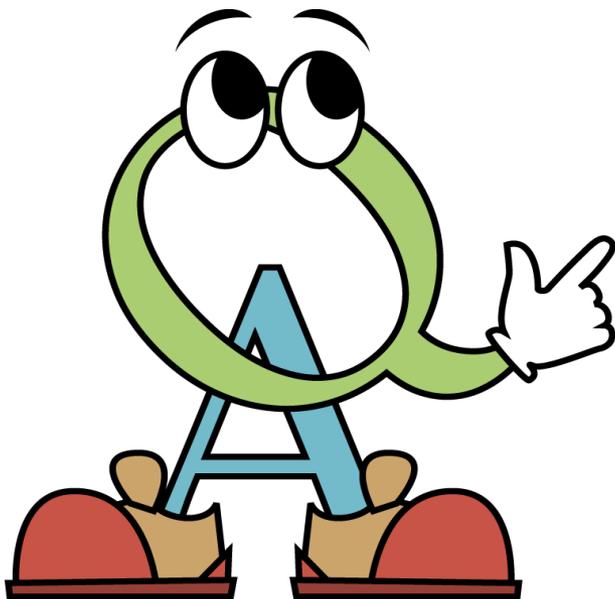


Region 8 QA Tribal Training

Using a Conceptual Site Model to Tell the Environmental Story of your Tribal Lands



Annual WQ Meeting 4/4/2012

Mary Goldade, EPA Region 8
Tim Spade, Flandreau Santee Sioux Tribe

Training Goals

Incorporate Conceptual Site Models into your Project Planning and QAPPs:

- Define a Conceptual Site Model (CSM)
- Use of CSMs in Project Planning and QAPPs
- CSM Case Study—Flandreau CWA 106 Program
 - CSM Worksheet
 - CSM for the Flandreau CWA 106 Program
 - CSMs in establishing Initial Target Levels for QAPPs



What's a Conceptual Site Model?

- Conceptual Site Model (CSM) is a tool used to help describe or visualize environmental conditions at your site
- Describes known or potential:
 - Sources of contamination
 - Media that are contaminated or may become contaminated
 - Contaminants of concern
 - Movement of contamination through the environment
 - Exposure scenarios/Receptors (human or ecological)
 - Potential Benchmarks or Action Levels (Target Levels)



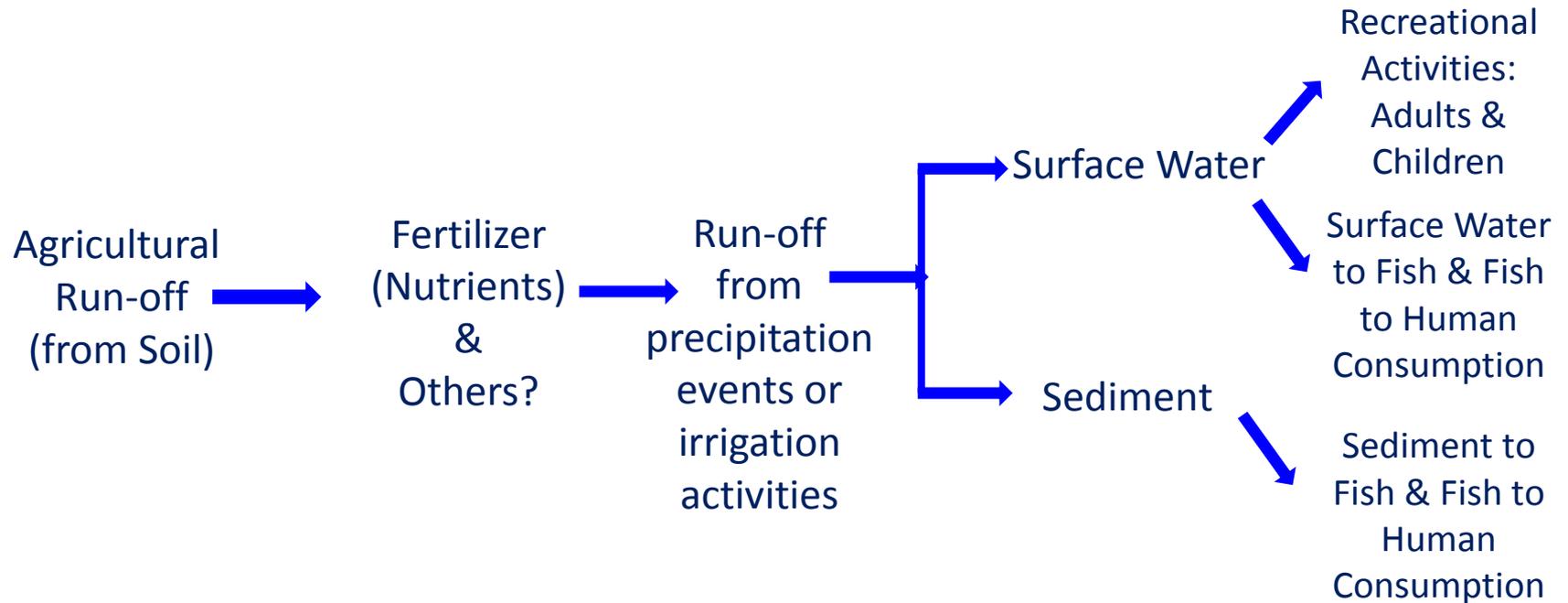
Why Develop a Conceptual Site Model?

- Tells the **pictorial story** of environmental conditions on your Tribal Lands and nearby property
- Identifies data needs and gaps that are customized to your regional, geographical and tribal needs
- Supports the rationale for selection of sampling locations
- Establishes requirements for background (off-site) and on-site characterization
- Serves as a Communication Tool to tell the **story**



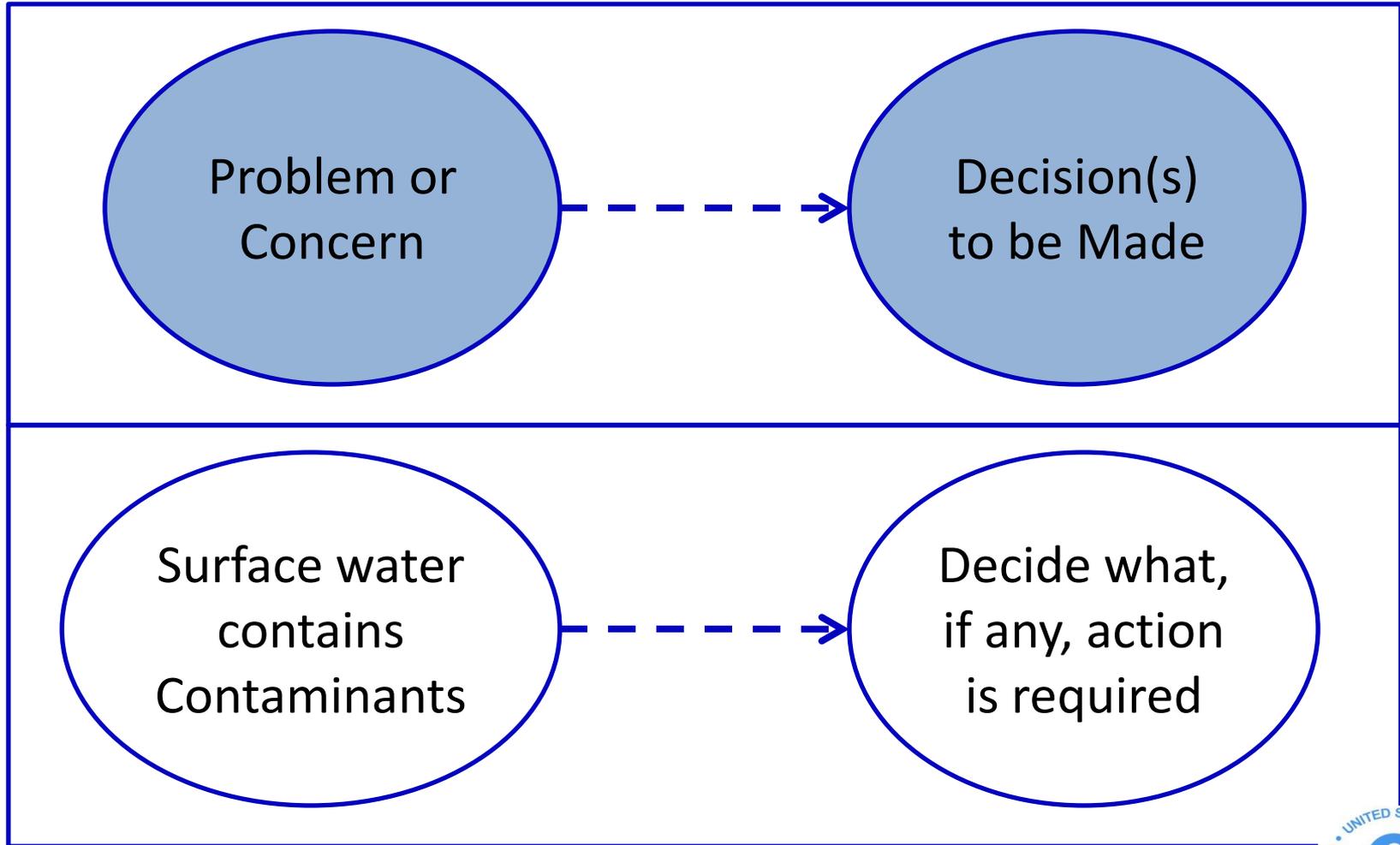
(Partial) Example Conceptual Site Model

Potential Source	Potential Contamination	Movement of Contaminant	Potentially Impacted Media	Potential Exposures/Receptors
------------------	-------------------------	-------------------------	----------------------------	-------------------------------



For demonstration purposes only

All Projects Begin with a Plan



Project Life Cycle

Project
Planning

Annual Work Plan

Monitoring Strategy
(CWA 106)

Conceptual Site Model

QAPP
Development

Quality Assurance
Project Plan

Standard Operating Procedures (SOPs)

Implement
& Assess

Conduct Study/
Implement QAPP

Midcourse correction

Assessment

Assess &
Decide

Decision

Project Planning & QAPP Development

Project
Planning

Annual Work Plan

Monitoring Strategy
(CWA 106)

Conceptual Site Model

QAPP
Development

Quality Assurance
Project Plan

Standard Operating
Procedures (SOPs)

Field

Lab

Data

Case Study: Development of a CSM for Big Sioux River



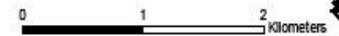
Developing a CSM

- Start with a map of the site
- Use CSM Worksheet to describe site conditions
- Draft/Create a CSM
- Discuss/Review with EPA Tribal Technical and QA Leads
- Use CSM to develop Initial Target Levels
- Include CSM and Initial Target Levels in QAPP



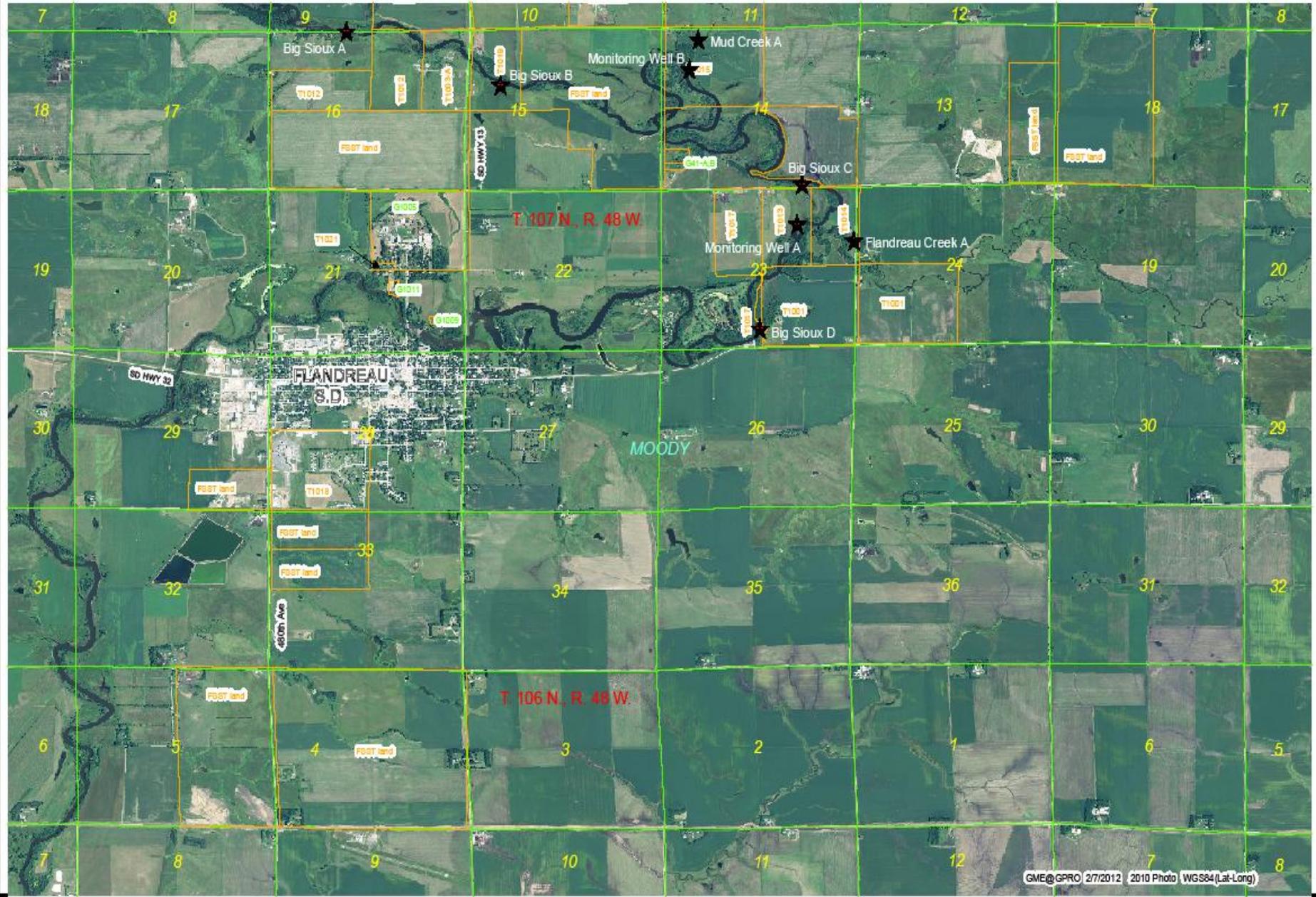
WATER SAMPLE SITES ON LANDS OF FLANDREAU SANTEE SIOUX TRIBE

These lines are not based on a Cadastral Survey, they are derived from GIS databases.



Legend

- ★ Water Sampling sites Lat-Long
- newlist polygon



Conceptual Site Model Worksheet*

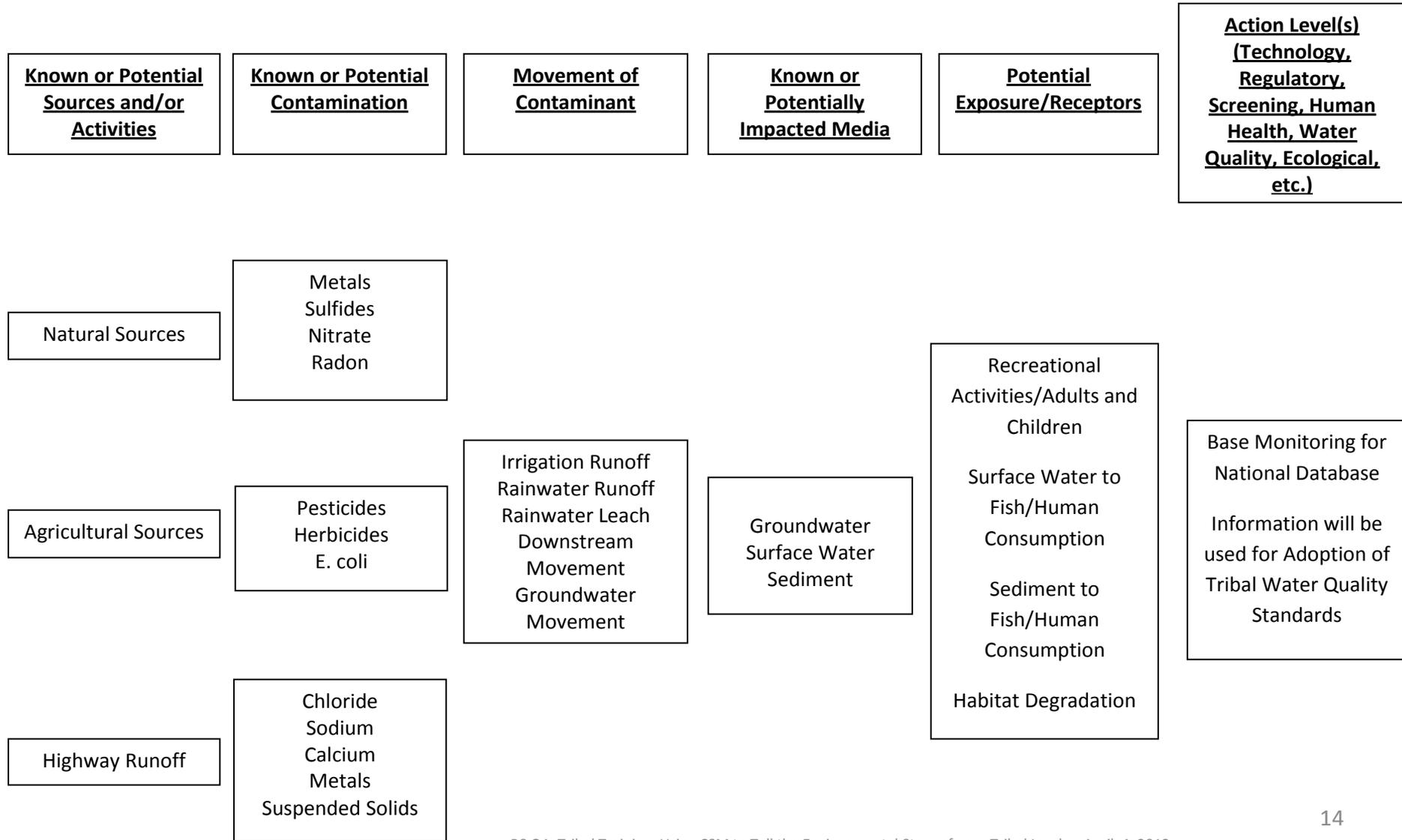
**This document and other QA references may be found at the QA website (<http://www.epa.gov/region8/qa/>)*



Conceptual Site Model Worksheet

Known or Potential Sources and/or Activities	Known or Potential Contamination	Movement of Contaminant	Known or Potentially Impacted Media	Potential Exposure Pathways	Potential Receptors	Action Level(s) (Technology, Regulatory, Screening, Human Health, Water Quality, Ecological, etc.)

CSM Worksheet: Big Sioux River

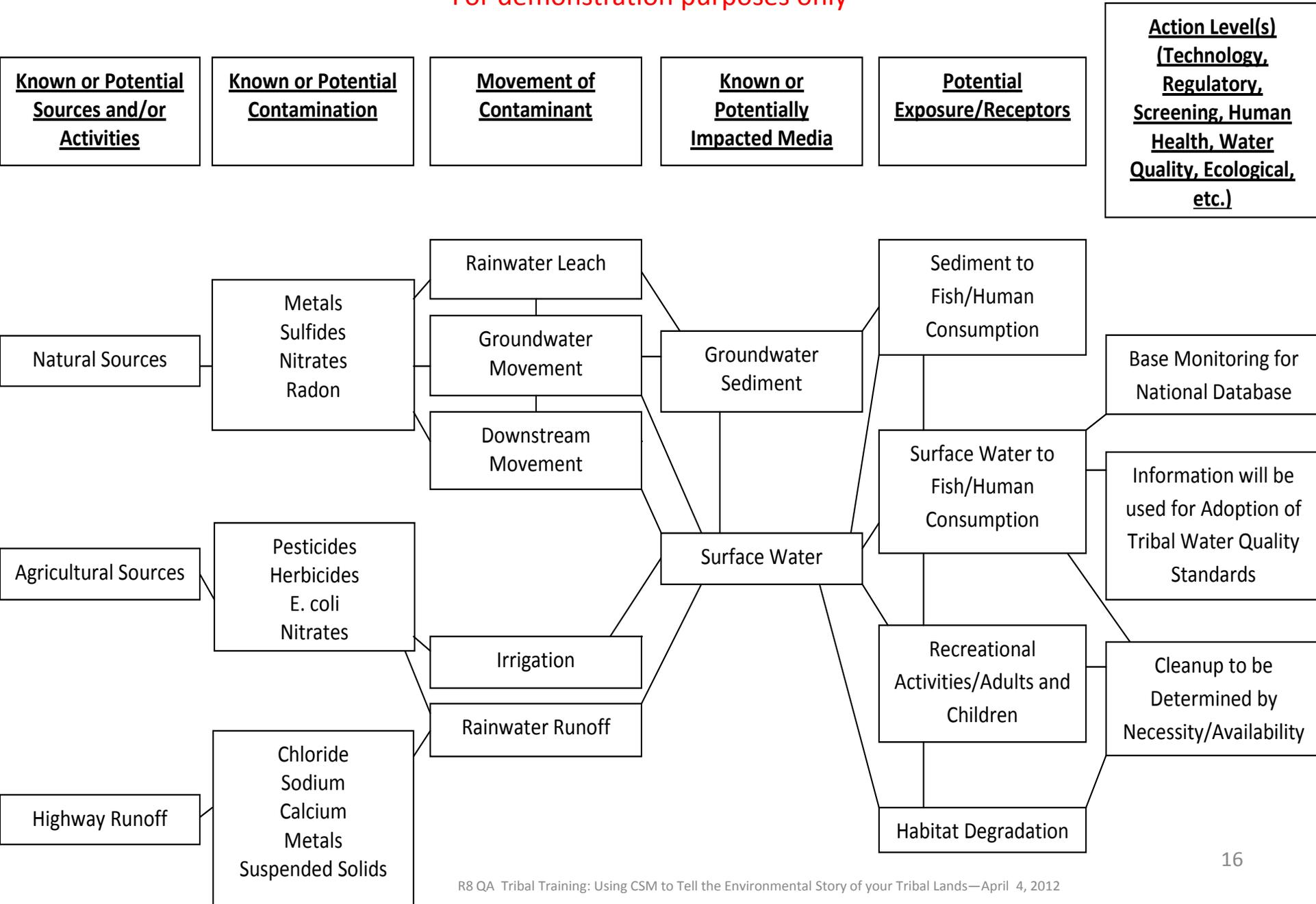


Build a Conceptual Site Model



Big Sioux A Conceptual Site Model

For demonstration purposes only



For demonstration purposes only

Potential Ecological Receptors
(Habitat Degredation)

Potential Human Receptors

Recreational

Known or Potential Sources and/or Activities

Known or Potential Contamination

Movement of Contaminant

Known or Potentially Impacted Media

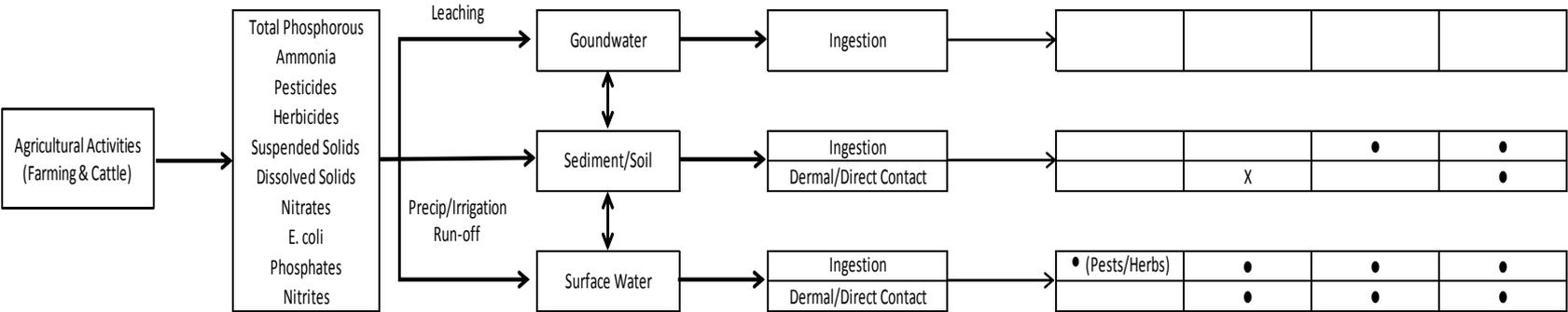
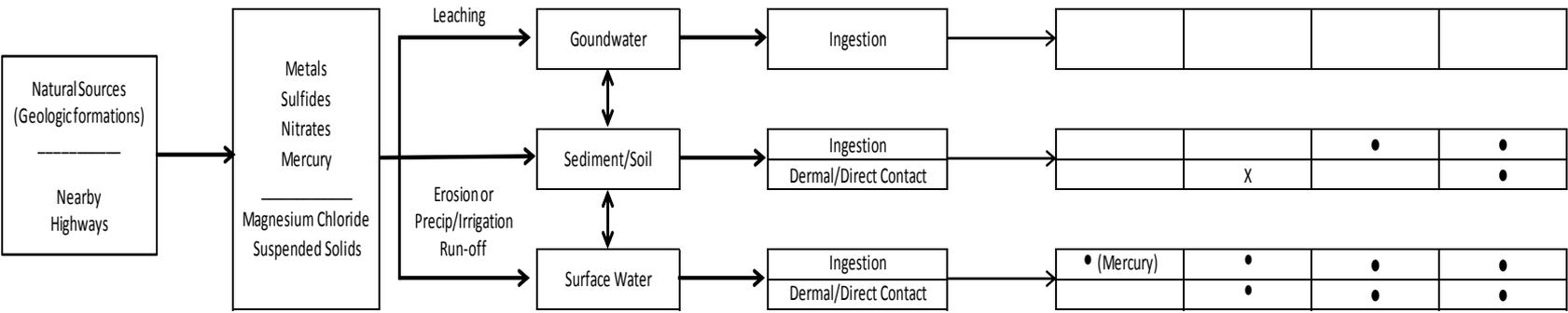
Potential Exposure Pathways

Fish Consumption (Adults & Children)

Recreational Activities (Adults & Children)

Aquatic Freshwater Fish

Benthic Invertebrates



LEGEND:

	Pathway is not complete, no evaluation required
X	Pathway is or may be complete, but is judged to be minor or unlikely. Quantitative data collection not required.
●	Pathway is or may be complete, collect quantitative data.



*initial target levels and justification listed on next tab and in Appendix C of the QAPP.

Initial Target Level(s)

- Numerical values included in the QAPP to define the laboratory detection limits needed to make decisions at your site
- Initial Target Level(s) may be:
 - Technology limits (e.g., analytical detection limits)
 - Risk-based concentrations or screening levels
 - Regulatory standards (Tribal, Federal or State)
 - Regulatory criteria (MCLs, tribal, etc.)
 - Other?
 - or a combination of all of the above
- Based upon CSM information (receptors, media and contaminants of concern)



Conclusions

- CSMs are a tool to aid in defining your
 - General site conditions or status
 - Overall Project Goals (e.g., Monitoring Strategy)
 - Annual Sampling Goals (e.g., QAPP)
 - Initial Target Level(s) for laboratory analysis of your samples
- Update your CSM annually to reflect new information or data you've gained from the last sampling season
- CSMs communicate the **pictorial story** of environmental conditions on your Tribal Lands (your “go to” document)
- Use CSMs at any stage in your work to refine your understanding of the site conditions (initial site characterization, and selection of remedial alternatives, post-remediation monitoring, etc.)



Questions?



Handouts

1. EPA Conceptual Site Model Worksheet*
2. Case Study Handouts
 - Flandreau Tribe Site Map
 - Flandreau Tribe CSM

**This document and other QA references may be found at the QA website (<http://www.epa.gov/region8/qa/>)*

