

# ADVISORY COMMITTEE ON WATER INFORMATION

- Recommendation for:
  - Data Elements for Reporting Water Quality Results of Chemical and Microbiological Analytes
- From the National Water Quality Monitoring Council
  - May 15, 2001

# OBJECTIVE OF THIS PRESENTATION

- Recommend to the Advisory Committee on Water Information a set of “Data Elements for Reporting Water Quality Results of Chemical and Microbiological Analytes” to:
  - Improve consistency of reporting across programs
  - Improve efficiency of data use
  - Establish a common framework for data sharing

# Direction from the National Water Quality Monitoring Council

- Objective:
  - To develop and recommend a “core” set of data elements for reporting water quality monitoring results, to be voluntarily implemented, that would allow data to be compared regardless of, but recognizing, the purpose of the monitoring activity

# DEVELOPMENT APPROACH

- ITFM concluded difficulty in data sharing
- NWQMC approves reference 1/99
- Methods & Data Comparability forms ad hoc committee
- WQ Data Elements Committee meets 3/99 to 3/01
- Committee holds Austin TX workshop 4/00
- NWQMC approves public review/meetings

# Criteria for WQDE Development

- Answer basic questions to facilitate data exchange:
  - Who? (Which organizations are responsible?)
  - What? (What was monitored and found?)
  - Why? (Why was the monitoring purpose?)
  - When? (When was the monitoring done?)
  - Where? (Where was the monitoring done?)
  - How? (How was the sampling/testing done?)

# BENEFITS OF COMMON SET OF DATA ELEMENTS

- Provide the basis for common documentation
- Can share with confidence
- Compare results more readily
- Facilitate more effective and economical use of monitoring resources at all levels

# Process Participants

- Workgroup - 16 representatives of:
  - Local, State, Federal, Private Sector, Research Organizations
- Austin TX NWQMC Workshop - over 60 participants from all types of organizations
- Public Comments - from 36 organizations
- Bottom Line: Supported Approach

## • WQDE Committee

- East Bay Municipal Utility District (California) - Bob Berger
- Hampton Roads Sanitation District (Virginia) - Norm LeBlanc
- Merck, Inc. - Clifford Annis
- National Water Research Institute - Ron Linsky
- George Washington University -Rebecca Parkin
- Association of Public Health Laboratories - Lynn Bradley
- Delaware River Basin Commission - Ed Santoro
- Florida Department of Environmental Protection -Ellen McCarron
- Virginia Department of Environmental Quality - Roger Stewart
- New Jersey State Geological Survey - Karl Muessig
- New York Department of Health - Katherine Alben
- Washington Department of Environmental Quality - Lynn Singleton
- Arizona Department of Environmental Quality - Mario Castenada
- US Department of Commerce, National Institute of Standards and Technology - John Rumble
- US Geological Survey - Glenn Patterson, Charlie Peters, Donna Francy
- US Environmental Protection Agency - Chuck Job, Chuck Spooner, Brand Niemann

# Data Model

1.0 Contact

2.0 Results

3.0 Reason for Sampling

4.0 Date/Time

5.0 Location

6.0 Sample Collection

7.0 Sample Analysis

# Data Model

- 1.0 Contact - 21 data elements
- 2.0 Results - 4 data elements
- 3.0 Reason for Sampling - 1 data element
- 4.0 Date/Time - 4 data elements
- 5.0 Location - 24 data elements
- 6.0 Sample Collection - 17 data elements
- 7.0 Sample Analysis - 23 data elements

- **1.0 Contact**
- 1.1 Sources of Data
  - 1.1.1 Organization Formal Name
  - 1.1.2 Mailing Address
  - 1.1.3 Mailing Address City Name
  - 1.1.4 Mailing Address State Name
  - 1.1.5 Mailing Address ZIP Code/ International Postal Code
  - 1.1.6 Telephone Number
  - 1.1.7 Electronic Mail Address Text
- 1.2 Sampling Entity/Person
  - 1.2.1 Sampling Entity/Person Formal Name
  - 1.2.2 Mailing Address
  - 1.2.3 Mailing Address City Name
  - 1.2.4 Mailing Address State Name
  - 1.2.5 Mailing Address ZIP Code/ International Postal Code
  - 1.2.6 Telephone Number
  - 1.2.7 Electronic Mail Address Text
- 1.3 Laboratory/Field
  - 1.3.1 Laboratory Formal Name Name
  - 1.3.2 Mailing Address
  - 1.3.3 Mailing Address City Name
  - 1.3.4 Mailing Address State Name
  - 1.3.5 Mailing Address ZIP Code/ International Postal Code
  - 1.3.6 Telephone Number
  - 1.3.7 Electronic Mail Address Text

- **2.0 Analyte Sampled**
- 2.1 Result Value
  - 2.1.1 (Result Value) Unit of Measure Name
- 2.2 Analyte Name
  - 2.2.1 Chemical Identifier
  - 2.2.2 Biological Systematic Name
- **3.0 Reason for Sampling**
- 3.1 Reason for Sample Collection
- **4.0 Date/Time**
- 4.1 Sample Collection Start Date
- 4.2 Sample Collection Start Time Measure
- 4.3 Sample Collection End Date
- 4.4 Sample Collection End Time Measure

- **5.0 Location**
- 5.1 Water Body/Aquifer Name
- 5.2 Sample Station Identifier
- 5.3 Sampling Station Type Name
- 5.4 Latitude Measure
- 5.5 Longitude Measure
- 5.6 Latitude/Longitude Accuracy
  - 5.6.1 Horizontal Accuracy Measure
  - 5.6.2 Source Map Scale Number
  - 5.6.3 Coordinate Data Source Name
- 5.7 Latitude/Longitude Method
  - 5.7.1 Horizontal Collection Method Code
  - 5.7.2 Horizontal Reference Datum
  - 5.7.3 Reference Point

- 5.8 Altitude of the Sampling Site
  - 5.8.1 Vertical Measure
    - 5.8.1.1 Vertical Collection Method
    - 5.8.1.2 Vertical Reference Datum
    - 5.8.1.3 Vertical Measure Unit of Measure
- 5.9 Altitude of Sampling Site Features
  - 5.9.1 Water Level
    - 5.9.1.1 Water Level Unit of Measure
  - 5.9.2 Bottom Depth Measure (Surface Water)
  - 5.9.3 Depth at Completion Measure (Ground Water)
    - 5.9.3.1 Bottom Depth Unit of Measure
  - 5.9.4 Well Open Interval Type
    - 5.9.4.1 Well Open Interval Unit of Measure
- 5.10 Altitude of Sample
  - 5.10.1 Sample Depth/Altitude Units Text

- **6.0 Sample Collection**
- 6.1 Sample Type
- 6.2 Media Sampled
- 6.3 Sample Temperature
  - 6.3.1 Temperature Unit Measure
- 6.4 Sample Identification
- 6.5 Sample Collection Method
- 6.6 Sample Preservation / Treatment
  - 6.6.1 Container Type
  - 6.6.2 Container Color
  - 6.6.3 Container size
    - 6.6.3.1 Container size unit of measure
  - 6.6.4 Sample collection filtering
  - 6.6.5 Chemical preservation method
  - 6.6.6 Temperature preservation method
- 6.10 Sample volume
  - 6.10.1 Sample volume unit of measure
- 6.11 Sample weight
  - 6.11.1 Sample weight unit of measure

- **7.0 Sample Analysis**
- 7.1 Extraction/Processing Date
- 7.2 Extraction Process Time
- 7.3 Analysis Date
- 7.4 Analysis Time
- 7.5 Analytical Method Number
- 7.6 Sample Size
- 7.6.1 Sample Size Unit of Measure
- 7.7 Serial Dilution
- 7.8 Composite Sample
- 7.9 Run Batch
- 7.10 (Spiking) Amount or Dose Added
- 7.10.1 (Spiking Amount or Dose Added) Unit of Measure
- 7.11 Analytical Precision
- 7.12 Analytical Accuracy/Error
- 7.13 Controls
- 7.13.1 Positive Control
- 7.13.2 Positive Control Result
- 7.13.3 Negative Control
- 7.13.4 Negative Control Result
- 7.14 Detection / Quantitation Level Measure
- 7.14.1 Detection / Quantitation Level Unit of Measure Name
- 7.15 Detection / Quantitation Level Type
- 7.16 QA/QC Exception Flags
- 7.16.1 QA/QC Comment Field

- Organizations that came or commented

- Metropolitan Water Reclamation District of Greater Chicago (MWRDGC)
- Illinois EPA
- East Bay Municipal Utility District
- California Dept of Health Services
- California State Water Resources Control Board, Division of Clean Water Programs,
- ArsenaultLegg, Inc.
- Colorado Department of Health and Environment, Lab Division
- Catalyst
- Brown & Caldwell, Engineering (Denver)
- Colorado Water Quality Monitoring Council
- Colorado Department of Health and Environment Water Quality Control Division
- USGS\_WRD, Denver Federal Center
- National Park Service - Water Resources Division
- Colorado Department of Health and Environment \_ Laboratory and Radiation Services
- South Platte Coalition for Urban River Evaluation (SP CURE)
- US Environmental Protection Agency Region 8
- Assn. of Public Health Laboratories

- **\*Comments Received or Postmarked by April 30, 2001**
- Louisiana Dept. of Environmental
- Meadowlands Environmental Research
- National Park Service
- Missouri Dept. of Natural Resources
- Florida Dept. of Environmental Protection
- Washington State Governor's Salmon Recovery Office
- Colorado Water Quality Monitoring Council
- Metro Wastewater Reclamation District, Denver, CO
- Assoc. Metropolitan Sewerage Agencies (AMSA)
- Oregon Dept of Environmental Quality
- New Jersey Dept of Environmental Protection
- Indian Health Service
- Wisconsin Dept Natural Resources
- Alabama Environmental Monitoring
- Environmental Data Standards Council
- California Urban Water Agencies
- American Water Works Assoc.
- Hunton&Williams o/b/ Utility Water Action Group and Ford Motor Co.
- Association of State Drinking Water Administrators (ASDWA)

# Comments Summary

1. Unanimous support for the *concept* of a standard set of core data elements
2. Unanimous support that the use/implementation is voluntary
3. Commentors noted they already used the list to plan or improve their data requirements – even if they can't adopt all elements now
4. Majority of data elements are “collected” in some form, but not typically recorded in results databases
5. Concern that the entire dataset may be burdensome, especially for small entities
6. Suggestions included: Using some phased approach for implementation
  - > Full list/ Long list the longer range goal
  - > Approach as a “time-step” for implementation
7. Note that the metadata are a framework to provide confidence in the use of data;
  - > People should understand that their data may not be used without such metadata
  - > Should not be an “all or nothing approach”
8. Emerging technologies may help in the long run, but in the short run there will be challenges
9. Data systems should not need to be reconfigured just to “rename” or reorganize data elements (in the proposal synonymous elements were expected and acceptable)
10. Don't get too specific in addressing database issues (e.g., alpha-numeric specifications)
11. Add Comment fields in many elements
12. Need Communications Strategy; need to make list widely available
  - > Use voluntary consensus groups
  - > Provide “guidance” documents to help users understand the intent and use
  - > Develop template for data entry and storage (e.g., STORET)

# Implementation Plans

- Implementation Strategy
- Pilot Projects
- Environmental Data Standards Council review
- Publicize through documentation, articles and presentations

# Data Elements for Reporting Water Quality Results of Chemical and Microbiological Analytes

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