Welcome
Illinois River Watershed
Total Phosphorus Criterion Revision

Stakeholder Webinar 2
September 22, 2020
Webinar Logistics

Questions

✓ Type all questions into the “Q & A” toolbar. Q & A will be held at 3 break points during the presentation.

✓ A recording and copy of the presentation will be posted on OWRB website

http://www.owrb.ok.gov/
OWRB Staff Introductions

- **Bill Cauthron**, Water Quality Division Chief
- **Monty Porter**, Water Quality Division Assistant Chief & WQS Coordinator
- **Rebecca Veiga Nascimento**, WQS Environmental Program Manager
- **Jade Jones**, WQS Environmental Specialist III
Illinois River Watershed
TP Criterion Revision

Stakeholder Webinar
September 22, 2020
Outline

- Background
- Draft revised total phosphorus criterion
- **Question Break 1**
- Critical Condition
  - Total Flow
  - Ecosystem Process
- **Question Break 2**
- Calculating 6-month average
- Rulemaking Process
- **Final Questions**
Illinois River Watershed

Scenic Rivers

Illinois River

Barren Fork Creek

Flint Creek
Beneficial Uses
Aesthetic Beneficial Use

Illinois River at Watts
Total Phosphorus Concentrations

Illinois River at Watts

Illinois River at Tahlequah
History: Total Phosphorus Criterion

- **2002**
  - Scenic River TP Criterion Adopted
  - 0.037 mg/L, 30-day geo-mean

- **2003**
  - 1st Statement of Joint Principles
  - OK & AR agreed to coordinated, but individual state actions to reduce phosphorus

- **2012**
  - Re-evaluation TP Criterion
  - Technical re-evaluation of phosphorus criterion
  - Technical Advisory Group (TAG), OK confirmed the Scenic River TP criterion
  - AR TAG members drafted minority report

- **2013**
  - 2nd Statement of Joint Principals
  - Reconcile differences regarding TAG findings
  - Formed Joint Study Committee
  - Special Study on phosphorus & algae growth conducted

- **2018**
  - MOA
  - OK & AR working together on various actions to improve water quality
2013 Second Statement of Joint Principals

<table>
<thead>
<tr>
<th>Formed 6-person Joint Study Committee</th>
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<tbody>
<tr>
<td>Responsible for overseeing study on phosphorus &amp; algae</td>
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<tr>
<td>June 2014 - April 2016, Ryan King with Baylor University conducted study</td>
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<td>December 2016, Committee Final Report &amp; Recommendations accepted by both state Governors</td>
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<tr>
<td>OWRB staff &amp; partners working to address committee recommendations</td>
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Joint Committee Recommendations

- 2 Recommendations
  1. Water quality criteria
  2. Ambient water quality monitoring

A six-month average total phosphorus level not to exceed 0.035 mg/L based on water samples taken during the CRITICAL CONDITION.
Interagency Cooperation

OK Agencies & Tribal Partners

- Extensive technical & general information meetings
  - 3 completed
  - Additional expected

- General communication & info exchange, as needed

Arkansas Division Environmental Quality

- Technical meetings, bimonthly since March 2019 & currently as needed

- General communication & info exchange, as needed

- Cooperation on stakeholder outreach
Water Quality Standard

- Beneficial Use
  - Aesthetics
- Water Quality Criterion
  - Total Phosphorus
- Antidegradation Policy
  - Scenic River
  - Outstanding Resource Water
Water Quality Criteria

- **Magnitude**
  - Remain at 0.037 mg/L TP
  - Magnitude (0.035 mg/L TP) recommended by committee is not considered “significantly different” under the Second Statement of Joint Principals
Water Quality Criteria - Duration

- Evaluated & confirmed 6-month average with OWRB long term data sets
- 6-month average will be protective and reasonable
Water Quality Criteria

- **Frequency**
  - Committee Recommended, “not to exceed”
    - Waterbodies have resiliency and can withstand infrequent exceedances
    - Not effective for implementation programs
  - OWRB staff recommend limited exceedance approach with 2 components for short term & moderate term protection
    - No more than 1 exceedance per 1-year period
    - No more than 3 exceedances per 5-year period
Draft Criterion

The total phosphorus **six month rolling average** of **0.037 mg/L** shall not be exceeded more than **once in a one-year period** and not more than **three times in a five-year period**.
Barren Fork Creek
Critical Condition

- New requirement not previously in OK Water Quality Standards
- Committee definition

“the conditions where surface runoff is not the dominant influence of total flow and stream ecosystem processes.”
Critical Condition

“the conditions where surface runoff is not the dominant influence of total flow and stream ecosystem processes.”

1. What does this mean?

2. We need an operational definition that can be implemented across 2 states and various monitoring programs
Critical Condition

Break critical condition language into 2 parts & created 2 analysis to consider each part

1) *the conditions where surface runoff is not the dominant influence of total flow*

&

2) *the conditions where surface runoff is not the dominant influence of stream ecosystem processes*
Critical Condition Analyses

1. Total Flow

Hydrograph separation analysis to evaluate flow conditions & when is surface runoff dominant and when is it not

- Effectively & efficiently identify surface runoff versus baseflow conditions
- Utilized USGS gages throughout watershed
- Consistent approach applicable watershed wide
Critical Condition Analyses

- What is the population of days that will satisfy critical condition term?
- Daily Average flow from 2008-2018
- Run hydrograph separation method from GW toolbox
  - Provides streamflow, baseflow, and baseflow percent
- Evaluate baseflow percentage at various thresholds
• Where does the population of days at different baseflow percentage threshold fall on the hydrograph?
Critical Condition Analyses

2. Stream Ecosystem Process

Hydrology scour analysis to determine when flow dominates ecosystem process of interest, which is benthic algal growth

- When are near bed velocities strong enough to scour algae?
- Can we relate the near bed velocities to discharge?
Max: 8 ft/s
Inter: 6 ft/s
Scour: 5 ft/s
No Scour: <5 ft/s
Tahlequah

2 different relationships, 1 gauge

Lots of different scour at similar flow

South Siloam Springs

Can not consistently relate scour velocity with discharge
Outcome of Critical Condition Analyses

**Scour Analysis Results**

- Results very dynamic and highly variable
- Not consistent across watershed
- Analysis very labor intensive
- Not effective for operational definition

- Hydrograph separation analysis will provide foundation for interpretation of critical condition language

- Staff finds that a 55% baseflow threshold would reasonably address the critical condition recommendation

- Only apply to WQ assessment for 303(d) & 305(b)
Tahlequah Creek
Calculating 6-month average

- How many measured TP values ("n") required for each 6-month average?

- How many 6-month averages ("N") per year?
  - 6-month rolling average calculated on monthly basis
  - Maximum of 12, 6-month averages per year
Calculating 6-month average

- Reviewed monitoring programs, found that at least 80% of time at least 1 measured TP value per month available

2 Goals
1. Monitoring programs need some flexibility, no program is perfect
2. Maximize the number of 6-month averages (“N”) calculated each year

- Requiring at least 4 measured TP values for each 6-month average calculation attains both of these goals.
Assessing 6-month averages

- How many 6-month averages ("N") required for beneficial use assessment
  - Frequency
    - 1-year
      - No More than 1 exceedance per 1-year period
    - 5-year
      - No More than 3 exceedances per 5-year period

- Current OK Assessment Protocol
  - Minimum of 10 samples.....
  - Considering minimum of 10 6-month averages ("N") per year
Lake Tenkiller

- **Beneficial Uses**
  - Recreation
  - Aesthetics
  - Fish & Wildlife Propagation
  - Fish Consumption
  - Water Supply

- **Criteria**
  - Dissolved oxygen
  - Chlorophyll
  - Aquatic life
  - Human health

- Reducing watershed phosphorus load benefits Lake Tenkiller
  - This is a key watershed management activity

- Illinois River TP criterion is not applicable to Lake Tenkiller
Rule Changes

- 6 scenic rivers, changes only apply to Illinois River Watershed
  - Chapter 45
    - Revised water quality criteria
  - Chapter 46
    - Critical condition operational definition
    - Use Assessment Protocol, changes accommodate monitoring programs
Stakeholder Participation

• We value stakeholder participation and want to hear from you!
  ❖ Contact us directly with questions
  ❖ Webinars
    October 6th at 7:00 pm
  ❖ Website
  ❖ Email Notices – GovDelivery
### Rulemaking Schedule

#### December 2020 Draft Rules published in OK Register and formal public participation process starts

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<tr>
<td>Governor &amp; OSEE review of draft rules</td>
<td>November 2020</td>
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<tr>
<td>Draft Rules Published in OK Register</td>
<td>December 2020</td>
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<tr>
<td>OWRB Public Hearing &amp; Public Comment Period</td>
<td>January 2021</td>
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<td>OWRB Meeting &amp; Rule Consideration</td>
<td>February 2021</td>
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<tr>
<td>Legislative &amp; Gubernatorial Review</td>
<td>Spring 2021</td>
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<td>Rules Become State Law</td>
<td>September 2021</td>
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<td>EPA Approval</td>
<td>February - March 2022</td>
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Final Questions

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Illinois River at Tahlequah