# 2013 Oklahoma Lakes Report

## Beneficial Use Monitoring Program

OKLAHOMA WATER RESOURCES BOARD

#### **EXECUTIVE SUMMARY**

It is the intent of this Oklahoma Water Resources Board (OWRB) report to advance concepts and principles of the Oklahoma Comprehensive Water Plan (OCWP). Consistent with a primary OCWP initiative, this and other OWRB technical studies provide invaluable data crucial to the ongoing management of Oklahoma's water supplies as well as the future use and protection of the state's water resources. Oklahoma's decision-makers rely upon this information to address specific water supply, quality, infrastructure, and related concerns. Maintained by the OWRB and updated every 10 years, the OCWP serves as Oklahoma's official long-term water planning strategy. Recognizing the essential connection between sound science and effective public policy, incorporated in the Water Plan are a broad range of water resource development and protection strategies substantiated by hard data – such as that contained in this report – and supported by Oklahoma citizens.

The Beneficial Use Monitoring Program exists as a result of the vital economic and social importance of Oklahoma's lakes, streams, wetlands, and aquifers and the associated need for their protection and management. The data contained in this report is scientifically defensible and has been collected and analyzed following procedures outlined in Use Support Assessment Protocols (USAP), developed by OWRB with input and concurrence of Oklahoma's other environmental agencies. Specifically, USAPs establish a consistent method to determine if beneficial uses assigned for individual waters through Oklahoma Water Quality Standards (WQS) are being supported. The legitimacy of data analyzed following protocols other than those outlined in the USAP (or the Oklahoma Continuing Planning Process (CPP) document where the USAP is silent) for use support determination is not appropriate. If the BUMP report indicates that a designated beneficial use is impaired, threatened, or otherwise compromised, measures must be taken to mitigate or restore the water quality.

The OWRB has worked diligently to follow the guidelines outlined in the USAP. Recommendations in this report should be consistent with recommendations for the state's 303(d) list. Although certain inconsistencies do exist, every effort has been taken to assure compatibility between the BUMP Report and the 303(d) list. Issues regarding stream/lake segmenting additional data from non-BUMP sources and unique non-representative conditions all affect the impairment decision-making process.

Traditionally, the State of Oklahoma has utilized numerous water monitoring programs conducted by individual state and federal agencies. In general, each environmental agency designs and implements its own program with only limited participation with other state, municipal, or federal entities. These programs collect information for a specific purpose or project (e.g., development of Total Maximum Daily Loads, WQS process, lake trophic status determination, water quality impact assessments from nonpoint and point source pollution, stream flow measurement, assessment of best management practices, etc.). Therefore, the information is specific to each project's data quality objectives (DQOs) and is often limited to a very small geographic area.

To synchronize Oklahoma's monitoring efforts related to water quality, the State Legislature appropriated funds in 1998 to create the Beneficial Use Monitoring Program (BUMP) under the direction of the Oklahoma Water Resources Board, who promulgates the WQS and WQS Implementation Rule.

BUMP brings the OWRB's overall water quality management program full circle. From the promulgation of WQS, to permitting and enforcement of permits stemming from WQS-established criteria, to nonpoint source controls, all agency water quality management activities are intended to work in concert to restore, protect, and maintain designated beneficial uses.

The specific objectives of BUMP are to detect and quantify water quality trends, document and quantify impairments of assigned beneficial uses, and identify pollution problems before they become a pollution crisis. This report interprets current Oklahoma Lake data collected as part of the comprehensive, long-term program. As the program has matured, the BUMP report has become one of the most important annually published documents in Oklahoma.

#### **Beneficial Use Monitoring Program Components**

**Monitoring Rivers & Streams** - The OWRB is currently monitoring approximately 84 stations on a 6week rotation. Fixed station monitoring is based largely upon the 84 planning basins as outlined in the Oklahoma Comprehensive Water Plan (OCWP). In general, at least one sample station is located at the terminal end of each of the planning basins. The OWRB also conducts on-going special studies as well as 25-30 probabilistic monitoring stations annually.

**Fixed Station Load Monitoring** – The OWRB is currently working with several partners including the US Geological Survey (USGS), US Army Corps of Engineers (USACE), Grand River Dam Authority (GRDA) and National Weather Service to conduct flow monitoring on all our fixed station sites that are not part of the State of Oklahoma/USGS Cooperative Gaging Network. This cooperative effort will allow for loadings to be calculated, trends to be assessed statewide and provide much needed data for the Use Support Assessment process.

**Fixed Station Lakes Monitoring** – As part of BUMP, the OWRB conducts sampling on lakes and reservoirs across the State of Oklahoma. To accomplish this task, the OWRB has taken a fixed station and probabilistic survey approach for the lakes monitoring program. This survey design allows the state's objectives to be met as well as ensure various sized waterbodies are represented adequately. The survey population includes all lakes above 50 surface acres, which encompasses approximately 206 different waterbodies. The population is then stratified into two groups – lakes greater than 500 surface acres and those below 500 surface acres. The greater than 500 surface acres group includes 68 lakes, of which approximately one-fifth are monitored annually (quarterly samples) on a randomized draw. They are then monitored again during a subsequent year in the 5-year rotation, so that each lake greater than 50 surface acres is sampled 2 non-consecutive years during each 5 year rotation. The lakes managed by our Federal partners, the USACE and Bureau of Reclamation (BOR) are included in the 68 large lakes. Additionally, ten randomly drawn lakes of less than 500 surface acres are sampled annually (quarterly samples) over the 5 year sample frame. Many of these smaller lakes have not been sampled historically through BUMP and include small municipal water supplies.

The OWRB works with other agencies, such as the USACE, for inclusion of additional information on waterbodies managed by the Corps. Data collected consists primarily of water chemistry, nutrients, and chlorophyll-a information. In general, a minimum of three to five stations per reservoir are sampled depending on the size of the reservoir. Stations are located such that they represent the lacustrine, transitional, and riverine zones of the lake. On many reservoirs, additional sites are monitored, including major arms of the reservoir as appropriate. Water quality parameters have been added to the lakes sampling effort over the years to enhance program ability to make use support determinations.

**Groundwater Monitoring (GMAP)** – This new program was made possible as result of a \$1,500,000 increase in funding received from the Oklahoma Legislature for water quality/quantity monitoring based on recommendations of the 2012 Update of the Oklahoma Comprehensive Water Plan. These additional monies were utilized to restore funding levels of the Beneficial Use Monitoring Program as well as to implement the new groundwater program. The new groundwater program prioritizes efforts on Oklahoma's 21 major groundwater aquifers and will continue to be phased in over the next 3 years. This baseline period will focus on 4-6 aquifers per year and will assess concentrations of nutrients, metals and major ion species. Water quality data will be collected from networks of wells on the basis of an aquifer's areal extent. This design feature generated sample populations of at least 30 wells for each of Oklahoma's 15 largest aquifers. Smaller aquifers are represented by fewer wells but proportionally have more sites per areal extent (Table 1).

Areal Extent Category	Sample Site Well Density	Sample Sizes Generated
> 5000 km <sup>2</sup>	1 well per 150 km <sup>2</sup> (6 Aquifers)	37 – 89
3001 – 5000 km <sup>2</sup>	1 well per 100 km <sup>2</sup> (5 aquifers)	33 – 48
1501 – 3000 km²	1 well per 75 km <sup>2</sup> (6 aquifers)	25 – 33
751 – 1500 km <sup>2</sup>	1 well per 50 km <sup>2</sup> (2 aquifers)	16 – 19
≤ 750 km²	2 aquifers	6 – 10

Table 1. Sample Networks Based on Aquifer Areal Extent.

In the first year of sampling, 203 wells in 6 major aquifers were sampled for water quality and 299 wells for water level. When fully implemented, there will be 750 wells in the statewide groundwater quality network statewide. In addition, the OWRB's annual groundwater level measurement program will be doubled in capacity (from around 530 to 1100 wells) and will be spatially redistributed. Work began on expanding the groundwater level measurement program in January 2014 with the addition of 87 new wells to the program. For one half of the water level network, manual measurements will become triannual events. In January 2014, 110 wells were added to the triannual measurement network. Additionally, over the 4-year baseline period, the OWRB plans to install 30-50 continuous water level

recorders to obtain daily or hourly measurements that are more sensitive to detecting seasonal changes (brought on by drought or variable climate conditions) than can be obtained by annual measurements. The 16 continuous water level recorders were installed in 8 aquifers across the state for this purpose in the first year of sampling.

*Intensive Investigations* – Historically, work occurred in the area in the early years of the program, but no work of this nature has occurred in the last 5-6 years. Work was discontinued to address other monitoring needs as the costs to operate the program have continued to increase since program inception.

#### **Program History/Overview**

Sampling of the numerous lakes, streams, and rivers across this state was initiated in the summer and fall of 1998. Lake sampling in connection with BUMP began in July of 1998. Sampling on numerous streams and rivers began in earnest in November of the same year. The two sampling programs, one for lakes and one for streams, had separate starting dates for a number of reasons. First, the OWRB had been conducting a lake-sampling program during the warmer summer months since 1990 as part of the Federal Clean Lakes Program. This historical lake sampling program was funded through federal dollars with the express purpose of determining lake trophic status. The trophic status of a lake can range from oligotrophic (low biological productivity) to hypereutrophic (excessive biological productivity). In general, the more productive a lake is the more water quality problems it is likely to experience. Federal dollars to fund this trophic state assessment of our state's lakes were discontinued in 1994. At that time, the OWRB searched for other funding sources, and through working with the Secretary of the Environment and the Oklahoma Conservation Commission, the OWRB was able to obtain a one-time federal CWA 319 nonpoint source grant to continue the lake trophic state assessment program. The OWRB subsequently initiated a quarterly lake sampling program in the spring of 1998 and was able to roll the existing lake program into BUMP.

The OWRB has developed USAPs for lakes and streams, which are essential if the state is to be consistent in identifying waters that are not meeting their assigned beneficial uses or are threatened. The OWRB has incorporated the USAP into Oklahoma Administrative Code (OAC) 785:46 to ensure that consistent determinations for impairments are made by the all of the monitoring agencies.

The state must follow consistent procedures for listing waters as impaired. Using the OWRB Use Support Assessment Protocols, it has been possible for OWRB staff to assess whether threats or impairments are present in our waterways. With continued funding, identification of impaired waters will be accomplished on additional waters.

#### **Results of Sampling Efforts**

It is essential that Oklahoma quantify impacts in a comprehensive and scientific manner and look for trends in water quality to identify waters that are not meeting their assigned beneficial uses. As a state, we must manage our water resources effectively and direct money to areas in most need of protection

or remediation to ensure that we continue to have good quality and sufficient quantity of water to meet our needs well into the 21st century. Comprehensive statewide data sets on rivers, streams and lakes for accurately assessing beneficial use impairments have not existed since 1993. With the implementation of monitoring on a large scale in October of 1998, this is no longer the case. With the availability of data, it is the desire of the Oklahoma Water Resources Board to provide the legislature and professional water managers with a comprehensive and up-to-date document for their review and approval. Administrative and Technical staff at the OWRB look forward to conducting the Beneficial Use Monitoring Program far into the future and providing the state of Oklahoma with the information it needs to make informed decisions that allow us to effectively manage our precious water resources.

Every two years, the OWRB analyzes data collected by BUMP and that data is used to identify if the waters of the state are meeting their assigned beneficial uses. If the stream/river segment is not meeting its beneficial use it is submitted for inclusion on the EPA's 303d list. The latest EPA approved 303d list of impaired waters can be found on the Oklahoma Department of Environmental Quality's website. Oklahoma's 303d list

#### INTRODUCTION

Protecting Oklahoma's valuable water resources is essential to maintaining the quality of life for all Oklahomans. Used for a myriad of purposes, such as irrigation, hydropower, public/private water supply, navigation, and a variety of recreational activities, the state's surface and ground waters provide enormous benefits to Oklahoma from both an economic and recreational standpoint.

The National Recreation Lakes Study Commission (NRLSC) estimates that 32,100 people in Oklahoma are employed in support of activities related to our numerous man-made lakes. Also, according to the NRLSC, 18,718,000 visitor days are spent on Oklahoma lakes each year and recreation in and around these lakes contributes approximately \$2.2 billion each year to Oklahoma's economy. Of additional value are the recreational benefits associated with our smaller municipal/watershed projects, Oklahoma Department of Wildlife Conservation (ODWC) lakes, and rivers and streams throughout the state, which infuse millions into state economy through fishing, hunting, camping, and related activities. (In 1987, the Oklahoma Comprehensive Outdoor Recreation Plan estimated that approximately \$10.7 million was realized through camping and \$15.2 million through hunting/fishing). According to a 2011 federal study, fishing activities alone contribute \$730,503,000 dollars to Oklahoma's economy, not including the substantial ancillary costs associated with that extremely popular sport.

In addition to surface waters, abundant groundwater also fuels the state's economy, serving as supply for thousands of municipalities, rural water districts, industrial facilities, and agricultural operations. According to the 2012 Update of the Oklahoma Comprehensive Water Plan (OCWP), groundwater represents the primary water supply for hundreds of cities and towns across Oklahoma and comprises 44 percent of the total water used in the state each year. Groundwater resources also supply approximately 90 percent of the state's irrigation needs.

Oklahoma works to protect and manage its water resources through a number of initiatives, with the OWQS serving as the cornerstone of the state's water quality management programs. The OWRB is designated by state statute as the agency responsible for promulgating water quality standards and developing or assisting the other environmental agencies with implementation framework. State agencies are responsible for implementing the WQS as outlined by the OWRB through development of implementation plans. Protecting our waters is a cooperative effort between many state agencies, and because the WQS are utilized by all agencies and represent a melding of both science and policy, they are an ideal mechanism to assess the effectiveness of our diverse water quality management activities.

The WQS are housed in OAC 785:45 and consist of three main components: beneficial uses, criteria to protect beneficial uses, and an anti-degradation policy. An additional component, which is not directly part of the WQS but necessary to water resource protection, is a monitoring program. A monitoring program is required in order to ensure that beneficial uses are maintained and protected. If uses are not being maintained, the cause of that impairment must be identified and restoration activities should be implemented to improve water quality such that it can meet its assigned beneficial uses.

All state agencies are currently required to implement Oklahoma's Water Quality Standards within the scope of their jurisdiction through the development of an implementation plan specific for their agency.

This process, called WQS Implementation, allows the WQS to be utilized by other state agencies in the performance of their regulatory (statutory) responsibilities to manage water quality or to facilitate best management practice initiatives.

With the development of BUMP, the need for protocols to determine beneficial use impairment was identified. Development of these protocols would facilitate state agencies in directing their time and money to the areas in most need of protection or remediation. The OWRB, working in close concert with other state environmental agencies and concerned parties, developed USAPs to be used by all parties for assessing if waters were meeting their assigned beneficial uses. In addition, protocols were developed that could be coupled with a trend monitoring system to detect threatened waters before they become seriously impaired. Data collection efforts connected with protocol development and/or implementation also serves a vital purpose in refining numerical criteria currently included in the WQS and in developing appropriate numerical and narrative criteria for future WQS documents. It is essential that our waters meet their assigned uses and that WQS implementation protocols are appropriate. Please see Appendix A for the applicable Oklahoma Administrative Code (OAC) 785:46 related to the USAP. Final approval of the USAP occurred in 2000, and the OWRB has constantly worked every year since then to refine the existing protocols and pursue the addition or modification of USAP protocols to further enhance its utility and effectiveness.

Work to be performed towards development and implementation of the critical fourth component of the WQS program, monitoring, is the subject of this report. All sampling activities described and conducted as part of this program were consistent with the Oklahoma USAP. It is also important to note that they are consistent with Environmental Protection Agency (EPA) reporting requirements for the "Integrated Water Quality Monitoring and Assessment Report" [305(b) Report and 303(d) list], CWA §319 Nonpoint Source (NPS) Assessment, and §314 Lake Water Quality Assessment (LWQA).

#### **Background and Problem Definition**

The State of Oklahoma has historically had numerous monitoring programs conducted by several state and federal agencies. In general, each environmental agency conducts their monitoring programs with some degree of integration and coordination with other state, municipal, or federal programs. Most water quality monitoring programs in Oklahoma are designed and implemented by each agency to collect information for one specific purpose or project (i.e., development of Total Maximum Daily Loads, the WQS process, lake trophic status determination, determining water quality impacts from point source dischargers, stream flow measurements, documenting success of best management practices, etc.). Information of this type is very specific to each individual project's data quality objectives (DQOs) and is often limited to a very small geographic area. This document describes sampling activities the OWRB has historically conducted for lakes and efforts that are currently ongoing for lakes and streams across Oklahoma as part of a comprehensive, long-term, statewide Beneficial Use Monitoring Program (BUMP). The goal of the BUMP is to detect and quantify water quality trends, document and quantify impairments of assigned beneficial uses, and identify pollution problems before they become a pollution crisis.

#### LAKES MONITORING PROGRAM

Lake trophic status is important from a water quality perspective because it is an indicator of potential nutrient impacts to a lake. In general, the higher the trophic state index (TSI) of a lake, the more nutrient loading into the system is occurring and the more productive the lake. One outcome of historical trophic assessment activity on Oklahoma's lakes was the prioritization of lakes most in need of remediation. Outcomes have included in-lake restoration activities or implementation of best management practices in the lake watershed. Results from the BUMP sampling effort should be viewed as a means to make relative comparisons between lakes and to determine beneficial use impairments based on USAP, detailed in Oklahoma Administrative Code (OAC) 785:46-15-5. Lakes with relatively poor water quality are identified, but that does not necessarily mean that these lakes have beneficial use impairments. Some lakes, due to the nature of their watershed and basin morphometry, may never attain the water quality of some of the state's more pristine waters. For example, an expectation that Broken Bow Lake and Great Salt Plains can attain the same level of water quality would be unrealistic, because these two lakes exhibit great differences in basin morphometry and substrate material and are located in totally different parts of the state. Soil types such as clays have a very small particle size such that the clay particulates are constantly re-suspended in the lake water column and never settle out, which is evident in some lakes across the state. In addition, the shallow nature of many of our lakes contributes to the lake bottom sediments being re-suspended in the water column due to wind action. Because so many factors affect the water quality of any given lake, comparing lakes from various parts of the state should only be viewed as a relative comparison.

For the 2012-2013 sampling season, BUMP identified lakes that had beneficial use impairments or threats. However, a data set to truly determine which lakes are not supporting their beneficial uses due to excess nutrients does not currently exist, nor have nutrient criteria for lakes been promulgated into the WQS. The OWRB has previously identified 21 lakes that are listed in the OWQS as NLWs. More intensive work on these lakes is required before a definitive assessment of nutrient impairment or non-support can be made. The OWRB recommends a Nutrient Impairment Study (NIS) be performed on identified NLW lakes. An NLW is defined in the WQS as "a watershed of a waterbody with a designated beneficial use which is adversely affected by excess nutrients as determined by Carlson's TSI (chlorophyll-a) of 62 or greater." If a lake is identified as having a TSI  $\geq$ 62 based on chlorophyll-a, and the minimum data requirements are met (n=10 on lakes with <250 surface acres; n=20 on lakes with >250 surface acres), it is recommended for listing as an NLW through the WQS setting process. Currently, the parameters that are analyzed to determine whether or not there is beneficial use impairment or threat include turbidity, chlorophyll-a, dissolved oxygen, metals, chloride, sulfates, biological collections, total dissolved solids, and pH values. A brief discussion on lake monitoring procedures and methods is provided below with data results following.

#### **Materials & Methods for Lake Sampling**

Data was collected quarterly on 31 lakes across the state from the fall of 2012 through the summer of 2013. Vertical water quality profiles were recorded at one meter intervals from the lake surface to the lake bottom for the following parameters: temperature, pH, dissolved oxygen, salinity, dissolved oxygen % saturation, oxidation-reduction potential (redox), specific conductivity, and total dissolved solids (TDS). A vertical profile was recorded for at least three sites per lake: in the central pool area near the dam (lacustrine zone), in the upper portion of the lake and in the major arms of the water body (riverine zone), and in the area between the lacustrine zone and the riverine zone (transitional zone). Turbidity values for each surface site were measured using a HACH portable turbidimeter. For lakes greater than 250 acres in size with only three routine chemical monitoring stations, additional sample sites have been established to ensure minimum data requirements are met. Secchi disk depths (in centimeters) were determined at all routine water chemistry sample sites. Water quality samples were collected at each site at the surface and one meter from the lake bottom at site 1, the dam, and preserved for analysis of nitrate nitrogen, nitrite nitrogen, ammonia nitrogen, Kjeldahl nitrogen, total phosphorus, chloride, sulfate, and total alkalinity. OWRB staff calculated total nitrogen based on laboratory-derived values. A Van Dorn sampler was used to collect samples near the lake bottom, just above the sediment-water interface, and grab samples were collected at the lake surface. At the dam site, a churn-splitter was used to split the surface sample for Quality Assurance (QA) purposes. Surface samples were also collected at all sites and analyzed for chlorophyll-a and pheophytin concentrations. Filtration and grinding (extraction of the chlorophyll-a collected in a filter with acetone) of the samples was performed immediately upon return to the OWRB lab. All chlorophyll-a samples were filtered, as stated in Standard Methods (APHA 1995), within 24 hours and stored for no more than 30 days in the freezer.

#### Sample Lake Locations

Lakes sampled by the BUMP Lakes staff in 2012-2013 are shown in Figure 1. Lake locations are identified on the map and are shaded in different colors based on their calculated TSI values.

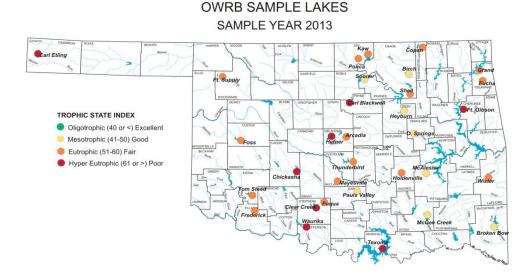


Figure 1. Lakes sampled by the Beneficial Use Monitoring Program in 2012-2013

#### Lake Data Analysis Protocols

There are numerous methods available for determining the trophic status of lakes. The majority of the trophic state models rely on a mathematical calculation to generate a single numerical value that is then categorized in an assessment hierarchy. Numerous chemical, and in some cases biological data are utilized in the various trophic indices, which characterize the "trophic status" of a water body. Some of the commonly used water quality parameters utilized in trophic state indices include chlorophyll-a, secchi disc depth, total phosphorus, total nitrogen, aquatic macrophytes, organic nitrogen, turbidity, lake user surveys, and hypolimnetic oxygen depletion rates, etc. Most indices use one or more variables in the determination of trophic status with varying degrees of applicability to systems. The OWRB has traditionally used Carlson's Trophic State Index (TSI) (Carlson, 1977) for reporting purposes, utilizing chlorophyll-a concentrations in calculating the lake trophic status. Carlson's TSI equation using chlorophyll-a (in  $\mu$ g/L) as the trophic status indicator is as follows:

#### $TSI = 9.81 \times ln(chlorophyll-a) + 30.6.$

In 1998, 1999, and 2000, the TSI was calculated using chlorophyll-a concentrations from the growing season (spring and summer only). Beginning in sample year 2001, an annualized trophic assessment was made as this was determined to be a more accurate reflection of trophic conditions for each waterbody. In order to make beneficial use determinations, minimum data requirements must be met as listed in OAC 785:46-15-3. A minimum of 20 samples is required on lakes greater than 250 surface acres, and a minimum of 10 samples on lakes with 250 surface acres and less. In 2001-2002, sites were added for chlorophyll-a and turbidity collections on lakes greater than 250 surface acres, in order to meet the minimum data requirements annually. Although data can be aggregated and historical values used, there was a concern in using data that was collected in the summer only as this would bias the data. An analysis of the limnological data collected on lakes is performed to determine the trophic state of each lake monitored. Chlorophyll-a concentrations for each lake sample site are determined and all values are averaged for each lake for all four sampling guarters. This annual chlorophyll-a value is then used in Carlson's TSI equation to determine trophic status of the lake. Through use of this technique the presence of localized trophic conditions are minimized (i.e. the effects of a single elevated chlorophyll-a value is minimized in the calculation of the TSI). The derived TSI represents an accurate assessment of the water quality as a whole and individual isolated areas that may be impacted due to eutrophication will be minimized in the reported TSI. A list of lake trophic state categories and corresponding TSI numerical values are displayed in Table 2. There are other descriptive terms and subset categories for trophic status, like dystrophic; however, Carlson's TSI has four major categories and these will be used to describe lake trophic status. Further discussion is included in each of the lake summaries as necessary. As stated earlier, prior to 2001, the TSI was based on growing season (spring and summer) chlorophyll-a concentrations. However, beginning in 2001, all TSI evaluations were based on annualized chlorophyll-a value for each lake and comparisons to previous TSI calculations will be specified as annual, growing season, or summer only evaluations. Prior to the onset of BUMP collections, lakes were sampled only in the summer and therefore the TSI was typically much higher than the annual assessments that are being done currently.

Carlson TSI No.	Trophic State	Definition
≤ 40	Oligotrophic	Low primary productivity and/or low nutrient levels
41 - 50	Mesotrophic	Moderate primary productivity with moderate nutrient levels
51 – 60	Eutrophic	High primary productivity and nutrient rich
≥ 61	Hypereutrophic	Excessive primary productivity and excessive nutrients

The beneficial use support determinations for the lakes sampled were determined following guidelines outlined in the USAP promulgated into OAC 785-46: Subchapter 15. In general, the USAP states that environmental data must be collected to take seasonal conditions into consideration. A minimum of 20 samples is required on lakes more than 250 surface acres to assess beneficial use support for water quality parameters such as dissolved oxygen, pH and temperature. In addition, data more than ten years old should not be used for use support purposes unless more recent data is not available. A minimum of 10 samples is required on lakes or lake-arms of 250 surface acres or less. Samples may be aggregated to meet the minimum data requirements. For some parameters such as metals, organic compounds, or toxics, fewer samples are required. Toxicants (metals and organics) require a minimum of 5 samples to determine use support, but less than 5 samples can be used to determine if a use is partially supported or not supported. Furthermore, if at least 2 sample concentrations of a toxicant exceed the criteria prescribed in the WQS by two or more orders of magnitude, then the use is determined to be "not supporting".

The USAP also addresses the issue of how the data should be used spatially for lake monitoring. In general, when determining what size area the data is representative of best professional judgment is used. Such things as major tributaries and major lake arms are considered when deciding the extent of the area that the data was applied to. Arms or portions of lake may be treated separately from the main body of a lake, however in most instances OWRB staff chose to deal with the lake as a single unit. Unless it was demonstrated to the contrary, a single site was not considered representative of an entire lake or an arm of the lake that was greater than 250 acres in size.

#### **Default Protocols**

USAP outlines the procedures for determining whether a set of data points for a particular variable support, partially support, or do not support a particular beneficial use. These protocols are constructed around two distinct types of numerical variables--short-term averages and long-term averages. In each case, samples collected for the range of water quality parameters are analyzed and aggregated in different ways.

Short-term average numerical variables measure variables with exposure periods of less than seven days (e.g., turbidity or a sample standard for chlorides). In other words, the set of samples that is being

analyzed considers each sample as a separate entity. For example, turbidity samples collected monthly from January through December are considered unique samples, and consequently, are not aggregated into a single sample for analysis but are considered a fraction of the whole.

Long-term average numerical variables measure variables with exposure periods of greater than or equal to seven days (e.g., yearly mean standard for chlorides). In other words, the set of samples that is being analyzed is considered a unique entity. For example, chloride samples collected monthly from January through December are aggregated through the calculation of a geometric mean. Use support determination for long-term numerical variables requires a three-step process:

- 1. Samples for a particular variable are aggregated into a geometric mean,
- 2. The geometric mean is compared to the prescribed criterion or screening level, and
- 3. Use support is determined to be supporting if the mean is less than the prescribed criterion or screening level or not supporting if the mean is greater than the prescribed criterion or screening level.

Because the long-term average compares only one value (the geometric mean) to the prescribed criterion or screening level, it cannot be considered partially supporting. In most instances, at least 10 samples are required to calculate a geometric mean.

#### Assessment of Fish & Wildlife Propagation Beneficial Use Support

The Fish & Wildlife Propagation (FWP) beneficial use utilizes five different water quality variables to assess use support: dissolved oxygen (D.O.) concentration, toxicants, hydrogen ion activity (pH), and turbidity. For purposes of this report, only D.O., metals concentrations in the water column, pH, and turbidity will be used in the assessment.

The USAP for each parameter as it relates to USAP are located in OAC:45-5-12 and can be found on the OWRB website:

www.owrb.ok.gov/standards

#### Assessment of Agriculture Beneficial Use Support

The Agriculture beneficial use utilizes three variables to assess use support: total dissolved solids, chlorides, and sulfates. Numerical criteria for both yearly mean standards and sample standards are located in Appendix F of OAC 785:45. The yearly mean standard for each variable is compared to the geometric mean of the samples using a long-term average numerical protocol. The sample standard for each variable is also compared to each sample using a short-term average numerical protocol. A description of the USAP for the Agriculture beneficial use can be found on the OWRB website:

www.owrb.ok.gov/standards

#### Assessment of Aesthetics Beneficial Use Support

The Aesthetics beneficial use is assessed using a couple of water quality parameters--true color and nutrients. The sample standard for each variable is compared to the each sample using a short-term average numerical protocol. Criteria are located in OAC 785:45-5-19 which can be found on the OWRB website:

#### www.owrb.ok.gov/standards

#### Assessment of Primary Body Contact Recreation (PBCR) Support

The PBCR beneficial use utilizes the following microorganisms to assess use support: Escherichia coli (E. coli), and enterococci (Ent.). The criteria are located in OAC 785:45-5-16 and can be found on the OWRB website:

#### www.owrb.ok.gov/standards

#### Lake Monitoring Results & Discussion

A lake-wide annual average of the chlorophyll-a values were calculated for each lake and used in the final calculation of the TSI. A summary table is included (Table 3) to present the number of lakes and appropriate surface acre size for each of the four trophic categories in 2012-2013 as well as the percentages of the total. As shown in Table 3, ten lakes were hypereutrophic, fourteen were eutrophic, eight were mesotrophic, and one was oligotrophic. Of the total 262,207 surface acres sampled, 17,733 were classified hypereutrophic, 118,742 were classified as eutrophic, 120,004 were classified as mesotrophic and 5,728 acres were classified as oligotrophic. TSI results, county, surface area, and volume for lakes sampled in 2012-2013 are listed in Table 3.

#### Table 3. Summary of Lake Trophic Status Results

Trophic Status	Number of Lakes	Percent of Total Lakes	Surface Area ( Acres)	Percent of Total Surface Acres
Hypereutrophic	8	26%	120,571	7%
Eutrophic	16	52%	106,328	45%
Mesotrophic	7	23%	27,698	46%
Oligotrophic	0	0%	0	2%
Totals =	31	100%	254,597	100%

Although TSI based on the chlorophyll-a concentration is used for BUMP, a comparison of TSI values calculated with total phosphorus and secchi disk depth was generated and displayed on Table 4. Data displayed is for the growing season using the various water quality parameters that can be used in calculating Carlson's TSI. The chlorophyll-a and phosphorus TSI calculations were derived through results of regression analysis relating secchi disk depth to the other two variables.

Calculations using secchi disk depth may not be a good parameter to use in highly colored or turbid reservoirs where turbidity is inorganic in nature. Both are common components of Oklahoma lakes. Additionally, phosphorus may not be an accurate variable to use in calculating the TSI in lakes that are not phosphorus-limited or those that are highly turbid due to clay particulates. Carlson (1977) stated chlorophyll-a seems to be the most acceptable parameter to use in calculating TSI, especially during the growing season, and for estimating algal biomass. In accordance with historical calculations at OWRB and Carlson's suggestion to measure chlorophyll-a, rather than secchi disk depth or total phosphorus, it is the variable utilized for BUMP's TSI calculations. The values displayed in Table 4 were calculated using lake-wide annual averages for all three parameters.

Lake Name	COUNTY	SURFACE AREA	VOLUME	TSI	YEAR SAMPLED	THREATS OR IMPAIRMENTS	CARLSON'S TSI
ARCADIA	Oklahoma	1,820	27,520	59	2013	TURBIDITY, CHLOR-A	Eutrophic
BIRCH	OSAGE	1,137	19,200	49	2013	DO, TURBIDITY	Mesotrophic
BROKEN BOW	McCurtain	14,200	918,070	45	2013	DO, PH	Mesotrophic
CARL BLACKWELL	Ραγνε	3,370	61,500	61	2013	TURBIDITY, PH, NLW	Hypereutrophic
CARL ETLING	CIMARRON	159	1,717	68	2013	TURBIDITY CHLOR-A	Hypereutrophic
CHICKASHA	Caddo	820	41,080	63	2013	NLW	Hypereutrophic
CLEAR CREEK	STEPHENS	722	7,710	62	2013	SULFATES	Hypereutrophic
COPAN	WASHINGTON	4,850	43,400	58	2013	TURBIDITY CHLOR-A	Eutrophic
EUCHA	DELAWARE	2,860	79,600	55	2013	DO, CHLOR-A, NLW	Eutrophic
FORT GIBSON	CHEROKEE	14,900	355,200	61	2013	DO, TURBIDITY, NLW	Hypereutrophic
FORT SUPPLY	Woodward	1,820,	13,900	60	2013	TURBIDITY CHLOR-A, NLW	Eutrophic
Foss	CUSTER	8,800	256,200	54	2013		Eutrophic

#### Table 4. List of Lakes Sampled in Sample Year 2012-2013

LAKE NAME	COUNTY	SURFACE AREA	VOLUME	TSI	YEAR SAMPLED	THREATS OR IMPAIRMENTS	CARLSON'S TSI
FREDERICK	TILLMAN	925	9,526	55	2013	TURBIDITY	Eutrophic
FUQUA	STEPHENS	1,500	21,100	52	2013	TURBIDITY	Eutrophic
GRAND	MAYES	46,500	1,672,000	55	2013	DO, TURBIDITY	Eutrophic
HEFNER	Oklahoma	2,500	75,000	62	2013	DO	Hypereutrophic
HEYBURN	CREEK	880	7,105	48	2013	DO, TURBIDITY	Mesotrophic
HOLDENVILLE	HUGHES	550	11,000	58	2013	DO, TURBIDITY, CHLOR-A	Eutrophic
Kaw	Osage	17,040	428,600	58	2013	TURBIDITY	Eutrophic
MAYESVILLE	MCCLAIN	302	2,082	58	2013	TURBIDITY	Eutrophic
MCALESTER	PITTSBURG	1,521	13,398	48	2013	TURBIDITY	Mesotrophic
MCGEE CREEK	Атока	3,810	113,930	49	2013	DO, PH	Mesotrophic
PAULS VALLEY	GARVIN	750	8,730	44	2013	TURBIDITY	Mesotrophic
Ponca	Kay	805	14,440	56	2013	DO, CHLOR-A	Eutrophic
SHELL	OSAGE	573	9,500	54	2013	DO	Eutrophic
SOONER	PAWNEE	5,400	149,000	41	2013		Mesotrophic
Τεχομα	Bryan	88,000	2,643,300	61	2013	DO, TURBIDITY	Hypereutrophic
THUNDERBIRD	CLEVELAND	6,070	119,600	56	2013	DO, CHLOR-A TURBIDITY, NLW	Eutrophic
TOM STEED	Kiowa	6,400	88,9970	58	2013	CHLOR-A, Turbidity,	Eutrophic
Waurika	JEFFERSON	10,100	203,100	61	2013	TURBIDITY CHLOR-A	Hypereutrophic
WISTER	LEFLORE	7,333	62,360	60	2013	DO, CHLOR-A, PH TURBIDITY, NLW	Eutrophic

	CHL-A	TROPHIC STATE	TOTAL P	Trophic State	SECCHI	Trophic State
Arcadia	59	Eutrophic	54	Eutrophic	72	Hypereutrophic
Birch	49	Mesotrophic	30	Oligotrophic	65	Hypereutrophic
BROKEN BOW	45	Mesotrophic	32	Oligotrophic	48	Mesotrophic
CARL BLACKWELL	61	Hypereutrophic	49	Mesotrophic	75	Hypereutrophic
CARL ETLING	68	Hypereutrophic	72	Hypereutrophic	79	Hypereutrophic
Снісказна	63	Hypereutrophic	44	Mesotrophic	67	Hypereutrophic
CLEAR CREEK	62	Hypereutrophic	43	Mesotrophic	72	Hypereutrophic
COPAN	58	Eutrophic	66	Hypereutrophic	83	Hypereutrophic
Еисна	55	Eutrophic	35	Oligotrophic	58	Eutrophic
Fort Gibson	61	Hypereutrophic	74	Hypereutrophic	64	Hypereutrophic
FORT SUPPLY	60	Eutrophic	68	Hypereutrophic	81	Hypereutrophic
Foss	54	Eutrophic	47	Mesotrophic	70	Hypereutrophic
Frederick	55	Eutrophic	66	Hypereutrophic	92	Hypereutrophic
Fuqua	52	Eutrophic	35	Oligotrophic	67	Hypereutrophic
GRAND	55	Eutrophic	66	Hypereutrophic	64	Hypereutrophic
Hefner	62	Hypereutrophic	70	Hypereutrophic	68	Hypereutrophic
Heyburn	48	Mesotrophic	69	Hypereutrophic	91	Hypereutrophic
HOLDENVILLE	58	Eutrophic	39	Oligotrophic	71	Hypereutrophic
Kaw	58	Eutrophic	73	Hypereutrophic	70	Hypereutrophic
MAYESVILLE	58	Eutrophic	72	Hypereutrophic	79	Hypereutrophic
McAlester	48	Mesotrophic	73	Hypereutrophic	94	Hypereutrophic
McGee Creek	49	Mesotrophic	34	Oligotrophic	56	Eutrophic
PAULS VALLEY	44	Mesotrophic	41	Mesotrophic	71	Hypereutrophic
Ponca	56	Eutrophic	45	Mesotrophic	68	Hypereutrophic
Shell	54	Eutrophic	44	Mesotrophic	65	Hypereutrophic
Sooner	41	Mesotrophic	28	Oligotrophic	54	Eutrophic
Τεχομα	61	Hypereutrophic	49	Mesotrophic	65	Hypereutrophic
THUNDERBIRD	56	Eutrophic	49	Mesotrophic	74	Hypereutrophic
Tom Steed	58	Eutrophic	65	Hypereutrophic	80	Hypereutrophic
WAURIKA	61	Hypereutrophic	70	Hypereutrophic	77	Hypereutrophic
WISTER	60	Eutrophic	54	Eutrophic	74	Hypereutrophic

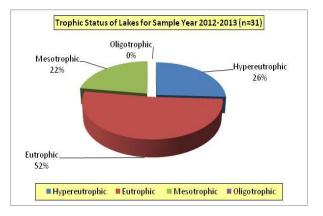
Using the chlorophyll-a methodology, four lakes were hypereutrophic, twenty- lakes were eutrophic, ten lakes were mesotrophic, and none were oligotrophic. Using total phosphorus and secchi disk depth in the TSI calculation produced a much different result although classification using these two variables is somewhat comparable to each other. Using the total phosphorus variable for TSI, six lakes were hypereutrophic, thirteen lakes were eutrophic, thirteen lakes were mesotrophic and two were oligotrophic. Using the secchi disk depth variable for TSI twenty-four lakes were identified as hypereutrophic, none lakes were eutrophic, one lake was mesotrophic and zero lakes were oligotrophic. The TSI values calculated using secchi depth were the highest of the three variables. For example, Heyburn Lake was classified as mesotrophic using chlorophyll-a concentration, eutrophic using total phosphorus as the, and hypereutrophic using secchi disk depth. Most of the TSI values were lowest using the chlorophyll-a concentration; therefore, it seems reasonable to say that this parameter is the most conservative variable to use.

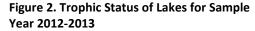
#### **Results of Lakes Sampling Efforts**

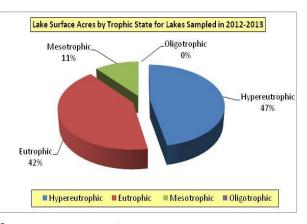
Data was collected by the OWRB on a quarterly basis for 31 lakes from the October of 2012 through August of 2013. The results of the sampling efforts are summarized below. As shown in Figure 2, 26% of lakes sampled were determined to have serious water quality nutrient concerns based upon their classification as hypereutrophic. Lakes classified as hypereutrophic have the potential for beneficial use impairments due to low dissolved oxygen concentrations, taste and odor problems, nutrient inputs, excessive productivity, and

general lake aesthetics. Hypereutrophic waters are adversely impacted primarily by excessive nutrients and primary productivity and should be monitored intensively in

the future to document the presence or absence of "beneficial use impairments." Fifty-two percent of the lakes sampled were classified as eutrophic, characterized by high primary productivity and nutrient rich conditions. A eutrophic lake also has the potential for beneficial use impairments, though the potential is less than for hypereutrophic waters. Mesotrophic waters have a small potential for beneficial use impairments and overall are representative of good water quality, low to moderate levels of nutrients, and productivity. Of the lakes







sampled, 22% were classified as mesotrophic. Oligotrophic Figure 3. Lake Surface Acres by Trophic Status waters have very low levels of primary productivity and for Lakes Sampled in 2012-2013 usually low concentrations of nutrient constituents. In Oklahoma, oligotrophic waters are either very clear waters with little nutrient inputs and genuinely good water quality conditions, or the waters are

very turbid with poor water clarity with the absence of sufficient ambient light inhibiting lake productivity. None of the 31 lakes sampled was classified as oligotrophic. Based on the results for trophic state index calculations, 47% of the waters sampled were exhibiting high to excessive levels of primary productivity and nutrient rich conditions characteristic of eutrophic and hypereutrophic waterbodies.

The distribution changes somewhat when the lake surface acres for each are classified into the corresponding trophic status. Results in Figure 3 are different than Figure 1, indicating the lakes classified as hypereutrophic were larger in surface acres than the lakes classified as mesotrophic and eutrophic. Lake trophic status, when broken out by the number of lake surface acres in each trophic state category, finds 42% of all surface acres sampled were eutrophic, 11% mesotrophic, 47% hypereutrophic, and 0% oligotrophic. One of the largest lakes sampled in 2012-2013, Lake Texoma, was classified as hypereutrophic, which skewed the surface acres percentages heavily towards the hypereutrophic category. In general, the larger lakes in the state have more extensive watersheds and are generally deeper than smaller lakes, which increase the likelihood of beneficial use impairments being present since a larger surface area is available. During stratification, the larger/deeper lakes have a greater portion of the water column that becomes anoxic for long periods of time, which also increases the potential for nutrient release from sediments. It is obvious that many lakes in Oklahoma are experiencing adverse environmental impacts. However, with the available data it is not possible to adequately assess if lakes are meeting their assigned beneficial uses as they relate to nutrients. At this time, 21 lakes have been identified by the OWRB as "Nutrient-Limited Watersheds" (NLW) in the WQS and efforts should be taken to definitively determine if NLW waters are meeting their uses through initiation of a nutrient impairment study to definitively determine the presence or absence of nutrient impairments in our NLW lakes. NLW are lakes with a TSI  $\geq$  62, based on Carlson's trophic state classification system and using chlorophyll-a as the trophic state indicator.

As stated previously, the OWRB is currently monitoring 30 to 40 lakes with repeat sampling on each scheduled to occur every few years. Prior to 1998, data was only collected once for each lake during the

summer months. In 1998, the OWRB began collecting data quarterly. This greatly improved the data set available to resource managers. Lakes that are identified as hypereutrophic should be sampled more often than quarterly, especially during the warmer months. Lakes identified as NLW should also be sampled more intensively to confirm if a water quality threat or impairment is present. Minimum data requirements as listed in USAP were closely followed to make beneficial use determinations. All impairments are listed in the Integrated Water Quality Report that is updated every two years. Toxicity concerns, if present, are listed as provided by the ODEQ as part of their Rotating Lakes Toxics Program and/or through sampling

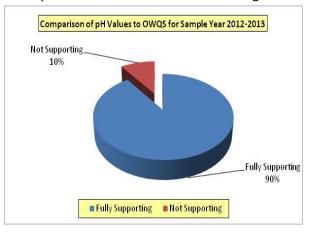


Figure 1. Comparison of pH values to OWQS for Sample Year 2012-2013

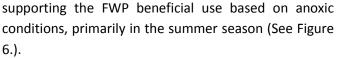
conducted by the OWRB.

The pH was examined and compared to the WQS for pH, 6.5 to 9 units, listed in 785:45-5. Twenty-eight of the 31 lakes sampled in the 2012-2013 sampling season were listed as supporting the Fish & Wildlife Propagation (FWP) beneficial use based on pH values and one lake was listed as not supporting (Figure 4).

Turbidity, in Nephelometric turbidity units (NTU), was measured via a HACH turbidimeter for all sites on each lake sampled to identify lakes that exceeded the WQS of 25 NTU. Of the 31 lakes sampled in the

2012-2013 sampling season, 18 lakes were not supporting their FWP beneficial use, 3 did not have enough information and 10 were fully supporting the use based on turbidity values (see Figure 5).

For dissolved oxygen (D.O.) vertical profiles recorded with a YSI® were examined to determine if anoxic conditions were present and whether or not the lake was meeting the FWP beneficial use. The USAP lists D.O. violations as values below 2.0 mg/L in > 70% of the entire water column, undetermined if between 50% and 70% of the water column and fully supporting if 50% of the water column is below 2.0 mg/L. Of the 31 lakes sampled in the 2012-2013 sampling season, only three lakes were not



Chloride and sulfate water quality parameters were also added to the lake sampling program in year 2003-2004. These additions allow for an assessment of the agriculture beneficial use of our lakes and much like metals sampling is a sampling effort that we plan on continuing into the future. The chloride and sulfate data revealed that 27 of the 31 lakes sampled were supporting the Agriculture beneficial use (See Figure7).

Bacteria analysis indicated 27 of the lakes sampled were supporting their Primary Body Contact Recreation beneficial use and 4 did not have enough information (See Figure 8).

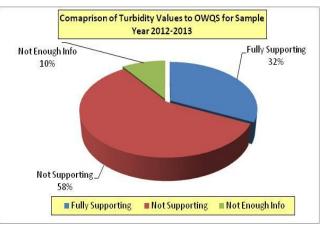


Figure 2. Comparison of Turbidity Values to OWQS for Sample Year 2012-2013

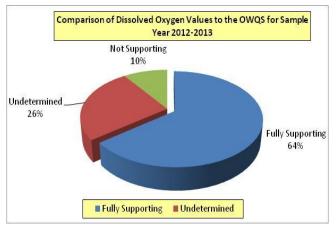


Figure 3. Comparison of Dissolved Oxygen Values to OWQS for Sample Year 2012-2013

It is the intent of the OWRB monitoring program to pursue adding additional monitoring parameters to the lake sampling initiative to allow all beneficial uses to be assessed. It is also the OWRB's intent to accomplish this without having to reduce the number of lakes sampled annually.

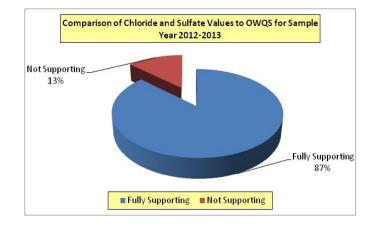


Figure 5. Comparison of Chloride & Sulfate Values to OWQS for Sample Year 2012-2013

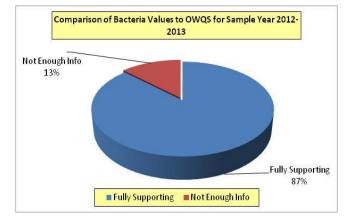


Figure 4. Comparison of Bacteria Values to OWQS for Sample Year 2012-2013

Each of the following pages represents a summary of the conditions for a given sample year. An interactive map on each page allows users to retrieve data for both current and past sample locations.

#### LITERATURE CITED

- APHA. 2005. <u>Standard methods for the examination of water and wastewater</u>. 21st ed. American Public Health Association, Washington D.C.
- Carlson, R.E. 1977. "A trophic state index for lakes". Limnology and Oceanography. 22:361-369.
- Hounslow, A.W., 1995, Water Quality Data Analysis and Interpretation: Lewis Publishers, Boca Raton, FL.
- Mueller, D.K., Hamilton, P.S., Hales, D.R., Hitt, K.J., and Ruddy, B.C., 1995, Nutrients in Ground Water and Surface Water of the United States--An Analysis of Data Through 1992: U.S. Geological Survey Water-Resources Investigations Report 95-4031, 74 p.
- Oklahoma Department of Tourism and Recreation. "Oklahoma Statewide Comprehensive Outdoor Recreation Plan - This Land is Your Land". 1987. 216pp.

Oklahoma Water Resources Board. "Lakes of Oklahoma". May 2012. 179pp.

Oklahoma Water Resources Board. "2012 Update of the Oklahoma Comprehensive Water Plan " February 2012.

Oklahoma Water Resources Board. "Use Support Assessment Protocols". July 2011.

OAC 785:46

U.S. Environmental Protection Agency. "The Lake and Reservoir Restoration

Guidance Manual". August 1990. 326pp.

U.S. Department of Interior, Fish and Wildlife Service, and U.S. Department of Commerce, U.S. Census Bureau. "2011 National Survey of Fishing, Hunting, and Wildlife Associated Recreation." 2011. 82 pp.

Wetzel, Robert G. "Limnology – Second Edition". 1983. 767pp.

#### **APPENDIX A**

**Oklahoma's Use Support Assessment Protocols** 

Amendments effective as of 07/01/2011

#### TITLE 785. OKLAHOMA WATER RESOURCES BOARD

#### CHAPTER 46. IMPLEMENTATION OF OKLAHOMA'S WATER QUALITY STANDARDS

#### SUBCHAPTER 15. USE SUPPORT ASSESSMENT PROTOCOLS

http://www.owrb.ok.gov/util/rules/pdf\_rul/current/Ch46.pdf#page=18

A	m	erican	Hor	se				Click Site	Names for A	Available Da				
		Sample Perio	d	Time: Visite		Sampling S	Sites		• 5a	mpling Sites	s			
	Oc	ctober 2007 - July	2008	4		3				X	5	>		
	Loc	cation	Blaine Cour	nty	Cli	ck map for s	ite data				3			
ធ	Imp	oundment	1966							Site 5	Site 3			
General	Are	a	100 acres								5	~		
မီ	Cap	pacity	2,200 acre-	feet						Site 2	Site 4			
	Pur	rposes	Recreation						Site 1 Surface	- AVI	rl	0	1/4 Miles	
		Parameter (Des	scriptions)	Res	ult				Notes/	Commer	nts			
		Average Turbidi	ty	13	nephelor	netric turbidi	ity units (	(NTU)	Lake-w	ide avera	ige			
		Average True C	olor	54	units				25% of	values >	> OWQS	of 70		
		Average Secchi	Disk Depth	118	cm									
		Water Clarity Ra	ating	goo	d									
		Trophic State In	dex	38					Previous value = 49					
S		Trophic Class		olig	otrophic									
Parameters		Salinity		0.0	7 - 0.13	ppt								
Iran	Specific Conductivity 151.5 - 274.7 µS/cm													
۳ ۳	pH 7.01 - 8.08 pH units													
	5	Oxidation-Reduc	ction Potentia	-4 t	o 551 m	V								
		Dissolved Oxyge	en	Up July	to 60% (	of water colu	ımn < 2	mg/L in	ng/L in					
	S	Surface Total Ni	itrogen	0.3	3 mg/L t	o 1.07 mg/L								
	Nutrients	Surface Total Pl	hosphorus	0.0	18 mg/L	to 0.053 mg	/L							
	NN	Nitrogen to Phos	sphorus Ratio	19:	1				Phosph	orus limit	ted			
		<u>Click to learn m</u> <u>Beneficial Uses</u>		Turbidity	Į	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
ses	Fisł	h & Wildlife Propa	gation	S	S		NEI							
Beneficial Uses	Aes	sthetics						S	NS					
icia	Agr	riculture								S	S	S		
enei	Prir	mary Body Contac	ct Recreation										NEI	
m	Pub	olic & Private Wate	er Supply											
	Ν	S = Fully Supporting NS = Not Supporting NEI = Not Enough In		Lab	accident -	- not enough o	data to ma	ike an ass	sessment					
JS/c	m = r	phelometric turbidity microsiemens per ce Escherichia coli	entimeter mV	QS = Okla = millivolt or-a = Ch	S	ater Quality Si a	tandards		= milligram n = microsi			ot = parts pe n = Enteroco		d

A	rk	ouckle								J.S		Click S	impling Sites		
	ę	Sample Period	т	imes Visite	d S	ampling	Sites			Site 2		Ava	ilable Data		
		ber 2010-June 20	11	4		5					Site 3				
	Loc	ation	Murray Co	unty	Click	map for sit	e data		-		5				
а а	Imp	oundment	1967							1	14 <b>7</b> - 7	-			
General	Are	а	2,350 acre	s						Site 1 Surface Site 1Bottom	Site 5	Ne star			
С В	Cap	pacity	72,400 acr	e-feet					0	1	-	T-SP-SP-SP-SP-SP-SP-SP-SP-SP-SP-SP-SP-SP-			
	Pur	poses	Water Sup and Recre	ply, Flood Co ation	ontrol, F	Fish and W	ildlife,		Mile	5		Site 4	mar la		
		Parameter (Des		Result					Notes/0	Commen	ts				
		Average Turbidit	ty	5 NTU					100% c	of values	< OWQS	5 of 25 NT	U (n=20)	)	
		Average Secchi	Disk Depth	177 cm											
	Situ	Water Clarity Ra	ating	Excelle	nt										
	ln 9	Chlorophyll-a		7 mg/n	า3										
		Trophic State Inc	dex	50					Previou	s value =	59				
ร		Trophic Class		Mesotro	Mesotrophic										
nete		Salinity		0.03-0.2	23 ppt										
Parameters	ð	Specific Conduc	tivity	88.7-45	4.3 µS/	cm									
å	Profile	рН		6.77-8.2	6.77-8.28 pH units					to slightl	y alkalin	e			
	Ē	Oxidation-Reduc	ction Potenti	al -68-406	-68-406 mV										
		Dissolved Oxyge	en		Up to 57% of water column < 2.0 mg/L in summer										
	ts	Surface Total Ni	trogen	0.35 mg	0.35 mg/L to 0.57 mg/L										
	Itrients	Surface Total Ph	nosphorus	0.013 m	ng/L to (	0.027 mg/L									
	Nutri	Nitrogen to Phos	sphorus Rati	o 26:1	26:1					Phosphorus limited					
		<u>Click to learn</u> <u>Beneficial Uses</u>	more abo	Turbidity	Hd	Dissolved	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E.coli	Chlor-a	
ses	Fisł	n & Wildlife Propa	gation	S	S	NS	S								
Beneficial Uses	Aes	sthetics						S	*						
fici	Agr	iculture								*	*	S			
ene	Prin	nary Body Contac	t Recreation	1									S		
ш	Pub	olic & Private Wate	er Supply												
	Ν	= Fully Supporting     *Did not collect for t       IS = Not Supporting     *Did not collect for t       IEI = Not Enough Information     *Did not collect for t					ameters								
μS/c	m = n	phelometric turbidity nicrosiemens per ce Scherichia coli	ntimeter m\	VQS = Oklahoi / = millivolts ilor-a = Chloro		er Quality Sta	ndards		= milligram n = microsi			t = parts pe = Enteroco		d	

		Sample Perio	d	Times Visited	Sar	npling S	ites		<ul> <li>Sample</li> </ul>	ing Sites	~	2	A	
C	Octol	ber 2012 - Augu	st 2013	4								Site 2		
	Loc	ation	Oklahoma (	County	Click r	map for sit	te data			5	· A		X	
	Imp	oundment	1986						6	3.0		¢.		
	Are	а	1,820 acres											
	Cap	pacity	27,520 acre	-feet					No	3			macing	
	Pur	poses	Water Supp	ly, Flood Co	ontrol, Re	ecreation			AC	Click Site N	ames for A	vailable Data	1 Miles	
1		Parameter (Des	scriptions)	Result						Commen				
		Average Turbidi	ty	24 NTL	J				20% of	values >	OWQS	of 25 NTU	J	
		Average Secchi	Disk Depth	44 cm										
		Water Clarity Ra	ating	average	e									
Chlorophyll-a				18 mg/i	m3									
		Trophic State In	dex	59	59						58			
		Trophic Class		Eutroph	nic									
		Salinity		0.11 – 0	0.22 ppt									
	ð	Specific Conduc	tivity	236 - 4	62 µS/cn	n								
	Profile	рН		7.47 - 8	8.81 pH u	inits			Neutral	to slightl	y alkalin	е		
	Ē	Oxidation-Reduc	ction Potentia		36 to 4123mV									
		Dissolved Oxyge	en		Up to 60% of water column < 2 mg/L in August									
ľ	S	Surface Total Ni	itrogen	0.77 mg	g/L to 1.6	62 mg/L								
	rients	Surface Total Pl	nosphorus	0.005 n	ng/L to 0	.100 mg/L								
	Nutrie	Nitrogen to Phos	sphorus Ratio	32:1					Phosphorus limited					
		<u>Click to learn m</u> <u>Beneficial Uses</u>	nore about	Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	
	Fisł	h & Wildlife Propa	gation	NS	S	S	S							
	Aes	sthetics						S	S					
	Agr	iculture								S	S	S		
	Primary Body Contact Recreation												S	
	Pub	olic & Private Wate											N	
	Ν	S = Fully Supporting IS = Not Supporting IEI = Not Enough Int	formation	Notes										

A	rc	dmore	City						te Names fo able Data			• Sam	pling Sites	
		Sample Perio	d	Times Visited	mes Sampling Sites							te 1 Surface Site 1 Bottom		
C	Dcto	ber 2006 - Augu	st 2007	4		3				5	Site 2	Site 4		
	Loc	cation	Carter Cou	nty	Click r	nap for si	te data			Site 5				
ធ្ម	Imp	ooundment	1910									~		
General	Are	a	142 acres								• Contraction of the second se			
้ด	Ca	pacity	600 acre-fe	et							Zh	2	1/4	
	Pur	rposes	Recreation						~				Miles	
		Parameter (Des	scriptions)	Result					Notes/	Commen	its			
		Average Turbidi	ty	10 NTU	J				100% o	f values	< OWQS	6 of 25 NT	Ū	
		Average True C	olor	25 units	3				100% o	f values	< OWQS	6 of 70		
		Average Secchi	Disk Depth	106 cm										
		Water Clarity Ra	ating	excelle	nt									
		Trophic State In	dex	52										
S		Trophic Class		eutroph	nic									
Parameters		Salinity		0.13 –	0.18 ppt									
aran	Ð	Specific Conduc	ctivity	278.6 -	· 365 µS/	cm								
ä	Profile	рН	7.16 - 8	8.85 pH u	inits			Neutral	to slightl	y alkaline	Э			
	₫.	Oxidation-Redu	ction Potentia											
		Dissolved Oxyg	en		Up to 63% of water column < 2 mg/L August									
	nts	Surface Total N	itrogen	0.32 m	0.32 mg/L to 0.62 mg/L									
	Nutrient	Surface Total Pl	hosphorus	0.009 n	ng/L to 0.	.035 mg/L								
	NU	Nitrogen to Pho	sphorus Ratio	22:1					Phosph	orus limi	ted			
		<u>Click to learn n</u> <u>Beneficial Uses</u>	nore about	Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
ses	Fis	h & Wildlife Propa	gation	S	S	NS	S							
Beneficial Uses	Aes	sthetics						S	S					
fici	Agr	riculture								S	S	S		
ene	Prir	mary Body Contac	t Recreation										S	
Δ	Puł	blic & Private Wate	er Supply											
	Λ	S = Fully Supporting NS = Not Supporting NEI = Not Enough In	formation	Notes										
µS/c	m = r	ephelometric turbidity microsiemens per ce Escherichia coli	entimeter mV	/QS = Oklaho = millivolts or-a = Chloro		Quality Sta	andards		= milligram n = microsi			t = parts pe = Enteroco		d

		Sample Perio	d	Times	San	npling S	ites					Site 4				
N	oven	nber 2011 - Aug		Visited 3		5		-			1 4					
	Loc	cation	Atoka Coun	ty	Click r	map for si	te data			3	s	site 3				
	Imp	oundment	1964							-	• Site 2					
	Are	a	5,700 acres					-		1	5					
	Cap	pacity	125,000 aci	e-feet				Click Sit	te Names for	)	Site 1 S     Site 1 Bott					
	Pur	poses	Water Supp	ly, Recreati	on				able Data		And She T Doll	(	) 2 Miles			
_		Parameter (Des	scriptions)	Result					Notes/Comments							
		Average Turbidi	ty	115 NT	U				100% c	f values	> OWQS	S of 25 NT	U			
		Average Secchi	Disk Depth	17 cm												
	Situ	Water Clarity Ra	ating	Poor												
	L L	Chlorophyll-a		16 mg/	m3											
		Trophic State In	dex	58												
		Trophic Class		Eutroph	nic											
		Salinity		0.05 -	0.06 ppt											
	đ	Specific Conduc	tivity	103 – 1	06 µS/cr	n										
	Profile	рН		6.98 –	3.27 pH ı	units			All reco	rded valu	ues withi	n standaro	ds			
	ā	Oxidation-Reduc	l 192 to	538 mV												
		Dissolved Oxyge	en	All data mg/L	are abo	ve screen	ing leve	l of 2.0								
	6	Surface Total Ni	trogen	0.47 mg	g/L to 1.7	73 mg/L										
	ients	Surface Total Pl	nosphorus	0.047 n	na/L to 0	.226 mg/L										
	Nutrier	Nitrogen to Phos	•		0	5		Phosphorus limited								
		<u>Click to learn m</u> <u>Beneficial Uses</u>	nore about	Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli			
	Fisl	h & Wildlife Propa	gation	NS*	S	S	S									
	Aes	sthetics						S	N/A							
	Agr	riculture								N/A	N/A	S				
		mary Body Contac											S			
		olic & Private Wate	er Supply											N		
	Λ	S = Fully Supporting VS = Not Supporting VEI = Not Enough Int	formation	* Althou	gh 100% (		dity samp	les excee			ment for t	the current s	sample ye	ar		

	Be	ell Cov	V							6		• Sam	pling Sites			
		Sample Period	d	Times Visited	San	npling S	ites		300	~						
	Oc	ctober 2011 - July	2012	4		3		-		Site 3	1.1					
	Loc	ation	Lincoln Cou	nty	Click r	nap for si	e data			Site	4		A			
ସ	Imp	oundment	1990					•			Site 2	e Site 5	Site	e 1 Surface		
General	Are	a	1,153 acres									7	Site 1 E	Bottom		
မီ	Cap	pacity	15,613 acre	-feet									1/2			
	Pur	poses	Water Supp	ly, Flood Co	ontrol, Re	ecreation			e Names for able Data	attand			Miles			
		Parameter (Des	criptions)	Result					Notes/Comments							
		Average Turbidit	ty	23 NTL	J				50% of values > OWQS of 25 NTU							
		Average Secchi	Disk Depth	31 cm												
	In Situ	Water Clarity Ra	iting	Fair												
	L	Chlorophyll-a		18 mg/	m3											
		Trophic State Inc	dex	59					Previous Value = 52							
SIS		Trophic Class		Eutroph	nic											
Parameters		Salinity		0.17 - 0	).21 ppt											
aran	ð	Specific Conduc	359 - 42	359 - 429 μS/cm												
å	Profile	рН	7.27 - 8	7.27 - 8.88 pH units						y alkalin	e					
	Ē	Oxidation-Reduc	52 to 5	52 to 536 mV												
	•	Dissolved Oxyge	Up to 6 July	0% of wa	ater colum	n < 2 m	g/L in									
	ıts	Surface Total Ni	trogen	0.93 m	g/L to 1.1	3 mg/L										
	Nutrient	Surface Total Pr	nosphorus	0.005 n	ng/L to 0	.043 mg/L										
	Ŋ	Nitrogen to Phos	sphorus Ratio	53:1					Phosph	iorus limi	ted					
		<u>Click to learn m</u> <u>Beneficial Uses</u>	nore about	Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a		
Beneficial Uses	Fisł	h & Wildlife Propa	gation	NS	S	*	S									
al U	Aes	sthetics						S	N/A							
ficia	Agr	riculture								N/A	N/A	S				
ene	Prir	mary Body Contac	t Recreation										S			
m	Pub	olic & Private Wate	er Supply													
	Ν	S = Fully Supporting IS = Not Supporting IEI = Not Enough Inf	formation	*N/A – p *50-70%	<i>arameter</i> 6 range is	s <i>not collec</i> undetermi	<i>ted in cui</i> ned for D	rent samp O.	ole year.							
µS/c	m = n	phelometric turbidity nicrosiemens per ce Escherichia coli	ntimeter mV =	QS = Oklahol = millivolts r-a = Chloro		Quality Sta	andards		= milligram n = microsi			t = parts pe = Enteroco		d		

## **Birch**

D		CN												Samplin     Former
(		Sample Period	2013	Tim	es Visite 4	d S	ampling 4	Sites		4		K	Data	New Site 4 Data not yet available online
	Loc	ation	Osage	Count	ý							5		Site
B	Imp	oundment	1977							5		Previous Site 4	Previous Site 4	Previous Site 4
General	Are	a	1,137	acres						-		2002-2009	2002-2009	2002-2009
9 9	Cap	pacity	19,200	) acre-f	eet									
	Pur	poses	Water Quality	Supply	, Recreati ol and Fisl	on, Floo n and W	d Control, ildlife	Water		0N	11	1 les	les 1	1 les
		Parameter (Des	scriptions	<b>)</b>	Result					Notes/	Cc	ommen	omments	omments
		Average Turbidi	ty		11 NTL	J				6% of v	/alu	es > (	es > OWQS o	es > OWQS of 25 NTU
		Average Secchi	Disk De	pth	70 cm									
	In Situ	Water Clarity Ra	ating		Good									
	u l	Chlorophyll-a			7 mg/m	3								
		Trophic State In	dex		49					Previou	ıs value	=	= 51	= 51
ers		Trophic Class			Mesotre	ophic								
Parameters		Salinity			0.07 - 0	0.14 ppt								
arar	G	Specific Conduc	tivity		149 – 3	601 µS/c	m			TDS=1	12.8 g/L			
ũ	Profile	рН			6.17 –	8.43 pH	units							
	Δ.	Oxidation-Reduc	ction Pot	ential	-91 to 2	-								
		Dissolved Oxyge	en		Up to 5 summe		ater colum	nn < 2.0	mg/L in					
	ts	Surface Total Ni	itrogen		0.80 m	g/L to 0.9	99 mg/L							
	Nutrients	Surface Total Pl	nosphoru	JS	0.005 n	ng/L to 0	).009 mg/L	_						
	٦ Z	Nitrogen to Phos	sphorus	Ratio	151:1					Phosph	norus limi	t	ed	ed
		<u>Click to learn m</u> <u>Beneficial Uses</u>	nore abo	<u>ut</u>	Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates		Chlorides	Chlorides Total Dissolved Solids
ses	Fis	h & Wildlife Propa	gation		NS	S	NS	S						
al C	Aes	sthetics							S	*				
Beneficial Uses	Agr	iculture									S		S	S S
ene	Prir	mary Body Contac	t Recrea	ation										
Ш	Put	olic & Private Wate	er Supply	y										
	٨	S = Fully Supporting IS = Not Supporting IEI = Not Enough Ini		Notes	*Did not	collect fo	or these par	ameters.						

NTU = nephelometric turbidity units  $\mu$ S/cm = microsiemens per centimeter E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards *mV* = *millivolts* Chlor-a = Chlorophyll-a

*mg/L* = *milligrams* per liter  $\mu$ S/cm = microsiemens/cm

Click Site Names for

Available Data

Sampling Sites

Site 1 Surface Site 1 Bottom

ppt = parts per thousand En = Enterococci

Chlor-a

		Bixho	ma							5			•	Site 1 Surface
		Sample Period	d	Times Visited	Sar	npling S	ites					Site 4		•
	Oct	ober 2005 - July	2006	4		3				Sit	Site 2	Site 2	Site 2	Site 2
	Loc	ation	Wagoner C	ounty	Click r	map for si	te data							
	Imp	oundment	1965								Site	Site 5	Site 5 Site 3	
	Area	а	110 acres										Previous Site 5	
	Cap	bacity	3,130 acre-1	eet								2002-2009	0	0 1/8
	Pur	poses	Water Supp	oly, Recreat	tion					<ul> <li>Samplin</li> </ul>	<ul> <li>Sampling Sites</li> </ul>	Sampling Sites	<ul> <li>Sampling Sites</li> </ul>	Sampling Sites     Miles
		Parameter (Des	scriptions)	Result						Notes/0	Notes/Commer	Notes/Comments	Notes/Comments	Notes/Comments
		Average Turbidit	ty	5 NTU						100% o	100% of values	100% of values < OWQS	100% of values < OWQS of 25 NT	100% of values < OWQS of 25 NTU
		Average True Co	olor	23 unit	S					100% o	100% of values	100% of values < OWQ	100% of values < OWQS of 70	100% of values < OWQS of 70
		Average Secchi	•	146 cm										
		Water Clarity Ra	•	excelle	nt									
		Trophic State Ind	dex	45	a mhi -									
		Trophic Class		mesotr	-									
		Salinity			0.05 ppt									
	ile	Specific Conduc	tivity		127.5 µS									
	Profile	рН			8.63 pH	units		Ī		Only 3 (	Only 3 (2.3%) va	Only 3 (2.3%) values < 6	Only 3 (2.3%) values < 6.5 pH unit	Only 3 (2.3%) values < 6.5 pH units
		Oxidation-Reduc				ater colum	n ~ 2 m	,	/L in	// in	/L in	/1 in	// in	
		Dissolved Oxyge	en		& 67% ir		nı < ∠ m(	J/	LIII					<u></u>
	nts	Surface Total Ni	trogen	0.25 m	ng/L to 0.	45 mg/L								
	Nutrient	Surface Total Ph	nosphorus	0.010 r	ng/L to 0	.026 mg/L	_							
	Nu	Nitrogen to Phos	sphorus Ratio	22:1						Phosph	Phosphorus limi	Phosphorus limited	Phosphorus limited	Phosphorus limited
		<u>Click to learn m</u> <u>Beneficial Uses</u>	nore about	Turbidity	Hd	Dissolved Oxygen	Metals		TSI	TSI True Color	TSI True Color Sulfates	TSI True Color Sulfates Chlorides	TSI True Color Sulfates Chlorides Chlorides Dissolved Solids	TSI True Color Sulfates Chlorides Total Dissolved Solids Enterro. & E. coli
Beneticial Uses	Fish	n & Wildlife Propa	gation	S	S	NS								
0	Aes	othetics							S	S S	S S	S S	S S	S S
	Agri	iculture									S	S S	S S S	S S S
5	Prin	nary Body Contac										S S		
		olic & Private Wate	er Supply											
	N	= Fully Supporting IS = Not Supporting IEI = Not Enough Inf	formation	Notes										
µS/c	m = n	phelometric turbidity nicrosiemens per ce Scherichia coli	entimeter mV	QS = Oklaho = millivolts vr-a = Chloro		Quality Sta	andards							

### DL.

B	lu	lestem	1							J	0		<ul> <li>Sampling</li> </ul>	g Sites				
		Sample Perio	d		nes ited	San	npling S	ites			~	K						
	Dece	ember 2011 - Ju	ly 2012	4	4		4			e Names for	Site	4	No.	出				
	Loc	ation	Osage Cou	nty		Click r	nap for sit	e data	Avail	able Data		Site 3	1					
ସ	Imp	oundment	1958							(	5	• Site	5					
General	Are	а	762 acres									1	Site 2	Site	e 1 Surface			
Ğ	Cap	pacity	17,000 acr	e-feet						0	1/2			Site 1 Bo				
	Pur	poses	Water Sup	oly, Re	ecreati	on				M	liles		"	Sile i bo				
		Parameter (Des	scriptions)	R	Result					Notes/Comments								
		Average Turbidi	ty	2	28 NTU	l				25% of	values >	OWQS	of 25 NTU	l (n=16)				
		Average Secchi	Disk Depth	3	38 cm													
		Water Clarity Ra	ating	A	Average	e												
		Chlorophyll-a		6	6 mg/r	n3												
		Trophic State In	dex	4	18													
ers		Trophic Class		N	Nesotro	ophic												
Parameters		Salinity		0	).00 – (	0.16 ppt												
araı	<u>e</u>	Specific Conduc	tivity	2	271 – 3	327 µS/c	m											
۵.	Profile	рН		7	7.02 – 8	3.27 pH ւ	units											
		Oxidation-Reduc	ction Potentia		118 - 473 mV Up to 67% of water column < 2.0 mg/L in													
		Dissolved Oxyge	en		July													
	Its	Surface Total Ni	trogen	0	0.36 mg/L to 0.98 mg/L													
	trients	Surface Total Ph	nosphorus	0	).005 n	ng/L to 0	.041 mg/L											
	Nutr	Nitrogen to Phos	sphorus Ratio	9 4	44:1						Phosphorus limited							
		<u>Click to learn m</u> <u>Beneficial Uses</u>	nore about		Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En terro.& E. coli	Chlor-a			
ses	Fish	n & Wildlife Propa	gation		NS	S	*	*										
Beneficial Uses	Aes	sthetics							S	N/A								
fici	Agr	Agriculture									N/A	N/A	S					
ene	Prin	mary Body Contac	t Recreation											S				
<u> </u>	Pub	Public & Private Water Supply																
	N	S = Fully Supporting IS = Not Supporting IEI = Not Enough Ini					s <i>not collec</i> undetermi			ole year.								
μS/c	m = n	phelometric turbidity nicrosiemens per ce Escherichia coli	entimeter mV	= milli			Quality Sta	andards		= milligram n = microsi			t = parts pe = Enteroco		1			

		omer			_					npling Sites		2				
		Sample Perio	d	Times Visited	San	npling S	ites		0 101	ner Sample	Shes					
1	love	mber 2008 - Augu	ust 2009	4		3										
	Loc	ation	Payne Cour	nty	Click r	map for sit	e data				O	5				
ភ្	Imp	oundment	1932								Site 2					
General	Are	a	260 acres							मन्द्राम्स		7				
ษั	Cap	pacity	3,200 acre-1	eet							Site 4	0	1/2 Miles			
	Pur	poses	Cooling Wa	ter and Rec	reation				Site 1 Surface Site 1Bottom							
		Parameter (Des	scriptions)	Result					Notes/Comments							
		Average Turbidi	ity	24 NTU	J				42% of	values >	OWQS	of 25 NTU	J (n=12)			
		Average True C	olor						Did not	collect fo	or these	parametei	rS			
		Average Secchi	Disk Depth	42 cm												
		Water Clarity Ra	ating	Average	e											
		Trophic State In	dex	59					Previou	s value =	51					
ers		Trophic Class		Eutrop	hic											
met		Salinity		0.10 - 0	).21 ppt											
Parameters	e	Specific Conduc	ctivity	278 – 4	l24.5 μS/	cm										
╸	Profile	рН		8.26 pH	units											
		Oxidation-Redu	ction Potential		574 mV		m a /l									
		Dissolved Oxyg	en	in Augu		ater colun	10 < 2.0	mg/L								
	ıts	Surface Total N	itrogen	0.49 m	ng/L to 0.	97 mg/L										
	Nutrien	Surface Total Pl	hosphorus	0.010 n	ng/L to 0	.071 mg/l	_									
	Nut	Nitrogen to Pho	sphorus Ratio	18:1					Phosphorus limited							
		<u>Click to learn n</u> <u>Beneficial Uses</u>		Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a		
Beneficial Uses	Fisl	h & Wildlife Propa	gation	NS	S	S	*									
⊂ ש	Aes	sthetics						S	*							
<b>Stic</b>	Agr	riculture								*	*	S				
sene	Prir	mary Body Contac	ct Recreation										NEI			
IJ	Pub	olic & Private Wate	er Supply													
	٨	S = Fully Supporting IS = Not Supporting IEI = Not Enough In	1	*Did not The PB0 issues fo	CR benefic	r these para cial use car	ameters. Inot be as	sessed a	ıs minimum	n data requ	uirement	were not me	et due to C	JA/QC		
S/c	m = r	phelometric turbidity microsiemens per ce Escherichia coli	entimeter mV	QS = Oklaho = millivolts pr-a = Chloro		Quality Sta	andards		= milligram n = microsi			t = parts pe = Enteroco		d		

3	rc	oken B	OW						<ul> <li>Samplin</li> </ul>	g Sites		Z	lick Site Nar Available [	
		Sample Perio	d	Times Visited	Sar	npling S	ites					3		
N	ove	mber 2012 – Ju	ly 2013	4		8		-			-	Site 8		
	Loc	ation	McCurtain C	County	Click	map for si	te data				S	Site 7	and the	
Ľ	Imp	oundment	1970									Site 6	-	
ŀ	Are	а	14,200 acre	S				-			Site 4		Site 5	
	Cap	bacity	918,070 acr	e-feet							Sile 4	Site 3	Site 2	
ľ	Pur	poses	Flood Contr Recreation,			ter Supply	Ι,		0 Mile	4 s		Site 1 Su	rface	
t		Parameter (Des		Result	line				Notes/0	Commen	its	Sile i bu	atom	
		Average Turbidi		3 NTU					3% of v	alues > (	OWQS o	f 25 NTU	(n=32)	
		Average Secchi	-	237 cm							-		. ,	
	Situ	Water Clarity Ra	ating	Excelle	nt									
	In Si	Chlorophyll-a		4 mg/m	3									
		Trophic State In	dex	45					Previous	s value =	41			
		Trophic Class		Mesotro	ophic									
ľ	_	Salinity		0.01 –	0.03 ppt									
		Specific Conduc	tivity	27 – 65	µS/cm									
	Profile	рН		4.71 –	12.45 p⊦	l units			75% of	values <	6.5 pH	units		
	Ţ	Oxidation-Reduc	-100 —	504 mV										
		Dissolved Oxyge	en	Up to 7 the sun		ater colun	nn < 2.0	mg/L in						
	S	Surface Total Ni	itrogen	0.26 m	g/L to 1.	08 mg/L								
	ients	Surface Total Ph	nosphorus	0.005 n	ng/L to 0	.045 mg/L	-							
	Nutrier	Nitrogen to Phos	sphorus Ratio	59:1					Phosphorus limited					
		<u>Click to learn m</u> <u>Beneficial Uses</u>	nore about	Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	
	Fisł	n & Wildlife Propa	gation	S	NS*	NS	S							
ſ	Aes	thetics						S	*					
	Agr	iculture								S	S	S		
	Prin	nary Body Contac	t Recreation										S	
	Pub	olic & Private Wate	er Supply											
	N	= Fully Supporting  S = Not Supporting  El = Not Enough Ini		soluble l causes;	bedrock. I therefore	Because of , the Water	these co Board is	nditions it looking at	s part of the is likely tha t the applica *Did not co	t the low p ability of d	oH values eveloping	s may be du g site-specil	ue to natura	al
′cn	n = n	ohelometric turbidity nicrosiemens per ce scherichia coli	entimeter mV :	QS = Oklaho = millivolts r-a = Chloro	ma Water			mg/L	= milligram n = microsie	s per liter	рр	t = parts pe = Enteroce		1

		Sample Perio	d	Times	Sai	mpling S	ites		Click Site N Available				2			
	Oc	tober 2007 - July		Visited 4		5		-		7/11-12	1	Site 5				
		ation	Sequoyah	Countv	Click	map for si	te data					• Site 2				
		oundment	1964	,				-								
	Area		358 acres					-			Sit	e 4				
	Сар	pacity	3,258 acre-	feet				-		Site 1 Surfa	ce					
	-	poses	Flood Cont	rol and Re	creation			-	0 Mile	1/4 es	Site 1 Bo	ttom				
		Parameter (Des		Resu				Notes/Comments								
		Average Turbidi				ric turbidi	tv units (	NTU)		values >		J				
		Average True C	-	41 u	·		, ,		25% of	values >	OWOS	of 70				
		Average Secchi		103	cm											
		Water Clarity Ra	ating	good												
		Trophic State In	dex	53					Previou	s value =	51					
		Trophic Class		eutro	phic											
rarameters		Salinity		0.00	- 0.10 ppt											
		Specific Conduc	tivity		- 605 µS/0											
	Profile	рН	<b>y</b>		- 8.12 pH				Only 7	values <	6.5 unit	ts				
	Pre	Oxidation-Redu	ction Potentia		606 mV				,							
	Dissolved Oxygen Up to 69% of water colu							mn < 2	mg/L in	Occurr	ed at site	1, the c	lam			
	ts	Surface Total Ni	trogen	0.38	mg/L to 0	).72 mg/L										
		Surface Total Pl	nosphorus	0.016	mg/L to (	0.050 mg/	L									
	Nutrien	Nitrogen to Phos	sphorus Ratio	20:1					Phosph	orus limit	ed					
		Click to learn m Beneficial Uses	nore about	Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	c - John		
	Fish	n & Wildlife Propa	gation	S	S	NS	S									
	Aes	sthetics						S	S							
	Agri	iculture							S	S	S					
	Prin	nary Body Contac	t Recreation										S			
	Pub	olic & Private Wate	er Supply													
	N	= Fully Supporting IS = Not Supporting IEI = Not Enough Ini	formation	Precipitation data suggests the peak in color & turbidity are likely due to runoff, therefore the uses are considered supporting.								are				

## Sample PeriodTimes<br/>VisitedSampling SitesNovember 2005 - August 200643

1958

180 acres

Grady County

2,140 acre-feet

Location

Capacity

Area

General

Impoundment



Sampling Sites

	Pur	poses	Recreation			0 1/4 Miles
	i ui					
		Parameter (Des	criptions)	Result	I	Notes/Comments
		Average Turbidit	ty	11 NTU		100% of values < OWQS of 25 NTU
		Average True Co	olor	18 units		100% of values < OWQS of 70
		Average Secchi	Disk Depth	72 cm		
		Water Clarity Ra	ıting	good		
		Trophic State Inc	dex	63		
S		Trophic Class		hypertrophic		
Parameters		Salinity		0.53 – 0.67 ppt		
arar	e	Specific Conduct	tivity	1011 – 1273 µS/cm		
ݣ	Profile	рН		7.19 – 10.74 pH units		16% of values were > 9 pH units
	Ē	Oxidation-Reduc	ction Potential	42 - 428 mV		
		Dissolved Oxyge	en	Up to 38% of water column < 2 mg/ August	L in	
	ts	Surface Total Nit	trogen	0.92 mg/L to 1.82 mg/L		
	Nutrients	Surface Total Ph	nosphorus	0.027 mg/L to 0.109 mg/L		
	N	Nitrogen to Phos	sphorus Ratio	24:1	F	Phosphorus limited

Click map for site data

	<u>Click to learn more about</u> <u>Beneficial Uses</u>	Turbidity	Hđ	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
<b>Beneficial Uses</b>	Fish & Wildlife Propagation	S	S	NS								
al U	Aesthetics					S	S					
fici	Agriculture							S	S	S		
ene	Primary Body Contact Recreation										S	
ŏ	Public & Private Water Supply											
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information90											
μS/c	m = microsiemens per centimeter $mV = m$			Quality St	andards			ns per liter emens/cm		= parts pe = Enteroco		d

		Sample Perio	d	-	Times Tisited	Sar	npling S	ites		25	Site	e 3 •	64		
No	oven	nber 2011 - Aug	ust 2012	v	4		3				7	Ś			
1	Loc	ation	Blaine Cou	nty		Click	map for sit	e data					Site 2 •	2	
ľ	Imp	oundment	1948			1							J		
	Are	a	7,910 acres	5						Site Names fo ailable Data	or	~	Site 1 Surfa	ice	
	Cap	pacity	111,310 ac	re-f	eet					0	:	2	7.		
	Pur	poses	Flood Cont	rol,	Water S	upply, Irr	igation				Miles		V Site	1 Bottom	
		Parameter (Des	scriptions)		Result					Notes/0	Commen	ts			
		Average Turbidi	ty		35 NTL	J				75% of	values >	OWQS	of 25 NTL	J (n=12)	
		Average Secchi	Disk Depth		22 cm										
	Situ	Water Clarity Ra	ating		Poor										
	ln S	Chlorophyll-a			29 mg	/m3									
		Trophic State In	dex		64					Previous	s value =	60			
		Trophic Class			Hypere	utrophic									
		Salinity			0.71 –	0.97 ppt									
	6	Specific Conduc	tivity		1420 –	1920 µ	S/cm								
	Profile	рН			7.62–8	.34 pH	units			Neutral	to slightly	y alkaline	е		
	5	Oxidation-Reduc	ction Potentia	ıl	196 - 5	30 mV									
		Dissolved Oxyge	en		All data mg/L	are abo	ve screen	ing level	of 2.0						
	nts	Surface Total Ni	itrogen		0.94 m	g/L to 1.6	65 mg/L								
	rient	Surface Total Pl	nosphorus		0.048 n	ng/L to 0	.091 mg/L								
	Nutrie	Nitrogen to Phos	sphorus Ratio	)	18:1					Phosph	orus limit	ted			
		<u>Click to learn m</u> <u>Beneficial Uses</u>	<u>iore about</u>		Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	ā
	Fisł	h & Wildlife Propa	gation		NS	S	S	*							
	Aes	sthetics							S	N/A					
	Agr	iculture									S	S	S		
		mary Body Contac												S	
	Pub	olic & Private Wate	er Supply												
	Ν	S = Fully Supporting IS = Not Supporting IEI = Not Enough In		Notes	*N/A – p	parameter	s not collec	ted in cur	rent samp	ole year.					

С	a	rl Albe	rt								5	• Sam	pling Sites	
		Sample Perio	d	Times Visited	Sar	mpling S	ites				)	. ?		
	Oc	ctober 2007 - July	2008	4		3					s and a			
	Loc	cation	Latimer Co	unty	Click	map for si	te data			$\leq$		5	1	
ធ្ម	Imp	oundment	1964							5	- <b>-</b> -		3	
General	Are	a	183 acres						~	$\sim$		~~~		
Ğ	Cap	pacity	2,739 acre-	feet					$\leq$	n	~	}	0 1/4	
	Pur	rposes	Water Supp	oly, Flood C	Control, ar	nd Recrea	tion						Miles	
		Parameter (Des	scriptions)	Resu	t				Notes/0	Commer	nts			
		Average Turbidi	ty	14 ne	phelomet	ric turbidit	y units (	NTU)	All valu	es < 25 l	NTU			
		Average True C	olor	72 un	ts				50% of	values >	OWQS	of 70		
		Average Secchi	Disk Depth	90 cn	า									
		Water Clarity Ra	ating	good										
		Trophic State In	dex	41					Previou	s value =	= 41			
ຽ														
lete	Trophic Class     mesotrophic       Salinity     0.00 - 0.01 ppt													
Iran	Salinity 0.00 - 0.01 ppt													
å	Profile	pН			7.32 pH u	nits			21% of	values <	<6.5 unit	s		
	ፈ	Oxidation-Reduc	ction Potentia		553 mV									
		Dissolved Oxyge	en	Up to Augus		ater colur	nn < 2 n	ng/L in	Occurr	ed at site	e 1, the c	lam		
	Ŋ	Surface Total Ni	itrogen	0.28	mg/L to 0.	.49 mg/L								
	Nutrients	Surface Total Ph	nosphorus		_	0.031 mg/L	-							
	Z	Nitrogen to Phos	sphorus Ratic	16:1					Phosph	orus limi	ted			
		<u>Click to learn m</u> Beneficial Uses	nore about	Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
ses	Fisl	h & Wildlife Propa	gation	S	NS	NS	*							
Beneficial Uses	Aes	sthetics						S	NS					
ficia	Agr	riculture								S	S	S		
ene	Prir	mary Body Contac	t Recreation										S	
õ	Put	olic & Private Wate	er Supply											
	٨	S = Fully Supporting IS = Not Supporting IEI = Not Enough Ini		*Not s	upporting fo	or lead as c	hronic cr	iteria was	exceeded.	All other t	oxicants a	are fully sup	oporting.	
μS/c	m = r	phelometric turbidity microsiemens per ce Escherichia coli	entimeter mV	'QS = Oklah = millivolts pr-a = Chlo		r Quality Sta	andards		= milligram n = microsie			t = parts pe a = Enteroco		d

С	a	rl Blac	kwell						<ul> <li>Samplin</li> </ul>	ng Sites		L.		
		Sample Perio	d	Times Visited	San	npling S	ites		AN IN	N.	5			
	00	ctober 2012 - July	2013	4		5			- And	Site 4	Site 2			1 Surface
	Loc	cation	Payne Cour	ity	Click r	map for si	te data				1 m		Site 5 Site	1 Bottom
a	Imp	poundment	1937					-	e Names for		JA		35	
General	Are	a	3,370 acres					Availa	able Data	-	me	and a		
õ	Ca	pacity	61,500 acre	-feet									01	
	Pur	rposes	Water Supp	ly and Rec	reation				~	reserved a			Miles	
		Parameter (Des	scriptions)	Result					Notes/	Commen	nts			
		Average Turbidi	ity	27 NTU	J				36% of	values >	25 NTU	(n=14)		
		Average Secchi	Disk Depth	36 cm										
	In Situ	Water Clarity Ra	ating	Averag	е									
	L L	Chlorophyll-a		23 mg/	m3									
	Chlorophyll-a 23 mg/m3 Trophic State Index 61 Trophic Class Hypereutrophic								Previou	s value =	= 51			
ง														
Parameters	Trophic Class     Hypereutrophic       Salinity     0.18 – 0.23 ppt													
Iram	<b>a</b>	Specific Conduc	ctivity	378 - 4	l77 μS/cr	n								
Ъ,	Profile	pН		7.19 –	8.71 pH ι	units			Neutral	to slightl	y alkalin	e		
	ሻ	Oxidation-Redu	ction Potential	-95 – 3	41 mV									
		Dissolved Oxyge	en	Up to 4 summe		ater colur	nn < 2 m	ng/L in						
	nts	Surface Total N	itrogen	0.77 m	g/L to 1.3	36 mg/L								
	Nutrient	Surface Total Pl	hosphorus	0.005 r	ng/L to 0	.041 mg/L								
	ñ	Nitrogen to Pho	sphorus Ratio	48:1					Phosph	orus limi	ted			
		<u>Click to learn n</u> <u>Beneficial Uses</u>		Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
ses	Fis	h & Wildlife Propa	gation	NS	S	S	S							
Beneficial Uses	Aes	sthetics						S	*					
ficia	Agr	riculture								S	S	S		
ene	Prir	mary Body Contac	ct Recreation										S	
ũ	Puł	blic & Private Wate	er Supply											NS
	Λ	S = Fully Supporting NS = Not Supporting NEI = Not Enough In	1	*Did not	collect for	r these par	ameters.							
μS/c	m = r	ephelometric turbidity microsiemens per ce Escherichia coli	entimeter mV :	QS = Oklaho = millivolts r-a = Chloro		Quality Sta	andards		= milligram 1 = microsi			t = parts pe = Enteroco		d

2	a	rter							h	~		• Sam	pling Sites	
		Sample Perio	d	Times Visited	San	npling S	ites					~		
١	love	ember 2007 - Augu	ust 2008	4		3							7	
	Loc	cation	Marshall Co	unty	Click r	nap for si	te data							
	Imp	ooundment	1960							民田			. 7	
	Are	a	108 acres						國			5		
	Cap	pacity	990 acre-fe	ət					0	1/4				
	Pur	rposes	Water Supp	ly and Rec	reation				Miles	1/4				
I		Parameter (Des	scriptions)	Result					Notes/	Commer	nts			
		Average Turbidi	ty	7 neph	elometrio	c turbidity	v units (N	ITU)	All valu	es < 25 l	NTU			
		Average True C	olor	25 unit	5				All Valu	es < OW	/QS of 7(	)		
		Average Secchi	Disk Depth	121 cn	า									
		Water Clarity Ra	ating	exceller	nt									
		Trophic State In	dex	40					Previou	s value =	= 40			
		Trophic Class		oligotro	phic									
		Salinity		0.10 - 0	).20 ppt									
	-	Specific Conduc	325 µS/c	m										
	Profile	pН		6.98 –	8.33 pH	units			Neutral	to slight	ly alkalin	e		
	ፈ	Oxidation-Reduc	ction Potentia	60 to 5	57 mV									
		Dissolved Oxyge	en	Up to 4 August	14% of w	ater colu	mn < 2	mg/L in	Occurr	ed at site	e 1, the o	dam		
	Its	Surface Total Ni	trogen	0.41 m	ig/L to 0.	54 mg/L								
	Nutrient	Surface Total Ph	nosphorus	0.011 n	ng/L to 0	.018 mg/	L							
	NU	Nitrogen to Phos	sphorus Ratio	37:1					Phosph	orus limit	ted			
		<u>Click to learn m</u> <u>Beneficial Uses</u>	nore about	Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	
1	Fisl	h & Wildlife Propa	gation	S	S	S	S							
	Aes	sthetics						S	S					
	Agr	riculture								S	S	S		
	Prir	mary Body Contac	t Recreation										S	
	Put	olic & Private Wate	er Supply											
	٨	S = Fully Supporting NS = Not Supporting NEI = Not Enough Ini	formation	Notes										
ć	m = r	phelometric turbidity microsiemens per ce Escherichia coli	entimeter mV	QS = Oklaho = millivolts pr-a = Chloro		Quality Sta	andards		= milligram n = microsi			t = parts pe = Enteroco		d

С	e	dar							<ul> <li>Sampl</li> </ul>	ing Sites		•	1 Surface	
		Sample Perio	d	Times Visited	Sar	npling S	lites		er a	5	S Site 2	ite 4	1 Bottom	
	Feb	ruary 2011 - Jul	y 2011	4		5					Site 5			
	Loc	ation	Le Flore Co	ounty	Click	map for si	te data			Site 3			日本田	
ធ	Imp	oundment	1937											
General	Are	a	78 acres						6					
ອ	Cap	pacity	1,000 acre-f	eet						lick Site Na	mes for	7		
	Pur	poses	Recreation						/ 0	Available		0	1/8 Miles	
		Parameter (Des	scriptions)	Result					Notes/	Commen	its			
		Average Turbidi	ty	6 NTU					100% c	f values	< OWQS	S of 25 NT	Ū	
		Average Secchi	Disk Depth	99 cm										
	itu	Water Clarity Ra	ating	Excelle	nt									
	Water Clarity Rating     Excellent       Chlorophyll-a     13 mg/m3       Trophic State Index     56													
	Trophic State Index 56								Previou	s Value=	-53			
ຽ														
Parameters	Trophic Class     Eutrophic       Salinity     0.0– 0.04 ppt													
aran	Salinity 0.0– 0.04 ppt Specific Conductivity 32.8 – 106.4 µS/cm													
å	Profile	рН		5.6 - 8.	94 pH u	nits			51.56%	< 6.5				
	5	Oxidation-Reduc	ction Potential	-12 - 50	)9 mV									
		Dissolved Oxyge	en	Up to 7 summe		ater colun	nn < 2 m	g/L in						
	s	Surface Total Ni	itrogen	0.18 m	g/L to 0.	97 mg/L								
	Nutrients	Surface Total Ph	hosphorus	0.016 n	ng/L to 0	.057 mg/l	_							
	N	Nitrogen to Phos	sphorus Ratio	18:1					Phosph	orus limi	ted			
		<u>Click to learn</u> <u>Beneficial Uses</u>		Turbidity	Hď	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
ses	Fisł	h & Wildlife Propa	gation	NEI	NS	S	S							
Beneficial Uses	Aes	sthetics						S	*					
ficia	Agr	iculture								*	*	S		
ene	Prir	mary Body Contac	ct Recreation										S	
m	Pub	olic & Private Wate	er Supply											
	Λ	S = Fully Supporting IS = Not Supporting IEI = Not Enough In	·						all turbidity imum data			U, The FWI not met.	P beneficia	al use
μS/c	m = n	phelometric turbidity nicrosiemens per ce Escherichia coli	entimeter mV =	QS = Oklaho = millivolts r-a = Chloro		Quality St	andards		= milligram n = microsi			t = parts pe = Enteroco		d

С	h	andler							h			• Sam	pling Sites	
		Sample Perio	d	Times Visited	San	npling S	ites					Z		
	00	ctober 2007 - July	2008	4		3							7	
	Loc	cation	Lincoln Cou	nty	Click r	map for sit	e data				/			
ភ្	Imp	ooundment	1960										- 7	
General	Are	a	129 acres						國	調査		5		
õ	Ca	pacity	2,778 acre-f	eet										
	Pur	rposes	Water Supp	ly and Rec	reation				Miles	1/4				
		Parameter (Des	scriptions)	Result					Notes/	Commen	nts			
		Average Turbidi	ty	29 nepl	helometr	ic turbidity	/ units (l	NTU)	58% of	values >	> 25 NTL	J		
		Average True C	olor	59 unit	5				25% of	values >	• OWQS	of 70		
		Average Secchi	Disk Depth	39 cm										
	Water Clarity Rating     average       Trophic State Index     60       Trophic Class     eutrophic       Salinity     0.10 - 0.18 ppt													
	Trophic State Index 60							Previou	s value =	= 50				
ร	Trankia Olaca autoratia													
Parameters	Trophic Class     eutrophic       Salinity     0.10 - 0.18 ppt       Specific Conductivity     268 - 365.7 µS/cm													
Iran	Salinity         0.10 - 0.18 ppt           Specific Conductivity         268 - 365.7 μS/cm           pH         7.35 - 8.82 pH units													
å	ofile	рН		7.35 –	8.82 pH (	units			Neutral	to slight	ly alkalin	e		
	5	pH 7.35 – 8.82 pH units Oxidation-Reduction Potential 23 to 533 mV												
							mn < 2 i	ng/L in	Occurr	ed at site	e 1, the d	lam		
	ts	Surface Total Ni	itrogen	0.82 m	g/L to 1.!	59 mg/L								
	Nutrient	Surface Total Pr	nosphorus	0.036 n	ng/L to 0	.082 mg/l	_							
	N	Nitrogen to Phos	sphorus Ratio	27:1					Phosph	orus limit	ted			
		<u>Click to learn m</u> <u>Beneficial Uses</u>		Turbidity	Hď	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
ses	Fis	h & Wildlife Propa	gation	NS	S	NS	S							
Beneficial Uses	Aes	sthetics						S	NS					
ficia	Agr	riculture								S	S	S		
ene	Prir	mary Body Contac	t Recreation										S	
Δ	Agriculture     Image: Contact Recreation       Primary Body Contact Recreation     Image: Contact Recreation       Public & Private Water Supply     Image: Contact Recreation													
	٨	S = Fully Supporting NS = Not Supporting NEI = Not Enough Int	formation	Notes										
μS/c	m = r	phelometric turbidity microsiemens per ce Escherichia coli	entimeter mV =	QS = Oklaho = millivolts r-a = Chloro		Quality Sta	andards		= milligram n = microsi			t = parts pe a = Enteroco		d

С	hi	ickash	а						• Samplin	g Sites		h		
		Sample Perio	d	Times Visited	Sar	npling S	ites		5			5		
	Oct	ober 2012 - July	2013	4		3				Site 2	(	Site 3		
	Loc	ation	Caddo Cou	nty	Click	map for si	te data			Site 2	Sit	e 5		
ସ	Imp	oundment	1958					Click Sit	te Names for	~				
General	Are	a	820 acres					Avail	able Data		Site 4			
õ	Cap	pacity	41,080 acre	-feet				_			~	Site 1 Surfac Site 1 Bott	e om	
	Pur	poses	Water Supp	ly, Recreati	on					題		0	1/2 Miles	
		Parameter (Des	scriptions)	Result				1	Notes/0	Commer	nts			
		Average Turbidit	ty	12 NTL	J				100% o	f values	< OWQS	S of 25 NT	U (n=12)	
		Average Secchi	Disk Depth	60 cm										
	Situ	Water Clarity Ra	ating	Good										
	Ч	Chlorophyll-a		28 mg/	m3									
		Trophic State Inc	dex	63					Previou	s Value=	=63			
S	Trankia Olara													
Parameters	Trophic Class     Hypereutrophic       Salinity     1.32 – 1.47 ppt       Specific Conductivity     2551 – 2820 µS/cm													
aran	Salinity     1.32 – 1.47 ppt       Specific Conductivity     2551 – 2829 µS/cm													
å	Profile	рН		7.01 –	8.28 pH	units			Neutral	to slightl	y alkalin	е		
	ā	Oxidation-Reduc	ction Potentia	l -22 to 3	396 mV									
		Dissolved Oxyge	en	Up to 5 summe		ater colum	n < 2 m	g/L in						
	Its	Surface Total Ni	trogen	1.59 m	ng/L to 2.	43 mg/L								
	Nutrien	Surface Total Ph	nosphorus	0.005 r	ng/L to 0	.037 mg/L	<u>.</u>							
	Nu	Nitrogen to Phos	sphorus Ratio	117:1					Phosph	orus limi	ted			
		<u>Click to learn m</u> <u>Beneficial Uses</u>	nore about	Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
ses	Fish	h & Wildlife Propa	gation	S	S	S	S							
Beneficial Uses	Aes	sthetics						NS	S					
ficia	Agr	iculture								S	S	S		
ene	Prir	mary Body Contac	t Recreation										S	
B	Pub	olic & Private Wate	er Supply											
	Ν	S = Fully Supporting IS = Not Supporting IEI = Not Enough Int	formation	<b>8</b> Watersh	ed (NLW)	. This listin	g means	that the la		dered thre	eatened fi	as a Nutrien rom nutrien		nore
μS/c	m = r	phelometric turbidity microsiemens per ce Escherichia coli	entimeter mV	QS = Oklaho = millivolts or-a = Chloro		Quality Sta	andards		= milligram n = microsie			t = parts pe = Enteroco		d

С	la	remor	е							<ul> <li>Samplir</li> </ul>	ng Sites			کم	
		Sample Perio			Times Tisited	Sar	npling S	ites	-		K	the state			
No	oven	nber 2005 - Aug	ust 2006		4		5				. /	•	•	_	
	Loc	ation	Rogers Co	ount	у	Click r	map for si	te data			$\mathbf{S}$	2			
ធ្ល	Imp	ooundment	1930						_				-		
General	Are	a	470 acres						_	-	7 8				
๛	Cap	oacity	7,900 acre-	fee	t									CHEELE	
	Pur	poses	Water Sup	ply,	Recreat	ion							0	1/2 Miles	
		Parameter (Des	scriptions)		Result					Notes/	Commer	nts			
		Average Turbidit	ty		19 NTU					13% of	values >	OWQS	of 25 NTL	J	
		Average True Co	olor		24units					100% o	of values	< OWQ	S of 70		
		Average Secchi	Disk Depth		41 cm										
		Water Clarity Ra	ating		good										
		Trophic State Inc	dex		67										
δ		Trophic Class			hypereu	utrophic									
Parameters		Salinity			0.11-0	.12 ppt									
Iram	Salinity     0.11-0.12 ppt       Φ     Specific Conductivity     242 - 257.4 µS/cm														
Pa	Profile	рН													
	Γ.	Oxidation-Reduc	ction Potentia	al	252- 45	4 mV									
		Dissolved Oxyge	en		Up to 2 May	9% of wa	ater colum	nn < 2 m	g/L in	Occurr	ed at site	e 1, the d	lam		
	nts	Surface Total Ni	trogen		0.91 m	g/L to 2.	00 mg/L								
	Nutrien	Surface Total Pr	nosphorus		0.072 m	ng/L to 0	.193 mg/L	-							
	Ž	Nitrogen to Phos	sphorus Ratio	D	12:1					Phosph	iorus Lim	iited			
		<u>Click to learn m</u> Beneficial Uses	nore about		Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
ses	Fisl	h & Wildlife Propa	gation		*	S	S	S							
Ĩ C	Aes	sthetics							NS**	*					
Beneficial Uses	Agr	iculture									S	S	S		
ene	Prir	mary Body Contac	t Recreation											S	
å	Put	olic & Private Wate	er Supply												
	٨	S = Fully Supporting IS = Not Supporting IEI = Not Enough Int		Notes	and colo **The la	r cannot b ake is liste	be made at	this time QS as a l	as minimu NLW indic	um data reating that t	quirement the Aesthe	s were no etics bene	eficial use I ot met for th ificial use is status	is sample	year.
μS/c	m = r	phelometric turbidity nicrosiemens per ce Escherichia coli	entimeter mV	= m	= Oklahor nillivolts = Chloro		Quality Sta	andards		= milligram = microsi			t = parts pe = Enteroco		d

С	le	ear Cre	ek							Si	•	• Sam	pling Sites	
		Sample Perio	d	Times Visited	San	npling S	lites				<u></u>			
I	Dece	ember 2012 - Ju	ly 2013	4		3				2	Site 5			
	Loc	cation	Stephens Co	ounty	Click r	nap for si	te data							
ធ្ម	Imp	ooundment	1948					Click Sit	e Names fo	r	• Site 2			
General	Are	a	722 acres					Availa	able Data	5	~			
ő	Cap	pacity	7,711 acre-f	eet				_		全国	Site	4 0	1/2	
	Pur	rposes	Water Supp	y, Recreati	on					and and	Si	Site 1 Surface ite 1 Bottom	Miles	
		Parameter (Des	scriptions)	Result					Notes/	Commer	nts			
		Average Turbidit	ty	14 NTL	J				100% c	of values	< OWQS	6 of 25 NT	U (n=6)	
		Average Secchi	Disk Depth	45 cm										
	In Situ	Water Clarity Ra	ating	Averag	е									
	Ч	Chlorophyll-a		26 mg/	m3									
		Trophic State Inc	dex	62					Previou	is Value=	=59			
şrs		Trophic Class												
Parameters		Salinity												
arar	e	Specific Conduc												
ä	Profile	рН		7.66 –	8.35 pH ι	units			Neutral	to slightl	y alkalin	е		
	₽	Oxidation-Reduc	ction Potential	-53 to 3	864 mV									
		Dissolved Oxyge	en						All data	a are abc	ve scree	ning level	of 2 mg/	Ľ
	s	Surface Total Ni	trogen	0.97 m	g/L to 1.9	96 mg/L								
	Nutrients	Surface Total Ph	nosphorus	0.005 n	ng/L to 0	.024 mg/l	_							
	nZ	Nitrogen to Phos	sphorus Ratio	99:1					Phosph	iorus limi	ted			
		<u>Click to learn m</u> <u>Beneficial Uses</u>	nore about	Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
ses	Fis	h & Wildlife Propa	gation	S	S	S	S							
Beneficial Uses	Aes	sthetics						S	*					
fici	Agr	riculture								NS	NS	NS		
ene	Prir	mary Body Contac	t Recreation										S	
Δ	Put	blic & Private Wate	er Supply											
	Λ	S = Fully Supporting NS = Not Supporting NEI = Not Enough Int	formation	* Did no	t collect fo	or this para	meter.							
μS/c	m = r	ephelometric turbidity microsiemens per ce Escherichia coli	entimeter mV =	QS = Oklaho = millivolts r-a = Chloro		Quality St	andards		= milligram n = microsi			t = parts pe = Enteroco		d

		Sample Perio	d	Times	Sar	npling S	lites						~	
N	oven	• nber 2006 - Aug		Visited 4		3				~	•	$\wedge$	7	
	Loc	cation	Pawnee Co	unty	Click	map for si	te data		44		~~~			
3	Imp	oundment	1936						$\bigcap$					
	Are	a	159 acres						5~	7 4				
	Cap	pacity	2,200 acre-	feet					0	1/4				
	Pur	poses	Water Supp	ly, Recrea	tion				Miles	-			- A A A A A A A A A A A A A A A A A A A	
-		Parameter (Des	scriptions)	Resu	t				Notes/	Commen	its			
		Average Turbidi	ty	17 NT	Ū				8% of v	alues >C	WQS of	25 NTU		
		Average True C	olor	63 un	ts				25% of	values >	OWQS	of 70		
		Average Secchi	Disk Depth	56 cm										
		Water Clarity Ra	ating	avera	ge									
		Trophic State In	dex	56										
		Trophic Class		eutrop	hic									
		Salinity		0.08 -	- 0.11 ppt									
	0	Specific Conduc	tivity	173.3	– 235.3 µ	S/cm								
	Profile	pН		6.93 -	- 8.64 pH	units			Neutral	to slightl	y alkalin	e		
	ፈ	Oxidation-Reduc	ction Potentia	82 to	438 mV									
		Dissolved Oxyge	en	Up to May	70% of wa	ater colum	nn < 2 mộ	g/L in						
	Ś	Surface Total Ni	itrogen	0.85 r	ng/L to 1.2	24 mg/L								
	Nutrients	Surface Total Pl	nosphorus	0.021	mg/L to 0	.050 mg/L	_							
	NU	Nitrogen to Phos	sphorus Ratic	30:1					Phosph	orus limi	ted			
		<u>Click to learn m</u> <u>Beneficial Uses</u>	nore about	Turbidity	Hď	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
	Fisł	h & Wildlife Propa	gation	S	S	NS	S							
	Aes	sthetics						S	S					
	Agr	iculture								S	S	S		
	Prir	mary Body Contac	t Recreation										NEI	
	Pub	olic & Private Wate	er Supply											
	Ν	S = Fully Supporting IS = Not Supporting IEI = Not Enough In		<b>e</b> issues		<i>cocci</i> . The p	beak repor	ted in co	lor is due to			were not me ents and th		QA/Q

C	lin	nton							<ul> <li>Samplir</li> </ul>	ig Sites				
					1				2	~		Site 4 Site 1	Surface	
		Sample Perio	d	Times Visited	San	npling S	ites		<u> </u>		• Site 2		Bottom	
	Octo	ober 2009 – July	/ 2010	4		5			5		4	Site 5		
	Loc	ation	Washita Cou	nty	Click r	nap for si	te data							
ភ្	Imp	oundment	1931						<ul> <li>Site Name</li> <li>Vailable Date</li> </ul>		لم	Site 3		
General	Are	а	335 acres					A	valiable Dai	a				
õ	Cap	bacity	3,980 acre-fe	et								0	1/4	
	Pur	poses	Water Supply	/, Recreati	on				and the second se			<b>····</b>	Miles	
		Parameter (Des	scriptions)	Result					Notes/	Commen	ts			
		Average Turbidit	ty	18 NTU	J				27% of	values >	OWQS	of 25 NTL	J	
		Average True Co	olor											
		Average Secchi	Disk Depth	57 cm										
		Water Clarity Ra	ating	average	е									
		Trophic State Inc	dex	65					Previou	s = 66				
Srs		Trophic Class		hypere	utrophic									
Parameters		Salinity		0.27 –	0.31 ppt									
arar	e	Specific Conduc	tivity	535.2 -	- 604.5 µ	S/cm								
ä	Profile	рН		7.52 –	8.23 pH u	units			Slightly	/ alkaline				
	đ	Oxidation-Reduc	ction Potential	-21 – 4										
		Dissolved Oxyge	en	Up to 4 the sun		ater colum	n < 2 mç	g/L in						
	ients	Surface Total Ni	trogen	0.79 m	g/L to 1.3	8 mg/L								
		Surface Total Ph	nosphorus	0.057 r	ng/L to 0.	104 mg/L								
	Nutri	Nitrogen to Phos	sphorus Ratio	16:1					Phosph	orus limi	ted			
		<u>Click to learn m</u> <u>Beneficial Uses</u>	nore about	Turbidity	Hď	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
ses	Fisł	n & Wildlife Propa	gation	S	S	S	S							
Beneficial Uses	Aes	sthetics						NS*	*					
<u>ș</u> fici	Agr	iculture								S	S	S		
ene	Prin	nary Body Contac	t Recreation											
<b>m</b>	Pub	olic & Private Wate	er Supply											NS
	N	= Fully Supporting IS = Not Supporting IEI = Not Enough Int	formation	threaten	ed by nuti	l in the WC ients until for this par	studies ca					cial use is c status.	considered	I
μS/c	m = n	phelometric turbidity nicrosiemens per ce Escherichia coli	ntimeter mV =	S = Oklaho millivolts -a = Chloro		Quality Sta	andards		= milligram n = microsi			t = parts pe = Enteroco		d

С	0	algate	City						<ul> <li>Sampl</li> </ul>	ing Sites	Not a	ſ		
		Sample Perio	d	Times Visited	Sar	npling S	ites			民国	4			
	Oct	ober 2006 - July	2007	4		5			展		25	Ç		
	Loc	ation	Coal Count	y	Click	map for sit	e data				5	· mm		
ភ្	Imp	oundment	1965						No. 16		5	• }		
General	Are	а	352 acres							2	Z	2		
ษั	Cap	pacity	3,437 acre-	feet							~ ~	5		
	Pur	poses	Water Supp	ly, Recreati	on and F	lood Cont	rol			2		0	1/2 Miles	
		Parameter (Des	scriptions)	Result					Notes/	Commen	nts			
		Average Turbidit	ty	92 NTU	J				85% of	values >	OWQS	of 25 NTL	J	
		Average True Co	olor	249 un	its				100% o	f values	> OWQS	S of 70		
		Average Secchi	Disk Depth	26 cm										
		Water Clarity Ra	ating	poor										
		Trophic State Inc	dex	47										
ຽ		Trophic Class		mesotr	ophic									
Parameters		Salinity		0.01 –	0.02 ppt									
Iran	0	Specific Conduc	tivity	47.1 –	72.7 µS/	cm								
å	Profile	рН		6.32– 8	3.03 pH u	inits			Only 8	(8%) of v	ales < 6	.5 pH units	6	
	ፈ	Oxidation-Reduc	ction Potentia	l 230 to	445 mV									
		Dissolved Oxyge	en	Up to 7 July	1% of wa	ater colum	n < 2 m	g/L in	Occurr	ed at site	92			
	ıts	Surface Total Ni	trogen	0.90 m	g/L to 1.4	43 mg/L								
	Nutrien	Surface Total Pr	nosphorus	0.061 r	ng/L to 0	.155 mg/L								
	Ň	Nitrogen to Phos	sphorus Ratio	13:1					Phosph	orus limi	ted			
		<u>Click to learn m</u> <u>Beneficial Uses</u>	nore about	Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
ses	Fish	n & Wildlife Propa	gation	NS	S	NS	S							
Beneficial Uses	Aes	sthetics						S	NS					
ficia	Agr	iculture								S	S	S		
ene	Prin	nary Body Contac	t Recreation										NEI	
m	Pub	olic & Private Wate	er Supply											
	N	S = Fully Supporting IS = Not Supporting IEI = Not Enough Ini	formation		CR benefi or fecal co		nnot be a	ssessed a	as minimum	ı data requ	uirement	were not me	et due to C	A/QC
μS/c	m = n	phelometric turbidity nicrosiemens per ce Escherichia coli	entimeter mV	QS = Oklaho = millivolts pr-a = Chloro		<sup>.</sup> Quality Sta	andards		= milligram n = microsi			t = parts pe = Enteroco		1

С	0	manch	e						<ul> <li>Samplir</li> </ul>	ng Sites	Site 3	¢.		
		Sample Perio	d	Times Visited	Sar	npling S	ites				~			
[	Dece	mber 2010 – Augi	ust 2011	4		5					Sit	te 5		
	Loc	cation	Stephens Co	ounty	Click r	map for si	te data				5.			
a	Imp	ooundment	1960					Click Sit	e Names fo		Site 2			
General	Are	a	184 acres					Availa	able Data					
ъ В	Ca	pacity	2,500 acre-f	eet								Site 4	) 1/4	
	Pu	rposes	Water Suppl	y and Recr	eation				- Andrew	and a	Site 1 Bot	1 Surface tom	Miles	
		Parameter (Des	scriptions)	Result					Notes/0	Commen	its			
		Average Turbidi	ty	12 NT	J				100% c	of values	< OWQS	6 of 25 NT	Ū	
		Average Secchi	Disk Depth	86					Did not	collect fo	or true co	olor		
	In Situ	Water Clarity Ra	ating	Good										
	L L	Chlorophyll-a		8 mg/m	13									
		Trophic State In	dex	50					Previou	s value =	58			
ร		Trophic Class		Mesotro	ophic									
nete		Salinity		0.14 - 0	).2 ppt									
Parameters	ð	Specific Conduc	ctivity	284.8 -	· 398.1 µ	S/cm								
ã	Profile	рН		6.9 – 8	.89 pH u	nits			Neutral	to slightl	y alkalin	e		
	Ē	Oxidation-Reduc	ction Potential	-47 to 4	127 mV									
		Dissolved Oxyge	en	50% o summe		olumn <	2.0 mg/l	. in						
	S	Surface Total Ni	itrogen	0.49 m	ig/L to 0	.72 mg/L								
	Nutrients	Surface Total Ph	nosphorus	0.015 r	ng/L to C	0.031 mg/	L							
	Ž	Nitrogen to Phos	sphorus Ratio	28:1					Phosph	orus limit	ed			
		<u>Click to learn</u> Beneficial Uses	n more about	Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
ses	Fis	h & Wildlife Propa	gation	S	S	S	S							
Beneficial Uses	Aes	sthetics						S	*					
fici	Agı	riculture								*	*	S		
ene	Pri	mary Body Contac	t Recreation										S	
Ш	Pul	olic & Private Wate	er Supply											
	1	S = Fully Supporting VS = Not Supporting VEI = Not Enough Ini	formation	*Did not	collect for	r these par	ameters							
μS/c	m = r	phelometric turbidity microsiemens per ce Escherichia coli	entimeter mV =	QS = Oklaho = millivolts r-a = Chloro		Quality Sta	andards		= milligram 1 = microsi			t = parts pe = Enteroco		d

		pan		Times							she a			
		Sample Perio	d	Times Visited	Sar	npling S	lites					Site 4	m	
	Oct	ober 2012 - Augus	st 2013	4		5					Site	s yr	man a	
	Loc	cation	Washington	County	Click	map for si	te data				7	Site 3		
ធ	Imp	oundment	1983						te Names for		Citro 2			
General	Are	a	4,850 acres					Avail	lable Data		Sille 2	1		
Ğ	Ca	pacity	43,400 acre-							離			01	
	Pur	rposes	Flood Contro Control, Fish							and a	Site 1 Bo	e 1 Surface ottom	Miles	
		Parameter (Des		Result					Notes/	Commer	nts			
		Average Turbidi	ty	59 nep	helometr	ic turbidity	y units (N	NTU)	100% o	f values	> 25 NT	U (n=20)		
		Average Secchi	Disk Depth	21 cm										
		Water Clarity Ra	ating	averag	e									
		Chlorophyll-a		16 mg/	m3									
		Trophic State In	dex	58					Previou	s value =	= 60			
<b>srs</b>		Trophic Class		Eutrop	nic									
Parameters		Salinity		0.09 -	0.16 ppt									
arar	e	Specific Conduc	tivity	186 – 3	840 µS/cı	m								
0	Profile	pН		6.86 -	8.18 pH	units			Neutral	to slight	ly alkalin	е		
	₽.	Oxidation-Reduc	ction Potential	-71 to 2	294 mV									
		Dissolved Oxyge	en	20% of	water co	olumn < 2	mg/L in	August						
	S	Surface Total Ni	trogen	0.74 m	ng/L to 1.	34 mg/L								
	Nutrients	Surface Total Pl	nosphorus	0.046 r	ng/L to 0	.138 mg/l	_							
	N	Nitrogen to Phos	sphorus Ratio	14:1					Phosph	orus limi	ited			
		<u>Click to learn m</u> <u>Beneficial Uses</u>	nore about	Turbidity	Hđ	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
ses	Fis	h & Wildlife Propa	gation	NS	S	S	S							
<b>Beneficial Uses</b>	Aes	sthetics						S	*					
ficia	Agr	riculture								S	S	S		
ene	Prir	mary Body Contac	t Recreation										S	
Ω	Pu	olic & Private Wate	er Supply											NS
	Λ	S = Fully Supporting NS = Not Supporting NEI = Not Enough Ini	formation	*No long	ger collec	t for this pa	arameter.							

С	rc	owder								}		• Sam	npling Sites	
		Sample Perio		Times Visited	San	npling S	ites	-		6				
N	over	mber 2005 - Aug	ust 2006	4		3							的形图	
	Loc	cation	Washita Co	unty	Click n	nap for si	te data	_		2				
a	Imp	poundment	1959					_						
General	Are	a	158 acres							2	$\sim$			
ຜັ	Ca	pacity	2,094 acre-1	feet							2			
	Pur	rposes	Flood Cont	rol, Recreat	ion					4	•	0	1/2 Miles	
		Parameter (Des	scriptions)	Result					Notes/	Commer	nts			
		Average Turbidit	ty	9 NTU					100% o	f values	< OWQS	S of 25 NT	U	
		Average True Co	olor	17 units	6				100% o	f values	< OWQ	S of 70		
		Average Secchi	Disk Depth	65 cm										
		Water Clarity Ra	ating	average	Э									
		Trophic State Inc	dex	57										
စ		Trophic Class		eutroph	nic									
Parameters		Salinity		0.38– 0	.57 ppt									
Iram		Specific Conduc	tivity	744 – 1	088 µS/c	m								
<b>P</b> a	Profile	рН		7.03– 8	.34 pH u	nits			Neutral	to slight	ly alkalin	е		
	ዾ	Oxidation-Reduc	ction Potential	I 275-44	5 mV									
		Dissolved Oxyge	en	Up to 3 May	7.5% of v	water colu	umn < 2	mg/L in	Occurr	ed at site	es 1 and	2		
	s	Surface Total Ni	itrogen	0.54 mg	g/L to 0.9	3 mg/L								
	Nutrients	Surface Total Pr	nosphorus	0.026 1	mg/L to 0	0.053 mg/	L							
	Ž	Nitrogen to Phos	sphorus Ratio	21:1					Phosph	orus Lim	nited			
		<u>Click to learn m</u> Beneficial Uses	nore about	Turbidity	Hď	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
Beneficial Uses	Fis	h & Wildlife Propa	gation	S	S	S	S							
al U	Aes	sthetics						NS*	S					
fici	Agr	riculture								S	S	S		
ene	Prir	mary Body Contac	t Recreation										S	
â	Pu	blic & Private Wate	er Supply											
	Λ	S = Fully Supporting NS = Not Supporting NEI = Not Enough Int							ing that the ducted to c			cial use is co status	onsidered	
μS/c	:m = 1	phelometric turbidity microsiemens per ce Escherichia coli	entimeter mV	QS = Oklahol = millivolts or-a = Chloro		Quality Sta	andards		= milligram n = microsi			nt = parts pe n = Enteroco		1

С	u	shing	Muni	cipa					<ul> <li>Samp</li> </ul>	ling Sites	•	Surface 1 Bottom		
		Sample Perio	d	Times Visited	Sar	npling S	ites			• Site 5				
	Oct	ober 2011 - July	y 2012	4		5								
	Loc	ation	Payne Cour	ty	Click r	map for sit	e data			4	• {			
ସ	Imp	oundment	1950					Click Si	te Names fo		te 2	0	1/2 Miles	
General	Are	a	591 acres					Avail	lable Data	E	Site 4			
မီ	Cap	pacity	3,304 acre-f	eet				_		X	Site	e 3		
	Pur	poses	Water Supp	y, Recreat	ion					•)				
		Parameter (Des	scriptions)	Result				1	Notes/	Commer	nts			
		Average Turbidi	ity	44 NTU	J				92% of	values >	OWQS	of 25 NTL	J	
		Average Secchi	Disk Depth	25 cm										
		Water Clarity Ra	ating	Poor										
		Chlorophyll-a		7 mg/	m3									
		Trophic State In	ıdex	50					Previou	s value =	= 50			
ຽ		Trophic Class		Mesotr	ophic									
Parameters		Salinity		0.15 –	0.19 ppt									
aran	đ	Specific Conduc	ctivity	324 – 4	402 µS/cr	n								
å	Profile	pН		7.32-8	3.20 pH u	inits			Neutral	to slight	ly alkalin	е		
	ā	Oxidation-Redu	ction Potential	335 to	613 mV									
		Dissolved Oxyg	en	Up to 1 July	7% of wa	ater colum	ın < 2 m	g/L in						
	S	Surface Total N	itrogen	0.56 m	g/L to 1.1	l2 mg/L								
	Nutrients	Surface Total Pl	hosphorus	0.038 r	mg/L to 0	.113 mg/L								
	Nu	Nitrogen to Pho	sphorus Ratio	10:1					Phosph	iorus limi	ted			
		<u>Click to learn n</u> <u>Beneficial Uses</u>		Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
ses	Fisł	h & Wildlife Propa	gation	NS	S	S	S							
Beneficial Uses	Aes	sthetics						S	N/A					
ficia	Agr	iculture								N/A	N/A	S		
ene	Prir	mary Body Contac	ct Recreation										S	
m	Pub	olic & Private Wat	er Supply											
	Ν	S = Fully Supporting IS = Not Supporting IEI = Not Enough In	1	N/A - /	parameter	s not collec	ted in cu	rrent sam	ole year.					
μS/c	m = r	phelometric turbidity nicrosiemens per ce Escherichia coli	entimeter mV =	QS = Oklaho = millivolts r-a = Chloro		Quality Sta	andards		= milligram n = microsi			t = parts pe = Enteroco		d

D	ri	pping	Sprir	ngs					te Names fo lable Data			Site 1	Surface e 1 Bottom	
		Sample Perio	d	Times Visited	Sar	npling S	ites		• San	npling Sites	Site	4		
	Oct	ober 2011 - July	2012	4		5						•		
	Loc	ation	Okmulgee (	County	Click r	map for sit	e data			~~~		Site 2		
ធ	Imp	oundment	1950						M	25	Site 3	X		
General	Are	а	1,150 acres								Site			
5	Cap	pacity	16,200 acre	-feet					5.	1/2	C			
	Pur	poses	Water Supp	ly, Recreati	on and F	lood Cont	rol		1	Miles		40		
		Parameter (Des	scriptions)	Result					Notes/	Commer	nts			
		Average Turbidi	ty	9 NTU					100% c	of values	< OWQS	S of 25 NT	U (n=12)	
		Average Secchi	Disk Depth	76 cm										
		Water Clarity Ra	ating	Good										
		Chlorophyll-a		5 mg/	m3									
		Trophic State In	dex	46					Previou	s value =	= 54			
ຶ		Trophic Class		Mesotr	ophic									
Parameters		Salinity		0.06 -	0.09 ppt									
aran	ð	Specific Conduc	tivity	122 – 1	92µS/cm	า								
ĩ	Profile	рН		6.44-7	'.99 pH u	inits			Only 3.	54% of v	alues be	low 6.5		
	•	Oxidation-Reduc	ction Potential		633.8 m									
		Dissolved Oxyge	en	Up to 5 July	7% of wa	ater colum	n < 2.0 r	ng/L in						
	s	Surface Total Ni	itrogen	0.28 m	g/L to 0.7	73 mg/L								
	rients	Surface Total Pl	nosphorus	0.005 r	ng/L to 0	.005 mg/L								
	Nutrie	Nitrogen to Phos	sphorus Ratio	107:1					Phosph	iorus limi	ted			
		<u>Click to learn m</u> <u>Beneficial Uses</u>	<u>nore about</u>	Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
Beneficial Uses	Fish	n & Wildlife Propa	gation	S	S	*	*							
C B	Aes	thetics						S	N/A					
<b>D</b>	Agr	iculture								N/A	N/A	S		
5	Prin	nary Body Contac	t Recreation										NS	
מ	Pub	olic & Private Wate	er Supply											
	N	= Fully Supporting IS = Not Supporting IEI = Not Enough In	formation			s <i>not collec</i> undetermi			ole year.					
IS/cl	m = n	phelometric turbidity nicrosiemens per ce Escherichia coli	entimeter mV =	QS = Oklaho = millivolts r-a = Chloro		Quality Sta	andards		= milligram n = microsi			t = parts pe = Enteroco		d

## Duncan

D	u	ncan									6	N		
		Sample Perio	d	Times Visited	San	npling S	ites					$\sim$	~~~	
N	oven	nber 2006 - Aug	ust 2007	4		5			F		~			
	Loc	ation	Stephens	County	Click r	nap for si	te data		2		•	$\sim$		
5	Imp	oundment	1937							$\sim$			•	
General	Are	а	500 acres										S	
ש ס	Cap	pacity	7,200 acre	-feet								0	1/4	
	Pur	poses	Water Sup	ply, Recreati	on								Miles	
		Parameter (Des	scriptions)	Result					Notes/C	Commer	nts			
		Average Turbidit	ty	15 NTL	J				100% o	f values	< OWQ	S of 25 NT	U	
		Average True Co	olor	34 unit	S				15% of	values >	OWQS	of 70		
		Average Secchi	Disk Depth	58 cm										
		Water Clarity Ra	ating	averag	е									
		Trophic State Inc	dex	57										
ຄ		Trophic Class		eutroph	nic									
rarameters		Salinity		0.12 –	0.24 ppt									
aran	a	Specific Conduc	tivity	244.5 -	- 472.2 µ	S/cm								
Ľ	Profile	рН		7.32– 8	3.44 pH u	nits			Only 13	(7.8%) (	of value	s < 6.5 pH	units	
	ē	Oxidation-Reduc	ction Potentia											
		Dissolved Oxyge	en	Up to 2 August		ater colum	nn < 2 m	g/L in	Occurre	ed at site	92			
	ţ	Surface Total Ni	trogen	0.59 m	g/L to 0.8	84 mg/L								
	Nutrients	Surface Total Pr	nosphorus	0.016 r	ng/L to 0	.039 mg/L	-							
	Nu	Nitrogen to Phos	sphorus Rati	o 26:1					Phosph	orus limi	ted			
		<u>Click to learn m</u> <u>Beneficial Uses</u>	nore about	Turbidity	Hq	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
Benericial Uses	Fish	n & Wildlife Propa	gation	S	S	S	S							
C B	Aes	sthetics						S	NS					
د	Agr	iculture								S	S	S		
ם נו	Prin	mary Body Contac	t Recreation										NEI	
٥	Pub	olic & Private Wate	er Supply											
	N	S = Fully Supporting IS = Not Supporting IEI = Not Enough Int	formation			cial use ca liform and			as minimum	data requ	uirement	were not me	et due to C	}A/QC

NTU = nephelometric turbidity units OWQS = Oklah $\mu S/cm =$  microsiemens per centimeter mV = millivolts Chlor-a = Chlo

OWQS = Oklahoma Water Quality Standards mV = millivolts Chlor-a = Chlorophyll-a mg/L = milligrams per liter μS/cm = microsiemens/cm

Sampling Sites

ppt = parts per thousand En = Enterococci

Ε	lk	City							<ul> <li>Samplin</li> </ul>	g Sites				
		Sample Perio	d	Times Visited	San	npling S	ites			Z	•			
N	over	mber 2005 - Aug	ust 2006	4		3				וחורכ	5	7		
	Loc	cation	Beckham C	ounty	Click n	nap for si	te data				2	~~ •		
ធ	Imp	ooundment	1970								~~~~		•	
General	Are	a	240 acres										2 1	
ื้	Ca	pacity	2,583 acre-	feet								71	33	
	Pu	rposes	Flood Cont	rol, Recreat	ion				0 Mile	1/4 es		1	2	
		Parameter (Des	scriptions)	Result					Notes/	Commer	nts			
		Average Turbidit	ty	15 NTL	J				100% c	of values	< OWQS	S of 25 NT	U	
		Average True Co	olor	26 units	6				100% c	of values	< OWQ	S of 70		
		Average Secchi	Disk Depth	56 cm										
		Water Clarity Ra	ating	Fair to	ooor									
		Trophic State Inc	dex	59										
ers		Trophic Class		eutroph	ic									
Parameters		Salinity		0.30-0	.39 ppt									
ara	е	Specific Conduc	tivity	593.3 -	749.9 µ	S/cm								
₽	Profile	рН		7.70– 8	.49 pΗι	units			Neutral	to slightl	y alkalin	е		
	а.	Oxidation-Reduc	ction Potentia											
		Dissolved Oxyge	en	May	2% of wa	ter colum	n < 2 m	g/∟ in						
	Ŋ	Surface Total Ni	trogen	0.74 m	g/L to 1.0	08 mg/L								
	Nutrients	Surface Total Pr	nosphorus	0.037 n	ng/L to 0.	067 mg/L	-							
	Nut	Nitrogen to Phos	sphorus Ratio	0 17:1					Possibl	y co-limit	ed			
		<u>Click to learn m</u> <u>Beneficial Uses</u>	nore about	Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
ses	Fis	h & Wildlife Propa	gation	S	S	S	S							
al U	Aes	sthetics						NS*	S					
Beneficial Uses		riculture								S	S	S		
3ene		mary Body Contac											S	
		blic & Private Wate	er Supply											
	Λ	S = Fully Supporting NS = Not Supporting NEI = Not Enough Inf	formation	*The lak threaten	e is listed ed by nutr	in the WQ ients until	S as a NL studies ca	W indicati an be cond	ng that the lucted to c	e Aesthetic confirm no	cs benefic n-support	cial use is co status	onsidered	
μS/c	m = l	ephelometric turbidity microsiemens per ce Escherichia coli	ntimeter mV	'QS = Oklahol = millivolts pr-a = Chloro		Quality Sta	andards		= milligram = microsi			t = parts pe = Enteroco		d

Ε		sworth									2 a	• Sam	oling Sites	
		Sample Perio	d	Times Visited	San	npling S	ites				~	Site 3		
N	oven	nber 2011 - Aug	ust 2012	4		5			Sec. 1		~~··	Site 5		
	Loc	ation	Comanche	County	Click r	map for si	te data		0	1		5-1-2	12	
ធ្ល	Imp	oundment	1962						Mil	es	Site 2	• ~	Site 4	
General	Are	a	5,600 acres	3						- Marine	~~ ~ ~	- min		
õ	Cap	pacity	95,200 acre	e-feet				Click Sit	e Names for	Site 1 Sur	face	L'Y		
	Pur	poses	Water Supp	oly, Recreati	on			Availa	able Data	Si	ite 1 Bottom	· / ~	The second second	
		Parameter (Des	scriptions)	Result				1	Notes/	Commer	nts			
		Average Turbidi	ty	31 NTL	J				56% of	values >	OWQS	of 25 NTL	J (n=20)	
		Average Secchi	Disk Depth	27 cm										
	Situ	Water Clarity Ra	ating	Poor										
	ln S	Chlorophyll-a		20 mg	/m3									
		Trophic State In	dex	60					Previou	s value =	= 54			
ပ		Trophic Class		Eutropl	nic									
Parameters		Salinity		0.25 –	0.30 ppt									
Iram	a,	Specific Conduc	ctivity	520 – 6	607 µS/cr	n								
Pa	Profile	рН		7.79 –	8.88 pH ι	units			Slightly	alkaline				
	ŗ	Oxidation-Reduc	ction Potentia	l -129 to	349 mV									
		Dissolved Oxyge	en	All data mg/L	a are abo	ve screen	ing level	of 2.0						
	S	Surface Total Ni	itrogen	0.95 m	g/L to 1.4	l7 mg/L								
	Nutrients	Surface Total Ph	hosphorus	0.039 r	ng/L to 0	.098 mg/L	-							
	Nu	Nitrogen to Phos	sphorus Ratio	20:1					Phosph	orus limi	ted			
		<u>Click to learn m</u> <u>Beneficial Uses</u>		Turbidity	Hď	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
ses	Fisł	h & Wildlife Propa	gation	NS	S	S	*							
Beneficial Uses	Aes	sthetics						S	N/A					
fici	Agr	iculture								N/A	N/A	S		
ene	Prir	mary Body Contac	t Recreation										S	
Δ	Pub	olic & Private Wate	er Supply											NS
	Ν	S = Fully Supporting IS = Not Supporting IEI = Not Enough Ini		N/A - µ	parameters	s not collec	cted in cu	rrent samp	ole year.					
μS/c	m = r	phelometric turbidity nicrosiemens per ce Escherichia coli	entimeter mV	′QS = Oklaho = millivolts or-a = Chloro		Quality Sta	andards		= milligram n = microsi			t = parts pe = Enteroco		d

Ε	In	ner Th	omas	5							~	• Sam	pling Sites	
		Sample Perio	d	Times Visited	San	npling S	ites		0 Mile	1/4 es				
	Oct	ober 2006 - July	/ 2007	4		5			2		~	• 🗸		
	Loc	cation	Comanche	County	Click r	map for si	te data				2		•	
୍ଷ	Imp	oundment								~	$\sim$	•		
General	Are	a	334 acres							25	}	<u>La</u> 6		
õ	Cap	pacity	12,000 acre	-feet								57	6	
	Pur	rposes	Recreation							~				
		Parameter (Des	scriptions)	Result					Notes/	Commer	nts			
		Average Turbidi	ty	2 NTU					100% c	f values	< OWQS	S of 25 NT	Ū	
		Average True C	olor	27 units	5				100% c	f values	< OWQS	S of 70		
		Average Secchi	Disk Depth	175 cm										
		Water Clarity Ra	ating	excelle	ent									
		Trophic State In	dex	39										
S		Trophic Class		oligotro	phic									
Parameters		Salinity		0.01 -	0.07 ppt									
aran	a)	Specific Conduc	ctivity	36.2 -	150.6 µS	/cm								
å	Profile	рН		5.43 –	8.13 pH u	units			38 (15.4	4%) of va	alues < 6	5.5 pH unit	s	
	æ	Oxidation-Reduc	ction Potential	41 to 5	22mV									
		Dissolved Oxyge	en	Up to 7 July	6% of wa	ater colum	n < 2 m	g/L in	Occurr	ed at site	es 1 and	2		
	ţ	Surface Total Ni	itrogen	0.31 m	g/L to 0.6	63 mg/L								
	Nutrients	Surface Total Pl	hosphorus	0.005 n	ng/L to 0	.015 mg/L	-							
	Nu	Nitrogen to Phos	sphorus Ratio	46:1					Phosph	orus limi	ted			
		<u>Click to learn m</u> <u>Beneficial Uses</u>		Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
ses	Fis	h & Wildlife Propa	gation	S	NS	NS	S							
Beneficial Uses	Aes	sthetics						S	S					
ficia	Agr	riculture								S	S	S		
ene	Prir	mary Body Contac	t Recreation										NEI	
Ω	Pu	olic & Private Wate	er Supply											
	٨	S = Fully Supporting IS = Not Supporting IEI = Not Enough Ini				cial use ca and fecal co		ssessed a	as minimum	ı data reqi	uirement	were not m	et due to (	QA/QC
μS/c	m = r	phelometric turbidity microsiemens per ce Escherichia coli	entimeter mV :	QS = Oklaho = millivolts r-a = Chloro		Quality Sta	andards		= milligram n = microsi			t = parts pe a = Enteroco		d

Ε		Reno							• Sampl	ing Sites		5	Site 1 Surfac	ce Bottom
		Sample Perio	d	Times Visited	Sar	npling S	ites				5	Site 4	5	
D	ecer	mber 2011 - Aug	ust 2012	4		3		Click Site	e Names for	, m		Site 2		
	Loc	cation	Canadian (	County	Click I	map for si	te data	_	able Data		Site 5			
a	Imp	poundment	1937								Site 5			
General	Are	a	500 acres							Site 3				
မီ	Ca	pacity	7,200 acre-	eet										
	Pur	rposes	Flood Contr	ol, Recreat	ion								0 1/8 Miles	
		Parameter (Des	scriptions)	Result	:				Notes/0	Commen	nts			
		Average Turbidi	ty	36 NT	J				50% of	values >	OWQS	of 25 NTL	J (n=12)	
		Average Secchi	Disk Depth	25 cm										
	Situ	Water Clarity Ra	ating	Poor										
	In S	Chlorophyll-a		20 mg	g/m3									
		Trophic State In	dex	78										
ပ		Trophic Class		Hypere	eutrophic									
Parameters		Salinity		0.55 –	0.81 ppt									
ram		Specific Conduc	ctivity	1108 -	- 1617 μS	s/cm								
Pa	Profile	рН		7.70 –	9.22 pH	units			Slightly	alkaline				
	Ţ	Oxidation-Reduc	ction Potentia	225 to	544 mV									
		Dissolved Oxyge	en	All data mg/L	a are abo	ve screen	ing leve	l of 2.0						
	S	Surface Total Ni	itrogen	1.33 m	g/L to 2.6	69 mg/L								
	Nutrients	Surface Total Pl	hosphorus	0.149 (	mg/L to 0	.441 mg/L	•							
	ŊŊ	Nitrogen to Phos	sphorus Ratio	7:1					Possibl	y co-limit	ed			
		<u>Click to learn m</u> <u>Beneficial Uses</u>	nore about	Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
Beneficial Uses	Fis	h & Wildlife Propa	gation	NS	S	S	S							
С С	Aes	sthetics						NS	N/A					
	Agı	riculture								S	S	S		
ene	Prir	mary Body Contac	t Recreation										NEI	
m	Puł	blic & Private Wate	er Supply											
	Λ	S = Fully Supporting NS = Not Supporting NEI = Not Enough In	formation	*N/A – * Based	parameter I on the TS	s not collec SI and chlo	ted in cu rophyll-a	rrent samp values, lal	ole year. ke will be re	ecomment	ded to be	considered	l and NLW	·.
IS/c	m = r	ephelometric turbidity microsiemens per ce Escherichia coli	entimeter mV	QS = Oklaho = millivolts pr-a = Chloro		Quality Sta	andards	mg/L μS/cn	= milligram n = microsie	s per liter emens/cm	pp n Er	nt = parts pe n = Enteroco		Ż

2	ai	rl Etlin	g						<ul> <li>Sampl</li> </ul>	ing Sites				
		Sample Perio	d	Times Visited	Sai	npling S	ites		-	Site 3	Sit	•	Site 1 Su Site 1 E	lottom
0	ctob	oer 2012 – Augu	ust 2013	4		3			2					
	Loc	ation	Cimarron Co	ounty	Click	map for si	te data			<u>f</u>				
3	Imp	oundment	1958											
	Are	а	159 acres						2	Clic	k Site Nam	es for	CEREBONIE OF CONTRACT OF CONTRACT.	
5	Cap	pacity	1717 acre-f	eet						Α	vailable Da	ata		
	Pur	poses	Recreation									0	1/4 Miles	
		Parameter (Des	scriptions)	Resu	lt				Notes/	Commer	nts			
		Average Turbidi	ty	37 N	ΓU				25% of	values >	OWQS	of 25 NTL	J	
		Average Secchi	Disk Depth	26 cr	า									
	Situ	Water Clarity Ra	ating	fair										
	ц Г	Chlorophyll-a		45 m	g/m3									
		Trophic State In	dex	68					Previou	ıs value =	= 72			
		Trophic Class		Нуре	reutrophic									
		Salinity		0.12	- 0.25 ppt									
	đ	Specific Conduc	ctivity	259 -	- 517 μS/c	m								
	Profile	рН		6.22	– 8.49 pH	units			6% of r	ecorded	values <	6.5 pH ur	nits	
	٩	Oxidation-Redu	ction Potential	-168	– 194 mV									
		Dissolved Oxyg	en	Up to	33% < 2n	ng/L in Au	gust							
	S	Surface Total N	itrogen	1.33	mg/L to 2.3	33 mg/L								
	ient	Surface Total Pl	hosphorus	0.074	mg/L to 0	.18 mg/L								
	Nutrients		-						Dhoonk		tod			
	_	Nitrogen to Pho	sphorus Ratio	18:1				1	Phospr	norus limi	tea			
		<u>Click to learn n</u> <u>Beneficial Uses</u>		Turbidity	H	Dissolved Oxygen	Metals	ISI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	
	Fish	n & Wildlife Propa	gation	NS	NS	S	S							
	Aes	sthetics						NS*	*					
	Agr	iculture								NS	NS	NS		
	Prir	mary Body Contac	ct Recreation										S	
	Pub	olic & Private Wate	er Supply											
	Ν	S = Fully Supporting IS = Not Supporting IEI = Not Enough In	formation	threat	lake is listed ened by nut arameter.									
/cr	n = n	phelometric turbidity nicrosiemens per ce Escherichia coli	entimeter mV :	QS = Oklai = millivolts pr-a = Chlo	noma Water rophyll-a	<sup>r</sup> Quality Sta	andards	mg/L μS/cn	= milligram n = microsi	ns per liter emens/cm	pp n En	t = parts pe = Enteroco		d

## Fucha

E	U	cna							Site 1 Surface					
		Sample Perio	d	Times Visited	San	npling S	ites		Site 1 Bottom		• Site 2			
D	ecen	nber 2012 - Aug	ust 2013	4		3		-	J.	• Site 4	tr			
	Loc	ation	Delaware Co	ounty	Click r	nap for si	te data		*	1. C	• Site 2	and the second	Site 3	
a	Imp	oundment	1952		1			Click Si	te Names for		Jul	Site 5		
General	Are	а	2,860 acres					-	able Data					
9 B	Cap	pacity	79,600 acre-	feet								0	2	
	Pur	poses	Water Suppl	y, Recreati	on				and the second sec				Miles	
		Parameter (Des	criptions)	Result					Notes/C	commen	nts			
		Average Turbidit	ty	6 NTU					100% of	f values	< OWQS	6 of 25 NT	Ū	
		Average Secchi	Disk Depth	117 cm	I									
	Situ	Water Clarity Ra	iting	excelle	nt									
	ln S	Chlorophyll-a		12 mg	/m3									
		Trophic State Inc	dex	55					Previou	s value =	= 50			
ຽ		Trophic Class		Eutrop	nic									
Parameters		Salinity		0.07 –	0.18 ppt									
Iram	0	Specific Conduc	tivity	146 – 3	869 µS/cr	n								
å	Profile	рН		6.52 -	8.92 pH ι	units			Neutral	to slightl	y alkalin	е		
	ę.	Oxidation-Reduc	ction Potential	-42 to 2	272 mV									
		Dissolved Oxyge	en	Up to 7 August		ater colum	n < 2 m	g/L in						
	ŝ	Surface Total Ni	trogen	0.75 m	g/L to 4.0	)8 mg/L								
	Nutrients	Surface Total Pr	nosphorus	0.005 r	ng/L to 0	.021 mg/L								
	Nu	Nitrogen to Phos	sphorus Ratio	205:1					Phosph	orus limi	ted			
		<u>Click to learn m</u> <u>Beneficial Uses</u>	oore about	Turbidity	Hď	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
ses	Fisł	n & Wildlife Propa	gation	S	S	NS	S							
Beneficial Uses	Aes	sthetics						NS	*					
ficia	Agr	iculture								S	S	S		
ene	Prir	nary Body Contac	t Recreation										S	
â	Pub	olic & Private Wate	er Supply											NS
	Ν	S = Fully Supporting IS = Not Supporting IEI = Not Enough Int	formation	The lake Standar	e is curren ds (WQS)	tly listed as and is con	a Nutrie sidered n	nt Limited utrient thr	Watershed eatened.*N	(NLW) ir o longer o	the Okla collect for	homa Wate this param	er Quality eter.	
µS/c	m = r	phelometric turbidity nicrosiemens per ce Escherichia coli	ntimeter mV =	S = Oklaho millivolts -a = Chloro		Quality Sta	andards		= milligrams n = microsie			t = parts pe = Enteroco		d

 $\mu$ S/cm = microsiemens per centimeter mV = millivolts E. coli = Escherichia coli Chlor-a = Chlor Chlor-a = Chlorophyll-a Sampling Sites

Ε	uí	faula, I	Deep	Fc	ork /	Arm	n (1-2	2)			1	Sit	• San	npling Sites	
		Sample Perio	d		imes isited	Sar	npling S	ites		Site Names f ailable Data	or		Site 2		
	Jan	uary 2012 – July	y 2012		3		17					*			
	Loc	ation	Haskell Cou	unty	,	Click r	map for sit	e data					S		
ធ	Imp	oundment	1964								-				
General	Are	a	105,000 ac	res							~	A C			
ъ В	Cap	pacity	2,314,600 a	acre	-feet							A			
	Pur	poses	Water Supp Sediment C			ontrol, Hy	/dropower	,						Miles	
		Parameter (Des			Result					Notes/	Commer	nts			
		Average Turbidi	ty		55 NTU					50% of	values >	OWQS	of 25 NTL	J (n=6)	
		Average Secchi	Disk Depth		21 cm										
	Situ	Water Clarity Ra	ating		Poor										
	In S	Chlorophyll-a			8 mg/r	n3									
		Trophic State In	dex		51										
ပ		Trophic Class			Eutroph	nic									
lete		Salinity			0.10 – (	).19 ppt									
Parameters		Specific Conduc	ctivity		205 – 4	11 µS/cr	n								
Ра	Profile	рН			5.61 – 8	3.02pH u	inits			Only 3.	54% of v	alues be	low 6.5 pł	l units	
	ሻ	Oxidation-Redu	ction Potentia	ı	292 –49	92 mV									
		Dissolved Oxyg	en		All data mg/L	are abo	ve screen	ing level	of 2.0						
	Ŋ	Surface Total N	itrogen		0.77 mg	g/L to 1.5	56 mg/L								
	Nutrients	Surface Total Pl	hosphorus		0.029 m	ng/L to 0	.138 mg/L								
	Nu	Nitrogen to Pho	sphorus Ratio	)	14:1					Phosph	orus limi	ted			
		<u>Click to learn m</u> <u>Beneficial Uses</u>			Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
ses	Fis	h & Wildlife Propa	gation		NS	S	S	*							
Ŭ Î	Aes	sthetics							S	N/A					
Beneficial Uses	Agr	iculture									N/A	N/A	S		
ene	Prir	mary Body Contac	t Recreation											NEI	
Ô	Pu	olic & Private Wate	er Supply												
	Λ	S = Fully Supporting IS = Not Supporting IEI = Not Enough In		Notes	and an a	issessme	values exce nt of the FV s <i>not collec</i>	VP benefi	cial use c	annot be n				ts were no	ot met
μS/c	m = r	phelometric turbidity nicrosiemens per ce Escherichia coli	entimeter mV	<i>= m</i>	= Oklahor illivolts = Chloro		Quality Sta	andards		= milligram 1 = microsi			t = parts pe = Enteroce		d

E	ufa	aula, Ga	aines	Cree	k Ar	m (1	<b>2-1</b>	7)		1		•	Sampling S	lites
		Sample Perio		Times Visited		Samplin				te Names fo able Data	or			
	Jan	uary 2012 – July	y 2012	3		17	7				tr_		No.	
	Loc	cation	Haskell Cou	inty	Cli	ick map fo	or site da	ta		-	Site	Site 12	2	
ิล	Imp	poundment	1964								Site 14	ð.		
General	Are	a	105,000 acr	es							Site 15	Site 16		
ອັ	Cap	pacity	2,314,600 a	cre-feet							Site 17	and the second s	0	10
	Pur	rposes	Water Supp Control	ly, Flood C	ontrol, Hy	/dropowei	r, Sedime	ent				and the second second	Miles	
		Parameter (Des	scriptions)	Result	:				Notes/	Commen	nts			
		Average Turbidi	ty	61 NT	J				67% of	values >	> OWQS	of 25 NTU	J (n=18)	
		Average Secchi	Disk Depth	33 cm										
	Situ	Water Clarity Ra	ating	Poor										
	In S	Chlorophyll-a		7 mg/r	n3									
		Trophic State In	dex	50					Previou	is value =	= 55			
ร		Trophic Class		Mesotr	ophic									
Parameters		Salinity		0.03 –	0.21 ppt									
aran	a)	Specific Conduc	tivity	67 – 43	32 µS/cm									
å	Profile	рН		6.71 –	8.12 pH (	units								
	đ	Oxidation-Reduc	ction Potentia	l 150 – 4	482 mV									
		Dissolved Oxyge	en	Up to 5 the sur		ater colum	nn < 2.0 i	ng/L in						
	nts	Surface Total Ni	itrogen	0.46 m	g/L to 1.6	68 mg/L								
	Nutrient	Surface Total Ph	nosphorus	0.009 ו	mg/L to 0	.227 mg/L	-							
	Ň	Nitrogen to Phos	sphorus Ratio	14:1					Phosph	iorus limi	ted			
		<u>Click to learn m</u> <u>Beneficial Uses</u>	nore about	Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
Beneficial Uses	Fis	h & Wildlife Propa	gation	NS	S	S	*							
al U	Aes	sthetics						S	N/A					
fici	Agr	riculture								N/A	N/A	S		
ene	Prir	mary Body Contac	t Recreation										NEI	
m	Pu	olic & Private Wate	er Supply											
	٨	S = Fully Supporting VS = Not Supporting VEI = Not Enough Int	formation	N/A - /	parameter	s not collec	ted in cur	rent sam	ole year.					
μS/c	m = r	phelometric turbidity microsiemens per ce Escherichia coli	entimeter mV	QS = Oklaho = millivolts or-a = Chloro		Quality Sta	andards		= milligram n = microsi			t = parts pe = Enteroco		1

E	ufa	aula, N.	Cana	dian	Arn	n (3-4	4)			1	Mr.	• Sam	pling Sites	
		Sample Perio	d	Times Visited	Sai	mpling Si	ites		Site Names		Site 3	the tit	ſ	
	Jan	uary 2012 – July	/ 2012	3		17					Site 4			
	Loc	cation	Haskell Cou	unty	Click	map for sit	e data					5		
ធ្ម	Imp	ooundment	1964							-	-			
General	Are	a	105,000 ac	res						5	- Maria	u l		
ဖီ	Cap	pacity	2,314,600 a	cre-feet							1	0	10	
	Pur	rposes	Water Supp Sediment C		Control, H	ydropower	,			the second		ta	Miles	
		Parameter (Des		Resu	lt				Notes/	Commer	nts			
		Average Turbidit	ty	23 N	ſU				50% of	values >	OWQS	of 25 NTL	J (n=6)	
		Average Secchi	Disk Depth	43 cn	ı									
	Situ	Water Clarity Ra	iting	Poor										
	In S	Chlorophyll-a		6 m(	g/m3									
		Trophic State In	dex	48					Previou	s value =	= 55			
ပ္ပ		Trophic Class		Meso	trophic									
Parameters		Salinity		0.15	- 0.22 ppt									
ram	_	Specific Conduc	tivity	316 -	464 µS/c	m								
Pa	Profile	рН		5.44	- 8.39 pH	units			Only 9.4	4% of va	lues are	below 6.5	,	
	Ţ	Oxidation-Reduc	ction Potentia	l 121 -	-500 mV									
		Dissolved Oxyge	en	Up to July	25% of w	ater colum	ın < 2.0 ı	mg/L in						
	S	Surface Total Ni	trogen	0.66	mg/L to 2.0	04 mg/L								
	Nutrients	Surface Total Pr	nosphorus	0.017	mg/L to 0	).112 mg/L								
	NN	Nitrogen to Phos	sphorus Ratio	20:1					Phosph	orus Lim	ited			
		<u>Click to learn m</u> <u>Beneficial Uses</u>	ore about	Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
ses	Fis	h & Wildlife Propa	gation	NS	S	S	*							
Beneficial Uses	Aes	sthetics						S	N/A					
lCla	Agr	riculture								N/A	N/A	S		
ene	Prir	mary Body Contac	t Recreation										NEI	
n	Put	olic & Private Wate	er Supply											
	٨	S = Fully Supporting NS = Not Supporting NEI = Not Enough Int	formation	and a	assessme	values exce ent of the FV rs not collec	VP benefi	icial use c	annot be m				its were no	ot met
IS/c	m = r	phelometric turbidity microsiemens per ce Escherichia coli	ntimeter mV	QS = Oklal = millivolts pr-a = Chlo		r Quality Sta	andards		= milligram n = microsi			t = parts pe = Enteroce		d

Ε	uf	aula (s	5-7)						Site Names fo ailable Data	or 🥋		• Sam	pling Sites	
		Sample Period	d	Times Visited	Sar	npling S	ites					Site 6	Site 7 Surfac	ce
	Jan	uary 2012 – July	/ 2012	3		17					*	Site 5	Site 7 Bottom	
	Loc	ation	Haskell Cou	inty	Click r	map for si	te data					5		
a	Imp	oundment	1964							-				
General	Are	а	105,000 acr	es				-		5	- Port			
ő	Cap	pacity	2,314,600 a	cre-feet				-			A	0	10	
	Pur	poses	Water Supp Sediment C		ontrol, Hy	/dropowe	•,	_				Tar -	Miles	
		Parameter (Des		Result				1	Notes/0	Commer	its			
		Average Turbidit	ty	6 NTU					100% c	f values	< OWQS	6 of 25 NT	U (n=9)	
		Average Secchi	Disk Depth	101 cm	1									
		Water Clarity Ra	nting	Excelle	ent									
		Chlorophyll-a		8 mg/	m3									
		Trophic State Inc	dex	51					Previou	s value =	= 55			
δ		Trophic Class		Eutrop	nic									
Parameters		Salinity		0.15 –	0.19 ppt									
Iram		Specific Conduc	tivity	317 – 4	11 μS/c	m								
Pa	Profile	рН		5.58 -	8.43 pH (	units			Only 0.	54% of v	alues be	low 6.5 p⊦	l units	
	ፈ	Oxidation-Reduc	ction Potentia	97 – 46	61 mV									
		Dissolved Oxyge	en	Up to 4 July	8% of wa	ater colum	n < 2.0	mg/L in						
	ıts	Surface Total Ni	trogen	0.56 m	g/L to 1.0	)0 mg/L								
	Nutrient	Surface Total Ph	nosphorus	0.005 r	ng/L to 0	.050 mg/L								
	NN	Nitrogen to Phos	sphorus Ratio	50:1					Phosph	orus limi	ted			
		<u>Click to learn m</u> <u>Beneficial Uses</u>	nore about	Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
ses	Fish	n & Wildlife Propa	gation	S	S	S	*							
Beneficial Uses	Aes	sthetics						S	N/A					
ficia	Agr	iculture								N/A	N/A	S		
ene	Prin	nary Body Contac	t Recreation										NEI	
Δ	Pub	olic & Private Wate	er Supply											
	N	= Fully Supporting IS = Not Supporting IEI = Not Enough Inf	formation	N/A - /	parameter	s not collec	ted in cu	rrent sam	ole year.					
μS/c	m = n	phelometric turbidity nicrosiemens per ce scherichia coli	ntimeter mV	QS = Oklaho = millivolts or-a = Chloro		Quality Sta	andards		= milligram n = microsie			t = parts pe = Enteroco		1

		Sample Perio	d	Times Visited	S	ampling	Sites		Click Site N Availabl			The the	1	
	Jan	uary 2012 – July	y 2012	3		17					the		A.	
	Loc	ation	Haskell Cou	inty	Clic	k map for	site data			-		Site 8	3	
ľ	Imp	oundment	1964								-	1		
	Are	a	105,000 acı	es							m the star	k		
ľ	Cap	pacity	2,314,600 a	cre-feet					- Auto		×.	The second se	0	10
	Pur	poses	Water Supp Control	ly, Flood C	ontrol, Hy	ydropowei	r, Sedime	ent		- And and		2	Miles	
1		Parameter (Des		Result	:				Notes/	Commer	its			
ľ		Average Turbidi	ty	6 NTU					100% c	of values	< OWQS	6 of 25 NT	U (n=3)	
		Average Secchi	Disk Depth	85 cm										
	Situ	Water Clarity Ra	ating	Good										
	ln S	Chlorophyll-a		7 mg/r	n3									
		Trophic State In	dex	50					Previou	ıs value =	= 58			
		Trophic Class		Mesotr	ophic									
8		Salinity		0.14 –	0.19 ppt									
	~	Specific Conduc	ctivity	285 – 4	400 µS/cr	m								
	Profile	рН		5.84 –	8.64 pH	units			Only 79	% of valu	es below	6.5 pH ui	nits	
	Γ.	Oxidation-Redu	ction Potentia	l 197 – 4	444 mV									
		Dissolved Oxyg	en	All data mg/L	a above s	screening	level of 2	2.0						
	S	Surface Total N	itrogen	0.53 m	g/L to 0.8	39 mg/L								
	rients	Surface Total Pl	hosphorus	0.005 ו	mg/L to 0	.014 mg/L	-							
	Nutrie	Nitrogen to Pho	sphorus Ratio	75:1					Phosph	iorus limi	ted			
		<u>Click to learn n</u> <u>Beneficial Uses</u>		Turbidity	Hď	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	
	Fisl	h & Wildlife Propa	gation	NS	S	S	*							
	Aes	sthetics						S	N/A					
	Agr	riculture								N/A	N/A	S		
	Prir	mary Body Contac	ct Recreation										NEI	
	Put	olic & Private Wat	er Supply											
	٨	S = Fully Supporting IS = Not Supporting IEI = Not Enough In		and an	assessme		NP benefi	cial use o	or turbidity, cannot be n				nts were n	ot m

E	ufa	aula, Ca	anadia	n Riv	ver /	٩rm	<b>(9-</b> 1	1)		7			Sampling S	ites
		Sample Perio	d	Times Visited	;	Samplin	g Sites			Names for ble Data				
	Jan	uary 2012 – July	y 2012	3		17	7				Sit	te 9		
	Loc	ation	Haskell Cou	nty	Cli	ick map fo	or site da	ta		<b>1</b>	Site 10 Site 1			
ធ	Imp	oundment	1964								-	St.		
General	Are	а	105,000 acr	es							m les			
Ğ	Cap	pacity	2,314,600 a	cre-feet						日本田	1	and the second s	0	10
	Pur	poses	Water Supp Control	y, Flood Co	ontrol, Hy	dropowe	r, Sedim	ent				The	Miles	-
		Parameter (Des		Result					Notes/	Commer	its			
		Average Turbidi	ity	25 NTU	J				33% of	values >	OWQS	of 25 NTL	J (n=9)	
		Average Secchi	Disk Depth	46 cm										
		Water Clarity Ra	ating	Fair to	Poor									
		Chlorophyll-a		8 mg/n	า3									
		Trophic State In	dex	50					Previou	us value =	= 57			
ູ		Trophic Class		Eutroph	nic									
Parameters		Salinity		0.14 –	0.26 ppt									
aran	¢)	Specific Conduc	ctivity	308 -	539 µS/c	m								
בי	Profile	рН		5.26 -	8.76 pH ı	units			Only 5.	49% of v	alues be	low 6.5 pł	l units	
	Ē	Oxidation-Redu	ction Potential	128 – 4	77 mV									
		Dissolved Oxyg	en	Up to 2 the July		ater colum	nn < 2.0	mg/L in						
	S	Surface Total N	itrogen	0.50 m	g/L to 1.1	5 mg/L								
	Nutrients	Surface Total Pl	hosphorus	0.016 n	ng/L to 0	.078 mg/L	_							
	Nui	Nitrogen to Pho	sphorus Ratio	20:1					Phosph	norus limi	ted			
		<u>Click to learn n</u> <u>Beneficial Uses</u>		Turbidity	Hď	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
Beneticial Uses	Fish	n & Wildlife Propa	gation	NS	S	S	*							
ק	Aes	sthetics						S	N/A					
5	Agr	iculture								N/A	N/A	S		
E E	Prin	mary Body Contac	ct Recreation										NEI	
-	Pub	olic & Private Wate	er Supply											
	N	S = Fully Supporting IS = Not Supporting IEI = Not Enough In	1	N/A - r	parameters	s not collec	cted in cu	rent sam	ple year.					
S/c	m = n	phelometric turbidity nicrosiemens per ce Escherichia coli	entimeter mV :	QS = Oklaho = millivolts r-a = Chloro		Quality St	andards		= milligran m = microsi			t = parts pe a = Enteroce		1

		rfax							ite Names fo lable Data	Site 3		<ul> <li>Sampling</li> </ul>	g Sites	
		Sample Perio	od	Times Visited	Sa	mpling S	ites		7					
Ma	arch	2011 - Septen	nber 2011	4		5				Site 5		r.		
	Loc	ation	Osage Cou	inty	Click	map for si	te data			Site 2				
3	Imp	oundment	1936					-				Site	•	
	Are	a	111 acres									Oile		
5	Cap	pacity	1,795 acre-	feet				_	0	1/9		• Site Site 1 Bott	1 Surface	
	Pur	poses	Water Supp	ly, Recrea	tion				Mile	1/8 es		Site 1 Bott	tom	
		Parameter (De	escriptions)	Resu	t			1	Notes/	Commen	its			
		Average Turbic	lity	11 NT	U				100% c	of values	< OWQS	6 of 25 NT	Ū	
		Average Secch	i Disk Depth	87 cm										
	Situ	Water Clarity R	ating	good										
	L L	Chlorophyll-a		12 mg	/m3									
		Trophic State I	ndex	55					Previou	is Value=	= 57			
		Trophic Class		Eutrop	ohic									
		Salinity		0.12–	0.2 ppt									
	6)	Specific Condu	ctivity	243.9	– 400.4 µ	IS/cm								
	Profile	рН		7.08 -	8.36 pH	units			Neutral	to slightl	y alkalin	е		
	Γ.	Oxidation-Redu	uction Potentia	-23 –	473 mV									
		Dissolved Oxy	gen	Up to summ		ater colum	nn < 2 mạ	g/L in						
	ıts	Surface Total N	litrogen	0.46 r	ng/L to 0.	73 mg/L								
	Nutrient	Surface Total F	hosphorus	0.025	mg/L to C	).033 mg/L	-							
	N	Nitrogen to Pho	osphorus Ratio	22:1					Phosph	iorus limi	ted			
		<u>Click to lear</u> <u>Beneficial Uses</u>	<u>n more abou</u> §	Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
	Fisł	h & Wildlife Propa	agation	NEI	S	S	S							
	Aes	sthetics						S	*					
	Agr	iculture								S	S	S		
	Prir	mary Body Conta	ct Recreation										NEI	
	Pub	olic & Private Wa	ter Supply											
	Λ	S = Fully Supporting IS = Not Supporting IEI = Not Enough II	g	si cannot	be assess	or this paran sed for this s sed as minir	sample ye	ar as min	nimum data	requireme	ents were	not met. T	he PBCR	use

F	Oľ	rt Cobl	b						ite Names fo lable Data	or V		• Sam	pling Sites	
		Sample Perio	d	Times Visited	San	npling S	ites			Site 4	2 5	Site 6		
D	ecen	nber 2011 - Aug	just 2012	4		6				2		3		
	Loc	ation	Caddo Cou	nty	Click r	nap for si	te data			KIII	Site 5	My Site 3		
ធ	Imp	oundment	1959							超型	Zu	· m		
General	Are	a	4,100 acres	;								17 • 3	Site 2	
9 9	Cap	oacity	80,010 acre	e-feet								Ze .	Site 1 Surface	
	Pur	poses	Flood Contr Recreation	ol, Water S	upply, Fis	sh & Wild	ife,		0Mile	2		Site	1 Bottom	3
		Parameter (Des	scriptions)	Result					Notes/	Commer	nts			
		Average Turbidi	ty	14 NTU	J				5% of v	/alues >	OWQS o	f 25 NTU	(n=20)	
		Average Secchi	Disk Depth	48 cm										
	Situ	Water Clarity Ra	ating	Averag	е									
	L L	Chlorophyll-a		43 mg/	′m3									
		Trophic State In	dex	68					Previou	is value =	= 65			
ຽ		Trophic Class		Hypere	utrophic									
Parameters		Salinity		0.25-0	).30 ppt									
aran	Ð	Specific Conduc	ctivity	531 – 6	606 µS/c	m								
å	Profile	pН		7.47– 9	9.54 рН u	units			Only 2.	76% of v	alues > 9	9 pH units		
	٦ ۲	Oxidation-Redu	ction Potentia	l 151 – 5	564 mV									
		Dissolved Oxyge	en	All data mg/L	a above s	creening	level of	2.0						
	ts	Surface Total N	itrogen	1.16 m	ng/L to 2.2	20 mg/L								
	Nutrient	Surface Total Pl	hosphorus	0.015 r	ng/L to 0	.163 mg/L	-							
	Nu	Nitrogen to Pho	sphorus Ratic	19:1					Phosph	orus limi	ted			
		<u>Click to learn n</u> <u>Beneficial Uses</u>		Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
ses	Fisl	h & Wildlife Propa	gation	S	S	S	*							
Beneficial Uses	Aes	sthetics						NS*	N/A					
ficia	Agr	riculture								N/A	N/A	S		
ene	Prir	mary Body Contac	ct Recreation										S	
ß	Put	olic & Private Wate	er Supply											NS
	٨	S = Fully Supporting IS = Not Supporting IEI = Not Enough In		<b>H</b> nutrients	until studies	the WQS as s can be cor s not colled	ducted to d	onfirm non	-support sta		ial use is c	onsidered th	reatened by	/
µS/c	m = r	phelometric turbidity microsiemens per ce Escherichia coli	entimeter mV	'QS = Oklaho = millivolts pr-a = Chloro		Quality St	andards		= milligram n = microsi			t = parts pe = Enteroco		d

F	0	SS								R		<ul> <li>Sampling</li> </ul>	g Sites	
		Sample Perio		Times Visited	Sar	npling S -	ites	-	2	Site 5	• Site	4		
(	Jcto	ber 2012 – Augu	ist 2013	4		5				5	- 5	2		
	Lo	cation	Custer Cou	nty	Click r	map for si	te data		te Names fo able Data		Cito 2	hm		
ral	Im	poundment	1961								Sile 5	Site 2		
General	Are	ea	8,800 acres	3				-		避	5	<u> </u>	}	
G	Ca	pacity	256,220 ad	cre-feet				-			-		Site 1 Surface	
	Pu	rposes	Recreation						Miles	2		~~~	Sile i Bollom	
		Parameter (Des	scriptions)	Result					Notes/	Commen	its			
		Average Turbidi	ty	25 NTL	J				37% of	values >	OWQS	of 25 NTL	J	
		Average Secchi	Disk Depth	49 cm										
	In-Situ	Water Clarity Ra	ating	Fair										
	Ļ	Chlorophyll-a		10 mg/	m3									
		Trophic State In	dex	54					Previou	s Value=	- 49			
ຽ		Trophic Class		Eutroph	nic									
Parameters		Salinity		1.19– 1	.4 ppt									
ram		Specific Conduc	tivity	2307 –	2724 µS/	/cm								
Pa	Profile	рН		7.8 – 8	.34 pH ui	nits								
	Ţ	Oxidation-Reduc	ction Potentia	l -73 to 4	402 mV									
		Dissolved Oxyge	en						All data of 2 mg		sample y	ear above	screenir	ıg level
	ts	Surface Total Ni	trogen	0.67 m	g/L to 1.5	51 mg/L								
	Nutrients	Surface Total Ph	nosphorus	0.005 r	ng/L to 0	.049 mg/L	-							
	Nut	Nitrogen to Phos	sphorus Ratio	47:1					Phosph	orus limi	ted			
		<u>Click to learn m</u> <u>Beneficial Uses</u>	nore about	Turbidity	Hď	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
ses	Fis	h & Wildlife Propa	gation	S	S	S	S							
Beneficial Uses	Ae	sthetics						S	*					
ficia	Ag	riculture								S	S	S		
ene	Pri	mary Body Contac	t Recreation										NEI	
Ď	Pu	blic & Private Wate	er Supply											
		S = Fully Supporting NS = Not Supporting NEI = Not Enough Int	formation	*Did no requiren	t collect fo nent were	or this para not met du	meter. Th ue to QA/0	e PBCR b QC issues	eneficial u for <i>E.coli</i> a	se cannot and enterc	be asses cocci.	sed as min	imum data	l
μS/c	cm =	ephelometric turbidity microsiemens per ce Escherichia coli	entimeter mV	′QS = Oklaho = millivolts or-a = Chloro		Quality St	andards	mg/L ∶ μS/cm	= milligram n = microsi	s per liter emens/cm	pp En	t = parts pe = Enteroco	er thousand Docci	2

F	re	derick							<ul> <li>Samplin</li> </ul>	ng Sites	( ,	$\tilde{)}$		
		Sample Perio	d	Times Visited	San	npling S	ites				3	4		
	Dec	ember 2012 -Jul	y 2013	4		3			e Names for		Si	ite 3		
	Loc	cation	Tillman Cou	nty	Click r	nap for sit	e data	Avana	able Data	4	s	Site 5		
a	Imp	ooundment	1974					-		the second se		Site 2		
General	Are	a	925 acres					-			Site 4			
Ğ	Ca	pacity	9,526 acre-f	eet							3	0	1	
	Pu	rposes	Water Supp	y, Recreati	on and F	lood Cont	rol			action	Site 1 Botto	om	Miles	
		Parameter (Des	scriptions)	Result					Notes/	Commen	its			
		Average Turbidit	ty	148 NT	Ū				100% c	f values	> OWQS	S of 25 NT	U	
		Average Secchi	Disk Depth	11 cm										
	Situ	Water Clarity Ra	ating	poor										
	Ц	Chlorophyll-a		12 mg/i	m3									
		Trophic State Ind	dex	55					Previou	s Value=	- 57			
Srs		Trophic Class		Eutroph	nic									
Parameters		Salinity		0.06-0	).27 ppt									
aran	e	Specific Conduc	tivity	135 – 5	570 μS/cr	n								
ä	Profile	рН		7.53 – 8	8.57 pH u	units			Neutral	to slightl	y alkalin	e		
	Ē	Oxidation-Reduc	ction Potential	22 – 37	′5 mV									
		Dissolved Oxyge	en						All data level of		sample	year above	e screeni	ng
	nts	Surface Total Ni	trogen	1.11 m	g/L to 1.5	i6 mg/L								
	Nutrient	Surface Total Ph	nosphorus	0.039 n	ng/L to 0.	.125 mg/L								
	NU	Nitrogen to Phos	sphorus Ratio	17:1					Phosph	orus limi	ted			
		<u>Click to learn m</u> <u>Beneficial Uses</u>	nore about	Turbidity	Hď	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
ses	Fis	h & Wildlife Propa	gation	S	S	S	S							
Beneficial Uses	Aes	sthetics						S	*					
ficia	Agı	riculture								S	S	S		
ene	Pri	mary Body Contac	t Recreation										S	
Ω	Pul	blic & Private Wate	er Supply											
	Λ	S = Fully Supporting NS = Not Supporting NEI = Not Enough Ini	formation	• •	No long	er collect fo	or this par	ameter						
μS/c	m = l	ephelometric turbidity microsiemens per ce Escherichia coli	entimeter mV =	QS = Oklaho = millivolts r-a = Chloro		Quality Sta	andards		= milligram n = microsi			t = parts pe = Enteroco		d

		Sample Perio	d	Times Visited	Sar	mpling S	ites				K	• Sam	pling Sites		
November 2012 - August 2013						8					5				
	Location Cherokee Cou			County	nty Click map for site data					-7					
	Impoundment 1953									لل	and the second second	424			
	Area 14,900 acres			es						4	Site 4	35			
	Capacity 355,200 acre-fe			re-feet	eet					Sit	e 2	0	5		
	Purposes Hydropower an			r and Flood	nd Flood Control						Site 1	Site 1 Surface Bottom	Miles		
1		Parameter (Descriptions)		Resul	Result				Notes/Comments						
	Situ	Average Turbidity		7 NTU	7 NTU				100% of values < OWQS of 25 NTU						
		Average Secchi Disk Depth		78 cm	78 cm										
		Water Clarity Rating		good	good										
	In S	Chlorophyll-a		20 mg	20 mg/m3										
		Trophic State Index		60	60					Previous value = 60					
		Trophic Class		Eutrop	Eutrophic										
		Salinity		0.11 –	0.11 – 0.19 ppt										
	<b>a</b>	Specific Conductivity		229 –	229 – 330 µS/cm										
Parameters	Profile	рН		7.04 –	7.04 – 8.56 pH units										
	Υ.	Oxidation-Reduction Potential		al -33 to	-33 to 297 mV										
		Dissolved Oxygen							All data for this sample year above screening level of 2 mg/L						
	s	Surface Total Nitrogen		0.62 m	0.62 mg/L to 1.22 mg/L										
	Nutrients	Surface Total Phosphorus		0.028	0.028 mg/L to 0.91 mg/L										
	Nut	Nitrogen to Phosphorus Ratio		o 7:1	7:1					Possibly co- limited					
		<u>Click to learn m</u> <u>Beneficial Uses</u>	nore about	Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a	
	Fish	n & Wildlife Propa	NS	S	NS	S									
	Aes	sthetics					NS	S							
	Agr	iculture							S	S	S				
	Prin	nary Body Contac										NEI			
	Pub	olic & Private Wate													
	N	= Fully Supporting IS = Not Supporting IEI = Not Enough In		Se Waters	The lake is currently listed in the Oklahoma Water Quality Standards (WQS) as a Nutrient Limited Watershed (NLW). This listing means that the lake is considered threatened from nutrients until a more intensive study can confirm the Aesthetics beneficial use non-support status.										

		Sample Perio	d		imes	San	npling S	ites				K	• Sam	pling Sites	
N	oven	nber 2012 - Aug	ust 2013	V	isited 4		8					5			
	Loc	ation	Cherokee (	Cour	nty	Click r	nap for si	te data			Site	Site 8			
	Imp	oundment	1953										Site 6		
	Are	a	14,900 acre	es							Site 5				
	Cap	pacity	355,200 ac	re-fe	eet								0	5	
	Pur	poses	Hydropowe	r an	d Flood	Control						3	sr.	Miles	
-		Parameter (Des	scriptions)		Result					Notes/	Commer	nts			
		Average Turbidit	ty		9 NTU					100% o	of values	< OWQS	6 of 25 NT	Ū	
		Average Secchi	Disk Depth		69 cm										
	ŝitu	Water Clarity Ra	ating		Good										
	In Situ	Chlorophyll-a			23 mg/r	n3									
		Trophic State Ind	dex		61					Previou	is value =	= 61			
		Trophic Class			Hypere	utrophic									
		Salinity			0.11– 0	.20 ppt									
	a)	Specific Conduc	tivity		228 – 4	24 µS/cr	n								
	Profile	рН			7.01 – 9	9.19 pH ι	units			2% of v	alues > 9	9.0 pH ur	nits		
	5	Oxidation-Reduc	ction Potentia	ıl	-46 to 3	307 mV									
		Dissolved Oxyge	en							All data level of		sample y	year above	e screeni	ing
	s	Surface Total Ni	trogen		0.65 mg	g/L to 1.5	5 mg/L								
	rients	Surface Total Ph	nosphorus		0.023 m	ng/L to 0.	.604 mg/L	<u>.</u>							
	Nutrie	Nitrogen to Phos	sphorus Ratio	)	7:1					Possibl	y co- limi	ted			
		Click to learn m Beneficial Uses	<u>ore about</u>		Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	
	Fish	h & Wildlife Propa	gation		NS	S	NS	S							
	Aes	sthetics							NS	S					
	Agr	iculture									S	S	S		
	Prir	mary Body Contac	t Recreation											NEI	
	Pub	olic & Private Wate	er Supply		<b>T</b> L 1 1			11 - O'			01				
	Ν	S = Fully Supporting IS = Not Supporting IEI = Not Enough Int	formation	Notes	Watersh	ed (NLW)	. This listin	g means	that the la		idered thre	eatened fr	is a Nutrien om nutrien		nore

		Suppl		Times							<u>ا</u>	En la		
		Sample Perio	d	Visited	Sar	npling S	ites			6	Site	4		
(	Octol	ber 2012 - Augu	ıst 2013	4		3				and	Site 2	3		
	Loc	ation	Woodward	County	Click r	map for si	te data		e Names for able Data	2		Ser. S		
ភ	Imp	oundment	1942							Si	te 5	1ª		
General	Are	а	1,820 acres	6						s Sept	Site 3			
อั	Cap	pacity	13,900 acr	e-feet					0	1/2				
	Pur	poses	Flood Cont	rol, Conserv	ation Pu	rposes			Miles		345		" Alight Lady	
		Parameter (Des	scriptions)	Result					Notes/0	Commer	nts			
		Average Turbidi	ty	61 NTL	J				100% o	f values	> OWQS	S of 25 NT	Ū	
		Average Secchi	Disk Depth	23 cm										
	Situ	Water Clarity Ra	ating	Fair to	Poor									
	In-Situ	Chlorophyll-a		20 mg/	m3									
		Trophic State In	dex	60					Previous	s value =	= 59			
ໂ		Trophic Class		Eutroph	nic									
Parameters		Salinity		0.70 –	0.76 ppt									
Iran	~	Specific Conduc	ctivity	1392 –	1510 µS	S/cm								
บั	Profile	рН		7.91 –	8.59 pH	units								
	ē.	Oxidation-Redu	ction Potentia	l -93 to 2	220 mV									
		Dissolved Oxyg	en						All dat	a are ab	ove scre	ening leve	el of 2.0 n	ng/L
		Surface Total N	itrogen	1.15 m	g/L to 1.7	75 mg/L								
	ents	Surface Total P	hosphorus		-	.229 mg/L								
	Nutrie		·			.225 mg/1	-							
	-	Nitrogen to Pho	sphorus Ratio	) 17:1	1	-			Phosph	orus limi	ted			
		<u>Click to learn n</u> <u>Beneficial Uses</u>		Turbidity	Hď	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
Beneficial Uses	Fish	h & Wildlife Propa	gation	NS	S	S	S							
C B	Aes	sthetics						NS*	*					
د	Agr	iculture								S	S	S		
บ บ	Prir	mary Body Contac	ct Recreation										S	
٥	Pub	olic & Private Wat	er Supply											NS
	Ν	S = Fully Supporting IS = Not Supporting IEI = Not Enough In	formation	Aestheti non-sup	cs benefic port statu	cial use is o	considered CR benefic	d threaten cial use ca	ed by nutri annot be as	ents until	studies ca	N indicating an be condu m data requ	ucted to co	

F	U(	qua								,	5~		<ul> <li>Sampling</li> </ul>	Sites	
		Sample Perio	d		mes sited	San	npling S	ites	Click Si	ite Names fo	Site 4	2	5		
	Nove	ember 2012 - Jul	ly 2013		4		5		Avai	lable Data		Site 2	5		
	Loc	cation	Stephens C	County	у	Click r	nap for sit	e data				· کر ا	2/5		
ସ	Imp	oundment	1953			1						2		{	
General	Are	a	1,500 acres	5						0 Mile	1/2 s			ite 1 Surface Bottom	
S	Cap	pacity	21,100 acro	e-feet	İ						and and	5.	/ Site 1	Bottom	
	Pur	rposes	Water Sup	oly, R	ecreatio	on and F	lood Cont	rol			h	Site 5			
		Parameter (Des	scriptions)	F	Result					Notes/0	Commer	nts			
		Average Turbidit	ty	1	16 NTU					15% of	values >	OWQS	of 25 NTL	J (n=20)	
		Average Secchi	Disk Depth	e	61 cm										
	litu	Water Clarity Ra	ating	ŀ	Average	Э									
	In-Situ	Chlorophyll-a		ç	9 mg/m	3									
		Trophic State Inc	dex	Ę	52					Previou	s Value=	= 57			
ร		Trophic Class		E	Eutroph	ic									
Parameters		Salinity		(	0.30– 0	.35 ppt									
Iram		Specific Conduc	tivity	6	612 – 7	24 µS/cr	n								
Pa	Profile	рН		7	7.54 – 8	3.62 pH ι	units								
	۲ ۲	Oxidation-Reduc	ction Potentia	al -	-151 to	320 mV									
		Dissolved Oxyge	en		Up to 3 summe		ater colum	n < 2 mç	g/L in						
	ts	Surface Total Ni	trogen	(	0.65 mg	g/L to 1.1	8 mg/L								
	rien	Surface Total Ph	nosphorus	(	0.005 m	ng/L to 0.	033 mg/L								
	Nut	Nitrogen to Phos	sphorus Ratio	<b>b</b> 1	112:1					Phosph	orus limi	ted			
	Surface Total Nilogen Surface Total Phosphorus Nitrogen to Phosphorus Ratio				Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
ses	Fisl	h & Wildlife Propa	gation		NS	S	S	S							
Beneficial Uses	Aes	sthetics							S	*					
ficia	Agr	riculture									S	S	S		
ene	Prir	mary Body Contac	t Recreation											S	
ă	Put	olic & Private Wate	er Supply												
	٨	S = Fully Supporting NS = Not Supporting NEI = Not Enough Int	formation	Notes	* did not	t collect fo	or these pa	rameters.							
μS/c	m = r	phelometric turbidity microsiemens per ce Escherichia coli	entimeter mV	= milli			Quality Sta	andards	mg/L = μS/cm	= milligram n = microsie	s per liter emens/cm	ppt n En	= parts pe = Enteroco		k

G	ra	and, Lo	ower L		(1-3)							C		
		Sample Perio	d	Times Visited	San	npling S	ites					5		
No	oven	nber 2012 - Aug	ust 2013	4		13		_			5		and to	
	Loc	ation	Mayes Cou	nty	Click r	map for si	te data				1.5		and .	
ធ	Imp	oundment	1940						Names for ble Data		S. C.			
General	Are	а	1,820 acres					_		Site		AT THE		
ดั	Cap	pacity	13,900 acre	e-feet					~	Site 2	K	0	5	
	Pur	poses	Flood Contr	ol, Hydropo	wer				Site 1 Surface Site 1 Botto	m		-	Miles	
		Parameter (Des	scriptions)	Result					Notes/0	Commen	nts			
		Average Turbidit	ty	7 NTU					100% o	f values	< OWQ	5 of 25 NT	ัU (n=12)	
		Average Secchi	Disk Depth	109 cm	l									
	In Situ	Water Clarity Ra	ating	Excelle	nt									
	L L	Chlorophyll-a		14 mg/	m3									
		Trophic State Ind	dex	56					Previous	s value =	= 56			
ຽ		Trophic Class		Eutroph	nic									
nete		Salinity		0.09 -	0.17 ppt									
Parameters	œ.	Specific Conduc	tivity	187 – 3	854 µS/c	m								
å	Profile	рН		6.35 –	8.49 pH	units			3% of v	ales < 6.	5 pH uni	its		
	5	Oxidation-Reduc	ction Potential	-78 to 3	327 mV									
		Dissolved Oxyge	en	Up to 7 in Aug		ater colum	n in < 2	.0 mg/L						
	nts	Surface Total Ni	itrogen	0.70 m	ng/L to 1.3	35 mg/L								
	Nutrient	Surface Total Pr	nosphorus	0.005 r	ng/L to 0	.124 mg/L	-							
	Nu	Nitrogen to Phos	sphorus Ratio	20:1					Phosph	orus limi	ted			
		<u>Click to learn m</u> <u>Beneficial Uses</u>	nore about	Turbidity	Hď	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
ses	Fisl	h & Wildlife Propa	gation	S	S	NS	*							
Beneficial Uses	Aes	sthetics						S	*					
fici	Agr	iculture								*	*	S		
ene	Prir	mary Body Contac	t Recreation										NEI	
m	Put	olic & Private Wate	er Supply											
	٨	S = Fully Supporting IS = Not Supporting IEI = Not Enough Ini		*Did not	collect for	r these par	ameters							
μS/c	m = r	phelometric turbidity nicrosiemens per ce Escherichia coli	entimeter mV	QS = Oklaho = millivolts pr-a = Chloro		Quality Sta	andards		= milligram n = microsie			t = parts pe a = Enteroco		d

G	ra	and, Mi	d Lak	e (4-9	9)				<ul> <li>Samplir</li> </ul>	ng Sites		à		
		Sample Perio	d	Times Visited	Sar	npling S	ites					2		
No	oven	nber 2012 - Aug	ust 2013	4		13					2			
	Loc	ation	Mayes Cou	unty	Click r	map for si	te data			and the second	Site 8	Site 9		
al	Imp	oundment	1940						Names for ble Data	Site	e 4	Site 7		
General	Are	a	1,820 acres	;						the	Site 5		, ,	
ອຶ	Cap	pacity	13,900 acr	e-feet					-	Suste	K		-	
	Pur	poses	Flood Contr	ol, Hydropo	ower							0	Miles	
		Parameter (Des	scriptions)	Result				,	Notes/0	Commen	nts			
		Average Turbidit	ty	14 NTU	J				13% of	values >	OWQS	of 25 NTL	J (n=24)	
		Average Secchi	Disk Depth	77 cm										
	In Situ	Water Clarity Ra	ating	Good										
	Ц	Chlorophyll-a		11 mg/	m3									
		Trophic State Ind	dex	54					Previou	s value =	= 60			
ร		Trophic Class		Eutrop	hic									
Parameters		Salinity		0.09 –	0.20 ppt									
aran	0	Specific Conduc	tivity	184 – 4	407 µS/c	m								
ã	Profile	рН		6.55 –	8.82 pH	units								
	Ē	Oxidation-Reduc	ction Potentia	l -81 to 3	332 mV									
		Dissolved Oxyge	en	Up to 7 August		ater colum	n < 2.0	mg/L in						
	nts	Surface Total Ni	trogen	0.66 n	ng/L to 3.	59 mg/L								
	Nutrient	Surface Total Pr	nosphorus	0.005 r	ng/L to 0	.187 mg/L								
	Nut	Nitrogen to Phos	sphorus Ratic	22:1					Phosph	orus limi	ted			
		<u>Click to learn m</u> <u>Beneficial Uses</u>	nore about	Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
ses	Fisł	h & Wildlife Propa	gation	NS	S	NS	*							
Beneficial Uses	Aes	sthetics						S	*					
fici	Agr	iculture								*	*	S		
ene	Prir	mary Body Contac	t Recreation										NEI	
Ш	Pub	olic & Private Wate	er Supply											
	Ν	S = Fully Supporting IS = Not Supporting IEI = Not Enough Int		*Did no	t collect fo	r these par	ameters							
µS/c	m = r	phelometric turbidity microsiemens per ce Escherichia coli	entimeter mV	'QS = Oklaho = millivolts pr-a = Chloro		Quality Sta	andards		= milligram a = microsie			nt = parts pe n = Enteroco		d

G	510	and, Up		Times			:400					Site 13	1	
NL		Sample Perio		Visited	San	npling S	nes	-					Site 12	
ING		nber 2012 - Aug		4	 	13			CT I I I I I I I I I I I I I I I I I I I	題	2	Site 10		
		ation	Mayes Cou	inty	Click r	nap for si	te data	Click Site	Names for		1.7	ST ST	te 11	
eral	-	oundment	1940						ble Data	a t		the second		
General	Are		1,820 acres					-		The second		K		
G	Cap	pacity	13,900 acre	e-feet					7	Start R	K	0	5	
	Pur	poses	Flood Contr	ol, Hydropo	wer								Miles	
		Parameter (Des	scriptions)	Result					Notes/	Commer	nts			
		Average Turbidi	ty	38 NTL	J				38% of	values >	OWQS	of 25 NTU	l (n=16)	
		Average Secchi	Disk Depth	47 cm										
	In Situ	Water Clarity Ra	ating	Good										
	Ē	Chlorophyll-a		13 mg/	m3									
		Trophic State In	dex	56					Previou	s value =	59			
ร		Trophic Class		Eutroph	nic									
Parameters		Salinity		0.09 -	0.25 ppt									
Iran	~	Specific Conduc	tivity	189 – 5	518 µS/c	m								
ъ Б	Profile	рН		6.88 -	8.68 pH	units								
	5	Oxidation-Reduc	ction Potential	-73 to 3	368 mV									
		Dissolved Oxyge	en							a for this ng level o		year are b	elow the	
	Ś	Surface Total Ni	itrogen	1.24 m	ng/L to 3.3	32 mg/L					0			
	rients	Surface Total Ph	nosphorus	0.005 r	ng/L to 0	.192 mg/L								
	Nutrie	Nitrogen to Phos	sphorus Ratio	22:1					Phosph	orus limi	ted			
		<u>Click to learn m</u> Beneficial Uses	nore about	Turbidity	Ha	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
Beneficial Uses	Fisł	n & Wildlife Propa	gation	NS	S	S	*							
al C	Aes	sthetics						S	*					
fici	Agr	iculture								*	*	S		
ene	Prir	nary Body Contac	t Recreation										NEI	
Ш	Pub	olic & Private Wate	er Supply											
	Ν	S = Fully Supporting IS = Not Supporting IEI = Not Enough Int		*Did not	collect for	these par	ameters							
µS/c	m = r	phelometric turbidity nicrosiemens per ce Escherichia coli	entimeter mV	QS = Oklaho = millivolts or-a = Chloro		andards		= milligram n = microsi			nt = parts pe n = Enteroco		1	

G	re	eat Sal	t Plai	ins					<ul> <li>Samplir</li> </ul>	ng Sites				
		Sample Perio		Times Visited	San	npling S	ites		e Names for able Data	Joseph Land	53 1	• Site 5	Site 1 Surface	
	Febr	uary 2012 – Ma	y 2012	2		5			, a			• Site 4	Site 1 Bottom	
	Loc	ation	Alfalfa Cou	nty	Click r	map for si	te data			5	e Site 3	Site 2		
ធ្ម	Imp	oundment	1941											
General	Are	a	8,690 acres					_	5					
Ğ	Cap	pacity	31,240 acre	e-feet						3				
	Pur	poses	Flood Cont	rol, Conser	vation								0 1 Miles	
		Parameter (Des	scriptions)	Result					Notes/	Commer	nts			
		Average Turbidit	ty	289 NT	U				100% c	of values	> OWQS	S of 25 NT	U (n=4)	
		Average Secchi	Disk Depth	13 cm										
	Situ	Water Clarity Ra	ating	Poor										
	In S	Chlorophyll-a		15 mg/	′m3									
		Trophic State In	dex	57					Previou	is value =	= 71			
ຽ		Trophic Class		Eutrop	nic									
Parameters		Salinity		3.57– 1	0.08 ppt									
Iran	0	Specific Conduc	tivity	6543 –	17,185	µS/cm								
Ъ <sup>9</sup>	Profile	рН		8.03 –	8.35 pH	units								
	ŗ.	Oxidation-Reduc	ction Potentia	93 – 49	90 mV									
		Dissolved Oxyge	en						Not str	atified at	any sam	npling eve	nt	
	(0	Surface Total Ni	trogen	1.56 m	ng/L to 3.	75 mg/L								
	Nutrients	Surface Total Pr	nosphorus	0 091 r	na/L to 0	.676 mg/l								
	Nutri		•		11g/ L 10 0	.or o mg/1	-							
		Nitrogen to Phos	sphorus Ratio	7:1	,				possibly	y co-limit	ed			
		<u>Click to learn m</u> <u>Beneficial Uses</u>	<u>nore about</u>	Turbidity	Hď	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
ses	Fisł	h & Wildlife Propa	gation	NS*	S	S	S							
Beneficial Uses	Aes	sthetics						NS*	N/A	N/A	N/A			
fici	Agr	iculture												
ene	Prir	mary Body Contac	t Recreation										NEI	
Δ	Pub	olic & Private Wate	er Supply											
	Ν	S = Fully Supporting IS = Not Supporting IEI = Not Enough Int	formation	threater ** Due t	ed by nut	rients until er conditior	studies cans the lake	an be cono e was only	ducted to c sampled t	onfirm no	n-support	cial use is co status. rent sample <i>nts not met</i>	e year.	у.
μS/c	m = r	phelometric turbidity nicrosiemens per ce Escherichia coli	entimeter mV	QS = Oklaho = millivolts pr-a = Chloro	ma Water			mg/L =	= milligram n = microsi	s per liter	рр	t = parts pe = Enteroco	er thousand	-

		Sample Perio	d	-	imes	Sar	npling Si	tes				Site 3	•		
No	vem	nber 2011 – Aug		Vi	isited 4	••••	5		-			Ĩ	•		
		cation	Muskogee (	Cou		Click	map for sit	e data		e Names for					
		poundment	1939	500		Chok		ouuu	Availa	able Data		• s	ite 2		
	Are		920 acres						-		Site 1 Surfac		ite 5		
		pacity	14,720 acre	ə-fe	et				_		大田	• 7			
	-	rposes	Recreation							CC II	Site 1	BOILON		1 Miles	
		Parameter (Des	scriptions)		Result					Notes/	Commer	nts			
		Average Turbidi			12 NTU					8% of v	/alues >	OWQS o	f 25 NTU	(n=12)	
		Average Secchi	Disk Depth		67 cm									· · ·	
	itu	Water Clarity Ra	ating		Good										
	In Situ	Chlorophyll-a			11 mg/	m3									
		Trophic State In	dex		54					Previou	is value =	= 52			
		Trophic Class			Eutroph	nic									
		Salinity			0.06– 0	.12 ppt									
		Specific Conduc	tivity		146 – 2	43 µS/ci	m								
	Profile	рН			6.89 – 8	3.65 pH	units								
	5	Oxidation-Redu	ction Potentia	I	22 – 42	7 mV									
		Dissolved Oxyge	en		Up to 5 May	7% of wa	ater colum	n < 2 m	g/L in						
	S	Surface Total N	itrogen		0.45 m	g/L to 1.	28 mg/L								
	ients	Surface Total Pl	nosphorus		0.006 m	ng/L to 0	.030 mg/L								
	Nutrie	Nitrogen to Pho	sphorus Ratio		42:1					Phosph	orus limi	ted			
		<u>Click to learn n</u> <u>Beneficial Uses</u>	nore about		Turbidity	Hď	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	-
	Fisł	h & Wildlife Propa	gation		S	S	•	S							
	Aes	sthetics							S	N/A					
	Agr	riculture									N/A	N/A	S		
	Prir	mary Body Contac	t Recreation											S	
	Pub	olic & Private Wate	er Supply												N
	Ν	S = Fully Supporting JS = Not Supporting JEI = Not Enough In		Notes	*N/A – p * 50-70%	<i>arameter</i> 6 range is	rs <i>not collec</i> s undetermin	<i>ted in cu</i> ned for D	rrent sam 0.	ple year.					

G	iu'	thrie									1	• Sam	npling Sites	
		Sample Perio	d	Times Visited	San	npling S	ites							
	Oct	ober 2005 – July	y 2006	4		5				Ά.				
	Loc	cation	Logan Cou	nty	Click r	nap for si	te data		V					
ଜ	Imp	ooundment	1919		-			1			h.	(		
General	Are	a	274 acres					1		•		2		
မီ	Ca	pacity	3,875 acre-	feet								o	1/4	
	Pur	rposes	Water Supp	ly, Recreat	tion					建立			Miles	
		Parameter (Des	scriptions)	Result				1	Notes/	Commer	nts			
		Average Turbidi	ty	19 NTU	J				20% of	values >	OWQS	of 25 NTL	J	
		Average True C	olor	21 unit	S				100% c	of values	< OWQS	S of 70		
		Average Secchi	Disk Depth	52 cm										
		Water Clarity Ra	ating	Averag	e to good	ł								
		Trophic State In	dex	61										
S		Trophic Class		hypere	utrophic									
Parameters		Salinity		0.32-0	).43 ppt									
aran	đ	Specific Conduc	tivity	623.1 -	- 821 µS/	cm								
č	Profile	рН		7.78 –	8.21 pH เ	units			Neutral	to slightl	y alkalin	e		
	Ē	Oxidation-Reduc	ction Potentia	357 – 4	170 mV									
		Dissolved Oxyge	en						Not str	atified du	iring any	sampling	interval	
	6	Surface Total Ni	itrogen	0.61 m	g/L to 1.3	3 mg/L								
	rients	Surface Total Pr	nosphorus	0.041m	ng/L to 0.	103 mg/L								
	Nutriel	Nitrogen to Phos	sphorus Ratio	15:1					Phosph	iorus limi	ted			
		<u>Click to learn m</u> <u>Beneficial Uses</u>	nore about	Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
ses	Fis	h & Wildlife Propa	gation	S*	S	S	S							
Beneficial Uses	Aes	sthetics						S	S					
ficia	Agı	riculture								S	S	S		
ene	Prir	mary Body Contac	t Recreation										S	
â	Pu	blic & Private Wate	er Supply											
	٨	S = Fully Supporting VS = Not Supporting VEI = Not Enough Ini	formation	data sug	ggest that	the peak ir	turbidity	which oc	exceeded curred in C FWP use.	the WQS October, is	of 25 NTL likely due	J, available to seasona	flow and r al storm e	ainfall vents;
μS/c	m = r	phelometric turbidity microsiemens per ce Escherichia coli	entimeter mV	QS = Oklaho = millivolts pr-a = Chloro		Quality Sta	andards		= milligram n = microsi			t = parts pe = Enteroco		d

Η	ea	aldton								2		• Sam	npling Sites	
		Sample Perio	d	Times Visited	San	npling S	ites			•				
No	overr	nber 2005 – Aug	ust 2006	4		5			}		$\bigcap$			
	Loc	ation	Carter Cou	inty	Click r	nap for si	te data		<b>\</b> •					
ଅ	Imp	oundment	1979		_			•					2	
General	Are	a	370 acres					•			、 _			
မီ	Cap	pacity	3,766 acre	-feet								0	1/4	
	Pur	poses	Water Supp	oly, Recrea	tion					出	•		Miles	
		Parameter (Des	criptions)	Result				1	Notes/	Commer	nts			
		Average Turbidit	ty	48 NT	J				100% c	f values	> OWQS	6 of 25 NT	Ū	
		Average True Co	olor	159 un	its				100% c	f values	> OWQS	S of 70		
		Average Secchi	Disk Depth	34 cm										
		Water Clarity Ra	ating	poor										
		Trophic State Inc	dex	49										
ຽ		Trophic Class		mesotr	ophic									
Parameters		Salinity		0.13-0	).19 ppt									
Iran	~	Specific Conduc	tivity	275.6 -	- 378.5 µ	S/cm								
Pa	Profile	рН		7.05 –	7.86 pH ι	units			Neutral	to slightl	y alkalin	e		
	5	Oxidation-Reduc	ction Potentia	I 304 – 4	450 mV									
		Dissolved Oxyge	en	Up to 3 Augus	33% of wa	ater colum	nn < 2 m	g/L in						
	nts	Surface Total Ni	trogen	0.59 m	g/L to 0.9	4 mg/L								
	Nutrient	Surface Total Ph	nosphorus	0.043 ו	mg/L to 0.	.100 mg/L	_							
	Nu	Nitrogen to Phos	sphorus Ratio	0 11:1					Phosph	orus limi	ted			
		<u>Click to learn m</u> <u>Beneficial Uses</u>	nore about	Turbidity	Hď	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
ses	Fish	h & Wildlife Propa	gation	NEI*	S	S	S							
Beneficial Uses	Aes	sthetics						S	NEI*					
fici	Agr	iculture								S	S	S		
ene	Prir	mary Body Contac	t Recreation										NEI*	
8	Pub	olic & Private Wate	er Supply											
	Ν	S = Fully Supporting IS = Not Supporting IEI = Not Enough Int	formation	* Due to cannot	b inclement be made fo	t weather o or turbidity,	conditions true colo	all sites c r or bacte	could not be ria as minir	e sample i num data	n May, th requirem	erefore an a ents were r	assessme not met.	nt
μS/c	m = r	phelometric turbidity nicrosiemens per ce Escherichia coli	ntimeter mV	′QS = Oklaho = millivolts or-a = Chloro		Quality St	andards		= milligram n = microsi			t = parts pe = Enteroco		d

-1	e	iner							<ul> <li>Samplir</li> </ul>	g Sites		te 1 Surface te 1 Bottom	Click Site N Availabl	
		Sample Perio	d	Times Visited	San	npling S	ites		-			• Site 5		o Data
I	Marc	ch 2013 – Augus	st 2013	4		3								
	Loc	ation	Oklahoma C	County	Click r	map for si	te data			Sit	• e 2	• Site	, Con	
ľ	Imp	oundment	1947							55	5	•	3	
	Are	а	2,500 acres	\$							A	Site 4	2	
	Cap	pacity	75,000 acre	e-feet							5	2	FI	
	Pur	poses	Water Supp	ly, Recreat	ion					的	1		0 1/2 Miles	
		Parameter (Des	scriptions)	Result				1	Notes/	Commer	nts			
		Average Turbidit	ty	9 NTU					100% o	f values	< OWQS	S of 25 NT	U (n=6)	
		Average Secchi	Disk Depth	57 cm										
	In-Situ	Water Clarity Ra	ating	Averag	е									
	-u	Chlorophyll-a		25 mg/	m3									
		Trophic State Inc	dex	62					Previou	s Value=	= 63			
		Trophic Class		Hypere	utrophic									
		Salinity		0.55–0	).69 ppt									
8	Ð	Specific Conduc	tivity	1116 –	1376 µS	/cm								
	Profile	рН		7.41 –	9 pH unit	S			Neutral	to slight	ly alkalin	е		
	₽	Oxidation-Reduc	ction Potential		o 411 mV									
		Dissolved Oxyge	en	Up to 5 summe		ater colum	nn < 2 m	g/L in						
	S	Surface Total Ni	itrogen	1.26 m	g/L to 1.5	58 mg/L								
	ients	Surface Total Ph	nosphorus	0.084m	ng/L to 0.	114 mg/L								
	Nutrie	Nitrogen to Phos		14:1	-				Phosph	orus limi	ted			
		<u>Click to learn m</u> Beneficial Uses	nore about	Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	
1	Fisł	n & Wildlife Propa	gation	S	S	NS	S							
	Aes	sthetics						S	*					
	Agr	iculture								S	S	S		
	Prir	nary Body Contac	t Recreation										S	
	Pub	olic & Private Wate	er Supply											
	Ν	S = Fully Supporting IS = Not Supporting IEI = Not Enough Int	formation	* This part of the second seco	arameter r ow water l	not collecte levels staff	d for. was unat	le to acce	ess lake du	ring the F	all and W	inter quarte	rs.	
'c	m = r	phelometric turbidity nicrosiemens per ce Escherichia coli	entimeter mV :	QS = Oklaho = millivolts pr-a = Chloro		Quality Sta	andards		= milligram n = microsi			t = parts pe a = Enteroco		d

J	im	n Hall (	Henr	yett	a)				<ul> <li>Sampli</li> </ul>	ng Sites	~	Site 2	Site 1 Surface	om
		Sample Perio	d	Times Visited	Sar	npling S	ites		Site Names		7			
		2012		4		5		AV	vailable Data			Site 4		
	Loc	ation	Okmulgee	County	Click	map for si	te data					(		
ଜ୍ମ	Imp	oundment	1928								3.	Site 3		
General	Are	а	450 acres								Site 5	2		
ื้อ	Cap	pacity	6,600 acre-1	eet								<u>م</u>	1/2	
	Pur	poses	Water Supp	ly and Reci	eation					when	12		Miles	
		Parameter (Des	scriptions)	Result					Notes/	Commer	nts			
		Average Turbidi	ty	132 NT	U				100% c	of values	> OWQS	6 of 25 NT	U (n=12)	
		Average Secchi	Disk Depth	8 cm										
	Situ	Water Clarity Ra	ating	Poor										
	ln S	Chlorophyll-a		3 mg/r	n3									
		Trophic State In	dex	43					Previou	s Value	= 45			
ပ		Trophic Class		Mesotr	ophic									
Parameters		Salinity		0.04 - (	).05 ppt									
ram	-	Specific Conduc	ctivity	87 – 11	1 µS/cm	1								
Pa	Profile	рН		6.50 –	8.04 pH	units								
	Ţ	Oxidation-Reduc	ction Potentia	298 to	637 mV									
		Dissolved Oxyge	en	Up to 1 July	1% of w	ater colum	nn < 2 m	g/L in						
	s	Surface Total Ni	itrogen	1.19 m	g/L to 1.3	36 mg/L								
	Nutrients	Surface Total Pl	hosphorus	0.088 r	ng/L to 0	.192 mg/L	-							
	Ŋ	Nitrogen to Phos	sphorus Ratio	10:1					Phosph	orus limi	ted			
		<u>Click to learn m</u> <u>Beneficial Uses</u>		Turbidity	Hď	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
ses	Fisł	h & Wildlife Propa	gation	NS	S	S								
Ĵ	Aes	sthetics						S	N/A					
Beneficial Uses	Agr	iculture								N/A	N/A	S		
ene	Prir	mary Body Contac	ct Recreation										NEI**	
m	Pub	olic & Private Wate	er Supply											
	Λ	S = Fully Supporting IS = Not Supporting IEI = Not Enough In	formation	👸 parame	ters	not be asse rs not collec				ements we	ere not me	et due to Q/	A/QC issue	es for all
μS/c	m = r	phelometric turbidity nicrosiemens per ce Escherichia coli	entimeter mV	QS = Oklaho = millivolts or-a = Chloro		<sup>r</sup> Quality Sta	andards		= milligram n = microsi			t = parts pe = Enteroco		1

		yburn		Times							A.	N. Car	Available	lames f e Data
		Sample Perio	d	Visited	San	npling S	ites	_		~ 图	R	79		
	Octo	ober 2012 - Augu	st 2013	4		4			CEE CEE	題		•		
	Loc	ation	Creek Cou	nty	Click r	nap for si	te data				2	Siles		
3	Imp	oundment	1950						1	22		h	చ	
5	Are	а	880 acres						\$	Site 5		Site 4	Surface	
5	Cap	pacity	7,105 acre-	feet				_			ite 2	Site 1 Bi	ottom	
	Pur	poses	Flood Contr	ol and Cons	servation				L	$\sim$		0	Miles	
		Parameter (De	scriptions)	Result					Notes/	Commer	nts			
		Average Turbid	ity	142 NT	U				100% c	of values	> 25 NT	ับ (n=15)		
		Average Secch	i Disk Depth	12 cm					75% of	values >	OWQS	of 70		
	In-Situ	Water Clarity R	ating	Poor										
	ln-0	Chlorophyll-a		6 mg/m	า3									
		Trophic State Ir	ndex	48					Previou	s value =	- 49			
)		Trophic Class		Mesotro	ophic									
		Salinity		0.10 -	0.15 ppt									
		Specific Condu	ctivity	214 – 3	24 µS/cr	n								
5 -	Profile	pН		6.68 –	8.51 pH ι	units								
	Ч.	Oxidation-Redu	ction Potentia	l -115 to	211 mV									
		Dissolved Oxyg	en	Up to 3 summe		ater colu	mn < 2 i	mg/L in						
	ts	Surface Total N	litrogen	0.79 m	g/L to 2.7	79 mg/L								
	Nutrien	Surface Total P	hosphorus	0.029 n	ng/L to 0	.273 mg/	L							
	NN	Nitrogen to Pho	sphorus Ratic	16:1					Phosph	orus limit	ed			
		<u>Click to learn r</u> <u>Beneficial Uses</u>		Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
	Fisł	h & Wildlife Propa	agation	NS	S	NS	S							
	Aes	sthetics						S	*					
	Agr	iculture								S	S	S		
	Prir	mary Body Conta	ct Recreation										S	
	Pub	olic & Private Wat	er Supply											
	Ν	S = Fully Supporting IS = Not Supporting IEI = Not Enough In	1	* Did no requirem	t collect fo nent were	or this para not met du	meter. Th ie to QA/0	e PBCR QC issues	beneficial u s for entero	se cannot cocci.	be asse	ssed as min	imum data	a

				Times					ite Names for	r			Site 3	
		Sample Perio	d	Times Visited	Sar	npling S	ites	Ava	ilable Data		25	Site 5	5	
C	Octob	ber 2012 - Augu	ist 2013	4		3				•		~		
	Loc	ation	Hughes Co	unty	Click	map for sit	te data		S	ite 4 Site	2	4		
	Imp	oundment	1931						• Site 1 S	urface			的政府	
	Are	а	550 acres						Site 1 Bottom					
	Cap	bacity	11,000 acre	e-feet									) 1/4	
	Pur	poses	Water Supp	oly, Recreati	on				2				Miles	
		Parameter (Des	scriptions)	Result					Notes/0	Commen	nts			
		Average Turbidi	ty	17 NTL	J				27% of	values >	OWQS	of 25 NTL	l (n=11)	
		Average Secchi	Disk Depth	48 cm										
	In Situ	Water Clarity Ra	ating	Fair										
	<u>п</u>	Chlorophyll-a		17 mg/	m3									
		Trophic State In	dex	58					Previou	s value =	= 60			
		Trophic Class		Eutropl	nic									
		Salinity		0.14 –	0.19 ppt									
	a,	Specific Conduc	ctivity	294 – 3	898 µS/ci	m								
	Profile	рН		6.51 –	8.37 pH	units								
	ሻ	Oxidation-Redu	ction Potentia	l -19 to 3	351 mV									
		Dissolved Oxyg	en	Up to 7 August		ater colum	nn < 2 m	g/L in						
	nts	Surface Total N	itrogen	0.72 m	g/L to 1.3	37 mg/L								
		Surface Total P	hosphorus	0.005 r	ng/L to 0	.036 mg/L	-							
	Nutrie	Nitrogen to Pho	sphorus Ratio	88:1					Phosph	orus limi	ted			
		Click to learn n Beneficial Uses	nore about	Turbidity	Hq	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	ī
	Fish	n & Wildlife Propa	gation	NS	S	NS	S							
	Aes	thetics						S	*					
	Agr	iculture								S	S	S		
	Prin	nary Body Contac	t Recreation										S	
	Pub	olic & Private Wat	er Supply											N
	N	= Fully Supporting IS = Not Supporting IEI = Not Enough In	formation	Notes •	No long	ger collect fo	or this pa	rameter						

		Sample Perio	d	Times Visited	San	npling S	ites				hr	~ '	~	
No	oven	nber 2006 - Aug	ust 2007	3		3					•		) (	
	Loc	ation	Osage Cou	nty	Click r	nap for si	te data		3	~	1			
	Imp	oundment	1940		-				7					
	Are	а	165 acres						Ţ					
	Cap	pacity	5,000 acre-	eet					1					
	Pur	poses	Water Supp	ly, Recreati	on							0	1/4 Miles	
		Parameter (Des	scriptions)	Result					Notes/0	Commen	its			
		Average Turbidi	ty	9 NTU					100% o	f values<	< OWQS	of 25 NT	J	
		Average True C	olor	35 unit	S				100% o	f values	< OWQ	S of 70		
		Average Secchi	Disk Depth	101 cm	1									
		Water Clarity Ra	ating	excelle	nt									
		Trophic State In	dex	56										
		Trophic Class		eutroph	nic									
		Salinity		0.10-0	).14 ppt									
	Ċ)	Specific Conduc	ctivity	224 – 2	297.7 μS/	′cm								
	Profile	рН		7.12 –	8.66 pH (	units			Neutral	to slightl	y alkalin	е		
	ē.	Oxidation-Redu	ction Potentia	-22 - 43	30 mV									
		Dissolved Oxyg	en	Up to 6 August		ater colum	nn < 2 mg	g/L in	Occurr	ed at site	es 1 and	2		
	S	Surface Total N	itrogen	0.45 m	g/L to 0.9	98 mg/L								
	rients	Surface Total Pl	hosphorus	0.010 r	ng/L to 0	.028 mg/L	-							
	Nutrie	Nitrogen to Phos	sphorus Ratio	34:1					Phosph	orus limi	ted			
		<u>Click to learn n</u> <u>Beneficial Uses</u>	nore about	Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	
	Fisł	n & Wildlife Propa	gation	NEI	S	NS	S							
	Aes	sthetics						S	NEI					
	Agr	iculture								S	S	S		
	Prin	mary Body Contac	t Recreation										S	
	Pub	olic & Private Wate	er Supply											
	N	S = Fully Supporting IS = Not Supporting IEI = Not Enough In							es were bel assessed a					

Н	U	dson,	Lower	(1-4	)				• Sampli	ng Sites	n th			
		Sample Perio	d	Times Visited	Sar	npling S	ites							
	Oct	ober 2011 - July	2012	4		8			Site Names vailable Data					
	Loc	ation	Mayes Cour	ty	Click r	map for si	te data							
ସ	Imp	oundment	1964								Site	e 4		
General	Are	a	10,900 acres	6							Site 3	Site 2		
မီ	Cap	oacity	200,300 acr	e-feet						Site 1	Surface	0	4	
	Pur	poses	Flood Contro	ol, Hydropo	wer					Site 1	Bottom		Miles	
		Parameter (Des	scriptions)	Result					Notes/	Commer	nts			
		Average Turbidi	ty	10 NTU	J				6% of v	/alues< (	DWQS of	25 NTU (	n=16)	
		Average Secchi	Disk Depth	89 cm										
	In Situ	Water Clarity Ra	ating	Good										
	u S	Chlorophyll-a		10 mg	/m3									
		Trophic State In	dex	53					Previou	is value =	= 54			
ຽ		Trophic Class		Eutrop	nic									
Parameters		Salinity		0.06 -	0.13 ppt									
Iran	0	Specific Conduc	tivity	137 – 2	279 µS/cr	n								
Ъ В	Profile	рН		6.99 –	8.63 pH (	units								
	Ł	Oxidation-Reduc	ction Potential	110 – 4	58mV									
		Dissolved Oxyge	en	Up to 9 July	0% of wa	ater colum	n < 2.0 r	ng/L in						
	S	Surface Total Ni	itrogen	0.45 m	g/L to 2.0	)1 mg/L								
	Nutrients	Surface Total Pl	nosphorus	0.010 r	ng/L to 0	.126 mg/L								
	NN	Nitrogen to Phos	sphorus Ratio	17:1					Phosph	orus limi	ted			
		<u>Click to learn m</u> <u>Beneficial Uses</u>	nore about	Turbidity	Hď	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
ses	Fisł	h & Wildlife Propa	gation	S	S	NS	*							
Beneficial Uses	Aes	sthetics						S	N/A					
fici	Agr	iculture								N/A	N/A	S		
ene	Prir	mary Body Contac	t Recreation										NEI	
ñ	Pub	olic & Private Wate	er Supply											
	Ν	S = Fully Supporting IS = Not Supporting IEI = Not Enough In	formation	N/A - µ	parameter	s not collec	ted in cur	rent samp	ole year.					
μS/c	m = r	phelometric turbidity microsiemens per ce Escherichia coli	entimeter mV =	QS = Oklaho = millivolts r-a = Chloro		Quality Sta	andards		= milligram n = microsi			t = parts pe = Enteroco		d

Н	U	dson,	Upper	(5-8	)				<ul> <li>Sampling</li> </ul>	ng Sites	net			
		Sample Perio		Times Visited	Sar	npling S	ites		k Site Name		Site 7	6 • Site 8		
	Oct	ober 2011 - July	/ 2012	4		8		ļ	Available Dat	ta	Site 5	X		
	Loc	ation	Mayes Cou	nty	Click	map for si	te data							
<u>ra</u>	Imp	oundment	1964											
General	Are	а	10,900 acre	S							1 F	•		
Ū	Cap	pacity	200,300 acr	e-feet								0	4	
	Pur	poses	Flood Contr	ol, Hydrop	ower						•		Miles	
		Parameter (Des	scriptions)	Resul	t				Notes/	Commer	nts			
		Average Turbidi	ty	26 NT	U				25% of	values<	OWQS o	of 25 NTU	(n=16)	
		Average Secchi	Disk Depth	50 cm										
	Situ	Water Clarity Ra	ating	Avera	ge									
	<u>ч</u>	Chlorophyll-a		14 m	g/m3									
		Trophic State In	dex	56					Previou	is value :	= 54			
ຽ		Trophic Class		Eutrop	hic									
Parameters		Salinity		0.10 –	0.12 ppt									
Iran	<b>a</b>	Specific Conduc	ctivity	212 –	257 µS/cr	m								
Ъ,	Profile	рН		7.21 –	8.78 pH	units								
	ሻ	Oxidation-Redu	ction Potentia	237 –	460mV									
		Dissolved Oxyg	en	Up to July	36% of wa	ater colum	n < 2.0 r	ng/L in						
	s	Surface Total N	itrogen	0.47 m	ng/L to 2.0	)7 mg/L								
	Nutrients	Surface Total Pl	hosphorus	0.034	mg/L to 0	.143 mg/L								
	Nu	Nitrogen to Pho	sphorus Ratio	15:1					Phosph	orus limi	ted			
		<u>Click to learn n</u> <u>Beneficial Uses</u>		Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
ses	Fisł	h & Wildlife Propa	gation	S	S	S	*							
Beneficial Uses	Aes	sthetics						S	N/A					
ficia	Agr	iculture								N/A	N/A	S		
ene	Prir	mary Body Contac	t Recreation										NEI	
ă	Pub	olic & Private Wate	er Supply											
	Ν	S = Fully Supporting IS = Not Supporting IEI = Not Enough In	formation	N/A -	parameter	s not collec	ted in cur	rent sam	ole year.					
μS/c	m = r	phelometric turbidity nicrosiemens per ce Escherichia coli	entimeter mV	QS = Oklaho = millivolts or-a = Chlor		Quality Sta	andards		= milligram n = microsi			t = parts pe = Enteroco		d

Η	U	dson (	Bartl	es	vi	lle)				Site Names		ي ا	● Sam	pling Sites	
		Sample Perio	d	Tim Visit		San	npling S	ites			2	2			
١	Nove	ember 2011 – Ju	ly 2012	4			3			. (	s s	Site 3			
	Loc	cation	Osage Cou	nty		Click r	map for si	te data				Site 2	54		
al	Imp	poundment	1949								1592	ę		2	
General	Are	ea	268 acres										2	200	
ъ В	Ca	pacity	2,776 acre	-feet								Sit	e 1 Surface		
	Pu	rposes	Water Supp	oly, Re	creat	ion				0 Mil	1/2 es		Site 1 Bo	ottom	
		Parameter (Des	scriptions)	Re	esult					Notes/	Commer	nts			
		Average Turbidi	ty	11	NTU	l				100% c	of values.	< OWQS	of 25 NTI	J (n=8)	
		Average Secchi	Disk Depth	66	cm										
	Situ	Water Clarity Ra	ating	A١	erag	е									
	ln S	Chlorophyll-a		8	mg/r	n3									
		Trophic State In	dex	51						Previou	ıs value =	= 58			
ຄ		Trophic Class		Ει	ıtroph	nic									
Parameters		Salinity		0.	) — 8	0.15 ppt									
Iram		Specific Conduc	tivity	17	2 – 3	13 µS/cr	n								
Ра	Profile	рН		5.9	99 – 8	3.22 pH ı	units			Only 5.	22% of v	alues < 6	6.5 pH uni	ts	
	2	Oxidation-Reduc	ction Potentia	I 75	- 49	5 mV									
		Dissolved Oxyge	en	Up Ju		0% of wa	ater colum	n < 2.0 ı	ng/L in						
	S	Surface Total Ni	itrogen	0.	62 mg	g/L to 0.9	98 mg/L								
	trients	Surface Total Ph	nosphorus	0.	005 n	ng/L to 0	.021 mg/L								
	Nutrie	Nitrogen to Phos	sphorus Ratio	60	:1					Phosph	norus limi	ted			
		<u>Click to learn m</u> <u>Beneficial Uses</u>	nore about		Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
ŝes	Fis	h & Wildlife Propa	gation		S	S	S	*							
Beneficial Uses		sthetics							S	N/A					
icia	Agı	riculture									N/A	N/A	S		
ene	Pri	mary Body Contac	t Recreation											NEI	
ă	Pul	blic & Private Wate	er Supply												
	1	S = Fully Supporting NS = Not Supporting NEI = Not Enough Ini		∧∗ Notes	/A – p	arameters	s not collec	ted in cur	rent sam	ole year.					
µS/c	cm = 1	ephelometric turbidity microsiemens per ce Escherichia coli	entimeter mV	'QS = 0 = millive or-a = 0	olts		Quality Sta	andards		= milligram m = microsi			t = parts pe = Enteroco		1

H	U	go								5. 10.	A Low	● Sam	npling Sites	
		Sample Period	d	Times Visited	San	npling S	ites			J.		r		
	Dece	mber 2011 - Augu	ıst 2012	4		5			Site Names fo iilable Data	r	Site	5		
	Loc	ation	Choctaw C	County	Click r	map for si	te data	, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		6	> <sup>556</sup> Site 4			
ਯੁ	Imp	oundment	1974							Porta	Site	e 3		
General	Are	a	13,250 acre	es				•			2 contraction	•Site 2		
မီ	Cap	oacity	157,600 ac	re-feet				-		を	r Gr	3 8	02	
	Pur	poses		rol, Water S sh and Wildl							Site 1 Surf	ace Site 1 Botto	Miles	
		Parameter (Des		Result				1	Notes/C	commer	nts			
		Average Turbidit	ty	61 NTU	J				90% of	values >	> OWQS	of 25 NTL	J (n=20)	
		Average Secchi	Disk Depth	25 cm										
	itu	Water Clarity Ra	nting	Poor										
	In Situ	Chlorophyll-a		11 mg	/m3									
		Trophic State Inc	dex	54					Previou	s value :	= 54			
စ		Trophic Class		Eutrop	hic									
Parameters		Salinity		0.02 - 0	).05 ppt									
ram		Specific Conduc	tivity	37 – 11	I4 µS/cm									
Pa	Profile	рН		6.59 –	8.21 pH (	units			Neutral					
	ዾ	Oxidation-Reduc	ction Potentia	l 191 to	456 mV									
		Dissolved Oxyge	en	All data mg/L	a are abo	ve screen	ing level	of 2.0						
	ţ	Surface Total Ni	trogen	0.68 m	g/L to 1.5	54 mg/L								
	Nutrients	Surface Total Ph	nosphorus	0.016 r	ng/L to 0	.127 mg/L	-							
	Ň	Nitrogen to Phos	sphorus Ratio	0 14:1					Phosph	orus limi	ted			
		<u>Click to learn m</u> <u>Beneficial Uses</u>	nore about	Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
ses	Fisl	h & Wildlife Propa	gation	NS	S	S	S							
С С	Aes	sthetics						S	N/A					
ficia	Agr	iculture								N/A	N/A	S		
Beneficial Uses	Prir	mary Body Contac	t Recreation										NEI	
Δ	Put	olic & Private Wate	er Supply											
	Λ	S = Fully Supporting IS = Not Supporting IEI = Not Enough Inf	formation			not be asse s not collec			data require ole year.	ments we	ere not me	et due to Q,	A/QC issu	es
μS/c	m = r	phelometric turbidity nicrosiemens per ce Escherichia coli	ntimeter mV	/QS = Oklaho = millivolts or-a = Chloro		Quality Sta	andards		= milligram n = microsie			t = parts pe = Enteroco		d

H	u	lah							<ul> <li>Samplin</li> </ul>	ng Sites	Le l			
		Sample Period	d	Times Visited	San	npling S	ites				Z	Å		
	Nov	ember 2011 – July	y 2012	4		5					~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~			
	Loc	ation	Osage Cou	nty	Click r	nap for si	te data				Site	2		
ସ	Imp	oundment	1951									• Site 4	CP.	
General	Are	a	3,570 acres							Si	Site 5	Site 1 Bo	ttom	
မီ	Cap	oacity	31,160 acre	-feet					e Names for		1 C		-	
	Pur	poses	Flood Contro Regulation,	ol, Water Su and Consei	upply, Lo vation	w-flow		Availa	able Data	(			0 1 Miles	
		Parameter (Des		Result					Notes/	Commer	its			
		Average Turbidit	ty	78 NTL	l				100% c	f values	> OWQS	5 of 25 NT	U (n=12)	
		Average Secchi	Disk Depth	17 cm										
	In Situ	Water Clarity Ra	ating	Poor										
	L L	Chlorophyll-a		9 mg/n	า3									
		Trophic State Inc	dex	52					Previou	s value =	= 55			
S		Trophic Class		Eutroph	nic									
Parameters		Salinity		0.10 - 0	.16 ppt									
aran	œ.	Specific Conduc	tivity	202 – 3	47 µS/cr	n								
å	Profile	рН		7.41 – 8	3.29 pH ւ	units								
	ā	Oxidation-Reduc	ction Potential	269 to \$	514 mV									
		Dissolved Oxyge	en	All data mg/L	are abo	ve screer	ing level	of 2.0						
	Its	Surface Total Ni	trogen	0.66 mg	g/L to 1.1	2 mg/L								
	Nutrients	Surface Total Ph	nosphorus	0.018 n	ng/L to 0.	.132 mg/L	-							
	Nu	Nitrogen to Phos	sphorus Ratio	13:1					Phosph	orus limi	ted			
		<u>Click to learn m</u> <u>Beneficial Uses</u>	nore about	Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
ses	Fisl	h & Wildlife Propag	gation	NS	S	S	S							
я П	Aes	sthetics						NS	N/A					
Beneficial Uses	Agr	iculture								N/A	N/A	S		
ene	Prir	mary Body Contac	t Recreation										NEI	
B	Pub	olic & Private Wate	er Supply											
	٨	S = Fully Supporting IS = Not Supporting IEI = Not Enough Inf	formation	Standar study ca	ds (WQS) n confirm	. This mea	ns that the etics bene	e lake is c ficial use i	onsidered non-suppo	threatene		ahoma Wai trients until		
μS/c	m = r	phelometric turbidity nicrosiemens per ce Escherichia coli	entimeter mV :	QS = Oklahol = millivolts r-a = Chloro	ma Water			mg/L =	= milligram n = microsi			t = parts pe = Enteroco		d

Н	U	mphre	ys						te Names fo able Data	ſ	Nr.	• Sam	pling Sites	
		Sample Perio		Times Visited	Sar	npling Si	tes		- AND	$\wedge$	•			
C	)ctol	ber 2011 – Augu	ist 2012	4		3			har	S	ite 3			
	Loc	ation	Stephens C	ounty	Click I	map for sit	e data				S	ite 2	R	
	Imp	oundment	1958								3		4	
	Are	a	10,900 acre	s						, ,	4 S		Site 1	Surface
	Cap	pacity	200,300 aci	e-feet					0 Mile	1/4 es		$\gamma_{-}$	Site 1 Botto	m
	Pur	poses	Water Supp	ly, Flood C	ontrol, Re	ecreation				5				
		Parameter (Des	scriptions)	Resul	t				Notes/	Commei	nts			
		Average Turbidi	ty	10 NT	J				100% c	of values	< OWQS	6 of 25 NT	U (n=12	)
		Average Secchi	Disk Depth	49 cm										
	ŝitu	Water Clarity Ra	ating	Avera	je									
	In Situ	Chlorophyll-a		32 m	g/m3									
		Trophic State In	dex	65					Previou	s value :	= 63			
2		Trophic Class		Hypere	eutrophic									
		Salinity		0.29 –	0.38 ppt									
		Specific Conduc	ctivity	602 -	775 µS/cı	m								
	Profile	рН		5.44 –	8.68 pH	units								
	Ţ	Oxidation-Reduc	ction Potentia	-54 – 5	536 mV									
		Dissolved Oxyge	en	Up to 3 Augus		ater colum	n < 2.0 r	ng/L in						
	nts	Surface Total Ni	itrogen	1.23 m	ig/L to 1.6	62 mg/L								
	Nutrient	Surface Total Pl	hosphorus	0.005	mg/L to 0	.061 mg/L								
	Ž	Nitrogen to Phos	sphorus Ratio	51:1					Phosph	orus lim	ited			
		<u>Click to learn m</u> <u>Beneficial Uses</u>	nore about	Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	
	Fis	h & Wildlife Propa	gation	S	S	S	*							
	Aes	sthetics						NS	N/A					
	Agr	iculture								N/A	N/A	S		
	Prir	mary Body Contac	ct Recreation										S	
	Put	olic & Private Wate	er Supply											N
	Λ	S = Fully Supporting IS = Not Supporting IEI = Not Enough In		N/A – p *With a water b	a TSI of 63	not collecte this lake w	ed in curre Il be furth	ent sampl er review	<i>e year.</i> ed to deter	mine the	need to b	e considere	ed as an N	ILW
S/c	m = r	phelometric turbidity microsiemens per ce Escherichia coli	entimeter mV	QS = Oklaho = millivolts or-a = Chlor		<sup>-</sup> Quality Sta	ndards		= milligram = microsi			t = parts pe = Enteroco		d

J	<b>e</b> a	an Neu	stad	t					Site Names f ailable Data		Sampling S	Sites		
		Sample Perio	d	Times Visite	- C	ampling S	Sites		-					
I	Nove	ember 2011 - Ju	ly 2012	4		5					J	11	• Site 2	
	Loc	cation	Carter Cou	nty	Clic	k map for s	ite data		Site		und f		2	
a	Imp	ooundment	1969		I							Site		
General	Are	a	462 acres								~	- One		
õ	Ca	pacity	6,106 acre-	feet					0	1/4	Ć.	$\sim$		
	Pur	rposes	Recreation						Mil	es	Site 1 Surfa	1 Bottom		
		Parameter (Des	scriptions)	Res	ult				Notes/	Commer	nts			
		Average Turbidi	ty	17 N	ITU				8% of v	/alues >	OWQS o	f 25 NTU	(n=12)	
		Average Secchi	Disk Depth	44 c	m									
	Situ	Water Clarity Ra	ating	Ave	rage									
	ц Ц	Chlorophyll-a		23 1	mg/m3									
		Trophic State In	dex	61					Previou	is value :	= 58			
Si		Trophic Class		Eutr	ophic									
Parameters		Salinity		0.13	– 0.20 pp	ot								
aran	e	Specific Conduc	tivity	271	– 406 µS	/cm								
Ĩ	Profile	pН		6.70	– 9 pH u	nits								
	ā	Oxidation-Reduc	ction Potentia		- 538 m∖									
		Dissolved Oxyge	en	Up t July		water colur	nn < 2 m	g/L in	Occurr	ed at site	e 1, the d	lam		
	ts	Surface Total Ni	itrogen	0.69	mg/L to	1.59 mg/L								
	Nutrient	Surface Total Ph	nosphorus	0.00	5mg/L to	0.039 mg/L	-							
	Nut	Nitrogen to Phos	sphorus Ratic	61:1					Phosph	iorus limi	ited			
		<u>Click to learn m</u> <u>Beneficial Uses</u>	nore about	Turbidity	Hď	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
ses	Fis	h & Wildlife Propa	gation	S	S	*	S							
Beneficial Uses	Aes	sthetics						S	N/A					
ficia	Agı	riculture								N/A	N/A	S		
ene	Prir	mary Body Contac	t Recreation										NEI	
ñ	Pu	blic & Private Wate	er Supply											
	٨	S = Fully Supporting NS = Not Supporting NEI = Not Enough Ini		tes		ers not collec e is undeterm			le year.					
μS/c	cm = 1	ephelometric turbidity microsiemens per ce Escherichia coli	entimeter mV	= millivolt		ter Quality Si	tandards		= milligram n = microsi			t = parts pe = Enteroce		d

J	oł	nn Wel	ls						<ul> <li>Samplir</li> </ul>	ng Sites				
		Sample Perio	d	Times Visited	Sar	npling S	ites						5	
	Oct	ober 2008 – July	/ 2009	4		3		-	~					
	Loc	cation	Haskell Cou	nty	Click r	map for si	te data	-			•			
ធ	Imp	ooundment	1936					-	5					
General	Are	a	194 acres						•					
ษั	Cap	pacity	1,352 acre-	feet								e e		
	Pur	rposes	Water Supp	y, Recreat	ion								Miles	
		Parameter (Des	scriptions)	Result				1	Notes/0	Commen	its			
		Average Turbidi	ty	3 NTU					100% c	f values	< OWQS	5 of 25 NT	ัU (n=12)	
		Average True C	olor						Did not	collect fo	or true co	olor		
		Average Secchi	Disk Depth	180 cm										
		Water Clarity Ra	ating	Excelle	nt									
		Trophic State In	dex	45					Previou	s value =	46			
ร		Trophic Class		Mesotre	ophic									
Parameters		Salinity		0.02 -	0.10 ppt									
aran	Ċ,	Specific Conduc	tivity	73 – 20	)7.5 μS/o	cm								
å	Profile	pН		6.3 – 9	.13 pH ui	nits			1% of v	alues < 6	6.50 and	2.38% > 9	9.00 pH ι	units
	۲ ۲	Oxidation-Reduc	ction Potential	-35 – 5	03 mV									
		Dissolved Oxyge	en	Up to 5 July	0% of wa	ater colum	n < 2.0	mg/L in						
	S	Surface Total Ni	trogen	0.30 m	g/L to 0.5	54 mg/L								
	Nutrients	Surface Total Ph	nosphorus	0.005 n	ng/L to 0	.014 mg/L	-							
	NZ	Nitrogen to Phos	sphorus Ratio	43:1					Phosph	orus limi	ted			
		<u>Click to learn m</u> <u>Beneficial Uses</u>	nore about	Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
ses	Fis	h & Wildlife Propa	gation	S	S	S	*							
Beneficial Uses	Aes	sthetics						S	*					
fici	Agr	riculture								*	*	S		
ene	Prir	mary Body Contac	t Recreation										S	
ñ	Put	blic & Private Wate	er Supply											
	Λ	S = Fully Supporting VS = Not Supporting VEI = Not Enough Ini	formation	*Did not	collect for	r these par	ameters							
μS/c	m = r	phelometric turbidity microsiemens per ce Escherichia coli	entimeter mV =	QS = Oklaho = millivolts r-a = Chloro		Quality Sta	andards		= milligram n = microsie			t = parts pe = Enteroco		d

K	a	W (Low	er)							5		<ul> <li>Sampling</li> </ul>	Sites	
		Sample Perio		Times Visited	Sar	npling S	ites		Site Names vailable Data				Lught	
	Oc	tober 2012 – July	2013	4		5						Y	X	
	Loc	ation	Osage Cour	nty	Click r	map for sit	te data		We describe and		2.			
ធ្ល	Imp	oundment	1976					_			14		e de la compañía de	
General	Are	a	17,040 acre	S				_		ACTEN - Y	Strate.	Site 2		
ຜັ	Cap	pacity	428,600 acr					_		fr.				
	Pur	poses	Flood Control Control, and			ater Quali	ty			Site 1 Surface	Site 1 Botto	m	Miles	
		Parameter (Des		Result				1	Notes/0	Commer	nts			
		Average Turbidi	ty	9 NTU					100% o	f values	< 25 NT	U		
		Average Secchi	Disk Depth	72 cm										
	itu	Water Clarity Ra	ating	Good										
	In Situ	Chlorophyll-a		9 mg/m	າ3									
		Trophic State In	dex	52					Previou	s value =	= 42			
ဖ		Trophic Class		Eutroph	nic									
Parameters		Salinity												
ram		Specific Conduc	tivity		0.53 ppt 070 µS/0	<b>~~</b>								
Pa	Profile	рН			8.62 pH i				Noutrol	to olight	y alkalin	•		
	Pre	Oxidation-Reduc	ction Potential		212 mV	unins			Neutrai	to silgriti	iy aikaiiri	с		
		Dissolved Oxyge	en		5% of wa	ater colum	n < 2 m	g/L in						
	S	Surface Total Ni	trogen	0.94 m	g/L to 1.5	58 ma/l								
	Nutrients	Surface Total Pr	nosphorus			.116 mg/L	-							
	N	Nitrogen to Phos	sphorus Ratio	15:1					Phosph	orus limi	ted			
		<u>Click to learn m</u> <u>Beneficial Uses</u>	nore about_	Turbidity	Hď	Dissolved Oxygen	Metals	ISI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
ses	Fisl	h & Wildlife Propa	gation	NS	S	S	S							
Beneficial Uses	Aes	sthetics						S	*					
fici	Agr	iculture								S	S	S		
ene	Prir	mary Body Contac	t Recreation										S	
ũ	Pub	olic & Private Wate	er Supply											
	٨	S = Fully Supporting IS = Not Supporting IEI = Not Enough Ini	formation	Notes										
μS/c	m = r	phelometric turbidity microsiemens per ce Escherichia coli	entimeter mV =	QS = Oklaho = millivolts r-a = Chloro		Quality Sta	andards		= milligram n = microsie			t = parts pe = Enteroco		d

K	a	w (Upp	er)							5		<ul> <li>Sampling</li> </ul>	Sites	
		Sample Perio	d	Times Visited	Sar	npling S	ites		ite Names for lable Data				- ANDE	
	Oc	tober 2012 – July	2013	4		5						3	X	
	Loc	ation	Osage Cour	nty	Click	map for sit	te data				Site 5	Sit	e 4	
ra	Imp	oundment	1976								44-	Site 3	t.	
General	Are	a	17,040 acre	s						eced -	Smr.	- This	1	
ษั	Cap	pacity	428,600 acr							f.	$) \in \mathcal{A}$			
	Pur	poses	Flood Contr Control, and			ater Quali	ty			*			Miles	
		Parameter (Des		Result					Notes/0	Commer	nts			
		Average Turbidi	ty	26 NTL	J				42% of	values >	25 NTU	ļ		
		Average Secchi	Disk Depth	34 cm										
	itu	Water Clarity Ra	ating	Fair										
	In Situ	Chlorophyll-a		19 mg/	m3									
		Trophic State In	dex	60					Previou	s value =	= 53			
รั		Trophic Class		Eutropl	nic									
Parameters		Salinity		0.36 –	0.66 ppt									
aran	đ	Specific Conduc	tivity	749 – 1	311 µS/	cm								
ã	Profile	рН		7.69 –	8.65 pH	units			Neutral	to slight	y alkalin	е		
	5	Oxidation-Reduc	ction Potential	-136 to	165 mV									
		Dissolved Oxyge	en	Up to 1 July	0% of wa	ater colum	n < 2 m	g/L in						
	S	Surface Total Ni	itrogen	1.23 m	g/L to 2.4	49 mg/L								
	rients	Surface Total Pl	nosphorus	0.067 r	ng/L to 0	.266 mg/L								
	Nutrie	Nitrogen to Phos	sphorus Ratio	12:1					Phosph	orus limi	ted			
		<u>Click to learn m</u> <u>Beneficial Uses</u>	nore about	Turbidity	Hđ	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
ses	Fisl	h & Wildlife Propa	gation	NS	S	S	S							
Beneficial Uses	Aes	sthetics						S	*					
ficia	Agr	riculture								S	S	S		
ene	Prir	mary Body Contac	t Recreation										S	
ă	Put	olic & Private Wate	er Supply											
	٨	S = Fully Supporting IS = Not Supporting IEI = Not Enough In	formation	• Notes	No long	ger collect fo	or this pa	rameter						
μS/c	m = r	phelometric turbidity microsiemens per ce Escherichia coli	entimeter mV :	QS = Oklaho = millivolts pr-a = Chloro		r Quality Sta	andards		= milligram n = microsie			nt = parts pe n = Enteroco		d

		ystone	(1-2)		-						-ll-	5	• Sam	pling Sites	
		Sample Perio	d		imes isited	San	npling S	ites					4	ud.	
No	vem	nber 2011 – Aug	ust 2012		4		12				問	-		Er	
	Loc	ation	Tulsa Coun	ty		Click r	map for si	te data		E C		Ser 1	und and a	· te	
3	Imp	oundment	1964								4	<u>5</u>		Site 2 Site 1 Surfa	~~
	Are	а	23,610 acr	es								J. L	ALL L	Site 1 Bottom	ce
5	Cap	pacity	557,600 ac									- And		5	
	Pur	poses	Flood Contr Navigation,				ydropowe	er,		e Names for able Data			£ _	Miles	
		Parameter (Des			Result					Notes/	Commer	nts			
		Average Turbidi	ty		29 NTU					25% of	values >	OWQS	of 25 NTL	J (n=8)	
		Average Secchi	Disk Depth		50 cm										
	Situ	Water Clarity Ra	ating		Average	9									
	Ц	Chlorophyll-a			7 mg/n	า3									
		Trophic State In	dex		49					Previou	s value =	= 57			
		Trophic Class			Mesotro	phic									
		Salinity			021 – 1	.42 ppt									
	ð	Specific Conduc	tivity		434 – 2	734 µS/	′cm								
	Profile	рН			7.38 – 8	8.42 pH ι	units								
	Ē	Oxidation-Reduc	ction Potentia	I	59 – 54										
		Dissolved Oxyge	en		Up to 47 August	7% of wa	ater colum	nn < 2.0 i	mg/L in						
I	S	Surface Total Ni	trogen		0.83 mg	ı∕L to 1.4	l mg/L								
	Nutrients	Surface Total Ph	nosphorus		0.085 m	g/L to 0.	.207 mg/L	_							
	Nut	Nitrogen to Phos	sphorus Ratio	)	8:1					Possibl	y co-limit	ed			
		<u>Click to learn m</u> <u>Beneficial Uses</u>	nore about		Turbidity	Hď	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	
	Fisł	n & Wildlife Propa	gation		NS	S	S	*							
	Aes	sthetics							S	N/A					
	Agr	iculture									NEI	NEI	S		
	Prin	mary Body Contac	t Recreation											NEI	
	Pub	olic & Private Wate	er Supply												
	N	s = Fully Supporting IS = Not Supporting IEI = Not Enough Ini	formation	Notes	an asses	ssment o		& Wildlif	e Propag	ation (FW			values ex cannot be		5 NT
/cr	m = n	phelometric turbidity nicrosiemens per ce Escherichia coli	entimeter mV	= mi	= Oklahon illivolts = Chlorop		Quality St	andards		= milligram n = microsi			t = parts pe = Enteroce		d

		Sample Perio	d	Times Visited	Sa	mpling S	ites			Site 5				
No	oven	nber 2011 – Aug	just 2012	4		12				FIR .		Site 3	the second	
	Loc	cation	Tulsa Coun	ty	Click	map for si	te data			遊	Site 4	1 3	it the	
5	Imp	oundment	1964						e Names for able Data	4	3 1			
	Are	a	23,610 acr	es				Availe		N		ELE EL		
5	Cap	pacity	557,600 ac	re-feet					$\sim$		-			
	Pur	rposes	Flood Contr Navigation,			lydropowe	r,				*	~ 0	5 Ailes	
		Parameter (Des		Result					Notes/Co	mments	5			
		Average Turbidi	ty	125 NT	U				75% of va	alues > C	WQS of	25 NTU (	n=12)	
		Average Secchi	Disk Depth	24 cm										
	In Situ	Water Clarity Ra	ating	Poor										
	L L	Chlorophyll-a		18 mg	/m3									
		Trophic State In	dex	59					Previous v	/alue = 6	51			
0		Trophic Class		Eutrop	hic									
בום		Salinity		0.26 -	0.88 ppt									
	đ	Specific Conduc	ctivity	551 – 1	743 μS/	cm								
Ľ	Profile	рН		7.60 –	8.46 pH	units								
	ā	Oxidation-Redu	ction Potentia	206 – 5	525 mV									
		Dissolved Oxyg	en	Up to 2 July	2% of wa	ater colum	in < 2.0 m	ng/L in						
	nts	Surface Total N	itrogen	0.93 m	g/L to 3.9	99 mg/L								
	rient	Surface Total Pl	hosphorus	0.107	mg/L to (	).480 mg/l	_							
	Nutrie	Nitrogen to Pho	sphorus Ratio	8:1					Possibly of	co-limited	ł			
		<u>Click to learn n</u> <u>Beneficial Uses</u>		Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
	Fisl	h & Wildlife Propa	gation	NS	S	S	*							
) 5	Aes	sthetics						S	N/A					
2	Agr	riculture								NEI	NEI	S		
2	Prir	mary Body Contac	ct Recreation										NEI	
נ	Pub	olic & Private Wate	er Supply											
	٨	S = Fully Supporting NS = Not Supporting NEI = Not Enough In		N/A -	parameter	rs not collec	cted in curr	ent samp	le year.					

		Sample Perio	d	Time Visite		Sar	npling Si	ites		lite Names for ilable Data		C.			
Nc	verr	nber 2011 – Aug	gust 2012	4			12				TP .		- they	er.	
	Loc	ation	Tulsa Coun	ty		Click	map for sit	e data				est .	11 - 2	T.t.	
ľ	Imp	oundment	1964			1					4	Site	9 • • Site 6	<b></b>	
	Are	a	23,610 acr	es							N	Site 8			
	Сар	pacity	557,600 ad	re-feet							5	Site 7			
	Pur	poses	Flood Cont Navigation,				ydropowei	-,					0	5 Ailes	
		Parameter (De	scriptions)	Re	sult					Notes/Co	mments	5			
		Average Turbid	ity	28	NTU	J				31% of va	lues > C	WQS of	f 25 NTU (	(n=14)	
		Average Secch	i Disk Depth	47	cm										
	Stu	Water Clarity R	ating	Fai	r										
	Ē	Chlorophyll-a		11	mg	/m3									
		Trophic State Ir	ldex	54						Previous v	alue = 5	57			
		Trophic Class		Eu	troph	nic									
		Salinity		0.2	4 – 1	1.22 ppt									
	a,	Specific Condu	ctivity	507	7 – 2	394 µS/0	cm								
	Profile	рН		7.6	0 – 8	3.74 pH ı	units								
	ፈ	Oxidation-Redu	ction Potentia	I 188	3 – 4	45 mV									
		Dissolved Oxyg	en		to 8 gust		er column	< 2.0 mg	/L in						
	s	Surface Total N	itrogen	0.6	7 mg	g/L to 1.7	2 mg/L								
	Nutrient	Surface Total P	hosphorus	0.0	67 r	mg/L to C	).204 mg/L								
	NU	Nitrogen to Pho	sphorus Ratio	10:	1					Phospho	us limite	ed or Po	ssibly co-l	imited	
		<u>Click to learn r</u> <u>Beneficial Uses</u>		H H H H H H H H H H H H H H H H H H H	ו עו טועווץ	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	
	Fisł	h & Wildlife Propa	agation	N	S	S	S	*							
	Aes	sthetics							S	N/A					
	Agr	iculture									NEI	NEI	S		
	Prin	mary Body Conta	ct Recreation											NEI	
	Pub	olic & Private Wat	er Supply												
	N	S = Fully Supporting IS = Not Supporting IEI = Not Enough Ir	1	D*D	id not	t collect fc	or these para	ameters.							

		Sample Perio	d	Times Visited	Sa	mpling S	Sites		te Names for able Data				. 4	
٧o	vem	nber 2011 – Aug	gust 2012	4		12				用			Er	
	Loc	ation	Tulsa Cour	nty	Click	map for s	ite data			Site 11	Site	10/	The second	
	Imp	oundment	1964							4	5 7			
	Area	а	23,610 ac	es						N	Site 12	and the	Č.	
ľ	Сар	acity	557,600 a	cre-feet						5	المحيد			
ľ	Pur	poses	Flood Cont Navigation			ydropowe	er,					0	5 Miles	
t		Parameter (Des		Resu					Notes/Co	mments	5			
ŀ		Average Turbidi		306 N	ITU				67% of va	lues > C	WQS of	f 25 NTU	(n=9)	
		Average Secchi	-	16 cn									( )	
	Ę	Water Clarity Ra		Poor										
	In Situ	Chlorophyll-a	3	34 m	a/m3									
	_	Trophic State In	dex	65	5,5				Previous v	value = 6	50			
		Trophic Class			reutrophic									
ł														
		Salinity Specific Conduc	stivity		· 3.68 ppt · 6762 µS/	cm								
	file	pH	Suvity						Neutral to	alightly	olkolino			
	Profile	p⊓ Oxidation-Redu	ation Datanti		– 8.82 pH 405 mV	units			Neutral to	siigniiy	aikaime			
					405 mV 64% of wa	ater colum	n < 2.0 m	ia/L in						
		Dissolved Oxyg	en	Augu				5						
	ts	Surface Total N	itrogen	1.14 ו	mg/L to 3.7	74 mg/L								
	Nutrient	Surface Total P	hosphorus	0.098	mg/L to (	).696 mg/	L							
	Nut	Nitrogen to Pho	sphorus Ratio	o 7:1					Possibly of	co-limited	ł			
		<u>Click to learn n</u> <u>Beneficial Uses</u>		Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	-
	Fish	n & Wildlife Propa	gation	NS	S	*	*							
	Aes	thetics						S	N/A					
	Agri	iculture								NEI	NEI	S		
	Prin	nary Body Contac	ct Recreation										NEI	
	Pub	olic & Private Wat	er Supply											
	N	= Fully Supporting S = Not Supporting EI = Not Enough In		(FWP) Yotes		l use cann or these pa	ot be mad rameters.	e, as mir	U an assess nimum data					tion

		Sample Period	t	Times Visited	Sa	mpling Si	ites		<ul> <li>Sampl</li> </ul>	ling Sites	r	Site 3	5	
l	Nove	mber 2011 – Aug	ust 2012	4		3				6	*	2		
	Loc	cation	Seminole C	ounty	Click r	map for si	te data		er )			5	Site 1 Surfa	ace
0	Imp	ooundment	1968						a construction	Site 2		S	Site 1 Botton	n
כפופו סו	Are	a	1,350 acres							m		6	3	
1) 5	Cap	pacity	23,000 acre	-feet							m.	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		
	Pur	rposes	Cooling Wa	ter					CC II	建生		• • •	1/2 Miles	
		Parameter (De	scriptions)	Result	:				Notes/	Commer	nts			
		Average Turbid	ity	7 NTU					100% c	of values	< 0WQ	S of 25 NT	U (n=12)	
		Average Secchi	Disk Depth	75 cm										
	itu	Water Clarity Ra	ating	Good										
	In Situ	Chlorophyll-a		24 mg	/m3									
		Trophic State In	dex	62					Previou	ıs value =	= 54			
ึง		Trophic Class		Hypere	eutrophic									
Parameters		Salinity		0.57 –	0.64 ppt									
aran	a)	Specific Conduc	ctivity	1144 –	1297 μS	/cm								
à	Profile	рН		8.02 –	8.77 pH (	units								
	ā	Oxidation-Redu	ction Potentia	l -49 to \$	552 mV									
		Dissolved Oxyg	en	Up to 3 August		ater colum	nn < 2.0 r	mg/L in						
	s	Surface Total N	itrogen	0.85 m	g/L to 1.4	15 mg/L								
	ients	Surface Total P	hosphorus	0.007 r	ng/L to 0	.037 mg/L								
	Nutrie	Nitrogen to Pho	-		-	-			Phosph	norus limi	ted			
		<u>Click to learn n</u> <u>Beneficial Uses</u>		Turbidity	Hđ	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
ses	Fis	h & Wildlife Propa	gation	S	S	S	*							
Beneticial Uses	Aes	sthetics						S	N/A					
5	Agr	riculture								S	S	S		
ene ene	Prir	mary Body Contac	ct Recreation										S	
n	Put	blic & Private Wat	er Supply											
	٨	S = Fully Supporting NS = Not Supporting NEI = Not Enough In	1	The PB	t collect fo CR benefi ening leve		ameters considere	d not sup	porting for	enterococ	ci as 1 (1	0%) of the	values exc	eeded

L	a	ngston									e 1 Surface ite 1 Bottom Site 4	• Sam	pling Sites	
		Sample Perio	d	Times Visited	San	npling Si	ites			37~~	Site 2	X		
	No	vember 2010 – Jul	y 2011	4		5				1	2			
	Loo	cation	Logan Coun	ty	Click n	map for sit	e data		e Names for Ible Data		Site 5	6		
ସ୍ଥ	Imp	poundment	1966								Site 3			
General	Are	ea	304 acres								7			
ษั	Ca	pacity	5,792 acre-fe	et							-Zrs			
	Pu	rposes	Water Supply	y, Flood Co	ontrol, an	d Recreat	ion				6		0 1/4 Miles	
		Parameter (Des	scriptions)	Result					Notes/0	Commer	nts			
		Average Turbidi	ty	13 NTU					5% of v	alues > 2	25			
		Average Secchi	Disk Depth	73 cm										
	situ	Water Clarity Ra	ating	Average	Э									
	In-Situ	Chlorophyll-a		4 mg/m	3									
		Trophic State In	dex	45					Previou	s value =	= 44			
ſS		Trophic Class		Mesotro	phic									
Parameters		Salinity		0.16 – 0	).19 ppt									
aran	e	Specific Conduc	tivity	325.2 -	384.3 µ	S/cm								
ä	Profile	рН		6.49 – 8	3.54 pH ι	units			Only 0.9	97% of v	alues < 6	8.5 pH uni	ts	
	ē	Oxidation-Reduc	ction Potential	-104 to	518 mV									
		Dissolved Oxyge	ən	Up to 4 summe		ater colum	n < 2 m	g/L in						
	nts	Surface Total Ni	trogen	0.27 mg	g/L to 0.6	64 mg/L								
	Nutrien	Surface Total Ph	nosphorus	0.011 m	ng/L to 0.	.014 mg/L								
	N	Nitrogen to Phos	sphorus Ratio	41:1					Phosph	orus limi	ted			
		<u>Click to learn</u> <u>Beneficial Uses</u>	more about	Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
ses	Fis	h & Wildlife Propa	gation	S	S	S	S							
Beneficial Uses	Ae	sthetics						S	S					
ficia	Ag	riculture								S	S	S		
ene	Pri	mary Body Contac	t Recreation										S	
m	Pu	blic & Private Wate	er Supply											
	- 1	S = Fully Supporting NS = Not Supporting NEI = Not Enough Int	formation	NOTES										
μS/c	m = 1	ephelometric turbidity microsiemens per ce Escherichia coli	ntimeter mV =	9S = Oklahoi millivolts r-a = Chloro		Quality Sta	ndards		= milligram n = microsie			t = parts pe = Enteroco		d

L	a١	wtonka	a							te Names for able Data	- A		• Sam	pling Sites	
		Sample Perio	d		nes ited	Sar	npling S	ites			Site 4	Site 5		~	
De	ecen	nber 2010 – Aug	gust 2011	2	4		5					2	Site 3		
	Loc	cation	Comanche	Coun	nty	Click	map for si	e data			21019			Z	
ื่อ	Imp	poundment	1905										Site 2		
General	Are	a	2,398 acres	5					-					ζ	
Ğ	Ca	pacity	56,574 acre	e-feet						0	1	2	Site 1 Surface	-E	
	Pur	rposes	Water Supp	oly, Re	ecreatio	on				Miles			Site 1 Bottom		
		Parameter (Des	scriptions)	R	Result					Notes/0	Commer	its			
		Average Turbidi	ty	7	' NTU					100% o	f values	<owqs< td=""><td>of 25 NTI</td><td>J</td><td></td></owqs<>	of 25 NTI	J	
		Average Secchi	Disk Depth	1	30 cm										
	In-Situ	Water Clarity Ra	ating	E	xcelle	nt									
	- L	Chlorophyll-a		1	3 mg/r	n3									
		Trophic State In	dex	5	6					Previou	s Value=	= 60			
S		Trophic Class		E	utroph	ic									
Parameters		Salinity		0	0.16– 0	.21 ppt									
aran	e	Specific Conduc	ctivity	3	26.9 –	422.1 µ	S/cm								
م	Profile	рН		6	6.55 – 8	3.73 pH	units								
	•	Oxidation-Reduc	ction Potentia			456 mV									
		Dissolved Oxyge	en		Jp to 60 umme		ater colum	in < 2 m	g/L in						
	S	Surface Total Ni	itrogen	0	).35 mg	g/L to 0.8	38 mg/L								
	rients	Surface Total Pr	hosphorus	0	.015m	g/L to 0.	030 mg/L								
	Nutrie	Nitrogen to Phos	sphorus Ratio	) 2	2:1					Phosph	orus limi	ted			
		<u>Click to learn</u> <u>Beneficial Uses</u>		<u>t</u>	Turbidity	Hď	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
ses	Fis	h & Wildlife Propa	gation		S	S	S	S							
Beneficial Uses	Aes	sthetics							S	*					
ficia	Agr	riculture									*	*	S		
ene	Prir	mary Body Contac	ct Recreation											S	
m	Pu	blic & Private Wate	er Supply											NS	
	٨	S = Fully Supporting NS = Not Supporting NEI = Not Enough In		Notes	Did not	collect fo	r these para	ameters							
µS/c	m = r	phelometric turbidity microsiemens per ce Escherichia coli	entimeter mV	= milli			<sup>r</sup> Quality Sta	andards		= milligram n = microsie			t = parts pe = Enteroco		d

		Sample Perio	d	Times Visited	Sar	npling S	ites					•		
٧c	ven	nber 2005 – Aug	gust 2006	4		3								
	Loc	ation	Latimer Cou	inty	Click	map for si	te data			$\sim$	•		3	
	Imp	oundment	1964							•		mm		
	Are	a	160 acres						2					
	Cap	pacity	3,060 acre-	feet								0	1/4	
	Pur	poses	Water Supp	ly, Recrea	tion, Floo	d Control			and the second s				Miles	
		Parameter (Des	scriptions)	Resul	t				Notes/0	Commen	nts			
		Average Turbidi	ty	14 NT	U				25% of	values >	OWQS	of 25 NTL	J	
		Average True C	olor	79 uni	ts				75% of	values >	OWQS	of 70		
		Average Secchi	Disk Depth	64 cm										
		Water Clarity Ra	ating	good										
		Trophic State In	dex	45										
		Trophic Class		mesot	rophic									
		Salinity		0.0 - 0	).01 ppt									
	Ð	Specific Conduc	ctivity	25.4 -	71.9 µS/	/cm								
	Profile	pН		5.9 – 7	7.51 pH u	nits			26% of	values <	6.5 pH u	inits		
	₽	Oxidation-Redu	ction Potentia		-									
		Dissolved Oxyg	en	Up to Augus		ater colun	nn < 2 mg	g/L in						
ľ	S	Surface Total N	itrogen	0.15 m	ng/L to 0.8	57 mg/L								
	rients	Surface Total Pl	hosphorus	0.020	mg/L to 0	.043 mg/L	_							
	Nutrie	Nitrogen to Pho	sphorus Ratio	12:1					Phosph	orus limi	ted			
		<u>Click to learn n</u> <u>Beneficial Uses</u>		Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	
	Fisł	h & Wildlife Propa	gation	S	NS	NS	S							
	Aes	sthetics						S	NS					
	Agr	iculture								S	S	S		
	Prir	mary Body Contac	ct Recreation										S	
	Pub	olic & Private Wate	er Supply											
	Ν	S = Fully Supporting IS = Not Supporting IEI = Not Enough In		<b>8</b> seasor	al storm ev	d rainfall da vents, there ) beneficia	efore Lloyd	t that the I Church	peak in tur Lake will be	bidity, whi e listed as	ich occur supporti	red in Marcl ng its Fish &	h is likely & Wildlife	due

L	ib	erty								•	Ç	• Sam	pling Sites	
		Sample Perio	d	Times Visited	San	npling S	ites			$\gamma$				
	Oct	ober 2005 – July	/ 2006	4		3					1 /			
	Loc	cation	Logan Cour	nty	Click r	nap for sit	e data							
ସ	Imp	oundment	1948		1									
General	Are	a	167 acres								•	~		
ອັ	Ca	pacity	2,740 acre-	feet				_			5		) 1/4	
	Pur	rposes	Water Supp	ly, Recreat	ion					进入		5	Miles	
		Parameter (Des	scriptions)	Result					Notes/	Commen	its			
		Average Turbidit	ty	21 NTL	J				16.7%	of values	> OWQ	S of 25 N	ГU	
		Average True Co	olor	20 units	6				100% c	f values	< OWQS	S of 70		
		Average Secchi	Disk Depth	42 cm										
		Water Clarity Ra	ating	good										
		Trophic State Inc	dex	67										
Srs		Trophic Class		hypere	utrophic									
Parameters		Salinity		0.22 – 0	0.30 ppt									
arar	e	Specific Conduc	tivity	439.1 -	- 580.5 μ	S/cm								
ã	Profile	рН		7.94 – 8	8.48 pH ւ	units			Neutral	to slightl	y alkalin	e		
	₽	Oxidation-Reduc	ction Potentia	404-54	4 mV									
		Dissolved Oxyge	en											
	Ņ	Surface Total Ni	trogen	0.82 m	g/L to 1.1	9mg/L								
	Nutrients	Surface Total Ph	nosphorus	0.056 1	mg/L to C	).110 mg/l	_							
	NN	Nitrogen to Phos	sphorus Ratio	16:1					Phosph	orus limi	ted			
		<u>Click to learn m</u> <u>Beneficial Uses</u>	nore about	Turbidity	Hď	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
ses	Fis	h & Wildlife Propa	gation	NS	S	S	S							
Beneficial Uses	Aes	sthetics						S	S					
fici	Agı	riculture								S	S	S		
ene	Prir	mary Body Contac	t Recreation										S	
ß	Pu	olic & Private Wate	er Supply											
	Λ	S = Fully Supporting JS = Not Supporting JEI = Not Enough Int	formation	Notes										
µS/c	m = r	phelometric turbidity microsiemens per ce Escherichia coli	entimeter mV	QS = Oklahol = millivolts or-a = Chloro		Quality Sta	andards		= milligram 1 = microsi			t = parts pe = Enteroco		d

L	01	ne Chi	mney	/					• Samplir				City 4 City	
		Sample Perio	d	Times Visited	San	npling Si	ites			Names for ole Data	ſ	• si	Site 1 Su Site 1 E	
Ν	love	mber 2010 – Ju	ne 2011	4		5			sug			200		
	Loc	cation	Pawnee Co	ounty	Click r	map for sit	e data			Le it	•5	Site 3	e.	
a	Imp	ooundment	1984		1					Les .		Site 5	Z	
General	Are	a	550 acres								-		3	
ອັ	Ca	pacity	6,200 acre-	feet								(	0 1/2	
	Pur	rposes	Water Supp	oly, Recreation	on and F	lood Cont	rol						Miles	
		Parameter (Des	criptions)	Result				1	Notes/0	Commer	nts			
		Average Turbidit	ty	15 NTU	l				1% of v	alues >C	OWQS of	25 NTU		
		Average Secchi	Disk Depth	67 cm										
	ŝitu	Water Clarity Ra	ating	Good										
	In-Situ	Chlorophyll-a		10 mg/r	n3									
		Trophic State Inc	dex	53					Previou	s Value=	=53			
ຽ		Trophic Class		Eutroph	nic									
Parameters		Salinity		0.1– 0.1	I4 ppt									
Iram		Specific Conduc	tivity	223.2 -	290.9 µ	S/cm			TDS= 1	52 g/L				
Ъа	Profile	рН		6.78 – 8	3.24 pH ւ	units								
	ሻ	Oxidation-Reduc	ction Potentia	l 64 - 44	9 mV									
		Dissolved Oxyge	en	Up to 5 summe		ater colum	n < 2 mę	g/L in						
	nts	Surface Total Ni	trogen	0.59 mg	g/L to 0.7	'4 mg/L								
	Nutrien	Surface Total Pr	nosphorus	0.018 m	ng/L to 0.	.034 mg/L								
	Nu	Nitrogen to Phos	sphorus Ratio	0 19:1					Phosph	orus limi	ited			
		<u>Click to learn</u> Beneficial Uses	more abou	Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
ses	Fis	h & Wildlife Propa	gation	S	S	S								
Beneficial Uses	Aes	sthetics						S	S					
ficia	Agr	riculture								S	S	S		
enel	Prir	mary Body Contac	t Recreation										S	
m	Pu	olic & Private Wate	er Supply											
	٨	S = Fully Supporting NS = Not Supporting NEI = Not Enough Int	formation	Notes										
μS/c	m = r	phelometric turbidity microsiemens per ce Escherichia coli	ntimeter mV	′QS = Oklahoi = millivolts or-a = Chloro		Quality Sta	ndards		= milligram n = microsie			t = parts pe = Enteroco		d

L	U	gert-Al	tus						~	Site 4		Clic	pling Sites k Site Name	
		Sample Perio	d	Times Visited	Sar	npling S	ites			m		A	vailable Da	ta
De	ecen	nber 2010 – Aug	just 2011	4		5					Site 3			
	Loc	cation	Greer Cour	ity	Click r	map for si	te data					Site 5		
al	Imp	poundment	1947		1						2	Site 2		
General	Are	ea	6,260 acres	i							~	- Land		
ອ	Ca	pacity	132,830 ac	re-feet					0		Site 1 Surface Site 1 Bottor			
	Pu	rposes	Water Supp	ly, Flood Co	ontrol, Irr	igation			Mile	es		hor		
		Parameter (Des	scriptions)	Result					Notes/0	Commen	its			
		Average Turbidi	ty	21 NTU	ļ				11% of	values >	OWQS o	of 25 NTU		
		Average Secchi	Depth	64 cm										
	In-Situ	Water Clarity Ra	ating	Fair										
	-u	Chlorophyll-a		16 mg/r	n3									
		Trophic State In	dex	58					Previou	s Value=	= 59			
ŝrs		Trophic Class		Eutroph	nic									
Parameters		Salinity		1.23 – 1	I.64 ppt									
arar	e	Specific Conduc	tivity	2295 –3	3037 µS/	′cm								
à	Profile	рН		7.65 – 8	3.43 pH ι	units								
	₽	Oxidation-Reduc	ction Potentia	l 257 - 4	43 mV									
		Dissolved Oxyge	en	All data	are abo	ve screen	ing level							
	S	Surface Total Ni	trogen	0.1mg/l	to 0.99	mg/L								
	rients	Surface Total Ph	nosphorus	0.025 m	ng/L to 0	.080 mg/L								
	Nutrie	Nitrogen to Phos	sphorus Ratic	17:1					Phosph	orus limi	ted			
						ed				S	es	eq	. =	
		<u>Click to learn</u> <u>Beneficial Uses</u>	<u>i more apou</u>	Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
ses	Fis	h & Wildlife Propa	gation	NS	S	S								
<b>Beneficial Uses</b>	Aes	sthetics						S	*					
ficia	Agı	riculture								S	S	S		
ene	Pri	mary Body Contac	t Recreation										NEI	
Δ	Pul	blic & Private Wate	er Supply											
	1	S = Fully Supporting NS = Not Supporting NEI = Not Enough In	formation	*This pa	rameter n	ot collected	d for.							
μS/c	:m = 1	ephelometric turbidity microsiemens per ce Escherichia coli	ntimeter mV	'QS = Oklahoi = millivolts pr-a = Chloro		Quality Sta	andards		= milligram n = microsie			t = parts pe = Enteroco		d

N		Aleste	r						<ul> <li>Samplin</li> </ul>	ng Sites		C	Click Site Na Available	
		Sample Period	d	Times Visited	Sar	mpling S	ites				2			
[	Decei	mber 2012 – Aug	ust 2013	4		3			725	n.	Site 5	~3{		
	Loc	ation	Pittsburg Co	ounty	Click r	map for s	ite data		100	Sile 3		Site 2		
ភ្ញ	Imp	oundment	1930							after a	54	Site	• 4	
General	Are	а	1,521 acres								5	1	Site Site 1	1 Surface Bottom
ื้อ	Cap	pacity	13,398 acre	feet						全国		0	1	
	Pur	poses	Water Supp	ly and Recr	eation								Miles	
		Parameter (De	<u>scriptions</u> )	Result					Notes/	Commer	nts			
		Average Turbid	ity	110 NT	Ū				100% c	of values	> OWQS	6 of 25 NT	U (n=12	)
		Average Secchi	i Disk Depth	9 cm										
	In Situ	Water Clarity Ra	ating	Poor										
	ц	Chlorophyll-a		6 mg/m	า3									
		Trophic State In	ndex	48					Previou	is value =	= 54			
srs		Trophic Class		Mesotro	ophic									
Parameters		Salinity		0.04 -	0.06 ppt									
arar	e	Specific Conduc	ctivity	89 – 11	8 µS/cm									
à	Profile	рН		6.38 –	8.11 pH ւ	units			8% of v	alues < 6	6.5 pH ur	nits		
	Ē	Oxidation-Redu	ction Potentia											
		Dissolved Oxyg	en	Up to 5 July	4% of wa	ater colun	nn < 2.0 i	mg/L in						
	ţ	Surface Total N	litrogen	1.02 m	g/L to 1.5	57 mg/L								
	Nutrient	Surface Total P	hosphorus	0.070 n	ng/L to 0.	.164 mg/l	_							
	N	Nitrogen to Pho	sphorus Ratio	11:1					Phosph	iorus limi	ted			
		<u>Click to learn n</u> <u>Beneficial Uses</u>		Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
ses	Fish	n & Wildlife Propa	agation	NS	S	S	S							
3														

Beneficial U

\* Aesthetics S S S S Agriculture Primary Body Contact Recreation S Public & Private Water Supply Notes S = Fully Supporting \*Did not collect for these parameters NS = Not Supporting The PBCR beneficial use cannot be assessed as minimum data requirement were not met due to QA/QC NEI = Not Enough Information issues for E.coli. *NTU* = *nephelometric turbidity units* OWQS = Oklahoma Water Quality Standards *mg/L* = *milligrams* per liter *ppt* = *parts per thousand* 

 $\mu$ S/cm = microsiemens per centimeter E. coli = Escherichia coli

mV = millivoltsChlor-a = Chlorophyll-a  $\mu$ Š/cm = microsiemens/cm

En = Enterococci

M	C	Gee C	reek						5	● Sam	pling Sites	5	Click Site Na Available	
		Sample Period	1	Times Visited	Sai	mpling S	ites		2	S	3			
	Dec	ember 2012 – Jul	y 2013	4		5				Site 4	5			
	Loc	ation	Atoka County	1	Click r	map for s	ite data			2	Ser	Site 2		
5	Imp	oundment	1987							3	7			
	Are	а	3,810 acres							5 4	Lu	1		
כי	Cap	pacity	113,930 acre	-feet					Site 3	Site 5				
	Pur	poses	Water Supply Control, Floor							Site 1 Su Site 1 Bo	inface	°	2 Miles	
		Parameter (Des		Result		nune			Notes/0	Commen	ts			
		Average Turbidi	ty	12 NTL	J				10% of	values <	OWQS	of 25 NTL	J (n=20)	
		Average Secchi	Disk Depth	128 cm	1				Did not	collect fo	or true co	olor		
	Situ	Water Clarity Ra	ating	Excelle	nt									
	In S	Chlorophyll-a		6 mg/n	า3									
		Trophic State In	dex	49					Previou	s value =	= 46			
0		Trophic Class		Mesotr	ophic									
		Salinity		0.02 –	0.04 ppt									
		Specific Conduc	tivitv	_	βµS/cm									
3	Profile	рН			8.21 pH ι	units			32% of	values <	6.5 pH	units		
	Pro	Oxidation-Reduc	ction Potential	-38 to 4	•						•			
		Dissolved Oxyge	ən	Up to 8 August		ater colun	nn < 2.0 r	mg/L in	Occurre	ed at site	1, the d	am		
	S	Surface Total Ni	trogen	0.50 m	g/L to 1.3	33 mg/L								
	rients	Surface Total Pr	nosphorus	0.005 r	ng/L to 0	.046 mg/l								
	Nutrie	Nitrogen to Phos	sphorus Ratio	89:1					Phosph	orus limit	ted			
		<u>Click to learn m</u> Beneficial Uses	nore about	Turbidity	Ha	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
S C	Fisł	n & Wildlife Propa	gation	S	NS*	NS	NEI							
	Aes	sthetics						S	*					
5	Agr	iculture								S	S	S		
5	Prin	nary Body Contac	t Recreation										S	
3	Pub	olic & Private Wate	er Supply											
	N	S = Fully Supporting IS = Not Supporting IEI = Not Enough Int		soluble causes; waters i	bedrock. E therefore n the sout	Because of the Water	f these cor Board is le portion of th	nditions it ooking at	is likely that	t the low p	oH values	vely low soi s may be du site-specif	ue to natur	al
S/ci	m = n	phelometric turbidity nicrosiemens per ce Escherichia coli	entimeter mV =	S = Oklaho millivolts -a = Chloro		Quality St	tandards		= milligram n = microsie			t = parts pe a = Enteroce		d

M	C	Murtry	1						Le	Y	ş	• Sam	npling Sites	
		Sample Period	d	Times Visited	Sa	mpling Si	ites			3	M			
	Oc	tober 2011 – July	2012	4		3		Click	Site Names f	Site 3		$\mathbf{J}$		
	Loc	ation	Noble Coun	ty	Click r	nap for si	te data		ailable Data	0I	1	• Site 2		
5	Imp	oundment	1971								$\lambda$	~		
מבוובו סו	Are	а	1,155 acres								2			
פֿ	Cap	pacity	19,733 acre	feet							Site	e 1 Surface	01/2	
	Pur	poses	Water Supp	ly, Flood Co	ontrol, an	d Recrea	tion			建立	17	Site 1 Bottom	Miles	
		Parameter (Dec	scriptions)	Result					Notes/	Commer	nts			
		Average Turbidi	ity	20 NTU	J				42% of	values >	> OWQS	of 25 NTL	J (n=12)	
		Average Secchi	Disk Depth	52 cm										
	Situ	Water Clarity Ra	ating	Averag	е									
	In S	Chlorophyll-a		8 mg/n	n3									
		Trophic State In	ıdex	51					Previou	is value :	= 55			
n		Trophic Class		Eutroph	nic									
rarameters		Salinity		0.17 –	0.23 ppt									
	<b>a</b>	Specific Conduc	ctivity	354 – 4	l79 μS/cr	n								
	Profile	pН		7.18 –	8.41 pH (	units								
	Γ.	Oxidation-Redu	ction Potentia	55 to 6	7 mV									
		Dissolved Oxyg	en	Up to 5 July	0% of wa	ater colum	nn < 2.0 r	ng/L in						
	S	Surface Total N	itrogen	0.57 m	g/L to 0.7	′8 mg/L								
	rients	Surface Total P	hosphorus	0.005 r	ng/L to 0	.030 mg/L	_							
	Nutrier	Nitrogen to Pho	sphorus Ratio	49:1					Phosph	orus limi	ted			
		<u>Click to learn n</u> <u>Beneficial Uses</u>		Turbidity	Нd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
ses	Fisł	h & Wildlife Propa	gation	NS	S	S	S							
	Aes	sthetics						S	N/A					
د	Agr	iculture								N/A	N/A	S		
benericial Uses	Prin	mary Body Contac	ct Recreation										S	
מ	Pub	olic & Private Wat	er Supply											
	N	S = Fully Supporting IS = Not Supporting IEI = Not Enough In	1	N/A - /	parameter	rs not colle	cted in cu	rrent sam	ple year.					
S/c	m = n	phelometric turbidity nicrosiemens per ce Escherichia coli	entimeter mV	QS = Oklaho = millivolts or-a = Chloro		Quality Sta	andards		= milligram n = microsi			t = parts pe = Enteroco		d

M	le	eker							<ul> <li>Samplir</li> </ul>	ng Sites		2	•	
		Sample Period	1	Times Visited	Sai	mpling Si	ites				$\sim$			
	Oc	ctober 2008 – July	2009	4		3					$\left\{ \right\}$	•	<u>لم</u>	
	Loc	cation	Lincoln Cou	inty	Click r	map for si	te data				<.			
ភ្	Imp	ooundment	1970								2			
General	Are	a	250 acres											
ษั	Cap	pacity	1,818 acre-	feet							5	c	) 1/4	
	Pur	rposes	Water Supp	ly, Recreat	ion, Floo	d Control					8		Miles	
		Parameter (Des	scriptions)	Result					Notes/	Commer	its			
		Average Turbidi	ty	143 NT	Ū				100% o	f values	> OWQS	S of 25 NT	U (n=12)	)
		Average True C	olor						Did not	collect fo	or true co	olor		
		Average Secchi	Disk Depth	10 cm										
		Water Clarity Ra	ating	Poor										
		Trophic State In	dex	50					Previou	s value =	= 50			
S		Trophic Class		Mesotro	ophic									
Parameters		Salinity		0.10 -	0.11 ppt									
aran	a	Specific Conduc	tivity	208.9 -	- 231.5 µ	S/cm								
à	Profile	pН		7.33 –	8.37 pH ι	units								
	ā	Oxidation-Reduc	ction Potentia	213 to 4	468 mV									
		Dissolved Oxyge	en	All data mg/L	are abo	ve screer	ing level	of 2.0						
	Ŋ	Surface Total Ni	itrogen	0.73 m	g/L to 1.0	)7 mg/L								
	rients	Surface Total Pl	nosphorus	0.062 n	ng/L to 0	.105 mg/L								
	Nutrie	Nitrogen to Phos	sphorus Ratio	11:1					Phosph	orus limi	ted, pos	sibly co-lir	nited	
		<u>Click to learn m</u> Beneficial Uses	nore about	Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
ses	Fisl	h & Wildlife Propa	gation	NS	S	S	*							
Beneficial Uses	Aes	sthetics						S	*					
ficia	Agr	riculture								*	*	S		
ene	Prir	mary Body Contac	t Recreation										S	
â	Put	blic & Private Wate	er Supply											
	٨	S = Fully Supporting NS = Not Supporting NEI = Not Enough Int	formation	*Did not	collect for	r these par	ameters							
µS/c	m = r	ephelometric turbidity microsiemens per ce Escherichia coli	entimeter mV	QS = Oklaho = millivolts or-a = Chloro		Quality Sta	andards	mg/L μS/cn	= milligram n = microsi	s per liter emens/cm	pp En	t = parts pe a = Enteroco		d

И	U	rray							Site 5	K	4		npling Sites Click Site Na Available	
		Sample Period	d	Times Visited	Sa	mpling Si	ites		Res.	BARE .	Site 3	1	Available	Dala
	Nov	ember 2011 – Ju	ly 2012	4		5			Site	The star				
	Loc	ation	Love Count	y	Click	map for si	te data		Sile 4		The second			
ľ	Imp	oundment	1937						*	The St	• 34		and and	
	Are	а	5,728 acre	S						10 4	Site 2			
	Cap	pacity	153,250 ad	cre-feet						the top	- Star	le .		
ľ	Pur	poses	Recreation							Site 1 Surface	ite 1 Bottom	0	2 Miles	
Ì		Parameter (De	scriptions)	Resu	lt				Notes/	Commer	nts			
ľ		Average Turbid	ity	6 NTU	J				100% c	of values	< 0WQS	6 of 25 NT	ับ (n=20)	
		Average Secchi	Disk Depth	141 c	m									
	itu	Water Clarity Ra	ating	Excel	ent									
	In Situ	Chlorophyll-a		2 mg/	′m3									
		Trophic State In	Idex	37					Previou	ıs value =	= 37			
		Trophic Class												
F		Salinity		0.14 -	- 0.18 ppt									
	_	Specific Conduc	ctivity	299 –	368 µS/c	m								
	Profile	рН		7.54 -	- 9.53 pH	units			Only 89	% of valu	es > 9 pł	H units		
	Ţ	Oxidation-Redu	ction Potentia	l 121 to	549 mV									
		Dissolved Oxyg	en	Up to July	48% of w	ater colum	nn < 2.0 r	ng/L in						
	S	Surface Total N	itrogen	0.28 r	ng/L to 0.0	61 mg/L								
	rients	Surface Total P	hosphorus	0.005	mg/L to 0	).005 mg/L								
	Nutrie	Nitrogen to Pho	sphorus Ratio	79:1					Phosph	orus limi	ted			
		<u>Click to learn n</u> <u>Beneficial Uses</u>		Turbidity	Hď	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
	Fisł	n & Wildlife Propa	gation	S	S	S	*							
	Aes	sthetics						S	N/A					
	Agr	iculture								N/A	N/A	S		
	Prin	mary Body Contac	ct Recreation										NEI	
	Pub	olic & Private Wat	er Supply											
	N	s = Fully Supporting IS = Not Supporting IEI = Not Enough In	1	N/A ·	- paramete	ers not colle	cted in cu	rrent sam	ple year.					
cr	m = n	phelometric turbidity nicrosiemens per ce Escherichia coli	entimeter mV	'QS = Oklah = millivolts or-a = Chlo		r Quality Sta	andards		= milligram n = microsi			t = parts pe = Enteroco		d

Ν	a	nih Wa	iiya						• Sampli	ng Sites				
		Sample Perio	d	Times Visited	San	npling S	ites			12	•	2	)	
	Dec	cember 2007 – Jul	y 2008	4		3		-	5	7		<u> </u>		
	Loc	cation	Pushmatah	a County	Click r	nap for sit	te data			>	•			
ସ	Imp	poundment	1958		1								~	
General	Are	ea	131 acres									•	~	
ອຶ	Ca	pacity	1,064 acre f	eet						各国			10	
	Pu	rposes	Recreation						and the second s			0	1/8 Miles	
		Parameter (Des	scriptions)	Result					Notes/	Commen	nts			
		Average Turbidi	ty	9 nephe	elometric	turbidity	units (N	FU)	All valu	es < 25 N	NTU			
		Average True C	olor	45 units	6				25% of	values >	OWQS	of 70		
		Average Secchi	Disk Depth	98 cm										
		Water Clarity Ra	ating	average	e									
		Trophic State In	dex	45					Previou	s value =	= 45			
S		Trophic Class		mesotro	ophic									
Parameters		Salinity		0.0 - 0.	10 ppt									
aran	e	Specific Conduc	tivity	63 – 26	2 µS/cm									
Å	Profile	рН		6.31 – 8	3.22 pH ւ	units			4 value	s (6.5%)	<6.5 pH	units		
	ā	Oxidation-Reduc	ction Potentia	5 to 576	3 mV									
		Dissolved Oxyge	en	Up to 4 August		ater colum	n < 2 m	g/L in	Occurre	ed at site	1			
	Its	Surface Total Ni	itrogen	0.32 mg	g/L to 0.7	'0 mg/L								
	Nutrient	Surface Total Ph	nosphorus	0.018 n	ng/L to 0	.032 mg/L								
	ŊŊ	Nitrogen to Phos	sphorus Ratio	18:1					Phosph	orus limi	ted			
		<u>Click to learn m</u> <u>Beneficial Uses</u>	nore about	Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
ses	Fis	h & Wildlife Propa	gation	S	S	S	S							
Beneficial Uses	Ae	sthetics						S	NS					
ficia	Ag	riculture								S	S	S		
ene	Pri	mary Body Contac	t Recreation										S	
Ô	Pul	blic & Private Wate	er Supply											
	1	S = Fully Supporting NS = Not Supporting NEI = Not Enough Ini	formation	Notes										
μS/c	m = 1	ephelometric turbidity microsiemens per ce Escherichia coli	entimeter mV	QS = Oklahol = millivolts or-a = Chloro		Quality Sta	andards		= milligram n = microsi			t = parts pe = Enteroco		d

V	e١	w Spir	0						~	•		• Sam	pling Sites	
		Sample Perio	d	Times Visited	Sar	npling S	ites			$\sum$				
	Octo	ober 2005 – July	y 2006	4		3				X		1		
	Loc	ation	Le Flore Co	unty	Click	map for si	te data			2				
	Imp	oundment	1960									•		
	Are	а	254 acres						E C	腔		~	5	
	Cap	pacity	2,160 acre-f	eet								2		
	Pur	poses	Water Supp	ly, Recreati	on				0 Mile:	1/4 s				
Ì		Parameter (Des	scriptions)	Result					Notes/0	Commen	nts			
ľ		Average Turbidi	ity	18 NTL	J				8% of v	alues >C	WQS o	f 25 NTU		
		Average True C	olor	26 units	6				100% o	f values	< OWQ	S of 70		
ſ		Average Secchi	Disk Depth	47 cm										
		Water Clarity Ra	ating	good										
		Trophic State In	ıdex	68										
		Trophic Class		hypere	utrophic									
I		Salinity		0.04 -	0.09 ppt									
	<b>A</b>	Specific Conduc	ctivity	106.8 -	· 155.4 µ	S/cm								
	Profile	рН		7.09 –	9.24 pH			10% of	values >	9.0 pH	units			
	ሻ	Oxidation-Redu	ction Potential	121 - 4	83 mV									
		Dissolved Oxyg	en	Up to 3 August	3% of wa	n < 2 m	g/L in	Occurre	ed at site	2				
	s	Surface Total N	itrogen	0.98 m	g/L to 1.6									
	Nutrients	Surface Total Pl	hosphorus	0.076 n	ng/L to 0	.170 mg/L								
	Nut	Nitrogen to Pho	sphorus Ratio	11:1					Phosph	orus limi	ted			
		<u>Click to learn n</u> <u>Beneficial Uses</u>		Turbidity	Hď	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli		
	Fisł	n & Wildlife Propa	gation	S	NS	S	S							
	Aes	thetics						NS*	S					
	Agr	iculture								S	S	S		
	Prin	nary Body Contac	ct Recreation										S	
	Pub	olic & Private Wate	er Supply											
	N	= Fully Supporting  S = Not Supporting  El = Not Enough In	1						ting that the ducted to c			cial use is c t status	onsidered	
/cı	m = n	ohelometric turbidity nicrosiemens per ce scherichia coli	entimeter mV :	QS = Oklaho = millivolts pr-a = Chloro		Quality Sta	andards		= milligram n = microsie			ot = parts pe n = Enteroco		1

			-	Times			_			~	Site	2		
		Sample Perio		Visited	Sai	npling S	ites	_	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	Site 3		L or	1	
	Oct	ober 2011 - July	/ 2012	4		5				3	Site 5			
	Loc	ation	Okfuskee C	ounty	Click	map for si	te data				Sile 5	Y		
5	Imp	oundment							e Names for Ible Data		2			
	Are	a	13,100 acre	-feet						7100	Site 4	2		
)	Cap	oacity	Water Supp	ly, Recreat	ion			_			2	· · · · ·	1/2 Miles	
	Pur	poses	761 acres								y -		Wiles	
		Parameter (Des	scriptions)	Result	t				Notes/	Commer	nts			
		Average Turbidi	ity	10 NT	U				100% c	of values	< OWQS	S of 25 NT	U (n=15)	
		Average Secchi	Disk Depth	72 cm										
	Situ	Water Clarity Ra	ating	Good										
	5	Chlorophyll-a		5 mg/i	m3									
		Trophic State In	dex	46					Previou	s value =	= 46			
		Trophic Class		Mesot	rophic									
		Salinity		0.10-	0.14ppt									
	e	Specific Conduc	ctivity	209 –3	807 µS/cr	n								
	Profile	pН		6.79 –	8.08 pH	units								
	₽	Oxidation-Redu	ction Potentia		- 565 m\									
		Dissolved Oxyg	en	Up to 4 July	40% of w	ater colum	nn < 2 m	g/L in						
	S	Surface Total N	itrogen	0.46 m	ng/L to 0.1	70 mg/L								
	ient	Surface Total Pl	hosphorus	0.005	ma/L to 0	).013 mg/L								
	Nutrients	Nitrogen to Pho			5				Dhaanh	oruo limi	tod			
		Nillogen to Pho	sphorus Raild	91.1					Phosph	orus limi	lea			
		<u>Click to learn n</u> <u>Beneficial Uses</u>		Turbidity	Ha	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	
	Fisł	h & Wildlife Propa	gation	S	S	S	S							
	Aes	sthetics						S	N/A					
	Agr	iculture								N/A	N/A	S		
	Prir	mary Body Contac	ct Recreation										S	
	Pub	olic & Private Wat	er Supply											
	Ν	S = Fully Supporting IS = Not Supporting IEI = Not Enough In		Notes •	N/A – p	parameters	not colle	cted in cur	rrent sampl	e year.				

		mulge										Si	te 1 Surface te 1 Bottom	
		Sample Perio	d	Times Visited	Sar	npling S	ites				2003	Site 2		
Ν	love	mber 2010 – Ju	ine 2011	4		5					Site 5	h		
	Loc	cation	Okmulgee C	County	Click	map for sit	te data				10	Site 3		
ភ	Imp	oundment	1928								y			
General	Are	a	668 acres								<i>K</i>			
<b>5</b>	Cap	pacity	14,170 acre	-feet				Click Sit	e Names for	)		0	1	
	Pur	rposes	Water Supp	ly, Recreati	on				able Data	$\sim$			Miles	
		Parameter (De	scriptions)	Result					Notes/0	Commen	its			
		Average Turbid	ity	8 NTU					100% o	f values	<owqs< td=""><td>of 25 NT</td><td>J</td><td></td></owqs<>	of 25 NT	J	
		Average Secchi	i Disk Depth	116										
	In-Situ	Water Clarity Ra	ating	Excelle	nt									
	Ľ	Chlorophyll-a		6 mg/m	13									
		Trophic State In	ndex	48					Previou	s Value=	- 46			
2		Trophic Class		Mesotr	ophic									
rarameters		Salinity		0.05-0	).06 ppt									
	ð	Specific Conduc	ctivity	118.6 -	- 136.9 µ	S/cm								
Ľ	Profile	pН		6.18–7	.62 pH ι	inits			12% of	values <	6.5 pH	units		
	Ē	Oxidation-Redu	ction Potential											
		Dissolved Oxyg	en	Up to 5 summe		ater colum	ın < 2 m	g/L in						
	S	Surface Total N	itrogen	0.29 m	ng/L to 0.	56 mg/L								
	ients	Surface Total P	hosphorus	0.010 r	ng/L to 0	.030 mg/L								
	Nutrie	Nitrogen to Pho	-		•				Phoenh	orus limi	ted			
				20.1					поэрп					
		<u>Click to learn</u> Beneficial Uses	n more about	Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
260	Fis	h & Wildlife Propa	agation	S	NS	S	S							
	Aes	sthetics						S	*					
د	Agr	riculture								*	*	S		
د د	Prir	mary Body Conta	ct Recreation										NEI	
נ	Put	olic & Private Wat	er Supply											
	Λ	S = Fully Supporting VS = Not Supporting VEI = Not Enough In	1	*Did not	collect fo	r this paran	neter							

0	0	logah							• Sampli	ng Sites	Stat	3	Click Site N Availabl	
		Sample Perio	d	Times Visited	Sar	npling S	ites			2	my fil	her and the second seco		
	Febr	ruary 2012 – Augu	ıst 2012	4		7		-			Site 7			
	Loc	cation	Rogers Cour	nty	Click	map for si	te data			1 mar	• Site 6	5		
ସ	Imp	poundment	1963							Site 5	•	*		
General	Are	a	29,460 acres	3							Site 4			
ອັ	Ca	pacity	553,400 acre	e feet						Site 2	Site 3	0	5	
	Pu	rposes	Water Suppl	y, Flood Co	ontrol, ar	nd Navigat	ion		Site 1 Surfa	Site 1 B	ottom	0	Miles	
		Parameter (Des	scriptions)	Result					Notes/	Commer	nts			
		Average Turbidi	ty	39 NTL	J				57% of	values >	> OWQS	of 25 NTL	J (n=21)	
		Average Secchi	Disk Depth	33 cm										
	Situ	Water Clarity Ra	ating	Poor										
	<u>ц</u>	Chlorophyll-a		8 mg/n	า3									
		Trophic State In	dex	51					Previou	is value =	= 54			
S		Trophic Class		Eutroph	nic									
Parameters		Salinity		0.12 –	0.21 ppt									
aran	e	Specific Conduc	ctivity	254- 43	84 μS/cm	1								
ä	Profile	рН		7.44 –	8.73 pH	units			Neutral	to slightl	y alkalin	e		
	Ē	Oxidation-Reduc	ction Potential	134 to										
		Dissolved Oxyge	en	All data 2 mg/L	are abo	ve the scr	eening l	evel of						
	nts	Surface Total Ni	itrogen	0.22 m	g/L to 1.4	46 mg/L								
	Nutrient	Surface Total Pl	hosphorus	0.005 n	ng/L to 0	.132 mg/L								
	Nut	Nitrogen to Phos	sphorus Ratio	14:1					Phosph	orus limi	ted			
		<u>Click to learn m</u> <u>Beneficial Uses</u>		Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
ses	Fis	h & Wildlife Propa	gation	NS	S	S	S							
Beneficial Uses	Aes	sthetics						S	N/A					
ficia	Agi	riculture								N/A	N/A	S		
ene	Pri	mary Body Contac	ct Recreation										S	
Ш	Pul	blic & Private Wate	er Supply											
	1	S = Fully Supporting NS = Not Supporting NEI = Not Enough In		* N/A - )	paramete	rs not colle	cted in cu	rrent sam	ple year.					
μS/c	:m = 1	ephelometric turbidity microsiemens per ce Escherichia coli	entimeter mV =	2S = Oklaho millivolts r-a = Chloro		Quality Sta	andards		= milligram n = microsi			t = parts pe = Enteroce		d

Sample Period er 2011 – Aug ion undment city bses Parameter (Des Average Turbidit Average Secchi Vater Clarity Ra Chlorophyll-a Frophic State Ind Frophic Class Salinity Specific Conduc oH	a         a           ust 2012         Image: Constraint of the second seco	feet Recreati 42 NTL 19 cm Poor 49 mg/ 69 Hypere	Click i ion J /m3 eutrophic 0.72 ppt 1449 µS				91% of	1/2 s Commer	> OWQS	Site 5 • Site 2 • Site 4 of 25 NTU	Site 1 Site 1	Surface Bottom
ion undment city ses Parameter (Des Average Turbidit Average Secchi Vater Clarity Ra Chlorophyll-a Frophic State Ind Frophic Class Salinity Specific Conduc oH Dxidation-Reduc	Uust 2012 Oklahoma Co 1919 1,500 acres 15,000 acref Water Supply, scriptions) ty Disk Depth ating dex	4 unty Feet Recreati 42 NTL 19 cm Poor 49 mg/ 69 Hypere 0.52 - 0 1051 -	ion J /m3 eutrophic 0.72 ppt 1449 μt	map for sit	e data		Notes/0	Commer values >	> OWQS	• Site 4	Site 1 Site 1	
undment city sees Parameter (Des Average Turbidit Average Secchi Water Clarity Ra Chlorophyll-a Frophic State Ind Frophic Class Salinity Specific Conduc oH Dxidation-Reduc	1919 1,500 acres 15,000 acre-f Water Supply, scriptions) ty Disk Depth ating dex tivity	feet Recreati 42 NTL 19 cm Poor 49 mg/ 69 Hypere 0.52 - 1 1051 -	ion J /m3 eutrophic 0.72 ppt 1449 μt	S/cm	e data		Notes/0	Commer values >	> OWQS		Site 1 Site 1	
city pses Parameter (Des Average Turbidit Average Secchi Vater Clarity Ra Chlorophyll-a Frophic State Ind Frophic Class Salinity Specific Conduc oH Dxidation-Reduc	1,500 acres 15,000 acre-f Water Supply, scriptions) ty Disk Depth ating dex	Recreation       Result       42 NTL       19 cm       Poor       49 mg/       69       Hypere       0.52 - 0       1051 - 0	J /m3 eutrophic 0.72 ppt 1449 µt				Notes/0	Commer values >	> OWQS		Site 1 Site 1	
Average Turbidit Average Turbidit Average Secchi Water Clarity Ra Chlorophyll-a Frophic State Ind Frophic Class Salinity Specific Conductor DH	15,000 acre-f Water Supply, scriptions) ty Disk Depth ating dex	Recreation       Result       42 NTL       19 cm       Poor       49 mg/       69       Hypere       0.52 - 0       1051 - 0	J /m3 eutrophic 0.72 ppt 1449 µt				Notes/0	Commer values >	> OWQS	of 25 NTU	Site 1	
Average Turbidit Average Turbidit Average Secchi Water Clarity Ra Chlorophyll-a Frophic State Ind Frophic Class Salinity Specific Conductor DH	Water Supply, scriptions) ty Disk Depth ating dex	Recreation       Result       42 NTL       19 cm       Poor       49 mg/       69       Hypere       0.52 - 0       1051 - 0	J /m3 eutrophic 0.72 ppt 1449 µt				Notes/0	Commer values >	> OWQS	of 25 NTU		Bottom
Parameter (Des Average Turbidit Average Secchi Water Clarity Ra Chlorophyll-a Trophic State Ind Trophic Class Salinity Specific Conduc oH Dxidation-Reduc	ty Disk Depth ating dex	Result           42 NTL           19 cm           Poor           49 mg/           69           Hypere           0.52 - 0           1051 -	J /m3 eutrophic 0.72 ppt 1449 µt				Notes/0	Commer values >	> OWQS	of 25 NTU	l (n=11)	
Average Turbidit Average Secchi Water Clarity Ra Chlorophyll-a Trophic State Ind Trophic Class Salinity Specific Conduc oH Dxidation-Reduc	ty Disk Depth ating dex tivity	42 NTU 19 cm Poor 49 mg/ 69 Hypere 0.52 - 0 1051 -	/m3 eutrophic 0.72 ppt 1449 µt				91% of	values >	> OWQS	of 25 NTU	l (n=11)	
Average Secchi Water Clarity Ra Chlorophyll-a Frophic State Inc Frophic Class Salinity Specific Conduc oH Dxidation-Reduc	Disk Depth ating dex tivity	19 cm Poor 49 mg/ 69 Hypere 0.52 - 0 1051 -	/m3 eutrophic 0.72 ppt 1449 µ\$							of 25 NTU	l (n=11)	
Vater Clarity Ra Chlorophyll-a Frophic State Inc Frophic Class Salinity Specific Conduc oH Dxidation-Reduc	ating dex tivity	Poor 49 mg/ 69 Hypere 0.52 - 1 1051 -	eutrophic 0.72 ppt 1449 μt				Previou	s value =	= 67			
Chlorophyll-a Frophic State Ind Frophic Class Salinity Specific Conduc oH Dxidation-Reduc	dex tivity	49 mg/ 69 Hypere 0.52 – 1 1051 –	eutrophic 0.72 ppt 1449 μt				Previou	s value =	= 67			
Frophic State In Frophic Class Salinity Specific Conduc oH Dxidation-Reduc	tivity	69 Hypere 0.52 - 1 1051 -	eutrophic 0.72 ppt 1449 μt				Previou	s value =	= 67			
Frophic Class Salinity Specific Conduc oH Dxidation-Reduc	tivity	Hypere 0.52 – 1051 –	0.72 ppt 1449 μ				Previou	s value =	= 67			
Salinity Specific Conduc bH Dxidation-Reduc		0.52 -	0.72 ppt 1449 μ									
Specific Conduc oH Dxidation-Reduc		1051 –	1449 µ\$									
bH Dxidation-Reduc												
Dxidation-Reduc	ction Potential	8.14–8	8 88 nH i	unite								
	ction Potential			inins								
		225 - 4	82 mV									
Dissolved Oxyge	en						Not stra	tified du	ring any	sampling i	interval	
Surface Total Ni	trogen	1.2 mg	/L to 2.14	4 mg/L								
Surface Total Ph	nosphorus	0.152 n	ng/L to 0	.427 mg/L								
Nitrogen to Phos	sphorus Ratio	6:1					Possibly	/ co- limi	ited			
								,				
<u>Click to learn m</u> Beneficial Uses	nore about	Turbidity	Hď	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	
& Wildlife Propa	gation	NS	S	S	S							
etics						NS*	N/A					
ulture								S	S	S		
ry Body Contac	t Recreation										S	
c & Private Wate	er Supply											
Fully Supporting = Not Supporting = Not Enough Int	formation	*The lat threaten * <i>N/A</i> –	ned by nut	rients until :	studies ca	an be con	ducted to co				considered	
	Wildlife Propa tics ture y Body Contac & Private Wate Fully Supporting Not Supporting	Wildlife Propagation tics ture y Body Contact Recreation & Private Water Supply Fully Supporting Not Supporting Not Enough Information	Wildlife Propagation NS tics ture y Body Contact Recreation & Private Water Supply fully Supporting Not Supporting Not Enough Information	Wildlife Propagation       NS       S         tics       Image: Signature Stress of the signate Stress of the signature Stress of the sign	Wildlife Propagation       NS       S       S         tics       Image: Second state st	Wildlife PropagationNSSSticsIIItureIIIy Body Contact RecreationIII& Private Water SupplyIII& Private Water SupplyIIIfully Supporting Not Supporting Not Enough Informationg*The lake is listed in the WQS as a N threatened by nutrients until studies ca * N/A - parameters not collected in cu	Wildlife Propagation       NS       S       S       S         tics       I       I       I       NS*         ture       I       I       I       I         y Body Contact Recreation       I       I       I       I         & Private Water Supply       I       I       I       I         fully Supporting Not Supporting Not Enough Information       g       *The lake is listed in the WQS as a NLW indication threatened by nutrients until studies can be comparated by nutrients	Wildlife Propagation       NS       S       S       S       S       S         tics       Image: Simple Sim	Wildlife PropagationNSSSSSticsImage: Simple Sim	Wildlife PropagationNSSSSStics $\cdot$ IINS*N/AItureIIIIISSy Body Contact RecreationIIIIII& Private Water SupplyIIIIIIfully Supporting Not Supporting Not Enough Information $\mathbf{g}$ *The lake is listed in the WQS as a NLW indicating that the Aesthetics benefit threaters not collected in current sample year.II	Wildlife PropagationNSSSSSNticsIIIINS*N/AIItureIIIIIIIIIy Body Contact RecreationIIIIIIIII& Private Water SupplyIIIIIIIIIIfully Supporting Not Supporting Not Supporting Not Enough InformationIII <td< td=""><td>Wildlife PropagationNSSSSNImage: Single Constraints of the single Constraints</td></td<>	Wildlife PropagationNSSSSNImage: Single Constraints of the single Constraints

		Commis Donis	-1	Times	Com									
		Sample Perio		Visited	Sar	npling S	ites	-			N			
٢	lover	mber 2007 – Aug	ust 2008	4		3					2			
	Loc	ation	Pushmataha	a County	Click r	nap for si	te data	-			- Y			
3	Imp	oundment	1958					_		5.	3			
	Are		116 acres					_			5	4		
)	Cap	bacity	833 acre fee	et				_		-		0	1/4	
	Pur	poses	Recreation									N	Ailes	
		Parameter (De	scriptions)	Result					Notes/0	Commen	ts			
		Average Turbid	ity	12 nep	helometr	ic turbidity	v units (N	ITU)	All valu	es < 25 N	ITU			
		Average True C	olor	51 units	5				25% of	values >	OWQS	of 70		
		Average Secchi	Disk Depth	56 cm										
		Water Clarity Ra	ating	average	e									
		Trophic State In	dex	59					Previou	s value =	= 55			
		Trophic Class		eutroph	nic									
		Salinity		0.00 -	0.20 ppt									
		Specific Conduc	ctivity	50.6 - 3	811 µS/cr	n								
	Profile	рН		6.32 –	7.96 pH ı	units			7 (13%)	of value	s < 6.5			
	ሻ	Oxidation-Redu	ction Potentia	15 to 54	43 mV									
		Dissolved Oxyg	en	Up to 5 August		ater colum	n < 2 m	g/L in	Occurre	ed at site	1			
	s	Surface Total N	itrogen	0.47 m	g/L to 0.9	94 mg/L								
	Nutrients	Surface Total P	hosphorus	0.034 n	ng/L to 0	.072 mg/L	-							
	Ŋ	Nitrogen to Pho	sphorus Ratio	17:1					Phosph	orus limi	ted			
		<u>Click to learn r</u> Beneficial Uses		Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	
	Fisł	n & Wildlife Propa	gation	S	NS	S	S							
	Aes	sthetics						NS*	NS					
	Agr	iculture								S	S	S		
	Prin	mary Body Conta	ct Recreation										S	
	Pub	olic & Private Wat	er Supply											
1	N	S = Fully Supporting IS = Not Supporting IEI = Not Enough In	r	soluble causes;	bedrock. E therefore	Because of	these co. Board is i	nditions it looking at	is likely the the application	nt the low probine the low problem is the low problem in the low problem is the low problem in the low problem is the low probl	oH values eveloping	ely low soil s may be du site-specifi	ie to natur ic criteria f	al

Ρ	ลเ	uls Val	ley C	ity					Names for ble Data			• Sam	pling Sites	
		Sample Perio	d	Times Visited	Sar	npling S	ites			$\mathcal{L}$	1			
	Octo	ober 2012 – Augus	st 2013	4		3		-	0	Site 3				
	Loc	cation	Garvin Cou	nty	Click I	map for sit	e data				Site 5	F		
ធ្ម	Imp	oundment	1954								Site 2			
General	Are	a	750 acres								Site			
ษั	Cap	pacity	8,730 acre f	eet								0	1/2	
	Pur	poses	Water Suppl	y and Reci	eation					Site 1 S Site 1 B	urface ottom		Miles	
		Parameter (Des	scriptions)	Result					Notes/	Commen	its			
		Average Turbidit	ty	30 NTU	J				75% of	values >	25 NTU			
		Average Secchi	Disk Depth	47 cm										
	In Situ	Water Clarity Ra	ating	Fair										
	ln S	Chlorophyll-a		4 mg/n	า3									
		Trophic State Inc	dex	44					Previou	is value =	= 50			
ຽ		Trophic Class		Mesotr	ophic									
Parameters		Salinity		0.13 –	0.20 ppt									
Iran	0	Specific Conduc	tivity	283 – 4	417 μS/ci	m								
å	Profile	pН		6.77 –	8.31 pH	units			Neutral	to slightl	y alkalin	е		
	Ł	Oxidation-Reduc	ction Potential	60 to 3	17 mV									
		Dissolved Oxyge	ən	Up to 5 July	6% of wa	ater colum	ın < 2 m	g/L in						
	s	Surface Total Ni	trogen	0.59 m	g/L to 1.0	)1 mg/L								
	Nutrients	Surface Total Pr	nosphorus	0.005 r	ng/L to 0	.036 mg/L								
	Nu	Nitrogen to Phos	sphorus Ratio	64:1					Phosph	iorus limi	ted			
		<u>Click to learn m</u> <u>Beneficial Uses</u>	nore about	Turbidity	Hđ	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
ses	Fisł	h & Wildlife Propa	gation	NS	S	S	S							
Beneficial Uses	Aes	sthetics						S	*					
ficia								S	S	S				
ene	Aesthetics     Image: Contract Recreation       Primary Body Contact Recreation     Image: Contract Recreation									S				
ñ	Pub	olic & Private Wate	er Supply											
	N	S = Fully Supporting IS = Not Supporting IEI = Not Enough Ini	formation	• Notes	No long	er collect fo	or this pa	rameter						
µS/c	m = n	phelometric turbidity microsiemens per ce Escherichia coli	ntimeter mV =	QS = Oklaho = millivolts r-a = Chloro		Quality Sta	andards		= milligram n = microsi			t = parts pe = Enteroco		d

Ρ	a١	whusk	a									• Sam	npling Sites	
		Sample Perio	d	Times Visited	Sar	npling S	ites				• ~			
	Oc	ctober 2007 – July	2008	4		3					~			
	Loc	cation	Osage Cou	nty	Click	map for si	te data				•			
ସ	Imp	ooundment	1936											
General	Are	a	96 acres									$\bigvee$		
မီ	Ca	pacity	3,600 acre f	eet				_					01/8	
	Pur	rposes	Water Supp	ly and Re	creation					the second			Miles	
		Parameter (Des	scriptions)	Resu	lt			1	Notes/	Commer	nts			
	Average True Color       21 units         Average Secchi Disk Depth       195 cm         Water Clarity Rating       excellent         Trophic State Index       41         Trophic Class       mesotrophic         Salinity       0.15 – 0.27 ppt         Specific Conductivity       311.1 – 523.1 µS/cm				units (N	FU)	All valu	es < 25 l	NTU					
	Average True Color       21 units         Average Secchi Disk Depth       195 cm         Water Clarity Rating       excellent         Trophic State Index       41							All valu	es < OW	QS of 70	)			
		Average Secchi	Disk Depth	195 c	m									
		Water Clarity Ra	ating	excel	lent									
		Trophic State In	dex	41					Previou	s value =	= 39			
S		Trophic Class		mesc	trophic									
nete		Salinity		0.15	- 0.27 ppt									
aran	Purposes       Vater Supply and Recreation         Parameter (Descriptions)       Result         Average Turbidity       3 nephelometric turbidity unit         Average True Color       21 units         Average Secchi Disk Depth       195 cm         Water Clarity Rating       excellent         Trophic State Index       41         Trophic Class       mesotrophic         Salinity       0.15 – 0.27 ppt         Specific Conductivity       311.1 – 523.1 µS/cm         pH       6.91 – 8.66 pH units         Oxidation-Reduction Potential       -114 to 485 mV         Dissolved Oxygen       Up to 54% of water column < July													
ä	Operation         Purposes       Water Supply and Recreation         Purposes       Water Supply and Recreation         Average Turbidity       3 nephelometric turbidity unit         Average Turbidity       3 nephelometric turbidity unit         Average True Color       21 units         Average Secchi Disk Depth       195 cm         Water Clarity Rating       excellent         Trophic State Index       41         Tophic Class       mesotrophic         Salinity       0.15 – 0.27 ppt         Specific Conductivity       311.1 – 523.1 µS/cm         pH       6.91 – 8.66 pH units         Oxidation-Reduction Potential       -114 to 485 mV         Dissolved Oxygen       Up to 54% of water column < July         Surface Total Nitrogen       0.24 mg/L to 0.46 mg/L         Surface Total Nitrogen       0.24 mg/L to 0.009 mg/L         Nitrogen to Phosphorus Ratio       51:1         Lick to learn more about       Augres State       Augres State         Original Click to learn more about       Augres State       Augres State				Neutral	to slight	ly alkalin	е						
	Image: Second Disk Depth       3 nephelometric turbidity units         Average True Color       21 units         Average Secchi Disk Depth       195 cm         Water Clarity Rating       excellent         Trophic State Index       41         Trophic Class       mesotrophic         Salinity       0.15 – 0.27 ppt         Specific Conductivity       311.1 – 523.1 µS/cm         pH       6.91 – 8.66 pH units         Oxidation-Reduction Potential       -114 to 485 mV         Dissolved Oxygen       Up to 54% of water column of yuly         Surface Total Nitrogen       0.24 mg/L to 0.46 mg/L         Nitrogen to Phosphorus Ratio       51:1         Eneficial Uses       Augres         Augres       Augres         Dissolved Oxygen       51:1													
		Dissolved Oxyge	en		54% of wa	ater colum	nn < 2 m	g/L in	Occurre	ed at site	1			
	S	Surface Total Ni	itrogen	0.24	mg/L to 0.4	16 mg/L								
	rient	Surface Total Ph	nosphorus	0.005	mg/L to 0	.009 mg/L	-							
	NU	Nitrogen to Phos	sphorus Ratio	51:1					Phosph	orus limi	ted			
			nore about	Turbidity	Hď	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
ses	Fis	h & Wildlife Propa	gation	S	S	NS	S							
al U	Aes	sthetics						S	S					
ficia	Agı	riculture								S	S	S		
ene	Prir	mary Body Contac	t Recreation										NEI	
Ô	Image: constraint of the													
	٨	VS = Not Supporting		The F coli a			sed as mi	nimum da	ta requiren	nents were	e not met	due to QA/	QC issues	s for E.
μS/c	m = r	phelometric turbidity microsiemens per ce Escherichia coli	entimeter mV	QS = Oklal = millivolts pr-a = Chlo	noma Water rophyll-a	Quality St	andards		= milligram 1 = microsi			t = parts pe a = Enteroce		d

		Sample Perio	d	Times Visited	Sar	mpling S	ites						200	
No	oven	nber 2006 - Aug	ust 2007	4		5				2	5	5		
	Loc	ation	Pawnee Co	unty	Click	map for si	te data			•	•			
	Imp	oundment	1932							2				
	Are	а	257 acres							2		3		
	Cap	pacity	3,855 acre-	feet							/	0	1/4	
	Pur	poses	Water Supp	ly, Recrea	tion						V		Miles	
		Parameter (Des	scriptions)	Resu	lt				Notes/	Commen	ts			
		Average Turbidi	ty	22 NT	Ū				30% of	values >	OWQS	of 25 NTI	J	
		Average True C	olor	66 un	its				50% of	values >	OWQS	of 70		
		Average Secchi	Disk Depth	44 cm										
		Water Clarity Ra	ating	avera	ge									
		Trophic State In	dex	59										
	Trophic Class     eutrophic       Salinity     0.09– 0.16 ppt       Specific Conductivity     205.9 – 331 µS/cm													
	Trophic Class     eutrophic       Salinity     0.09– 0.16 ppt       Specific Conductivity     205.9 – 331 µS/cm													
	Salinity     0.09– 0.16 ppt       Specific Conductivity     205.9 – 331 µS/cm													
	Specific Conductivity         205.9 – 331 µS/cm           pH         7.25 – 8.69 pH units								Neutral	to slightly	y alkalin	e		
		Dissolved Oxyg	en	Up to Augus	38% of wa st	ater colum	nn < 2 m	g/L in	Occurr	ed at site	s1&2			
	Its	Surface Total N	itrogen	0.80	mg/L to 1.	25 mg/L								
	ient	Surface Total Pl	nosphorus	0.023	mg/L to 0	.060 mg/L								
	Nutrien	Nitrogen to Pho	sphorus Ratio	24:1					Phosph	iorus limit	ted			
		<u>Click to learn n</u> <u>Beneficial Uses</u>	<u>nore about</u>	Turbidity	Ha	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	
	Fisł	h & Wildlife Propa	gation	S	S	S	S							
	Aes	sthetics						S	S					
	Agr	iculture								S	S	S		
	Prir	mary Body Contac	t Recreation										S	
	Pub	olic & Private Wate	er Supply	A'I			to o	4 4b = 4 1b	nook in t		ooler	ioh coor		0.12
	Ν	S = Fully Supporting IS = Not Supporting IEI = Not Enough In	formation	due to	ble flow and seasonal s gation (FWI	torm event	s, therefor	re Pawne	e Lake will					

## Perry

		• У										
		Sample Perio	d	Times Visited	Sampling	Sites				2		
No	over	nber 2006 - Aug	ust 2007	4	5						~ ~	
	Loc	ation	Noble Cour	nty	Click map for s	site data			題			
<b>7</b>	Imp	oundment	1937								•	
	Are	a	614 acres						35	•	A V	
5	Cap	pacity	6,892 acre	-feet					405			
	Pur	poses	Water Supp	oly, Recreati	on and Flood Co	ntrol			4		Mile	ðS
		Parameter (Des	scriptions)	Result				Notes/C	commen	ts		
		Average Turbidi	ty	75 NTU	J			100% of	values	> OWQ	S of 25 NTU	
		Average True C	olor	143 uni	ts			50% of v	values >	OWQS	of 70	
_		Average Secchi	Disk Depth	22 cm								
		Water Clarity Ra	ating	poor								
		Trophic State In	dex	48								
ຶ		Trophic Class		mesotro	ophic							
Parameters		Salinity		0.08-0	.21 ppt							
aran	đ	Specific Conduc	tivity	181.9 –	415 µS/cm							
ĭ	Profile	рН		6.90 – 8	8.19 pH units			Neutral	to slightly	/ alkalin	e	
	ā	Oxidation-Reduc	ction Potentia									
		Dissolved Oxyge	en	Up to 3 August	6% of water colu	mn < 2 m(	g/L in					
	ţs	Surface Total Ni	trogen	0.50 m	g/L to 1.35 mg/L							
	Nutrients	Surface Total Ph	nosphorus	0.027 n	ng/L to 0.253 mg/	Ĺ						
	N	Nitrogen to Phos	sphorus Ratio	9:1				Phospho	orus limit	ed		
		<u>Click to learn m</u> Beneficial Uses	nore about	urbidity	H ssolved vygen	etals		ue blor	ulfates	lorides	otal ssolved blids	F coli

Sampling Sites

Chlor-a & Ente Tu Met TSI л С О Tot Dis: Soli Š Č Sul G Н **Beneficial Uses** S S S Fish & Wildlife Propagation NS Aesthetics S NS Agriculture S S S S Primary Body Contact Recreation Public & Private Water Supply Available flow and rainfall data suggest that the peak in turbidity and color, which occurred in May is likely S = Fully Supporting Notes due to seasonal storm events, therefore Pawnee Lake will be listed as supporting its Fish & Wildlife NS = Not Supporting Propagation (FWP) and Aesthetics beneficial uses. NEI = Not Enough Information NTU = nephelometric turbidity units OWQS = Oklahoma Water Quality Standards *mg/L* = *milligrams per liter* ppt = parts per thousand  $\mu$ S/cm = microsiemens per centimeter mV = millivolts $\mu$ S/cm = microsiemens/cm En = Enterococci E. coli = Escherichia coli Chlor-a = Chlorophyll-a

Ρ	in	e Cree	ek						Names for ole Data	La	~	● Sam	pling Sites	
		Sample Perio	d	Times Visited	Sar	npling S	ites			y.	for			
	Nov	ember 2010 – Jul	y 2011	4		5				S	ite 5			
	Loc	ation	Mc Curtain	County	Click	map for si	te data				Site	4		
ସ	Imp	oundment	1969							1				
General	Are	а	3,750 acres	;							Nº 10	Site 3		
ອຶ	Cap	pacity	53,750 acre	e feet							Site 2	Site 1 Su Site 1 Bo	ttom 3	
	Pur	poses	Water Supp Control, Fis								12		Miles	
		Parameter (Des	scriptions)	Result					Notes/C	Commer	nts			
		Average Turbidi	ty	13 NTL	J				100% o	f Values	< OWQ	S of 25		
		Average Secchi	Disk Depth	67 cm										
	In-Situ	Water Clarity Ra	ating	Good										
	-u	Chlorophyll-a		16 mg/	m3									
	Trophic State Index     58       Trophic Class     Eutrophic						Previou	s value =	= 53					
ຽ	Trophic Class Eutrophic													
Parameters	Salinity     0.0 – 0.03 ppt													
Iran	Specific Conductivity 34.4 – 190.8 µS/cm				s/cm									
Ра	Profile	рН		5.34 –	8.49 pH	units			67.7% c	of values	< 6.5			
	ኯ	Oxidation-Reduc	ction Potentia	I -23 to 5	500 mV									
		Dissolved Oxyge	en	Up to 7 summe		ater colum	n < 2 m	g/L in						
	ts	Surface Total Ni	itrogen	0.27 m	g/L to 0.7	73 mg/L								
	Nutrient	Surface Total Ph	nosphorus	0.021 n	ng/L to 0	.060 mg/L								
	Nut	Nitrogen to Phos	sphorus Ratio	0 16:1					Phosph	orus limi	ted			
		<u>Click to learn</u> <u>Beneficial Uses</u>	n more abou	Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
ses	Fisł	n & Wildlife Propa	gation	S	NS	NS	S							
Beneficial Uses	Aes	sthetics						S	*					
ficia	Agr	iculture								*	*	S		
ene	Prin	mary Body Contac	t Recreation										NEI	
Ш	Pub	olic & Private Wate	er Supply											
	Ν	S = Fully Supporting IS = Not Supporting IEI = Not Enough In		soluble therefor	bedrock. I e the Wat	Due to thes er Board is	e conditio looking a	ons it is like at the appli	ely that the	low pH v leveloping	alues ma	v low soil pH y be due to cific criteria	natural ca	uses;
µS/c	m = n	phelometric turbidity nicrosiemens per ce Escherichia coli	entimeter mV	'QS = Oklaho = millivolts pr-a = Chloro		<sup>·</sup> Quality Sta	andards		= milligram n = microsie			t = parts pe = Enteroco		d

## Ponca

		Sample Period		Times Visited	Sampling Sites	
	Oc	tober 2012 – July	2013	4	5	
	Loc	cation	Kay County	/	Click map for site data	Site 2
ସ	Imp	oundment	1935		• •	Site 4
General	Are	a	805 acres			Site :
ອ	Cap	pacity	14,440 acre	e feet		Site 1 Surface Site 5
	Pur	rposes	Water Supp	oly and Recr	reation	
		Parameter (Des	criptions)	Result		Notes/Comments
		Average Turbidit	ţy	10 NTU	J	100% of values < OWQS of 25 NTL
		Average Secchi	Disk Depth	57 cm		
	In-Situ	Water Clarity Ra	iting	Averag	е	
	Ē	Chlorophyll-a		14 mg/	m3	
		Trophic State Inc	dex	56		Previous value = 57
S		Trophic Class		Eutroph	nic	
Parameters		Salinity		0.15 –	0.20 ppt	
aran	e	Specific Conduc	tivity	317 – 4	112 µS/cm	
à	Profile	рН		7.40 - 3	8.67 pH units	
	Ē	Oxidation-Reduc	ction Potentia		186 mV	
		Dissolved Oxyge	en	Up to 4 summe	7% of water column < 2.0 mg/L in er	
	ts	Surface Total Ni	trogen	0.73 m	g/L to 1.16 mg/L	
	Nutrients	Surface Total Pr	nosphorus	0.005 n	ng/L to 0.037 mg/L	
	Ŋ	Nitrogen to Phos	sphorus Ratio	54:1		Phosphorus limited

Phosphorus limited

S

Sampling Sites

1/2 Miles

	<u>Click to learn more about</u> <u>Beneficial Uses</u>	Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
Uses	Fish & Wildlife Propagation	S	S	NS	*							
	Aesthetics					S	*					
Beneficia	Agriculture							S	S	S		
ene	Primary Body Contact Recreation										S	
ă	Public & Private Water Supply											NS
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information	🖁 The Pl	ot collect for BCR benefic for <i>E.coli</i> a	cial use ca	nnot be as	ssessed as	s minimum	n data requ	uirement v	vere not m	et due to (	QA/QC
μS/c	m = microsiemens per centimeter mV =	QS = Oklah = millivolts r-a = Chlo	oma Water rophyll-a	Quality St	andards			ns per liter emens/cm		= parts pe = Enteroco		d

		Sample Perio	d	Times	Sar	mpling S	ites			1	2	• Sam	pling Sites	
N	lovei	mber 2007 – Aug		Visited 4		3	1100		5		2			
		ation	Lincoln Co		Click	map for si	te data				• ~			
		poundment	84	лпу	CIICK	inap ioi si						2		
	Are		225 acres									~		
		pacity	2,415 acre 1	eet										
	-	-			creation				0 Miles	1/4		A.		
-	i ui	•		-					Notes/	Commer	nts			
	Parameter (Descriptions)       Result         Average Turbidity       12 nephelometric turbidity under the second s						/ units (N	ITU)		es < 25 N				
	Average Turbidity12 nephelometric turbidity uAverage Turbidity46 unitsAverage True Color46 unitsAverage Secchi Disk Depth74 cmWater Clarity RatinggoodTrophic State Index48Trophic ClassmesotrophicSalinity0.0 - 0.20 pptSpecific Conductivity112 - 362 µS/cmpH6.78 - 8.65 pH unitsOxidation-Reduction Potential-51 to 543 mV									values >	-	of 70		
		Average True Color       46 units         Average Secchi Disk Depth       74 cm         Water Clarity Rating       good         Trophic State Index       48         Trophic Class       mesotrophic         Salinity       0.0 – 0.20 ppt         Specific Conductivity       112 – 362 µS/cm         pH       6.78 – 8.65 pH units         Oxidation-Reduction Potential       -51 to 543 mV         Dissolved Oxygen       57 - 63% of water column < 20												
		Water Clarity RatinggoodTrophic State Index48Trophic ClassmesotrophicSalinity0.0 – 0.20 pptSpecific Conductivity112 – 362 µS/cmpH6.78 – 8.65 pH units												
		Trophic State Index       48         Trophic Class       mesotrophic         Salinity       0.0 – 0.20 ppt         Specific Conductivity       112 – 362 µS/cm							Previou	is value =	= 52			
	Trophic State Index       48         Trophic Class       mesotrophic         Salinity       0.0 – 0.20 ppt         Specific Conductivity       112 – 362 µS/cm         pH       6.78 – 8.65 pH units													
	Image: Property of the system       Trophic Class       mesotrophic         Image: Property of the system       0.0 – 0.20 ppt       0.0 – 0.20 ppt         Image: Property of the system       112 – 362 µS/cm       0.0 – 0.20 ppt         Image: Property of the system       0.0 – 0.20 ppt       0.0 – 0.20 ppt         Image: Property of the system       0.0 – 0.20 ppt       0.0 – 0.20 ppt         Image: Property of the system       0.0 – 0.20 ppt       0.0 – 0.20 ppt         Image: Property of the system       0.0 – 0.20 ppt       0.0 – 0.20 ppt         Image: Property of the system       0.0 – 0.20 ppt       0.0 – 0.20 ppt         Image: Property of the system       0.0 – 0.20 ppt       0.0 – 0.20 ppt         Image: Property of the system       0.0 – 0.20 ppt       0.0 – 0.20 ppt         Image: Property of the system       0.0 – 0.20 ppt       0.0 – 0.20 ppt         Image: Property of the system       0.0 – 0.20 ppt       0.0 – 0.20 ppt         Image: Property of the system       0.0 – 0.20 ppt       0.0 – 0.20 ppt         Image: Property of the system       0.0 – 0.20 ppt       0.0 – 0.20 ppt         Image: Property of the system       0.0 – 0.20 ppt       0.0 – 0.20 ppt         Image: Property of the system       0.0 – 0.20 ppt       0.0 – 0.20 ppt         Image: Property of the system													
	Salinity 0.0 – 0.20 ppt Specific Conductivity 112 – 362 µS/cm													
	Salinity         0.0 – 0.20 ppt           Specific Conductivity         112 – 362 µS/cm           pH         6.78 – 8.65 pH units								Neutral	to slightl	y alkalin	е		
	Specific Conductivity112 – 362 µS/cmpH6.78 – 8.65 pH units													
	Trophic State Index       48         Trophic Class       mesotrophic         Salinity       0.0 – 0.20 ppt         Specific Conductivity       112 – 362 μS/cm         pH       6.78 – 8.65 pH units         Oxidation-Reduction Potential       -51 to 543 mV         Dissolved Oxygen       57 - 63% of water column < August				i < 2 mg/	L in	Occurre	ed at site	s 1, 4 &	5				
Average Secchi Disk Depth74 cmWater Clarity RatinggoodTrophic State Index48Trophic ClassmesotrophicSalinity0.0 – 0.20 pptSpecific Conductivity112 – 362 µS/cmpH6.78 – 8.65 pH unitsOxidation-Reduction Potential-51 to 543 mVDissolved Oxygen57 - 63% of water column AugustSurface Total Nitrogen0.024 mg/L to 1.17 mg/LSurface Total Phosphorus Ratio25:1Click to learn more about Beneficial UsesAge g g g gMitogen to Phosphorus RatioFish & Wildlife PropagationSSNS														
Specific Conductivity     112 – 362 µS/cm       pH     6.78 – 8.65 pH units       Oxidation-Reduction Potential     -51 to 543 mV       Dissolved Oxygen     57 - 63% of water column < August				_										
	Nut	Nitrogen to Pho	sphorus Ratio	25:1					Phosph	iorus limi	ted			
	PH       6.78 – 8.65 pH units         Oxidation-Reduction Potential       -51 to 543 mV         Dissolved Oxygen       57 - 63% of water column August         Surface Total Nitrogen       0.51 mg/L to 1.17 mg/L         Surface Total Phosphorus       0.024 mg/L to 0.057 mg/L         Nitrogen to Phosphorus Ratio       25:1					Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	ī	
	Fisł	h & Wildlife Propa	gation	S	S	NS	S							
	Aes	sthetics						S	NS					
	Agr	iculture								S	S	S		
	Prin	Oxidation-Reduction Potential       -51 to 543 mV         Dissolved Oxygen       57 - 63% of water column < August         Surface Total Nitrogen       0.51 mg/L to 1.17 mg/L         Surface Total Phosphorus       0.024 mg/L to 0.057 mg/L         Nitrogen to Phosphorus Ratio       25:1         Click to learn more about Beneficial Uses $\stackrel{30}{4}_{12}$ Fish & Wildlife Propagation       S       S         Aesthetics       Image: Similar Simil											NEI	
	Pub	Average Turbidity       12 nephelometric turbidity         Average True Color       46 units         Average Secchi Disk Depth       74 cm         Water Clarity Rating       good         Trophic State Index       48         Trophic Class       mesotrophic         Salinity       0.0 – 0.20 ppt         Specific Conductivity       112 – 362 µS/cm         pH       6.78 – 8.65 pH units         Oxidation-Reduction Potential       -51 to 543 mV         Dissolved Oxygen       57 - 63% of water column August         Surface Total Nitrogen       0.51 mg/L to 1.17 mg/L         Nitrogen to Phosphorus Ratio       25:1         Nitrogen to Phosphorus Ratio       25:1         Click to learn more about Beneficial Uses       jig         gif       S       NS         Agriculture       Index       Index         Primary Body Contact Recreation       Index       Index         Primary Body Contact Recreation       Index       Index         Private Water Supply       Index       Index												
	N	S = Fully Supporting IS = Not Supporting IEI = Not Enough In	formation	The Place	BCR canno	t be assess	sed as mii	nimum da	ta requiren	nents were	e not met	due to QA/	QC issues	s for l

		Sample Perio	d	Times	Sar	npling S	ites					•	•	
1	love	mber 2007 – Augi		Visited 4		3				65				
	Loc	cation	McClain Co	unty	Click r	map for si	te data				h			
	Imp	oundment	1930						1					
	Are	a	150 acres						5					
	Cap	pacity	2,600 acre f	eet					5				马联剧	
	Pur	poses	Water Supp	y and Reci	eation				0 Miles	1/4				
		Parameter (Des	scriptions)	Result					Notes/0	Commer	its			
		Average Turbidi	ty	14 nep	helometr	ic turbidity	/ units (N	ITU)	All valu	es < 25 N	NTU			
		Average True C	olor	25 unit	S				All valu	es < OW	QS of 70	)		
Oxidation-Reduction Potential     18 to 645 mV       Dissolved Owgen     Up to 50% of water column < 2														
		Water Clarity Ra	ating	good										
							Previou	s value =	= 50					
	Trophic Class eutrophic													
	Salinity         0.19 – 0.23 ppt													
Salinity         0.19 – 0.23 ppt           Specific Conductivity         374 – 462.8 μS/cm														
	rofil	рН		7.17 –	8.37 pH (	units			Neutral	to slightl	y alkalin	e		
	₽	Oxidation-Reduc	ction Potential		-									
		Dissolved Oxyge	en			ater colun	nn < 2 m	g/L in	Occurre	ed at site	1 & 2			
pH       7.17 – 8.37 pH units         Oxidation-Reduction Potential       18 to 645 mV         Dissolved Oxygen       Up to 50% of water column < 2 August														
	ient	Surface Total Pl	nosphorus	0.018 r	ng/L to 0	.041 mg/L	_							
	Nutrier	Nitrogen to Phos	sphorus Ratio	24:1	-				Phosph	orus limi	ted			
		<u>Click to learn m</u> <u>Beneficial Uses</u>	nore about	Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	
	Fis	h & Wildlife Propa	gation	S	S	NS	S							
	Aes	sthetics						S	S					
	Aesthetics       Agriculture									S	S	S		
	Prir	mary Body Contac	t Recreation										NEI	
	Put	olic & Private Wate	er Supply											
	Λ	S = Fully Supporting VS = Not Supporting VEI = Not Enough Int	formation		CR canno fecal colif		sed as mii	nimum da	ta requiren	nents were	e not met	due to QA/	QC issues	s for

		Sample Perio	d	Times Visited	Sa	mpling Si	ites				5			
٨	lovei	mber 2008 – Aug	just 2009	4		3					25			
	Loc	ation	Choctaw C	ounty	Click r	map for si	te data				5			
ľ	Imp	oundment	1956								72	,		
	Are	a	263 acres								(•)	4		
	Cap	pacity	1,681 acre	feet						R	ال ليو	-		
	Pur	poses	Recreation							)~	$\sim$	<u> </u>	1/2 Miles	
1		Parameter (De	scriptions)	Result					Notes/0	Commer	its			
ľ		Average Turbid	ity	11 NTU	J				100% o	f values	< OWQ	S of 25 NT	U (n=11)	
ľ		Average True C	Color						Did not	collect fo	or true c	olor		
ľ		Average Secch	i Disk Depth	55 cm										
		Water Clarity R	ating	Averag	е									
ľ		Trophic State Ir	ndex	55					Previou	s value =	= 55			
ľ		Trophic Class		Eutrop	nic									
ľ		Salinity		0.00 -	0.49 ppt									
		Specific Conductivity 69.3 – 936.2 µS/cm												
	Profile	pН		6.61 –	7.83 pH (	units								
	ŗ	Oxidation-Redu	ction Potentia	al 83 to 5	21 mV									
		Dissolved Oxyg	en	Up to 6 June	7% of wa	ater colum	nn < 2.0 r	ng/L in	Occurre	ed at site	1, the d	lam		
	S	Surface Total N	litrogen	0.30 m	g/L to 0.8	32 mg/L								
	rients	Surface Total P	hosphorus	0.005 r	ng/L to 0	.048 mg/L	-							
	Nutrie	Nitrogen to Pho	sphorus Ratio	o 17:1					Phosph	orus limi	ted			
		<u>Click to learn r</u> <u>Beneficial Uses</u>		Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
	Fisł	h & Wildlife Propa	agation	S	S	NS	*							
	Aes	sthetics						S	*					
	Agr	iculture								*	*	S		
	Prin	mary Body Conta	ct Recreation										NEI	
	Pub	olic & Private Wat	er Supply											
	N	S = Fully Supporting IS = Not Supporting IEI = Not Enough Ir	7		CR benefi	r these par cial use ca		sessed a	as minimum	data requ	uirement	were not me	et due to C	QA/Q

R	.0	C. Long	gmire	•					● Sampl	ing Sites	Y 2			
		Sample Perio	d	Times Visited	Sar	npling S	ites				Site 3	C	Click Site Na	
N	love	mber 2011 – Augu	ust 2012	4		5				$\mathbf{x}$			Available	Data
	Loc	ation	Garvin Cou	nty	Click r	map for si	te data			Site 5 •	5	R	<u>Cu</u>	
ସ	Imp	oundment	1989								Site 4	Site 2	~	
General	Are	a	935 acres											
ອັ	Ca	pacity	13,162 acre	feet					Site 1 Surfac	Site 1 Bot	tom	0	1/2	
	Pur	poses	Navigation,	Hydropow	er, and R	ecreation							Miles	
	Area       935 acres         Capacity       13,162 acre feet         Purposes       Navigation, Hydropower, and Recreation         Varage Turbidity       28 NTU         Average Turbidity       28 NTU         Average Secchi Disk Depth       31 cm         Water Clarity Rating       Poor         Chlorophyll-a       28 mg/m3         Trophic State Index       63         Trophic Class       Hypereutrophic         Salinity       0.14 – 018 ppt         Specific Conductivity       305 – 389 µS/cm         pH       7.41 – 8.51 pH units         Oxidation-Reduction Potential       65 to 545 mV         Dissolved Oxygen       Up to 11% of water column August         Surface Total Nitrogen       1.04 mg/L to 1.82 mg/L         Nitrogen to Phosphorus Ratio       49:1				Notes/	Commer	nts							
	Parameter (Descriptions)ResultAverage Turbidity28 NTUAverage Secchi Disk Depth31 cmWater Clarity RatingPoorChlorophyll-a28 mg/m3Trophic State Index63Trophic ClassHypereutrophicSalinity0.14 – 018 pptSpecific Conductivity305 – 389 µS/cmpH7.41 – 8.51 pH units						42% of	values >	> OWQS	of 25 NTL	l (n=12)			
	Water Clarity Rating Poor Chlorophyll-a 28 mg/m3 Trophic State Index 63							All valu	es < OW	QS of 70	)			
	Purposes       Navigation, Hydropower, and Recreation         Parameter (Descriptions)       Result         Average Turbidity       28 NTU         Average Secchi Disk Depth       31 cm         Water Clarity Rating       Poor         Chlorophyll-a       28 mg/m3         Trophic State Index       63         Trophic Class       Hypereutrophic         Salinity       0.14 – 018 ppt         Specific Conductivity       305 – 389 µS/cm         pH       7.41 – 8.51 pH units         Oxidation-Reduction Potential       65 to 545 mV         Dissolved Oxygen       Up to 11% of water column August         Surface Total Nitrogen       1.04 mg/L to 1.82 mg/L         Surface Total Phosphorus       0.006 mg/L to 0.060 mg/L         Nitrogen to Phosphorus Ratio       49:1         Click to learn more about Beneficial Uses       Age a													
	Ē	Chlorophyll-a		28 mg	/m3									
		Trophic State In	dex	63					Previou	is value =	= 57			
SIS		Trophic Class		Hypere	eutrophic									
nete		Salinity		0.14 –	018 ppt									
arar	PionWater Clarity RatingPoorChlorophyll-a28 mg/m3Trophic State Index63Trophic ClassHypereutrophicSalinity0.14 – 018 pptSpecific Conductivity305 – 389 µS/cmpH7.41 – 8.51 pH unitsOxidation-Reduction Potential65 to 545 mVDissolved OxygenUp to 11% of water column AugustggSurface Total Nitrogen1.04 mg/L to 1.82 mg/L													
ä	Poor         Vater Clarity Rating       Poor         Chlorophyll-a       28 mg/m3         Trophic State Index       63         Trophic Class       Hypereutrophic         Salinity       0.14 – 018 ppt         Specific Conductivity       305 – 389 µS/cm         pH       7.41 – 8.51 pH units         Oxidation-Reduction Potential       65 to 545 mV         Dissolved Oxygen       Up to 11% of water column August         Surface Total Nitrogen       1.04 mg/L to 1.82 mg/L													
	₽	Oxidation-Reduc	ction Potentia		-									
		Dissolved Oxyge	en			ater colun	nn < 2mg	g/L in	Occurre	ed at site	1			
	S	Surface Total Ni	itrogen	1.04 m	g/L to 1.8	32 mg/L								
	rient	Surface Total Ph	nosphorus	0.006	mg/L to 0	.060 mg/L	-							
	Nut	Nitrogen to Phos	sphorus Ratio	49:1					Phosph	iorus limi	ted			
			nore about	Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
ses	Fis	h & Wildlife Propa	gation	NS	S	S	S							
Beneficial Uses	Aes	sthetics						S	N/A					
fici	Agr	riculture								N/A	N/A	S		
ene	Prir	mary Body Contac	t Recreation										NEI	
ш	Image: Problem in the second secon													
	٨	IS = Not Supporting	formation	N/A -	paramete	rs not colle	cted in cu	irrent sam	ple year.					
μS/c	m = r	phelometric turbidity nicrosiemens per ce Escherichia coli	entimeter mV	QS = Oklaho = millivolts pr-a = Chloro		Quality St	andards		= milligram n = microsi			t = parts pe = Enteroce		d

		cky (H	UDai	L)										
		Sample Period		Times Visited	Sa	mpling Si	tes			5	•	Site 3		
No	veml	ber 2011 –Septer	nber 2012	4		3				5	$\langle$	~	6	
	Loc	ation	Washita Co	ounty	Click r	map for si	te data			N				
3	Imp	oundment	1933		1					Site 2			<b>U</b>	
	Area	а	347 acres							<				
5	Сар	bacity	4,210 acre	-feet				•			Site 1 Surfa	0e	0 1/4	
	Pur	poses	Water Supp	oly, Recreati	on				e Names for able Data	建立	Site 1 Bottom	2	Miles	
		Parameter (Des	criptions)	Result				, want		Commer	nts			
		Average Turbidit	Y	83 NTU	J				58% of	values >	OWQS	of 25 NTL	J (n=12)	
		Average Secchi	Disk Depth	25 cm										
	In Situ	Water Clarity Ra	ting	Poor										
	In S	Chlorophyll-a		46 mg/	′m3									
		Trophic State Inc	dex	68					Previou	is value =	= 73			
စ		Trophic Class		Hypere	utrophic									
Parameters		Salinity		0.22 -	0.31 ppt									
	0	Specific Conduc	tivity	448 – 6	i31 μS/cr	n								
	Profile	рН		7.87 –	8.98 pH (	units								
	٩ ٩	Oxidation-Reduc	ction Potentia	I 360 to	523 mV									
		Dissolved Oxyge	en	All data mg/L	are abo	ve screen	ing level	of 2.0						
	s	Surface Total Nit	trogen	1.59 m	g/L to 3.6	6 mg/L								
	Nutrients	Surface Total Ph	nosphorus	0171 m	ig/L to 0.	316 mg/L								
	NC	Nitrogen to Phos	sphorus Ratio	0 11:1					Phosph	iorus limi	ted			
		Click to learn m <u>Beneficial Uses</u>	ore about	Turbidity	Hq	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
Beneticial Uses	Fish	n & Wildlife Propag	gation	NS	S	S	*							
Э т	Aes	thetics						NS*	N/A					
د	Agri	iculture								N/A	N/A	S		
0	Prin	nary Body Contac	t Recreation										S	
٥	Pub	olic & Private Wate	er Supply											NS
	N	= Fully Supporting  S = Not Supporting  El = Not Enough Inf	ormation	*Current Standar	ly, the lak ds (WQS)		as a Nutrie g means t	ent Limite	d Watershe ke is consi	dered thre	eatened fr	lahoma Wa om nutrien		

R	0	bert S.	Kerr	•					Z			• Sam	pling Sites	
		Sample Perio	d	Times Visited	Sar	npling S	ites		2	2				
	Nov	ember 2010 – Jun	e 2011	4		6		-		Jan Jan	1. 3	N I		
	Loc	cation	Sequoyah	County	Click I	map for si	te data		Names for	1	Site 6	Site 5	<u>6</u>	
a	Imp	oundment	1970					Availa	ble Data		and	• Site 4	7 1	Surface Bottom
General	Are	a	43,800 acre	S							Site	3	ite 2	
ອັ	Ca	pacity	525,700 acr	e feet							E.			
	Pur	rposes	Navigation,	Hydropowe	er, and R	ecreation							Miles	
		Parameter (Des	criptions)	Result					Notes/0	Commer	nts			
		Average Turbidit	ty	30 NTL	J				63% of	values >	25 NTU	l (n=24)		
		Average Secchi	Depth	57 cm					All value	es > OW	QS of 70	C		
	In-Situ	Water Clarity Ra	ıting	Fair										
	-u	Chlorophyll-a		11 mg/r	m3									
		Trophic State Ind	dex	54					Previou	s value =	= 50			
ຽ		Trophic Class		Eutroph	nic									
Parameters		Salinity		0.09-0	.93 ppt									
aran	đ	Specific Conduc	tivity	190.2 –	·1754 μ	S/cm								
ã	Profile	рН		7.25 – 8	8.52 pH	units			Neutral	to slightl	ly alkalin	е		
	Ē	Oxidation-Reduc	ction Potential	301 to 4	448 mV									
		Dissolved Oxyge	en	All data mg/L	are abo	ve screen	ing leve	l of 2.0						
	nts	Surface Total Ni	trogen	0.26 mg	g/L to 1.1	I2 mg/L								
	Nutrient	Surface Total Ph	nosphorus	0.048 n	ng/L to 0	.124mg/L								
	NUİ	Nitrogen to Phos	sphorus Ratio	9:1					Phosph	orus limi	ted			
		<u>Click to learn</u> <u>Beneficial Uses</u>	more about	Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
ses	Fis	h & Wildlife Propa	gation	NS	S	S	S							
Beneficial Uses	Aes	sthetics						S	*					
fici	Agr	riculture								S	S	S		
ene	Prir	mary Body Contac	t Recreation										NEI	
Ш	Pu	olic & Private Wate	er Supply											
	Λ	S = Fully Supporting VS = Not Supporting VEI = Not Enough Inf	formation			r this parar C issues fo				sessed as	s minimur	n data requ	irements v	vere not
μS/c	m = r	phelometric turbidity microsiemens per ce Escherichia coli	ntimeter mV :	QS = Oklahol = millivolts pr-a = Chloro		Quality Sta	andards		= milligram n = microsie			t = parts pe = Enteroco		d

## Sabor

3	ar	noma												
		Sample Perio	d	Times Visited	Sar	npling S	ites		)		)			
No	overr	nber 2005 – Aug	ust 2006	4		5			5	-	•		~	
	Loc	ation	Creek Cou	nty	Click r	map for sit	e data		3			•		
5	Imp	oundment	1947		1						8		5	
	Are	а	312 acres											
5	Cap	pacity	4,850 acre	-feet									0 1/4	
	Pur	poses	Water Supp	oly, Recreati	on				- Call				Miles	
		Parameter (Des	criptions)	Result					Notes/	Commer	nts			
		Average Turbidit	ty	9 NTU					100% o	f values	< OWQ	S of 25 NT	U	
		Average True Co	olor	30 units	6				100% o	f values	< OWQ	S of 70		
		Average Secchi	Disk Depth	73 cm										
		Water Clarity Ra	iting	Fair										
		Trophic State Inc	dex	51										
0		Trophic Class		eutroph	nic									
		Salinity		0.08 - 0	0.09 ppt									
	œ	Specific Conduc	tivity	184.1 –	203.1 µ	JS/cm								
-	Profile	рН		7.02–7	.80 pH u	inits			Neutral	to slightl	y alkalir	е		
	Ē	Oxidation-Reduc	ction Potentia	al 125 - 4	51 mV									
		Dissolved Oxyge	en	Up to 6 May	9% of wa	ater colum	ın < 2 mç	ı∕L in	Occurre	ed at site	1, the d	am		
	S	Surface Total Ni	trogen	0.58 m	g/L to 0.	74 mg/L								
	utrients	Surface Total Ph	nosphorus	0.023 n	ng/L to 0	.039 mg/L								
	Nu	Nitrogen to Phos	sphorus Ratio	22:1					Phosph	orus limi	ted			
		<u>Click to learn m</u> <u>Beneficial Uses</u>	ore about	Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
	Fisł	n & Wildlife Propa	gation	S	S	NS	S							
	Aes	sthetics						S	S					
	Agr	iculture								S	S	S		
>	Prin	mary Body Contac	t Recreation										S	
1	Pub	olic & Private Wate	er Supply											
	N	S = Fully Supporting IS = Not Supporting IEI = Not Enough Inf	formation	Notes										

 $\mu$ S/cm = microsiemens per centimeter mV = millivolts E. coli = Escherichia coli Chlor-a = Chlo Chlor-a = Chlorophyll-a  $\mu$ Š/cm = microsiemens/cm

Sampling Sites

En = Enterococci

## Sardie

S = Fully Supporting NS = Not Supporting

5	ar	<b>'CIS</b>								.g =			,	o Dala
		Sample Period	d	Times Visited	San	npling S	ites				4	\$ y	( and	
	Nov	ember 2010 – July	y 2011	4		5			~		A STATE	Site 3	Site 4	
	Loc	ation	Pushmatah	a County	Click r	nap for si	te data		Site 2		si Si	te 5	In Constant	
a	Imp	oundment	1970						$\sim$	man a	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~			
General	Are	а	13,610 acre	es									ite 1 Surface ite 1 Bottom	
ອັ	Cap	pacity	274,330 ac									0	3	
	Pur	poses	Flood Contr and Recrea	rol, Waters S ition	Supply, F	ish and V	Vildlife,						Miles	
		Parameter (Des	criptions)	Result					Notes/0	Commen	ts			
		Average Turbidit	y	16 NTU	l				21% of	values >	25 NTU	(n=20)		
		Average Secchi	Disk Depth	81 cm					30% of	values >	OWQS	of 70		
	In-Situ	Water Clarity Ra	ting	Average	е									
	ů.	Chlorophyll-a		9 mg/m	3									
		Trophic State Inc	dex	52					Previou	s value =	= 46			
si		Trophic Class		Eutroph	nic									
Parameters		Salinity		0.01 – 0	0.02 ppt									
arar	e	Specific Conduct	tivity	49.4 -	71.8 µS/	cm								
ä	Profile	рН		5.5 – 7.	77 pH ur	nits			35.7% (	of values	< 6.5 p⊦	l units		
	ፈ	Oxidation-Reduc	ction Potentia											
		Dissolved Oxyge	en	Up to 4 summe		ater colun	nn < 2 mỹ	g/L in						
	ţs	Surface Total Nit	trogen	0.16 mg	g/L to 0.4	7 mg/L								
	Nutrients	Surface Total Ph	osphorus	0.012 m	ng/L to 0.	.04 mg/L								
	Nu	Nitrogen to Phos	phorus Ratio	0 16:1					Phosph	orus limi	ted			
		<u>Click to learn</u> Beneficial Uses	Turbidity	Hď	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a	
ses	Fisł	n & Wildlife Propag	gation	S	NS	S	S							
Beneficial Uses	Aes	sthetics						S	*					
fici	Agr	iculture								*	*	S		
ene	Prir	nary Body Contac	t Recreation										NEI	
8	Pub	olic & Private Wate	er Supply											

Click Site Names for

Available Data

Sampling Sites

Notes Available rainfall data suggest that the peak in turbidity and true color, which occurred in May is likely due to seasonal storm events, therefore Sardis Lake will be listed as supporting its Fish & Wildlife Propagation *NEI* = *Not Enough Information* (FWP) and Aesthetics beneficial use for these parameters. \* Did not collect for these parameters.

*NTU* = *nephelometric turbidity units* OWQS = Oklahoma Water Quality Standards mg/L = milligrams per liter ppt = parts per thousand  $\mu$ S/cm = microsiemens per centimeter mV = millivolts $\mu$ S/cm = microsiemens/cm En = Enterococci E. coli = Escherichia coli Chlor-a = Chlorophyll-a

		Sample Period	1	Times Visited	Sai	mpling Si	ites			מחוייכו		5		
	Oc	tober 2008 – July	2009	4		3					5			
	Loc	ation	Carter Cou	nty	Click r	map for si	te data				2		11	
ľ	Imp	oundment	1979		1				5			5		
	Are	a	248 acres								(	$\sim$		
	Cap	pacity	3,588 acre-	feet							$ \rightarrow $		2	
	Pur	poses	Recreation							T		0	1/4 Miles	
		Parameter (Des	scriptions)	Result					Notes/	Commer	nts			
ľ		Average Turbidi	ty	9 NTU					100% (	of values	< OWQ	S of 25 NT	ับ (n=12)	)
I		Average True C	olor						Did not	collect fo	or true co	olor		
		Average Secchi	Disk Depth	80 cm										
		Water Clarity Ra	ating	Good										
ľ		Trophic State In	dex	51					Previou	us value =	= 48			
		Trophic Class		Eutropl	nic									
		Salinity		0.10 -	0.15 ppt									
		Specific Conduc	tivity	278.8 -	- 307 µS/	′cm								
	Profile	рН		6.96 –	8.53 pH ι	units								
	Ţ	Oxidation-Redu	ction Potentia	-10 to 4	461 mV									
		Dissolved Oxyg	en	Up to 5 July	0% of wa	ater colum	nn < 2.0 r	ng/L in						
	S	Surface Total N	itrogen	0.55 m	g/L to 0.8	30 mg/L								
	rients	Surface Total P	nosphorus	0.009 r	ng/L to 0	.026 mg/L	_							
	Nutrie	Nitrogen to Pho	sphorus Ratio	39:1					Phosph	norus limi	ted			
		<u>Click to learn n</u> <u>Beneficial Uses</u>	nore about	Turbidity	Hď	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
	Fish	h & Wildlife Propa	gation	S	S	S	*							
	Aes	sthetics						S	*					
	Agr	iculture								*	*	S		
	Prin	mary Body Contac	t Recreation										NEI	
	Pub	olic & Private Wat	er Supply											
	N	S = Fully Supporting IS = Not Supporting IEI = Not Enough In	formation	The PB				sessed a	as minimun	n data req	uirement	were not me	et due to (	QA/QC

S	ha	awnee	Twir	No	. 1				<ul> <li>Samplir</li> </ul>	ng Sites			Site 1 Surface Site 1 Bottom	
		Sample Perio	d	Times Visited	Sar	npling S	ites			Site 4	A	Site 2		
١	love	ember 2010 – Ju	ıly 2011	4		5								
	Loc	cation	Pottawatom	ie County	Click	map for sit	te data	Click Site	e Names for		_	Site 3		
a	Imp	ooundment	1935						able Data		Site 5		•	
General	Are	a	1,336 acres					_						
ອັ	Cap	pacity	22,600 acre	e-feet							2		0 1/2	
	Pur	rposes	Water Supp	ly, Recreati	on				and the second s				Miles	
		Parameter (Des	scriptions)	Result					Notes/0	Commer	nts			
		Average Turbidi	ty	13 NTL	J				100% o	f value <	OWQS	of 25 NT	U	
		Average Secchi	Disk Depth	103 cm	l									
	In-Situ	Water Clarity Ra	ating	Averag	е									
	-u	Chlorophyll-a		5 mg/m	13									
		Trophic State In	dex	46					Previou	s Value=	-41			
ร		Trophic Class		Mesotr	ophic									
nete		Salinity		0.11 –	0.13 ppt									
Parameters	đ	Specific Conduc	ctivity	161.7	- 268.2	µS/cm								
å	Profile	рН		7.32 –	8.57 pH	units								
	ā	Oxidation-Reduc	ction Potential	180 to	402 mV									
		Dissolved Oxyge	en	Up to 3 summe		ater colum	in < 2 m	g/L in						
	s	Surface Total Ni	itrogen	0.26 m	ng/L to 0.	5 mg/L								
	rients	Surface Total Pl	nosphorus	0.008 r	ng/L to 0	.014 mg/L								
	Nutrie	Nitrogen to Phos	sphorus Ratio	30:1					Phosph	orus limi	ted			
		<u>Click to learn</u> <u>Beneficial Uses</u>	n more about	Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
ses	Fisl	h & Wildlife Propa	gation	S	S	S	S							
Beneficial Uses	Aes	sthetics						S	*					
ficia	Agr	riculture								*	*	S		
ene	Prir	mary Body Contac	ct Recreation										S	
m	Pub	olic & Private Wate	er Supply											
	٨	S = Fully Supporting NS = Not Supporting NEI = Not Enough In	formation	*Did not	collect fo	r these para	ameters.							
μS/c	m = r	phelometric turbidity microsiemens per ce Escherichia coli	entimeter mV =	QS = Oklaho = millivolts r-a = Chloro		<sup>r</sup> Quality Sta	andards		= milligram n = microsie			t = parts pe = Enteroco		d

S	ha	awnee	Twin	No	. 2				<ul> <li>Samplin</li> </ul>	ng Sites			Click Site N Availabl	
		Sample Perio	d	Times	Sar	npling S	ites			n.				
	Nov	• ember 2010 – Jul		Visited 4		5			Site 3	Site 4	•		~~~~)	
	Loc	ation	Pottawatomi County	е	Click I	map for si	te data		a d		Site 2	Site 5	• Site Site	1 Surface 1 Bottom
ធ	Imp	oundment	1960								-	01		
General	Are	а	1,100 acres											
Ge	Cap	pacity	11,400 acre	feet								0	1/2	
	Pur	poses	Waters Supp	oly and Red	creation								Miles	
		Parameter (Des	scriptions)	Result					Notes/0	Commen	Its			
		Average Turbidi	ity	12 NTU	J				11% of	values >	> OWQS	6 of 25 NT	Ū	
		Average Secchi	i Disk Depth	80 cm										
	In-Situ	Water Clarity Ra	ating	Good										
	-u-	Chlorophyll-a		9 mg/m	13									
		Trophic State In	ndex	52					Previou	s value =	= 43			
ຽ		Trophic Class		Eutrop	nic									
Parameters		Salinity		0.1 – 0	.15 ppt									
aran	¢)	Specific Conduc	ctivity	224.6 -	- 301.6 µ	S/cm			TDS= 1	60 g/L				
å	Profile	рН		7.21 –	8.69 pH	units			Neutral					
	Ē	Oxidation-Redu	ction Potential	-67 to 4	l51 mV									
		Dissolved Oxyg	en	Up to 4 summe		ater colum	nn < 2 m	g/L in						
	S	Surface Total N	itrogen	0.35 m	g/L to 2.0	00 mg/L								
	rients	Surface Total P	hosphorus	0.010 r	ng/L to 0	.026 mg/L	<u>.</u>							
	Nutrie	Nitrogen to Pho	sphorus Ratio	36:1					Phosph	orus limi	ted			
		<u>Click to learr</u> Beneficial Uses		Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
ses	Fish	n & Wildlife Propa	agation	NS	S	S	S							
Beneficial Uses	Aes	sthetics						S	*					
ficia	Agr	iculture								*	*	S		
ene	Prin	mary Body Contac	ct Recreation										NEI	
Δ	Pub	olic & Private Wat	er Supply											
	Ν	S = Fully Supporting IS = Not Supporting IEI = Not Enough In	1	*Did not	collect fo	r these par	ameters.							
μS/c	m = n	phelometric turbidity nicrosiemens per ce Escherichia coli	entimeter mV =	QS = Oklaho = millivolts r-a = Chloro		<sup>.</sup> Quality Sta	andards		= milligram n = microsi			t = parts pe = Enteroco		d

S	he	ell							Names for ble Data	2		• Sam	pling Sites		
		Sample Period	I	Times Visited	Sar	mpling S	ites		J.						
	Octo	ober 2012 – Augus	st 2013	4		3				e 3 Sit			~		
	Loc	cation	Osage Cou	nty	Click r	nap for si	te data		2	Site 5	7	al	-		
ភ្	Imp	oundment	1922							50	R	Site 2			
General	Are	a	573 acres							Site	1 Surface				
Ğ	Cap	pacity	9,500 acre	-feet				_	0		1 Bottom				
	Pur	poses	Water Supp	oly, Recreati	on				Miles	-					
		Parameter (Des	criptions)	Result					Notes/	Commer	nts				
		Average Turbidit	ty	8 NTU					100% c	of values	< OWQS	6 of 25 NT	U (n=12)		
		Average Secchi	Disk Depth	73 cm											
	In Situ	Water Clarity Ra	iting	Good											
	Ч	Chlorophyll-a		10 mg/	m3										
		Trophic State Inc	dex	54					Previou	s value =	= 55				
si		Trophic Class		Eutroph	nic										
Parameters		Salinity		0.10 -	0.16 ppt										
aran	e	Specific Conduc	tivity	204 – 3	34 µS/cr	n									
à	Profile	рН		6.59 –	8.39 pH ι	units									
	•	Oxidation-Reduc	ction Potentia												
		Dissolved Oxyge	en	Up to 5 August		ater colun	nn < 2.0	mg/L in							
	ţ	Surface Total Ni	trogen	0.89 m	g/L to 1.2	21 mg/L									
	Nutrients	Surface Total Ph	nosphorus	0.005 r	ng/L to 0.	.036 mg/l	-								
	Nu	Nitrogen to Phos	sphorus Ratio	66:1					Phosph	orus limi	ted				
		<u>Click to learn m</u> <u>Beneficial Uses</u>	ore about	Turbidity	Hď	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a	
ses	Fisł	h & Wildlife Propag	gation	S	S	NS	NEI								ſ
Ŭ I	Aes	sthetics						S	*						
ficia	Agr	iculture								S	S	S			
eficial Uses	Aes	h & Wildlife Propaget	gation											Ċ	

Primary Body Contact Recreation Public & Private Water Supply

> S = Fully Supporting NS = Not Supporting NEI = Not Enough Information

\*Did not collect for these parameters

NTU = nephelometric turbidity units  $\mu$ S/cm = microsiemens per centimeter E. coli = Escherichia coli OWQS = Oklahoma Water Quality Standards mV = millivolts Chlor-a = Chlorophyll-a

Notes

*mg/L = milligrams per liter* μS/cm = microsiemens/cm ppt = parts per thousand En = Enterococci

S

S	ki	atook									Z	• San	npling Sites	
		Sample Period	ł	Times Visited	Sa	mpling Si	ites		3 ph	Site 4	Site 5	ŧ		
	Oc	tober 2011 – July	2012	4		7			at the second		3	Site 3	6.	
	Loc	ation	Osage Cou	nty	Click	map for si	te data			The second secon	Site	6	Site 2 Site 1	Surface
ਰ	Imp	oundment	1984						e Names for able Data	• (	10	St Site 7	Site	1 Bottom
	Are	a	10,190 acre	S								Sile 7		
פ	Cap	pacity	322,700 ac	re-feet								0	4	
	Pur	poses	Flood Contro Control, Red				ity			建长			Miles	
		Parameter (Des		Result		viidine			Notes/	Commer	nts			
		Average Turbidi	ty	21 NTL	J				14% of	values >	OWQS	of 25 NTL	J (n=28)	
		Average Secchi	Disk Depth	82 cm										
	itu	Water Clarity Ra	ating	Good										
	In Situ	Chlorophyll-a		5 mg/n	า3									
		Trophic State In	dex	47					Previou	s value :	= 48			
ပ်		Trophic Class		Mesotr	ophic									
Parameters		Salinity		0.09 –	0.24 ppt									
		Specific Conduc	ctivity	192 – 4	86 µS/ci	n								
מ	Profile	рН		6.72–8	.61 pH ι	inits								
	Ţ	Oxidation-Redu	ction Potential	100 to	520 mV									
		Dissolved Oxyg	en	Up to 6 July	5% of wa	ater colum	nn < 2.0 r	ng/L in						
	s	Surface Total N	itrogen	0.28 m	g/L to 1.3	31 mg/L								
	Nutrients	Surface Total P	hosphorus	0.005 r	ng/L to 0	.114 mg/L	-							
	Nu	Nitrogen to Pho	sphorus Ratio	39:1					Phosph	orus limi	ited			
		<u>Click to learn n</u> <u>Beneficial Uses</u>		Turbidity	Ha	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
ses	Fisł	h & Wildlife Propa	gation	NS	S	*	*							
Beneticial Uses	Aes	sthetics						S	N/A					
2	Agr	iculture								N/A	N/A	S		
D D	Prir	mary Body Contac	ct Recreation										S	
מ	Pub	olic & Private Wat	er Supply											
	Ν	S = Fully Supporting IS = Not Supporting IEI = Not Enough In		ote		rs <i>not colle</i> undetermi			ple year.					
S/c	= ne m = n	phelometric turbidity nicrosiemens per ce Escherichia coli	/ units OW entimeter mV =	QS = Oklaho = millivolts r-a = Chloro	ma Water			mg/L :	= milligram n = microsi			t = parts pe = Enteroc		d

S	0	oner							<ul> <li>Samp</li> </ul>	ing Sites	18A	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	Site 1 S Site 1 B	
		Sample Perio	d	Times Visited	Sar	npling S	ites	Click Site	e Names for			Site 4		
	Oct	tober 2012 - July	y 2013	4		3			ible Data	3		<b>N 1</b>	3	
	Loc	cation	Pawnee Co	unty	Click r	map for si	te data			2.	Site 2	K D	}	
a	Imp	ooundment	1972						- No	W.	Site 5			
General	Are	a	5,400 acres	;					3	Site 3	7.5			
G	Ca	pacity	149,000 ac	re-feet					25	NU.		×		
	Pur	rposes	Cooling Wa	ter					-			0	1 Miles	
		Parameter (De	scriptions)	Result					Notes/	Commer	nts			
		Average Turbid	ity	5 NTU					100% c	of values	< OWQ	S of 25 N	ГU	
		Average Secchi	i Disk Depth	150 cm	ı									
	Situ	Water Clarity Ra	ating	Excelle	ent									
	In S	Chlorophyll-a		3 mg/m	13									
		Trophic State In	ndex	41					Previou	is value =	= 46			
ຽ		Trophic Class		Mesotr	ophic									
Parameters		Salinity		1.00 –	1.07 ppt									
Iran	-	Specific Conduc	ctivity	1980 –	2074 µS	/cm								
<b>P</b> a	Profile	рН		7.43 –	8.59 pH	units			Neutral	to slight	ly alkalin	е		
	ዾ	Oxidation-Redu	ction Potentia	l -90 to 3	382 mV									
		Dissolved Oxyg	en						All data level of		sample y	ear below	the scre	ening
	ts	Surface Total N	itrogen	0.61 m	g/L to 0.8	35 mg/L								
	Nutrient	Surface Total P	hosphorus	0.005 r	ng/L to 0	.009 mg/L	-							
	NU	Nitrogen to Pho	sphorus Ratio	132:1					Phosph	iorus limi	ted			
		<u>Click to learn n</u> <u>Beneficial Uses</u>	nore about	Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
ses	Fis	h & Wildlife Propa	agation	S	S	S	S							
<b>Beneficial Uses</b>	Aes	sthetics						S	*					
ficia	Agı	riculture								S	S	S		
ene	Prir	mary Body Contac	ct Recreation										S	
õ	Pu	blic & Private Wat	er Supply											
	Λ	S = Fully Supporting NS = Not Supporting NEI = Not Enough In	1	* No lon	ger collec	t for this pa	arameter							
μS/c	:m = 1	ephelometric turbidity microsiemens per ce Escherichia coli	entimeter mV	QS = Oklaho = millivolts pr-a = Chloro		Quality St	andards	mg/L μS/cn	= milligram n = microsi	ns per liter emens/cm	pp n Er	nt = parts pe n = Enteroco		d

S	pa	avinaw	/						<ul> <li>Samplin</li> </ul>	ng Sites				
		Sample Period	k	Times Visited	Sa	mpling S	ites		Site Names ailable Data			Site 4		
	Oc	tober 2011 – July	2012	4		3				2	•	- te		
	Loc	ation	Mayes Cou	nty	Click	map for si	te data		aml	J.	Site	3		
ត	Imp	oundment	1924					Site 1 Surf	ace	Si	te 2			
General	Are	а	1,584 acres					Site 1 Bo	ottom	<b>K</b>				
פֿ	Cap	pacity	38,000 acre	-feet					\$					
	Pur	poses	Water Supp	ly, Recreati	on, Fish	& Wildlife	1					0	1 Miles	
		Parameter (Des	scriptions)	Result					Notes/	Commer	nts			
		Average Turbidi	ty	8 NTU					100% (	of values	< OWQS	S of 25 NT	U (n=12	)
		Average Secchi	Disk Depth	65 cm										
	In Situ	Water Clarity Ra	ating	Averag	е									
	ln S	Chlorophyll-a		19 mg/	′m3									
		Trophic State In	dex	59					Previou	us value =	= 57			
ທ		Trophic Class		Eutropl	nic									
Jete		Salinity		0.06 -	0.12 ppt									
Parameters	ň	Specific Conduc	ctivity	141 – 2	257 µS/ci	m								
ב מ	Profile	рН		6.33 –	8.83 pH	units			Only 4	.34% of v	alues be	elow 6.5 p	oH units	
	Ē	Oxidation-Reduc	ction Potential	53 to 5	31 mV									
		Dissolved Oxyge	en	Up to 6 July	57% of wa	ater colun	nn < 2.0 r	ng/L in						
	s	Surface Total Ni	itrogen	0.61 m	g/L to 1.2	29 mg/L								
	Nutrients	Surface Total Pl	hosphorus	0.005 r	ng/L to 0	.013 mg/l	_							
	N	Nitrogen to Phos	sphorus Ratio	67:1					Phosph	norus limi	ted			
		<u>Click to learn m</u> <u>Beneficial Uses</u>		Turbidity	Hď	Dissolved	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
Beneficial Uses	Fisł	n & Wildlife Propa	gation	S	S	*	*							
	Aes	sthetics						NS*	N/A					
Ď	Agr	iculture								N/A	N/A	S		
ם ש	Prin	mary Body Contac	ct Recreation										S	
מ	Pub	olic & Private Wate	er Supply											NS
	N	S = Fully Supporting IS = Not Supporting IEI = Not Enough Int	formation	Standar	tly, the lak ds (WQS)	r these par te is listed to This listing undeterm	as a Nutrie Ig means f	hat the la	d Watersh ke is consi	ed (NLW) idered thre	in the Okleatened.	ahoma Wa	ter Qualit	/
S/ci	m = n	phelometric turbidity nicrosiemens per ce Escherichia coli	entimeter mV =	QS = Oklaho = millivolts r-a = Chloro	ma Water			mg/L :	= milligran n = microsi			t = parts pe = Enteroce		d

S	p	ortsma	an							~	Z		• Sam	pling Sites	
		Sample Perio	d		imes sited	San	npling S	ites			~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	F	16		
	Oc	tober 2007 – July	2008		4		5		-				1F		
	Loc	ation	Seminole	Cou	unty	Click r	nap for si	te data			(				
ត	Imp	oundment	1958			1			-				5° 4		
General	Are	а	354 acres						-	well.		Su			
פֿ	Cap	pacity	5,349 acre	feet					-	SI.	1650				
	Pur	poses	Waters Su	oply a	and Rec	reation				0 Mile	1/2 es				
		Parameter (Des	scriptions)		Result				1	Notes/0	Commer	nts			
		Average Turbidi	ty		23 nepł	nelometri	c turbidity	v units (N	ITU)	25% of	values >	25 NTU	ļ		
		Average True C	olor		82 units	6				25% of	values >	OWQS	of 70		
		Average Secchi	Disk Depth		76 cm										
		Water Clarity Ra		average	Э										
		Trophic State In		43					Previou	s value =	= 40				
ໂ		Trophic Class			mesotro	ophic									
Parameters		Salinity			0.06 – 0	).12 ppt									
Iran	0	Specific Conduc	tivity		148.3 -	- 251.2 µ	IS/cm								
<u>ז</u>	Profile	рН			6.6 – 7.	93 pH ur	nits			Neutral					
	ፈ	Oxidation-Reduc	ction Potentia	al	37 to 50	04 mV									
		Dissolved Oxyge	en		Up to 6 July	0% of wa	ater colum	n < 2 m	g/L in	Occurre	ed at site	1			
	s	Surface Total Ni	trogen		0.43 mg	g/L to 0.7	'1 mg/L								
	Nutrients	Surface Total Ph	nosphorus		0.010 m	ng/L to 0.	.062 mg/L								
	Nut	Nitrogen to Phos	sphorus Ratio	D	23:1					Phosph	orus limi	ted			
		<u>Click to learn m</u> <u>Beneficial Uses</u>	nore about		Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
Beneticial Uses	Fisł	n & Wildlife Propa	gation		S	S	NS	S							
C B	Aes	sthetics							S	S					
3	Agr	iculture									S	S	S		
ם שווי שווי	Prir	nary Body Contac	t Recreation											NEI	
ם	Pub	olic & Private Wate	er Supply												
	Ν	= Fully Supporting IS = Not Supporting IEI = Not Enough Ini	formation	es	seasona Propaga	l storm ev tion (FWF	ents, there	efore Spo thetics be	rtsman La neficial us	ake will be li se for these	sted as si	upporting	urred in Ma its Fish & V PBCR canno	Vildlife	
S/c	m = r	phelometric turbidity nicrosiemens per ce scherichia coli	entimeter mV	' = mi	= Oklahoi Ilivolts = Chloro		Quality Sta	andards		= milligram n = microsie			t = parts pe a = Enteroco		d

S	ta	nley D	rape	r					Y	- 4		• Sam	npling Sites	
		Sample Perio	d	Times Visited	San	npling Si	ites		3					
No	oven	nber 2005 – Aug	ust 2006	4		5			2M					
	Loc	ation	Cleveland	County	Click n	nap for sit	e data			hy	516	1		
ସ୍ଥ	Imp	oundment	1962					-		2	· ~			
General	Are	a	2,900 acres	6				-		<u>``</u>	• 22	2		
้อ	Cap	pacity	100,000 ac	re-feet				-		2	~	~		
	Pur	poses	Water Supp	oly, Recreati	on						• m		1 Miles	
		Parameter (Des	scriptions)	Result					Notes/	Commen	its			
		Average Turbidit	ty	7 NTU					100% o	f values	< OWQS	6 of 25 NT	Ū	
		Average True Co	olor	28 units	6				100% o	f values	< OWQS	6 of 70		
		Average Secchi	Disk Depth	133 cm										
		Water Clarity Ra	ating	good										
		Trophic State Inc	dex	40										
SIS		Trophic Class		oligotro	phic									
Parameters		Salinity		0.03 -	0.09 ppt									
arar	Ð	Specific Conduc	tivity	95 – 19	1.5 µS/c	m								
ä	Profile	pН		6.90 -	8.18 pH	units								
	٩	Oxidation-Reduc	ction Potentia											
		Dissolved Oxyge	en	Up to 5 August		ater colum	n < 2 m	g/L in	Occurre	ed at site	1, the da	am		
	nts	Surface Total Ni	trogen	0.16 m	g/L to 0.3	3 mg/L								
	Nutrien	Surface Total Pr	nosphorus	0.010 n	ng/L to 0.	.015 mg/L								
	Ŋ	Nitrogen to Phos	sphorus Ratic	20:1					Phosph	orus limi	ted			
		<u>Click to learn m</u> <u>Beneficial Uses</u>	nore about	Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
ses	Fisl	h & Wildlife Propa	gation	S	S	NS	S							
Beneficial Uses	Aes	sthetics						S	S					
efici	Agr	iculture								S	S	S		
ene	Prir	mary Body Contac	t Recreation										S	
ш	Put	olic & Private Wate	er Supply											
	٨	S = Fully Supporting IS = Not Supporting IEI = Not Enough Int	formation	Notes										
μS/c	m = r	phelometric turbidity microsiemens per ce Escherichia coli	ntimeter mV	′QS = Oklaho = millivolts pr-a = Chloro		Quality Sta	andards		= milligram n = microsi			t = parts pe = Enteroco		d

Stilwell City										2		• Sam	pling Sites		
				Times Visited							•				
C	Octol	ber 2005 – Augu	3	3 3											
General	Location Adair County			nty	Click map for site data						4				
	Impoundment 1965									6	ļ				
	Area 188 acres											•			
	Capacity 3,110 acre-feet			feet	t							0	1/4		
	Purposes Water Supply,			oly, Recreati	Recreation, Flood Control				Miles						
Parameters	Parameter (Descriptions)			Result	Result					Notes/Comments					
		Average Turbidity			6 NTU					100% of values < OWQS of 25 NTU					
	Average True Color			14 units	14 units					100% of values < OWQS of 70					
	Average Secchi Disk Depth			161 cm	161 cm										
		Water Clarity Rating			excellent										
		Trophic State Index			54										
		Trophic Class			eutrophic										
		Salinity		0.07 – 0	0.07 – 0.14 ppt										
	đ	Specific Conductivity		159.1 –	159.1 – 297.2 µS/cm										
	Profile	рН		6.87 –	6.87 – 8.53 pH units										
	Ē	Oxidation-Reduction Potential		l 88 – 45	88 – 452 mV										
		Dissolved Oxygen			Up to 64% of water column < 2 mg/L in August				Occurred at site 1, the dam						
	Surface Total Nitrogen			0.32 mg	0.32 mg/L to 0.88 mg/L										
	Nutrients	Surface Total Phosphorus		0.019 n	0.019 mg/L to 0.044 mg/L										
	Nitrogen to Phosphorus Ratio			20:1	20:1					Phosphorus limited					
		<u>Click to learn m</u> <u>Beneficial Uses</u>	nore about	Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a	
ses	Fish & Wildlife Propagation			S	S	NS	S								
	Aesthetics							S	S						
ficia	Agr	riculture							S	S	S				
Beneficial Uses	Prir	mary Body Contac										S			
	Put	olic & Private Wate													
	Λ	S = Fully Supporting NS = Not Supporting NEI = Not Enough Int	Notes												
μS/c	m = r	phelometric turbidity microsiemens per ce Escherichia coli	ntimeter mV	'QS = Oklahol = millivolts pr-a = Chloro		Quality Sta	andards		= milligram 1 = microsi			t = parts pe = Enteroco		d	

## Stroud

S	tr	oud										• Sam	pling Sites	
		Sample Perio	d	Times Visited	Sar	npling S	ites		my s			11	R	
D	ecer	mber 2011 – Se	pt. 2012	4		5				Site 3	Site 5	Site 4 •	- And	
	Loc	ation	Creek Cour	nty	Click	map for si	te data	Click Site	Names for			Site 2	(	
a	Imp	oundment	1968					Availa	ble Data			5		
General	Are	а	600 acres					-			Site 1 Su	rface		
9 B	Cap	pacity	8,800 acre-	feet				-				Site 1 Bott	om 1/2	
	Pur	poses	Water Supp	oly, Recrea	ation, Floo	d Control		_		建长			Miles	
		Parameter (Des	scriptions)	Resu	lt			1	Notes/0	Commer	nts			
		Average Turbidi	ty	6 NTU	J				100% o	of values	< OWQS	6 of 25 NT	U (n=12)	
		Average Secchi	Disk Depth	101 c	m									
	itu	Water Clarity Ra	ating	Excel	lent									
	In Situ	Chlorophyll-a		5 mg	/m3									
		Trophic State In	dex	46					Previou	s value =	= 41			
စ		Trophic Class		Meso	trophic									
lete		Salinity		0.12 -	- 0.13 ppt									
Parameters	0	Specific Conduc	tivity	251 -	279 µS/c	m								
Ъ,	Profile	рН		7.18	– 8.40 pH	units								
	ፈ	Oxidation-Reduc	ction Potentia	ıl 118 –	438 mV									
		Dissolved Oxyge	en	Up to Septe		ater colum	nn < 2 m	g/L in						
	Its	Surface Total Ni	itrogen	0.44 เ	mg/L to 0.6	67 mg/L								
	trients	Surface Total Ph	nosphorus	0.005	mg/L to 0	0.008 mg/L	-							
	Nuti	Nitrogen to Phos	sphorus Ratio	0 104:1					Phosph	orus limi	ted			
		<u>Click to learn m</u> <u>Beneficial Uses</u>	nore about	Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
ses	Fish	n & Wildlife Propa	gation	S	S	S	S							
Beneficial Uses	Aes	sthetics						S	S					
ficia	Agr	iculture								S	S	S		
ene	Prin	nary Body Contac	t Recreation										S	
ā	Pub	olic & Private Wate	er Supply											
	Ν	= Fully Supporting IS = Not Supporting IEI = Not Enough Ini		* This	page refle	cts the cu	rrent sam	iple year	only.					
μS/c	m = n	phelometric turbidity nicrosiemens per ce Escherichia coli	entimeter mV	/QS = Oklał = millivolts or-a = Chlo		r Quality Sta	andards		= milligram n = microsie			t = parts pe = Enteroco		d

Т	al	awand	la No	<b>).</b> 1					Names for ble Data			• Sam	pling Sites	
		Sample Perio	d	Times	Sar	npling S	ites		Site 1 Site 1	Surface Bottom				
	Dec	ember 2010 – Jul		Visited 4		5		-	Site 4	•	~			
	Loc	ation	Pittsburg	County	Click r	map for sit	e data		• Site 3	•	Site 5	Site 2	2	
a	Imp	oundment	1902		1								5	
General	Are	а	91 acres									4		
9 B	Cap	pacity	12,000 acr	e feet								0	1/4	
	Pur	poses	Waters Sup	oply and Rec	reation								Miles	
		Parameter (Des	scriptions)	Result					Notes/0	Commen	Its			
		Average Turbidit	ty	3 NTU					100% o	f Values	< OWQ	S of 25 NT	U	
		Average Secchi	Disk Depth	153 cm										
	In-Situ	Water Clarity Ra	ating	Excelle	nt									
	ln-0	Chlorophyll-a		5 mg/m	3									
		Trophic State Inc	dex	47					Previou	s value =	- 42			
s		Trophic Class		Mesotro	ophic									
Parameters		Salinity		0.03 - 0	0.07 ppt									
aran	CD	Specific Conduc	tivity	90.4 -	152.1 µS	/cm								
å	Profile	рН		6.22 –	7.75 pH (	units			10.53%	of value	s < 6.5 p	H units		
	ď	Oxidation-Reduc	ction Potentia	al -34 to 4	34 mV									
		Dissolved Oxyge	en	Up to 4 summe		ater colum	n < 2 m	g/L in						
	ıts	Surface Total Ni	trogen	0.41 m	g/L to 0.6	65 mg/L								
		Surface Total Ph	nosphorus	0.009 n	ng/L to 0	.016 mg/L								
	Nutrier	Nitrogen to Phos	sphorus Ratio	o 39:1					Phosph	orus limi	ted			
		<u>Click to learn</u> <u>Beneficial Uses</u>	more abou	Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
ses	Fish	n & Wildlife Propa	gation	S	NS	S	S							
Beneficial Uses	Aes	sthetics						S	*					
fici	Agr	iculture								*	*	S		
ene	Prin	nary Body Contac	t Recreation										S	
8	Pub	olic & Private Wate	er Supply											
	N	S = Fully Supporting IS = Not Supporting IEI = Not Enough Inf	formation	Notes										
µS/c	m = n	phelometric turbidity nicrosiemens per ce Escherichia coli	ntimeter mV	/QS = Oklaho / = millivolts lor-a = Chloro		Quality Sta	andards		= milligram n = microsie			t = parts pe = Enteroco		d

Т	al	awand	la Nc	).	2					Sampl     Site 1 Surface					
		Sample Perio	d	-	imes isited	Sar	npling S	ites		Site 1 Bottom	•	h			
	Dec	ember 2010 – Jul	ly 2011	V	4		5		-	5	Si	te 4	m	al s	
	Loc	ation	Pittsburg	Coui	nty	Click r	map for si	te data		5	Site 3		• Site 2		
ସ	Imp	oundment	1924			1				27	• Site 3				
General	Are	a	195 acres								Site 5	i			
Ge	Cap	pacity	2,750 acre	feet					Oliala Oita		5		0	1/4	
	Pur	poses	Waters Sup	oply	and Rec	reation				Names for ble Data	V			Miles	
		Parameter (Des	scriptions)		Result				1	Notes/0	Commen	Its			
		Average Turbidi	ty		6 NTU					100% o	f Values	< OWQ	S of 25 NT	Ū	
		Average Secchi	Disk Depth		123 cm										
	situ	Water Clarity Ra	ating		Excelle	nt									
	In-Situ	Chlorophyll-a			4 mg/m	3									
		Trophic State In	dex		44					Previou	s value =	= 45			
S		Trophic Class			Mesotro	ophic									
Parameters		Salinity			0.04 - 0	0.06 ppt									
Iram	0	Specific Conduc	ctivity		99.7 –	141.2 µS	S/cm								
Ъ В	Profile	рН			6.42 – 8	3.06 pH (	units			6.82% (	of values	< 6.5 pł	H units		
	5	Oxidation-Redu	ction Potentia	ıl	-48 to 4	86 mV									
		Dissolved Oxyg	en		Up to 5 summe		ater colum	ın < 2 m	g/L in						
	ıts	Surface Total N	itrogen		0.19 mg	g/L to 0.3	37 mg/L								
	Nutrient	Surface Total Pl	hosphorus		0.006 n	ng/L to 0	.013 mg/L								
	NU	Nitrogen to Pho	sphorus Ratio	)	31:1					Phosph	orus limi	ted			
		<u>Click to learn</u> <u>Beneficial Uses</u>	n more abou	<u>ıt</u>	Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
ses	Fisł	h & Wildlife Propa	gation		S	S	S	S							
Beneficial Uses	Aes	sthetics							S	S					
ficia	Agr	iculture									S	S	S		
ene	Prir	mary Body Contac	ct Recreation											NEI	
õ	Pub	olic & Private Wate	er Supply												
	Λ	S = Fully Supporting IS = Not Supporting IEI = Not Enough In		Notes			cial use ca C issues for		ssessed fo	or this sam	ole year a	s minimu	m data requ	uirement w	ere not
μS/c	m = n	phelometric turbidity nicrosiemens per ce Escherichia coli	entimeter mV	= m	= Oklahoi illivolts = Chloro		Quality Sta	andards		= milligram n = microsie			t = parts pe = Enteroco	r thousand occi	1

T	ay	/lor							9	4		• Sam	pling Sites	
		Sample Period	i I	Times Visited	Sa	mpling S	ites							
	Oc	tober 2008 – July	2009	4		3								
	Loc	ation	Grady Coun	ty	Click r	nap for si	te data			•				
	Imp	oundment	1960						~		•			
	Are	а	227 acres							1	$\sim \mu$	•		
	Cap	pacity	1,877 acre f	eet						5				
	Pur	poses	Waters Supp	oly, Flood C	Control, a	nd Recre	ation					0	1/4 Miles	
		Parameter (Des	scriptions)	Result					Notes/	Commen	its			
		Average Turbidi	ty	14 NTL	J				8% of v	/alues > (	OWQS o	of 25 NTU	(n=12)	
		Average True C	olor						Did not	collect fo	or true co	olor		
		Average Secchi	Disk Depth	48 cm										
		Water Clarity Ra	ating	Averag	е									
		Trophic State In	dex	68					Previou	us value =	= 64			
		Trophic Class		Hypere	utrophic									
		Salinity		0.23 –	0.30 ppt									
	đ	Specific Conduc	ctivity	461.2 -	- 553 µS/	′cm								
	Profile	рН		8.05 –	8.51 pH (	units								
	Ē	Oxidation-Reduc	ction Potential	315 to	583 mV									
		Dissolved Oxyge	en	All data mg/L	are abo	ve screer	ing level	of 2.0						
	S	Surface Total Ni	itrogen	0.85 m	g/L to 1.5	56 mg/L								
	rients	Surface Total Pl	hosphorus	0.067 r	ng/L to 0	.223 mg/L								
	Nutrie	Nitrogen to Phos	sphorus Ratio	10:1					Phospl	norus limi	ted, pos	sibly co-lir	nited	
		<u>Click to learn n</u> <u>Beneficial Uses</u>	nore about	Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
	Fisł	n & Wildlife Propa	gation	S	S	S	*							
	Aes	sthetics						NS*	*					
	Agr	iculture								*	*	S		
	Prir	mary Body Contac	t Recreation										S	
	Pub	olic & Private Wate	er Supply											
	Ν	S = Fully Supporting IS = Not Supporting IEI = Not Enough In	formation	in the O	klahoma V	Vater Qual	ity Standa	rds (WQS	<ol><li>This list</li></ol>	ting means	that the	nt Limited \ lake is cons al use non-	sidered the	reatene
S/c	= ne m = r	phelometric turbidity nicrosiemens per ce Escherichia coli	v units OWC entimeter mV =	QS = Oklaho = millivolts r-a = Chloro	ma Water			mg/L =	= milligran	ns per liter iemens/cm	pp	t = parts pe = Enteroce	er thousan	

T	ec	cumse	h						<ul> <li>Sample</li> </ul>	ing Sites		•		
		Sample Perio	d	Times Visited	Sar	npling S	ites				<u></u>			
	Oc	tober 2007 – July	2008	4		3				Ş		~		
	Loc	ation	Pottawatom	e County	Click r	nap for si	te data				1•/		NHKH	
ធ	Imp	oundment	1934		1						$\langle \rangle$			
General	Are	a	127 acres							/.	5			
ő	Cap	pacity	1,118 acre f	eet					{	5		0	1/4	
	Pur	poses	Waters Sup	oly, and Re	creation					$\sim$		0	Miles	
		Parameter (Des	scriptions)	Result					Notes/	Commer	nts			
		Average Turbidit	ty	132 nej	phelome	tric turbidi	ty units	(NTU)	All valu	es > 25 N	UTU			
		Average True Co	olor	244 uni	ts				All valu	es > OW	QS of 70	)		
		Average Secchi	Disk Depth	11 cm										
		Water Clarity Ra	ating	poor										
		Trophic State Inc	dex	49					Previou	is value =	= 57			
ers		Trophic Class		mesotre	ophic									
Parameters		Salinity		0.00 - 0	0.10 ppt									
araı	е	Specific Conduc	tivity	105.6 -	- 141 μS/	′cm								
₫.	Profile	рН		7.08 –	7.60 pH	units			Neutral					
	<u>с</u>	Oxidation-Reduc	ction Potential	337 to \$	537 mV									
		Dissolved Oxyge	en						D.O. al	ways > 5	.0 mg/L			
	s	Surface Total Ni	itrogen	1.01 m	g/L to 1.5	55 mg/L								
	Nutrients	Surface Total Ph	nosphorus	0.066 n	ng/L to 0	.131 mg/L	<u>.</u>							
	NN	Nitrogen to Phos	sphorus Ratio	12:1					Phosph	iorus limi	ted			
		<u>Click to learn m</u> <u>Beneficial Uses</u>	nore about	Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
ses	Fisł	h & Wildlife Propa	gation	NS	S	S	*							
Beneficial Uses	Aes	sthetics						S	NS					
fici	Agr	iculture								S	S	S		
ene	Prin	mary Body Contac	t Recreation										NEI**	
m	Pub	olic & Private Wate	er Supply											
	N	S = Fully Supporting IS = Not Supporting IEI = Not Enough Int	formation	**The P		ot be asse						are fully sup et due to Q		es for E.
μS/c	m = n	phelometric turbidity nicrosiemens per ce Escherichia coli	entimeter mV :	QS = Oklaho = millivolts r-a = Chloro		Quality Sta	andards		= milligram n = microsi			t = parts pe = Enteroc		d

T	er	nkiller	(1,2,7)	)					<ul> <li>Samplin</li> <li>Click Site I</li> <li>Availab</li> </ul>	Names for	2 st	S		
		Sample Perio	d	Times Visited	San	npling S	ites		, , , , , , , , , , , , , , , , , , , ,	o Data	C C	3		
No	oven	nber 2011 – Aug	just 2012	4		7		-				5		
	Loc	ation	Sequoyah (	County	Click r	nap for si	te data				N	5		
<u></u>	Imp	oundment	1953								www.r			
General	Are	a	12,900 acre	s				-		32	Site 2			
Ge	Cap	pacity	654,100 acı	re-feet						Site	2 E			
	Pur	poses	Flood Contr	ol, Hydropo	wer			1	Site 1 Surf	ace Site 1 B	ottom	0	5 Miles	
		Parameter (Des	scriptions)	Result				1	Notes/	Commen	its			
		Average Turbidit	ty	5 NTU					100% (	of values	< OWQS	6 of 25 NT	U (n=11)	
		Average Secchi	Disk Depth	138 cm										
	itu	Water Clarity Ra	ating	Excelle	nt									
	In Situ	Chlorophyll-a		8 mg/n	n3									
		Trophic State Inc	dex	51					Previou	ıs value =	= 53			
S		Trophic Class		Eutroph	nic									
Parameters		Salinity		0.08 -	0.13 ppt									
Iram		Specific Conduc	tivity	177 – 2	278 µS/cr	n								
Pa	Profile	рН		6.56 -	9.02 pH	units			Only 0.	54% of re	ecorded	values > 9	9 pH units	;
	ሻ	Oxidation-Reduc	ction Potentia	l 124-57	4mV									
		Dissolved Oxyge	en	Up to 7 August		ater colum	nn < 2 m	g/L in						
	S	Surface Total Ni	itrogen	0.40 m	g/L to 1.4	6 mg/L								
	Nutrients	Surface Total Ph	nosphorus	0.005 n	ng/L to 0	.016 mg/L	-							
	Nu	Nitrogen to Phos	sphorus Ratio	124:1					Phosph	norus limi	ted			
		<u>Click to learn m</u> <u>Beneficial Uses</u>	nore about	Turbidity	Hď	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
ses	Fis	h & Wildlife Propa	gation	S	S	NS	S							
Beneficial Uses	Aes	sthetics						NS	N/A					
ficia	Agr	iculture								N/A	N/A	S		
ene	Prir	mary Body Contac	t Recreation										S	
Ш	Put	olic & Private Wate	er Supply											S
	٨	S = Fully Supporting IS = Not Supporting IEI = Not Enough Int		threaten	ed by nuti	in the WQ rients until s <i>not collec</i>	studies ca	an be con	ducted to d			ial use is c status.	onsidered	
μS/c	m = r	phelometric turbidity microsiemens per ce Escherichia coli	entimeter mV	QS = Oklaho = millivolts pr-a = Chloro		Quality Sta	andards		= milligram = microsi			t = parts pe = Enteroce		d

		Sample Perio	d	Times Visited	Sar	npling S	ites	Click Si	ite Names fo	r	( C	C		
Nc	overr	nber 2011 – Aug	gust 2012	4		7			lable Data		Site 5	2		
	Loc	cation	Sequoyah	County	Click	map for sit	e data			S	ite 3	Site 6		
	Imp	oundment	1953								A CAR			
	Are	a	12,900 acre	es						30	•			
	Cap	oacity	654,100 ac	re-feet						-forter	1 K		and the state of t	
	Pur	poses	Flood Cont	rol, Hydropo	ower					سلي ا		0	5 Miles	
		Parameter (Des	scriptions)	Result	:				Notes/	Commer	its			
		Average Turbidi	ity	14 NT	J				14% of	values <	OWQS	of 25 NTU	(n=16)	
		Average Secchi	Disk Depth	56 cm										
		Water Clarity Ra	ating	Averag	je									
		Chlorophyll-a		16 mg	/m3									
		Trophic State In	dex	58					Previou	ıs value =	= 59			
		Trophic Class		Eutrop	hic									
		Salinity		0.09 –	0.13 ppt									
	•	Specific Conduc	ctivity	197 – 2	275 µS/ci	m								
	Profile	рН		7.47 -	9.01 pH	units			Only 0.	66% of re	ecorded	values are	e > 9 pH ι	units
	Γ.	Oxidation-Redu	ction Potentia	l 86-567	'mV									
		Dissolved Oxyg	en	Up to 5 Augus		ater colum	ın < 2 m	g/L in						
	s	Surface Total N	itrogen	0.50 m	g/L to 3.4	43 mg/L								
	Nutrients	Surface Total Pl	hosphorus	0.005 1	mg/L to 0	.097 mg/L								
	Nut	Nitrogen to Pho	sphorus Ratio	51:1					Phosph	iorus limi	ted			
		<u>Click to learn n</u> <u>Beneficial Uses</u>		Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	
	Fisł	h & Wildlife Propa	gation	NS	S	S	S							
	Aes	sthetics						NS	N/A					
	Agr	riculture								N/A	N/A	S		
	Prir	mary Body Contac	ct Recreation										S	
	Pub	olic & Private Wat	er Supply											N
	Ν	S = Fully Supporting IS = Not Supporting IEI = Not Enough In	1			in the WQ						cial use is co status.	onsidered	

Т	ex	koma (	1-2)						<ul> <li>Samplir</li> </ul>	ng Sites			,	
		Sample Period		Times Visited	Sai	npling S	ites		e Names for able Data			1.4	- Ar	
	Octo	ber 2012 – Augus	st 2013	4		13							L'yes	
	Loc	ation	Bryan Count	ty	Click r	nap for si	te data		The second second second second second second second second second second second second second second second se			1	and the second second	
ធ	Imp	oundment	1944		-				31		5	• Site 2	A start	
General	Are	а	88,000 acres	5						3 mart		r (en)	Site 1 Surface	
ۍ ع	Cap	pacity	2,643,000 a	cre-feet								1 Jam	Site 1 Bottom	
	Pur	poses	Flood Contro Low-flow Re				er,		CALLS.	图	1		Miles	
		Parameter (Des		Result					Notes/	Commen	its			
		Average Turbidi	ty	3 NTU					100% c	of values	< OWQS	5 of 25 NT	U	
		Average Secchi	Disk Depth	142 cm	ı									
	itu	Water Clarity Ra	ating	Excelle	ent									
	In-Situ	Chlorophyll-a		10 mg/	m3									
		Trophic State In	dex	53					Previou	is value =	= 51			
ဖ		Trophic Class		Eutropl	nic									
Parameters		Salinity		0.79 –	0.90 ppt									
ram		Specific Conduc	tivity		1769 µS	/cm								
מ	Profile	рН		7.10 -	8.39 pH ι	units								
	Ţ	Oxidation-Reduc	ction Potential	-122 to	419 mV									
		Dissolved Oxyge	en	Up to 6 summe		ater colun	n < 2.0 ו	ng/L in						
	s	Surface Total Ni	trogen	0.79 m	g/L to 0.9	96 mg/L								
	Nutrients	Surface Total Pr	nosphorus	0.005 r	ng/L to 0	.026 mg/l	_							
	Ŋ	Nitrogen to Phos	sphorus Ratio	80:1					Phosph	iorus limi	ted			
		<u>Click to learn m</u> <u>Beneficial Uses</u>	nore about	Turbidity	Hď	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
Beneficial Uses	Fish	n & Wildlife Propa	gation	NS	S	NS	NEI							
Э С	Aes	sthetics						S	*					
	Agr	iculture								S	S	S		
ene	Prin	mary Body Contac	t Recreation										NEI	
ñ	Pub	olic & Private Wate	er Supply											
	N	S = Fully Supporting IS = Not Supporting IEI = Not Enough Ini	formation	Notes										
IS/cl	m = n	phelometric turbidity nicrosiemens per ce Escherichia coli	entimeter mV =	QS = Oklaho = millivolts r-a = Chloro		Quality St	andards		= milligram n = microsi			t = parts pe = Enteroco		d

	Sample Peric	bd	Times Visited	Sa	mpling S	ites		e Names for able Data			*	A.	
Octo	ober 2012 – Aug	ust 2013	4		13		-				Site 4	for	
Loc	ation	Bryan Cou	nty	Click r	map for si	te data		The	4.		Site 3	a with	
Imp	oundment	1944		1				11		5.7		· ·	
Are	a	88,000 acr	es						Prove and	3.	MACH S		
Cap	oacity	2,643,000	acre-feet								to be under	0 5	
Pur	poses		rol, Waters S			er, Low-		國旗	腔	2		Miles	
	Parameter (De		ation, and Re Result	ecreation				Notes/	Comme	nts			
	Average Turbio		5 NTU					100% (	of values	< 0W0	S of 25 NTI	IJ	
	Average Secch	-	85 cm						collect f	-			
tu	Water Clarity F		Good										
In-Situ	Chlorophyll-a	5	13 mg/r	m3									
-	Trophic State I	ndex	56					Previou	is value	= 56			
	Trophic Class		Eutroph	nic				_					
	Salinity		0.69 – 0										
	Specific Condu	uctivity		1756 µS/	/cm								
Profile	рН	,		8.55 рН и									
Pro	Oxidation-Red	uction Potentia		•				_					
	Dissolved Oxy	gen	Up to 5 summe		ater colum	n < 2.0 r	ng/L in						
ts	Surface Total	Vitrogen	0.82 mg	g/L to 0.9	96 mg/L								
ient	Surface Total F	Phosphorus	0.005 n	ng/L to 0	.026 mg/L								
Nutrien	Nitrogen to Ph		o 77:1	-	-			Phosph	iorus lim	ited			
	<u>Click to learn</u> Beneficial Use	<u>more about</u> <u>s</u>	Turbidity	Hď	Dissolved Oxygen	Metals	TSI	T rue Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	
Fish	h & Wildlife Prop	agation	NS	S	NS	NEI							
Aes	sthetics						S	*					
Agr	iculture								S	S	S		
Prin	mary Body Conta	act Recreation										NEI	
Pub	olic & Private Wa	ter Supply											
N	S = Fully Supporting IS = Not Supportin IEI = Not Enough I	g	Notes										

		Sample Period	Ł	Times Visited	Sa	npling S	ites		e Names for able Data			X	-Ax	
	Octo	ober 2012 – Augu	st 2013	4		13		-				- Contraction	from	
	Loc	ation	Bryan Count	ty	Click r	nap for si	te data		2			1.	with	
	Imp	oundment	1944		1				1	Site 1	5 7	Site 5	J. S. C. S.	
	Are	a	88,000 acres	5				-		Site	Site 8	Site 6		
	Cap	oacity	2,643,000 a	cre-feet				-		Site 1	Site 7	S Jam	0 5	
	Pur	poses	Flood Contro Low-flow Re				ər,		CALLS.	臣	2.		Miles	
		Parameter (Des		Result					Notes/	Commen	its			
		Average Turbidi	ty	8 NTU					100% c	of Values	< OWQ	S of 25 NT	Ū	
		Average Secchi	Disk Depth	63 cm										
	itu	Water Clarity Ra	ating	Good										
	In-Situ	Chlorophyll-a		21 mg/	m3									
		Trophic State In	dex	60					Previou	ıs value =	= 59			
0		Trophic Class		Eutroph	nic									
rai ailletei >		Salinity		0.80 –	1.11 ppt									
0	•	Specific Conduc	ctivity	1595 —	2151 µS	S/cm								
ง -	Profile	рН		7.01 –	8.54 pH (	units								
	5	Oxidation-Redu	ction Potential	-142 to	367 mV									
		Dissolved Oxyg	en	Up to 5 summe		ater colum	nn < 2.0 i	mg/L in						
	ıts	Surface Total N	itrogen	0.70 m	g/L to 1.2	21 mg/L								
	Nutrient	Surface Total Pl	hosphorus	0.005 r	ng/L to 0	.091 mg/L	-							
	Nut	Nitrogen to Pho	sphorus Ratio	47:1					Phosph	norus limi	ted			
		<u>Click to learn n</u> <u>Beneficial Uses</u>	nore about	Turbidity	Ha	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
Denelicial USES	Fisł	h & Wildlife Propa	gation	NS	S	NS	NEI							
5	Aes	sthetics						S	*					
>	Agr	iculture								S	S	S		
2	Prir	mary Body Contac	ct Recreation										NEI	
1	Pub	olic & Private Wate	er Supply											
	Ν	S = Fully Supporting IS = Not Supporting IEI = Not Enough In	·	*Did not	collect for	r these par	ameters							

		Sample Period	Ł	Times Visited	Sa	mpling S	ites		e Names for able Data			X	Ax	
	Octo	ober 2012 – Augu	st 2013	4		13		-				- Charles	from	
	Loc	ation	Bryan Coun	ty	Click r	map for si	ite data		2	Site 13		AL CONTRACTOR	with	
3	Imp	oundment	1944						Site	e 12	5 7		- Far	
	Are	a	88,000 acre	S						Part .		THE S		
	Cap	oacity	2,643,000 a							國		1 Jam	0 5	
	Pur	poses	Flood Contr Low-flow Re				er,		COLOR IN COLOR	假	2		Miles	
		Parameter (Des		Result				1	Notes/	Commen	its			
		Average Turbidi	ity	27 NTU	J				33% of	values >	OWQS	of 25 NTL	J	
		Average Secchi	Disk Depth	25 cm										
	situ	Water Clarity Ra	ating	Fair to	Poor									
	In-Situ	Chlorophyll-a		49 mg/	m3									
		Trophic State In	dex	69					Previou	ıs value =	= 66			
		Trophic Class		Hypere	utrophic									
		Salinity		0.99 –	2.13 ppt									
	•	Specific Conduc	ctivity	1966 -	4055 µS/	/cm								
	Profile	рН		7.61 –	8.67 pH (	units								
	ፈ	Oxidation-Redu	ction Potential	44 to 1	58 mV									
		Dissolved Oxyg	en	Up to 1 summe		ater colun	nn < 2 m	g/L in						
	s	Surface Total N	itrogen	0.66 m	g/L to 1.5	50 mg/L								
	rients	Surface Total P	hosphorus	0.041 r	ng/L to 0	.104 mg/l								
	Nutrier	Nitrogen to Pho	sphorus Ratio	18:1					Phosph	norus limi	ted			
		<u>Click to learn n</u> <u>Beneficial Uses</u>	nore about	Turbidity	Hď	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
	Fisl	h & Wildlife Propa	igation	NS	S	NS	NEI							
	Aes	sthetics						S*	*					
	Agr	riculture								S	S	S		
	Prir	mary Body Contac	ct Recreation										NEI	
	Put	olic & Private Wat	er Supply											
1	٨	S = Fully Supporting IS = Not Supporting IEI = Not Enough In	1	Notes										

Т	hı	underb	bird							<ul> <li>Samplir</li> </ul>	ng Sites	•	1		
		Sample Perio	d	Time Visite		San	npling S	ites					2		
N	oven	nber 2012 - Aug	ust 2013	4			7		-	~~~~			Site 3		
	Loc	ation	Cleveland	County		Click n	nap for si	te data		5	e Lu			9	
a	Imp	oundment	1965			1			-	2	Site 6	un	Site 2	59	
General	Are	а	6,070 acres	S					-	6.	• Site	15 S	Site 4 Site	1 Surface te 1 Bottom	
ъ В	Cap	pacity	119,600 ac	re-feet						Click	Names	for			
	Pur	poses	Flood Cont Wildlife	rol, Wat	er Sı	upply, Re	creation,	Fish &	1		ailable Data		e 7 0	2 Miles	
		Parameter (Des		Re	sult				1	Notes/0	Commen	its			
		Average Turbidit	ty	22	NTU	l				15% of	values >	> OWQS	of 25 NTI	J	
		Average Secchi	Disk Depth	37	cm										
	Situ	Water Clarity Ra	ating	ave	erage	Э									
	In S	Chlorophyll-a		13	mg/r	m3									
		Trophic State Inc	dex	56						Previou	s value =	= 57			
က		Trophic Class		Eu	troph	nic									
Parameters		Salinity		0.1	8 – (	).23 ppt									
ram		Specific Conduc	tivity	38	0 – 4	83 µS/cn	n								
Ъа	Profile	рН		7.2	:3 – 8	3.83 pH	units			Neutral	to slightl	y alkalin	е		
	Å	Oxidation-Reduc	ction Potentia	al -51	to 3	90 mV									
		Dissolved Oxyge	en	Up Jui		7% of wa	ater colum	nn < 2 m	g/L in	Occurr	ed at site	es 1, the	dam		
	ts	Surface Total Ni	itrogen	0.7	'9 mg	g/L to 1.4	4 mg/L								
	Nutrient	Surface Total Ph	nosphorus	0.0	05 n	ng/L to 0.	.038 mg/L	-							
	NN	Nitrogen to Phos	sphorus Ratio	o 26	:1					Phosph	orus limi	ted			
		<u>Click to learn m</u> <u>Beneficial Uses</u>	nore about		I UIDIOIILY	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
ses	Fisł	n & Wildlife Propa	gation	N	S	S	NS	S							
Beneficial Uses	Aes	sthetics							NS*	S					
ficia	Agr	iculture									S	S	S		
ene	Prir	nary Body Contac	t Recreation											S	
Ш	Pub	olic & Private Wate	er Supply												NS
	Ν	s = Fully Supporting I <mark>S = Not Supporting</mark> IEI = Not Enough Inf		NL (NL	W). 1	This listing	means th	at the lak	e is consid	ity Standar lered threa upport statu	tened fron	as a Nuti n nutrient	rient Limiteo s until a mo	d watersho pre intensi	ed ve study
μS/c	m = r	phelometric turbidity nicrosiemens per ce Escherichia coli	entimeter mV	/QS = OF ' = millivo lor-a = C	lts		Quality Sta	andards		= milligram n = microsie			t = parts pe = Enteroco		d

Т	or	n Stee	d						<ul> <li>Sample</li> </ul>	ing Sites			\$	
		Sample Perio		Times Visited	Sar	npling S	ites				Site	• 2		
[	Dece	ember 2012 - Ju	ly 2013	4		3					5		Site 4	
	Loc	ation	Kiowa Cour	nty	Click	map for si	te data		1		_{		5	
	Imp	oundment	1975							e Site 3	Site 5		Site 1 Surfa	ace
General	Area	а	6,400 acres					-	~	1 from	m 12	2 Jun	Site 1 Bot	
ש פ	Сар	bacity	88,970 acre	-feet				Click Sit	e Names for	PT -		1		
	Pur	poses	Flood Contr Wildlife	ol, Water S	upply, Re	ecreation,	Fish &		able Data			<u> </u>	1 Miles	
		Parameter (Des	scriptions)	Result					Notes/	Commen	nts			
		Average Turbidi	ty	54 NTU	J				92% of	values >	> OWQS	of 25 NTI	J	
		Average Secchi	Disk Depth	25 cm										
	Situ	Water Clarity Ra	ating	poor										
	In S	Chlorophyll-a		16 mg/	m3									
		Trophic State In	dex	58					Previou	is value =	= 55			
n		Trophic Class		Eutrop	nic									
rarameters		Salinity		0.51 –	0.61 ppt									
		Trophic State Index Trophic Class Salinity Specific Conductivity pH	ctivity	1023 –	1226 µS	S/cm								
מ	Profile			8.14 –	8.74 pH	units								
	ዾ	Oxidation-Reduc	ction Potentia	65 to 2	70 mV									
		Dissolved Oxyge	en						All data level of		sample	year belov	the scre	ening
	ŝ	Surface Total Ni	itrogen	0.81 m	g/L to 1.7	76 mg/L								
	Nutrient	Surface Total Pl	hosphorus	0.005 r	ng/L to 0	.117 mg/L								
	Nut	Nitrogen to Phos	sphorus Ratio	18:1					Phosph	iorus limi	ted			
		<u>Click to learn m</u> <u>Beneficial Uses</u>		Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
benericial Uses	Fish	n & Wildlife Propa	gation	NS	S	S	S							
D R	Aes	thetics						S	*					
د	Agri	iculture								S	S	S		
5	Prin	nary Body Contac	t Recreation										S	
۵	Pub	olic & Private Wate	er Supply											NS
	N	= Fully Supporting IS = Not Supporting IEI = Not Enough In		• Notes	No long	ger collect f	or this pa	rameter						
S/c	m = n	phelometric turbidity nicrosiemens per ce scherichia coli	entimeter mV	QS = Oklaho = millivolts pr-a = Chloro		<sup>r</sup> Quality Sta	andards		= milligram n = microsi			t = parts pe a = Enteroco		d

/:	ar	nderwo	ork							X			• Sam	pling Sites	
		Sample Perio	d	Times Visite		San	npling S	ites			5		4		
	Oc	tober 2007 – July	2008	4			3				~	•	5		
	Loc	ation	Washita Co	ounty		Click n	nap for sit	e data			2100				
ŀ	Imp	oundment	1968	-			•					).			
	Area	а	135 acres									3		~	
	Сар	acity	1,578 acre f	eet											
ľ	Pur	poses	Recreation							0 Miles	1/4		•		
t		Parameter (Des	scriptions)	Res	ult					Notes/0	Commer	nts			
ľ				9 ne	phelo	ometric	turbidity	units (N1	-U)	All value	es < 25 N	NTU			
ŀ		Average True C	olor	17 u	nits					All value	es < OW	QS of 7	0		
ľ		Average Secchi	rage True Color 17 units rage Secchi Disk Depth 59 cm good 59 cm ter Clarity Rating 64 bhic Class hypereutr nity 0.83 - 1.0												
		Water Clarity Ra	Prage True Color17 unitsPrage True Color17 unitsPrage Secchi Disk Depth59 cmter Clarity Ratinggoodphic State Index64phic Classhypereutinity0.83 - 1.0pecific Conductivity1568 - 17.2 - 8.1	ł											
ľ		Trophic State In							Previou	s value =	= 60				
		Trophic Class		hype	ereutr	ophic									
F		Average True Color17 uAverage Secchi Disk Depth59 cWater Clarity RatinggoodTrophic State Index64Trophic ClasshypeSalinity0.83Specific Conductivity1568pH7.2 -Oxidation-Reduction Potential-116	- 1.0	1 ppt											
		Specific Conduc	ctivity	156	3 – 18	396 µS	/cm								
	Profile	рН		7.2 -	- 8.18	3 pH ur	nits			Neutral	to slightl	y alkalin	e		
	ፈ	Oxidation-Reduc	ction Potentia	-116	i to 53	30 mV									
		Dissolved Oxyge	en	Up t June		% of wa	ter colum	n < 2 m	g/L in	Occurre	ed at site	1			
	S	Surface Total Ni	itrogen	0.87	mg/L	_ to 1.7	5 mg/L								
	Nutrients	Surface Total Pl	hosphorus	0.04	1 mg/	/L to 0.	100 mg/L								
	Nui	Nitrogen to Phos	sphorus Ratio	18:1						Phosph	orus limi	ted			
		Click to learn m Beneficial Uses	nore about	Turbidity		Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	
	Fish	n & Wildlife Propa	gation	S		S	S	S							
	Aes	thetics							NS	S					
	Agri	iculture									S	S	S		
	Prin	nary Body Contac	t Recreation											NEI	
	Pub	lic & Private Wate	er Supply												
	N	= Fully Supporting S = Not Supporting El = Not Enough Ini		WQ)	S). Th	is listing	g means th	at the lak	e is consi		tened fro		ater Quality Its until a mo		
cn	n = n	phelometric turbidity nicrosiemens per ce scherichia coli	entimeter mV	QS = Okla = millivolt or-a = Ch	S		Quality Sta	andards		= milligram n = microsie			ot = parts pe n = Enteroco		1

V	in	cent										• Sam	pling Sites	
		Sample Perio		Times Visited	San	npling S	ites	-						
	Nov	vember 2010 – Jul	y 2011	4		5				Site 3	K			
	Loc	cation	Ellis County	,	Click r	nap for si	te data			• s	ite 5			
ฐ	Imp	ooundment	1961								• Site 2			
General	Are	a	160 acres					-	Click Site I Availab			Site 4	1 Surface Site 1 Bottom	
õ	Cap	pacity	2,579 acre f	eet					Availab	1/4	~			
	Pur	rposes	Recreation						Miles					
		Parameter (Des	criptions)	Result					Notes/	Commer	nts			
		Average Turbidit	ty	14 NTL	J				100% o	f Values	< OWQ	S of 25 NT	Ū	
		Average Secchi	Disk Depth	63 cm										
	Situ	Average Secchi Disk Depth       63 cm         Water Clarity Rating       Good         Chlorophyll-a       8 mg/m3         Trophic State Index       51         Trophic Class       Eutrophic         Salinity       0.43 – 0.48 ppt         Specific Conductivity       833.1 - 928 µS/cm												
	<u>-1</u>	Average Secchi Disk Depth63 cmWater Clarity RatingGoodChlorophyll-a8 mg/m3Trophic State Index51Trophic ClassEutrophicSalinity0.43 – 0.48 pptSpecific Conductivity833.1 - 928 uS/cm												
		Water Clarity Rating Good Chlorophyll-a 8 mg/m3 Trophic State Index 51 Trophic Class Eutrophic Salinity 0.43 – 0.48 pp Specific Conductivity 833.1 - 928 µS					Previou	s value =	= 46					
ຽ		Trophic Class	Average Secchi Disk Depth Water Clarity Rating Chlorophyll-a Trophic State Index Trophic Class Salinity Specific Conductivity oH	Eutroph	nic									
Parameters		Average Turbidity14 NTUAverage Secchi Disk Depth63 cmWater Clarity RatingGoodChlorophyll-a8 mg/m3Trophic State Index51Trophic ClassEutrophiSalinity0.43 - 0Specific Conductivity833.1 - 9pH7.14 - 8Oxidation-Reduction Potential-50 to 48	0.48 ppt											
Iran	Ċ,	Parameter (Descriptions)ResultAverage Turbidity14 NTUAverage Secchi Disk Depth63 cmWater Clarity RatingGoodChlorophyll-a8 mg/m3Trophic State Index51Trophic ClassEutrophiSalinity0.43 - 0Specific Conductivity833.1 - 9pH7.14 - 8Oxidation-Reduction Potential-50 to 48	928 µS/0	cm										
å	Profile	Parameter (Descriptions)ResAverage Turbidity14 hAverage Secchi Disk Depth63 dWater Clarity RatingGodChlorophyll-a8 mTrophic State Index51 dTrophic ClassEutreSalinity0.43Specific Conductivity833pH7.14Oxidation-Reduction Potential-50	7.14 – 8	8.19 pH	units			Neutral	to slightl	y alkalin	e			
	ā	Average Turbidity14Average Secchi Disk Depth63Water Clarity RatingGodChlorophyll-a8 mTrophic State Index51Trophic ClassEutSalinity0.43Specific Conductivity833pH7.1Oxidation-Reduction Potential-50	-50 to 4	90 mV										
		Dissolved Oxyge	Average Secchi Disk Depth         Water Clarity Rating         Chlorophyll-a         Trophic State Index         Trophic Class         Salinity         Specific Conductivity         pH         Oxidation-Reduction Potential	Up to 4	5 % < 2 ı	mg/L in sı	ummer							
	S	Surface Total Ni	trogen	0.27 mg	g/L to 0.5	55 mg/L								
	Nutrients	Surface Total Pr	nosphorus	0.015 n	ng/L to 0.	.028 mg/L	<u>-</u>							
	N	Nitrogen to Phos	sphorus Ratio	21:1					Phosph	orus limi	ted			
		<u>Click to learn</u> <u>Beneficial Uses</u>	more about	Turbidity	Hď	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
ses	Fis	h & Wildlife Propa	gation	S	S	S	S							
Beneficial Uses	Aes	sthetics						S	S					
ficia	Agr	riculture								S	S	S		
ene	Prir	mary Body Contac	t Recreation										NEI	
m	Pu	blic & Private Wate	er Supply											
	٨	S = Fully Supporting NS = Not Supporting NEI = Not Enough Ini	formation	The PBC enteroco		t be assess	sed as mi	nimum da	ta requiren	nents were	e not met	due QA/QC	C issue with	h
µS/c	m = r	phelometric turbidity microsiemens per ce Escherichia coli	ntimeter mV =	QS = Oklaho = millivolts r-a = Chloro		Quality Sta	andards		= milligram n = microsi			t = parts pe = Enteroco		1

			_						2					
		Sample Perio		Visited	Sar	npling S	ites		Ę	•	-	•		
	Oc	tober 2007 – July	2008	4		3						•		
	Loc	ation	Cotton Cou	nty	Click r	map for sit	te data							
la	Imp	oundment	1936											
General	Are	Capacity       861 acre feet         Purposes       Water Supply, and Recreation         Parameter (Descriptions)       Result         Average Turbidity       98 nephelometric turbid         Average True Cor       166 units         Average Secchi Disk Depth       21 cm         Water Clarity Rating       poor         Vater Clarity Rating       poor         Salinity       51         Salinity       0.12 – 0.17 ppt         Specific Conductivity       253.8 – 353 µS/cm         pH       7.92 – 8.34 pH units         Oxidation-Reduction Potential       376 to 520 mV					2109							
G	Cap	Capacity       861 acre feet         Purposes       Water Supply, and Recreation         Parameter (Descriptions)       Result         Average Turbidity       98 nephelometric turbidit         Average True Color       166 units         Average Secchi Disk Depth       21 cm         Water Clarity Rating       poor         Trophic State Index       51         Trophic Class       eutrophic         Salinity       0.12 – 0.17 ppt         Specific Conductivity       253.8 – 353 µS/cm         pH       7.92 – 8.34 pH units			E.				0 1/8 Miles					
	Pur	Purposes       Water Supply, and Recreation         Parameter (Descriptions)       Result         Average Turbidity       98 nephelometric turbid         Average True Color       166 units         Average Secchi Disk Depth       21 cm         Water Clarity Rating       poor         Vater Clarity Rating       51         Trophic State Index       51         Salinity       0.12 – 0.17 ppt         Specific Conductivity       253.8 – 353 µS/cm         pH       7.92 – 8.34 pH units												
		Purposes       Water Supply, and Recreation         Parameter (Descriptions)       Result         Average Turbidity       98 nephelometric turb         Average True Cor       166 units         Average Secchi Disk Depth       21 cm         Water Clarity Rating       poor         Trophic State Index       51         Salinity       0.12 – 0.17 ppt         Specific Conductivity       253.8 – 353 µS/cm         pH       7.92 – 8.34 pH units         Oxidation-Reduction Potential       376 to 520 mV				Notes/0	Commer	nts						
		Water Supply, and Recreation         Parameter (Descriptions)       Result         Average Turbidity       98 nephelometric turb         Average True Coor       166 units         Average Secchi Disk Depth       21 cm         Vater Clarity Rating       poor         Trophic State Index       51         Salinity       0.12 – 0.17 ppt         Specific Conductivity       253.8 – 353 µS/cm         pH       7.92 – 8.34 pH units         Oxidation-Reduction Potential       376 to 520 mV	ic turbidity	vunits (N	ITU)	75% of	values >	25 NTL	J					
		Water Supply, and Recreation         Parameter (Descriptions)       Result         Average Turbidity       98 nephelometric turbidity         Average True Color       166 units         Average Secchi Disk Depth       21 cm         Water Clarity Rating       poor         Trophic State Index       51         Trophic Class       eutrophic         Salinity       0.12 – 0.17 ppt         Specific Conductivity       253.8 – 353 µS/cm         pH       7.92 – 8.34 pH units         Oxidation-Reduction Potential       376 to 520 mV				75% of	values >	OWQS	of 70					
		Water Supply, and Recreation         Parameter (Descriptions)       Result         Average Turbidity       98 nephelometer         Average True Color       166 units         Average Secchi Disk Depth       21 cm         Water Clarity Rating       poor         Trophic State Index       51         Salinity       0.12 – 0.17 ppt         Specific Conductivity       253.8 – 353 µS         pH       7.92 – 8.34 pH												
		Notes       Water Supply and F         Parameter (Descriptions)       Result         Average Turbidity       98 million         Average True Cor       166 million         Average Secchi Disk Depth       21 cmillion         Average Secchi Disk Depth       51 million         Trophic State Index       51         Salinity       0.12         Specific Conductivity       253.8         pH       7.92         Oxidation-Reduction Potential       376 million         Dissolved Oxygen       10	poor											
		Trophic State In	Average Turbidity Average True Color Average Secchi Disk Depth Water Clarity Rating Trophic State Index Trophic Class Salinity Specific Conductivity pH Oxidation-Reduction Potential Dissolved Oxygen	51					Previou	s value =	= 52			
ers		oses Water Supply, a Parameter (Descriptions) Average Turbidity A verage True Color Average Secchi Disk Depth Water Clarity Rating Trophic State Index Trophic Class Salinity Specific Conductivity pH Oxidation-Reduction Potential Dissolved Oxygen	eutroph	nic										
Parameters		acity       861 acre feet         poses       Water Supply, and R         Parameter (Descriptions)       Result         Average Turbidity       98 ne         Average True Cor       166 u         Average Secchi Disk Depth       21 cm         Water Clarity Rating       poor         Trophic State International Class       51         Salinity       0.12 cm         Specific Conduction Potential       376 tm         Dissolved Oxygen       376 tm	0.12 –	0.17 ppt										
araı	<u>e</u>	a 148 acres Bacity 861 acre feet Vater Supply and R Parameter (Descriptions) Res Average Turbidity 98 m Average True Color 166 Average Secchi Disk Depth 21 c Vater Clarity Rating poor Trophic State Index 51 Trophic Class eutre Salinity 0.12 Specific Conductivity 253. pH 7.92 Oxidation-Reduction Potential 376 Dissolved Oxygen (14)	253.8 -	- 353 µS/	/cm									
Δ.	rofil	poundment       1936         aa       148 acres         pacity       861 acre feet         rboses       Water Supply, and R         Parameter (Descriptions)       Result         Average Turbidity       98 net         Average Turbidity       98 net         Average Turbidity       98 net         Average Turbidity       98 net         Average Secchi Disk Depth       21 cm         Water Clarity Rating       poor         Trophic State Index       51         Trophic Class       eutron         Salinity       0.12 -         Specific Conductivity       253.8         pH       7.92 -         Oxidation-Reduction Potential       376 te         Dissolved Oxygen       0.47 te	7.92 –	8.34 pH (	units			Neutral	to slightl	y alkalin	e			
	<b>L</b>	acity861 acre feetbosesWater Supply, andParameter (Descriptions)ReAverage Turbidity98Average True Cor16Average Secchi Disk Depth21Water Clarity RatingpoTrophic State Index51Trophic ClasseuSalinity0.1Specific Conductivity25pH7.5Oxidation-Reduction Potential37Dissolved Oxygen61	I 376 to	520 mV										
		Notes       Water Supply, and         Parameter (Descriptions)       Resolutions)         Average Turbidity       98         Average True Color       166         Average Secchi Disk Depth       21         Water Clarity Rating       poor         Trophic State Index       51         Salinity       0.11         Specific Conductivity       253         pH       7.91         Oxidation-Reduction Potential       376         Dissolved Oxygen       1						All valu	es >7 mg	g/L				
	S	Surface Total Ni	trogen	0.47 m	g/L to 1.1	19 mg/L								
	Nutrients	Surface Total Pr	nosphorus	0.029 r	ng/L to 0	.138 mg/L								
	NU	Nitrogen to Phos	sphorus Ratic	0 10:1					Phosph	orus limi	ted			
		<u>Click to learn m</u> <u>Beneficial Uses</u>	nore about	Turbidity	Hď	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
ses	Fisl	h & Wildlife Propa	gation	NS	S	S	S							
<b>Beneficial Uses</b>	Aes	sthetics						S	NS					
ficia	Agr	iculture								S	S	S		
ene	Prir	mary Body Contac	t Recreation										NEI	
m	Put	olic & Private Wate	er Supply											
	٨	S = Fully Supporting IS = Not Supporting IEI = Not Enough Int	formation	Notes										

## 

W	la	urika								Chip.	2	W	<ul> <li>Sampling</li> </ul>	Sites	
		Sample Perio	d		Times /isited	San	npling S	ites		7	Site 5	3			
[	Dece	ember 2012 - Ju	ly 2013		4		5		-		Site	4	1		
	Loc	ation	Jefferson C	coui	nty	Click r	nap for si	te data				Site 3	my		
5	Imp	oundment	1977			1						2 mil		7	
	Are	а	10,100 acr	es						Click Site Na	ames for	20	Site 2		
5	Cap	pacity	203,100 ac	re f	eet					Available	Data	J	Site	1 Surface	
	Pur	apacity 203,100 acre fe Flood Control, I Quality Control, Average Turbidity Average Secchi Disk Depth Water Clarity Rating Chlorophyll-a Trophic State Index Trophic Class Salinity Specific Conductivity pH Oxidation-Reduction Potential				ater	-	0 Miles	2		•	Site 1 Bottom			
		Quality Cor       Parameter (Descriptions)       Average Turbidity       Average Secchi Disk Depth       Water Clarity Rating       Chlorophyll-a       Trophic State Index       Trophic Class       Salinity       Specific Conductivity		Result		,		1	Notes/0	Commen	ts				
		Average TurbidityAverage Secchi Disk DepthWater Clarity RatingChlorophyll-aTrophic State IndexTrophic ClassSalinitySpecific Conductivity		57 NTL	J				56% of	values >	25 NTU				
		Parameter (Descriptions)         Average Turbidity         Average Secchi Disk Depth         Water Clarity Rating         Chlorophyll-a         Trophic State Index         Trophic Class         Salinity         Specific Conductivity         pH         Oxidation-Reduction Potential         Dissolved Oxygen         Surface Total Nitrogen		31 cm											
	Situ			Fair											
	In S				22 mg/ı	m3									
			dex		61					Previou	s value =	- 54			
2					Hypere	utrophic									
					0.30 – 0	).35 ppt									
5			tivity		621 – 7	22 µS/cr	n								
5	Profile				8.10 – 8	3.63 pH ι	units								
	ኯ		ction Potentia	al	11 to 38	30 mV									
		Dissolved Oxyge	en							All data level of		ample y	ear below	the scre	ening
	ts	Surface Total Ni	trogen		0.90 mg	g/L to 1.8	89 mg/L								
	utrients	Surface Total Ph	nosphorus		0.028 n	ng/L to 0	.281 mg/L								
	NU	Nitrogen to Phos	sphorus Ratio	D	13:1					Phosph	orus limit	ted			
		<u>Click to learn m</u> Beneficial Uses	nore about		Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
	Fisł	n & Wildlife Propa	gation		NS	S	S	S							
	Aes	sthetics							*	S					
5	Agr	iculture									S	S	S		
	Prin	nary Body Contac	t Recreation											S	
D	Pub	olic & Private Wate	er Supply												NS
	N	= Fully Supporting IS = Not Supporting IEI = Not Enough Int	formation	Notes	*No long	er collect	for this par	rameter							
S/c	m = n	phelometric turbidity nicrosiemens per ce scherichia coli	entimeter mV	= n	= Oklahol nillivolts = Chloro		Quality Sta	andards		= milligram n = microsie			t = parts pe = Enteroco		d

del

W	/a	xhoma	l						<ul> <li>Samplin</li> </ul>	ng Sites			51	
		Sample Perio	d	Times Visited	San	npling S	ites						5	
C	Octob	ber 2005 – Augu	ıst 2006	4		3				/				
	Loc	cation	Osage Cou	unty	Click r	nap for si	te data							
ସ	Imp	oundment	1955					•			•			
General	Are	a	197 acres					•				}		
မီ	Cap	pacity	2,100 acre-	feet				-	•		کے			
	Pur	rposes	Water Supp	oly, Recreati	on								0 1/8 Miles	
		Parameter (Des	scriptions)	Result					Notes/	Commen	ts			
		pH6.77 – 8.77 pH unitsOxidation-Reduction Potential135 – 438 mV				100% c	of values	< OWQS	6 of 25 NT	U				
		Average True Color       18 units         Average Secchi Disk Depth       153 cm         Water Clarity Rating       excellent         Trophic State Index       45         Trophic Class       mesotrophic         Salinity       0.09 – 0.11 ppt         Specific Conductivity       187.6 – 231.6 µS/cm         pH       6.77 – 8.77 pH units         Oxidation-Reduction Potential       135 – 438 mV         Dissolved Oxygen       Up to 62% of water comparison				100% c	of values	< OWQS	6 of 70					
		Average Turbidity       5 NTU         Average True Color       18 units         Average Secchi Disk Depth       153 cm         Water Clarity Rating       excellent         Trophic State Index       45         Trophic Class       mesotrophic         Salinity       0.09 – 0.11 ppt         Specific Conductivity       187.6 – 231.6 µS/c         pH       6.77 – 8.77 pH unit         Oxidation-Reduction Potential       135 – 438 mV         Dissolved Oxygen       Up to 62% of water         Surface Total Nitrogen       0.15 mg/L to 0.49 mg/L												
		Capacity       2,100 acre-feet         Purposes       Water Supply, Recreation         Parameter (Descriptions)       Result         Average Turbidity       5 NTU         Average True Color       18 units         Average Secchi Disk Depth       153 cm         Water Clarity Rating       excellent         Trophic State Index       45         Trophic Class       mesotrophic         Salinity       0.09 – 0.11 pp         Specific Conductivity       187.6 – 231.6         pH       6.77 – 8.77 pf         Oxidation-Reduction Potential       135 – 438 mV         Dissolved Ovvren       Up to 62% of v	nt											
ຽ			ophic											
Parameters			0.11 ppt											
aran	đ		231.6 µ	S/cm										
å	ofile		8.77 pH	units			Neutral	to slightl	y alkalin	е				
	đ		38 mV											
		Dissolved Oxyge	en		2% of wa	ater colum	nn < 2 m	g/L in						
	s	Surface Total Ni	trogen	0.15 m	g/L to 0.4	l9 mg/L								
	trient	Surface Total Pr	nosphorus	0.011m	g/L to 0.	023 mg/L								
	NC	Nitrogen to Phos	sphorus Ratic	0 14:1					Phosph	norus limit	ted			
		<u>Click to learn m</u> <u>Beneficial Uses</u>	nore about	Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
ses	Fisl	h & Wildlife Propa	gation	S	S	NS	S							
Beneficial Uses	Aes	sthetics						S	S					
ficia	Agr	riculture								NS *	S	S		
ene	Prir	mary Body Contac	t Recreation										S	
ñ	Pub	olic & Private Wate	er Supply											
	٨	S = Fully Supporting VS = Not Supporting VEI = Not Enough Inf	formation	10	-	5-2006 four 0AC 785:	-		eneficial us	se not sup	ported ba	sed on nun	nerical crit	eria for
μS/c	m = r	phelometric turbidity microsiemens per ce Escherichia coli	entimeter mV	'QS = Oklaho = millivolts or-a = Chloro		Quality Sta	andards		= milligram n = microsi			t = parts pe = Enteroce		d

Λ	la	yne W	allac	e					Z	Site 3		● Sam	pling Sites	
		Sample Perio	d	Times Visited	Sar	npling S	ites			-	Site 5			
F	ebr	uary 2012 – Augu	ıst 2012	4		5					• Site 2			
	Loc	ation	Latimer Co	unty	Click	map for sit	e data			本田	Sile 2			
	Imp	oundment	1969					-	CELLE		Site	e 4		
	Are	а	94 acres					-	Click Site I Availab		2			
	Cap	pacity	1,746 acre	feet				-			•	Site 1 Surface	0 1/8 Miles	
	Pur	poses	Flood Cont	ol and Rec	reation						Site 1 E	Bottom	Miles	
Ì		Parameter (Des	scriptions)	Resul	t				Notes/	Commer	nts			
ľ		Average Turbidi	ty	6 NTU					100% c	of values	< OWQS	S of 25 NT	U (n=6)	
		Average TurbiditySTNTOAverage Secchi Disk Depth115 cmWater Clarity RatingExcellentChlorophyll-a27 mg/m3Trophic State Index63Trophic ClassHypereutrophicSalinity0.02 – 0.07 pptSpecific Conductivity56 – 153.5 µS/cm												
ľ		Water Clarity RatingExcellentChlorophyll-a27 mg/m3Trophic State Index63Trophic ClassHypereutrophicSalinity0.02 – 0.07 pptSpecific Conductivity56 – 153.5 µS/cr												
		Average Secchi Disk Depth115 cmWater Clarity RatingExcellentChlorophyll-a27 mg/m3Trophic State Index63Trophic ClassHypereutrophSalinity0.02 – 0.07 pr	/m3											
		Trophic State In	Water Clarity RatingExcelChlorophyll-a27 mTrophic State Index63Frophic ClassHypeSalinity0.02 -Specific Conductivity56OH6.11 -					Previou	s value =	= 48				
		Trophic Class		Hyper	eutrophic									
		Parameter (Descriptions)       Result         Average Turbidity       6 NTU         Average Turbidity       115 cm         Average Secchi Disk Depth       115 cm         Water Clarity Rating       Excellent         Chlorophyll-a       27 mg/m         Trophic State Index       63         Salinity       0.02 - 0.         Specific Conductivity       56 - 153         pH       6.11 - 9.         Oxidation-Reduction Potential       51 to 484	0.07 ppt											
		Specific Conduc	Flood Control and Recruptions)Resultverage Turbidity6 NTUverage Turbidity6 NTUverage Turbidity6 NTUverage Secchi Disk Depth115 cmVater Clarity RatingExcellerchlorophyll-a27 mg/rchlorophyll-a63rophic State Index63rophic ClassHyperercalinity0.02 - 0calinity56 - 15H6.11 - 9oxidation-Reduction Potential51 to 48up to 6	53.5 µS/c	m									
	Profile	oses       Flood Control and Recr         Parameter (Descriptions)       Result         Average Turbidity       6 NTU         Average Secchi Disk Depth       115 cm         Water Clarity Rating       Excelle         Chlorophyll-a       27 mg/         Trophic State Index       63         Trophic Class       Hypere         Salinity       0.02 − 0         Specific Conductivity       56 − 15         pH       6.11 − 9         Oxidation-Reduction Potential       51 to 44         Dissolved Ovygen       Up to 6	9.4 pH u	nits			14.5%	of record	ed value	s are < 6.	5 pH unit	s		
	ሻ		84 mV											
		Average Turbidity Average Secchi Disk Depth Water Clarity Rating Chlorophyll-a Trophic State Index Trophic Class Salinity Specific Conductivity pH Oxidation-Reduction Poten Dissolved Oxygen	en			ater colum	n < 2 m	g/L in						
	S	Surface Total N	itrogen	0.48 m	ig/L to 0.8	59 mg/L								
	Nutrients	Surface Total Pl	hosphorus	0.005	mg/L to 0	.014 mg/L								
	Nui	Nitrogen to Pho	sphorus Ratio	74:1					Phosph	orus limi	ted			
		<u>Click to learn n</u> <u>Beneficial Uses</u>		Turbidity	Hď	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	
	Fish	n & Wildlife Propa	gation	S	NS	*	S							
	Aes	thetics						NS	N/A					
	Agr	iculture								N/A	N/A	S		
	Prin	nary Body Contac	ct Recreation										S	
	Pub	olic & Private Wate	er Supply											
	Ν	= Fully Supporting IS = Not Supporting IEI = Not Enough In		soluble therefo	bedrock. I re the Wat	nditions are Due to thes ter Board is tion of the s	e conditio looking a	ons it is lik t the appl	ely that the	low pH v developing	alues may g site-spe	y be due to	natural ca	uses
'cı	n = n	phelometric turbidity nicrosiemens per ce scherichia coli	entimeter mV	'QS = Oklaho = millivolts or-a = Chlor	oma Water			mg/L	= milligram n = microsi	s per liter	рр	t = parts pe = Enteroco		d

Λ	/e	bbers	Falls	5					e Names fo able Data	Der	K	• Sam	pling Sites	
		Sample Period	1	Times Visited	Sa	mpling Si	tes		2					
Ν	love	mber 2010 – Augi	ust 2011	4		6		-				~ ~ ~		
	Loc	ation	Muskogee	County	Click	map for si	te data	-						
3	Imp	oundment	170									Site 5	oite 6	
	Are	а	11,600 acre	es				1				Site 4		
3	Cap	pacity	170,100 ac	re-feet								and the	Site 2	
	Pur	poses	Navigation,	Hydropowe	r				0 Mil	5 es		Site 3	Site 1 Site 1 E	
		Parameter (Des	scriptions)	Result					Notes/	Commen	its			
		Average Turbidi	ty	13 NTL	J				100% o	of values	< OWQ	S of 25 NT	U (n=17)	
		Average Secchi	Disk Depth	63 cm										
	In-Situ	Water Clarity Ra	ating	Averag	е									
	ln-0	Chlorophyll-a		27 mg/	m3									
		Trophic State In	Trophic Class     Hype       Salinity     0.21						Previou	us value =	= 55			
		Trophic Class	Trophic Class Salinity Specific Conductivity											
		Salinity	Trophic State Index63Trophic ClassHypereutroSalinity0.21 - 0.75Specific Conductivity422.1 - 145		0.79 ppt									
	c)	Specific Conduc			1490 µS	s/cm								
	Profile	Trophic State Index63Trophic ClassHypereutroph		9.07 pH	units			0.45%	of Values	s > 9 pH	units			
	Ē	Oxidation-Reduc	ction Potentia	l 276 - 4	58 mV									
		Dissolved Oxyge	en	All data mg/L	are abo	ve screen	ing level	of 2.0						
	Ś	Surface Total Ni	itrogen	0.38 m	g/L to 1.3	3 mg/L								
	Nutrients	Surface Total Pl	nosphorus	0.101 n	ng/L to 0	.166 mg/L								
	Nut	Nitrogen to Phos	sphorus Ratio	7:1					Phosph	norus limi	ted, pos	sibly co-lir	nited	
		<u>Click to learn</u> <u>Beneficial Uses</u>	n more abou	Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
	Fisł	n & Wildlife Propa	gation	NEI	S	S	S							
	Aes	sthetics						S	*					
	Agr	iculture								S	S	S		
		mary Body Contac											NEI	
	Pub	olic & Private Wate	er Supply											
	Λ	S = Fully Supporting IS = Not Supporting IEI = Not Enough In				the turbidit						VP benefici	al use can	not be
'cı	m = n	phelometric turbidity nicrosiemens per ce Escherichia coli	entimeter mV	'QS = Oklaho = millivolts or-a = Chloro		Quality Sta	andards			ns per liter iemens/cm		ot = parts pe n = Enteroco		d

W	le	s Watl	kins						<ul> <li>Samplir</li> <li>Names for</li> </ul>	ig Sites				
		Sample Perio	d	Times	Sar	npling S	ites	Availa	able Data		- Contraction of the second se			
Ν	love	• mber 2010 – Ju		Visited 3		5					Site 4	Site 2	Sit	e 1 Surface
	Loc	cation	Pottawatom	ie Countv	Click r	map for sit	te data		*	Site 3	7,5	)m		e 1 Bottom
=		ooundment	1997					-	pr	Site 5	1			
General	Are		1,142 acres	;				-						
Gel	Ca	pacity	14,065 acre	e-feet				-						
	Pur	rposes	Water Supp	ly, Recreati	on, Flood	d Control						0	1 Miles	
		Parameter (Des		Result					Notes/	Commen	its			
				18 NTL	J				16% of	values >	OWQS	of 25 NTL	J	
	Average Turbidity       18 NTU         Average Secchi Disk Depth       65 cm         Water Clarity Rating       Good         Chlorophyll-a       13 mg/m3         Trophic State Index       56         Trophic Class       Eutrophic         Salinity       0.11 – 0.16 ppt         Specific Conductivity       231.5 – 336.1 µS/cm													
	Average Secchi Disk Depth65 cmWater Clarity RatingGoodChlorophyll-a13 mg/m3Trophic State Index56Trophic ClassEutrophicSalinity0.11 – 0.16 ppt													
	Average Secchi Disk Depth       65 cm         Water Clarity Rating       Good         Chlorophyll-a       13 mg/m3         Trophic State Index       56         Trophic Class       Eutrophic         Salinity       0.11 – 0.16 ppt         Specific Conductivity       231.5 – 336.1 uS/cm													
		Average Turbidity       18 NTU         Average Secchi Disk Depth       65 cm         Water Clarity Rating       Good         Chlorophyll-a       13 mg/m3         Trophic State Index       56         Trophic Class       Eutrophic         Salinity       0.11 – 0.16 ppt				Previou	s Values	= 53						
ຽ		Average Secchi Disk Depth65 cmWater Clarity RatingGoodChlorophyll-a13 mgTrophic State Index56Trophic ClassEutropSalinity0.11 -Specific Conductivity231.5pH6.91 -	Eutroph	nic										
Parameters	Average Turbidity       18 NTU         Average Secchi Disk Depth       65 cm         Water Clarity Rating       Good         Chlorophyll-a       13 mg/m3         Trophic State Index       56         Trophic Class       Eutrophic         Salinity       0.11 – 0.16 ppt													
aran	Water Supply, Recreation, Flood Con         Parameter (Descriptions)       Result         Average Turbidity       18 NTU         Average Secchi Disk Depth       65 cm         Water Clarity Rating       Good         Chlorophyll-a       13 mg/m3         Trophic State Index       56         Salinity       0.11 – 0.16 ppt         Specific Conductivity       231.5 – 336.1 µS/cm	S/cm												
å	Parameter (Descriptions)ResultAverage Turbidity18 NTUAverage Secchi Disk Depth65 cmWater Clarity RatingGoodChlorophyll-a13 mg/m3Trophic State Index56Trophic ClassEutrophicSalinity0.11 – 0.16 pptSpecific Conductivity231.5 – 336.1 µS/cmpH6.91 – 8.83 pH units	units												
	Ē	Oxidation-Reduc	ction Potentia	l 18 - 45	9 mV									
		Dissolved Oxyge	en	Up to 4	5 % < 2	mg/L in su	ummer							
	S	Surface Total Ni	trogen	0.69 mg	g/L to 1.1	2 mg/L								
	rients	Surface Total Ph	nosphorus	0.033 n	ng/L to 0	.050 mg/L								
	Nutrie	Nitrogen to Phos	sphorus Ratio	25:1					Phosph	orus limit	ted			
		<u>Click to learn</u> <u>Beneficial Uses</u>	n more abou	Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
ses	Fis	h & Wildlife Propa	gation	S*	S	S	S							
Beneficial Uses	Aes	sthetics						S	*					
fici	Agr	riculture								*	*	S		
ene	Prir	mary Body Contac	t Recreation										NEI	
m	Pu	blic & Private Wate	er Supply											
	Λ	S = Fully Supporting NS = Not Supporting NEI = Not Enough Int	formation									ts this is lik eneficial use		ample
μS/c	m = r	phelometric turbidity microsiemens per ce Escherichia coli	entimeter mV	QS = Oklahol = millivolts pr-a = Chloro		Quality Sta	andards		= milligram n = microsi			t = parts pe = Enteroco		1

## Wetumka

										5	E .		
		Sample Period	d	Times Visited	San	npling S	lites				- And	· ····	
	Oct	ober 2006 - July	2007	4		3							
	Loc	ation	Hughes Co	unty	Click r	map for si	te data						1
ସ୍ଥ	Imp	oundment	1939									7	2
General	Are	a	169 acres										
ອັ	Cap	pacity	1839 acre-f	eet									
	Pur	poses	Water Supp	ply, Recreat	ion					~~~~	- water	water	with the
		Parameter (Des	criptions)	Result						Notes/	Notes/Commer	Notes/Comments	Notes/Comments
		Average Turbidit	ty	18 NTL	J					8% of v	8% of values >	8% of values >OWQS or	8% of values >OWQS of 25 NTU
		Average True Co	olor	58 units	5					58% of	58% of values a	58% of values > OWQS	58% of values > OWQS of 70
		Average Secchi	Disk Depth	59 cm									
		Water Clarity Ra	iting	fair									
		· ·	dex	53									
ers		acity 169 acres	eutroph	nic									
met		acity 1839 acre-fee Noses 1839 acre-fee Water Suppl Parameter (Descriptions) Average Turbidity Average True Corright Average Secchi Disk Depth Water Clarity Rating Trophic State Index Trophic Class	0.03 - 0	0.08 ppt									
Parameters	e	169 acresacity1839 acre-feosesWater SuppParameter (Descriptions)Average TurbidityAverage TurbidityAverage True ColorAverage Secchi Disk DepthWater Clarity RatingTrophic State IndexTrophic ClassSalinitySpecific Conductivity	92.4 - 7	173.3 µS	/cm								
<b>L</b>	Profile	рН		6.49 –	7.90 pH	units				Only 2	Only 2 values <	Only 2 values < 6.5 pH u	Only 2 values < 6.5 pH units
	ш	Oxidation-Reduc	ction Potentia					~ '	1 :	1 :	1 :	1 1	1 1
		Dissolved Oxyge	en	Up to 6 July	7 % OT Wa	ater colun	m < 2 m	y/I	Lin	L IN Occurr	Occurred at site	Occurred at site 1, the d	C CCUITED AT SITE 1, the dam
	ţs	Surface Total Ni	trogen	0.52 m	g/L to 1.3	35 mg/L							
	Nutrients	Surface Total Ph	nosphorus	0.022 n	ng/L to 0	.088 mg/l	_						
	Nut	Nitrogen to Phos	sphorus Ratio	0 13:1						Phosph	Phosphorus limi	Phosphorus limited	Phosphorus limited
		<u>Click to learn m</u> <u>Beneficial Uses</u>	nore about	Turbidity	Hđ	Dissolved Oxygen	Metals		TSI	TSI True Color	TSI True Color Sulfates	TSI True Color Sulfates Chlorides	TSI True Color Sulfates Chlorides Chlorides Total Dissolved Solids
Beneficial Uses	Fisł	h & Wildlife Propa	gation	S	S	NS	S						
al U	Aes	sthetics							S	S NS	S NS	S NS	S NS
₿fici	Agr	iculture									S	S S	S S S
ene	Prir	mary Body Contac	t Recreation										
B	Pub	olic & Private Wate	er Supply										

The PBCR cannot be assessed as minimum data requirements were not met due to QA/QC issues for Notes fecal coliform and enterococci. NEI = Not Enough Information

*NTU* = *nephelometric turbidity units* OWQS = Oklahoma Water Quality Standards  $\mu$ S/cm = microsiemens per centimeter *mV* = *millivolts* E. coli = Escherichia coli Chlor-a = Chlorophyll-a

S = Fully Supporting NS = Not Supporting

*mg/L* = *milligrams per liter*  $\mu$ S/cm = microsiemens/cm

Sampling Sites

*ppt* = *parts per thousand* En = Enterococci

Chlor-a

1/4

		woka										35		
		Sample Perio	d	Times Visited	Sar	npling S	lites				)			
N	over	nber 2008 - Aug	ust 2009	4		3					all	$\overline{)}$		
	Loc	cation	Seminole C	ounty	Click r	nap for si	te data			2	•			
	Imp	ooundment	1925							S	~			
	Are	a	371 acres							2	2			
	Cap	pacity	3,301 acre-f	eet							3		10	
	Pur	rposes	Water Supp	oly, Recreat	ion							0	1/2 Miles	
		Parameter (Des	scriptions)	Result					Notes/	Commen	its			
		Average Turbidi	ty	31 NTL	J				58% of	values >	OWQS	of 25 NTL	J (n=12)	
		Average True C	olor						Did not	collect fo	or true co	olor		
		Average Secchi	Disk Depth	33 cm										
		Water Clarity Ra	ating	Averag	е									
		Trophic State Index       56         Trophic Class       Eutrophic         Salinity       0.08 – 0.12 ppt         Specific Conductivity       135 – 254.1 µS/cm							Previou	s value =	55			
Water Clarity Rating     Average       Trophic State Index     56       Trophic Class     Eutrophic       Salinity     0.08 – 0.12 ppt       Specific Conductivity     135 – 254.1 µS/cm														
	/cm													
	Average Secchi Disk Depth33 cmWater Clarity RatingAverageTrophic State Index56Trophic ClassEutrophicSalinity0.08 – 0.12 ppt	units												
	Ē	Oxidation-Redu	ction Potentia											
		Dissolved Oxyg	en	Up to 2 August		ater colum	n < 2.0 ו	ng/L in						
	nts	Surface Total N	itrogen	0.58 mg	g/L to 0.8	88 mg/L								
	Nutrient	Surface Total Pl	nosphorus	0.016 n	ng/L to 0	.078 mg/L	_							
	Nut	Nitrogen to Pho	sphorus Ratio	16:1					Phosph	orus limi	ted			
		<u>Click to learn n</u> <u>Beneficial Uses</u>	nore about	Turbidity	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	į
	Fis	h & Wildlife Propa	gation	NS	S	S	*							
	Aes	sthetics						S	*					
	Agr	riculture								*	*	S		
	Prir	mary Body Contac	t Recreation										S	
	Put	olic & Private Wate	er Supply											
	Λ	S = Fully Supporting NS = Not Supporting NEI = Not Enough In	formation	*Did not	collect for	r these par	ameters							

	st 2013 McClain Cour 1971 302 acres 2,086 acre fee Water Supply, scriptions) ty Disk Depth ating	et	Click r	npling S 4 map for sit	e data			commen values >		Site 3 •	1/4 Miles	
Decation   apoundment   rea   apacity   urposes   Parameter (Desting Rate)   Average Turbidi   Average Secchi   Water Clarity Rate   Chlorophyll-a   Trophic State In   Trophic Class	McClain Cour 1971 302 acres 2,086 acre fee Water Supply, scriptions) ty Disk Depth ating	et Flood Co Result 36 NTL 27 cm Poor 17 mg/	ontrol, an J	map for sit			Site 1 Surfa Site 1 Bo e Names for able Data Notes/(	ce tom	• Site 2	<u></u>	1/4 Miles	
Pool   rea   apacity   urposes   Parameter (Des   Average Turbidi   Average Secchi   Water Clarity Ra   Chlorophyll-a   Trophic State In   Trophic Class	1971 302 acres 2,086 acre fee Water Supply, scriptions) ty Disk Depth ating	et Flood Co Result 36 NTL 27 cm Poor 17 mg/	ontrol, an J				Site 1 Surfa Site 1 Bo e Names for able Data Notes/(		nts	<u></u>	1/4 Miles	
rea apacity urposes Average Turbidi Average Secchi Water Clarity Ra Chlorophyll-a Trophic State In Trophic Class	302 acres 2,086 acre fee Water Supply, scriptions) ty Disk Depth ating	Result 36 NTL 27 cm Poor 17 mg/	J	ld Recrea	tion		Site 1 Surfa Site 1 Bo e Names for able Data Notes/(		nts	0	1/4 Miles	
apacity urposes Average Turbidi Average Secchi Water Clarity Ra Chlorophyll-a Trophic State In Trophic Class	2,086 acre fee Water Supply, scriptions) ty Disk Depth ating	Result 36 NTL 27 cm Poor 17 mg/	J	ld Recrea	tion		Site 1 Surfa Site 1 Bo e Names for able Data Notes/(		nts	<u></u>	1/4 Miles	
Parameter (Dest         Average Turbidi         Average Secchi         Water Clarity Rate         Chlorophyll-a         Trophic State In         Trophic Class	Water Supply, scriptions) ty Disk Depth ating	Result 36 NTL 27 cm Poor 17 mg/	J	ld Recrea	lion		able Data			0	1/4 Miles	
Parameter (Dest         Average Turbidi         Average Secchi         Water Clarity Rate         Chlorophyll-a         Trophic State In         Trophic Class	ty Disk Depth ating	Result36 NTL27 cmPoor17 mg/	J	id Recrea	tion		able Data			1	Miles	
Average Turbidi Average Secchi Water Clarity Ra Chlorophyll-a Trophic State In Trophic Class	ty Disk Depth ating	36 NTU 27 cm Poor 17 mg/	J									
Average Secchi Water Clarity Ra Chlorophyll-a Trophic State In Trophic Class	Disk Depth ating	27 cm Poor 17 mg/					54% of	values >	25 NTU			
Water Clarity Ra Chlorophyll-a Trophic State In Trophic Class	ating	Poor 17 mg/	m3							, 		
Chlorophyll-a Trophic State In Trophic Class		17 mg/	m3									
Chlorophyll-a Trophic State In Trophic Class	dex		m3									
Trophic Class	dex	58	1113									
-							Previou	s value =	= 51			
Salinity	erage Secchi Disk Depth ter Clarity Rating orophyll-a phic State Index phic Class inity ecific Conductivity	Eutroph	nic									
,		0.16 – 0	0.26 ppt									
Specific Conduc	ctivity	347 – 5	533 µS/cr	n								
pH		6.88 – 8	8.58 pH (	units			Neutral	to slightl	y alkalin	e		
Oxidation-Redu	ction Potential	86 to 32	20 mV									
Dissolved Oxyge	en	Up to 4 August		ater colum	in < 2 m	g/L in	Occurre	d at site	4			
Surface Total Ni	itrogen	0.85 mg	g/L to 1.6	62 mg/L								
	hosphorus	0.074 n	ng/L to 0	.176 mg/L								
Nitrogen to Phos	sphorus Ratio	12:1					Phosph	orus limi	ted			
<u>Click to learn m</u> <u>Beneficial Uses</u>	nore about	Turbidity	Hď	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	
sh & Wildlife Propa	gation	NS	S	S	S							
esthetics						S	*					
griculture								S	S	S		
rimary Body Contac	ct Recreation										S	
ublic & Private Wate	er Supply											
S = Fully Supporting NS = Not Supporting NEI = Not Enough In	formation Second	•	No long	er collect fo	or this par	ameter						
s e g ri u	Dissolved Oxyg Surface Total N Surface Total Pl Nitrogen to Phot <u>Click to learn n</u> <u>Beneficial Uses</u> th & Wildlife Propa sthetics riculture mary Body Contact blic & Private Wate S = Fully Supporting NS = Not Supporting NS = Not Supporting	th & Wildlife Propagation sthetics riculture mary Body Contact Recreation blic & Private Water Supply S = Fully Supporting NS = Not Supporting NEI = Not Enough Information Sephelometric turbidity units microsiemens per centimeter ME = V	Dissolved Oxygen       Up to 4 August         Surface Total Nitrogen       0.85 m         Surface Total Phosphorus       0.074 r         Nitrogen to Phosphorus Ratio       12:1         Click to learn more about Beneficial Uses       Pig gg         th & Wildlife Propagation       NS         sthetics       NS         riculture       Mage         mary Body Contact Recreation       S         blic & Private Water Supply       S         S = Fully Supporting NEI = Not Enough Information       S         exphelometric turbidity units microsiemens per centimeter       OWQS = Oklaho mV = millivolts	Dissolved Oxygen       Up to 40% of ware August         Surface Total Nitrogen       0.85 mg/L to 1.6         Surface Total Phosphorus       0.074 mg/L to 0         Nitrogen to Phosphorus Ratio       12:1         Click to learn more about Beneficial Uses       Image: Click to learn more about Beneficial Uses         Sth & Wildlife Propagation       NS         Sthetics       Image: Click Propagation         Sthetics       Image: C	Dissolved Oxygen       Up to 40% of water colum August         Surface Total Nitrogen       0.85 mg/L to 1.62 mg/L         Surface Total Phosphorus       0.074 mg/L to 0.176 mg/L         Nitrogen to Phosphorus Ratio       12:1         Click to learn more about Beneficial Uses       Image: Column and transformation       Image: Column and transformation       Image: Column and transformation         A Wildlife Propagation       NS       S       S         sthetics       Image: Column and transformation       Image: Column and transformation       Image: Column and transformation         S = Fully Supporting WEI = Not Enough Information       Image: Column and transformation       Image: Column and transformation       Image: Column and transformation         OWQS = Oklahoma Water Quality State microsiemens per centimeter       OWQS = Oklahoma Water Quality State	Dissolved OxygenUp to 40% of water column < 2 ma AugustSurface Total Nitrogen $0.85 \text{ mg/L}$ to $1.62 \text{ mg/L}$ Surface Total Phosphorus $0.074 \text{ mg/L}$ to $0.176 \text{ mg/L}$ Nitrogen to Phosphorus Ratio $12:1$ Lick to learn more about Beneficial Uses $\frac{Click to learn more aboutBeneficial Uses\frac{1}{12}\frac{Click to learn more aboutBeneficial Uses\frac{1}{12}Click to learn more $	Dissolved OxygenUp to 40% of water column < 2 mg/L in AugustSurface Total Nitrogen0.85 mg/L to 1.62 mg/LSurface Total Phosphorus0.074 mg/L to 0.176 mg/LNitrogen to Phosphorus Ratio12:1Click to learn more about Beneficial Uses $iging H = H = H = H = H = H = H = H = H = H $	Dissolved OxygenUp to 40% of water column < 2 mg/L in AugustOccurrent OccurrentSurface Total Nitrogen0.85 mg/L to 1.62 mg/LSurface Total Phosphorus0.074 mg/L to 0.176 mg/LNitrogen to Phosphorus Ratio12:1Phosph	Dissolved OxygenUp to 40% of water column < 2 mg/L in AugustOccurred at siteSurface Total Nitrogen0.85 mg/L to 1.62 mg/L $V = 1.62 mg/L$ Surface Total Phosphorus0.074 mg/L to 0.176 mg/L $V = 1.62 mg/L$ Nitrogen to Phosphorus Ratio12:1Phosphorus limitClick to learn more about Beneficial Uses $V = 1.62 mg/L$ $V = 1.62 mg/L$ Nitrogen to Phosphorus Ratio12:1Phosphorus limitClick to learn more about Beneficial Uses $V = 1.62 mg/L$ $V = 1.62 mg/L$ NSSSSSstheticsIIIricultureIIISSSSmary Body Contact Recreation blic & Private Water SupplySIS = Fully Supporting VE = Not Supporting VE = Not Supporting VE = Not Supporting VE = Not Supporting VE = Not Supporting VE = Not Supporting VE = Not Supporting VE = millivoltsSmg/L = milligrams per liter mV = millivolts	Dissolved OxygenUp to 40% of water column < 2 mg/L in AugustOccurred at site 4Surface Total Nitrogen0.85 mg/L to 1.62 mg/L $V = V = V = V = V = V = V = V = V = V =$	Dissolved OxygenUp to 40% of water column < 2 mg/L in AugustOccurred at site 4Surface Total Nitrogen0.85 mg/L to 1.62 mg/L $V = V = V = V = V = V = V = V = V = V =$	Dissolved OxygenUp to 40% of water column < 2 mg/L in AugustOccurred at site 4Surface Total Nitrogen0.85 mg/L to 1.62 mg/L $V = V = V = V = V = V = V = V = V = V =$

Wister								Sampling Sites									
Sample Period Times Sampling Sites							Site 2 Site 1 Surface Site 3 Site 1 Bottom										
November 2012 – July 2013			4		5		Site 4										
General	Location LeFlore Count		unty	ty Click map for site data				Jun 2 Ware									
	Impoundment 1949				CI				Click Site Names for								
	Are	а	7,333 acres	6					Available Data								
	Capacity 62,360 acre fe			e feet	et					<b> 王 田 </b>			2				
	Pur	poses		rol, Water So and Conse		ow flow			e de la constante de la consta				Miles				
		Parameter (Descriptions)		Result	Result					Notes/Comments							
	In-Situ	Average Turbidity		23 NTU	23 NTU				50% of values < OWQS 25 NTU								
		Average Secchi Disk Depth		39 cm	39 cm												
		Water Clarity Rating		Fair	Fair												
		Chlorophyll-a		19 mg/	19 mg/m3												
		Trophic State Index		60	60				Previous value = 57								
S		Trophic Class		Eutroph	Eutrophic												
nete		Salinity		0.04 -	0.09 ppt												
Parameters	e	Specific Conductivity		94 – 19	94 – 191 µS/cm												
Ĩ	Profile	рН		5.80 –	5.80 – 8.63 pH units				24.1 % of Values < 6.5 pH units								
		Oxidation-Reduction Potential			15 to 450 mV												
		Dissolved Oxygen		Up to 5 spring	Up to 50% of water column < 2.0 mg/L in spring												
	utrients	Surface Total Nitrogen		0.45 m	0.45 mg/L to 1.24 mg/L												
		Surface Total Phosphorus		0.008 n	0.008 mg/L to 0.065 mg/L												
	Ň	Nitrogen to Phos	trogen to Phosphorus Ratio		24:1					Phosphorus limited							
Beneficial Uses		<u>Click to learn m</u> <u>Beneficial Uses</u>	nore about	Turbidity	Hď	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a			
	Fish & Wildlife Propagation			NS	NS	NS	S								Ē .		
	Aesthetics							NS*	*						1		
	Agriculture									S	S	S					
	Primary Body Contact Recreation												NEI				
	Public & Private Water Supply													NS			

S = Fully Supporting *NS* = *Not Supporting* 

NEI = Not Enough Information *NTU* = *nephelometric turbidity units* 

 $\mu$ S/cm = microsiemens per centimeter

E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards *mV* = *millivolts* Chlor-a = Chlorophyll-a

Notes

*mg/L* = *milligrams* per liter  $\mu$ Š/cm = microsiemens/cm

\*Did not collect for these parameters. \*Currently, the lake is listed as a Nutrient Limited Watershed (NLW)

in the Oklahoma Water Quality Standards (WQS). This listing means that the lake is considered threatened

from nutrients until a more intensive study can confirm the Aesthetics beneficial use non-support status.

ppt = parts per thousand En = Enterococci

Λ	/	R. Holy	way						<ul> <li>Names for ble Data</li> <li>Samplir</li> </ul>	ng Sites Site 1 Surface		~ ו	Site 3		
		Sample Peric	od	Times Visited	Sar	npling S	ites			Site 1 Bottom			R		
March 2011 – September 2011 4						5		Site 4							
	Location Mayes Count			nty	Click I	map for sit	e data			S	ite 2	Ly I			
Impoundment 1968							3		7						
	Area 712 acres									7					
ľ	Capacity 48,000 acre-fe			e-feet	et						2	0	1/2		
Purposes Water Supply,				ply, Hydropo	, Hydropower, Recreation						1 -	_	Miles		
Parameter (Descriptions)			Result	Result					Notes/Comments						
		Average Turbid	4 NTU	4 NTU					100% of Values < OWQS of 25						
		Average Secchi Disk Depth		198 cm	198 cm										
	situ	Water Clarity Rating		Excelle	Excellent										
	In-Situ	Chlorophyll-a		13 mg/i	13 mg/m3										
		Trophic State Index		56	56					Previous Value= 58					
		Trophic Class		Eutroph	Eutrophic										
		Salinity		0.10 - 0	0.10 – 0.14 ppt										
	<i>~</i>	Specific Condu	215.4 -	215.4 - 283 µS/cm											
	Profile	рН		7.10 – 9	7.10 – 9.01 pH units					0.30% of Values > 9 pH units					
	ሻ	Oxidation-Reduction Potential		I 308 to 0	308 to 600 mV										
		Dissolved Oxygen			Up to 45% of water column < 2 mg/L in summer										
	s	Surface Total N	0.45 m	0.45 mg/L to 1.18 mg/L											
	Nutrient	Surface Total Phosphorus		0.051 n	0.051 mg/L to 0.066 mg/L										
	Nut	Nitrogen to Phosphorus Ratio			14:1					Phosphorus limited					
		<u>Click to learn</u> Beneficial Uses		t	Hd	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli		
	Fisł	n & Wildlife Propa	S	S	S	S									
	Aes	sthetics					S	*							
	Agr	iculture								*	*	S			
	Primary Body Contact Recreation												NEI		
	Pub	olic & Private Wat	ter Supply												
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information*Did not collect for these part						ameters								
cr	n = n	phelometric turbidit nicrosiemens per c scherichia coli	entimeter mV	'QS = Oklaho = millivolts or-a = Chloro		Quality Sta	andards	mg/L μS/cn	= milligram n = microsi	s per liter emens/cm	pp n Er	t = parts pe = Enteroco		d	