



Sioux Falls Total Maximum Daily Load (TMDL) Project

Office of Public Works

RESPEC

Meeting With Sioux Falls Land Use Committee

June 30, 2008

AGENDA

❖ *Introductions*

- *City project managers*
- *RESPEC's project team*

❖ *Background Information*

- *History of impaired waterbodies*
- *City as third-party lead*
- *Total Maximum Daily Load (TMDL)*
- *National Pollutant Discharge Elimination System (NPDES) and the Maximum Extent Practicable (MEP)*
- *Linking the TMDL to the MEP*

❖ *Overview of Approach*

❖ *Questions*

CITY PROJECT MANAGERS

❖ *Andy Berg*

→ Public Works Engineering

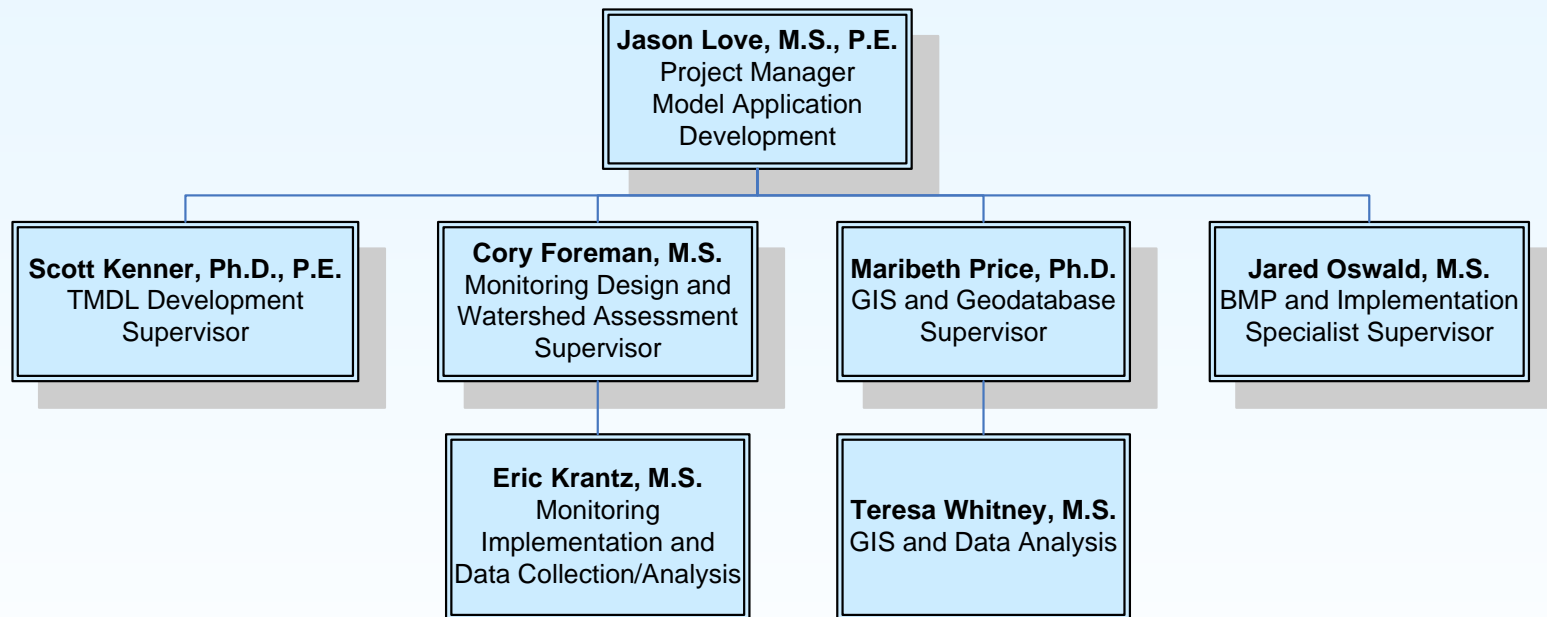
☞ *Storm Drainage Principal Engineer*

❖ *Bob Kappel*

→ Public Works Environmental

☞ *Environmental Manager*

RESPEC's Project Team



- ❖ ***Collectively 30 Years of TMDL Experience***
- ❖ ***All Members That Will Work on This Project Have Advanced Degrees***

Impaired Waterbodies

❖ Clean Water Act (CWA) 1972

- *Assigned beneficial uses to waters of the state*
- *Developed water-quality standards (WQS) and criteria to protect the beneficial uses of waters of state*
- *Issue permits to meet water-quality standards*
- *Periodically evaluate actual water quality*
- *If water quality exceeds standard, waterbody is “impaired”*
- *“Impaired” waterbodies require the development of a Total Maximum Daily Load (TMDL)*

Impaired Waterbodies

❖ Central Big Sioux River (BSR)

→ *Historical BSR impairments-not meeting water-quality standards (WQS)*

☞ Ammonia

☞ Dissolved oxygen

☞ Iron

☞ Total suspended solids

☞ Fecal coliform (bacteria)

→ *Improvements by 2004*

☞ Targeted TMDLs and point source permits

☞ Improved treatment of point source discharges

☞ BSR no longer impaired for iron

☞ BSR no longer impaired for dissolved oxygen

☞ BSR no longer impaired for ammonia



Impaired Waterbodies

❖ Central Big Sioux River (BSR)

→ *Improvements by 2006*

☞ **Sioux Falls Stormwater Permit**

- Implemented Stormwater Program
- Best Management Practices (BMP)

☞ **BSR no longer impaired for total suspended solids**

☞ **BSR still impaired *for fecal coliform (bacteria)***

→ **US EPA and South Dakota Department of Environment and Natural Resources (SD DENR) requiring TMDLs**

☞ **Fecal coliform (still impaired)**

☞ **Total suspended solids (historical impairment)**



Impaired Waterbodies

❖ Covell Lake

- *Impaired for Trophic State Index (TSI)*
- *US EPA and SD DENR requiring TMDL*
 - TSI



TMDL City Third-Party Lead

❖ SD DENR Offered City the Opportunity to Lead TMDL Project

- *City shall take the lead and collaborate with SD DENR*
 - ☞ City hired RESPEC Consulting & Services
- *SD DENR has ultimate responsibility to develop TMDL*
- *US EPA has final approval authority of TMDL*

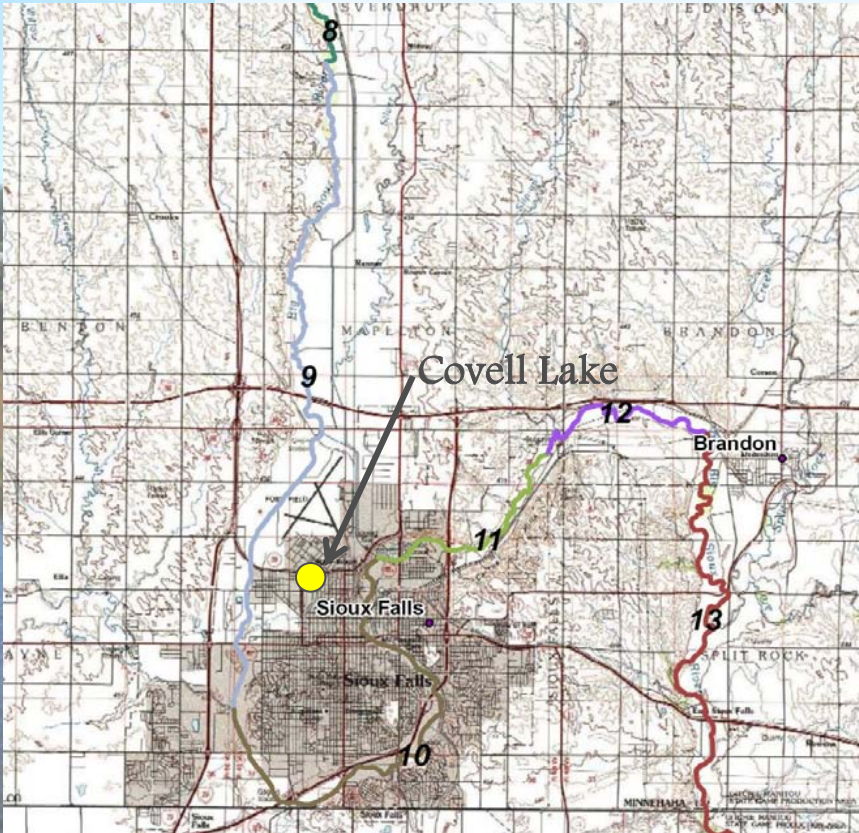
❖ Benefits of City Taking on Third-Party Lead

- *City and local stakeholders are more familiar with the watershed and can provide greater insight and direction during TMDL process*
- *Local involvement and resources can be used to leverage more federal and state grant funds for TMDL project*
 - ☞ Acquired a \$125,000 US EPA 604(b) Grant award
 - ☞ Will pursue US EPA 319 Grant in October 2008
- *Increase in public understanding, involvement, and education*
- *More support for TMDL and implementation by stakeholders*

Total Maximum Daily Loads

- ❖ **The Primary Goal of the TMDL Program Is to Ensure That Waters of the State Attain water-Quality Standards**
- ❖ **Waterbodies That do not Meet Water-Quality Standards Are put on a List of Impaired Waters (303d list)**
- ❖ **303d List Includes:**
 - ➔ *Waterbody name and location*
 - ➔ *Beneficial uses*
 - ➔ *Pollutants of concern*
 - ➔ *Basis for listing*
 - ➔ *Prioritizations*

WQS –Targets: Big Sioux River



BSR Reaches 9-12

❖ Immersion Recreation

➔ *Fecal coliform*

☞ <200 cfu 100/mL (mean)

☞ <400 cfu 100/mL (single)

❖ Warmwater Semipermanent Fish Life

➔ *Suspended solids*

☞ ≤ 90 mg/L (mean)

☞ ≤ 158 mg/L (single)

Covell Lake

❖ Warmwater Marginal Fish Life

➔ *TSI*

Total Maximum Daily Loads

- ❖ **Loading Capacity (LC) Is the Maximum Load That a Waterbody can Receive Without Violating Water-Quality Standards**
- ❖ **Load Allocation (LA) Is the Portion of LC Attributed to Nonpoint Sources and/or to Natural Background**
- ❖ **Waste Load Allocation (WLA) Is the Portion of the LC Allocated to Permitted Sources**
- ❖ **Margin of Safety (MOS) Is a Portion of the TMDL Necessary to Account for Uncertainty**
- ❖ **$TMDL = LC = WLA + LA + MOS$**

TMDL Process

- ❖ **Target Load Capacity Identification**
- ❖ **Current Deviation From Target Load Capacity**
- ❖ **Source Identification**
- ❖ **Allocation of Pollutant Loads**
- ❖ **Implementation**
- ❖ **Follow-up Monitoring**

Stormwater Treatment Capability (MEP)

- ❖ NPDES Regulated Stormwater Discharges Must Be Addressed by the WLA Component of a TMDL
- ❖ The Level of Stormwater-Quality Control Is Also Defined in the Federal Regulations in Terms of the MEP
 - *Economics of trying to treat low frequency (very large) events*
 - *Majority of loadings are generated by the frequent, smaller events*
- ❖ Implementation of BMPs to Reduce Stormwater Loadings Must Meet the TMDL WLA

Project Approach (1/2)

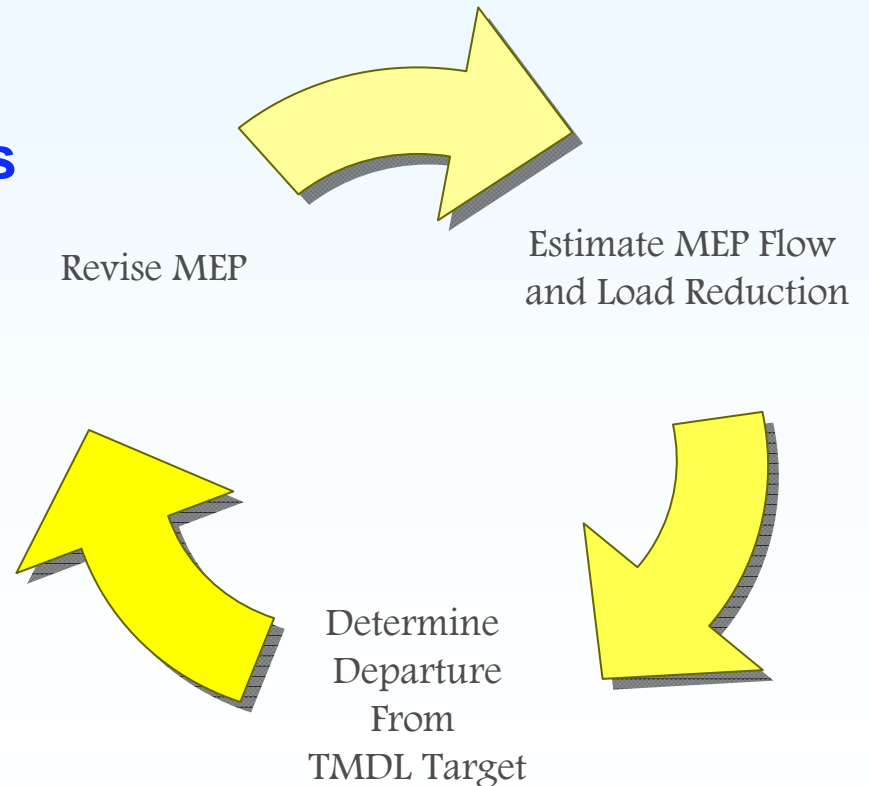
- ❖ **Project Planning**
- ❖ **Data Acquisition and Analysis**
- ❖ **Proposal Preparation for EPA 319 Grant Program**
- ❖ **Stormwater Treatment Capability (MEP)**
- ❖ **Modeling Framework Development and Flow and Load Estimations for TMDL Development**
- ❖ **BMP Analysis and Implementation Plan**

Project Approach (2/2)

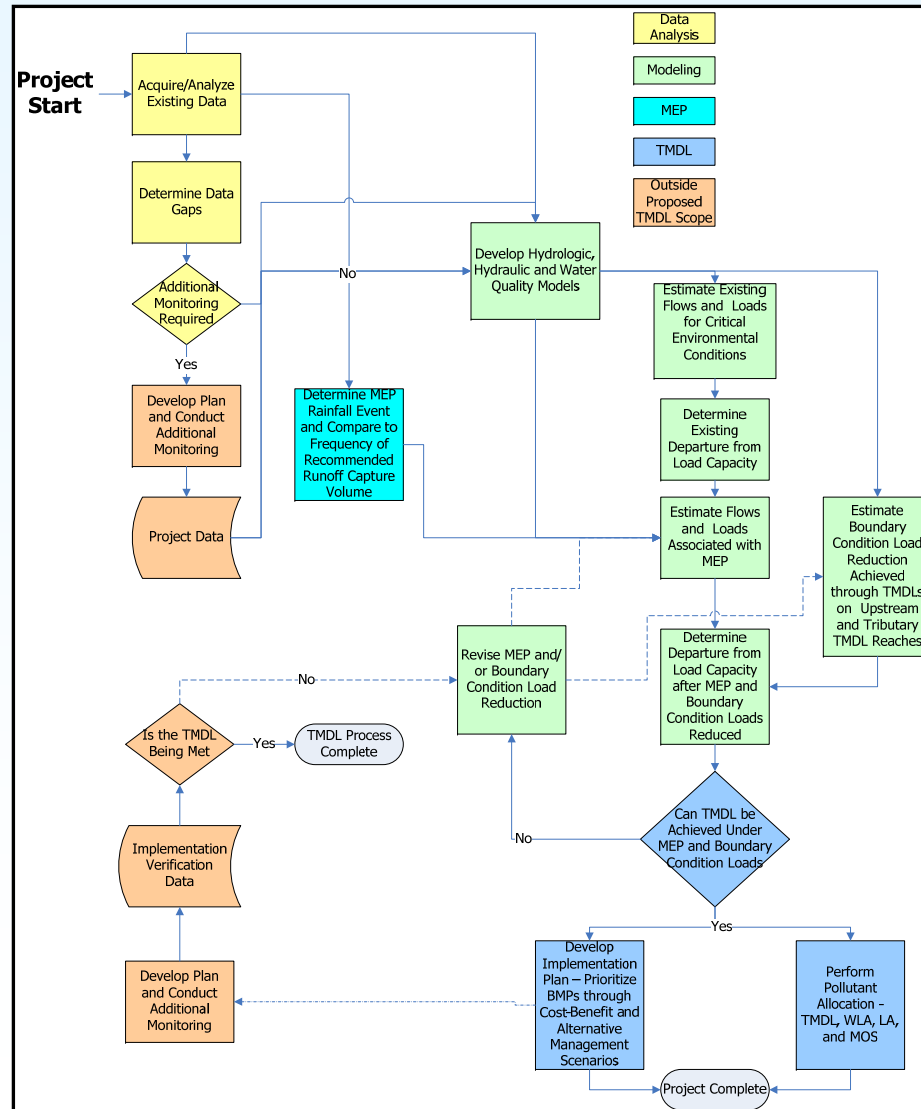
Process Flow
(see handout)

Adaptive MEP
Approach

- ❖ **Develop/Calibrate Modeling Framework to Existing Conditions**
- ❖ **Set Boundary Conditions for Future TMDL Representation**
- ❖ **Adaptively Develop MEP**
- ❖ **Analyze BMP Scenarios**



Process Flow



Schedule

- ❖ **Workplan Completed by August 15, 2008**
- ❖ **EPA 319 Grant Completed by October 1, 2008**
- ❖ **Final Project Completed by December 31, 2010**

Questions ?

