

FARGO-MOORHEAD RED RIVER/STORMWATER SAMPLING PLAN
Draft
August 18, 2006

The objectives of this short-term sampling plan are to: 1) characterize current “low flow” (<500 cfs) water quality conditions for the Fargo-Moorhead (FM) reach of the Red River; and 2) assess the effects of stormwater runoff on the FM reach, with special emphasis on the segment from the 12th Ave N, Fargo/15th Ave N, Moorhead Toll Bridge to the North Broadway Bridge. The objectives of this sampling plan will be accomplished through a combination of baseline ambient Red River sampling, targeted storm runoff and river sampling and continuous water quality monitoring.

1. **Baseline Sampling** – To characterize current water quality conditions on the Red River field measurements of dissolved oxygen, temperature, specific conductance and pH will be taken from 5 locations twice per week. Sampling will proceed through September or until the onset of consistently high flows (>500 cfs) or consistently low water temperatures (< ??).

Sampling Sites:

1. Cass Co. 16/Clay Co. 8 Bridge
2. Walking bridge (Lindenwood Park)
3. Toll bridge
4. N. Broadway Bridge
5. Cass Co. 22/Clay Co. 26 Bridge east of Harwood, ND

(I deleted the Ditch 41 site on the Moorhead side; we can add it back if you think it's important to the baseline monitoring)

Sampling Frequency:

Field measurements will be taken twice per week on Monday or Tuesday and Thursday or Friday. If possible, measurements should be taken in the early morning when dissolved oxygen is expected to be at its minimum.

Field Parameters:

1. Temperature
2. pH
3. Specific Conductance
4. Dissolved Oxygen

Responsible Parties:

Staff with the North Dakota Department of Health’s Fargo office and the Minnesota Pollution Control Agency’s Detroit Lakes regional office will be responsible for monitoring. Sampling schedules will be coordinated between these two agencies on a weekly basis or as needed.

2. **Storm Event Sampling** – To assess the potential effects of stormwater runoff on the water quality of the Red River targeted stormwater runoff and river sampling will be conducted following a rainfall event. Following a 0.25-0.5 inch rainfall event samples will be collected daily from five Red River locations and 5 stormwater outfalls.

Red River Sampling Sites:

1. Cass Co. 16/Clay Co. 8 Bridge
2. Walking bridge (Lindenwood Park)
3. Toll bridge
4. N. Broadway Bridge
5. Cass Co. 22/Clay Co. 26 Bridge east of Harwood, ND

Stormwater Outfall Sites:

Fargo: 9th Ave N near Jack Williams Stadium
Elm Street and 15th Ave N near El Zagal Golf Course
19th Ave and Woodland Dr near VA

Moorhead: 10th Ave N
Ditch 41 at 11th St N near ACS

Parameters:

Field Measurements: Temperature, pH, specific conductance, DO

Laboratory Analysis: CBOD (5-day), CBOD (ultimate), fecal coliform bacteria

Sampling Frequency: Sampling will be initiated with a 0.25 -0.5 inch rainfall event in the Fargo-Moorhead area. It should be noted the volume and timing of runoff generated with each rainfall event will largely depend on the magnitude and duration of the rainfall event and the percentage of impervious area in the stormshed.

Stormwater Sampling: At a minimum, one sample should be collected on the rising limb of the hydrograph. If possible, a sample should also be collected at the peak of the hydrograph and during falling limb of the hydrograph for a total of three samples.

River Sampling: With the onset of the runoff event samples will be collected and measurements taken daily at each site. Daily sampling will continue until water quality conditions suggest that the effects of the rainfall event have passed.

Responsible Parties:

Staff with the North Dakota Department of Health's Fargo office, the Minnesota Pollution Control Agency's Detroit Lakes regional office, and the cities of Fargo and Moorhead will be responsible for monitoring. (Need more specificity here. Will the cities be willing to collect samples from the stormwater outfall during daytime hours during the week? Who will collect samples on the weekend? Who will collect samples from the river? Who is going to analyze the samples? The NDDH is will to provide analysis of samples collected from the ND side and from the river. What will RiverKeepers role, if any, be in this sampling? Can the NDDH and MPCA find funding to pay for supplemental monitoring? If so, how much?)

3. **Continuous River Monitoring** – Water quality conditions will be monitored on a continuous basis through the deployment of two multi-parameter sondes (pH, DO, temperature and specific

conductance) and from data collected at the “real-time” USGS monitoring station located near Main Ave.

Sampling Sites: One multi-parameter sonde will be deployed in the Red River at a location below the north dam (Toll bridge) and above the discharge point for ditch # 41. The other sonde will be deployed near the North Broadway bridge. Data collected at the “real-time” station at Fargo operated by the USGS will also be used.

Sampling Frequency: The sondes will be deployed the week of August 28th and maintained and downloaded every two weeks. Fecal coliform and CBOD (5-day) samples will also be collected during sonde deployment and maintenance.

Responsible Parties: The Minnesota Pollution Control Agency will be responsible for the deployment and maintenance of these sondes.

COMMENTS/E-mail string:

[8/22/06 Comments from the City of Moorhead re: FM Area Sampling Plan:](#)

Baseline Sampling: We would recommend some verification testing, especially for field DO, using a DO meter. Although sondes may be useful for monitoring changes in certain parameters over time, we have concerns with the accuracy of the data collected if it is to be compared to a water quality standard.

Storm Event Sampling:

Someone needs to be designated as the lead for initiating a sampling event (i.e. who decides when an upcoming event is significant enough to sample?).

Because of the effort involved, CBODu analyses should only be conducted on one sample per outfall. Preferably, this would not be during the first sampling event. Not knowing the expected concentration for CBOD5, it is difficult to estimate CBODu. Without an estimate for CBODu, the laboratory effort is multiplied significantly. If we can get some data for CBOD5 from an initial sampling event, we may be in a better position to estimate CBODu more accurately with more reasonable effort.

Without knowing more about the response of each stormshed to a given rainfall event (which could be predicted via modeling), it will be difficult to collect three samples (rising limb, peak, and falling limb....especially peak). To do this, we would need an outfall that is not surcharged and someone would need to be present at the sampling location for the entire event to monitor the flow level at the collection point. This will tie up twice the staff. We can try, but no guarantees.

What constituents will be monitored for the river sampling activities associated with the storm event sampling?

We are willing to collect stormwater outfall samples Mon-Thurs for events that begin between 7 am and 4 pm (when we have staff available). Late afternoon events are less desirable. We can analyze samples we collect and may have some ability to do additional analysis.

Continuous River Monitoring: We believe that some serious on-going QA/QC is needed for the USGS site. It appears that significant fluctuations in water quality parameters occurs relatively frequently.

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9/13/06 e-mail from Jack Frederick (MPCA) to Mike Eil (NDDH):

Hi Mike! I talked to Bruce and apparently no monitoring was done while I was gone last week. Bruce didn't think the conditions warranted it. The last monitoring that we did was by Dan Olson on Friday the 1st. Dan said all the parameters were in the acceptable range. Based on the USGS station information as of today, I think our critical period is over unless something extraordinary happens, so I would suggest we discontinue the monitoring for this fall. However, we probably should discuss that further.

Bob Bachman indicated that there was also a fish kill this fall on the Red in the vicinity of Grand Forks. Given that fact, it would probably be appropriate to develop an action plan that addresses responses to low DO, low flow, and high temp. conditions, anywhere on the Red. Will need to firm up a response and monitoring plan this fall/winter which among other things, would identify protocols and a chain of command in response to pending events. Let me know your thoughts on this.

8/25/06 e-mail from Mike Eil to FM monitoring group:

Just an update on stormwater sampling. Fargo (and presumable Moorhead) received more rain last night. Mike Hargiss and Mark Blonigan, with the city of Fargo, collected an additional set of stormwater samples from the three outfalls on the Fargo side. The city of Fargo is going to analyze them for CBOD and fecal coliform.

8/24/06 e-mail from Jack Frederick to FM monitoring group:

Greetings! Yesterday Dan Olson and I did some sampling in the Fargo Moorhead area. Mike Hargiss of the ND Health Department did some monitoring separately as well. In addition to the sites identified in the draft work plan, we also sampled Rose Creek in Fargo and Ditch 41 on the Moorhead side. We used a sonde for temp, DO, and conductivity for 3 sites until the battery crapped out, but the numbers did look good and comparable to the readings at the USGS station in Fargo. We also collected fecal and CBOD5 samples at each of the sites. We'll make that information available to you some time next week. If your organization has collected any data recently, we'd appreciate receiving that information when available.

Flows are now way up, between 500-600 CFS and DO levels are good at the USGS station, with more rain in the forecast. If flows consistently are maintained above 400 CFS and temps are good our monitoring scenario, may not come into full play this fall. However, Mike and I agree the sampling at the stormwater outfalls and drains identified in the plan would still be useful data. If you haven't provided either Mike E. or myself comments on the monitoring plan, please do so. We feel it appropriate to have an approved plan, acceptable to all, in place for future dry periods, so that we can respond in a timely and effective fashion.

Either Mike or I will contact you with more information next week!