APPENDIX B. Credible Data Requirements

(Revised January 2004)

Credible and Scientifically Defensible Data Requirements from the Impaired Waters Identification Rule (R18-11-602)
(An abridged, reader-friendly version)

Credible and scientifically defensible data.

1. Develop a Quality Assurance Plan (QAP) and Sampling Analysis Plan (SAP) that meets the following requirements:

- An approval page – date of approval, signatures of the approving officials;

- A project organization outline - identify personnel, organizations, and laboratories involved in monitoring, specific roles and responsibilities;

- **Sampling design** that ensures that:
  1. Samples are spatially and temporally representative of the surface water;
  2. Samples are taken at locations and in a manner so that samples fairly represent surface water conditions; and
  3. The monitoring is reproducible;

- **A SAP containing**, at a minimum, the following elements:
  1. Experimental design of the project, the project goals and objectives, and evaluation criteria for data results;
  2. Background or historical perspective of the project;
  3. Identification of target conditions – indicate weather conditions, seasonal variations, stream flow, lake level, or site access issues that may affect the project and sampling;
  4. Identification of data quality objectives – describe in quantitative and qualitative terms how the data will meet the project objectives of precision, accuracy, completeness, comparability, and representativeness;
  5. The types of samples scheduled for collection;
  6. The sampling frequency and the sampling periods,
  7. The sampling locations -- rationale for the site selection, how site locations are benchmarked, including scaled maps indicating approximate location of sites; and
  8. A list of the field equipment – including tolerance range and any other manufacturer's specifications relating to accuracy and precision;

- **A field sampling QAP** containing the following field sampling information (at a minimum):
  1. Sampling and field protocols for each parameter or parametric group – sampling methods, equipment and containers, sample preservation, holding times, and a description of analysis to be conducted in the field or outside of a laboratory;
  2. Sample identification and custody protocols used;
  3. Quality control protocols – describe the number and type of field quality control samples (field blanks, travel blanks, equipment blanks, method blanks, split samples, and duplicate samples);
  4. Procedures for testing, inspecting, and maintaining field equipment;
  5. Field instrument calibration procedures that describe how and when field sampling and analytical instruments will be calibrated;
  6. Field notes and records that describe the conditions that require documentation in the field, such as weather, stream flow, transect information, distance from water edge, water and sample depth, equipment calibration measurements, field observations of watershed activities, and bank conditions. Indicate the procedures implemented for

maintaining field notes and records and the process used for attaching pertinent information to monitoring results to assist in data interpretation;
7. Minimum training needed and how training will be achieved -- including any specialized training;

- **A laboratory QAP** containing the following laboratory analysis methods and quality assurance/quality control procedures, at a minimum: (Simply reference the laboratory Quality Assurance Plan if it contains all of the following)
    1. Analytical methods and equipment necessary for analysis of each parameter, including the laboratory detection limits for each parameter. Note that data collection, preservation, and analysis of all chemical and toxicological samples must meet requirements established by the Arizona Department of Health Services in Arizona Administrative Code R9-14-610;
    2. The name of the designated laboratory, its license number (if licensed by the Arizona Department of Health Services), and the name of a laboratory contact person to assist ADEQ with quality assurance questions;
    3. Quality controls – number and type of laboratory quality control samples (field blanks, travel blanks, equipment blanks, method blanks, split samples, and duplicate samples);
    4. Procedures for testing, inspecting, and maintaining laboratory equipment and facilities;
    5. Laboratory calibration procedures -- schedule, and description of methods and record keeping;
    6. Sample equipment decontamination procedures; and
    7. Minimum training needed and how training will be achieved -- including any specialized training.

- **A description of data review, management, and use** in the QAP/SAP at a minimum:
    1. Data handling process from field to laboratory, from laboratory to data review and validation/verification, and from validation to data storage and use. Include roles and responsibility of personnel, description of database, and procedures used by laboratory and data manager. How are data accepted, rejected or qualified? What data qualifiers will be used by the laboratory?
    2. Reports to be made – frequency, content, and distribution;
    3. Reconciliation with data quality objectives - define the process used to determine whether the data collected meets the project objectives, which may include discarding data, setting limits on data use, or revising data quality objectives.

2. **Optional additions** to a good QAP or SAP would include:
    - Distribution list of who received a copy of the approved QAP and SAP;
    - A table of contents;
    - A health and safety plan;
    - The inspection/acceptance criteria for supplies;
    - Description of additional data acquired for the project;
    - Audits and response actions for field, laboratory, and data management activities; and
    - Waste disposal methods.

3. **Exceptions**. ADEQ may accept a QAP or SAP containing less than the required elements if:
    - Data submission requirements (see below) are met,
    - Laboratory requirements (see below) are met, and
    - ADEQ determines that the data yield results that are of comparable reliability to the data collected if all required elements are present. This applies if:
        1. The element is not relevant to the sampling activity due to the limited type of pollutants to be sampled, the type of surface water, and the purpose of the sampling. (The monitoring entity should indicate why the element or elements are not relevant.)

2. The data were collected before July 12, 2002 (approval date of this rule);
3. The data were collected after July 12, 2002 as part of an ongoing monitoring effort by a governmental agency; or
4. Instream water quality data were collected under terms of:
    a. A NPDES or AZPDES permit;
    b. A compliance order issued by the ADEQ or EPA,
    c. A consent decree signed by ADEQ or EPA, or
    d. A sampling program approved by the ADEQ or EPA under WQARF or CERCLA.

4. **Laboratory Requirements**. All chemical and toxicological samples must be analyzed in a state-licensed laboratory, a laboratory exempted by the Arizona Department of Health Services for specific analyses, or a federal or academic laboratory that can demonstrate proper quality assurance/quality control procedures substantially equal to those required by the Arizona Department of Health Services. These laboratories shall use approved methods identified in A.A.C. R9-14-610.

5. **Documentation for data submission.** The monitoring entity needs to provide ADEQ with the following information either before or with data submission:

- A copy of the QAP and/or SAP, or revisions to a previously submitted QAP and/or SAP, and any other information necessary for ADEQ to evaluate the data. If revised, indicate when the new QAP/SAP went into affect, so it can be related to data collected;
- Written assurance that the methods and procedures specified in the QAP and SAP were followed;
- The name of the laboratory used for sample analyses and its certification number, if the laboratory is licensed by the Arizona Department of Health Services;
- The quality assurance/quality control documentation, including the analytical methods used by the laboratory, method number, detection limits, and any blank, duplicate, and spike sample information necessary to properly interpret the data, if different from that stated in the QAP or SAP;
- The data reporting unit of measure;
- Any field notes, laboratory comments, or laboratory notations concerning a deviation from standard procedures, quality control, or quality assurance that affects data reliability, data interpretation, or data validity; and
- If needed by ADEQ to interpret the data, other information may be requested during the assessment, such as information related to flow, field conditions, or documented sources of pollutants in the watershed. Note that this information is particularly important in determining whether "natural background conditions" are the sole cause of the exceedance.

6. **Record Keeping**. The monitoring entity needs to maintain all records. If a surface water or segment is assessed, ADEQ will coordinate with the monitoring entity to ensure that records are kept for the duration of any further investigations based on the assessment.