TMDLs for Salt Creek, East and West Branches DuPage Rivers

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Illinois Environmental Protection Agency

Salt Creek, East/West Branch DuPage River TMDL Work Group

November 17th, 2004—Meeting Agenda

- Total Maximum Daily Load Report – Bruce Yurdin, Illinois EPA
  - Overview of individual reports
  - Overview of report recommendations and how they may impact communities and wastewater treatment plants
- TMDL Workgroup – Dennis Streicher, City of Elmhurst
  - Overview of Steering Committee
  - Workgroup goals statement
- Proposed Watershed Activities – Jennifer Hammer, The Conservation Foundation
  - Comprehensive Water Quality Monitoring Program
  - Projects to enhance water quality
- Future Actions – Larry Cox, Downers Grove Sanitary District
  - Funding opportunities and implications for watershed activities
  - Organizational Structure for workgroup

- What are TMDLs and what effect might they have on DuPage County municipalities?
  - State program overview
  - Legal basis and implications on point sources
- Salt Creek/E&W Branch TMDLs
  - Focus on DO
  - Data and modeling
  - Recommendations
  - Costs

What is a TMDL?

- A TMDL determines the greatest amount of loading that a water can receive without violating Water Quality Standards/Designated Uses

TMDL Components

TMDL = WLA + LA + MOS + SV

- WLA = Waste Load Allocation (Point Sources)
- LA = Load Allocation (Nonpoint and Natural Background Sources)
- MOS = Margin of Safety (Scientific Uncertainty & Future Growth)
- SV = Seasonal Variation

Section 303(d) of the Clean Water Act Requires States to…..

- Identify waters which are not meeting applicable water quality standards/designated uses
- Establish priority ranking for those waters taking into account the severity of pollution and the uses to be made of such waters
- Target waters for the development of TMDLs

What Waters Have To Be On The 303(d) List?

- Waters for which assessments show less than full support based on recent chemical, physical and biological data
- Waters previously listed on approved 303(d) Lists
- Waters with sport fish consumption advisories
- Waters impaired by NPS only

2004 303(d) List

- 327 watersheds, based on HUC 10
- 945 segments
  - 663 streams
  - 282 lakes
- 8,078 stream miles
  - 9.3% of total miles
- 138,578 lake acres
  - 54.7% of total acres

Illinois Environmental Protection Agency
Bureau of Water
1021 North Grand Avenue East
Springfield, IL 62794--9276
October 2004

IEPA/BOW/04-005

Illinois 2004
Section 303(d) List

Illinois Environmental Protection Agency
Bureau of Water
Watershed Management Section
Planning Unit

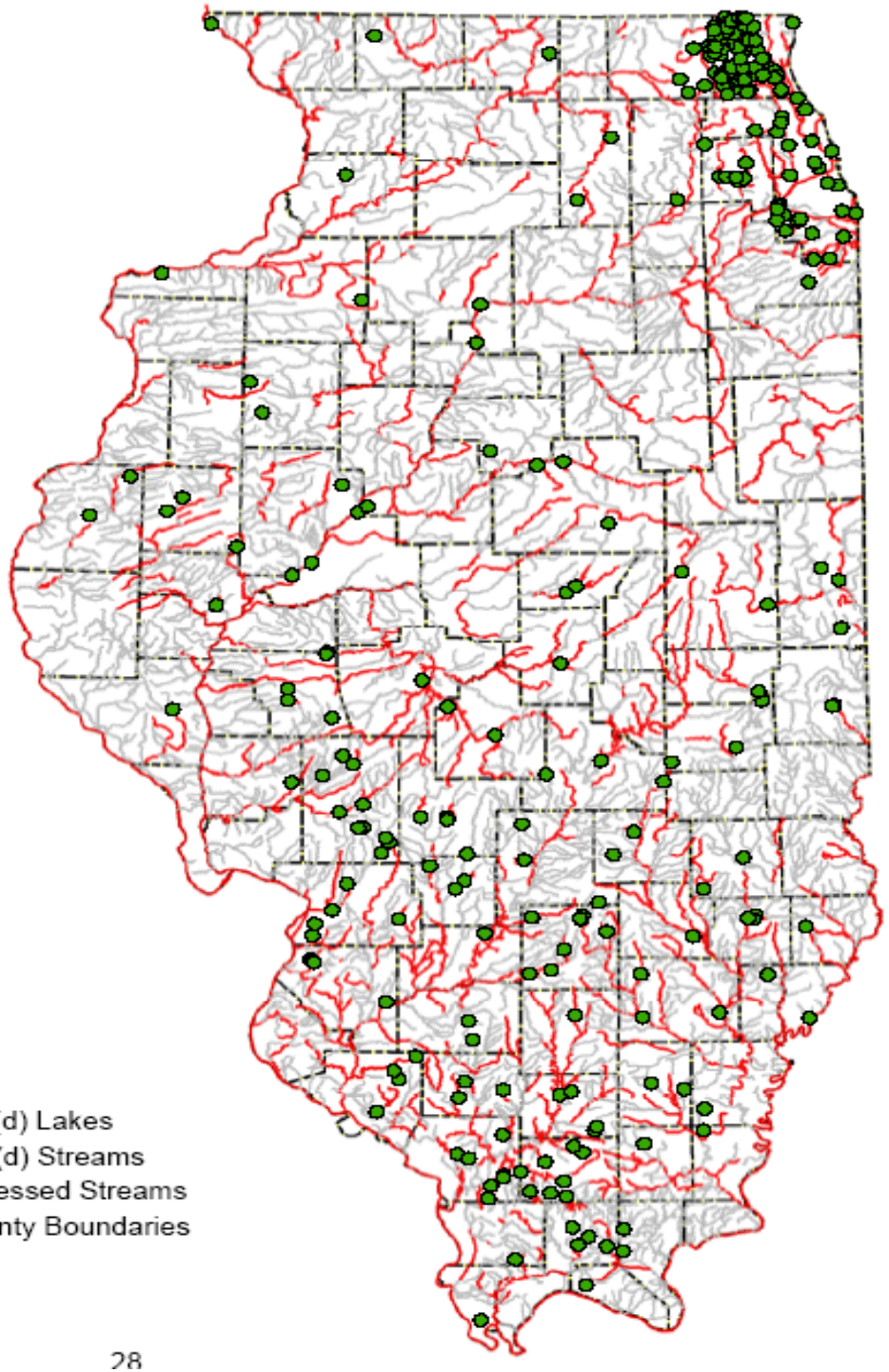
Illinois 2004 Section 303(d) Listed Waters

Streams

8,078 miles on the 2004 303(d) List
15,069 total miles assessed in Illinois

Lakes

138,578 acres on the 2004 303(d) List
154,048 total acres assessed in Illinois



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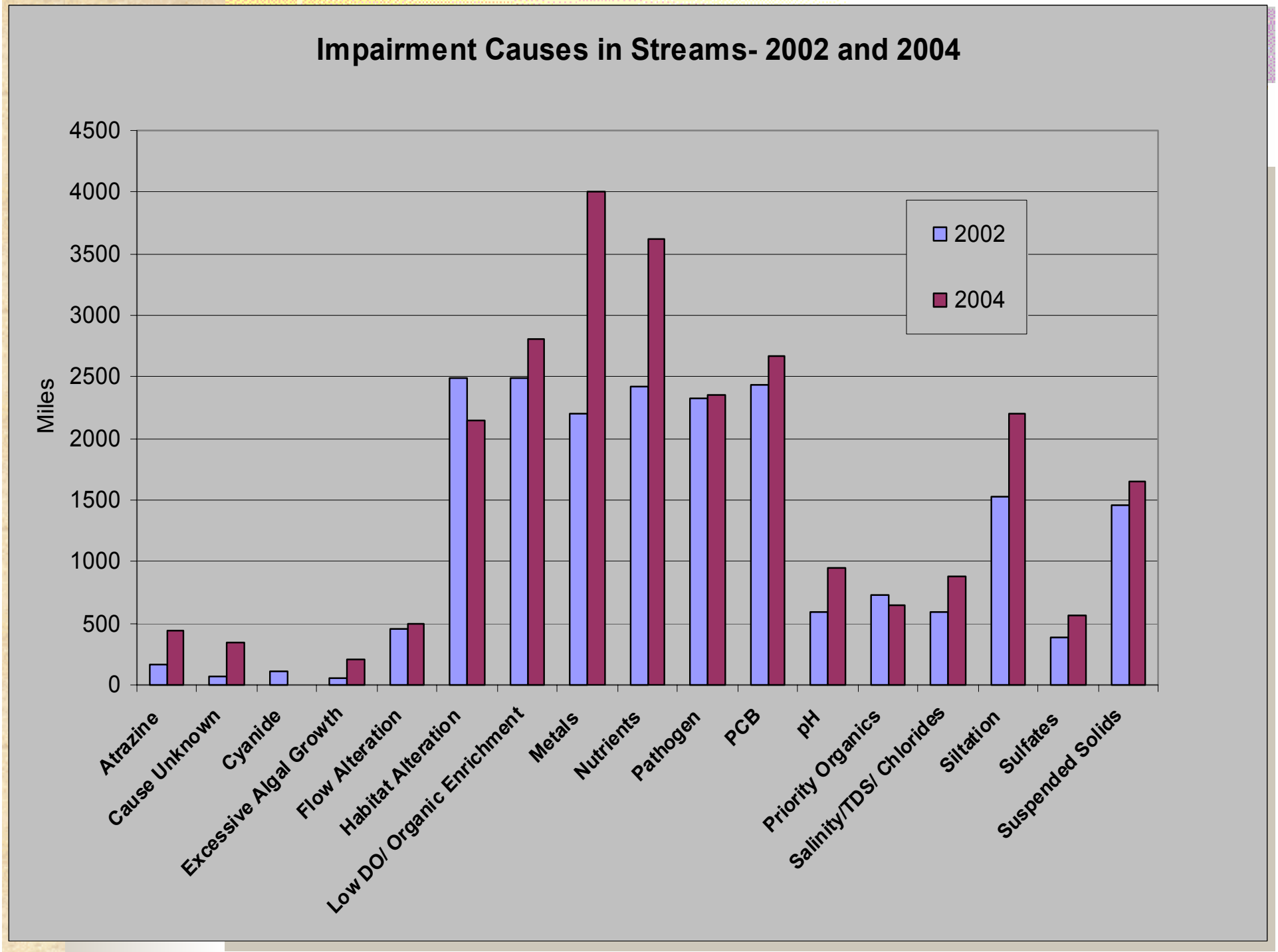
2004


Impairment Causes in Streams- 2002 and 2004
Miles
4500
4000
3500
3000
2500
2000
1500
1000
500
0
2002
2004
Atrazine
Cause Unknown
Cyanide
Excessive Algal Growth
Flow Alteration
Habitat Alteration
Low DO/ Organic Enrichment
Metals
Nutrients
Pathogen
PCB
pH
Priority Organics
Salinity/TDS/ Chlorides
Siltation
Sulfates
Suspended Solids

TMDL Watersheds

TMDL Timeline

- 1992-98—Salt Creek and EBDR segments listed
- 1996—USGS publishes draft TMDL for Salt Creek
- February 2000—CH2MHILL begins work on TMDLs for SC and EBDR
- January 2001—Public meetings
- September 2003—Public hearings
- April 2004—Watershed Group 1st meeting
- July 2004—TMDL submitted to USEPA
- September 2004—USEPA approves TMDL

Salt Creek

- 148.5 square mile watershed
- 49.1 percent residential land use
- 23 percent impervious surfaces
- 31 point sources
  - 11 municipal WWTPs—10 majors
  - Others are minor or stormwater discharges
- USGS TMDL in 1996

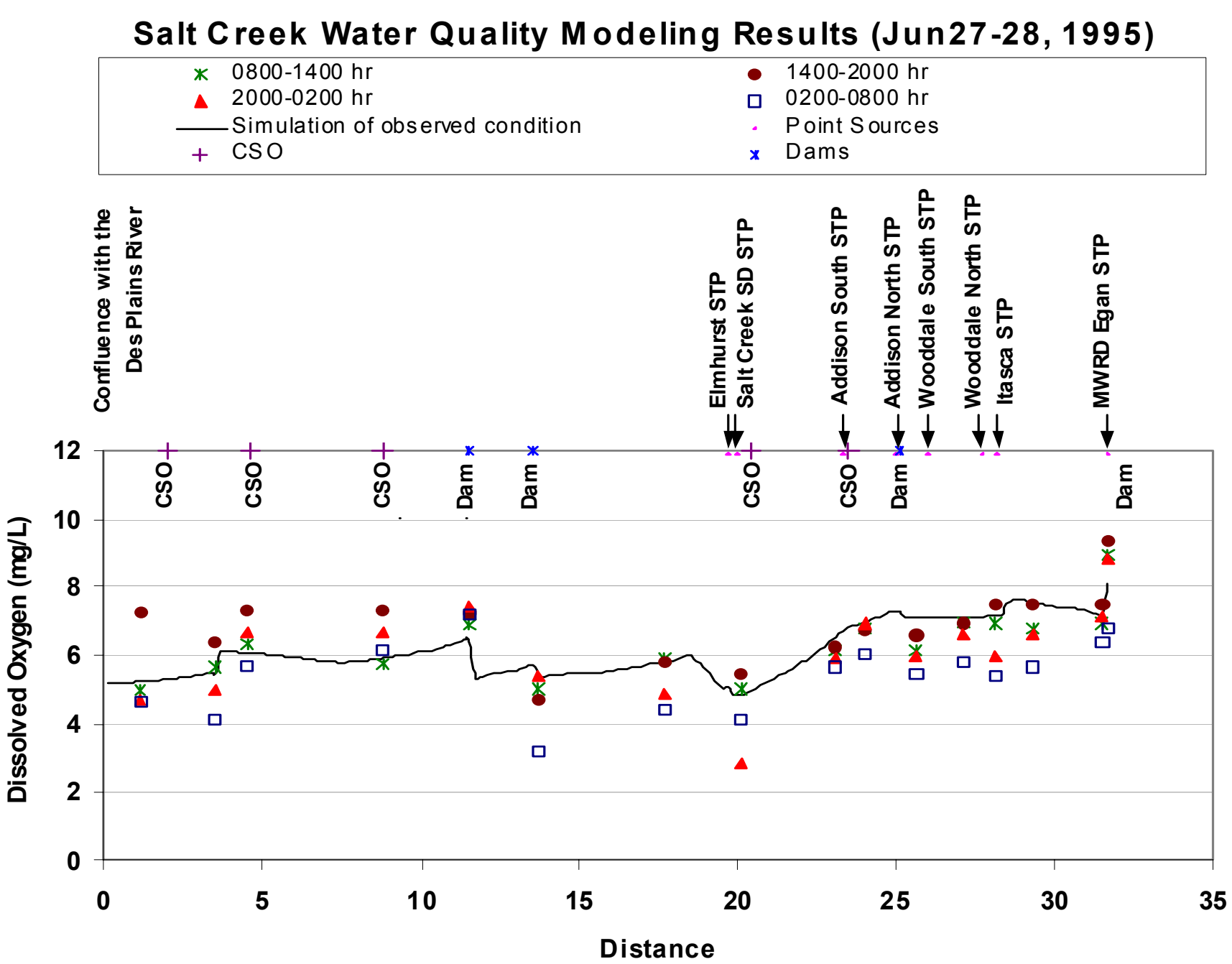
Salt Creek/EBDR Watershed Background

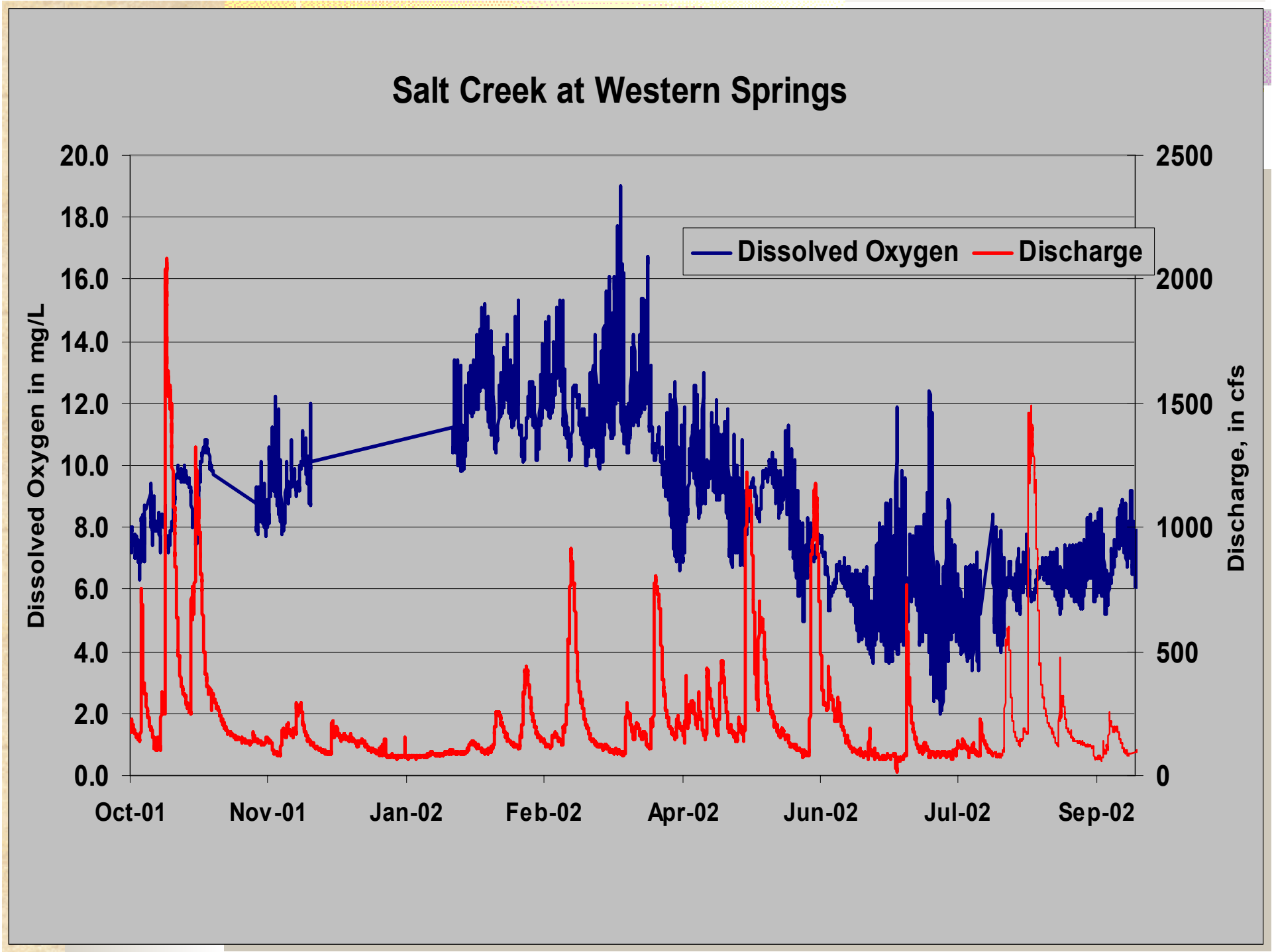
- Water Quality Problems and Sources:
  - ***Chloride:*** Road salt for deicing
  - ***TDS/Conductivity:*** Erosion, urban runoff, deicing operation
  - ***Copper:*** Runoff from roads, parking lots, industrial and contaminated sites *(Salt Creek only)*
  - ***DO and Nutrients:*** Wastewater treatment plants, lawn care, atmospheric deposition, BOD in runoff from roads and parking lots

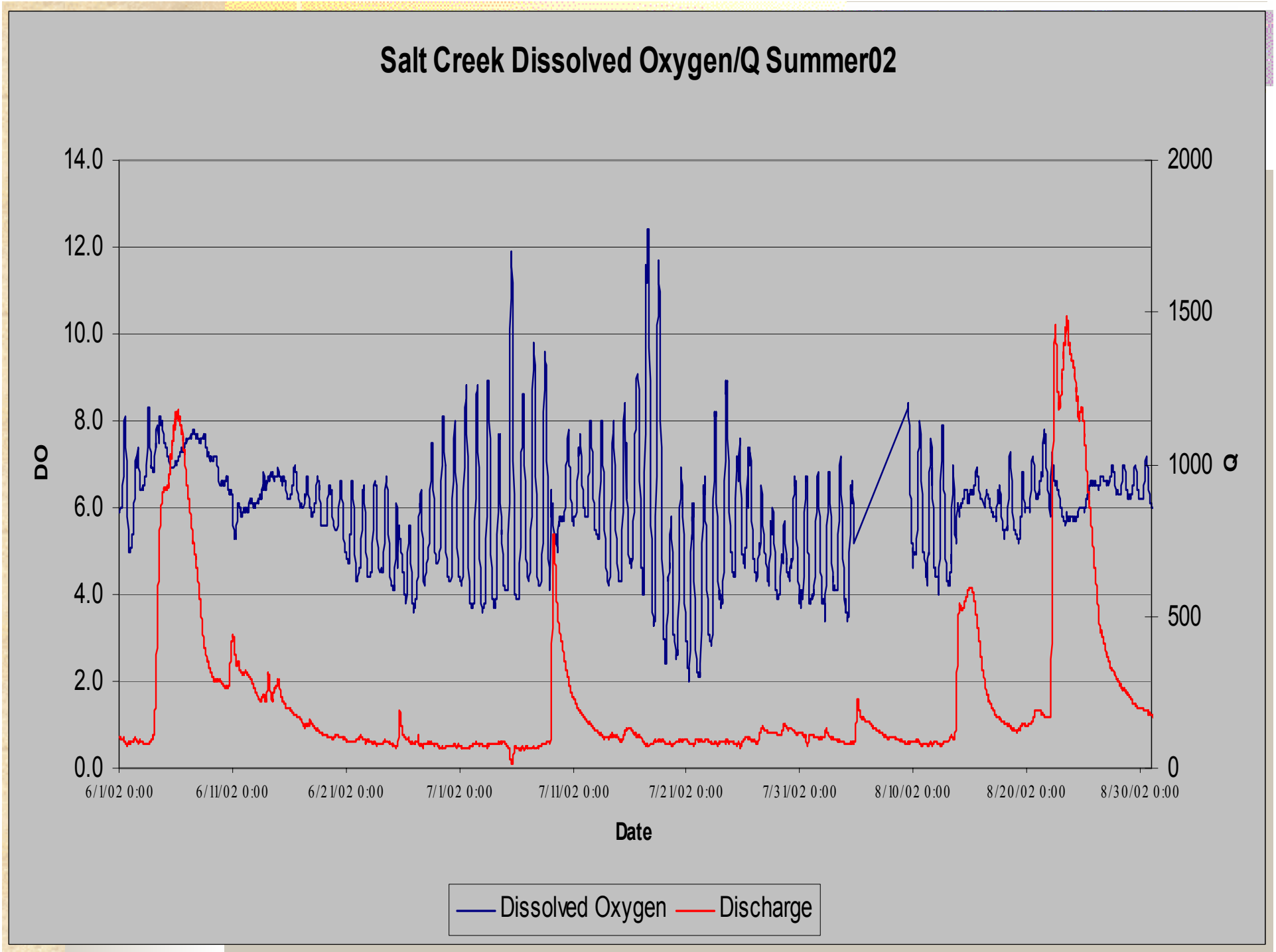
Salt Creek/EBDR TMDL for DO

Other TMDLs for Cu, Cl, TDS and P

- Standard - not less than 6 mg/l during 16 out of 24 hours; not less than 5 mg/l at any time
- Data support the 303(d) listing
- Causes include WWTPs, CSOs, and hydraulic impacts from dams
- QUAL2E water quality model used for DO


Salt Creek Water Quality Modeling Results (Jun27-28, 1995)
0800-1400 hr
1400-2000 hr
2000-0200 hr
0200-0800 hr
Simulation of observed condition
Point Sources
CSO
Dams
Confluence with the Des Plains River
Elmhurst STP
Salt Creek SD STP
Addison South STP
Addison North STP
Wooddale South STP
Wooddale North STP
Itasca STP
MWRD Egan STP
CSO
CSO
CSO
Dam
Dam
CSO
CSO
Dam
Dam
Dissolved Oxygen (mg/L)
0
2
4
6
8
10
12
0
5
10
15
20
25
30
35
Distance


Salt Creek at Western Springs
Dissolved Oxygen
Discharge
Dissolved Oxygen in mg/L
Discharge, in cfs
20.0
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
2500
2000
1500
1000
500
0
Oct-01
Nov-01
Jan-02
Feb-02
Apr-02
Jun-02
Jul-02
Sep-02


Salt Creek Dissolved Oxygen/Q Summer02
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
DO
2000
1500
1000
500
0
Q
6/1/02 0:00
6/11/02 0:00
6/21/02 0:00
7/1/02 0:00
7/11/02 0:00
7/21/02 0:00
7/31/02 0:00
8/10/02 0:00
8/20/02 0:00
8/30/02 0:00
Date
Dissolved Oxygen
Discharge

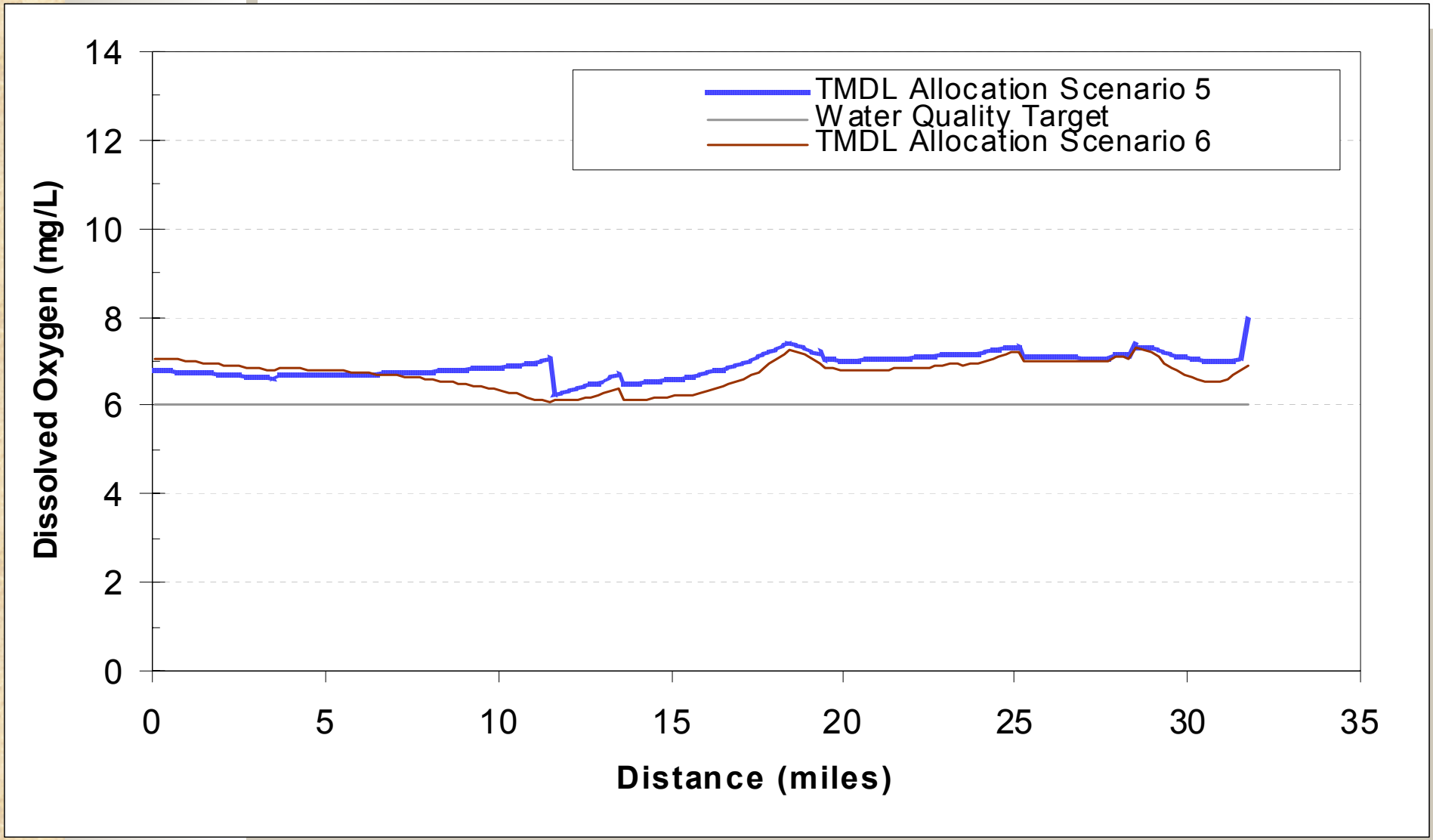
Salt Creek TMDL for DO

- Allocation Scenario 5
  - Point Sources
    - meet 8 mg/l BOD and 1 mg/l NH-3
    - except Bensonville which must meet 10 mg/l BOD5 and 1 mg/l NH-3
  - NPS - 0 lb/day allocated
  - MOS - implicit

Salt Creek TMDL for DO

- Allocation Scenario 6
  - Point Sources
    - Meet existing permitted loads
  - NPS - 0 lb/day allocated
  - MOS - implicit
  - Remove Fullersburg Dam

Salt Creek TMDL for DO



DO TMDL Recommendations

Salt Creek

- Reduce effluent limits to (except Bensenville)
  - 8 mg/L BOD5
  - 1 mg/L ammonia

OR

- Dam removal @Fullersburg

Assumes 7Q10 flow and SOD matches non-CSO reaches

EBDR

- Reduce effluent limits to
  - 8 mg/L BOD5
  - 1 mg/L ammonia

OR

- In-stream aeration @ Crescent Blvd

Assumes 7Q10 flow and much reduced SOD.

Churchill Woods dam removal ineffective

TMDL Costs

Salt Creek estimates shown here-EBDR are similar

- Illinois EPA estimated costs to Salt Creek WWPTs--$18M
  - Based on tertiary filtration @ $0.30/gal DAF
  - O&M costs not included—$0.073/gal
- Other estimates based on wet weather peak flow--$48M
- No estimates for Phase II control of VSS
- No estimates for dam removal/in-stream aeration
- No estimates for nutrient removal, or for savings if CBOD/ammonia/nutrients combined

Phased & Adaptive Management TMDLs

- Phased-in TMDL
  - use incremental approach
  - investigate practical, low-cost options
- Adaptive management
  - consistent with the monitoring program
  - identify success or failure in achieving WQS for DO as each remedy is implemented successively, or as the plan is modified as needed over time

Phased & Adaptive Management TMDLs

The implementation plans for these TMDLs could be phased-in, in the following sequence:

- Step 1: Organize local watershed committee.
  - Establish meeting schedule
    - Began April 2004
    - Monthly April--October
  - Organize committee structure
    - Ongoing
  - Assess funding mechanisms
    - 85K in 2004, for WQ monitoring
    - Additional funds available for general investigations/projects, 40% local match required
  - Begin comprehensive WQ monitoring program
    - Start in Spring 2005

Phased & Adaptive Management TMDLs

- Step 2: Place reaerators at strategic locations ***and/or*** remove low head Fullersburg Dam
  - Conduct pre- and post monitoring over the critical period
  - Make adjustments to the monitoring and rearation system as necessary to attain WQS.
  - If not cost-effective or institutionally acceptable/ practical, move to Step 3.

Phased & Adaptive Management TMDLs

- Step 3: If Step 2 does not attain DO compliance then
  - Reassess new data with local watershed committee
  - In 2008, reduce effluent limits in NPDES permits for BOD5 and NH3
- Continue to rely on Phase II storm water controls and CSO control strategies to reduce VSS and SOD
- Nutrients standards adoption
  - Re-visit the model and monitoring data
  - Develop strategy for DO and nutrients combined

Other considerations…

- All costs are estimates
- No values are currently available for dam removal/rearation at these locations
- Local match timing and amount for 319 funds
- Cultural, social, practical limits


Graue Mill, DuPage County


Graue Mill and Fullersburg Dam

For more information on Illinois TMDLs

- Illinois EPA Web site
  www.epa.state.il.us/tmdl

- Phone 217/782-3362