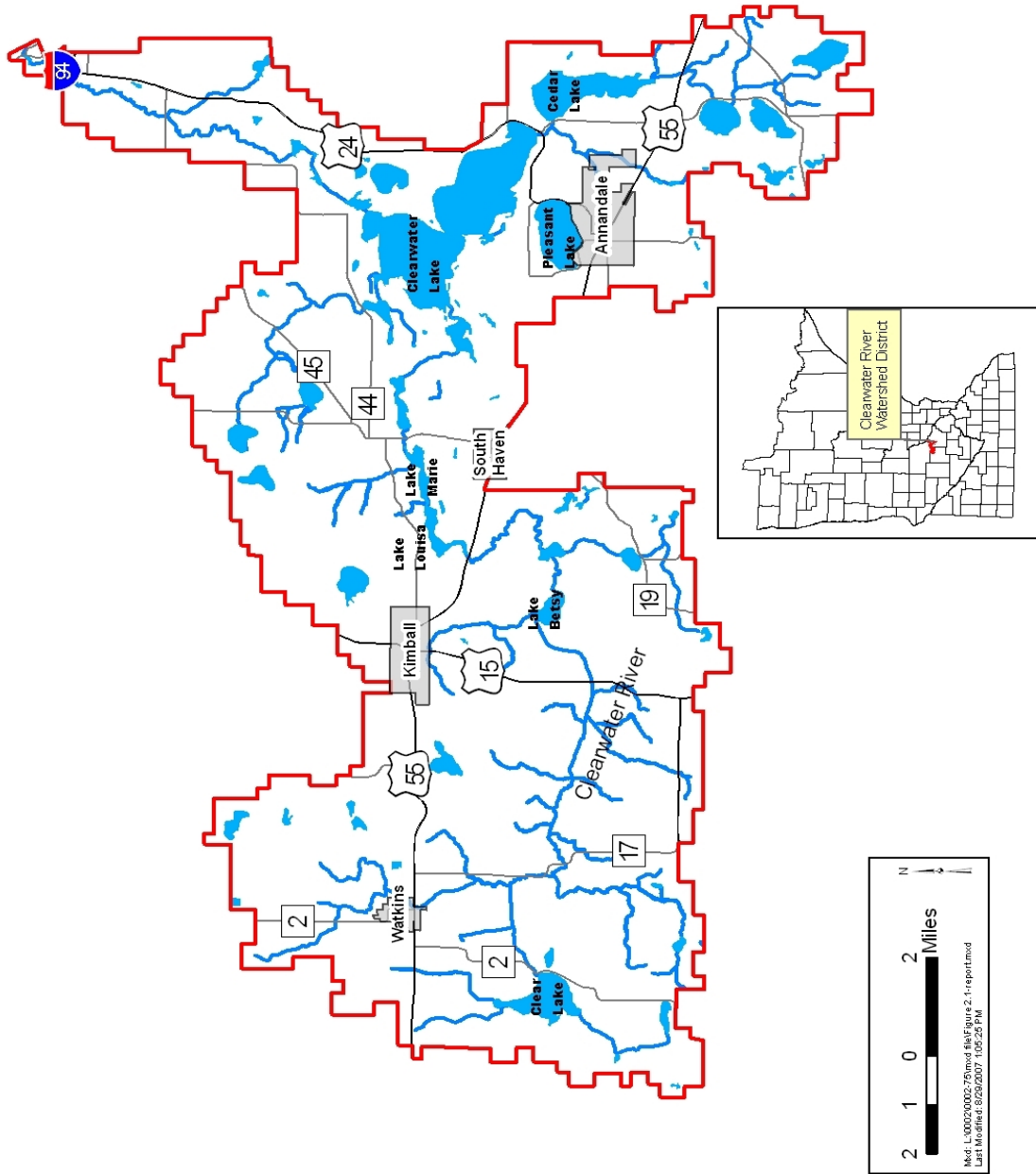
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The Clearwater River Watershed District is a primarily agricultural 168-square mile watershed in central Minnesota (Figure 2.1). The Clearwater River and the Clearwater River Chain of Lakes are the predominant water features of the District. As specified in Minnesota Rules, Chapter 7050, the Clearwater River's Class 2B designated uses are aquatic life, recreation, industrial consumption, agriculture, wildlife, aesthetic enjoyment, and navigation.

The Clearwater River Watershed District has been proactive in the protection and improvement of water quality and has made considerable improvements in water quality throughout the District. However, historic monitoring data indicates that a 10-mile stretch of Clearwater River between Grass Lake and the Mississippi River does not meet water quality standards for dissolved oxygen (DO).

The Clean Water Act requires the State to develop TMDLs for impaired waters. A TMDL is the amount of a pollutant that a water body can assimilate without exceeding the pollutant's water quality standard. The State of Minnesota's Clean Water Act Section 303(d) list of impaired waters within the Clearwater River Watershed District is summarized in Table 2.1 and Figure 2.2.

**Figure 2.1 Clearwater River Watershed District**

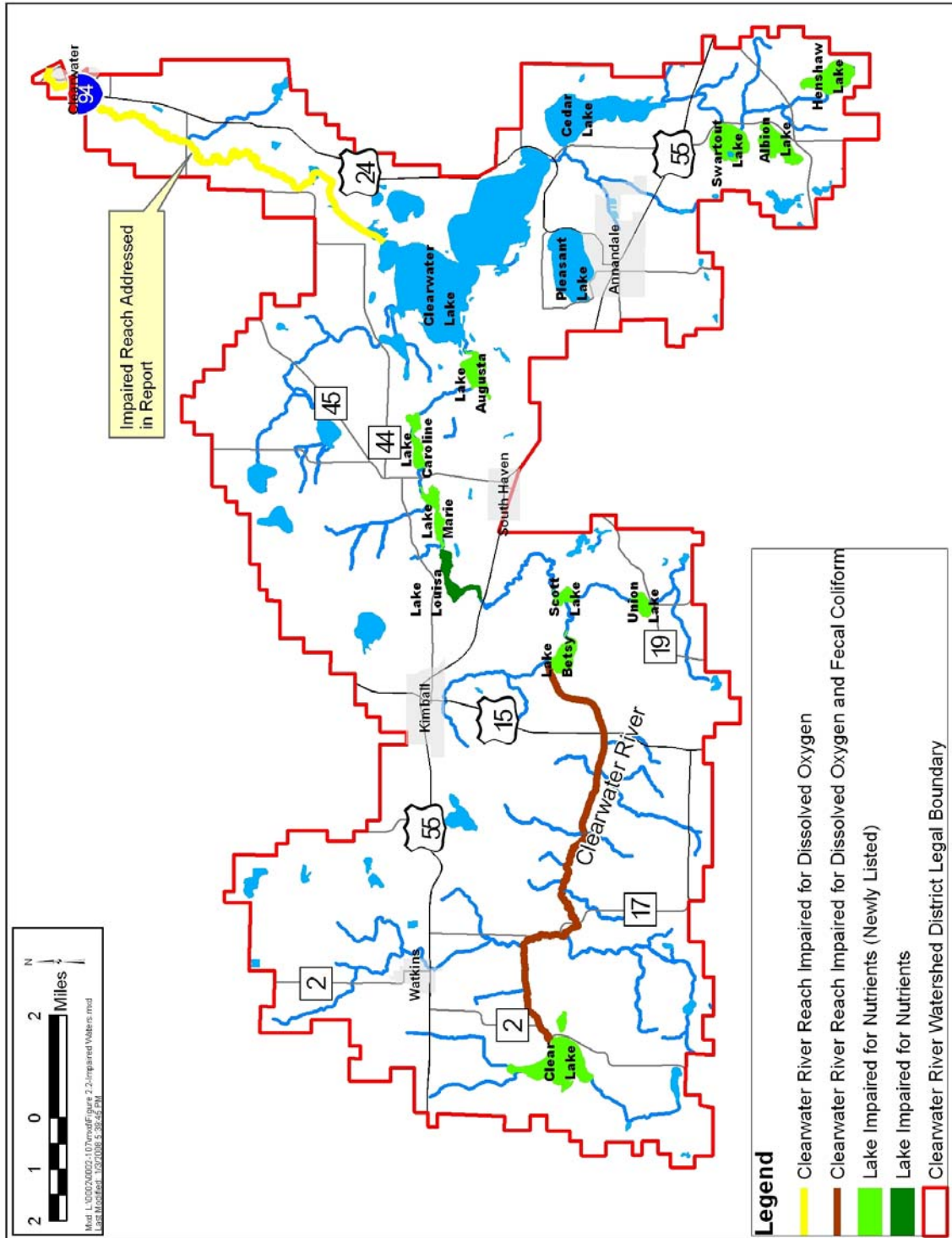


**Table 2.1 Summary of 303(d) Listings in the CRWD**

<u>Water Body</u>	<u>Reach/ Lake ID</u>	<u>Listing Parameter</u>	<u>Impaired Use</u>	<u>Addressed in this Report</u>
Lake Louisa	86-0282-00	Excess Nutrients	Swimming	No <sup>1,2</sup>
Lake Betsy	47-0042-00	Excess Nutrients	Swimming	No <sup>2</sup>
Lake Marie	73-0014-00	Excess Nutrients	Swimming	No <sup>2</sup>
Scott Lake	86-0297-00	Excess Nutrients	Swimming	No <sup>2</sup>
Union Lake	86-0298-00	Excess Nutrients	Swimming	No <sup>2</sup>
Clear Lake	47-0095-00	Excess Nutrients	Swimming	No <sup>2</sup>
Lake Augusta	86-0284-00	Excess Nutrients	Swimming	No <sup>3</sup>
Lake Caroline	86-0281-00	Excess Nutrients	Swimming	No <sup>3</sup>
Swartout Lake	86-0208-00	Excess Nutrients	Swimming	No <sup>3</sup>
Albion Lake	86-0212-00	Excess Nutrients	Swimming	No <sup>3</sup>
Henshaw Lake	86-0213-00	Excess Nutrients	Swimming	No <sup>3</sup>
Clearwater River, Clear Lake to Lake Betsy	07010203-502	Fecal Coliform	Swimming	No <sup>1,2</sup>
		Low Oxygen	Aquatic Life	No <sup>1,2</sup>
Clearwater River, Grass Lake to the Mississippi River	07010203-511	Low Oxygen	Aquatic Life	Yes

1. The Phase II Report for these impairments was submitted to the MPCA in September 2007.
2. A work plan to address Phase III for these impairments was submitted to the MPCA in July of 2007.
3. The impairments for these lakes will be addressed starting in 2009 using existing data where appropriate.

Figure 2.2 Impaired Waters in the Clearwater River Watershed District



In 2004, the CRWD partnered with the MPCA to conduct a TMDL Study for Lake Louisa and the Clearwater River between Clear Lake and Lake Betsy. The project was broken down into three phases. Existing water quality data for the Clearwater River between Clear Lake and Lake Betsy and Lake Louisa was analyzed and a work plan outlining the remaining work necessary to complete the TMDLs was prepared for Phase I. During Phase II, field data was collected to address data gaps, that work is summarized in *Phase II Project Report to the MPCA: Lake Louisa Nutrient TMDL and The Clearwater River, Clear Lake to Lake Betsy Bacteria and Dissolved Oxygen TMDL* submitted in final format December 2007.

In 2006, a second reach of the Clearwater River between Grass Lake and the Mississippi River was added to the 303(d) list for DO. This report summarizes historical data and data collected in 2007 for this reach.

In 2008, 10 additional CRWD lakes were added to the impaired waters list. The Technical Advisory Group (TAC) agreed that it was cost effective to set TMDLs for those lakes with drainage areas that overlap the drainage areas of the impaired waters for which TMDL studies were already underway. As the result, during Phase III of this project CRWD will set TMDLs for the two impaired reaches of the Clearwater River, Lake Louisa, Lake Marie, Lake Betsy, Clear Lake, Union Lake, and Scott Lake.

The TMDL process provides science-based pollutant load allocations and information that the District and other local officials can use when making decisions regarding land use, and land management that will affect water quality within the watershed. The main objectives for the Clearwater River Watershed District's TMDL Phase II Addendum are listed below:

- Define the spatial extent, persistence, severity, and causes of the DO depletion in the Clearwater River between Grass Lake and the Mississippi River;
- Quantify point and non-point sources of oxygen demand to the Clearwater River between Grass Lake and the Mississippi River and assess their contributions to water

- quality impairments by land use category and main-stem river and tributary sub-watersheds for targeting priority areas for rehabilitation as well as protection;
- Allocate the Clearwater River assimilative capacity to both point and non-point sources of pollution and develop a margin of safety (MOS) protective of water quality standards; and
  - Develop models for evaluating the impact of management practices and rehabilitation alternatives on water quality.

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## 3.0 Historical Data

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A review of the MPCA's environmental database shows that water quality samples were collected on this impaired reach of the Clearwater River at CR 0.1 near the confluence with the Mississippi River, CR 4.0 near the reaches' midpoint and at CR 10.1, Grass Lake outlet (Figure 3.1). Station CR 0.1 was sampled in 1984 and 1985. Station CR 4.0 had the most recent measurements collected between April 2002 and October 2003. Station CR 10.1 had the most complete record compiled between June 1981 and October 1995.

**Figure 3.1 Historical Monitoring Locations**

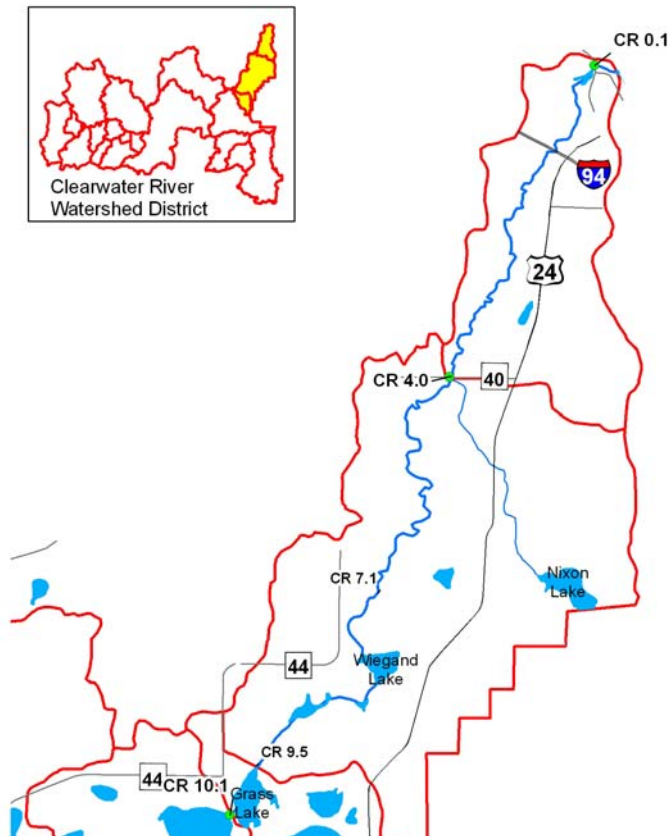




Table 3.1 compares historical water quality characteristics at CR 4.0 located approximately in the middle of the listed reach to those of minimally impacted streams in the same Ecoregion (North Central Hardwood Forest). The striking differences are that total suspended solids (TSS), total phosphorus, fecal coliform bacteria and biochemical oxygen demand (BOD) concentrations in this section of the Clearwater River are lower than those observed in minimally impacted streams of the same Ecoregion. The low concentrations in this portion of the river are due to the small direct tributary watershed area and because runoff from the much larger indirect watershed is filtered through the Clearwater Chain of Lakes where nutrients and sediments are deposited.

**Table 3.1 Historical Water Quality in the Clearwater River at CR 4.0 and Minimally Impacted Streams in the North Central Hardwood Forest Ecoregion**

Parameter	Water Quality of Minimally Impacted Streams in NCHF, Annual 1970-1992*				Clearwater River at CSAH 40 (CR 4.0) Historical Data Collected 2002-2003			
	Mean	SD	MAX	MIN	Mean	SD	MAX	MIN
Conductivity (µmhos/cm)	298	83	840	40	418	48	551	231
pH (SU)	8.1	0.3	8.9	7.2	7.8	0.3	8.4	7.2
TSS (mg/L)	13.7	22.5	330	0.5	4.8	5.5	29.0	1.0
NO2+NO3 (mg/L)	0.16	0.15	0.65	0.01	0.16	0.14	0.77	0.05
TP (mg/L)	0.13	0.15	1.6	0.01	0.05	0.05	0.25	0.02
Fecal Coliform (#/100mL)	920	3,277	27,000	4	40	37	114	2
BOD5 (mg/L)	2.7	2.1	17	0.3	1.6	0.8	3.8	0.5

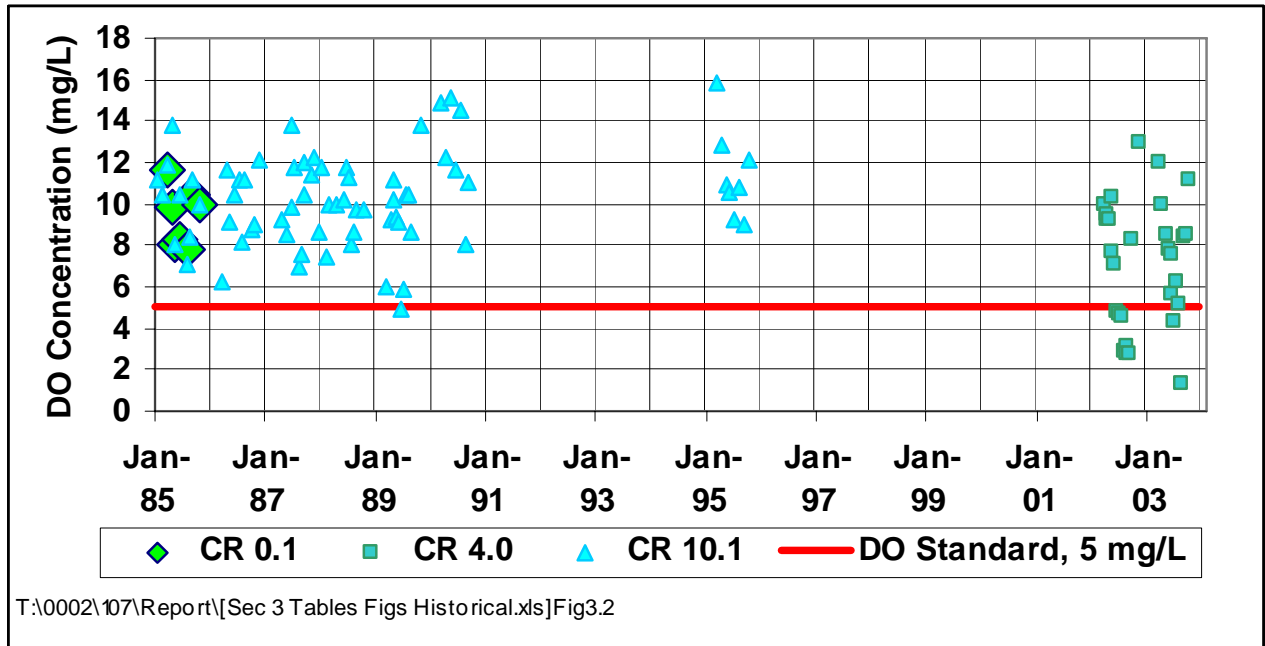
\*McCollar & Heiskary, 1993

T:\0002\107\Report\Sec 3 Tables Figs Historical.xls]Table 3.1

Dissolved oxygen was measured 35 times at CR 4.0 during 2002 and 2003. The mean DO concentration at CR 4.0 was 7 mg/L, concentrations ranged from 1.4 to 13 mg/L over the period of record. Nine of the 35 DO measurements were below the state DO standard of 5 mg/L, the violations were observed during late summer and early fall.

Dissolved oxygen was measured 119 times at CR 10.1 between June of 1981 and October 1996. The mean concentration at this station was 10.6 mg/L with standard deviation of 2.5 mg/L over the 15-year record. One of the 119 measurements was below the state standard for DO, that violation was recorded in June of 1998 (Figure 3.2).

**Figure 3.2 Historical DO Concentrations, Grass Lake to Mississippi River**



Total Kjeldahl (TKN) concentrations at CR 4.0 ranged from 2.15 to 0.58 mg/L, with an average concentration of 0.96 mg/L, lower than those observed in the upper watershed. BOD concentrations ranged from 3.8 to 0.5, with a mean BOD concentration of 1.6 mg/L, lower than concentrations observed in minimally impacted streams of the same ecoregion.

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## 4.0 2007 Data Collected

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Field monitoring for the Clearwater River between Grass Lake and the Mississippi River was conducted between April 24 and August 22, 2007 to determine the spatial and temporal extent of the DO depletion on the Clearwater River and to quantify the sources.

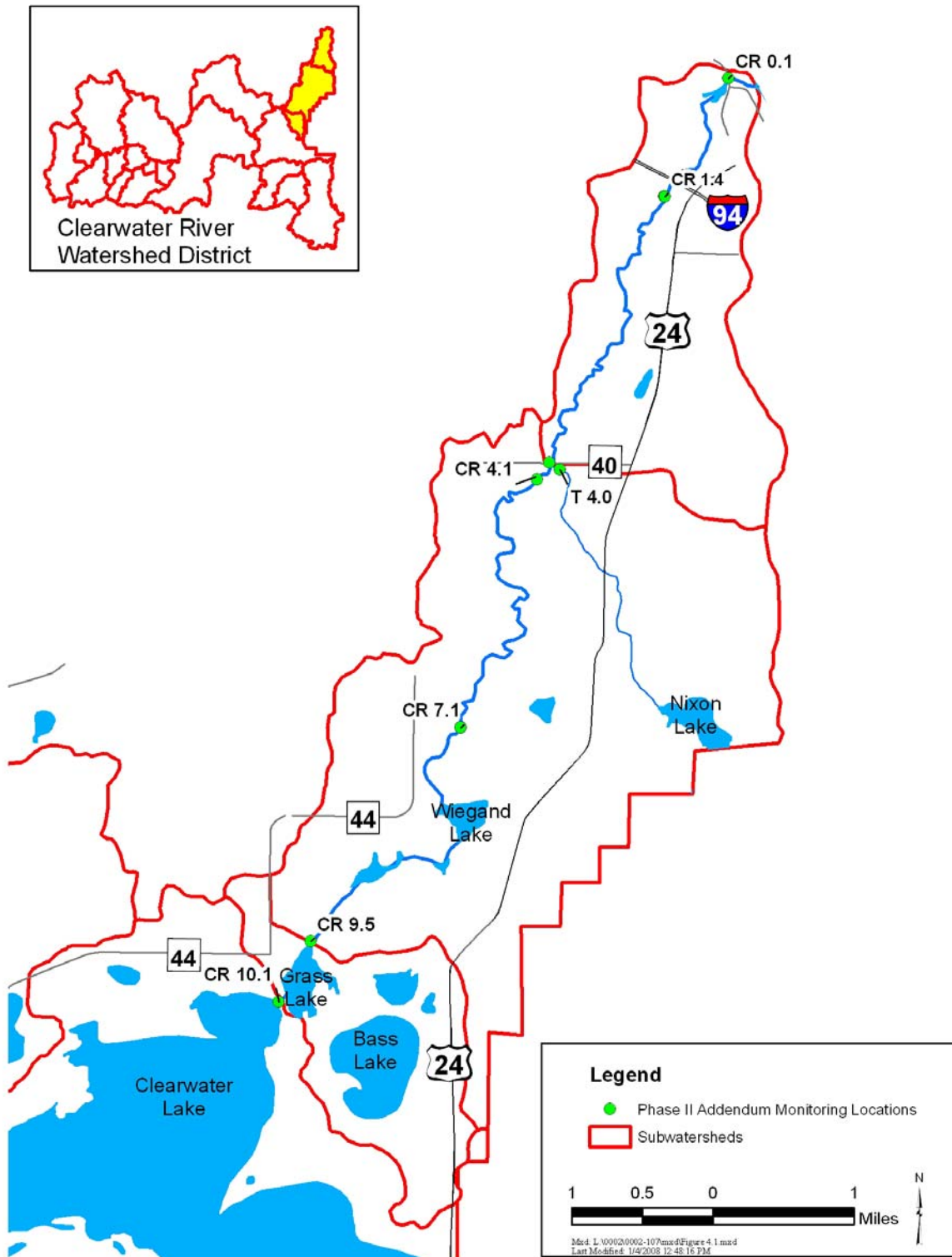
Monitoring was conducted in accordance with the work plan approved for this study and is described below. There were no significant deviations from the approved Monitoring Plan.

Figure 4.1 shows the monitoring locations for the DO TMDL in the Clearwater River between Grass Lake and the Mississippi River. Table 4.1 lists monitoring station descriptions. Data collection at these locations included:

- Both low and high flow synoptic surveys of the Clearwater River between Grass Lake and the Mississippi River were conducted. The high flow synoptic survey was conducted April 24, 2007; the low flow synoptic survey was conducted August 22, 2007 (Appendix A).
- The Clearwater River main stem was also sampled approximately twice monthly in 2007 as flow conditions permitted between May and August. Longitudinal water quality, flow, and loading profiles from 2007 sampling are included in Appendix A.
- Box plots in Appendix B show the mean, max, min and standard deviation of water quality parameters from upstream to downstream for data collected during Phase II. Field and lab data sheets are in Appendix C.
- Continuous DO measurements were collected during each synoptic survey, and for an extended period between July 3 and September 4, 2007. Data are plotted in Appendix D.
- Continuous stage was measured CSAH 40 in 2007. Provisional flow records are in Appendix E along with a provisional flow record for the Fairhaven Dam.

- A time of travel dye study was conducted in the listed reach under two flow regimes April 24, 2007 (high flow) and July 17 through the 20<sup>th</sup>, 2007 (low flow). During the time of travel study, flows at the downstream end of the reach (CR 1.4) were 183 cfs during the April high-flow survey and 14 cfs during the July low-flow survey, therefore satisfying the project requirements of obtaining time of travel during high and low flow. Results are shown in Appendix F.
- A field survey was conducted. Appendix G contains a digital map, photos, topography and the field survey results. The riparian corridor study included evaluation of riparian canopy and vegetation, in-stream macrophytes, stream substrate, and channel stability.
- Passive sampling for optical brighteners was conducted on the Clearwater River July 25 to August 8, 2007. Results are shown in Appendix H.

**Figure 4.1 Phase II Addendum Monitoring Locations**



**Table 4.1 Monitoring Station Descriptions**

<b>TMDL Site ID</b>	<b>Station Description</b>
CR 0.1	CLEARWATER R AT COUNTY HIGHWAY 75, 0.1 MI N OF CLEARWATER
CR 1.4	CLEARWATER R AT CO RD 145, 0.1 MI SW OF CLEARWATER
CR 4.0	CLEARWATER R AT CSAH 40, 2.4 MI SW OF CLEARWATER
CR 4.1	CLEARWATER R UPSTREAM OF CSAH 40 AND TRIBUTARY STREAM INLET, 2.5 MI SW OF CLEARWATER
T 4.0	TRIBUTARY TO CLEARWATER R NEAR CSAH 40, 2.5 MI SW OF CLEARWATER
CR 7.1	CLEARWATER R AT 140TH ST NW, 6.1 MI N OF ANNANDALE
CR 9.5	CLEARWATER R AT OUTLET OF GRASS LAKE, 4.4 MI N OF ANNANDALE
CR 10.1	CLEARWATER R AT OUTLET OF CLEARWATER LAKE AT CO RD 128, 4 MI N OF ANNANDALE

T:\0002\107\Report\Table 4.1.xls]Table

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## 5.0 Results and Analysis

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Results of the field survey, hydrologic monitoring and water quality sampling conducted in the Clearwater River and tributary watershed in 2007 are presented in this section. Water quality data is compared with that of minimally impacted streams in the North Central Forest Ecoregion. Longitudinal water quality profiles allow an evaluation of the extent of impairment. In stream and tributary loadings are calculated and evaluated. Each of these elements allows an evaluation of the sources oxygen demand in the watershed.

### 5.1 FIELD SURVEY

A field survey of the Clearwater River between Grass Lake, CR 10.1, at the upstream end and the Mississippi River was conducted in June 2007. This 10 mile reach of the Clearwater River can be broken into three distinct sections based on channel characteristics such as slope, morphometry and channel bed. The field team canoed from Wiegand Lake to Country Road 40 (CR 4.0) to conduct the survey and visually inspected the remainder of the channel from road access points and air photos.

Table 5.1.1 summarizes stream characterization in each reach. Photos of the stream, along with assessment of the sediments, riparian cover, topography, and DO concentrations collected during the survey are presented in Appendix G. A 2005 survey conducted by the Minnesota DNR was also reviewed (Altena 2005).

**Table 5.1.1 Stream Characteristics of the Clearwater River between Grass Lake and the Mississippi River**

River Mile	Elevation (ft NGVD)	Slope (ft/mile)	Stream		Sediment Description	Description
			Width (ft)	Tree Canopy		
CR 10.1	991	--	54	0% turf grass	Mowed gravel and cobbles, medium to coarse sand	Channel between Clearwater Lake and Grass Lake.
CR 9.5	991	0	100	5% downstream	medium to coarse sand and gravel upstream near Grass Lake Dam; sand and silt with some muck in less channelized areas through wetland	Channel starts below Grass Lake Dam and flows through large wetland area and Wiegand Lake. Channel width varies through wetland. Channel is braided with numerous backwater areas in wetland. Flow becomes channelized below Wiegand Lake. Riparian area is nearly all wetland.
CR 7.1	990	0	42	15% upstream 25% downstream	Gravel and sand, some cobble and boulders on outside bends	Meandering channel with oxbows, and cutoff channels. Narrow wetland fringe along stream, forested in some areas. Narrow floodplain.
CR 4.0	975	5	48	20% upstream, 30% downstream	Medium to coarse sand, some gravel and cobble on outside bends and riffle areas	Meandering channel that is braided in some areas, with many oxbows and cutoff channels. Wetland fringe of varying width along channel. Forested riparian area, especially downstream. Some agricultural fields in riparian zone.
CR 1.4	960	6	45	75% upstream, 90% downstream	Sand and gravel, with cobble and boulders in riffle areas and outside bends	Sharply meandering channel. Steep banks along channel. Riparian area is predominantly forested. Some private residences also located adjacent to channel.
CR 0.1	950	8	60	90% upstream, 80% downstream	Sand and gravel in channel and tailwater above dam. Sand, gravel, and cobble below dam	Meandering channel through forested area flows into tailwater area above dam. Channel drops approximately 10 feet below dam before flowing into Mississippi River. Riparian area is mostly forested, with some small areas of wetland. Steep banks along channel.

T:\0002\107\Report[Table 5.1Stream Inventory Table.xls]Table 4.1

The impaired reach can be broken down into three main sections: the Grass Lake outlet to the Wiegand Lake outlet, Wiegand Lake outlet (river mile 7.1) to river mile 3.0, and river mile 3.0 to the Mississippi at the downstream end.



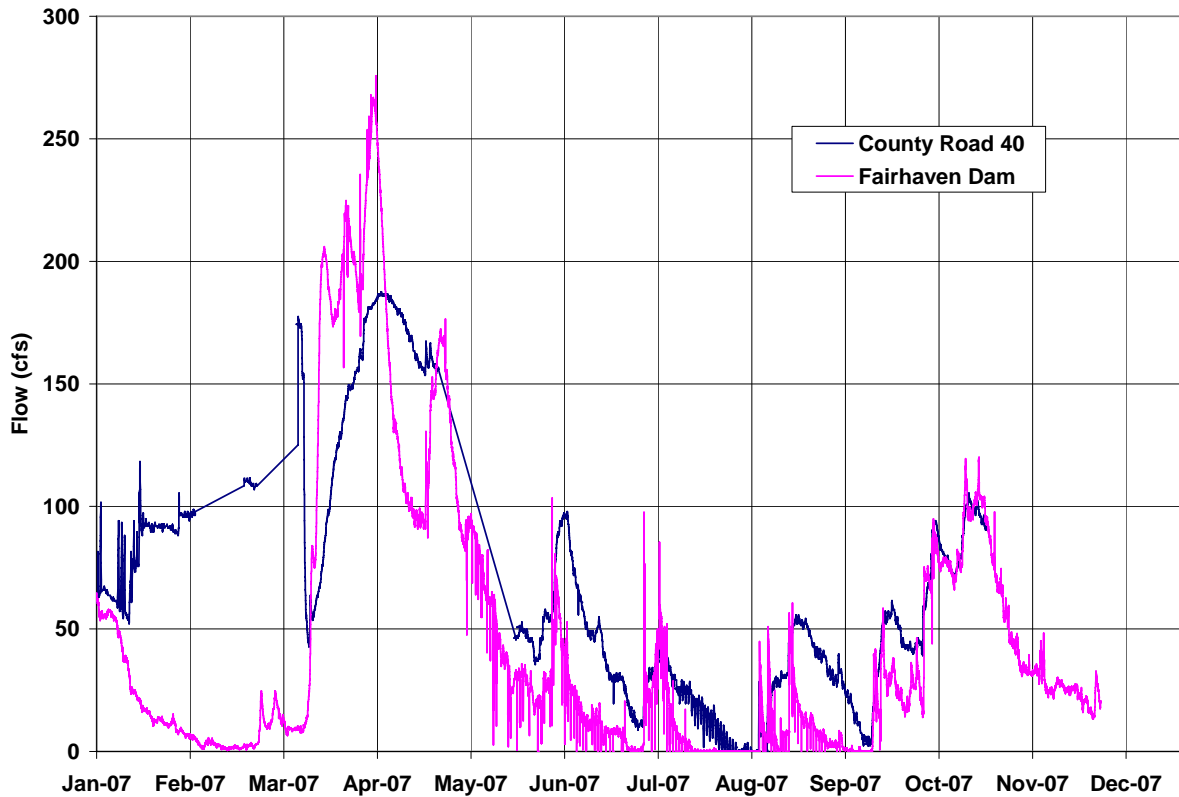
The Grass Lake outlet is controlled by a MN DNR dam. The channel between Grass and Wiegand Lake is a flat (slope is zero), gently meandering channel draining large wetland complexes. The reach between the Wiegand Lake outlet and river mile 3.0 is more sinuous than the upstream section with an average slope of 5 feet per mile. The channel in this section is braided in some areas with cut off channels, and is mostly flanked by a woody riparian buffer consisting of trees and grasses. The banks of the channel between river mile 3.0 and the Mississippi River are very steep, the channel is less sinuous than the upstream section. A broad crested weir just upstream of the Rivers' confluence with the Mississippi River controls the outflow.

## **5.2 HYDROLOGY**

Precipitation and runoff volumes were below average in 2007. Precipitation was measured in Annandale by a citizen precipitation recorder. Annual precipitation was 27.82 inches, a 1.24 inch departure from the 1971-2000 Normal at Cokato.

Continuous stage measurements were recorded in the Clearwater River at the Fairhaven Dam downstream of Lake Marie and at County Road 40 downstream of Grass Lake in the lower watershed. Flow data collected at each site is presented in Figure 5.2.1. It should be noted that this data is preliminary, the finalized flow record from HYSTRA will be used for Phase III.

**Figure 5.2.1 2007 Continuous Stream Flow Record (Provisional)**



T:\0002\106\CR40\_Fairhaven Q Records.xls\CR 40

### 5.3 WATER QUALITY

Synoptic surveys and bi-weekly river profile sampling of the Clearwater River between Grass Lake and the Mississippi River were over a range of flow conditions. Flow at the Grass Lake outlet at the upstream end of the reach ranged from 190 cfs to 2 cfs. Downstream flow ranged from 183 cfs in early June to 6 cfs in early August at CR 1.4.

Table 5.3.1 compares water quality in the Clearwater River in 2007 to that of minimally impacted streams in the North Central Hardwood Forest Ecoregion.

**Table 5.3.1 Water Quality in the Clearwater River and Minimally Impacted Streams of the North Central Hardwood Forest Ecoregion**

Parameter	Water Quality of Minimally Impacted Streams in NCHF, Annual 1970-1992*				Clearwater River Main Stem, Grass Lake to the Mississippi River (2007)			
	Mean	SD	MAX	MIN	Mean	SD	MAX	MIN
Conductivity (µmhos/cm)	298	83	840	40	415	55	571	328
pH (SU)	8.1	0.3	8.9	7.2	8.3	0.3	9.0	7.2
TSS (mg/L)	13.7	22.5	330	0.5	6.1	8.5	64.0	2.0
NO2+NO3 (mg/L)	0.16	0.15	0.65	0.01	0.22	0.04	0.33	0.20
Ammonia-N (mg/L)	0.2	0.2	1.3	0.02	0.2	0.03	0.4	0.2
TP (mg/L)	0.13	0.15	1.6	0.01	0.03	0.04	0.33	0.01
Fecal Coliform (#/100mL)	920	3,277	27,000	4	697	3,364	28,000	10
BOD5 (mg/L)	2.7	2.1	17	0.3	2.3	0.6	5.0	2.0
*McCollar & Heiskary, 1993								
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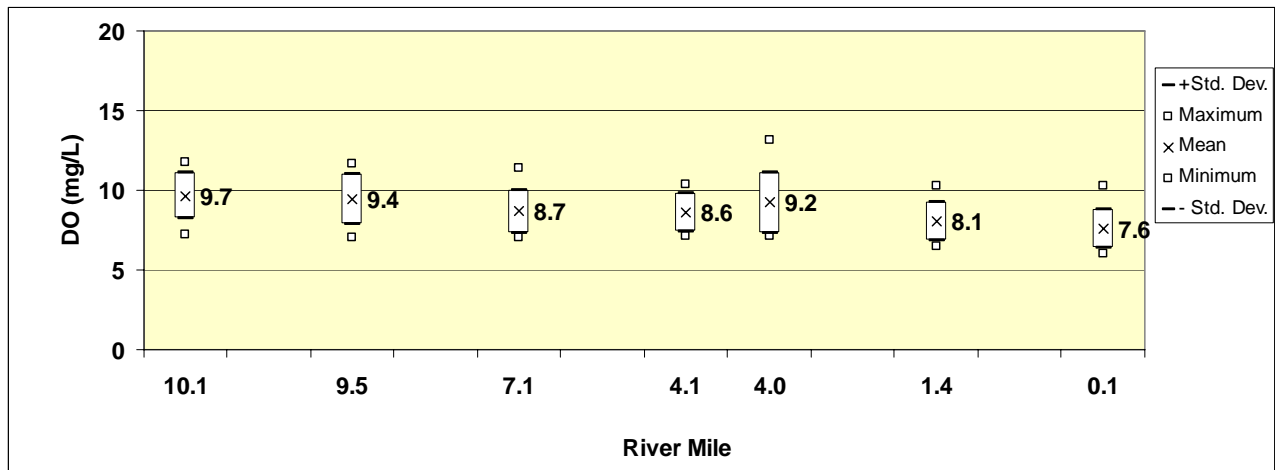
By comparison, Clearwater River water quality in this reach is quite similar or even better than that observed in minimally impacted streams in the same Ecoregion. The values measured are inconsistent with a stream severely impacted by anthropogenic activities. The reason for this is likely the high water quality coming out of Clearwater Lake.

Flow measured during the June 6, 2007 sampling event showed a dramatic increase in flow from 107 cfs at CR 4.0 to 183 cfs at CR 1.4. The increase in flow is not typical of the increase in flow between the two stations. The flow measurement was verified and may be the result of lagged hydrographs following a storm event. The provisional flow record at County Road 40 (CR4.0) shows that June 6 is the rising limb of a storm hydrograph. In any case, the in stream loading profiles shown in Appendix A for June 6 indicate that stream loads increased dramatically as the result of this increased flow.

### 5.3.1 Dissolved Oxygen

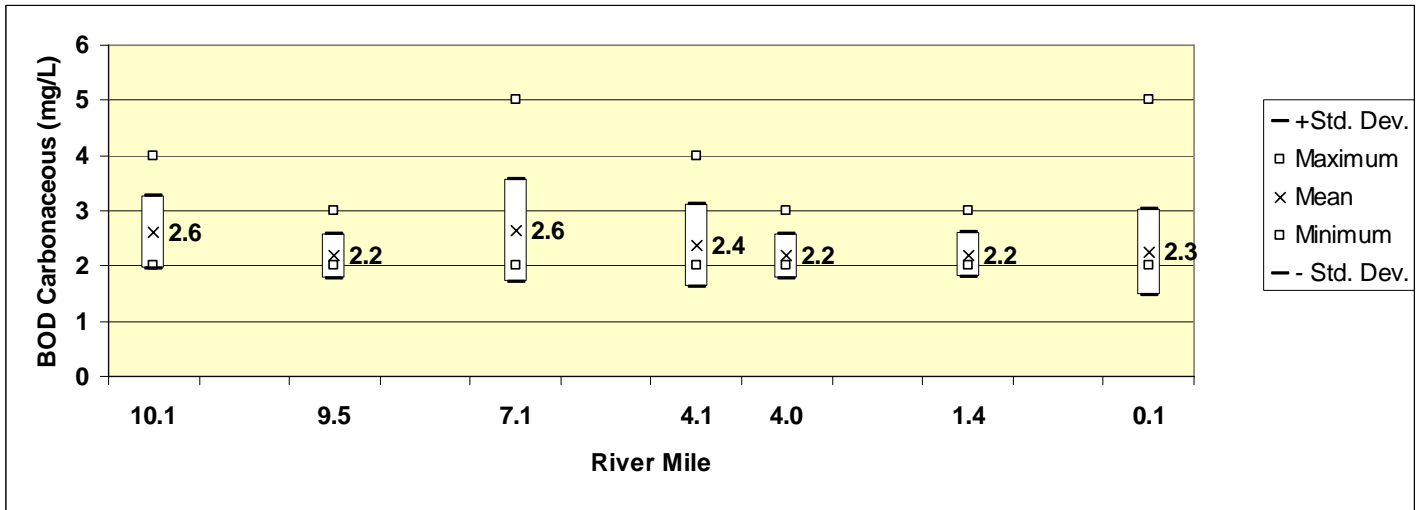
Discrete measurements of DO along the profile of the Clearwater River in 2007 show that DO concentrations were consistently above the 5 mg/L state standard. Though DO concentrations decrease slightly from upstream to downstream, they are fairly consistent with average concentrations ranging from 9.7 to 7.6 mg/L (Figure 5.3.1.1).

**Figure 5.3.1.1 Longitudinal DO Concentrations in the Clearwater River**

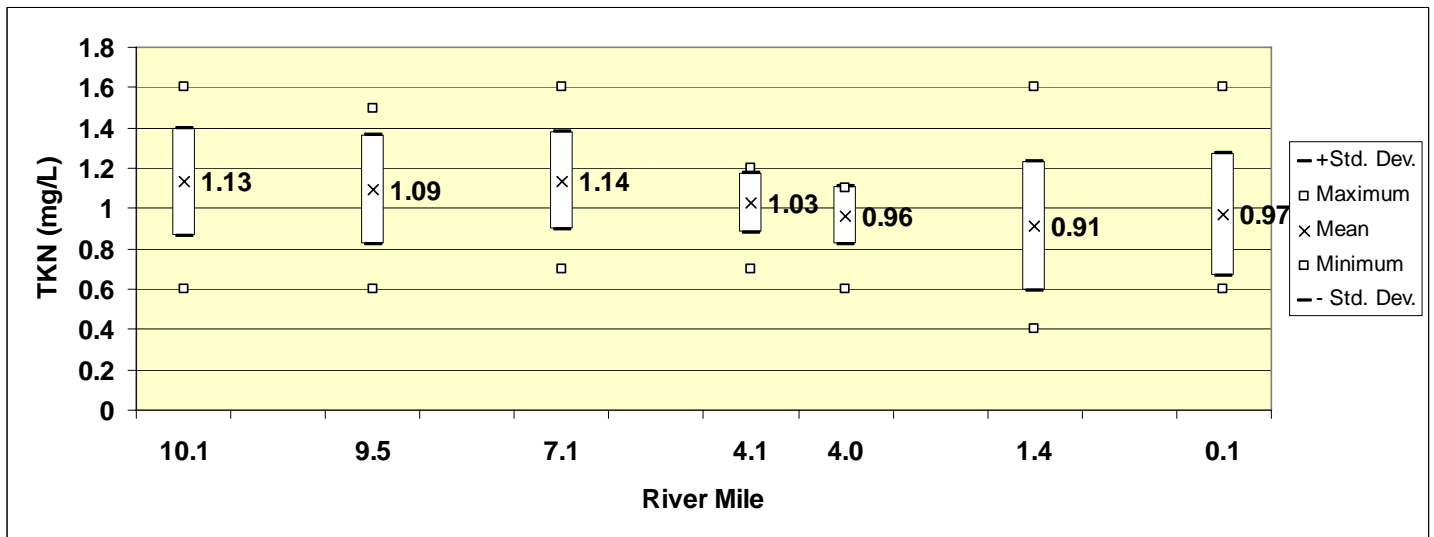


The consistency in DO concentrations from upstream to downstream indicate the river is generally in equilibrium. This is supported by in-stream CBOD-5 and TKN concentrations (Figures 5.3.1.2 and 5.3.1.3).

**Figure 5.3.1.2 Longitudinal CBOD-5 Concentrations in the Clearwater River**



**Figure 5.3.1.3 Longitudinal TKN Concentrations in the Clearwater River**



Dissolved oxygen, temperature, conductivity and pH were measured continuously July 2 to September 3, 2007 at CR 7.1 at the outlet of Wiegand Lake and at CR 0.1, the downstream end of the reach. Measurements were collected upstream of the dam to avoid measuring re-aeration by the dam. Continuous measurements were also collected at CR 1.4 April 18 to April 30, 2007. Continuous measurements of dissolved oxygen showed that DO concentrations were consistently above the state DO standard of 5 mg/L except for two late summer readings. The DO

concentration at CR 0.1 in the downstream end of the reach fell to 4.8 mg/L at the low-point in the diurnal cycle on 7/26/2007. The DO concentration at CR 7.1 fell to 4.6 mg/L at the low point in the diurnal cycle on August 14, 2007. Both violations occurred during the lowest recorded flow of the season: The provisional flow record for that period at CR 40 shows that average daily flows ranged from 0 to 14 cfs, close to the 7 Q 10. Results of all continuous DO monitoring are presented in Appendix E.

## **5.4 SOURCE ASSESSMENT**

An assessment of sources of oxygen demand in the watershed is discussed in this section. The sources are non-point source in nature, no point sources were identified. Sources may include livestock and associated land practices including feedlots and pasturing, crop farming and associated land uses including drain tiles, urban runoff from the City of Clearwater, septic systems, and natural sources such as wildlife and wetlands.

### **5.4.1 Livestock and Liquid Manure Application**

Livestock and liquid manure application can be a source of bacteria and oxygen demand to receiving waters. Livestock are sometimes allowed to graze too closely to receiving waters, and some receiving waters lack sufficient buffer areas. Manure is primarily applied to crops in the fall prior to a corn rotation and sometimes in the spring. The absence of high bacteria and nutrient concentrations indicate that land application and livestock do not significantly contribute to the oxygen demand in this section of the Clearwater River.

### **5.4.2 Crop Farming**

Corn and soy bean rotation are the primary row crops in the watershed tributary to the portion of the Clearwater River between Grass Lake and the Mississippi River. The in-stream nutrient and sediment concentrations indicate that crop farming is not a significant source of nutrients to the stream.

### **5.4.3 Urban Runoff**

One urban area, the City of Clearwater, lies within the watershed tributary to the Clearwater River between Grass Lake and the Mississippi River. The City of Clearwater is located at the downstream edge of the impaired reach, its stormwater enters the Clearwater River between monitoring stations at CR 1.4 and CR 0.1. Highway 94 crosses the Clearwater River at CR 1.3 and County Road 40 crosses the river at CR 4.0, there is a slight increase in TSS at these locations indicating that urban runoff does impact the river.

### **5.4.4 Septic Systems and Human Waste**

Few homes, and therefore few septic systems, are located close enough to the Clearwater River to be a source of oxygen demand to the Clearwater River in the impaired reach. The lack of optical brighteners observed in the reach supports this conclusion.

Wastewater from the City of Clearwater discharges to the Mississippi River downstream of the Clearwater River.

### **5.4.5 Wetlands**

The DO concentrations are fairly consistent from upstream to downstream in the Clearwater River, though wetlands downstream of the Grass Lake may occasionally contribute to the oxygen impairment during low flow through SOD and plant/algal respiration.

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## **6.0 Stakeholder Involvement**

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Six stakeholder involvement meetings have been held to date for this TMDL Project. They are summarized in the Phase II Report. One additional stakeholder meeting will be scheduled during Phase III.



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## 7.0 References

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## **Appendix A**

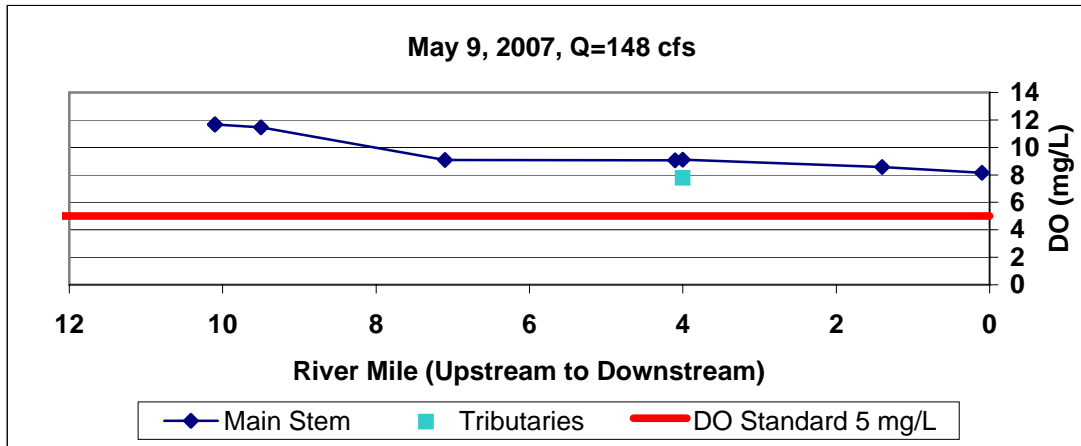
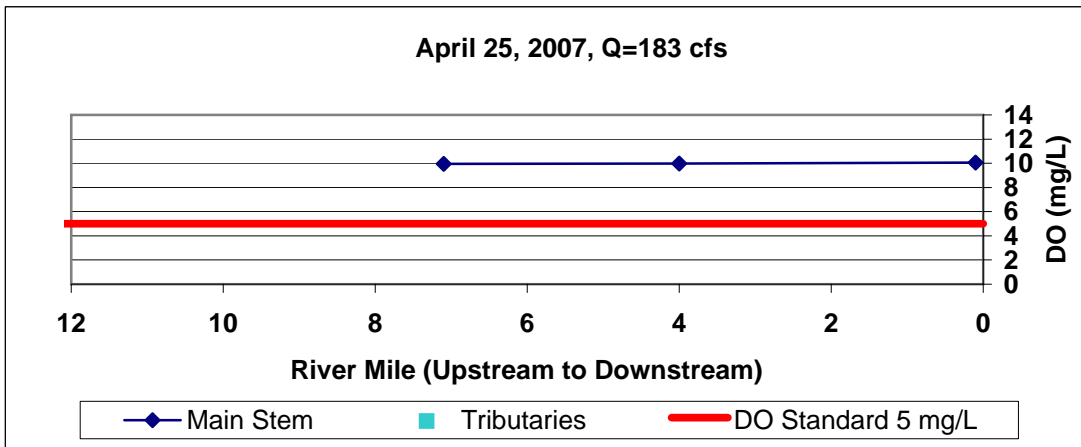
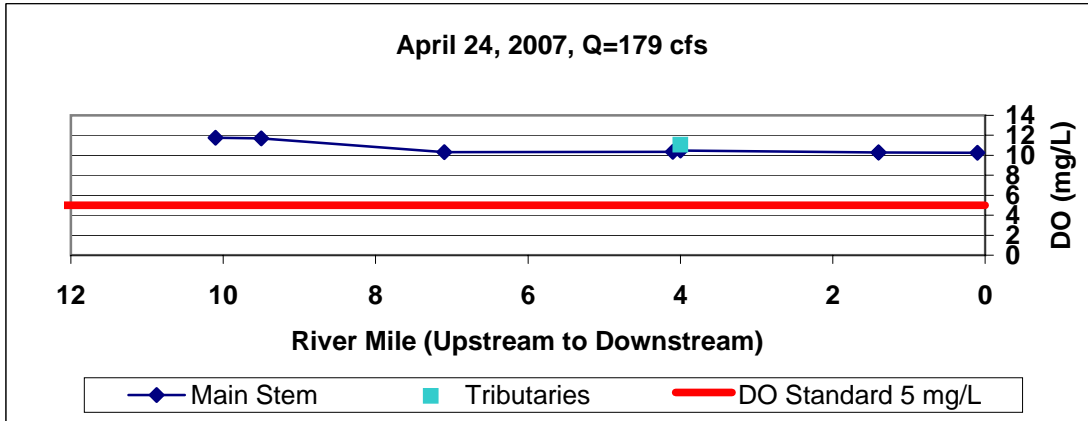
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### **2007 Clearwater River In-stream Loading and Water Quality Profiles**

# Appendix A

## Clearwater River Watershed District

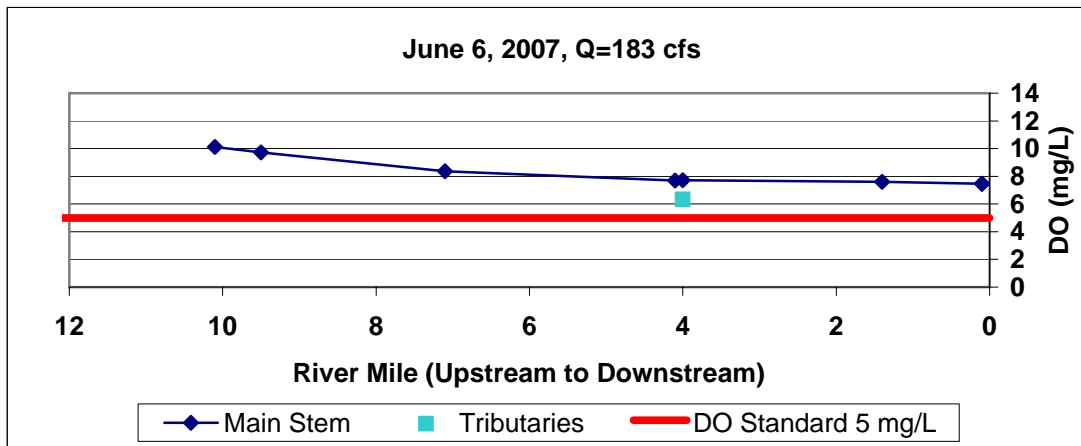
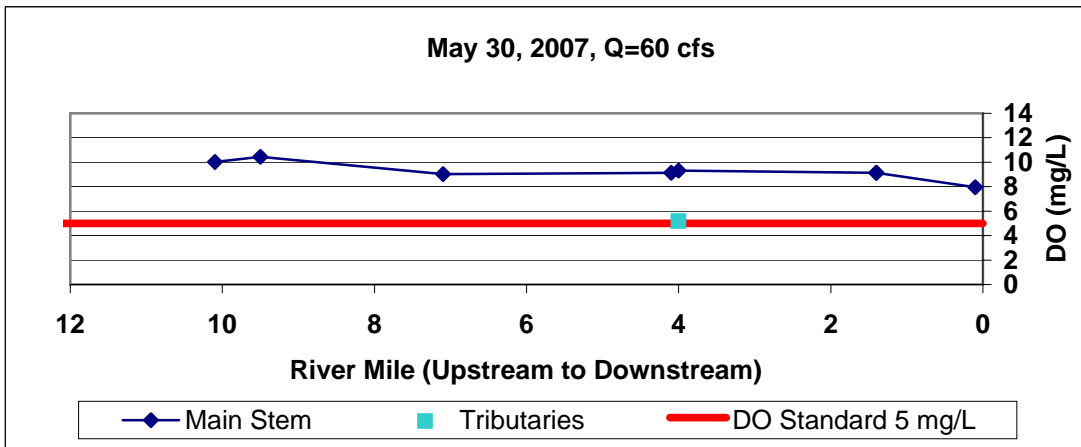
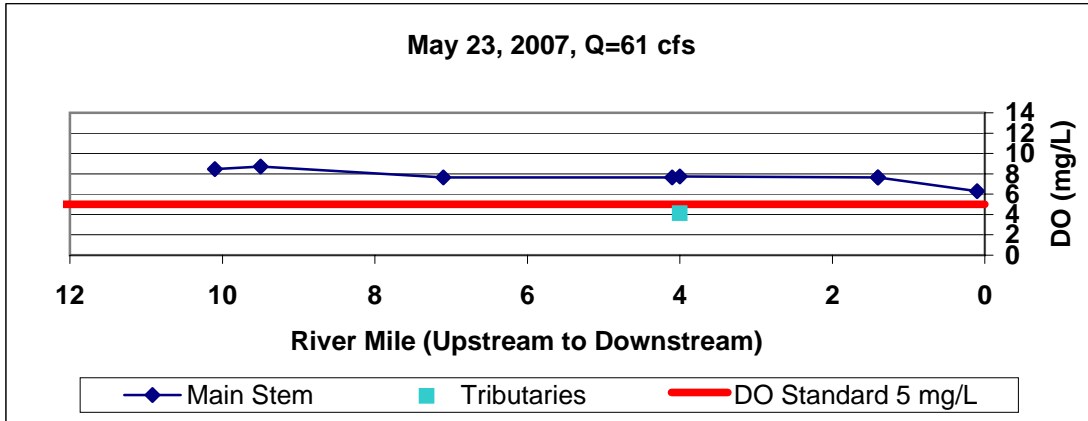
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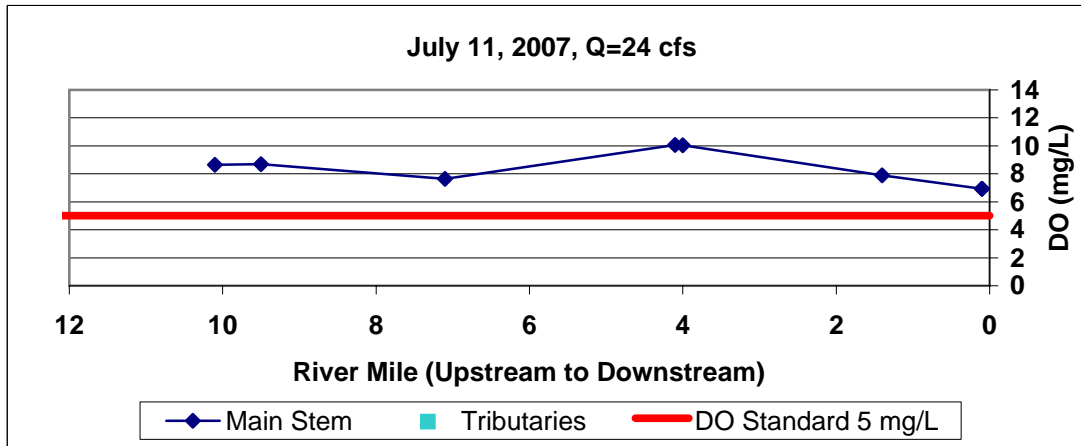
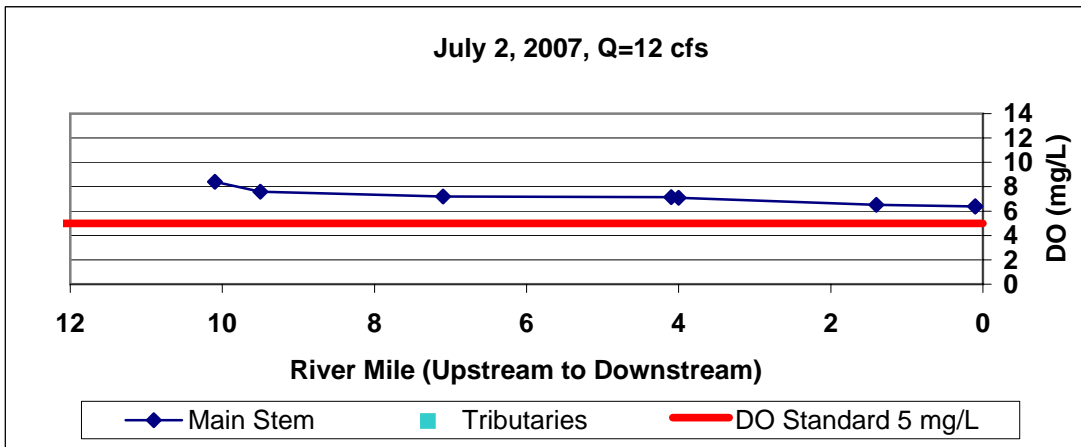
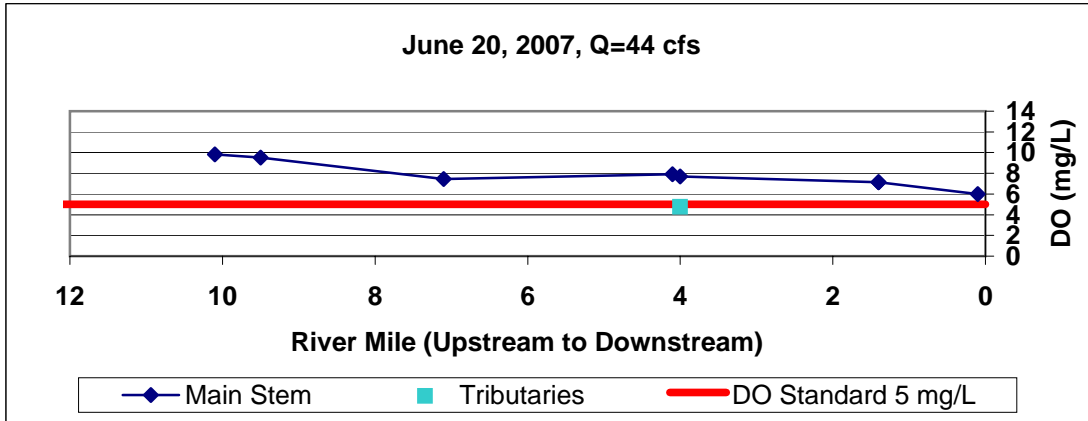
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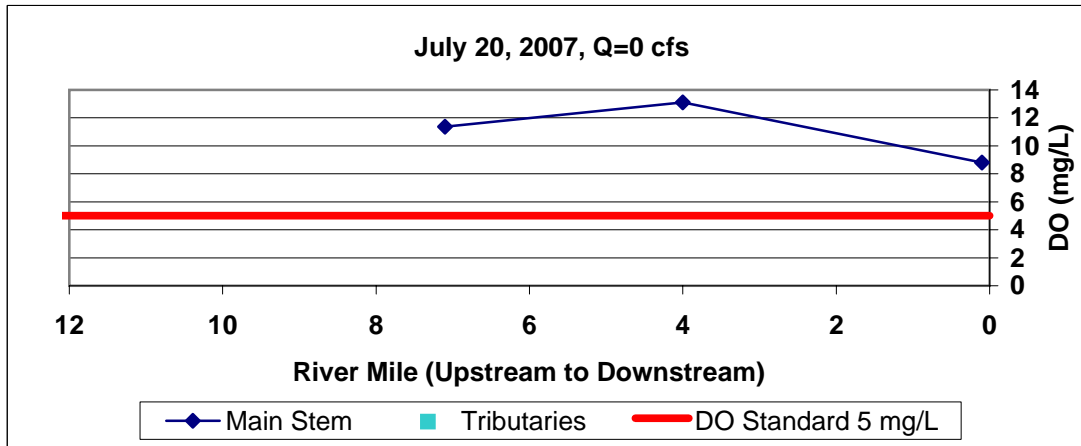
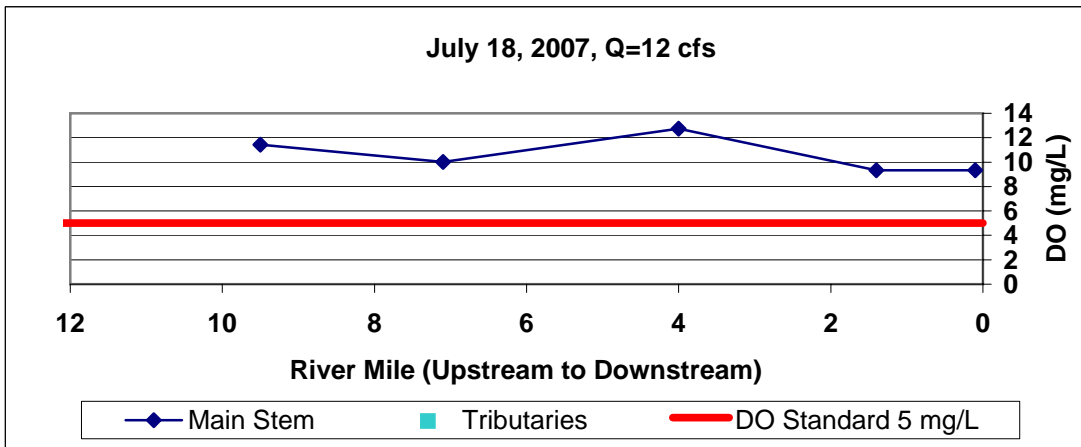
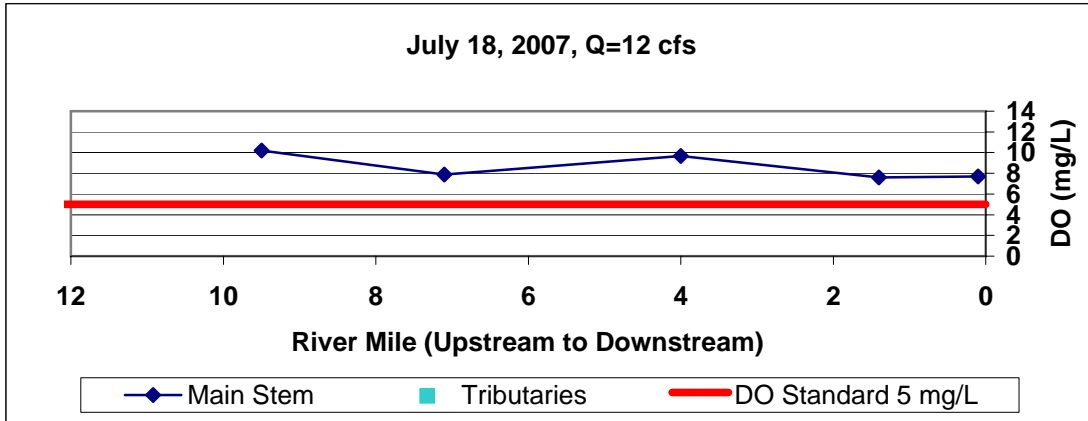
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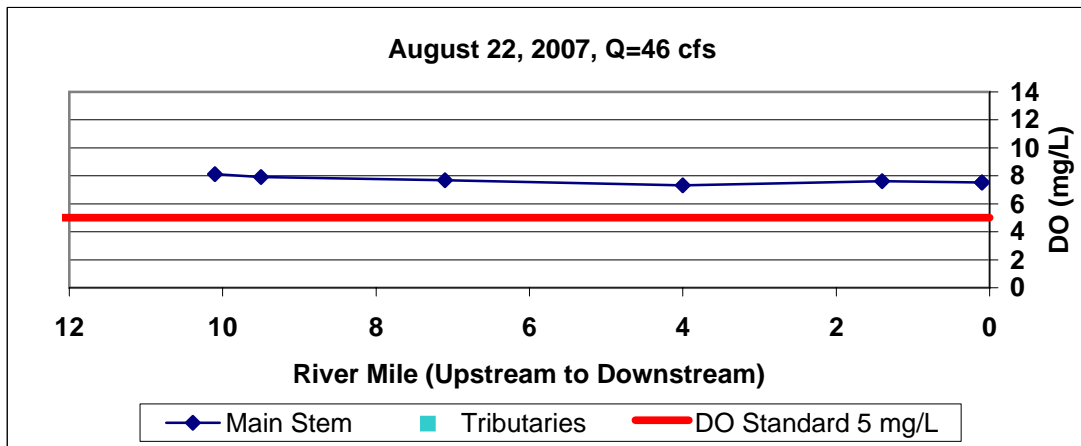
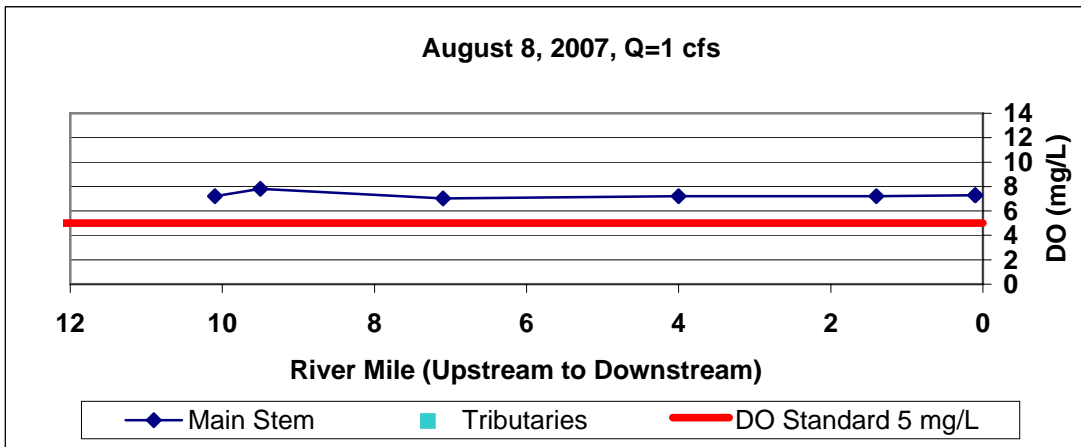
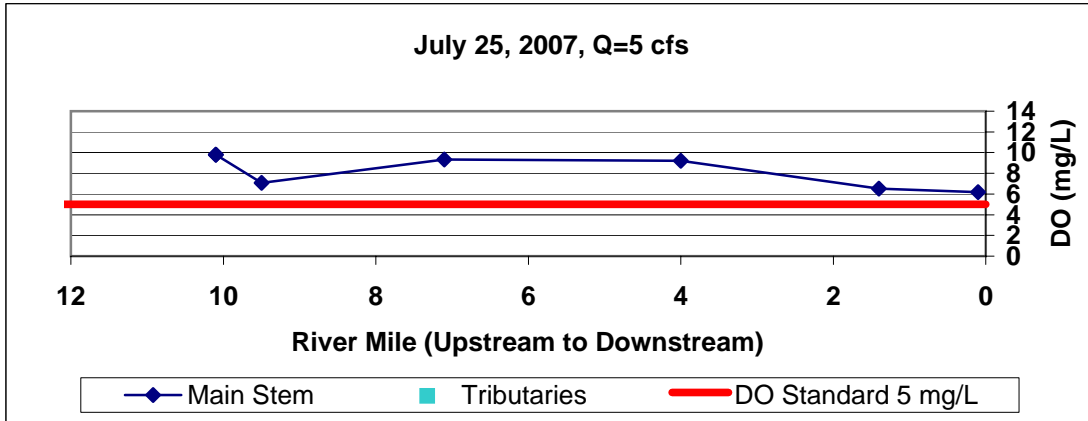
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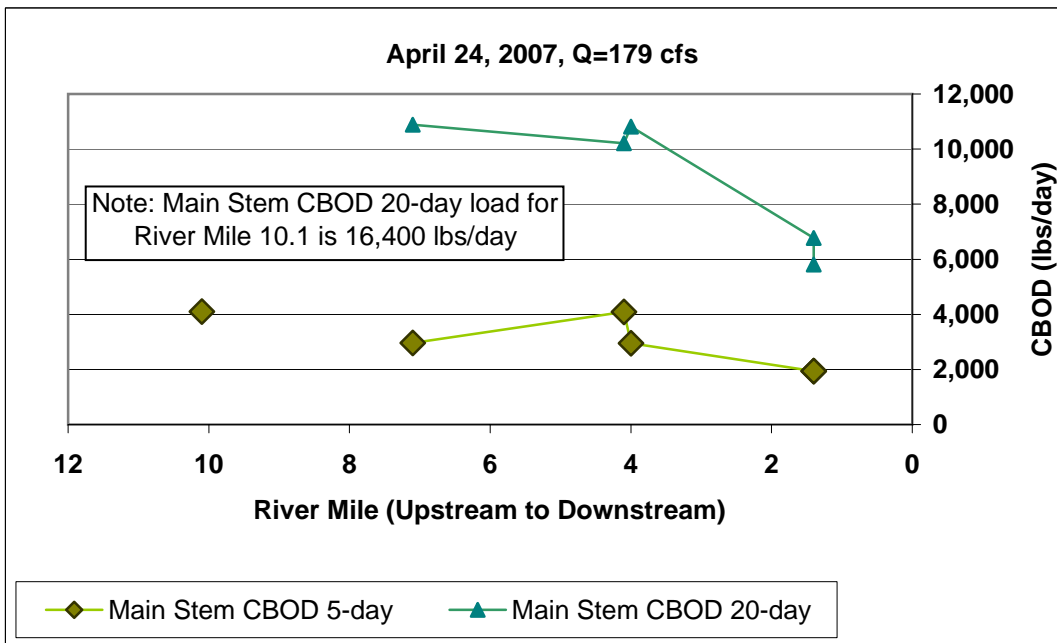
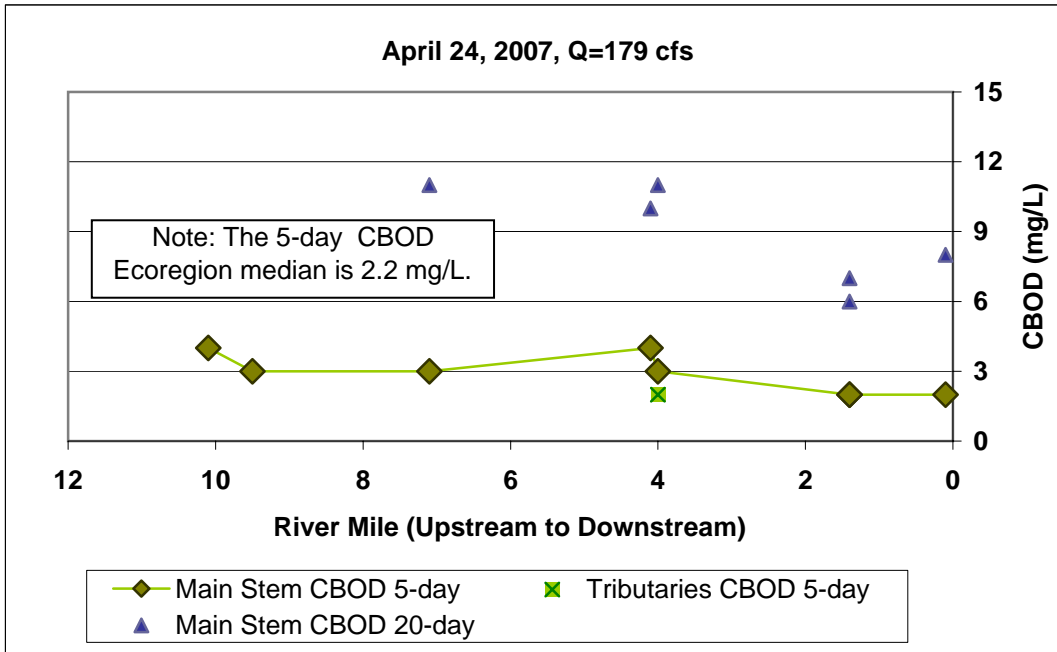




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### Phase II Addendum TMDL Study 2007 Clearwater River in-stream Loading and Water Quality Profiles

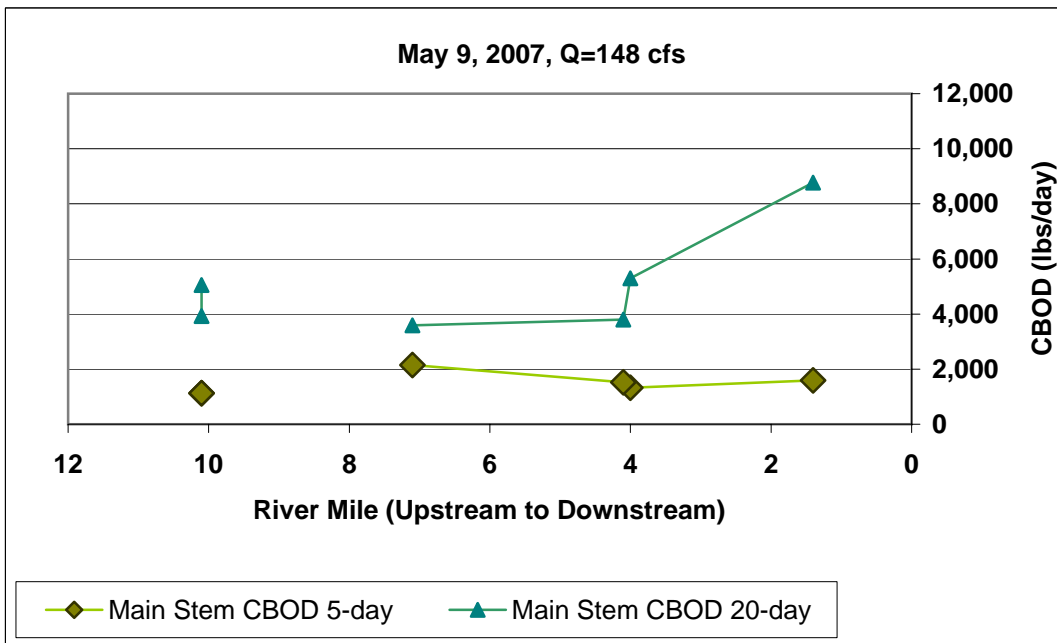
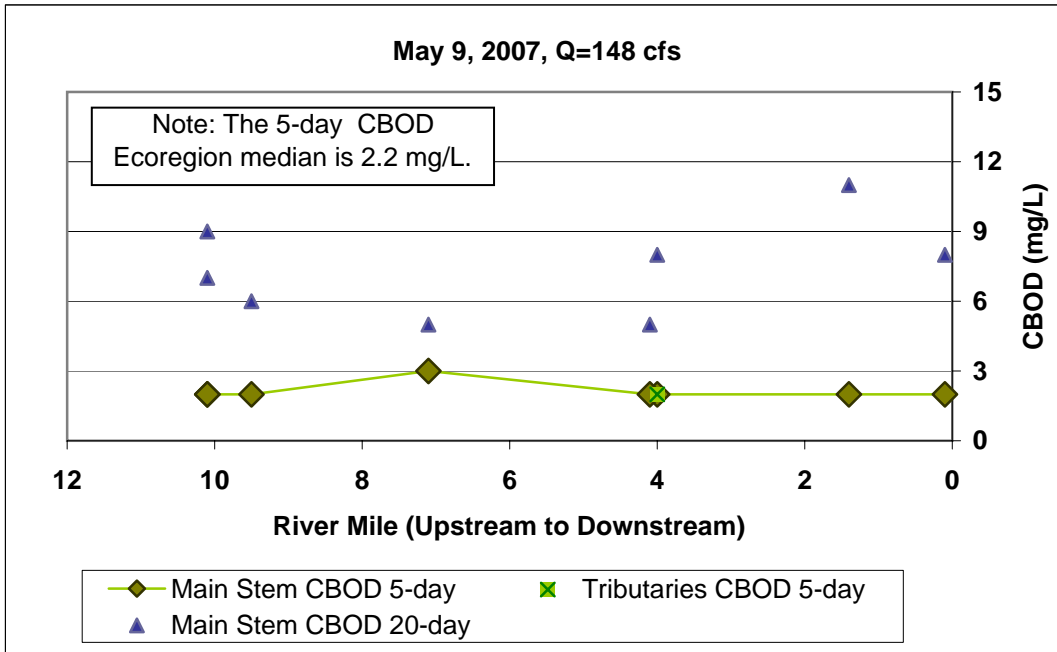


**Note: Calculation of loading profile is in pounds per day**

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### Phase II Addendum TMDL Study 2007 Clearwater River In-stream Loading and Water Quality Profiles

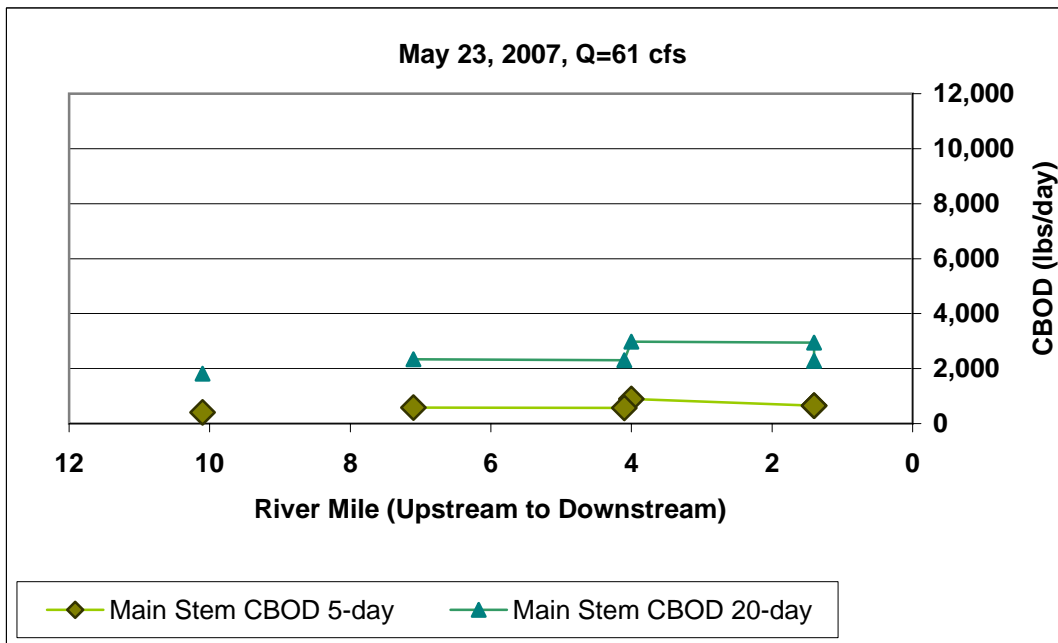
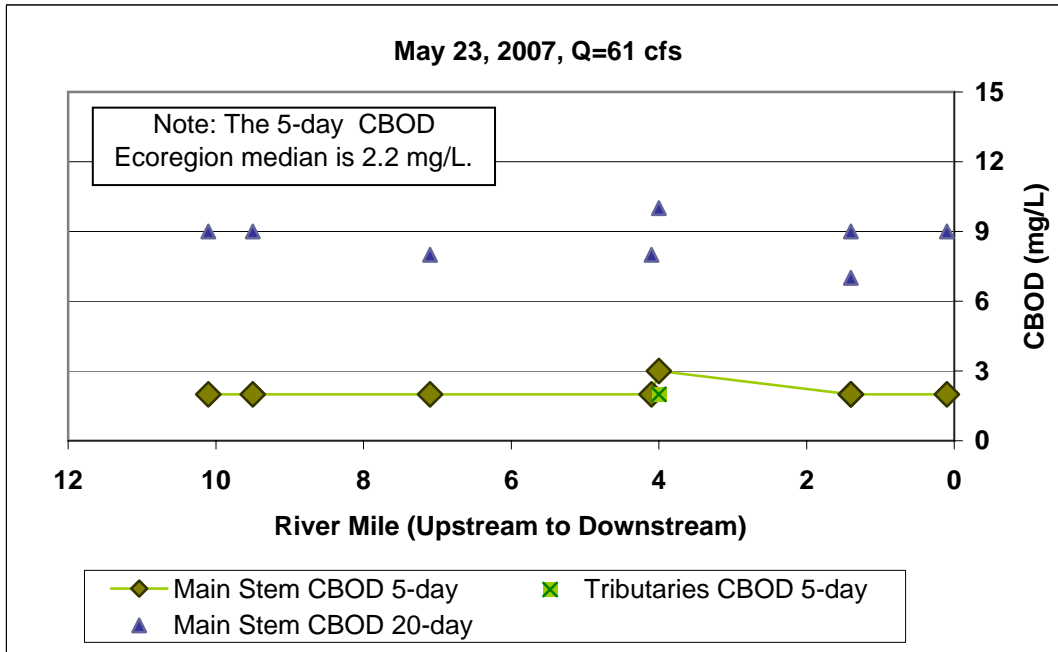


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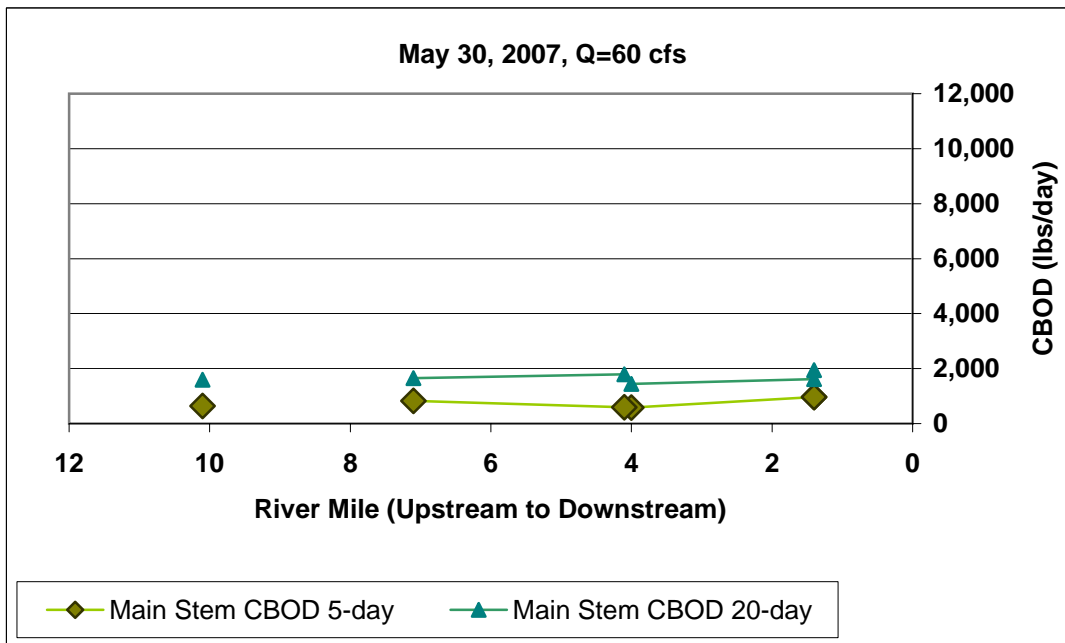
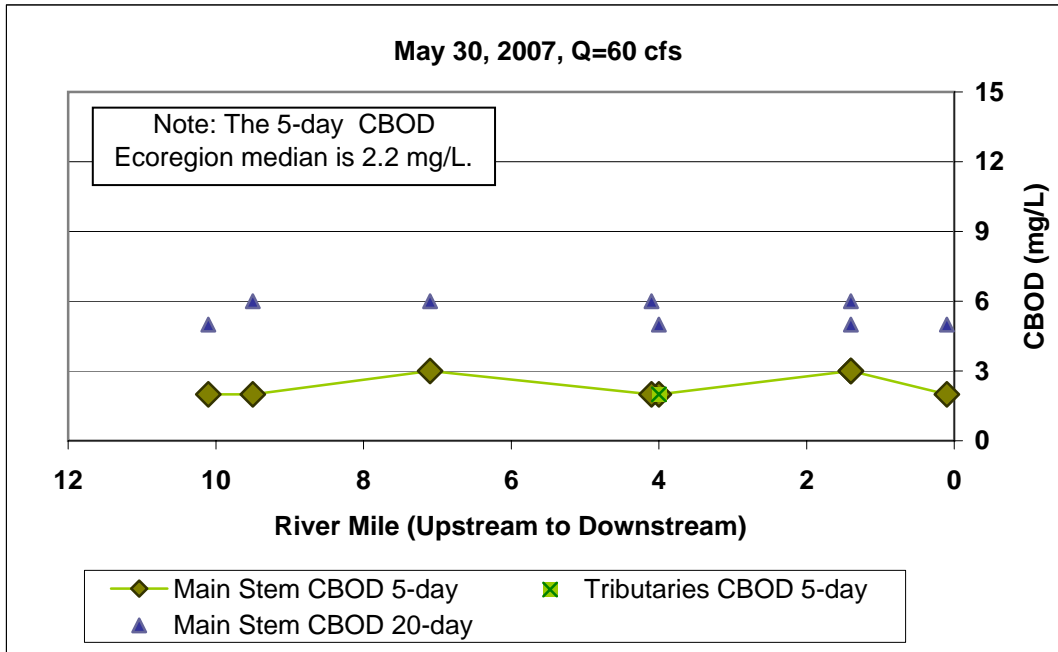


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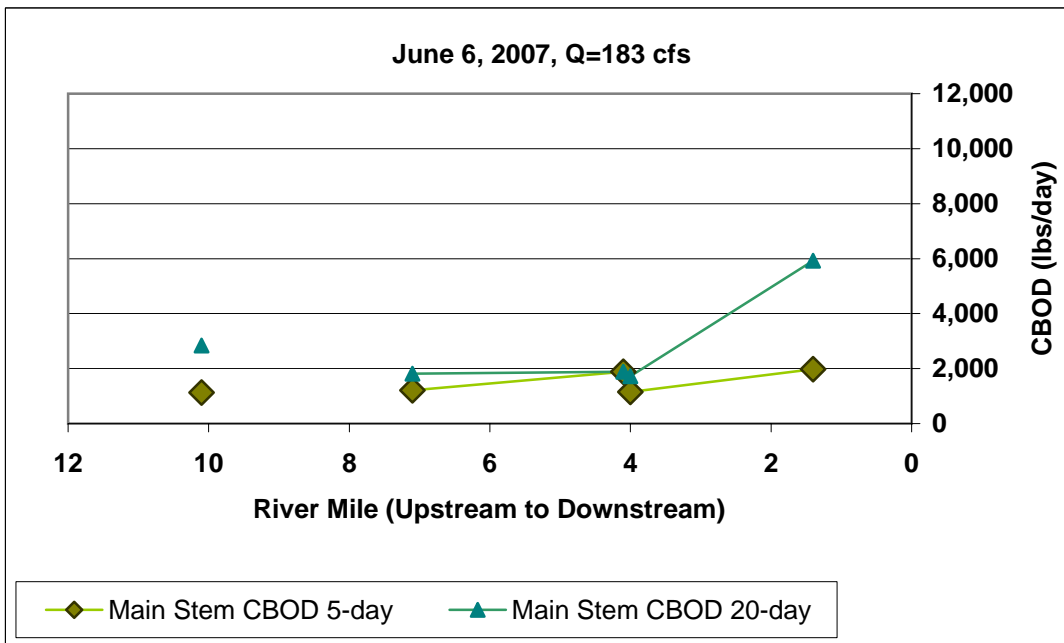
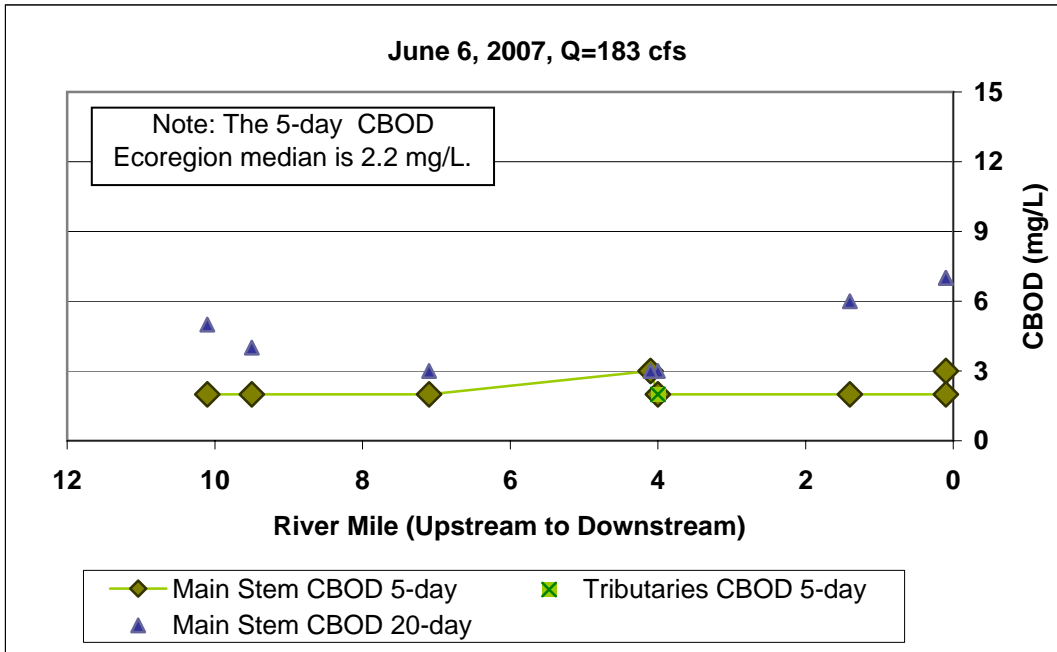


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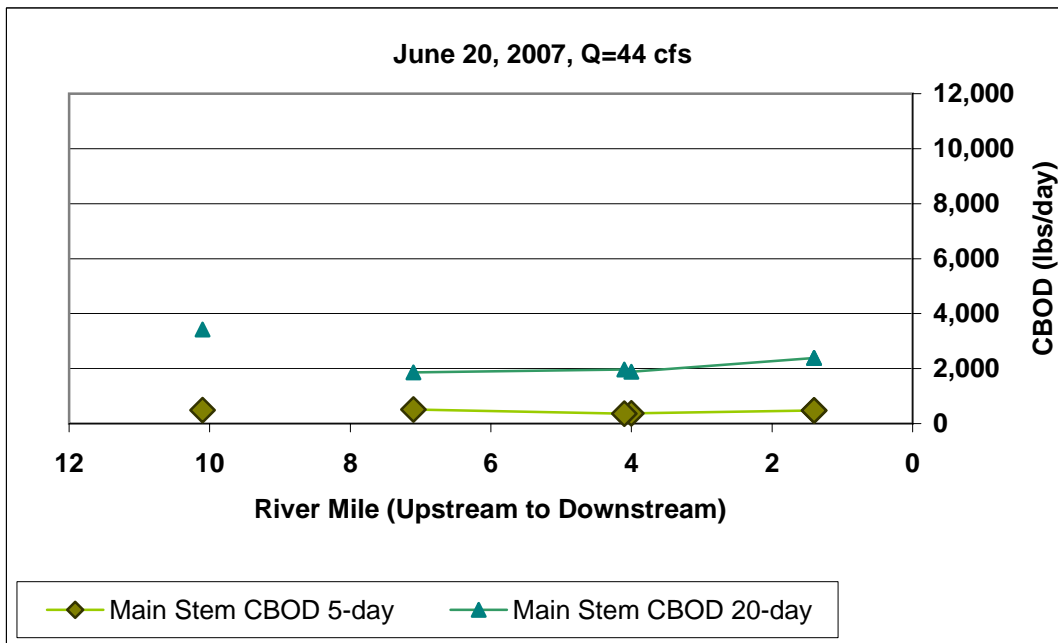
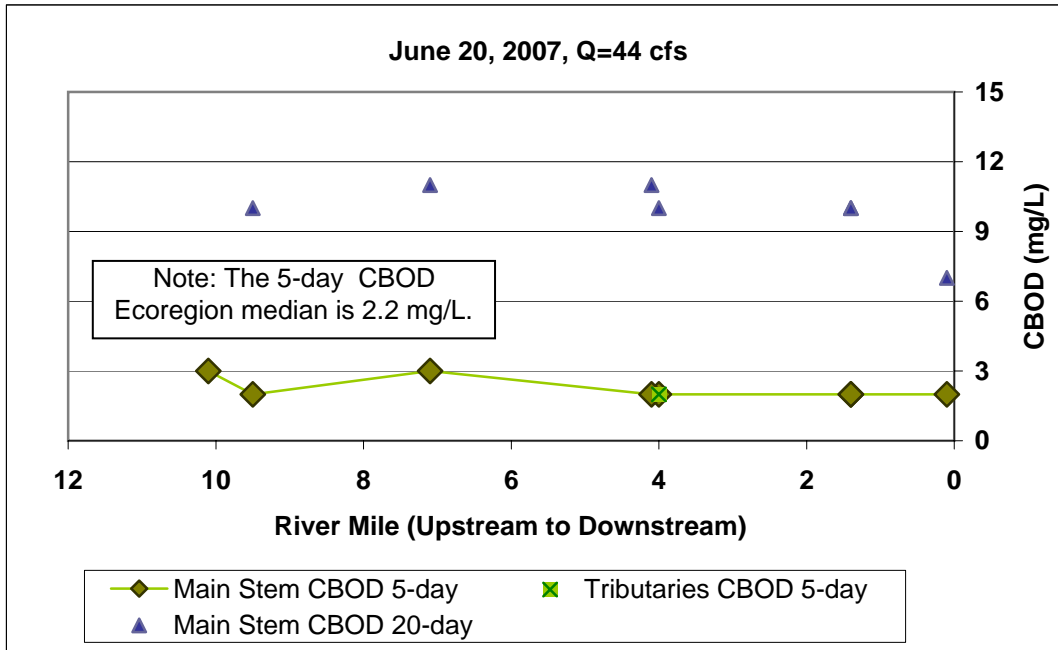


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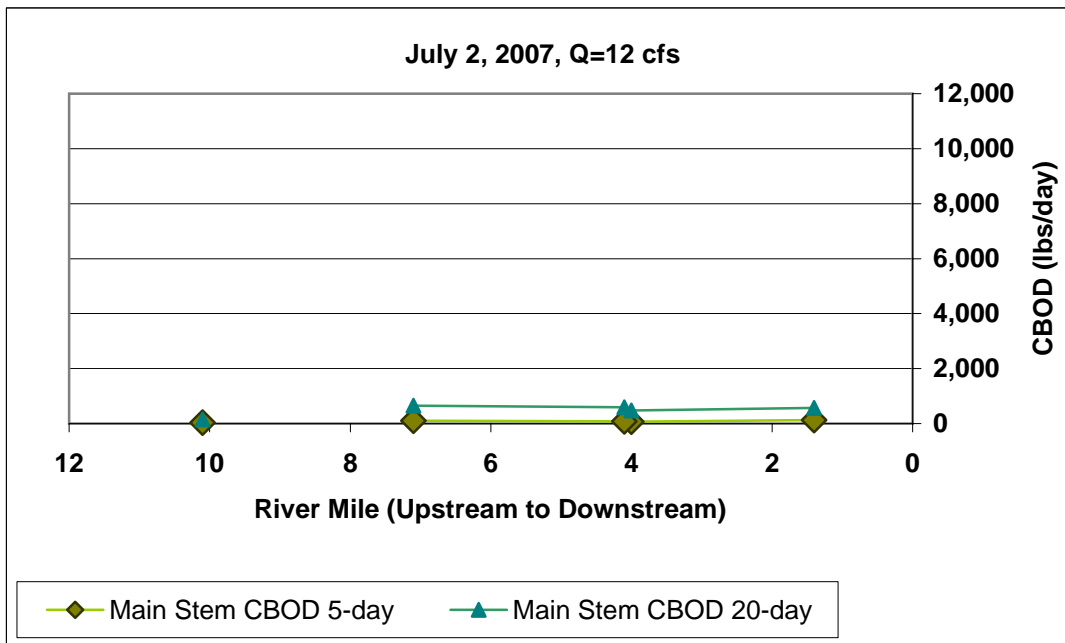
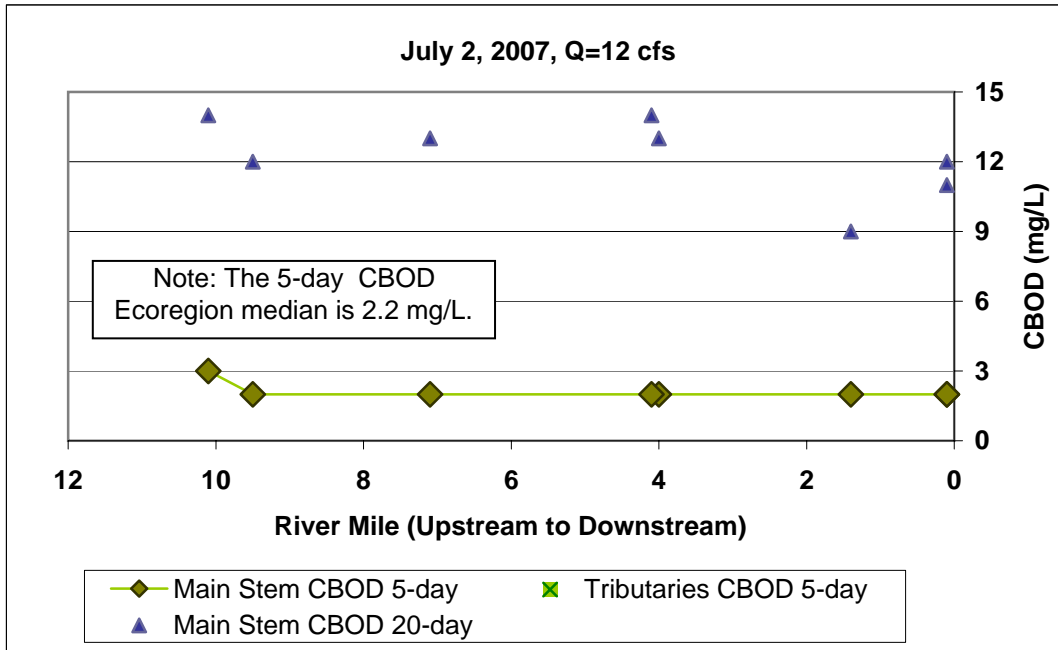


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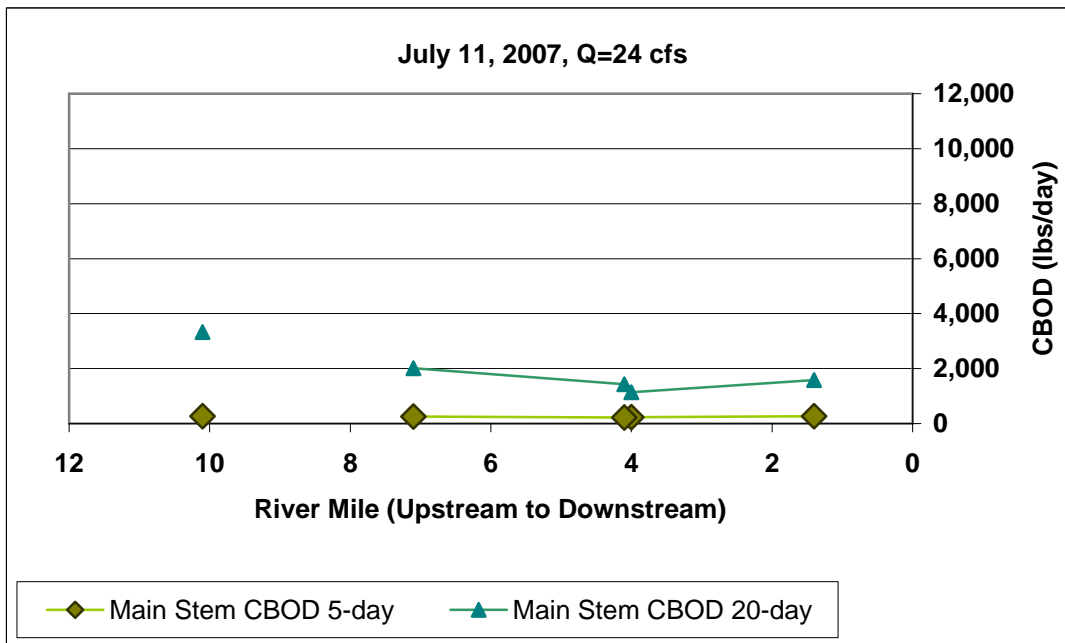
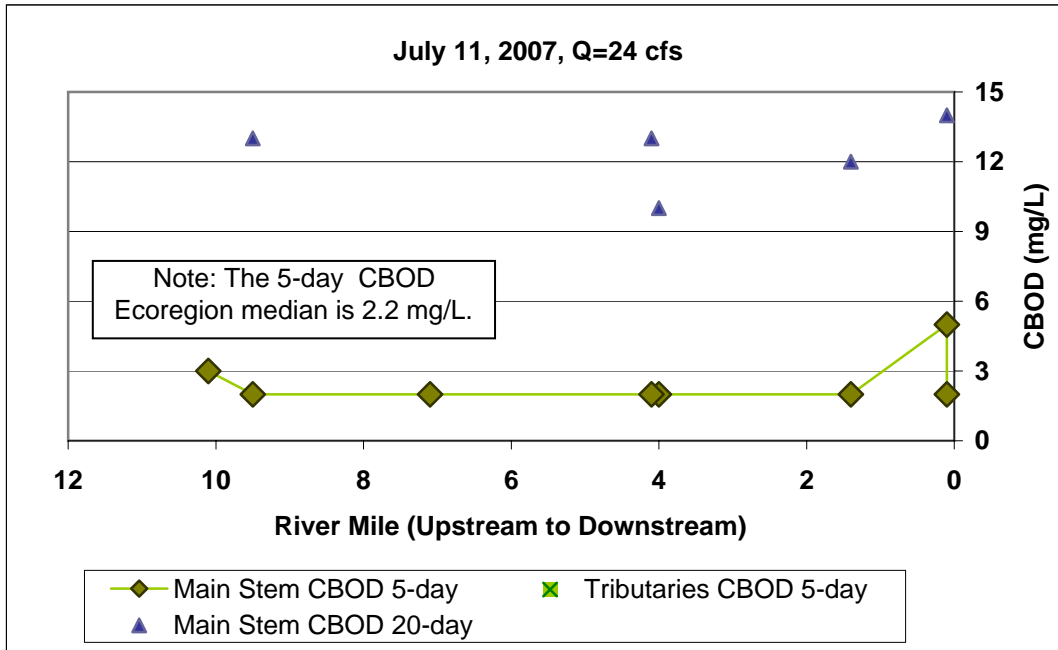


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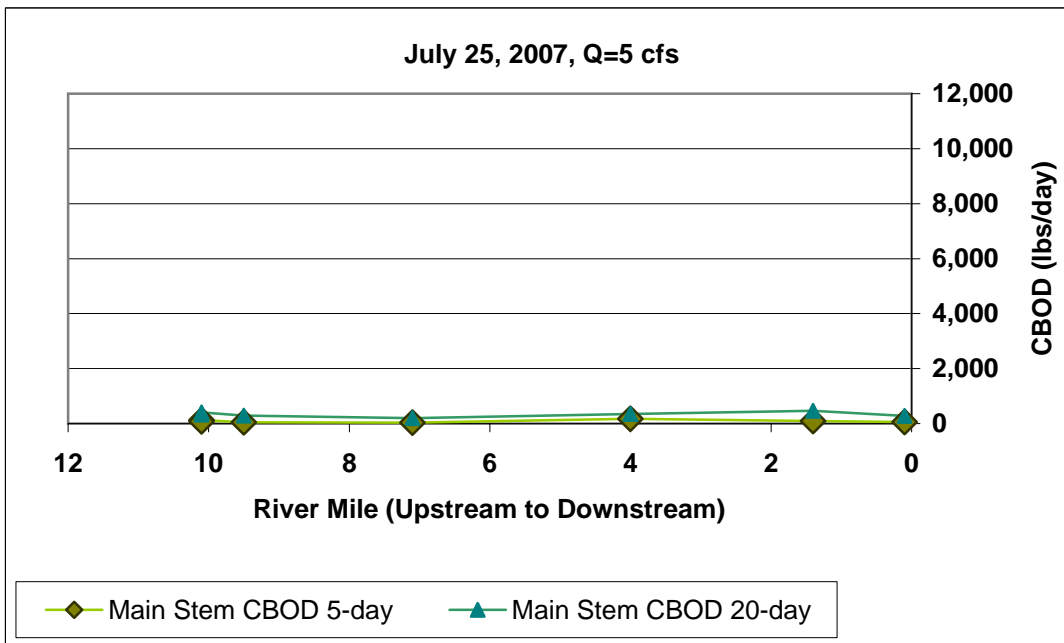
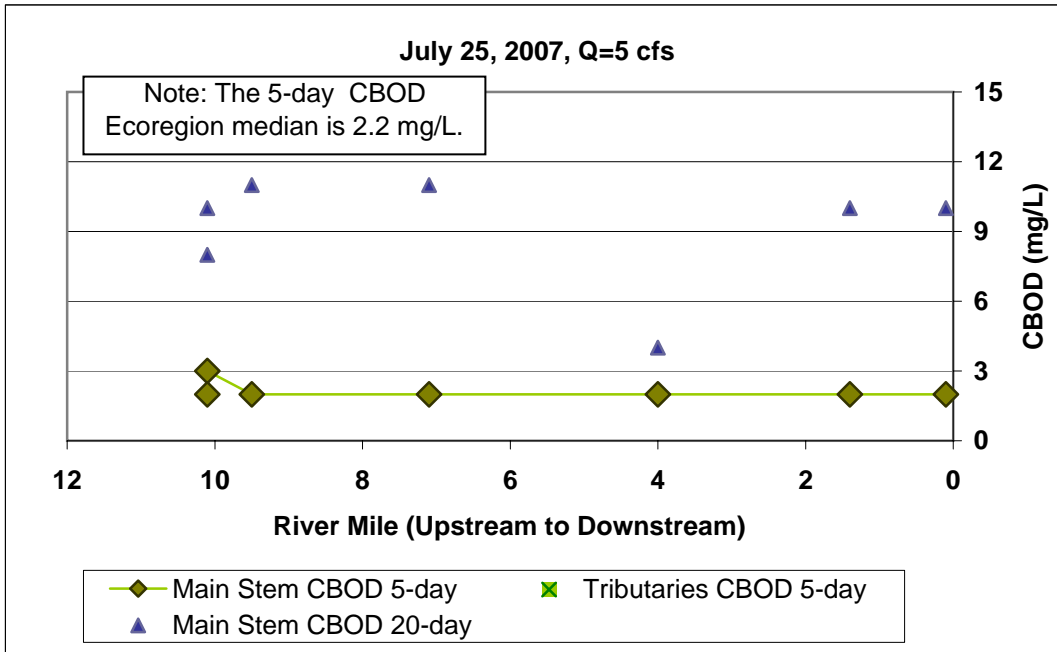
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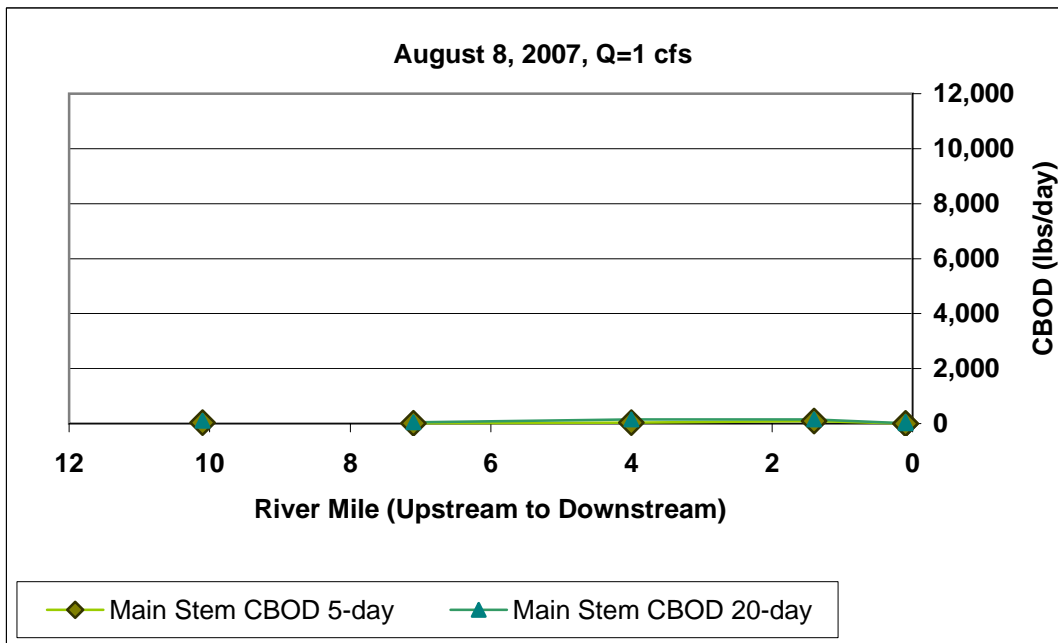
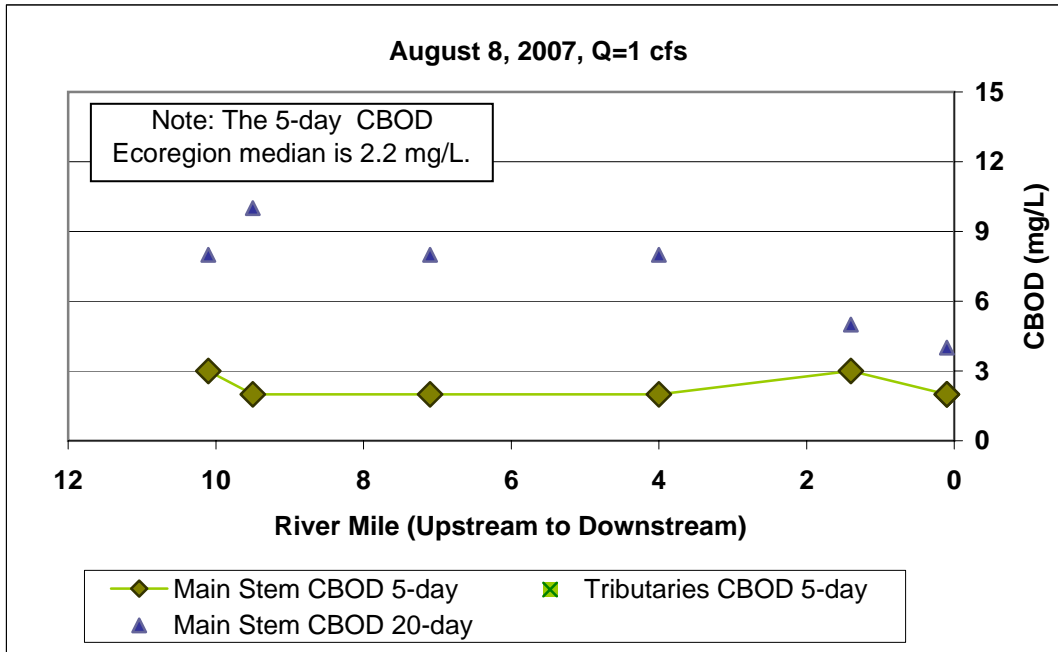


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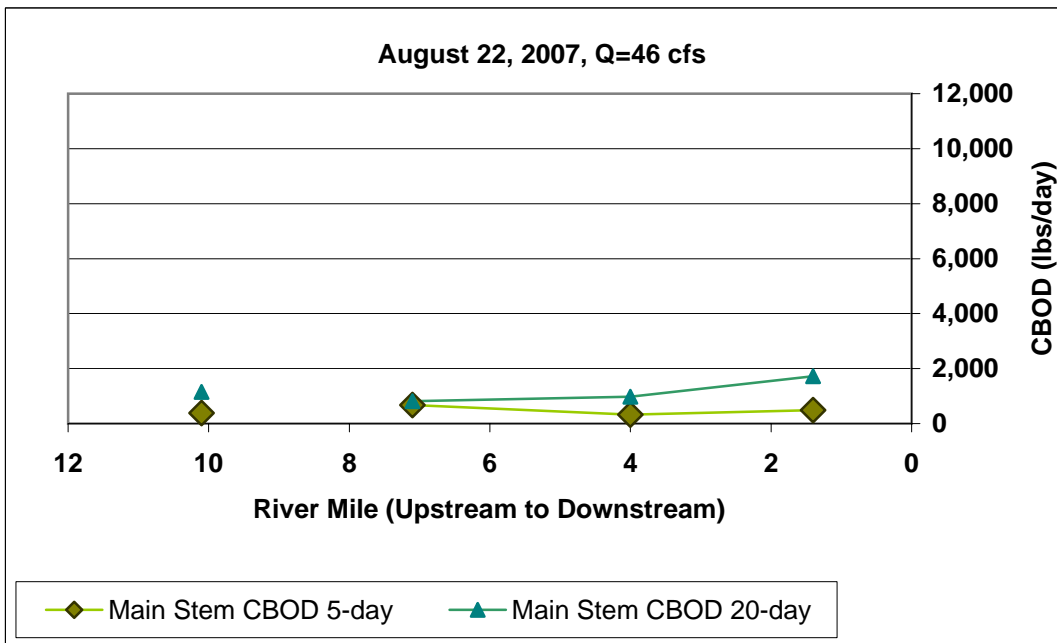
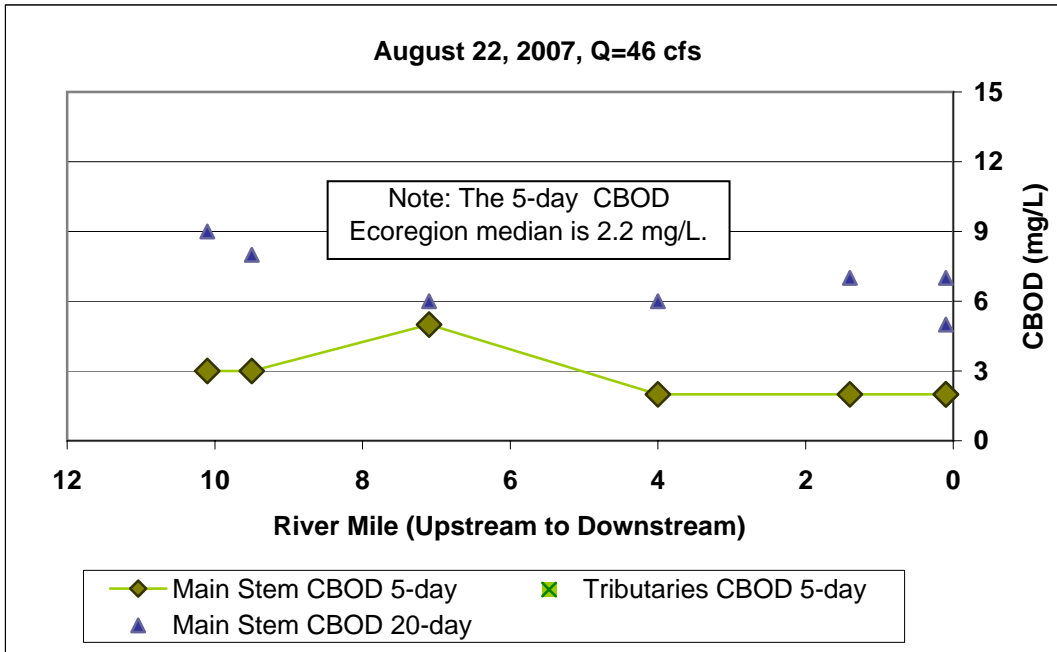


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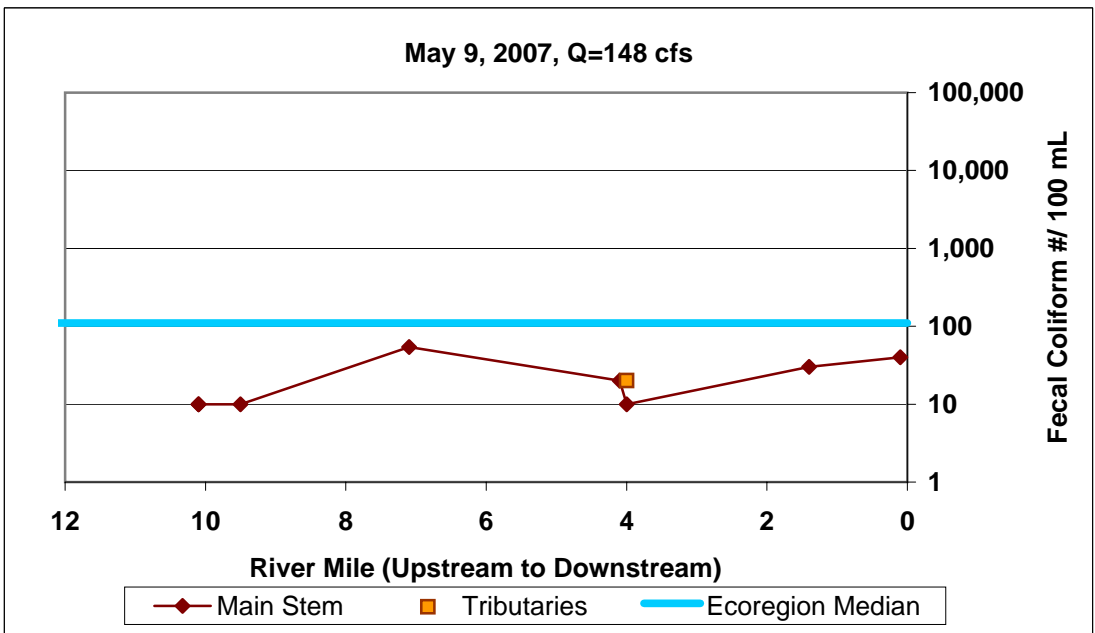
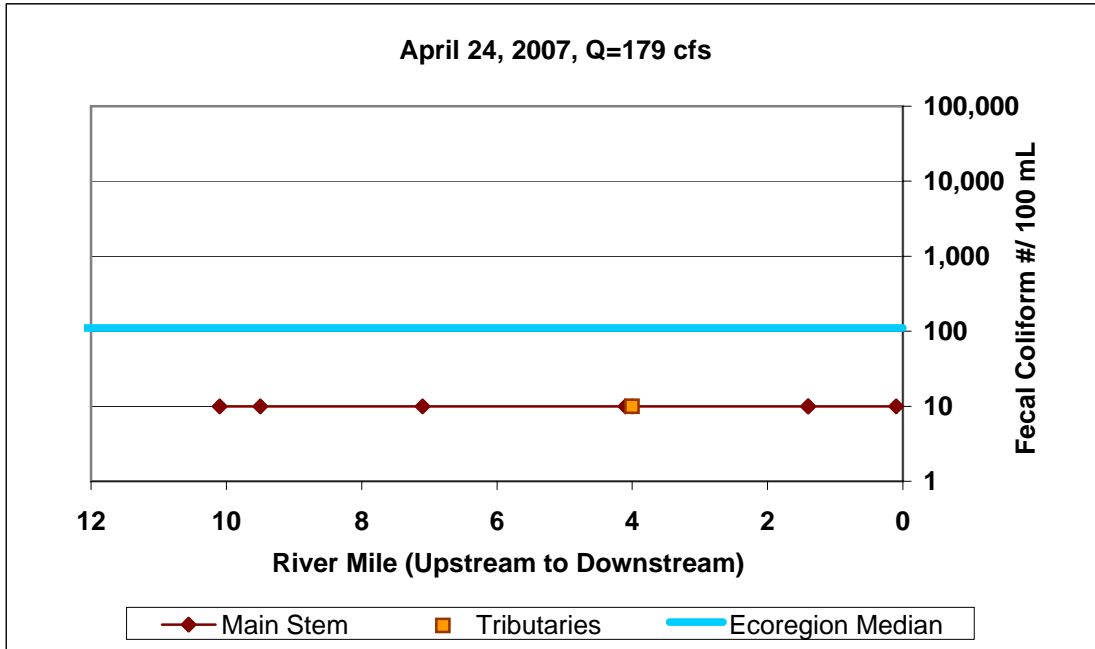


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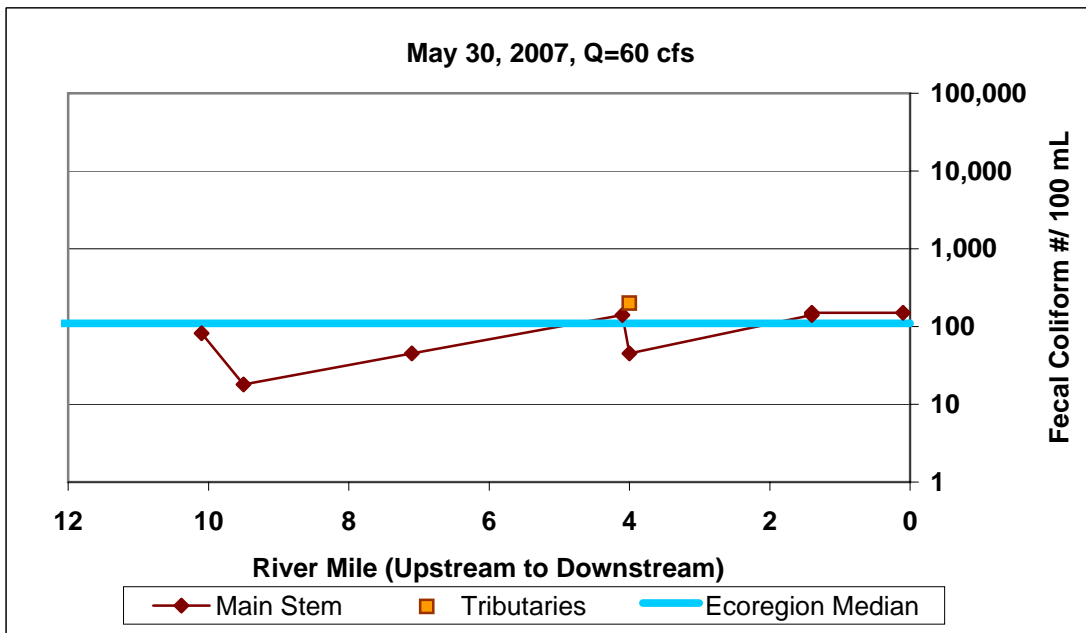
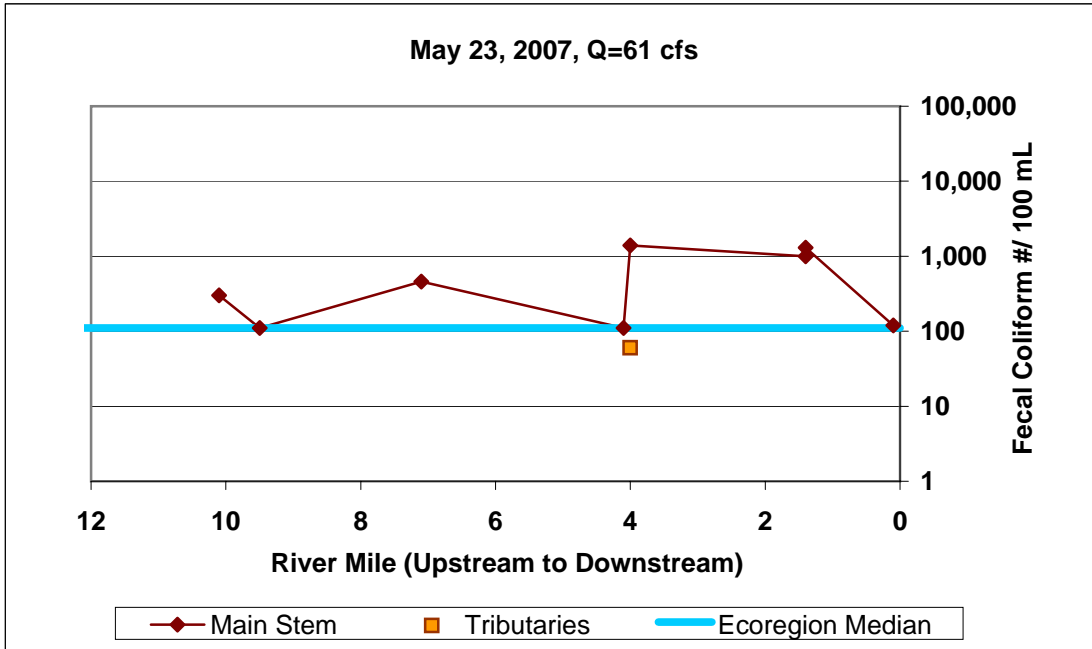
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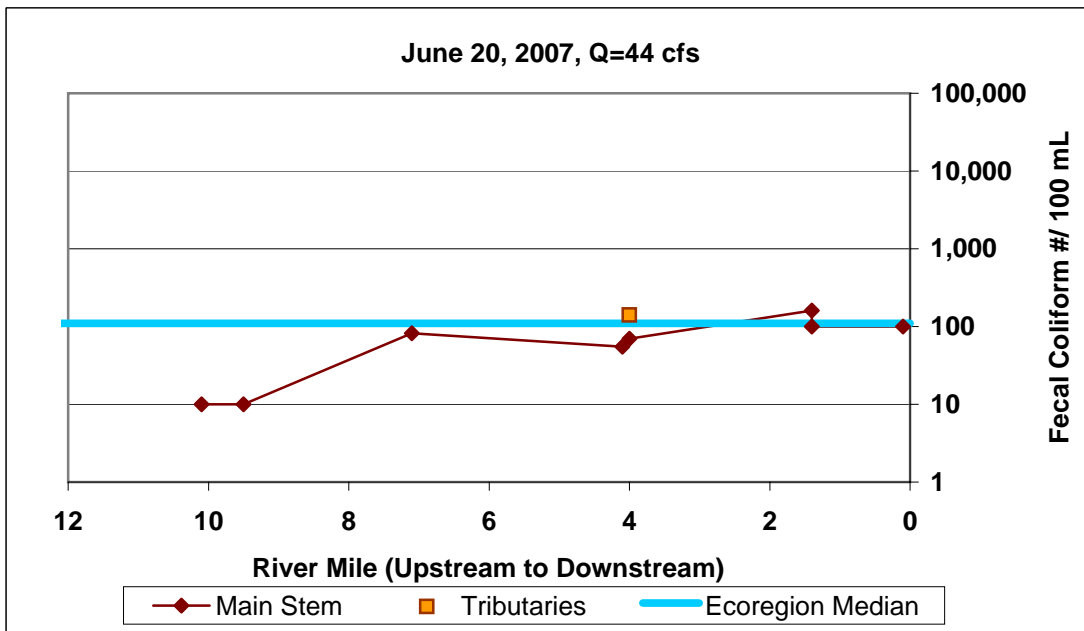
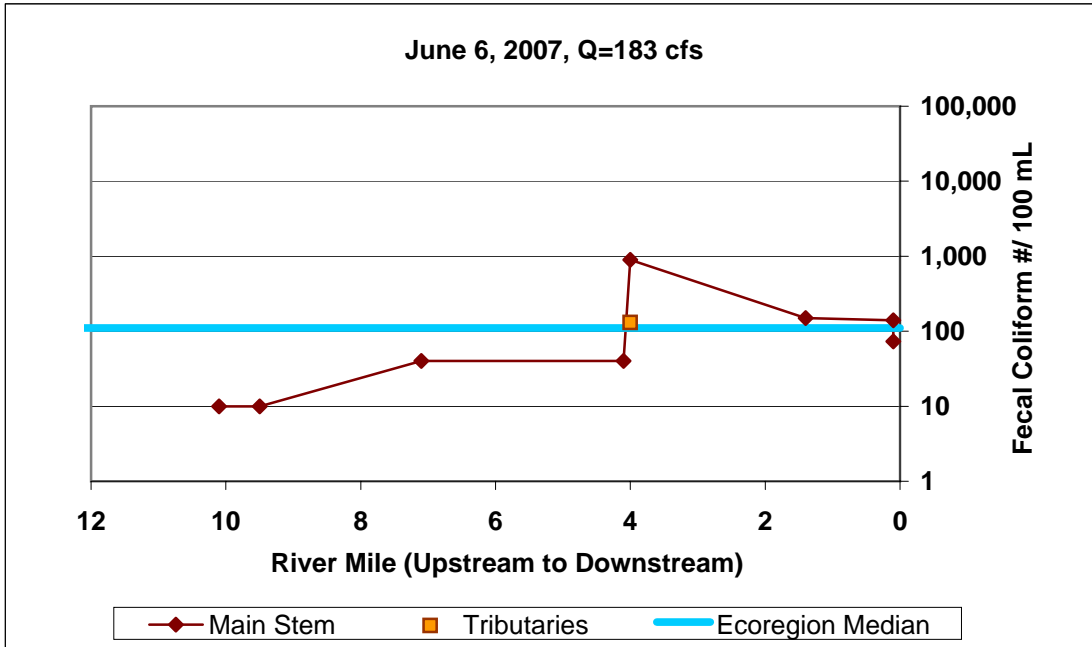
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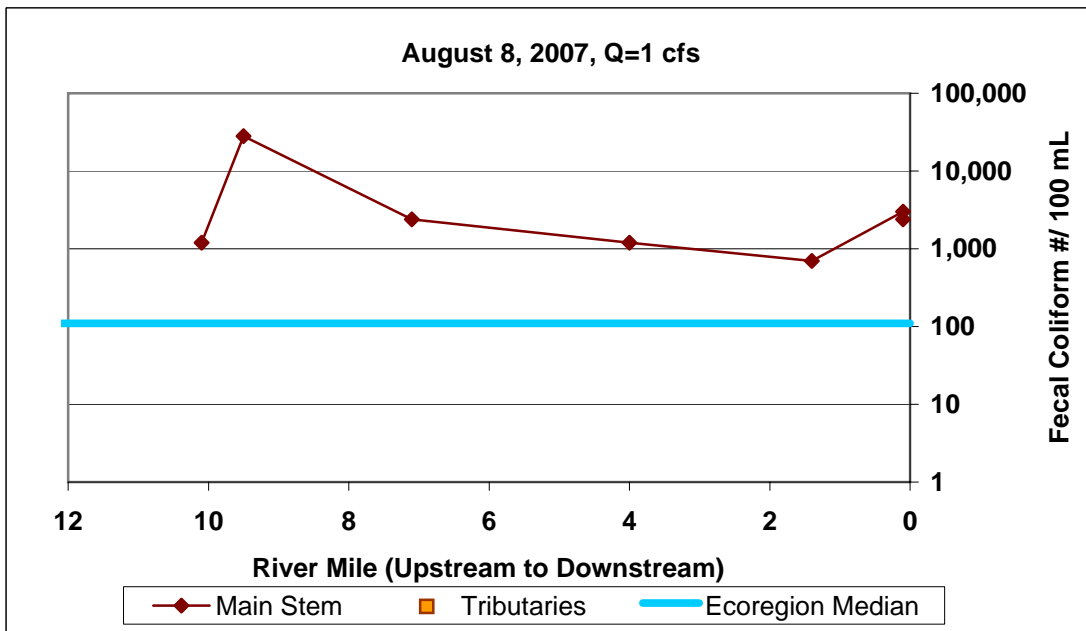
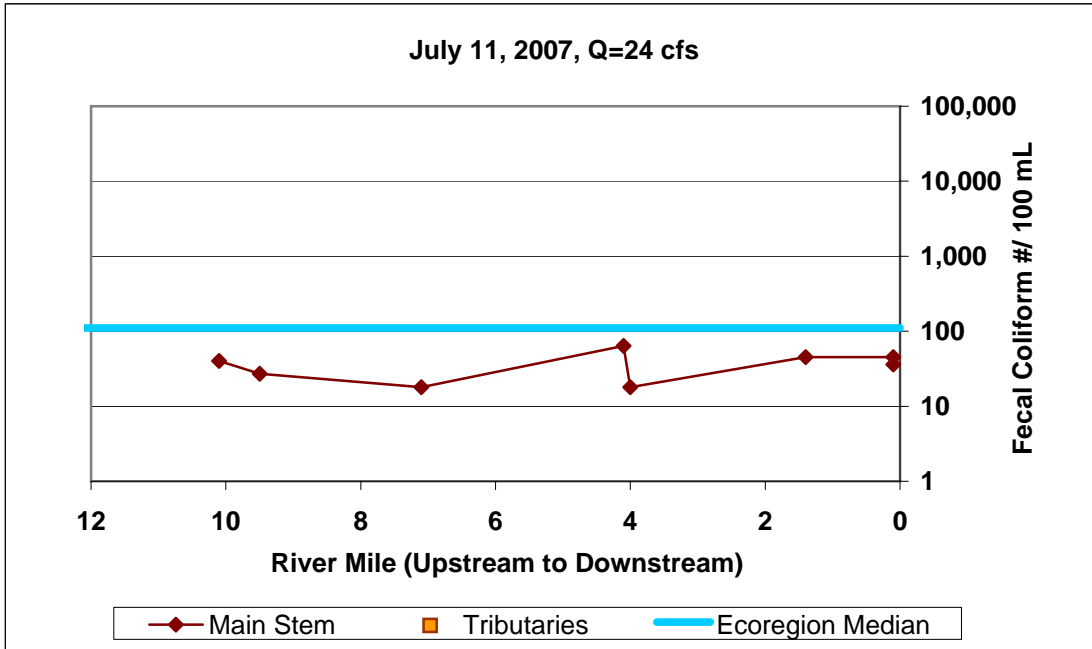
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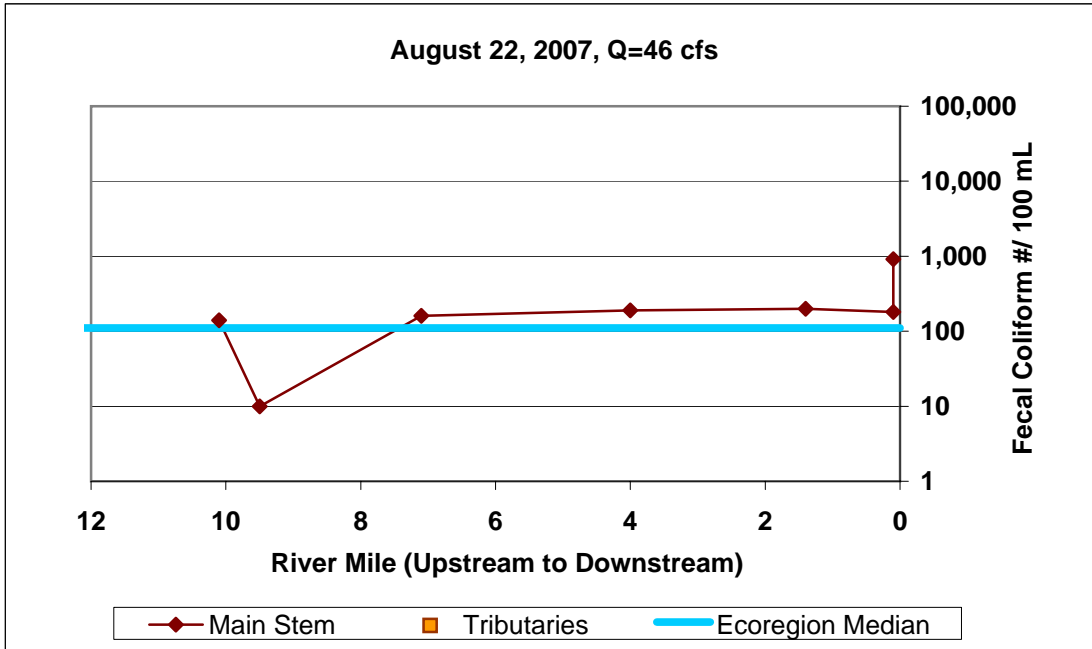
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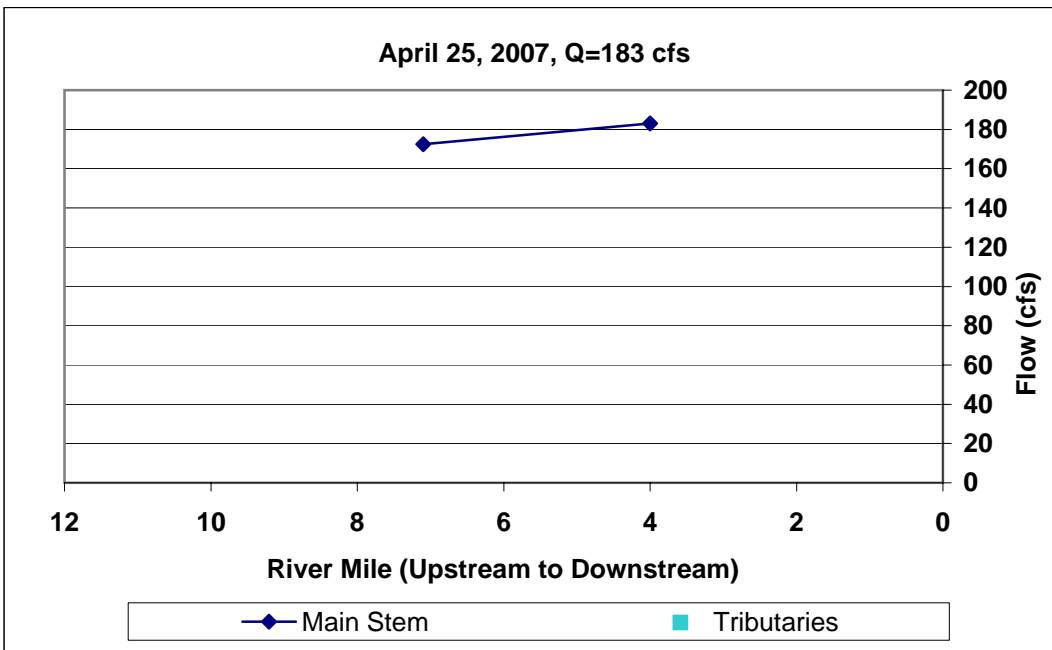
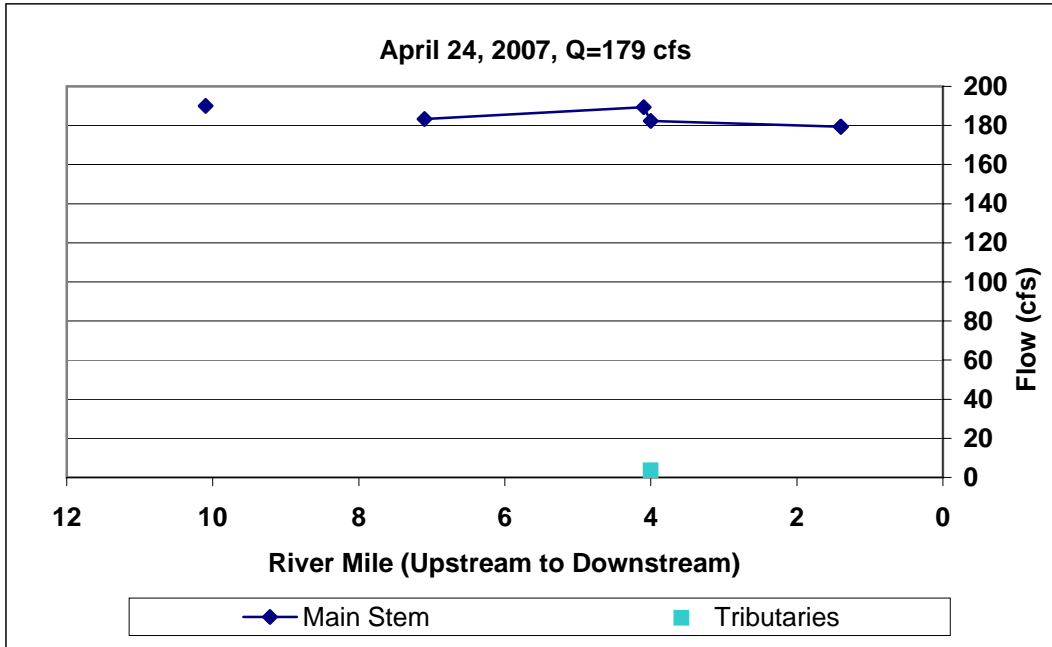




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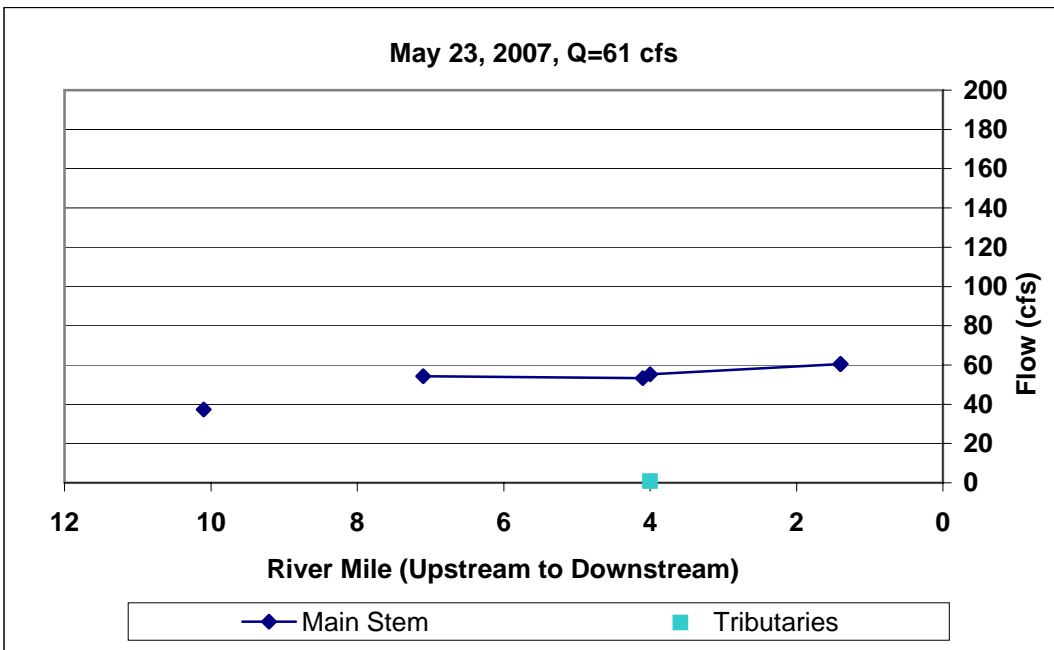
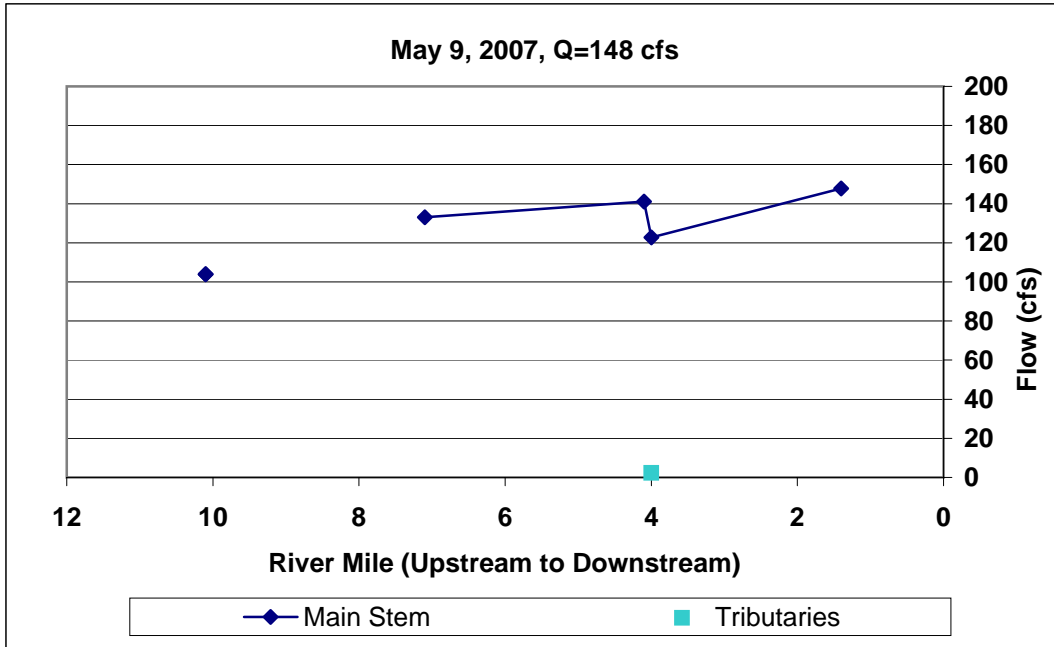
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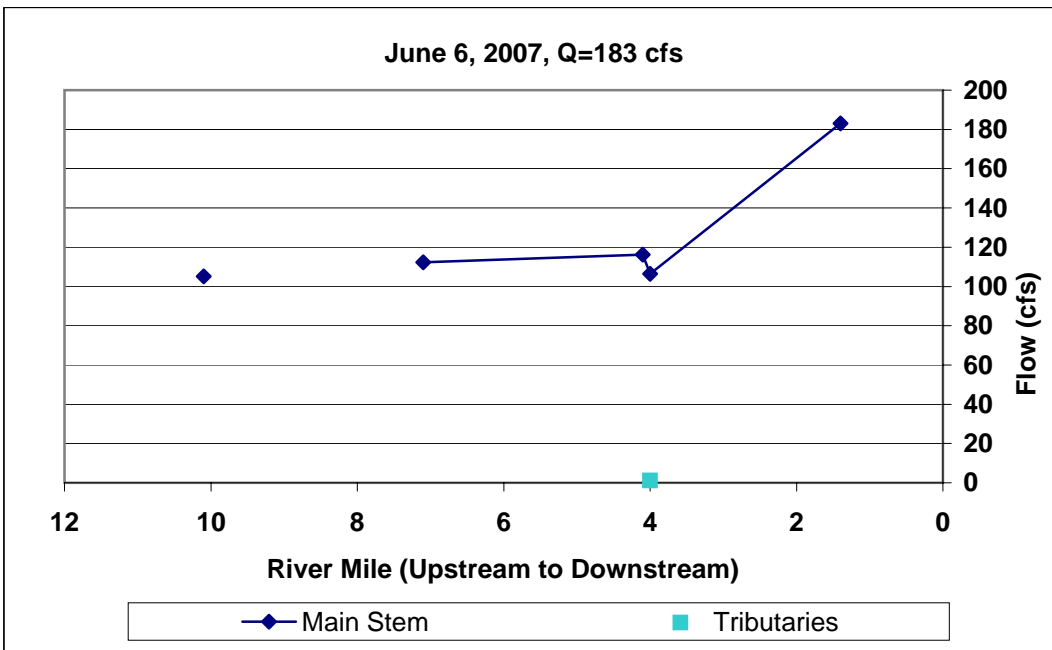
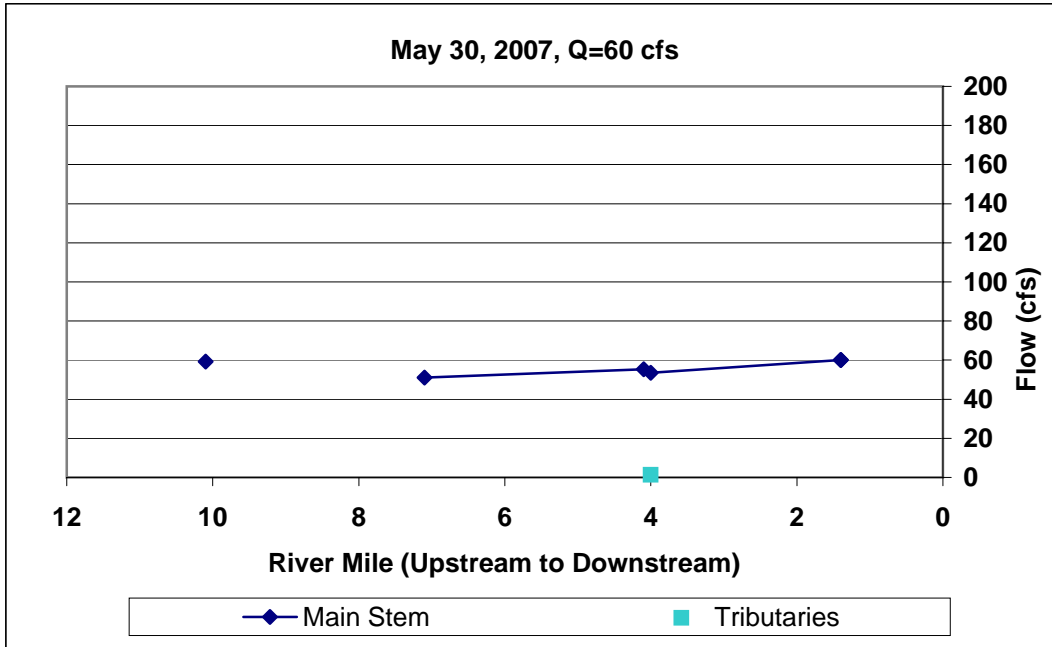
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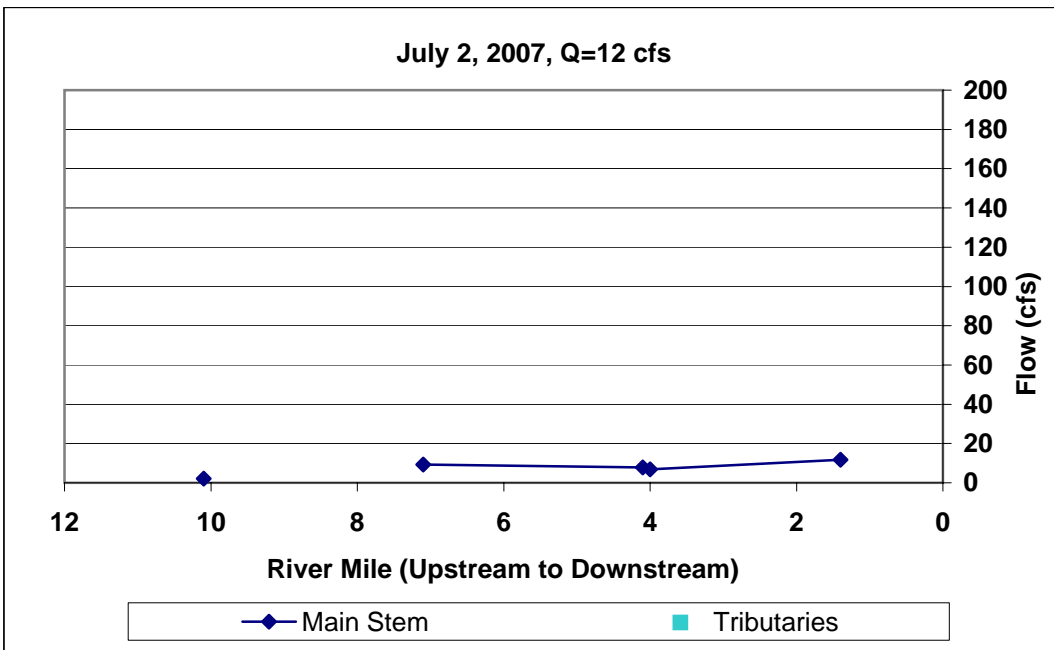
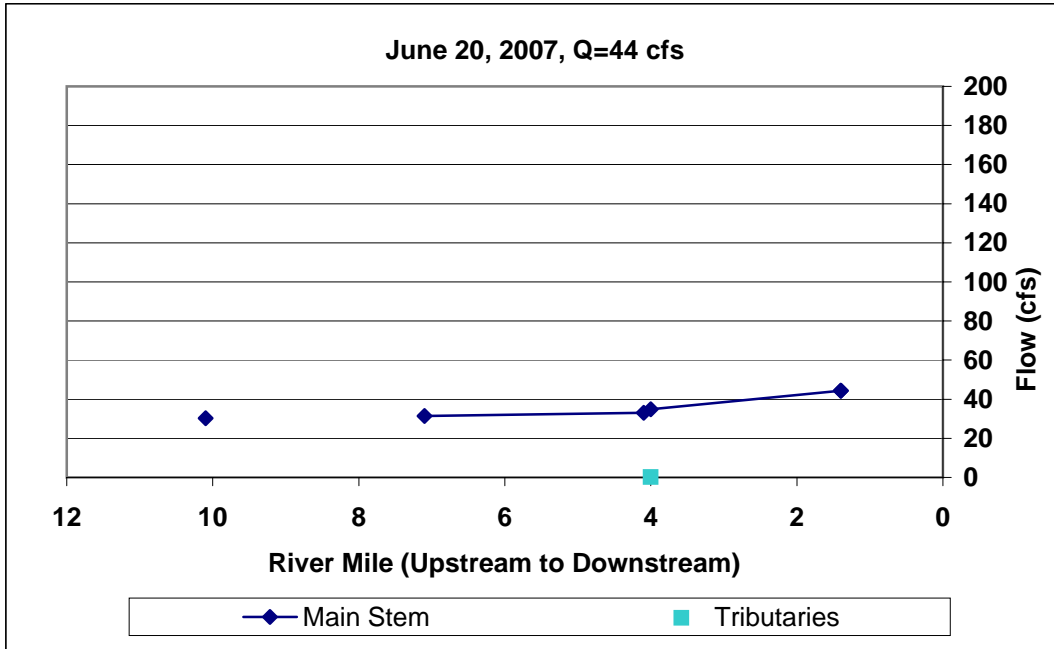
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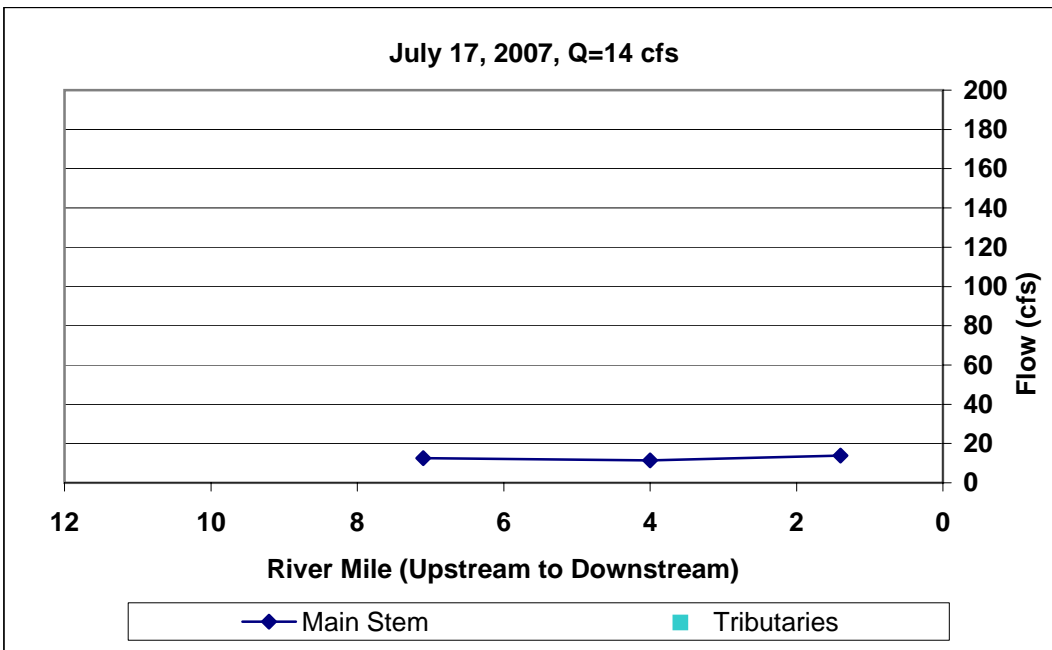
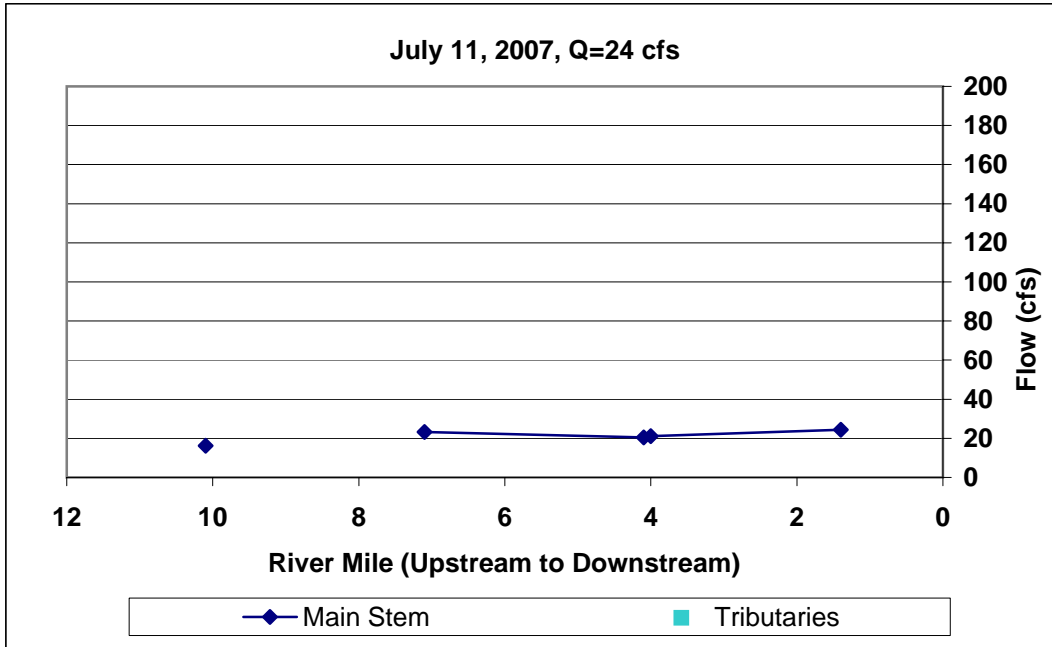
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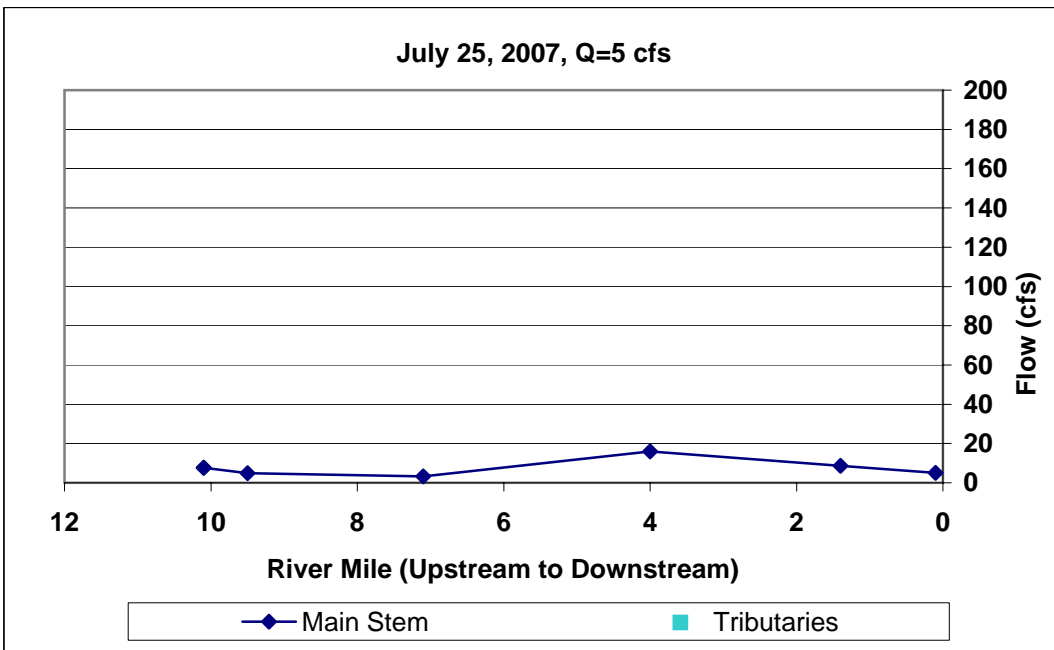
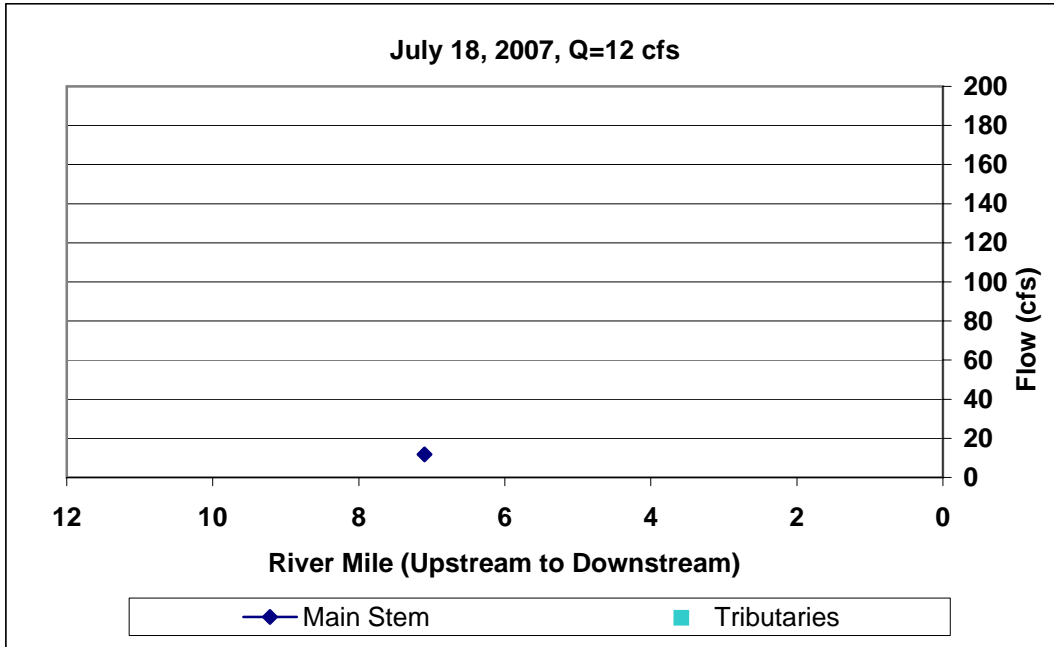
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# Appendix A

## Clearwater River Watershed District

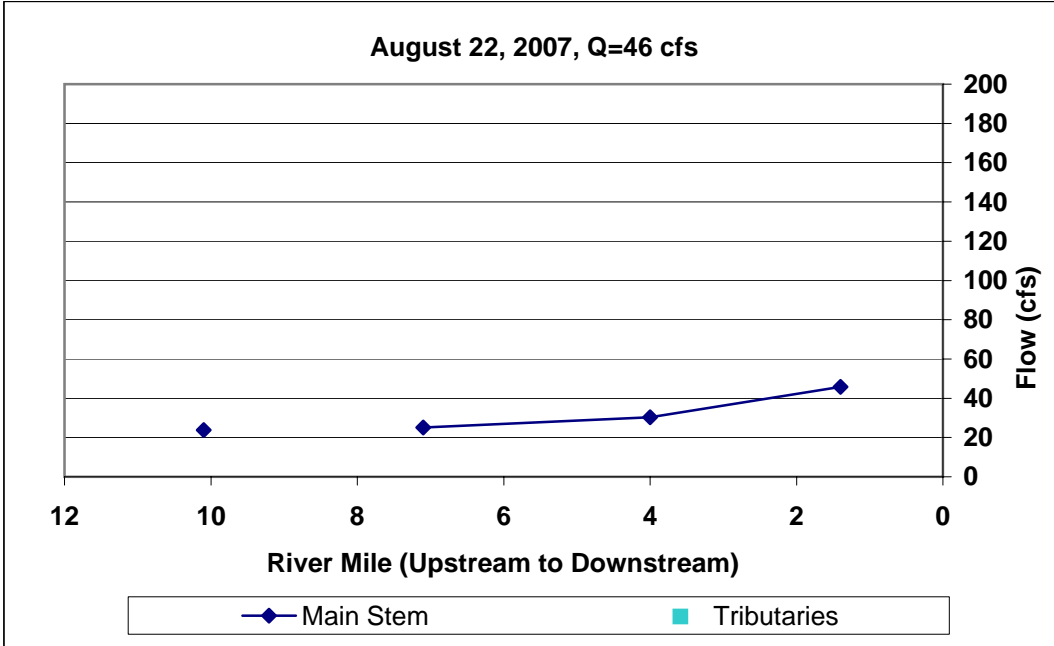
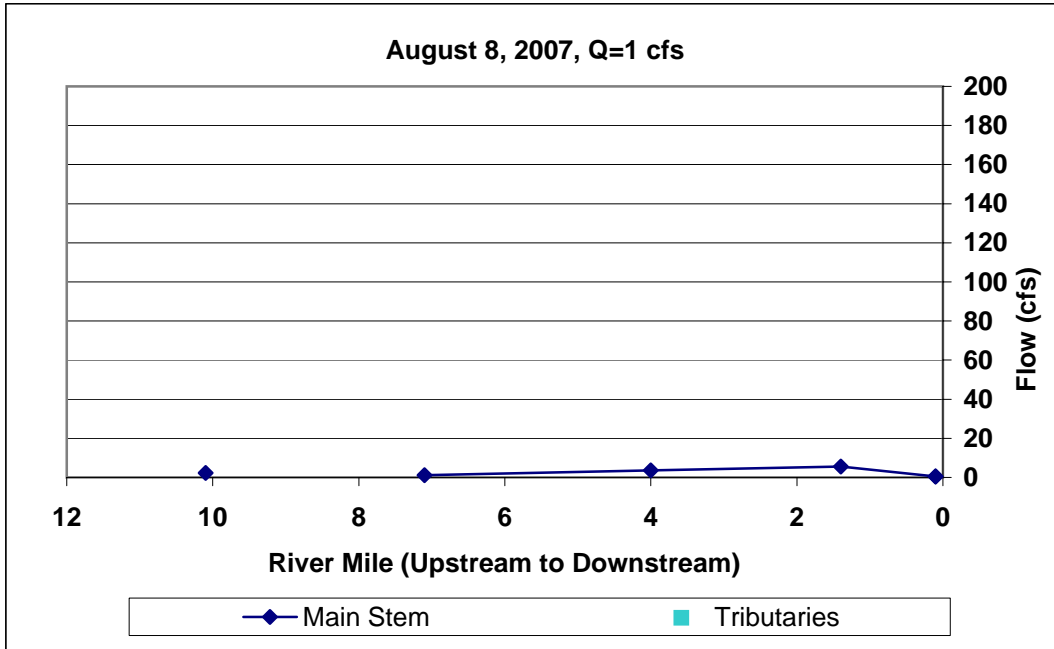
### Phase II Addendum TMDL Study 2007 Clearwater River In-stream Loading and Water Quality Profiles



# Appendix A

## Clearwater River Watershed District

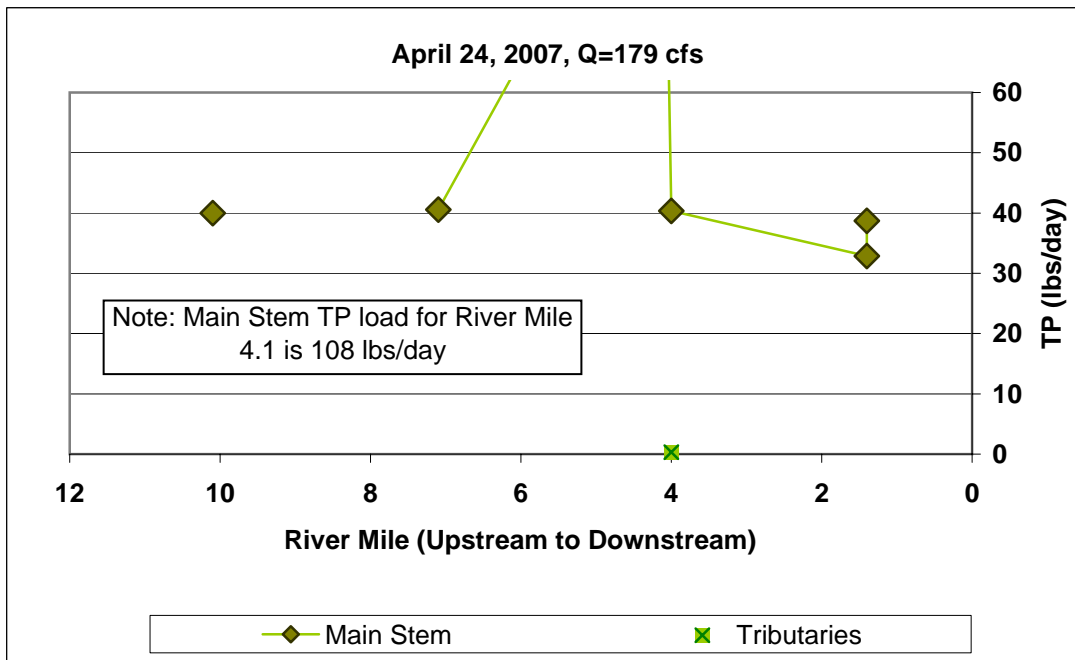
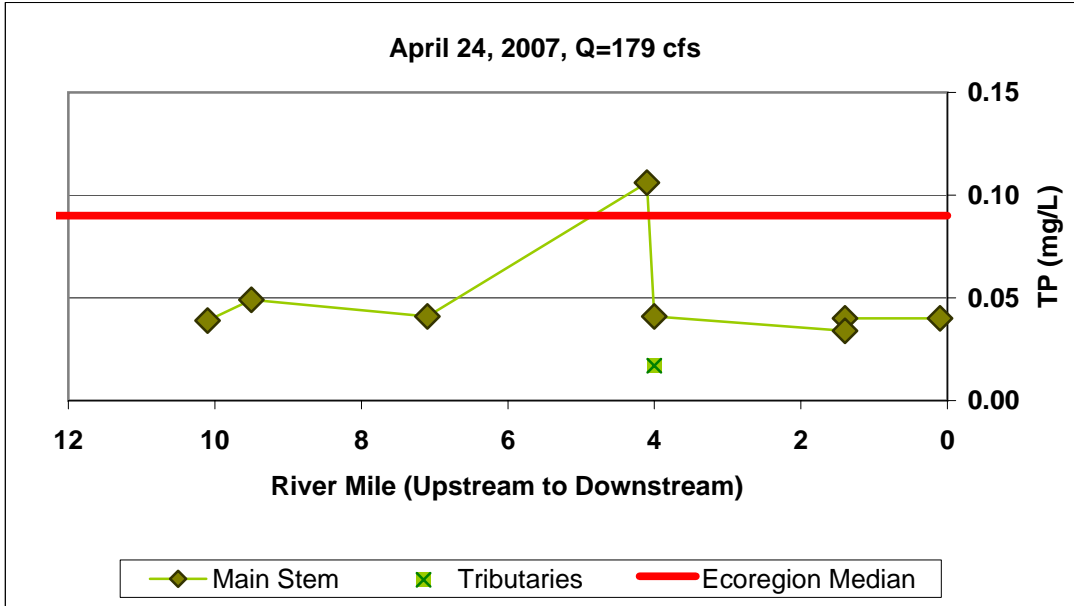
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# Appendix A

## Clearwater River Watershed District

### Phase II Addendum TMDL Study 2007 Clearwater River In-stream Loading and Water Quality Profiles

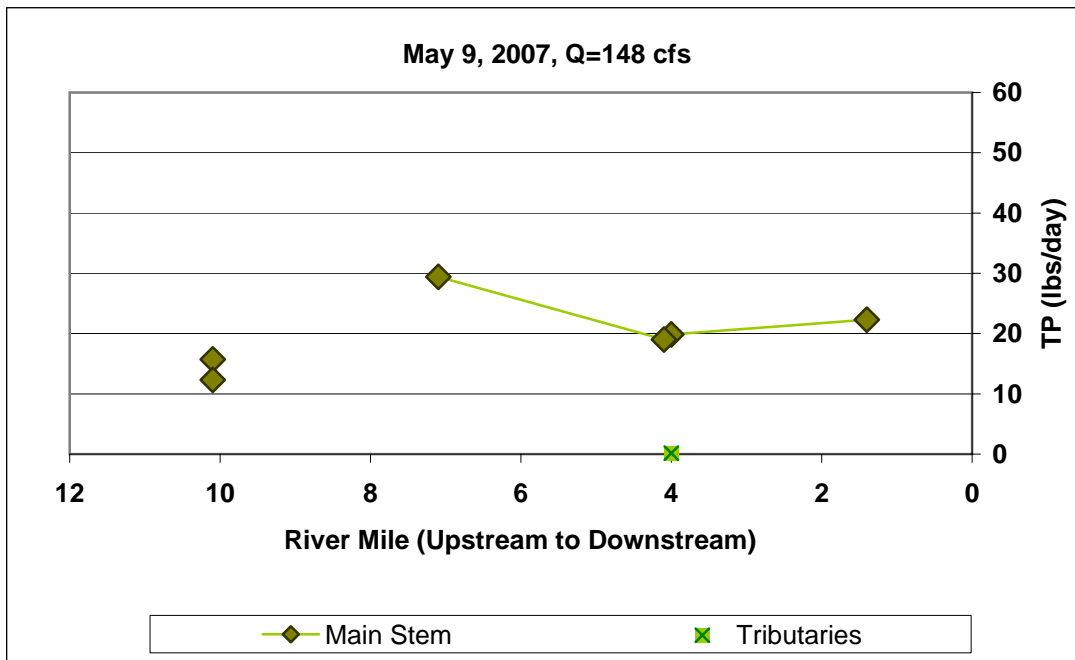
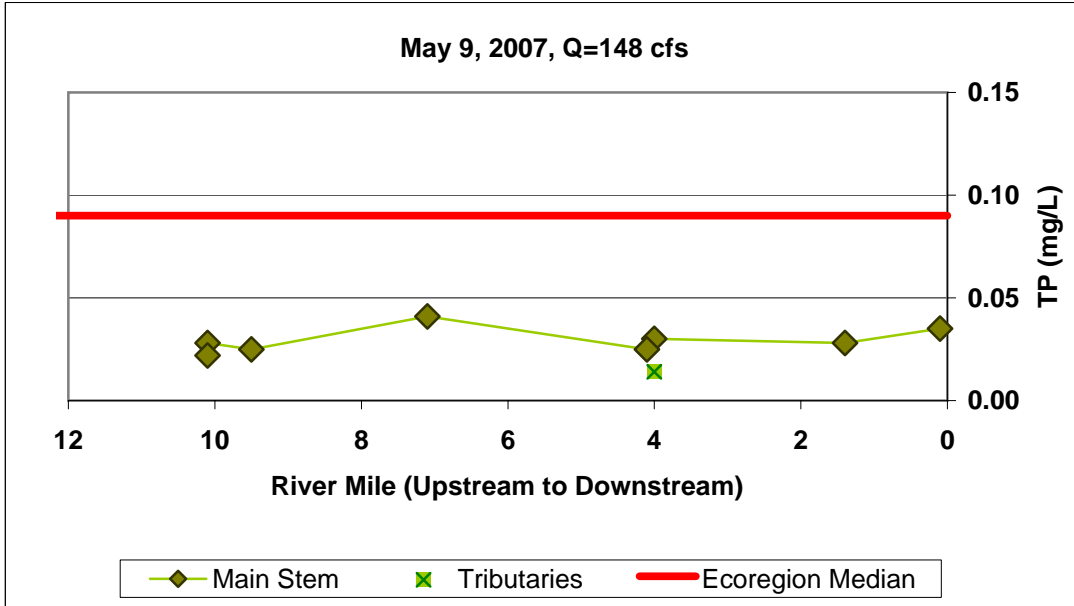




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## Clearwater River Watershed District

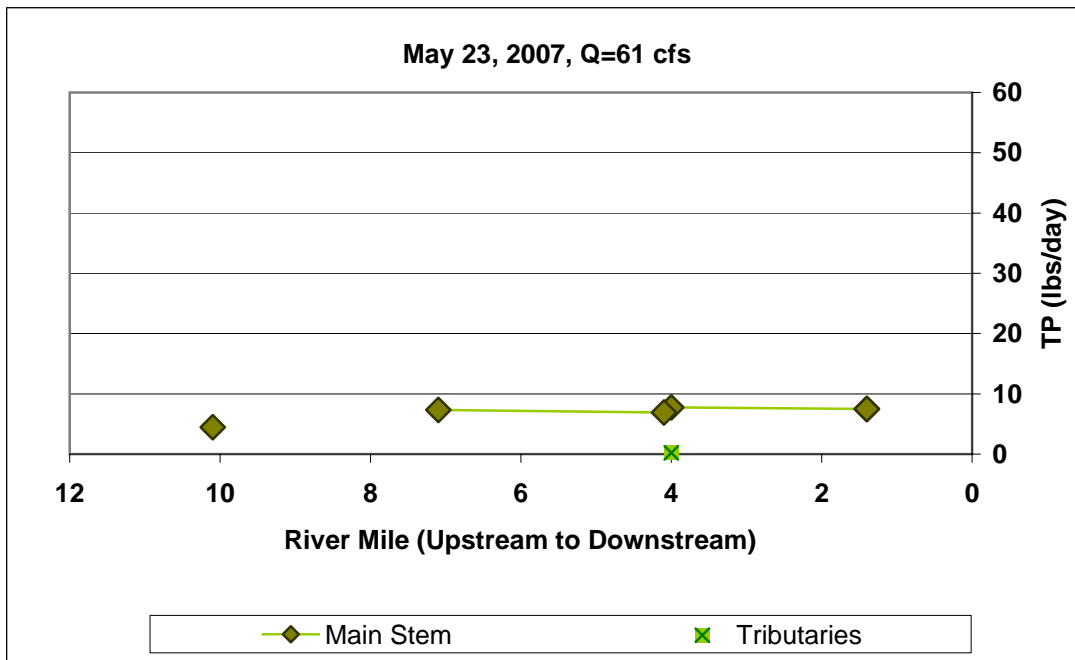
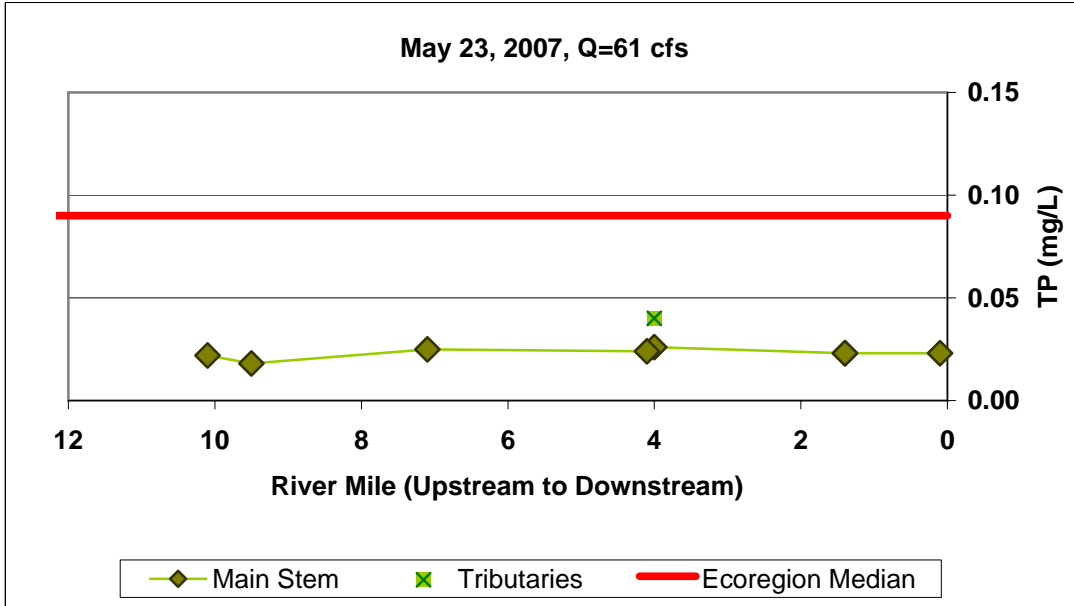
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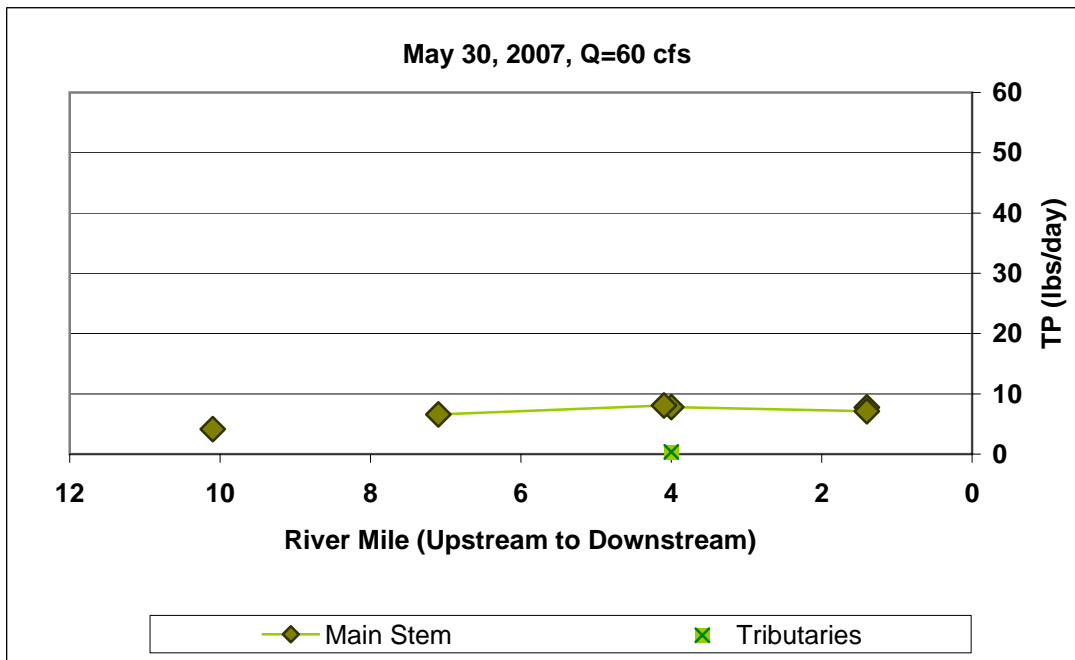
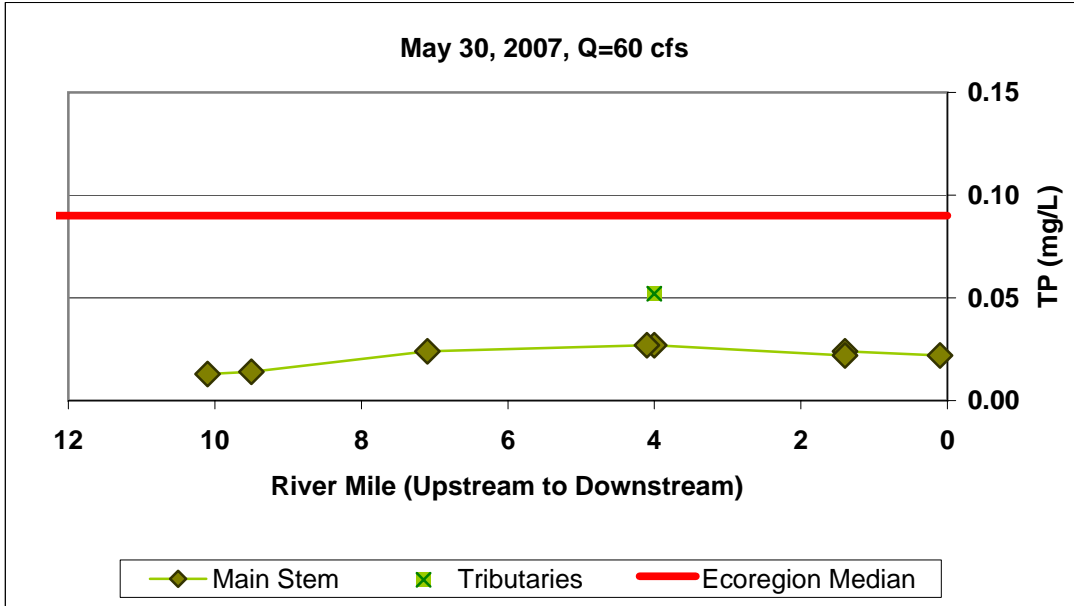
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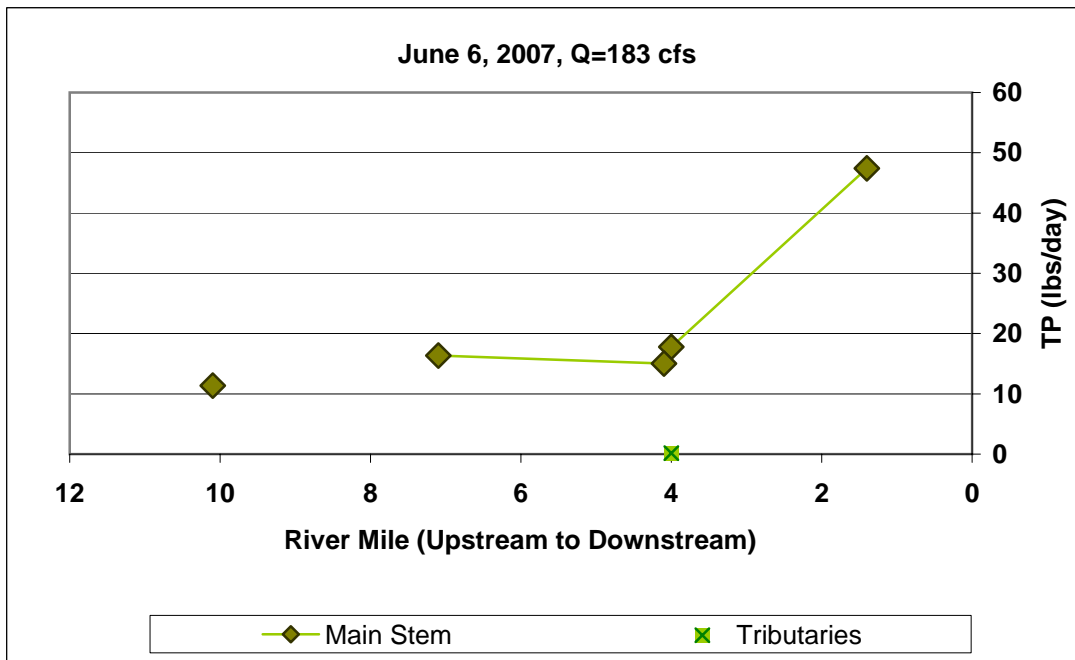
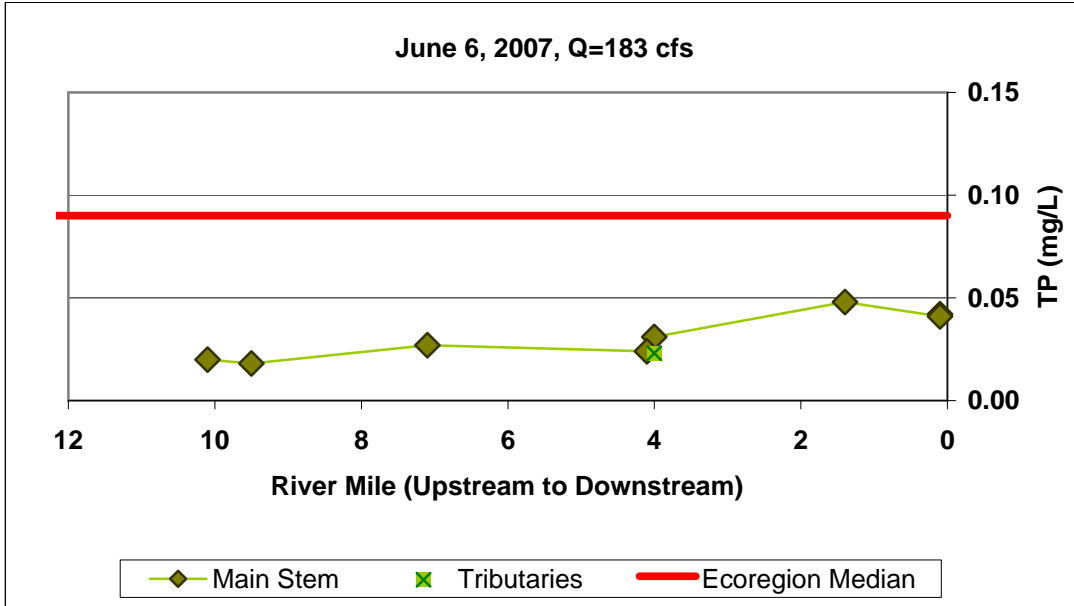
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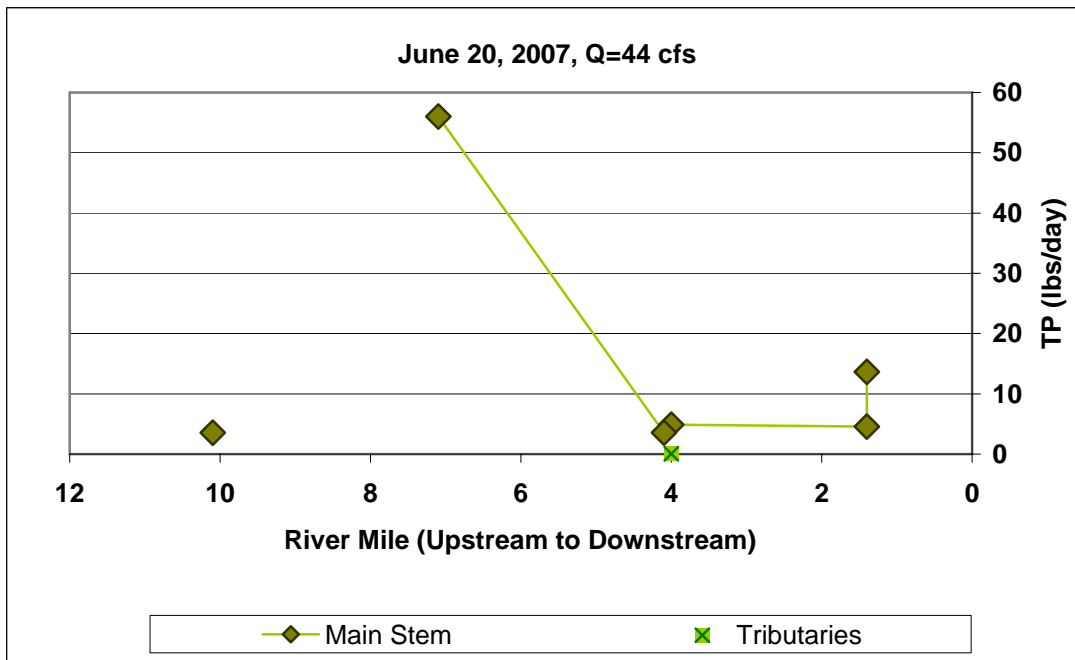
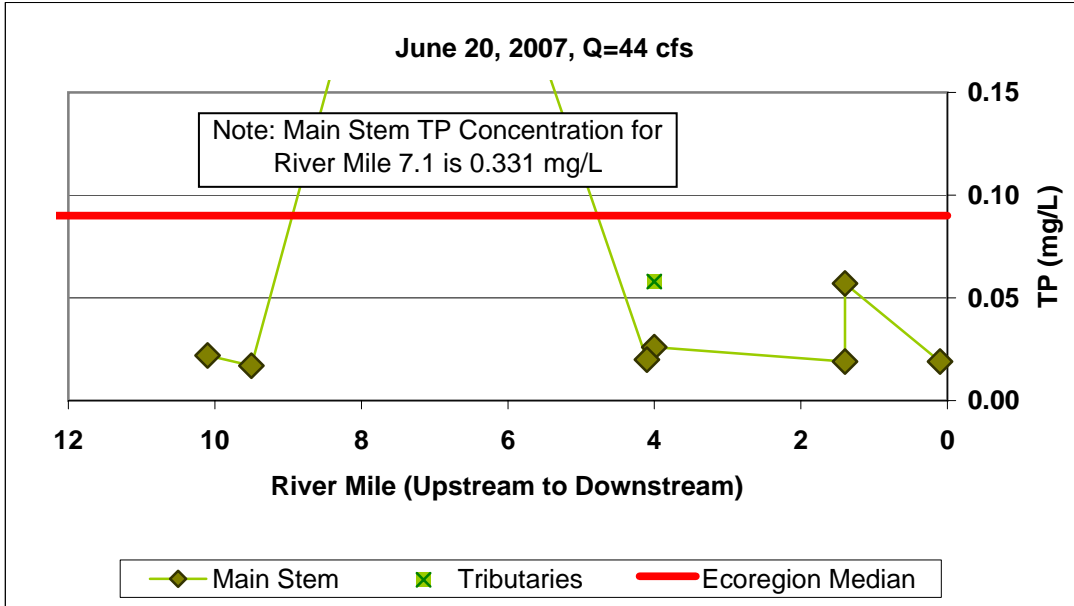
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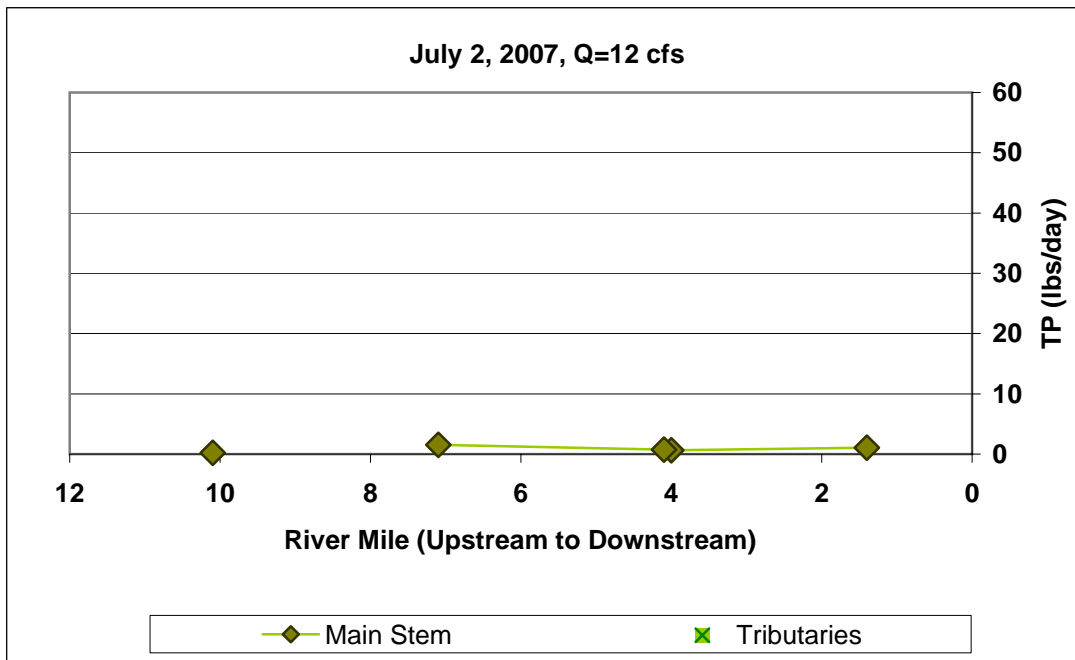
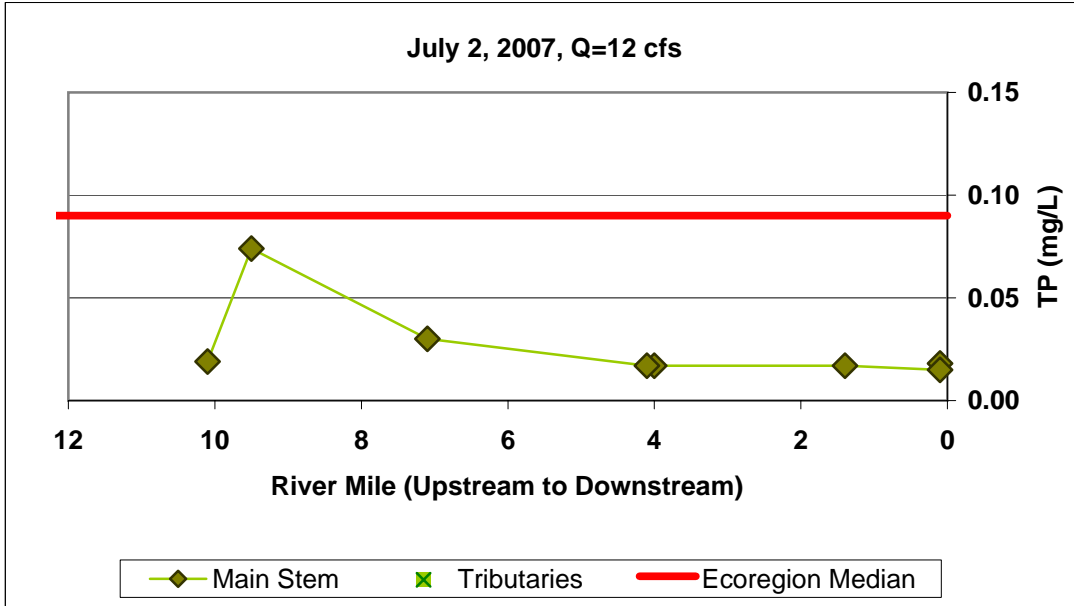
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## Clearwater River Watershed District

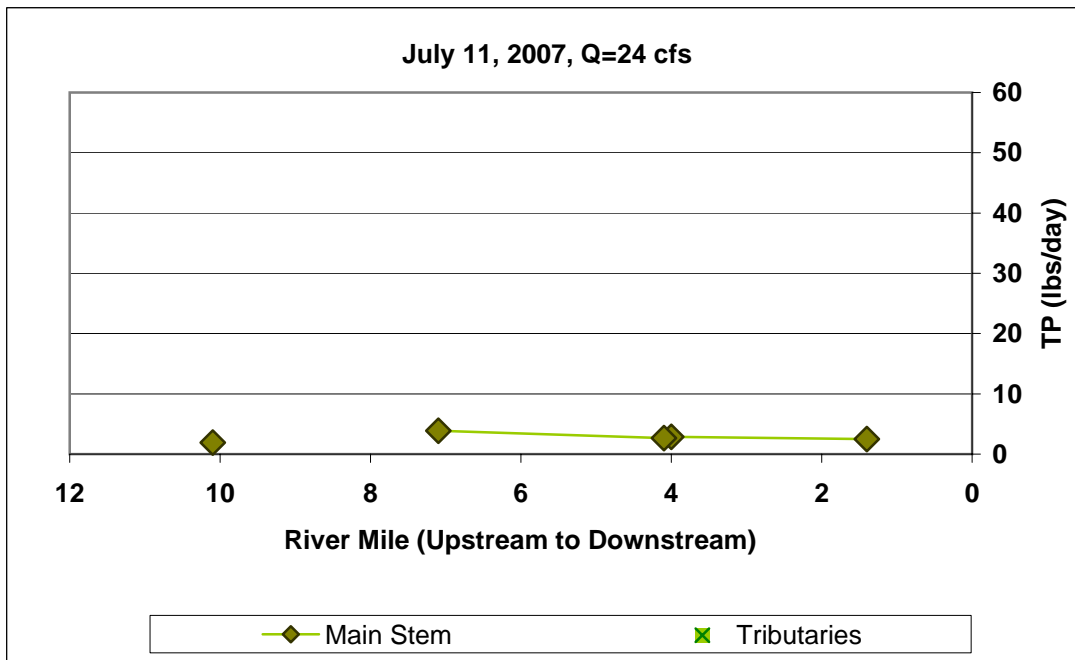
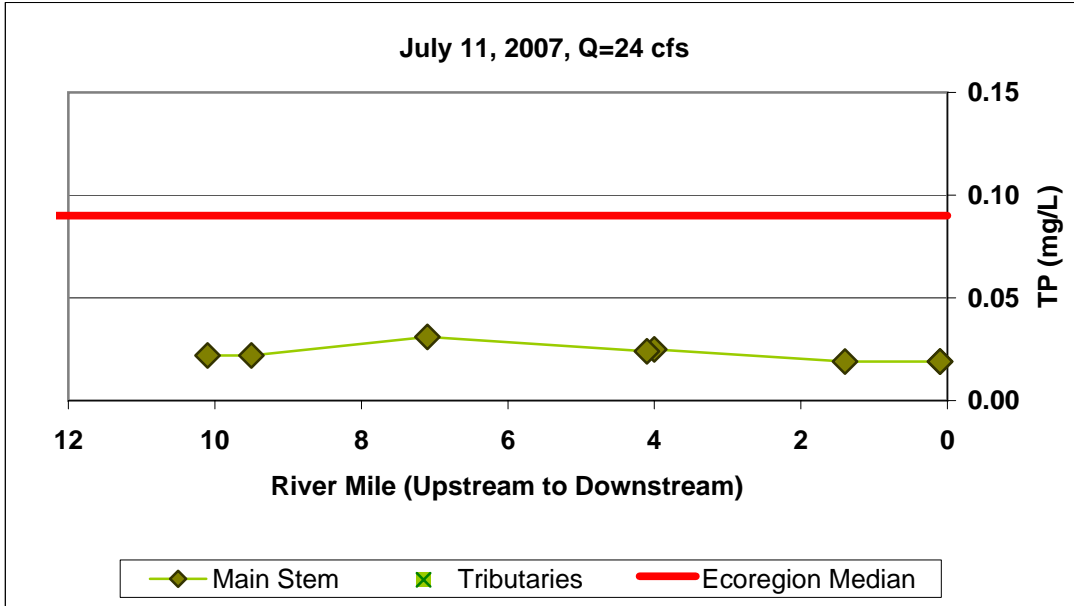
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## Clearwater River Watershed District

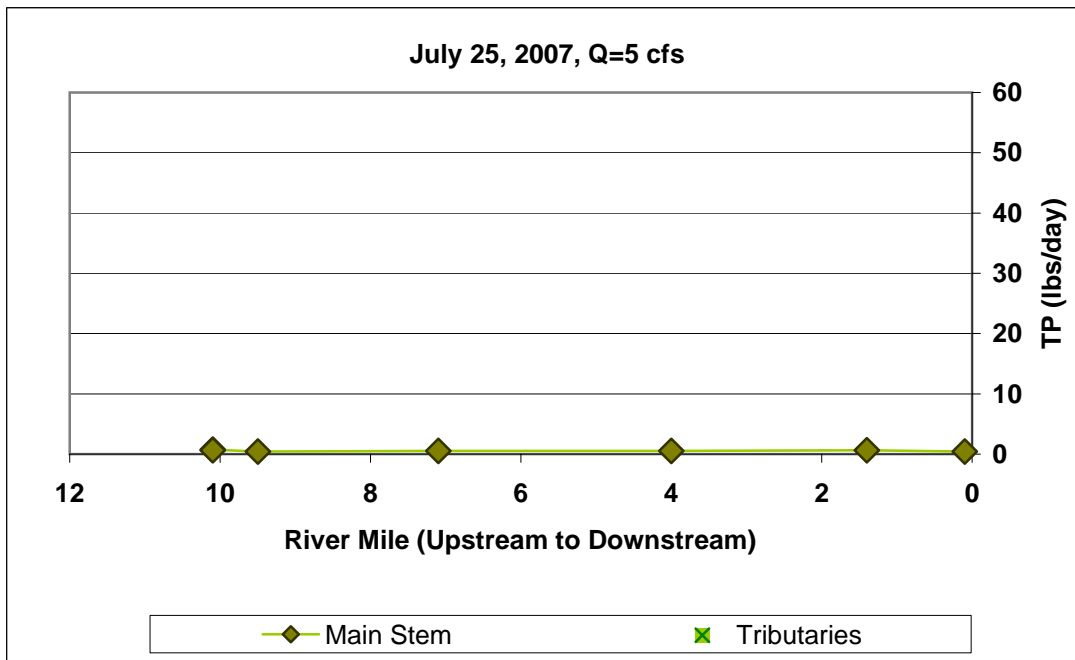
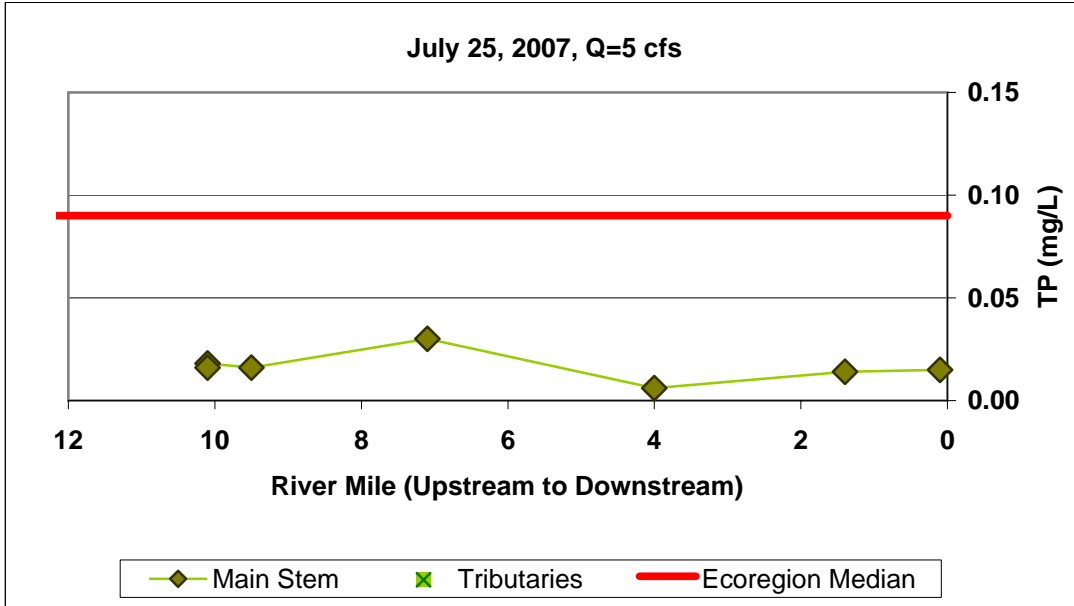
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# Appendix A

## Clearwater River Watershed District

### Phase II Addendum TMDL Study 2007 Clearwater River In-stream Loading and Water Quality Profiles

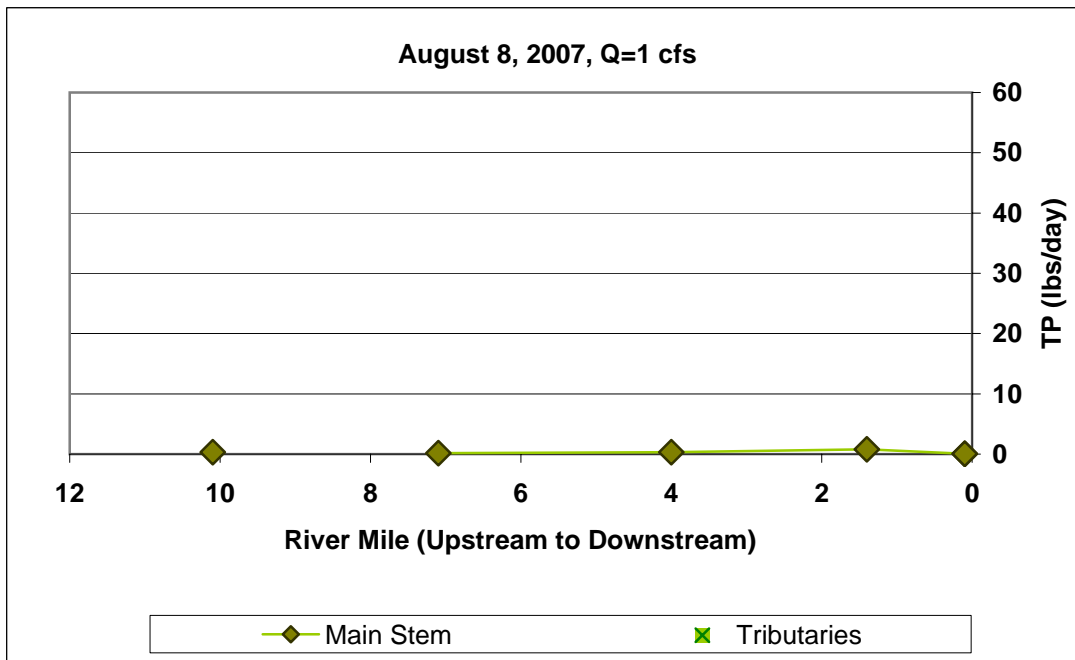
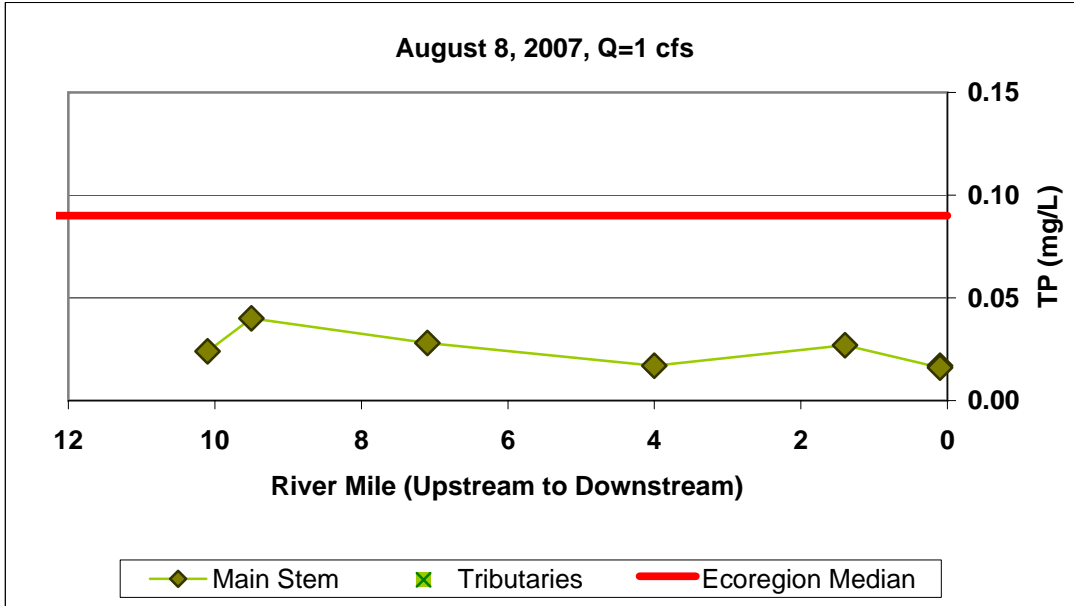




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## Clearwater River Watershed District

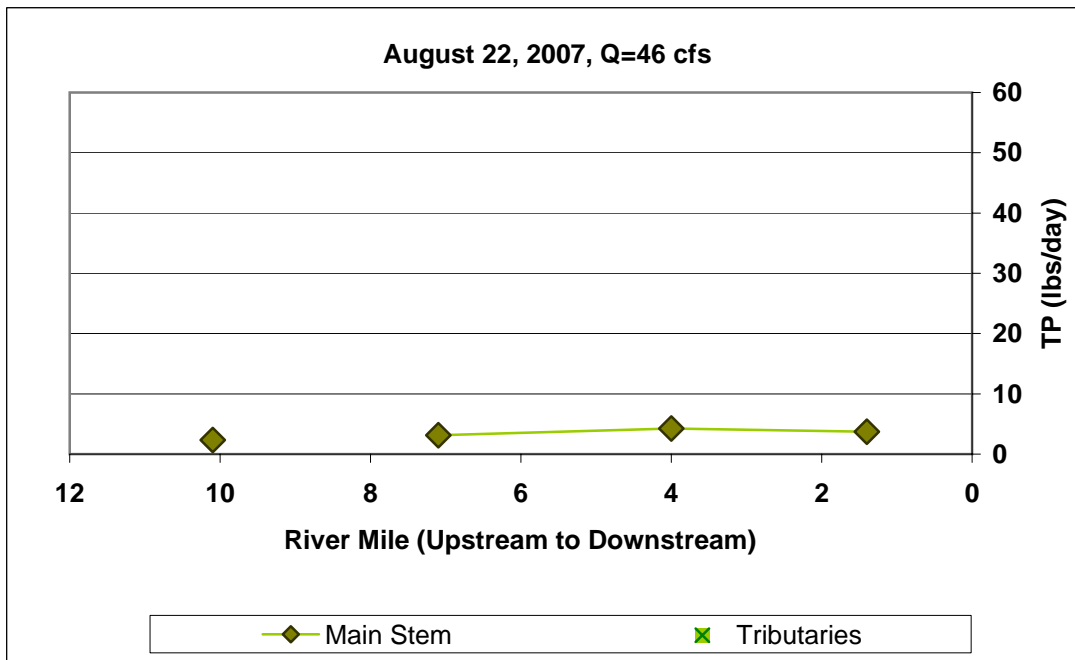
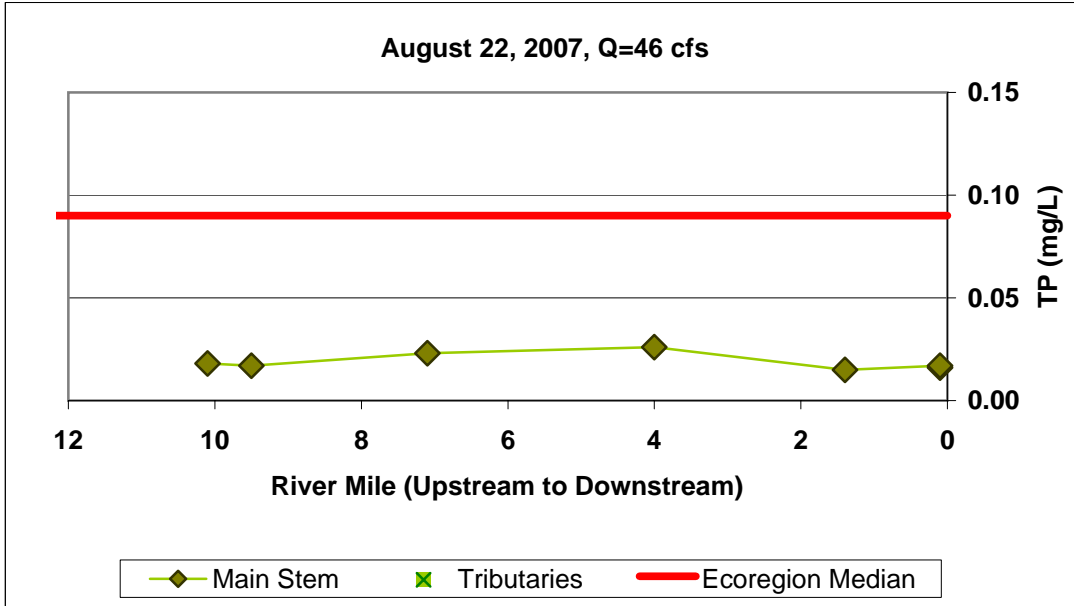
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## Clearwater River Watershed District

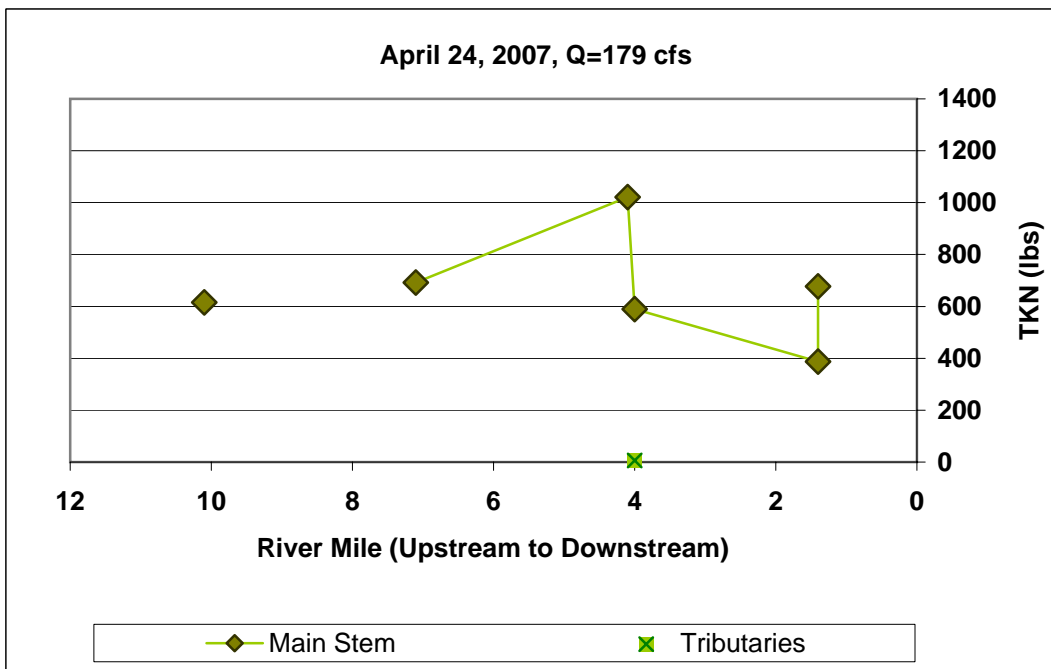
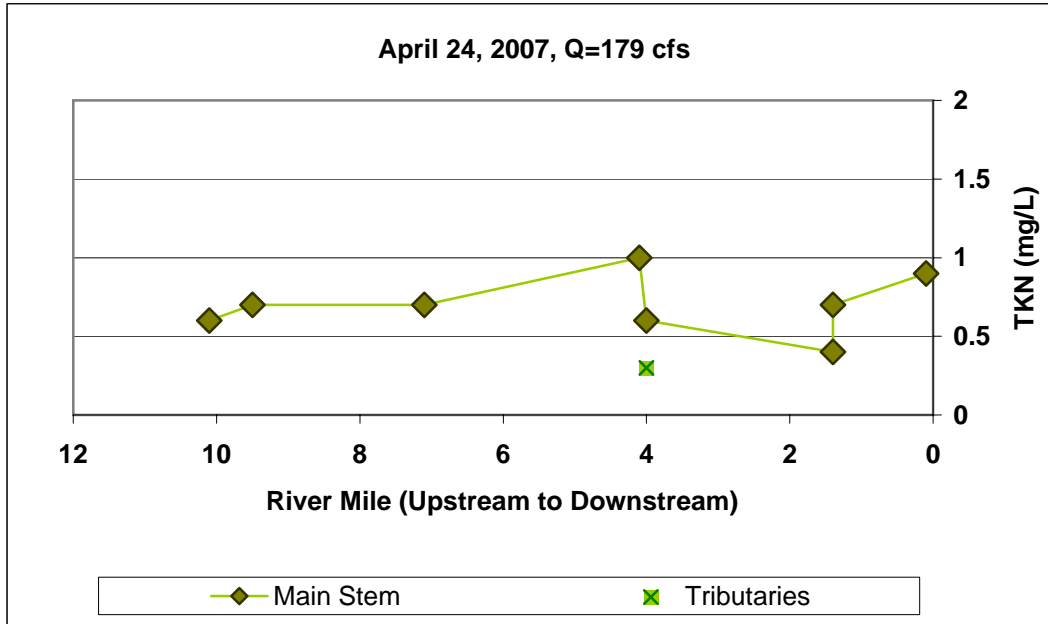
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# Appendix A

## Clearwater River Watershed District

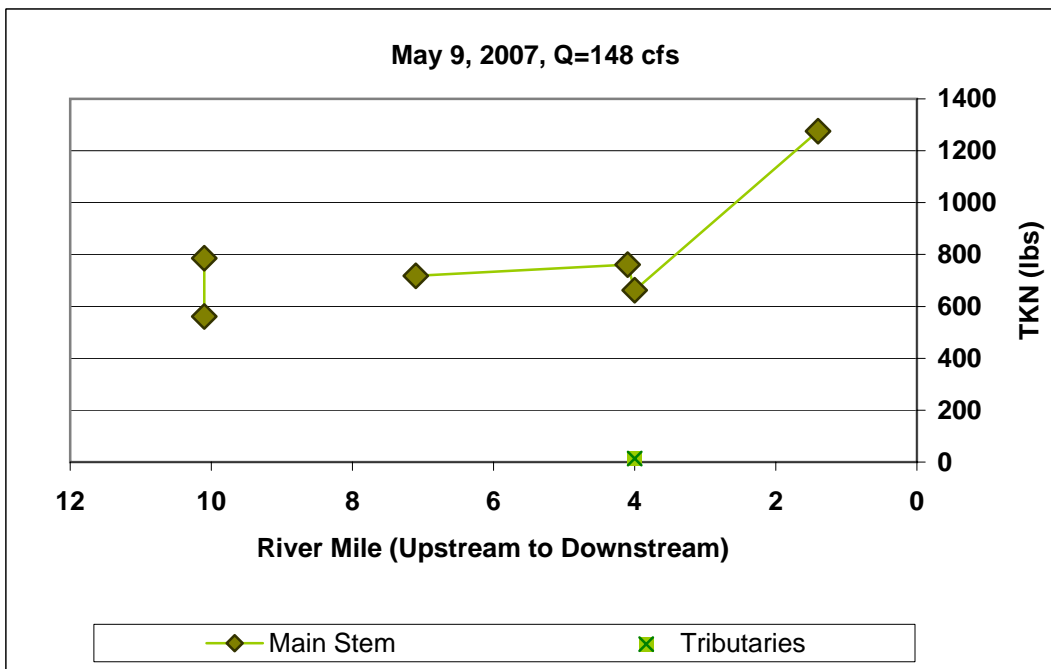
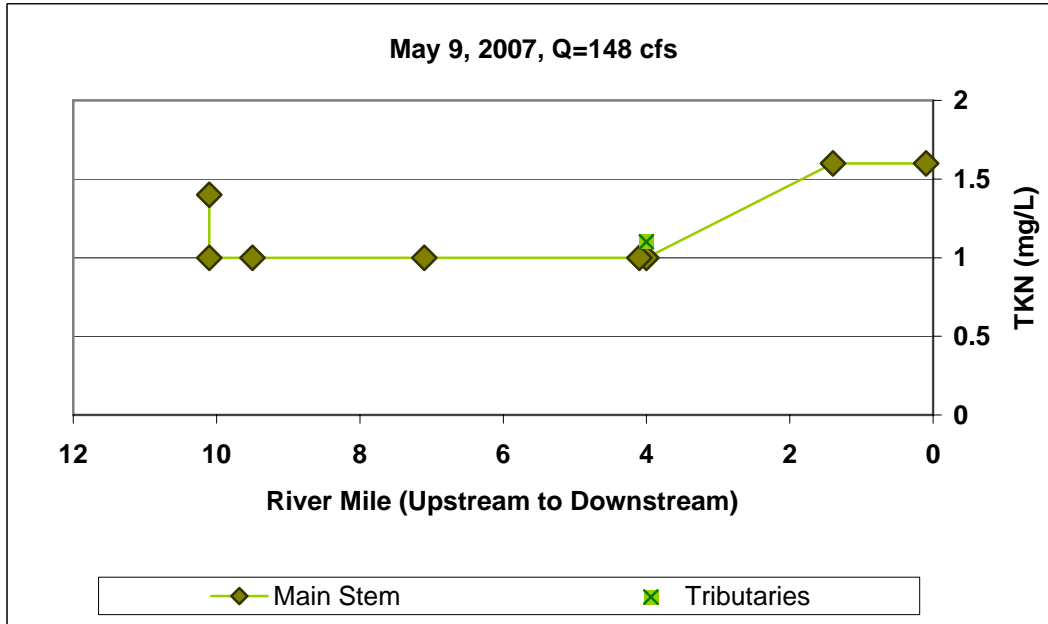
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## Clearwater River Watershed District

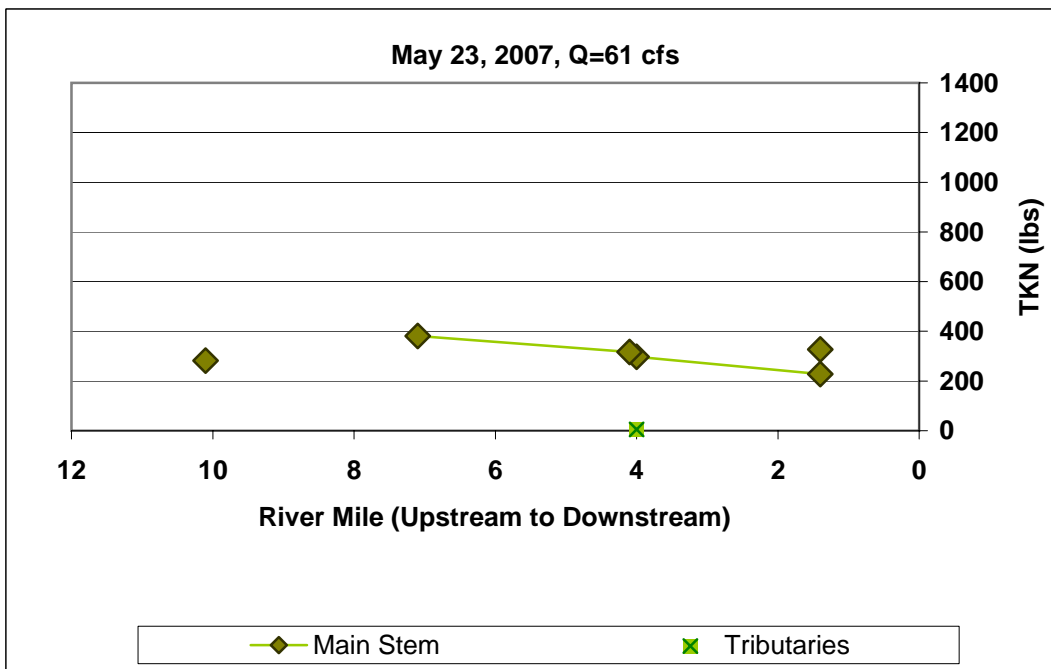
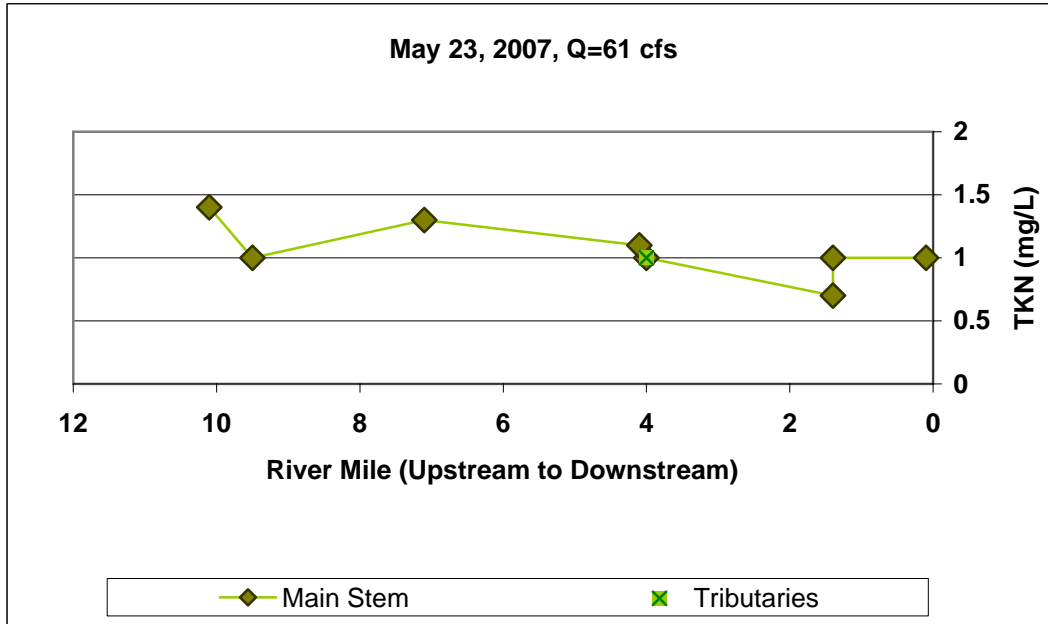
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## Clearwater River Watershed District

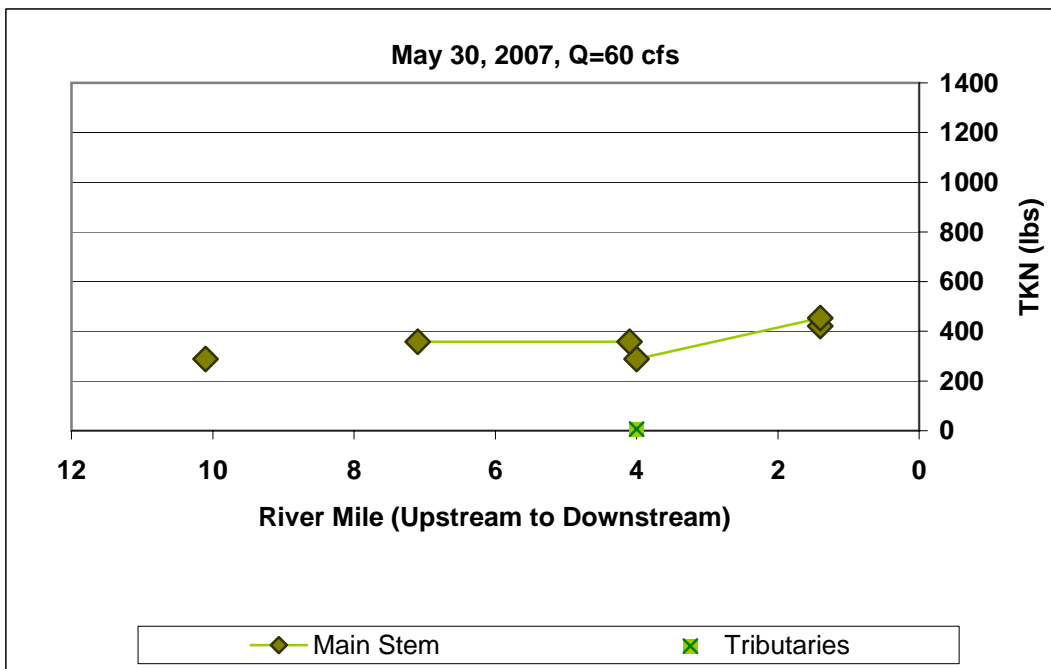
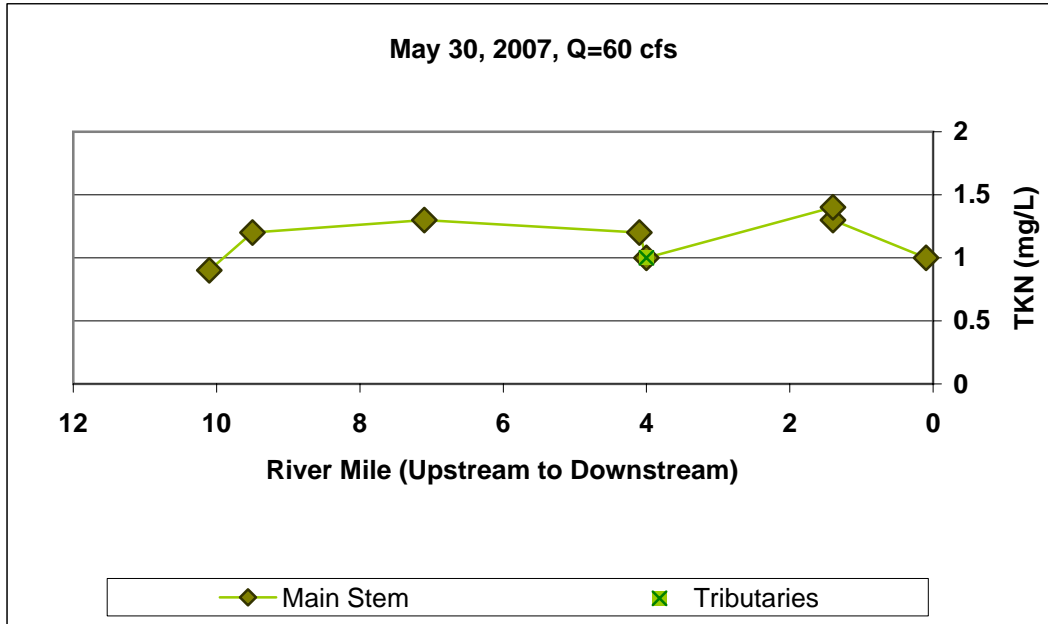
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## Clearwater River Watershed District

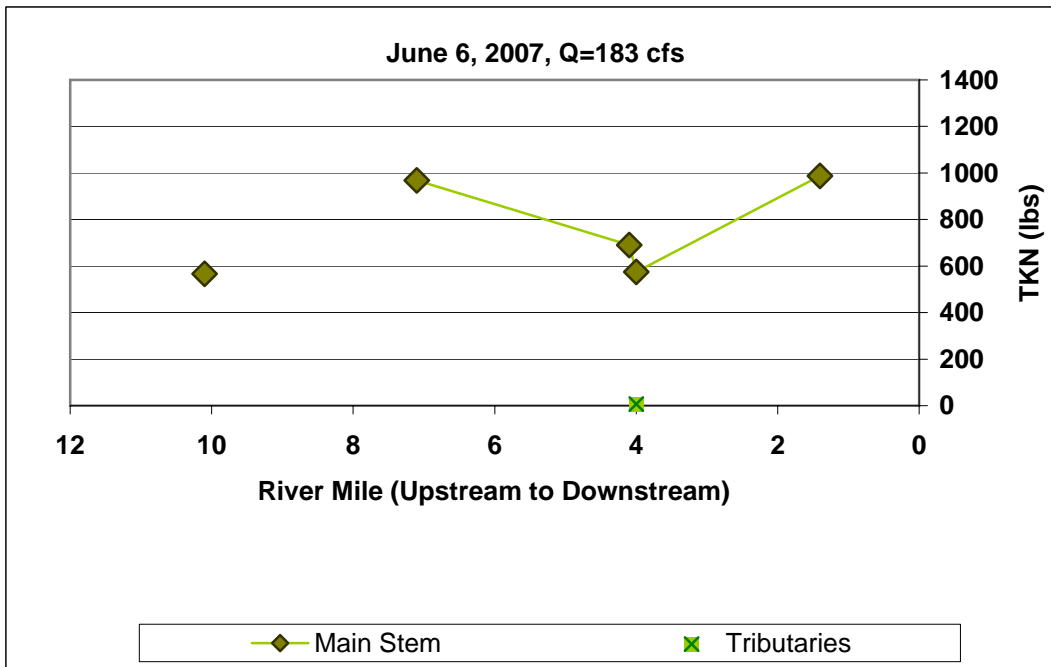
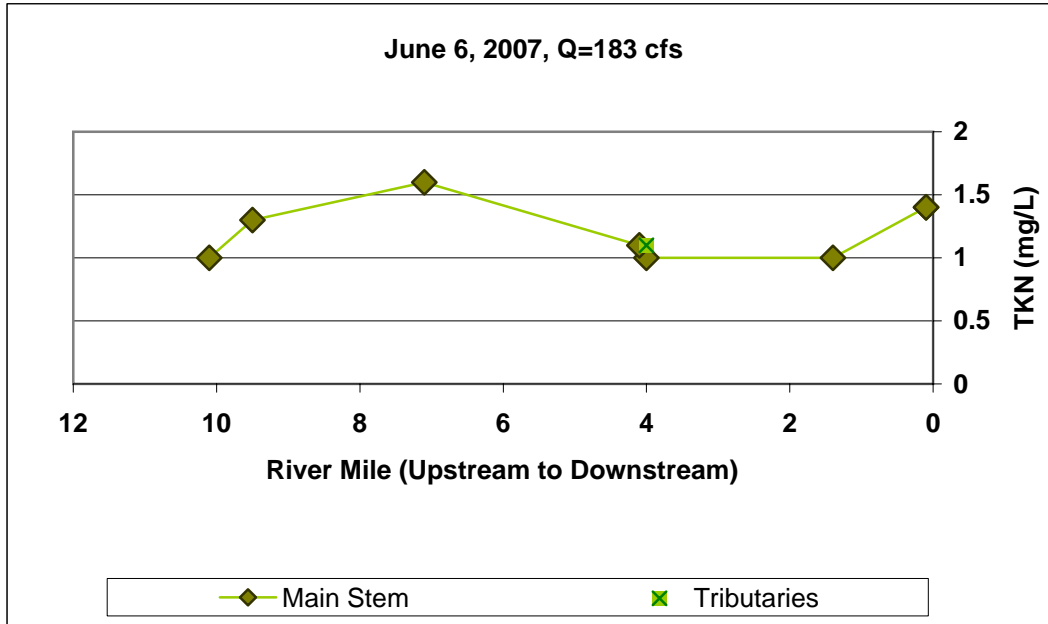
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## Clearwater River Watershed District

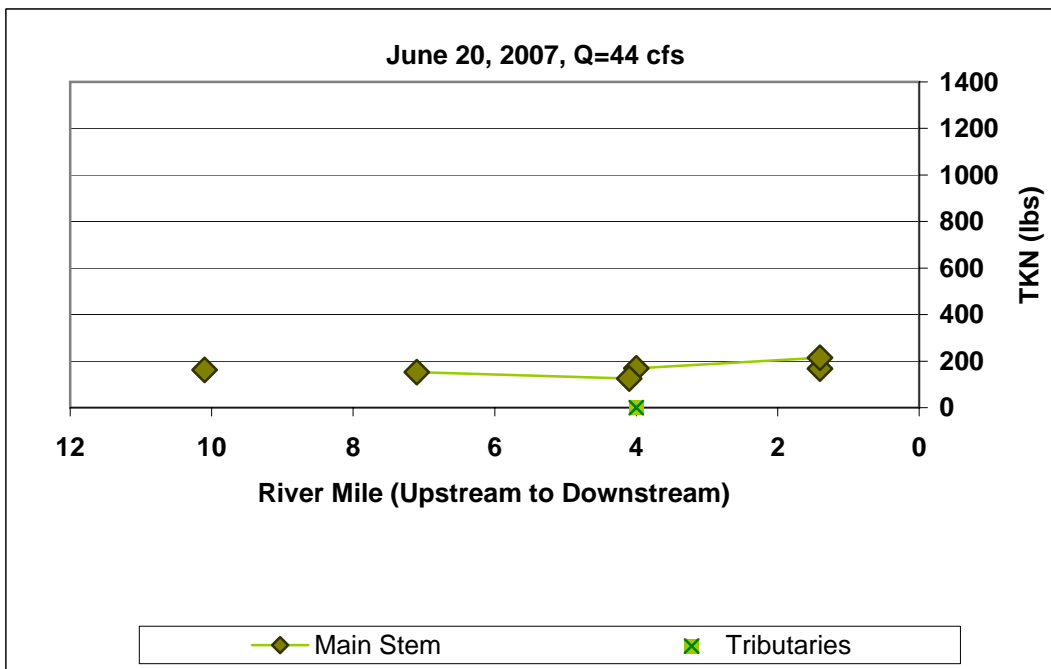
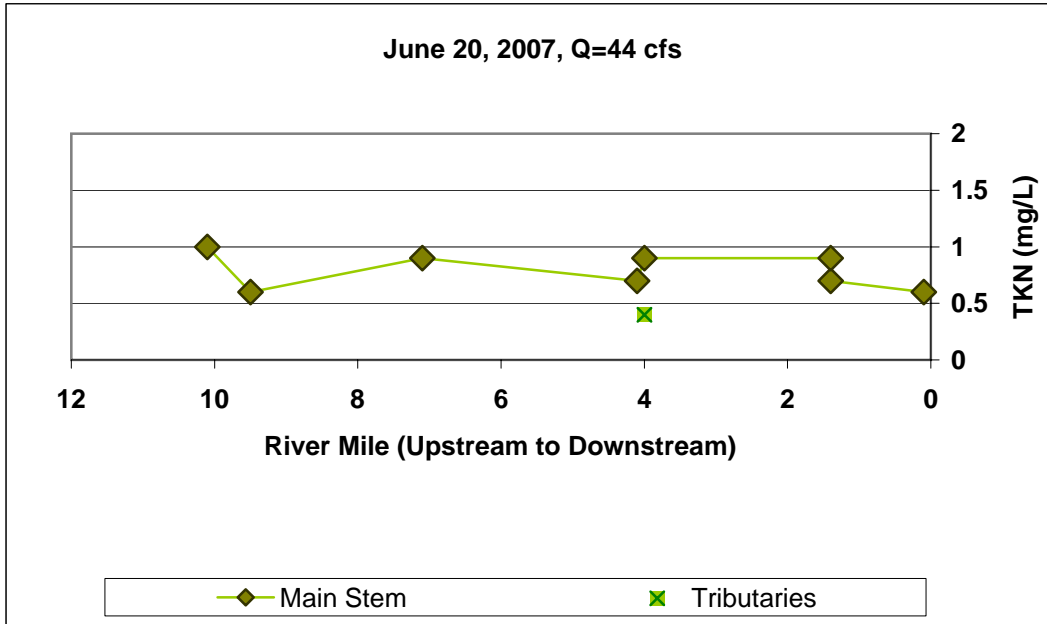
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## Clearwater River Watershed District

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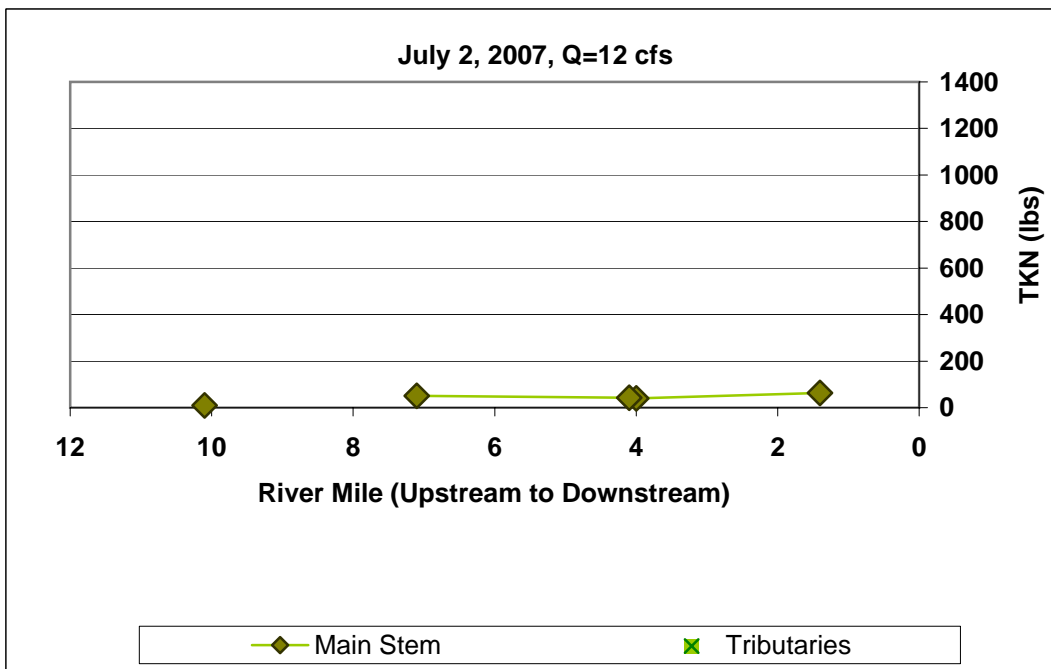
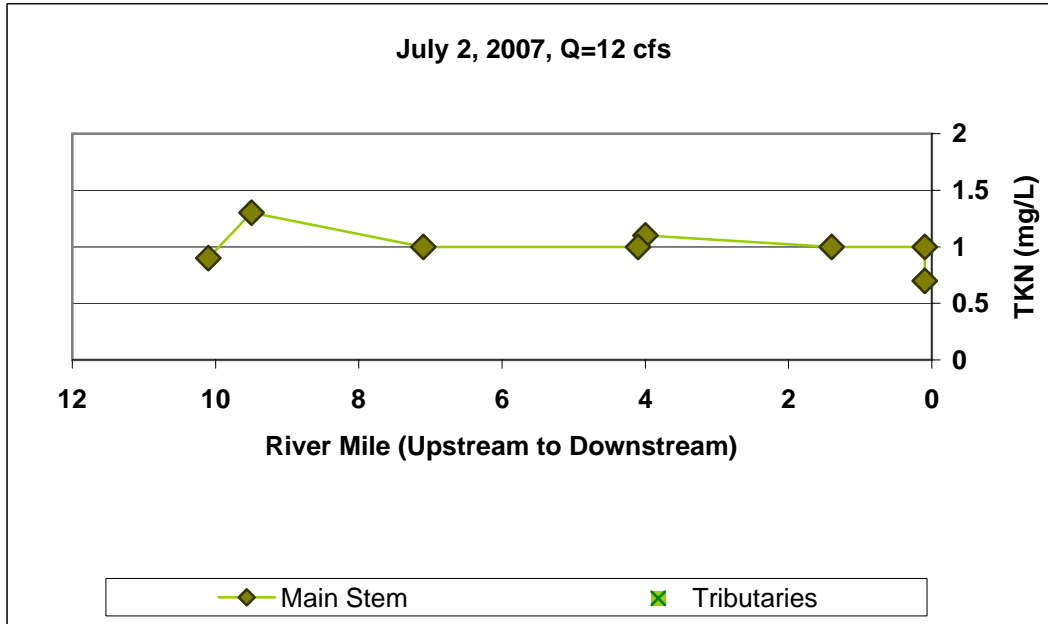




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## Clearwater River Watershed District

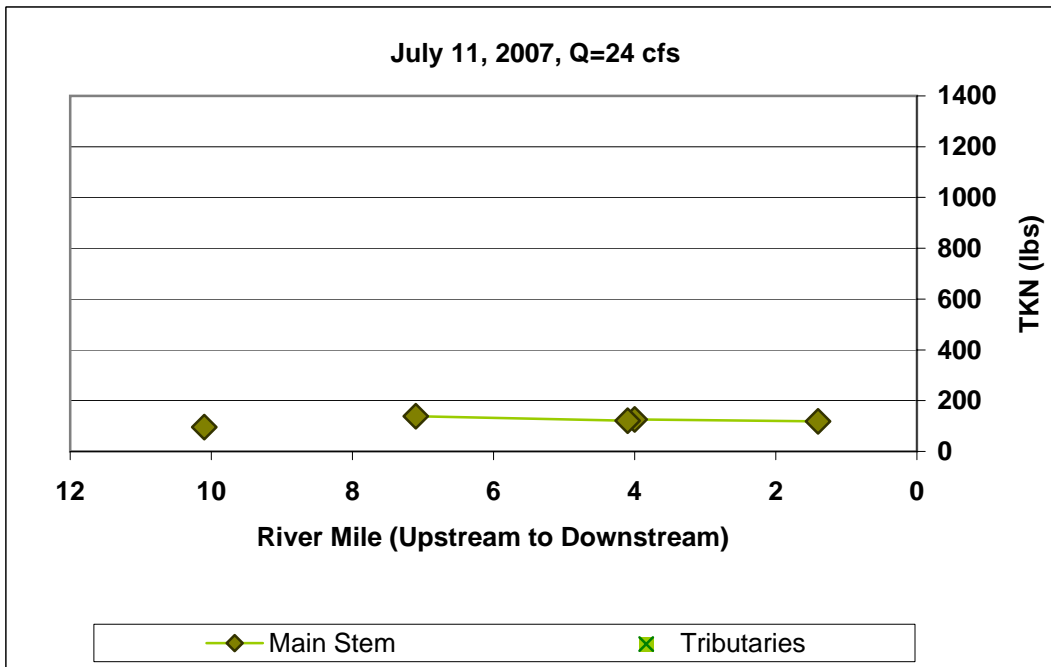
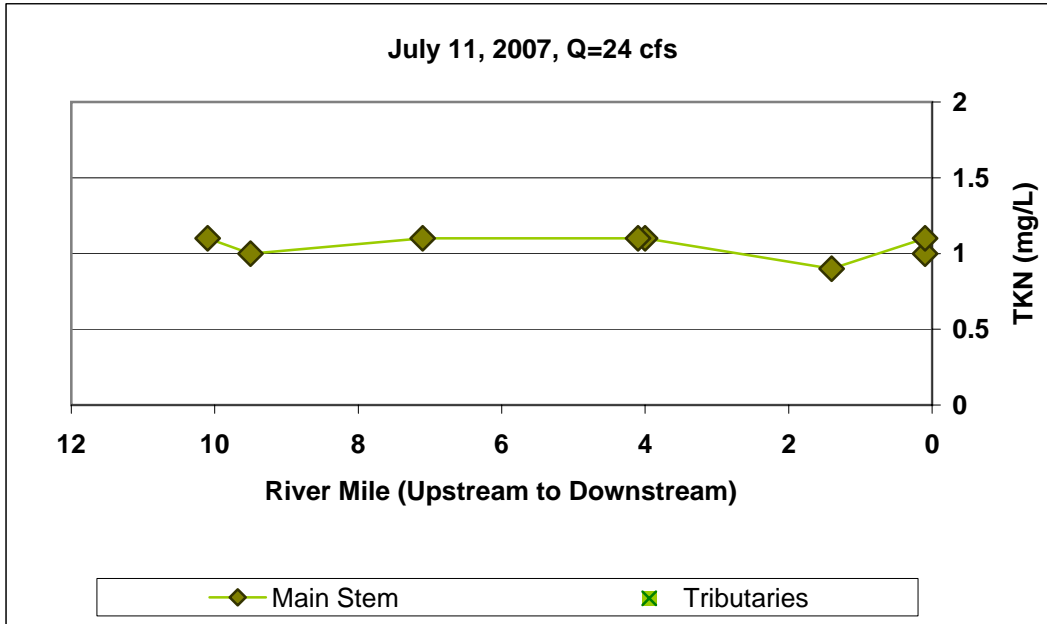
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## Clearwater River Watershed District

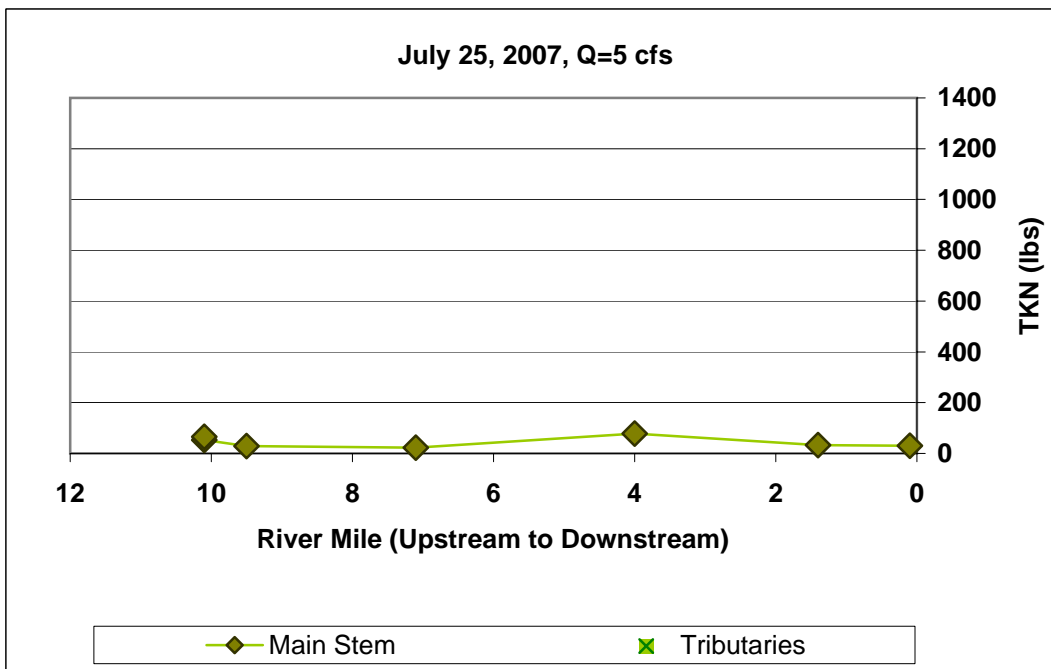
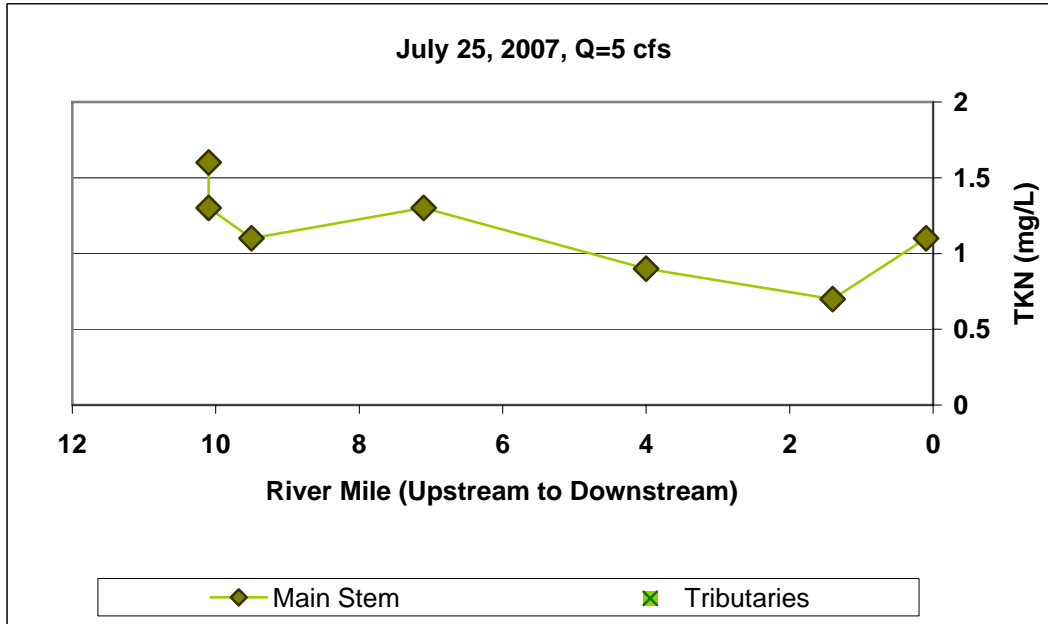
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## Clearwater River Watershed District

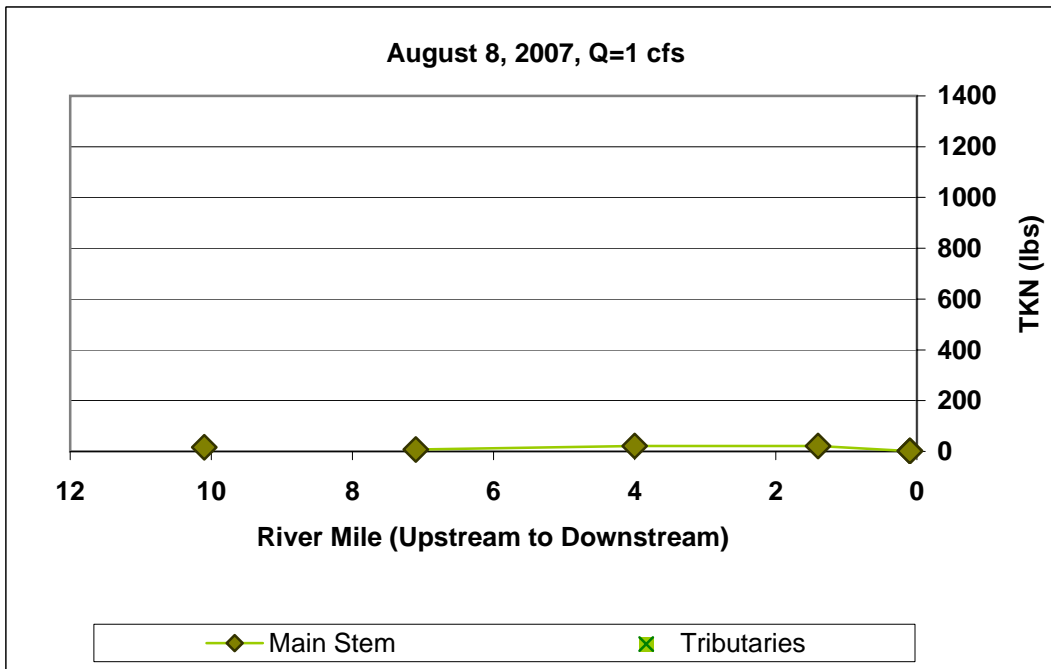
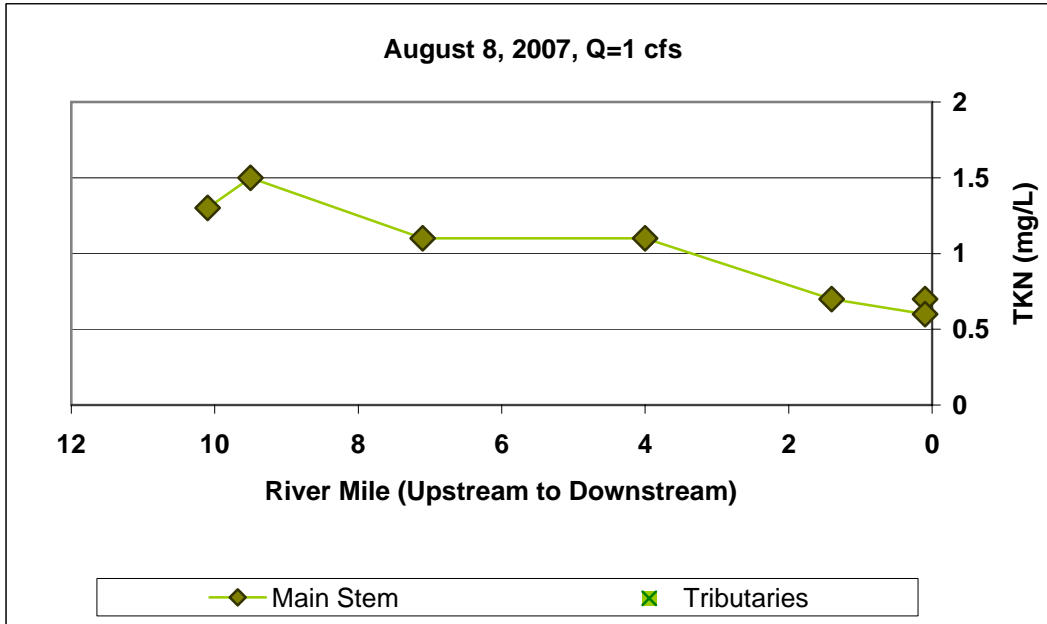
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## Clearwater River Watershed District

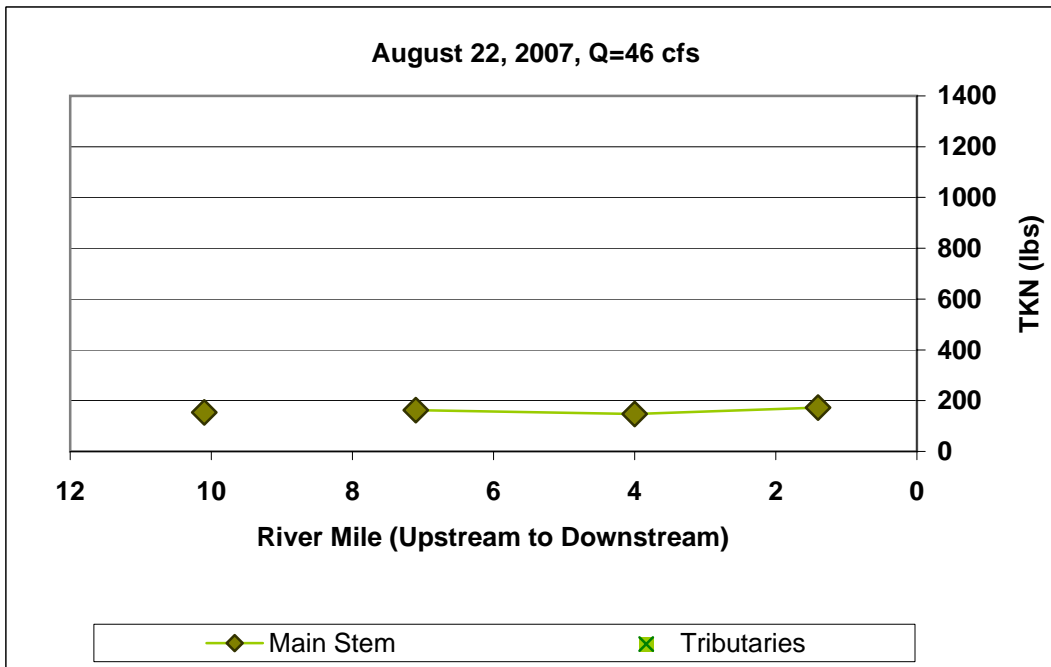
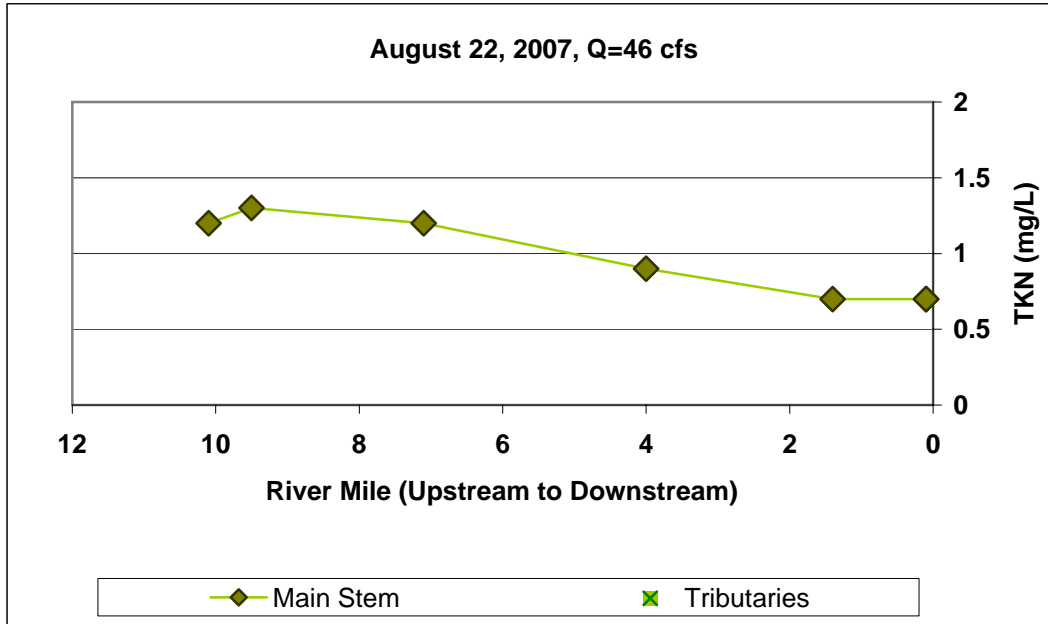
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## Clearwater River Watershed District

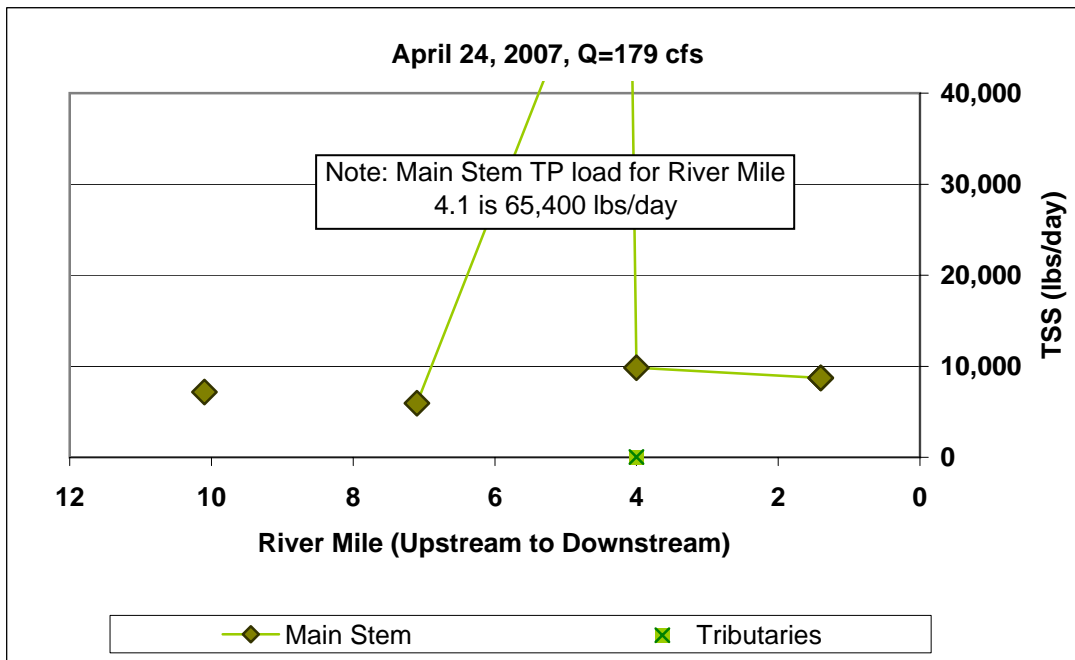
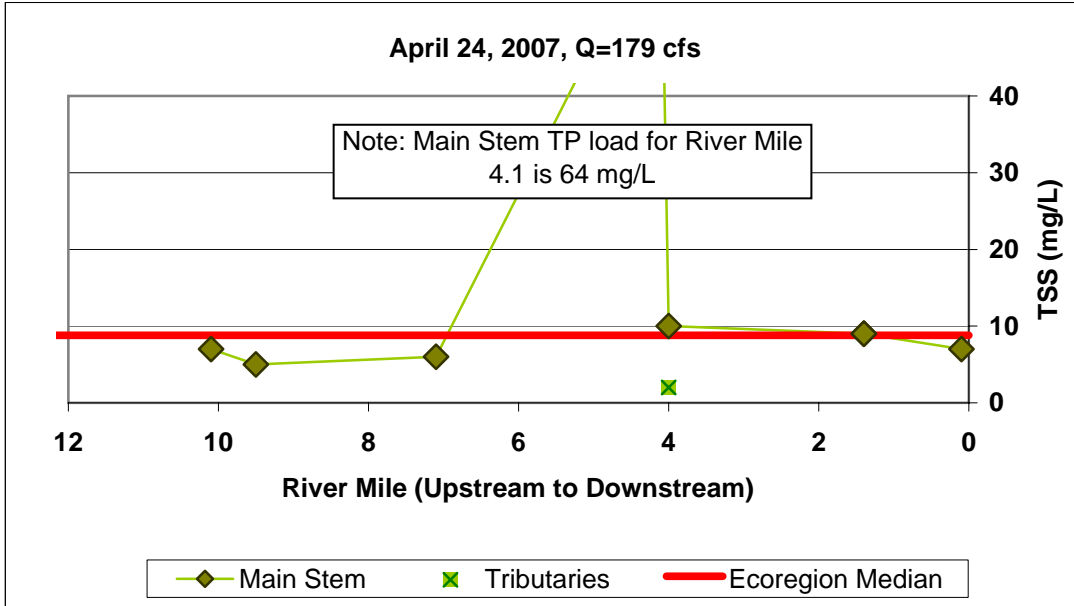
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# Appendix A

## Clearwater River Watershed District

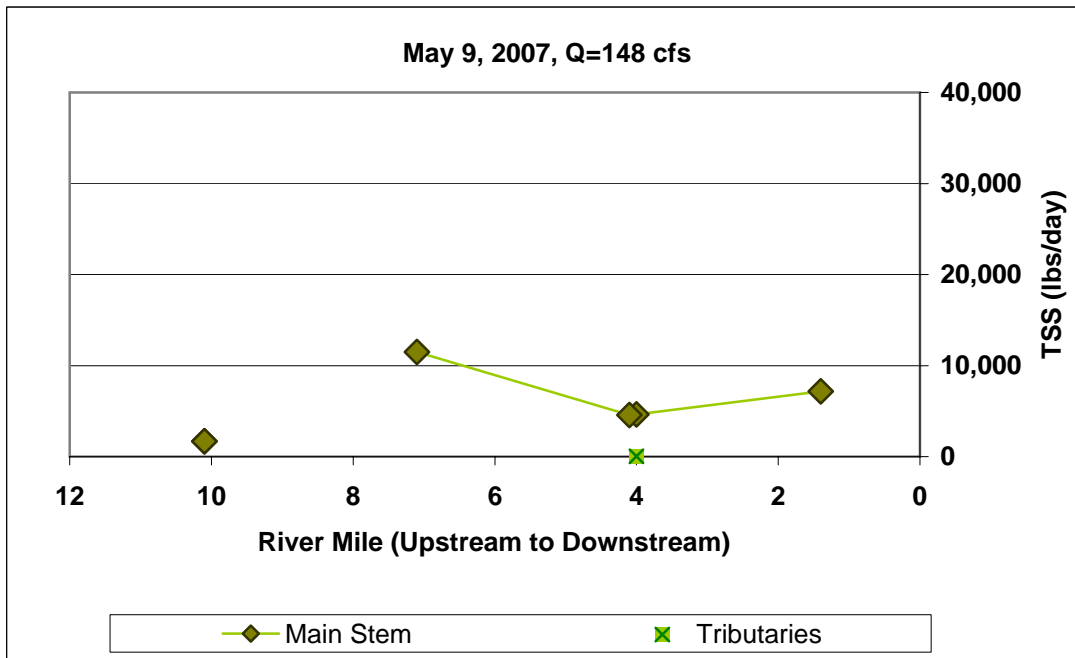
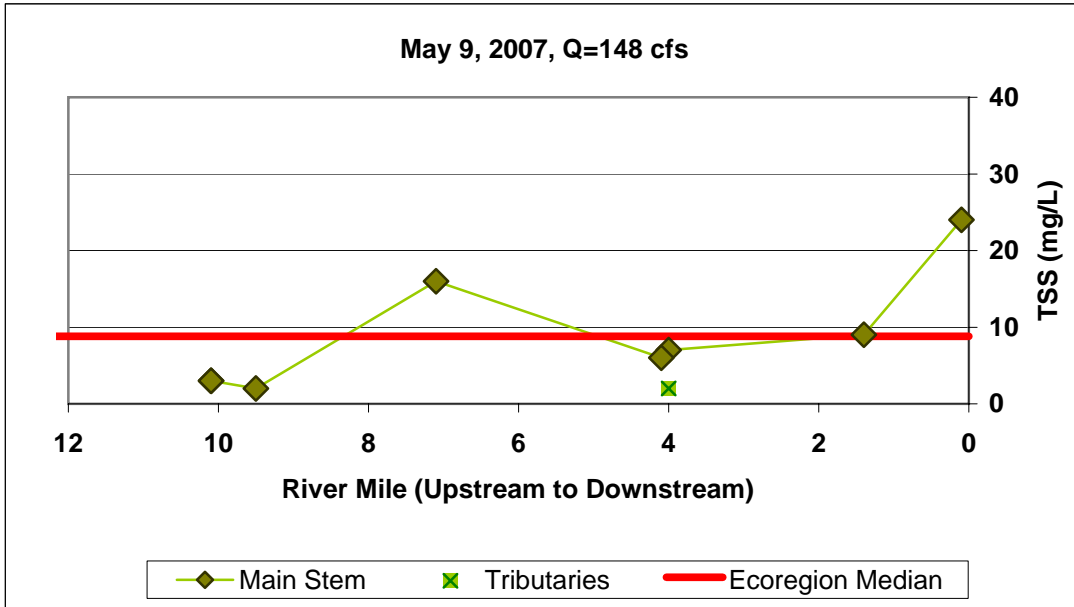
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## Clearwater River Watershed District

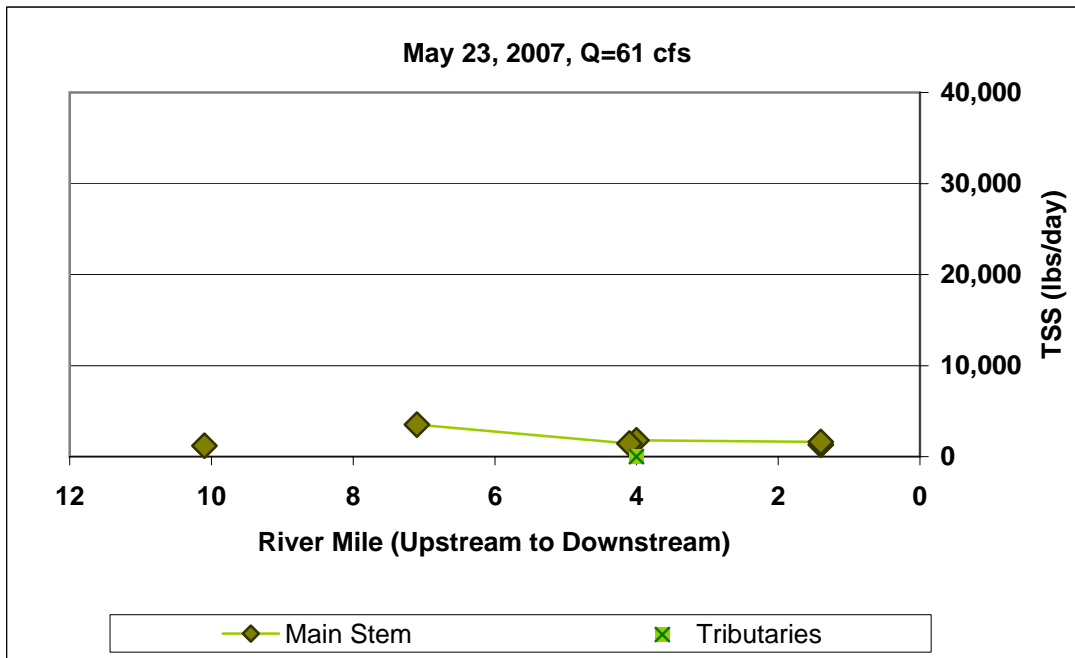
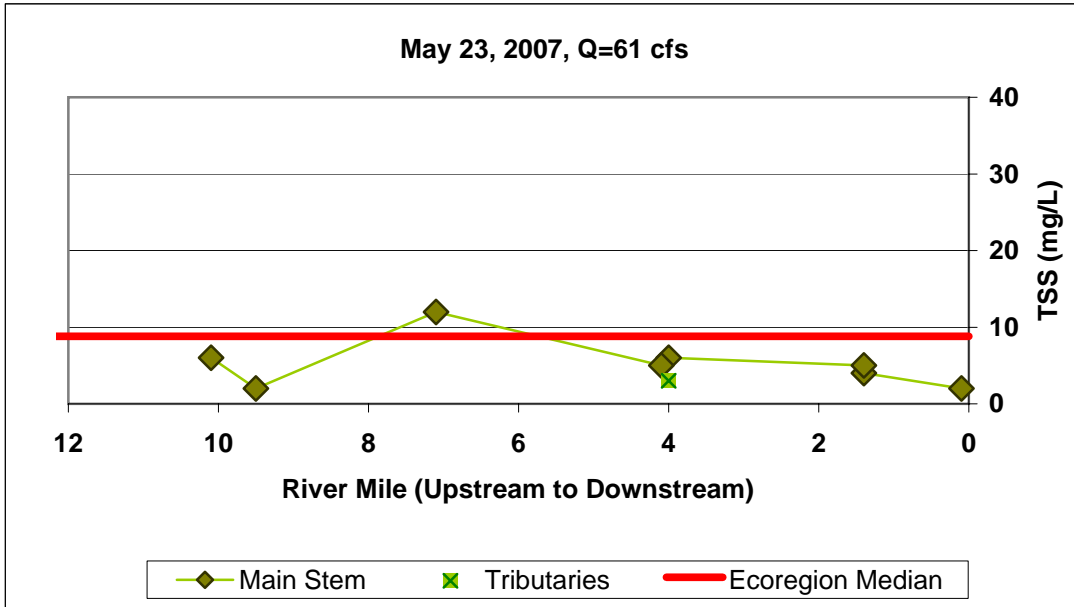
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# Appendix A

## Clearwater River Watershed District

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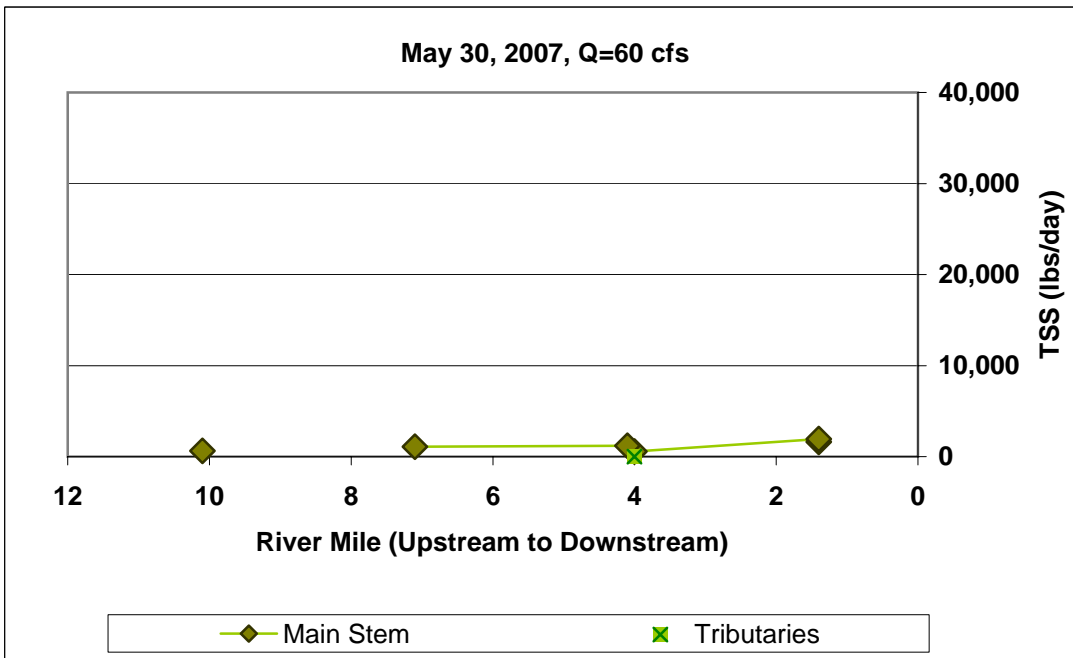
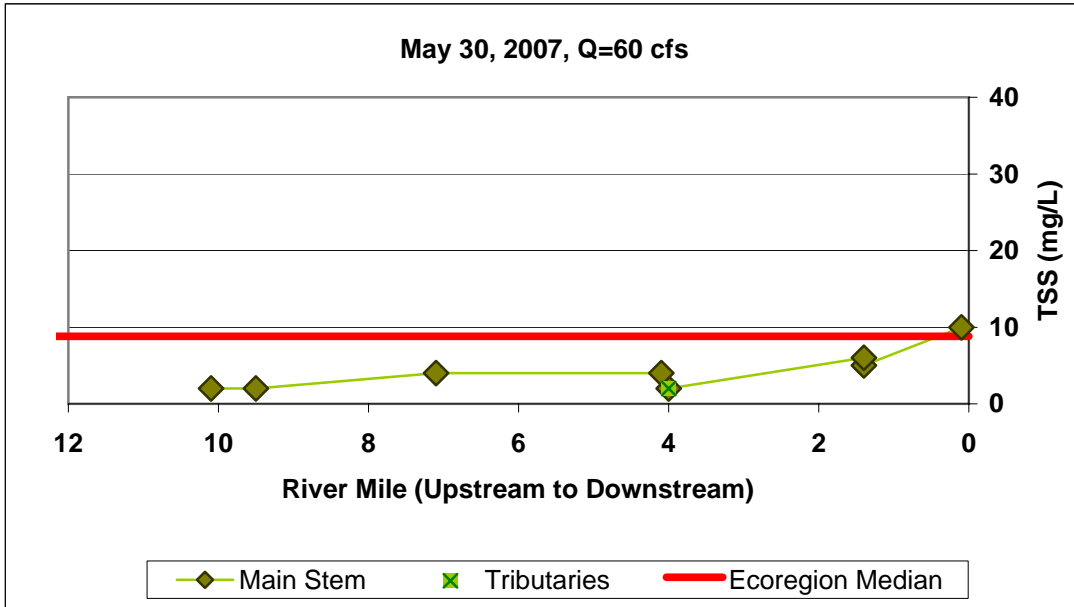




# Appendix A

## Clearwater River Watershed District

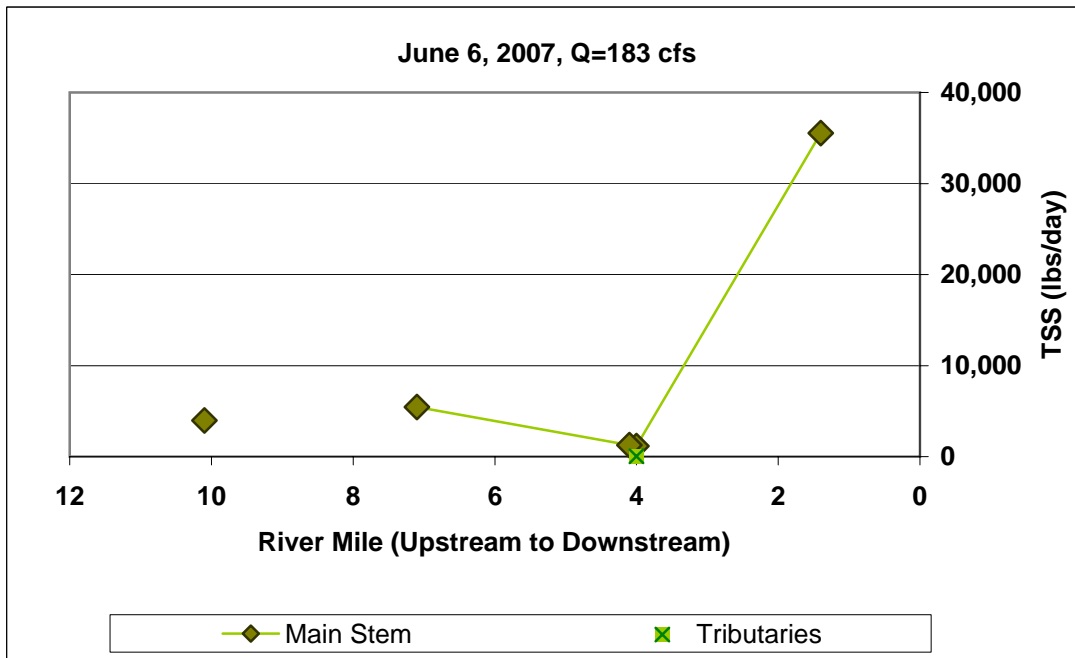
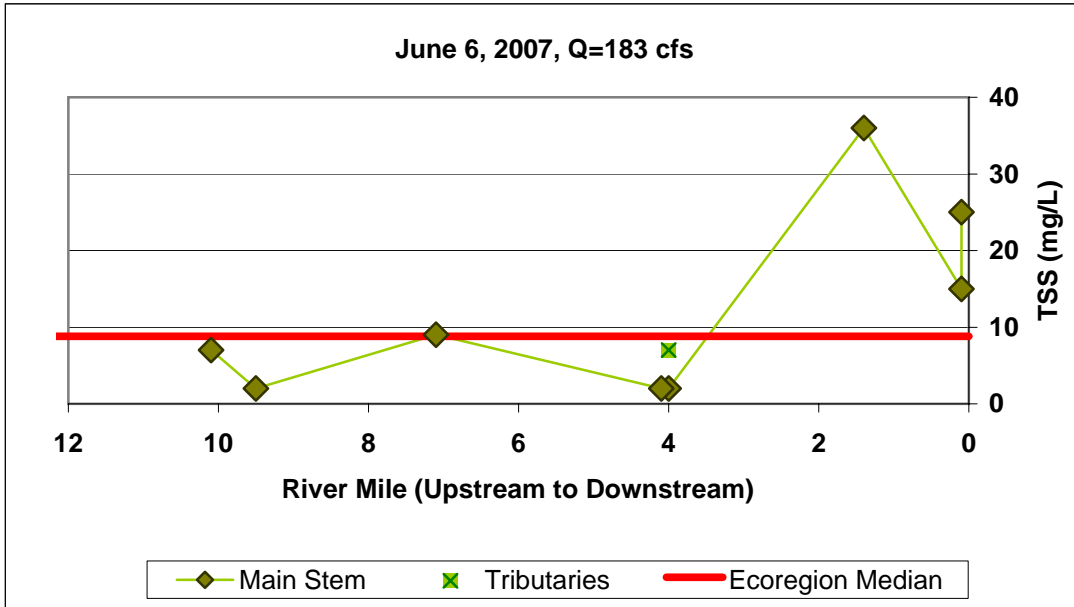
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# Appendix A

## Clearwater River Watershed District

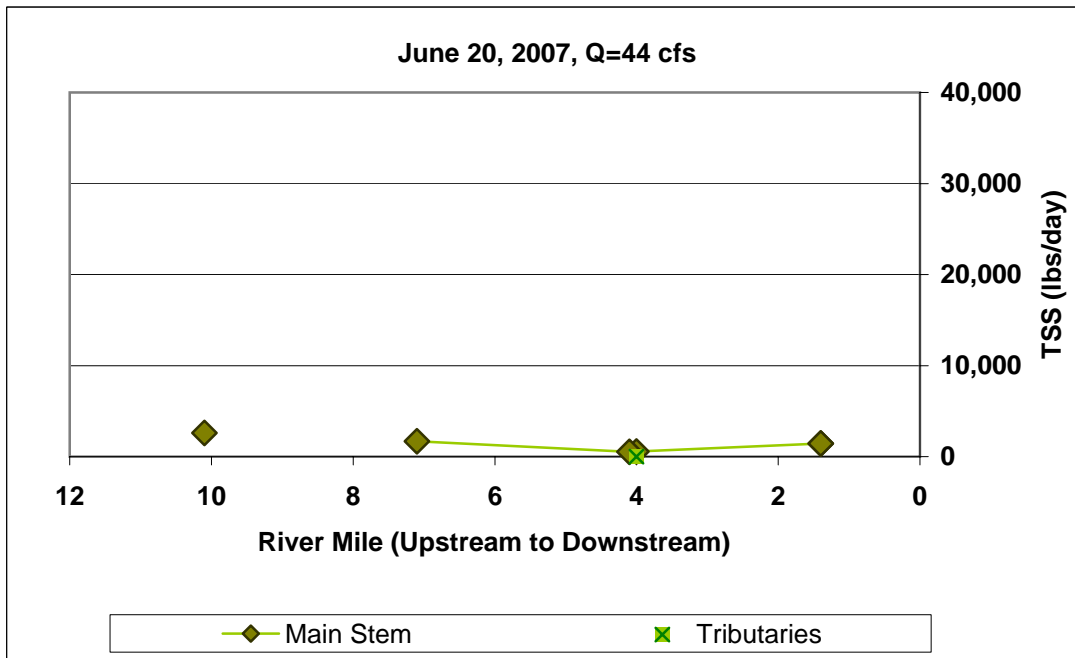
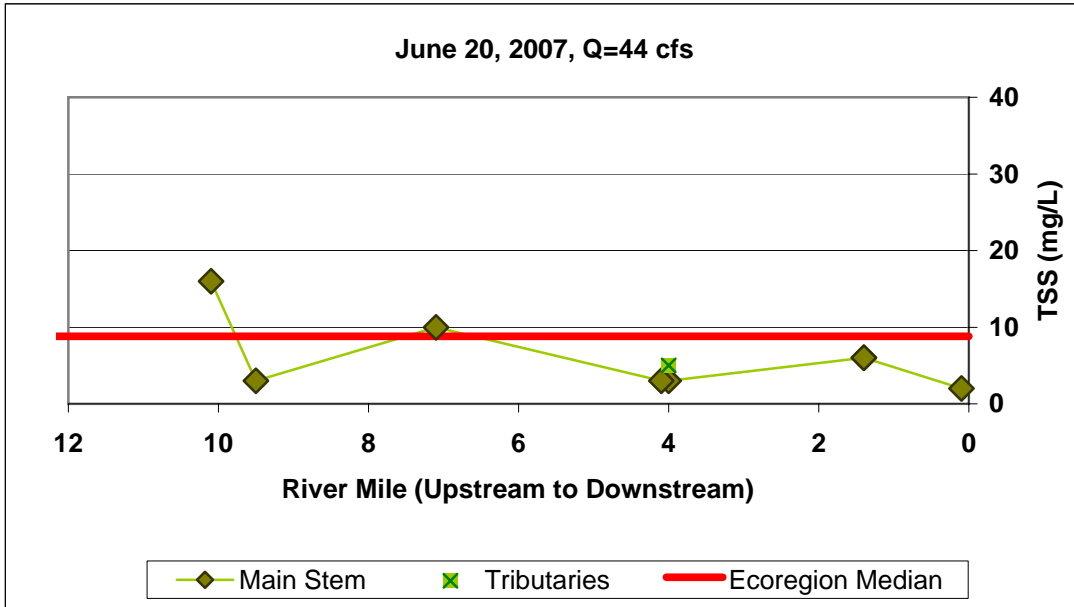
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# Appendix A

## Clearwater River Watershed District

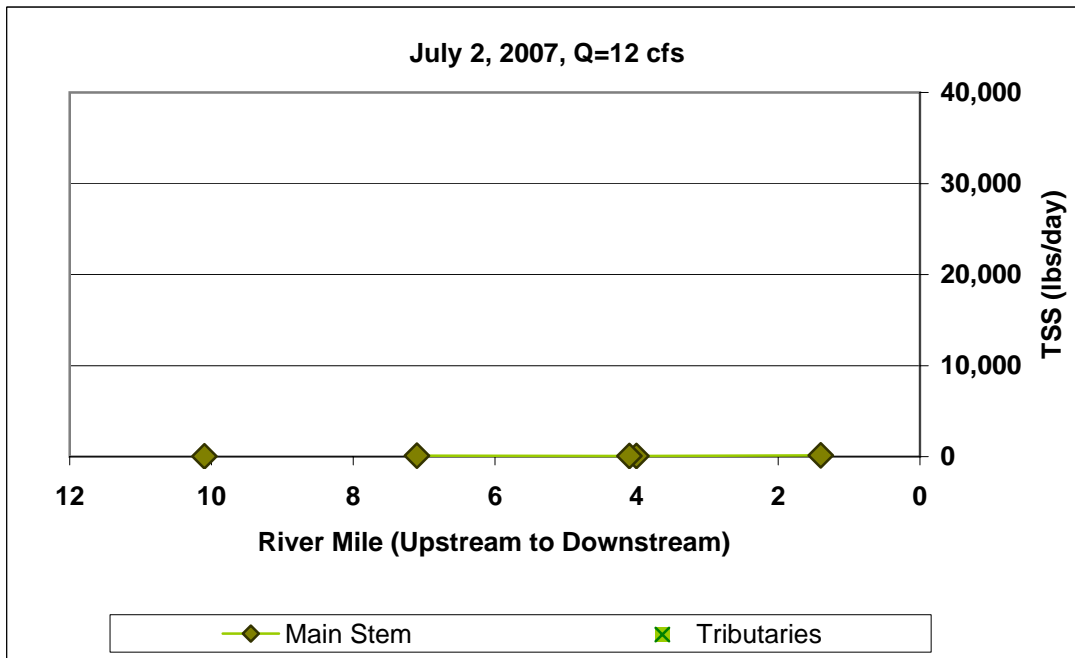
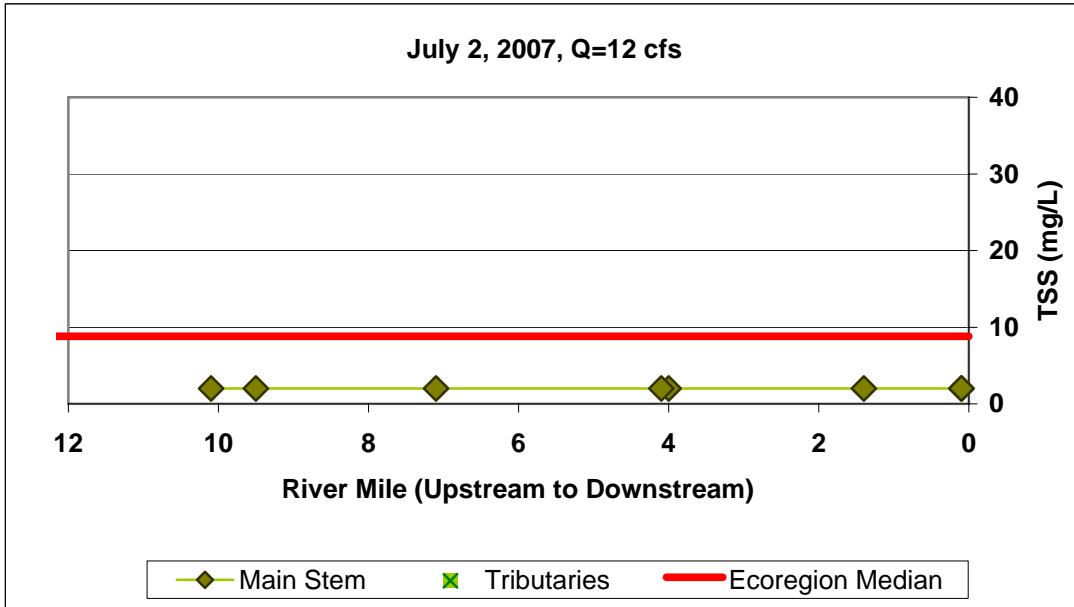
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## Clearwater River Watershed District

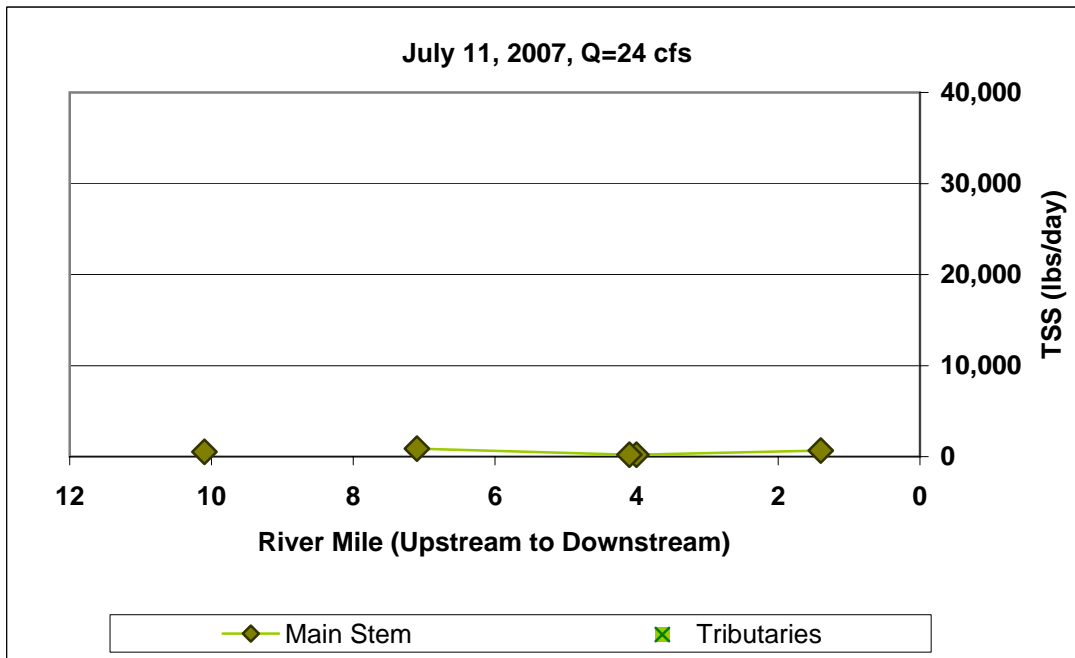
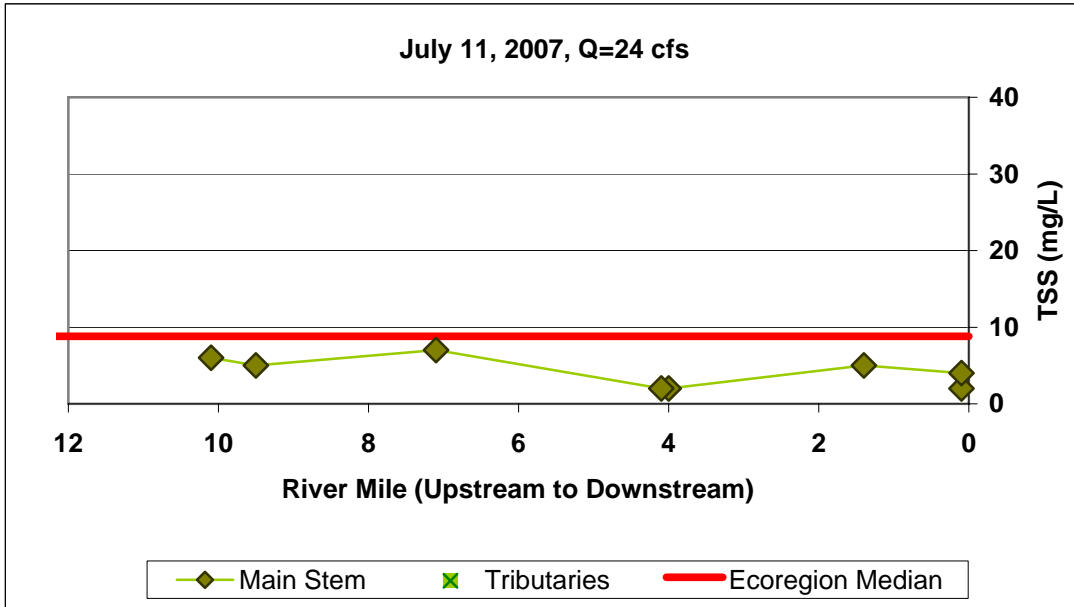
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# Appendix A

## Clearwater River Watershed District

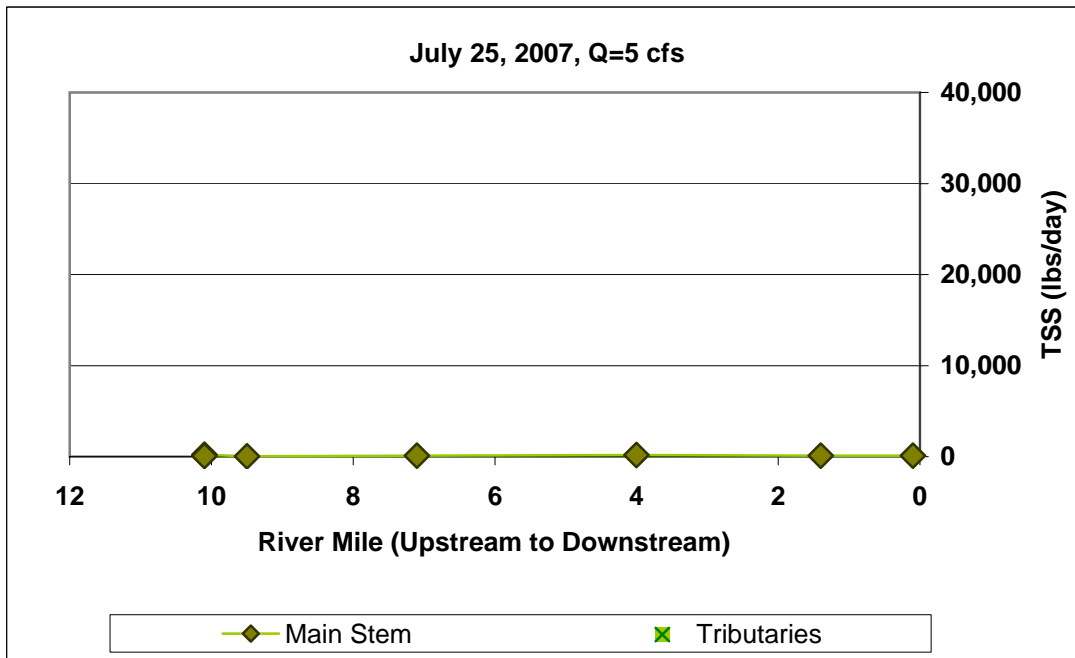
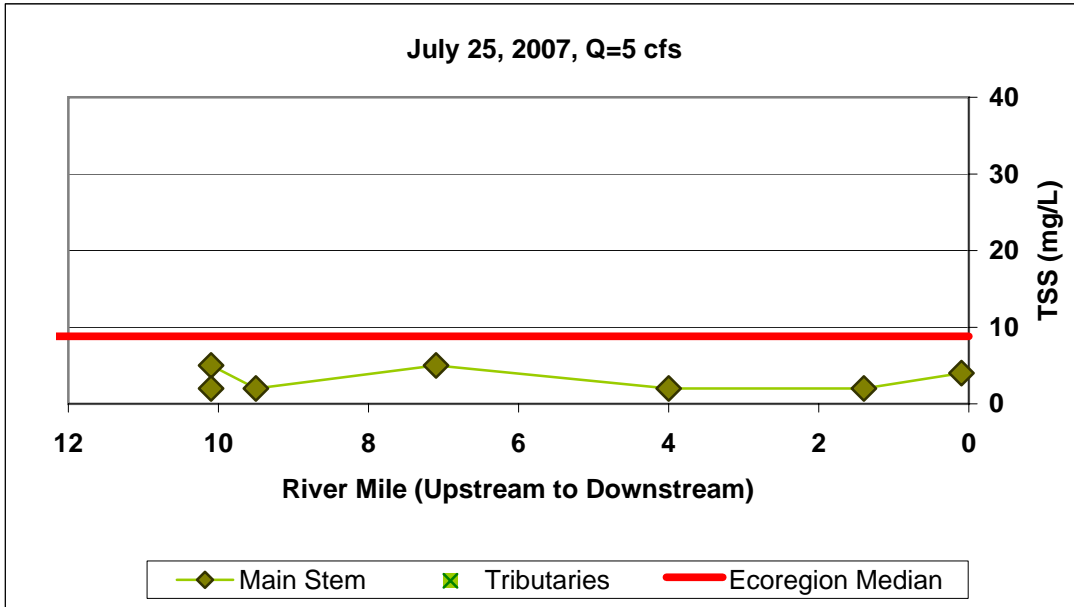
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# Appendix A

## Clearwater River Watershed District

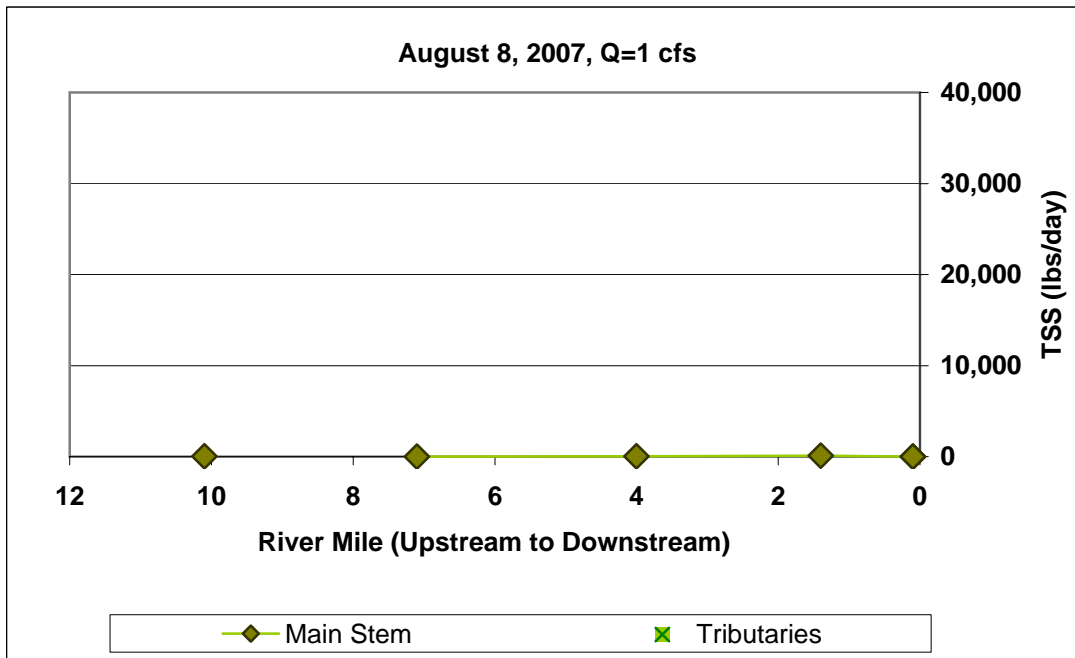
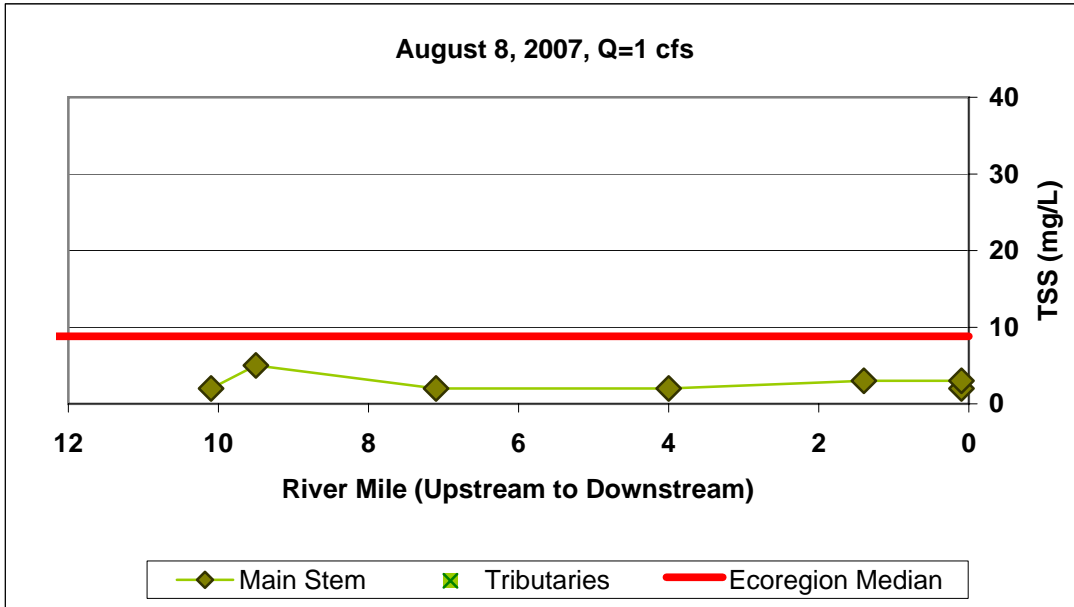
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# Appendix A

## Clearwater River Watershed District

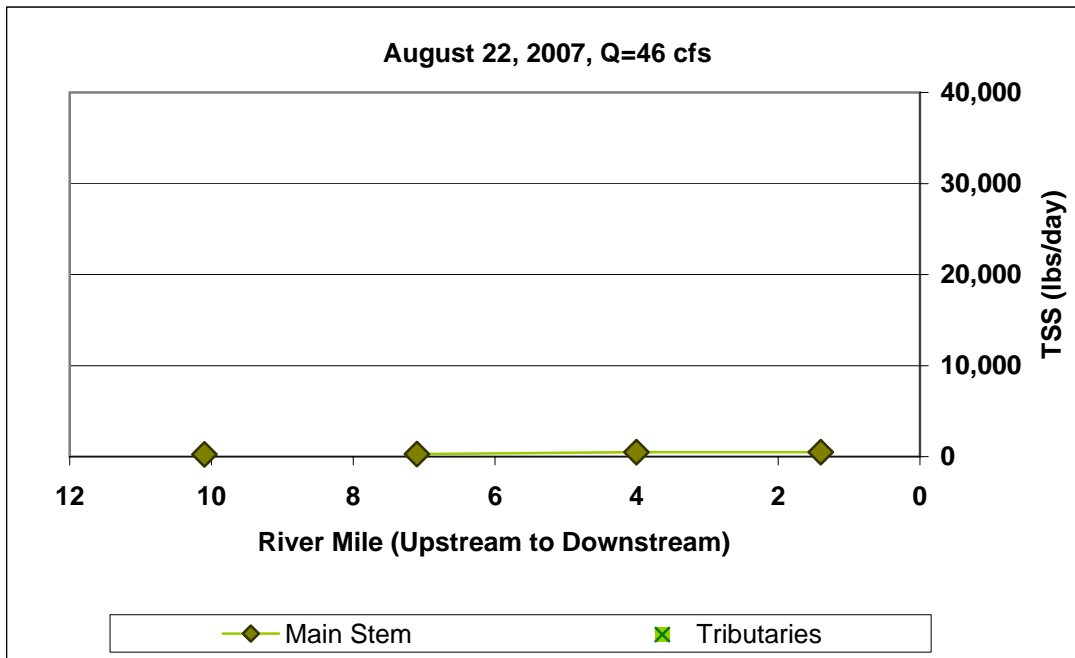
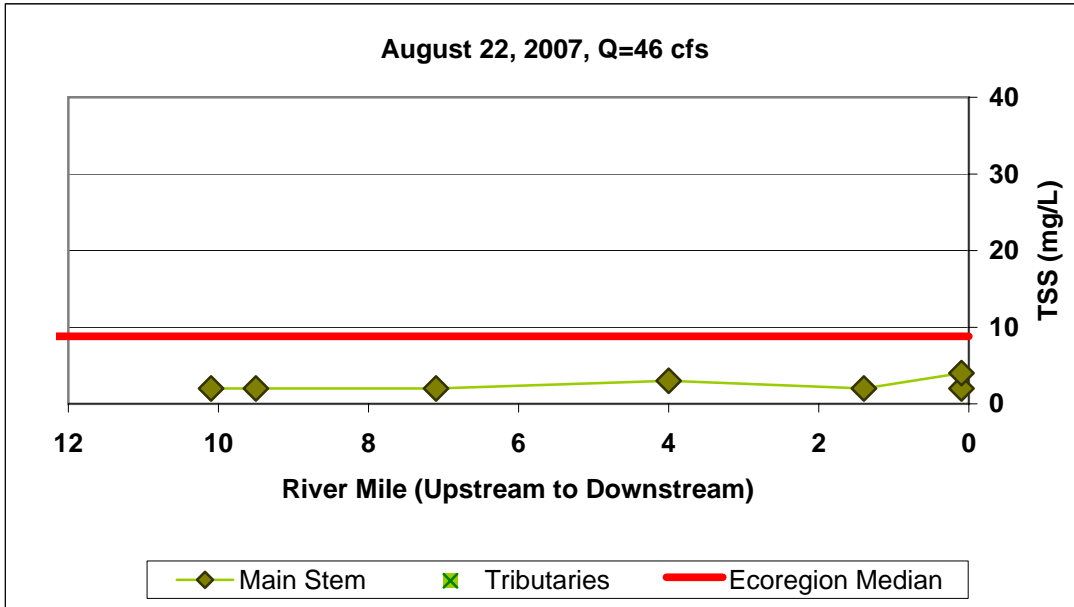
### Phase II Addendum TMDL Study 2007 Clearwater River In-stream Loading and Water Quality Profiles



# Appendix A

## Clearwater River Watershed District

### Phase II Addendum TMDL Study 2007 Clearwater River In-stream Loading and Water Quality Profiles





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## **Appendix B**

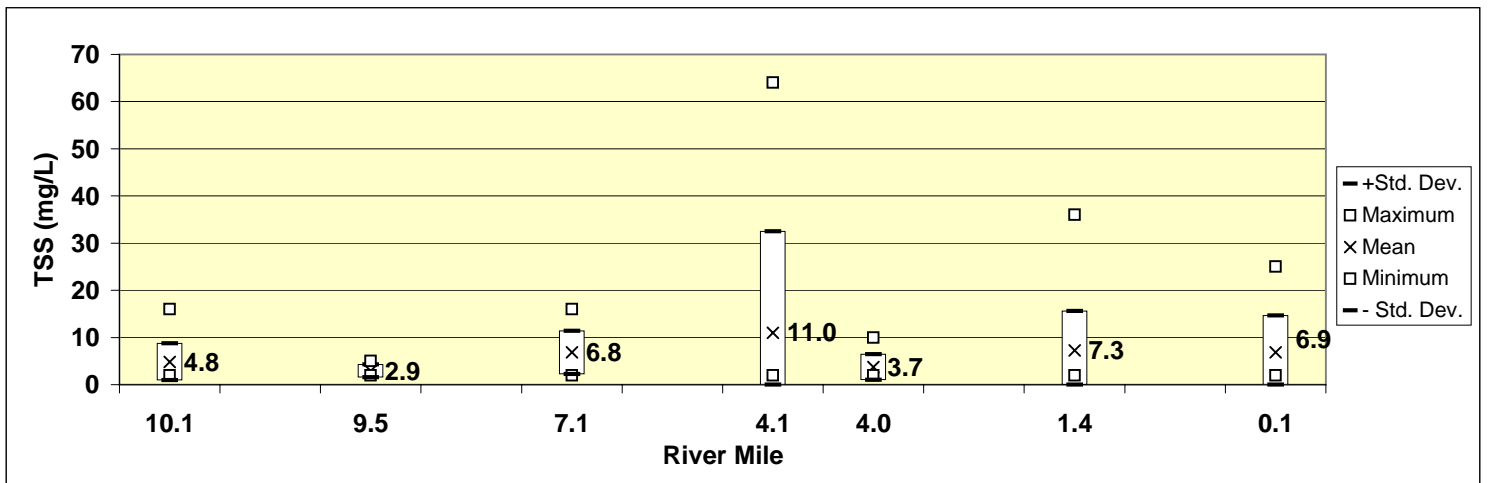
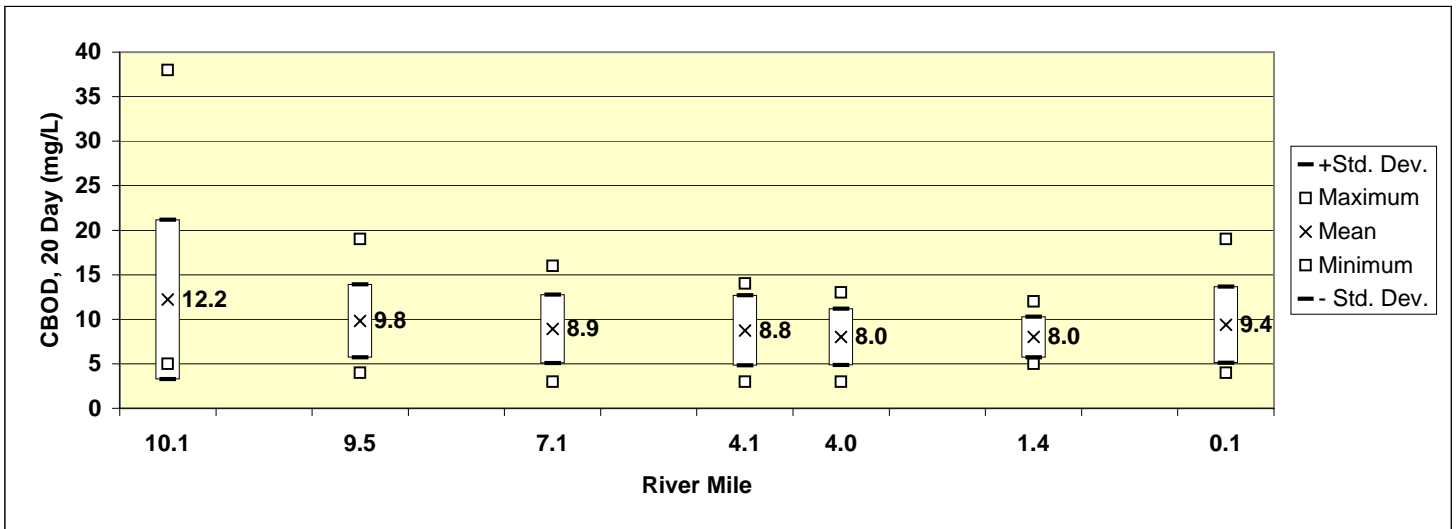
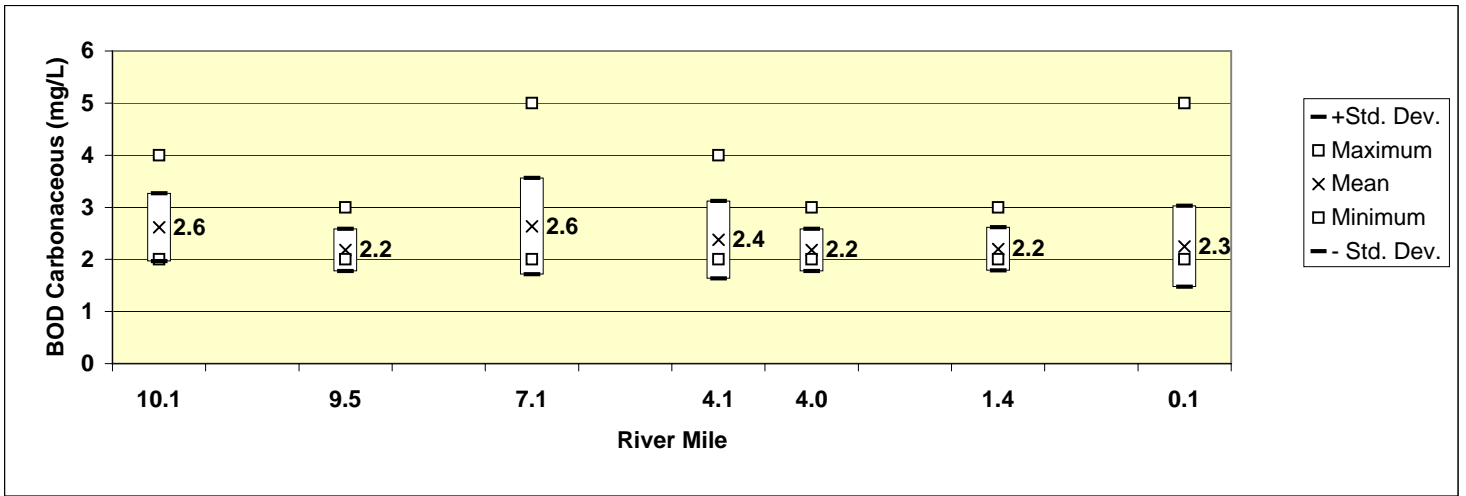
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### **Mean Maximum and Minimum Water Quality Profiles**

# Appendix B

## Clearwater River Watershed District

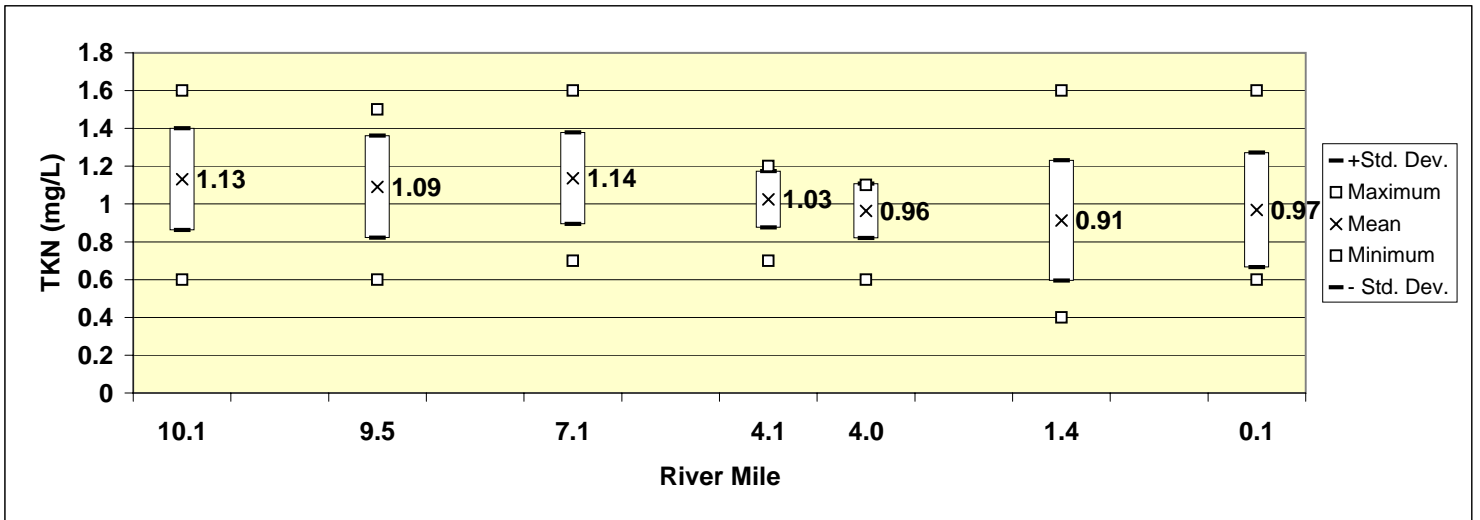
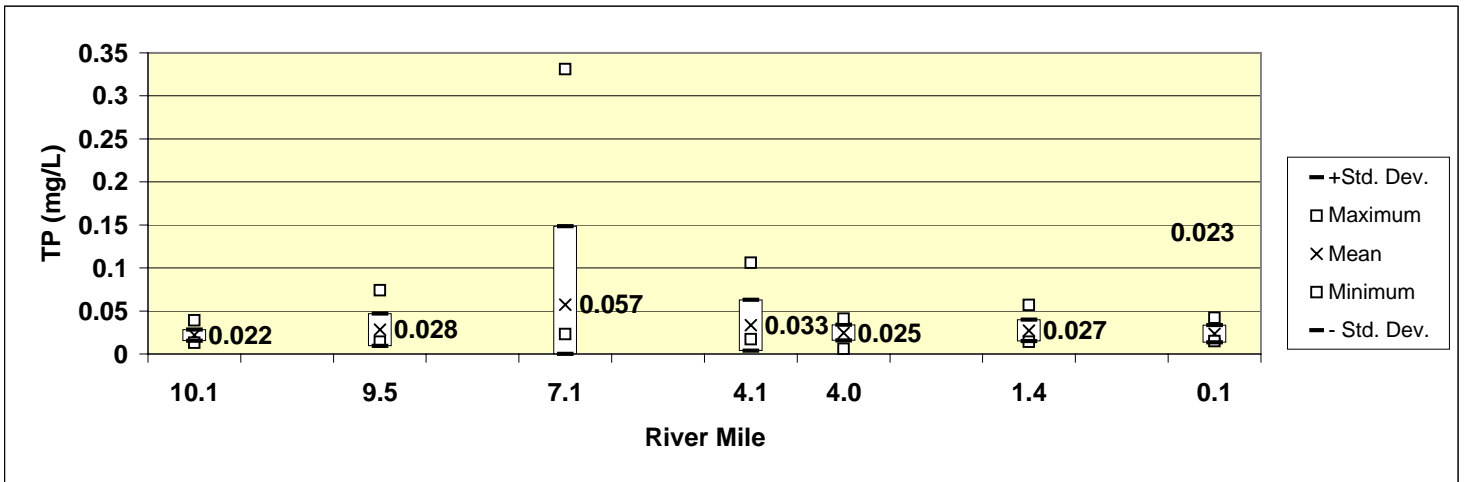
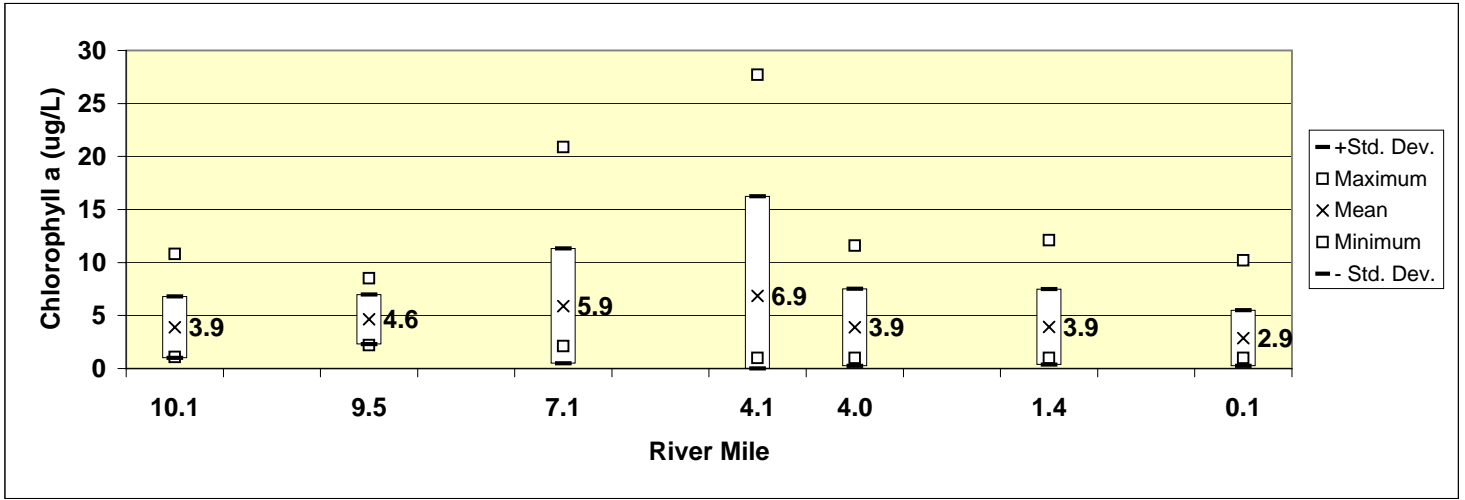
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Appendix B

Clearwater River Watershed District

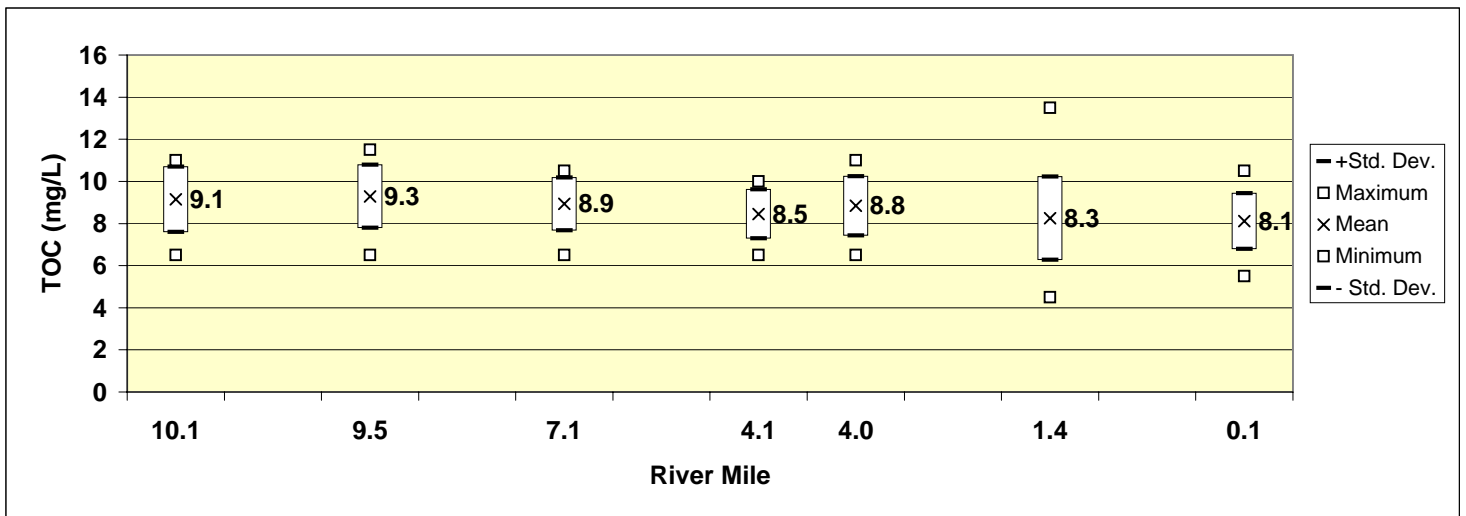
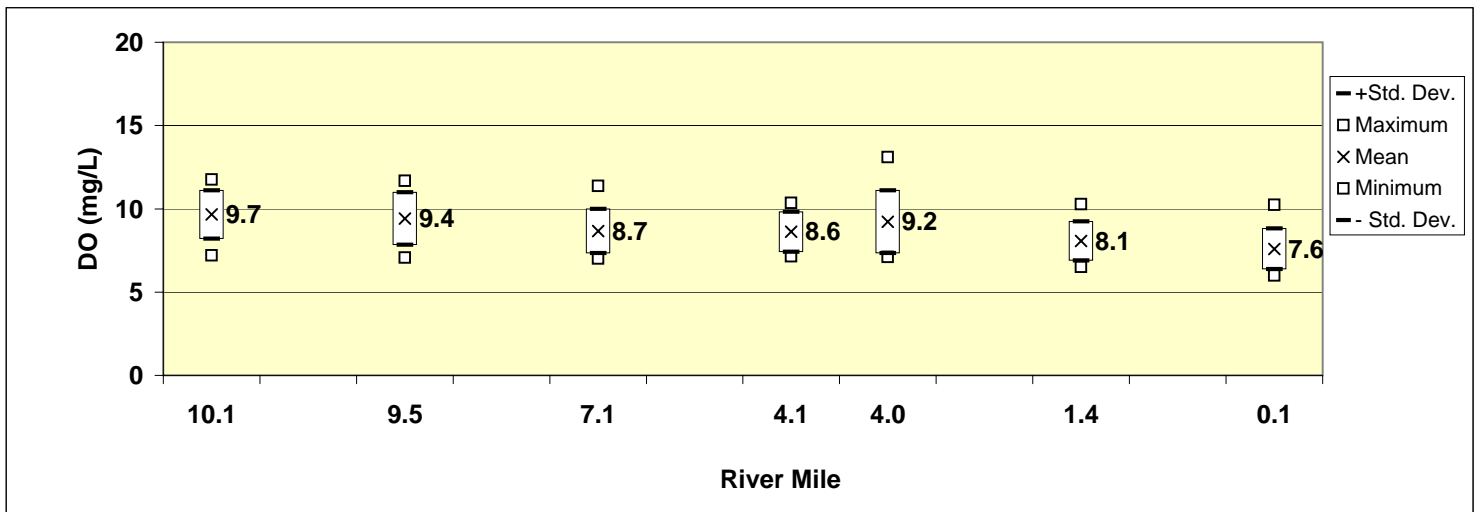
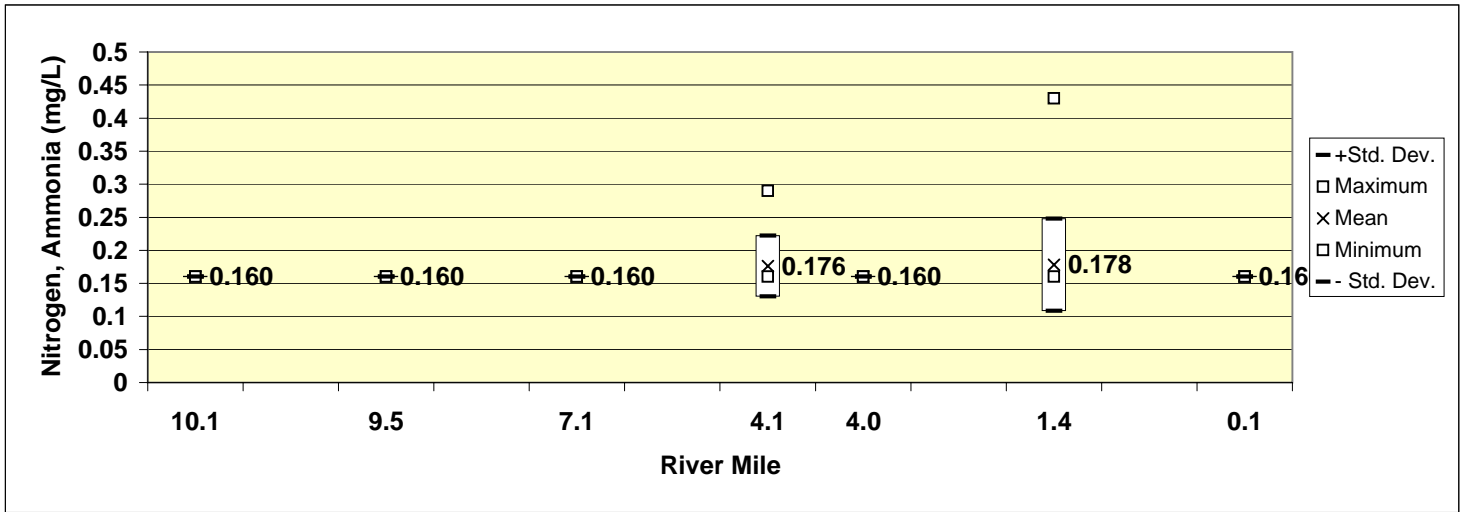
Phase II Addendum TMDL Study  
Mean, Max and Min Water Quality Upstream to Downstream



Appendix B

Clearwater River Watershed District

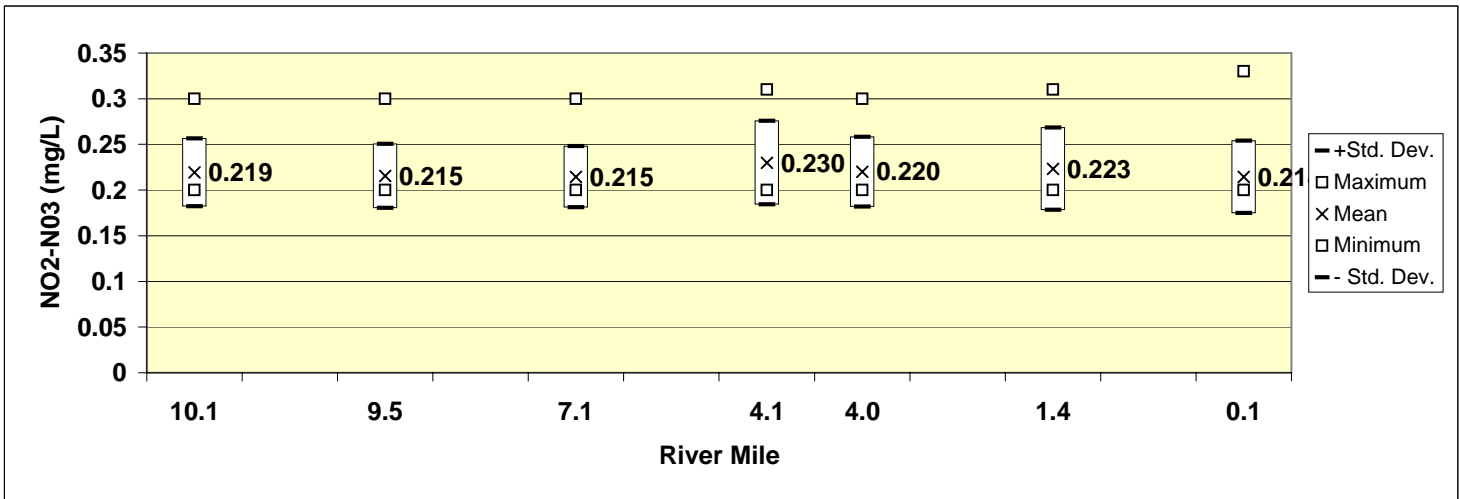
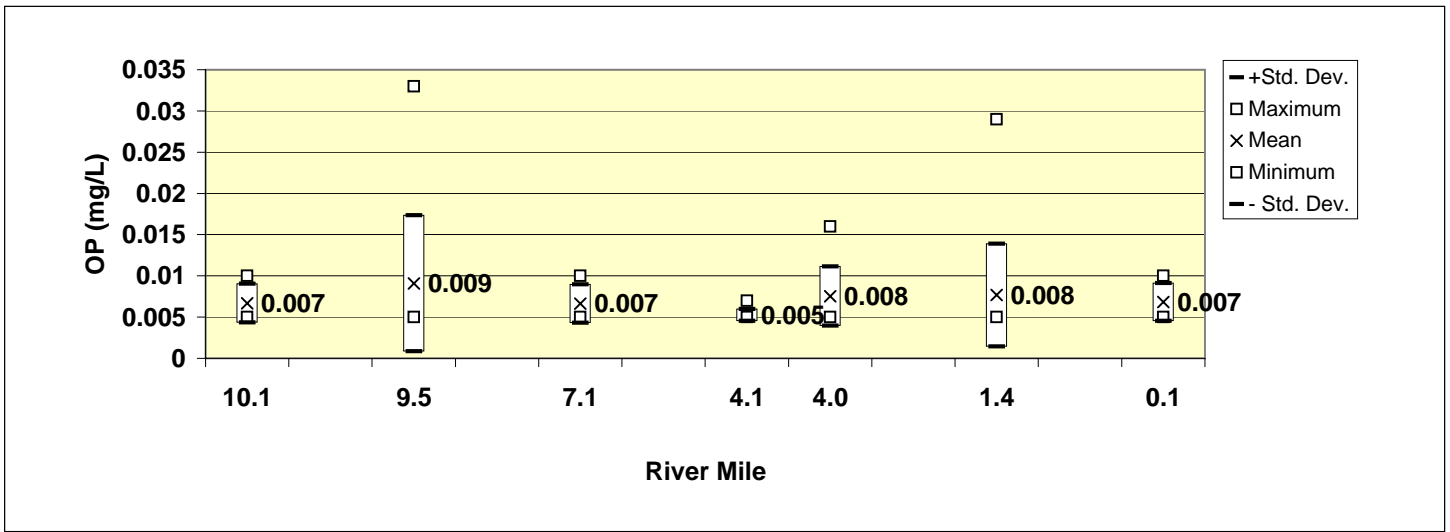
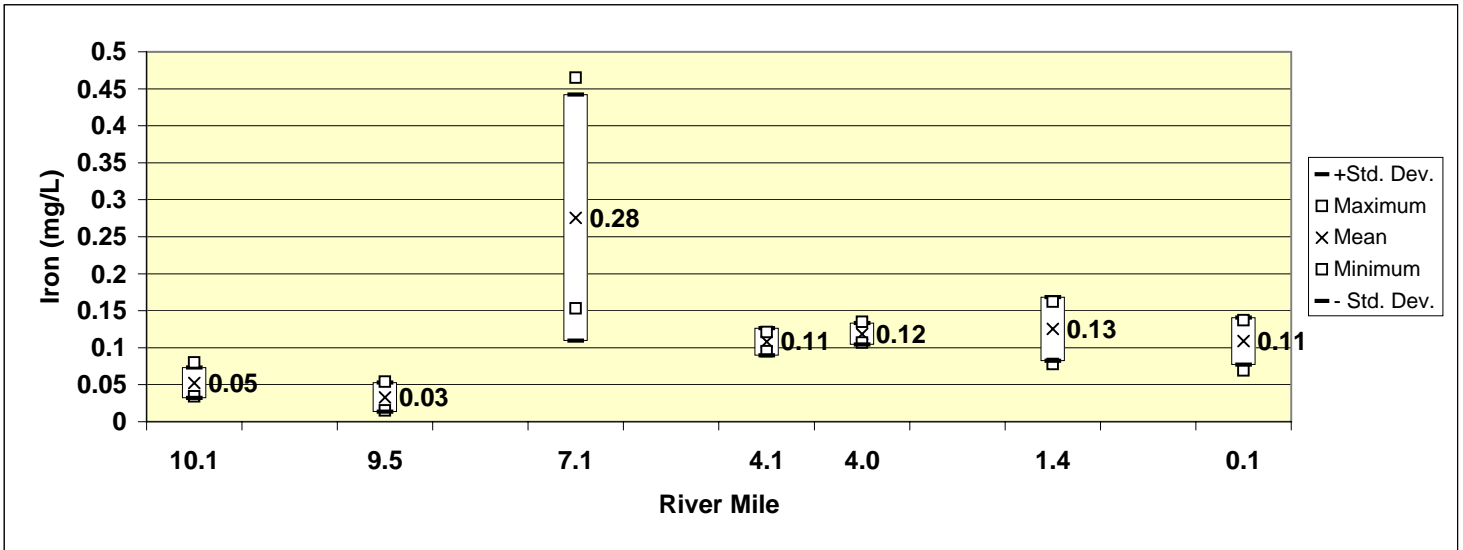
Phase II Addendum TMDL Study  
Mean, Max and Min Water Quality Upstream to Downstream



Appendix B

Clearwater River Watershed District

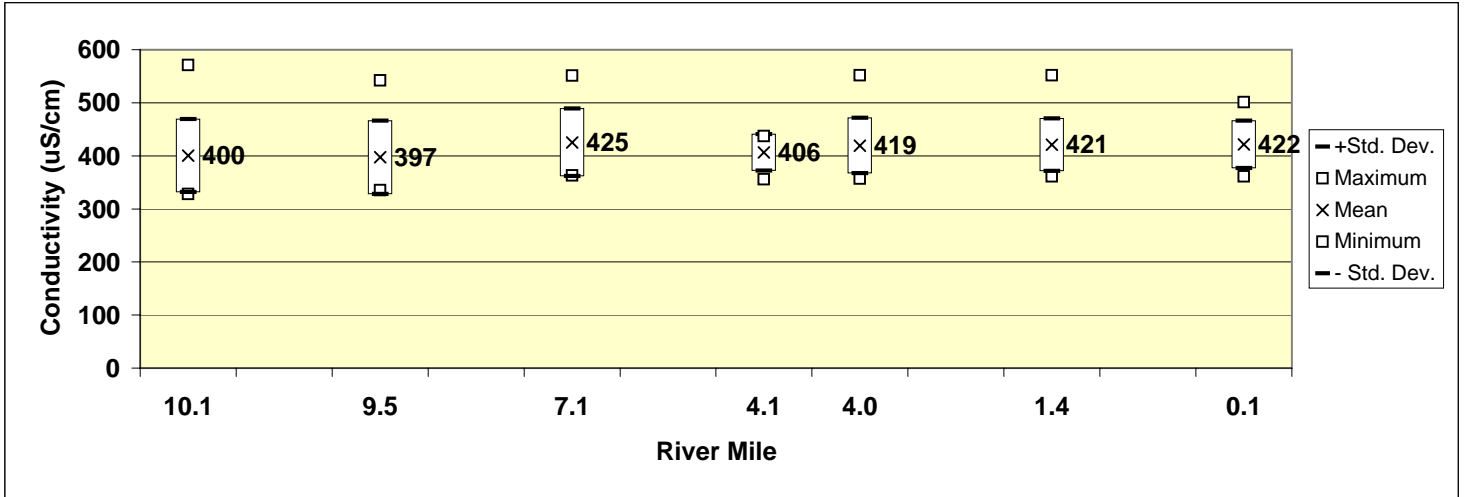
Phase II Addendum TMDL Study  
Mean, Max and Min Water Quality Upstream to Downstream



# Appendix B

## Clearwater River Watershed District

### Phase II Addendum TMDL Study Mean, Max and Min Water Quality Upstream to Downstream



---

## **Appendix C**

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### **Field and Laboratory Data Sheets**



# MINNESOTA VALLEY TESTING LABORATORIES, INC.

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www.mvttl.com



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WES BOLL  
WENCK ASSOCIATES INC  
1800 PIONEER CRK CTR  
MAPLE PLAIN MN 55359-9000

Report Date: 29 Jun 07  
Lab Number: 07-A24670  
Work Order #: 12-6814  
Account #: 013173  
Sample Matrix: SURFACE WATER  
Date Sampled: 6 Jun 07 12:00  
Sampled By: NICK C  
Date Received: 6 Jun 07 16:00  
PO #: CRWD TMDL

Project Name: CRWD TMDL

Sample Description: B 1

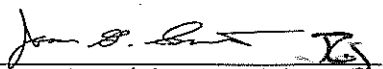
Temp at Receipt: 5.0C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Fecal Coliform, MF	* < 10	CFU/100 mL	10.	SM 9222D 18th Ed	6 Jun 07 18:55 ES

CFU = Colony Forming Units

\* Holding time Exceeded

Approved by:

  
Jason G. Smith, Inorganic  
Laboratory Manager New Ulm, MN

Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix  
! = Due to sample quantity

# = Due to sample concentration  
+ = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447600 ND MICRO # 1013-M ND WN/DW # R-040 IA LAB #: 132 IA LAB #: 022

MVTL guarantees the accuracy of the analysis done on the sample submitted for testing. It is not possible for MVTL to guarantee that a test result obtained on a particular sample will be the same on any other sample unless all conditions affecting the sample are the same, including sampling by MVTL. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.





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WES BOLL  
WENCK ASSOCIATES INC  
1800 PIONEER CRK CTR  
MAPLE PLAIN MN 55359-9000

Report Date: 21 Jun 07  
Lab Number: 07-A23072  
Work Order #: 12-6461  
Account #: 013173  
Sample Matrix: SURFACE WATER  
Date Sampled: 30 May 07 12:30  
Sampled By: NICK C  
Date Received: 30 May 07 16:00  
PO #: 0002-107

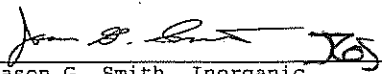
Sample Description: CR B

Temp at Receipt: 1.0C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Fecal Coliform, MF	< 10	CFU/100 mL	10.	SM 9222D 18th Ed	30 May 07 17:10 ES

CFU = Colony Forming Units

Approved by:

  
Jason G. Smith, Inorganic  
Laboratory Manager New Ulm, MN

Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix  
! = Due to sample quantity

# = Due to sample concentration  
+ = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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Page: 1 of 1

WES BOLL  
WENCK ASSOCIATES INC  
1800 PIONEER CRK CTR  
MAPLE PLAIN MN 55359-9000

Report Date: 14 Jun 07  
Lab Number: 07-A21658  
Work Order #: 12-6194  
Account #: 013173  
Sample Matrix: SURFACE WATER  
Date Sampled: 23 May 07 12:00  
Sampled By: NICK C  
Date Received: 23 May 07 15:55  
PO #: CRWD TMDL

Project Name: CRWD TMDL

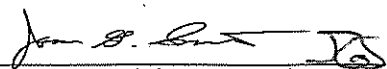
Sample Description: CRB 01

Temp at Receipt: 4.0C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Fecal Coliform, MF	< 10	CFU/100 mL	10.	SM 9222D 18th Ed	23 May 07 17:55 JLS

CFU = Colony Forming Units

Approved by:

  
Jason G. Smith, Inorganic  
Laboratory Manager New Ulm, MN

Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration  
! = Due to sample quantity + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447600 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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ACIL

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WES BOLL
WENCK ASSOCIATES INC
1800 PIONEER CRK CTR
MAPLE PLAIN MN 55359-9000

Report Date: 8 Jun 07
Lab Number: 07-A18776
Work Order #:12-5557
Account #: 013173
Sample Matrix: SURFACE WATER
Date Sampled: 9 May 07 8:00
Sampled By: WES BOLL
Date Received: 9 May 07 16:12
PO #: 0002-107

Project Number: 0002-107
Sample Description: CRB 0.1

Temp at Receipt: 3.0C

Table with 6 columns: As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Row 1: Fecal Coliform, MF, \* < 10, CFU/100 mL, 10., SM 9222D 18th Ed, 9 May 07 18:05, ES

CFU = Colony Forming Units

\* Holding time Exceeded

Approved by: [Signature]
Jason G. Smith, Inorganic
Laboratory Manager New Ulm, MN

RL = Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration
! = Due to sample quantity \* = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447600 ND MICRO # 1013-M ND HW/DW # R-040 IA LAB #: 132 IA LAB # 927

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PRELIMINARY REPORT

WES BOLL
WENCK ASSOCIATES INC
1800 PIONEER CRK CTR
MAPLE PLAIN MN 55359-9000

Report Date: 22 May 07
Lab Number: 07-A18776
Work Order #:12-5557
Account #: 013173
Sample Matrix: SURFACE WATER
Date Sampled: 9 May 07 8:00
Sampled By: WES BOLL
Date Received: 9 May 07 16:12
PO #: 0002-107

Project Number: 0002-107
Sample Description: CRB 0.1

Temp at Receipt: 3.0C

Table with 6 columns: As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Row 1: Fecal Coliform, MF, \* < 10, CFU/100 mL, 10., SM 9222D 18th Ed, 9 May 07 18:05, ES

CFU = Colony Forming Units

\* Holding time Exceeded

PRELIMINARY REPORT: RESULTS ARE SUBJECT TO CHANGE PENDING FINAL APPROVAL OF DATA.

RL = Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration
! = Due to sample quantity + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND HW/DW # R-040 IA LAB #: 132 IA LAB #: 022

MVTL

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MEMBER
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Page: 1 of 1

PRELIMINARY REPORT

WES BOLL
WENCK ASSOCIATES INC
1800 PIONEER CRK CTR
MAPLE PLAIN MN 55359-9000

Report Date: 22 May 07
Lab Number: 07-A15441
Work Order #:12-4795
Account #: 013173
Sample Matrix: SURFACE WATER
Date Sampled: 24 Apr 07
Date Received: 24 Apr 07 16:30
PO #: 002-107

Project Number: 0002-107
Sample Description: CRB 01

Temp at Receipt: 4.0C

Table with 6 columns: As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Row 1: Fecal Coliform, MF, \* < 10, CFU/100 mL, 10., SM 9222D 18th Ed, 24 Apr 07 19:00, ES

CFU = Colony Forming Units

\* Holding time Exceeded

\*\* No collection time supplied by the client.

PRELIMINARY REPORT: RESULTS ARE SUBJECT TO CHANGE PENDING FINAL APPROVAL OF DATA.

RL = Reporting Limit

Elevated "Less Than Result" (<): \* = Due to sample matrix # = Due to sample concentration
! = Due to sample quantity . = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND HW/DW # R-040 IA LAB #: 132 IA LAB #: 022



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WES BOLL  
WENCK ASSOCIATES INC  
1800 PIONEER CRK CTR  
MAPLE PLAIN MN 55359-9000

Report Date: 12 Jul 07  
Lab Number: 07-A27473  
Work Order #: 12-7478  
Account #: 013173  
Sample Matrix: SURFACE WATER  
Date Sampled: 20 Jun 07 14:00  
Sampled By: NICK C  
Date Received: 20 Jun 07 16:00  
PO #: CLEARWATER

Project Name: CLEARWATER  
Project Number: 0002-108  
Sample Description: B 1

Temp at Receipt: 6.0C

	As Received Result	Method	Method Reference	Date Analyzed	Analyst
Fecal Coliform, MF	< 10	CFU/100 mL	10.	SM 9222D 20th Ed	20 Jun 07 18:25 ES

CFU = Colony Forming Units

Approved by:

Jason G. Smith, Inorganic  
Laboratory Manager New Ulm, MN

Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix  
! = Due to sample quantity

# = Due to sample concentration  
+ = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447600 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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# Field Form: 2007 Stream Sampling

Client: CRWD

Project No.: 0002-107

Date: 5/09

Sampler(s): WB, VC

Start Time: 8:25

End Time: 8:45

Channel Conditions: flowing

COC Number: \_\_\_\_\_

Site Location: C.R.O.1

Site Description: Dam at CR 75

Weather: 60° Sunny

Samples Taken: Yes No

Sample Time: 8:30

DTW Measurement: 2.43

Field Parameters				
Sample I.D.	Temp. (°C)	Cond. (mS/cm)	D.O. (mg/l)	pH (S.U.)
<u>C.R.O.1</u>	<u>14.8</u>	<u>434</u>	<u>8.15</u>	<u>7.97</u>

Notes: -water is clear  
-stream is flowing over banks

Stage Ht: \_\_\_\_\_ Rated Flow: \_\_\_\_\_ Gauged Flow: \_\_\_\_\_

## Stream Gauging Data

Distance from Initial Point (ft)	Width (ft)	Depth (ft)	Velocity (60% Depth)	Velocity		Average Velocity (ft/sec)	Area (ft <sup>2</sup> )	Discharge (Q, ft <sup>3</sup> /sec)
				20% Depth	80% Depth			
0, (left side)								
				Data Set: _____				
				Entered By/Date: <u>JT 7/9/08</u>				
				QA/QC By/Date: _____				

Field Form: 2007 Stream Sampling

763-566-2751  
Ralph  
for land access

Client: CRWD  
 Project No.: 0002-107  
 Date: 5.23.07  
 Sampler(s): NIC/WB  
 Start Time: 09:00  
 End Time: 0930  
 Channel Conditions: flowing 1/2 sec  
 COC Number: \_\_\_\_\_

Site Location: CR 0.1  
 Site Description: CR at HWY 75  
 Weather: Cloudy 60°  
 Samples Taken: Yes No  
 Sample Time: 9:15  
 DTW Measurement: 3.03

Notes: -Water levels  
receding  
-Water flowing over  
dam

Field Parameters				
Sample I.D.	Temp. (°C)	Cond. (mS/cm)	D.O. (mg/l)	pH (S.U.)
	<u>18.12</u>	<u>442</u>	<u>6.29</u>	<u>8.05</u>

Stage Ht: \_\_\_\_\_ Rated Flow: \_\_\_\_\_ Gauged Flow: \_\_\_\_\_

Stream Gauging Data

Distance from Initial Point (ft)	Width (ft)	Depth (ft)	Velocity (60% Depth)	Velocity		Average Velocity (ft/sec)	Area (ft <sup>2</sup> )	Discharge (Q, ft <sup>3</sup> /sec)
				20% Depth	80% Depth			
0, (left side)								

Data Set: \_\_\_\_\_  
 Entered By/Date: JT 7/9/07  
 Q/VOC By/Date: \_\_\_\_\_

## Field Form: 2007 Stream Sampling

Client: CRWD  
 Project No.: 0002-107  
 Date: 5-30-07  
 Sampler(s): NIC/JES  
 Start Time: 8:45  
 End Time: 9:02  
 Channel Conditions: floury  
 COC Number: \_\_\_\_\_

Site Location: C20.1  
 Site Description: clear water river @ C2 Highway 95  
 Weather: Sunny & clear, 70° up stream  
 Samples Taken: (Yes) No  
 Sample Time: 845  
 DTW Measurement: 3.00

Notes: Oily sheen in backwater

Field Parameters				
Sample I.D.	Temp. (°C)	Cond. (mS/cm)	D.O. (mg/l)	pH (S.U.)
	<u>19.28</u>	<u>443</u>	<u>7.96</u>	<u>7.94</u>

Stage Ht: \_\_\_\_\_ Rated Flow: \_\_\_\_\_ Gauged Flow: \_\_\_\_\_

### Stream Gauging Data

Distance from Initial Point (ft)	Width (ft)	Depth (ft)	Velocity (60% Depth)	Velocity		Average Velocity (ft/sec)	Area (ft <sup>2</sup> )	Discharge (Q, ft <sup>3</sup> /sec)
				20% Depth	80% Depth			
0, (left side)								

Data Set: \_\_\_\_\_  
 Entered By/Date: JT 7/19/07  
 QA/QC By/Date: \_\_\_\_\_

\* Duplicate

**Field Form: 2007 Stream Sampling**

Client: CRWD  
 Project No.: 0002-107  
 Date: 0-0-07  
 Sampler(s): Nic / Jess  
 Start Time: 8:42  
 End Time: 9:00  
 Channel Conditions: Flowing  
 COC Number: \_\_\_\_\_

Site Location: CL 0.1  
 Site Description: Charwater River C.C.O. Hwy 75  
 Weather: 65° scattered clouds  
 Samples Taken:  Yes  No  
 Sample Time: 8:50  
 DTW Measurement: 2.71  
C-90+

Notes: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Field Parameters				
Sample I.D.	Temp. (°C)	Cond. (mS/cm)	D.O. (mg/l)	pH (S.U.)
	<u>18.0</u>	<u>-</u>	<u>7.47</u>	<u>-</u>

Stage Ht: \_\_\_\_\_ Rated Flow: \_\_\_\_\_ Gauged Flow: —

**Stream Gauging Data**

Distance from Initial Point (ft)	Width (ft)	Depth (ft)	Velocity (60% Depth)	Velocity-		Average Velocity (ft/sec)	Area (ft <sup>2</sup> )	Discharge (Q, ft <sup>3</sup> /sec)
				20% Depth	80% Depth			
<u>0, (left side)</u>								

Data Set: \_\_\_\_\_  
 Entered By/Date: JT 7/9/07  
 QA/QC By/Date: \_\_\_\_\_

# Field Form: 2007 Stream Sampling

Client: CRWD  
 Project No.: 0002-107  
 Date: 08-20-07  
 Sampler(s): Nic/Jess  
 Start Time: 8:50  
 End Time: 9:05  
 Channel Conditions: Flowing  
 COC Number: \_\_\_\_\_

Site Location: CR 0.1  
 Site Description: CR Co. HW 75 Cross. of stream  
 Weather: Sunny 70°  
 Samples Taken:  Yes  No  
 Sample Time: 8:55  
 DTW Measurement: 3.23  
c-95<sup>+</sup>

Notes: made lower, slightly  
more brown looking.  
Sand bar visible  
in middle of stream

Field Parameters				
Sample I.D.	Temp. (°C)	Cond. (mS/cm)	D.O. (mg/l)	pH (S.U.)
20.07	367	5.99	8.20	

Stage Ht: \_\_\_\_\_

Rated Flow: \_\_\_\_\_

Gauged Flow:   —  

### Stream Gauging Data

Distance from Initial Point (ft)	Width (ft)	Depth (ft)	Velocity (60% Depth)	Velocity-		Average Velocity (ft/sec)	Area (ft <sup>2</sup> )	Discharge (Q, ft <sup>3</sup> /sec)
				20% Depth	80% Depth			
0, (left side)								

Data Set: \_\_\_\_\_

Entered By/Date: JT 7/9/07

QA/QC By/Date: \_\_\_\_\_



*\* Duplicate*

### Field Form: 2007 Stream Sampling

Client: CRWD  
Project No.: 0002-107  
Date: 7.11.07  
Sampler(s): NIC  
Start Time: 830  
End Time: 910  
Channel Conditions: flowing  
COC Number: \_\_\_\_\_

Site Location: CR 0.1  
Site Description: \_\_\_\_\_  
Weather: Sun 70°  
Samples Taken:  Yes  No  
Sample Time: 845  
DTW Measurement: 3.49

Notes: -water is very clear  
-vegetation abundant upstream of dam

Field Parameters				
Sample I.D.	Temp. (°C)	Cond. (mS/cm)	D.O. (mg/l)	pH (S.U.)
CR0.1	20.13	365	6.93	8.19

Downstream of Dam 19.97 365 7.71 8.31  
Rest Stop 19.86 370 7.68 8.34

Stage Ht: \_\_\_\_\_ Rated Flow: \_\_\_\_\_ Gauged Flow: \_\_\_\_\_

#### Stream Gauging Data

Distance from Initial Point (ft)	Width (ft)	Depth (ft)	Velocity (60% Depth)	Velocity		Average Velocity (ft/sec)	Area (ft <sup>2</sup> )	Discharge (Q, ft <sup>3</sup> /sec)
				20% Depth	80% Depth			
0, (left side)								

Data Ser: \_\_\_\_\_  
Entered By/Date: WB 7/12/07  
Checked By/Date: \_\_\_\_\_

## Field Form: 2007 Stream Sampling

Client: CRWD  
 Project No.: 0002-107  
 Date: 7-25-07  
 Sampler(s): Nick Suss  
 Start Time: 4:45  
 End Time: 9:06  
 Channel Conditions: Flowing  
 COC Number: \_\_\_\_\_

Site Location: CR 0.1  
 Site Description: Clearwater @ Co. Hwy 75  
 Weather: 80° Sunny  
 Samples Taken:  Yes  No  
 Sample Time: 8:55  
 DTW Measurement: 740

Notes: put detergent  
 sampler in.

Field Parameters				
Sample I.D.	Temp. (°C)	Cond. (mS/cm)	D.O. (mg/l)	pH (S.U.)
	25.07	.412	4.17	8.21

Stage Ht: \_\_\_\_\_ Rated Flow: \_\_\_\_\_ Gauged Flow: 5.122

### Stream Gauging Data

Distance from Initial Point (ft)	Width (ft)	Depth (ft)	Velocity (60% Depth)	Velocity		Average Velocity (ft/sec)	Area (ft <sup>2</sup> )	Discharge (Q, ft <sup>3</sup> /sec)
				20% Depth	80% Depth			
0, (left side)								



## Field Form: 2007 Stream Sampling

~~DUO~~ DUO

Client: CRWD

Project No.: 0002-107

Date: 8.8.07

Sampler(s): NIC

Start Time: 9:30

End Time: 10:00

Channel Conditions: flowing

COC Number: \_\_\_\_\_

Site Location: CR 0.1

Site Description: 1. /

Weather: sun 70°

Samples Taken: (Yes) No

Sample Time: 0945

DTW Measurement: 4.39

Field Parameters				
Sample I.D.	Temp. (°C)	Cond. (mS/cm)	D.O. (mg/l)	pH (S.U.)
	<u>21.75</u>	<u>407</u>	<u>7.30</u>	<u>8.55</u>

Notes: almost dry,  
small flowing  
channel

Stage Ht: \_\_\_\_\_ Rated Flow: \_\_\_\_\_ Gauged Flow: 0.513

### Stream Gauging Data

Distance from Initial Point (ft)	Width (ft)	Depth (ft)	Velocity (60% Depth)	Velocity		Average Velocity (ft/sec)	Area (ft <sup>2</sup> )	Discharge (Q, ft <sup>3</sup> /sec)
				20% Depth	80% Depth			
0, (left side)								

Data Set: \_\_\_\_\_

Entered By/Date: WB 10/08/07

QA/QC By/Date: \_\_\_\_\_

### Field Form: 2007 Stream Sampling

Client: CRWD  
 Project No.: 0002-107  
 Date: A 8.22.07  
 Sampler(s): NIC  
 Start Time: 0845  
 End Time: 0920  
 Channel Conditions: flowing  
 COC Number: \_\_\_\_\_

Site Location: CR 01  
 Site Description: \_\_\_\_\_  
 Weather: overcast  
 Samples Taken: (2) No  
 Sample Time: 0900  
 DTW Measurement: 3.81

Notes: Flowing more due to recent rains.

Field Parameters				
Sample I.D.	Temp. (°C)	Cond. (mS/cm)	D.O. (mg/l)	pH (S.U.)
	21.21	501	7.52	8.42

Stage Ht: \_\_\_\_\_ Rated Flow: \_\_\_\_\_ Gauged Flow: \_\_\_\_\_

#### Stream Gauging Data

Distance from Initial Point (ft)	Width (ft)	Depth (ft)	Velocity (60% Depth)	Velocity		Average Velocity (ft/sec)	Area (ft <sup>2</sup> )	Discharge (Q, ft <sup>3</sup> /sec)
				20% Depth	80% Depth			
0, (left side)								

Data Set: \_\_\_\_\_  
 Entered By/Date: WB 10/09/07  
 Q/AQC By/Date: \_\_\_\_\_

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## PRELIMINARY REPORT

WES BOLL  
 WENCK ASSOCIATES INC  
 1800 PIONEER CRK CTR  
 MAPLE PLAIN MN 55359-9000

Report Date: 22 May 07  
 Lab Number: 07-A15440  
 Work Order #: 12-4795  
 Account #: 013173  
 Sample Matrix: SURFACE WATER  
 Date Sampled: 24 Apr 07 13:30  
 Date Received: 24 Apr 07 16:30  
 PO #: 002-107

Project Number: 0002-107  
 Sample Description: CR 0.1

Temp at Receipt: 4.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					2 May 07	DAP
BOD, Carbonaceous	2	mg/L	2	SM 5210B	25 Apr 07 14:41	JED
CBOD, 40 Day	Not Entered		2	SM 5210B		
CBOD, 20 Day	8	mg/L	2	SM 5210B	25 Apr 07 17:39	AKF
Solids, Total Suspended	7	mg/L	2	USGS I-3765-85	25 Apr 07 11:50	JED
Carbon, Total Organic	8.8	mg/L	0.5	415.1	27 Apr 07 10:30	Bis
Chlorophyll a	5.9	mg/cubic m	1.0	10200H	2 May 07 7:05	JD
Fecal Coliform, MF	< 10	CFU/100 mL	10.	SM 9222D 18th Ed	24 Apr 07 19:00	ES
Chloride	18.3	mg/L	3.0	325.2	30 Apr 07 15:48	DAP
Nitrate+Nitrite	0.30	mg/L as N	0.20	353.2	25 Apr 07 15:39	DAP
Nitrogen, Ammonia	< 0.16	mg/L	0.16	4500 NH3 B, E	2 May 07 10:45	TAM
Phosphorus, Total	0.040	mg/L	0.005	EPA 365.1	2 May 07 9:36	DAP
Phosphorus, Ortho	< 0.005	mg/L	0.005	EPA 365.1	25 Apr 07 7:20	DAP
Nitrogen, Total Kjeldahl	0.9	mg/L	0.2	SM 4500NorgB/NH3 E	2 May 07 6:30	TAM

CFU = Colony Forming Units

Data Set: \_\_\_\_\_  
 Entered By/Date: JT 7/19/07  
 QA/QC By/Date: WB 10/19/07

RL = Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix  
 ! = Due to sample quantity

# = Due to sample concentration  
 . = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND NW/DW # R-040 IA LAB #: 132 IA LAB #: 022

**MINNESOTA VALLEY TESTING LABORATORIES, INC.**

**MVTL**

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WES BOLL  
 WENCK ASSOCIATES INC  
 1800 PIONEER CRK CTR  
 MAPLE PLAIN MN 55359-9000

Report Date: 8 Jun 07  
 Lab Number: 07-A18767  
 Work Order #: 12-5557  
 Account #: 013173  
 Sample Matrix: SURFACE WATER  
 Date Sampled: 9 May 07 8:30  
 Sampled By: WES BOLL  
 Date Received: 9 May 07 16:12  
 PO #: 0002-107

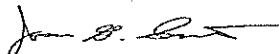
Project Number: 0002-107  
 Sample Description: CR 0.1

Temp at Receipt: 3.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					14 May 07	RMV
BOD, Carbonaceous	2	mg/L	2	SM 5210B	10 May 07 14:16	JED
CBOD, 20 Day	8	mg/L	2	SM 5210B	10 May 07 13:11	AKF
Solids, Total Suspended	24	mg/L	2	USGS I-3765-85	10 May 07 10:50	CJL
Carbon, Total Organic	8.0	mg/L	0.5	415.1	5 Jun 07 16:30	Bis
Chlorophyll a	2.8	mg/cubic m	1.0	10200H	11 May 07 8:31	JD
Fecal Coliform, MF	* 40	CFU/100 mL	10.	SM 9222D 18th Ed	9 May 07 18:05	ES
Chloride	22.5	mg/L	3.0	325.2	16 May 07 15:57	DAP
Nitrate+Nitrite	0.33	mg/L as N	0.20	353.2	14 May 07 7:22	RMV
Nitrogen, Ammonia	< 0.16	mg/L	0.16	4500 NH3 B, E	15 May 07 7:20	TAM
Phosphorus, Total	0.035	mg/L	0.005	EPA 365.1	17 May 07 7:59	DAP
Phosphorus, Ortho	< 0.005	mg/L	0.005	EPA 365.1	10 May 07 10:06	DAP
Nitrogen, Total Kjeldahl	1.6	mg/L	0.2	SM 4500NorgB/NH3 E	16 May 07 6:55	TAM

CFU = Colony Forming Units

\* Holding time Exceeded

Approved by:   
 Jason G. Smith, Inorganic  
 Laboratory Manager New Ulm, MN

Data Set: \_\_\_\_\_  
 Entered By/Date: JT 7/19/07  
 QA/QC By/Date: WB 10/9/07

RL = Reporting Limit

Elevated "Less Than Result" (L): \* = Due to sample matrix # = Due to sample concentration  
 † = Due to sample quantity † = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND HW/DW # R-040 IA LAB #: 13V IA LAB #: 022



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WES BOLL  
WENCK ASSOCIATES INC  
1800 PIONEER CRK CTR  
MAPLE PLAIN MN 55359-9000

Report Date: 14 Jun 07  
Lab Number: 07-A21656  
Work Order #: 12-6194  
Account #: 013173  
Sample Matrix: SURFACE WATER  
Date Sampled: 23 May 07 9:15  
Sampled By: NICK C  
Date Received: 23 May 07 15:55  
PO #: CRWD TMDL

Project Name: CRWD TMDL

Sample Description: CR 0.1

Temp at Receipt: 4.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					29 May 07	AKW
BOD, Carbonaceous	2	mg/L	2	SM 5210B	24 May 07 11:40	JED
CBOD, 20 Day	9	mg/L	2	SM 5210B	24 May 07 11:12	JED
Solids, Total Suspended	< 2	mg/L	2	USGS I-3765-85	24 May 07 9:45	CJL
Carbon, Total Organic	7.0	mg/L	0.5	415.1	6 Jun 07 8:00	Bis
Fecal Coliform, MF	* 120	CFU/100 mL	10.	SM 9222D 18th Ed	23 May 07 17:55	JLS
Chloride	19.9	mg/L	3.0	325.2	25 May 07 13:13	AKW
Nitrate+Nitrite	0.20	mg/L as N	0.20	353.2	25 May 07 11:26	RMV
Nitrogen, Ammonia	< 0.16	mg/L	0.16	4500 NH3 B, E	25 May 07 7:00	TAM
Phosphorus, Total	0.023	mg/L	0.005	EPA 365.1	31 May 07 15:26	DAP
Phosphorus, Ortho	< 0.005	mg/L	0.005	EPA 365.1	24 May 07 6:26	JGS
Nitrogen, Total Kjeldahl	1.0	mg/L	0.2	SM 4500NorgB/NH3 E	30 May 07 8:45	EJP

CFU = Colony Forming Units

\* Holding time Exceeded

Data Set: \_\_\_\_\_

Entered By/Date: JT 7/9/07

QA/QC By/Date: WB 10/9/07

*Chlor-A -> Not tested for*

Approved by: Jason G. Smith  
Jason G. Smith, Inorganic  
Laboratory Manager New Ulm, MN

Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration  
! = Due to sample quantity + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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WES BOLL  
 WENCK ASSOCIATES INC  
 1800 PIONEER CRK CTR  
 MAPLE PLAIN MN 55359-9000

Report Date: 21 Jun 07  
 Lab Number: 07-A23070  
 Work Order #: 12-6461  
 Account #: 013173  
 Sample Matrix: SURFACE WATER  
 Date Sampled: 30 May 07 8:45  
 Sampled By: NICK C  
 Date Received: 30 May 07 16:00  
 PO #: 0002-107

Temp at Receipt: 1.0C

Sample Description: CR 0.1

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					4 Jun 07	AKW
BOD, Carbonaceous	2	mg/L	2	SM 5210B	31 May 07 11:25	CJL
CBOD, 20 Day	5	mg/L	2	SM 5210B	31 May 07 11:04	CJL
Solids, Total Suspended	10	mg/L	2	USGS I-3765-85	31 May 07 10:10	JED
Carbon, Total Organic	7.0	mg/L	0.5	415.1	8 Jun 07 16:00	Bis
Chlorophyll a	10.2	mg/cubic m	1.0	10200H	1 Jun 07 13:07	JD
Fecal Coliform, MF	* 150	CFU/100 mL	10.	SM 9222D 18th Ed	30 May 07 17:10	ES
Chloride	21.1	mg/L	3.0	325.2	31 May 07 8:42	AKW
Nitrate+Nitrite	0.20	mg/L as N	0.20	353.2	4 Jun 07 8:14	RMV
Nitrogen, Ammonia	< 0.16	mg/L	0.16	4500 NH3 B, E	4 Jun 07 9:25	TAM
Phosphorus, Total	0.022	mg/L	0.005	EPA 365.1	5 Jun 07 8:07	RMV
Phosphorus, Ortho	< 0.005	mg/L	0.005	EPA 365.1	31 May 07 8:12	DAP
Nitrogen, Total Kjeldahl	1.0	mg/L	0.2	SM 4500NorgB/NH3 E	4 Jun 07 8:10	EJP

U = Colony Forming Units

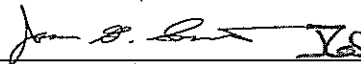
\* Holding time Exceeded

Data Set: \_\_\_\_\_

Entered By/Date: JT 7/9/07

QA/QC By/Date: WB 10/9/07

Approved by:

  
 Jason G. Smith, Inorganic  
 Laboratory Manager New Ulm, MN

### Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix  
 ! = Due to sample quantity

# = Due to sample concentration  
 + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND NW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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WES BOLL  
WENCK ASSOCIATES INC  
1800 PIONEER CRK CTR  
MAPLE PLAIN MN 55359-9000

Report Date: 29 Jun 07  
Lab Number: 07-A24666  
Work Order #: 12-6814  
Account #: 013173  
Sample Matrix: SURFACE WATER  
Date Sampled: 6 Jun 07 8:50  
Sampled By: NICK C  
Date Received: 6 Jun 07 16:00  
PO #: CRWD TMDL

Project Name: CRWD TMDL

Sample Description: CR 0.1

Temp at Receipt: 5.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					7 Jun 07	AKW
BOD, Carbonaceous	3	mg/L	2	SM 5210B	7 Jun 07 11:43	JED
CBOD, 20 Day	7	mg/L	2	SM 5210B	7 Jun 07 11:29	JED
Solids, Total Suspended	25	mg/L	2	USGS I-3765-85	7 Jun 07 9:15	CJL
Carbon, Total Organic	9.0	mg/L	0.5	415.1	13 Jun 07 8:00	Bis
Chlorophyll a	3.7	mg/cubic m	1.0	10200H	12 Jun 07 9:45	AJK
Fecal Coliform, MF	* 73	CFU/100 mL	10.	SM 9222D 18th Ed	6 Jun 07 18:55	ES
Chloride	21.9	mg/L	3.0	325.2	11 Jun 07 10:37	AKW
Nitrate+Nitrite	< 0.2	mg/L as N	0.2	353.2	7 Jun 07 12:23	DAP
Nitrogen, Ammonia	< 0.16	mg/L	0.16	4500 NH3 B, E	11 Jun 07 9:15	TAM
Phosphorus, Total	0.042	mg/L	0.005	EPA 365.1	12 Jun 07 11:50	RMV
Phosphorus, Ortho	0.007	mg/L	0.005	EPA 365.1	7 Jun 07 7:23	RMV
Nitrogen, Total Kjeldahl	1.4	mg/L	0.2	SM 4500NorgB/NH3 E	8 Jun 07 13:00	EJP

U = Colony Forming Units

\* Holding time Exceeded

Data Set: \_\_\_\_\_

Entered By/Date: JT 7/9/07

QA/QC By/Date: WB 10/09/07

Approved by: Jason G. Smith  
Jason G. Smith, Inorganic  
Laboratory Manager New Ulm, MN

Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix  
! = Due to sample quantity

# = Due to sample concentration  
+ = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447600 ND MICRO # 1013-M ND WW/DH # R-040 IA LAB #: 132 IA LAB #: 022

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WES BOLL  
WENCK ASSOCIATES INC  
1800 PIONEER CRK CTR  
MAPLE PLAIN MN 55359-9000

Report Date: 29 Jun 07  
Lab Number: 07-A24669  
Work Order #: 12-6814  
Account #: 013173  
Sample Matrix: SURFACE WATER  
Date Sampled: 6 Jun 07  
Sampled By: NICK C  
Date Received: 6 Jun 07 16:00  
PO #: CRWD TMDL

Project Name: CRWD TMDL

Sample Description: FD 1

Temp at Receipt: 5.0C

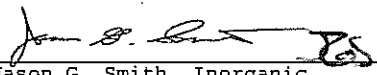
	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					7 Jun 07	AKW
BOD, Carbonaceous	2	mg/L	2	SM 5210B	7 Jun 07 11:43	JED
CBOD, 20 Day	7	mg/L	2	SM 5210B	7 Jun 07 11:29	JED
Solids, Total Suspended	15	mg/L	2	USGS I-3765-85	7 Jun 07 9:15	CJL
Carbon, Total Organic	9.0	mg/L	0.5	415.1	13 Jun 07 8:00	Bis
Chlorophyll a	5.7	mg/cubic m	1.0	10200H	12 Jun 07 9:45	AJK
Fecal Coliform, MF	* 140	CFU/100 mL	10.	SM 9222D 10th Ed	6 Jun 07 18:55	ES
Chloride	21.6	mg/L	3.0	325.2	11 Jun 07 10:37	AKW
Nitrate+Nitrite	< 0.2	mg/L as N	0.2	353.2	7 Jun 07 12:23	DAP
Nitrogen, Ammonia	< 0.16	mg/L	0.16	4500 NH3 B, E	11 Jun 07 9:15	TAM
Phosphorus, Total	0.041	mg/L	0.005	EPA 365.1	12 Jun 07 11:51	RMV
Phosphorus, Ortho	< 0.005	mg/L	0.005	EPA 365.1	7 Jun 07 7:23	RMV
Nitrogen, Total Kjeldahl	1.4	mg/L	0.2	SM 4500NorgB/NH3 E	8 Jun 07 13:00	EJP

U = Colony Forming Units

\* Holding time Exceeded

\*\* No collection time supplied by the client.

Approved by:

  
Jason G. Smith, Inorganic  
Laboratory Manager New Ulm, MN

QA WB  
10/9/07

Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix  
! = Due to sample quantity

# = Due to sample concentration  
+ = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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WES BOLL
WENCK ASSOCIATES INC
1800 PIONEER CRK CTR
MAPLE PLAIN MN 55359-9000

Report Date: 12 Jul 07
Lab Number: 07-A27470
Work Order #: 12-7478
Account #: 013173
Sample Matrix: SURFACE WATER
Date Sampled: 20 Jun 07 8:55
Sampled By: NICK C
Date Received: 20 Jun 07 16:00
PO #: CLEARWATER

Temp at Receipt: 6.0C

Project Name: CLEARWATER
Project Number: 0002-108
Sample Description: CR 0.1

Table with 6 columns: As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Rows include various water quality tests like BOD, CBOD, Solids, Carbon, Chlorophyll, etc.

U = Colony Forming Units

\* Holding time Exceeded

Approved by: Jason G. Smith, Inorganic Laboratory Manager New Ulm, MN

Ent WB
7/25/07
QA
WB
10/10/07

Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration
! = Due to sample quantity + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447600 ND MICRO # 1013-M ND WH/DW # R-040 IA LAB #: 132 IA LAB #: 022

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WES BOLL  
 WENCK ASSOCIATES INC  
 1800 PIONEER CRK CTR  
 MAPLE PLAIN MN 55359-9000

Report Date: 24 Jul 07  
 Lab Number: 07-A29581  
 Work Order #: 12-7958  
 Account #: 013173  
 Sample Matrix: SURFACE WATER  
 Date Sampled: 2 Jul 07 9:00  
 Sampled By: NICK C  
 Date Received: 3 Jul 07 9:55

Project Name: CRWD TMDL  
 Project Number: 0002-107  
 Sample Description: CR 0.1

Temp at Receipt: 3.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					9 Jul 07	AKW
Water Digestions					9 Jul 07	JMS
BOD, Carbonaceous	< 2	mg/L	2	SM 5210B	3 Jul 07 14:14	JED
CBOD, 20 Day	12	mg/L	2	SM 5210B	3 Jul 07 14:27	JED
Solids, Total Suspended	< 2	mg/L	2	USGS I-3765-85	3 Jul 07 11:30	CJL
Carbon, Total Organic	7.5	mg/L	0.5	415.1	12 Jul 07 8:00	Bis
Chlorophyll a	< 1	mg/cubic m	1.0	10200H	10 Jul 07 7:35	JD
Nitrogen Total, Calculat	0.7	mg/L	NA	Calc	20 Jul 07 11:43	Calculated
Chloride	24.0	mg/L	3.0	325.2	9 Jul 07 15:20	AKW
Nitrate+Nitrite	< 0.2	mg/L as N	0.2	353.2	20 Jul 07 11:43	DAP
Nitrogen, Ammonia	< 0.16	mg/L	0.16	4500 NH3 B, E	5 Jul 07 7:15	TAM
Phosphorus, Total	0.018	mg/L	0.005	EPA 365.1	10 Jul 07 11:00	DAP
Phosphorus, Ortho	< 0.005	mg/L	0.005	EPA 365.1	3 Jul 07 18:57	DAP
Nitrogen, Total Kjeldahl	0.7	mg/L	0.2	SM 4500NorgB/NH3 E	9 Jul 07 5:40	TAM
Iron	0.133	mg/L	0.015	6010	9 Jul 07 15:44	CJR

Ent WB

7/26/07

QA

WB

10/9/07

Approved by: Jason G. Smith  
 Jason G. Smith, Inorganic  
 Laboratory Manager New Ulm, MN

Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration  
 ! = Due to sample quantity + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447660 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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WES BOLL  
WENCK ASSOCIATES INC  
1800 PIONEER CRK CTR  
MAPLE PLAIN MN 55359-9000

Report Date: 24 Jul 07  
Lab Number: 07-A29587  
Work Order #: 12-7958  
Account #: 013173  
Sample Matrix: SURFACE WATER  
Date Sampled: 2 Jul 07  
Sampled By: NICK C  
Date Received: 3 Jul 07 9:55

Project Name: CRWD TMDL  
Project Number: 0002-107  
Sample Description: FD-1

Temp at Receipt: 3.0C

*CRO-1*

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					9 Jul 07	AKW
Water Digestions					9 Jul 07	JMS
BOD, Carbonaceous	< 2	mg/L	2	SM 5210B	3 Jul 07 15:52	JED
CBOD, 20 Day	11	mg/L	2	SM 5210B	3 Jul 07 14:27	JED
Solids, Total Suspended	< 2	mg/L	2	USGS I-3765-85	3 Jul 07 11:30	CJL
Carbon, Total Organic	8.0	mg/L	0.5	415.1	12 Jul 07 8:00	Bis
Chlorophyll a	< 1	mg/cubic m	1.0	10200H	10 Jul 07 7:35	JD
Nitrogen Total, Calculat	1.0	mg/L	NA	Calc	20 Jul 07 12:00	Calculated
Chloride	25.1	mg/L	3.0	325.2	9 Jul 07 15:20	AKW
Nitrate+Nitrite	< 0.2	mg/L as N	0.2	353.2	20 Jul 07 12:00	DAP
Nitrogen, Ammonia	< 0.16	mg/L	0.16	4500 NH3 B, E	5 Jul 07 7:15	TAM
Phosphorus, Total	0.015	mg/L	0.005	EPA 365.1	10 Jul 07 11:14	DAP
Phosphorus, Ortho	< 0.005	mg/L	0.005	EPA 365.1	3 Jul 07 18:57	DAP
Phosphorus, Total Kjeldahl	1.0	mg/L	0.2	SM 4500NorgB/NH3 E	9 Jul 07 5:40	TAM
Phosphorus, Total Kjeldahl on	0.125	mg/L	0.015	6010	9 Jul 07 15:44	CJR

\*\* No collection time supplied by the client.

*Ent WB  
7/26/07*

Approved by:   
Jason G. Smith, Inorganic  
Laboratory Manager New Ulm, MN

*QA  
WB  
10/24/07*

Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration  
! = Due to sample quantity + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND NW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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WES BOLL  
WENCK ASSOCIATES INC  
1800 PIONEER CRK CTR  
MAPLE PLAIN MN 55359-9000

Report Date: 2 Aug 07  
Lab Number: 07-A31296  
Work Order #: 12-8261  
Account #: 013173  
Sample Matrix: SURFACE WATER  
Date Sampled: 11 Jul 07 8:45  
Sampled By: WES B  
Date Received: 11 Jul 07 15:50  
PO #: 0002-107

Project Number: 0002-107  
Sample Description: CR 0.1

Temp at Receipt: 0.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					13 Jul 07	AKW
Water Digestions					17 Jul 07	JMS
BOD, Carbonaceous	< 2	mg/L	2	SM 5210B	12 Jul 07 11:11	CJL
CBOD, 20 Day	14	mg/L	2	SM 5210B	12 Jul 07 11:24	CJL
Solids, Total Suspended	2	mg/L	2	USGS I-3765-85	12 Jul 07 9:30	JED
Carbon, Total Organic	9.50	mg/L	0.50	415.1	19 Jul 07 11:00	Bis
Chlorophyll a	1.3	mg/cubic m	1.0	10200H	17 Jul 07 9:43	JD
Fecal Coliform, MF	* 36	CFU/100 mL	10.	SM 9222D 20th Ed	11 Jul 07 19:00	ES
Nitrogen Total, Calculat	1.0	mg/L	NA	Calc	21 Jul 07 13:15	Calculated
Chloride	22.0	mg/L	3.0	325.2	23 Jul 07 14:11	AKW
Nitrate+Nitrite	< 0.2	mg/L as N	0.2	353.2	21 Jul 07 13:15	JGS
Nitrogen, Ammonia	< 0.16	mg/L	0.16	4500 NH3 B, E	16 Jul 07 11:45	EJP
Phosphorus, Total	0.019	mg/L	0.005	EPA 365.1	18 Jul 07 11:10	DAP
Phosphorus, Ortho	0.006	mg/L	0.005	EPA 365.1	12 Jul 07 8:18	DAP
Nitrogen, Total Kjeldahl	1.0	mg/L	0.2	SM 4500NorgB/NH3 E	16 Jul 07 15:00	EJP
Iron	0.080	mg/L	0.015	6010	18 Jul 07 11:37	CJR

Batch matrix spike and spike duplicate recoveries for Nitrate+Nitrite were outside MVTl 85-115% limit at 126% and 126%. Data reported based on acceptable spike duplication and known recovery.

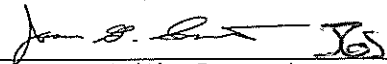
CFU = Colony Forming Units

\* Holding time Exceeded

Data Set: \_\_\_\_\_

Entered By/Date: WB 10/08/07

QA/QC By/Date: WB 10/09/07

Approved by:   
Jason G. Smith, Inorganic  
Laboratory Manager New Ulm, MN

Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration  
! = Due to sample quantity + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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WES BOLL
WENCK ASSOCIATES INC
1800 PIONEER CRK CTR
MAPLE PLAIN MN 55359-9000

Report Date: 2 Aug 07
Lab Number: 07-A31303
Work Order #: 12-8261
Account #: 013173
Sample Matrix: SURFACE WATER
Date Sampled: 11 Jul 07
Sampled By: WES B
Date Received: 11 Jul 07 15:50
PO #: 0002-107

Temp at Receipt: 0.0C

Project Number: 0002-107
Sample Description: FD 1

CRAI

Table with columns: As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Rows include Phosphorus Water Digest, Water Digestions, BOD, Carbonaceous, CBOD, 20 Day, Solids, Total Suspended, Carbon, Total Organic, Chlorophyll a, Fecal Coliform, MF, Nitrogen Total, Calculat Chloride, Nitrate+Nitrite, Nitrogen, Ammonia, Phosphorus, Total, Phosphorus, Ortho, Nitrogen, Total Kjeldahl, Iron.

CFU = Colony Forming Units

\* Holding time Exceeded

\*\* No collection time supplied by the client.

Data Set: \_\_\_\_\_

Entered By/Date: WB 10/08/07

QA/QC By/Date: WB 10/09/07

Approved by: Jason G. Smith, Inorganic Laboratory Manager New Ulm, MN

Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration
! = Due to sample quantity + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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WES BOLL  
WENCK ASSOCIATES INC  
1800 PIONEER CRK CTR  
MAPLE PLAIN MN 55359-9000

Report Date: 16 Aug 07  
Lab Number: 07-A33998  
Work Order #: 12-8817  
Account #: 013173  
Sample Matrix: SURFACE WATER  
Date Sampled: 25 Jul 07 8:55  
Sampled By: NICK C  
Date Received: 25 Jul 07 15:15  
PO #: CLEARWATER

Project Name: CLEARWATER TMDL

Sample Description: CR 0.1

Temp at Receipt: 4.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					28 Jul 07	AKW
Water Digestions					27 Jul 07	JMS
BOD, Carbonaceous	< 2	mg/L	2	SM 5210B	26 Jul 07 11:34	CJL
CBOD, 20 Day	10	mg/L	2	SM 5210B	26 Jul 07 12:00	CJL
Solids, Total Suspended	4	mg/L	2	USGS I-3765-85	26 Jul 07 9:45	JED
Carbon, Total Organic	7.50	mg/L	0.50	415.1	6 Aug 07 8:00	Bis
Chlorophyll a	< 1	mg/cubic m	1.0	10200H	31 Jul 07 9:09	JD
Nitrogen Total, Calculat	1.1	mg/L	NA	Calc	6 Aug 07 11:50	Calculated
Chloride	22.5	mg/L	3.0	325.2	3 Aug 07 10:59	AKW
Nitrate+Nitrite	< 0.2	mg/L as N	0.2	353.2	6 Aug 07 11:50	DAP
Nitrogen, Ammonia	< 0.16	mg/L	0.16	4500 NH3 B, E	1 Aug 07 11:50	EJP
Phosphorus, Total	0.015	mg/L	0.005	EPA 365.1	1 Aug 07 10:41	DAP
Phosphorus, Ortho	< 0.01	mg/L	0.005	EPA 365.1	26 Jul 07 8:41	DAP
Nitrogen, Total Kjeldahl	1.1	mg/L	0.2	SM 4500NorgB/NH3 E	26 Jul 07 9:50	EJP
Iron	0.137	mg/L	0.015	6010	30 Jul 07 12:37	CJR

Data Set: \_\_\_\_\_  
Entered By/Date: WB 10/08/07  
QA/QC By/Date: WB 10/09/07

Approved by: Jason G. Smith  
Jason G. Smith, Inorganic  
Laboratory Manager New Ulm, MN

Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration  
! = Due to sample quantity + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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WES BOLL  
WENCK ASSOCIATES INC  
1800 PIONEER CRK CTR  
MAPLE PLAIN MN 55359-9000

Report Date: 24 Sep 07  
Lab Number: 07-A36434  
Work Order #: 12-9361  
Account #: 013173  
Sample Matrix: SURFACE WATER  
Date Sampled: 8 Aug 07 9:45  
Sampled By: NICK C  
Date Received: 8 Aug 07 15:30  
PO #: CRWD TMDL

Project Name: CRWD TMDL

Sample Description: CR 0.1

Temp at Receipt: 3.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					10 Aug 07	KAD
BOD, Carbonaceous	2	mg/L	2	SM 5210B	9 Aug 07 11:30	CJL
CBOD, 40 Day	< 60	mg/L	2	SM 5210B	9 Aug 07 11:53	JED
CBOD, 20 Day	19	mg/L	2	SM 5210B	9 Aug 07 11:42	CJL
Solids, Total Suspended	2	mg/L	2	USGS I-3765-85	9 Aug 07 9:50	JED
Carbon, Total Organic	6.00	mg/L	0.50	415.1	16 Aug 07 8:00	Bis
Chlorophyll a	1.2	mg/cubic m	1.0	10200H	10 Aug 07 12:54	JD
Fecal Coliform, MF	* 2400	CFU/100 mL	10.	SM 9222D 20th Ed	8 Aug 07 16:40	JLS
Nitrogen Total, Calculat	0.7	mg/L	NA	Calc	13 Aug 07 14:28	Calculated
Chloride	24.7	mg/L	3.0	325.2	14 Aug 07 9:50	AKW
Nitrate+Nitrite	< 0.2	mg/L as N	0.2	353.2	13 Aug 07 14:28	DAP
Nitrogen, Ammonia	< 0.16	mg/L	0.16	4500 NH3 B, E	10 Aug 07 8:35	EJP
Phosphorus, Total	0.017	mg/L	0.005	EPA 365.1	20 Aug 07 13:42	DAP
Phosphorus, Ortho	< 0.01	mg/L	0.005	EPA 365.1	9 Aug 07 8:31	DAP
Nitrogen, Total Kjeldahl	0.7	mg/L	0.2	SM 4500NorgB/NH3 E	10 Aug 07 15:00	EJP

RL for Ortho Phosphorus elevated to 0.01 mg/L due to reporting limit check falling outside method 60-140% acceptance limit at 0.005 mg/L.

CFU = Colony Forming Units

\* Holding time Exceeded

Data Ser: \_\_\_\_\_  
Entered By/Date: WB 10/08/07  
QA/QC By/Date: WB 10/09/07

Approved by: Jason G. Smith  
Jason G. Smith, Inorganic  
Laboratory Manager New Ulm, MN

Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix  
! = Due to sample quantity

# = Due to sample concentration  
+ = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447660 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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WES BOLL  
WENCK ASSOCIATES INC  
1800 PIONEER CRK CTR  
MAPLE PLAIN MN 55359-9000

Report Date: 24 Sep 07  
Lab Number: 07-A36440  
Work Order #: 12-9361  
Account #: 013173  
Sample Matrix: SURFACE WATER  
Date Sampled: 8 Aug 07  
Sampled By: NICK C  
Date Received: 8 Aug 07 15:30  
PO #: CRWD TMDL

Temp at Receipt: 3.0C

Project Name: CRWD TMDL

Sample Description: FD-1

*CRO.1*

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					10 Aug 07	KAD
BOD, Carbonaceous	< 2	mg/L	2	SM 5210B	9 Aug 07 11:30	CJL
CBOD, 20 Day	4	mg/L	2	SM 5210B	9 Aug 07 11:42	CJL
Solids, Total Suspended	3	mg/L	2	USGS I-3765-85	9 Aug 07 9:50	JED
Carbon, Total Organic	5.50	mg/L	0.50	415.1	16 Aug 07 8:00	Bis
Chlorophyll a	< 1	mg/cubic m	1.0	10200H	10 Aug 07 12:54	JD
Fecal Coliform, MF	* 3000	CFU/100 mL	10.	SM 9222D 20th Ed	8 Aug 07 16:40	JLS
Nitrogen Total, Calculat	0.6	mg/L	NA	Calc	14 Aug 07 8:15	Calculated
Chloride	24.3	mg/L	3.0	325.2	14 Aug 07 10:04	AKW
Nitrate+Nitrite	< 0.2	mg/L as N	0.2	353.2	13 Aug 07 14:44	DAP
Nitrogen, Ammonia	< 0.16	mg/L	0.16	4500 NH3 B, E	14 Aug 07 9:15	EJP
Phosphorus, Total	0.016	mg/L	0.005	EPA 365.1	20 Aug 07 13:42	DAP
Phosphorus, Ortho	< 0.01	mg/L	0.005	EPA 365.1	9 Aug 07 8:31	DAP
rogen, Total Kjeldahl	0.6	mg/L	0.2	SM 4500NorgB/NH3 E	14 Aug 07 8:15	EJP

RL for Ortho Phosphorus elevated to 0.01 mg/L due to reporting limit check falling outside method 60-140% acceptance limit at 0.005 mg/L.

CFU = Colony Forming Units

\* Holding time Exceeded

\*\* No collection time supplied by the client.

Data Set: \_\_\_\_\_

Entered By/Date: WB 10/08/07

QA/QC By/Date: WB 10/09/07

Approved by:

Jason G. Smith, Inorganic  
Laboratory Manager New Ulm, MN

Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix  
! = Due to sample quantity

# = Due to sample concentration  
+ = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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SEP 17 2007

Report Date: 13 Sep 07  
Lab Number: 07-A39071  
Work Order #: 12-9964  
Account #: 013173  
Sample Matrix: SURFACE WATER  
Date Sampled: 22 Aug 07 9:00  
Sampled By: NICK C  
Date Received: 22 Aug 07 15:20  
PO #: CRWD TMDL

WES BOLL  
WENCK ASSOCIATES INC  
1800 PIONEER CRK CTR  
MAPLE PLAIN MN 55359-9000

WENCK ASSOCIATES, INC.

Project Name: CRWD TMDL

Sample Description: CR 0.1

Temp at Receipt: 3.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					24 Aug 07	KAD
BOD, Carbonaceous	2	mg/L	2	SM 5210B	23 Aug 07 13:56	CJL
CBOD, 20 Day	7	mg/L	2	SM 5210B	23 Aug 07 14:10	CJL
Solids, Total Suspended	< 2	mg/L	2	USGS I-3765-85	23 Aug 07 10:30	JED
Carbon, Total Organic	10.50	mg/L	0.50	415.1	29 Aug 07 8:00	Bis
Chlorophyll a	3.2	mg/cubic m	1.0	10200H	24 Aug 07 9:14	JD
Fecal Coliform, MF	* 910	CFU/100 mL	10.	SM 9222D 20th Ed	22 Aug 07 18:55	MKG
Nitrogen Total, Calculat	0.7	mg/L	NA	Calc	28 Aug 07 14:45	Calculated
Chloride	22.5	mg/L	3.0	325.2	27 Aug 07 14:27	DAP
Nitrate+Nitrite	< 0.2	mg/L as N	0.2	353.2	28 Aug 07 12:47	DAP
Nitrogen, Ammonia	< 0.16	mg/L	0.16	4500 NH3 B, E	29 Aug 07 9:45	TAM
Phosphorus, Total	0.016	mg/L	0.005	EPA 365.1	31 Aug 07 12:14	DAP
Phosphorus, Ortho	< 0.01	mg/L	0.005	EPA 365.1	23 Aug 07 8:56	DAP
Nitrogen, Total Kjeldahl	0.7	mg/L	0.2	SM 4500NorgB/NH3 E	28 Aug 07 14:45	TAM

Elevated RL for Ortho Phosphorus due to RL check failure at 0.005 mg/L.

CFU = Colony Forming Units

\* Holding time Exceeded

Data Set: \_\_\_\_\_

Entered By/Date: WB 10/08/07

QA/QC By/Date: WB 10/09/07

Approved by:   
Jason G. Smith, Inorganic  
Laboratory Manager New Ulm, MN

Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration  
! = Due to sample quantity + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447660 ND MICRO # 1013-M ND WW/DH # R-040 IA LAB #: 13C IA LAB #: 022

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www.mvttl.com



Page: 1 of 1

WES BOLL  
WENCK ASSOCIATES INC  
1800 PIONEER CRK CTR  
MAPLE PLAIN MN 55359-9000

Report Date: 13 Sep 07  
Lab Number: 07-A39077  
Work Order #: 12-9964  
Account #: 013173  
Sample Matrix: SURFACE WATER  
Date Sampled: 22 Aug 07  
Sampled By: NICK C  
Date Received: 22 Aug 07 15:20  
PO #: CRWD TMDL

Temp at Receipt: 3.0C

Project Name: CRWD TMDL

Sample Description: FD-1

*CRO.1*

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					24 Aug 07	KAD
BOD, Carbonaceous	2	mg/L	2	SM 5210B	23 Aug 07 13:56	CJL
CBOD, 20 Day	5	mg/L	2	SM 5210B	23 Aug 07 14:10	CJL
Solids, Total Suspended	4	mg/L	2	USGS I-3765-85	23 Aug 07 12:00	JED
Carbon, Total Organic	9.50	mg/L	0.50	415.1	29 Aug 07 8:00	Bis
Chlorophyll a	2.8	mg/cubic m	1.0	10200H	24 Aug 07 9:14	JD
Fecal Coliform, MF	* 180	CFU/100 mL	10.	SM 9222D 20th Ed	22 Aug 07 18:55	MKG
Nitrogen Total, Calculat	0.7	mg/L	NA	Calc	28 Aug 07 14:45	Calculated
Chloride	22.1	mg/L	3.0	325.2	27 Aug 07 14:27	DAP
Nitrate+Nitrite	< 0.2	mg/L as N	0.2	353.2	28 Aug 07 12:47	DAP
Nitrogen, Ammonia	< 0.16	mg/L	0.16	4500 NH3 B, E	29 Aug 07 9:45	TAM
Phosphorus, Total	0.017	mg/L	0.005	EPA 365.1	29 Aug 07 13:11	DAP
Phosphorus, Ortho	< 0.01	mg/L	0.005	EPA 365.1	23 Aug 07 8:56	DAP
Nitrogen, Total Kjeldahl	0.7	mg/L	0.2	SM 4500NorgB/NH3 E	28 Aug 07 14:45	TAM

Elevated RL for Ortho Phosphorus due to RL check failure at 0.005 mg/L.

CFU = Colony Forming Units

\* Holding time Exceeded

\*\* No collection time supplied by the client.

Data Set: \_\_\_\_\_

Entered (by/Date):

*WB 10/08/07*

QA/QC by (Date):

*WB 10/09/07*

Approved by:

*[Signature]*  
Jason G. Smith, Inorganic  
Laboratory Manager New Ulm, MN

Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix  
! = Due to sample quantity

# = Due to sample concentration  
+ = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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# Field Form: 2007 Stream Sampling

*# Duplicate*

Client: CRWD  
 Project No.: 0002-107  
 Date: 4/24/07  
 Sampler(s): WB/NC  
 Start Time: 12:40  
 End Time: \_\_\_\_\_  
 Channel Conditions: flowing  
 COC Number: \_\_\_\_\_

Site Location: CR 1.4  
 Site Description: \_\_\_\_\_  
 Weather: 60° Pt. cloudy  
 Samples Taken:  Yes  No  
 Sample Time: 12:55

DTW Measurement: 10.14  
*-top middle of downstream culvert*  
 Notes: Duplicate sample taken at this site.

Field Parameters				
Sample I.D.	Temp. (°C)	Cond. (mS/cm)	D.O. (mg/l)	pH (S.U.)
	<u>13.50</u>	<u>427</u>	<u>10.27</u>	<u>8.18</u>

Stage Ht: \_\_\_\_\_

Rated Flow: \_\_\_\_\_

Gauged Flow: 179.36

### Stream Gauging Data

Distance from Initial Point (ft)	Width (ft)	Depth (ft)	Velocity (60% Depth)	Velocity		Average Velocity (ft/sec)	Area (ft <sup>2</sup> )	Discharge (Q, ft <sup>3</sup> /sec)
				20% Depth	80% Depth			
0, (left side)								
		<i>-water is flowing very fast -gauged downstream of culvert</i>						

Data Set: \_\_\_\_\_  
 Entered By: JT Date: 7/9/07  
 QA/QC By: WB Date: 10/2/07

Clearwater River TMDL  
Dye Study

4/25/07 13:30 0.135, 0.083, 0.012

Site Name	Date	Time	Concentration	Sample Type	Notes
CR 1.4	4/25/07	2:50	0.071, 0.059, 0.039	Grab	NO. red dye
		3:05	0.056, 0.024, 0.171		
		3:20	0.011, 0.029, 0.024		
		3:35	0.054, 0.167, 0.197		
		3:50	0.525, 0.645, 0.537		
		4:05	0.068, 0.011, 0.030		
		4:20	3.795, 3.849, 3.863		
		4:35	11.68, 11.71, 11.72		
		4:50	15.81, 15.77, 15.80		
		5:05	13.50, 13.58, 13.51		
		5:20	11.59, 11.54, 11.74		
		5:35	6.942, 6.973, 6.780		
		<del>5:45</del>			
		5:50	5.295, 5.220, 5.208		

started to see hints of red  
Peak darkens

getting much lighter  
very little dye noted

Field Form: 2007 Stream Sampling

Client: CRWD  
Project No.: 0002-107  
Date: 5/9/07  
Sampler(s): NIK/WB  
Start Time: 8:40  
End Time: 9:05  
Channel Conditions: Flowing  
COC Number:

Site Location: CR 1.4  
Site Description: CR at CR145  
Weather: Sunny 60°  
Samples Taken: (Yes) No  
Sample Time: 8.55  
DTW Measurement: 10.56

Sample I.D.	Temp. (°C)	Cond. (mS/cm)	D.O. (mg/l)	pH (S.U.)
	15.05	483	8.58	7.96

Notes:

Stage Ht: \_\_\_\_\_ Rated Flow: \_\_\_\_\_ Gauged Flow: 147.73 cfs

Stream Gauging Data

Distance from Initial Point (ft)	Width (ft)	Depth (ft)	Velocity (60% Depth)	Velocity		Average Velocity (ft/sec)	Area (ft <sup>2</sup> )	Discharge (Q, ft <sup>3</sup> /sec)
				20% Depth	80% Depth			
0, (left side)								

Data Set: \_\_\_\_\_  
Entered By/Date: JT 5/9/07  
QA/QC By/Date: \_\_\_\_\_

# Field Form: 2007 Stream Sampling

*\*Duplicate Site*

Client: CRWD

Project No.: 0002-107

Date: 5.23.07

Sampler(s): Niel WB

Start Time: 9:35

End Time: 1000

Channel Conditions: flowing

COC Number: \_\_\_\_\_

Site Location: CR 14

Site Description: cloudy 65°

Weather: CR west of I-99 at CR 145

Samples Taken:  Yes  No

Sample Time: 0945

DTW Measurement: 11.41

Field Parameters				
Sample I.D.	Temp. (°C)	Cond. (mS/cm)	D.O. (mg/l)	pH (S.U.)
	18.12	442	7.65	8.10

Notes: -water level receding

Stage Ht: \_\_\_\_\_ Rated Flow: \_\_\_\_\_ Gauged Flow: 60.548

### Stream Gauging Data

Distance from Initial Point (ft)	Width (ft)	Depth (ft)	Velocity (60% Depth)	Velocity		Average Velocity (ft/sec)	Area (ft²)	Discharge (Q, ft³/sec)
				20% Depth	80% Depth			
0, (left side)								

Data Set: \_\_\_\_\_

Entered By/Date: JT 7/9/07

QA/QC By/Date: NWB 10/9/07

Field Form: 2007 Stream Sampling

Duplicate

Client: CRWD

Project No.: 0002-107

Date: 5.30.07

Sampler(s): Nic/Jess

Start Time: 9:17

End Time: 9:53

Channel Conditions: Flowing

COC Number: \_\_\_\_\_

Site Location: CR 1.4

Site Description: Clearwater River upstream of I-94

Weather: Sunny 75° CCO: 145

Samples Taken: (Yes) No

Sample Time: 9:34 78°

DTW Measurement: 4.50

Field Parameters				
Sample I.D.	Temp. (°C)	Cond. (mS/cm)	D.O. (mg/l)	pH (S.U.)
	19.20	440	<del>9.12</del>	8.01

9.12

Stage Ht: \_\_\_\_\_

Rated Flow: \_\_\_\_\_

Gauged Flow: 60.86

Notes: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Stream Gauging Data

Distance from Initial Point (ft)	Width (ft)	Depth (ft)	Velocity (60% Depth)	Velocity		Average Velocity (ft/sec)	Area (ft²)	Discharge (Q, ft³/sec)
				20% Depth	80% Depth			
0, (left side)								

Entered By/Date: JT 7/9/07

QA/QC By/Date: WB 10/09/07

**Field Form: 2007 Stream Sampling**

Client: CRWD  
Project No.: 0002-107  
Date: 6-4-07  
Sampler(s): Nic/Jess  
Start Time: 9:00  
End Time: 9:25  
Channel Conditions: Flowing  
COC Number: \_\_\_\_\_

Site Location: CE 1.4  
Site Description: Clearwater River upstream of I-94  
Weather: ☁ Overcast Clouded  
Samples Taken:  Yes  No 145  
Sample Time: 9:12  
DTW Measurement: 10.82

Field Parameters				
Sample I.D.	Temp. (°C)	Cond. (mS/cm)	D.O. (mg/l)	pH (S.U.)
	<u>15.2</u>		<u>7.60</u>	

Notes: Very strong current, high water.

Stage Ht: \_\_\_\_\_ Rated Flow: \_\_\_\_\_ Gauged Flow: 183.0 ~~113~~

**Stream Gauging Data**

Distance from Initial Point (ft)	Width (ft)	Depth (ft)	Velocity (60% Depth)	Velocity-		Average Velocity (ft/sec)	Area (ft²)	Discharge (Q, ft³/sec)
				20% Depth	80% Depth			
<u>0, (left side)</u>								

Date Set: \_\_\_\_\_  
Entered By/Date: JT 7/9/07  
QA/QC By/Date: WB 10/9/07



*Duplicate*

### Field Form: 2007 Stream Sampling

Client: CRWD  
Project No.: 0002-107  
Date: 6-20-07  
Sampler(s): Nick Jess  
Start Time: 9:10  
End Time: 9:35  
Channel Conditions: Flowing  
COC Number: \_\_\_\_\_

Site Location: CZ 1.4  
Site Description: CZ @ upstream of I-94/accord 145  
Weather: Sunny 70°  
Samples Taken:  Yes  No  
Sample Time: 9:20  
DTW Measurement: 11.58

Notes: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Field Parameters				
Sample I.D.	Temp. (°C)	Cond. (mS/cm)	D.O. (mg/l)	pH (S.U.)
	19.52	305	7.15	8.11

Stage Ht: \_\_\_\_\_

Rated Flow: \_\_\_\_\_

Gauged Flow: ~~44.315~~ 44.315

#### Stream Gauging Data

Distance from Initial Point (ft)	Width (ft)	Depth (ft)	Velocity (60% Depth)	Velocity-		Average Velocity (ft/sec)	Area (ft²)	Discharge (Q, ft³/sec)
				20% Depth	80% Depth			
0, (left side)								

Data Ser: \_\_\_\_\_  
Entered By/Date: JT 7/9/07  
QA/QC By/Date: WB 10/9/07

### Field Form: 2007 Stream Sampling

Client:	<u>CRWD</u>	Site Location:	<u>CR 1.4</u>
Project No.:	<u>0002-107</u>	Site Description:	_____
Date:	<u>7.2.07</u>	Weather:	<u>overcast 65°</u>
Sampler(s):	<u>YIC</u>	Samples Taken:	<input checked="" type="radio"/> Yes <input type="radio"/> No
Start Time:	<u>8 920</u>	Sample Time:	<u>930</u>
End Time:	<u>0940</u>		
Channel Conditions:	<u>flowing</u>	DTW Measurement:	<u>11.96</u>
COC Number:	_____		

Notes: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Field Parameters				
Sample I.D.	Temp. (°C)	Cond. (mS/cm)	D.O. (mg/l)	pH (S.U.)
	<u>21.05</u>	<u>398</u>	<u>6.51</u>	<u>8.23</u>

Stage Ht: \_\_\_\_\_      Rated Flow: \_\_\_\_\_      Gauged Flow: 11.708  
~~11.708~~ cfs

#### Stream Gauging Data

Distance from Initial Point (ft)	Width (ft)	Depth (ft)	Velocity (60% Depth)	Velocity		Average Velocity (ft/sec)	Area (ft <sup>2</sup> )	Discharge (Q, ft <sup>3</sup> /sec)
				20% Depth	80% Depth			
0, (left side)								

Data Set: \_\_\_\_\_  
 Entered By/Date: WB  
 QA/QC By/Date: WB 10/01/07

## Field Form: 2007 Stream Sampling

Client: <u>CRWD</u>	Site Location: <u>CR 1.4</u>
Project No.: <u>0002-107</u>	Site Description: _____
Date: <u>7.11.07</u>	Weather: <u>Sunny 70°</u>
Sampler(s): <u>NK</u>	Samples Taken: <input checked="" type="radio"/> Yes <input type="radio"/> No
Start Time: <u>9:20</u>	Sample Time: <u>09:30</u>
End Time: _____	
Channel Conditions: <u>flowing</u>	DTW Measurement: <u>11.74</u>
COC Number: _____	

Notes: \_\_\_\_\_

Field Parameters				
Sample I.D.	Temp. (°C)	Cond. (mS/cm)	D.O. (mg/l)	pH (S.U.)
	<u>14.58</u>	<u>378</u>	<u>7.89</u>	<u>8.25</u>

Stage Ht: \_\_\_\_\_ Rated Flow: \_\_\_\_\_ Gauged Flow: 24.439

### Stream Gauging Data

Distance from Initial Point (ft)	Width (ft)	Depth (ft)	Velocity (60% Depth)	Velocity		Average Velocity (ft/sec)	Area (ft <sup>2</sup> )	Discharge (Q, ft <sup>3</sup> /sec)
				20% Depth	80% Depth			
0, (left side)								

Data Set: \_\_\_\_\_  
 Entered By/ Date: WB 7/12/07  
 QA/QC By/ Date: WB 10/11/07

### Field Form: 2007 Stream Sampling

Client: CRWD  
 Project No.: 0002-107  
 Date: 7.25.07  
 Sampler(s): Jess/Nic  
 Start Time: 9:23  
 End Time: 9:45  
 Channel Conditions: Flowing  
 COC Number:   

Site Location: CL 1.4  
 Site Description: Clearwater River downstream @  
 Weather: 85° Sunny  
 Samples Taken:  Yes  No  
 Sample Time: 9:35  
 DTW Measurement: 11.89

107-94 Co.  
Ldj  
145

Notes: detergent pad  
placed clear, slow  
water. @

Field Parameters				
Sample I.D.	Temp. (°C)	Cond. (mS/cm)	D.O. (mg/l)	pH (S.U.)
	24.06	.414	6.51	8.22

Stage Ht: \_\_\_\_\_ Rated Flow: \_\_\_\_\_ Gauged Flow: 8.62 cfs

#### Stream Gauging Data

Distance from Initial Point (ft)	Width (ft)	Depth (ft)	Velocity (60% Depth)	Velocity		Average Velocity (ft/sec)	Area (ft <sup>2</sup> )	Discharge (Q, ft <sup>3</sup> /sec)
				20% Depth	80% Depth			

Data Set: \_\_\_\_\_  
 Entered By/Date: WB 7/25/07  
 O/WOC By/Date: WB 10/09/07

## Field Form: 2007 Stream Sampling

Client: <u>CRWD</u>	Site Location: <u>CR 1.4</u>
Project No.: <u>0002-107</u>	Site Description: <u>''</u>
Date: <u>8.8.07</u>	Weather: <u>Sunny 75°</u>
Sampler(s): <u>NIC</u>	Samples Taken: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Start Time: <u>1030</u>	Sample Time: <u>1045</u>
End Time: <u>1110</u>	
Channel Conditions: <u>Slough</u>	DTW Measurement: <u>11.97</u>
COC Number: _____	

Notes: Very clear water, cold water

Field Parameters				
Sample I.D.	Temp. (°C)	Cond. (mS/cm)	D.O. (mg/l)	pH (S.U.)
	<u>21.36</u>	<u>478</u>	<u>7.21</u>	<u>8.40</u>

Stage Ht: \_\_\_\_\_ Rated Flow: \_\_\_\_\_ Gauged Flow: 5.559

### Stream Gauging Data

Distance from Initial Point (ft)	Width (ft)	Depth (ft)	Velocity (60% Depth)	Velocity		Average Velocity (ft/sec)	Area (ft²)	Discharge (Q, ft³/sec)
				20% Depth	80% Depth			
0, (left side)								

Data Set: \_\_\_\_\_  
 Entered By/Date: NB 10/08/07  
 QA/QC By/Date: NB 10/09/07

## Field Form: 2007 Stream Sampling

Client: CRWD  
 Project No.: 0002-107  
 Date: 8.22.07  
 Sampler(s): NIC  
 Start Time: 0915  
 End Time: 0945  
 Channel Conditions: flowing  
 COC Number: \_\_\_\_\_

Site Location: CR 1.4  
 Site Description: \_\_\_\_\_  
 Weather: overcast 70°  
 Samples Taken:  Yes  No  
 Sample Time: 0930  
 DTW Measurement: 11.11

Field Parameters				
Sample I.D.	Temp. (°C)	Cond. (mS/cm)	D.O. (mg/l)	pH (S.U.)
	21.00	552	7.62	8.01

Notes: Broke Gauge handle at this site. replace asap!

Stage Ht: \_\_\_\_\_ Rated Flow: \_\_\_\_\_ Gauged Flow: 45.749

### Stream Gauging Data

Distance from Initial Point (ft)	Width (ft)	Depth (ft)	Velocity (60% Depth)	Velocity		Average Velocity (ft/sec)	Area (ft <sup>2</sup> )	Discharge (Q, ft <sup>3</sup> /sec)
				20% Depth	80% Depth			
0, (left side)								

Data Set: WB 10/08/07  
 Entered By/Date: WB 10/09/07  
 QA/QC By/Date: WB 10/09/07

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PRELIMINARY REPORT

WES BOLL
WENCK ASSOCIATES INC
1800 PIONEER CRK CTR
MAPLE PLAIN MN 55359-9000

Report Date: 22 May 07
Lab Number: 07-A15438
Work Order #: 12-4795
Account #: 013173
Sample Matrix: SURFACE WATER
Date Sampled: 24 Apr 07 12:55
Date Received: 24 Apr 07 16:30
PO #: 002-107

Project Number: 0002-107
Sample Description: CR 1.4

Temp at Receipt: 4.0C

Table with 6 columns: Parameter, As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Rows include Phosphorus Water Digest, BOD, Carbonaceous, CBOD, 20 Day, Solids, Total Suspended, Carbon, Total Organic, Chlorophyll a, Fecal Coliform, MF, Chloride, Nitrate+Nitrite, Nitrogen, Ammonia, Phosphorus, Total, Phosphorus, Ortho, Nitrogen, Total Kjeldahl.

CFU = Colony Forming Units

\* Holding time Exceeded

Data Set:

Entered By/Date: JT 7/9/07

QA/QC By/Date: WB 10/9/07

PRELIMINARY REPORT: RESULTS ARE SUBJECT TO CHANGE PENDING FINAL APPROVAL OF DATA.

RL = Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration
! = Due to sample quantity + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-N ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

MVTL

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PRELIMINARY REPORT

WES BOLL
WENCK ASSOCIATES INC
1800 PIONEER CRK CTR
MAPLE PLAIN MN 55359-9000

Report Date: 22 May 07
Lab Number: 07-A15439
Work Order #:12-4795
Account #: 013173
Sample Matrix: SURFACE WATER
Date Sampled: 24 Apr 07
Date Received: 24 Apr 07 16:30
PO #: 002-107

Project Number: 0002-107
Sample Description: FD 1

Temp at Receipt: 4.0C

CR 1.4

Table with columns: As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Rows include Phosphorus Water Digest, BOD, Carbonaceous, CBOD, 20 Day, Solids, Total Suspended, Carbon, Total Organic, Chlorophyll a, Fecal Coliform, MF, Chloride, Nitrate+Nitrite, Nitrogen, Ammonia, Phosphorus, Total, Phosphorus, Ortho, Nitrogen, Total Kjeldahl.

CFU = Colony Forming Units

\* Holding time Exceeded

\*\* No collection time supplied by the client.

Data Ser:
Entered By/Date: JT 7/19/07
QA/QC By/Date: WB 10/19/07

PRELIMINARY REPORT: RESULTS ARE SUBJECT TO CHANGE PENDING FINAL APPROVAL OF DATA.

RL = Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration
! = Due to sample quantity \* = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022



MVTL

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WES BOLL
WENCK ASSOCIATES INC
1800 PIONEER CRK CTR
MAPLE PLAIN MN 55359-9000

Report Date: 8 Jun 07
Lab Number: 07-A18768
Work Order #:12-5557
Account #: 013173
Sample Matrix: SURFACE WATER
Date Sampled: 9 May 07 8:55
Sampled By: WES BOLL
Date Received: 9 May 07 16:12
PO #: 0002-107

Project Number: 0002-107
Sample Description: CR 1.4

Temp at Receipt: 3.0C

Table with columns: As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Rows include Phosphorus Water Digest, BOD, Carbonaceous, CBOD, 20 Day, Solids, Total Suspended, Carbon, Total Organic, Chlorophyll a, Fecal Coliform, MF Chloride, Nitrate+Nitrite, Nitrogen, Ammonia, Phosphorus, Total, Phosphorus, Ortho, Nitrogen, Total Kjeldahl.

CFU = Colony Forming Units

\* Holding time Exceeded

Approved by: Jason G. Smith, Inorganic Laboratory Manager New Ulm, MN

Received By/Date: JT 7/9/07
Analyzed By/Date: WB 10/9/07

RL = Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration
! = Due to sample quantity \* = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WQ/DW # R-040 IA LAB #: 132 IA LAB #: 022



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WES BOLL  
WENCK ASSOCIATES INC  
1800 PIONEER CRK CTR  
MAPLE PLAIN MN 55359-9000

Report Date: 14 Jun 07  
Lab Number: 07-A21655  
Work Order #: 12-6194  
Account #: 013173  
Sample Matrix: SURFACE WATER  
Date Sampled: 23 May 07 9:45  
Sampled By: NICK C  
Date Received: 23 May 07 15:55  
PO #: CRWD TMDL

Project Name: CRWD TMDL

Sample Description: CR 1.4

Temp at Receipt: 4.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					29 May 07	AKW
BOD, Carbonaceous	< 2	mg/L	2	SM 5210B	24 May 07 11:40	JED
CBOD, 20 Day	7	mg/L	2	SM 5210B	24 May 07 11:12	JED
Solids, Total Suspended	4	mg/L	2	USGS I-3765-85	24 May 07 9:45	CJL
Carbon, Total Organic	8.2	mg/L	0.5	415.1	6 Jun 07 8:00	Bis
Fecal Coliform, MF	* 1300	CFU/100 mL	10.	SM 9222D 18th Ed	23 May 07 17:55	JLS
Chloride	19.2	mg/L	3.0	325.2	25 May 07 13:13	AKW
Nitrate+Nitrite	0.21	mg/L as N	0.20	353.2	25 May 07 11:26	RMV
Nitrogen, Ammonia	< 0.16	mg/L	0.16	4500 NH3 B, E	25 May 07 7:00	TAM
Phosphorus, Total	0.023	mg/L	0.005	EPA 365.1	31 May 07 15:26	DAP
Phosphorus, Ortho	< 0.005	mg/L	0.005	EPA 365.1	24 May 07 6:26	JGS
Nitrogen, Total Kjeldahl	1.0	mg/L	0.2	SM 4500NorgB/NH3 E	30 May 07 8:45	EJP

CFU = Colony Forming Units

\* Holding time Exceeded

Data Set: \_\_\_\_\_

Entered By/Date: JT 7/9/07

QA/QC By/Date: WB 10/9/07

Chlor-A → Not tested for

Approved by: Jason G. Smith  
Jason G. Smith, Inorganic  
Laboratory Manager New Ulm, MN

Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration  
! = Due to sample quantity + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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WES BOLL  
WENCK ASSOCIATES INC  
1800 PIONEER CRK CTR  
MAPLE PLAIN MN 55359-9000

Report Date: 14 Jun 07  
Lab Number: 07-A21657  
Work Order #: 12-6194  
Account #: 013173  
Sample Matrix: SURFACE WATER  
Date Sampled: 23 May 07  
Sampled By: NICK C  
Date Received: 23 May 07 15:55  
PO #: CRWD TMDL

Temp at Receipt: 4.0C

Project Name: CRWD TMDL

Sample Description: FD 1

*CR1.4*

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					29 May 07	AKW
BOD, Carbonaceous	< 2	mg/L	2	SM 5210B	24 May 07 11:40	JED
CBOD, 20 Day	9	mg/L	2	SM 5210B	24 May 07 11:12	JED
Solids, Total Suspended	5	mg/L	2	USGS I-3765-85	24 May 07 9:45	CJL
Carbon, Total Organic	7.8	mg/L	0.5	415.1	6 Jun 07 8:00	Bis
Fecal Coliform, MF	* 1000	CFU/100 mL	10.	SM 9222D 18th Ed	23 May 07 17:55	JLS
Chloride	19.5	mg/L	3.0	325.2	25 May 07 13:13	AKW
Nitrate+Nitrite	0.21	mg/L as N	0.20	353.2	25 May 07 11:26	RMV
Nitrogen, Ammonia	< 0.16	mg/L	0.16	4500 NH3 B, E	25 May 07 7:00	TAM
Phosphorus, Total	0.023	mg/L	0.005	EPA 365.1	31 May 07 15:26	DAP
Phosphorus, Ortho	< 0.005	mg/L	0.005	EPA 365.1	24 May 07 7:27	JGS
Nitrogen, Total Kjeldahl	0.7	mg/L	0.2	SM 4500NorgB/NH3 E	30 May 07 8:45	EJP

\* = Colony Forming Units

\* Holding time Exceeded

\*\* No collection time supplied by the client.

Data Set: \_\_\_\_\_

Entered By/Date: WB 10/09/07

QA/QC By/Date: WB 10/09/07

*chlor-A: Not tested for*

Approved by: \_\_\_\_\_

Jason G. Smith, Inorganic  
Laboratory Manager New Ulm, MN

Reporting Limit

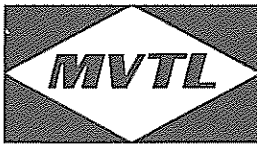
Elevated "Less Than Result" (<): @ = Due to sample matrix  
! = Due to sample quantity

# = Due to sample concentration  
+ = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WH/DW # R-040 IA LAB #: 132 IA LAB #: 022

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Page: 1 of 1

WES BOLL
WENCK ASSOCIATES INC
1800 PIONEER CRK CTR
MAPLE PLAIN MN 55359-9000

Report Date: 21 Jun 07
Lab Number: 07-A23069
Work Order #:12-6461
Account #: 013173
Sample Matrix: SURFACE WATER
Date Sampled: 30 May 07 9:34
Sampled By: NICK C
Date Received: 30 May 07 16:00
PO #: 0002-107

Sample Description: CR 1.4

Temp at Receipt: 1.0C

Table with columns: As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Rows include Phosphorus Water Digest, BOD, Carbonaceous, CBOD, 20 Day, Solids, Total Suspended, Carbon, Total Organic, Chlorophyll a, Fecal Coliform, MF, Chloride, Nitrate+Nitrite, Nitrogen, Ammonia, Phosphorus, Total, Phosphorus, Ortho, Nitrogen, Total Kjeldahl.

U = Colony Forming Units

\* Holding time Exceeded

Data Set: \_\_\_\_\_

Entered By/Date: JT 7/19/07

QA/QC By/Date: WB 10/1/07

Approved by: Jason G. Smith, Inorganic Laboratory Manager New Ulm, MN

Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix ! = Due to sample quantity

# = Due to sample concentration + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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WES BOLL  
WENCK ASSOCIATES INC  
1800 PIONEER CRK CTR  
MAPLE PLAIN MN 55359-9000

Report Date: 21 Jun 07  
Lab Number: 07-A23071  
Work Order #: 12-6461  
Account #: 013173  
Sample Matrix: SURFACE WATER  
Date Sampled: 30 May 07  
Sampled By: NICK C  
Date Received: 30 May 07 16:00  
PO #: 0002-107

Temp at Receipt: 1.0C

Sample Description: FD 1

*CR14*

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					4 Jun 07	AKW
BOD, Carbonaceous	3 mg/L		2	SM 5210B	31 May 07 11:39	CJL
CBOD, 20 Day	5 mg/L		2	SM 5210B	31 May 07 11:04	CJL
Solids, Total Suspended	6 mg/L		2	USGS I-3765-85	31 May 07 10:10	JED
Carbon, Total Organic	6.5 mg/L		0.5	415.1	8 Jun 07 16:00	Bis
Chlorophyll a	12.1 mg/cubic m		1.0	10200H	1 Jun 07 13:07	JD
Fecal Coliform, MF	* 140 CFU/100 mL		10.	SM 9222D 18th Ed	30 May 07 17:10	ES
Chloride	20.5 mg/L		3.0	325.2	31 May 07 8:42	AKW
Nitrate+Nitrite	0.20 mg/L as N		0.20	353.2	4 Jun 07 8:14	RMV
Nitrogen, Ammonia	< 0.16 mg/L		0.16	4500 NH3 B, E	4 Jun 07 9:25	TAM
Phosphorus, Total	0.022 mg/L		0.005	EPA 365.1	5 Jun 07 8:08	RMV
Phosphorus, Ortho	< 0.005 mg/L		0.005	EPA 365.1	31 May 07 8:12	DAP
Nitrogen, Total Kjeldahl	1.4 mg/L		0.2	SM 4500NorgB/NH3 E	4 Jun 07 8:10	EJP

U = Colony Forming Units

\* Holding time Exceeded

\*\* No collection time supplied by the client.

Data Set: \_\_\_\_\_

Entered (By/Date): WB 10/08/07

QA/QC (By/Date): WB 10/09/07

Approved by:

*Jason G. Smith*

Jason G. Smith, Inorganic  
Laboratory Manager New Ulm, MN

Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix  
! = Due to sample quantity

# = Due to sample concentration  
+ = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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WES BOLL
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1800 PIONEER CRK CTR
MAPLE PLAIN MN 55359-9000

Report Date: 29 Jun 07
Lab Number: 07-A24665
Work Order #: 12-6814
Account #: 013173
Sample Matrix: SURFACE WATER
Date Sampled: 6 Jun 07 9:12
Sampled By: NICK C
Date Received: 6 Jun 07 16:00
PO #: CRWD TMDL

Project Name: CRWD TMDL

Sample Description: CR 1.4

Temp at Receipt: 5.0C

Table with 6 columns: As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Rows include various water quality tests like BOD, CBOD, Solids, Carbon, Chlorophyll, Fecal Coliform, Nitrate, Nitrogen, Phosphorus, and Nitrogen Kjeldahl.

J = Colony Forming Units

\* Holding time Exceeded

Data Set:

Entered By/Date: JT 7/19/07

QW/QC By/Date: WB 10/1/07

Approved by: Jason G. Smith, Inorganic Laboratory Manager New Ulm, MN

Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration
! = Due to sample quantity + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND NW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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WES BOLL  
WENCK ASSOCIATES INC  
1800 PIONEER CRK CTR  
MAPLE PLAIN MN 55359-9000

Report Date: 12 Jul 07  
Lab Number: 07-A27469  
Work Order #: 12-7478  
Account #: 013173  
Sample Matrix: SURFACE WATER  
Date Sampled: 20 Jun 07 9:20  
Sampled By: NICK C  
Date Received: 20 Jun 07 16:00  
PO #: CLEARWATER

Project Name: CLEARWATER  
Project Number: 0002-108  
Sample Description: CR 1.4

Temp at Receipt: 6.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					22 Jun 07	AKW
BOD, Carbonaceous	< 2	mg/L	2	SM 5210B	21 Jun 07 14:34	JED
CBOD, 20 Day	10	mg/L	2	SM 5210B	21 Jun 07 14:05	JED
Solids, Total Suspended	6	mg/L	2	USGS I-3765-85	21 Jun 07 11:45	CJL
Carbon, Total Organic	10.0	mg/L	0.5	415.1	27 Jun 07 8:00	Bis
Chlorophyll a	3.0	mg/cubic m	1.0	10200H	26 Jun 07 15:02	JD
Fecal Coliform, MF	* 160	CFU/100 mL	10.	SM 9222D 20th Ed	20 Jun 07 18:25	ES
Chloride	20.6	mg/L	3.0	325.2	25 Jun 07 13:13	DAP
Nitrate+Nitrite	< 0.2	mg/L as N	0.2	353.2	27 Jun 07 14:52	DAP
Nitrogen, Ammonia	< 0.16	mg/L	0.16	4500 NH3 B, E	25 Jun 07 8:25	EJP
Phosphorus, Total	0.019	mg/L	0.005	EPA 365.1	26 Jun 07 14:00	DAP
Phosphorus, Ortho	< 0.005	mg/L	0.005	EPA 365.1	21 Jun 07 7:40	RMV
Nitrogen, Total Kjeldahl	0.9	mg/L	0.2	SM 4500NorgB/NH3 E	21 Jun 07 15:15	EJP

J = Colony Forming Units

\* Holding time Exceeded

Approved by:

*Jason G. Smith*  
Jason G. Smith, Inorganic  
Laboratory Manager New Ulm, MN

Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix  
! = Due to sample quantity

# = Due to sample concentration  
+ = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447600 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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*Ent  
WB  
7/25/07  
QA  
WB  
10/9/07*



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WES BOLL  
WENCK ASSOCIATES INC  
1800 PIONEER CRK CTR  
MAPLE PLAIN MN 55359-9000

Report Date: 12 Jul 07  
Lab Number: 07-A27471  
Work Order #: 12-7478  
Account #: 013173  
Sample Matrix: SURFACE WATER  
Date Sampled: 20 Jun 07  
Sampled By: NICK C  
Date Received: 20 Jun 07 16:00  
PO #: CLEARWATER

Temp at Receipt: 6.0C

Project Name: CLEARWATER  
Project Number: 0002-108  
Sample Description: FD 1

*CR 1.4*

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					22 Jun 07	AKW
BOD, Carbonaceous	2	mg/L	2	SM 5210B	21 Jun 07 14:50	JED
CBOD, 20 Day	10	mg/L	2	SM 5210B	21 Jun 07 14:05	JED
Solids, Total Suspended	6	mg/L	2	USGS I-3765-85	21 Jun 07 11:45	CJL
Carbon, Total Organic	13.5	mg/L	0.5	415.1	27 Jun 07 8:00	Bis
Chlorophyll a	< 1	mg/cubic m	1.0	10200H	26 Jun 07 15:02	JD
Fecal Coliform, MF	* 100	CFU/100 mL	10.	SM 9222D 20th Ed	20 Jun 07 18:25	ES
Chloride	6.3	mg/L	3.0	325.2	25 Jun 07 13:14	DAP
Nitrate+Nitrite	< 0.2	mg/L as N	0.2	353.2	27 Jun 07 14:52	DAP
Nitrogen, Ammonia	< 0.16	mg/L	0.16	4500 NH3 B, E	25 Jun 07 8:25	EJP
Phosphorus, Total	0.057	mg/L	0.005	EPA 365.1	26 Jun 07 14:00	DAP
Phosphorus, Ortho	0.029	mg/L	0.005	EPA 365.1	21 Jun 07 7:40	RMV
Nitrogen, Total Kjeldahl	0.7	mg/L	0.2	SM 4500NorgB/NH3 E	21 Jun 07 15:15	EJP

J = Colony Forming Units

\* Holding time Exceeded

\*\* No collection time supplied by the client.

*Ent WB  
7/25/07*

*QA WB  
10/9/07*

Approved by: Jason G. Smith  
Jason G. Smith, Inorganic  
Laboratory Manager New Ulm, MN

Reporting Limit

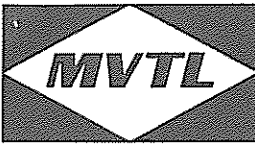
Elevated "Less Than Result" (<): # = Due to sample matrix      # = Due to sample concentration  
  ! = Due to sample quantity                    + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125    WI LAB # 999447600    ND MICRO # 1013-M    ND NW/DN # R-040    IA LAB #: 132    IA LAB #: 022

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WES BOLL  
WENCK ASSOCIATES INC  
1800 PIONEER CRK CTR  
MAPLE PLAIN MN 55359-9000

Report Date: 24 Jul 07  
Lab Number: 07-A29582  
Work Order #: 12-7958  
Account #: 013173  
Sample Matrix: SURFACE WATER  
Date Sampled: 2 Jul 07 9:15  
Sampled By: NICK C  
Date Received: 3 Jul 07 9:55

Project Name: CRWD TMDL  
Project Number: 0002-107  
Sample Description: CR 1.4

Temp at Receipt: 3.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					9 Jul 07	AKW
Water Digestions					9 Jul 07	JMS
BOD, Carbonaceous	< 2	mg/L	2	SM 5210B	3 Jul 07 14:14	JED
CBOD, 20 Day	9	mg/L	2	SM 5210B	3 Jul 07 14:27	JED
Solids, Total Suspended	< 2	mg/L	2	USGS I-3765-85	3 Jul 07 11:30	CJL
Carbon, Total Organic	8.0	mg/L	0.5	415.1	12 Jul 07 8:00	Bis
Chlorophyll a	< 1	mg/cubic m	1.0	10200H	10 Jul 07 7:35	JD
Nitrogen Total, Calculat	1.0	mg/L	NA	Calc	20 Jul 07 11:43	Calculated
Chloride	22.7	mg/L	3.0	325.2	9 Jul 07 15:20	AKW
Nitrate+Nitrite	< 0.2	mg/L as N	0.2	353.2	20 Jul 07 11:43	DAP
Nitrogen, Ammonia	< 0.16	mg/L	0.16	4500 NH3 B, E	5 Jul 07 7:15	TAM
Phosphorus, Total	0.017	mg/L	0.005	EPA 365.1	10 Jul 07 11:00	DAP
Phosphorus, Ortho	< 0.005	mg/L	0.005	EPA 365.1	3 Jul 07 18:57	DAP
Nitrogen, Total Kjeldahl	1.0	mg/L	0.2	SM 4500NorgB/NH3 E	9 Jul 07 5:40	TAM
on	0.162	mg/L	0.015	6010	9 Jul 07 15:44	CJR

Ent WB  
7/26/07

QA  
WB  
10/9/07

Approved by: Jason G. Smith  
Jason G. Smith, Inorganic  
Laboratory Manager New Ulm, MN

Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix  
! = Due to sample quantity

# = Due to sample concentration  
+ = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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1411 S. 12th St. - Bismarck, ND 58502 - 800-279-6885 - Fax 701-258-9724  
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WES BOLL  
WENCK ASSOCIATES INC  
1800 PIONEER CRK CTR  
MAPLE PLAIN MN 55359-9000

Report Date: 2 Aug 07  
Lab Number: 07-A31297  
Work Order #: 12-8261  
Account #: 013173  
Sample Matrix: SURFACE WATER  
Date Sampled: 11 Jul 07 9:30  
Sampled By: WES B  
Date Received: 11 Jul 07 15:50  
PO #: 0002-107

Project Number: 0002-107  
Sample Description: CR 1.4

Temp at Receipt: 0.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					13 Jul 07	AKW
Water Digestions					17 Jul 07	JMS
BOD, Carbonaceous	< 2	mg/L	2	SM 5210B	12 Jul 07 11:11	CJL
CBOD, 20 Day	12	mg/L	2	SM 5210B	12 Jul 07 11:24	CJL
Solids, Total Suspended	5	mg/L	2	USGS I-3765-85	12 Jul 07 10:30	JED
Carbon, Total Organic	8.00	mg/L	0.50	415.1	19 Jul 07 11:00	Bis
Chlorophyll a	< 1	mg/cubic m	1.0	10200H	17 Jul 07 9:43	JD
Fecal Coliform, MF	* 45	CFU/100 mL	10.	SM 9222D 20th Ed	11 Jul 07 19:00	ES
Nitrogen Total, Calculat Chloride	0.9	mg/L	NA	Calc	21 Jul 07 13:15	Calculated
	21.2	mg/L	3.0	325.2	23 Jul 07 14:11	AKW
Nitrate+Nitrite	< 0.2	mg/L as N	0.2	353.2	21 Jul 07 13:15	JGS
Nitrogen, Ammonia	< 0.16	mg/L	0.16	4500 NH3 B, E	16 Jul 07 11:45	EJP
Phosphorus, Total	0.019	mg/L	0.005	EPA 365.1	18 Jul 07 11:10	DAP
Phosphorus, Ortho	0.006	mg/L	0.005	EPA 365.1	12 Jul 07 8:18	DAP
Nitrogen, Total Kjeldahl	0.9	mg/L	0.2	SM 4500NorgB/NH3 E	16 Jul 07 15:00	EJP
Iron	0.078	mg/L	0.015	6010	18 Jul 07 11:37	CJR

Batch matrix spike and spike duplicate recoveries for Nitrate+Nitrite were outside MVTL 85-115% limit at 126% and 126%. Data reported based on acceptable spike duplication and known recovery.

CFU = Colony Forming Units

\* Holding time Exceeded

Data Set: \_\_\_\_\_

Entered By/Date: WB 10/08/07

QA/QC By/Date: WB 10/09/07

Approved by: Jason G. Smith  
Jason G. Smith, Inorganic  
Laboratory Manager New Ulm, MN

Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration  
! = Due to sample quantity + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND HW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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WES BOLL  
WENCK ASSOCIATES INC  
1800 PIONEER CRK CTR  
MAPLE PLAIN MN 55359-9000

Report Date: 16 Aug 07  
Lab Number: 07-A33997  
Work Order #: 12-8817  
Account #: 013173  
Sample Matrix: SURFACE WATER  
Date Sampled: 25 Jul 07 9:35  
Sampled By: NICK C  
Date Received: 25 Jul 07 15:15  
PO #: CLEARWATER

Project Name: CLEARWATER TMDL

Sample Description: CR 1.4



Temp at Receipt: 4.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					28 Jul 07	AKW
Water Digestions					27 Jul 07	JMS
BOD, Carbonaceous	< 2	mg/L	2	SM 5210B	26 Jul 07 11:34	CJL
CBOD, 20 Day	10	mg/L	2	SM 5210B	26 Jul 07 12:00	CJL
Solids, Total Suspended	2	mg/L	2	USGS I-3765-85	26 Jul 07 9:45	JED
Carbon, Total Organic	8.00	mg/L	0.50	415.1	6 Aug 07 8:00	Bis
Chlorophyll a	< 1	mg/cubic m	1.0	10200H	31 Jul 07 9:09	JD
Nitrogen Total, Calculat	0.7	mg/L	NA	Calc	6 Aug 07 11:33	Calculated
Chloride	21.0	mg/L	3.0	325.2	3 Aug 07 10:59	AKW
Nitrate+Nitrite	< 0.2	mg/L as N	0.2	353.2	6 Aug 07 11:33	DAP
Nitrogen, Ammonia	< 0.16	mg/L	0.16	4500 NH3 B, E	1 Aug 07 11:50	EJP
Phosphorus, Total	0.014	mg/L	0.005	EPA 365.1	1 Aug 07 10:41	DAP
Phosphorus, Ortho	< 0.01	mg/L	0.005	EPA 365.1	26 Jul 07 8:27	DAP
Nitrogen, Total Kjeldahl	0.7	mg/L	0.2	SM 4500NorgB/NH3 E	26 Jul 07 9:50	EJP
Iron	0.136	mg/L	0.015	6010	30 Jul 07 12:37	CJR

Data Set: \_\_\_\_\_

Entered By/Date: WB 10/08/07

QA/QC By/Date: WB 10/09/07

Approved by:    
Jason G. Smith, Inorganic  
Laboratory Manager New Ulm, MN

Reporting Limit

Elevated "Less Than Result" (<): # = Due to sample matrix # = Due to sample concentration  
! = Due to sample quantity + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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WES BOLL  
WENCK ASSOCIATES INC  
1800 PIONEER CRK CTR  
MAPLE PLAIN MN 55359-9000

Report Date: 24 Sep 07  
Lab Number: 07-A36435  
Work Order #: 12-9361  
Account #: 013173  
Sample Matrix: SURFACE WATER  
Date Sampled: 8 Aug 07 10:45  
Sampled By: NICK C  
Date Received: 8 Aug 07 15:30  
PO #: CRWD TMDL

Project Name: CRWD TMDL

Sample Description: CR 1.4

Temp at Receipt: 3.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					10 Aug 07	KAD
BOD, Carbonaceous	3	mg/L	2	SM 5210B	9 Aug 07 11:30	CJL
CBOD, 20 Day	5	mg/L	2	SM 5210B	9 Aug 07 11:42	CJL
Solids, Total Suspended	3	mg/L	2	USGS I-3765-85	9 Aug 07 9:50	JED
Carbon, Total Organic	4.50	mg/L	0.50	415.1	16 Aug 07 8:00	Bis
Chlorophyll a	< 1	mg/cubic m	1.0	10200H	10 Aug 07 12:54	JD
Fecal Coliform, MF	700	CFU/100 mL	10.	SM 9222D 20th Ed	8 Aug 07 16:40	JLS
Nitrogen Total, Calculat	0.7	mg/L	NA	Calc	13 Aug 07 14:28	Calculated
Chloride	19.5	mg/L	3.0	325.2	14 Aug 07 9:50	AKW
Nitrate+Nitrite	< 0.2	mg/L as N	0.2	353.2	13 Aug 07 14:28	DAP
Nitrogen, Ammonia	< 0.16	mg/L	0.16	4500 NH3 B, E	10 Aug 07 8:35	EJP
Phosphorus, Total	0.027	mg/L	0.005	EPA 365.1	20 Aug 07 13:42	DAP
Phosphorus, Ortho	< 0.01	mg/L	0.005	EPA 365.1	9 Aug 07 8:31	DAP
trogen, Total Kjeldahl	0.7	mg/L	0.2	SM 4500NorgB/NH3 E	10 Aug 07 15:00	EJP

RL for Ortho Phosphorus elevated to 0.01 mg/L due to reporting limit check falling outside method 60-140% acceptance limit at 0.005 mg/L.

CFU = Colony Forming Units

Data Set: \_\_\_\_\_  
Entered By/Date: WB 10/08/07  
QA/QC By/Date: WB 10/09/07

Approved by: Jason G. Smith  
Jason G. Smith, Inorganic  
Laboratory Manager New Ulm, MN

Reporting Limit

Elevated "Less Than Result" (<): # = Due to sample matrix # = Due to sample concentration  
! = Due to sample quantity + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DN # R-040 IA LAB #: 132 IA LAB #: 022

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WES BOLL
WENCK ASSOCIATES INC
1800 PIONEER CRK CTR
MAPLE PLAIN MN 55359-9000

Report Date: 13 Sep 07
Lab Number: 07-A39072
Work Order #: 12-9964
Account #: 013173
Sample Matrix: SURFACE WATER
Date Sampled: 22 Aug 07 9:30
Sampled By: NICK C
Date Received: 22 Aug 07 15:20
PO #: CRWD TMDL

Project Name: CRWD TMDL

Sample Description: CR 1.4

Temp at Receipt: 3.0C

Table with 7 columns: As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Rows include Phosphorus Water Digest, BOD, Carbonaceous, CBOD, 20 Day, Solids, Total Suspended, Carbon, Total Organic, Chlorophyll a, Fecal Coliform, MF, Nitrogen Total, Calculat, Chloride, Nitrate+Nitrite, Nitrogen, Ammonia, Phosphorus, Total, Phosphorus, Ortho, Nitrogen, Total Kjeldahl.

Elevated RL for Ortho Phosphorus due to RL check failure at 0.005 mg/L.

CFU = Colony Forming Units

\* Holding time Exceeded

Data Set: \_\_\_\_\_

Entered By/Date: WB 10/08/07

QA/QC By/Date: WB 10/09/07

Approved by: Jason G. Smith, Inorganic Laboratory Manager New Ulm, MN

Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration
! = Due to sample quantity + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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# Field Form: 2007 Stream Sampling

Client: CRWD  
 Project No.: 0002-107  
 Date: 4/24/07  
 Sampler(s): WB, NC  
 Start Time: \_\_\_\_\_  
 End Time: \_\_\_\_\_  
 Channel Conditions: Flowing  
 COC Number: \_\_\_\_\_

Site Location: CR 4.0  
 Site Description: Clearwater River at CR 40  
 Weather: 60°, Sunny  
 Samples Taken:  Yes  No  
 Sample Time: 12:15

DTW Measurement: 7.78  
 - downstream center post of bridge (E of sensor)  
 Notes:

Field Parameters				
Sample I.D.	Temp. (°C)	Cond. (mS/cm)	D.O. (mg/l)	pH (S.U.)
	13.42	426	10.46	8.19

- tributary from ditch on NW side of bridge

Stage Ht: \_\_\_\_\_

Rated Flow: \_\_\_\_\_

Gauged Flow: 182,369

### Stream Gauging Data

Distance from Initial Point (ft)	Width (ft)	Depth (ft)	Velocity (60% Depth)	Velocity		Average Velocity (ft/sec)	Area (ft <sup>2</sup> )	Discharge (Q, ft <sup>3</sup> /sec)
				20% Depth	80% Depth			
0, (left side)								
- gauged downstream of bridge								
				Data Set: _____				
				Entered By/Date: <u>JT 7/19/07</u>				
				QA/QC By/Date: <u>WB 10/19/07</u>				

# Field Form: 2007 Stream Sampling

Client: CRWD  
 Project No.: 0002-107  
 Date: 4/25/07  
 Sampler(s): WB, NC  
 Start Time: 12:20  
 End Time: \_\_\_\_\_  
 Channel Conditions: flowing  
 COC Number: \_\_\_\_\_

Site Location: CR4.0  
 Site Description: County Rd 40  
 Weather: 60°, Sunny  
 Samples Taken: Yes  No   
 Sample Time: \_\_\_\_\_  
 DTW Measurement: 7.78

Notes: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

12:20

Field Parameters				
Sample I.D.	Temp. (°C)	Cond. (mS/cm)	D.O. (mg/l)	pH (S.U.)
12:20	13.32	424	9.97	8.21

Stage Ht: \_\_\_\_\_

Rated Flow: \_\_\_\_\_

Gauged Flow: 183,114

### Stream Gauging Data

Distance from Initial Point (ft)	Width (ft)	Depth (ft)	Velocity (60% Depth)	Velocity		Average Velocity (ft/sec)	Area (ft <sup>2</sup> )	Discharge (Q, ft <sup>3</sup> /sec)
				20% Depth	80% Depth			
0, (left side)								
-collected <sup>grab</sup> samples every 15 minutes starting at 12:30								
0626 - 13:50 looking downstream dye visible								
Data Set: _____								
Entered By/Date: <u>JT 7/19/07</u>								
QA/QC By/Date: <u>WB 10/19/07</u>								

# Field Form: 2007 Stream Sampling

Client: CRWD  
 Project No.: 0002-107  
 Date: 5.9.07  
 Sampler(s): OK/WB  
 Start Time: 10:05  
 End Time: 10:25  
 Channel Conditions: Flowing  
 COC Number: \_\_\_\_\_

Site Location: CR 4.0  
 Site Description: CR 40 st bridge  
 Weather: Sunny 70°  
 Samples Taken: Yes No  
 Sample Time: 10:15  
 DTW Measurement: 827

Notes: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Field Parameters				
Sample I.D.	Temp. (°C)	Cond. (mS/cm)	D.O. (mg/l)	pH (S.U.)
	16.8	430	9.11	7.96

Stage Ht: \_\_\_\_\_ Rated Flow: \_\_\_\_\_ Gauged Flow: 122.831

### Stream Gauging Data

Distance from Initial Point (ft)	Width (ft)	Depth (ft)	Velocity (60% Depth)	Velocity		Average Velocity (ft/sec)	Area (ft²)	Discharge (Q, ft³/sec)
				20% Depth	80% Depth			
0, (left side)								
						Data Set: _____		
						Entered By/Date: <u>JT 5/9/07</u>		
						QA/QC By/Date: <u>WB 10/9/07</u>		



# Field Form: 2007 Stream Sampling

Client: CRWD  
 Project No.: 0002-107  
 Date: 5.23.07  
 Sampler(s): MC/WP  
 Start Time: 1050  
 End Time: 1110  
 Channel Conditions: flowing  
 COC Number: \_\_\_\_\_

Site Location: CR 4.0  
 Site Description: bridge at CH 40  
 Weather: cloud GS<sup>o</sup>  
 Samples Taken:  Yes  No  
 Sample Time: 1100  
 DTW Measurement: 9.24

Notes: water level  
receding.  
 \_\_\_\_\_  
 \_\_\_\_\_

Field Parameters				
Sample I.D.	Temp. (°C)	Cond. (mS/cm)	D.O. (mg/l)	pH (S.U.)
	19.16	439	<del>7.75</del>	8.25

7.75

Stage Ht: \_\_\_\_\_

Rated Flow: \_\_\_\_\_

Gauged Flow: 55.19 cfs

## Stream Gauging Data

Distance from Initial Point (ft)	Width (ft)	Depth (ft)	Velocity (60% Depth)	Velocity		Average Velocity (ft/sec)	Area (ft <sup>2</sup> )	Discharge (Q, ft <sup>3</sup> /sec)
				20% Depth	80% Depth			
0, (left side)								

Data Set: \_\_\_\_\_

Entered By: JT Date: 7/9/07

QA/QC By: WP Date: 10/9/07

### Field Form: 2007 Stream Sampling

Client: CRWD  
 Project No.: 0002-107  
 Date: 5.30.07  
 Sampler(s): JESS/NIC  
 Start Time: 10:50  
 End Time: 11:11  
 Channel Conditions: flaring  
 COC Number: \_\_\_\_\_

Site Location: CL 4.0  
 Site Description: Clearwater River @ CO. RD 40 crossing  
 Weather: Sunny 77°  
 Samples Taken:  Yes  No  
 Sample Time: 10:55  
 DTW Measurement: 9.30

Notes: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Field Parameters				
Sample I.D.	Temp. (°C)	Cond. (mS/cm)	D.O. (mg/l)	pH (S.U.)
	21.60	437	9.32	8.19

Stage Ht: \_\_\_\_\_

Rated Flow: \_\_\_\_\_

Gauged Flow: 53.45 cfs

#### Stream Gauging Data

Distance from Initial Point (ft)	Width (ft)	Depth (ft)	Velocity (60% Depth)	Velocity		Average Velocity (ft/sec)	Area (ft <sup>2</sup> )	Discharge (Q, ft <sup>3</sup> /sec)
				20% Depth	80% Depth			
0, (left side)								

Data Set: \_\_\_\_\_  
 Entered By/Date: JT 7/9/07  
 QA/QC By/Date: MB 10/2/07

# Field Form: 2007 Stream Sampling

Client: CRWD  
 Project No.: 0002-107  
 Date: 10-6-07  
 Sampler(s): Nic/Jess  
 Start Time: 10:20  
 End Time: 10:43  
 Channel Conditions: Flowing  
 COC Number: ~

Site Location: ct 4.0  
 Site Description: Clearwater River @ ca rd 40 crossing  
 Weather: 63° cloudy  
 Samples Taken:  Yes  No  
 Sample Time: 10:30

DTW Measurement: 0.67  
 C: 44%

Notes: cloudy, brownish water, very high, and fast moving.

Field Parameters				
Sample I.D.	Temp. (°C)	Cond. (mS/cm)	D.O. (mg/l)	pH (S.U.)
	19.7	-	7.7	-

Stage Ht: \_\_\_\_\_

Rated Flow: \_\_\_\_\_

Gauged Flow: 106.505

### Stream Gauging Data

Distance from Initial Point (ft)	Width (ft)	Depth (ft)	Velocity (60% Depth)	Velocity		Average Velocity (ft/sec)	Area (ft²)	Discharge (Q, ft³/sec)
				20% Depth	80% Depth			
0, (left side)								

Data Set: \_\_\_\_\_  
 Entered By Date: JT 7/9/07  
 QA/QC By Date: TWB 10/9/07

### Field Form: 2007 Stream Sampling

Client:	CRWD	Site Location:	CR4.0
Project No.:	0002-107	Site Description:	CR @ road 40 crossing
Date:	6-20-07	Weather:	Sunny 75°
Sampler(s):	Nic/Jess	Samples Taken:	(Yes) No
Start Time:	10:55	Sample Time:	11:00
End Time:	11:10		
Channel Conditions:	Grading	DTW Measurement:	9.35 ft
COC Number:			

Field Parameters				
Sample I.D.	Temp. (°C)	Cond. (mS/cm)	D.O. (mg/l)	pH (S.U.)
	22.36	357	7.71	8.35

Notes: Very clean, lots of aquatic vegetation growing throughout stretch. some algae lots of smaller fish present

Stage Ht: \_\_\_\_\_ Rated Flow: \_\_\_\_\_ Gauged Flow: ~~34.981~~  
34.921

#### Stream Gauging Data

Distance from Initial Point (ft)	Width (ft)	Depth (ft)	Velocity (60% Depth)	Velocity-		Average Velocity (ft/sec)	Area (ft <sup>2</sup> )	Discharge (Q, ft <sup>3</sup> /sec)
				20% Depth	80% Depth			
0, (left side)								

Data Set: \_\_\_\_\_  
 Entered By/Date: JF 7/9/07  
 C/NOC By/Date: W 12/10/07

# Field Form: 2007 Stream Sampling

Client: CRWD  
 Project No.: 0002-107  
 Date: 7.2.07  
 Sampler(s): NIC  
 Start Time: 1005  
 End Time: 1030  
 Channel Conditions: Flowing  
 COC Number: \_\_\_\_\_

Site Location: CR 4.0  
 Site Description: \_\_\_\_\_  
 Weather: Overcast 65°  
 Samples Taken: Yes No  
 Sample Time: 1015  
 DTW Measurement: 9.81

Notes: - filamentous algae and vegetation altering flow

Field Parameters				
Sample I.D.	Temp. (°C)	Cond. (mS/cm)	D.O. (mg/l)	pH (S.U.)
	21.01	397	7.10	8.16

Stage Ht: \_\_\_\_\_ Rated Flow: \_\_\_\_\_ Gauged Flow: 6.83 cfs

## Stream Gauging Data

Distance from Initial Point (ft)	Width (ft)	Depth (ft)	Velocity (60% Depth)	Velocity		Average Velocity (ft/sec)	Area (ft²)	Discharge (Q, ft³/sec)
				20% Depth	80% Depth			
0, (left side)								

Data Set: \_\_\_\_\_  
 Entered By/Date: JLT 7-9-2007  
 Q/COC By/Date: WBS 10/09/07

## Field Form: 2007 Stream Sampling

Client: CRWD  
 Project No.: 0002-107  
 Date: 7.11.07  
 Sampler(s): NLC  
 Start Time: 1025  
 End Time: \_\_\_\_\_  
 Channel Conditions: Flowing  
 COC Number: \_\_\_\_\_

Site Location: CR 4.0  
 Site Description: \_\_\_\_\_  
 Weather: Sunny 70°  
 Samples Taken: Yes No  
 Sample Time: 1030  
 DTW Measurement: ~~8.42~~ 9.42

Notes: - Channel is heavily vegetated on west side - vegetation affecting some velocity readings  
21.139

Field Parameters				
Sample I.D.	Temp. (°C)	Cond. (mS/cm)	D.O. (mg/l)	pH (S.U.)
	21.10	364	10.05	8.59

Stage Ht: \_\_\_\_\_ Rated Flow: \_\_\_\_\_ Gauged Flow: 21.139

### Stream Gauging Data

Distance from Initial Point (ft)	Width (ft)	Depth (ft)	Velocity (60% Depth)	Velocity		Average Velocity (ft/sec)	Area (ft <sup>2</sup> )	Discharge (Q, ft <sup>3</sup> /sec)
				20% Depth	80% Depth			
0, (left side)								

Data Set: \_\_\_\_\_  
 Entered By/Date: WB 7/12/07  
 QA/QC By/Date: WB 10/9/07

# Field Form: 2007 Stream Sampling

Client:	CRWD	Site Location:	CR 4.0
Project No.:	0002-107	Site Description:	CH 40 of Sndge
Date:	7.25.07	Weather:	sunny 85°
Sampler(s):	Soss T.	Samples Taken:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Start Time:	9:53	Sample Time:	10:00
End Time:	<del>9:53</del> 10:10		
Channel Conditions:	flowing	DTW Measurement:	9.75
COC Number:			

Field Parameters				
Sample I.D.	Temp. (°C)	Cond. (mS/cm)	D.O. (mg/l)	pH (S.U.)
	26.20	.400	9.20	6.57

Notes: lots of aquatic  
plant life on banks  
of algae, lots of  
fish (minnow)  
\* polecat pole set out

Stage Ht: \_\_\_\_\_ Rated Flow: \_\_\_\_\_ Gauged Flow: 15,983

## Stream Gauging Data

Distance from Initial Point (ft)	Width (ft)	Depth (ft)	Velocity (60% Depth)	Velocity		Average Velocity (ft/sec)	Area (ft <sup>2</sup> )	Discharge (Q, ft <sup>3</sup> /sec)
				20% Depth	80% Depth			
0, (left side)								
			Data Set:					
			Entered By/Date:	WB	7/25/07			
			O/A/O/C By/Date:	WB	10/23/07			

# Field Form: 2007 Stream Sampling

Client: CRWD Site Location: CR 4.0

Project No.: 0002-107 Site Description: \_\_\_\_\_

Date: 8.8.07 Weather: Sunny 80°

Sampler(s): NIC Samples Taken:  Yes  No

Start Time: 1100 Sample Time: 1115

End Time: 1130 \_\_\_\_\_

Channel Conditions: \_\_\_\_\_ DTW Measurement: 9.96

COC Number: \_\_\_\_\_

**Notes:** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Field Parameters				
Sample I.D.	Temp. (°C)	Cond. (mS/cm)	D.O. (mg/l)	pH (S.U.)
	<u>22.48</u>	<u>491</u>	<u>7.81</u>	<u>8.12</u>

Stage Ht: \_\_\_\_\_ Rated Flow: \_\_\_\_\_ Gauged Flow: 3.635

## Stream Gauging Data

Distance from Initial Point (ft)	Width (ft)	Depth (ft)	Velocity (60% Depth)	Velocity		Average Velocity (ft/sec)	Area (ft <sup>2</sup> )	Discharge (Q, ft <sup>3</sup> /sec)
				20% Depth	80% Depth			
0, (left side)								
				Data Set: _____				
				Entered By/Date: <u>WB 10/23/07</u>				
				QA/QC By/Date: <u>WB 10/23/07</u>				



## Field Form: 2007 Stream Sampling

Client: CRWD Site Location: CR 4.0  
 Project No.: 0002-107 Site Description: \_\_\_\_\_  
 Date: 8.22.07 Weather: overcast 70°  
 Sampler(s): NIC Samples Taken:  Yes  No  
 Start Time: 0950 Sample Time: 1000  
 End Time: 1020  
 Channel Conditions: flung DTW Measurement: 9.03  
 COC Number: \_\_\_\_\_

Notes: lots of quartz  
vegetation, minnows,  
 \_\_\_\_\_  
 \_\_\_\_\_

Field Parameters				
Sample I.D.	Temp. (°C)	Cond. (mS/cm)	D.O. (mg/l)	pH (S.U.)
	22.12	552	7.31	7.89

Stage Ht: \_\_\_\_\_ Rated Flow: \_\_\_\_\_ Gauged Flow: 30.340

### Stream Gauging Data

Distance from Initial Point (ft)	Width (ft)	Depth (ft)	Velocity (60% Depth)	Velocity		Average Velocity (ft/sec)	Area (ft <sup>2</sup> )	Discharge (Q, ft <sup>3</sup> /sec)
				20% Depth	80% Depth			
0, (left side)								

Data Set: \_\_\_\_\_  
 Entered By/Date: WB 10/08/07  
 QA/QC By/Date: WB 10/23/07

MVTL

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PRELIMINARY REPORT

WES BOLL
WENCK ASSOCIATES INC
1800 PIONEER CRK CTR
MAPLE PLAIN MN 55359-9000

Report Date: 22 May 07
Lab Number: 07-A15437
Work Order #:12-4795
Account #: 013173
Sample Matrix: SURFACE WATER
Date Sampled: 24 Apr 07 12:15
Date Received: 24 Apr 07 16:30
PO #: 002-107

Project Number: 0002-107
Sample Description: CR 4.0

Temp at Receipt: 4.0C

Table with 6 columns: Parameter, As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Rows include Phosphorus Water Digest, BOD, CBOD, Solids, Carbon, Chlorophyll a, Fecal Coliform, Chloride, Nitrate+Nitrite, Nitrogen, Ammonia, Phosphorus, Total, Phosphorus, Ortho, Nitrogen, Total Kjeldahl.

CFU = Colony Forming Units

\* Holding time Exceeded

Order Set
Entered By/Date: JT 7/9/07
Analyzed by/Date: WB 10/23/07

PRELIMINARY REPORT: RESULTS ARE SUBJECT TO CHANGE PENDING FINAL APPROVAL OF DATA.

RL = Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration
! = Due to sample quantity + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1613-M ND WR/DW # R-040 IA LAB #: 132 IA LAB #: 022

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WES BOLL  
 WENCK ASSOCIATES INC  
 1800 PIONEER CRK CTR  
 MAPLE PLAIN MN 55359-9000

Report Date: 8 Jun 07  
 Lab Number: 07-A18771  
 Work Order #: 12-5557  
 Account #: 013173  
 Sample Matrix: SURFACE WATER  
 Date Sampled: 9 May 07 10:15  
 Sampled By: WES BOLL  
 Date Received: 9 May 07 16:12  
 PO #: 0002-107

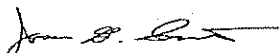
Project Number: 0002-107  
 Sample Description: CR 4.0

Temp at Receipt: 3.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					14 May 07	RMV
BOD, Carbonaceous	< 2	mg/L	2	SM 5210B	10 May 07 14:16	JED
CBOD, 20 Day	8	mg/L	2	SM 5210B	10 May 07 13:11	AKF
Solids, Total Suspended	7	mg/L	2	USGS I-3765-85	10 May 07 12:06	CJL
Carbon, Total Organic	8.2	mg/L	0.5	415.1	5 Jun 07 16:30	Bis
Chlorophyll a	2.5	mg/cubic m	1.0	10200H	11 May 07 8:31	JD
Fecal Coliform, MF	* 10	CFU/100 mL	10.	SM 9222D 18th Ed	9 May 07 18:05	ES
Chloride	21.6	mg/L	3.0	325.2	16 May 07 15:57	DAP
Nitrate+Nitrite	0.29	mg/L as N	0.20	353.2	14 May 07 7:22	RMV
Nitrogen, Ammonia	< 0.16	mg/L	0.16	4500 NH3 B, E	15 May 07 10:35	TAM
Phosphorus, Total	0.030	mg/L	0.005	EPA 365.1	17 May 07 8:00	DAP
Phosphorus, Ortho	< 0.005	mg/L	0.005	EPA 365.1	10 May 07 10:06	DAP
Nitrogen, Total Kjeldahl	1.0	mg/L	0.2	SM 4500NorgB/NH3 E	16 May 07 6:55	TAM

CFU = Colony Forming Units

\* Holding time Exceeded

Approved by:   
 Jason G. Smith, Inorganic  
 Laboratory Manager New Ulm, MN

Trans Sent: \_\_\_\_\_  
 Colored By/Date: JT 7/19/07  
 CWA/C By/Date: WB 10/23/07

RL = Reporting Limit

Elevated "Less Than Result" (c): \* = Due to sample matrix # = Due to sample concentration  
 † = Due to sample quantity • = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022



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WES BOLL  
WENCK ASSOCIATES INC  
1800 PIONEER CRK CTR  
MAPLE PLAIN MN 55359-9000

Report Date: 14 Jun 07  
Lab Number: 07-A21652  
Work Order #: 12-6194  
Account #: 013173  
Sample Matrix: SURFACE WATER  
Date Sampled: 23 May 07 11:00  
Sampled By: NICK C  
Date Received: 23 May 07 15:55  
PO #: CRWD TMDL

Project Name: CRWD TMDL

Sample Description: CR 4.0

Temp at Receipt: 4.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					29 May 07	AKW
BOD, Carbonaceous	3	mg/L	2	SM 5210B	24 May 07 11:40	JED
CBOD, 20 Day	10	mg/L	2	SM 5210B	24 May 07 11:12	JED
Solids, Total Suspended	6	mg/L	2	USGS I-3765-85	24 May 07 9:45	CJL
Carbon, Total Organic	8.6	mg/L	0.5	415.1	6 Jun 07 8:00	Bis
Fecal Coliform, MF	* 1400	CFU/100 mL	10.	SM 9222D 18th Ed	23 May 07 17:55	JLS
Chloride	19.8	mg/L	3.0	325.2	25 May 07 13:13	AKW
Nitrate+Nitrite	0.20	mg/L as N	0.20	353.2	25 May 07 11:26	RMV
Nitrogen, Ammonia	< 0.16	mg/L	0.16	4500 NH3 B, E	25 May 07 7:00	TAM
Phosphorus, Total	0.026	mg/L	0.005	EPA 365.1	31 May 07 15:26	DAP
Phosphorus, Ortho	< 0.005	mg/L	0.005	EPA 365.1	24 May 07 6:26	JGS
Nitrogen, Total Kjeldahl	1.0	mg/L	0.2	SM 4500NorgB/NH3 E	29 May 07 14:10	EJP

\*FU = Colony Forming Units

\* Holding time Exceeded

Data Set: \_\_\_\_\_

Entered By/Date: JT 7/9/07

QA/QC By/Date: WB 10/23/07

*Chlor-A → NOT TESTED  
SW*

Approved by: Jason G. Smith  
Jason G. Smith, Inorganic  
Laboratory Manager New Ulm, MN

Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix  
! = Due to sample quantity

# = Due to sample concentration  
+ = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WH/DW # R-040 IA LAB #: 132 IA LAB #: 022

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WES BOLL  
WENCK ASSOCIATES INC  
1800 PIONEER CRK CTR  
MAPLE PLAIN MN 55359-9000

Report Date: 21 Jun 07  
Lab Number: 07-A23066  
Work Order #: 12-6461  
Account #: 013173  
Sample Matrix: SURFACE WATER  
Date Sampled: 30 May 07 10:55  
Sampled By: NICK C  
Date Received: 30 May 07 16:00  
PO #: 0002-107

Sample Description: CR 4.0

Temp at Receipt: 1.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					4 Jun 07	AKW
BOD, Carbonaceous	2	mg/L	2	SM 5210B	31 May 07 11:25	CJL
CBOD, 20 Day	5	mg/L	2	SM 5210B	31 May 07 11:04	CJL
Solids, Total Suspended	< 2	mg/L	2	USGS I-3765-85	31 May 07 8:00	JED
Carbon, Total Organic	6.5	mg/L	0.5	415.1	8 Jun 07 16:00	Bis
Chlorophyll a	8.6	mg/cubic m	1.0	10200H	1 Jun 07 13:07	JD
Fecal Coliform, MF	* 45	CFU/100 mL	10.	SM 9222D 18th Ed	30 May 07 17:10	ES
Chloride	20.8	mg/L	3.0	325.2	31 May 07 8:42	AKW
Nitrate+Nitrite	< 0.2	mg/L as N	0.2	353.2	4 Jun 07 8:15	RMV
Nitrogen, Ammonia	< 0.16	mg/L	0.16	4500 NH3 B, E	4 Jun 07 9:25	TAM
Phosphorus, Total	0.027	mg/L	0.005	EPA 365.1	5 Jun 07 8:07	RMV
Phosphorus, Ortho	< 0.005	mg/L	0.005	EPA 365.1	31 May 07 8:12	DAP
Nitrogen, Total Kjeldahl	1.0	mg/L	0.2	SM 4500NorgB/NH3 E	4 Jun 07 8:10	EJP

U = Colony Forming Units

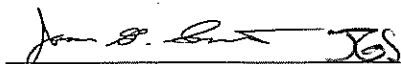
\* Holding time Exceeded

Data Set: \_\_\_\_\_

Entered By/Date: JT 7/9/07

QA/QC By/Date: WB 10/23/07

Approved by:



Jason G. Smith, Inorganic  
Laboratory Manager New Ulm, MN

### Reporting Limit

Notated "Less Than Result" (<): @ = Due to sample matrix  
! = Due to sample quantity

# = Due to sample concentration  
+ = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447600 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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WES BOLL  
WENCK ASSOCIATES INC  
1800 PIONEER CRK CTR  
MAPLE PLAIN MN 55359-9000

Report Date: 29 Jun 07  
Lab Number: 07-A24647  
Work Order #: 12-6814  
Account #: 013173  
Sample Matrix: SURFACE WATER  
Date Sampled: 6 Jun 07 10:30  
Sampled By: NICK C  
Date Received: 6 Jun 07 16:00  
PO #: CRWD TMDL

Project Name: CRWD TMDL

Sample Description: CR 4.0

Temp at Receipt: 5.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					7 Jun 07	AKW
BOD, Carbonaceous	< 2	mg/L	2	SM 5210B	7 Jun 07 11:43	JED
CBOD, 20 Day	3	mg/L	2	SM 5210B	7 Jun 07 11:29	JED
Solids, Total Suspended	< 2	mg/L	2	USGS I-3765-85	7 Jun 07 9:15	CJL
Carbon, Total Organic	10.0	mg/L	0.5	415.1	13 Jun 07 8:00	Bis
Chlorophyll a	1.0	mg/cubic m	1.0	10200H	12 Jun 07 9:45	AJK
Fecal Coliform, MF	* 900	CFU/100 mL	10.	SM 9222D 18th Ed	6 Jun 07 18:55	ES
Chloride	4.6	mg/L	3.0	325.2	11 Jun 07 10:22	AKW
Nitrate+Nitrite	< 0.2	mg/L as N	0.2	353.2	7 Jun 07 12:23	DAP
Nitrogen, Ammonia	< 0.16	mg/L	0.16	4500 NH3 B, E	7 Jun 07 11:20	EJP
Phosphorus, Total	0.031	mg/L	0.005	EPA 365.1	12 Jun 07 11:50	RMV
Phosphorus, Ortho	0.016	mg/L	0.005	EPA 365.1	7 Jun 07 7:23	RMV
Nitrogen, Total Kjeldahl	1.0	mg/L	0.2	SM 4500NorgB/NH3 E	8 Jun 07 13:00	EJP

J = Colony Forming Units

\* Holding time Exceeded

Data Set: \_\_\_\_\_

Entered By/Date: JT 7/19/07

QA/QC By/Date: WB 10/23/07

Approved by: \_\_\_\_\_

Jason G. Smith, Inorganic  
Laboratory Manager New Ulm, MN

Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix  
! = Due to sample quantity

# = Due to sample concentration  
+ = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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WES BOLL  
WENCK ASSOCIATES INC  
1800 PIONEER CRK CTR  
MAPLE PLAIN MN 55359-9000

Report Date: 12 Jul 07  
Lab Number: 07-A27466  
Work Order #: 12-7478  
Account #: 013173  
Sample Matrix: SURFACE WATER  
Date Sampled: 20 Jun 07 11:00  
Sampled By: NICK C  
Date Received: 20 Jun 07 16:00  
PO #: CLEARWATER

Temp at Receipt: 6.0C

Project Name: CLEARWATER  
Project Number: 0002-108  
Sample Description: CR 4.0

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					22 Jun 07	AKW
BOD, Carbonaceous	< 2	mg/L	2	SM 5210B	21 Jun 07 14:34	JED
CBOD, 20 Day	10	mg/L	2	SM 5210B	21 Jun 07 14:05	JED
Solids, Total Suspended	3	mg/L	2	USGS I-3765-85	21 Jun 07 10:00	CJL
Carbon, Total Organic	10.0	mg/L	0.5	415.1	27 Jun 07 8:00	Bis
Chlorophyll a	2.6	mg/cubic m	1.0	10200H	26 Jun 07 15:02	JD
Fecal Coliform, MF	* 70	CFU/100 mL	10.	SM 9222D 20th Ed	20 Jun 07 18:25	ES
Chloride	20.8	mg/L	3.0	325.2	25 Jun 07 13:13	DAP
Nitrate+Nitrite	< 0.2	mg/L as N	0.2	353.2	27 Jun 07 14:51	DAP
Nitrogen, Ammonia	< 0.16	mg/L	0.16	4500 NH3 B, E	21 Jun 07 9:40	EJP
Phosphorus, Total	0.026	mg/L	0.005	EPA 365.1	26 Jun 07 14:00	DAP
Phosphorus, Ortho	< 0.005	mg/L	0.005	EPA 365.1	21 Jun 07 7:39	RMV
Nitrogen, Total Kjeldahl	0.9	mg/L	0.2	SM 4500NorgB/NH3 E	21 Jun 07 15:15	EJP

.U = Colony Forming Units

\* Holding time Exceeded

Approved by: Jason G. Smith  
Jason G. Smith, Inorganic  
Laboratory Manager New Ulm, MN

Ent  
WB  
7/25/07  
QA  
WB  
10/23/07

### Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration  
! = Due to sample quantity + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WH/DW # R-040 IA LAB #: 132 IA LAB #: 022

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WES BOLL  
 WENCK ASSOCIATES INC  
 1800 PIONEER CRK CTR  
 MAPLE PLAIN MN 55359-9000

Report Date: 24 Jul 07  
 Lab Number: 07-A29586  
 Work Order #: 12-7958  
 Account #: 013173  
 Sample Matrix: SURFACE WATER  
 Date Sampled: 2 Jul 07 11:10  
 Sampled By: NICK C  
 Date Received: 3 Jul 07 9:55

Project Name: CRWD TMDL  
 Project Number: 0002-107  
 Sample Description: ~~CR 4.1~~ CR 4.0

Temp at Receipt: 3.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					9 Jul 07	AKW
Water Digestions					9 Jul 07	JMS
BOD, Carbonaceous	< 2	mg/L	2	SM 5210B	3 Jul 07 15:52	JED
CBOD, 20 Day	13	mg/L	2	SM 5210B	3 Jul 07 14:27	JED
Solids, Total Suspended	< 2	mg/L	2	USGS I-3765-85	3 Jul 07 11:30	CJL
Carbon, Total Organic	8.5	mg/L	0.5	415.1	12 Jul 07 8:00	Bis
Chlorophyll a	1.2	mg/cubic m	1.0	10200H	10 Jul 07 7:35	JD
Nitrogen Total, Calculat	1.3	mg/L	NA	Calc	20 Jul 07 12:00	Calculated
Chloride	22.9	mg/L	3.0	325.2	9 Jul 07 15:20	AKW
Nitrate+Nitrite	0.23	mg/L as N	0.20	353.2	20 Jul 07 12:00	DAP
Nitrogen, Ammonia	< 0.16	mg/L	0.16	4500 NH3 B, E	5 Jul 07 7:15	TAM
Phosphorus, Total	0.017	mg/L	0.005	EPA 365.1	10 Jul 07 11:14	DAP
Phosphorus, Ortho	< 0.005	mg/L	0.005	EPA 365.1	3 Jul 07 18:57	DAP
Nitrogen, Total Kjeldahl	1.1	mg/L	0.2	SM 4500NorgB/NH3 E	9 Jul 07 5:40	TAM
on	0.135	mg/L	0.015	6010	9 Jul 07 15:44	CJR

Ent WB  
 7/26/07

QA WB  
 10/23/07

Approved by: Jason G. Smith  
 Jason G. Smith, Inorganic  
 Laboratory Manager New Ulm, MN

### Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration  
 ! = Due to sample quantity + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447660 ND MICRO # 1013-M ND WH/DW # R-040 IA LAB #: 132 IA LAB #: 022

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WES BOLL  
 WENCK ASSOCIATES INC  
 1800 PIONEER CRK CTR  
 MAPLE PLAIN MN 55359-9000

Report Date: 2 Aug 07  
 Lab Number: 07-A31299  
 Work Order #: 12-8261  
 Account #: 013173  
 Sample Matrix: SURFACE WATER  
 Date Sampled: 11 Jul 07 10:30  
 Sampled By: WES B  
 Date Received: 11 Jul 07 15:50  
 PO #: 0002-107

Project Number: 0002-107  
 Sample Description: CR 4.0

Temp at Receipt: 0.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					13 Jul 07	AKW
Water Digestions					17 Jul 07	JMS
BOD, Carbonaceous	< 2	mg/L	2	SM 5210B	12 Jul 07 11:11	CJL
CBOD, 20 Day	10	mg/L	2	SM 5210B	12 Jul 07 11:24	CJL
Solids, Total Suspended	< 2	mg/L	2	USGS I-3765-85	12 Jul 07 10:30	JED
Carbon, Total Organic	9.50	mg/L	0.50	415.1	19 Jul 07 11:00	Bis
Chlorophyll a	2.5	mg/cubic m	1.0	10200H	17 Jul 07 9:43	JD
Fecal Coliform, MF	* 18	CFU/100 mL	10.	SM 9222D 20th Ed	11 Jul 07 19:00	ES
Nitrogen Total, Calculat	1.1	mg/L	NA	Calc	21 Jul 07 13:15	Calculated
Chloride	21.7	mg/L	3.0	325.2	23 Jul 07 14:11	AKW
Nitrate+Nitrite	< 0.2	mg/L as N	0.2	353.2	21 Jul 07 13:15	JGS
Nitrogen, Ammonia	< 0.16	mg/L	0.16	4500 NH3 B, E	16 Jul 07 11:45	EJP
Phosphorus, Total	0.025	mg/L	0.005	EPA 365.1	18 Jul 07 11:10	DAP
Phosphorus, Ortho	0.007	mg/L	0.005	EPA 365.1	12 Jul 07 8:18	DAP
Nitrogen, Total Kjeldahl	1.1	mg/L	0.2	SM 4500NorgB/NH3 E	16 Jul 07 15:00	EJP
Iron	0.107	mg/L	0.015	6010	18 Jul 07 11:37	CJR

Batch matrix spike and spike duplicate recoveries for Nitrate+Nitrite were outside MVTL 85-115% limit at 126% and 126%. Data reported based on acceptable spike duplication and known recovery.

CFU = Colony Forming Units

\* Holding time Exceeded

Data Set: \_\_\_\_\_

Entered By/Date: WB 10/08/07

QA/QC By/Date: WB 10/23/07

Approved by: \_\_\_\_\_

Jason G. Smith, Inorganic  
 Laboratory Manager New Ulm, MN

Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix  
 ! = Due to sample quantity

# = Due to sample concentration  
 + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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WES BOLL
WENCK ASSOCIATES INC
1800 PIONEER CRK CTR
MAPLE PLAIN MN 55359-9000

Report Date: 16 Aug 07
Lab Number: 07-A33999
Work Order #:12-8817
Account #: 013173
Sample Matrix: SURFACE WATER
Date Sampled: 25 Jul 07 10:00
Sampled By: NICK C
Date Received: 25 Jul 07 15:15
PO #: CLEARWATER

Project Name: CLEARWATER TMDL

Sample Description: CR 4.0

Temp at Receipt: 4.0C

Table with columns: As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Rows include Phosphorus Water Digest, BOD, Carbonaceous, CBOD, Solids, Total Suspended, Carbon, Total Organic, Chlorophyll a, Nitrogen Total, Chloride, Nitrate+Nitrite, Nitrogen, Ammonia, Phosphorus, Total, Phosphorus, Ortho, Nitrogen, Total Kjeldahl, Iron.

Data Set:
Entered By/Date: WB 10/08/07
QA/QC By/Date: WB 10/23/07

Approved by: Jason G. Smith, Inorganic Laboratory Manager New Ulm, MN

Reporting Limit
Elevated "Less Than Result" (<): @ = Due to sample matrix, # = Due to sample concentration, ! = Due to sample quantity, + = Due to extract volume
CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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WES BOLL  
WENCK ASSOCIATES INC  
1800 PIONEER CRK CTR  
MAPLE PLAIN MN 55359-9000

Report Date: 24 Sep 07  
Lab Number: 07-A36436  
Work Order #: 12-9361  
Account #: 013173  
Sample Matrix: SURFACE WATER  
Date Sampled: 8 Aug 07 11:15  
Sampled By: NICK C  
Date Received: 8 Aug 07 15:30  
PO #: CRWD TMDL

Project Name: CRWD TMDL

Sample Description: CR 4.0

Temp at Receipt: 3.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					10 Aug 07	KAD
BOD, Carbonaceous	< 2	mg/L	2	SM 5210B	9 Aug 07 11:30	CJL
CBOD, 20 Day	8	mg/L	2	SM 5210B	9 Aug 07 11:42	CJL
Solids, Total Suspended	2	mg/L	2	USGS I-3765-85	9 Aug 07 9:50	JED
Carbon, Total Organic	6.50	mg/L	0.50	415.1	16 Aug 07 8:00	Bis
Chlorophyll a	1.9	mg/cubic m	1.0	10200H	10 Aug 07 12:54	JD
Fecal Coliform, MF	1200	CFU/100 mL	10.	SM 9222D 20th Ed	8 Aug 07 16:40	JLS
Nitrogen Total, Calculat	1.1	mg/L	NA	Calc	13 Aug 07 14:28	Calculated
Chloride	19.8	mg/L	3.0	325.2	14 Aug 07 9:50	AKW
Nitrate+Nitrite	< 0.2	mg/L as N	0.2	353.2	13 Aug 07 14:28	DAP
Nitrogen, Ammonia	< 0.16	mg/L	0.16	4500 NH3 B, E	10 Aug 07 8:35	EJP
Phosphorus, Total	0.017	mg/L	0.005	EPA 365.1	20 Aug 07 13:42	DAP
Phosphorus, Ortho	< 0.01	mg/L	0.005	EPA 365.1	9 Aug 07 8:31	DAP
trogen, Total Kjeldahl	1.1	mg/L	0.2	SM 4500NorgB/NH3 E	10 Aug 07 15:00	EJP

RL for Ortho Phosphorus elevated to 0.01 mg/L due to reporting limit check falling outside method 60-140% acceptance limit at 0.005 mg/L.

CFU = Colony Forming Units

Data Set: \_\_\_\_\_

Entered By/Date: WB 10/08/07

QA/QC By/Date: WB 10/23/07

Approved by: Jason G. Smith  
Jason G. Smith, Inorganic  
Laboratory Manager New Ulm, MN

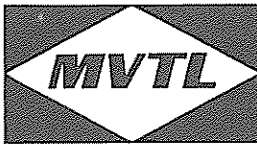
Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration  
! = Due to sample quantity + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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Page: 1 of 1

WES BOLL  
WENCK ASSOCIATES INC  
1800 PIONEER CRK CTR  
MAPLE PLAIN MN 55359-9000

Report Date: 13 Sep 07  
Lab Number: 07-A39073  
Work Order #: 12-9964  
Account #: 013173  
Sample Matrix: SURFACE WATER  
Date Sampled: 22 Aug 07 10:00  
Sampled By: NICK C  
Date Received: 22 Aug 07 15:20  
PO #: CRWD TMDL

Temp at Receipt: 3.0C

Project Name: CRWD TMDL

Sample Description: CR 4.0


	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					24 Aug 07	KAD
BOD, Carbonaceous	2	mg/L	2	SM 5210B	23 Aug 07 13:56	CJL
CBOD, 20 Day	6	mg/L	2	SM 5210B	23 Aug 07 14:10	CJL
Solids, Total Suspended	3	mg/L	2	USGS I-3765-85	23 Aug 07 10:30	JED
Carbon, Total Organic	11.00	mg/L	0.50	415.1	29 Aug 07 8:00	Bis
Chlorophyll a	11.6	mg/cubic m	1.0	10200H	24 Aug 07 9:14	JD
Fecal Coliform, MF	* 190	CFU/100 mL	10.	SM 9222D 20th Ed	22 Aug 07 18:55	MKG
Nitrogen Total, Calculat	0.9	mg/L	NA	Calc	28 Aug 07 14:45	Calculated
Chloride	22.6	mg/L	3.0	325.2	27 Aug 07 14:27	DAP
Nitrate+Nitrite	< 0.2	mg/L as N	0.2	353.2	28 Aug 07 12:47	DAP
Nitrogen, Ammonia	< 0.16	mg/L	0.16	4500 NH3 B, E	29 Aug 07 9:45	TAM
Phosphorus, Total	0.026	mg/L	0.005	EPA 365.1	29 Aug 07 13:11	DAP
Phosphorus, Ortho	< 0.01	mg/L	0.005	EPA 365.1	23 Aug 07 8:56	DAP
Nitrogen, Total Kjeldahl	0.9	mg/L	0.2	SM 4500NorgB/NH3 E	28 Aug 07 14:45	TAM

Elevated RL for Ortho Phosphorus due to RL check failure at 0.005 mg/L.

CFU = Colony Forming Units

\* Holding time Exceeded

Data Set: \_\_\_\_\_  
Entered By/Date: WB 10/08/07  
QA/QC By/Date: WB 10/23/07

Approved by:   
Jason G. Smith, Inorganic  
Laboratory Manager New Ulm, MN

Reporting Limit

Elevated "Less Than Result" (<): # = Due to sample matrix # = Due to sample concentration  
! = Due to sample quantity + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND NW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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# Field Form: 2007 Stream Sampling

Client: CRWD  
 Project No.: 0002-107  
 Date: 5.23.07  
 Sampler(s): NW/WB  
 Start Time: 10 25  
 End Time: 10 45  
 Channel Conditions: flowing  
 COC Number: \_\_\_\_\_

Site Location: CR 41  
 Site Description: upstr of CR40, trib st. in bch  
 Weather: cloudy 65°  
 Samples Taken:  Yes  No  
 Sample Time: 10 30  
 DTW Measurement: 2.32

Notes: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Field Parameters				
Sample I.D.	Temp. (°C)	Cond. (mS/cm)	D.O. (mg/l)	pH (S.U.)
	19.20	437	7.64	8.24

Stage Ht: \_\_\_\_\_

Rated Flow: \_\_\_\_\_

Gauged Flow: 53.332 <sup>AS/23 cfs</sup>

## Stream Gauging Data

Distance from Initial Point (ft)	Width (ft)	Depth (ft)	Velocity (60% Depth)	Velocity		Average Velocity (ft/sec)	Area (ft <sup>2</sup> )	Discharge (Q, ft <sup>3</sup> /sec)
				20% Depth	80% Depth			
0, (left side)								

Data Set: \_\_\_\_\_  
 Entered By/Date: JT 7/9/07  
 Checked By/Date: WB 10/23/07





### Field Form: 2007 Stream Sampling

Client: CRWD  
 Project No.: 0002-107  
 Date: 6-6-07  
 Sampler(s): Nic/Jess  
 Start Time: 9:51  
 End Time: 10:12  
 Channel Conditions: Flowing  
 COC Number: \_\_\_\_\_

Site Location: CR4.1  
 Site Description: Clearwater River upstream of Co.Rd.  
 Weather: cloudy 63° 40+  
 Samples Taken:  Yes  No tributary stream inlet  
 Sample Time: 10:00

DTW Measurement: 1.53  
C:90+

Notes: \_\_\_\_\_

Field Parameters				
Sample I.D.	Temp. (°C)	Cond. (mS/cm)	D.O. (mg/l)	pH (S.U.)
	<u>19.6</u>		<u>7.69</u>	

Stage Ht: \_\_\_\_\_ Rated Flow: \_\_\_\_\_ Gauged Flow: ~~100.25~~ 116.252

#### Stream Gauging Data

Distance from Initial Point (ft)	Width (ft)	Depth (ft)	Velocity (60% Depth)	Velocity-		Average Velocity (ft/sec)	Area (ft²)	Discharge (Q, ft³/sec)
				20% Depth	80% Depth			
0, (left side)								

Data Set: \_\_\_\_\_  
 Entered By/Date: JT 7/9/07  
WB 10/25/07

# Field Form: 2007 Stream Sampling

Client: CRWD Site Location: CR 4.1  
 Project No.: 0002-107 Site Description: CR upstream of cold 40 end streamlet  
 Date: 6-20-07 Weather: Sunny 78°  
 Sampler(s): Nick Jess Samples Taken:  Yes  No  
 Start Time: 10:10 Sample Time: 10:20  
 End Time: 10:25  
 Channel Conditions: Flowing DTW Measurement: 23.15  
 COC Number: \_\_\_\_\_ c. 90' 2.35

Notes: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Field Parameters				
Sample I.D.	Temp. (°C)	Cond. (mS/cm)	D.O. (mg/l)	pH (S.U.)
	21.45	356	7.90	8.25

Stage Ht: \_\_\_\_\_ Rated Flow: \_\_\_\_\_ Gauged Flow: 33.140

### Stream Gauging Data

Distance from Initial Point (ft)	Width (ft)	Depth (ft)	Velocity (60% Depth)	Velocity		Average Velocity (ft/sec)	Area (ft <sup>2</sup> )	Discharge (Q, ft <sup>3</sup> /sec)
				20% Depth	80% Depth			
0, (left side)								

Data Set: \_\_\_\_\_  
 Entered By/Date: JT 7/9/07  
 Q/QC By/Date: WB 10/25/07



## Field Form: 2007 Stream Sampling

Client: CRWD  
 Project No.: 0002-107  
 Date: 7.9.07  
 Sampler(s): JK  
 Start Time: 0955  
 End Time: \_\_\_\_\_  
 Channel Conditions: flowing  
 COC Number: \_\_\_\_\_

Site Location: CR 410 4.1  
 Site Description: \_\_\_\_\_  
 Weather: Sunny 70°  
 Samples Taken: 5 No \_\_\_\_\_  
 Sample Time: 1000  
 DTW Measurement: '29 inches' (2.42')

Notes: -vegetation  
in channel

Field Parameters				
Sample I.D.	Temp. (°C)	Cond. (mS/cm)	D.O. (mg/l)	pH (S.U.)
	20.76	365	10.07	8.56

Stage Ht: \_\_\_\_\_ Rated Flow: \_\_\_\_\_ Gauged Flow: 20.474

### Stream Gauging Data

Distance from Initial Point (ft)	Width (ft)	Depth (ft)	Velocity (60% Depth)	Velocity		Average Velocity (ft/sec)	Area (ft <sup>2</sup> )	Discharge (Q, ft <sup>3</sup> /sec)
				20% Depth	80% Depth			
0, (left side)								

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**PRELIMINARY REPORT**

WES BOLL  
 WENCK ASSOCIATES INC  
 1800 PIONEER CRK CTR  
 MAPLE PLAIN MN 55359-9000

Report Date: 22 May 07  
 Lab Number: 07-A15436  
 Work Order #: 12-4795  
 Account #: 013173  
 Sample Matrix: SURFACE WATER  
 Date Sampled: 24 Apr 07 11:50  
 Date Received: 24 Apr 07 16:30  
 PO #: 002-107

Project Number: 0002-107  
 Sample Description: CR 4.1

Temp at Receipt: 4.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					2 May 07	DAP
BOD, Carbonaceous	4	mg/L	2	SM 5210B	25 Apr 07 14:26	JED
CBOD, 20 Day	10	mg/L	2	SM 5210B	25 Apr 07 17:39	AKF
Solids, Total Suspended	64	mg/L	2	USGS I-3765-85	25 Apr 07 11:50	JED
Carbon, Total Organic	9.2	mg/L	0.5	415.1	27 Apr 07 10:30	Bis
Chlorophyll a	27.7	mg/cubic m	1.0	10200H	2 May 07 7:05	JD
Fecal Coliform, MF	* < 10	CFU/100 mL	10.	SM 9222D 18th Ed	24 Apr 07 19:00	ES
Chloride	18.3	mg/L	3.0	325.2	30 Apr 07 15:47	DAP
Nitrate+Nitrite	0.31	mg/L as N	0.20	353.2	25 Apr 07 15:39	DAP
Nitrogen, Ammonia	< 0.16	mg/L	0.16	4500 NH3 B, E	30 Apr 07 10:45	TAM
Phosphorus, Total	0.106	mg/L	0.005	EPA 365.1	2 May 07 9:35	DAP
Phosphorus, Ortho	< 0.005	mg/L	0.005	EPA 365.1	25 Apr 07 7:20	DAP
Nitrogen, Total Kjeldahl	1.0	mg/L	0.2	SM 4500NorgB/NH3 E	2 May 07 6:30	TAM

CFU = Colony Forming Units

\* Holding time Exceeded

Info For:

Entered By/Date: JT 7/9/07

Checked By/Date: WB 10/25/07

PRELIMINARY REPORT: RESULTS ARE SUBJECT TO CHANGE PENDING FINAL APPROVAL OF DATA.

RL = Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix  
 ! = Due to sample quantity

# = Due to sample concentration  
 + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND HW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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WES BOLL  
 WENCK ASSOCIATES INC  
 1800 PIONEER CRK CTR  
 MAPLE PLAIN MN 55359-9000

Report Date: 8 Jun 07  
 Lab Number: 07-A18769  
 Work Order #: 12-5557  
 Account #: 013173  
 Sample Matrix: SURFACE WATER  
 Date Sampled: 9 May 07 9:45  
 Sampled By: WES BOLL  
 Date Received: 9 May 07 16:12  
 PO #: 0002-107

Project Number: 0002-107  
 Sample Description: CR 4.1

Temp at Receipt: 3.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					14 May 07	RMV
BOD, Carbonaceous	< 2	mg/L	2	SM 5210B	10 May 07 14:16	JED
CBOD, 20 Day	5	mg/L	2	SM 5210B	10 May 07 13:11	AKF
Solids, Total Suspended	6	mg/L	2	USGS I-3765-85	10 May 07 10:50	CJL
Carbon, Total Organic	6.5	mg/L	0.5	415.1	5 Jun 07 16:30	Bis
Chlorophyll a	3.5	mg/cubic m	1.0	10200H	11 May 07 8:31	JD
Fecal Coliform, MF	* 20	CFU/100 mL	10.	SM 9222D 18th Ed	9 May 07 18:05	ES
Chloride	21.4	mg/L	3.0	325.2	16 May 07 15:57	DAP
Nitrate+Nitrite	0.29	mg/L as N	0.20	353.2	14 May 07 7:22	RMV
Nitrogen, Ammonia	< 0.16	mg/L	0.16	4500 NH3 B, E	15 May 07 10:35	TAM
Phosphorus, Total	0.025	mg/L	0.005	EPA 365.1	17 May 07 8:00	DAP
Phosphorus, Ortho	< 0.005	mg/L	0.005	EPA 365.1	10 May 07 10:06	DAP
Nitrogen, Total Kjeldahl	1.0	mg/L	0.2	SM 4500NorgB/NH3 E	16 May 07 6:55	TAM

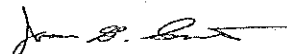
CFU = Colony Forming Units

\* Holding time Exceeded

Data Set: \_\_\_\_\_

Entered By/Date: JT 7/9/07

QA/QC By/Date: WB 10/25/07

Approved by:   
 Jason G. Smith, Inorganic  
 Laboratory Manager New Ulm, MN

RL = Reporting Limit

Elevated "Less Than Result" (e): # = Due to sample matrix  
 ! = Due to sample quantity

# = Due to sample concentration  
 \* = Due to extract volume



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WES BOLL
WENCK ASSOCIATES INC
1800 PIONEER CRK CTR
MAPLE PLAIN MN 55359-9000

Report Date: 14 Jun 07
Lab Number: 07-A21653
Work Order #: 12-6194
Account #: 013173
Sample Matrix: SURFACE WATER
Date Sampled: 23 May 07 10:30
Sampled By: NICK C
Date Received: 23 May 07 15:55
PO #: CRWD TMDL

Project Name: CRWD TMDL

Sample Description: CR 4.1

Temp at Receipt: 4.0C

Table with 6 columns: As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Rows include Phosphorus Water Digest, BOD, Carbonaceous, CBOD, 20 Day, Solids, Total Suspended, Carbon, Total Organic, Fecal Coliform, MF, Chloride, Nitrate+Nitrite, Nitrogen, Ammonia, Phosphorus, Total, Phosphorus, Ortho, Nitrogen, Total Kjeldahl.

\*FU = Colony Forming Units

\* Holding time Exceeded

Data Set: \_\_\_\_\_

Entered By/Date: JT 7/19/07

QA/QC By/Date: WB 10/25/07

Chlor-A - not tested for

Approved by: Jason G. Smith, Inorganic Laboratory Manager New Ulm, MN

Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration
! = Due to sample quantity + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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WES BOLL  
WENCK ASSOCIATES INC  
1800 PIONEER CRK CTR  
MAPLE PLAIN MN 55359-9000

Report Date: 21 Jun 07  
Lab Number: 07-A23067  
Work Order #: 12-6461  
Account #: 013173  
Sample Matrix: SURFACE WATER  
Date Sampled: 30 May 07 10:25  
Sampled By: NICK C  
Date Received: 30 May 07 16:00  
PO #: 0002-107

Sample Description: CR 4.1

Temp at Receipt: 1.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					4 Jun 07	AKW
BOD, Carbonaceous	2	mg/L	2	SM 5210B	31 May 07 11:25	CJL
CBOD, 20 Day	6	mg/L	2	SM 5210B	31 May 07 11:04	CJL
Solids, Total Suspended	4	mg/L	2	USGS I-3765-85	31 May 07 8:00	JED
Carbon, Total Organic	7.0	mg/L	0.5	415.1	8 Jun 07 16:00	Bis
Chlorophyll a	7.2	mg/cubic m	1.0	10200H	1 Jun 07 13:07	JD
Fecal Coliform, MF	* 140	CFU/100 mL	10.	SM 9222D 18th Ed	30 May 07 17:10	ES
Chloride	21.2	mg/L	3.0	325.2	31 May 07 8:42	AKW
Nitrate+Nitrite	0.20	mg/L as N	0.20	353.2	4 Jun 07 8:14	RMV
Nitrogen, Ammonia	< 0.16	mg/L	0.16	4500 NH3 B, E	4 Jun 07 9:25	TAM
Phosphorus, Total	0.027	mg/L	0.005	EPA 365.1	5 Jun 07 8:07	RMV
Phosphorus, Ortho	< 0.005	mg/L	0.005	EPA 365.1	31 May 07 8:12	DAP
Nitrogen, Total Kjeldahl	1.2	mg/L	0.2	SM 4500NorgB/NH3 E	4 Jun 07 8:10	EJP

U = Colony Forming Units

\* Holding time Exceeded

Data Set: \_\_\_\_\_

Entered By/Date: JT 7/9/07

QA/QC By/Date: WB 10/29/07

Approved by:

Jason G. Smith, Inorganic  
Laboratory Manager New Ulm, MN

Reporting Limit

Elevated "Less Than Result" (<): # = Due to sample matrix  
! = Due to sample quantity

# = Due to sample concentration  
+ = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447600 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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WES BOLL
WENCK ASSOCIATES INC
1800 PIONEER CRK CTR
MAPLE PLAIN MN 55359-9000

Report Date: 29 Jun 07
Lab Number: 07-A24668
Work Order #: 12-6814
Account #: 013173
Sample Matrix: SURFACE WATER
Date Sampled: 6 Jun 07 10:00
Sampled By: NICK C
Date Received: 6 Jun 07 16:00
PO #: CRWD TMDL

Temp at Receipt: 5.0C

Project Name: CRWD TMDL

Sample Description: CR 4.1

Table with 6 columns: As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Rows include Phosphorus Water Digest, BOD, Carbonaceous, CBOD, 20 Day, Solids, Total Suspended, Carbon, Total Organic, Chlorophyll a, Fecal Coliform, MF, Chloride, Nitrate+Nitrite, Nitrogen, Ammonia, Phosphorus, Total, Phosphorus, Ortho, Nitrogen, Total Kjeldahl.

J = Colony Forming Units

\* Holding time Exceeded

Data Set: \_\_\_\_\_

Entered By/Date: JT 7/9/07

QA/QC By/Date: WB 10/25/07

Approved by: Jason G. Smith, Inorganic Laboratory Manager New Ulm, MN

Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration
! = Due to sample quantity + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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WES BOLL  
WENCK ASSOCIATES INC  
1800 PIONEER CRK CTR  
MAPLE PLAIN MN 55359-9000

Report Date: 12 Jul 07  
Lab Number: 07-A27467  
Work Order #: 12-7478  
Account #: 013173  
Sample Matrix: SURFACE WATER  
Date Sampled: 20 Jun 07 10:20  
Sampled By: NICK C  
Date Received: 20 Jun 07 16:00  
PO #: CLEARWATER

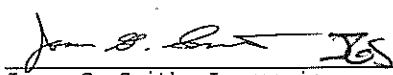
Temp at Receipt: 6.0C

Project Name: CLEARWATER  
Project Number: 0002-108  
Sample Description: CR 4.1

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					22 Jun 07	AKW
BOD, Carbonaceous	< 2	mg/L	2	SM 5210B	21 Jun 07 14:34	JED
CBOD, 20 Day	11	mg/L	2	SM 5210B	21 Jun 07 14:05	JED
Solids, Total Suspended	3	mg/L	2	USGS I-3765-85	21 Jun 07 11:45	CJL
Carbon, Total Organic	10.0	mg/L	0.5	415.1	27 Jun 07 8:00	Bis
Chlorophyll a	2.8	mg/cubic m	1.0	10200H	26 Jun 07 15:02	JD
Fecal Coliform, MF	* 55	CFU/100 mL	10.	SM 9222D 20th Ed	20 Jun 07 18:25	ES
Chloride	20.6	mg/L	3.0	325.2	25 Jun 07 13:13	DAP
Nitrate+Nitrite	< 0.2	mg/L as N	0.2	353.2	27 Jun 07 14:51	DAP
Nitrogen, Ammonia	< 0.16	mg/L	0.16	4500 NH3 B, E	21 Jun 07 9:40	EJP
Phosphorus, Total	0.020	mg/L	0.005	EPA 365.1	26 Jun 07 14:00	DAP
Phosphorus, Ortho	< 0.005	mg/L	0.005	EPA 365.1	21 Jun 07 7:40	RMV
Nitrogen, Total Kjeldahl	0.7	mg/L	0.2	SM 4500NorgB/NH3 E	21 Jun 07 15:15	EJP

U = Colony Forming Units

\* Holding time Exceeded

Approved by:   
Jason G. Smith, Inorganic  
Laboratory Manager New Ulm, MN

Ent  
WB  
7/25/07  
QA WB  
10/25/07

Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration  
! = Due to sample quantity + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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WES BOLL  
 WENCK ASSOCIATES INC  
 1800 PIONEER CRK CTR  
 MAPLE PLAIN MN 55359-9000

Report Date: 24 Jul 07  
 Lab Number: 07-A29583  
 Work Order #: 12-7958  
 Account #: 013173  
 Sample Matrix: SURFACE WATER  
 Date Sampled: 2 Jul 07 9:50  
 Sampled By: NICK C  
 Date Received: 3 Jul 07 9:55

Project Name: CRWD TMDL  
 Project Number: 0002-107  
 Sample Description: CR 4.1

Temp at Receipt: 3.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					9 Jul 07	AKW
Water Digestions					9 Jul 07	JMS
BOD, Carbonaceous	< 2	mg/L	2	SM 5210B	3 Jul 07 14:14	JED
CBOD, 20 Day	14	mg/L	2	SM 5210B	3 Jul 07 14:27	JED
Solids, Total Suspended	< 2	mg/L	2	USGS I-3765-85	3 Jul 07 11:30	CJL
Carbon, Total Organic	9.0	mg/L	0.5	415.1	12 Jul 07 8:00	Bis
Chlorophyll a	< 1	mg/cubic m	1.0	10200H	10 Jul 07 7:35	JD
Nitrogen Total, Calculat	1.2	mg/L	NA	Calc	20 Jul 07 11:43	Calculated
Chloride	23.2	mg/L	3.0	325.2	9 Jul 07 15:20	AKW
Nitrate+Nitrite	0.24	mg/L as N	0.20	353.2	20 Jul 07 11:43	DAP
Nitrogen, Ammonia	< 0.16	mg/L	0.16	4500 NH3 B, E	5 Jul 07 7:15	TAM
Phosphorus, Total	0.017	mg/L	0.005	EPA 365.1	10 Jul 07 11:14	DAP
Phosphorus, Ortho	< 0.005	mg/L	0.005	EPA 365.1	3 Jul 07 18:57	DAP
Nitrogen, Total Kjeldahl	1.0	mg/L	0.2	SM 4500NorgB/NH3 E	9 Jul 07 5:40	TAM
on	0.121	mg/L	0.015	6010	9 Jul 07 15:44	CJR

Ent  
 WB  
 7/26/07

QA  
 WB  
 10/25/07

Approved by: Jason G. Smith  
 Jason G. Smith, Inorganic  
 Laboratory Manager New Ulm, MN

Reporting Limit  
 Elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration  
 ! = Due to sample quantity + = Due to extract volume  
 CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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WES BOLL  
 WENCK ASSOCIATES INC  
 1800 PIONEER CRK CTR  
 MAPLE PLAIN MN 55359-9000

Report Date: 2 Aug 07  
 Lab Number: 07-A31298  
 Work Order #: 12-8261  
 Account #: 013173  
 Sample Matrix: SURFACE WATER  
 Date Sampled: 11 Jul 07 10:00  
 Sampled By: WES B  
 Date Received: 11 Jul 07 15:50  
 PO #: 0002-107

Project Number: 0002-107  
 Sample Description: CR 4.1

Temp at Receipt: 0.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					13 Jul 07	AKW
Water Digestions					17 Jul 07	JMS
BOD, Carbonaceous	< 2	mg/L	2	SM 5210B	12 Jul 07 11:11	CJL
CBOD, 20 Day	13	mg/L	2	SM 5210B	12 Jul 07 11:24	CJL
Solids, Total Suspended	2	mg/L	2	USGS I-3765-85	12 Jul 07 10:30	JED
Carbon, Total Organic	9.00	mg/L	0.50	415.1	19 Jul 07 11:00	Bis
Chlorophyll a	2.8	mg/cubic m	1.0	10200H	17 Jul 07 9:43	JD
Fecal Coliform, MF	* 64	CFU/100 mL	10.	SM 9222D 20th Ed	11 Jul 07 19:00	ES
Nitrogen Total, Calculat	1.1	mg/L	NA	Calc	21 Jul 07 13:15	Calculated
Chloride	21.2	mg/L	3.0	325.2	23 Jul 07 14:11	AKW
Nitrate+Nitrite	< 0.2	mg/L as N	0.2	353.2	21 Jul 07 13:15	JGS
Nitrogen, Ammonia	< 0.16	mg/L	0.16	4500 NH3 B, E	16 Jul 07 11:45	EJP
Phosphorus, Total	0.024	mg/L	0.005	EPA 365.1	18 Jul 07 11:10	DAP
Phosphorus, Ortho	0.007	mg/L	0.005	EPA 365.1	12 Jul 07 8:18	DAP
Nitrogen, Total Kjeldahl	1.1	mg/L	0.2	SM 4500NorgB/NH3 E	16 Jul 07 15:00	EJP
Iron	0.095	mg/L	0.015	6010	18 Jul 07 11:37	CJR

Batch matrix spike and spike duplicate recoveries for Nitrate+Nitrite were outside MVTL 85-115% limit at 126% and 126%. Data reported based on acceptable spike duplication and known recovery.

CFU = Colony Forming Units

\* Holding time Exceeded

Data Set: \_\_\_\_\_

Entered By/Date: WB 10/08/07

QA/QC By/Date: WB 10/25/07

Approved by: \_\_\_\_\_

Jason G. Smith, Inorganic  
 Laboratory Manager New Ulm, MN

Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix  
 ! = Due to sample quantity

# = Due to sample concentration  
 + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND NW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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# Field Form: 2007 Stream Sampling

Client: CRWD  
 Project No.: 0002-107  
 Date: 4/25/07  
 Sampler(s): WB  
 Start Time: 12:00  
 End Time: \_\_\_\_\_  
 Channel Conditions: \_\_\_\_\_  
 COC Number: \_\_\_\_\_

Site Location: CR 7.1  
 Site Description: \_\_\_\_\_  
 Weather: 55°, Sunny  
 Samples Taken: Yes  No   
 Sample Time: \_\_\_\_\_  
 DTW Measurement: 15.16

Notes: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Field Parameters				
Sample I.D.	Temp. (°C)	Cond. (mS/cm)	D.O. (mg/l)	pH (S.U.)
	13.12	423	9.96	8.25

\* Calibration at 1230 | 16.61 |  
 12/25/07

9.43%  
 96.2

Stage Ht: \_\_\_\_\_

Rated Flow: \_\_\_\_\_

Gauged Flow: ~~172.529~~ 172.529

### Stream Gauging Data

Distance from Initial Point (ft)	Width (ft)	Depth (ft)	Velocity (60% Depth)	Velocity		Average Velocity (ft/sec)	Area (ft <sup>2</sup> )	Discharge (Q, ft <sup>3</sup> /sec)
				20% Depth	80% Depth			
0, (left side)								
- Programmed ISCO to collect samples 15 min @ 12:00								
- Dumped 54 oz of dye at 11:00								
Photos								
0619 - Grass Lake Dam facing E								
0620 - Grass Lake								
0621 - 0622 - Dye ds of dam								
Data Set: _____								
0623 - CR 7.1 Downstream								
Entered By/Date: JT 7/9/07								
0624 CR 7.1 Upstream								
QA/QC By/Date: WB 10/30/07								

# Field Form: 2007 Stream Sampling

Client: CRWD  
 Project No.: 0002-107  
 Date: 8.9.07  
 Sampler(s): NIC/WB  
 Start Time: 10:30  
 End Time: 10:50  
 Channel Conditions: flowing  
 COC Number: \_\_\_\_\_

Site Location: CR 71  
 Site Description: \_\_\_\_\_  
 Weather: Sunny 75°  
 Samples Taken:  Yes  No  
 Sample Time: 10:45  
 DTW Measurement: 15.48

Notes: -Water is clear  
-Stream is within banks

Field Parameters				
Sample I.D.	Temp. (°C)	Cond. (mS/cm)	D.O. (mg/l)	pH (S.U.)
	17.12	428	9.09	7.99

Stage Ht: \_\_\_\_\_

Rated Flow: \_\_\_\_\_

Gauged Flow: 133.082

### Stream Gauging Data

Distance from Initial Point (ft)	Width (ft)	Depth (ft)	Velocity (60% Depth)	Velocity		Average Velocity (ft/sec)	Area (ft <sup>2</sup> )	Discharge (Q, ft <sup>3</sup> /sec)
				20% Depth	80% Depth			
0, (left side)								

Data Set: \_\_\_\_\_  
 Entered By/Date: JT 7/9/07  
 QA/QC By/Date: WB 10/30/07

# Field Form: 2007 Stream Sampling

Client: CRWD

Project No.: 0002-107

Date: 5.23.07

Sampler(s): NIC/WB

Start Time: 1112

End Time: 1140

Channel Conditions: Flowing

COC Number: \_\_\_\_\_

Site Location: CR 7.1

Site Description: \_\_\_\_\_

Weather: cloudy / sprinkles 65°

Samples Taken:  Yes  No

Sample Time: 1120

DTW Measurement: 16.26

Notes: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Field Parameters				
Sample I.D.	Temp. (°C)	Cond. (mS/cm)	D.O. (mg/l)	pH (S.U.)
	19.31	434	7.65	8.20

Stage Ht: \_\_\_\_\_ Rated Flow: \_\_\_\_\_ Gauged Flow: 54.338

## Stream Gauging Data

Distance from Initial Point (ft)	Width (ft)	Depth (ft)	Velocity (60% Depth)	Velocity		Average Velocity (ft/sec)	Area (ft²)	Discharge (Q, ft³/sec)
				20% Depth	80% Depth			
0, (left side)								

Data Set: \_\_\_\_\_

Entered By/Date: JT 7/9/07

QA/QC By/Date: WB 10/30/07



# Field Form: 2007 Stream Sampling

Client: CRWD  
 Project No.: 0002-107  
 Date: 5.30.07  
 Sampler(s): Jess/Nic  
 Start Time: 11:20  
 End Time: 11:40  
 Channel Conditions: flowing  
 COC Number: \_\_\_\_\_

Site Location: CR 7.1  
 Site Description: Clearwater River @ 140<sup>th</sup> St NW  
 Weather: Sunny 77°  
 Samples Taken: (Yes) No  
 Sample Time: 11:30  
 DTW Measurement: 16.50

Field Parameters				
Sample I.D.	Temp. (°C)	Cond. (mS/cm)	D.O. (mg/l)	pH (S.U.)
	21.91	433	9.03	6.14

Notes: Stagnant looking  
water in upstream  
Right hand side,  
downstream of bridge.  
51.025  
180 cfs

Stage Ht: \_\_\_\_\_ Rated Flow: \_\_\_\_\_ Gauged Flow: \_\_\_\_\_

## Stream Gauging Data

Distance from Initial Point (ft)	Width (ft)	Depth (ft)	Velocity (60% Depth)	Velocity		Average Velocity (ft/sec)	Area (ft <sup>2</sup> )	Discharge (Q, ft <sup>3</sup> /sec)
				20% Depth	80% Depth			
0, (left side)								
Data Set: _____								
Entered By/Date: <u>JT 7/9/07</u>								
QA/QC By/Date: <u>WB 10/30/07</u>								

## Field Form: 2007 Stream Sampling

Client: CRWD  
 Project No.: 0002-107  
 Date: 10-6-07  
 Sampler(s): Nic/Jess  
 Start Time: 10:53  
 End Time: 11:10  
 Channel Conditions: Flowing  
 COC Number: \_\_\_\_\_

Site Location: CR 7.1  
 Site Description: Clearwater River @ 140<sup>th</sup> St NW  
 Weather: 63° cloudy  
 Samples Taken:  Yes  No  
 Sample Time: ~~10:53~~ 11:00  
 DTW Measurement: 16.11  
0:40+

Notes: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Field Parameters				
Sample I.D.	Temp. (°C)	Cond. (mS/cm)	D.O. (mg/l)	pH (S.U.)
	<u>20.3</u>		<u>4.36</u>	

Stage Ht: \_\_\_\_\_

Rated Flow: \_\_\_\_\_

Gauged Flow: ~~112.237~~ 112.237

### Stream Gauging Data

Distance from Initial Point (ft)	Width (ft)	Depth (ft)	Velocity (60% Depth)	Velocity		Average Velocity (ft/sec)	Area (ft <sup>2</sup> )	Discharge (Q, ft <sup>3</sup> /sec)
				20% Depth	80% Depth			
0, (left side)								
				Data Set: _____				
				Entered By/Date: <u>JT 7/9/07</u>				
				QA/QC By/Date: <u>WB 10/30/07</u>				





## Field Form: 2007 Stream Sampling

Client: CRWD  
 Project No.: 0002-107  
 Date: 7.11.07  
 Sampler(s): pic  
 Start Time: 1050  
 End Time: \_\_\_\_\_  
 Channel Conditions: flowing  
 COC Number: \_\_\_\_\_

Site Location: CR 7.1  
 Site Description: \_\_\_\_\_  
 Weather: Sunny 75°  
 Samples Taken:  Yes  No  
 Sample Time: 1100  
 DTW Measurement: 16.49

Notes: \_\_\_\_\_  
- sandbar on west side of channel

Field Parameters				
Sample I.D.	Temp. (°C)	Cond. (mS/cm)	D.O. (mg/l)	pH (S.U.)
	<u>22.74</u>	<u>363</u>	<u>7.65</u>	<u>8.49</u>

Stage Ht: \_\_\_\_\_

Rated Flow: \_\_\_\_\_

Gauged Flow: ~~23.298~~  
23.298

### Stream Gauging Data

Distance from Initial Point (ft)	Width (ft)	Depth (ft)	Velocity (60% Depth)	Velocity		Average Velocity (ft/sec)	Area (ft <sup>2</sup> )	Discharge (Q, ft <sup>3</sup> /sec)
				20% Depth	80% Depth			
0, (left side)								

Data Set: \_\_\_\_\_  
 Entered By/Date: WB 7/12/07  
 QA/QC By/Date: WB 10/30/07

# Field Form: 2007 Stream Sampling

Client: CRWD  
 Project No.: 0002-107  
 Date: 7.25.07  
 Sampler(s): JCS/NL  
 Start Time: 10:51  
 End Time: 11:25  
 Channel Conditions: Flowing  
 COC Number: \_\_\_\_\_

Site Location: CRF1  
 Site Description: Clearwater Crossing @ 140<sup>th</sup> St NW  
 Weather: 90° Sunny  
 Samples Taken:  Yes  No  
 Sample Time: 11:05  
 DTW Measurement: 17.12

Notes: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Field Parameters				
Sample I.D.	Temp. (°C)	Cond. (mS/cm)	D.O. (mg/l)	pH (S.U.)
	<u>21.17</u>	<u>.386</u>	<u>9.34</u>	<u>8.66</u>

Stage Ht: \_\_\_\_\_ Rated Flow: \_\_\_\_\_ Gauged Flow: 3.31

### Stream Gauging Data

Distance from Initial Point (ft)	Width (ft)	Depth (ft)	Velocity (60% Depth)	Velocity		Average Velocity (ft/sec)	Area (ft <sup>2</sup> )	Discharge (Q, ft <sup>3</sup> /sec)
				20% Depth	80% Depth			
0, (left side)								

Data Set: \_\_\_\_\_  
 Entered By/Date: WB 7/25/07  
 QA/QC By/Date: WB 10/30/07

## Field Form: 2007 Stream Sampling

Client: CRWD

Project No.: 0002-107

Date: 8.8.07

Sampler(s): N/C

Start Time: 1135

End Time: 1155

Channel Conditions: flowing

COC Number: \_\_\_\_\_

Site Location: CR 7.1

Site Description: \_\_\_\_\_

Weather: Sunny 85°

Samples Taken:  Yes  No

Sample Time: 1145

DTW Measurement: 17.09

Notes: width of channel is drastically less. sandbars are prominent now.

1.17

Gauged Flow: ~~1.17~~ cfs

Field Parameters				
Sample I.D.	Temp. (°C)	Cond. (mS/cm)	D.O. (mg/l)	pH (S.U.)
	<u>22.69</u>	<u>499</u>	<u>7.02</u>	<u>8.01</u>

Stage Ht: \_\_\_\_\_

Rated Flow: \_\_\_\_\_

Gauged Flow: \_\_\_\_\_

### Stream Gauging Data

Distance from Initial Point (ft)	Width (ft)	Depth (ft)	Velocity (60% Depth)	Velocity		Average Velocity (ft/sec)	Area (ft <sup>2</sup> )	Discharge (Q, ft <sup>3</sup> /sec)
				20% Depth	80% Depth			
0, (left side)								

Data Set: \_\_\_\_\_

Entered By/Date: WB 10/08/07

QA/QC By/Date: WB 10/30/07

## Field Form: 2007 Stream Sampling

Client: CRWD Site Location: CR 7-1  
 Project No.: 0002-107 Site Description: \_\_\_\_\_  
 Date: 8.22.07 Weather: Sunny 75°  
 Sampler(s): NIC Samples Taken: (2) No  
 Start Time: 1030 Sample Time: 1045  
 End Time: 1055  
 Channel Conditions: flumpy DTW Measurement: 16.61  
 COC Number: \_\_\_\_\_

Notes: slightly more flow  
1/2 of small  
amount of rain.

Field Parameters				
Sample I.D.	Temp. (°C)	Cond. (mS/cm)	D.O. (mg/l)	pH (S.U.)
	<u>22.21</u>	<u>539</u>	<u>7.69</u>	<u>7.59</u>

Stage Ht: \_\_\_\_\_ Rated Flow: \_\_\_\_\_ Gauged Flow: ~~25.1~~ 25.1 gfs

### Stream Gauging Data

Distance from Initial Point (ft)	Width (ft)	Depth (ft)	Velocity (60% Depth)	Velocity		Average Velocity (ft/sec)	Area (ft <sup>2</sup> )	Discharge (Q, ft <sup>3</sup> /sec)
				20% Depth	80% Depth			
0, (left side)								

Data Set: \_\_\_\_\_  
 Entered By/Date: WB 10/08/07  
 QA/QC By/Date: WB 10/30/07



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**PRELIMINARY REPORT**

WES BOLL  
 WENCK ASSOCIATES INC  
 1800 PIONEER CRK CTR  
 MAPLE PLAIN MN 55359-9000

Report Date: 22 May 07  
 Lab Number: 07-A15434  
 Work Order #: 12-4795  
 Account #: 013173  
 Sample Matrix: SURFACE WATER  
 Date Sampled: 24 Apr 07 10:45  
 Date Received: 24 Apr 07 16:30  
 PO #: 002-107

Project Number: 0002-107  
 Sample Description: CR 7.1

Temp at Receipt: 4.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					2 May 07	DAP
BOD, Carbonaceous	3	mg/L	2	SM 5210B	25 Apr 07 14:26	JED
CBOD, 20 Day	11	mg/L	2	SM 5210B	25 Apr 07 17:39	AKF
Solids, Total Suspended	6	mg/L	2	USGS I-3765-85	25 Apr 07 9:45	JED
Carbon, Total Organic	8.6	mg/L	0.5	415.1	27 Apr 07 10:30	Bis
Chlorophyll a	5.6	mg/cubic m	1.0	10200H	2 May 07 7:05	JD
Fecal Coliform, MF	* 10	CFU/100 mL	10.	SM 9222D 18th Ed	24 Apr 07 19:00	ES
Chloride	18.5	mg/L	3.0	325.2	30 Apr 07 15:47	DAP
Nitrate+Nitrite	0.30	mg/L as N	0.20	353.2	25 Apr 07 15:39	DAP
Nitrogen, Ammonia	< 0.16	mg/L	0.16	4500 NH3 B, E	30 Apr 07 10:45	TAM
Phosphorus, Total	0.041	mg/L	0.005	EPA 365.1	2 May 07 9:35	DAP
Phosphorus, Ortho	< 0.005	mg/L	0.005	EPA 365.1	25 Apr 07 7:19	DAP
Nitrogen, Total Kjeldahl	0.7	mg/L	0.2	SM 4500NorgB/NH3 E	2 May 07 6:30	TAM

CFU = Colony Forming Units

\* Holding time Exceeded

\_\_\_\_\_ Data Set \_\_\_\_\_  
 Entered By/Date: JT 7/9/07  
 QA/QC By/Date: WB 10/30/07

PRELIMINARY REPORT: RESULTS ARE SUBJECT TO CHANGE PENDING FINAL APPROVAL OF DATA.

RL = Reporting Limit

Elevated "Less Than Result" (c): @ = Due to sample matrix # = Due to sample concentration  
 ! = Due to sample quantity + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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WES BOLL  
 WENCK ASSOCIATES INC  
 1800 PIONEER CRK CTR  
 MAPLE PLAIN MN 55359-9000

Report Date: 8 Jun 07  
 Lab Number: 07-A18772  
 Work Order #: 12-5557  
 Account #: 013173  
 Sample Matrix: SURFACE WATER  
 Date Sampled: 9 May 07 10:45  
 Sampled By: WES BOLL  
 Date Received: 9 May 07 16:12  
 PO #: 0002-107

Project Number: 0002-107  
 Sample Description: CR 7.1

Temp at Receipt: 3.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					14 May 07	WV
BOD, Carbonaceous	3	mg/l	2	SM 5210B	10 May 07 14:16	JMD
CBOD, 20 Day	5	mg/L	2	SM 5210B	10 May 07 13:11	AKF
Solids, Total Suspended	16	mg/L	2	USGS I-3765-85	10 May 07 12:05	CJL
Carbon, Total Organic	7.5	mg/L	0.5	415.1	5 Jun 07 16:30	Bis
Chlorophyll a	3.3	mg/cubic m	1.0	10200H	11 May 07 8:31	JD
Fecal Coliform, MF Chloride	* 54	CFU/100 mL	10.	SM 9222D 18th Ed	9 May 07 18:05	ES
Nitrate+Nitrite	21.7	mg/L	3.0	325.2	16 May 07 15:57	DAP
Nitrogen, Ammonia	0.26	mg/L as N	0.20	353.2	14 May 07 7:22	RMV
Phosphorus, Total	< 0.16	mg/L	0.16	4500 NH3 B, E	15 May 07 10:35	TAM
Phosphorus, Ortho	0.041	mg/L	0.005	EPA 365.1	17 May 07 8:00	DAP
Nitrogen, Total Kjeldahl	< 0.005	mg/L	0.005	EPA 365.1	10 May 07 10:06	DAP
	1.0	mg/L	0.2	SM 4500NorgB/NH3 E	16 May 07 6:55	TAM

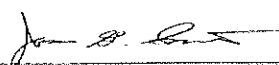
CFU = Colony Forming Units

\* Holding time Exceeded

Data Set: \_\_\_\_\_

Entered By/Date: JT 7/19/07

QA/QC By/Date: WB 10/30/07

Approved by:   
 Jason G. Smith, Inorganic  
 Laboratory Manager New Ulm, MN

RL = Reporting Limit

Elevated "Less Than Result" (c): @ = Due to sample matrix  
 ! = Due to sample quantity

# = Due to sample concentration  
 \* = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WH/DW # R-040 IA LAB #: 132 IA LAB #: 022



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WES BOLL  
WENCK ASSOCIATES INC  
1800 PIONEER CRK CTR  
MAPLE PLAIN MN 55359-9000

Report Date: 14 Jun 07  
Lab Number: 07-A21651  
Work Order #: 12-6194  
Account #: 013173  
Sample Matrix: SURFACE WATER  
Date Sampled: 23 May 07 11:20  
Sampled By: NICK C  
Date Received: 23 May 07 15:55  
PO #: CRWD TMDL

Project Name: CRWD TMDL

Sample Description: CR 7.1

Temp at Receipt: 4.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					29 May 07	AKW
BOD, Carbonaceous	< 2	mg/L	2	SM 5210B	24 May 07 11:40	JED
CBOD, 20 Day	8	mg/L	2	SM 5210B	24 May 07 11:12	JED
Solids, Total Suspended	12	mg/L	2	USGS I-3765-85	24 May 07 9:45	CJL
Carbon, Total Organic	8.6	mg/L	0.5	415.1	6 Jun 07 8:00	Bis
Fecal Coliform, MF	* 460	CFU/100 mL	10.	SM 9222D 18th Ed	23 May 07 17:55	JLS
Chloride	20.6	mg/L	3.0	325.2	25 May 07 12:59	AKW
Nitrate+Nitrite	< 0.2	mg/L as N	0.2	353.2	25 May 07 11:26	RMV
Nitrogen, Ammonia	< 0.16	mg/L	0.16	4500 NH3 B, E	25 May 07 7:00	TAM
Phosphorus, Total	0.025	mg/L	0.005	EPA 365.1	31 May 07 15:26	DAP
Phosphorus, Ortho	< 0.005	mg/L	0.005	EPA 365.1	24 May 07 6:26	JGS
Nitrogen, Total Kjeldahl	1.3	mg/L	0.2	SM 4500NorgB/NH3 E	29 May 07 14:10	EJP

\*U = Colony Forming Units

\* Holding time Exceeded

Data Set: \_\_\_\_\_

Entered By/Date: JT 7/19/07

QA/QC By/Date: WB 10/30/07

*Chlor-A: NOT tested for*

Approved by: Jason G. Smith  
Jason G. Smith, Inorganic  
Laboratory Manager New Ulm, MN

### Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix  
! = Due to sample quantity

# = Due to sample concentration  
+ = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447660 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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WES BOLL  
WENCK ASSOCIATES INC  
1800 PIONEER CRK CTR  
MAPLE PLAIN MN 55359-9000

Report Date: 21 Jun 07  
Lab Number: 07-A23065  
Work Order #: 12-6461  
Account #: 013173  
Sample Matrix: SURFACE WATER  
Date Sampled: 30 May 07 11:30  
Sampled By: NICK C  
Date Received: 30 May 07 16:00  
PO #: 0002-107

Temp at Receipt: 1.0C

Sample Description: CR 7.1

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					4 Jun 07	AKW
BOD, Carbonaceous	3	mg/L	2	SM 5210B	31 May 07 11:25	CJL
CBOD, 20 Day	6	mg/L	2	SM 5210B	31 May 07 11:04	CJL
Solids, Total Suspended	4	mg/L	2	USGS I-3765-85	31 May 07 8:00	JED
Carbon, Total Organic	6.5	mg/L	0.5	415.1	8 Jun 07 16:00	Bis
Chlorophyll a	4.7	mg/cubic m	1.0	10200H	1 Jun 07 13:07	JD
Fecal Coliform, MF	45	CFU/100 mL	10.	SM 9222D 18th Ed	30 May 07 17:10	ES
Chloride	21.7	mg/L	3.0	325.2	31 May 07 8:42	AKW
Nitrate+Nitrite	< 0.2	mg/L as N	0.2	353.2	4 Jun 07 8:15	RMV
Nitrogen, Ammonia	< 0.16	mg/L	0.16	4500 NH3 B, E	31 May 07 8:55	TAM
Phosphorus, Total	0.024	mg/L	0.005	EPA 365.1	5 Jun 07 8:07	RMV
Phosphorus, Ortho	< 0.005	mg/L	0.005	EPA 365.1	31 May 07 8:12	DAP
Nitrogen, Total Kjeldahl	1.3	mg/L	0.2	SM 4500NorgB/NH3 E	4 Jun 07 8:10	EJP

CFU = Colony Forming Units

Data Set: \_\_\_\_\_

Entered By/Date: JT 7/9/07

QA/QC By/Date: WB 10/30/07

Approved by: Jason G. Smith  
Jason G. Smith, Inorganic  
Laboratory Manager New Ulm, MN

Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration  
! = Due to sample quantity + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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WES BOLL  
 WENCK ASSOCIATES INC  
 1800 PIONEER CRK CTR  
 MAPLE PLAIN MN 55359-9000

Report Date: 21 Jun 07  
 Lab Number: 07-A23068  
 Work Order #: 12-6461  
 Account #: 013173  
 Sample Matrix: SURFACE WATER  
 Date Sampled: 30 May 07 10:07  
 Sampled By: NICK C  
 Date Received: 30 May 07 16:00  
 PO #: 0002-107

Sample Description: T 4.0

Temp at Receipt: 1.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					4 Jun 07	AKW
BOD, Carbonaceous	2	mg/L	2	SM 5210B	31 May 07 11:25	CJL
CBOD, 20 Day	3	mg/L	2	SM 5210B	31 May 07 11:04	CJL
Solids, Total Suspended	2	mg/L	2	USGS I-3765-85	31 May 07 8:00	JED
Carbon, Total Organic	9.5	mg/L	0.5	415.1	8 Jun 07 16:00	Bis
Chlorophyll a	5.8	mg/cubic m	1.0	10200H	1 Jun 07 13:07	JD
Fecal Coliform, MF	* 200	CFU/100 mL	10.	SM 9222D 18th Ed	30 May 07 17:10	ES
Chloride	6.7	mg/L	3.0	325.2	31 May 07 8:42	AKW
Nitrate+Nitrite	< 0.2	mg/L as N	0.2	353.2	4 Jun 07 8:14	RMV
Nitrogen, Ammonia	< 0.16	mg/L	0.16	4500 NH3 B, E	4 Jun 07 9:25	TAM
Phosphorus, Total	0.052	mg/L	0.005	EPA 365.1	5 Jun 07 8:07	RMV
Phosphorus, Ortho	0.020	mg/L	0.005	EPA 365.1	31 May 07 8:12	DAP
Nitrogen, Total Kjeldahl	1.0	mg/L	0.2	SM 4500NorgB/NH3 E	4 Jun 07 8:10	EJP

U = Colony Forming Units

\* Holding time Exceeded

Data Set: \_\_\_\_\_  
 Entered By/Date: JT 7/9/07  
 QA/QC By/Date: WB 10/30/07

Approved by: Jason G. Smith  
 Jason G. Smith, Inorganic  
 Laboratory Manager New Ulm, MN

Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration  
 ! = Due to sample quantity + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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WES BOLL  
WENCK ASSOCIATES INC  
1800 PIONEER CRK CTR  
MAPLE PLAIN MN 55359-9000

Report Date: 29 Jun 07  
Lab Number: 07-A24646  
Work Order #: 12-6814  
Account #: 013173  
Sample Matrix: SURFACE WATER  
Date Sampled: 6 Jun 07 11:00  
Sampled By: NICK C  
Date Received: 6 Jun 07 16:00  
PO #: CRWD TMDL

Project Name: CRWD TMDL

Sample Description: CR 7.1

Temp at Receipt: 5.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					7 Jun 07	AKW
BOD, Carbonaceous	2	mg/L	2	SM 5210B	7 Jun 07 11:43	JED
CBOD, 20 Day	3	mg/L	2	SM 5210B	7 Jun 07 11:29	JED
Solids, Total Suspended	9	mg/L	2	USGS I-3765-85	7 Jun 07 9:15	CJL
Carbon, Total Organic	9.0	mg/L	0.5	415.1	13 Jun 07 8:00	Bis
Chlorophyll a	2.7	mg/cubic m	1.0	10200H	12 Jun 07 9:45	AJK
Fecal Coliform, MF	* 40	CFU/100 mL	10.	SM 9222D 18th Ed	6 Jun 07 18:55	ES
Chloride	21.8	mg/L	3.0	325.2	11 Jun 07 10:22	AKW
Nitrate+Nitrite	< 0.2	mg/L as N	0.2	353.2	7 Jun 07 12:23	DAP
Nitrogen, Ammonia	< 0.16	mg/L	0.16	4500 NH3 B, E	7 Jun 07 11:20	EJP
Phosphorus, Total	0.027	mg/L	0.005	EPA 365.1	12 Jun 07 11:50	RMV
Phosphorus, Ortho	< 0.005	mg/L	0.005	EPA 365.1	7 Jun 07 7:23	RMV
Nitrogen, Total Kjeldahl	1.6	mg/L	0.2	SM 4500NorgB/NH3 E	8 Jun 07 13:00	EJP

J = Colony Forming Units

\* Holding time Exceeded

Data Set: \_\_\_\_\_

Entered By/Date: JT 7/9/07

QA/QC By/Date: WB 10/30/07

Approved by: Jason G. Smith  
Jason G. Smith, Inorganic  
Laboratory Manager New Ulm, MN

Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix  
! = Due to sample quantity

# = Due to sample concentration  
+ = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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WES BOLL  
WENCK ASSOCIATES INC  
1800 PIONEER CRK CTR  
MAPLE PLAIN MN 55359-9000

Report Date: 12 Jul 07  
Lab Number: 07-A27465  
Work Order #: 12-7478  
Account #: 013173  
Sample Matrix: SURFACE WATER  
Date Sampled: 20 Jun 07 11:25  
Sampled By: NICK C  
Date Received: 20 Jun 07 16:00  
PO #: CLEARWATER

Project Name: CLEARWATER  
Project Number: 0002-108  
Sample Description: CR 7.1

Temp at Receipt: 6.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					22 Jun 07	AKW
BOD, Carbonaceous	3	mg/L	2	SM 5210B	21 Jun 07 14:34	JED
CBOD, 20 Day	11	mg/L	2	SM 5210B	21 Jun 07 14:05	JED
Solids, Total Suspended	10	mg/L	2	USGS I-3765-85	21 Jun 07 10:00	CJL
Carbon, Total Organic	10.5	mg/L	0.5	415.1	27 Jun 07 8:00	Bis
Chlorophyll a	20.9	mg/cubic m	1.0	10200H	26 Jun 07 15:02	JD
Fecal Coliform, MF	* 82	CFU/100 mL	10.	SM 9222D 20th Ed	20 Jun 07 18:25	ES
Chloride	20.2	mg/L	3.0	325.2	25 Jun 07 13:13	DAP
Nitrate+Nitrite	< 0.2	mg/L as N	0.2	353.2	27 Jun 07 14:51	DAP
Nitrogen, Ammonia	< 0.16	mg/L	0.16	4500 NH3 B, E	21 Jun 07 9:40	EJP
Phosphorus, Total	0.331	mg/L	0.005	EPA 365.1	26 Jun 07 13:59	DAP
Phosphorus, Ortho	< 0.005	mg/L	0.005	EPA 365.1	21 Jun 07 7:39	RMV
Nitrogen, Total Kjeldahl	0.9	mg/L	0.2	SM 4500NorgB/NH3 E	21 Jun 07 15:15	EJP

J = Colony Forming Units

\* Holding time Exceeded

Approved by:

*Jason G. Smith*  
Jason G. Smith, Inorganic  
Laboratory Manager New Ulm, MN

*Entered  
WB  
7/25/07*

*WB  
10/30/07*

Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix  
! = Due to sample quantity

# = Due to sample concentration  
+ = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447690 ND MICRO # 1013-M ND NW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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WES BOLL  
WENCK ASSOCIATES INC  
1800 PIONEER CRK CTR  
MAPLE PLAIN MN 55359-9000

Report Date: 24 Jul 07  
Lab Number: 07-A29584  
Work Order #: 12-7958  
Account #: 013173  
Sample Matrix: SURFACE WATER  
Date Sampled: 2 Jul 07 10:45  
Sampled By: NICK C  
Date Received: 3 Jul 07 9:55

Project Name: CRWD TMDL  
Project Number: 0002-107  
Sample Description: CR 7.1

Temp at Receipt: 3.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					9 Jul 07	AKW
Water Digestions					9 Jul 07	JMS
BOD, Carbonaceous	< 2	mg/L	2	SM 5210B	3 Jul 07 14:14	JED
CBOD, 20 Day	13	mg/L	2	SM 5210B	3 Jul 07 14:27	JED
Solids, Total Suspended	< 2	mg/L	2	USGS I-3765-85	3 Jul 07 11:30	CJL
Carbon, Total Organic	10.5	mg/L	0.5	415.1	12 Jul 07 8:00	Bis
Chlorophyll a	2.1	mg/cubic m	1.0	10200H	10 Jul 07 7:35	JD
Nitrogen Total, Calculat	1.0	mg/L	NA	Calc	20 Jul 07 12:00	Calculated
Chloride	25.0	mg/L	3.0	325.2	9 Jul 07 15:20	AKW
Nitrate+Nitrite	< 0.2	mg/L as N	0.2	353.2	20 Jul 07 12:00	DAP
Nitrogen, Ammonia	< 0.16	mg/L	0.16	4500 NH3 B, E	5 Jul 07 7:15	TAM
Phosphorus, Total	0.030	mg/L	0.005	EPA 365.1	10 Jul 07 11:14	DAP
Phosphorus, Ortho	< 0.005	mg/L	0.005	EPA 365.1	3 Jul 07 18:57	DAP
Nitrogen, Total Kjeldahl	1.0	mg/L	0.2	SM 4500NorgB/NH3 E	9 Jul 07 5:40	TAM
on	0.209	mg/L	0.015	6010	9 Jul 07 15:44	CJR

Ent WB  
7/26/07

WB  
10/30/07

Approved by: Jason G. Smith  
Jason G. Smith, Inorganic  
Laboratory Manager New Ulm, MN

Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration  
! = Due to sample quantity + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447600 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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WES BOLL  
WENCK ASSOCIATES INC  
1800 PIONEER CRK CTR  
MAPLE PLAIN MN 55359-9000

Report Date: 2 Aug 07  
Lab Number: 07-A31300  
Work Order #: 12-8261  
Account #: 013173  
Sample Matrix: SURFACE WATER  
Date Sampled: 11 Jul 07 11:00  
Sampled By: WES B  
Date Received: 11 Jul 07 15:50  
PO #: 0002-107

Project Number: 0002-107  
Sample Description: CR 7.1

Temp at Receipt: 0.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					13 Jul 07	AKW
Water Digestions					17 Jul 07	JMS
BOD, Carbonaceous	2	mg/L	2	SM 5210B	12 Jul 07 11:11	CJL
CBOD, 20 Day	16	mg/L	2	SM 5210B	12 Jul 07 11:24	CJL
Solids, Total Suspended	7	mg/L	2	USGS I-3765-85	12 Jul 07 10:30	JED
Carbon, Total Organic	9.50	mg/L	0.50	415.1	19 Jul 07 11:00	Bis
Chlorophyll a	5.5	mg/cubic m	1.0	10200H	17 Jul 07 9:43	JD
Fecal Coliform, MF	* 18	CFU/100 mL	10.	SM 9222D 20th Ed	11 Jul 07 19:00	ES
Nitrogen Total, Calculat	1.1	mg/L	NA	Calc	21 Jul 07 13:15	Calculated
Chloride	21.4	mg/L	3.0	325.2	23 Jul 07 14:11	AKW
Nitrate+Nitrite	< 0.2	mg/L as N	0.2	353.2	21 Jul 07 13:15	JGS
Nitrogen, Ammonia	< 0.16	mg/L	0.16	4500 NH3 B, E	16 Jul 07 11:45	EJP
Phosphorus, Total	0.031	mg/L	0.005	EPA 365.1	18 Jul 07 11:23	DAP
Phosphorus, Ortho	0.008	mg/L	0.005	EPA 365.1	12 Jul 07 8:18	DAP
Nitrogen, Total Kjeldahl	1.1	mg/L	0.2	SM 4500NorgB/NH3 E	16 Jul 07 15:00	EJP
Iron	0.153	mg/L	0.015	6010	18 Jul 07 11:37	CJR

Batch matrix spike and spike duplicate recoveries for Nitrate+Nitrite were outside MVTL 85-115% limit at 126% and 126%. Data reported based on acceptable spike duplication and known recovery.

CFU = Colony Forming Units

\* Holding time Exceeded

Data Set: \_\_\_\_\_  
Entered By/Date: WB 10/08/07  
QA/QC By/Date: WB 10/30/07

Approved by: Jason G. Smith  
Jason G. Smith, Inorganic  
Laboratory Manager New Ulm, MN

### Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration  
! = Due to sample quantity + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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WES BOLL  
WENCK ASSOCIATES INC  
1800 PIONEER CRK CTR  
MAPLE PLAIN MN 55359-9000

Report Date: 16 Aug 07  
Lab Number: 07-A34000  
Work Order #: 12-8817  
Account #: 013173  
Sample Matrix: SURFACE WATER  
Date Sampled: 25 Jul 07 11:05  
Sampled By: NICK C  
Date Received: 25 Jul 07 15:15  
PO #: CLEARWATER

Project Name: CLEARWATER TMDL

Sample Description: CR 7.1

Temp at Receipt: 4.0C

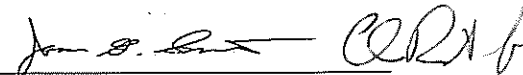
	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					28 Jul 07	AKW
Water Digestions					27 Jul 07	JMS
BOD, Carbonaceous	< 2	mg/L	2	SM 5210B	26 Jul 07 11:34	CJL
CBOD, 20 Day	11	mg/L	2	SM 5210B	26 Jul 07 12:00	CJL
Solids, Total Suspended	5	mg/L	2	USGS I-3765-85	26 Jul 07 9:45	JED
Carbon, Total Organic	10.00	mg/L	0.50	415.1	6 Aug 07 8:00	Bis
Chlorophyll a	5.5	mg/cubic m	1.0	10200H	1 Aug 07 8:41	JD
Nitrogen Total, Calculat	1.3	mg/L	NA	Calc	6 Aug 07 11:50	Calculated
Chloride	22.0	mg/L	3.0	325.2	3 Aug 07 10:59	AKW
Nitrate+Nitrite	< 0.2	mg/L as N	0.2	353.2	6 Aug 07 11:50	DAP
Nitrogen, Ammonia	< 0.16	mg/L	0.16	4500 NH3 B, E	1 Aug 07 11:50	EJP
Phosphorus, Total	0.030	mg/L	0.005	EPA 365.1	1 Aug 07 10:41	DAP
Phosphorus, Ortho	< 0.01	mg/L	0.005	EPA 365.1	26 Jul 07 8:41	DAP
Nitrogen, Total Kjeldahl	1.3	mg/L	0.2	SM 4500NorgB/NH3 E	26 Jul 07 9:50	EJP
Iron	0.465	mg/L	0.015	6010	30 Jul 07 12:37	CJR

Data Set: \_\_\_\_\_

Entered By/Date: WB 10/08/07

QA/QC By/Date: WB 10/30/07

Approved by:

  
Jason G. Smith, Inorganic  
Laboratory Manager New Ulm, MN

Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix  
! = Due to sample quantity

# = Due to sample concentration  
+ = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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WES BOLL  
WENCK ASSOCIATES INC  
1800 PIONEER CRK CTR  
MAPLE PLAIN MN 55359-9000

Report Date: 24 Sep 07  
Lab Number: 07-A36437  
Work Order #: 12-9361  
Account #: 013173  
Sample Matrix: SURFACE WATER  
Date Sampled: 8 Aug 07 11:45  
Sampled By: NICK C  
Date Received: 8 Aug 07 15:30  
PO #: CRWD TMDL

Project Name: CRWD TMDL

Sample Description: CR 7.1

Temp at Receipt: 3.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					10 Aug 07	KAD
BOD, Carbonaceous	< 2	mg/L	2	SM 5210B	9 Aug 07 11:30	CJL
CBOD, 20 Day	8	mg/L	2	SM 5210B	9 Aug 07 11:42	CJL
Solids, Total Suspended	2	mg/L	2	USGS I-3765-85	9 Aug 07 9:50	JED
Carbon, Total Organic	8.00	mg/L	0.50	415.1	16 Aug 07 8:00	Bis
Chlorophyll a	3.8	mg/cubic m	1.0	10200H	10 Aug 07 12:54	JD
Fecal Coliform, MF	2400	CFU/100 mL	10.	SM 9222D 20th Ed	8 Aug 07 16:40	JLS
Nitrogen Total, Calculat	1.1	mg/L	NA	Calc	13 Aug 07 14:28	Calculated
Chloride	25.3	mg/L	3.0	325.2	14 Aug 07 10:04	AKW
Nitrate+Nitrite	< 0.2	mg/L as N	0.2	353.2	13 Aug 07 14:28	DAP
Nitrogen, Ammonia	< 0.16	mg/L	0.16	4500 NH3 B, E	10 Aug 07 8:35	EJP
Phosphorus, Total	0.028	mg/L	0.005	EPA 365.1	20 Aug 07 13:42	DAP
Phosphorus, Ortho	< 0.01	mg/L	0.005	EPA 365.1	9 Aug 07 8:31	DAP
rogen, Total Kjeldahl	1.1	mg/L	0.2	SM 4500NorgB/NH3 E	10 Aug 07 15:00	EJP

RL for Ortho Phosphorus elevated to 0.01 mg/L due to reporting limit check falling outside method 60-140% acceptance limit at 0.005 mg/L.

CFU = Colony Forming Units

Data Set: \_\_\_\_\_

Entered By/Date: WB 10/08/07

QA/QC By/Date: WB 10/30/07

Approved by: Jason G. Smith  
Jason G. Smith, Inorganic  
Laboratory Manager New Ulm, MN

Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration  
! = Due to sample quantity + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WR/DW # R-040 IA LAB #: 132 IA LAB #: 022

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WES BOLL  
 WENCK ASSOCIATES INC  
 1800 PIONEER CRK CTR  
 MAPLE PLAIN MN 55359-9000

Report Date: 13 Sep 07  
 Lab Number: 07-A39074  
 Work Order #: 12-9964  
 Account #: 013173  
 Sample Matrix: SURFACE WATER  
 Date Sampled: 22 Aug 07 10:45  
 Sampled By: NICK C  
 Date Received: 22 Aug 07 15:20  
 PO #: CRWD TMDL

Project Name: CRWD TMDL

Sample Description: CR 7.1

Temp at Receipt: 3.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					24 Aug 07	KAD
BOD, Carbonaceous	5	mg/L	2	SM 5210B	23 Aug 07 13:56	CJL
CBOD, 20 Day	6	mg/L	2	SM 5210B	23 Aug 07 14:10	CJL
Solids, Total Suspended	< 2	mg/L	2	USGS I-3765-85	23 Aug 07 10:30	JED
Carbon, Total Organic	9.50	mg/L	0.50	415.1	29 Aug 07 8:00	Bis
Chlorophyll a	4.8	mg/cubic m	1.0	10200H	24 Aug 07 9:14	JD
Fecal Coliform, MF	* 160	CFU/100 mL	10.	SM 9222D 20th Ed	22 Aug 07 18:55	MKG
Nitrogen Total, Calculat	1.2	mg/L	NA	Calc	28 Aug 07 14:45	Calculated
Chloride	23.7	mg/L	3.0	325.2	27 Aug 07 14:27	DAP
Nitrate+Nitrite	< 0.2	mg/L as N	0.2	353.2	28 Aug 07 12:47	DAP
Nitrogen, Ammonia	< 0.16	mg/L	0.16	4500 NH3 B, E	29 Aug 07 9:45	TAM
Phosphorus, Total	0.023	mg/L	0.005	EPA 365.1	29 Aug 07 13:11	DAP
Phosphorus, Ortho	< 0.01	mg/L	0.005	EPA 365.1	23 Aug 07 8:56	DAP
Nitrogen, Total Kjeldahl	1.2	mg/L	0.2	SM 4500NorgB/NH3 E	28 Aug 07 14:45	TAM


Elevated RL for Ortho Phosphorus due to RL check failure at 0.005 mg/L.

CFU = Colony Forming Units

\* Holding time Exceeded

Data Set: \_\_\_\_\_  
 Entered By/Date: NB 10/08/07  
 QA/QC By/Date: NB 10/30/07

Approved by:

  
 Jason G. Smith, Inorganic  
 Laboratory Manager New Ulm, MN

Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix  
 ! = Due to sample quantity

# = Due to sample concentration  
 + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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### Field Form: 2007 Stream Sampling

Client: <u>CRWD</u>	Site Location: <u>CR 9.5</u>
Project No.: <u>0002-107</u>	Site Description: <u>Grass Lake Dam</u>
Date: <u>4/25/07</u>	Weather: _____
Sampler(s): <u>WB</u>	Samples Taken: Yes <input type="radio"/> No <input checked="" type="radio"/>
Start Time: _____	Sample Time: _____
End Time: _____	
Channel Conditions: _____	DTW Measurement: <u>us: 3.46</u>
COC Number: _____	<u>ds: 336</u>

Notes: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Field Parameters				
Sample I.D.	Temp. (°C)	Cond. (mS/cm)	D.O. (mg/l)	pH (S.U.)

Stage Ht: \_\_\_\_\_      Rated Flow: \_\_\_\_\_      Gauged Flow: \_\_\_\_\_

#### Stream Gauging Data

Distance from Initial Point (ft)	Width (ft)	Depth (ft)	Velocity (60% Depth)	Velocity		Average Velocity (ft/sec)	Area (ft <sup>2</sup> )	Discharge (Q, ft <sup>3</sup> /sec)
				20% Depth	80% Depth			
0, (left side)								
- Dumped 50 oz of dye @ 11:45 - Dye is circling in eddys downstream of dam								
Data Set: _____								
Entered By/Date: <u>JT 4/19/07</u>								
QA/QC By/Date: _____								









## Field Form: 2007 Stream Sampling

Client: CRWD  
 Project No.: 0002-107  
 Date: 6-8-07  
 Sampler(s): Nic/Jess  
 Start Time: 11:35  
 End Time: 11:50  
 Channel Conditions: Flowing  
 COC Number: \_\_\_\_\_

9.5

Site Location: C-90~~+~~  
 Site Description: outlet of Glass Lake, Delco  
 Weather: 60° cloudy Dawn  
 Samples Taken:  Yes  No  
 Sample Time: 11:45  
 DTW Measurement: 2.62 down hr  
C-90+ 300 up stream

Notes: high levels  
clear water  
coming out of  
the lake

Field Parameters				
Sample I.D.	Temp. (°C)	Cond. (mS/cm)	D.O. (mg/l)	pH (S.U.)
	19.78	-	9.73	-

Stage Ht: \_\_\_\_\_ Rated Flow: \_\_\_\_\_ Gauged Flow:     

### Stream Gauging Data

Distance from Initial Point (ft)	Width (ft)	Depth (ft)	Velocity (60% Depth)	Velocity-		Average Velocity (ft/sec)	Area (ft²)	Discharge (Q, ft³/sec)
				20% Depth	80% Depth			
0, (left side)								

Data Set: \_\_\_\_\_  
 Entered By/Date: JT 7/19/07  
 QA/QC By/Date: WB 10/30/07





## Field Form: 2007 Stream Sampling

Client: CRWD  
 Project No.: 0002-107  
 Date: 7.11.07  
 Sampler(s): NK  
 Start Time: 1155  
 End Time: \_\_\_\_\_  
 Channel Conditions: Flowing  
 COC Number: \_\_\_\_\_

Site Location: CR 95  
 Site Description: \_\_\_\_\_  
 Weather: Sunny 70°  
 Samples Taken: Yes No  
 Sample Time: 1200  
 DTW Measurement: \_\_\_\_\_

Notes: -water is  
 flowing  
 over the  
 dam  
 2.80-us  
 1.42-ds

Field Parameters				
Sample I.D.	Temp. (°C)	Cond. (mS/cm)	D.O. (mg/l)	pH (S.U.)
	25.23	338	8.69	8.83

Stage Ht: \_\_\_\_\_

Rated Flow: \_\_\_\_\_

Gauged Flow: \_\_\_\_\_

### Stream Gauging Data

Distance from Initial Point (ft)	Width (ft)	Depth (ft)	Velocity (60% Depth)	Velocity		Average Velocity (ft/sec)	Area (ft <sup>2</sup> )	Discharge (Q, ft <sup>3</sup> /sec)
				20% Depth	80% Depth			
0, (left side)								

Data Set: \_\_\_\_\_

Entered By/Date: WB 7/12/07

QC By/Date: WB 10/30/07

## Field Form: 2007 Stream Sampling

Client: CRWD  
 Project No.: 0002-107  
 Date: 7-25-07  
 Sampler(s): JBS/NIS  
 Start Time: 10:22  
 End Time: \_\_\_\_\_  
 Channel Conditions: Flowing  
 COC Number: \_\_\_\_\_

Site Location: CR 9.5  
 Site Description: outlet of Grass Lake below Dam  
 Weather: 90° sunny  
 Samples Taken:  Yes  No  
 Sample Time: 10:35  
 DTW Measurement: Down stream - 1.15  
Upstream - 2.70

Notes: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Field Parameters				
Sample I.D.	Temp. (°C)	Cond. (mS/cm)	D.O. (mg/l)	pH (S.U.)
	<u>24.45</u>	<u>.353</u>	<u>7.07</u>	<u>6.73</u>

Stage Ht: \_\_\_\_\_ Rated Flow: \_\_\_\_\_ Gauged Flow: 4.839

### Stream Gauging Data

Distance from Initial Point (ft)	Width (ft)	Depth (ft)	Velocity (60% Depth)	Velocity		Average Velocity (ft/sec)	Area (ft <sup>2</sup> )	Discharge (Q, ft <sup>3</sup> /sec)
				20% Depth	80% Depth			
0, (left side)								

Data Set: \_\_\_\_\_  
 Entered By/Date: WB 7/25/07  
 QA/QC By/Date: WB 10/30/07

## Field Form: 2007 Stream Sampling

Client: CRWD  
 Project No.: 0002-107  
 Date: 8.22.07  
 Sampler(s): NIC  
 Start Time: 1050  
 End Time: 1125  
 Channel Conditions: Slowing  
 COC Number: \_\_\_\_\_

Site Location: CR 9.5  
 Site Description: \_\_\_\_\_  
 Weather: Sunny 78°  
 Samples Taken:  Yes  No  
 Sample Time: 1115  
 DTW Measurement: upstream - 2.88  
downstream - 1.72

Field Parameters				
Sample I.D.	Temp. (°C)	Cond. (mS/cm)	D.O. (mg/l)	pH (S.U.)
	21.89	542	7.92	8.01

Notes: weaker flow  
over dam very  
slightly, probably only  
last a week or so.

Stage Ht: \_\_\_\_\_ Rated Flow: \_\_\_\_\_ Gauged Flow: \_\_\_\_\_

### Stream Gauging Data

Distance from Initial Point (ft)	Width (ft)	Depth (ft)	Velocity (60% Depth)	Velocity		Average Velocity (ft/sec)	Area (ft²)	Discharge (Q, ft³/sec)
				20% Depth	80% Depth			
0, (left side)								

Data Set: \_\_\_\_\_  
 Entered By/Date: NB 10/08/07  
 QA/OC By/Date: WB 10/30/07

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PRELIMINARY REPORT

WES BOLL
WENCK ASSOCIATES INC
1800 PIONEER CRK CTR
MAPLE PLAIN MN 55359-9000

Report Date: 22 May 07
Lab Number: 07-A15433
Work Order #:12-4795
Account #: 013173
Sample Matrix: SURFACE WATER
Date Sampled: 24 Apr 07 10:15
Date Received: 24 Apr 07 16:30
PO #: 002-107

Project Number: 0002-107
Sample Description: CR 9.5

Temp at Receipt: 4.0C

Table with columns: As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Rows include various water quality tests like BOD, CBOD, Solids, Carbon, Chlorophyll, etc.

CFU = Colony Forming Units

\* Holding time Exceeded

Data Set:
Entered By/Date: JT 7/19/07
QA/QC By/Date: WB 10/30/07

RL = Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration
! = Due to sample quantity \* = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 HI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022



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WES BOLL
WENCK ASSOCIATES INC
1800 PIONEER CRK CTR
MAPLE PLAIN MN 55359-9000

Report Date: 8 Jun 07
Lab Number: 07-A18773
Work Order #: 12-5557
Account #: 013173
Sample Matrix: SURFACE WATER
Date Sampled: 9 May 07 11:10
Sampled By: WES BOLL
Date Received: 9 May 07 16:12
PO #: 0002-107

Project Number: 0002-107
Sample Description: CR 9.5

Temp at Receipt: 3.0C

Table with columns: As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Rows include Phosphorus Water Digest, BOD, Carbonaceous, CBOD, 20 Day, Solids, Total Suspended, Carbon, Total Organic, Chlorophyll a, Fecal Coliform, MF, Chloride, Nitrate+Nitrite, Nitrogen, Ammonia, Phosphorus, Total, Phosphorus, Ortho, Nitrogen, Total Kjeldahl.

CFU = Colony Forming Units

\* Holding time Exceeded

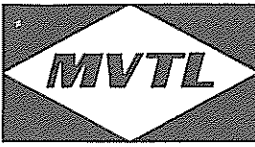
Approved by: Jason G. Smith, Inorganic Laboratory Manager New Ulm, MN

Data Set:
Entered By/Date: JT 7/9/07
QA/QC By/Date: WB 10/30/07

RL = Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration
! = Due to sample quantity + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND NW/DH # R-040 IA LAB #: 132 IA LAB #: 022



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WES BOLL
WENCK ASSOCIATES INC
1800 PIONEER CRK CTR
MAPLE PLAIN MN 55359-9000

Report Date: 14 Jun 07
Lab Number: 07-A21650
Work Order #: 12-6194
Account #: 013173
Sample Matrix: SURFACE WATER
Date Sampled: 23 May 07 12:00
Sampled By: NICK C
Date Received: 23 May 07 15:55
PO #: CRWD TMDL

Project Name: CRWD TMDL

Sample Description: CR 9.5

Temp at Receipt: 4.0C

Table with 6 columns: As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Rows include Phosphorus Water Digest, BOD, Carbonaceous, CBOD, 20 Day, Solids, Total Suspended, Carbon, Total Organic, Fecal Coliform, MF, Chloride, Nitrate+Nitrite, Nitrogen, Ammonia, Phosphorus, Total, Phosphorus, Ortho, Nitrogen, Total Kjeldahl.

\*FU = Colony Forming Units

Data Set:

Entered By/Date: JT 7/9/07

QA/QC By/Date: WB 10/30/07 Chlor A - NOT TESTED FOR

Approved by: Jason G. Smith, Inorganic Laboratory Manager New Ulm, MN

Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration
! = Due to sample quantity + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447690 ND MICRO # 1013-M ND WH/DW # R-040 IA LAB #: 132 IA LAB #: 022

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WES BOLL  
WENCK ASSOCIATES INC  
1800 PIONEER CRK CTR  
MAPLE PLAIN MN 55359-9000

Report Date: 21 Jun 07  
Lab Number: 07-A23064  
Work Order #: 12-6461  
Account #: 013173  
Sample Matrix: SURFACE WATER  
Date Sampled: 30 May 07 12:00  
Sampled By: NICK C  
Date Received: 30 May 07 16:00  
PO #: 0002-107

Sample Description: CR 9.X5

Temp at Receipt: 1.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					4 Jun 07	AKW
BOD, Carbonaceous	< 2	mg/L	2	SM 5210B	31 May 07 11:25	CJL
CBOD, 20 Day	6	mg/L	2	SM 5210B	31 May 07 11:04	CJL
Solids, Total Suspended	< 2	mg/L	2	USGS I-3765-85	31 May 07 8:00	JED
Carbon, Total Organic	7.5	mg/L	0.5	415.1	8 Jun 07 16:00	Bis
Chlorophyll a	2.3	mg/cubic m	1.0	10200H	1 Jun 07 13:07	JD
Fecal Coliform, MF	18	CFU/100 mL	10.	SM 9222D 18th Ed	30 May 07 17:10	ES
Chloride	21.7	mg/L	3.0	325.2	31 May 07 8:42	AKW
Nitrate+Nitrite	< 0.2	mg/L as N	0.2	353.2	4 Jun 07 8:15	RMV
Nitrogen, Ammonia	< 0.16	mg/L	0.16	4500 NH3 B, E	31 May 07 8:55	TAM
Phosphorus, Total	0.014	mg/L	0.005	EPA 365.1	5 Jun 07 8:07	RMV
Phosphorus, Ortho	< 0.005	mg/L	0.005	EPA 365.1	31 May 07 8:12	DAP
Nitrogen, Total Kjeldahl	1.2	mg/L	0.2	SM 4500NorgB/NH3 E	4 Jun 07 8:10	EJP

\*U = Colony Forming Units

Data Set: \_\_\_\_\_

Entered By/Date: JT 7/9/07

QA/QC By/Date: WB 10/30/07

Approved by:

Jason G. Smith, Inorganic  
Laboratory Manager New Ulm, MN

### Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix  
! = Due to sample quantity

# = Due to sample concentration  
+ = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447600 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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WES BOLL
WENCK ASSOCIATES INC
1800 PIONEER CRK CTR
MAPLE PLAIN MN 55359-9000

Report Date: 29 Jun 07
Lab Number: 07-A24645
Work Order #: 12-6814
Account #: 013173
Sample Matrix: SURFACE WATER
Date Sampled: 6 Jun 07 11:45
Sampled By: NICK C
Date Received: 6 Jun 07 16:00
PO #: CRWD TMDL

Project Name: CRWD TMDL

Sample Description: CR 9.X5

Temp at Receipt: 5.0C

Table with columns: As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Rows include Phosphorus Water Digest, BOD, Carbonaceous, CBOD, 20 Day, Solids, Total Suspended, Carbon, Total Organic, Chlorophyll a, Fecal Coliform, MF, Chloride, Nitrate+Nitrite, Nitrogen, Ammonia, Phosphorus, Total, Phosphorus, Ortho, Nitrogen, Total Kjeldahl.

J = Colony Forming Units

\* Holding time Exceeded

Data Set:

Entered By/Date: JT 7/9/07

QA/QC By/Date: WB 10/30/07

Approved by: Jason G. Smith, Inorganic Laboratory Manager New Ulm, MN

Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration
! = Due to sample quantity + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447600 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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WES BOLL  
 WENCK ASSOCIATES INC  
 1800 PIONEER CRK CTR  
 MAPLE PLAIN MN 55359-9000

Report Date: 12 Jul 07  
 Lab Number: 07-A27472  
 Work Order #: 12-7478  
 Account #: 013173  
 Sample Matrix: SURFACE WATER  
 Date Sampled: 20 Jun 07 12:25  
 Sampled By: NICK C  
 Date Received: 20 Jun 07 16:00  
 PO #: CLEARWATER

Project Name: CLEARWATER  
 Project Number: 0002-108  
 Sample Description: CR 9.5

Temp at Receipt: 6.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					22 Jun 07	AKW
BOD, Carbonaceous	< 2	mg/L	2	SM 5210B	21 Jun 07 14:50	JED
CBOD, 20 Day	10	mg/L	2	SM 5210B	21 Jun 07 14:05	JED
Solids, Total Suspended	3	mg/L	2	USGS I-3765-85	21 Jun 07 11:45	CJL
Carbon, Total Organic	10.5	mg/L	0.5	415.1	27 Jun 07 8:00	Bis
Chlorophyll a	7.8	mg/cubic m	1.0	10200H	26 Jun 07 15:02	JD
Fecal Coliform, MF	10	CFU/100 mL	10.	SM 9222D 20th Ed	20 Jun 07 18:25	ES
Chloride	21.0	mg/L	3.0	325.2	25 Jun 07 13:14	DAP
Nitrate+Nitrite	< 0.2	mg/L as N	0.2	353.2	27 Jun 07 14:52	DAP
Nitrogen, Ammonia	< 0.16	mg/L	0.16	4500 NH3 B, E	25 Jun 07 8:25	EJP
Phosphorus, Total	0.017	mg/L	0.005	EPA 365.1	26 Jun 07 14:00	DAP
Phosphorus, Ortho	< 0.005	mg/L	0.005	EPA 365.1	21 Jun 07 7:40	RMV
Nitrogen, Total Kjeldahl	0.6	mg/L	0.2	SM 4500NorgB/NH3 E	21 Jun 07 15:15	EJP

.U = Colony Forming Units

Enti  
 WB  
 7/26/07

WB  
 10/30/07

Approved by:

Jason G. Smith, Inorganic  
 Laboratory Manager New Ulm, MN

= Reporting Limit

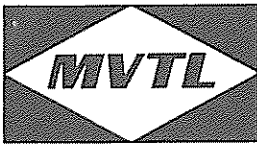
Elevated "Less Than Result" (<): @ = Due to sample matrix  
 ! = Due to sample quantity

# = Due to sample concentration  
 + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND NH/DW # R-040 IA LAB #: 132 IA LAB #: 022

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WES BOLL
WENCK ASSOCIATES INC
1800 PIONEER CRK CTR
MAPLE PLAIN MN 55359-9000

Report Date: 24 Jul 07
Lab Number: 07-A29585
Work Order #:12-7958
Account #: 013173
Sample Matrix: SURFACE WATER
Date Sampled: 2 Jul 07 11:10
Sampled By: NICK C
Date Received: 3 Jul 07 9:55

Project Name: CRWD TMDL
Project Number: 0002-107
Sample Description: CR 9.5

Temp at Receipt: 3.0C

Table with columns: As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Rows include various chemical tests like Phosphorus Water Digest, BOD, CBOD, Solids, Carbon, Chlorophyll, Nitrogen, etc.

Ent
WB
7/26/07

WB
10/30/07

Approved by: [Signature]
Jason G. Smith, Inorganic
Laboratory Manager New Ulm, MN

Reporting Limit
Elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration
! = Due to sample quantity + = Due to extract volume
CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447690 ND MICRO # 1013-M ND NW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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WES BOLL
WENCK ASSOCIATES INC
1800 PIONEER CRK CTR
MAPLE PLAIN MN 55359-9000

Report Date: 2 Aug 07
Lab Number: 07-A31302
Work Order #:12-8261
Account #: 013173
Sample Matrix: SURFACE WATER
Date Sampled: 11 Jul 07 12:00
Sampled By: WES B
Date Received: 11 Jul 07 15:50
PO #: 0002-107

Temp at Receipt: 0.0C

Project Number: 0002-107
Sample Description: CR 9.5

Table with columns: As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Rows include various water quality tests like BOD, CBOD, Solids, Carbon, Chlorophyll, Fecal Coliform, Nitrogen, Phosphorus, and Iron.

CFU = Colony Forming Units

\* Holding time Exceeded

Data Set:
Entered By/Date: WB 10/08/07
QA/QC By/Date: WB 10/30/07

Approved by: Jason G. Smith, Inorganic Laboratory Manager New Ulm, MN

Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration
! = Due to sample quantity + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND NW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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WES BOLL  
WENCK ASSOCIATES INC  
1800 PIONEER CRK CTR  
MAPLE PLAIN MN 55359-9000

Report Date: 16 Aug 07  
Lab Number: 07-A33996  
Work Order #: 12-8817  
Account #: 013173  
Sample Matrix: SURFACE WATER  
Date Sampled: 25 Jul 07 10:35  
Sampled By: NICK C  
Date Received: 25 Jul 07 15:15  
PO #: CLEARWATER

Project Name: CLEARWATER TMDL

Sample Description: CR 9.5

Temp at Receipt: 4.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					28 Jul 07	AKW
Water Digestions					27 Jul 07	JMS
BOD, Carbonaceous	< 2	mg/L	2	SM 5210B	26 Jul 07 11:34	CJL
CBOD, 20 Day	11	mg/L	2	SM 5210B	26 Jul 07 12:00	CJL
Solids, Total Suspended	2	mg/L	2	USGS I-3765-85	26 Jul 07 9:45	JED
Carbon, Total Organic	11.00	mg/L	0.50	415.1	6 Aug 07 8:00	Bis
Chlorophyll a	3.0	mg/cubic m	1.0	10200H	31 Jul 07 9:09	JD
Nitrogen Total, Calculat	1.1	mg/L	NA	Calc	6 Aug 07 11:33	Calculated
Chloride	23.2	mg/L	3.0	325.2	3 Aug 07 10:59	AKW
Nitrate+Nitrite	< 0.2	mg/L as N	0.2	353.2	6 Aug 07 11:33	DAP
Nitrogen, Ammonia	< 0.16	mg/L	0.16	4500 NH3 B, E	1 Aug 07 11:50	EJP
Phosphorus, Total	0.016	mg/L	0.005	EPA 365.1	1 Aug 07 10:28	DAP
Phosphorus, Ortho	< 0.01	mg/L	0.005	EPA 365.1	26 Jul 07 8:27	DAP
Nitrogen, Total Kjeldahl	1.1	mg/L	0.2	SM 4500NorgB/NH3 E	26 Jul 07 9:50	EJP
Iron	0.030	mg/L	0.015	6010	30 Jul 07 12:37	CJR

Data Set: \_\_\_\_\_

Entered By/Date: WB 10/08/07

QA/QC By/Date: WB 10/30/07

Approved by:   
Jason G. Smith, Inorganic  
Laboratory Manager New Ulm, MN

Reporting Limit  
Elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration  
! = Due to sample quantity + = Due to extract volume  
CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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WES BOLL  
WENCK ASSOCIATES INC  
1800 PIONEER CRK CTR  
MAPLE PLAIN MN 55359-9000

Report Date: 24 Sep 07  
Lab Number: 07-A36438  
Work Order #: 12-9361  
Account #: 013173  
Sample Matrix: SURFACE WATER  
Date Sampled: 8 Aug 07 12:30  
Sampled By: NICK C  
Date Received: 8 Aug 07 15:30  
PO #: CRWD TMDL

Project Name: CRWD TMDL

Sample Description: CR 9.5

Temp at Receipt: 3.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					10 Aug 07	KAD
BOD, Carbonaceous	< 2	mg/L	2	SM 5210B	9 Aug 07 11:30	CJL
CBOD, 40 Day	22	mg/L	2	SM 5210B	9 Aug 07 11:53	JED
CBOD, 20 Day	10	mg/L	2	SM 5210B	9 Aug 07 11:42	CJL
Solids, Total Suspended	5	mg/L	2	USGS I-3765-85	9 Aug 07 9:50	JED
Carbon, Total Organic	9.50	mg/L	0.50	415.1	16 Aug 07 8:00	Bis
Chlorophyll a	8.5	mg/cubic m	1.0	10200H	10 Aug 07 12:54	JD
Fecal Coliform, MF	28000	CFU/100 mL	10.	SM 9222D 20th Ed	8 Aug 07 16:40	JLS
Nitrogen Total, Calculat	1.5	mg/L	NA	Calc	20 Aug 07 13:40	Calculated
Chloride	24.7	mg/L	3.0	325.2	14 Aug 07 10:04	AKW
Nitrate+Nitrite	< 0.2	mg/L as N	0.2	353.2	13 Aug 07 14:28	DAP
Nitrogen, Ammonia	< 0.16	mg/L	0.16	4500 NH3 B, E	14 Aug 07 9:15	EJP
Phosphorus, Total	0.040	mg/L	0.005	EPA 365.1	20 Aug 07 13:42	DAP
Phosphorus, Ortho	< 0.01	mg/L	0.005	EPA 365.1	9 Aug 07 8:31	DAP
Nitrogen, Total Kjeldahl	1.5	mg/L	0.2	SM 4500NorgB/NH3 E	20 Aug 07 13:40	EJP

RL for Ortho Phosphorus elevated to 0.01 mg/L due to reporting limit check falling outside method 60-140% acceptance limit at 0.005 mg/L.

CFU = Colony Forming Units

Data Set: \_\_\_\_\_  
Entered By/Date: WB 10/08/07  
QA/QC By/Date: WB 10/30/07

Approved by: Jason G. Smith  
Jason G. Smith, Inorganic  
Laboratory Manager New Ulm, MN

Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration  
! = Due to sample quantity + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447600 ND MICRO # 1013-M ND NW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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Page: 1 of 1

WES BOLL  
WENCK ASSOCIATES INC  
1800 PIONEER CRK CTR  
MAPLE PLAIN MN 55359-9000

Report Date: 13 Sep 07  
Lab Number: 07-A39075  
Work Order #: 12-9964  
Account #: 013173  
Sample Matrix: SURFACE WATER  
Date Sampled: 22 Aug 07 11:15  
Sampled By: NICK C  
Date Received: 22 Aug 07 15:20  
PO #: CRWD TMDL

Temp at Receipt: 3.0C

Project Name: CRWD TMDL

Sample Description: CR 9.5

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					24 Aug 07	KAD
BOD, Carbonaceous	3	mg/L	2	SM 5210B	23 Aug 07 13:56	CJL
CBOD, 20 Day	8	mg/L	2	SM 5210B	23 Aug 07 14:10	CJL
Solids, Total Suspended	< 2	mg/L	2	USGS I-3765-85	23 Aug 07 10:30	JED
Carbon, Total Organic	11.50	mg/L	0.50	415.1	29 Aug 07 8:00	Bis
Chlorophyll a	5.1	mg/cubic m	1.0	10200H	24 Aug 07 9:14	JD
Fecal Coliform, MF	* < 10	CFU/100 mL	10.	SM 9222D 20th Ed	22 Aug 07 18:55	MKG
Nitrogen Total, Calculat	1.3	mg/L	NA	Calc	28 Aug 07 14:45	Calculated
Chloride	23.7	mg/L	3.0	325.2	27 Aug 07 14:27	DAP
Nitrate+Nitrite	< 0.2	mg/L as N	0.2	353.2	28 Aug 07 12:47	DAP
Nitrogen, Ammonia	< 0.16	mg/L	0.16	4500 NH3 B, E	29 Aug 07 9:45	TAM
Phosphorus, Total	0.017	mg/L	0.005	EPA 365.1	29 Aug 07 13:11	DAP
Phosphorus, Ortho	< 0.01	mg/L	0.005	EPA 365.1	23 Aug 07 8:56	DAP
Nitrogen, Total Kjeldahl	1.3	mg/L	0.2	SM 4500NorgB/NH3 E	28 Aug 07 14:45	TAM

Elevated RL for Ortho Phosphorus due to RL check failure at 0.005 mg/L.


CFU = Colony Forming Units

\* Holding time Exceeded

Data Set:

Entered By/Date: WB 10/08/07  
QA/QC By/Date: WB 10/30/07

Approved by:

  
Jason G. Smith, Inorganic  
Laboratory Manager New Ulm, MN

Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration  
! = Due to sample quantity + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WN/DW # R-040 IA LAB #: 132 IA LAB #: 022

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## Field Form: 2007 Stream Sampling

Client: CRWD  
 Project No.: 0002-107  
 Date: 4/24/07  
 Sampler(s): WB, NC  
 Start Time: 8:50  
 End Time: \_\_\_\_\_  
 Channel Conditions: Flowing  
 COC Number: \_\_\_\_\_

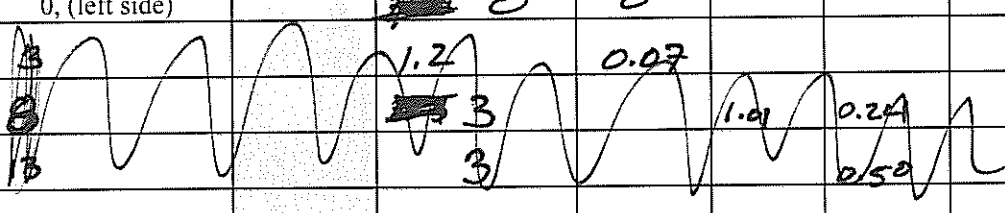
Site Location: CR 10.1  
 Site Description: Clearwater Lake Outlet  
 Weather: 50°, Cloudy  
 Samples Taken:  Yes  No  
 Sample Time: 9:15  
 DTW Measurement: 10.58  
 Lake Gauge: 11.60

Notes: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Field Parameters				
Sample I.D.	Temp. (°C)	Cond. (mS/cm)	D.O. (mg/l)	pH (S.U.)
	12.87	423	11.76	8.42

Stage Ht: \_\_\_\_\_ Rated Flow: \_\_\_\_\_ Gauged Flow: 190.061

### Stream Gauging Data

Distance from Initial Point (ft)	Width (ft)	Depth (ft)	Velocity (60% Depth)	Velocity		Average Velocity (ft/sec)	Area (ft <sup>2</sup> )	Discharge (Q, ft <sup>3</sup> /sec)
				20% Depth	80% Depth			
0, (left side)		<del>0</del> 0	0					
		1.2	0.07					
		<del>3</del> 3		1.01	0.24			
					0.50			

Data Set: \_\_\_\_\_  
 Entered By/Date: JT 7/9/07  
 QA/QC By/Date: WB 10/9/07

Field Form: 2007 Stream Sampling

\* Duplicate site

Client: CRWD  
 Project No.: 0002-107  
 Date: 5/09/07  
 Sampler(s): WB, NC  
 Start Time: 11:00  
 End Time: 11:50  
 Channel Conditions: flowing  
 COC Number: \_\_\_\_\_

Site Location: CR 10.1  
 Site Description: Clegwater Lake Outlet  
 Weather: sunny 75°  
 Samples Taken: Yes No  
 Sample Time: 11:35  
 DTW Measurement: 10.83  
 Lake Gauge: 11.36

Notes:

- filamentous algae  
 and vegetation  
 pieces suspended  
 in stream

Field Parameters				
Sample I.D.	Temp. (°C)	Cond. (mS/cm)	D.O. (mg/l)	pH (S.U.)
	17.61	419	11.67	8.31

Stage Ht: \_\_\_\_\_

Rated Flow: \_\_\_\_\_

Gauged Flow: 103.983

Stream Gauging Data

Distance from Initial Point (ft)	Width (ft)	Depth (ft)	Velocity (60% Depth)	Velocity		Average Velocity (ft/sec)	Area (ft <sup>2</sup> )	Discharge (Q, ft <sup>3</sup> /sec)
				20% Depth	80% Depth			
0, (left side)								

Data Set: \_\_\_\_\_

Entered By/Date: JT 7/19/07

CA/OC By/Date: WB 10/1/07

# Field Form: 2007 Stream Sampling

Client: CRWD

Project No.: 0002-107

Date: 6.23.07

Sampler(s): NIC/WB

Start Time: 12:05

End Time: 12:25

Channel Conditions: f/burny

COC Number: \_\_\_\_\_

Site Location: CR 10.1

Site Description: leisure lake outlet

Weather: cloudy/sprinkler 65°

Samples Taken:  Yes  No

Sample Time: 12:15

DTW Measurement: 11.06

Notes: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Field Parameters				
Sample I.D.	Temp. (°C)	Cond. (mS/cm)	D.O. (mg/l)	pH (S.U.)
	<u>18.66</u>		<u>8.46</u>	<u>8.41</u>

↑ 1421

Stage Ht: \_\_\_\_\_ Rated Flow: \_\_\_\_\_ Gauged Flow: 37,369

### Stream Gauging Data

Distance from Initial Point (ft)	Width (ft)	Depth (ft)	Velocity (60% Depth)	Velocity		Average Velocity (ft/sec)	Area (ft <sup>2</sup> )	Discharge (Q, ft <sup>3</sup> /sec)
				20% Depth	80% Depth			
0, (left side)								
						Data Set: _____		
						Entered By/Date: <u>JT 7/19/07</u>		
						QA/QC By/Date: <u>WB 10/19/07</u>		

### Field Form: 2007 Stream Sampling

Client: CRWD

Project No.: 0002-107

Date: 5.30.07

Sampler(s): Nick Joss

Start Time: 12:00

End Time: 12:30

Channel Conditions: flowing

COC Number: \_\_\_\_\_

Site Location: CR 10.1

Site Description: outlet of Clearwater Lake @

Weather: overcast 70° cond. 128

Samples Taken:  Yes  No

Sample Time: 12:15

DTW Measurement: 10.94

Notes: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Field Parameters				
Sample I.D.	Temp. (°C)	Cond. (mS/cm)	D.O. (mg/l)	pH (S.U.)
	<u>20.63</u>	<u>419</u>	<u>10.02</u>	<u>8.44</u>

Stage Ht: \_\_\_\_\_ Rated Flow: \_\_\_\_\_ Gauged Flow: ~~59.320~~ 59.320

#### Stream Gauging Data

Distance from Initial Point (ft)	Width (ft)	Depth (ft)	Velocity (60% Depth)	Velocity		Average Velocity (ft/sec)	Area (ft <sup>2</sup> )	Discharge (Q, ft <sup>3</sup> /sec)
				20% Depth	80% Depth			
0, (left side)								

Data Set: \_\_\_\_\_  
 Entered By/Date: JT 7/9/07  
 QA/QC By/Date: WB 10/9/07

### Field Form: 2007 Stream Sampling

Client: CRWD  
 Project No.: 0002-107  
 Date: 6-6-07  
 Sampler(s): NIC/JESS  
 Start Time: 11:53  
 End Time: 12:15  
 Channel Conditions: flowing  
 COC Number: \_\_\_\_\_

Site Location: CR 10.1  
 Site Description: outlet of Clearwater lake @  
 Weather: 60° cloudy CO. Rd 124  
 Samples Taken:  Yes  No crossing  
 Sample Time: 12:05  
 DTW Measurement: 10.82  
C-90 Ca. 11.25

Field Parameters				
Sample I.D.	Temp. (°C)	Cond. (mS/cm)	D.O. (mg/l)	pH (S.U.)
	<u>20.5</u>	<u>—</u>	<u>10.13</u>	<u>—</u>

Notes: 107 high, slightly  
murky. Alga growth.

Stage Ht: \_\_\_\_\_ Rated Flow: \_\_\_\_\_ Gauged Flow: ~~100.1~~ 105.16

#### Stream Gauging Data

Distance from Initial Point (ft)	Width (ft)	Depth (ft)	Velocity (60% Depth)	Velocity-		Average Velocity (ft/sec)	Area (ft²)	Discharge (Q, ft³/sec)
				20% Depth	80% Depth			
0, (left side)								
Data Set: _____								
Entered By/Date: <u>JT 7/19/07</u>								
QA/QC B./Date: <u>WB 10/6/07</u>								

## Field Form: 2007 Stream Sampling

Client: CRWD  
 Project No.: 0002-107  
 Date: 0-20-07  
 Sampler(s): N. C. JESS  
 Start Time: 11:45  
 End Time: 12:11  
 Channel Conditions: flowing  
 COC Number: \_\_\_\_\_

Site Location: CR 10.1  
 Site Description: Outlet @ Clearlake CCORD  
 Weather: Sunny 85°  
 Samples Taken: Yes No  
 Sample Time: ~~11:50~~ 11:55  
 DTW Measurement: 11.54

Notes: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Field Parameters				
Sample I.D.	Temp. (°C)	Cond. (mS/cm)	D.O. (mg/l)	pH (S.U.)
	<u>23.70</u>	<u>326</u>	<u>9.83</u>	<u>8.74</u>

Stage Ht: \_\_\_\_\_ Rated Flow: \_\_\_\_\_ Gauged Flow: ~~30~~ 30.200'

### Stream Gauging Data

Distance from Initial Point (ft)	Width (ft)	Depth (ft)	Velocity (60% Depth)	Velocity		Average Velocity (ft/sec)	Area (ft <sup>2</sup> )	Discharge (Q, ft <sup>3</sup> /sec)
				20% Depth	80% Depth			
0, (left side)								

Entered By/Date: JT 7/19/07

QA/QC By/Date: \_\_\_\_\_



## Field Form: 2007 Stream Sampling

Client: CRWD  
 Project No.: 0002-107  
 Date: 7.2.07  
 Sampler(s): NIC  
 Start Time: 11:20  
 End Time: 11:40  
 Channel Conditions: flowing  
 COC Number: \_\_\_\_\_

Site Location: CR 10.1  
 Site Description: \_\_\_\_\_  
 Weather: Rain 65°  
 Samples Taken:  Yes  No  
 Sample Time: 11:30  
 DTW Measurement: 11.26

Notes: -very little flow  
-vegetation abundant in channel (Pontweeds)

Field Parameters				
Sample I.D.	Temp. (°C)	Cond. (mS/cm)	D.O. (mg/l)	pH (S.U.)
	23.14	338	8.41	8.78

Stage Ht: \_\_\_\_\_

Rated Flow: \_\_\_\_\_

Gauged Flow: 2.079

### Stream Gauging Data

Distance from Initial Point (ft)	Width (ft)	Depth (ft)	Velocity (60% Depth)	Velocity		Average Velocity (ft/sec)	Area (ft <sup>2</sup> )	Discharge (Q, ft <sup>3</sup> /sec)
				20% Depth	80% Depth			
0, (left side)								

Data Set: \_\_\_\_\_  
 Entered By/Date: WB  
 Date/DCB/ID: WB 10/9/07

# Field Form: 2007 Stream Sampling

Client: CRWD  
 Project No.: 0002-107  
 Date: 7.11.07  
 Sampler(s): NIC  
 Start Time: 1120  
 End Time: \_\_\_\_\_  
 Channel Conditions: flowing  
 COC Number: \_\_\_\_\_

Site Location: CR 10.1  
 Site Description: \_\_\_\_\_  
 Weather: Sunny 75°  
 Samples Taken:  Yes  No  
 Sample Time: 1130  
 DTW Measurement: 11.12  
 lake gage: —

Notes: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Field Parameters				
Sample I.D.	Temp. (°C)	Cond. (mS/cm)	D.O. (mg/l)	pH (S.U.)
	<u>22.96</u>	<u>334</u>	<u>8.64</u>	<u>8.80</u>

Stage Ht: \_\_\_\_\_ Rated Flow: \_\_\_\_\_ Gauged Flow: 16.221

### Stream Gauging Data

Distance from Initial Point (ft)	Width (ft)	Depth (ft)	Velocity (60% Depth)	Velocity		Average Velocity (ft/sec)	Area (ft²)	Discharge (Q, ft³/sec)
				20% Depth	80% Depth			

Data Set: \_\_\_\_\_  
 Entered by/Date: WB 7/12/07  
 Date Collected/Date: WB 10/09/07

# Field Form: 2007 Stream Sampling

Duplicate

Client: CRWD

Project No.: 0002-107

Date: 7-25-07

Sampler(s): JESS/NIC

Start Time: 11:32

End Time: 11:58

Channel Conditions: Flowing

COC Number: \_\_\_\_\_

Site Location: CR 10.1

Site Description: Outlet of clear water lake @  
co. rd 128 crossing

Weather: 90° Sunny

Samples Taken:  Yes  No

Sample Time: 11:45

DTW Measurement: 11.15

Notes: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Field Parameters				
Sample I.D.	Temp. (°C)	Cond. (mS/cm)	D.O. (mg/l)	pH (S.U.)
	27.62	347	<del>8.98</del> 9.91	<del>7.98</del> 8.99

Stage Ht: \_\_\_\_\_

Rated Flow: \_\_\_\_\_

Gauged Flow: 7.632

### Stream Gauging Data

Distance from Initial Point (ft)	Width (ft)	Depth (ft)	Velocity (60% Depth)	Velocity		Average Velocity (ft/sec)	Area (ft²)	Discharge (Q, ft³/sec)
				20% Depth	80% Depth			

Data Set: \_\_\_\_\_

Entered By/Date: WB 10/08/07

QA/QC By/Date: WB 10/09/07

# Field Form: 2007 Stream Sampling

Client: CRWD  
 Project No.: 0002-107  
 Date: 8.22.07  
 Sampler(s): NIC  
 Start Time: 1135  
 End Time: 1215  
 Channel Conditions: Flowing.  
 COC Number: \_\_\_\_\_

Site Location: CR 10.5  
 Site Description: \_\_\_\_\_  
 Weather: Sunny 75°  
 Samples Taken:  Yes  No  
 Sample Time: 1200  
 DTW Measurement: 11.01  
 Lake gauge: 11.10

Notes: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Field Parameters				
Sample I.D.	Temp. (°C)	Cond. (mS/cm)	D.O. (mg/l)	pH (S.U.)
	<u>21.83</u>	<u>571</u>	<u>8.12</u>	<u>7.78</u>

Stage Ht: \_\_\_\_\_ Rated Flow: \_\_\_\_\_ Gauged Flow: 23.819

### Stream Gauging Data

Distance from Initial Point (ft)	Width (ft)	Depth (ft)	Velocity (60% Depth)	Velocity		Average Velocity (ft/sec)	Area (ft <sup>2</sup> )	Discharge (Q, ft <sup>3</sup> /sec)
				20% Depth	80% Depth			
0, (left side)								

Data Set: \_\_\_\_\_  
 Entered By/Date: WB 10/08/07  
 QA/QC By/Date: WB 10/09/07

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**PRELIMINARY REPORT**

WES BOLL  
 WENCK ASSOCIATES INC  
 1800 PIONEER CRK CTR  
 MAPLE PLAIN MN 55359-9000

Report Date: 22 May 07  
 Lab Number: 07-A15432  
 Work Order #: 12-4795  
 Account #: 013173  
 Sample Matrix: SURFACE WATER  
 Date Sampled: 24 Apr 07 9:15  
 Date Received: 24 Apr 07 16:30  
 PO #: 002-107

Project Number: 0002-107  
 Sample Description: CR 10.1

Temp at Receipt: 4.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					2 May 07	DAP
BOD, Carbonaceous	4	mg/L	2	SM 5210B	25 Apr 07 14:26	JED
CBOD, 20 Day	16	mg/L	2	SM 5210B	25 Apr 07 17:39	AKF
Solids, Total Suspended	7	mg/L	2	USGS I-3765-85	25 Apr 07 9:45	JED
Carbon, Total Organic	8.4	mg/L	0.5	415.1	27 Apr 07 10:30	Bis
Chlorophyll a	8.2	mg/cubic m	1.0	10200H	2 May 07 7:05	JD
Fecal Coliform, MF	* < 10	CFU/100 mL	10.	SM 9222D 18th Ed	24 Apr 07 19:00	ES
Chloride	19.0	mg/L	3.0	325.2	30 Apr 07 15:47	DAP
Nitrate+Nitrite	0.30	mg/L as N	0.20	353.2	25 Apr 07 15:39	DAP
Nitrogen, Ammonia	< 0.16	mg/L	0.16	4500 NH3 B, E	30 Apr 07 10:45	TAM
Phosphorus, Total	0.039	mg/L	0.005	EPA 365.1	2 May 07 9:35	DAP
Phosphorus, Ortho	< 0.005	mg/L	0.005	EPA 365.1	25 Apr 07 7:19	DAP
Nitrogen, Total Kjeldahl	0.6	mg/L	0.2	SM 4500NorgB/NH3 E	2 May 07 6:30	TAM

CFU = Colony Forming Units

\* Holding time Exceeded

Data Set: \_\_\_\_\_  
 Entered By/Date: JT 7/9/07  
 QA/QC By/Date: WB 10/9/07

PRELIMINARY REPORT: RESULTS ARE SUBJECT TO CHANGE PENDING FINAL APPROVAL OF DATA.

RL = Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration  
 ! = Due to sample quantity \* = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WR/DW # R-040 IA LAB #: 132 IA LAB #: 022

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WES BOLL  
 WENCK ASSOCIATES INC  
 1800 PIONEER CRK CTR  
 MAPLE PLAIN MN 55359-9000

Report Date: 8 Jun 07  
 Lab Number: 07-A18774  
 Work Order #: 12-5557  
 Account #: 013173  
 Sample Matrix: SURFACE WATER  
 Date Sampled: 9 May 07 11:35  
 Sampled By: WES BOLL  
 Date Received: 9 May 07 16:12  
 PO #: 0002-107

Project Number: 0002-107  
 Sample Description: CR 10.1

Temp at Receipt: 3.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					14 May 07	RMV
BOD, Carbonaceous	< 2	mg/L	2	SM 5210B	10 May 07 14:16	JED
CBOD, 20 Day	9	mg/L	2	SM 5210B	10 May 07 13:11	AKF
Solids, Total Suspended	3	mg/L	2	USGS I-3765-85	10 May 07 12:05	CJL
Carbon, Total Organic	6.5	mg/L	0.5	415.1	5 Jun 07 16:30	Bis
Chlorophyll a	1.1	mg/cubic m	1.0	10200H	11 May 07 8:31	JD
Fecal Coliform, MF	* < 10	CFU/100 mL	10.	SM 9222D 18th Ed	9 May 07 18:05	ES
Chloride	22.8	mg/L	3.0	325.2	16 May 07 15:57	DAP
Nitrate+Nitrite	0.28	mg/L as N	0.20	353.2	14 May 07 7:23	RMV
Nitrogen, Ammonia	< 0.16	mg/L	0.16	4500 NH3 B, E	15 May 07 10:35	TAM
Phosphorus, Total	0.028	mg/L	0.005	EPA 365.1	17 May 07 8:00	DAP
Phosphorus, Ortho	< 0.005	mg/L	0.005	EPA 365.1	10 May 07 10:07	DAP
Nitrogen, Total Kjeldahl	1.0	mg/L	0.2	SM 4500NorgB/NH3 E	16 May 07 6:55	TAM

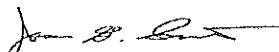
CFU = Colony Forming Units

\* Holding time Exceeded

Data Set: \_\_\_\_\_

Entered By/Date: JT 7/9/07

QA/QC By/Date: WB 10/9/07

Approved by:   
 Jason G. Smith, Inorganic  
 Laboratory Manager New Ulm, MN

RL = Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix  
 ! = Due to sample quantity

# = Due to sample concentration  
 + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND NW/DW # R-040 IA LAB #: 132 IA LAB #: 022

MVTL

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ACIL

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Page: 1 of 1

WES BOLL
WENCK ASSOCIATES INC
1800 PIONEER CRK CTR
MAPLE PLAIN MN 55359-9000

Report Date: 8 Jun 07
Lab Number: 07-A18775
Work Order #:12-5557
Account #: 013173
Sample Matrix: SURFACE WATER
Date Sampled: 9 May 07
Sampled By: WES BOLL
Date Received: 9 May 07 16:12
PO #: 0002-107

Project Number: 0002-107
Sample Description: FD 1

Temp at Receipt: 3.0C

CR10.1

Table with columns: As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Rows include Phosphorus Water Digest, BOD, Carbonaceous, CBOD, 20 Day, Solids, Total Suspended, Carbon, Total Organic, Chlorophyll a, Fecal Coliform, MF, Chloride, Nitrate+Nitrite, Nitrogen, Ammonia, Phosphorus, Total, Phosphorus, Ortho, Nitrogen, Total Kjeldahl.

CFU = Colony Forming Units

\* Holding time Exceeded

\*\* No collection time supplied by the client.

Data Set:

Entered By/Date: JT 7/9/07

QA/QC By/Date: WB 10/9/07

Approved by: Jason G. Smith, Inorganic Laboratory Manager New Ulm, MN

RL = Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix
! = Due to sample quantity

# = Due to sample concentration
+ = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WR/DW # R-040 IA LAB #: 132 IA LAB #: 022



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WES BOLL  
WENCK ASSOCIATES INC  
1800 PIONEER CRK CTR  
MAPLE PLAIN MN 55359-9000

Report Date: 14 Jun 07  
Lab Number: 07-A21649  
Work Order #: 12-6194  
Account #: 013173  
Sample Matrix: SURFACE WATER  
Date Sampled: 23 May 07 12:15  
Sampled By: NICK C  
Date Received: 23 May 07 15:55  
PO #: CRWD TMDL

Project Name: CRWD TMDL

Sample Description: CR 10.1

Temp at Receipt: 4.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest	< 2	mg/L	2	SM 5210B	29 May 07	AKW
BOD, Carbonaceous	9	mg/L	2	SM 5210B	24 May 07 11:28	JED
CBOD, 20 Day	6	mg/L	2	USGS I-3765-85	24 May 07 11:12	CJL
Solids, Total Suspended	9.0	mg/L	0.5	415.1	24 May 07 9:45	CJL
Carbon, Total Organic	300	CFU/100 mL	10.	SM 9222D 18th Ed	6 Jun 07 8:00	Bis
Fecal Coliform, MF	20.5	mg/L	3.0	325.2	23 May 07 17:55	JLS
Chloride	< 0.2	mg/L as N	0.2	353.2	25 May 07 12:59	AKW
Nitrate+Nitrite	< 0.16	mg/L	0.16	4500 NH3 B, E	25 May 07 11:26	RMV
Nitrogen, Ammonia	0.022	mg/L	0.005	EPA 365.1	25 May 07 7:00	TAM
Phosphorus, Total	< 0.005	mg/L	0.005	EPA 365.1	31 May 07 15:26	DAP
Phosphorus, Ortho	1.4	mg/L	0.2	SM 4500NorgB/NH3 E	24 May 07 6:26	JGS
Nitrogen, Total Kjeldahl					29 May 07 14:10	EJP

\*U = Colony Forming Units

Data Set: \_\_\_\_\_

Entered By/Date: JT 7/9/07

QA/QC By/Date: WB 10/9/07

*Chlor A -> not tested for*

Approved by: Jason G. Smith  
Jason G. Smith, Inorganic  
Laboratory Manager New Ulm, MN

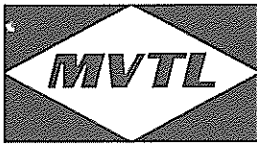
\* Reporting Limit

elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration  
! = Due to sample quantity + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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WES BOLL  
WENCK ASSOCIATES INC  
1800 PIONEER CRK CTR  
MAPLE PLAIN MN 55359-9000

Report Date: 21 Jun 07  
Lab Number: 07-A23063  
Work Order #: 12-6461  
Account #: 013173  
Sample Matrix: SURFACE WATER  
Date Sampled: 30 May 07 12:15  
Sampled By: NICK C  
Date Received: 30 May 07 16:00  
PO #: 0002-107

Sample Description: CR 10.1

Temp at Receipt: 1.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					4 Jun 07	AKW
BOD, Carbonaceous	< 2	mg/L	2	SM 5210B	31 May 07 11:25	CJL
CBOD, 20 Day	5	mg/L	2	SM 5210B	31 May 07 11:04	CJL
Solids, Total Suspended	< 2	mg/L	2	USGS I-3765-85	31 May 07 8:00	JED
Carbon, Total Organic	7.5	mg/L	0.5	415.1	8 Jun 07 16:00	Bis
Chlorophyll a	2.2	mg/cubic m	1.0	10200H	1 Jun 07 13:07	JD
Fecal Coliform, MF	82	CFU/100 mL	10.	SM 9222D 18th Ed	30 May 07 17:10	ES
Chloride	21.7	mg/L	3.0	325.2	31 May 07 8:42	AKW
Nitrate+Nitrite	< 0.2	mg/L as N	0.2	353.2	4 Jun 07 8:15	RMV
Nitrogen, Ammonia	< 0.16	mg/L	0.16	4500 NH3 B, E	31 May 07 8:55	TAM
Phosphorus, Total	0.013	mg/L	0.005	EPA 365.1	5 Jun 07 8:07	RMV
Phosphorus, Ortho	< 0.005	mg/L	0.005	EPA 365.1	31 May 07 8:12	DAP
Nitrogen, Total Kjeldahl	0.9	mg/L	0.2	SM 4500NorgB/NH3 E	4 Jun 07 8:10	EJP

U = Colony Forming Units

Data Set: \_\_\_\_\_

Entered By/Date: JT 7/9/07

QA/QC By/Date: WB 10/9/07

Approved by: Jason G. Smith  
Jason G. Smith, Inorganic  
Laboratory Manager New Ulm, MN

Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration  
! = Due to sample quantity + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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WES BOLL  
WENCK ASSOCIATES INC  
1800 PIONEER CRK CTR  
MAPLE PLAIN MN 55359-9000

Report Date: 29 Jun 07  
Lab Number: 07-A24644  
Work Order #: 12-6814  
Account #: 013173  
Sample Matrix: SURFACE WATER  
Date Sampled: 6 Jun 07 12:05  
Sampled By: NICK C  
Date Received: 6 Jun 07 16:00  
PO #: CRWD TMDL

Project Name: CRWD TMDL

Sample Description: CR 10.1

Temp at Receipt: 5.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					7 Jun 07	AKW
BOD, Carbonaceous	2	mg/L	2	SM 5210B	7 Jun 07 11:43	JED
CBOD, 20 Day	5	mg/L	2	SM 5210B	7 Jun 07 11:29	JED
Solids, Total Suspended	7	mg/L	2	USGS I-3765-85	7 Jun 07 9:15	CJL
Carbon, Total Organic	8.5	mg/L	0.5	415.1	13 Jun 07 8:00	Bis
Chlorophyll a	3.0	mg/cubic m	1.0	10200H	12 Jun 07 9:45	AJK
Fecal Coliform, MF	* < 10	CFU/100 mL	10.	SM 9222D 18th Ed	6 Jun 07 18:55	ES
Chloride	21.5	mg/L	3.0	325.2	11 Jun 07 10:22	AKW
Nitrate+Nitrite	< 0.2	mg/L as N	0.2	353.2	7 Jun 07 12:23	DAP
Nitrogen, Ammonia	< 0.16	mg/L	0.16	4500 NH3 B, E	7 Jun 07 11:20	EJP
Phosphorus, Total	0.020	mg/L	0.005	EPA 365.1	12 Jun 07 11:50	RMV
Phosphorus, Ortho	< 0.005	mg/L	0.005	EPA 365.1	7 Jun 07 7:22	RMV
Nitrogen, Total Kjeldahl	1.0	mg/L	0.2	SM 4500NorgB/NH3 E	8 Jun 07 13:00	EJP

CFU = Colony Forming Units

\* Holding time Exceeded

Approved by:

*Jason G. Smith*  
Jason G. Smith, Inorganic  
Laboratory Manager New Ulm, MN

Reporting Limit

Elevated "Less Than Result" (<): # = Due to sample matrix  
! = Due to sample quantity

# = Due to sample concentration  
+ = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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WES BOLL  
WENCK ASSOCIATES INC  
1800 PIONEER CRK CTR  
MAPLE PLAIN MN 55359-9000

Report Date: 12 Jul 07  
Lab Number: 07-A27464  
Work Order #: 12-7478  
Account #: 013173  
Sample Matrix: SURFACE WATER  
Date Sampled: 20 Jun 07 11:55  
Sampled By: NICK C  
Date Received: 20 Jun 07 16:00  
PO #: CLEARWATER

Project Name: CLEARWATER  
Project Number: 0002-108  
Sample Description: CR 10.1

Temp at Receipt: 6.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					22 Jun 07	AKW
BOD, Carbonaceous	3	mg/L	2	SM 5210B	21 Jun 07 14:34	JED
CBOD, 20 Day	21	mg/L	2	SM 5210B	21 Jun 07 14:05	JED
Solids, Total Suspended	16	mg/L	2	USGS I-3765-85	21 Jun 07 10:00	CJL
Carbon, Total Organic	10.5	mg/L	0.5	415.1	27 Jun 07 8:00	Bis
Chlorophyll a	10.8	mg/cubic m	1.0	10200H	26 Jun 07 15:02	JD
Fecal Coliform, MF	* < 10	CFU/100 mL	10.	SM 9222D 20th Ed	20 Jun 07 18:25	ES
Chloride	21.2	mg/L	3.0	325.2	25 Jun 07 13:13	DAP
Nitrate+Nitrite	< 0.2	mg/L as N	0.2	353.2	27 Jun 07 14:51	DAP
Nitrogen, Ammonia	< 0.16	mg/L	0.16	4500 NH3 B, E	21 Jun 07 9:40	EJP
Phosphorus, Total	0.022	mg/L	0.005	EPA 365.1	26 Jun 07 14:00	DAP
Phosphorus, Ortho	< 0.005	mg/L	0.005	EPA 365.1	21 Jun 07 7:39	RMV
Nitrogen, Total Kjeldahl	1.0	mg/L	0.2	SM 4500NorgB/NH3 E	21 Jun 07 15:15	EJP

--U = Colony Forming Units

\* Holding time Exceeded

Data Set: \_\_\_\_\_

Entered By/Date: \_\_\_\_\_

QA/QC By/Date: WB 10/9/07 - Entered WB  
7/25/07

Approved by: Jason G. Smith  
Jason G. Smith, Inorganic  
Laboratory Manager New Ulm, MN

### Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration  
! = Due to sample quantity + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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WES BOLL  
 WENCK ASSOCIATES INC  
 1800 PIONEER CRK CTR  
 MAPLE PLAIN MN 55359-9000

Report Date: 24 Jul 07  
 Lab Number: 07-A29580  
 Work Order #: 12-7958  
 Account #: 013173  
 Sample Matrix: SURFACE WATER  
 Date Sampled: 2 Jul 07 11:30  
 Sampled By: NICK C  
 Date Received: 3 Jul 07 9:55

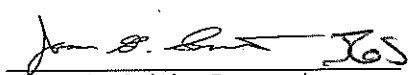
Project Name: CRWD TMDL  
 Project Number: 0002-107  
 Sample Description: CR 10.1

Temp at Receipt: 3.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					9 Jul 07	AKW
Water Digestions					9 Jul 07	JMS
BOD, Carbonaceous	3	mg/L	2	SM 5210B	3 Jul 07 14:14	JED
CBOD, 20 Day	14	mg/L	2	SM 5210B	3 Jul 07 14:27	JED
Solids, Total Suspended	< 2	mg/L	2	USGS I-3765-85	3 Jul 07 11:30	CJL
Carbon, Total Organic	10.5	mg/L	0.5	415.1	12 Jul 07 8:00	Bis
Chlorophyll a	2.8	mg/cubic m	1.0	10200H	10 Jul 07 7:35	JD
Nitrogen Total, Calculat	0.9	mg/L	NA	Calc	20 Jul 07 11:43	Calculated
Chloride	25.2	mg/L	3.0	325.2	9 Jul 07 15:20	AKW
Nitrate+Nitrite	< 0.2	mg/L as N	0.2	353.2	20 Jul 07 11:43	DAP
Nitrogen, Ammonia	< 0.16	mg/L	0.16	4500 NH3 B, E	5 Jul 07 7:15	TAM
Phosphorus, Total	0.019	mg/L	0.005	EPA 365.1	10 Jul 07 11:00	DAP
Phosphorus, Ortho	< 0.005	mg/L	0.005	EPA 365.1	3 Jul 07 18:56	DAP
Nitrogen, Total Kjeldahl	0.9	mg/L	0.2	SM 4500NorgB/NH3 E	9 Jul 07 5:40	TAM
on	0.034	mg/L	0.015	6010	9 Jul 07 15:44	CJR

Ent  
 WB  
 7/26/07

QA  
 WB  
 10/9/07

Approved by:   
 Jason G. Smith, Inorganic  
 Laboratory Manager New Ulm, MN

Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration  
 ! = Due to sample quantity + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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WES BOLL  
WENCK ASSOCIATES INC  
1800 PIONEER CRK CTR  
MAPLE PLAIN MN 55359-9000

Report Date: 2 Aug 07  
Lab Number: 07-A31301  
Work Order #: 12-8261  
Account #: 013173  
Sample Matrix: SURFACE WATER  
Date Sampled: 11 Jul 07 11:30  
Sampled By: WES B  
Date Received: 11 Jul 07 15:50  
PO #: 0002-107

Project Number: 0002-107  
Sample Description: CR 10.1

Temp at Receipt: 0.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					13 Jul 07	AKW
Water Digestions					17 Jul 07	JMS
BOD, Carbonaceous	3	mg/L	2	SM 5210B	12 Jul 07 13:36	CJL
CBOD, 20 Day	38	mg/L	2	SM 5210B	12 Jul 07 11:24	CJL
Solids, Total Suspended	6	mg/L	2	USGS I-3765-85	12 Jul 07 10:30	JED
Carbon, Total Organic	10.50	mg/L	0.50	415.1	19 Jul 07 11:00	Bis
Chlorophyll a	3.3	mg/cubic m	1.0	10200H	17 Jul 07 9:43	JD
Fecal Coliform, MF	* 40	CFU/100 mL	10.	SM 9222D 20th Ed	11 Jul 07 19:00	ES
Nitrogen Total, Calculat	1.1	mg/L	NA	Calc	21 Jul 07 13:15	Calculated
Chloride	22.6	mg/L	3.0	325.2	23 Jul 07 14:11	AKW
Nitrate+Nitrite	< 0.2	mg/L as N	0.2	353.2	21 Jul 07 13:15	JGS
Nitrogen, Ammonia	< 0.16	mg/L	0.16	4500 NH3 B, E	16 Jul 07 11:45	EJP
Phosphorus, Total	0.022	mg/L	0.005	EPA 365.1	18 Jul 07 11:23	DAP
Phosphorus, Ortho	0.007	mg/L	0.005	EPA 365.1	12 Jul 07 8:32	DAP
Nitrogen, Total Kjeldahl	1.1	mg/L	0.2	SM 4500NorgB/NH3 E	16 Jul 07 15:00	EJP
Iron	0.080	mg/L	0.015	6010	18 Jul 07 11:37	CJR

Batch matrix spike and spike duplicate recoveries for Nitrate+Nitrite were outside MVTL 85-115% limit at 126% and 126%. Data reported based on acceptable spike duplication and known recovery.

CFU = Colony Forming Units

\* Holding time Exceeded

Data Set: \_\_\_\_\_

Entered By/Date: WB 10/08/07

QA/QC By/Date: WB 10/09/07

Approved by:

Jason G. Smith, Inorganic  
Laboratory Manager New Ulm, MN

\* Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix  
! = Due to sample quantity

# = Due to sample concentration  
+ = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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WES BOLL  
WENCK ASSOCIATES INC  
1800 PIONEER CRK CTR  
MAPLE PLAIN MN 55359-9000

Report Date: 16 Aug 07  
Lab Number: 07-A34001  
Work Order #: 12-8817  
Account #: 013173  
Sample Matrix: SURFACE WATER  
Date Sampled: 25 Jul 07 11:45  
Sampled By: NICK C  
Date Received: 25 Jul 07 15:15  
PO #: CLEARWATER

Project Name: CLEARWATER TMDL

Sample Description: CR 10.1

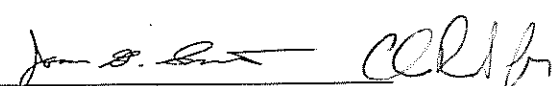
Temp at Receipt: 4.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					28 Jul 07	AKW
Water Digestions					27 Jul 07	JMS
BOD, Carbonaceous	3	mg/L	2	SM 5210B	26 Jul 07 11:48	CJL
CBOD, 20 Day	10	mg/L	2	SM 5210B	26 Jul 07 12:00	CJL
Solids, Total Suspended	5	mg/L	2	USGS I-3765-85	26 Jul 07 9:45	JED
Carbon, Total Organic	11.00	mg/L	0.50	415.1	6 Aug 07 8:00	Bis
Chlorophyll a	2.2	mg/cubic m	1.0	10200H	1 Aug 07 8:41	JD
Nitrogen Total, Calculat	1.3	mg/L	NA	Calc	6 Aug 07 11:50	Calculated
Chloride	23.7	mg/L	3.0	325.2	3 Aug 07 10:59	AKW
Nitrate+Nitrite	< 0.2	mg/L as N	0.2	353.2	6 Aug 07 11:50	DAP
Nitrogen, Ammonia	< 0.16	mg/L	0.16	4500 NH3 B, E	1 Aug 07 11:50	EJP
Phosphorus, Total	0.018	mg/L	0.005	EPA 365.1	1 Aug 07 10:41	DAP
Phosphorus, Ortho	< 0.01	mg/L	0.005	EPA 365.1	26 Jul 07 8:41	DAP
Nitrogen, Total Kjeldahl	1.3	mg/L	0.2	SM 4500NorgB/NH3 E	31 Jul 07 8:30	EJP
Iron	0.056	mg/L	0.015	6010	30 Jul 07 12:37	CJR

Data Set: \_\_\_\_\_

Entered By/Date: WB 10/08/07

QA/QC By/Date: WB 10/09/07

Approved by:   
Jason G. Smith, Inorganic  
Laboratory Manager New Ulm, MN

\* Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration  
! = Due to sample quantity + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND HW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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WES BOLL  
WENCK ASSOCIATES INC  
1800 PIONEER CRK CTR  
MAPLE PLAIN MN 55359-9000

Report Date: 16 Aug 07  
Lab Number: 07-A34002  
Work Order #: 12-8817  
Account #: 013173  
Sample Matrix: SURFACE WATER  
Date Sampled: 25 Jul 07  
Sampled By: NICK C  
Date Received: 25 Jul 07 15:15  
PO #: CLEARWATER

Project Name: CLEARWATER TMDL

Sample Description: FD1

Temp at Receipt: 4.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					28 Jul 07	AKW
Water Digestions					27 Jul 07	JMS
BOD, Carbonaceous	2	mg/L	2	SM 5210B	26 Jul 07 11:48	CJL
CBOD, 20 Day	8	mg/L	2	SM 5210B	26 Jul 07 12:00	CJL
Solids, Total Suspended	2	mg/L	2	USGS I-3765-85	26 Jul 07 9:45	JED
Carbon, Total Organic	10.00	mg/L	0.50	415.1	6 Aug 07 8:00	Bis
Chlorophyll a	2.1	mg/cubic m	1.0	10200H	1 Aug 07 8:41	JD
Nitrogen Total, Calculat	1.6	mg/L	NA	Calc	6 Aug 07 11:50	Calculated
Chloride	23.4	mg/L	3.0	325.2	3 Aug 07 10:59	AKW
Nitrate+Nitrite	< 0.2	mg/L as N	0.2	353.2	6 Aug 07 11:50	DAP
Nitrogen, Ammonia	< 0.16	mg/L	0.16	4500 NH3 B, E	2 Aug 07 8:40	EJP
Phosphorus, Total	0.016	mg/L	0.005	EPA 365.1	1 Aug 07 10:41	DAP
Phosphorus, Ortho	< 0.01	mg/L	0.005	EPA 365.1	26 Jul 07 8:41	DAP
Nitrogen, Total Kjeldahl	1.6	mg/L	0.2	SM 4500NorgB/NH3 E	31 Jul 07 8:30	EJP
Iron	0.040	mg/L	0.015	6010	30 Jul 07 12:37	CJR


\*\* No collection time supplied by the client.

Data Set: \_\_\_\_\_

Entered By/Date: <sup>WB</sup> 10/08/07

QA/QC By/Date: <sup>WB</sup> 10/09/07

Approved by:

  
Jason G. Smith, Inorganic  
Laboratory Manager New Ulm, MN

= Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix  
! = Due to sample quantity

# = Due to sample concentration  
+ = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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WES BOLL
WENCK ASSOCIATES INC
1800 PIONEER CRK CTR
MAPLE PLAIN MN 55359-9000

Report Date: 24 Sep 07
Lab Number: 07-A36439
Work Order #: 12-9361
Account #: 013173
Sample Matrix: SURFACE WATER
Date Sampled: 8 Aug 07 13:00
Sampled By: NICK C
Date Received: 8 Aug 07 15:30
PO #: CRWD TMDL

Project Name: CRWD TMDL

Sample Description: CR 10.1

Temp at Receipt: 3.0C

Table with 6 columns: As Received Result, Method RL, Method Reference, Date Analyzed, and Analyst. Rows include various water quality tests like BOD, CBOD, Solids, Carbon, Chlorophyll, Fecal Coliform, Nitrogen, Phosphorus, etc.

RL for Ortho Phosphorus elevated to 0.01 mg/L due to reporting limit check falling outside method 60-140% acceptance limit at 0.005 mg/L.

CFU = Colony Forming Units

Data Set:
Entered By/Date: WB 10/08/07
QA/QC By/Date: WB 10/09/07

Approved by: Jason G. Smith, Inorganic Laboratory Manager New Ulm, MN

Reporting Limit

Elevated "Less Than Result" (<): # = Due to sample matrix, ! = Due to sample quantity, # = Due to sample concentration, + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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WES BOLL  
WENCK ASSOCIATES INC  
1800 PIONEER CRK CTR  
MAPLE PLAIN MN 55359-9000

Report Date: 13 Sep 07  
Lab Number: 07-A39076  
Work Order #: 12-9964  
Account #: 013173  
Sample Matrix: SURFACE WATER  
Date Sampled: 22 Aug 07 12:00  
Sampled By: NICK C  
Date Received: 22 Aug 07 15:20  
PO #: CRWD TMDL

Project Name: CRWD TMDL

Sample Description: CR 10.1

Temp at Receipt: 3.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					24 Aug 07	KAD
BOD, Carbonaceous	3	mg/L	2	SM 5210B	23 Aug 07 13:56	CJL
CBOD, 20 Day	9	mg/L	2	SM 5210B	23 Aug 07 14:10	CJL
Solids, Total Suspended	< 2	mg/L	2	USGS I-3765-85	23 Aug 07 12:00	JED
Carbon, Total Organic	10.00	mg/L	0.50	415.1	29 Aug 07 8:00	Bis
Chlorophyll a	5.0	mg/cubic m	1.0	10200H	24 Aug 07 9:14	JD
Fecal Coliform, MF	* 140	CFU/100 mL	10.	SM 9222D 20th Ed	22 Aug 07 18:55	MKG
Nitrogen Total, Calculat	1.2	mg/L	NA	Calc	28 Aug 07 14:45	Calculated
Chloride	24.1	mg/L	3.0	325.2	27 Aug 07 14:27	DAP
Nitrate+Nitrite	< 0.2	mg/L as N	0.2	353.2	28 Aug 07 12:47	DAP
Nitrogen, Ammonia	< 0.16	mg/L	0.16	4500 NH3 B, E	29 Aug 07 9:45	TAM
Phosphorus, Total	0.018	mg/L	0.005	EPA 365.1	29 Aug 07 13:11	DAP
Phosphorus, Ortho	< 0.01	mg/L	0.005	EPA 365.1	23 Aug 07 8:56	DAP
Nitrogen, Total Kjeldahl	1.2	mg/L	0.2	SM 4500NorgB/NH3 E	28 Aug 07 14:45	TAM

Elevated RL for Ortho Phosphorus due to RL check failure at 0.005 mg/L.

CFU = Colony Forming Units

\* Holding time Exceeded

Data Set: \_\_\_\_\_

Entered By/Date: WB 10/08/07

QA/QC By/Date: WB 10/09/07

Approved by: \_\_\_\_\_

Jason G. Smith, Inorganic  
Laboratory Manager New Ulm, MN

Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix  
! = Due to sample quantity

# = Due to sample concentration  
+ = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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# Field Form: 2007 Stream Sampling

Client: CRWD  
 Project No.: 0002-107  
 Date: 5.9.07  
 Sampler(s): NIC/WB  
 Start Time: 9:05  
 End Time: 9:30  
 Channel Conditions: Flowing  
 COC Number: \_\_\_\_\_

Site Location: T 4.0  
 Site Description: Tributary at Driveway by CRWD  
 Weather: Sunny 65°  
 Samples Taken:  Yes  No  
 Sample Time: 9:20  
 DTW Measurement: 0.80

Notes: - slow moving water  
 \_\_\_\_\_  
 \_\_\_\_\_

Field Parameters				
Sample I.D.	Temp. (°C)	Cond. (mS/cm)	D.O. (mg/l)	pH (S.U.)
	12.28	399	7.79	7.62

Stage Ht: \_\_\_\_\_ Rated Flow: \_\_\_\_\_ Gauged Flow: 2.22 cfs

### Stream Gauging Data

Distance from Initial Point (ft)	Width (ft)	Depth (ft)	Velocity (60% Depth)	Velocity		Average Velocity (ft/sec)	Area (ft <sup>2</sup> )	Discharge (Q, ft <sup>3</sup> /sec)
				20% Depth	80% Depth			
0, (left side)								
				Data Set:		_____		
				Entered By/Date:		JT 7/19/07		
				QA/QC By/Date:		WB 10/30/07		

# Field Form: 2007 Stream Sampling

Client: CRWD

Project No.: 0002-107

Date: 5.23.07

Sampler(s): NK/WB

Start Time: 1010

End Time: 1025

Channel Conditions: Flowing

COC Number: \_\_\_\_\_

Site Location: T 4.0

Site Description: trib. to CR at Druewing

Weather: cloudy 65°

Samples Taken:  Yes  No

Sample Time: 1015

DTW Measurement: 1.51

Field Parameters				
Sample I.D.	Temp. (°C)	Cond. (mS/cm)	D.O. (mg/l)	pH (S.U.)
	18.31	462	4.13	7.52

Notes: - small amount of flow through Culvert

Stage Ht: \_\_\_\_\_ Rated Flow: \_\_\_\_\_ Gauged Flow: 0.882 cfs

### Stream Gauging Data

Distance from Initial Point (ft)	Width (ft)	Depth (ft)	Velocity (60% Depth)	Velocity		Average Velocity (ft/sec)	Area (ft <sup>2</sup> )	Discharge (Q, ft <sup>3</sup> /sec)
				20% Depth	80% Depth			
0, (left side)								

Data Set: \_\_\_\_\_

Entered By/Date: 7/9/07 JT

QA/QC By/Date: WB 10/30/07



**Field Form: 2007 Stream Sampling**

Client: CRWD  
 Project No.: 0002-107  
 Date: 4-8-07  
 Sampler(s): Nick Jess  
 Start Time: 9:34  
 End Time: 9:47  
 Channel Conditions: flowing  
 COC Number: \_\_\_\_\_

Site Location: T. 4.0 175' down to CR  
 Site Description: Clearwater River @ CR 4.0  
 Weather: 65°-69° clear, Raindrops  
 Samples Taken: (Yes) No  
 Sample Time: 9:40  
 DTW Measurement: 1.48  
C-90+

Notes: clear, higher than past few weeks.

Field Parameters				
Sample I.D.	Temp. (°C)	Cond. (mS/cm)	D.O. (mg/l)	pH (S.U.)
	<u>13.6</u>		<u>6.32</u>	

Stage Ht: \_\_\_\_\_ Rated Flow: \_\_\_\_\_ Gauged Flow: 1.148

**Stream Gauging Data**

Distance from Initial Point (ft)	Width (ft)	Depth (ft)	Velocity (60% Depth)	Velocity-		Average Velocity (ft/sec)	Area (ft <sup>2</sup> )	Discharge (Q, ft <sup>3</sup> /sec)
				20% Depth	80% Depth			
0, (left side)								

Data Set: \_\_\_\_\_  
 Entered By/Date: JT 7/9/07  
 QA/QC B/Date: WB 10/30/07

# Field Form: 2007 Stream Sampling

Client: CRWD  
 Project No.: 0002-107  
 Date: 6-20-07  
 Sampler(s): Nic / JSS  
 Start Time: 9:46  
 End Time: 10:05  
 Channel Conditions: Flowing  
 COC Number: \_\_\_\_\_

Site Location: T.40  
 Site Description: Tributary to Cre. Dr. Veeway  
 Weather: Sunny 420 near 40  
 Samples Taken: (Yes) No  
 Sample Time: 9:55  
 DTW Measurement: 2.79 1.74  
C-82

Field Parameters				
Sample I.D.	Temp. (°C)	Cond. (mS/cm)	D.O. (mg/l)	pH (S.U.)
	18.84	459	4.76	7.52

Notes: Brown water,  
low flow, Duck  
weed present

Stage Ht: \_\_\_\_\_ Rated Flow: \_\_\_\_\_ Gauged Flow: 0.144 cfs

### Stream Gauging Data

Distance from Initial Point (ft)	Width (ft)	Depth (ft)	Velocity (60% Depth)	Velocity		Average Velocity (ft/sec)	Area (ft²)	Discharge (Q, ft³/sec)
				20% Depth	80% Depth			
0, (left side)								

Data Set: \_\_\_\_\_  
 Entered By/Date: JT 7/9/07  
 QA/QC By/Date: WB 10/30/07

# Field Form: 2007 Stream Sampling

Client: CRWD  
Project No.: 0002-107  
Date: 7.2.07  
Sampler(s): NK  
Start Time: 930  
End Time: 935  
Channel Conditions: dry  
COC Number: \_\_\_\_\_

Site Location: T 4.0  
Site Description: \_\_\_\_\_  
Weather: Overcast 65°  
Samples Taken: Yes  No   
Sample Time: \_\_\_\_\_  
DTW Measurement: \_\_\_\_\_

Notes: NO flow, dry  
NO samples or  
flow data  
taken

Field Parameters				
Sample I.D.	Temp. (°C)	Cond. (mS/cm)	D.O. (mg/l)	pH (S.U.)
	-	-	-	-

Stage Ht: \_\_\_\_\_

Rated Flow: \_\_\_\_\_

Gauged Flow: Dry

### Stream Gauging Data

Distance from Initial Point (ft)	Width (ft)	Depth (ft)	Velocity (60% Depth)	Velocity		Average Velocity (ft/sec)	Area (ft <sup>2</sup> )	Discharge (Q, ft <sup>3</sup> /sec)
				20% Depth	80% Depth			
0, (left side)								

Entered By/Date: WJB

Checked By/Date: \_\_\_\_\_

Q/WQC By/Date: \_\_\_\_\_



## Field Form: 2007 Stream Sampling

Client: CRWD  
 Project No.: 0002-107  
 Date: 7/11/07  
 Sampler(s): \_\_\_\_\_  
 Start Time: 10:20  
 End Time: \_\_\_\_\_  
 Channel Conditions: \_\_\_\_\_  
 COC Number: \_\_\_\_\_

Site Location: T4.0  
 Site Description: Tributary Stream  
 Weather: \_\_\_\_\_  
 Samples Taken: Yes  No   
 Sample Time: \_\_\_\_\_  
 DTW Measurement: \_\_\_\_\_

Notes: -No Flow  
through culvert

Field Parameters				
Sample I.D.	Temp. (°C)	Cond. (mS/cm)	D.O. (mg/l)	pH (S.U.)

Stage Ht: \_\_\_\_\_ Rated Flow: \_\_\_\_\_ Gauged Flow: \_\_\_\_\_

### Stream Gauging Data

Distance from Initial Point (ft)	Width (ft)	Depth (ft)	Velocity (60% Depth)	Velocity		Average Velocity (ft/sec)	Area (ft <sup>2</sup> )	Discharge (Q, ft <sup>3</sup> /sec)
				20% Depth	80% Depth			
0, (left side)								

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PRELIMINARY REPORT

WES BOLL  
 WENCK ASSOCIATES INC  
 1800 PIONEER CRK CTR  
 MAPLE PLAIN MN 55359-9000

Report Date: 22 May 07  
 Lab Number: 07-A15435  
 Work Order #:12-4795  
 Account #: 013173  
 Sample Matrix: SURFACE WATER  
 Date Sampled: 24 Apr 07 11:15  
 Date Received: 24 Apr 07 16:30  
 PO #: 002-107

Project Number: 0002-107  
 Sample Description: T4.0

Temp at Receipt: 4.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					2 May 07	DAP
BOD, Carbonaceous	< 2	mg/L	2	SM 5210B	25 Apr 07 14:26	JED
CBOD, 20 Day	5	mg/L	2	SM 5210B	25 Apr 07 17:39	AKF
Solids, Total Suspended	< 2	mg/L	2	USGS I-3765-85	25 Apr 07 11:50	JED
Carbon, Total Organic	9.6	mg/L	0.5	415.1	27 Apr 07 10:30	Bis
Chlorophyll a	< 1	mg/cubic m	1.0	10200H	2 May 07 7:05	JD
Fecal Coliform, MF	* 10	CFU/100 mL	10.	SM 9222D 18th Ed	24 Apr 07 19:00	ES
Chloride	7.6	mg/L	3.0	325.2	30 Apr 07 15:47	DAP
Nitrate+Nitrite	< 0.2	mg/L as N	0.2	353.2	25 Apr 07 15:39	DAP
Nitrogen, Ammonia	< 0.16	mg/L	0.16	4500 NH3 B, E	30 Apr 07 10:45	TAM
Phosphorus, Total	0.017	mg/L	0.005	EPA 365.1	2 May 07 9:35	DAP
Phosphorus, Ortho	< 0.005	mg/L	0.005	EPA 365.1	25 Apr 07 7:20	DAP
Nitrogen, Total Kjeldahl	0.3	mg/L	0.2	SM 4500NorgB/NH3 E	2 May 07 6:30	TAM

CFU = Colony Forming Units

\* Holding time Exceeded

Data Set: \_\_\_\_\_  
 Entered By/Date: JT 7/9/07  
 QA/QC By/Date: WB 10/30/07

PRELIMINARY REPORT: RESULTS ARE SUBJECT TO CHANGE PENDING FINAL APPROVAL OF DATA.

RL = Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration  
 ! = Due to sample quantity \* = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND HW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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WES BOLL
WENCK ASSOCIATES INC
1800 PIONEER CRK CTR
MAPLE PLAIN MN 55359-9000

Report Date: 8 Jun 07
Lab Number: 07-A18770
Work Order #:12-5557
Account #: 013173
Sample Matrix: SURFACE WATER
Date Sampled: 9 May 07 9:20
Sampled By: WES BOLL
Date Received: 9 May 07 16:12
PO #: 0002-107

Project Number: 0002-107
Sample Description: T 4.0

Temp at Receipt: 3.0C

Table with 6 columns: As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Rows include Phosphorus Water Digest, BOD, CBOD, Solids, Carbon, Chlorophyll a, Fecal Coliform, Chloride, Nitrate+Nitrite, Nitrogen, Ammonia, Phosphorus, Total, Phosphorus, Ortho, Nitrogen, Total Kjeldahl.

CFU = Colony Forming Units

\* Holding time Exceeded

Data Set:

Entered By/Date: JT 7/9/07

QA/QC By/Date: WB 10/30/07

Approved by: Jason G. Smith, Inorganic Laboratory Manager New Ulm, MN

RL = Reporting Limit

Elevated "Less Than Result" (<): \* = Due to sample matrix # = Due to sample concentration
! = Due to sample quantity \* = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022



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WES BOLL
WENCK ASSOCIATES INC
1800 PIONEER CRK CTR
MAPLE PLAIN MN 55359-9000

Report Date: 14 Jun 07
Lab Number: 07-A21654
Work Order #: 12-6194
Account #: 013173
Sample Matrix: SURFACE WATER
Date Sampled: 23 May 07 10:15
Sampled By: NICK C
Date Received: 23 May 07 15:55
PO #: CRWD TMDL

Project Name: CRWD TMDL

Sample Description: T 4.0

Temp at Receipt: 4.0C

Table with 6 columns: As Received Result, Method RL, Method Reference, Date Analyzed, and Analyst. Rows include Phosphorus Water Digest, BOD, Carbonaceous, CBOD, 20 Day, Solids, Total Suspended, Carbon, Total Organic, Fecal Coliform, MF Chloride, Nitrate+Nitrite, Nitrogen, Ammonia, Phosphorus, Total, Phosphorus, Ortho, Nitrogen, Total Kjeldahl.

\*FU = Colony Forming Units

\* Holding time Exceeded

Data Set:

Entered By/Date: JT 7/9/07

QA/QC By/Date: WB 10/30/07

Chlor-A -> NOT tested for

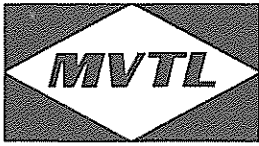
Approved by: Jason G. Smith, Inorganic Laboratory Manager New Ulm, MN

Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix # = Due to sample concentration
! = Due to sample quantity + = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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Page: 1 of 1

WES BOLL  
WENCK ASSOCIATES INC  
1800 PIONEER CRK CTR  
MAPLE PLAIN MN 55359-9000

Report Date: 29 Jun 07  
Lab Number: 07-A24667  
Work Order #: 12-6814  
Account #: 013173  
Sample Matrix: SURFACE WATER  
Date Sampled: 6 Jun 07 9:40  
Sampled By: NICK C  
Date Received: 6 Jun 07 16:00  
PO #: CRWD TMDL

Project Name: CRWD TMDL

Sample Description: T 4.0

Temp at Receipt: 5.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					7 Jun 07	AKW
BOD, Carbonaceous	2	mg/L	2	SM 5210B	7 Jun 07 11:43	JED
CBOD, 20 Day	5	mg/L	2	SM 5210B	7 Jun 07 11:29	JED
Solids, Total Suspended	7	mg/L	2	USGS I-3765-85	7 Jun 07 9:15	CJL
Carbon, Total Organic	8.5	mg/L	0.5	415.1	13 Jun 07 8:00	Bis
Chlorophyll a	2.7	mg/cubic m	1.0	10200H	12 Jun 07 9:45	AJK
Fecal Coliform, MF	* 130	CFU/100 mL	10.	SM 9222D 18th Ed	6 Jun 07 18:55	ES
Chloride	21.3	mg/L	3.0	325.2	11 Jun 07 10:37	AKW
Nitrate+Nitrite	< 0.2	mg/L as N	0.2	353.2	7 Jun 07 12:23	DAP
Nitrogen, Ammonia	< 0.16	mg/L	0.16	4500 NH3 B, E	11 Jun 07 9:15	TAM
Phosphorus, Total	0.023	mg/L	0.005	EPA 365.1	12 Jun 07 11:50	RMV
Phosphorus, Ortho	< 0.005	mg/L	0.005	EPA 365.1	7 Jun 07 7:23	RMV
Nitrogen, Total Kjeldahl	1.1	mg/L	0.2	SM 4500NorgB/NH3 E	8 Jun 07 13:00	EJP

J = Colony Forming Units

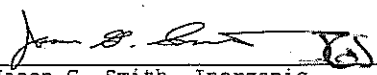
\* Holding time Exceeded

Data Set: \_\_\_\_\_

Entered By/Date: JT 7/19/07

QA/QC By/Date: WB 10/30/07

Approved by:

  
Jason G. Smith, Inorganic  
Laboratory Manager New Ulm, MN

Reporting Limit

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! = Due to sample quantity

# = Due to sample concentration  
+ = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447660 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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Page: 1 of 1

WES BOLL  
WENCK ASSOCIATES INC  
1800 PIONEER CRK CTR  
MAPLE PLAIN MN 55359-9000

Report Date: 12 Jul 07  
Lab Number: 07-A27468  
Work Order #: 12-7478  
Account #: 013173  
Sample Matrix: SURFACE WATER  
Date Sampled: 20 Jun 07 9:55  
Sampled By: NICK C  
Date Received: 20 Jun 07 16:00  
PO #: CLEARWATER

Project Name: CLEARWATER  
Project Number: 0002-108  
Sample Description: T 4.0

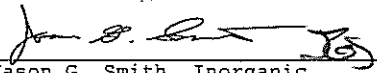
Temp at Receipt: 6.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Phosphorus Water Digest					22 Jun 07	AKW
BOD, Carbonaceous	< 2	mg/L	2	SM 5210B	21 Jun 07 14:34	JED
CBOD, 20 Day	10	mg/L	2	SM 5210B	21 Jun 07 14:05	JED
Solids, Total Suspended	5	mg/L	2	USGS I-3765-85	21 Jun 07 11:45	CJL
Carbon, Total Organic	12.0	mg/L	0.5	415.1	27 Jun 07 8:00	Bis
Chlorophyll a	1.1	mg/cubic m	1.0	10200H	26 Jun 07 15:02	JD
Fecal Coliform, MF	* 140	CFU/100 mL	10.	SM 9222D 20th Ed	20 Jun 07 18:25	ES
Chloride	6.1	mg/L	3.0	325.2	25 Jun 07 13:13	DAP
Nitrate+Nitrite	< 0.2	mg/L as N	0.2	353.2	27 Jun 07 14:52	DAP
Nitrogen, Ammonia	< 0.16	mg/L	0.16	4500 NH3 B, E	25 Jun 07 8:25	EJP
Phosphorus, Total	0.058	mg/L	0.005	EPA 365.1	26 Jun 07 14:00	DAP
Phosphorus, Ortho	0.027	mg/L	0.005	EPA 365.1	21 Jun 07 7:40	RMV
Nitrogen, Total Kjeldahl	0.4	mg/L	0.2	SM 4500NorgB/NH3 E	21 Jun 07 15:15	EJP

.U = Colony Forming Units

\* Holding time Exceeded

Approved by:

  
Jason G. Smith, Inorganic  
Laboratory Manager New Ulm, MN

Ent  
WB  
7/25/07

WB  
10/30/07

Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix  
! = Due to sample quantity

# = Due to sample concentration  
+ = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447600 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

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## **Appendix D**

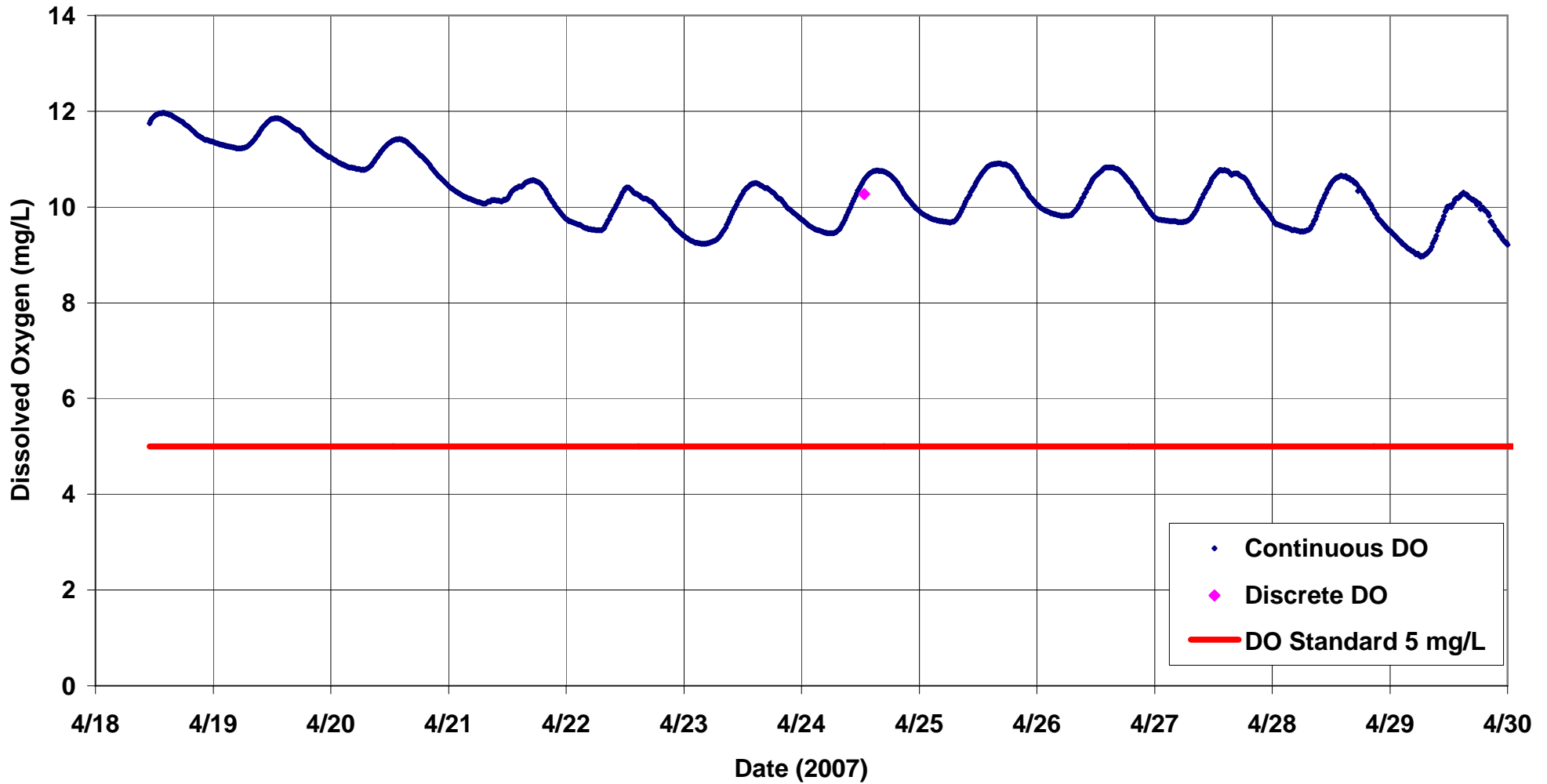
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### **Continuous Dissolved Oxygen Records**

# Appendix D Figure 1

## Phase II Addendum TMDL Study Clearwater River (Grass Lake to the Mississippi)

### Continuous DO Measurements at CR 1.4 During Synoptic Survey 1

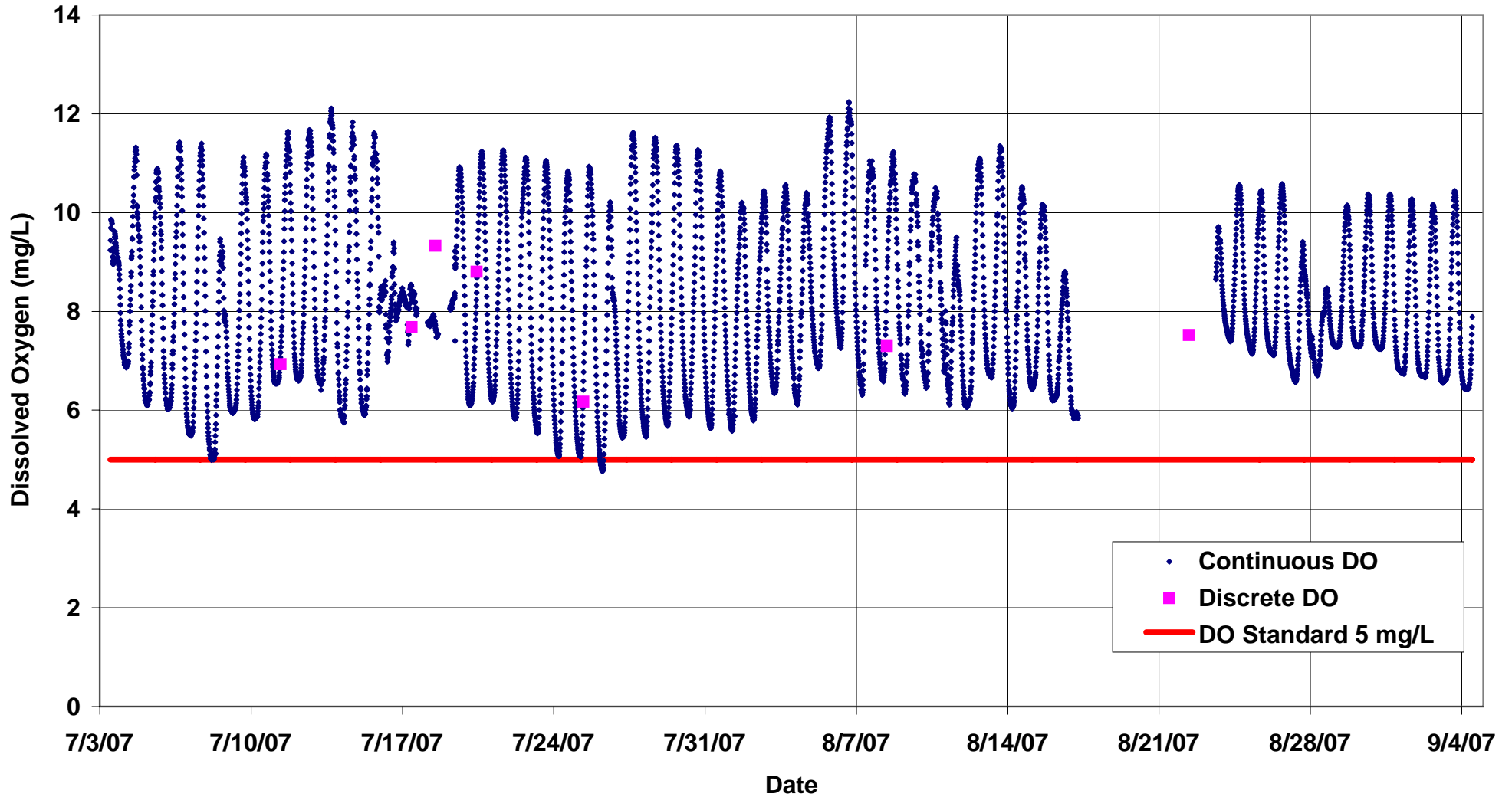




## Appendix D Figure 2

### Phase II Addendum TMDL Study Clearwater River (Grass Lake to the Mississippi)

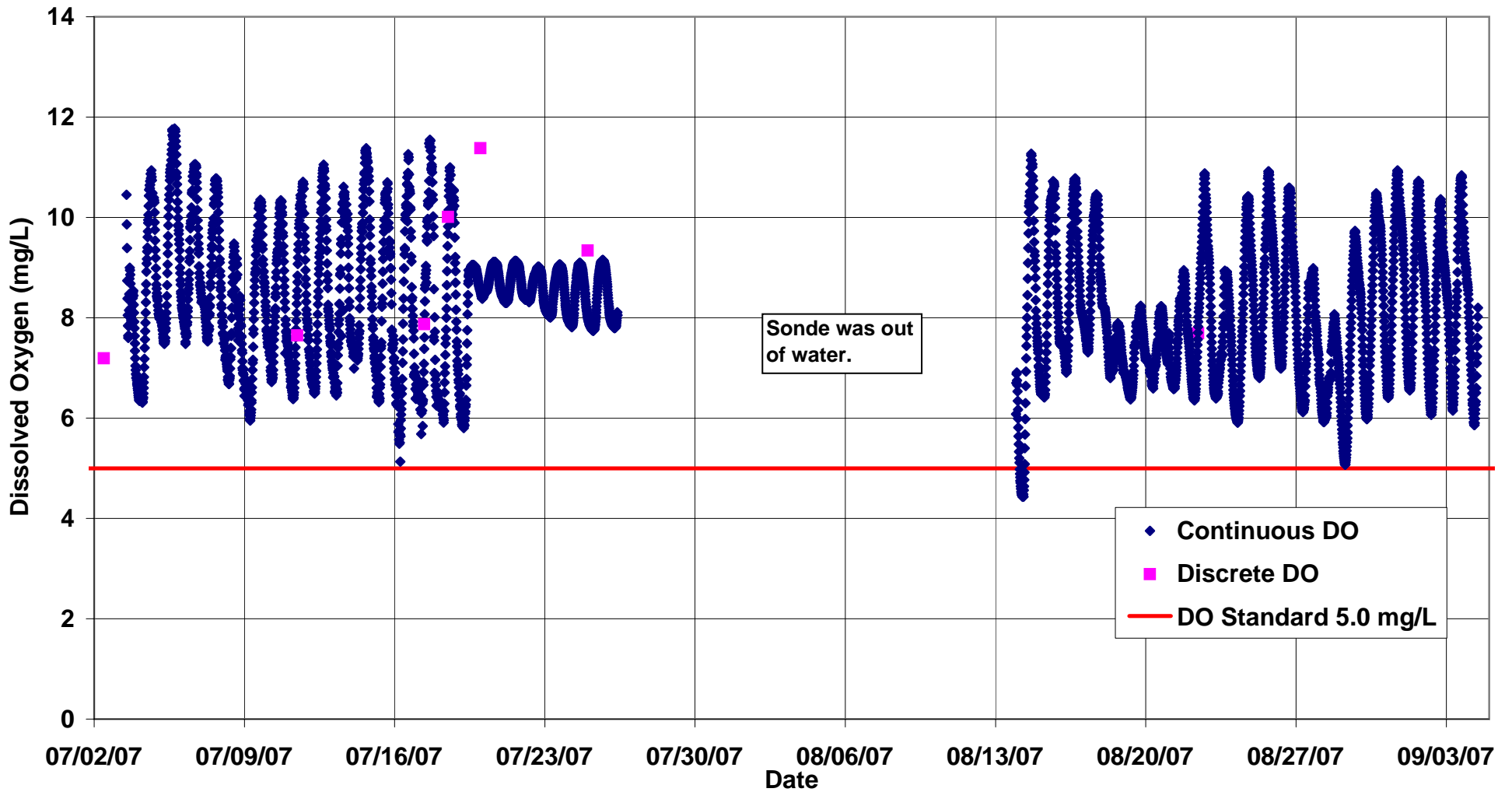
#### Continuous DO Measurements at CR 0.1



### Appendix D Figure 3

#### Phase II Addendum TMDL Study Clearwater River (Grass Lake to the Mississippi)

#### Continuous DO Measurements at CR 7.1



---

## **Appendix E**

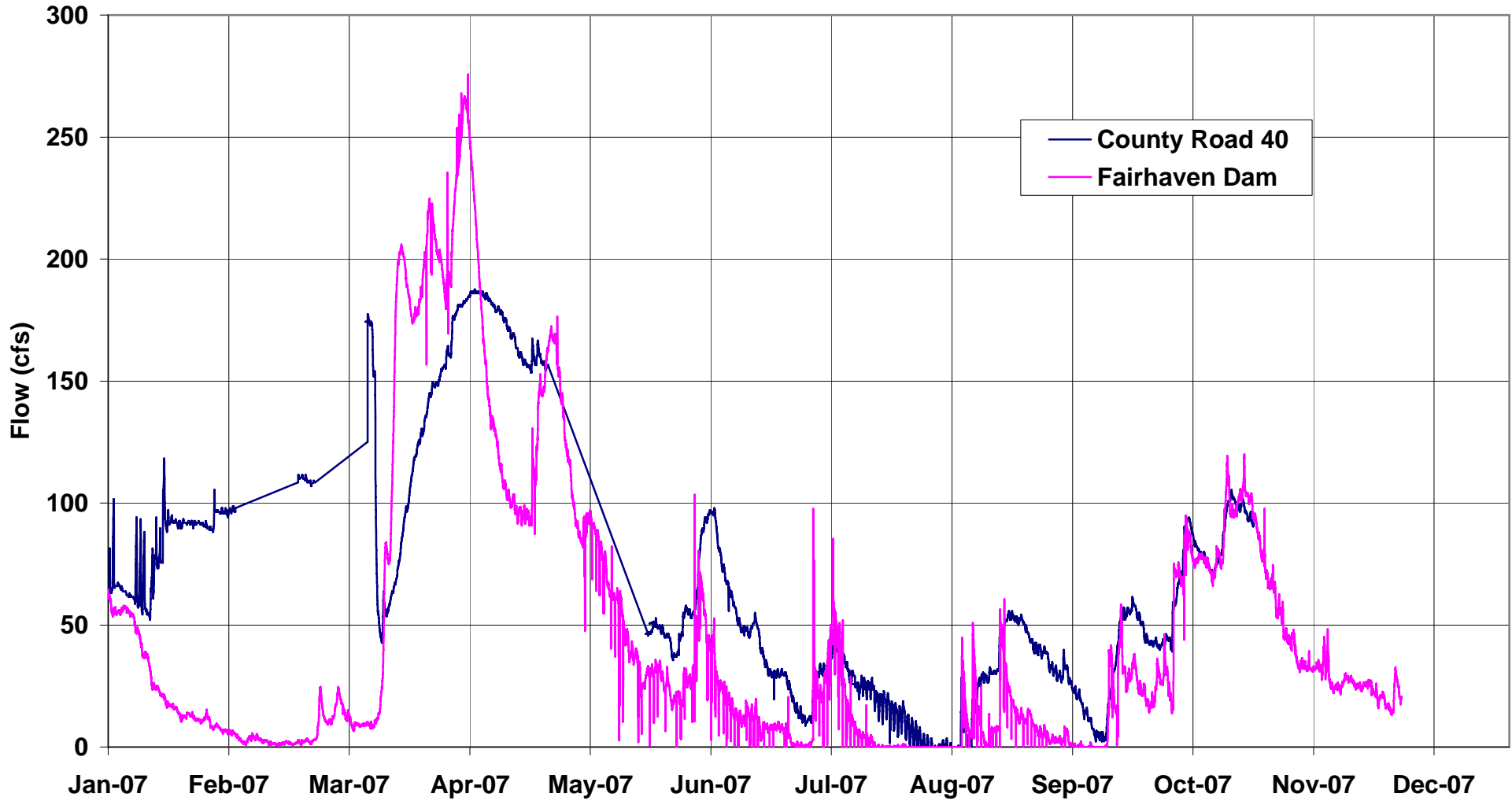
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### **Continuous Flow Records**

# Appendix E Figure 1

## Phase II Addendum TMDL Study Clearwater River (Grass Lake to the Mississippi River)

### Provisional Flow Record at CR 40 and Fairhaven Dam



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## **Appendix F**

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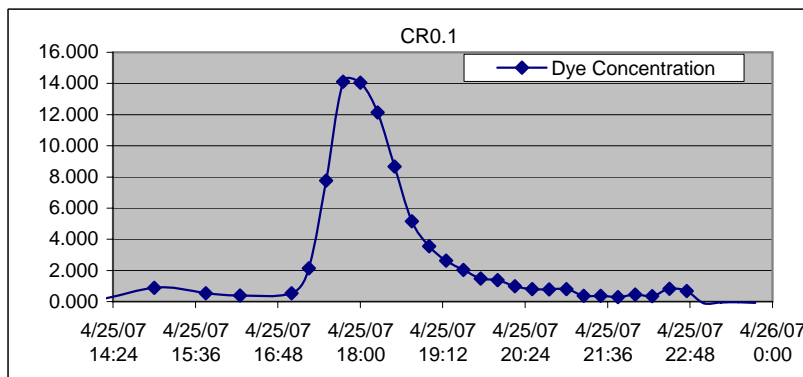
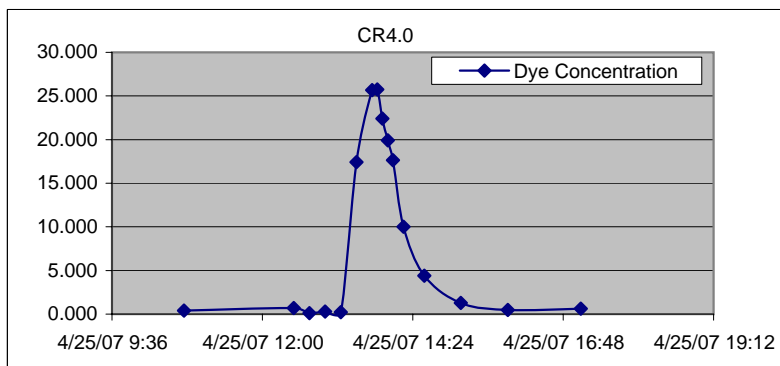
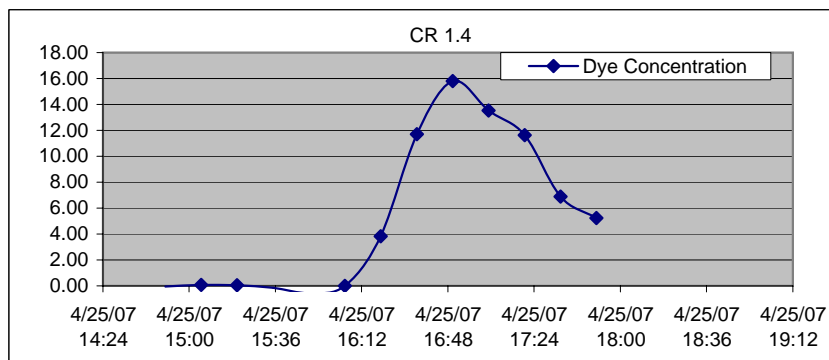
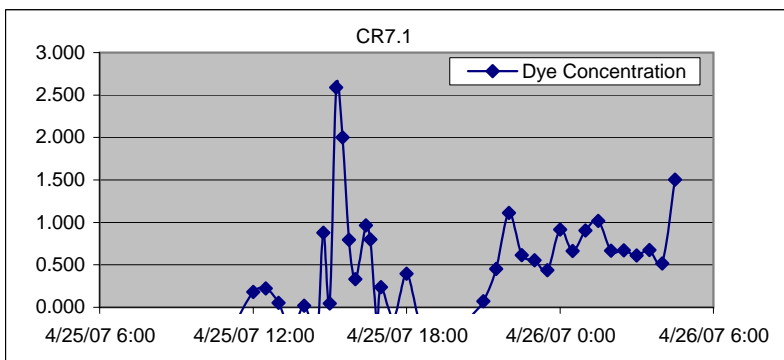
### **Time of Travel Study Results**

## Appendix F Figure 1

### Phase II Addendum TMDL Study Clearwater River (Grass Lake to the Mississippi)

#### April 2007, High Flow Time of Travel Study Results

	Site	Dye Dump Time	Dye Concentration (oz)	Distance from Dump Site (miles)	Dye Peak Time	Time of Travel (hours)	Velocity (miles/hr)	Velocity (ft/sec)	Measured Velocity (ft/sec)	Gauged Flow (cfs)
Dye Dump #1	CR9.5	4/25/2007 11:45	54	--	--	--	--	--	--	--
	CR7.1	--	--	2.4	4/25/2007 15:15	5.50	0.436364	0.637091	1.85	183.386
Dye Dump #2	CR7.1	4/25/200 11:00	54	--	--	--	--	--	1.85	183.386
	CR4.0	--	--	3.1	4/25/2007 13:50	2.83	1.095406	1.599293	1.59	183.114
	CR1.4	--	--	5.7	4/25/2007 16:50	5.83	0.977702	1.427444	2.4	179.364
	CR0.1	--	--	7	4/25/2007 17:45	6.75	1.037037	1.514074	--	--

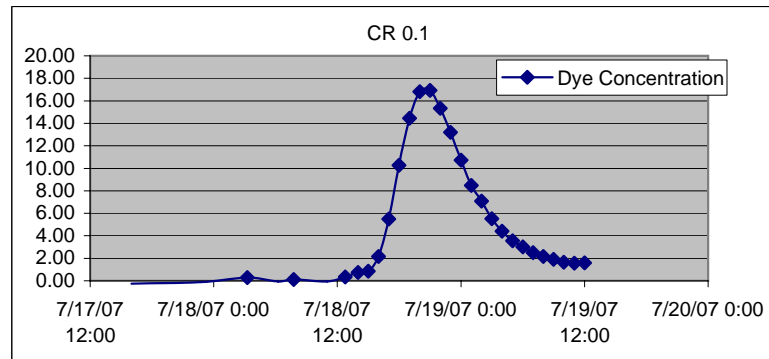
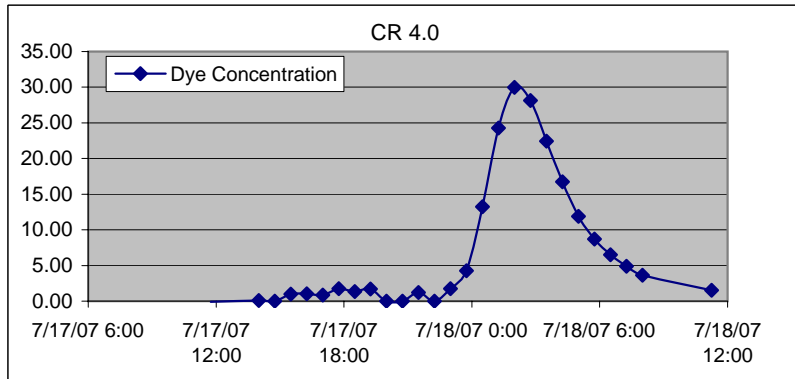
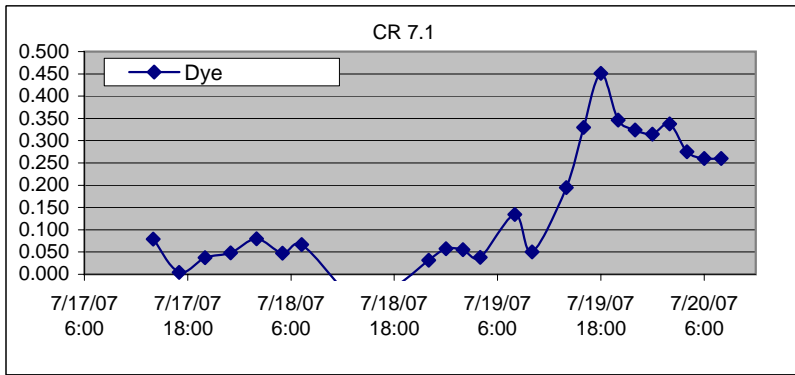


## Appendix F Figure 2

### Phase II Addendum TMDL Study Clearwater River (Grass Lake to the Mississippi)

#### July 2007, Low Flow Time of Travel Study Results

Dye Dump #	Site	Dye Dump Time	Dye Concentration (oz)	Distance from Dump Site (miles)	Dye Peak Time	Time of Travel (hours)	Velocity (miles/hr)	Velocity (ft/sec)	Average Velocity (Gauged)	Gauged Flow (cfs)
Dye Dump #1	CR9.5	7/17/2007 12:20	30	--	--	--	--	--	--	11.75
	CR7.1	--	--	2.4	7/19/2007 18:00	53.66	0.044726	0.0653	0.52	12.53
Dye Dump #2	CR7.1	7/17/2007 11:00	24	--	--	--	--	--	0.52	12.53
	CR4.0	--	--	3.1	7/18/2007 2:00	15	0.206667	0.301733	0.29	11.34
	CR0.1	--	--	7	7/18/2007 21:00	34	0.205882	0.300588	0.49	13.84



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## **Appendix G**

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### **Field Survey Results**



Clearwater River TMDL  
Physical Inventory

Date/Time 6/06/07

Stream Site Reach 8

Water Body Clearwater River

Observer WB

GPS Coordinates:

Photos:

3307-340 → wide area in channel upstream of Wilgart

341-344 → channel and backwaters

Channel Morphometry

- channel widens to various widths through wetland area

- backwater pools are numerous

- side channels and braided flow

Riparian Land Use Characteristics

- wetland corridor

- some boat channels maintained through wetland

Vegetation

wetland - cattail, blue flag, phragmites, need carry ash

forest - ash, oak, boxelder

aquatic - water lily, curly leaf pondweed, coontail, Eurasian milfoil

Tree Canopy and Shaded Areas

50% near dam

0% rest of reach

- some wooded areas upslope from riparian wetland

Sediment Type and Classification

- sand/gravel mix near dam and in channelized areas

- sand/silt in wetland channel

- muck in wetland

Comments and Notes

- many carp spawning in emergent vegetation throughout wetland and along edges of channel

- very wide riparian wetland vegetated almost exclusively by narrow leaf cattail.

Clearwater River TMDL  
Physical Inventory

Date/Time 6/06/07

Stream Site Reach 7

Water Body Clearwater River (Wiegand Lk) Observer WB

GPS Coordinates:

Photos:

345-347 → Photos of Wiegand Lk and channel at outlet of lake

Channel Morphometry

~~●~~ - Channelized through wetland on upper end of lake  
channel opens into lake and becomes channelized again at outlet

Riparian Land Use Characteristics

- Wetland fringe
- 2 residences near lake

Vegetation

Wetland - Narrow Leaf cattail, phragmites

Aquatic - Eurasian Milfoil, coontail, bulrush

Tree Canopy and Shaded Areas

0% tree canopy directly adjacent to stream

Sediment Type and Classification

- Silty muck through lake, becomes gradually harder at ds end of lake
- Sand/gravel at outlet

Comments and Notes

- Distinct change in riparian zone downstream of Wiegand Lake outlet (changes from wide, flat, wetland to narrower wetland fringe with some forest)

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Clearwater River TMDL  
Physical Inventory

Date/Time 6/06/07

Stream Site Reach 6

Water Body Clearwater River

Observer WB

GPS Coordinates:

Photos: 348-357

Channel Morphometry

- point/bend stream channel
- many meanders with some oxbows and cut-off channels
- Narrow floodplain

Riparian Land Use Characteristics

- Wetland fringe along entire reach (varies in width)
- Mostly forested upslope of wetland fringe with some ag fields

Vegetation

Wetland - Narrowleaf cattail

Forest - oak, boxelder, ash

Tree Canopy and Shaded Areas

Wooded riparian zone upslope from wetland fringe

≈ 15% tree cover

Sediment Type and Classification

- Substrate is mostly gravel and sand with some larger rocks on outside bends

Comments and Notes

- channel is varied in width throughout reach
- water depth is variable with some deep pools next to steep banks on outside bends

Clearwater River TMDL  
Physical Inventory

Date/Time 6/06/07

Stream Site Reach 5

Water Body Clearwater River

Observer WB

GPS Coordinates:

Photos: 358-371

Channel Morphometry

- many sharp meanders with oxbows and <sup>side</sup> channels
- braided in some locations

Riparian Land Use Characteristics

- narrow to wide wetland fringe, wide floodplain in some areas
- forested riparian area in some portions
- ag fields

Vegetation

Wetland - Reed, Canary Grass, Narrow leaf cattail  
Forest - Ash, Oak, Boxelder, Maple, Willow

Tree Canopy and Shaded Areas

- some tree canopy, where forested in riparian zone

Sediment Type and Classification

- substrate is mostly sand, with some gravel and rock in fast current areas

Comments and Notes

- bordered by steep, rolling hills
- agriculture more prevalent than farther upstream



IMG\_0557



IMG\_0558



IMG\_0337



IMG\_0339



IMG\_0341



IMG\_0342



IMG\_0344



IMG\_0345



IMG\_0347



IMG\_0348



IMG\_0349



IMG\_0350



IMG\_0354



IMG\_0356



IMG\_0357



IMG\_0359





IMG\_0360



IMG\_0362



IMG\_0366



IMG\_0368



IMG\_0370



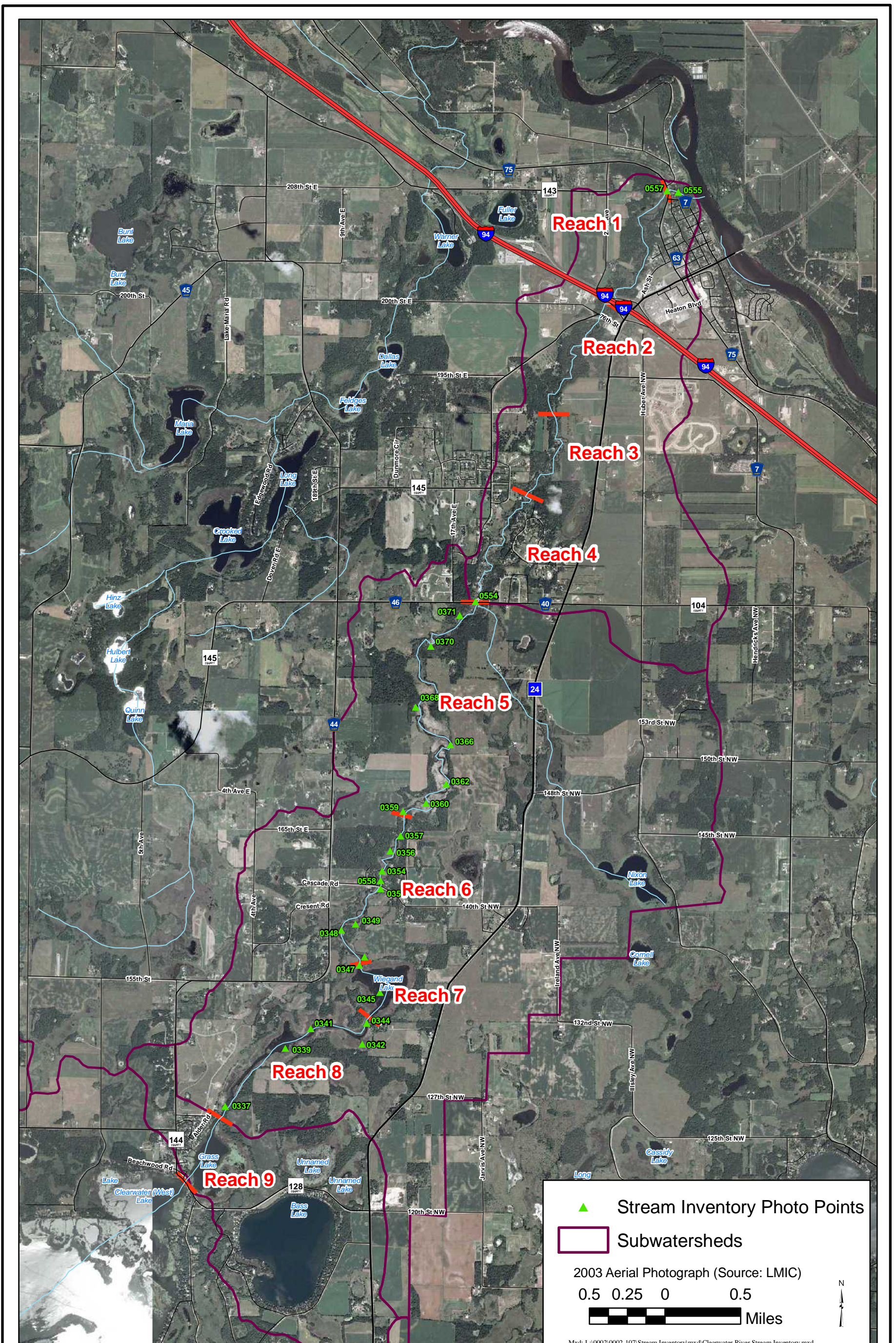
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IMG\_0555



CLEARWATER RIVER WATERSHED DISTRICT

Clearwater River Field Inventory

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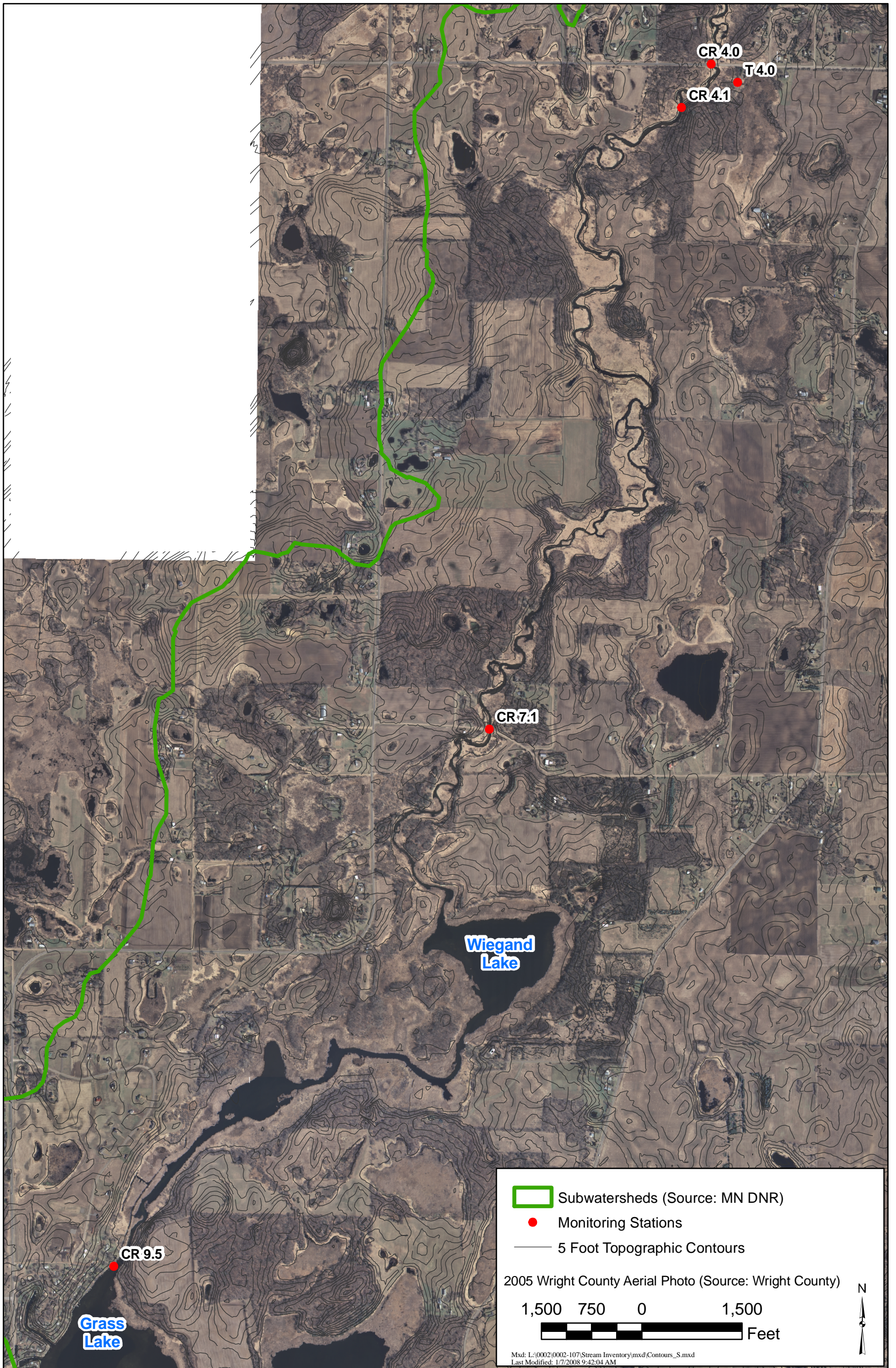


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Environmental Engineers Maple Plain, MN 55359-0429

JAN 2008

App G Fig 1



CRWD

Clearwater River Field Inventory

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App G Fig 2a



CRWD

Clearwater River Field Inventory

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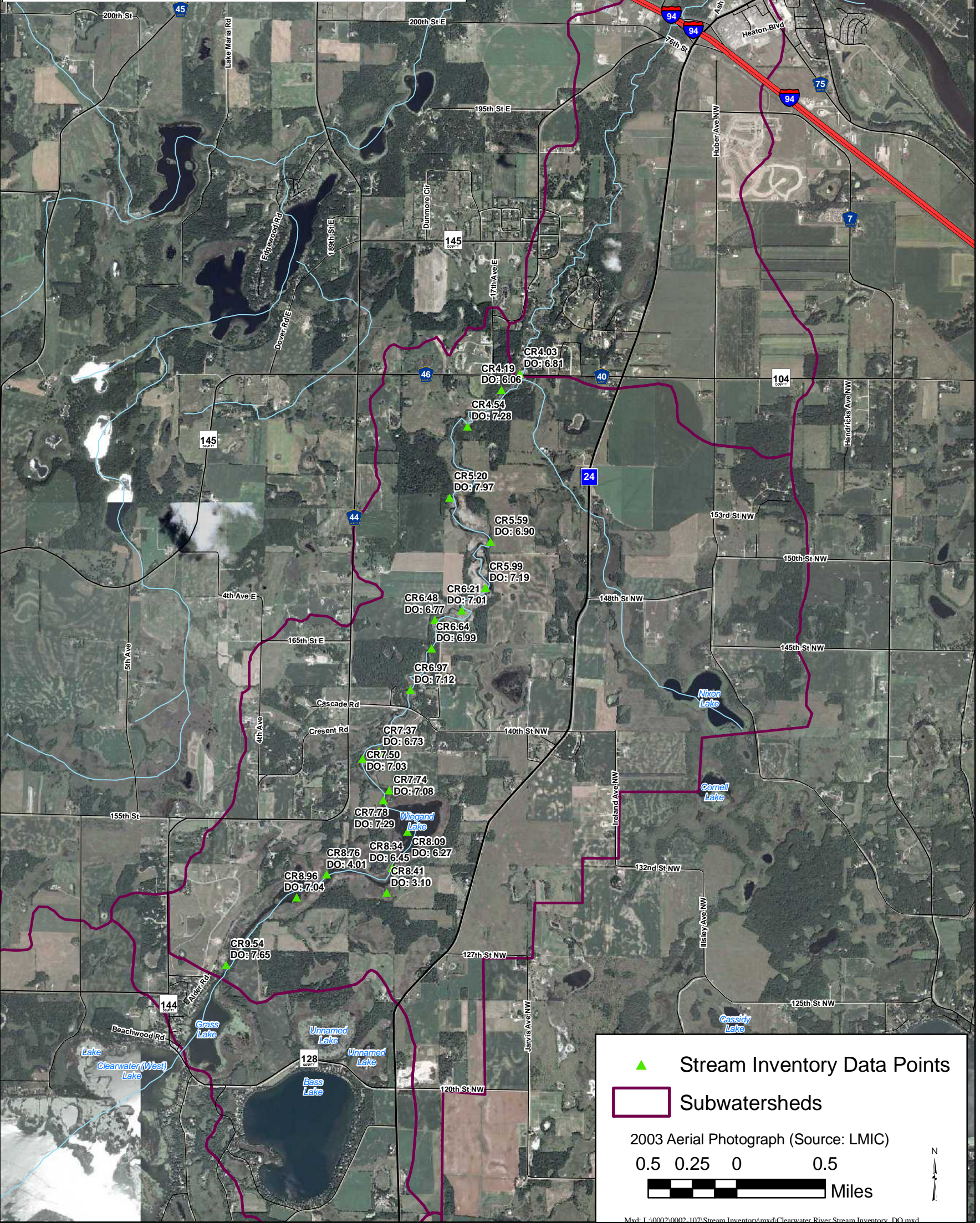
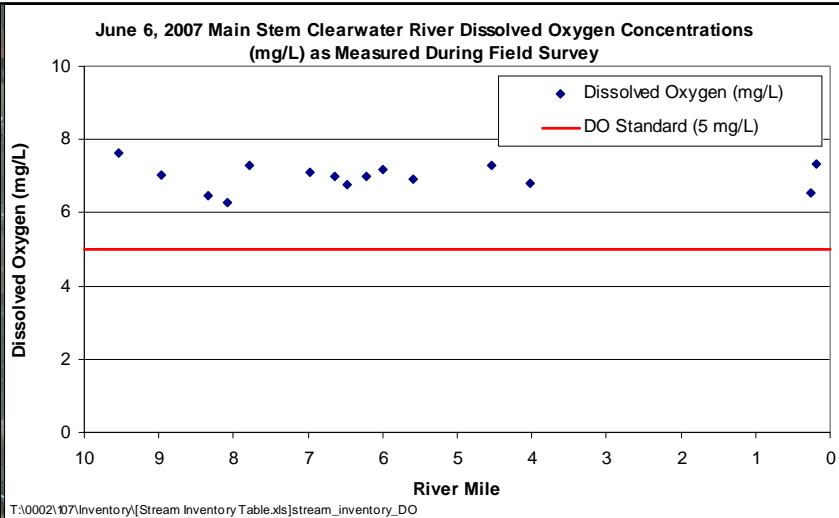


**Wenck**

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Environmental Engineers Maple Plain, MN 55359-0429

JAN 2008

App G Fig 2b



CLEARWATER RIVER WATERSHED DISTRICT

Stream Inventory-Dissolved Oxygen Concentrations

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**Wenck**

Wenck Associates, Inc. 1800 Pioneer Creek Center  
Environmental Engineers Maple Plain, MN 55359-0429

JAN 2008

App G Fig 3

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## **Appendix H**

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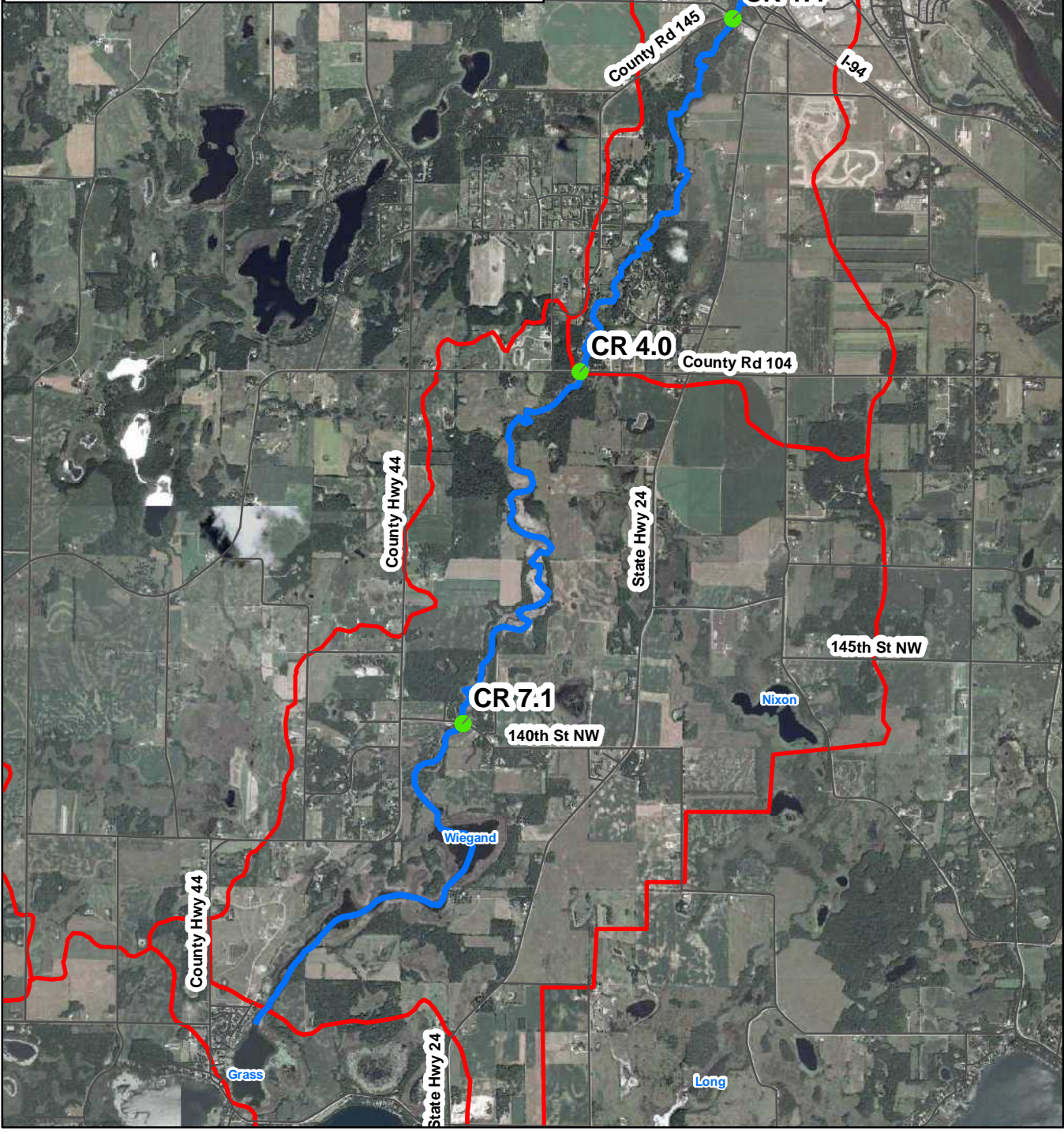
### **Optical Brightener Sampling Results**

- Optical Brightener Sampling Locations
- Clearwater River Reach Impaired for Dissolved Oxygen
- Subwatersheds

Wright and Stearns County Aerial Photograph (FSA, 2003)

1      0.5      0      1  
 ─────────── Miles

Mxd: L:\0002\0002-107\mxd\Optical Brightener Sampling.mxd  
 Last Modified: 1/4/2008 1:11:10 PM



CRWD

Optical Brightener Sampling Locations


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 Environmental Engineers Maple Plain, MN 55359-0429

JAN 2008  
 Appendix H  
 Figure 1



**Appendix H**  
**Clearwater River Watershed District**  
**TMDL Phase II Addendum**

**Optical Brightener Sampling Results**

Passive sampling for optical brighteners was conducted in the CRWD in 2007 to determine the role of failing septic systems in the dissolved oxygen impairment for the listed reach of the Clearwater River between Grass Lake and the Mississippi River. The study was conducted as part of the Phase II TMDL Addendum.

Optical brighteners are fluorescent white dyes that are often added to laundry soaps and detergents. As a result of their use in laundry soaps, they typically can be found in domestic waste waters that contain laundry effluent. Optical brighteners are removed from waste water by binding to soil and organic particles. If they are not removed by a functioning septic system, they can enter groundwater and surface water bodies.

Because optical brighteners can be detected with the use of a long wave fluorescent, or black light, their presence can be detected in surface or groundwater. The presence of optical brighteners in surface or groundwater, while they are not necessarily harmful to the water themselves, can be an indicator of failing septic systems or a direct discharge of untreated waste water into a surface water body. Since untreated wastewater can be a source of oxygen demand in natural waters, optical brightener sampling is useful in this TMDL study to determine if failing septic systems are contributing to the impairment.

**Methodology**

Optical brightener sampling involves placing a sampling device into a stream and allowing the stream to flow through the device for a fixed period of time. As water flows through sampling device, the optical brighteners accumulate on the pad. The sampling device is then viewed under a fluorescent or black light. If fluorescent areas are seen on the pad under the light, the pad has been exposed to optical brighteners. If the pad does

not fluoresce, it can be assumed that optical brighteners were not present in the stream in which it was deployed.

The sampling device is made up of an unwashed cotton pad that is placed inside of a black plastic mesh cage that secures the pad. The sampling device is then secured in flowing water in the stream.

Optical brightener sampling was conducted at four mainstem sites on the Clearwater River between Grass Lake and the Mississippi River (Figure H-1). The sampling devices were placed in the stream on July 25, 2007 and were collected August 8, 2007.

After the devices were collected from the stream, the cotton pads were cleaned of as much sediment and organic matter as possible, dried, and analyzed for the presence of optical brighteners in accordance with methodologies set forth in “An Optical Brightener Sampling Handbook” that can be found at <http://www.naturecompass.org/8tb/sampling/>.

## **Results**

After the cotton pads collected from each site were dried, they were analyzed for the presence of optical brighteners by viewing them in a dark room under a black light. Indicators of optical brighteners were not detected on any of the pads.

## **Conclusions**

Because no optical brighteners were found in the Clearwater River, and there are very few homes in close proximity to the stream in the reach that was sampled, results indicate that failing septic systems are most likely not a significant source of oxygen demand in the impaired reach of the Clearwater River.

## **Reference**

Sargent, Dave and Castonguay, Wayne. “An Optical Brightener Sampling Handbook”  
<http://www.naturecompass.org/8tb/sampling/>