

# Hydrology Task Group Update

Prepared by the  
CBNG Interagency Work Group –  
Hydrology Task Group

# Outline for Hydro Task Group Discussion

- Progress Overview- Andy Bobst, BLM-MT
- Summary of Surface Water Monitoring Plan—Melanie Clark, USGS, WY
- Discussion of State and CWA Issues - Dan Hengel, WY DEQ
- Discussion of Monitor Plan package—Andy Bobst, BLM-MT

# Water Tasks

1. Develop a surface water monitoring plan for watersheds anticipated to be affected by CBNG development (build off of EPA/USGS outline, the WY-BLM monitoring plan, and existing surface water monitoring). The whole group will be involved for watersheds that cross state lines, while state sub-groups will be used for watersheds which lie exclusively in a single state.
2. Develop an integrated groundwater monitoring plan for aquifers anticipated to be affected by CBNG development. (Build off of MT-TAC recommendations, and existing monitoring in WY and MT).

# Water Tasks (cont.)

3. Prepare an ongoing list of studies being conducted, and provide recommendations on additional studies that are needed.
4. Function as a forum for discussion of issues relating to the development of TMDLs. The whole group will be involved in developing TMDLs for watersheds that cross state lines, while state sub-groups will be used for watersheds which lie exclusively in a single state. The final decision on appropriate TMDLs is a State and EPA function.

# Status of Development of an Integrated Groundwater Monitoring Network (Task 2)

- Working to develop pdf type Maps of the different regional monitoring sites (Data to be compiled by MBMG)
- Plan to post on the CBM Clearinghouse website (WY-BLM)
- Also plan to construct coverage of “study sites” where basins, alluvium, sandstone above coals etc. are being monitored (all to go on the Clearinghouse)

# Groundwater Monitoring Impoundments

- A sub-task group has been identified to address issues relating to Impoundments

# Status of the Development of a list of Studies and Suggestions for Future Studies (Task 3)

- USGS Wyoming has compiled an extensive bibliography of current, historical and ongoing information relating to CBNG in the PRB (prepared for WY-BLM)
  - Prepared as a Searchable Database (CD)
  - Finished in May 2004
- Montana Bureau of Mines and Geology has also compiled a bibliography of current and historical information relating to CBNG in the PRB (prepared for MT-BLM)
  - Available online

# Function as a forum for discussion of issues relating to the development of TMDLs (Task 4)

- Several members of the CBNG Water Task group are also on the Modeling Committee for the development of TMDLs for the Tongue River, Powder River and Rosebud Creek.
  - This is an ongoing effort
    - Allocations and Reports are projected to be completed by December 2004.
  - The TMDL process is an adaptive one.

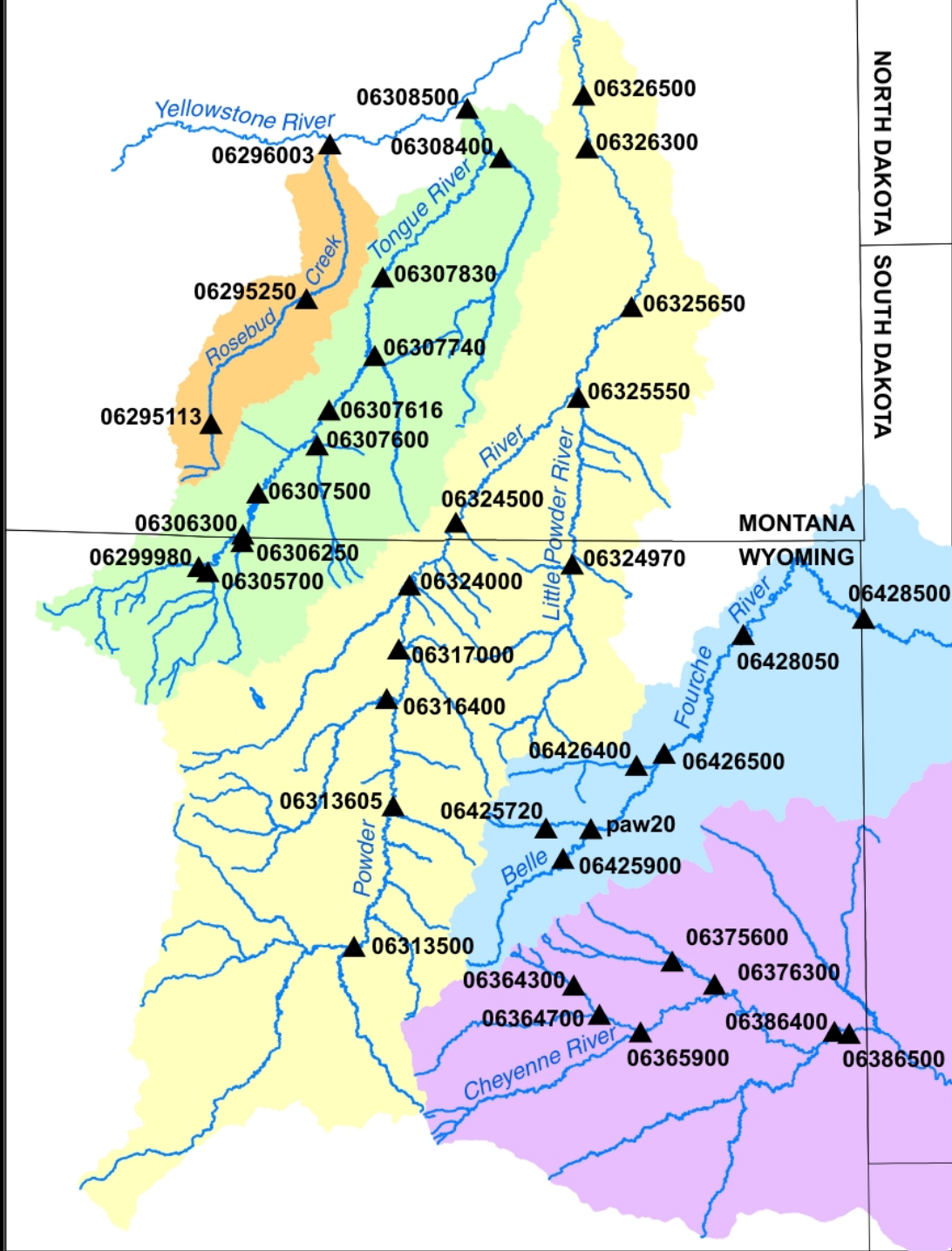


# **TASK 1**

## **Develop Surface Water Monitoring Plan**

# Surface-water Monitoring Plan includes:

- Rosebud Creek watershed
- Tongue River watershed
- Powder River watershed
- Cheyenne River watershed
- Belle Fourche River watershed



NORTH DAKOTA  
SOUTH DAKOTA

MONTANA  
WYOMING

# Monitoring Plan process:

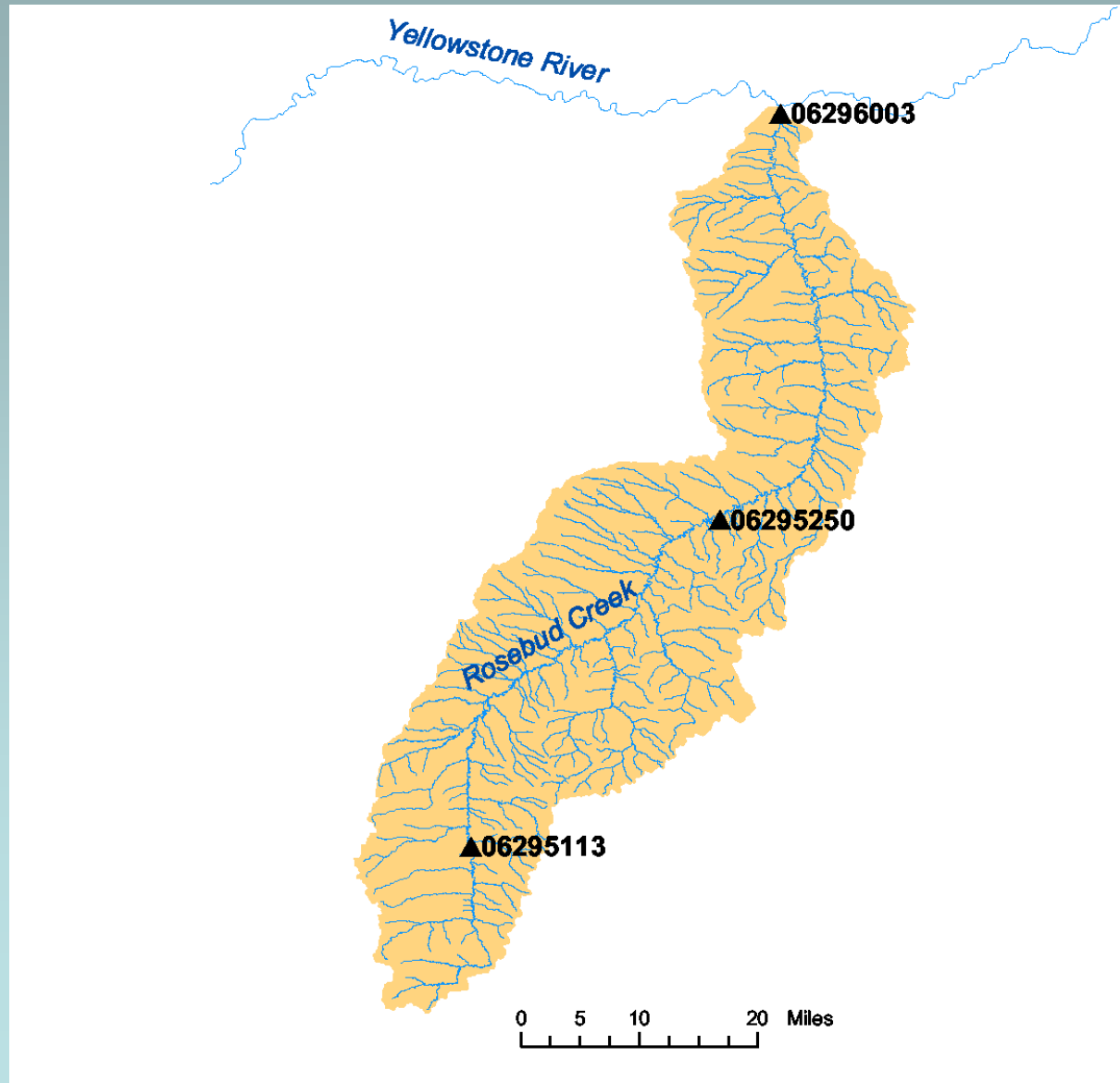
- Compiled existing monitoring information
- Identified monitoring goals
- Identified additional monitoring to fill in the “gaps” between existing information and monitoring goals

# Site selection based on:

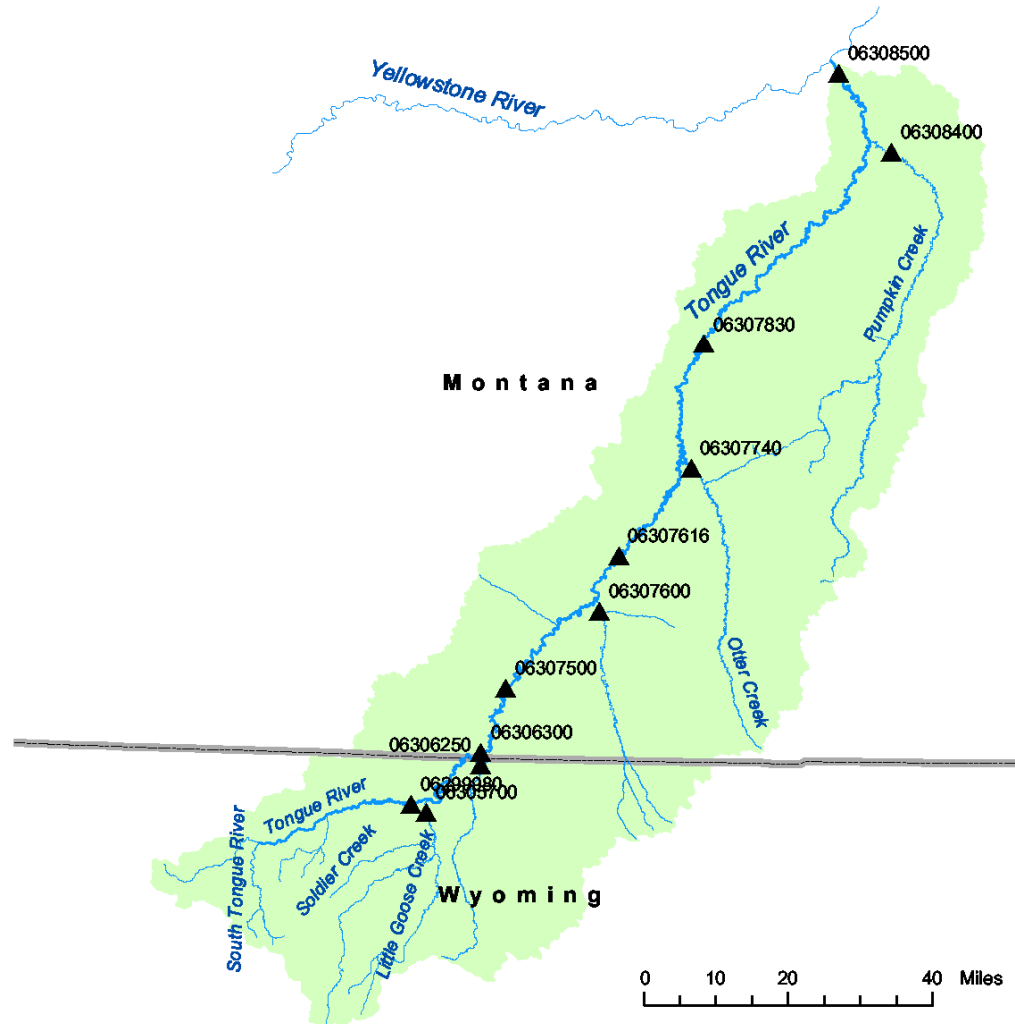
- Rosebud Creek—existing water-quality and streamflow sites operated by Tribes, BLM, and USGS
- Tongue River—network analysis done as part of monitoring plan developed by USGS for USEPA
- Powder River—network analysis done as part of monitoring plan developed by USGS for USEPA
- Cheyenne River\*—existing water-quality and streamflow sites operated by WDEQ, USGS, and SDDENR (originally 8, now 7 sites)
- Belle Fourche\*—existing water- quality and streamflow sites operated by WDEQ and USGS (originally 8, now 7 sites)

\*Network analysis currently being done by USGS for USEPA

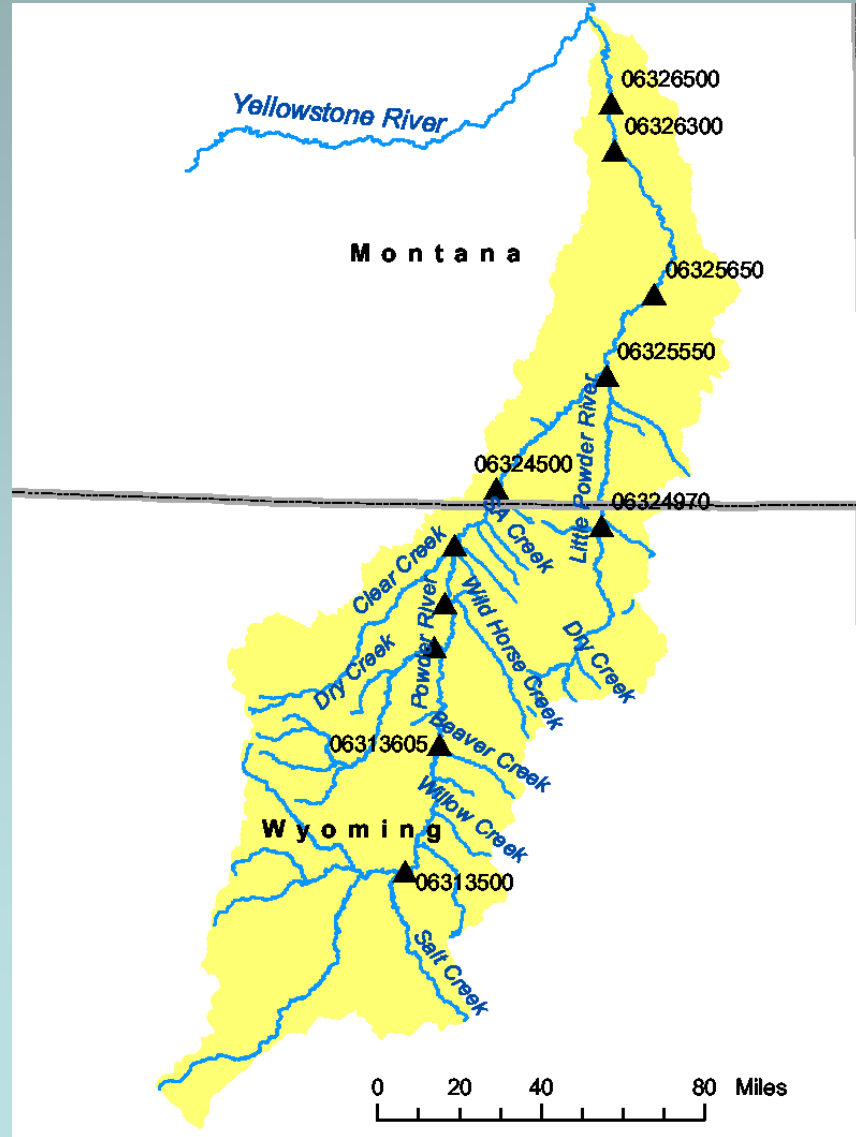
# Rosebud Creek—3 mainstem sites



# Tongue River—6 mainstem and 5 tributary sites

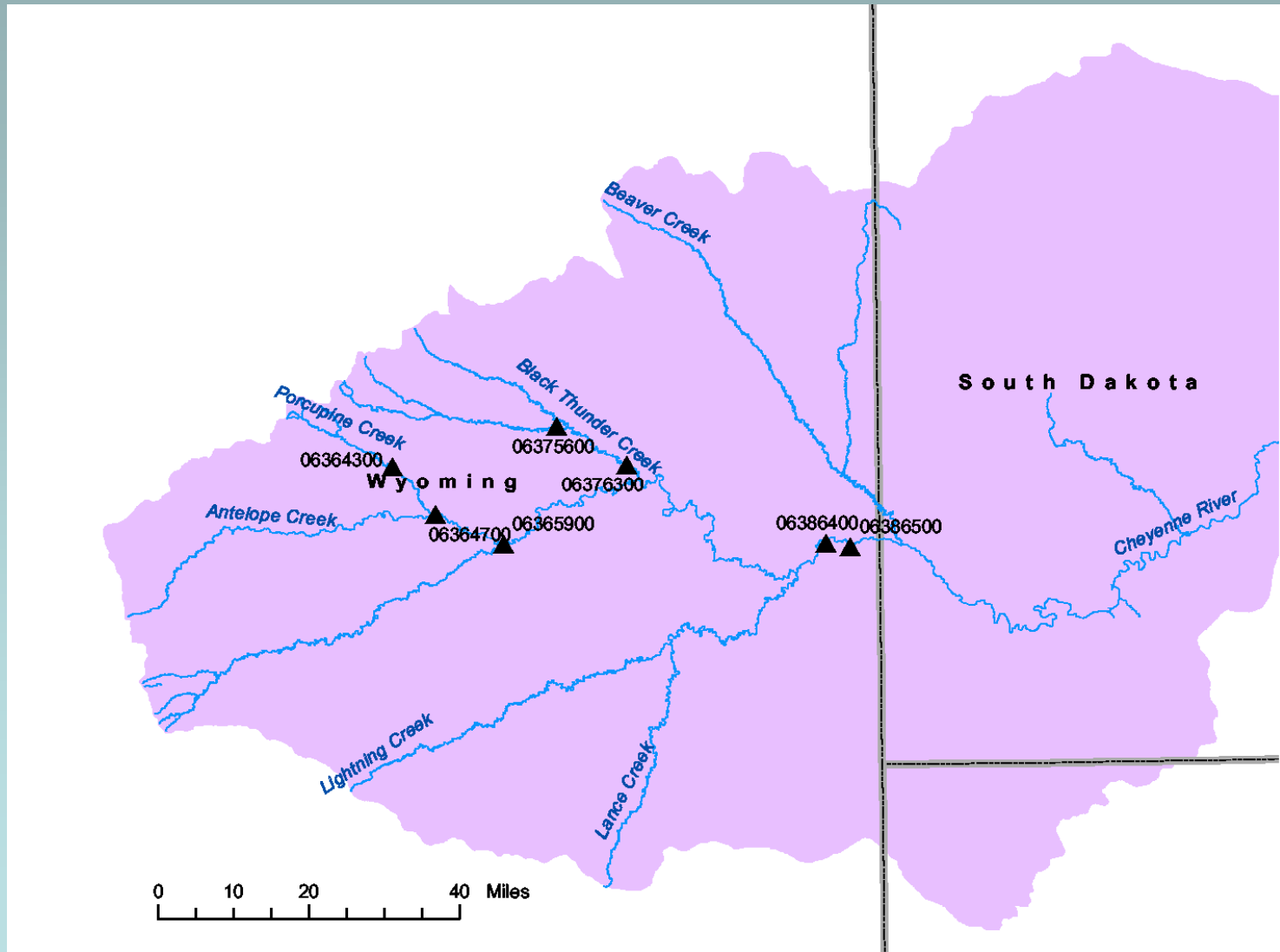


# Powder River—6 mainstem and 5 tributary sites

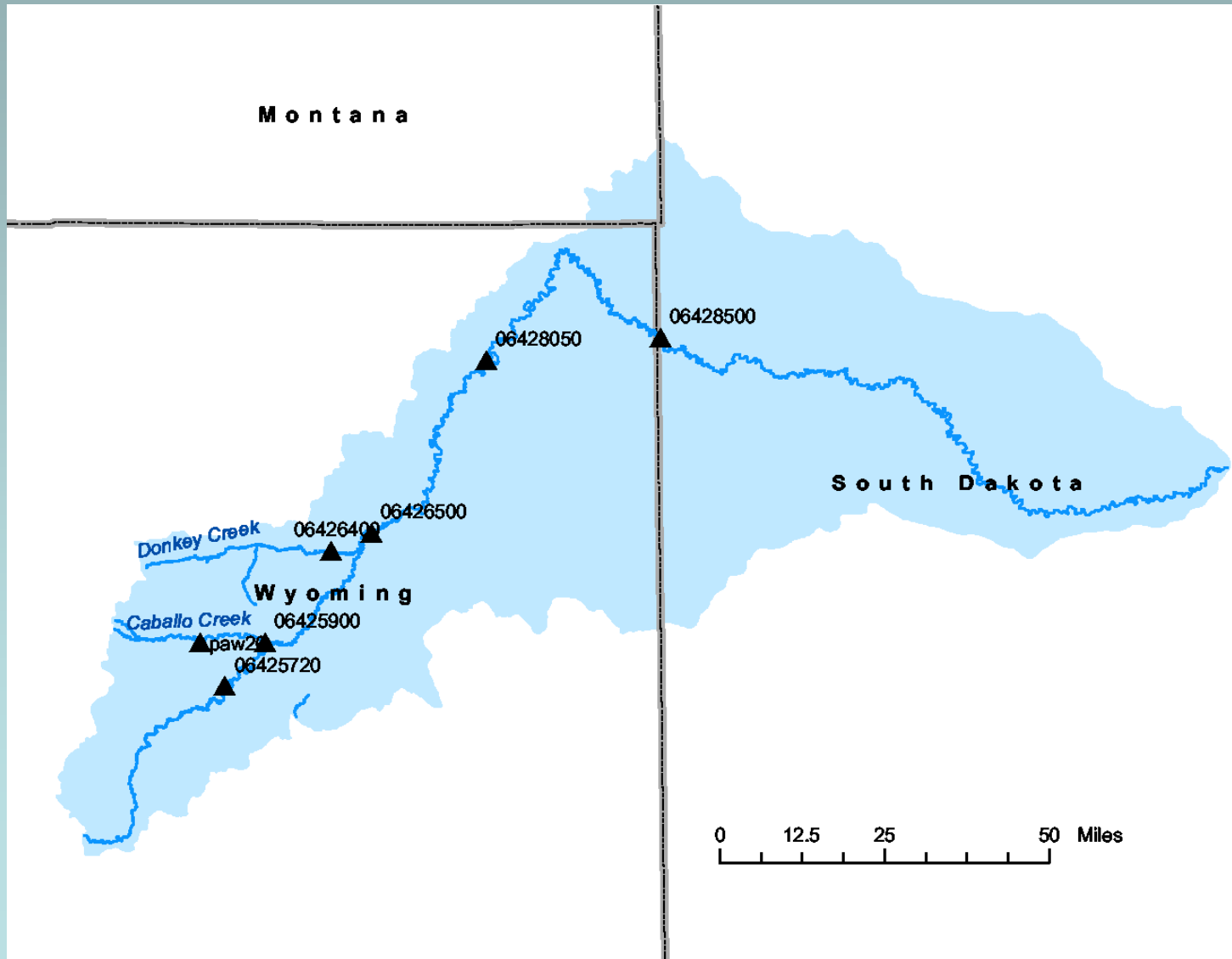




# Cheyenne River—3 mainstem and 4 tributary



# Belle Fourche—4 mainstem and 3 tributary



# Sampling Frequency

- Mainstem sites—12 samples/year analyzed for core constituents; continuous streamflow
- Tributary sites—6 samples/year analyzed for core constituents ; continuous streamflow
- Mainstem and tributary sites—  
2 of the samples/year (high and low flow)  
analyzed for a full trace metal suite and nutrients

# Core constituents

- Common ions (filtered Ca, Mg, Na, K, SO<sub>4</sub>, Cl, F, Alk, and Si; total dissolved solids; sodium adsorption ratio)
- Field measurements (discharge, pH, dissolved oxygen, specific conductance, temperature)
- Core metals (unfiltered Al, Ba, Be, and Se; filtered As, Fe, and Mn)
- Suspended sediment

# Additional constituents

Full suite of trace metals (tiered):

- High - Al, As, Ba, Be, Fe, Mn, and Se (Unfiltered and filtered)
- Med - B, Cd, Cr, Cu, Pb, Ni, Zn, Hg, Li, Sr (unfiltered and filtered)
- Low - Other

Nutrients:

- Unfiltered and filtered nitrogen and phosphorus species, including filtered ammonia and nitrate, unfiltered ammonia and organic N, filtered P and orthophosphate, unfiltered P

# Monitoring Plan Budget

- Based on current USGS monitoring network costs for streamflow and water-quality sampling
- Approximate total cost for completely new site:  
\$33,300 for mainstem  
\$23,800 for tributary
- Most sites are currently being monitored with some funding
- Additional monitoring costs to fill in “gaps”
- Still flexible for adding or removing constituents from sampling schedule

# Monitoring Plan Products

- Sample analyses to be electronically available to stakeholders
- Streamflow available in real-time on Web
- Annual summary report
- Interpretive report every ~3 years

# Annual Monitoring Report

- Report includes Introduction, basin conditions, summary, appendix of tabled data
- Designed to be compatible with State 305(b) reports
- Discussion by basin to include:
  - 1) Summary statistics for selected constituents,
  - 2) Comparisons to State water-quality criteria,
  - 3) Time-series plots
  - 4) comparison of SAR, and Specific conductance to FEIS



# Structure of Monitoring Plan

- Cover page – Mission/Objectives
- Maps
- Comparison Tables & Comparison Matrixes
  - Current Monitoring and Costs
  - Proposed Monitoring and Costs
- Annual Report Outline

# Example Comparison Table

Site Information						Current Monitoring		
Project Name	Priority	State	Location			Current \$/yr	Funding Source	Current Parameters/Frequency
			TN	RG	Sec			
Rosebud Creek near Kirby	Med	MT	5S	38E	36	37,600	MT-BLM, Northern Cheyenne Tribe, USGS	C,F,N,S - 12/yr; B - 1/yr; CF

Identified Monitoring Goals		Additional Monitoring Needed	
\$/yr	Proposed Parameters/Frequency	\$/yr	Parameters/Frequency Needed to Meet Goals
33,300	Core - 12/yr; FM, N - 2/yr; CF	4,300	CM - 12/yr; FM - 2/yr

# Abbreviations

Core = C + F + CM + S

C = Common Ions (Ca, Mg, Na, K, SO<sub>4</sub>, Cl, F, Alk, Si, TDS, SAR)

S = Suspended Sediment (TSS)

F = Field Measurements (Q, pH, DO, EC, T, Flow)

N = Nutrients

CM = Core Metals: Al (total), As (dissolved), Ba(total), Be(total), Fe(dissolved), Mn(dissolved), and Se(total)

FM = Full Metals

CF = Continuous Flow

B = Biological (invertebrates, algae)



# Dan

- Metals, Filtered vs. Unfiltered
- Permitting issues
- Site Specific Monitoring

# Questions?

