

QUALITY ASSURANCE PROJECT PLAN
for
Secondary Data Collection and Analysis

FY 09/10 604b
Scenic Rivers Phosphorus Criterion Review
CA #C6-400000-48
Project 7



OKLAHOMA WATER RESOURCES BOARD
WATER QUALITY PROGRAMS DIVISION
3800 NORTH CLASSEN
OKLAHOMA CITY, OK 73118

May 2011

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A. Project Management

A.1. TITLE AND SIGNATURE PAGE

**FY 09/10 604b Scenic Rivers Phosphorus Criterion Review
CA #C6-400000-48, Project 7**

Oklahoma Water Resources Board

_____ Date: _____
Derek Smithee, Division Chief,
Oklahoma Water Quality Programs Division

_____ Date: _____
Phillip Moershel, Water Quality Standards Section Head
Oklahoma Water Quality Programs Division

_____ Date: _____
Lynda Williamson, Quality Assurance Officer
Water Quality Programs Division

Office of the Secretary of the Environment

_____ Date: _____
Gayle Bartholomew, Environmental Grants Manager
Office of the Secretary of Environment

EPA

_____ Date: _____
Kara Alexander, EPA Region VI Project Officer

_____ Date: _____
EPA Region VI Approving Official

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A.3. Distribution List

The following represents the list of individuals who will receive copies or have access to copies of the final approved QAPP for this project.

Derek Smithee,
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Phil Moershel,
Jason Childress,
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Water Quality Programs Division
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Oklahoma City, OK 73118

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3800 N. Classen Boulevard
Oklahoma City, OK. 73118

Kara Alexander
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US EPA, Region VI
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Dallas, TX 75202-2733

A.4. Project Organization

The OWRB Director has the responsibility, at the direction of the Governor through the Board, of overseeing all operations of the Board staff for the people of Oklahoma. The Director has numerous Program Division chiefs who direct and coordinate all the program operations within their respective divisions. Section Heads are assigned the responsibility of overseeing the daily progress and activities of programs within their sections. Each OWRB Project Manager has the responsibility of insuring the efficient, timely and accurate completion of the projects to which they are assigned. Part of this responsibility is coordination of the various facets of the project from design to data collection protocols and onward to the construction of the final document.

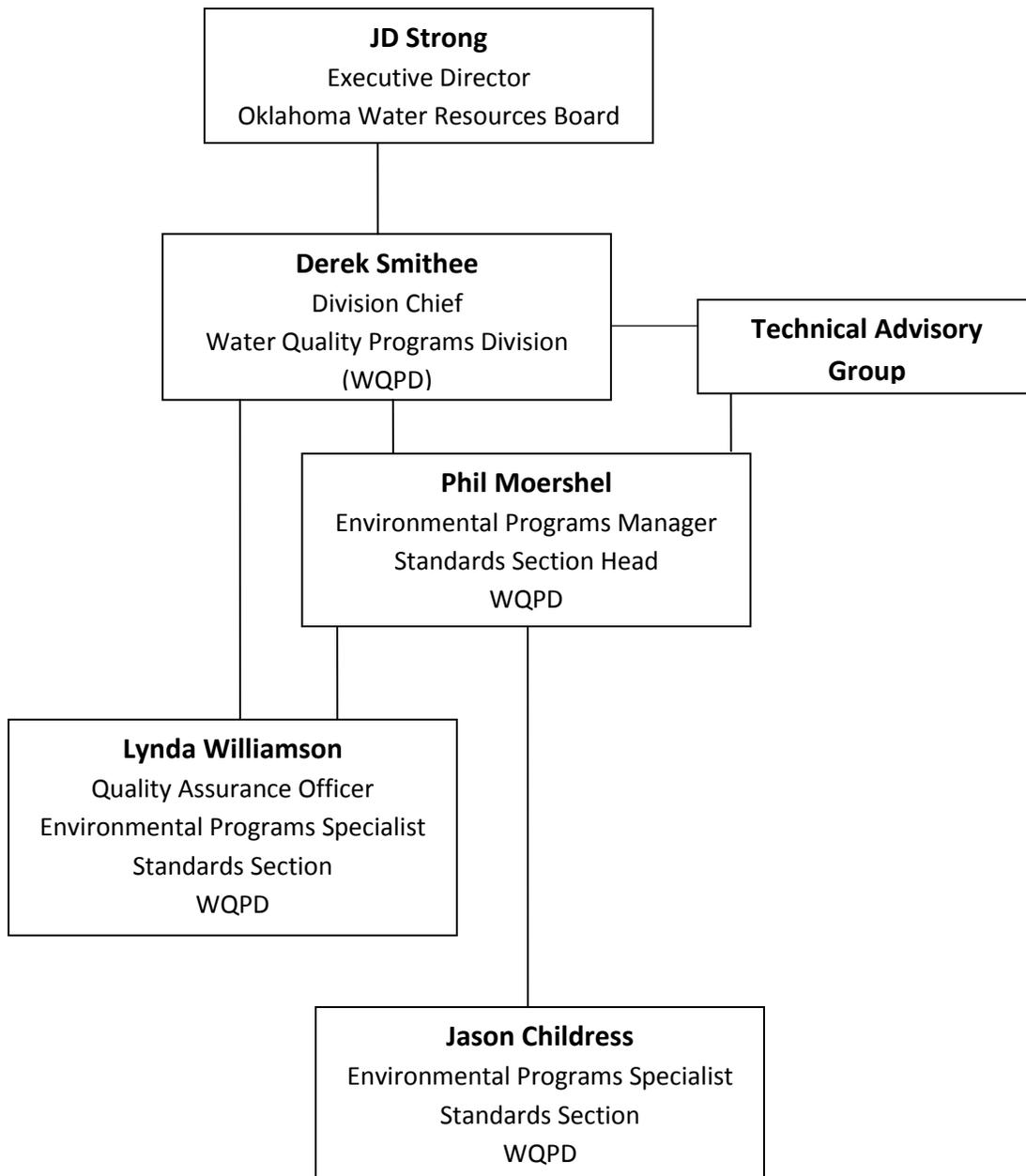


Figure 1. OWRB Water Quality Programs Division Chain of Command Structure for this Project.

Table 1. Description of Project Positions, Personnel, and their Responsibilities.

<p>Kara Alexander Project Officer EPA Region VI</p>	<p>Responsible for grant administration from USEPA Region VI, QAPP review and approval, and final report approval.</p>
<p>Gayle Bartholomew Environmental Programs Manager OK Office of the Secretary of Environment</p>	<p>Responsible for grant administration by the Oklahoma Office of Secretary of Environment.</p>
<p>J.D. Strong Executive Director, Oklahoma Water Resources Board</p>	<p>Responsible for all aspects of OWRB actions and programs. Reports directly to the 9 Members of the Oklahoma Water Resources Board.</p>
<p>Derek Smithee, Chief Water Quality Programs Division Oklahoma Water Resources Board</p>	<p>Directs and coordinates all program operations within the Water Quality Programs Division.</p>
<p>Lynda Williamson Quality Assurance Officer Oklahoma Water Resources Board Water Quality Programs Division Environmental Programs Specialist Standards Section</p>	<p>The Quality Assurance Officer (QAO) for the OWRB is charged with monitoring the quality control activities to determine conformance, distributing quality control related information, training personnel on QC procedures, reviewing QA/QC documents for completeness, and approving QA plans and reports. The QAO will maintain the official, approved QA project plan (QAPP).</p>
<p>Phil Moershel Water Quality Standards Section Head Environmental Programs Manager Oklahoma Water Resources Board Water Quality Programs Division</p>	<p>Responsible for project oversight and guidance.</p>

<p>Jason Childress Environmental Programs Specialist Standards Section</p>	<p>Responsible for developing and implementing the project plans, collecting and processing secondary data and detailing results of the project in a draft final report.</p>
<p>Technical Advisory Group: Shanon Phillips (OCC), Quang Pham (ODAFF) Shellie Chard-M^cClary (ODEQ), Cara Cowan Watts (Cherokee Nation) Ed Swaim (ANRC), Steve Drown (ADEQ), Melinda McCoy (USEPA) Derek Smithee (OWRB) Facilitator</p>	<p>Advise OWRB staff regarding acquisition of “best available scientific information” and for recommendation to OWRB staff regarding additional criterion development should be pursued.</p>

A.5. Problem Definition and Background

The Oklahoma Legislature resolved to protect a handful of treasured streams when, in 1970, it passed the “Scenic Rivers Act” (82 O.S. 1451-1471) as a means to identify and preserve the unique characteristics and uses of the state’s most scenic streams. This same legislation identified four streams to be designated as “Scenic River Areas”: Flint Creek, Illinois River, Barren Fork Creek, and Upper Mountain Fork River. In 1975, the Legislature added Lee Creek and Little Lee Creek. The primary purpose of the Scenic Rivers Act, and the subsequent Water Quality Standards (WQS) regulations promulgated pursuant thereto, is to preserve the high quality and unique characteristics of these outstanding resource waters.

*“The Oklahoma Legislature finds that some of the **free-flowing streams and rivers of Oklahoma** possess such **unique natural scenic beauty, water conservation, fish, wildlife and outdoor recreational values of present and future benefit to the people of the state** that it is the policy of the Legislature to preserve these areas for the benefit of the people of Oklahoma. For this purpose there are hereby designated certain “scenic river areas” to be preserved as a part of Oklahoma's diminishing resource of free-flowing rivers and streams.”*

A body of statute and rule has been subsequently established to protect Oklahoma’s six Scenic Rivers. Rules are now in place limiting placement of septic tanks, placement of poultry houses, disposal poultry waste, and disposal of biosolids. Substantial resources have been dedicated to limiting nutrients in the watersheds with Best Management Practices (BMP) demonstrations, incentives and education. Antidegradation protection for scenic rivers, in place since 1973, adds basis to implement the statutory policy to preserve the Scenic Rivers as a part of Oklahoma's diminishing resource of free-flowing rivers and streams.

In 2001, it was recognized that both empirical and anecdotal evidence over the preceding two decades indicates that, Illinois River status as a “Scenic River” pursuant to Title 82 Chapter 21 of Oklahoma Statute, was seriously threatened by excess nutrients. These nutrients - primarily phosphorus – were seen to be causing accelerated primary productivity in the Illinois River, resulting in significant growths of both attached algae (periphyton) and suspended algae (phytoplankton). As a consequence, historical river clarity and substrate quality were being adversely affected to such an extent that, without intervention, the Illinois River’s exceptional ecological and recreational significance were in jeopardy. Unfortunately, the problems with ecological and recreational integrity

on the Illinois River are also present in the other five Scenic Rivers. Although less pronounced and obvious to the public, the Baron Fork River, Flint Creek, Lee Creek, Little Lee Creek and the Upper Mountain Fork River above Broken Bow Reservoir were all showing signs of adverse impacts from excess nutrients.

To holistically address these problems and protect Oklahoma's six Scenic Rivers, it was proposed that a numerical criterion be incorporated into Oklahoma's WQS applicable to total phosphorus for all six Scenic Rivers. While water quality management programs were already in place to protect designated beneficial uses, this numerical value should assure that water quality better than that necessary to support beneficial uses is achieved. Based upon input received through personal communications and at informal water quality standards meetings in late 2001, the general consensus was that Oklahoma's six Scenic Rivers should be "better than average"

OWRB staff investigated statistical techniques appropriate for historical data. EPA's July 2000 *Nutrient Criteria Technical Guidance Manual for Rivers and Streams* (EPA-822-B-00-002) based a substantial portion of their recommended nutrient criteria on the premise that the 25th percentile of nutrient concentrations on all streams in a given region is roughly equivalent to the 75th percentile of concentrations in least impacted or reference quality streams. An analysis of nutrient values in relatively un-impacted basins is found in *Nutrient Concentrations and Yield in Undeveloped Stream Basins of the United States* (Gregory M Clark, David K. Mueller and M. Alisa Mast; *Journal of the American Water Resources Association* Volume 36, No. 4 August 2000). This research was the basis for this comparison as it evaluates total phosphorus data on least impacted/reference sites. In this report, 75 % of the streams assessed in least impacted areas had a flow weighted total phosphorus concentration of 0.037 mg/L or less. This value was similar to the median total phosphorus concentration seen in the Baron Fork River and the relatively un-impacted Mountain Fork River from Oklahoma's Beneficial Use Monitoring Program (BUMP) (0.045 mg/L and 0.028 mg/L, respectively). It is also consistent with USGS monitoring of the Baron Fork which results in a median concentration of 0.03 mg/L. The OWRB staff therefore, recommended that 0.037 mg/L of total phosphorus be promulgated as a numerical criterion to protect our Scenic Rivers.

Revisions of the Oklahoma Water Quality Standards (OWQS) must follow the process required by the Oklahoma Administrative Procedures Act. Prior to adoption, Notice of Rule Making Intent was published in the Oklahoma Register that initiated a 45 day comment period. A Rule Impact Statement was filed and

the formal rule revisions were available for public review. After the 45 day comment period, a formal hearing was held. In the process, over 600 comments were received supporting the criterion or asking for a more stringent criterion. Sixty Five (65) comments were received opposed to the criterion. Subsequent to the public review process, OWRB staff recommended that the Board adopt a not to be exceeded 30 day geometric mean total phosphorus criterion of 0.037 mg/L for the Scenic Rivers in both the Antidegradation section of the OWQS and the Aesthetics beneficial use section.

Recognizing the impacts and the revolutionary nature of the criterion, the nine-member Oklahoma Water Resources Board added the caveat: “*such criterion shall be fully implemented within ten (10) years as provided in a separate rule promulgated by the Board*”. The OWRB then followed through with its requirement of an additional rule and promulgated an emergency rule and a final rule in February 2003.

A serious consequence of criterion is that the discharge of the pollutant to Oklahoma’s Scenic Rivers must be strictly controlled. The point and nonpoint source phosphorus dischargers of northwest Arkansas in particular have steadfastly maintained that the 0.037 mg/L for total phosphorus is neither attainable nor appropriate. EPA negotiated the December 2003, “Statement of Joint Principles and Actions” signed by Oklahoma and Arkansas, stating that “Oklahoma periodically reevaluates all of its water quality standards. In particular, Oklahoma will reevaluate Oklahoma’s 0.037 mg/L criterion for total phosphorus in Oklahoma’s Scenic Rivers by 2012, based on the best scientific information available at that time, and with the full, timely inclusion of officials from the State of Arkansas representing both point and nonpoint source dischargers.” Following this agreement EPA approved the Oklahoma criterion on December 29, 2003.

Additionally, prior to its approval, EPA reviewed the total phosphorus criterion in light of the USGS study previously referenced (Clark et. al.), EPA’s national nutrient criteria recommendations, and Ozark Highlands ecoregion stream data for total phosphorus presented in another USGS report entitled *Percentile Distributions of Median Nitrite Plus Nitrate as Nitrogen, Total Nitrogen, and Total Phosphorus Concentrations in Oklahoma Streams, 1973-2001 (Report 03-4084)*. Based upon this analysis and the record before it, EPA determined that Oklahoma’s total phosphorus criterion of 0.037 mg/L for its Scenic Rivers is sufficient to protect the designated uses of the affected rivers (including the fish and wildlife propagation, recreational, and aesthetic uses).”

Objectives:

The objective of this project will be to reevaluate the Oklahoma Scenic Rivers phosphorus criterion to reaffirm its appropriateness or to recommend if a revised phosphorous criterion might better serve to restore and protect the integrity of Oklahoma’s Scenic Rivers. Because the current criterion has three components, including a magnitude (0.037 mg/L), duration (30-day geometric mean), and frequency (shall not exceed), all three of these components will be considered as part of the criterion reevaluation. The process embodied in this QAPP will facilitate review of the best scientific information available utilizing a technical advisory group that includes appropriate technical staff designated by officials from EPA, Cherokee Nation and the States of Oklahoma and Arkansas representing both point and nonpoint source dischargers. Staff of the OWRB will compile summaries of the information reviewed and recommendations made by the technical advisory group (TAG), then advise the OWRB regarding whether it should separately pursue promulgation of a revised criterion or other alternatives.

If a revised criterion is ultimately pursued by the OWRB, revisions to the Oklahoma Water Quality Standards and Implementation Rules would be made following the procedures for rulemaking and public participation established in the Oklahoma Administrative Procedures Act and the Clean Water Act. Revision of the OWQS must be initiated with publication of formal notice of Rule Making Intent. A Rule Impact Statement must be drafted and along with a 45 day comment period, a formal hearing must be held. Proposed revisions must be approved by the Board and Governor and pass a 30 day legislative review period. The whole process must be certified by the Oklahoma Attorney General as compliant with state law. The revision process culminates with a 60 day EPA review and approval.

A.6. Project and Task Description

The August 2010 Region 6 approved work plan for this project describing the funded tasks is attached as Appendix A.

A.7. Quality Objectives and Criteria

Quality Assurance (QA) and Quality Control (QC) are essential components of all analytical work done at the OWRB. It is vital to our agency that our data is as dependable as possible if we are to best serve our customers, the people of the State of Oklahoma. It is the OWRB’s policy that sufficient QA activities are established and conducted within all programs to ensure data generated and processed is scientifically valid, of known precision and accuracy, of acceptable

completeness, representativeness and comparability, well documented, and where appropriate, legally defensible.

Work done under this Quality Assurance Project Plan (QAPP) will not generate any direct environmental data measurements. The goal for this project is to collect and evaluate the “best scientific information available”. Data will be selected that provide the appropriate information to reevaluate the Oklahoma Scenic Rivers phosphorus criterion to reaffirm its appropriateness or to advise if a revised phosphorous criterion might better serve to restore and protect the integrity of Oklahoma’s Scenic Rivers.

The following are the data quality objectives (DQOs) that have been established for this project following *Guidance on Systematic Planning Using the Data Quality Objectives Process (EPA QA/G-4)(2006)*:

DQO1 - Problem Statement:

The overall condition of a stream is dependent on many factors. Of concern in this study is the influence of phosphorus upon the condition of the stream. Phosphorus is an essential nutrient for the growth of algae. However, slight changes of phosphorus concentration have been demonstrated to cause shifts in the diatom community and in the benthic invertebrate community that feeds upon the diatoms. Higher concentrations have been demonstrated to cause elevated levels of periphyton. Shifts in the fish population and community structure can also be anticipated with excess productivity caused by nutrient pollution. Moderate levels of nutrients can cause excessive growth of algae which affects the aesthetic quality of streams by producing long growths of filamentous algae.

The Oklahoma Scenic Rivers total phosphorus criterion was proposed to restore and protect its Scenic Rivers from impacts by phosphorus. Oklahoma, as part of the Joint Statement of Principles has agreed to reevaluate the criterion. In this project Oklahoma must provide for full and timely inclusion of officials representing point and nonpoint source dischargers to reassess the criterion using the best available scientific information. This reassessment must determine if the adopted criterion is protective of the Scenic Rivers, as well as downstream uses, or if the state should initiate development of new criteria that will protect and restore the unique natural scenic beauty, water conservation, fish, wildlife and outdoor recreational values of these streams as well as to protect downstream beneficial uses.

The reevaluation process must address three perspectives.

- 1) The Oklahoma Scenic Rivers criterion (including the magnitude, duration, and frequency components of the criterion) must preserve unique natural scenic beauty, water conservation, fish, wildlife and outdoor recreational values of these streams,
- 2) The criterion must be protective of the downstream uses of Lake Tenkiller. The State must take into consideration the water quality standards of downstream waters and ensure that its water quality standards provide for the attainment and maintenance of the water quality standards of downstream waters, including the downstream uses of Lake Tenkiller,
- 3) The criterion must be no lower than is necessary to accomplish 1) and 2) to reduce treatment costs for point and nonpoint source dischargers in the watershed.

The review process outlined in this QAPP was initially planned by Phillip Moershel, Derek Smithee, and JD Strong of the OWRB. This criterion reassessment plan also reflects input by EPA Region 6 through the work plan approval process and has been distributed to the technical advisory group (TAG). The project has dedicated funding of \$43,000 as a FY 2010 604(b) Cooperative Agreement through the EPA. This funding will partially provide administrative support and staff salaries for this project.

DQO2 – Decision:

If, with the best scientific information available, maximum phosphorus levels protective of the *unique natural scenic beauty, water conservation, fish, wildlife and outdoor recreational values of present and future benefit to the people of the state* and protective the downstream beneficial uses of Tenkiller Ferry Lake are substantially greater or less than the criterion of 0.037 mg/L total phosphorus based upon a 30 day geometric mean of stream concentrations; **then** the TAG should recommend that OWRB pursue development of a criterion/criteria to replace the current approved criterion. Additionally, if the best scientific information available indicates that a refinement of the duration and frequency components of the current criterion would be appropriate and protective, then the TAG should recommend that OWRB pursue a criterion revision to address these criterion components.

The Data and Information Report regarding the Scenic Rivers phosphorus criterion will be reviewed by the Technical Advisory Group. The TAG review should produce one of three recommendations:

1. No change due to lack of adequate information
2. No change necessary because best scientific information supports the criterion
3. Revise criterion (including the magnitude, duration, and/or frequency components of the criterion) because best scientific information/data indicate that the Scenic River's "*unique natural scenic beauty, water conservation, fish, wildlife and outdoor recreational values of present and future benefit to the people of the state*" and downstream uses will be protected with a different criterion.

DQO3 – Inputs into the Decision: The primary information needed to reevaluate the criterion includes:

- Best available scientific information consisting of:
 - Peer review data literature
 - Nutrient related studies and models, particularly those relating total phosphorus concentrations in the Scenic Rivers to chlorophyll a concentrations in downstream reservoirs, and those that address magnitude, duration, frequency, flow, or seasonal considerations relative to total phosphorus and protection of in-stream or downstream designated uses.
 - Water chemistry data (including, hardness, metals, dissolved oxygen).
 - Scenic River nutrient data (including phosphorus and nitrogen)
 - Scenic River chlorophyll-a data
 - seston
 - periphyton
 - Trophic State Index (TSI) values
 - Dissolved oxygen (DO) related fish kill occurrence data
 - Turbidity
 - Analysis of current Scenic Rivers conditions and progress in implementing all best available phosphorus control practices and treatments
 - Water quality models
 - Stressor response models based upon Oklahoma Scenic rivers data.
 - Aesthetics or recreation usage data and stream user perception surveys

- Biological community
 - fish
 - macroinvertebrates
 - algal
- EPA's Total Phosphorus TMDL modeling run results associated with 30 day geometric mean of 0.037 m/L
- EPA's Total Phosphorus TMDL modeling run results associated with protecting Tenkiller Ferry Reservoir dissolved oxygen (Fish and Wildlife beneficial use) and chlorophyll-a (Public Water Supply beneficial use) criteria.

DQO4 – Study Boundaries: The spatial boundaries of this study are limited to Oklahoma Scenic Rivers and downstream streams and reservoirs.

DQO5 – Decision Rule:

	Condition	Recommendation
1	If a majority TAG finds there is inadequate “best scientific information”; then:	No criteria development recommendation due to lack of adequate information; further literature and information review.
2	If the majority of best scientific information indicate that the Scenic Rivers Criterion is suitable and necessary to restore and maintain Oklahoma Scenic Rivers; then:	No criteria development recommendation because collected information indicate that the criterion is protective
3	If the majority of best scientific information indicate that a criterion greater than Scenic Rivers Criterion would be sufficient to restore and maintain Oklahoma Scenic Rivers; then:	TAG recommendation for criteria development.
4	If the majority of best scientific information indicate that a criterion less than the Scenic Rivers Criterion is necessary to restore and maintain Oklahoma Scenic Rivers; then:	TAG recommendation for criteria development.
5	If the TMDL modeling run results implementing the .037 geometric mean total phosphorus criterion is greater than the total phosphorus annual load required to keep chlorophyll-a concentrations in Tenkiller Ferry Reservoir below and average of 10µg/L; then:	TAG recommendation for development of criteria protective of downstream use
6	If the TMDL modeling run results implementing the 0.037 mg/Lgeometric mean total phosphorus criterion is less than the total phosphorus annual load required to keep chlorophyll-a concentrations in Tenkiller Ferry Reservoir below an average of 10µg/L; then:	TAG recommendation of no criteria development unless 3 or 4 above.
7	If the best scientific information available indicates that a refinement of the duration and frequency components of the current criterion would be appropriate and protective, then:	TAG recommendation for criteria development related to the duration and/or frequency components of the criterion.

Unanimous decisions by the TAG are desired throughout the review process. Where a consensus is not obtained, decisions will follow a simple majority rule. On any given decision the dissenting minority may submit and incorporate a minority opinion in the recommendations presented to the nine members of the OWRB.

DQO6 –Tolerable Limits on Decision Error: False assessment limits (either false negative or false positive) cannot be determined in a group decision format. Limits on the consequences of either a false positive or false negative decision may be mitigated by additional research and phased or extended implementation schedules.

DQO7 – Data Acquisition: See B.9.2.

A.8. Special Training/Certification

All staff working on this project will have prior knowledge of water quality related issues by education or professional work experience. No special training or certification will be needed to complete this project.

A.9. Documentation and Records

The Project Manager is responsible for insuring that all persons listed in Section A.3., receive updated and approved copies of this Quality Assurance Project Plan (QAPP). The Project Manager will maintain all project documents. Project documents will consist of the original or master electronic data obtained from the previously named data providers. The final report will include documentation on data sources and quality, including a data quality disclaimer that will be added to the results.

B. Data Generation and Acquisition

B.1. Sampling and Process Design

This section is not applicable.

B.2. Sampling Methods

This section is not applicable.

B.3. Sample Handling and Custody

This section is not applicable.

B.4. Analytical Methods

This section is not applicable.

B.5. Quality Control

This section is not applicable.

B.6. Instrument/Equipment Testing, Inspection and Maintenance

This section is not applicable.

B.7. Instrument/Equipment Calibration and Frequency

This section is not applicable.

B.8. Inspection/Acceptance for Supplies and Consumables

This section is not applicable.

B.9. Non-direct Measurements (Secondary Data)

B.9.1. Secondary Data Sampling and Process Design

The process established in this QAPP will address acquisition of scientific information relevant to the Oklahoma Scenic Rivers criterion determining what is “best scientific information” and then the review of the best scientific information to recommend action regarding the criterion.

B.9. 2. Secondary Data Acquisition Methods

Technical Advisory Group (TAG) member contributions: Individual TAG members/organizations will provide suggested papers, reports, data, model results for review by the relevant technical staff of the TAG.

OWRB staff will seek analysis of state, federal and tribal data and data contained in EPA STORET and L-STORET data bases and scientific information listed in Section A.7, DQO 3. Such analysis shall be subject to the information ranking system in B9.4. QA for such analysis should document data objective statistical analytic methods handling of non detections and measures to insure the integrity, precision and accuracy of the data used and other common elements of EPA QAR4.

OWRB staff will conduct a literature search of the following sources:

USGS, major journals, papers identified through:

EPA NSTEMPS Web Page

<http://www.sciencedirect.com/>

and other scientific databases using key combinations of words including:

- Phosphorus
- Total Phosphorus
- Periphyton
- Seston
- Potamophyton
- Ozark
- “Nutrient ecoregion XI”
- Chlorophyll
- Other search terms recommended by the TAG
 - Nutrient response theories such as Michaelis-Menton and Monod

Papers from Stevenson, Dodds, Matlock, King, Haggard, Welch, Storm, Justius, and Paul and other researchers identified by the TAG will be specifically targeted.

A “request for information” will be published and forwarded to individuals and organizations as recommended by members of the TAG.

B.9.3. Secondary Data Handling and Custody

Attached as Appendix B, is a sample information tracking and ranking sheet.

B.9.4. Secondary Data Analytical Methods

Acquired information regarding nutrients in Oklahoma Scenic Rivers will be reviewed by OWRB staff and a subcommittee of the TAG to preliminarily determine what should be considered “best scientific information”. The subcommittee will consist of any TAG member submitting reviews. Preliminary rankings will be averaged by category. Borderline and disputed ranking should be resolved in discussion between the subcommittee and if necessary by the TAG. Where disputes are not resolved, dissenting opinions shall be, if submitted included in recommendations to the Board.

Initial review and ranking of information will be according to the following guidelines for information quality, geographic relevance, and environmental response.

The information will be ranked by its provenience. Ranking will follow the guidelines below. By agreement of the TAG, a different ranking may be assigned in any category. “Best Scientific information” status will be assigned to information that rank 1, 2 or 3 in each of three categories or as deemed by a majority of the TAG. All information acquired, however, will be available for TAG review and consideration.

Rank	Quality Guideline
1	Peer reviewed scientific journals, models, studies and data analysis with accepted QA-deemed best scientific information by a majority of the TAG.
2	Peer reviewed unpublished studies, government reports, graduate level studies with adequate quality assurance
3	Un-reviewed studies, models, analysis of data with suitable quality assurance that are deemed suitable by a majority vote of the TAG.
4	Studies with no quality assurance or peer review
5	Anecdotal or personal communication.”

The information will be ranked by relevance to the Scenic Rivers by geographic location and ecoregion and stream habitat and morphology. Ranking will follow the guidelines below. By agreement of the TAG, a different ranking may be assigned.

Rank	Geographic Attribute Guideline
1	Studies and information and data analysis of water quality data and beneficial use support focused on using data from any or all of the six Scenic Rivers.
2	Studies and information focused on streams in the Ozark Plateau, Boston or Ouachita Mountain ecoregions with similar gradient, canopy and substrate as the Scenic Rivers
3	Studies and information focused on EPA Nutrient ecoregion XI outside the Scenic Rivers areas
4	Studies and information focused on habitat, low gradient, extreme high gradient, soft substrate, tropical or boreal ecoregions, extreme canopy cover, very high or stream order watershed size, stream flow different from the six Scenic Rivers.
5	Tidal and marine studies

The information will be ranked by relevance to the Scenic Rivers “*unique natural scenic beauty, water conservation, fish, wildlife and outdoor recreational values of present and future benefit to the people of the state*”.

Rank	Environmental Response Guideline
1	Environmental end points that prevent elevated biomass, shifts in trophic structure, shift in community composition for fish, benthic invertebrates and algae from un-impacted, undeveloped conditions for waterbodies similar to the Oklahoma Scenic Rivers. Environmental endpoints that prevent departures of applicable water quality standards and antidegradation policies including bio-criteria, dissolved oxygen, pH and applicable narrative criteria.
2	Average periphyton chlorophyll-a less than 50 mg/m ² Maximum periphyton less than 100 mg/m ² Average sestonic chlorophyll-a less than 1.0 µg/L
3	Average periphyton chlorophyll-a less than 100 mg/m ² Maximum periphyton less than 150 mg/m ² Average sestonic chlorophyll-a less than 2 µg/L
4	Average periphyton chlorophyll-a greater than 100 mg/m ² Maximum periphyton greater than 150 mg/m ²
5	Average sestonic chlorophyll-a greater than 2.5 µg/L Maximum periphyton greater than 200 mg/m ²

As a guideline, top rank should go to endpoints that would restore and maintain the chemical, physical, and biological integrity of Oklahoma Scenic Rivers. Secondary and tertiary rank should go to endpoints that prevent levels of algae identified as nuisance conditions by various Dodd’s publications and Welch 1988. As a guideline for ranking endpoints for secondary and tertiary rankings for sestonic algae, the median chlorophyll levels sampled by the OWRB BUMP program rounded up from Barron Fork, Lee and Little Lee Creeks and the Upper Mountain Fork.

B.9.5. Secondary Data Quality Control

Acquired information regarding nutrients in Oklahoma’s Scenic Rivers will be preliminarily reviewed and ranked by a subcommittee of the TAG. All information acquired will also be made available to the TAG for review.

B.10. Secondary Data Management

Since there is no sampling or measurements involved in this project, no monitoring data will be generated. The data processing equipment are personal computers and network stations using the Windows XP operating system. Primary storage of data will be on the OWRB server. The data will be maintained, managed and an electronic library of all secondary data sources will be created by the Project Manager. Data will be backed up daily to reduce any risk of contamination or loss. The OWRB primary data storage files utilize a weekly tape backup system. A complete system backup is performed each month. Backups will also be done prior to any repairs, moves, and/or procedures that may threaten data integrity. Anti-virus software is installed on all OWRB computers and updated daily.

C. Assessment and Oversight

C.1. Assessments and Oversight

Oversight of project activities will be accomplished through the existing structure of the OWRB staff. The Project Manager will be the immediate monitor and assessor of all work done on this project. In the event that the Project Manager discovers a significant condition that will impact data quality, the Project Manager will immediately address the situation through whatever means deemed appropriate. The Project Manager will also notify the OWRB QA Officer and document events thoroughly.

C.2. Reports to Management

At a minimum, progress reports will be provided on semi-annual intervals to satisfy EPA requirements. The Semi-annual Progress Reports will note the status of project activities, identify any project problems encountered and explain how they were handled. The Project Manager is in charge of accomplishing these tasks.

D. Data Validation and Usability

D.1. Data Validation Procedures

Data acquired for use in this project from outside sources will be reviewed for completeness, quality, and how it meets the data quality objectives. The Project Manager will be responsible for internal data analysis, validation and reporting. Professional judgment will be used to determine if the data are reasonable. All information collected will be available TAG review.

D.2. Verification and Validation Methods

The reviews and report will be performed in accordance with the OWRB's Quality Management Plan. Data acquired for use in this project from outside sources will be reviewed for completeness, quality, and how it meets the data quality objectives. All data from outside sources will be cited appropriately. Data validation is an integral part of this process, as described in Section B.10. The data collected for this project will be reviewed for abnormalities, inconsistencies, or unusual results. If any of these occur, the data will be traced back to look for possible causes of the error. In the event that no error is found, the data will be assumed to be normal and appropriate for use in project reports and in decision-making. If an error is found and no resolution can be arrived at concerning its source or cause, the data will be discarded.

D.3. Reconciliation with Data Quality Objectives

The primary outcome for this data project is a recommendation by the TAG. If a decision of "No Action" results from inadequate information, then data collection should continue.