Spokane River Regional Toxics Task Force Monitoring Objectives Meeting

July 24, 2013
Agenda

• Background and Status
• Monitoring Plan Design
  – Up-front specification of objectives
• Data Quality Objectives for Other Tasks
• Discussion
  – Consensus on primary objectives
  – Discussion of required certainty of data
Background

• Provide technical support to the SRRTTF in developing a plan to bring the Spokane River into compliance with applicable water quality standards for toxic pollutants

• Work being conducted in four phases
  – Phase 1: Gather existing data, identify data gaps, prepare a monitoring plan
  – Phase 2: Collect new data
  – Phase 3: Analyze data and characterize sources
  – Phase 4: Assess potential BMPs and develop Comprehensive Plan
Phase 1 Tasks and Status

- Work Plan √ Completed
- Data Request Memo √ Completed
- Review SOPs √ Completed
- Collection of Existing Data √ Completed
- Data Review and Evaluation – July 31, 2013
- Data Gap Identification – August 31, 2013
- Review of Modeling Tools – September 15, 2013
- Data Collection Strategy – November 15, 2013
- QAPP/SAPP – January 15, 2014
- Scoping for Future Phases – February 15, 2014
Monitoring Plan Design

• Goal of monitoring is to produce information needed for effective environmental management

• Management information needs should be expressed as *clear objectives* to guide design and implementation of monitoring program
Hierarchy of Monitoring Objectives

Broad Objectives
(management-oriented)

Detailed Sampling Plans
(technically-oriented)
Hierarchy of Monitoring Objectives

• Level I – Public/Management Concerns
  – Broadest-level questions
• Level II – Management/Scientific Objectives
  – Combination of management and technical issues
• Level III – Measurement Goals
  – Broad-level technical planning
• Level IV – Technical Plans and Methods
  – Detailed technical planning
Example SRRTTF Objectives

I. Overall management goals
   – What needs to be done to bring the Spokane River in compliance with water quality standards for toxics?

II. Combined management and technical issues
    – What degree of certainty/precision is required?

III. Broad-level technical planning
     – What agencies will be responsible for the monitoring?

IV. Technical details
    – Sampling parameters, locations, frequency, protocols
Today’s Goals

• Obtain consensus on Level I Objectives
• Conduct discussion of Level II Objectives

Note: Level III and IV Objectives will not be addressed until Level I and II Objectives are finalized
Stated SRRTTF Level I Objectives

• Develop a comprehensive plan to bring the Spokane River into compliance with applicable water quality standards for toxic pollutants
  – Can be divided into two monitoring-related objectives
    1. Define the nature and magnitude of existing pollutant loads
    2. Define the relationship between loads and resulting environmental concentration
Stated SRRTTF Level I Objectives

- Other objectives listed in the draft SRRTTF Work Plan also include:
  - Establish the baseline conditions for PCBs and the other identified toxics
  - Monitor and assess the effectiveness of toxic reduction measures
  - Be adaptable to take into account newly generated data and sampling techniques
Questions on Level I Objectives

• How much emphasis should be given to dioxins/furans relative to PCBs?
  – Some documents mention PCBs only; some mention “toxic pollutants”

• How forward-looking does the initial monitoring plan need to be?
  – Current scope of work is for one year of monitoring
  – Some objectives are suited for long-term monitoring

• Are there other Level I Objectives not stated here?
Level II Objectives

• Level II combines management and scientific objectives
  – Level II objectives are defined for each Level I objective
• Questions that can be used to help define Level II objectives:
  – What are acceptable levels?
  – What degree of certainty/precision is required?
  – What monitoring strategy is appropriate?
  – What spatial scale is appropriate?
  – What temporal scale is appropriate?
Level II: Define Existing Pollutant Loads

• Acceptable levels/required certainty
  – Water quality standards in Spokane are very low
  – Monitoring costs depends on required certainty
  – How much effort should be devoted to accurately quantifying very small sources? Options include:
    • Measure all sources, regardless of size, with the level of accuracy typically provided by TMDL studies.
    • Measure all *significant* sources with the level of accuracy typically attributed to TMDL studies, and accept much larger uncertainty for very low-level sources.
Level II: Define Existing Pollutant Loads

• Monitoring strategy
  – Combination of direct measurement, literature values and model simulation

• Spatial scale
  – Define loads at a sub-watershed scale
  – Understand origin of sources

• What temporal scale is appropriate?
  – Annual scale is acceptable
Level II: Define Relationship between Loads and Resulting Concentration

- Acceptable levels/required certainty
  - Similar to defining loads – how low do we go?
- Monitoring strategy
  - Monitoring data will be used to calibrate water quality model
- What spatial scale is appropriate?
  - Laterally/vertically averaged is acceptable, but finer detail may be used
- What temporal scale is appropriate?
  - Annual scale is acceptable, but finer time scale may be needed to provide accurate annual results
Level II: Define Baseline Conditions

• Acceptable levels/required certainty
  – Is the level of detail/certainty provided by prior objectives sufficient, or do we want to define baseline conditions in greater detail?
  – If greater detail is desired, how much?
Level II: Define Baseline Conditions

• Do we better define baseline loading prior to monitoring in the watershed to find sources?
  – Routine dry weather monitoring at gaging stations
  – Use this data to more accurately define monitoring needs
Data Quality Objectives for Other Tasks

• TMDL QAPPs require specification of Data Quality Objectives
  – Define qualities that data must possess to be considered in the TMDL
• Issue of “How accurate do data need to be?” extends into other tasks, as well
  – Review of existing data (i.e. “secondary” data)
  – Existing and future SOPs
Secondary Data Quality Objectives

• Different categories of secondary data quality
  a. Data were generated under an approved QAPP or other sampling document and fully validated;
  b. Data generated under a QAPP but documentation of validation not provided;
  c. Data come from peer-reviewed publications; and
  d. Data collected without an approved QAPP, but come from a reliable source
Secondary Data Quality Objectives

• Several existing data sources are not “a” quality
  – Some data collected as part of a QAPP, but no documentation provided of evaluation of QA/QC data (i.e. Category “b”)
  – Some data were collected outside of a QAPP, but from reliable sources (i.e. Category “d”)

• What data do we use/exclude?
Secondary Data Quality Objectives

• Current plan for considering secondary data
  – Perform data validation for Category “b” sources
  – Exclude those data that don’t meet validation criteria
• Consider all remaining data using a graded approach
  – Significance of decision to be supported by data depends on data category
  – Category “a” and screened category “b” data given full consideration
  – Category “c” and “d” data used more to support weight of evidence approach
Data Quality Objectives and Ongoing Monitoring

• Our review of existing SOPs identified variability in QA/QC procedures
  — Scope of SOP review task was not designed to define data quality objectives

• Data quality objectives will need to be defined moving forward
  — Plan to work with Ecology to define consistent QA/QC protocols for ongoing monitoring
Questions for Discussion: Level I

- How much emphasis should be given to dioxins/furans relative to PCBs?
- How forward-looking does the monitoring plan need to be?
- Are there other Level I Objectives not stated here?
Questions for Discussion: Level II

• How much effort should be devoted to accurately quantifying very small sources?

• Does the objective “Define Baseline Conditions” require more detail than what is necessary to support the model?

• Should the monitoring plan be staged?
  – Better data, but delays completion of comprehensive plan
  – Tradeoff between schedule/accuracy/budget