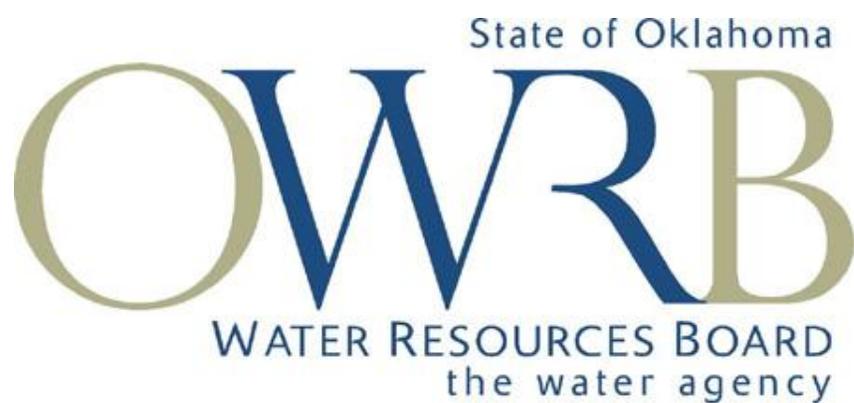


DETERMINATION OF REGULATORY FLOWS FOR  
IMPLEMENTING THE AGRICULTURE BENEFICIAL USE



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# REGULATORY DEFAULT FLOWS FOR IMPLEMENTING THE AGRICULTURE BENEFICIAL USE

## INTRODUCTION

The Oklahoma Water Resources Board (OWRB) is assigned statutory authority for setting regulatory flows in OS 82 1085.30-C in both OAC 785 45 and 46 language for protecting the Agriculture beneficial use establishing the regulatory flow for minerals as the long term average flow and the short term average flow. These flows can either be determined with "Statistical Summaries of Streamflow in Oklahoma through 1999" or "Statistical Summaries of Streamflow Records in Oklahoma and Parts of Arkansas, Kansas, Missouri and Texas through 1984" on streams with the United States Geological Survey (USGS) gages. They may also be estimated on streams without gages using the OWRB publication entitled "Estimation of Mean Annual Average Flows" (OWRB Technical Report 96-2). This language was adopted for the greater part in the 1997- 1998 Water Quality Standards (WQS) revision. Prior to 1998, the regulatory flows for the Agriculture beneficial use were not specified and a one (1.0) cubic feet per second (cfs) default minimum flow was applicable. The adoption of the mean annual flow and short term annual flow implementation language in **785:45-5-13** eliminated the applicability of the default flow language in 45-5-4(a) language. The 1.0 cfs default flow was first adopted in the WQS in 1982. Such default flows are common to most state WQS.

*785:45-5-4. Applicability of narrative and numerical criteria*

*(a) For purposes of permitting discharges for attainment of numerical criteria, streamflows of the greater of 1.0 cfs or 7Q2 and complete mixing of effluent and receiving water shall be used to determine appropriate limits unless otherwise provided in the Standards.*

The net effect of the 1997 – 1998 revisions is that in limited circumstances implementation of the criteria for the Agriculture beneficial use is more stringent than that for toxics and for dissolved oxygen. Where the watershed area is smaller than 5 square miles in western Oklahoma or 0.7 square miles in Ouachita Mountains, the mean annual flow will be less than one cfs and implementation of the minerals criteria becomes more stringent. In these waters the likelihood of dependable flow for irrigation is limited.

To restore the 1.0 cfs default flow for the Agriculture beneficial use, both the Oklahoma WQS and the implementation rules must be amended. With the goal of applying 1.0 cfs as the default low flow for short term average flow, and since the State rule for short term flow is established as 0.68 cfs of the long term flow, therefore, 1.47 cfs is proposed as the new default minimum flow for implementing long term average criteria.

The references to both USGS statistical summaries of streamflows in Oklahoma are also proposed to be updated to the latest version of the USGS publication entitled "Statistical Summaries of Streamflow in and near Oklahoma through 2007".

## **DRAFT PROPOSED LANGUAGE CHANGES**

### **Chapter 45, OWQS Revisions:**

#### **785:45-5-13. Agriculture**

(e) General criteria for the protection of Irrigation Agriculture. This subsection prescribes general criteria to protect the Irrigation Agriculture subcategory. For chlorides, sulfates and total dissolved solids at 180°C (see Standard Methods), the arithmetic mean of the concentration of the samples taken for a year in a particular segment shall not exceed the historical "yearly mean standard" determined from the table in Appendix F of this Chapter. For permitting purposes, the long term average concentration shall not exceed the yearly mean standard. Yearly mean standards shall be implemented by the permitting authority using the greater of 1.47 cfs or long term average flows and complete mixing of effluent and receiving water. For permitting purposes, the short term average concentration shall not exceed the sample standard. Sample standards shall be implemented by the permitting authority using the greater of 1.0 cfs or short term average flows and complete mixing of effluent and receiving water. The data from sampling stations in each segment are averaged, and the mean chloride, sulfate, and total dissolved solids at 180°C are presented in Appendix F of this Chapter. Segment averages shall be used unless more appropriate data are available.

### **Chapter 46, Implementation Rule Revisions:**

#### **785:46-9-3. Regulatory flows**

(a) General. Six regulatory flows are required for implementation of yearly mean standards and sample standards. They include stream flows, regulatory flows for lakes and regulatory effluent flows.

(b) Long term average flows for streams. The greater of 1.47 cfs or mean annual average flow, A, will be used by the permitting authority for long term average flows to implement yearly mean standards. Mean annual average flows may be obtained from the USGS publication entitled "United States Geological Survey publications entitled "Statistical Summaries of Streamflow in and near Oklahoma through 2007" "Statistical Summaries of Streamflow in Oklahoma through 1999" or "Statistical Summaries of Streamflow Records in Oklahoma and Parts of Arkansas, Kansas, Missouri and Texas through 1984"on streams with USGS gages. They may also be estimated on streams without gages using the Oklahoma Water Resources Board publication entitled "Estimation of Mean Annual Average Flows" (OWRB Technical Report 96-2).

(c) Long term average flow for lakes. Mean annual average discharge from the lake, A, shall be used to implement the Agriculture beneficial use.

(d) Regulatory long term effluent flows. If the permitting authority determines that sufficient data is available to calculate the mean annual effluent discharge, then such discharge shall be the long term effluent flow, Qel. If the permitting authority determines insufficient data is

available to calculate the mean annual effluent discharge, then the design flow shall be the long term effluent flow,  $Q_{el}$ .

(e) Short term average flow for streams. OAC 785:45-5-4(d) requires that short term average flow,  $Q_s$ , be used to implement sample standards. The short term average flow is determined so that short term and long term wasteload allocations are equally likely to be more stringent, depending on the historical concentration distribution for a particular segment.  $Q_s$  shall equal the greater of 1.0 cfs or 0.68 A, where

$$Q_s = 0.68 A.$$

A is mean annual average stream flow.

(f) Short term average flows for lakes. Short term average flows for lakes are also determined by the formula in OAC 785:46-9-3(e). In this case A is the mean annual average lake discharge.

**(Subsequent text omitted for brevity, see 785: 46-9-4 and 9-5)**