

**WATER QUALITY STUDY**

**OF THE CEDAR RIVER AND TRIBUTARIES**

**IN MOWER COUNTY**

**SUMMER OF 2001**

**Carol Mostrom**

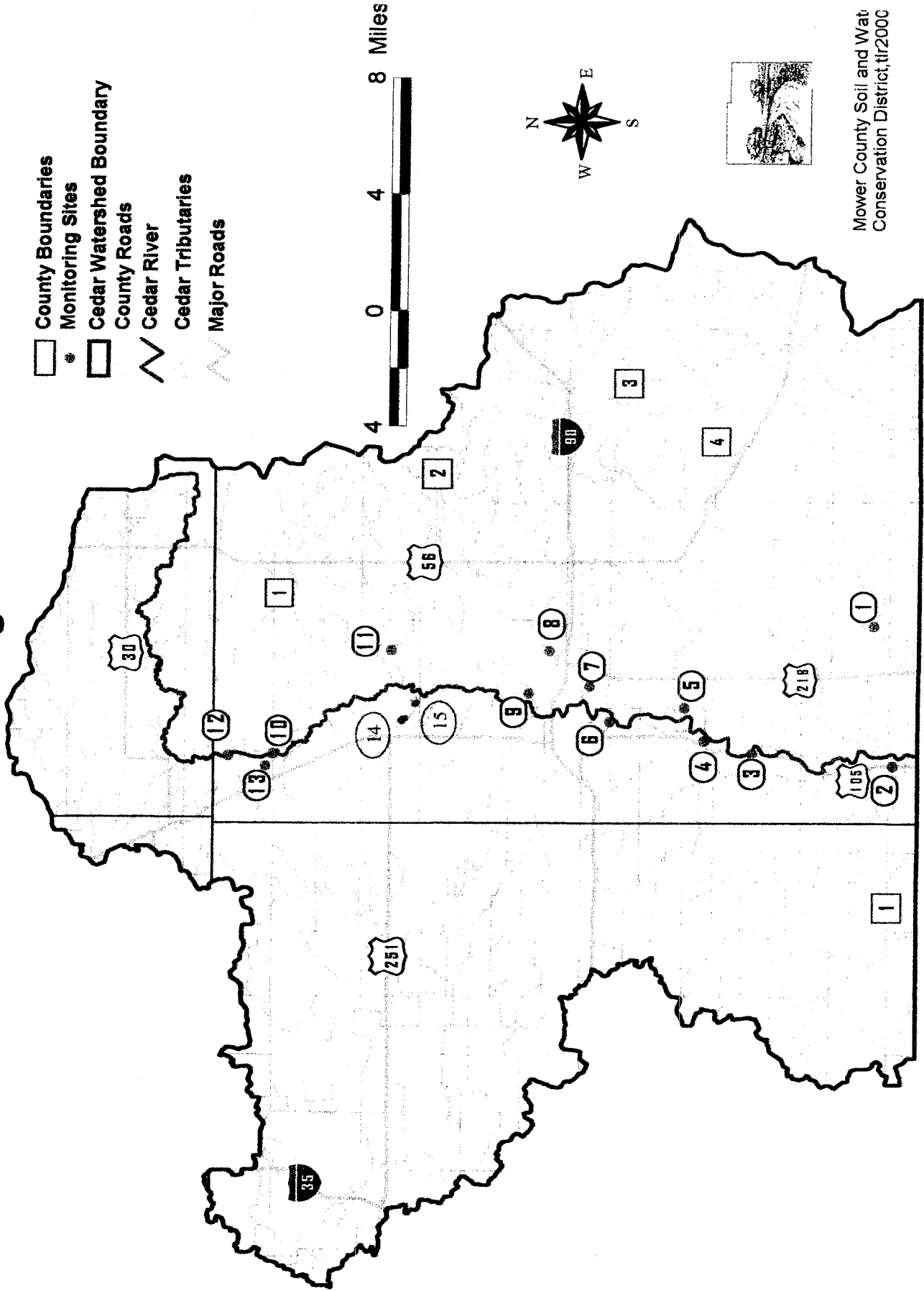
## MAP KEY

1. OTTER CREEK ..... at Lyle, MN approximately two miles prior to where it joins the Cedar River.
2. WOODBURY CREEK ..... at Highway 105 approximately ½ mile from where it joins the Cedar River.
3. ORCHARD CREEK ..... where it is crossed by Highway 105 just before it's joining the Cedar River.
4. CD 4 CEDAR RIVER ..... where it is crossed by County Road 4, approximately 7 miles from the Iowa border.
5. ROSE CREEK ..... where it is crossed by Highway 29 about ½ mile before where it joins the Cedar River.
6. TURTLE CREEK ..... where it is crossed by 4<sup>th</sup> Drive S.W., just before where it joins the Cedar River.
7. DOBBINS CREEK E.S. .... below East Side Lake just before it enters the Cedar River.
8. DOBBINS CREEK ..... in the J. C. Hormel Center.
9. WOLF CREEK ..... at a point in Todd Park west of its entrance to Cedar River.
10. CD 24 CEDAR RIVER ..... where it is crossed by County Road 1.
11. ROBERTS CREEK ..... north and east of Lansing, MN.
12. CD-COUNTY ENTRANCE ..... as it enters Mower County just south of Dodge County Road 12.
13. BLOOMING PRAIRIE TIBUTARY .. stream north of Mower County Road 1.
14. LANSING CULVERT ..... the west side of the bridge on Highway 25 in Lansing, MN.
15. LANSING BRIDGE ..... the east side of the bridge on County Road 2 in Lansing, MN.

This is a summary of the 2001 results compiled from sampling 15 sites in the Cedar River watershed. 13 sites remained the same as the 2000 study. Two additional sites were added in 2001, Lansing Culvert and Lansing Bridge. Three sites were directly on the Cedar and 12 were on tributary creeks flowing into the Cedar River in Mower County. All sample sites were in agricultural areas except Turtle Creek, Dobbins Creek (East Side Lake), and the two Lansing sites. There were a total of 16 samples from each site. Sampling began on May 21, 2001 and ended on August 13, 2001. Analytical Tests on these samples included total suspended solids (TSS), fecal coliform bacteria, transparency and nitrates (nitrate-nitrogen). Recreation suitability and appearance were done by personal observation.

# Monitoring Sites

-  County Boundaries
-  Monitoring Sites
-  Cedar Watershed Boundary
-  County Roads
-  Cedar River
-  Cedar Tributaries
-  Major Roads

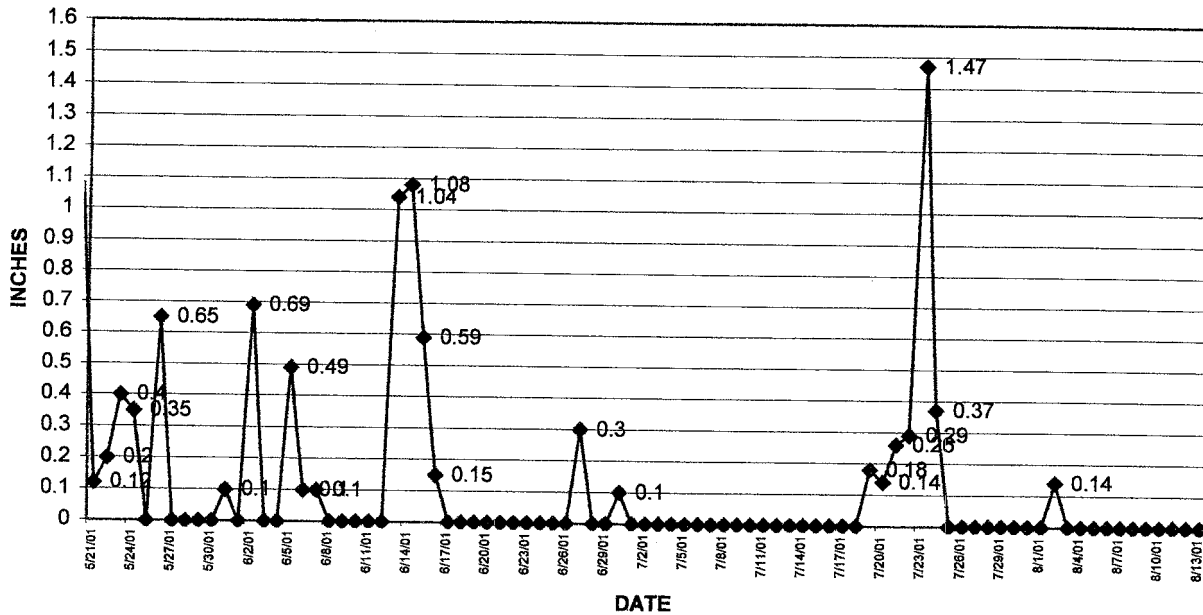


Mower County Soil and Water  
Conservation District, tir2000

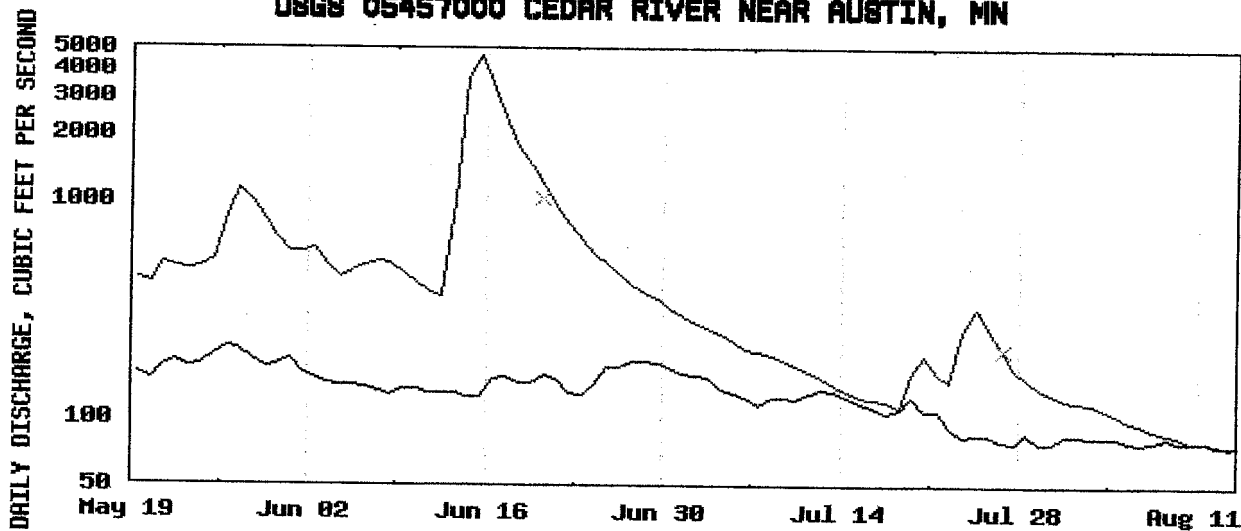
Increased rainfall from July 19 through July 24 correlates with the spikes of Total Suspended Solids and Fecal Coliform during the same time frame.

|         |           |
|---------|-----------|
| JULY 19 | 0.18 INCH |
| JULY 20 | 0.14 INCH |
| JULY 21 | 0.26 INCH |
| JULY 22 | 0.29 INCH |
| JULY 23 | 1.17 INCH |
| JULY 24 | 0.37 INCH |

**RAINFALL**



**USGS 05457000 CEDAR RIVER NEAR AUSTIN, MN**



- EXPLANATION**
- DAILY MEAN DISCHARGE
  - - - MEDIAN DAILY STREAMFLOW BASED ON 61 YEARS OF RECORD
  - x MEASURED DISCHARGE

Streamflow was above the 61-year average from early spring to the middle of August 2001.

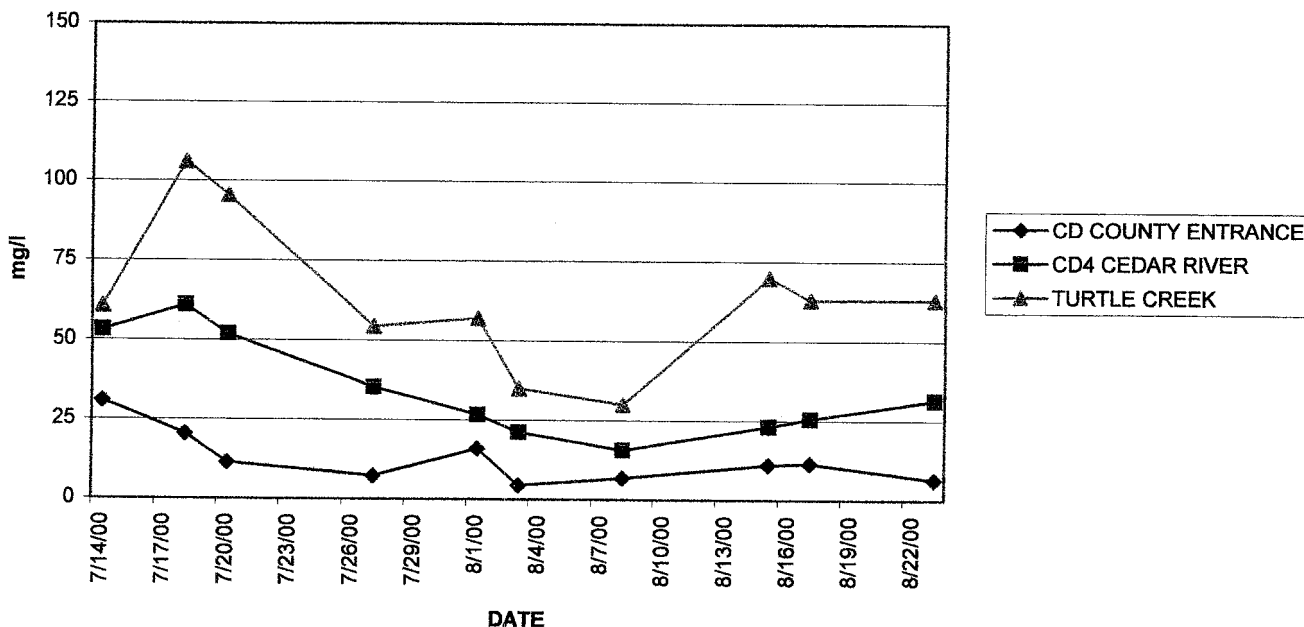
Provisional Data Subject to Revision



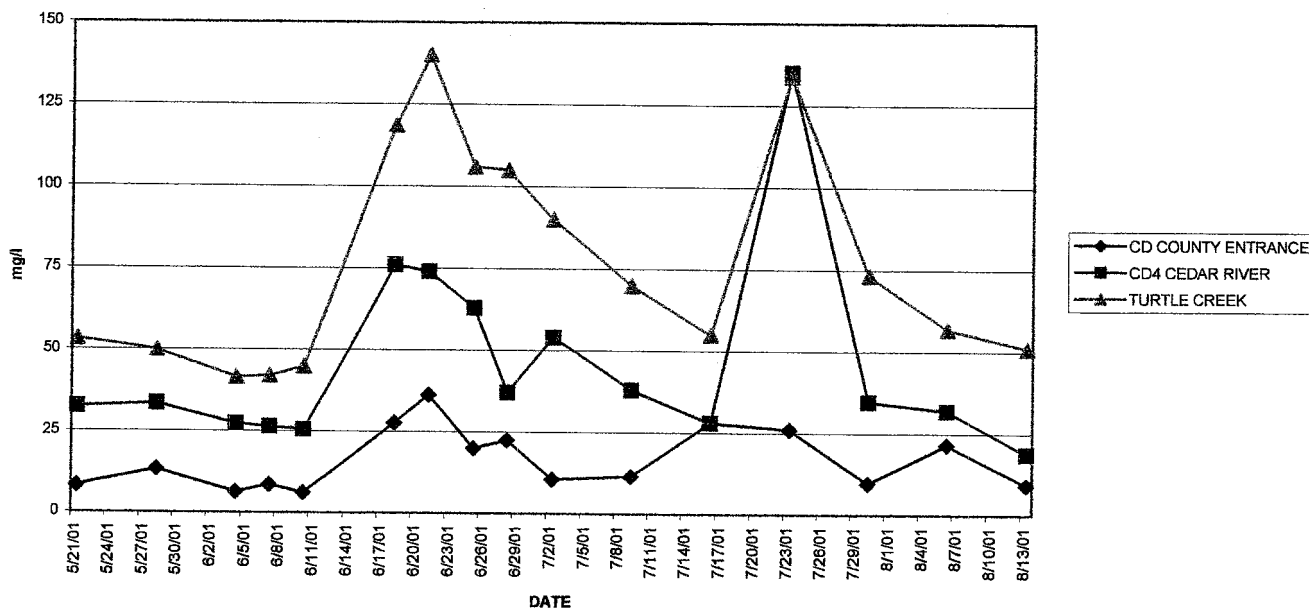
**SUSPENDED SOLIDS (mg/l):** Solids refer to matter suspended or dissolved in water or wastewater. Solids may affect water or effluent water quality adversely in a number of ways. Waters high in suspended solids may be unsatisfactory for such things as swimming. Less than 45mg/l is the state standard.

**The short-term study performed the summer of 2000 and 2001 reinforces the fact that suspended solids are consistently lower north of Austin and increase in the Cedar River south of Austin. Turtle Creek shows the highest average Suspended Solid results in both 2000 and 2001.**

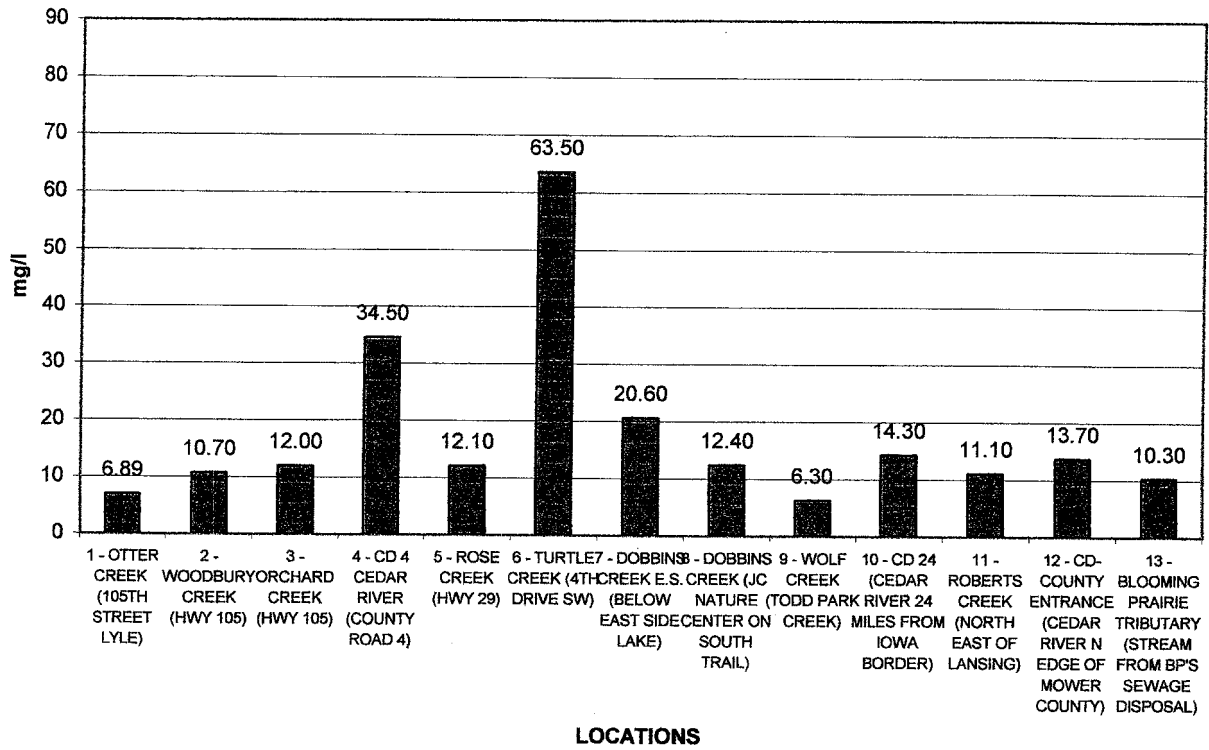
2000 TOTAL SUSPENDED SOLIDS (TURTLE CREEK, CD4, COUNTY ENTRANCE)



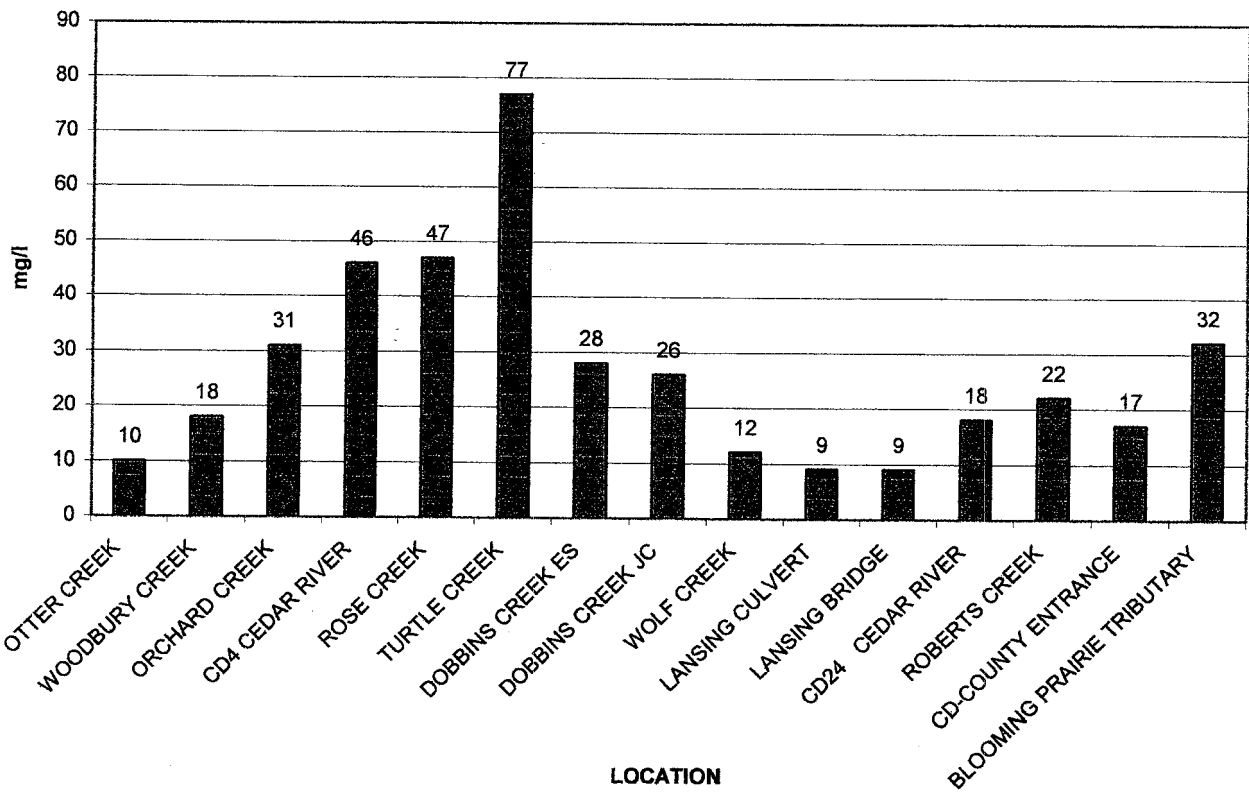
2001 TOTAL SUSPENDED SOLIDS (TURTLE CREEK, CD4, COUNTY ENTRANCE)



**2000 AVERAGE SUSPENDED SOLIDS**

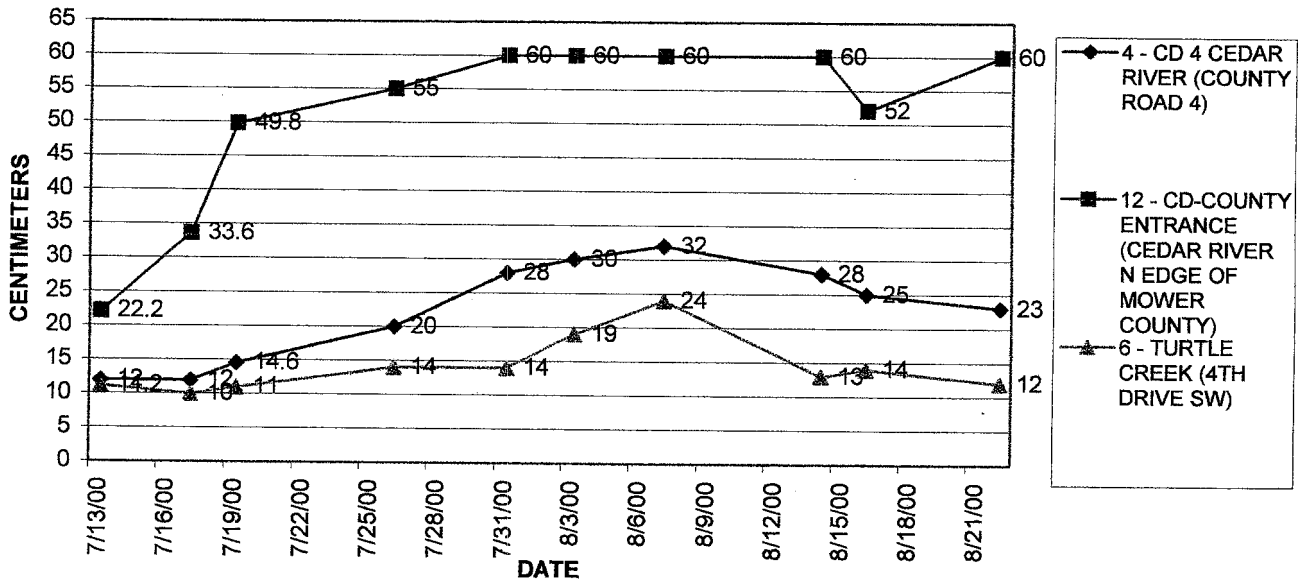


**2001 AVERAGE SUSPENDED SOLIDS**

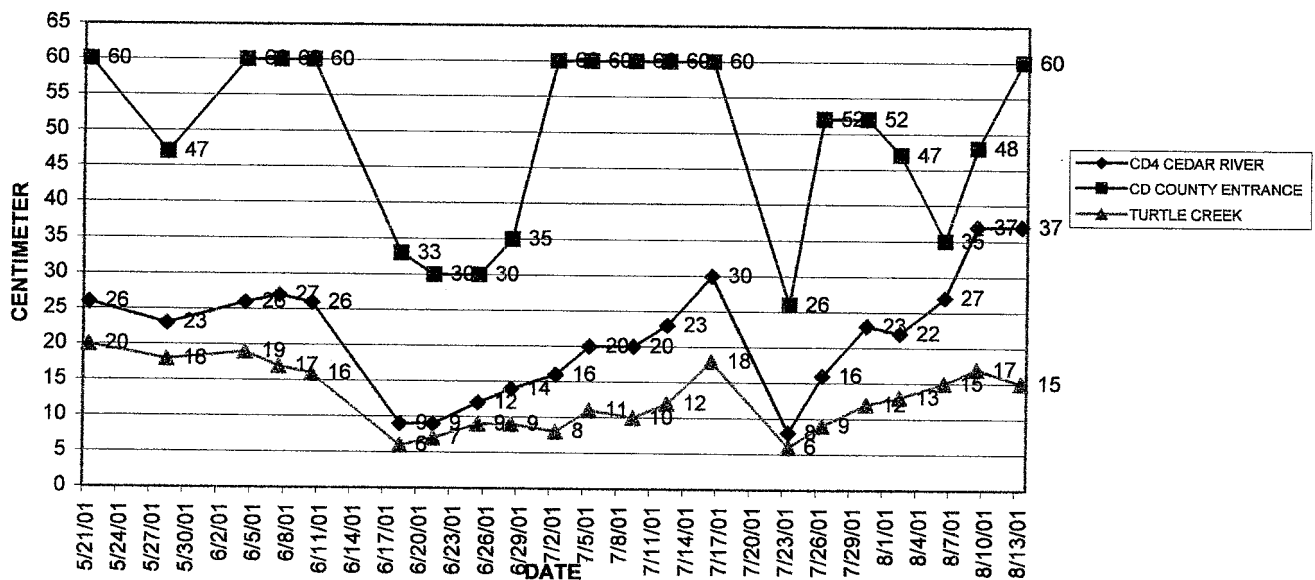


**TRANSPARENCY (the clarity of the water in centimeters): Transparency results correlate well with total suspended solids readings. Poor transparency at County Road 4 may be influenced by Turtle Creek. Results show relatively good transparency on the upper Cedar River while decreasing south of Austin.**

**2000 TRANSPARENCY (TURTLE CREEK, CD4, COUNTY ENTRANCE)**



**2001 TRANSPARENCY (TURTLE CREEK, CD4, COUNTY ENTRANCE)**





**FECAL COLIFORM:** The coliform group consists of several bacteria. The fecal coliform test differentiates between coliforms of fecal origin (feces of various warm-blooded animals) and coliforms from other sources. Less than 200 colonies per 100ml sample is the acceptable state standard for safe water.

**ALL SAMPLES EXCEED STATE WATER QUALITY LIMITS OF 200**

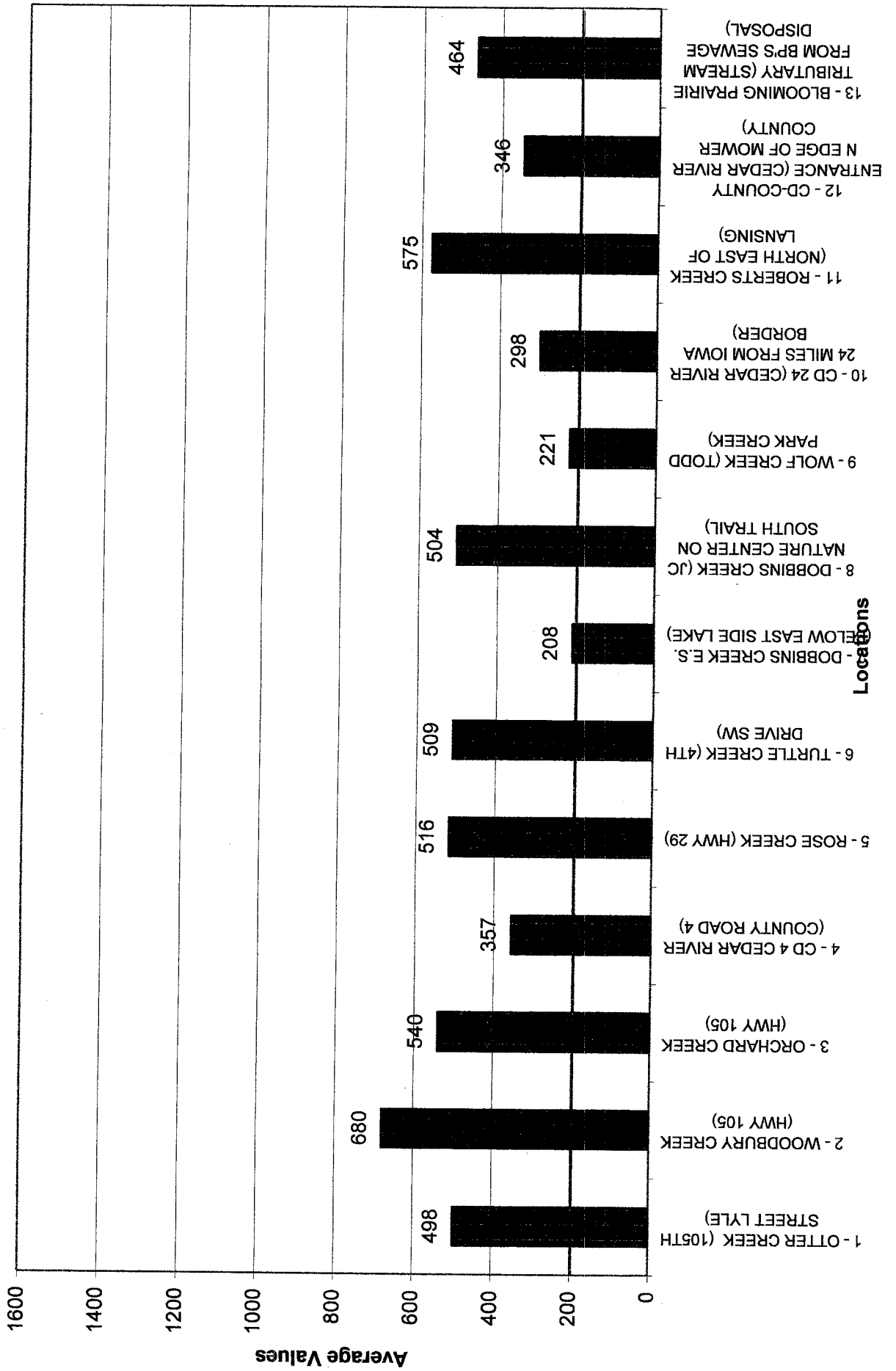
**COLONIES PER 100ml IN 2000 & 2001.**

**Woodbury Creek, Orchard Creek, Dobbins Creek (Nature Center), Lansing Culvert, Lansing Bridge, Roberts Creek, and Blooming Prairie Tributary all have average fecal coliform levels over 1000 colonies/100 ml.**

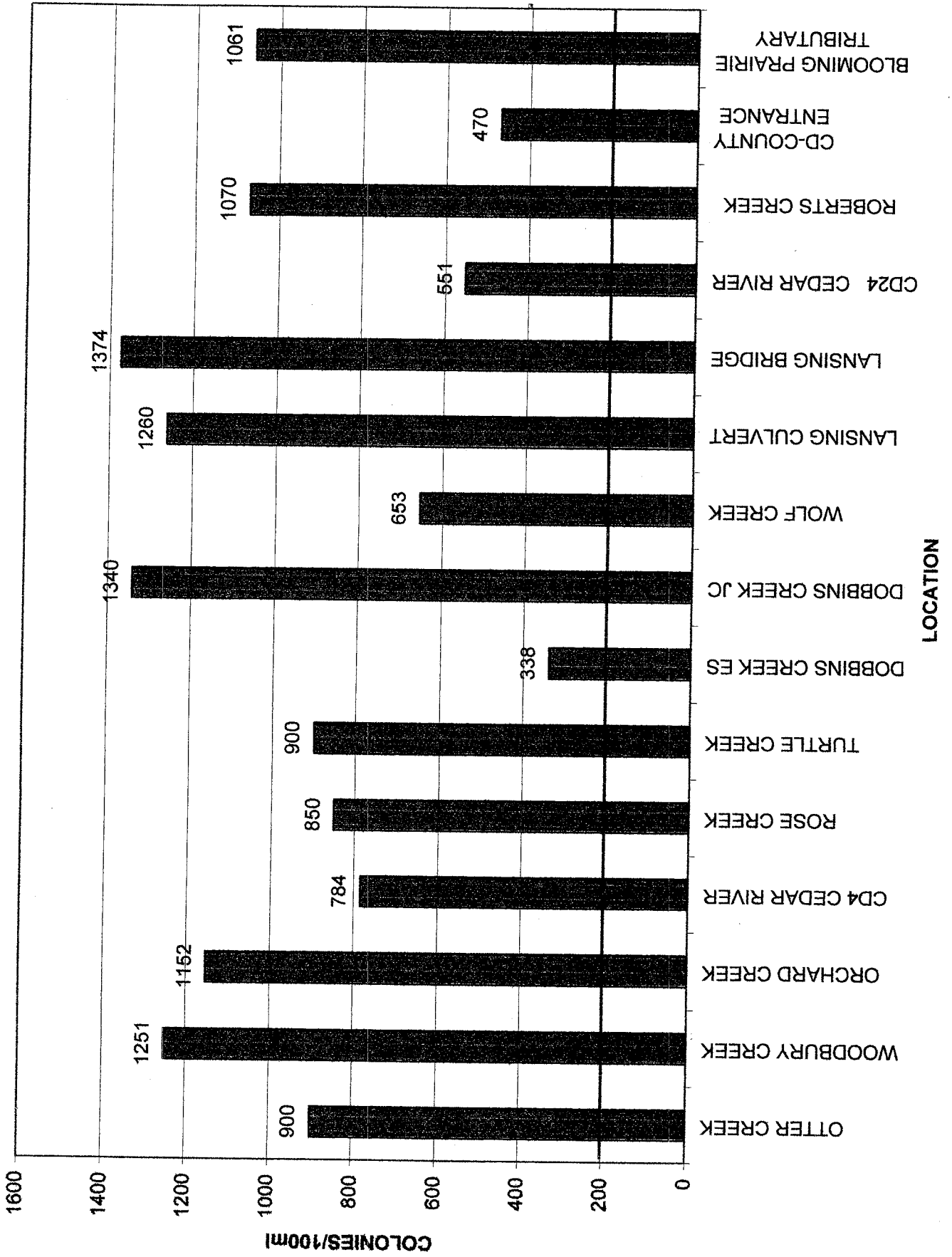
**Lansing Bridge and Lansing Culvert were added as sampling sites this year. They both show high fecal levels and total suspended solids. Dye tests were performed on several privately owned Lansing septic systems. At least six of these systems drained directly into the tributary. Lansing has now been funded to build a central septic system. This should help clean up the tributary and the Cedar River in the Lansing area. Continued monitoring would be necessary to determine if there is a change in the fecal bacteria and total suspended solids levels when the new system is operating.**

**As the Cedar River enters Mower County it has a fecal coliform average of 470 colonies/100 ml. When it leaves Mower County the average fecal coliform has gone up to 784 colonies/100 ml. This is a 60% increase in fecal coliform level as the Cedar River flows through Mower County.**

AVERAGE FECALS 2000



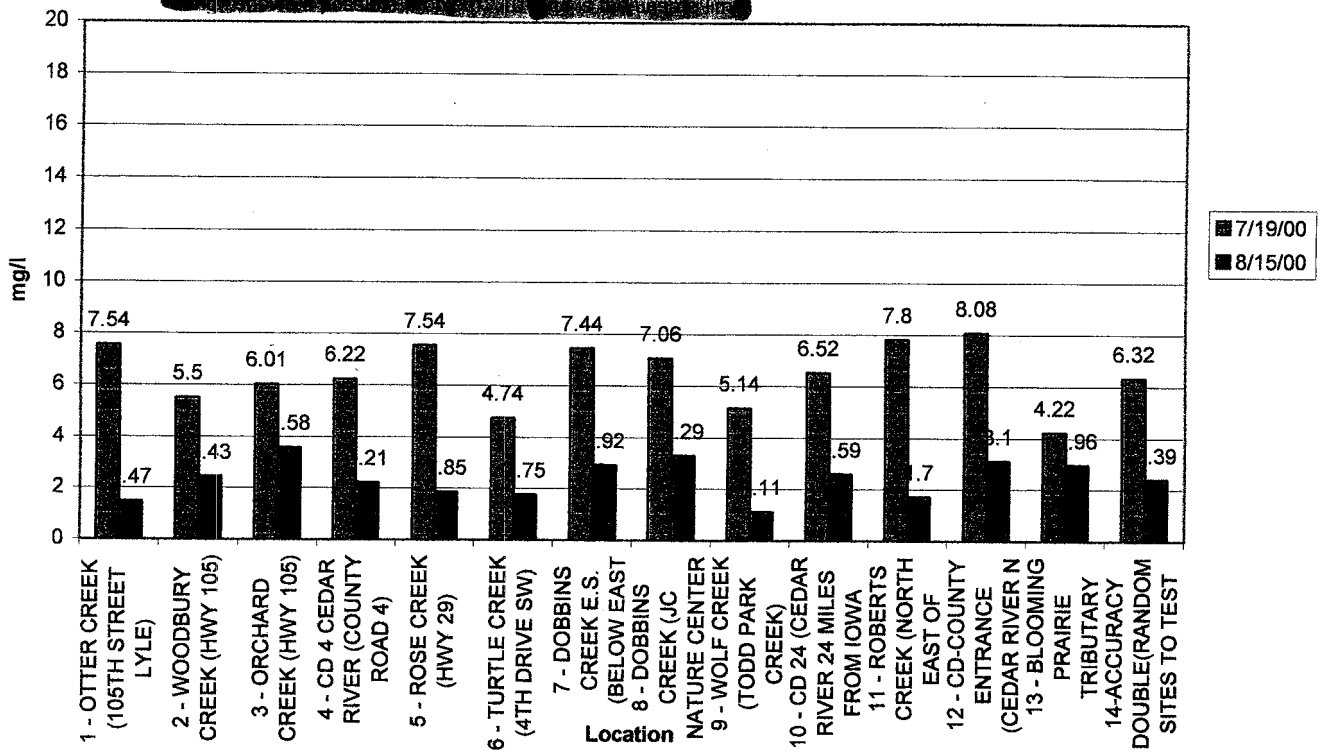
# AVERAGE FECALS 2001



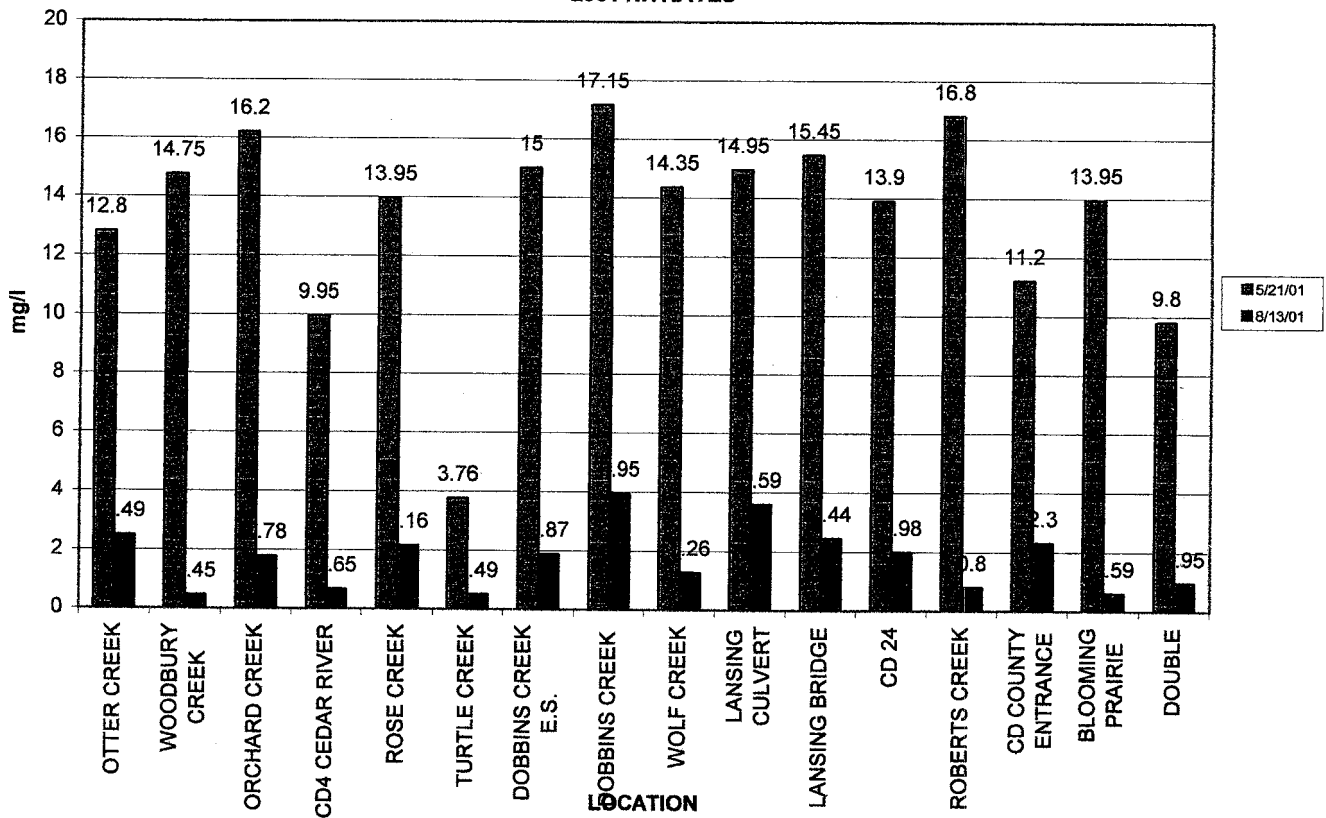
**NITRATE is the end product of decomposition and final oxidation (breakdown) of the organic nitrogen compounds which are found in plant and animal matter, including feces and urine.**

**Results show Nitrate levels high in the spring and decreasing into July and August. Spring run-off going into the streams and the Cedar River could cause this occurrence. Various interferences as well as nitrogen being present in other forms in surface water may have resulted in some of the relatively low nitrate concentrations.**

### 2000 Nitrates



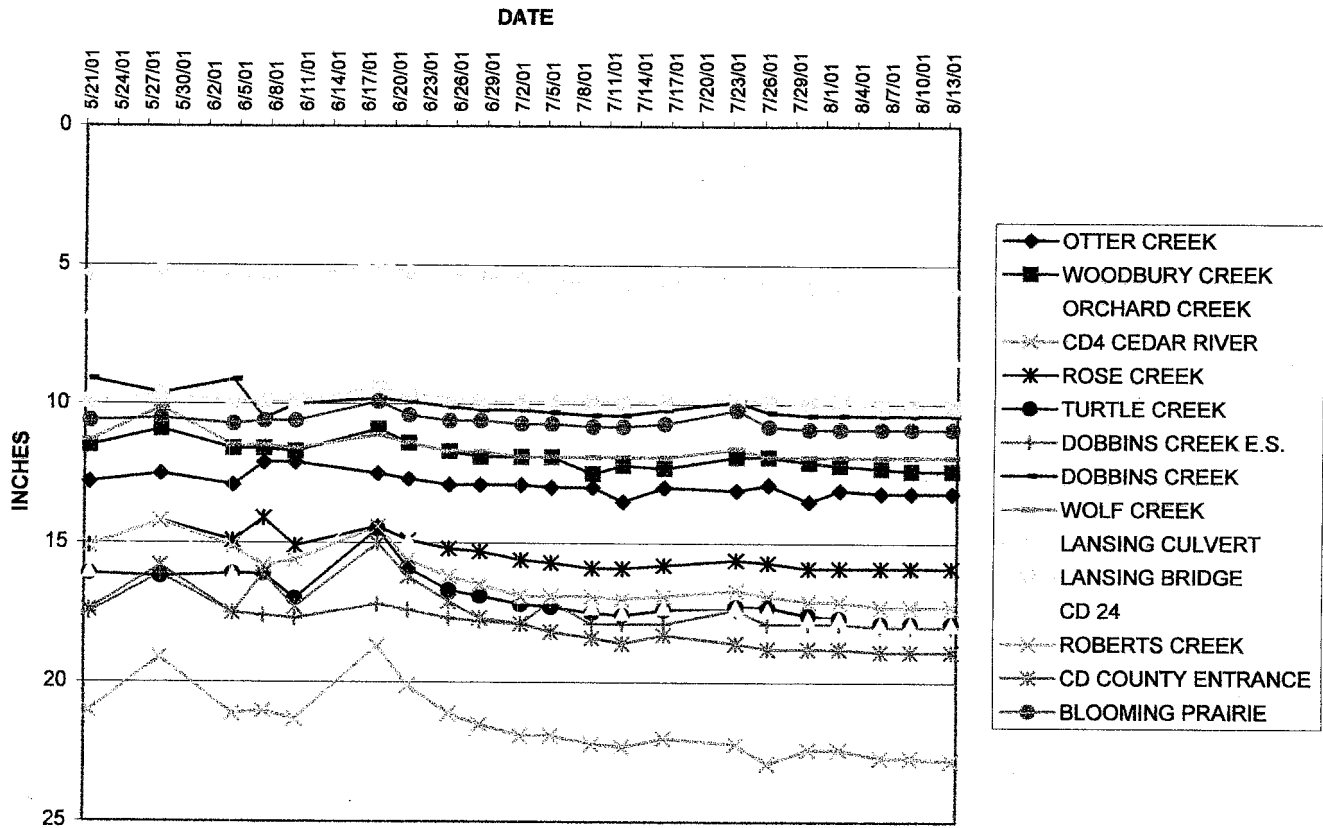
### 2001 NITRATES





Stream stages remained fairly constant due to the dry conditions for most of the 2001 summer.

### 2001 STREAM STAGES



## **CONCLUSION**

As shown in this report, the fecal coliform bacteria and total suspended solids levels in Cedar River are above state health standards. A significant source of this contamination is the tributaries, Turtle Creek in particular. The fecal coliform bacteria and total suspended solids peaked immediately following the heavy rain and snow runoff. These could possibly have flushed bacteria from the soil into the streams and tributaries. It is important to continue to monitor the Cedar River and its tributaries under various precipitations and flow conditions to determine other sources of fecal coliform bacteria and total suspended solids flowing into the Cedar River.