STAGE 1 REPORT

Lake Lou Yaeger Watershed TMDL Final Stage 1 Report

Prepared for Illinois EPA

July 2017

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Acronyms

BMPs	best management practices
C-BMP	Council on best management practices
CDL	Cropland Data Layer
cfs	cubic feet per second
CSTR	Constinuously stirred tank reactor
CWA	Clean Water Act
DMR	Discharge monitoring report
EQIP	Environmental Quality Incentives Program
GIS	geographic information system
IDA	Illinois Department of Agriculture
Illinois EPA	Illinois Environmental Protection Agency
IPCB	Illinois Pollution Control Board
ISWS	Illinois State Water Survey
LA	Load Allocation
LC	Loading Capacity
mg/L	milligrams per liter
µg/L	micrograms per liter
MCL	Maximum contaminant level
MGD	Million gallons per day
MOS	Margin of Safety
NA	not applicable
NASS	National Agricultural Statistics Service
NCDC	National Climatic Data Center
NED	National Elevation Dataset
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
RC	Reserve Capacity
SLAM	Simplified Lake Analysis Model
SSURGO	Soil Survey Geographic
SWCDs	Soil and Water Conservation Districts
TMDL	total maximum daily load
TSS	total suspended solids
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
USLE	Universal Soil Loss Equation
WLA	Waste Load Allocation

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Section 1

Goals and Objectives for the Lake Lou Yaeger Watershed

1.1 Total Maximum Daily Load Overview

A total maximum daily load, or TMDL, is a calculation of the maximum amount of a pollutant that a water body can receive and still meet water quality standards. TMDLs are a requirement of Section 303(d) of the Clean Water Act (CWA). To meet this requirement, the Illinois Environmental Protection Agency (Illinois EPA) must identify water bodies not meeting water quality standards and then establish TMDLs for restoration of water quality. Illinois EPA develops a list known as the "303(d) list" of water bodies not meeting water quality standards every 2 years, and it is included in the Integrated Water Quality Report. Water bodies on the 303(d) list are then targeted for TMDL development. The Illinois EPA's most recent Integrated Water Quality Report was submitted to the United States Environmental Protection Agency (USEPA) in July 2016. In accordance with USEPA's guidance, the report assigns all waters of the state to one of five categories; 303(d) listed water bodies make up category five in the integrated report (Appendix A of the Integrated Report).

In general, a TMDL is a quantitative assessment of water quality impairments, contributing potential sources, and pollutant reductions needed to attain water quality standards. The TMDL specifies the amount of pollutant or other stressor that needs to be reduced to meet water quality standards, allocates pollutant control or management responsibilities among sources in a watershed, and provides a scientific and policy basis for taking actions needed to restore a water body.

Water quality standards are laws or regulations that states authorize to enhance water quality and protect public health and welfare. Water quality standards provide the foundation for accomplishing two of the principal goals of the CWA. These goals are:

- Restore and maintain the chemical, physical, and biological integrity of the nation's waters; and
- Where attainable, to achieve water quality that promotes protection and propagation of fish, shellfish, and wildlife, and provides for recreation in and on the water.

Water quality standards consist of three elements:

- The designated beneficial use or uses of a water body or segment of a water body;
- The water quality criteria necessary to protect the use or uses of that particular water body; and
- An antidegradation policy.

Examples of designated uses are primary contact (swimming), protection of aquatic life, and public and food processing water supply. Water quality criteria describe the quality of water that will support a designated use. Water quality criteria can be expressed as numeric limits or as a narrative statement. Antidegradation policies are adopted so that water quality improvements are conserved, maintained, and protected.

1.2 TMDL Goals and Objectives for the Lake Lou Yaeger Watershed

The Illinois EPA has a three-stage approach to TMDL development. The stages are:

Stage 1 – Watershed Characterization, Data Analysis, Methodology Selection

Stage 2 – Data Collection (optional)

Stage 3 – Model Calibration, TMDL Scenarios, Implementation Plan

This report addresses Stage 1 TMDL development for the Lake Lou Yaeger watershed. Stages 2 and 3 will be conducted upon completion of Stage 1. Stage 2 is optional as data collection may not be necessary if additional data are not required to calculate the TMDL.

Following this process, the TMDL goals and objectives for the Lake Lou Yaeger watershed will include developing TMDLs for all impaired water bodies within the watershed, describing all of the necessary elements of the TMDL, developing an implementation plan for each TMDL, and gaining public acceptance of the process. Following are the impaired water body segments in the Lake Lou Yaeger watershed:

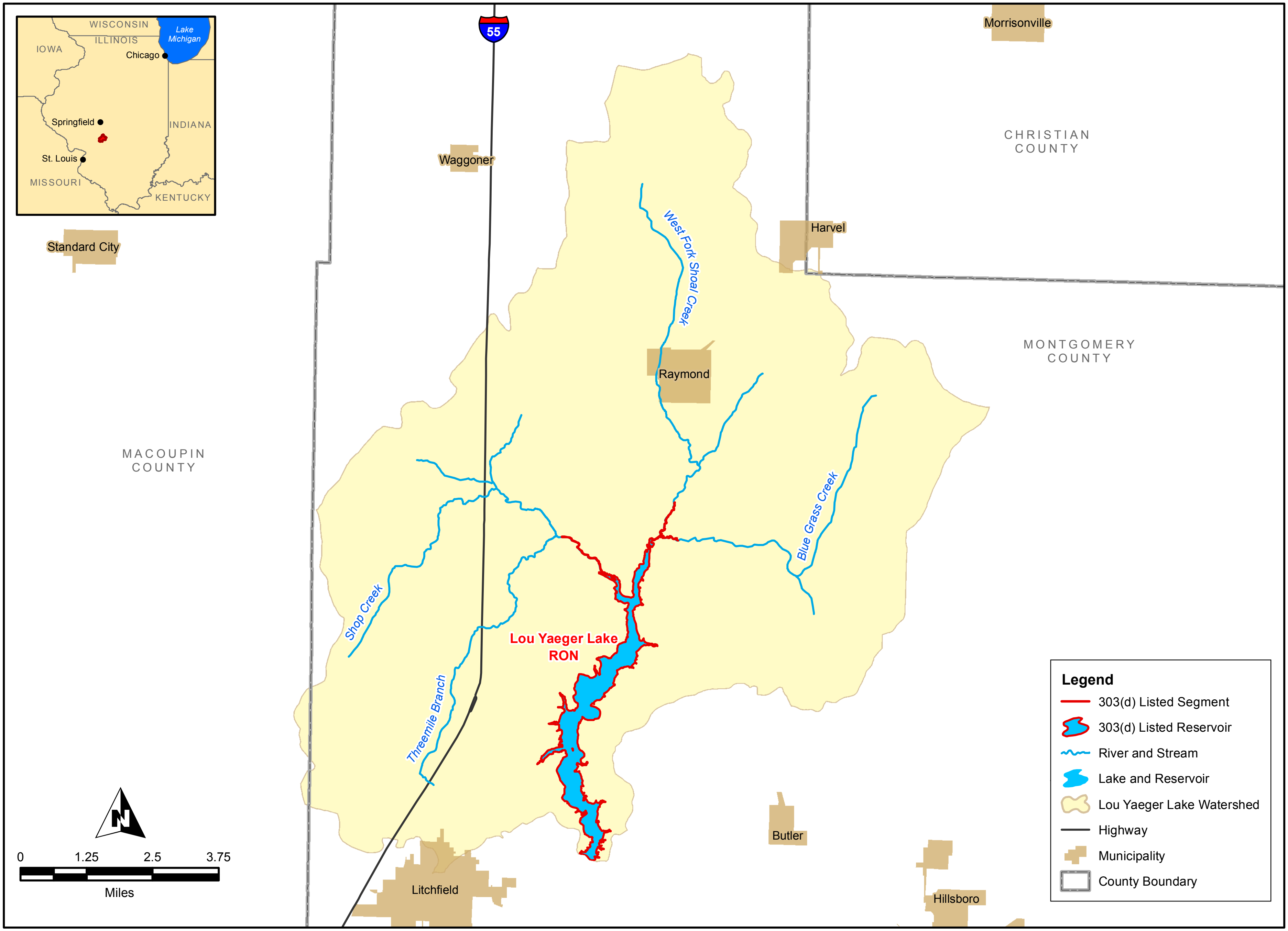
- Lake Lou Yaeger (RON)

The impaired water body segment is shown on **Figure 1-1**. There is one water body segment within the Lake Lou Yaeger watershed for which TMDLs and/or load reduction strategies (LRSs) are being developed. **Table 1-1** lists the water body segment, potential causes of impairment, use description and potential sources of impairment.

Table 1-1 Impaired Water Bodies in Lake Lou Yaeger Watershed

Segment ID	Segment Name	Potential Causes of Impairment	Use Description	Potential Sources (as identified by the 2016 303(d) list)
RON	Lake Lou Yaeger	**Phosphorus (Total)**	Aesthetic Quality	Agriculture, Internal Nutrient Recycling, Runoff from forest/grassland/parkland
		Total Suspended Solids (TSS)	Aesthetic Quality	Agriculture, Littoral/shore area modifications (non-riverine), other recreational pollution sources, Runoff from forest/grassland/parkland

Bold Causes of Impairment have numeric water quality standards and TMDLs will be developed. Italicized Causes of Impairment do not have numeric water quality standards and a LRS will be developed.



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Lou Yaeger Lake TMDL Watershed

FIGURE 1-1

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Illinois EPA is currently only developing TMDLs for parameters that have numeric water quality standards. For potential causes that do not have numeric water quality standards as noted in **Table 1-1**, TMDLs will be deferred until those criteria are developed. However, until numeric criteria are adopted, LRSs will be developed using watershed-specific target values that have been established by Illinois EPA.

The TMDL for Lake Lou Yaeger will specify the following elements:

- Loading Capacity (LC) or the maximum amount of pollutant loading a water body can receive without violating water quality standards
- Waste Load Allocation (WLA) or the portion of the TMDL allocated to existing or future point sources
- Load Allocation (LA) or the portion of the TMDL allocated to existing or future nonpoint sources and natural background
- Margin of Safety (MOS) or an accounting of uncertainty about the relationship between pollutant loads and receiving water quality
- Reserve Capacity (RC) or a portion of the load explicitly set aside to account for growth in the watershed

These elements are combined into the following equation:

$$\mathbf{TMDL = LC = \Sigma WLA + \Sigma LA + MOS + RC}$$

Where target criteria are available for parameters without established numeric criteria, LRSs will be developed that include a LC, reductions needed to meet the LC, and a MOS and/or RC where applicable. LRSs differ from TMDLs in that the allowable load is not broken out between point and nonpoint sources. Both TMDL and LRS development will also take into account the seasonal variability of pollutant loads so that water quality standards are met during all seasons of the year. Also, reasonable assurance that the TMDLs and LRSs will be achieved will be described in the implementation plan. The implementation plan for the Lake Lou Yaeger watershed will describe how water quality standards and targets will be met and attained. This implementation plan will include recommendations for implementing best management practices (BMPs), cost estimates, institutional needs to implement BMPs and controls throughout the watershed, and a timeframe for completion of implementation activities.

1.3 Report Overview

The remaining sections of this report contain:

- **Section 2 Lake Lou Yaeger Watershed Description** provides a description of the watershed's location, topography, geology, land use, soils, population, and hydrology.
- **Section 3 Public Participation and Involvement** discusses public participation activities that will occur throughout TMDL development.

- **Section 4 Lake Lou Yaeger Watershed Water Quality Standards** defines the water quality standards and guidelines/targets for the impaired water body.
- **Section 5 Lake Lou Yaeger Watershed Characteristics** presents the available water quality data needed to develop TMDLs and LRSs, discusses the characteristics of the impaired water body in the watershed, and also describes the point and nonpoint sources with potential to contribute to the watershed load.
- **Section 6 Approach to Developing TMDL and Identification of Data Needs** makes recommendations for the models and analysis that are needed for TMDL and LRS development and also suggests data collection in cases where TMDLs and/or LRSs cannot be developed without additional information.

Section 2

Lake Lou Yaeger Watershed Description

2.1 Lake Lou Yaeger Watershed Location

The Lake Lou Yaeger watershed is located in south-central Illinois (refer to **Figure 1-1**). The watershed is 69,604 acres and is located 45 miles south of Springfield, Illinois. The majority of the watershed (approximately 69,300 acres) lies within Montgomery County. The additional acreage lies within Macoupin and Christian Counties (229 and 13 acres, respectively). Lake Lou Yaeger is located on the West Fork of Shoal Creek and has a surface area of approximately 1,268 acres. [1]

2.2 Topography

Topography is an important factor in watershed management because stream types, precipitation, and soil types can vary dramatically by elevation. National Elevation Dataset (NED) coverages containing 30-meter grid resolution elevation data are available from the U.S. Geological Survey (USGS) for each 1:24,000-topographic quadrangle in the United States. Elevation data for the Lake Lou Yaeger watershed were obtained by overlaying the NED grid onto the geographic information system (GIS)-delineated watershed. **Figure 2-1** shows the elevations found within the watershed. Elevation in the Lake Lou Yaeger watershed ranges from 591 feet above sea level along the waterways in the watershed to 730 feet in the southwestern portion of the watershed.

Lake Lou Yaeger

Photo taken from the City of Litchfield
(http://www.cityoflitchfieldil.com/)

2.3 Land Use

Land use data for the Lake Lou Yaeger watershed were extracted from the U.S. Department of Agriculture's (USDA) National Agriculture Statistics Service (NASS) 2014 Cropland Data Layer (CDL), The CDL is a raster based, geo-referenced, crop-specific land cover data layer created to provide acreage estimates to the Agricultural Statistics Board for the state's major commodities and to produce digital, crop-specific, categorized geo-referenced output products. This information is made available to all agencies and to the public free of charge and represents the most accurate and up-to-date land cover datasets available at a national scale. The most recent available CDL dataset was produced in 2014 and includes 34 separate land use classes applicable to the watershed. The available resolution of the land cover dataset is 30 square meters. The 2014 CDL and extensive metadata are available at http://www.nass.usda.gov/Research_and_Science/Cropland/SARS1a.php.

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[1] Lake Lou Yaeger Master Plan. 2015. http://www.cityoflitchfieldil.com/news/images/FinalReport6-8-15.pdf

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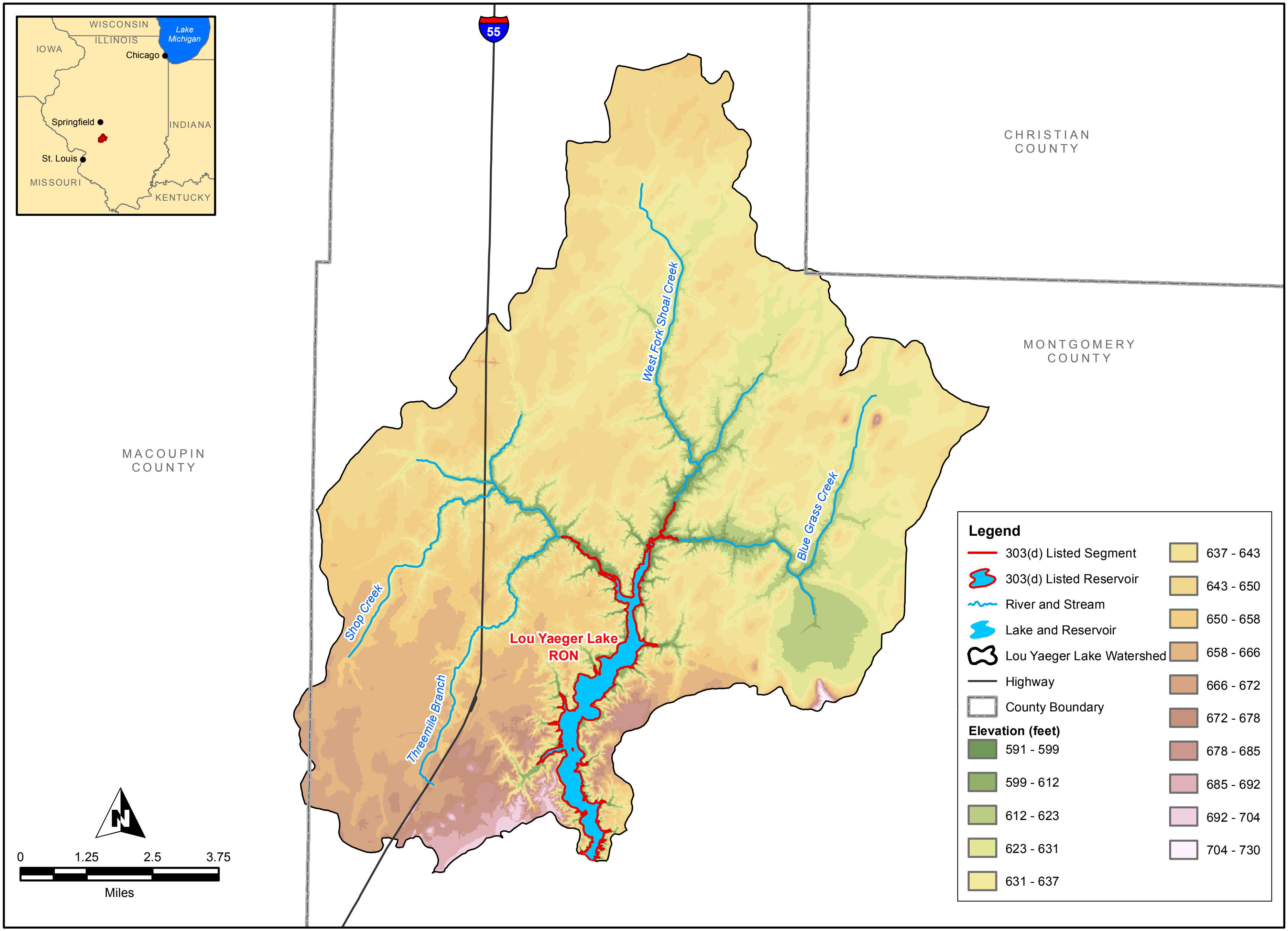

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Lou Yaeger Lake
Watershed Elevation

FIGURE 2-1

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Land use characteristics of the watershed were determined by overlaying the Illinois Statewide 2014 CDL data layers onto the GIS-delineated watershed. **Table 2-1** contains the land uses contributing to the Lake Lou Yaeger watershed and also includes the area of each land cover category and percentage of the watershed area. **Figure 2-2** illustrates the land uses of the watershed. Appendix A contains future detail of the land uses in the watershed.

Table 2-1 Land Cover and Land Use in the Lake Lou Yaeger Watershed

USDA/NASS Land Use Cropland Category	Acres	Percentage
Corn	28,924	42%
Soybeans	22,497	32%
Deciduous Forest	6,394	9%
Grass/Pasture	3,935	6%
Developed/Open Space	2,404	4%
Developed/Low Intensity	2,402	4%
Open Water	1,481	2%
Double Crop (Winter Wheat/Soybeans)	735	1%
Winter Wheat	410	<1%
Developed/Med Intensity	314	<1%
Developed/High Intensity	38	<1%
Other	68	<1%
Total	69,602	

The land cover data reveal that 52,620 acres, representing 76 percent of the total watershed area, are devoted to agricultural activities. Deciduous forests, grass/pasture, and barren land cover 15 percent of the watershed (10,338 acres). Approximately 7 percent of the watershed area (5,159 acres) is developed, urbanized land. The remaining watershed (2 percent of land area) is wetland and open water.

2.4 Soils

Soils data are available through the Soil Survey Geographic (SSURGO) database. For SSURGO data, field mapping methods using national standards are used to construct the soil maps. Mapping scales generally range from 1:12,000 to 1:63,360 making SSURGO the most detailed level of soil mapping done by the Natural Resources Conservation Service (NRCS).

Attributes of the spatial coverage can be linked to the SSURGO databases, which provide information on various chemical and physical soil characteristics for each map unit and soil series. Of particular interest for TMDL development are the hydrologic soil groups as well as the K-factor of the Universal Soil Loss Equation (USLE). The following sections describe and summarize the specified soil characteristics for the Lake Lou Yaeger watershed.

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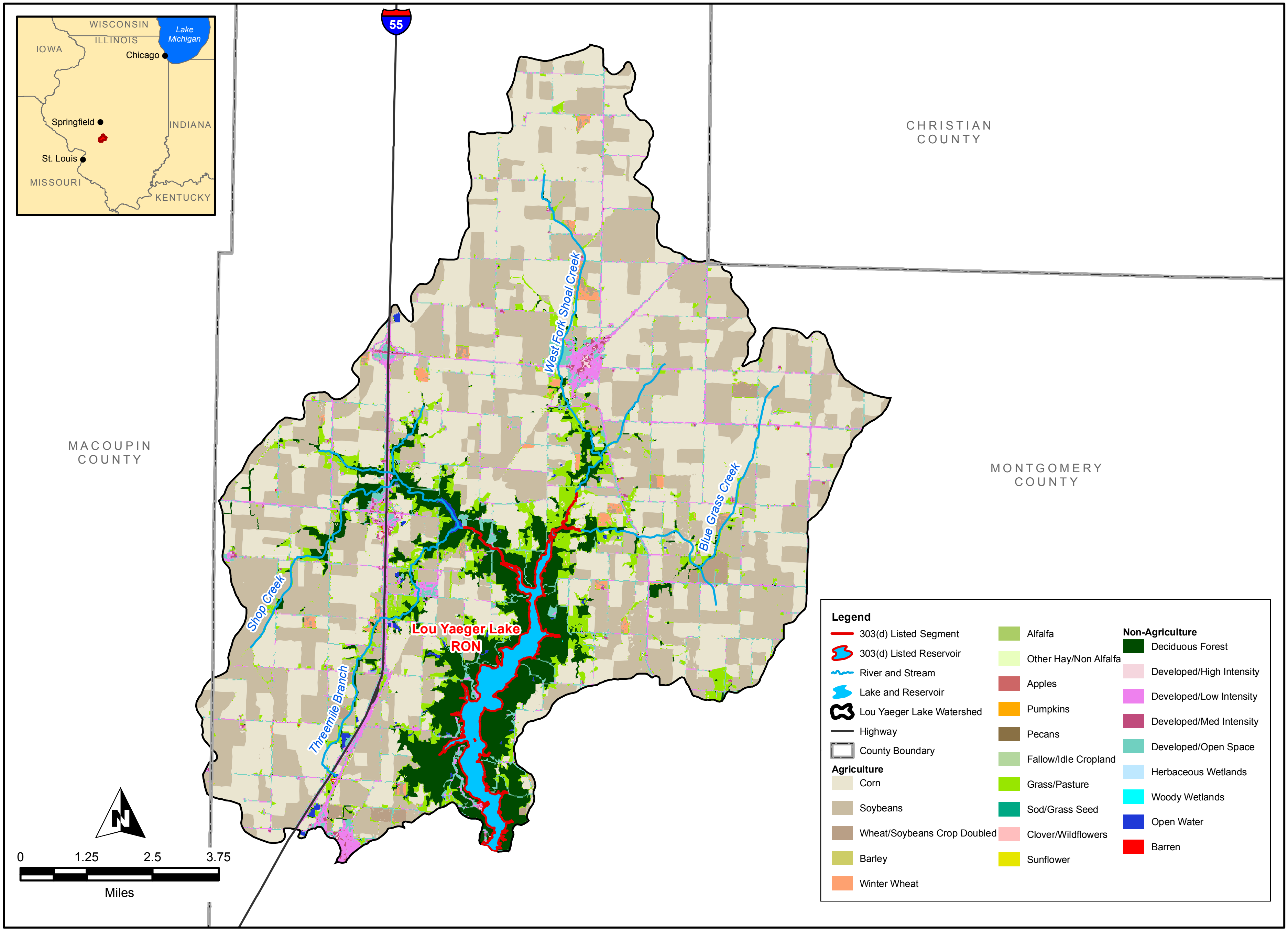

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Lou Yaeger Lake Watershed Land Use

FIGURE 2-2

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2.4.1 Lake Lou Yaeger Watershed Soil Characteristics

Appendix B contains a table of the SSURGO soil series for the Lake Lou Yaeger watershed. A total of 58 soil types exist in the watershed. The three most common soil types—Virden silty clay loam (0 to 2 percent slopes), Herrick-Biddle-Piasa silt loams (0 to 2 percent slopes), and Herrick silt loam (0 to 2 percent slopes) — cover over 54 percent of the watershed (21, 18, and 15 percent, respectively). All other soil types each represent less than 4 percent of the total watershed area. The table in Appendix B also contains the area, dominant hydrologic soil group, and K-factor range. Each of these characteristics is described in more detail in the following paragraphs.

Figure 2-3 shows the hydrologic soils groups found within the Lake Lou Yaeger watershed. Hydrologic soil groups are used to estimate runoff from precipitation. Soils are assigned to one of four groups according to the infiltration of water when the soils are thoroughly wet and receive precipitation from long-duration storms:

- Group A: Soils in this group have low runoff potential when thoroughly wet. Water is transmitted freely through the soil.
- Group B: Soils in this group have moderately low runoff potential when thoroughly wet. Water transmission through the soil is unimpeded.
- Group C: Soils in this group have moderately high runoff potential when thoroughly wet. Water transmission through the soil is somewhat restricted.
- Group D: Soils in this group have high runoff potential when thoroughly wet. Water movement through the soil is restricted or very restricted.

While hydrologic soil groups B, C, D, B/D, and C/D are all found within the Lake Lou Yaeger watershed, group C/D soils are the most common type representing 76 percent of the watershed. Group B, C, D, and B/D soils cover a relatively smaller portion of the watershed at 6.5, 7.0, 3.4, and 3.5 percent, respectively. The most common type, group C/D is a dual hydrologic soil group because these soils can be adequately drained. The first letter applies to the drained condition and the second to the undrained condition. For the purpose of hydrologic soil group, adequately drained means that the seasonal high water table is kept at 24 inches below the surface (NRCS 2007). **Figure 2-3** shows that while the majority of the watershed is Group C/D soils, Group B and C soils are located along tributaries and streams that drain to the impaired Lake Lou Yaeger Lake, as well as along the perimeter of the lake. Group B soils "have moderately low runoff potential when thoroughly wet". These soils have a moderate rate of water transmission. Group C soils "have moderately high runoff potential when thoroughly wet". These soils have a slow rate of water transmission.

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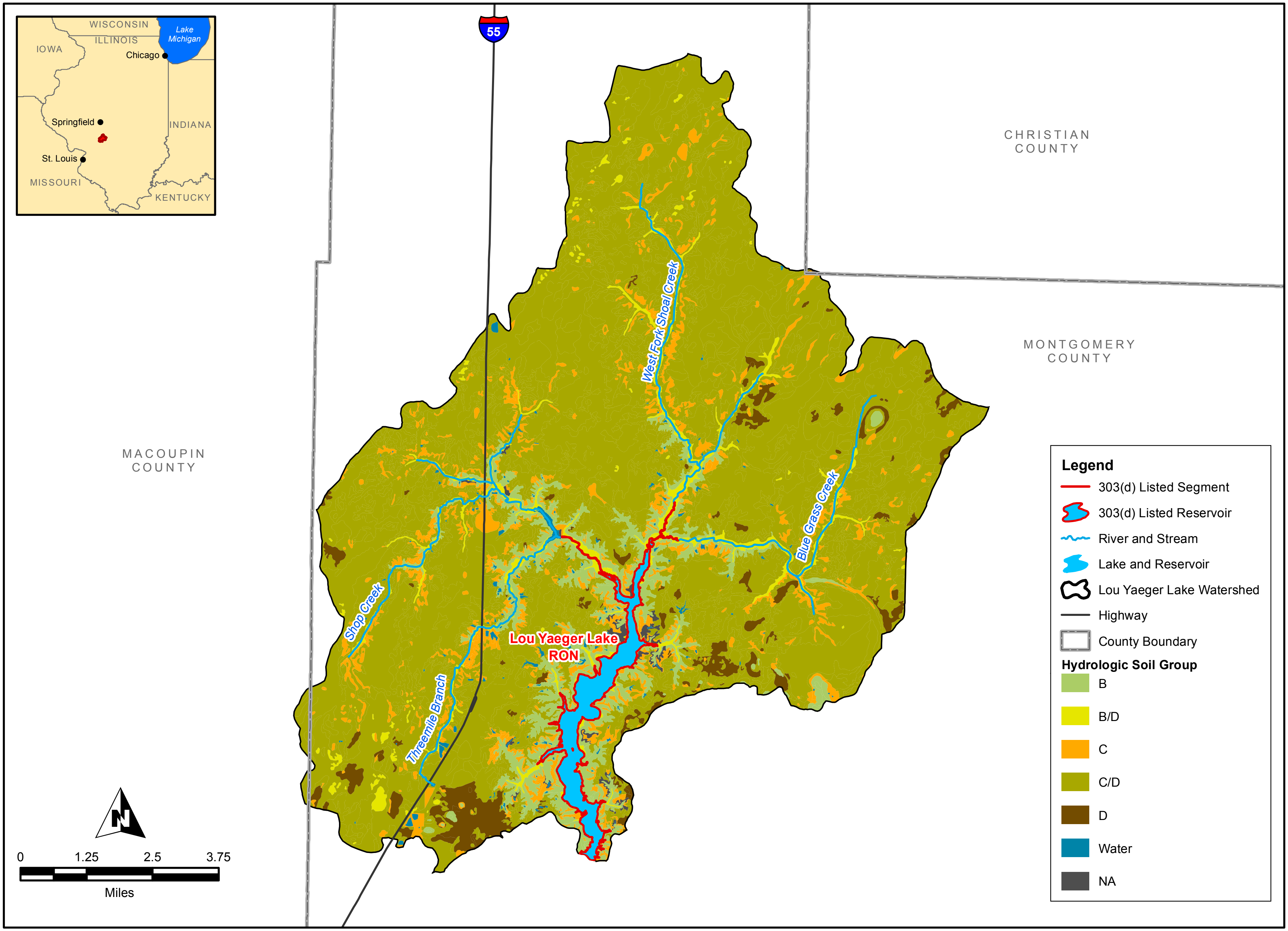

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Lou Yaeger Lake Watershed Soils

FIGURE 2-3

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A commonly used soil attribute is the K-factor. The K-factor:

> *Indicates the susceptibility of a soil to sheet and rill erosion by water. (The K-factor) is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion. Losses are expressed in tons per acre per year. These estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. Values of K range from 0.02 to 0.69. The higher the value, the more susceptible the soil is to sheet and rill erosion by water (NRCS 2005).*

The distribution of K-factor values in the Lake Lou Yaeger watershed range from 0.24 to 0.49 **Figure 2-4**.

2.5 Population

The Census 2010 TIGER/Line data from the U.S. Census Bureau were reviewed along with shapefiles of census blocks that are available for the entire state of Illinois. All census blocks that have geographic center points (centroids) within the watershed were selected and tallied in order to provide an estimate of populations in all census blocks both completely and partially contained by the watershed boundary. Approximately 4,078 people reside in the Lake Lou Yaeger watershed. The main municipalities in the watershed were shown in **Figure 1-1**. The largest urban development in the watershed is the city of Litchfield, with a total population of approximately 6,934 people. Population estimates from 2015 show a slight reduction (-3%) in the population of Litchfield since 2010 (www.census.gov). A small portion of the city of Litchfield lies within the Lake Lou Yaeger watershed, while the majority of the city limits are located outside of the watershed.

2.6 Climate, Pan Evaporation, and Streamflow

2.6.1 Climate

Central Illinois has a temperate climate with hot summers and cold, moderately snowy winters. A National Climatic Data Center (NCDC) climate station is located within the watershed in Honey Bend, IL; however, temperature data are not available prior to 2011 and an alternative station was selected to lengthen the historical record. Monthly temperature and precipitation data from a station in Hillsboro, Illinois (station id. USC00114108) were extracted from the NCDC database for the years 1915 through 2015. This station was selected due to its proximity to the watershed (approximately 10 miles west) and completeness of its dataset.

Table 2-2 contains the average monthly precipitation along with average high and low temperatures for the period of record. The average annual precipitation is 39 inches. May and June are historically the wettest months while January and February are the driest.

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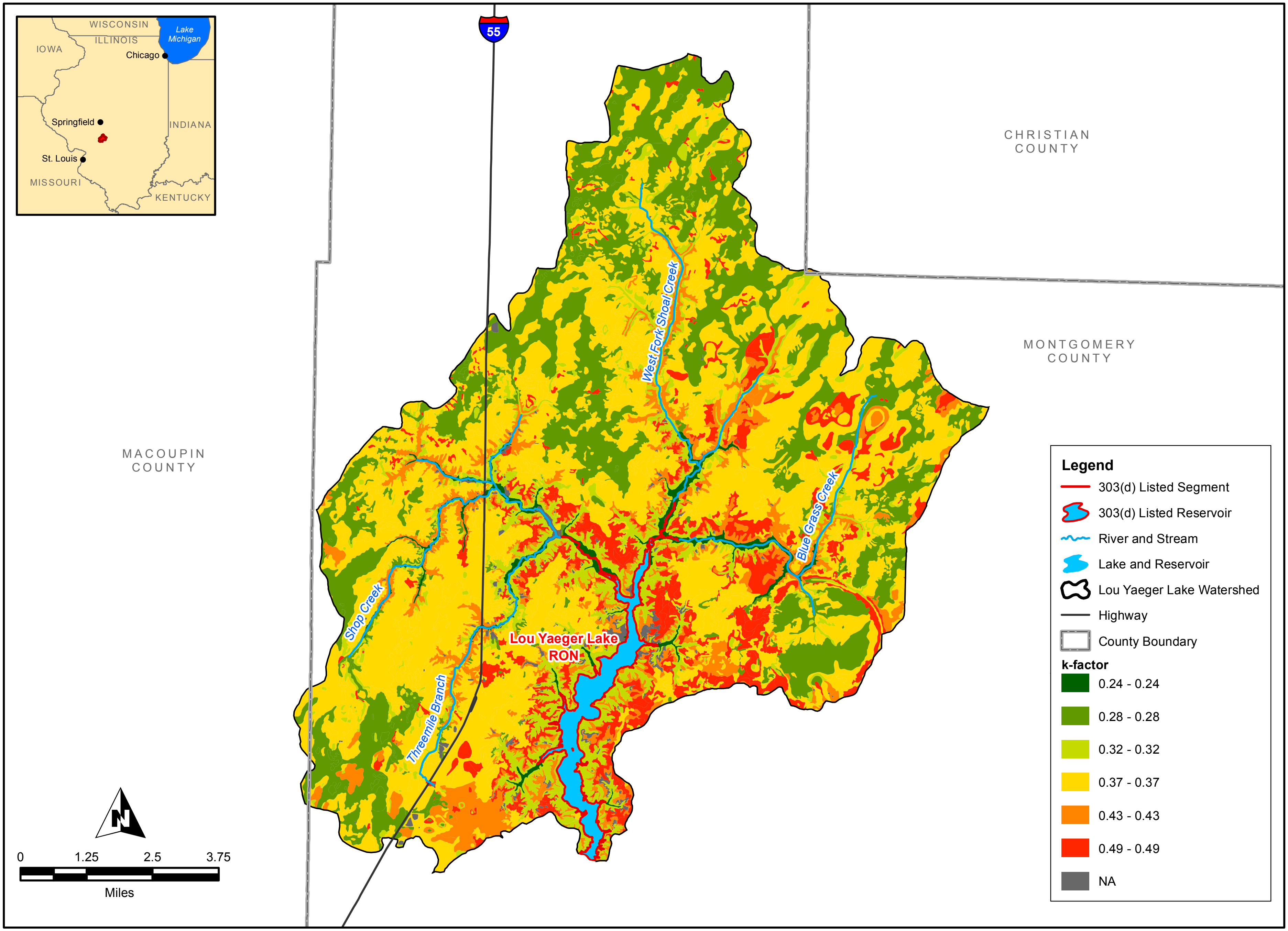

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Lou Yaeger Lake
Watershed k-factor Ranges

FIGURE 2-4

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Table 2-2 Average Monthly Climate Data for Hillsboro, Illinois

Month	Average Total Precipitation (inches)	Average Daily Maximum Temperature (degrees F)	Average Daily Minimum Temperature (degrees F)
January	2.19	37.9	20.6
February	2.03	43.0	24.2
March	3.28	54.2	33.2
April	4.17	66.6	43.7
May	4.56	76.1	53.2
June	4.32	85.0	62.3
July	3.38	89.2	65.9
August	3.29	87.5	63.9
September	3.35	80.9	56.1
October	3.15	69.4	45.3
November	3.14	54.0	34.7
December	2.62	41.5	24.9
Total	39.22		

2.6.2 Pan Evaporation

Through the Illinois State Water Survey (ISWS) website, pan evaporation data are available from nine locations across Illinois (ISWS 2009). The Springfield, Illinois station was chosen to be representative of pan evaporation conditions for the Lake Lou Yaeger watershed. The Springfield station is located approximately 30 miles north of the Lake Lou Yaeger watershed. This station was chosen due to being the closest pan evaporation station to the Lake Lou Yaeger watershed. The average annual pan evaporation at the Springfield station for the years 1980 to 1990 is 49.2 inches. Actual evaporation is typically less than pan evaporation, so the average annual pan evaporation was multiplied by 0.75 to calculate an average annual evaporation of 36.9 inches[2].

2.6.3 Streamflow

Analysis of the Lake Lou Yaeger watershed requires an understanding of flow throughout the drainage area. There are no USGS gages located within the boundaries of the watershed, however, a gage located on the East Fork of Shoal Creek provides a comparison of flow conditions in the area (**Figure 2-5**). **Table 2-3** summarizes the station information.

Table 2-3 USGS Stream Gages

Gage Number	Name	POR
USGS 05593900	East Fork Shoal Creek Near Coffen, IL	1964-2015

[2] Data provided by the Illinois State Climatologist's Office, a part of the Illinois State Water Survey (ISWS) located in Champaign and Peoria, Illinois, and on the web at www.isws.illinois.edu/atmos/statecli.

Based on data collected from this gage (USGS 05593900 East Fork Shoal Creek Near Coffen, IL), the lowest flows are historically seen in August while highest flows have occurred in April (see **Figure 2-6**). The gage drains an area of 55.5 square miles.

Because flows for the Lake Lou Yaeger watershed will need to be estimated using surrogate data from a site located outside of the watershed, flow values will be adjusted during Stage 3 using the drainage area ratio method, represented by the following equation.

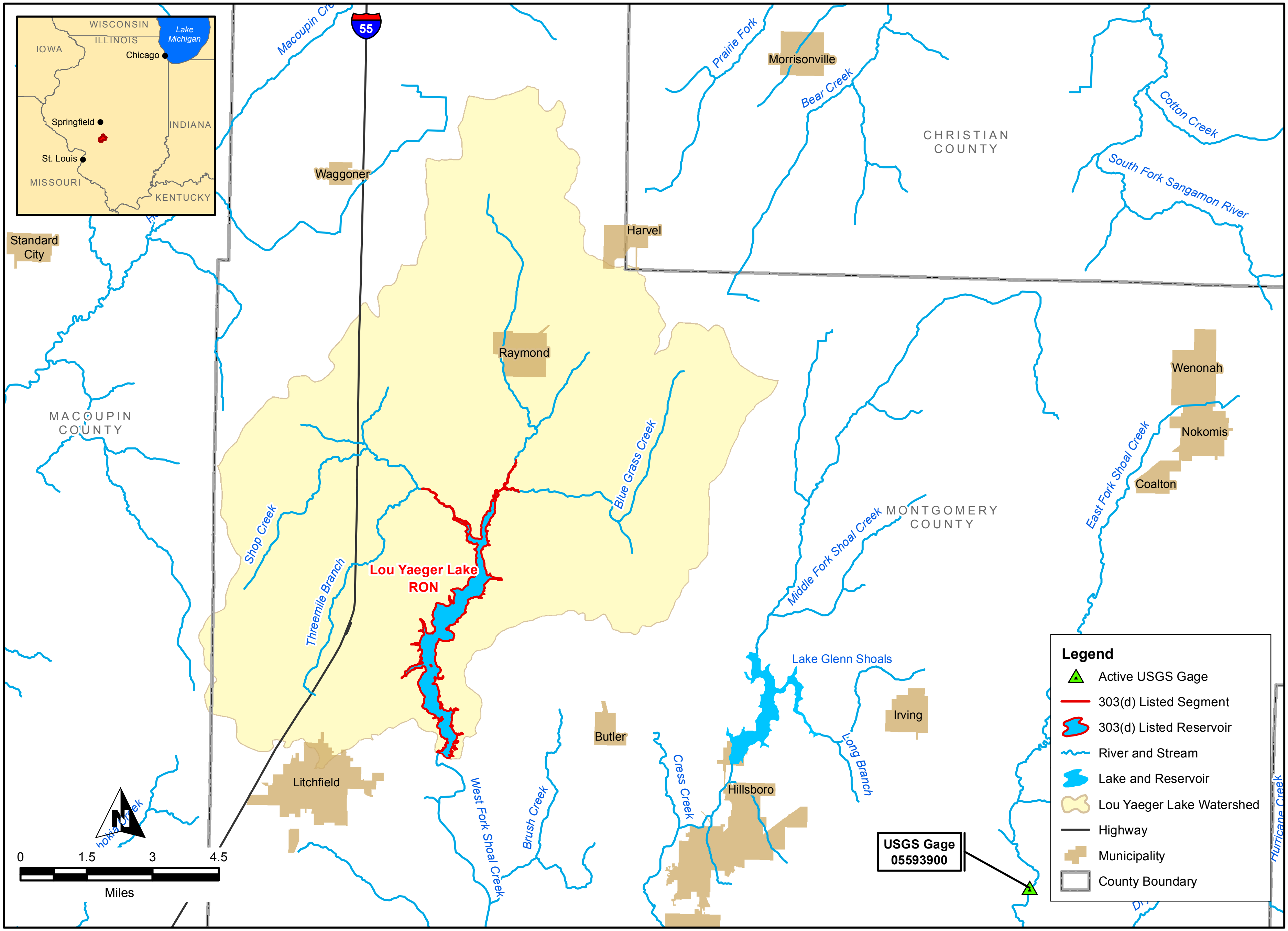
$$Q_{gaged}\left(\frac{Area_{ungaged}}{Area_{gaged}}\right) = Q_{ungaged}$$

where

Q_{gaged}	=	Streamflow of the gaged basin
$Q_{ungaged}$	=	Streamflow of the ungaged basin
$Area_{gaged}$	=	Area of the gaged basin
$Area_{ungaged}$	=	Area of the ungaged basin

The assumption behind the equation is that the flow per unit area is equivalent in watersheds with similar characteristics. Therefore, the flow per unit area in the gaged watershed multiplied by the area of the ungaged watershed, and adjusted for point source influences, estimates the flow for the ungaged watershed.

Local stakeholders suggested that the gage near Coffen, IL may not be the most representative gage due to differences in watershed soils and suggested Sugar Creek data as surrogate measures for flows in the Lake Lou Yaeger watershed. The gage located on Sugar Creek near Springfield, IL is located below Lake Springfield which means that flows recorded at the gage are regulated by reservoir releases and cannot be used to estimate natural flows in the Lake Lou Yaeger drainage area. Further investigation into alternative gages will occur prior to estimating flows for modeling inputs during Stage 3 TMDL development.



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Lou Yaeger Lake Active USGS Gages

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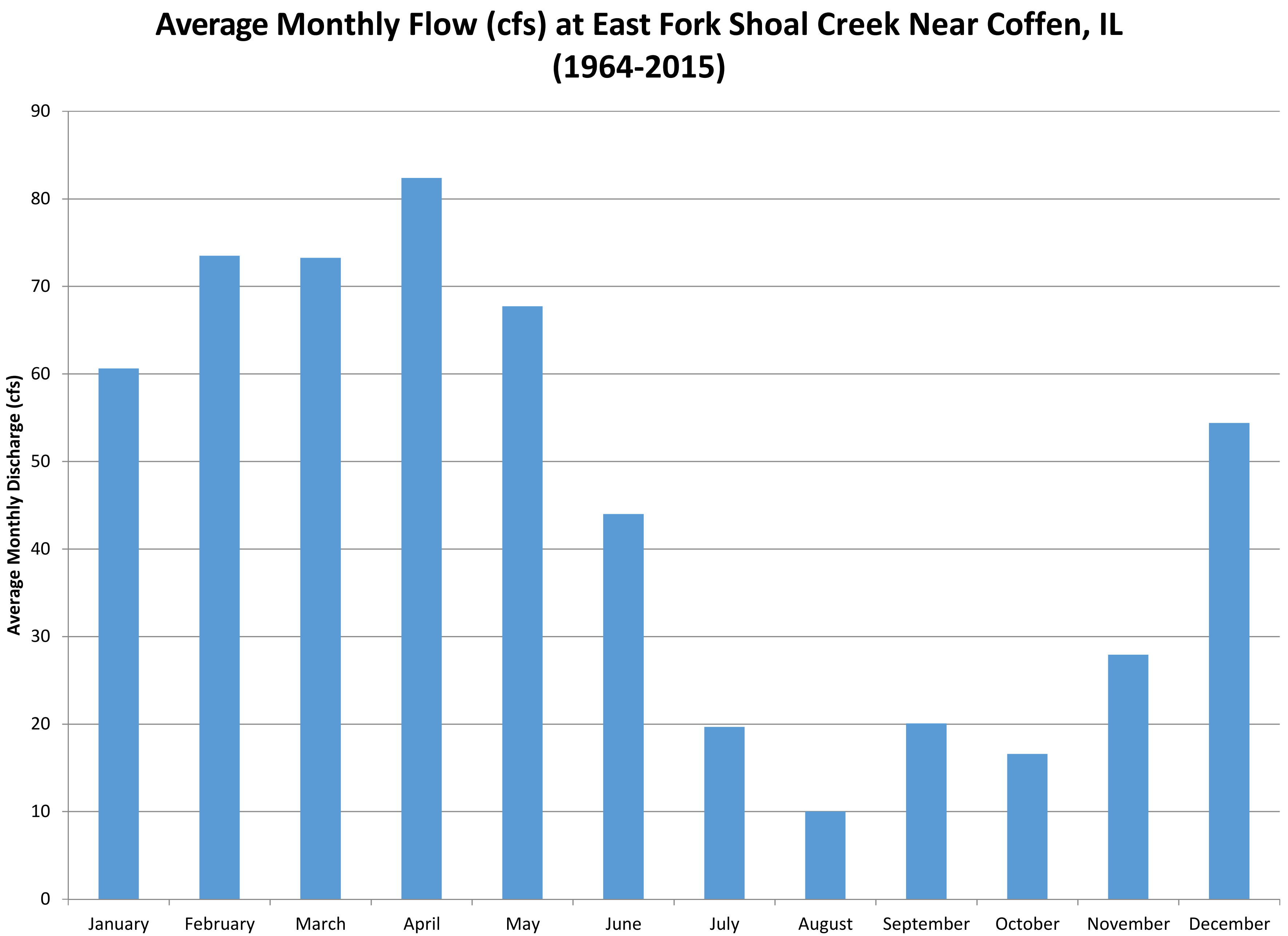

Figure 2-6
Average Daily Streamflow by Month at USGS Gage 05593900
Lou Yaeger Lake Watershed

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Section 3

Lake Lou Yaeger Watershed Public Participation

3.1 Lake Lou Yaeger Watershed Public Participation

Public knowledge, acceptance, and follow-through are necessary to implement a plan to meet recommended TMDLs and LRSs. It is important to involve the public as early in the process as possible to achieve maximum cooperation and counter concerns as to the purpose of the process and the regulatory authority to implement any recommendations.

Illinois EPA, along with CDM Smith, held a Stage 1 public meeting in the Lake Lou Yaeger watershed at the Litchfield Community Center on March 7, 2017. An additional public meeting will be held to present the final TMDL results and implementation plan (Stage 3). Comments received through the public meeting process are included in Appendix D. This section will be updated following the final public meeting.

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Section 4

Lake Lou Yaeger Water Quality Standards and Guidelines

4.1 Illinois Water Quality Standards

Water quality standards are developed and enforced by the state to protect the "designated uses" of the state's waterways. In the state of Illinois, water quality standards are established by the Illinois Pollution Control Board (IPCB). Illinois is required to update water quality standards every 3 years in accordance with the CWA. The standards requiring modifications are identified and prioritized by Illinois EPA, in conjunction with USEPA. New standards are then developed or revised during the 3-year period.

Illinois EPA is also responsible for developing scientifically based water quality criteria and proposing them to the IPCB for adoption into state rules and regulations. The Illinois water quality standards are established in the Illinois Administrative Rules Title 35, Environmental Protection; Subtitle C, Water Pollution; Chapter I, Pollution Control Board; Part 302, Water Quality Standards (IPCB, 2015).

4.2 Designated Uses

The waters of Illinois are classified by designated uses, which include: General Use, Public and Food Processing Water Supply, Lake Michigan Basin, and Secondary Contact and Indigenous Aquatic Life Use[1]. The designated uses applicable to the Lake Lou Yaeger watershed are the General Use and Public and Food Processing Water Supplies Use.

4.2.1 General Use

The General Use classification is defined by IPCB as standards that "will protect the state's water for aquatic life, wildlife, agricultural use, secondary contact use and most industrial uses, and ensure the aesthetic quality of the state's aquatic environment." Primary contact uses are protected for all General Use waters whose physical configuration permits such use.

4.2.2 Public and Food Processing Water Supplies

The Public and Food Processing Water Supplies Use is defined by IPCB as standards that are "cumulative with the general use standards of Subpart B and must be met in all waters designated in Part 303 at any point at which water is withdrawn for treatment and distribution as a potable supply or for food processing."

[1] Illinois EPA, 2016. Illinois Integrated Water Quality Report and Section 303(d) List. http://www.epa.illinois.gov/topics/water-quality/watershed-management/tmdls/303d-list/index

4.3 Illinois Water Quality Standards

To make 303(d) listing determinations for general use waters, Illinois EPA compares available data with water quality standards to make impairment determinations. To make 303(d) listing determinations for public and food processing water supplies, data are reviewed for both the raw water intake and the finished/treated water. Although both uses are applicable within the watershed, it should be noted that the lake is 303(d) listed for impairment of aesthetic quality under General Use and the public water supply use is currently not listed as impaired. **Table 4-1** presents the numeric water quality standards for the listed cause of impairment for Lake Lou Yaeger.

Table 4-1 Summary of Numeric Water Quality Standards for Potential Causes of Impairments in Lake Lou Yaeger Watershed

Parameter	Units	General Use Water Quality Standard	Regulatory Reference	Public and Food Processing Water Supplies	Regulatory Reference
Phosphorus (Total)	mg/L	0.05[(1)]	302.205	No numeric standard	N/A

mg/L = milligrams per liter
NA = Not Applicable
(1) Standard applies in particular to inland lakes and reservoirs (greater than 20 acres) and in any stream at the point where it enters any such lake or reservoir.

4.4 Water Quality Guidelines

In addition to the water quality standards provided above, the Illinois EPA has also established watershed-specific water quality guidelines for a number of parameters. As part of the TMDL development process, Illinois EPA started to include LRSs in TMDL watershed projects in 2012 for those pollutants that do not currently have a numeric water quality standards. Developing a LRS involves determining the loading capacity and load reduction necessary that is needed in order for the water body to meet "Full Use Support" for its designated uses. The load capacity is not divided into WLA, LA, or MOS; these are represented by one number as a target concentration for load reduction within each unique watershed. The LRS provides guidance (with no regulatory requirements) for voluntary nonpoint source reduction efforts by implementing agricultural and urban stormwater BMPs.

The LRS targets are based on data from all stream segments within the HUC-10 basins of the watershed, as well as stream segments or lakes which closely border the watershed in neighboring HUC-10 basins, in order to best represent the land use, hydrologic, and geologic conditions unique to the watershed. Load reduction targets were calculated by Illinois EPA using data from stream segments whose most current assessment shows full support for aquatic life and data that has passed quality assurance and quality checks within Illinois EPA and are in accordance with state and federal laws. Applicable LRS target values developed by Illinois EPA for the Lake Lou Yaeger watershed are provided in **Table 4-2**.

Table 4-2 LRS Target Values for the Lake Lou Yaeger Watershed

Segment Name	Segment ID	Potential Causes of Impairment	LRS Target Value
Lake Lou Yaeger	RON	Total Suspended Solids (TSS)	21.9 mg/L

4.5 Potential Pollutant Sources

In order to properly address the conditions within the Lake Lou Yaeger watershed, potential pollutant sources must be investigated for the pollutants where TMDLs and LRSs will be developed. The following is a summary of the potential sources identified by Illinois EPA on the 2016 303(d) list.

Table 4-3 Impaired Water Bodies

Segment ID	Segment Name	Potential Causes of Impairment	Use Description	Potential Sources (as identified by the 2016 303(d) list)
RON	Lake Lou Yaeger	**Phosphorus (Total)**	Aesthetic Quality	Agriculture, Internal Nutrient Recycling, Runoff from forest/grassland/parkland
		Total Suspended Solids (TSS)	Aesthetic Quality	Agriculture, Littoral/shore area modifications (non-riverine), other recreational pollution sources, Runoff from forest/grassland/parkland

Bold Causes of Impairment have numeric water quality standards and TMDLs will be developed. Italicized Causes of Impairment do not have numeric water quality standards and a LRS will be developed.

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Section 5

Lake Lou Yaeger Watershed Characterization

In order to further characterize the Lake Lou Yaeger watershed, a wide range of pertinent data were collected and reviewed. Lake water quality data, as well as information on potential point and nonpoint sources within the watershed, were compiled from a variety of data sources. This information is presented and discussed in further detail in the remainder of this section.

5.1 Water Quality Data

Data from a total of three historical water quality stations within the Lake Lou Yaeger watershed were located and reviewed for this report (**Figure 5-1**). The water quality data were primarily provided by Illinois EPA. Stations RON-01, RON-02 and RON-03, located on Lake Lou Yaeger, are part of the Illinois EPA Ambient Water Program and were sampled approximately four times a year in 2003, 2008 and 2012.

Lake Lou Yaeger is listed for impairment of aesthetic quality due to total phosphorus and TSS. Data presented below relate to the constituents of concern that currently have numeric criteria as well as those with water quality targets. These values (presented in Section 4) will be used to confirm impairment listings in the following sections.

There are three active water quality monitoring locations on Lake Lou Yaeger used for the following data discussion (**Figure 5-1**). All historical water quality data for the impaired waterbody are available in Appendix D. An inventory of all available data associated with the impairments in the Lake Lou Yaeger watershed is presented in **Table 5-1**.

Table 5-1 Data Inventory for Impairments in Lake Lou Yaeger Watershed

Lake Lou Yaeger Segment RON; Sample locations RON-01, RON-02, RON-03		
RON-01	**Period of Record**	**Number of Samples**
Phosphorus, Total	2003,2008,2012	14
Phosphorus, Dissolved	2003,2008,2012	13
Phosphorus in Bottom Deposits	2003, 2008	2
Total Suspended Solids[1]	2003,2008,2012	42
RON-02		
Phosphorus, Total	2003,2008,2012	14
Phosphorus, Dissolved	2003,2008,2012	14
Phosphorus in Bottom Deposits	-	0
Total Suspended Solids[1]	2003,2008,2012	15
RON-03		
Phosphorus, Total	2003,2008,2012	14
Phosphorus, Dissolved	2003,2008,2012	14
Phosphorus in Bottom Deposits	-	0
Total Suspended Solids[1]	2003,2008,2012	15

(1) Number of TSS samples at all depths

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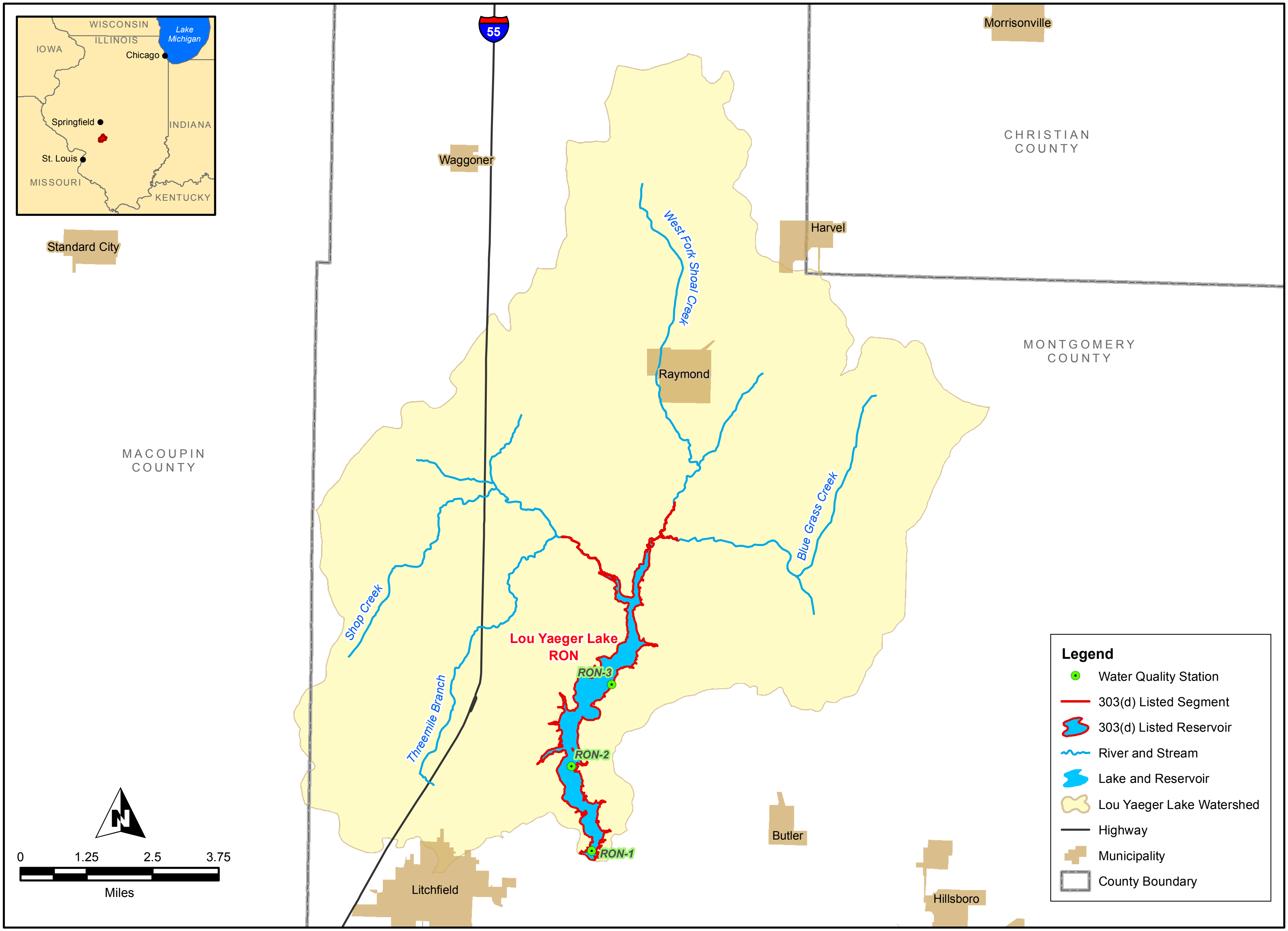

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Lou Yaeger Lake
Water Quality Stations

FIGURE 5-1

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5.1.1 Total Phosphorus in Lake Lou Yaeger

The applicable water quality standard for total phosphorus in Lake Lou Yaeger is 0.05 mg/L. Compliance with the total phosphorus standard is assessed using samples collected at a 1-foot depth from the lake surface. The number of samples, a count of exceedances, and the average total phosphorus concentrations at 1-foot depth for each year of available data at each monitoring station in Lake Lou Yaeger are presented in **Table 5-2** and shown on **Figure 5-2**. Based on the available dataset, total phosphorus concentrations in Lake Lou Yaeger are consistently higher than the water quality standard. No significant seasonal or annual trends in total phosphorus concentrations were observed based on the available dataset.

Table 5-2 Sample Counts, Exceedances of WQ Standard (0.05 mg/L, and Average Total Phosphorus Concentrations (mg/L) at One-Foot Depth in Lake Lou Yaeger Watershed

Station	RON-01		RON-02		RON-03	
Year	Data Count; Number of Exceedances	Average	Data Count; Number of Exceedances	Average	Data Count; Number of Exceedances	Average
2003	4; 4	0.10	4;4	0.09	4;3	0.10
2008	5; 5	0.20	5;5	0.21	5;5	0.25
2012	5;5	0.16	5;5	0.19	5;5	0.25

5.1.2 Total Suspended Solids in Lake Lou Yaeger

The LRS target value for TSS in Lake Lou Yaeger is 21.9 mg/L. The average TSS concentrations for each year of available data at each monitoring site in Lake Lou Yaeger are presented in **Table 5-3.** TSS concentrations in excess of the LRS target value occur at each sampling location with the highest levels recorded at RON-3 (**Figure 5-3**). TSS values have also increased over time at all locations.

Table 5-3 Sample Counts, Exceedances of LRS Target Value (21.9 mg/L), and Average TSS Concentrations (mg/L) in Lake Lou Yaeger Watershed

Year	RON-1		RON-2		RON-3		Lake Average	
	Data Count; Number of Exceedances	Average	Data Count; Number of Exceedances	Average	Data Count; Number of Exceedances	Average	Data Count; Number of Exceedances	Average
2003	15; 0	11.0	5; 1	13.0	5; 3	23.8	25; 4	15.9
2008	14; 3	16.1	5; 2	16.2	5; 3	27.2	24; 8	19.8
2012	13; 3	16.8	5; 2	18.8	5; 3	31.8	23; 8	22.5

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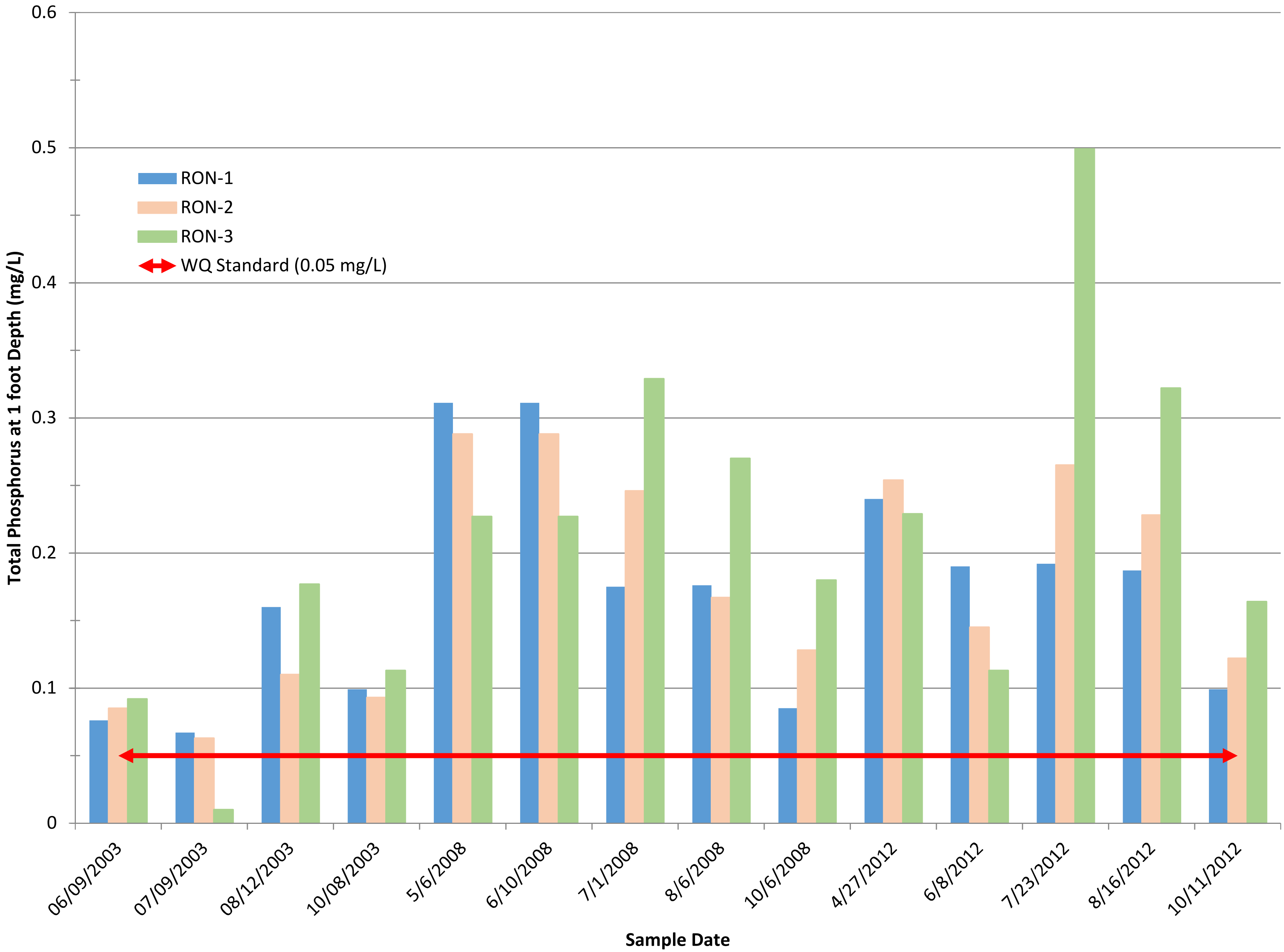

Figure 5-2
Total Phoshporus at 1-ft Depth
Lou Yaeger Lake (RON)

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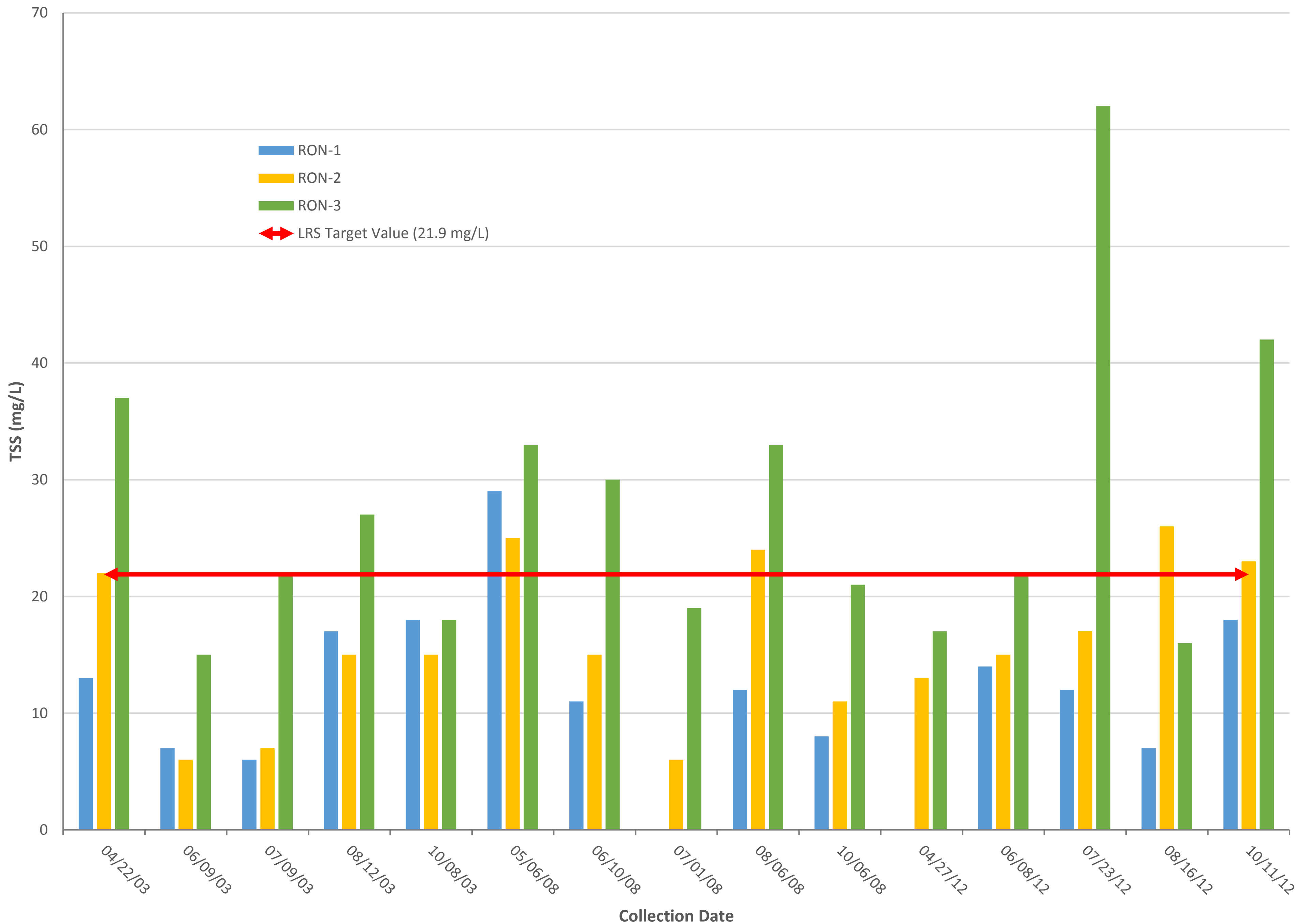

Figure 5-3
TSS
Lou Yaeger Lake (RON)

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5.2 Lake Characteristics

Lake Lou Yaeger was built in 1966 and is located within Montgomery County, approximately 45 miles south of the City of Springfield, Illinois. The lake provides flood control on Shoal Creek and is a municipal water supply for the City of Litchfield, serving approximately 13,000 customers. Additionally, it offers a number of recreational activities including boating, fishing, and camping. It is fed by the West Fork of Shoal Creek, Blue Grass Creek, Shop Creek and Threemile Branch. Lake Lou Yaeger has a surface area of 1,200 acres with an average depth of 10 feet and a reported maximum depth of 32 feet. The lake is used for recreational activities such as boating, fishing, swimming, camping, hiking, equestrian trails, picnic pavilions and the Shoal Creek Nature Conservation Area[1].

5.3 Point Sources

There are two active point sources that are located within the Lake Lou Yaeger watershed. Both facilities treat municipal waste; one for a commercial facility (the Magnus Grand Hotel) and the other for the Village of Raymond. **Table 5-4** contains permit information for both facilities. Facility locations are shown on **Figure 5-4**.

Wastewater can contain nutrients from human waste, food and certain soaps and detergents. Treated municipal wastewater can be a source of phosphorus to receiving waters. The amount of phosphorus in treated effluent varies by the type of treatment used at each facility. Treatment processes, permits and associated discharge monitoring reports (DMRs) will be reviewed and relevant data included in Stage 3 TMDL development.

Table 5-4 Permitted Facilities Discharging to or Upstream of Impaired Segments in the Lake Lou Yaeger Watershed

Facility ID	Facility Name	Flow (MGD)	Permit Program/ Facility Type	Effluent Limits	Receiving Water
IL0025381	Raymond STP	0.25	NPDES/ Municipal Wastewater	BOD, Chlorine (total residual), Fecal Coliform, DO, TSS, pH	Unnamed Tributary to West Fork of Shoal Creek
IL0063525	Magnus Grand Hotel and Conference Center	0.033	NPDES/ Municipal Wastewater	BOD, Chlorine (total residual), Fecal Coliform, DO, TSS, Nitrogen, Ammonia-N, pH	Shop Creek, Tributary to Shoal Creek

[1] June, 2015. Lake Lou Yaeger Master Plan Facility use Evaluation with Recommendations. Prepared by M.E. Badash & Associates, LLC.

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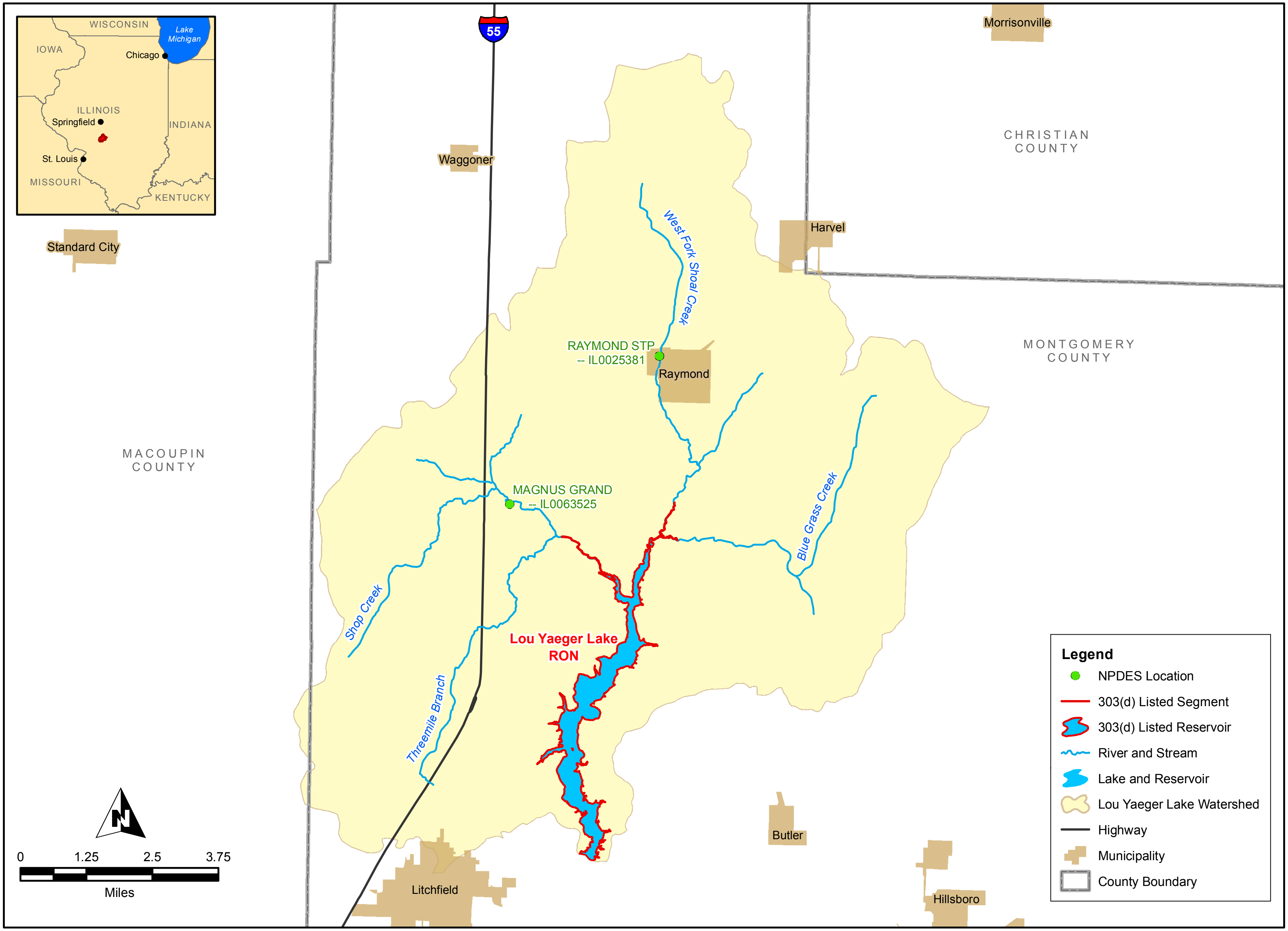

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Lou Yaeger Lake NPDES Locations

FIGURE 5-4

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5.4 Nonpoint Sources

There are many potential nonpoint sources of phosphorus and TSS to Lake Lou Yaeger. The following section presents information on watershed cropping practices, animal operations, and area septic systems. Data were collected where available through communications with the local NRCS, Illinois Soil and Water Conservation Districts (SWCDs), and public health departments.

5.4.1 Crop Information

Approximately 76 percent of the land within the Lake Lou Yaeger watershed is devoted to agriculture. Because most the watershed is under cultivation, soil loss from fields is likely the primary source of sediment and phosphorus (attached to the sediment) to Lake Lou Yaeger. Tillage practices for crops such as corn, soybeans, and grains can be categorized as conventional till, reduced till, mulch till, and no till. The percentage of each tillage practice for corn, soybeans, and small grains by county are generated from County Transect Surveys by the Illinois Department of Agriculture (IDA). Data from the 2015 survey are presented in **Tables 5-5** through **5-7** for Montgomery, Macoupin, and Christian Counties, respectively.

According to the County Transect Survey summary report fields planted conventionally leave less than 15% of the soil surfaced covered with crop residue after planting while mulch-till leaves at least 30% of the residue from the previous crop remaining on the soil surface after being tilled and planted. Reduced-till falls between conventional and mulch (greater than 15% but less than 30%) and no-till practices leave the soil virtually undisturbed from harvest through planting. Residue is important because it shields the ground from the eroding effects of rain and helps retain moisture for crops.

Table 5-5 Tillage Practices in Montgomery County, Illinois – 2015

Tillage System	Corn	Soybean	Small Grain
Conventional	62%	0.5%	0%
Reduced - Till	15%	5%	0%
Mulch - Till	19%	66%	0%
No - Till	4%	29%	100%

Table 5-6 Tillage Practices in Macoupin County, Illinois – 2015

Tillage System	Corn	Soybean	Small Grain
Conventional	62%	21%	60%
Reduced - Till	18%	16%	40%
Mulch - Till	17%	37%	0%
No - Till	3%	26%	0%

Table 5-7 Tillage Practices in Christian County, Illinois – 2015

Tillage System	Corn	Soybean	Small Grain
Conventional	41%	3%	0%
Reduced - Till	58%	84%	20%
Mulch - Till	0%	4%	0%
No - Till	1%	8%	80%

Tillage practices from the 2004 County Transect Survey for Montgomery County were also reviewed to gain an understanding of how cropping practices have changed over time (**Table 5-8**). The data indicate that since 2004, both corn and soybean conventional tillage has decreased.

Table 5-8 Historical and Current Tillage Practices in Montgomery County, Illinois – 2004 and 2015

Tillage System	Corn		Soybean		Small Grain	
	2004	2015	2004	2015	2004	2015
Conventional	76%	62%	6%	0.5%	0%	0%
Reduced - Till	9%	15%	23%	5%	0%	0%
Mulch - Till	8%	19%	38%	66%	0%	0%
No - Till	7%	4%	33%	29%	100%	100%

Information on field tiling practices was also sought as field drains can influence the timing and amounts of water delivered to the lake as well as deliver dissolved nutrients from fields to receiving waters. Local NRCS offices reported that they currently do not keep records on which farms use tile drainage. The NRCS office in Montgomery County said the use of drain tile is common but they did not have exact numbers. As a rule of thumb, tile drainage is more common north of Route 16 and less common south of Route 16. The dividing line was said to be due to clay soil in the southern part of the county, in which tile drainage does not work as well.

Local stakeholders also indicated their willingness to share additional area farming practices and existing agricultural best management practices implemented throughout the watershed to reduce erosion and nutrient loss. This information will be included in this section and the implementation section as Stage 3 is developed.

5.4.2 Animal Operations

Information on commercial animal operations is available from the NASS. Although watershed-specific data are not available, county-wide data for Montgomery County, Macoupin County, and Christian County, are presented in the following **Tables 5-9** through **5-11**. Data from 2007 and 2012 have been published on the USDA website.

Table 5-9 Montgomery County Animal Population (2007 and 2012 Census of Agriculture)

Livestock Type	2007	2012	Percent Change
Cattle and Calves	9,644	8,035	-17%
Beef	4,662	2,907	-38%
Dairy	548	590	8%
Hogs and Pigs	70,689	126,949	80%
Poultry(1)	1,069	1,482	39%
Sheep and Lambs	698	791	13%
Horses and Ponies	736	550	-25%

(1) Poultry census data inclusive of broilers, layers, pullets, roosters and turkeys

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Table 5-10 Macoupin County Animal Population (2007 and 2012 Census of Agriculture)

Livestock Type	2007	2012	Percent Change
Cattle and Calves	22,314	23,721	6%
Beef	7,408	7,645	3%
Dairy	997	1,109	11%
Hogs and Pigs	81,456	34,373	-58%
Poultry(1)	1,144	1,092	-5%
Sheep and Lambs	704	702	0%
Horses and Ponies	810	323	-60%

(1) Poultry census data inclusive of broilers, layers, pullets, roosters and turkeys

Table 5-11 Christian County Animal Population (2007 and 2012 Census of Agriculture)

Livestock Type	2007	2012	Percent Change
Cattle and Calves	8,610	7,164	-17%
Beef	4,771	1,974	-59%
Dairy	ND	10	-
Hogs and Pigs	35,096	46,581	33%
Poultry(1)	881	529	-40%
Sheep and Lambs	537	388	-28%
Horses and Ponies	517	337	-35%

(1) Poultry census data inclusive of broilers, layers, pullets, roosters and turkeys
ND= No data

Specific information on animal operations within the watershed was not available. It should be noted that local stakeholders indicated that the numbers reported in the agricultural census seemed very high for the watershed counties. Should site-specific information become available during TMDL development, this section will be updated and information will be used, as appropriate, during Stage 3.

5.4.3 Septic Systems

Many households in rural areas of Illinois that are not connected to municipal sewers make use of onsite sewage disposal systems, or septic systems. Across the U.S., septic systems have been found to be a significant source of phosphorus pollution. There are many types of septic systems, but the most common septic system is composed of a septic tank draining to a septic field, where nutrient removal occurs. However, the degree of nutrient removal is limited by soils and system upkeep and maintenance.

Information on the extent of sewered and non-sewered municipalities in the Lake Lou Yaeger watershed was obtained from the county health departments. Health department officials in Montgomery County stated that the towns are served by sewer systems, but most county residents within the watershed rely on private septic systems. It was said that most, if not all homes around Lake Lou Yaeger have septic systems. It was also noted during the Stage 1 public meeting that there are several campsites near the lakeshore that are potential sources of nutrients to the lake.

5.5 Watershed Studies and Other Watershed Information

A number of efforts have been performed in Lake Lou Yaeger and the Lake Lou Yaeger watershed, as described in the following timeline:

1964 – Construction of Lake Lou Yaeger, financed under Federal Public Law 566 for flood control. The lake serves as the public drinking water supply for the City of Litchfield. Construction was completed in 1966.

1995 – USEPA Clean Lakes Program Phase 1 Diagnostic/Feasibility Study and Illinois Division of Water Pollution Control Restoration plan for Lake Lou Yaeger (by Crawford Murphy and Tilley)

1999 –In order to help farmers in adopting sound agricultural practices the Illinois Council on Best Management Practices (C-BMP) was formed. The Council is a coalition of agribusiness and agricultural producer organizations, with the support of the University of Illinois Extension, and serves as a clearinghouse on current research to protect water quality in Illinois. The council also provides information and support to local watershed groups to help implement sound water quality initiatives, and can offer educational assistance to help facilitate the technical and financial resources needed to carry out water quality objectives.

1999 – Lake Lou Yaeger Resource Planning Committee formed.

2000 – City of Litchfield received a grant in the amount of $3,438 from the Illinois Conservation 2000 program in support of local private-public partnerships for natural resource protection project. Cypress tree seedlings were planted in critical locations in an effort to protect and stabilize 600 feet of shoreline at Lake Lou Yeager.

2001 – Lake Lou Yaeger Resource plan, a report providing ways to reduce sedimentation and water quality impairments to Lake Lou Yaeger, presented to City of Litchfield council members by the Lake Lou Yaeger Resource Planning Committee.

2011 – Environmental Quality Incentives Program (EQIP), administered by NRCS, provided funding for sediment trapping in the upper portion of the Lake Lou Yaeger watershed. EQIP is a voluntary based conservation program providing technical and financial assistance to individual or groups facing natural resource problems.

2013 – Federal Interest and Determination was completed and approved by USACE. The FID identified potential wetland restoration that could only be created by essentially eliminating motorized boat access to the northernmost portion of the lake.

2015 – Lake Lou Yaeger Master Plan Facility Use Evaluation with Recommendations released. The report provides recommended upgrades to Lake Lou Yaeger, such as construction of an equestrian campground, renovating the existing beach house, implementing a master signage plan and redesign of the website.

2015 – USACE presented the results of the Aquatic Ecosystem Restoration study to the City of Litchfield. The Plan addresses key problems including loss of lake depth due to sedimentation, reduced water quality, degraded fisheries, and shoreline erosion. Constructing a rock berm at the northern end of the lake was proposed, in addition to other possible measures such as dredging, in-lake and tributary detention structures, lake draw-down, artificial underwater reefs and lake destratifiers. USACE presented the results of sediment sampling and analysis, sediment yield calculations for two primary tributaries and lake bottom depth-change analysis. Next steps are for USACE to continue with the wetlands investigation or for USACE to end the study, provide the City of Litchfield with the results, and return unused funds.

An active local stakeholder group was present for the Stage 1 public meeting in March 2017. They indicated that several projects for improved water quality have been identified for grant applications and future implementation. Any local information that is gained through the public meeting process will be included in Stage 3 development and implementation planning, as applicable.

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Section 6

Approach to Developing TMDL and Identification of Data Needs

Illinois EPA is currently developing TMDLs for pollutants that have numeric water quality standards. Of the pollutants listed in the 2016 Integrated Report as causing impairment in Lake Lou Yaeger, total phosphorus has a numeric water quality standard. In addition, a LRS will be developed for TSS. Recommended technical approaches for developing a total phosphorus TMDL and a LRS for TSS in Lake Lou Yaeger are presented in this section. Additional data needs are also discussed.

6.1 Simple and Detailed Approaches for Developing TMDLs

The range of analyses used for developing TMDLs varies from simple to complex. Examples of a simple approach include mass-balance, load-duration, and simple watershed and receiving water models. Detailed approaches incorporate the use of complex watershed and receiving water models. Simplistic approaches typically require less data than detailed approaches and therefore these are the analyses recommended for the Lou Yaeger watershed. Adequate data exists from Lake Lou Yaeger to develop a simple modeling approach for both total phosphorus and TSS. Total phosphorus and TSS data from lake tributaries would be useful information and could be used for calibration purposes, however, tributary data are not essential to proceeding with TMDL and LRS calculations. Should tributary data become available prior to Stage 3, they will be incorporated into the modeling and calculations where appropriate.

Establishing a link between pollutant loads and resulting water quality is one of the most important steps in developing a TMDL. As discussed above, this link can be established through a variety of techniques. The objective of the remainder of this section is to recommend approaches for establishing these links for the constituents of concern in Lake Lou Yaeger.

6.2 Approaches for Developing TMDLs and LRSs for Lake Lou Yaeger

6.2.1 Recommended Approach for Total Phosphorus TMDL

Lake Lou Yaeger is listed for impairment of the aesthetic quality use, caused by elevated total phosphorus. The BATHTUB model (Walker, 1996) is typically recommended for TMDL development for lake and reservoir impairments such as those in Lake Lou Yaeger. The BATHTUB model performs steady-state water and nutrient balance calculations in a spatially segmented hydraulic network that account for advective and diffusive transport, and nutrient sedimentation[1]. The model relies on empirical relationships to predict lake trophic conditions as functions of total phosphorus and nitrogen loads, residence time, and mean depth. Watershed

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[1] EPA, 2000. Nutrient Criteria Technical Guidance Manual. Lakes and Reservoirs.

loadings to the lake will be estimated using event mean concentration data, precipitation data, and estimated flows within the watershed.

Another option for the total phosphorus TMDL for Lake Lou Yaeger is CDM Smith's Simplified Lake Analysis Model (SLAM). SLAM was developed specifically to address an identified need for a practical and low cost water quality model focused on lake eutrophication that could be easily and simply applied in planning studies by a wide range of end-users. The model was originally developed as an enhanced version of the BATHTUB model and retains many of the core algorithms of that model.

SLAM calculates lake mass and flow balances on a daily time step assuming one or more well-mixed lake zones. Each zone follows the conceptual model often referred to as a "continuously stirred tank reactor" (CSTR), whereby complete and immediate mixing is assumed for each zone in both the vertical and horizontal directions. This assumption makes the model particularly well suited for Lake Lou Yaeger, which is generally well-mixed and can justifiably be divided into a limited number of small and/or shallow zones. The model targets the key parameters important for eutrophic lakes: phytoplankton (as chl-a), phosphorus (P), and nitrogen (N), and can be easily modified to aid in assessment of unrelated conservative parameters such as TSS.

SLAM also includes a state-of-the-art dynamic sediment nutrient flux module. This module calculates internal nutrient loads from the sediments to the water column as a function of shallow sediment nutrient dynamics and diffusive exchanges between sediment pore water and the overlying water column. Internal nutrient loads are a key component of many eutrophic lakes, particularly small and/or shallow lakes with large catchment areas. The inclusion of dynamic and rigorous sediment nutrient calculations within a practical planning level water quality model distinguishes SLAM from the majority of other published lake water quality models and is a particularly appealing feature for this application.

6.2.2 Recommended Approach for TSS LRS

A simple spreadsheet approach is recommended to calculate the reduction in TSS loading into Lake Lou Yaeger required to meet the target value established by Illinois EPA. The calculations utilize the watershed flow estimates developed as part of the BATHTUB or SLAM model, the relative proportion of the lake watershed made up by each subbasin, measured in-lake TSS concentrations, and the target value developed by Illinois EPA to calculate the current daily load of TSS into the lake (lbs/day), the target load (lbs/day), and the percent reduction needed in order to meet the LRS target. This simplified approach is appropriate for LRS development as it does not require the explicit assessment of WLA and LA.

Section 7
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Appendix A

Land Use Categories

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Lake Lou Yaeger

Land Cover Code	Land Cover Class	Acres	Percent Watershed
1	Corn	28,923.77	41.556
5	Soybeans	22,497.17	32.322
6	Sunflower	0.44	0.001
21	Barley	0.22	0.000
24	Winter Wheat	409.87	0.589
26	Dbl Crop WinWht/Soybeans	735.42	1.057
36	Alfalfa	31.41	0.045
37	Other Hay/Non Alfalfa	10.67	0.015
58	Clover/Wildflowers	0.76	0.001
59	Sod/Grass Seed	1.07	0.002
61	Fallow/Idle Cropland	3.44	0.005
68	Apples	0.44	0.001
74	Pecans	0.22	0.0003
111	Open Water	1,481.15	2.128
121	Developed/Open Space	2,404.12	3.454
122	Developed/Low Intensity	2,402.39	3.452
123	Developed/Med Intensity	314.00	0.451
124	Developed/High Intensity	38.31	0.055
131	Barren	9.26	0.013
141	Deciduous Forest	6,394.07	9.187
176	Grass/Pasture	3,934.58	5.653
190	Woody Wetlands	0.97	0.001
195	Herbaceous Wetlands	2.88	0.004
229	Pumpkins	5.67	0.008
Total		**69,602.30**	**100**

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Appendix B

SSURGO Soil Series

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Lake Lou Yaeger

SSURGO Soil Series Code	SSURGO Soil Series Code Definition	Dominant Hydrologic Soil Group	Acres	Percent of Watershed	ksat_l	ksat_r	ksat_h	kwfact	kffact
128B	Douglas silt loam, 2 to 5 percent slopes	B	39.25	0.06	4.23	9.170	14.11	0.32	0.32
128C2	Douglas silt loam, 5 to 10 percent slopes, eroded	B	69.33	0.10	4.23	23.290	42.34	0.43	0.43
256C2	Pana loam, 5 to 10 percent slopes, eroded	B	45.39	0.07	4.23	9.170	14.11	0.28	0.28
583B	Pike silt loam, 2 to 5 percent slopes	B	16.55	0.02	4.23	9.170	14.11	0.49	0.49
583C2	Pike silt loam, 5 to 10 percent slopes, eroded	B	27.36	0.04	4.23	9.170	14.11	0.43	0.43
583D2	Pike silt loam, 10 to 18 percent slopes, eroded	B	61.65	0.09	4.23	9.170	14.11	0.37	0.37
8D2	Hickory silt loam, 10 to 18 percent slopes, eroded	B	1,676.65	2.41	4.23	9.170	14.11	0.32	0.32
8D3	Hickory clay loam, 10 to 18 percent slopes, severely eroded	B	247.18	0.36	4.23	9.170	14.11	0.32	0.32
8F	Hickory silt loam, 18 to 35 percent slopes	B	2,195.57	3.15	4.23	9.170	14.11	0.32	0.32
8G	Hickory silt loam, 35 to 60 percent slopes	B	152.64	0.22	4.23	9.170	14.11	0.32	0.32
3074A	Radford silt loam, 0 to 2 percent slopes, frequently flooded	B/D	687.20	0.99	4.23	9.170	14.11	0.32	0.32
3451A	Lawson silt loam, 0 to 2 percent slopes, frequently flooded	B/D	1,322.68	1.90	4.23	9.170	14.11	0.24	0.24
385A	Mascoutah silty clay loam, 0 to 2 percent slopes	B/D	342.40	0.49	4.23	9.170	14.11	0.28	0.28
7788B	Shoals and Terril loams, 1 to 4 percent slopes, rarely flooded	B/D	112.30	0.16	4.23	9.170	14.11	0.32	0.32
127A	Harrison silt loam, 0 to 2 percent slopes	C	129.95	0.19	4.23	9.170	14.11	0.32	0.32
127B	Harrison silt loam, 2 to 5 percent slopes	C	1,821.28	2.62	4.23	9.170	14.11	0.32	0.32
127B2	Harrison silt loam, 2 to 5 percent slopes, eroded	C	1,011.75	1.45	4.23	9.170	14.11	0.37	0.37
259C2	Assumption silt loam, 5 to 10 percent slopes, eroded	C	462.92	0.67	0.42	2.330	4.23	0.28	0.28

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SSURGO Soil Series Code	SSURGO Soil Series Code Definition	Dominant Hydrologic Soil Group	Acres	Percent of Watershed	ksat_l	ksat_r	ksat_h	kwfact	kffact
582B	Homen silt loam, 2 to 5 percent slopes	C	610.18	0.88	4.23	9.170	14.11	0.43	0.43
582C	Homen silt loam, 5 to 10 percent slopes	C	91.65	0.13	4.23	9.170	14.11	0.43	0.43
582C2	Homen silt loam, 5 to 10 percent slopes, eroded	C	346.50	0.50	4.23	9.170	14.11	0.43	0.43
5C3	Blair silty clay loam, 5 to 10 percent slopes, severely eroded	C	4.24	0.01	4.23	9.170	14.11	0.43	0.43
680B	Campton silt loam, 2 to 5 percent slopes	C	5.09	0.01	4.23	9.170	14.11	0.43	0.43
7C2	Atlas silt loam, 5 to 10 percent slopes, eroded	C	74.06	0.11	4.23	9.170	14.11	0.43	0.43
7D2	Atlas silt loam, 10 to 18 percent slopes, eroded	C	130.27	0.19	4.23	9.170	14.11	0.43	0.43
802B	Orthents, loamy, undulating	C	199.83	0.29	1.41	2.820	4.23	0.37	0.37
802E	Orthents, loamy, hilly	C	10.09	0.01	1.41	2.820	4.23	0.28	0.28
112A	Cowden silt loam, 0 to 2 percent slopes	C/D	1,244.66	1.79	4.23	9.170	14.11	0.49	0.49
113A	Oconee silt loam, 0 to 2 percent slopes	C/D	1,397.81	2.01	4.23	9.170	14.11	0.37	0.37
113B	Oconee silt loam, 2 to 5 percent slopes	C/D	677.23	0.97	4.23	9.170	14.11	0.37	0.37
113B2	Oconee silt loam, 2 to 5 percent slopes, eroded	C/D	59.36	0.09	4.23	9.170	14.11	0.49	0.49
127C2	Harrison silt loam, 5 to 10 percent slopes, eroded	C/D	82.80	0.12	1.41	2.820	4.23	0.37	0.37
287A	Chauncey silt loam, 0 to 2 percent slopes	C/D	93.64	0.13	4.23	9.170	14.11	0.37	0.37
46A	Herrick silt loam, 0 to 2 percent slopes	C/D	10,775.09	15.48	4.23	9.170	14.11	0.37	0.37
470B2	Keller silt loam, 2 to 5 percent slopes, eroded	C/D	2,365.42	3.40	4.23	9.170	14.11	0.37	0.37
48A	Ebbert silt loam, 0 to 2 percent slopes	C/D	983.11	1.41	1.41	2.820	4.23	0.37	0.37
50A	Virden silty clay loam, 0 to 2 percent slopes	C/D	14,667.38	21.07	4.23	9.170	14.11	0.28	0.28
515C2	Bunkum silt loam, 5 to 10 percent slopes, eroded	C/D	265.10	0.38	1.41	2.820	4.23	0.43	0.43
515C3	Bunkum silty clay loam, 5 to 10 percent slopes, severely eroded	C/D	15.24	0.02	1.41	2.820	4.23	0.43	0.43
517A	Marine silt loam, 0 to 2 percent slopes	C/D	511.26	0.73	4.23	9.170	14.11	0.49	0.49
517B	Marine silt loam, 2 to 5 percent slopes	C/D	1,613.08	2.32	1.41	2.820	4.23	0.49	0.49
6B2	Fishhook silt loam, 2 to 5 percent slopes, eroded	C/D	119.97	0.17	4.23	9.170	14.11	0.37	0.37
6C2	Fishhook silt loam, 5 to 10 percent slopes, eroded	C/D	39.73	0.06	0.42	0.920	1.41	0.32	0.32
790A	Herrick-Biddle silt loams, 0 to 2 percent slopes	C/D	357.68	0.51	4.23	9.170	14.11	0.37	0.37
882B2	Oconee-Darmstadt-Coulterville silt loams, 2 to 5 percent slopes, eroded	C/D	2,120.50	3.05	4.23	9.170	14.11	0.49	0.49
885A	Virden-Fosterburg silt loams, 0 to 2 percent slopes	C/D	713.53	1.03	4.23	9.170	14.11	0.37	0.37

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SSURGO Soil Series Code	SSURGO Soil Series Code Definition	Dominant Hydrologic Soil Group	Acres	Percent of Watershed	ksat_l	ksat_r	ksat_h	kwfact	kffact
894A	Herrick-Biddle-Piasa silt loams, 0 to 2 percent slopes	C/D	12,550.88	18.03	4.23	9.170	14.11	0.37	0.37
897C2	Bunkum-Atlas silt loams, 5 to 10 percent slopes, eroded	C/D	2,741.09	3.94	4	9.000	14.00	0.43	0.43
31A	Pierron silt loam, 0 to 2 percent slopes	D	118.16	0.17	4.23	9.170	14.11	0.49	0.49
581B	Tamalco silt loam, 2 to 5 percent slopes	D	81.51	0.12	4.23	9.170	14.11	0.49	0.49
581B2	Tamalco silt loam, 2 to 5 percent slopes, eroded	D	211.94	0.30	4.23	9.170	14.11	0.49	0.49
5C2	Blair silt loam, 5 to 10 percent slopes, eroded	D	49.17	0.07	0.141	0.776	1.41	0.49	0.49
882A	Oconee-Darmstadt-Coulterville silt loams, 0 to 2 percent slopes	D	348.30	0.50	0.42	0.920	1.41	0.43	0.43
882A	Oconee-Darmstadt-Coulterville silt loams, 0 to 2 percent slopes	D	5.39	0.01	1.41	2.820	4.23	0.43	0.43
882B	Oconee-Darmstadt-Coulterville silt loams, 2 to 5 percent slopes	D	6.58	0.01	0.42	0.920	1.41	0.43	0.43
993A	Cowden-Piasa silt loams, 0 to 2 percent slopes	D	1,564.82	2.25	0.423	2.330	4.23	0.43	0.43
835G	Earthen dam		5.16	0.01	0	0.000	0.00		
8D	Hickory silt loam, 10 to 18 percent slopes		257.05	0.37	0	0.000	0.00		
M-W	Miscellaneous water		3.39	0.00	0	0.000	0.00		
W	Water		1,662.51	2.39	0	0.000	0.00		
	Total		69,602.53	100.00					

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Appendix C

Historical Water Quality Data

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Segment	Date	Time	Analyte	Fraction	Result	Units	Depth
RON-1	2012-06-08	09:41	2,4-D	Total	0.12	ug/l	17 ft
RON-1	2012-10-11	11:47	2,4-D	Total	0.18	ug/l	17 ft
RON-1	2012-08-16	08:51	2,4-D	Total	0.22	ug/l	17 ft
RON-1	2012-04-27	09:11	2,4-D	Total	0.32	ug/l	17 ft
RON-1	2008-10-06	00-Jan-00	Acetochlor	Total	0.01	ug/l	17 ft
RON-1	2012-10-11	11:47	Acetochlor	Total	0.027	ug/l	17 ft
RON-1	2012-08-16	08:51	Acetochlor	Total	0.091	ug/l	17 ft
RON-1	2012-07-23	09:20	Acetochlor	Total	0.13	ug/l	17 ft
RON-1	2012-04-27	09:11	Acetochlor	Total	0.62	ug/l	17 ft
RON-1	2008-08-06	00-Jan-00	Acetochlor	Total	0.76	ug/l	17 ft
RON-1	2012-06-08	09:41	Acetochlor	Total	0.84	ug/l	17 ft
RON-1	2008-06-10	00-Jan-00	Acetochlor	Total	1.9	ug/l	17 ft
RON-1	2008-07-01	00-Jan-00	Acetochlor	Total	2.5	ug/l	17 ft
RON-3	2008-08-06	00-Jan-00	Acetochlor	Total	21	ug/kg	7 ft
RON-1	2008-07-01	00-Jan-00	Alachlor	Total	0.017	ug/l	17 ft
RON-1	2008-06-10	00-Jan-00	Alachlor	Total	0.032	ug/l	17 ft
RON-1	2012-06-08	09:41	Alachlor	Total	0.056	ug/l	17 ft
RON-3	2008-08-06	00-Jan-00	Alachlor	Total	3.2	ug/kg	7 ft
RON-1	2008-10-06	00-Jan-00	Alkalinity, total		40	mg/l	1 ft
RON-1	2008-10-06	00-Jan-00	Alkalinity, total		43	mg/l	17 ft
RON-2	2008-10-06	00-Jan-00	Alkalinity, total		43	mg/l	1 ft
RON-1	2008-10-06	00-Jan-00	Alkalinity, total		47	mg/l	21 ft
RON-3	2008-10-06	00-Jan-00	Alkalinity, total		54	mg/l	1 ft
RON-1	2008-05-06	00-Jan-00	Alkalinity, total		70	mg/l	20 ft
RON-1	2008-05-06	00-Jan-00	Alkalinity, total		70	mg/l	17 ft
RON-2	2008-05-06	00-Jan-00	Alkalinity, total		75	mg/l	1 ft
RON-1	2008-05-06	00-Jan-00	Alkalinity, total		75	mg/l	1 ft
RON-1	2012-06-08	09:38	Alkalinity, total		80	mg/l	1 ft
RON-2	2012-06-08	09:43	Alkalinity, total		80	mg/l	1 ft
RON-1	2012-06-08	09:41	Alkalinity, total		82	mg/l	17 ft
RON-3	2008-05-06	00-Jan-00	Alkalinity, total		85	mg/l	1 ft
RON-3	2008-07-01	00-Jan-00	Alkalinity, total		85	mg/l	1 ft
RON-1	2012-06-08	09:43	Alkalinity, total		88	mg/l	19 ft

Segment	Date	Time	Analyte	Fraction	Result	Units	Depth
RON-3	2012-06-08	10:46	Alkalinity, total		90	mg/l	1 ft
RON-3	2008-06-10	00-Jan-00	Alkalinity, total		90	mg/l	1 ft
RON-2	2008-06-10	00-Jan-00	Alkalinity, total		90	mg/l	1 ft
RON-1	2008-06-10	00-Jan-00	Alkalinity, total		90	mg/l	17 ft
RON-1	2008-06-10	00-Jan-00	Alkalinity, total		95	mg/l	1 ft
RON-1	2008-07-01	00-Jan-00	Alkalinity, total		95	mg/l	1 ft
RON-1	2008-07-01	00-Jan-00	Alkalinity, total		95	mg/l	19 ft
RON-2	2008-08-06	00-Jan-00	Alkalinity, total		95	mg/l	1 ft
RON-2	2012-07-23	09:21	Alkalinity, total		100	mg/l	1 ft
RON-1	2012-10-11	11:47	Alkalinity, total		100	mg/l	17 ft
RON-1	2008-07-01	00-Jan-00	Alkalinity, total		100	mg/l	17 ft
RON-2	2008-07-01	00-Jan-00	Alkalinity, total		100	mg/l	1 ft
RON-1	2008-08-06	00-Jan-00	Alkalinity, total		100	mg/l	19 ft
RON-1	2008-08-06	00-Jan-00	Alkalinity, total		100	mg/l	17 ft
RON-1	2012-07-23	09:18	Alkalinity, total		105	mg/l	1 ft
RON-1	2012-08-16	08:51	Alkalinity, total		105	mg/l	17 ft
RON-1	2012-08-16	08:51	Alkalinity, total		105	mg/l	20 ft
RON-1	2012-10-11	11:47	Alkalinity, total		105	mg/l	20 ft
RON-2	2012-10-11	12:14	Alkalinity, total		105	mg/l	1 ft
RON-1	2008-08-06	00-Jan-00	Alkalinity, total		105	mg/l	1 ft
RON-3	2012-04-27	10:07	Alkalinity, total		110	mg/l	1 ft
RON-1	2012-07-23	09:20	Alkalinity, total		110	mg/l	17 ft
RON-3	2012-07-23	09:51	Alkalinity, total		110	mg/l	1 ft
RON-1	2012-08-16	08:49	Alkalinity, total		110	mg/l	1 ft
RON-2	2012-08-16	08:52	Alkalinity, total		110	mg/l	1 ft
RON-3	2008-08-06	00-Jan-00	Alkalinity, total		110	mg/l	1 ft
RON-1	2012-04-27	09:10	Alkalinity, total		115	mg/l	1 ft
RON-2	2012-04-27	09:11	Alkalinity, total		115	mg/l	1 ft
RON-3	2012-08-16	09:21	Alkalinity, total		115	mg/l	1 ft
RON-1	2012-10-11	11:47	Alkalinity, total		115	mg/l	1 ft
RON-3	2012-10-11	12:27	Alkalinity, total		115	mg/l	1 ft
RON-1	2012-04-27	09:11	Alkalinity, total		120	mg/l	17 ft
RON-1	2012-04-27	09:11	Alkalinity, total		120	mg/l	21 ft

Segment	Date	Time	Analyte	Fraction	Result	Units	Depth
RON-1	2012-07-23	09:21	Alkalinity, total		130	mg/l	20 ft
RON-1	2012-04-27	09:11	Aluminum	Total	67.9	ug/l	17 ft
RON-1	2012-06-08	09:41	Aluminum	Total	174	ug/l	17 ft
RON-1	2008-08-06	00-Jan-00	Aluminum	Total	198	ug/l	17 ft
RON-1	2012-07-23	09:20	Aluminum	Total	212	ug/l	17 ft
RON-1	2012-10-11	11:47	Aluminum	Total	301	ug/l	17 ft
RON-1	2012-08-16	08:51	Aluminum	Total	311	ug/l	17 ft
RON-1	2008-10-06	00-Jan-00	Aluminum	Total	632	ug/l	17 ft
RON-1	2008-06-10	00-Jan-00	Aluminum	Total	776	ug/l	17 ft
RON-1	2008-05-06	00-Jan-00	Aluminum	Total	4270	ug/l	17 ft
RON-3	2012-08-16	09:21	Ammonia-nitrogen	Total	0.02	mg/l	1 ft
RON-1	2012-06-08	09:38	Ammonia-nitrogen	Total	0.03	mg/l	1 ft
RON-1	2012-10-11	11:47	Ammonia-nitrogen	Total	0.11	mg/l	1 ft
RON-1	2012-10-11	11:47	Ammonia-nitrogen	Total	0.13	mg/l	17 ft
RON-1	2012-10-11	11:47	Ammonia-nitrogen	Total	0.15	mg/l	20 ft
RON-1	2012-06-08	09:41	Ammonia-nitrogen	Total	0.27	mg/l	17 ft
RON-1	2012-06-08	09:43	Ammonia-nitrogen	Total	0.36	mg/l	19 ft
RON-1	2012-07-23	09:20	Ammonia-nitrogen	Total	0.4	mg/l	17 ft
RON-1	2012-08-16	08:51	Ammonia-nitrogen	Total	0.62	mg/l	17 ft
RON-2	2012-08-16	08:52	Ammonia-nitrogen	Total	0.68	mg/l	1 ft
RON-1	2012-08-16	08:49	Ammonia-nitrogen	Total	0.73	mg/l	1 ft
RON-1	2012-08-16	08:51	Ammonia-nitrogen	Total	0.74	mg/l	20 ft
RON-1	2012-07-23	09:21	Ammonia-nitrogen	Total	2.34	mg/l	20 ft
RON-1	2012-04-27	09:11	Arsenic	Total	1.85	ug/l	17 ft
RON-1	2012-10-11	11:47	Arsenic	Total	2.87	ug/l	17 ft
RON-1	2012-07-23	09:20	Arsenic	Total	5.6	ug/l	17 ft
RON-1	2012-08-16	08:51	Arsenic	Total	6.66	ug/l	17 ft
RON-1	2008-05-06	00-Jan-00	Arsenic	Total	8.92	ug/l	17 ft
RON-3	2008-08-06	00-Jan-00	Arsenic	Total	10.9	mg/kg	7 ft
RON-1	2008-08-06	00-Jan-00	Arsenic	Total	12.6	mg/kg	21 ft
RON-1	2008-07-01	00-Jan-00	Atrazine	Total	0.11	ug/l	17 ft
RON-1	2008-10-06	00-Jan-00	Atrazine	Total	0.27	ug/l	17 ft
RON-1	2012-10-11	11:47	Atrazine	Total	0.72	ug/l	17 ft

Segment	Date	Time	Analyte	Fraction	Result	Units	Depth
RON-1	2012-06-08	09:41	Atrazine	Total	0.9	ug/l	17 ft
RON-1	2008-08-06	00-Jan-00	Atrazine	Total	0.98	ug/l	17 ft
RON-1	2012-08-16	08:51	Atrazine	Total	1	ug/l	17 ft
RON-1	2012-07-23	09:20	Atrazine	Total	1.1	ug/l	17 ft
RON-1	2012-04-27	09:11	Atrazine	Total	5.4	ug/l	17 ft
RON-1	2008-06-10	00-Jan-00	Atrazine	Total	8.9	ug/l	17 ft
RON-1	2008-10-06	00-Jan-00	Barium	Total	34	ug/l	17 ft
RON-1	2008-08-06	00-Jan-00	Barium	Total	54.9	ug/l	17 ft
RON-1	2012-04-27	09:11	Barium	Total	66.2	ug/l	17 ft
RON-1	2012-07-23	09:20	Barium	Total	69.7	ug/l	17 ft
RON-1	2008-07-01	00-Jan-00	Barium	Total	73	ug/l	17 ft
RON-1	2012-06-08	09:41	Barium	Total	76.3	ug/l	17 ft
RON-1	2008-06-10	00-Jan-00	Barium	Total	76.3	ug/l	17 ft
RON-1	2012-10-11	11:47	Barium	Total	83.1	ug/l	17 ft
RON-1	2008-05-06	00-Jan-00	Barium	Total	97.8	ug/l	17 ft
RON-1	2012-08-16	08:51	Barium	Total	123	ug/l	17 ft
RON-3	2008-08-06	00-Jan-00	Barium	Total	123	mg/kg	7 ft
RON-1	2008-08-06	00-Jan-00	Barium	Total	177	mg/kg	21 ft
RON-1	2012-07-23	09:20	Beryllium	Total	0.16	ug/l	17 ft
RON-1	2012-04-27	09:11	Beryllium	Total	0.81	ug/l	17 ft
RON-1	2008-06-10	00-Jan-00	Boron	Total	4.07	ug/l	17 ft
RON-1	2008-10-06	00-Jan-00	Boron	Total	15.1	ug/l	17 ft
RON-1	2008-08-06	00-Jan-00	Boron	Total	21.9	ug/l	17 ft
RON-1	2012-08-16	08:51	Boron	Total	22.7	ug/l	17 ft
RON-1	2012-07-23	09:20	Boron	Total	22.8	ug/l	17 ft
RON-1	2012-06-08	09:41	Boron	Total	23	ug/l	17 ft
RON-1	2012-04-27	09:11	Boron	Total	26.2	ug/l	17 ft
RON-1	2012-10-11	11:47	Boron	Total	31	ug/l	17 ft
RON-1	2008-07-01	00-Jan-00	Boron	Total	40.6	ug/l	17 ft
RON-1	2012-06-08	09:41	Cadmium	Total	0.5	ug/l	17 ft
RON-1	2008-06-10	00-Jan-00	Cadmium	Total	0.54	ug/l	17 ft
RON-1	2012-04-27	09:11	Cadmium	Total	0.68	ug/l	17 ft
RON-1	2008-07-01	00-Jan-00	Cadmium	Total	0.88	ug/l	17 ft

Segment	Date	Time	Analyte	Fraction	Result	Units	Depth
RON-1	2008-05-06	00-Jan-00	Cadmium	Total	1.49	ug/l	17 ft
RON-1	2008-10-06	00-Jan-00	Calcium	Total	11300	ug/l	17 ft
RON-1	2012-06-08	09:41	Calcium	Total	25300	ug/l	17 ft
RON-1	2012-07-23	09:20	Calcium	Total	26700	ug/l	17 ft
RON-1	2012-08-16	08:51	Calcium	Total	29000	ug/l	17 ft
RON-1	2012-10-11	11:47	Calcium	Total	31900	ug/l	17 ft
RON-1	2008-05-06	00-Jan-00	Calcium	Total	32200	ug/l	17 ft
RON-1	2008-08-06	00-Jan-00	Calcium	Total	32900	ug/l	17 ft
RON-1	2008-07-01	00-Jan-00	Calcium	Total	35500	ug/l	17 ft
RON-1	2012-04-27	09:11	Calcium	Total	38300	ug/l	17 ft
RON-3	2008-08-06	00-Jan-00	Carbon, organic	Total	2.37	%	7 ft
RON-1	2008-08-06	00-Jan-00	Carbon, organic	Total	3.49	%	21 ft
RON-3	2008-08-06	00-Jan-00	Chlordane, cis	Total	0.27	ug/kg	7 ft
RON-1	2008-08-06	00-Jan-00	Chlordane, cis	Total	0.31	ug/kg	21 ft
RON-1	2008-10-06	00-Jan-00	Chloride	Total	3.34	mg/l	21 ft
RON-2	2008-10-06	00-Jan-00	Chloride	Total	3.38	mg/l	1 ft
RON-1	2008-10-06	00-Jan-00	Chloride	Total	3.5	mg/l	1 ft
RON-1	2008-10-06	00-Jan-00	Chloride	Total	3.58	mg/l	17 ft
RON-3	2008-10-06	00-Jan-00	Chloride	Total	4.58	mg/l	1 ft
RON-1	2012-06-08	09:41	Chloride	Total	16.5	mg/l	17 ft
RON-1	2012-07-23	09:20	Chloride	Total	17	mg/l	17 ft
RON-2	2012-10-11	12:14	Chloride	Total	18.6	mg/l	1 ft
RON-1	2012-08-16	08:51	Chloride	Total	19	mg/l	17 ft
RON-1	2012-10-11	11:47	Chloride	Total	19.9	mg/l	20 ft
RON-3	2008-07-01	00-Jan-00	Chloride	Total	20.8	mg/l	1 ft
RON-1	2008-08-06	00-Jan-00	Chloride	Total	21	mg/l	19 ft
RON-1	2008-08-06	00-Jan-00	Chloride	Total	21.2	mg/l	17 ft
RON-3	2008-08-06	00-Jan-00	Chloride	Total	21.5	mg/l	1 ft
RON-1	2008-08-06	00-Jan-00	Chloride	Total	21.6	mg/l	1 ft
RON-2	2008-08-06	00-Jan-00	Chloride	Total	21.8	mg/l	1 ft
RON-1	2008-07-01	00-Jan-00	Chloride	Total	23	mg/l	17 ft
RON-2	2008-07-01	00-Jan-00	Chloride	Total	23	mg/l	1 ft
RON-1	2008-05-06	00-Jan-00	Chloride	Total	23.1	mg/l	17 ft

Segment	Date	Time	Analyte	Fraction	Result	Units	Depth
RON-1	2008-05-06	00-Jan-00	Chloride	Total	23.2	mg/l	1 ft
RON-1	2008-05-06	00-Jan-00	Chloride	Total	23.4	mg/l	20 ft
RON-1	2008-07-01	00-Jan-00	Chloride	Total	23.6	mg/l	19 ft
RON-1	2008-07-01	00-Jan-00	Chloride	Total	23.9	mg/l	1 ft
RON-2	2008-05-06	00-Jan-00	Chloride	Total	24.3	mg/l	1 ft
RON-1	2008-06-10	00-Jan-00	Chloride	Total	24.6	mg/l	17 ft
RON-1	2008-06-10	00-Jan-00	Chloride	Total	24.7	mg/l	1 ft
RON-3	2008-06-10	00-Jan-00	Chloride	Total	25.6	mg/l	1 ft
RON-2	2008-06-10	00-Jan-00	Chloride	Total	25.6	mg/l	1 ft
RON-3	2008-05-06	00-Jan-00	Chloride	Total	25.7	mg/l	1 ft
RON-1	2012-04-27	09:11	Chloride	Total	26.2	mg/l	17 ft
RON-1	2008-05-06	00-Jan-00	Chlorophyll a, corrected for pheophytin	Total	2.91	ug/l	1 ft
RON-2	2008-05-06	00-Jan-00	Chlorophyll a, corrected for pheophytin	Total	5.89	ug/l	1 ft
RON-1	2008-07-01	00-Jan-00	Chlorophyll a, corrected for pheophytin	Total	6.95	ug/l	5 ft
RON-2	2008-06-10	00-Jan-00	Chlorophyll a, corrected for pheophytin	Total	9.09	ug/l	1 ft
RON-2	2008-07-01	00-Jan-00	Chlorophyll a, corrected for pheophytin	Total	9.5	ug/l	3 ft
RON-3	2008-06-10	00-Jan-00	Chlorophyll a, corrected for pheophytin	Total	11.3	ug/l	1 ft
RON-1	2008-06-10	00-Jan-00	Chlorophyll a, corrected for pheophytin	Total	13.3	ug/l	2 ft
RON-1	2008-10-06	00-Jan-00	Chlorophyll a, corrected for pheophytin	Total	17.1	ug/l	4 ft
RON-3	2008-07-01	00-Jan-00	Chlorophyll a, corrected for pheophytin	Total	20.6	ug/l	2 ft
RON-1	2012-08-16	08:49	Chlorophyll a, corrected for pheophytin	Total	25.4	ug/l	4 ft
RON-2	2008-10-06	00-Jan-00	Chlorophyll a, corrected for pheophytin	Total	35.6	ug/l	4 ft
RON-1	2012-10-11	11:47	Chlorophyll a, corrected for pheophytin	Total	38.3	ug/l	3 ft
RON-1	2012-07-23	09:18	Chlorophyll a, corrected for pheophytin	Total	39.2	ug/l	4 ft
RON-3	2008-10-06	00-Jan-00	Chlorophyll a, corrected for pheophytin	Total	42.7	ug/l	3 ft
RON-3	2012-10-11	12:27	Chlorophyll a, corrected for pheophytin	Total	48.1	ug/l	2 ft
RON-2	2012-10-11	12:14	Chlorophyll a, corrected for pheophytin	Total	53.4	ug/l	3 ft
RON-2	2012-07-23	09:21	Chlorophyll a, corrected for pheophytin	Total	55.2	ug/l	3 ft
RON-3	2008-05-06	00-Jan-00	Chlorophyll a, corrected for pheophytin	Total	61.3	ug/l	1 ft
RON-1	2008-08-06	00-Jan-00	Chlorophyll a, corrected for pheophytin	Total	80.7	ug/l	4 ft
RON-1	2012-04-27	09:10	Chlorophyll a, corrected for pheophytin	Total	87.2	ug/l	3 ft
RON-3	2012-04-27	10:07	Chlorophyll a, corrected for pheophytin	Total	87.6	ug/l	2 ft
RON-3	2012-08-16	09:21	Chlorophyll a, corrected for pheophytin	Total	89.4	ug/l	1 ft

Segment	Date	Time	Analyte	Fraction	Result	Units	Depth
RON-2	2012-08-16	08:52	Chlorophyll a, corrected for pheophytin	Total	91.7	ug/l	2 ft
RON-3	2012-07-23	09:51	Chlorophyll a, corrected for pheophytin	Total	92.1	ug/l	2 ft
RON-2	2012-04-27	09:11	Chlorophyll a, corrected for pheophytin	Total	110	ug/l	2 ft
RON-3	2008-08-06	00-Jan-00	Chlorophyll a, corrected for pheophytin	Total	113	ug/l	2 ft
RON-2	2008-08-06	00-Jan-00	Chlorophyll a, corrected for pheophytin	Total	139	ug/l	3 ft
RON-1	2008-05-06	00-Jan-00	Chlorophyll a, uncorrected for pheophytin	Total	7.12	ug/l	1 ft
RON-1	2008-07-01	00-Jan-00	Chlorophyll a, uncorrected for pheophytin	Total	7.18	ug/l	5 ft
RON-2	2008-07-01	00-Jan-00	Chlorophyll a, uncorrected for pheophytin	Total	8.07	ug/l	3 ft
RON-2	2008-05-06	00-Jan-00	Chlorophyll a, uncorrected for pheophytin	Total	9.16	ug/l	1 ft
RON-2	2008-06-10	00-Jan-00	Chlorophyll a, uncorrected for pheophytin	Total	12.2	ug/l	1 ft
RON-3	2008-06-10	00-Jan-00	Chlorophyll a, uncorrected for pheophytin	Total	14.9	ug/l	1 ft
RON-1	2008-06-10	00-Jan-00	Chlorophyll a, uncorrected for pheophytin	Total	15.1	ug/l	2 ft
RON-1	2008-10-06	00-Jan-00	Chlorophyll a, uncorrected for pheophytin	Total	18.5	ug/l	4 ft
RON-3	2008-07-01	00-Jan-00	Chlorophyll a, uncorrected for pheophytin	Total	21	ug/l	2 ft
RON-1	2012-08-16	08:49	Chlorophyll a, uncorrected for pheophytin	Total	32.8	ug/l	4 ft
RON-2	2008-10-06	00-Jan-00	Chlorophyll a, uncorrected for pheophytin	Total	38.3	ug/l	4 ft
RON-1	2012-10-11	11:47	Chlorophyll a, uncorrected for pheophytin	Total	42.6	ug/l	3 ft
RON-1	2012-07-23	09:18	Chlorophyll a, uncorrected for pheophytin	Total	47.1	ug/l	4 ft
RON-3	2008-10-06	00-Jan-00	Chlorophyll a, uncorrected for pheophytin	Total	48.6	ug/l	3 ft
RON-3	2012-10-11	12:27	Chlorophyll a, uncorrected for pheophytin	Total	53.1	ug/l	2 ft
RON-2	2012-10-11	12:14	Chlorophyll a, uncorrected for pheophytin	Total	61.7	ug/l	3 ft
RON-3	2008-05-06	00-Jan-00	Chlorophyll a, uncorrected for pheophytin	Total	66.8	ug/l	1 ft
RON-2	2012-07-23	09:21	Chlorophyll a, uncorrected for pheophytin	Total	67	ug/l	3 ft
RON-1	2008-08-06	00-Jan-00	Chlorophyll a, uncorrected for pheophytin	Total	85.3	ug/l	4 ft
RON-1	2012-04-27	09:10	Chlorophyll a, uncorrected for pheophytin	Total	88.8	ug/l	3 ft
RON-3	2012-04-27	10:07	Chlorophyll a, uncorrected for pheophytin	Total	92.4	ug/l	2 ft
RON-3	2012-08-16	09:21	Chlorophyll a, uncorrected for pheophytin	Total	98.7	ug/l	1 ft
RON-2	2012-08-16	08:52	Chlorophyll a, uncorrected for pheophytin	Total	101	ug/l	2 ft
RON-3	2012-07-23	09:51	Chlorophyll a, uncorrected for pheophytin	Total	110	ug/l	2 ft
RON-2	2012-04-27	09:11	Chlorophyll a, uncorrected for pheophytin	Total	111	ug/l	2 ft
RON-3	2008-08-06	00-Jan-00	Chlorophyll a, uncorrected for pheophytin	Total	117	ug/l	2 ft
RON-2	2008-08-06	00-Jan-00	Chlorophyll a, uncorrected for pheophytin	Total	147	ug/l	3 ft
RON-1	2012-04-27	09:10	Chlorophyll b	Total	1.67	ug/l	3 ft

Segment	Date	Time	Analyte	Fraction	Result	Units	Depth
RON-2	2012-04-27	09:11	Chlorophyll b	Total	1.84	ug/l	2 ft
RON-3	2012-04-27	10:07	Chlorophyll b	Total	1.91	ug/l	2 ft
RON-1	2012-08-16	08:49	Chlorophyll c	Total	1.57	ug/l	4 ft
RON-1	2012-07-23	09:18	Chlorophyll c	Total	3.03	ug/l	4 ft
RON-2	2012-07-23	09:21	Chlorophyll c	Total	3.38	ug/l	3 ft
RON-3	2012-08-16	09:21	Chlorophyll c	Total	6.55	ug/l	1 ft
RON-3	2012-07-23	09:51	Chlorophyll c	Total	6.65	ug/l	2 ft
RON-2	2012-08-16	08:52	Chlorophyll c	Total	7.82	ug/l	2 ft
RON-3	2012-04-27	10:07	Chlorophyll c	Total	9.39	ug/l	2 ft
RON-1	2012-04-27	09:10	Chlorophyll c	Total	9.54	ug/l	3 ft
RON-2	2012-04-27	09:11	Chlorophyll c	Total	11.8	ug/l	2 ft
RON-1	2008-06-10	00-Jan-00	Chlorophyll-c	Total	1.38	ug/l	2 ft
RON-2	2008-06-10	00-Jan-00	Chlorophyll-c	Total	1.89	ug/l	1 ft
RON-3	2008-06-10	00-Jan-00	Chlorophyll-c	Total	2.03	ug/l	1 ft
RON-1	2008-10-06	00-Jan-00	Chlorophyll-c	Total	3.58	ug/l	4 ft
RON-3	2008-07-01	00-Jan-00	Chlorophyll-c	Total	3.85	ug/l	2 ft
RON-2	2008-10-06	00-Jan-00	Chlorophyll-c	Total	4.81	ug/l	4 ft
RON-3	2008-10-06	00-Jan-00	Chlorophyll-c	Total	5.58	ug/l	3 ft
RON-1	2008-08-06	00-Jan-00	Chlorophyll-c	Total	6.32	ug/l	4 ft
RON-3	2008-05-06	00-Jan-00	Chlorophyll-c	Total	7.01	ug/l	1 ft
RON-3	2008-08-06	00-Jan-00	Chlorophyll-c	Total	7.98	ug/l	2 ft
RON-2	2008-08-06	00-Jan-00	Chlorophyll-c	Total	13	ug/l	3 ft
RON-1	2012-08-16	08:51	Chromium	Total	0.49	ug/l	17 ft
RON-1	2012-10-11	11:47	Chromium	Total	0.5	ug/l	17 ft
RON-1	2012-06-08	09:41	Chromium	Total	0.82	ug/l	17 ft
RON-1	2008-10-06	00-Jan-00	Chromium	Total	0.93	ug/l	17 ft
RON-1	2008-08-06	00-Jan-00	Chromium	Total	1.23	ug/l	17 ft
RON-1	2008-06-10	00-Jan-00	Chromium	Total	1.31	ug/l	17 ft
RON-1	2008-07-01	00-Jan-00	Chromium	Total	1.4	ug/l	17 ft
RON-1	2008-05-06	00-Jan-00	Chromium	Total	4.78	ug/l	17 ft
RON-3	2008-08-06	00-Jan-00	Chromium	Total	12.3	mg/kg	7 ft
RON-1	2008-08-06	00-Jan-00	Chromium	Total	15.4	mg/kg	21 ft
RON-1	2012-10-11	11:47	Cobalt	Total	0.33	ug/l	17 ft

Segment	Date	Time	Analyte	Fraction	Result	Units	Depth
RON-1	2012-07-23	09:20	Cobalt	Total	0.34	ug/l	17 ft
RON-1	2012-06-08	09:41	Cobalt	Total	0.48	ug/l	17 ft
RON-1	2012-08-16	08:51	Cobalt	Total	0.6	ug/l	17 ft
RON-1	2008-05-06	00-Jan-00	Cobalt	Total	1.24	ug/l	17 ft
RON-1	2012-04-27	09:11	Cobalt	Total	3.65	ug/l	17 ft
RON-1	2008-07-01	00-Jan-00	Copper	Total	1.68	ug/l	17 ft
RON-1	2012-06-08	09:41	Copper	Total	2.53	ug/l	17 ft
RON-1	2008-05-06	00-Jan-00	Copper	Total	2.99	ug/l	17 ft
RON-1	2008-08-06	00-Jan-00	Copper	Total	3.55	ug/l	17 ft
RON-1	2012-04-27	09:11	Copper	Total	3.62	ug/l	17 ft
RON-1	2012-08-16	08:51	Copper	Total	4.98	ug/l	17 ft
RON-3	2008-08-06	00-Jan-00	Copper	Total	8.4	mg/kg	7 ft
RON-1	2008-08-06	00-Jan-00	Copper	Total	13.3	mg/kg	21 ft
RON-3	2008-06-10		Depth, bottom		6	ft	
RON-3	2008-07-01		Depth, bottom		6	ft	
RON-3	2008-05-06		Depth, bottom		7	ft	
RON-3	2008-08-06		Depth, bottom		7	ft	
RON-3	2008-10-06		Depth, bottom		7	ft	
RON-2	2008-07-01		Depth, bottom		13	ft	
RON-2	2008-10-06		Depth, bottom		14	ft	
RON-2	2008-08-06		Depth, bottom		15	ft	
RON-2	2008-06-10		Depth, bottom		16	ft	
RON-2	2008-05-06		Depth, bottom		20	ft	
RON-1	2008-06-10		Depth, bottom		21	ft	
RON-1	2008-07-01		Depth, bottom		21	ft	
RON-1	2008-08-06		Depth, bottom		21	ft	
RON-1	2008-05-06		Depth, bottom		22	ft	
RON-1	2008-10-06		Depth, bottom		23	ft	
RON-2	2008-05-06	00-Jan-00	Depth, Secchi Disk Depth		5	in	
RON-3	2008-06-10	00-Jan-00	Depth, Secchi Disk Depth		5	in	
RON-1	2008-05-06	00-Jan-00	Depth, Secchi Disk Depth		6	in	
RON-1	2008-05-06	00-Jan-00	Depth, Secchi Disk Depth		6	in	
RON-3	2008-05-06	00-Jan-00	Depth, Secchi Disk Depth		6	in	

Segment	Date	Time	Analyte	Fraction	Result	Units	Depth
RON-2	2008-06-10	00-Jan-00	Depth, Secchi Disk Depth		7	in	
RON-3	2008-07-01	00-Jan-00	Depth, Secchi Disk Depth		10	in	
RON-1	2008-06-10	00-Jan-00	Depth, Secchi Disk Depth		12	in	
RON-3	2008-08-06	00-Jan-00	Depth, Secchi Disk Depth		12	in	
RON-2	2008-08-06	00-Jan-00	Depth, Secchi Disk Depth		15	in	
RON-3	2008-10-06	00-Jan-00	Depth, Secchi Disk Depth		15	in	
RON-2	2008-07-01	00-Jan-00	Depth, Secchi Disk Depth		17	in	
RON-1	2008-08-06	00-Jan-00	Depth, Secchi Disk Depth		21	in	
RON-2	2008-10-06	00-Jan-00	Depth, Secchi Disk Depth		23	in	
RON-1	2008-10-06	00-Jan-00	Depth, Secchi Disk Depth		25	in	
RON-1	2008-07-01	00-Jan-00	Depth, Secchi Disk Depth		29	in	
RON-1	2012-06-08	09:41	Dicamba	Total	0.054	ug/l	17 ft
RON-1	2008-06-10	00-Jan-00	Dicamba	Total	0.087	ug/l	17 ft
RON-1	2008-07-01	00-Jan-00	Dicamba	Total	0.11	ug/l	17 ft
RON-1	2012-04-27	09:11	Dieldrin	Total	0.0019	ug/l	17 ft
RON-1	2008-05-06	00-Jan-00	Dieldrin	Total	0.0037	ug/l	17 ft
RON-1	2012-06-08	09:41	Dieldrin	Total	0.0052	ug/l	17 ft
RON-1	2008-06-10	00-Jan-00	Dieldrin	Total	0.0058	ug/l	17 ft
RON-1	2012-07-23	09:20	Dieldrin	Total	0.0061	ug/l	17 ft
RON-1	2008-08-06	00-Jan-00	Dieldrin	Total	0.0063	ug/l	17 ft
RON-1	2008-07-01	00-Jan-00	Dieldrin	Total	0.0092	ug/l	17 ft
RON-3	2008-08-06	00-Jan-00	Dieldrin	Total	0.87	ug/kg	7 ft
RON-1	2008-08-06	00-Jan-00	Dieldrin	Total	0.93	ug/kg	21 ft
RON-1	2012-04-27	09:11	Dinoseb	Total	0.063	ug/l	17 ft
RON-1	2012-06-08	09:41	Dinoseb	Total	0.099	ug/l	17 ft
RON-1	2012-06-08	09:41	Fluoride	Total	0.25	mg/l	17 ft
RON-1	2012-07-23	09:20	Fluoride	Total	0.26	mg/l	17 ft
RON-1	2012-04-27	09:11	Fluoride	Total	0.29	mg/l	17 ft
RON-1	2012-08-16	08:51	Fluoride	Total	0.3	mg/l	17 ft
RON-1	2012-10-11	11:47	Fluoride	Total	0.31	mg/l	17 ft
RON-1	2008-10-06	00-Jan-00	Hardness, Ca + Mg	Total	41500	ug/l	17 ft
RON-1	2008-05-06	00-Jan-00	Hardness, Ca + Mg	Total	125000	ug/l	17 ft
RON-1	2008-08-06	00-Jan-00	Hardness, Ca + Mg	Total	129000	ug/l	17 ft

Segment	Date	Time	Analyte	Fraction	Result	Units	Depth
RON-1	2008-07-01	00-Jan-00	Hardness, Ca + Mg	Total	137000	ug/l	17 ft
RON-1	2012-06-08	09:41	Hardness, Ca, Mg		97000	ug/l	17 ft
RON-1	2012-07-23	09:20	Hardness, Ca, Mg		108000	ug/l	17 ft
RON-1	2012-08-16	08:51	Hardness, Ca, Mg		116000	ug/l	17 ft
RON-1	2012-10-11	11:47	Hardness, Ca, Mg		126000	ug/l	17 ft
RON-1	2012-04-27	09:11	Hardness, Ca, Mg		155000	ug/l	17 ft
RON-1	2012-08-16	08:51	Heptachlor	Total	0.00075	ug/l	17 ft
RON-1	2012-04-27	09:11	Heptachlor	Total	0.0011	ug/l	17 ft
RON-1	2012-08-16	08:51	Inorganic nitrogen (nitrate and nitrite)	Total	0.019	mg/l	20 ft
RON-2	2012-10-11	12:14	Inorganic nitrogen (nitrate and nitrite)	Total	0.047	mg/l	1 ft
RON-1	2012-10-11	11:47	Inorganic nitrogen (nitrate and nitrite)	Total	0.225	mg/l	17 ft
RON-1	2012-10-11	11:47	Inorganic nitrogen (nitrate and nitrite)	Total	0.235	mg/l	20 ft
RON-1	2012-10-11	11:47	Inorganic nitrogen (nitrate and nitrite)	Total	0.249	mg/l	1 ft
RON-1	2012-04-27	09:11	Inorganic nitrogen (nitrate and nitrite)	Total	0.95	mg/l	21 ft
RON-1	2012-04-27	09:11	Inorganic nitrogen (nitrate and nitrite)	Total	0.973	mg/l	17 ft
RON-1	2012-04-27	09:10	Inorganic nitrogen (nitrate and nitrite)	Total	0.974	mg/l	1 ft
RON-3	2012-06-08	10:46	Inorganic nitrogen (nitrate and nitrite)	Total	1.42	mg/l	1 ft
RON-1	2012-06-08	09:38	Inorganic nitrogen (nitrate and nitrite)	Total	1.83	mg/l	1 ft
RON-2	2012-06-08	09:43	Inorganic nitrogen (nitrate and nitrite)	Total	1.85	mg/l	1 ft
RON-1	2012-06-08	09:43	Inorganic nitrogen (nitrate and nitrite)	Total	2.46	mg/l	19 ft
RON-2	2012-04-27	09:11	Inorganic nitrogen (nitrate and nitrite)	Total	2.5	mg/l	1 ft
RON-1	2012-06-08	09:41	Inorganic nitrogen (nitrate and nitrite)	Total	2.62	mg/l	17 ft
RON-3	2012-04-27	10:07	Inorganic nitrogen (nitrate and nitrite)	Total	3.55	mg/l	1 ft
RON-1	2012-07-23	09:20	Iron	Total	242	ug/l	17 ft
RON-1	2008-08-06	00-Jan-00	Iron	Total	263	ug/l	17 ft
RON-1	2012-04-27	09:11	Iron	Total	304	ug/l	17 ft
RON-1	2012-06-08	09:41	Iron	Total	362	ug/l	17 ft
RON-1	2012-10-11	11:47	Iron	Total	508	ug/l	17 ft
RON-1	2012-08-16	08:51	Iron	Total	575	ug/l	17 ft
RON-1	2008-06-10	00-Jan-00	Iron	Total	662	ug/l	17 ft
RON-1	2008-07-01	00-Jan-00	Iron	Total	777	ug/l	17 ft
RON-1	2008-10-06	00-Jan-00	Iron	Total	784	ug/l	17 ft
RON-1	2008-05-06	00-Jan-00	Iron	Total	4600	ug/l	17 ft

Segment	Date	Time	Analyte	Fraction	Result	Units	Depth
RON-3	2008-08-06	00-Jan-00	Iron	Total	13600	mg/kg	7 ft
RON-1	2008-08-06	00-Jan-00	Iron	Total	19100	mg/kg	21 ft
RON-1	2012-06-08	09:41	Kjeldahl nitrogen	Total	0.511	mg/l	17 ft
RON-1	2012-06-08	09:43	Kjeldahl nitrogen	Total	0.514	mg/l	19 ft
RON-3	2012-06-08	10:46	Kjeldahl nitrogen	Total	0.677	mg/l	1 ft
RON-1	2012-07-23	09:18	Kjeldahl nitrogen	Total	0.927	mg/l	1 ft
RON-1	2012-04-27	09:11	Kjeldahl nitrogen	Total	0.937	mg/l	17 ft
RON-1	2012-10-11	11:47	Kjeldahl nitrogen	Total	0.948	mg/l	1 ft
RON-1	2012-10-11	11:47	Kjeldahl nitrogen	Total	1.01	mg/l	17 ft
RON-1	2012-04-27	09:11	Kjeldahl nitrogen	Total	1.05	mg/l	21 ft
RON-2	2012-10-11	12:14	Kjeldahl nitrogen	Total	1.13	mg/l	1 ft
RON-1	2012-04-27	09:10	Kjeldahl nitrogen	Total	1.14	mg/l	1 ft
RON-1	2012-10-11	11:47	Kjeldahl nitrogen	Total	1.14	mg/l	20 ft
RON-3	2012-10-11	12:27	Kjeldahl nitrogen	Total	1.14	mg/l	1 ft
RON-1	2012-08-16	08:49	Kjeldahl nitrogen	Total	1.16	mg/l	1 ft
RON-2	2012-06-08	09:43	Kjeldahl nitrogen	Total	1.18	mg/l	1 ft
RON-3	2012-04-27	10:07	Kjeldahl nitrogen	Total	1.2	mg/l	1 ft
RON-1	2012-07-23	09:20	Kjeldahl nitrogen	Total	1.26	mg/l	17 ft
RON-3	2012-08-16	09:21	Kjeldahl nitrogen	Total	1.26	mg/l	1 ft
RON-1	2012-08-16	08:51	Kjeldahl nitrogen	Total	1.28	mg/l	17 ft
RON-2	2012-08-16	08:52	Kjeldahl nitrogen	Total	1.33	mg/l	1 ft
RON-1	2012-08-16	08:51	Kjeldahl nitrogen	Total	1.45	mg/l	20 ft
RON-2	2012-04-27	09:11	Kjeldahl nitrogen	Total	1.5	mg/l	1 ft
RON-3	2012-07-23	09:51	Kjeldahl nitrogen	Total	1.55	mg/l	1 ft
RON-1	2012-06-08	09:38	Kjeldahl nitrogen	Total	1.6	mg/l	1 ft
RON-1	2012-07-23	09:21	Kjeldahl nitrogen	Total	2.82	mg/l	20 ft
RON-2	2012-07-23	09:21	Kjeldahl nitrogen	Total	2.83	mg/l	1 ft
RON-1	2008-08-06	00-Jan-00	Lead	Total	0.76	ug/l	17 ft
RON-1	2008-06-10	00-Jan-00	Lead	Total	0.89	ug/l	17 ft
RON-1	2012-04-27	09:11	Lead	Total	1	ug/l	17 ft
RON-1	2012-06-08	09:41	Lead	Total	1.04	ug/l	17 ft
RON-1	2008-05-06	00-Jan-00	Lead	Total	3.89	ug/l	17 ft
RON-1	2008-08-06	00-Jan-00	Lead	Total	13.1	mg/kg	21 ft

Segment	Date	Time	Analyte	Fraction	Result	Units	Depth
RON-3	2008-08-06	00-Jan-00	Lead	Total	14.3	mg/kg	7 ft
RON-1	2008-10-06	00-Jan-00	Magnesium	Total	3210	ug/l	17 ft
RON-1	2012-06-08	09:41	Magnesium	Total	8180	ug/l	17 ft
RON-1	2012-07-23	09:20	Magnesium	Total	10100	ug/l	17 ft
RON-1	2012-08-16	08:51	Magnesium	Total	10600	ug/l	17 ft
RON-1	2008-05-06	00-Jan-00	Magnesium	Total	10900	ug/l	17 ft
RON-1	2012-10-11	11:47	Magnesium	Total	11300	ug/l	17 ft
RON-1	2008-08-06	00-Jan-00	Magnesium	Total	11400	ug/l	17 ft
RON-1	2008-07-01	00-Jan-00	Magnesium	Total	11800	ug/l	17 ft
RON-1	2012-04-27	09:11	Magnesium	Total	14300	ug/l	17 ft
RON-1	2008-06-10	00-Jan-00	Manganese	Total	65.4	ug/l	17 ft
RON-1	2008-08-06	00-Jan-00	Manganese	Total	73.5	ug/l	17 ft
RON-1	2008-07-01	00-Jan-00	Manganese	Total	97.8	ug/l	17 ft
RON-1	2008-05-06	00-Jan-00	Manganese	Total	104	ug/l	17 ft
RON-1	2012-04-27	09:11	Manganese	Total	115	ug/l	17 ft
RON-1	2012-06-08	09:41	Manganese	Total	140	ug/l	17 ft
RON-1	2012-10-11	11:47	Manganese	Total	167	ug/l	17 ft
RON-1	2008-10-06	00-Jan-00	Manganese	Total	174	ug/l	17 ft
RON-1	2012-08-16	08:51	Manganese	Total	318	ug/l	17 ft
RON-3	2008-08-06	00-Jan-00	Manganese	Total	379	mg/kg	7 ft
RON-1	2012-07-23	09:20	Manganese	Total	622	ug/l	17 ft
RON-1	2008-08-06	00-Jan-00	Manganese	Total	1080	mg/kg	21 ft
RON-1	2008-08-06	00-Jan-00	Mercury	Total	0.03	mg/kg	21 ft
RON-3	2008-08-06	00-Jan-00	Mercury	Total	0.04	mg/kg	7 ft
RON-1	2008-10-06	00-Jan-00	Methoxychlor	Total	0.0065	ug/l	17 ft
RON-1	2008-05-06	00-Jan-00	Methoxychlor	Total	0.012	ug/l	17 ft
RON-1	2008-08-06	00-Jan-00	Methoxychlor	Total	0.024	ug/l	17 ft
RON-1	2008-05-06	00-Jan-00	Metolachlor	Total	0.095	ug/l	17 ft
RON-1	2008-10-06	00-Jan-00	Metolachlor	Total	0.2	ug/l	17 ft
RON-1	2012-10-11	11:47	Metolachlor	Total	0.23	ug/l	17 ft
RON-1	2012-08-16	08:51	Metolachlor	Total	0.8	ug/l	17 ft
RON-1	2012-07-23	09:20	Metolachlor	Total	1.3	ug/l	17 ft
RON-1	2012-04-27	09:11	Metolachlor	Total	1.7	ug/l	17 ft

Segment	Date	Time	Analyte	Fraction	Result	Units	Depth
RON-1	2008-08-06	00-Jan-00	Metolachlor	Total	2.8	ug/l	17 ft
RON-1	2008-06-10	00-Jan-00	Metolachlor	Total	3.3	ug/l	17 ft
RON-1	2012-06-08	09:41	Metolachlor	Total	4.2	ug/l	17 ft
RON-1	2008-07-01	00-Jan-00	Metolachlor	Total	4.7	ug/l	17 ft
RON-1	2012-07-23	09:20	Metribuzin	Total	0.0082	ug/l	17 ft
RON-1	2012-04-27	09:11	Metribuzin	Total	0.01	ug/l	17 ft
RON-1	2012-10-11	11:47	Metribuzin	Total	0.01	ug/l	17 ft
RON-1	2012-08-16	08:51	Metribuzin	Total	0.012	ug/l	17 ft
RON-1	2012-06-08	09:41	Metribuzin	Total	0.038	ug/l	17 ft
RON-1	2008-08-06	00-Jan-00	Nickel	Total	0.6	ug/l	17 ft
RON-1	2012-07-23	09:20	Nickel	Total	0.68	ug/l	17 ft
RON-1	2008-06-10	00-Jan-00	Nickel	Total	0.79	ug/l	17 ft
RON-1	2012-10-11	11:47	Nickel	Total	1.03	ug/l	17 ft
RON-1	2008-10-06	00-Jan-00	Nickel	Total	1.13	ug/l	17 ft
RON-1	2012-06-08	09:41	Nickel	Total	1.7	ug/l	17 ft
RON-1	2008-07-01	00-Jan-00	Nickel	Total	2.33	ug/l	17 ft
RON-1	2008-05-06	00-Jan-00	Nickel	Total	3.13	ug/l	17 ft
RON-3	2008-08-06	00-Jan-00	Nickel	Total	10.9	mg/kg	7 ft
RON-1	2008-08-06	00-Jan-00	Nickel	Total	15.3	mg/kg	21 ft
RON-2	2008-08-06	00-Jan-00	Nitrogen, ammonia as N	Total	0.0516	mg/l	1 ft
RON-3	2008-08-06	00-Jan-00	Nitrogen, ammonia as N	Total	0.0553	mg/l	1 ft
RON-1	2008-08-06	00-Jan-00	Nitrogen, ammonia as N	Total	0.0604	mg/l	1 ft
RON-1	2008-08-06	00-Jan-00	Nitrogen, ammonia as N	Total	0.0681	mg/l	17 ft
RON-1	2008-08-06	00-Jan-00	Nitrogen, ammonia as N	Total	0.136	mg/l	19 ft
RON-3	2008-10-06	00-Jan-00	Nitrogen, ammonia as N	Total	0.17	mg/l	1 ft
RON-1	2008-06-10	00-Jan-00	Nitrogen, ammonia as N	Total	0.175	mg/l	17 ft
RON-1	2008-07-01	00-Jan-00	Nitrogen, ammonia as N	Total	0.185	mg/l	1 ft
RON-1	2008-06-10	00-Jan-00	Nitrogen, ammonia as N	Total	0.207	mg/l	1 ft
RON-1	2008-06-10	00-Jan-00	Nitrogen, ammonia as N	Total	0.217	mg/l	19 ft
RON-3	2008-07-01	00-Jan-00	Nitrogen, ammonia as N	Total	0.251	mg/l	1 ft
RON-2	2008-06-10	00-Jan-00	Nitrogen, ammonia as N	Total	0.28	mg/l	1 ft
RON-3	2008-06-10	00-Jan-00	Nitrogen, ammonia as N	Total	0.288	mg/l	1 ft
RON-2	2008-10-06	00-Jan-00	Nitrogen, ammonia as N	Total	0.31	mg/l	1 ft

Segment	Date	Time	Analyte	Fraction	Result	Units	Depth
RON-2	2008-07-01	00-Jan-00	Nitrogen, ammonia as N	Total	0.339	mg/l	1 ft
RON-1	2008-07-01	00-Jan-00	Nitrogen, ammonia as N	Total	0.36	mg/l	17 ft
RON-1	2008-10-06	00-Jan-00	Nitrogen, ammonia as N	Total	0.369	mg/l	17 ft
RON-1	2008-10-06	00-Jan-00	Nitrogen, ammonia as N	Total	0.466	mg/l	1 ft
RON-1	2008-07-01	00-Jan-00	Nitrogen, ammonia as N	Total	0.553	mg/l	19 ft
RON-1	2008-10-06	00-Jan-00	Nitrogen, ammonia as N	Total	0.842	mg/l	21 ft
RON-1	2008-07-01	00-Jan-00	Nitrogen, Kjeldahl	Total	0.593	mg/l	1 ft
RON-1	2008-10-06	00-Jan-00	Nitrogen, Kjeldahl	Total	0.757	mg/l	1 ft
RON-2	2008-10-06	00-Jan-00	Nitrogen, Kjeldahl	Total	0.761	mg/l	1 ft
RON-3	2008-10-06	00-Jan-00	Nitrogen, Kjeldahl	Total	0.768	mg/l	1 ft
RON-1	2008-05-06	00-Jan-00	Nitrogen, Kjeldahl	Total	0.822	mg/l	1 ft
RON-1	2008-05-06	00-Jan-00	Nitrogen, Kjeldahl	Total	0.843	mg/l	17 ft
RON-1	2008-05-06	00-Jan-00	Nitrogen, Kjeldahl	Total	0.855	mg/l	20 ft
RON-1	2008-06-10	00-Jan-00	Nitrogen, Kjeldahl	Total	0.872	mg/l	19 ft
RON-2	2008-05-06	00-Jan-00	Nitrogen, Kjeldahl	Total	0.873	mg/l	1 ft
RON-1	2008-10-06	00-Jan-00	Nitrogen, Kjeldahl	Total	0.896	mg/l	17 ft
RON-1	2008-08-06	00-Jan-00	Nitrogen, Kjeldahl	Total	0.966	mg/l	17 ft
RON-1	2008-06-10	00-Jan-00	Nitrogen, Kjeldahl	Total	0.967	mg/l	1 ft
RON-1	2008-08-06	00-Jan-00	Nitrogen, Kjeldahl	Total	0.992	mg/l	19 ft
RON-1	2008-07-01	00-Jan-00	Nitrogen, Kjeldahl	Total	1.04	mg/l	17 ft
RON-2	2008-07-01	00-Jan-00	Nitrogen, Kjeldahl	Total	1.06	mg/l	1 ft
RON-1	2008-08-06	00-Jan-00	Nitrogen, Kjeldahl	Total	1.07	mg/l	1 ft
RON-3	2008-05-06	00-Jan-00	Nitrogen, Kjeldahl	Total	1.08	mg/l	1 ft
RON-1	2008-06-10	00-Jan-00	Nitrogen, Kjeldahl	Total	1.1	mg/l	17 ft
RON-1	2008-10-06	00-Jan-00	Nitrogen, Kjeldahl	Total	1.1	mg/l	21 ft
RON-1	2008-07-01	00-Jan-00	Nitrogen, Kjeldahl	Total	1.12	mg/l	19 ft
RON-2	2008-06-10	00-Jan-00	Nitrogen, Kjeldahl	Total	1.19	mg/l	1 ft
RON-3	2008-07-01	00-Jan-00	Nitrogen, Kjeldahl	Total	1.23	mg/l	1 ft
RON-3	2008-06-10	00-Jan-00	Nitrogen, Kjeldahl	Total	1.33	mg/l	1 ft
RON-2	2008-08-06	00-Jan-00	Nitrogen, Kjeldahl	Total	1.78	mg/l	1 ft
RON-3	2008-08-06	00-Jan-00	Nitrogen, Kjeldahl	Total	1.91	mg/l	1 ft
RON-3	2008-08-06	00-Jan-00	Nitrogen, Kjeldahl	Total	2260	mg/kg	7 ft
RON-1	2008-08-06	00-Jan-00	Nitrogen, Kjeldahl	Total	3890	mg/kg	21 ft

Segment	Date	Time	Analyte	Fraction	Result	Units	Depth
RON-2	2008-10-06	00-Jan-00	Nitrogen, Nitrite (NO2) + Nitrate (NO3) as N	Total	0.029	mg/l	1 ft
RON-1	2008-10-06	00-Jan-00	Nitrogen, Nitrite (NO2) + Nitrate (NO3) as N	Total	0.031	mg/l	17 ft
RON-1	2008-10-06	00-Jan-00	Nitrogen, Nitrite (NO2) + Nitrate (NO3) as N	Total	0.034	mg/l	1 ft
RON-1	2008-10-06	00-Jan-00	Nitrogen, Nitrite (NO2) + Nitrate (NO3) as N	Total	0.044	mg/l	21 ft
RON-3	2008-08-06	00-Jan-00	Nitrogen, Nitrite (NO2) + Nitrate (NO3) as N	Total	0.513	mg/l	1 ft
RON-2	2008-08-06	00-Jan-00	Nitrogen, Nitrite (NO2) + Nitrate (NO3) as N	Total	1.32	mg/l	1 ft
RON-1	2008-08-06	00-Jan-00	Nitrogen, Nitrite (NO2) + Nitrate (NO3) as N	Total	2.12	mg/l	1 ft
RON-1	2008-08-06	00-Jan-00	Nitrogen, Nitrite (NO2) + Nitrate (NO3) as N	Total	2.24	mg/l	17 ft
RON-1	2008-08-06	00-Jan-00	Nitrogen, Nitrite (NO2) + Nitrate (NO3) as N	Total	2.26	mg/l	19 ft
RON-3	2008-07-01	00-Jan-00	Nitrogen, Nitrite (NO2) + Nitrate (NO3) as N	Total	4.16	mg/l	1 ft
RON-1	2008-07-01	00-Jan-00	Nitrogen, Nitrite (NO2) + Nitrate (NO3) as N	Total	4.98	mg/l	19 ft
RON-2	2008-07-01	00-Jan-00	Nitrogen, Nitrite (NO2) + Nitrate (NO3) as N	Total	5.07	mg/l	1 ft
RON-1	2008-07-01	00-Jan-00	Nitrogen, Nitrite (NO2) + Nitrate (NO3) as N	Total	5.15	mg/l	17 ft
RON-1	2008-07-01	00-Jan-00	Nitrogen, Nitrite (NO2) + Nitrate (NO3) as N	Total	5.17	mg/l	1 ft
RON-1	2008-06-10	00-Jan-00	Nitrogen, Nitrite (NO2) + Nitrate (NO3) as N	Total	5.52	mg/l	19 ft
RON-1	2008-06-10	00-Jan-00	Nitrogen, Nitrite (NO2) + Nitrate (NO3) as N	Total	5.56	mg/l	17 ft
RON-1	2008-06-10	00-Jan-00	Nitrogen, Nitrite (NO2) + Nitrate (NO3) as N	Total	5.69	mg/l	1 ft
RON-2	2008-06-10	00-Jan-00	Nitrogen, Nitrite (NO2) + Nitrate (NO3) as N	Total	5.73	mg/l	1 ft
RON-2	2008-05-06	00-Jan-00	Nitrogen, Nitrite (NO2) + Nitrate (NO3) as N	Total	5.81	mg/l	1 ft
RON-1	2008-05-06	00-Jan-00	Nitrogen, Nitrite (NO2) + Nitrate (NO3) as N	Total	5.94	mg/l	20 ft
RON-1	2008-05-06	00-Jan-00	Nitrogen, Nitrite (NO2) + Nitrate (NO3) as N	Total	5.99	mg/l	17 ft
RON-1	2008-05-06	00-Jan-00	Nitrogen, Nitrite (NO2) + Nitrate (NO3) as N	Total	6	mg/l	1 ft
RON-3	2008-06-10	00-Jan-00	Nitrogen, Nitrite (NO2) + Nitrate (NO3) as N	Total	6.13	mg/l	1 ft
RON-3	2008-05-06	00-Jan-00	Nitrogen, Nitrite (NO2) + Nitrate (NO3) as N	Total	6.24	mg/l	1 ft
RON-1	2012-04-27	09:11	Pentachlorophenol	Total	0.019	ug/l	17 ft
RON-1	2012-06-08	09:41	Pentachlorophenol	Total	0.042	ug/l	17 ft
RON-1	2008-10-06	00-Jan-00	pH		7		17 ft
RON-1	2008-10-06	00-Jan-00	pH		7.06		21 ft
RON-1	2008-10-06	00-Jan-00	pH		7.21		1 ft
RON-1	2008-06-10	00-Jan-00	pH		7.25		19 ft
RON-1	2008-06-10	00-Jan-00	pH		7.35		17 ft
RON-1	2008-07-01	00-Jan-00	pH		7.39		19 ft
RON-1	2008-05-06	00-Jan-00	pH		7.4		1 ft

Segment	Date	Time	Analyte	Fraction	Result	Units	Depth
RON-1	2008-07-01	00-Jan-00	pH		7.44		17 ft
RON-2	2008-06-10	00-Jan-00	pH		7.49		1 ft
RON-1	2008-05-06	00-Jan-00	pH		7.5		17 ft
RON-1	2008-05-06	00-Jan-00	pH		7.5		20 ft
RON-2	2008-05-06	00-Jan-00	pH		7.5		1 ft
RON-3	2008-06-10	00-Jan-00	pH		7.53		1 ft
RON-1	2008-07-01	00-Jan-00	pH		7.58		1 ft
RON-1	2008-06-10	00-Jan-00	pH		7.67		1 ft
RON-2	2008-10-06	00-Jan-00	pH		7.68		1 ft
RON-2	2008-07-01	00-Jan-00	pH		7.71		1 ft
RON-3	2008-07-01	00-Jan-00	pH		7.84		1 ft
RON-1	2008-08-06	00-Jan-00	pH		8.4		19 ft
RON-3	2008-05-06	00-Jan-00	pH		8.5		1 ft
RON-1	2008-08-06	00-Jan-00	pH		8.7		17 ft
RON-3	2008-10-06	00-Jan-00	pH		8.8		1 ft
RON-1	2008-08-06	00-Jan-00	pH		9.14		1 ft
RON-2	2008-08-06	00-Jan-00	pH		9.4		1 ft
RON-3	2008-08-06	00-Jan-00	pH		9.5		1 ft
RON-1	2008-10-06	00-Jan-00	Phenol	Total	46	ug/l	17 ft
RON-1	2012-04-27	09:11	Phenols	Total	1.55	ug/l	17 ft
RON-1	2012-10-11	11:47	Phenols	Total	1.59	ug/l	17 ft
RON-3	2012-04-27	10:07	Pheophytin a	Total	2.88	ug/l	2 ft
RON-1	2012-10-11	11:47	Pheophytin a	Total	4.72	ug/l	3 ft
RON-3	2012-10-11	12:27	Pheophytin a	Total	5.21	ug/l	2 ft
RON-3	2012-08-16	09:21	Pheophytin a	Total	9.61	ug/l	1 ft
RON-2	2012-08-16	08:52	Pheophytin a	Total	9.88	ug/l	2 ft
RON-2	2012-10-11	12:14	Pheophytin a	Total	10.1	ug/l	3 ft
RON-1	2012-08-16	08:49	Pheophytin a	Total	10.6	ug/l	4 ft
RON-1	2012-07-23	09:18	Pheophytin a	Total	10.7	ug/l	4 ft
RON-2	2012-07-23	09:21	Pheophytin a	Total	15.8	ug/l	3 ft
RON-3	2012-07-23	09:51	Pheophytin a	Total	23.8	ug/l	2 ft
RON-1	2008-10-06	00-Jan-00	Pheophytin-a	Total	1.35	ug/l	4 ft
RON-1	2008-06-10	00-Jan-00	Pheophytin-a	Total	1.96	ug/l	2 ft

Segment	Date	Time	Analyte	Fraction	Result	Units	Depth
RON-2	2008-10-06	00-Jan-00	Pheophytin-a	Total	2.04	ug/l	4 ft
RON-1	2008-08-06	00-Jan-00	Pheophytin-a	Total	2.19	ug/l	4 ft
RON-2	2008-08-06	00-Jan-00	Pheophytin-a	Total	2.94	ug/l	3 ft
RON-2	2008-06-10	00-Jan-00	Pheophytin-a	Total	4.6	ug/l	1 ft
RON-2	2008-05-06	00-Jan-00	Pheophytin-a	Total	4.97	ug/l	1 ft
RON-3	2008-06-10	00-Jan-00	Pheophytin-a	Total	5.19	ug/l	1 ft
RON-3	2008-05-06	00-Jan-00	Pheophytin-a	Total	5.25	ug/l	1 ft
RON-1	2008-05-06	00-Jan-00	Pheophytin-a	Total	6.67	ug/l	1 ft
RON-3	2008-10-06	00-Jan-00	Pheophytin-a	Total	6.75	ug/l	3 ft
RON-3	2012-06-08	10:46	Phosphorus	Dissolved	0.015	mg/l	1 ft
RON-2	2012-06-08	09:43	Phosphorus	Dissolved	0.027	mg/l	1 ft
RON-1	2012-10-11	11:47	Phosphorus	Dissolved	0.028	mg/l	1 ft
RON-1	2012-04-27	09:10	Phosphorus	Dissolved	0.029	mg/l	1 ft
RON-1	2012-04-27	09:11	Phosphorus	Dissolved	0.031	mg/l	17 ft
RON-2	2012-10-11	12:14	Phosphorus	Dissolved	0.034	mg/l	1 ft
RON-1	2012-04-27	09:11	Phosphorus	Dissolved	0.037	mg/l	21 ft
RON-2	2012-04-27	09:11	Phosphorus	Dissolved	0.041	mg/l	1 ft
RON-3	2012-10-11	12:27	Phosphorus	Dissolved	0.045	mg/l	1 ft
RON-3	2012-04-27	10:07	Phosphorus	Dissolved	0.053	mg/l	1 ft
RON-1	2012-06-08	09:38	Phosphorus	Dissolved	0.066	mg/l	1 ft
RON-1	2012-06-08	09:41	Phosphorus	Dissolved	0.077	mg/l	17 ft
RON-1	2012-06-08	09:43	Phosphorus	Dissolved	0.087	mg/l	19 ft
RON-2	2012-08-16	08:52	Phosphorus	Dissolved	0.096	mg/l	1 ft
RON-1	2012-08-16	08:51	Phosphorus	Dissolved	0.098	mg/l	17 ft
RON-1	2012-08-16	08:51	Phosphorus	Dissolved	0.099	mg/l	20 ft
RON-1	2012-10-11	11:47	Phosphorus	Total	0.099	mg/l	1 ft
RON-1	2012-10-11	11:47	Phosphorus	Total	0.103	mg/l	17 ft
RON-1	2012-08-16	08:49	Phosphorus	Dissolved	0.104	mg/l	1 ft
RON-3	2012-06-08	10:46	Phosphorus	Total	0.113	mg/l	1 ft
RON-1	2012-10-11	11:47	Phosphorus	Total	0.114	mg/l	20 ft
RON-1	2012-07-23	09:18	Phosphorus	Dissolved	0.12	mg/l	1 ft
RON-2	2012-10-11	12:14	Phosphorus	Total	0.122	mg/l	1 ft
RON-1	2012-06-08	09:41	Phosphorus	Total	0.124	mg/l	17 ft

Segment	Date	Time	Analyte	Fraction	Result	Units	Depth
RON-1	2012-04-27	09:11	Phosphorus	Total	0.128	mg/l	21 ft
RON-1	2012-04-27	09:10	Phosphorus	Total	0.135	mg/l	1 ft
RON-1	2012-06-08	09:43	Phosphorus	Total	0.135	mg/l	19 ft
RON-1	2012-04-27	09:11	Phosphorus	Total	0.136	mg/l	17 ft
RON-3	2012-08-16	09:21	Phosphorus	Dissolved	0.138	mg/l	1 ft
RON-2	2012-06-08	09:43	Phosphorus	Total	0.145	mg/l	1 ft
RON-2	2012-07-23	09:21	Phosphorus	Dissolved	0.146	mg/l	1 ft
RON-3	2012-10-11	12:27	Phosphorus	Total	0.164	mg/l	1 ft
RON-3	2012-04-27	10:07	Phosphorus	Total	0.169	mg/l	1 ft
RON-1	2012-07-23	09:20	Phosphorus	Dissolved	0.173	mg/l	17 ft
RON-2	2012-04-27	09:11	Phosphorus	Total	0.181	mg/l	1 ft
RON-1	2012-08-16	08:49	Phosphorus	Total	0.187	mg/l	1 ft
RON-1	2012-06-08	09:38	Phosphorus	Total	0.19	mg/l	1 ft
RON-1	2012-07-23	09:18	Phosphorus	Total	0.192	mg/l	1 ft
RON-1	2012-08-16	08:51	Phosphorus	Total	0.2	mg/l	17 ft
RON-1	2012-08-16	08:51	Phosphorus	Total	0.208	mg/l	20 ft
RON-2	2012-08-16	08:52	Phosphorus	Total	0.228	mg/l	1 ft
RON-1	2012-07-23	09:20	Phosphorus	Total	0.261	mg/l	17 ft
RON-2	2012-07-23	09:21	Phosphorus	Total	0.265	mg/l	1 ft
RON-3	2012-07-23	09:51	Phosphorus	Dissolved	0.27	mg/l	1 ft
RON-3	2012-08-16	09:21	Phosphorus	Total	0.322	mg/l	1 ft
RON-1	2012-07-23	09:21	Phosphorus	Dissolved	0.327	mg/l	20 ft
RON-3	2012-07-23	09:51	Phosphorus	Total	0.499	mg/l	1 ft
RON-1	2012-07-23	09:21	Phosphorus	Total	0.649	mg/l	20 ft
RON-1	2008-08-06	00-Jan-00	Phosphorus as P	Dissolved	0.019	mg/l	1 ft
RON-2	2008-08-06	00-Jan-00	Phosphorus as P	Dissolved	0.02	mg/l	1 ft
RON-1	2008-08-06	00-Jan-00	Phosphorus as P	Dissolved	0.029	mg/l	17 ft
RON-1	2008-08-06	00-Jan-00	Phosphorus as P	Dissolved	0.035	mg/l	19 ft
RON-3	2008-08-06	00-Jan-00	Phosphorus as P	Dissolved	0.04	mg/l	1 ft
RON-1	2008-05-06	00-Jan-00	Phosphorus as P	Dissolved	0.072	mg/l	17 ft
RON-3	2008-05-06	00-Jan-00	Phosphorus as P	Dissolved	0.073	mg/l	1 ft
RON-1	2008-08-06	00-Jan-00	Phosphorus as P	Total	0.085	mg/l	1 ft
RON-1	2008-08-06	00-Jan-00	Phosphorus as P	Total	0.09	mg/l	19 ft

Segment	Date	Time	Analyte	Fraction	Result	Units	Depth
RON-3	2008-10-06	00-Jan-00	Phosphorus as P	Dissolved	0.095	mg/l	1 ft
RON-1	2008-08-06	00-Jan-00	Phosphorus as P	Total	0.096	mg/l	17 ft
RON-1	2008-06-10	00-Jan-00	Phosphorus as P	Dissolved	0.12	mg/l	1 ft
RON-2	2008-07-01	00-Jan-00	Phosphorus as P	Dissolved	0.123	mg/l	1 ft
RON-2	2008-08-06	00-Jan-00	Phosphorus as P	Total	0.128	mg/l	1 ft
RON-1	2008-06-10	00-Jan-00	Phosphorus as P	Dissolved	0.129	mg/l	19 ft
RON-2	2008-05-06	00-Jan-00	Phosphorus as P	Dissolved	0.13	mg/l	1 ft
RON-1	2008-05-06	00-Jan-00	Phosphorus as P	Dissolved	0.13	mg/l	1 ft
RON-1	2008-06-10	00-Jan-00	Phosphorus as P	Dissolved	0.131	mg/l	17 ft
RON-1	2008-05-06	00-Jan-00	Phosphorus as P	Dissolved	0.136	mg/l	20 ft
RON-1	2008-07-01	00-Jan-00	Phosphorus as P	Dissolved	0.139	mg/l	1 ft
RON-2	2008-10-06	00-Jan-00	Phosphorus as P	Dissolved	0.141	mg/l	1 ft
RON-1	2008-10-06	00-Jan-00	Phosphorus as P	Dissolved	0.143	mg/l	21 ft
RON-1	2008-07-01	00-Jan-00	Phosphorus as P	Dissolved	0.146	mg/l	17 ft
RON-1	2008-07-01	00-Jan-00	Phosphorus as P	Dissolved	0.146	mg/l	19 ft
RON-1	2008-10-06	00-Jan-00	Phosphorus as P	Dissolved	0.161	mg/l	17 ft
RON-2	2008-06-10	00-Jan-00	Phosphorus as P	Dissolved	0.162	mg/l	1 ft
RON-2	2008-07-01	00-Jan-00	Phosphorus as P	Total	0.167	mg/l	1 ft
RON-1	2008-06-10	00-Jan-00	Phosphorus as P	Total	0.168	mg/l	19 ft
RON-1	2008-06-10	00-Jan-00	Phosphorus as P	Total	0.173	mg/l	17 ft
RON-1	2008-06-10	00-Jan-00	Phosphorus as P	Total	0.175	mg/l	1 ft
RON-1	2008-07-01	00-Jan-00	Phosphorus as P	Total	0.176	mg/l	1 ft
RON-1	2008-07-01	00-Jan-00	Phosphorus as P	Total	0.176	mg/l	17 ft
RON-3	2008-07-01	00-Jan-00	Phosphorus as P	Dissolved	0.177	mg/l	1 ft
RON-1	2008-07-01	00-Jan-00	Phosphorus as P	Total	0.179	mg/l	19 ft
RON-1	2008-10-06	00-Jan-00	Phosphorus as P	Dissolved	0.179	mg/l	1 ft
RON-3	2008-08-06	00-Jan-00	Phosphorus as P	Total	0.18	mg/l	1 ft
RON-3	2008-06-10	00-Jan-00	Phosphorus as P	Dissolved	0.192	mg/l	1 ft
RON-3	2008-05-06	00-Jan-00	Phosphorus as P	Total	0.227	mg/l	1 ft
RON-3	2008-10-06	00-Jan-00	Phosphorus as P	Total	0.229	mg/l	1 ft
RON-1	2008-10-06	00-Jan-00	Phosphorus as P	Total	0.24	mg/l	1 ft
RON-2	2008-06-10	00-Jan-00	Phosphorus as P	Total	0.246	mg/l	1 ft
RON-2	2008-10-06	00-Jan-00	Phosphorus as P	Total	0.254	mg/l	1 ft

Segment	Date	Time	Analyte	Fraction	Result	Units	Depth
RON-3	2008-07-01	00-Jan-00	Phosphorus as P	Total	0.27	mg/l	1 ft
RON-1	2008-10-06	00-Jan-00	Phosphorus as P	Total	0.273	mg/l	17 ft
RON-2	2008-05-06	00-Jan-00	Phosphorus as P	Total	0.288	mg/l	1 ft
RON-1	2008-05-06	00-Jan-00	Phosphorus as P	Total	0.302	mg/l	17 ft
RON-1	2008-05-06	00-Jan-00	Phosphorus as P	Total	0.311	mg/l	1 ft
RON-1	2008-05-06	00-Jan-00	Phosphorus as P	Total	0.313	mg/l	20 ft
RON-3	2008-06-10	00-Jan-00	Phosphorus as P	Total	0.329	mg/l	1 ft
RON-1	2008-10-06	00-Jan-00	Phosphorus as P	Total	0.367	mg/l	21 ft
RON-3	2008-08-06	00-Jan-00	Phosphorus as P	Total	791	mg/kg	7 ft
RON-1	2008-08-06	00-Jan-00	Phosphorus as P	Total	1130	mg/kg	21 ft
RON-1	2012-06-08	09:41	Picloram	Total	0.049	ug/l	17 ft
RON-1	2012-04-27	09:11	Picloram	Total	0.057	ug/l	17 ft
RON-3	2008-08-06	00-Jan-00	Potassium	Total	1340	mg/kg	7 ft
RON-1	2008-08-06	00-Jan-00	Potassium	Total	1740	mg/kg	21 ft
RON-1	2012-04-27	09:11	Potassium	Total	3130	ug/l	17 ft
RON-1	2012-06-08	09:41	Potassium	Total	3520	ug/l	17 ft
RON-1	2012-07-23	09:20	Potassium	Total	3910	ug/l	17 ft
RON-1	2008-07-01	00-Jan-00	Potassium	Total	4270	ug/l	17 ft
RON-1	2012-08-16	08:51	Potassium	Total	4320	ug/l	17 ft
RON-1	2012-10-11	11:47	Potassium	Total	4400	ug/l	17 ft
RON-1	2008-08-06	00-Jan-00	Potassium	Total	4630	ug/l	17 ft
RON-1	2008-05-06	00-Jan-00	Potassium	Total	4720	ug/l	17 ft
RON-1	2008-10-06	00-Jan-00	Potassium	Total	4920	ug/l	17 ft
RON-1	2008-07-01	00-Jan-00	Simazine	Total	0.037	ug/l	17 ft
RON-1	2012-08-16	08:51	Simazine	Total	0.042	ug/l	17 ft
RON-1	2008-10-06	00-Jan-00	Simazine	Total	0.1	ug/l	17 ft
RON-1	2008-08-06	00-Jan-00	Simazine	Total	0.11	ug/l	17 ft
RON-1	2012-04-27	09:11	Simazine	Total	0.25	ug/l	17 ft
RON-1	2008-06-10	00-Jan-00	Simazine	Total	0.41	ug/l	17 ft
RON-1	2008-05-06	00-Jan-00	Simazine	Total	0.74	ug/l	17 ft
RON-1	2008-10-06	00-Jan-00	Sodium	Total	2120	ug/l	17 ft
RON-1	2012-06-08	09:41	Sodium	Total	9380	ug/l	17 ft
RON-1	2012-07-23	09:20	Sodium	Total	11300	ug/l	17 ft

Segment	Date	Time	Analyte	Fraction	Result	Units	Depth
RON-1	2008-05-06	00-Jan-00	Sodium	Total	11300	ug/l	17 ft
RON-1	2008-08-06	00-Jan-00	Sodium	Total	11900	ug/l	17 ft
RON-1	2012-08-16	08:51	Sodium	Total	12400	ug/l	17 ft
RON-1	2012-10-11	11:47	Sodium	Total	12400	ug/l	17 ft
RON-1	2008-07-01	00-Jan-00	Sodium	Total	12400	ug/l	17 ft
RON-1	2012-04-27	09:11	Sodium	Total	18400	ug/l	17 ft
RON-1	2008-10-06	00-Jan-00	Solids, Dissolved	Dissolved	48	mg/l	17 ft
RON-1	2008-08-06	00-Jan-00	Solids, Dissolved	Dissolved	194	mg/l	17 ft
RON-1	2008-06-10	00-Jan-00	Solids, Dissolved	Dissolved	216	mg/l	1 ft
RON-1	2008-06-10	00-Jan-00	Solids, Dissolved	Dissolved	218	mg/l	17 ft
RON-1	2008-07-01	00-Jan-00	Solids, Dissolved	Dissolved	226	mg/l	17 ft
RON-3	2008-05-06	00-Jan-00	Solids, Dissolved	Dissolved	240	mg/l	1 ft
RON-2	2008-05-06	00-Jan-00	Solids, Dissolved	Dissolved	240	mg/l	1 ft
RON-1	2008-05-06	00-Jan-00	Solids, Dissolved	Dissolved	240	mg/l	20 ft
RON-1	2008-05-06	00-Jan-00	Solids, Dissolved	Dissolved	246	mg/l	17 ft
RON-2	2008-06-10	00-Jan-00	Solids, Dissolved	Dissolved	250	mg/l	1 ft
RON-1	2008-05-06	00-Jan-00	Solids, Dissolved	Dissolved	254	mg/l	1 ft
RON-3	2008-06-10	00-Jan-00	Solids, Dissolved	Dissolved	262	mg/l	1 ft
RON-3	2008-06-10	00-Jan-00	Solids, suspended, volatile		4	mg/l	1 ft
RON-1	2008-06-10	00-Jan-00	Solids, suspended, volatile		4	mg/l	1 ft
RON-1	2008-07-01	00-Jan-00	Solids, suspended, volatile		4	mg/l	19 ft
RON-1	2008-08-06	00-Jan-00	Solids, suspended, volatile		4	mg/l	19 ft
RON-1	2008-06-10	00-Jan-00	Solids, suspended, volatile		5	mg/l	19 ft
RON-1	2008-10-06	00-Jan-00	Solids, suspended, volatile		5	mg/l	1 ft
RON-2	2008-05-06	00-Jan-00	Solids, suspended, volatile		6	mg/l	1 ft
RON-1	2008-05-06	00-Jan-00	Solids, suspended, volatile		6	mg/l	20 ft
RON-1	2008-05-06	00-Jan-00	Solids, suspended, volatile		7	mg/l	17 ft
RON-1	2008-05-06	00-Jan-00	Solids, suspended, volatile		7	mg/l	1 ft
RON-3	2008-07-01	00-Jan-00	Solids, suspended, volatile		7	mg/l	1 ft
RON-1	2008-08-06	00-Jan-00	Solids, suspended, volatile		7	mg/l	17 ft
RON-2	2008-10-06	00-Jan-00	Solids, suspended, volatile		7	mg/l	1 ft
RON-1	2008-10-06	00-Jan-00	Solids, suspended, volatile		8	mg/l	17 ft
RON-3	2008-05-06	00-Jan-00	Solids, suspended, volatile		9	mg/l	1 ft

Segment	Date	Time	Analyte	Fraction	Result	Units	Depth
RON-1	2008-08-06	00-Jan-00	Solids, suspended, volatile		10	mg/l	1 ft
RON-3	2008-10-06	00-Jan-00	Solids, suspended, volatile		11	mg/l	1 ft
RON-1	2008-10-06	00-Jan-00	Solids, suspended, volatile		16	mg/l	21 ft
RON-2	2008-08-06	00-Jan-00	Solids, suspended, volatile		18	mg/l	1 ft
RON-3	2008-08-06	00-Jan-00	Solids, suspended, volatile		20	mg/l	1 ft
RON-1	2008-07-01	00-Jan-00	Solids, Total Suspended (TSS)		4	mg/l	17 ft
RON-2	2008-07-01	00-Jan-00	Solids, Total Suspended (TSS)		6	mg/l	1 ft
RON-1	2008-08-06	00-Jan-00	Solids, Total Suspended (TSS)		8	mg/l	17 ft
RON-1	2008-10-06	00-Jan-00	Solids, Total Suspended (TSS)		8	mg/l	1 ft
RON-1	2008-06-10	00-Jan-00	Solids, Total Suspended (TSS)		9	mg/l	17 ft
RON-1	2008-08-06	00-Jan-00	Solids, Total Suspended (TSS)		9	mg/l	19 ft
RON-1	2008-06-10	00-Jan-00	Solids, Total Suspended (TSS)		11	mg/l	1 ft
RON-2	2008-10-06	00-Jan-00	Solids, Total Suspended (TSS)		11	mg/l	1 ft
RON-1	2008-08-06	00-Jan-00	Solids, Total Suspended (TSS)		12	mg/l	1 ft
RON-1	2008-06-10	00-Jan-00	Solids, Total Suspended (TSS)		14	mg/l	19 ft
RON-2	2008-06-10	00-Jan-00	Solids, Total Suspended (TSS)		15	mg/l	1 ft
RON-1	2008-10-06	00-Jan-00	Solids, Total Suspended (TSS)		18	mg/l	17 ft
RON-3	2008-07-01	00-Jan-00	Solids, Total Suspended (TSS)		19	mg/l	1 ft
RON-3	2008-10-06	00-Jan-00	Solids, Total Suspended (TSS)		21	mg/l	1 ft
RON-2	2008-08-06	00-Jan-00	Solids, Total Suspended (TSS)		24	mg/l	1 ft
RON-2	2008-05-06	00-Jan-00	Solids, Total Suspended (TSS)		25	mg/l	1 ft
RON-1	2008-05-06	00-Jan-00	Solids, Total Suspended (TSS)		29	mg/l	20 ft
RON-1	2008-05-06	00-Jan-00	Solids, Total Suspended (TSS)		29	mg/l	1 ft
RON-1	2008-05-06	00-Jan-00	Solids, Total Suspended (TSS)		30	mg/l	17 ft
RON-3	2008-06-10	00-Jan-00	Solids, Total Suspended (TSS)		30	mg/l	1 ft
RON-3	2008-05-06	00-Jan-00	Solids, Total Suspended (TSS)		33	mg/l	1 ft
RON-3	2008-08-06	00-Jan-00	Solids, Total Suspended (TSS)		33	mg/l	1 ft
RON-1	2008-10-06	00-Jan-00	Solids, Total Suspended (TSS)		75	mg/l	21 ft
RON-1	2008-10-06	00-Jan-00	Specific conductance		95	umho/cm	1 ft
RON-1	2008-10-06	00-Jan-00	Specific conductance		99	umho/cm	17 ft
RON-1	2008-10-06	00-Jan-00	Specific conductance		99	umho/cm	21 ft
RON-2	2008-10-06	00-Jan-00	Specific conductance		103	umho/cm	1 ft
RON-3	2008-10-06	00-Jan-00	Specific conductance		133	umho/cm	1 ft

Segment	Date	Time	Analyte	Fraction	Result	Units	Depth
RON-1	2008-05-06	00-Jan-00	Specific conductance		298	umho/cm	17 ft
RON-1	2008-05-06	00-Jan-00	Specific conductance		299	umho/cm	20 ft
RON-1	2008-05-06	00-Jan-00	Specific conductance		300	umho/cm	1 ft
RON-2	2008-08-06	00-Jan-00	Specific conductance		302	umho/cm	1 ft
RON-3	2008-08-06	00-Jan-00	Specific conductance		303	umho/cm	1 ft
RON-2	2008-05-06	00-Jan-00	Specific conductance		305	umho/cm	1 ft
RON-1	2008-08-06	00-Jan-00	Specific conductance		318	umho/cm	1 ft
RON-1	2008-08-06	00-Jan-00	Specific conductance		326	umho/cm	17 ft
RON-3	2008-07-01	00-Jan-00	Specific conductance		327	umho/cm	1 ft
RON-1	2008-08-06	00-Jan-00	Specific conductance		331	umho/cm	19 ft
RON-2	2008-06-10	00-Jan-00	Specific conductance		355	umho/cm	1 ft
RON-3	2008-05-06	00-Jan-00	Specific conductance		355	umho/cm	1 ft
RON-3	2008-06-10	00-Jan-00	Specific conductance		355	umho/cm	1 ft
RON-1	2008-07-01	00-Jan-00	Specific conductance		368	umho/cm	1 ft
RON-1	2008-06-10	00-Jan-00	Specific conductance		369	umho/cm	1 ft
RON-1	2008-07-01	00-Jan-00	Specific conductance		369	umho/cm	17 ft
RON-1	2008-07-01	00-Jan-00	Specific conductance		371	umho/cm	19 ft
RON-2	2008-07-01	00-Jan-00	Specific conductance		372	umho/cm	1 ft
RON-1	2008-06-10	00-Jan-00	Specific conductance		375	umho/cm	19 ft
RON-1	2008-06-10	00-Jan-00	Specific conductance		376	umho/cm	17 ft
RON-1	2008-10-06	00-Jan-00	Strontium	Total	33.5	ug/l	17 ft
RON-1	2012-06-08	09:41	Strontium	Total	87.9	ug/l	17 ft
RON-1	2012-07-23	09:20	Strontium	Total	91.6	ug/l	17 ft
RON-1	2008-05-06	00-Jan-00	Strontium	Total	95	ug/l	17 ft
RON-1	2012-08-16	08:51	Strontium	Total	106	ug/l	17 ft
RON-1	2012-10-11	11:47	Strontium	Total	106	ug/l	17 ft
RON-1	2008-08-06	00-Jan-00	Strontium	Total	107	ug/l	17 ft
RON-1	2012-04-27	09:11	Strontium	Total	110	ug/l	17 ft
RON-1	2008-07-01	00-Jan-00	Strontium	Total	111	ug/l	17 ft
RON-1	2008-06-10	00-Jan-00	Strontium	Total	115	ug/l	17 ft
RON-1	2012-07-23	09:20	Sulfate	Total	4.35	mg/l	17 ft
RON-1	2012-06-08	09:41	Sulfate	Total	9.44	mg/l	17 ft
RON-1	2008-05-06	00-Jan-00	Sulfate	Total	10.7	mg/l	17 ft

Segment	Date	Time	Analyte	Fraction	Result	Units	Depth
RON-1	2012-08-16	08:51	Sulfate	Total	11.4	mg/l	17 ft
RON-1	2008-07-01	00-Jan-00	Sulfate	Total	17.5	mg/l	17 ft
RON-1	2008-06-10	00-Jan-00	Sulfate	Total	20.5	mg/l	17 ft
RON-1	2012-04-27	09:11	Sulfate	Total	33.3	mg/l	17 ft
RON-1	2008-05-06	00-Jan-00	Temperature, sample		0	deg C	1 ft
RON-2	2008-05-06	00-Jan-00	Temperature, sample		0	deg C	1 ft
RON-3	2008-05-06	00-Jan-00	Temperature, sample		0	deg C	1 ft
RON-1	2008-06-10	00-Jan-00	Temperature, sample		0	deg C	2 ft
RON-2	2008-06-10	00-Jan-00	Temperature, sample		0	deg C	1 ft
RON-3	2008-06-10	00-Jan-00	Temperature, sample		0	deg C	1 ft
RON-1	2008-07-01	00-Jan-00	Temperature, sample		0	deg C	5 ft
RON-2	2008-07-01	00-Jan-00	Temperature, sample		0	deg C	3 ft
RON-3	2008-07-01	00-Jan-00	Temperature, sample		0	deg C	2 ft
RON-1	2008-08-06	00-Jan-00	Temperature, sample		0	deg C	21 ft
RON-3	2008-08-06	00-Jan-00	Temperature, sample		0	deg C	7 ft
RON-1	2008-08-06	00-Jan-00	Temperature, sample		0	deg C	4 ft
RON-2	2008-08-06	00-Jan-00	Temperature, sample		0	deg C	3 ft
RON-3	2008-08-06	00-Jan-00	Temperature, sample		0	deg C	2 ft
RON-1	2008-10-06	00-Jan-00	Temperature, sample		0	deg C	4 ft
RON-2	2008-10-06	00-Jan-00	Temperature, sample		0	deg C	4 ft
RON-3	2008-10-06	00-Jan-00	Temperature, sample		0	deg C	3 ft
RON-1	2012-06-08	09:38	Temperature, sample		2	deg C	
RON-1	2012-06-08	09:41	Temperature, sample		2	deg C	
RON-1	2012-06-08	09:43	Temperature, sample		2	deg C	
RON-2	2012-06-08	09:43	Temperature, sample		2	deg C	
RON-3	2012-06-08	10:46	Temperature, sample		2	deg C	
RON-1	2012-10-11	11:47	Temperature, sample		2	deg C	
RON-1	2012-10-11	11:47	Temperature, sample		2	deg C	
RON-1	2012-10-11	11:47	Temperature, sample		2	deg C	
RON-2	2012-10-11	12:14	Temperature, sample		2	deg C	
RON-3	2012-10-11	12:27	Temperature, sample		2	deg C	
RON-1	2012-04-27	09:11	Temperature, sample		3	deg C	
RON-1	2012-04-27	09:11	Temperature, sample		3	deg C	

Segment	Date	Time	Analyte	Fraction	Result	Units	Depth
RON-1	2012-04-27	09:10	Temperature, sample		3	deg C	
RON-2	2012-04-27	09:11	Temperature, sample		3	deg C	
RON-3	2012-04-27	10:07	Temperature, sample		3	deg C	
RON-1	2008-05-06	00-Jan-00	Temperature, sample		3	deg C	17 ft
RON-3	2008-05-06	00-Jan-00	Temperature, sample		3	deg C	1 ft
RON-2	2008-05-06	00-Jan-00	Temperature, sample		3	deg C	1 ft
RON-1	2008-05-06	00-Jan-00	Temperature, sample		3	deg C	17 ft
RON-1	2008-05-06	00-Jan-00	Temperature, sample		3	deg C	1 ft
RON-3	2008-06-10	00-Jan-00	Temperature, sample		3	deg C	1 ft
RON-2	2008-06-10	00-Jan-00	Temperature, sample		3	deg C	1 ft
RON-1	2008-06-10	00-Jan-00	Temperature, sample		3	deg C	19 ft
RON-1	2008-06-10	00-Jan-00	Temperature, sample		3	deg C	17 ft
RON-1	2008-06-10	00-Jan-00	Temperature, sample		3	deg C	17 ft
RON-1	2008-06-10	00-Jan-00	Temperature, sample		3	deg C	1 ft
RON-1	2008-05-06	00-Jan-00	Temperature, sample		4	deg C	20 ft
RON-1	2008-10-06	00-Jan-00	Temperature, sample		4	deg C	17 ft
RON-1	2008-10-06	00-Jan-00	Temperature, sample		4	deg C	17 ft
RON-1	2008-10-06	00-Jan-00	Temperature, sample		4	deg C	21 ft
RON-1	2008-10-06	00-Jan-00	Temperature, sample		4	deg C	1 ft
RON-2	2008-10-06	00-Jan-00	Temperature, sample		4	deg C	1 ft
RON-3	2008-10-06	00-Jan-00	Temperature, sample		4	deg C	1 ft
RON-1	2012-07-23	09:18	Temperature, sample		5	deg C	
RON-1	2012-07-23	09:20	Temperature, sample		5	deg C	
RON-1	2012-07-23	09:21	Temperature, sample		5	deg C	
RON-2	2012-07-23	09:21	Temperature, sample		5	deg C	
RON-3	2012-07-23	09:51	Temperature, sample		5	deg C	
RON-1	2012-08-16	08:49	Temperature, sample		6	deg C	
RON-1	2012-08-16	08:51	Temperature, sample		6	deg C	
RON-1	2012-08-16	08:51	Temperature, sample		6	deg C	
RON-2	2012-08-16	08:52	Temperature, sample		6	deg C	
RON-3	2012-08-16	09:21	Temperature, sample		6	deg C	
RON-1	2008-07-01	00-Jan-00	Temperature, sample		6	deg C	1 ft
RON-1	2008-07-01	00-Jan-00	Temperature, sample		6	deg C	17 ft

Segment	Date	Time	Analyte	Fraction	Result	Units	Depth
RON-1	2008-07-01	00-Jan-00	Temperature, sample		6	deg C	17 ft
RON-1	2008-07-01	00-Jan-00	Temperature, sample		6	deg C	19 ft
RON-2	2008-07-01	00-Jan-00	Temperature, sample		6	deg C	1 ft
RON-3	2008-07-01	00-Jan-00	Temperature, sample		6	deg C	1 ft
RON-1	2008-08-06	00-Jan-00	Temperature, sample		8	deg C	19 ft
RON-1	2008-08-06	00-Jan-00	Temperature, sample		8	deg C	1 ft
RON-2	2008-08-06	00-Jan-00	Temperature, sample		8	deg C	1 ft
RON-3	2008-08-06	00-Jan-00	Temperature, sample		8	deg C	1 ft
RON-1	2008-08-06	00-Jan-00	Temperature, sample		8	deg C	17 ft
RON-1	2008-08-06	00-Jan-00	Temperature, sample		8	deg C	17 ft
RON-1	2008-10-06	00-Jan-00	Terbufos	Total	0.024	ug/l	17 ft
RON-1	2008-08-06	00-Jan-00	Terbufos	Total	0.032	ug/l	17 ft
RON-1	2008-06-10	00-Jan-00	Terbufos	Total	0.039	ug/l	17 ft
RON-1	2008-07-01	00-Jan-00	Terbufos	Total	0.049	ug/l	17 ft
RON-1	2012-06-08	09:41	Terbufos	Total	0.11	ug/l	17 ft
RON-1	2012-08-16	08:51	Terbufos	Total	0.11	ug/l	17 ft
RON-1	2012-07-23	09:20	Terbufos	Total	0.13	ug/l	17 ft
RON-1	2012-07-23	09:20	Total dissolved solids		134	mg/l	17 ft
RON-1	2012-06-08	09:41	Total dissolved solids		162	mg/l	17 ft
RON-1	2012-08-16	08:51	Total dissolved solids		198	mg/l	17 ft
RON-1	2012-04-27	09:11	Total dissolved solids		206	mg/l	17 ft
RON-1	2008-08-06	00-Jan-00	Total fixed solids		89.5	%	21 ft
RON-3	2008-08-06	00-Jan-00	Total fixed solids		92.2	%	7 ft
RON-1	2008-08-06	00-Jan-00	Total solids		42.7	%	21 ft
RON-3	2008-08-06	00-Jan-00	Total solids		53.4	%	7 ft
RON-1	2012-08-16	08:49	Total suspended solids		7	mg/l	1 ft
RON-1	2012-04-27	09:11	Total suspended solids		10	mg/l	21 ft
RON-1	2012-04-27	09:10	Total suspended solids		10	mg/l	1 ft
RON-1	2012-04-27	09:11	Total suspended solids		12	mg/l	17 ft
RON-1	2012-07-23	09:18	Total suspended solids		12	mg/l	1 ft
RON-2	2012-04-27	09:11	Total suspended solids		13	mg/l	1 ft
RON-1	2012-06-08	09:41	Total suspended solids		13	mg/l	17 ft
RON-1	2012-06-08	09:38	Total suspended solids		14	mg/l	1 ft

Segment	Date	Time	Analyte	Fraction	Result	Units	Depth
RON-2	2012-06-08	09:43	Total suspended solids		15	mg/l	1 ft
RON-1	2012-08-16	08:51	Total suspended solids		15	mg/l	17 ft
RON-1	2012-08-16	08:51	Total suspended solids		16	mg/l	20 ft
RON-3	2012-08-16	09:21	Total suspended solids		16	mg/l	1 ft
RON-3	2012-04-27	10:07	Total suspended solids		17	mg/l	1 ft
RON-1	2012-07-23	09:20	Total suspended solids		17	mg/l	17 ft
RON-2	2012-07-23	09:21	Total suspended solids		17	mg/l	1 ft
RON-1	2012-06-08	09:43	Total suspended solids		18	mg/l	19 ft
RON-1	2012-10-11	11:47	Total suspended solids		18	mg/l	1 ft
RON-3	2012-06-08	10:46	Total suspended solids		22	mg/l	1 ft
RON-1	2012-07-23	09:21	Total suspended solids		23	mg/l	20 ft
RON-2	2012-10-11	12:14	Total suspended solids		23	mg/l	1 ft
RON-1	2012-10-11	11:47	Total suspended solids		24	mg/l	17 ft
RON-2	2012-08-16	08:52	Total suspended solids		26	mg/l	1 ft
RON-1	2012-10-11	11:47	Total suspended solids		32	mg/l	20 ft
RON-3	2012-10-11	12:27	Total suspended solids		42	mg/l	1 ft
RON-3	2012-07-23	09:51	Total suspended solids		62	mg/l	1 ft
RON-3	2008-08-06	00-Jan-00	Total volatile solids		7.79	%	7 ft
RON-1	2008-08-06	00-Jan-00	Total volatile solids		10.5	%	21 ft
RON-1	2008-08-06	00-Jan-00	Trifluralin	Total	0.51	ug/kg	21 ft
RON-1	2008-10-06	00-Jan-00	Turbidity		14	NTU	1 ft
RON-2	2008-10-06	00-Jan-00	Turbidity		15	NTU	1 ft
RON-1	2008-07-01	00-Jan-00	Turbidity		17	NTU	1 ft
RON-1	2008-08-06	00-Jan-00	Turbidity		18	NTU	17 ft
RON-1	2008-08-06	00-Jan-00	Turbidity		19	NTU	1 ft
RON-2	2008-07-01	00-Jan-00	Turbidity		21	NTU	1 ft
RON-1	2008-07-01	00-Jan-00	Turbidity		22	NTU	17 ft
RON-3	2008-10-06	00-Jan-00	Turbidity		22	NTU	1 ft
RON-1	2008-10-06	00-Jan-00	Turbidity		28	NTU	17 ft
RON-1	2008-06-10	00-Jan-00	Turbidity		33	NTU	1 ft
RON-1	2008-06-10	00-Jan-00	Turbidity		33	NTU	17 ft
RON-2	2008-08-06	00-Jan-00	Turbidity		39	NTU	1 ft
RON-3	2008-07-01	00-Jan-00	Turbidity		46	NTU	1 ft

Segment	Date	Time	Analyte	Fraction	Result	Units	Depth
RON-3	2008-08-06	00-Jan-00	Turbidity		56	NTU	1 ft
RON-2	2008-06-10	00-Jan-00	Turbidity		76	NTU	1 ft
RON-3	2008-05-06	00-Jan-00	Turbidity		85	NTU	1 ft
RON-1	2008-05-06	00-Jan-00	Turbidity		126	NTU	1 ft
RON-3	2008-06-10	00-Jan-00	Turbidity		136	NTU	1 ft
RON-2	2008-05-06	00-Jan-00	Turbidity		137	NTU	1 ft
RON-1	2008-05-06	00-Jan-00	Turbidity		148	NTU	17 ft
RON-1	2008-05-06	00-Jan-00	Turbidity		299	NTU	20 ft
RON-1	2012-06-08	09:41	Vanadium	Total	2.49	ug/l	17 ft
RON-1	2012-08-16	08:51	Vanadium	Total	3.6	ug/l	17 ft
RON-1	2012-08-16	08:49	Volatile suspended solids		4	mg/l	1 ft
RON-1	2012-08-16	08:51	Volatile suspended solids		6	mg/l	17 ft
RON-1	2012-08-16	08:51	Volatile suspended solids		8	mg/l	20 ft
RON-1	2012-04-27	09:11	Volatile suspended solids		9	mg/l	21 ft
RON-3	2012-04-27	10:07	Volatile suspended solids		9	mg/l	1 ft
RON-1	2012-07-23	09:18	Volatile suspended solids		9	mg/l	1 ft
RON-3	2012-08-16	09:21	Volatile suspended solids		9	mg/l	1 ft
RON-1	2012-04-27	09:11	Volatile suspended solids		10	mg/l	17 ft
RON-1	2012-06-08	09:41	Volatile suspended solids		10	mg/l	17 ft
RON-1	2012-06-08	09:43	Volatile suspended solids		10	mg/l	19 ft
RON-1	2012-07-23	09:20	Volatile suspended solids		10	mg/l	17 ft
RON-1	2012-10-11	11:47	Volatile suspended solids		10	mg/l	1 ft
RON-1	2012-10-11	11:47	Volatile suspended solids		10	mg/l	17 ft
RON-2	2012-10-11	12:14	Volatile suspended solids		10	mg/l	1 ft
RON-1	2012-07-23	09:21	Volatile suspended solids		11	mg/l	20 ft
RON-2	2012-08-16	08:52	Volatile suspended solids		11	mg/l	1 ft
RON-1	2012-10-11	11:47	Volatile suspended solids		11	mg/l	20 ft
RON-3	2012-06-08	10:46	Volatile suspended solids		13	mg/l	1 ft
RON-2	2012-07-23	09:21	Volatile suspended solids		13	mg/l	1 ft
RON-1	2012-04-27	09:10	Volatile suspended solids		13	mg/l	1 ft
RON-2	2012-04-27	09:11	Volatile suspended solids		14	mg/l	1 ft
RON-1	2012-06-08	09:38	Volatile suspended solids		14	mg/l	1 ft
RON-2	2012-06-08	09:43	Volatile suspended solids		14	mg/l	1 ft

Segment	Date	Time	Analyte	Fraction	Result	Units	Depth
RON-3	2012-10-11	12:27	Volatile suspended solids		15	mg/l	1 ft
RON-3	2012-07-23	09:51	Volatile suspended solids		20	mg/l	1 ft
RON-1	2012-07-23	09:20	Zinc	Total	0.97	ug/l	17 ft
RON-1	2008-08-06	00-Jan-00	Zinc	Total	1.88	ug/l	17 ft
RON-1	2012-08-16	08:51	Zinc	Total	2.16	ug/l	17 ft
RON-1	2012-10-11	11:47	Zinc	Total	3.36	ug/l	17 ft
RON-1	2008-10-06	00-Jan-00	Zinc	Total	3.86	ug/l	17 ft
RON-1	2012-06-08	09:41	Zinc	Total	8.9	ug/l	17 ft
RON-1	2008-05-06	00-Jan-00	Zinc	Total	16.9	ug/l	17 ft
RON-3	2008-08-06	00-Jan-00	Zinc	Total	53.7	mg/kg	7 ft
RON-1	2008-08-06	00-Jan-00	Zinc	Total	64.5	mg/kg	21 ft

Appendix D

Public Comments

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Notes from Lake Lou Yaeger Public Stage 1 Meeting

- One stakeholder took issue with the assertion that tile drainage can increase nutrient delivery to surface waters and can increase runoff. Text has been updated in Section 5.
- Several stakeholders disagreed with the presented ag statistics (such as number of cattle in the county). Census data were reviewed and confirmed. A statement was added to document that the local stakeholders disagreed with the values.
- For the slide with the breakdown of tillage practices from the county transect surveys, a stakeholder asked if there was documentation of the ranges of percentage residue for each category. Additional information has been added to Section 5.
- A stakeholder noted that the USGS flow gage that we propose to use to calculate flows for the Lake Lou Yaeger watershed is not necessarily representative of the Lake Lou Yaeger watershed because the tributary area has very different soils. Gages with available data were reviewed and flows from a different gage will be evaluated prior to Stage 3 modeling.
- A stakeholder mentioned that there are likely wastewater loadings coming from camp sites and trailers. Text was added to the septic system discussion and information will be included in the implementation plan.
- The Mayor mentioned that they have compiled a list of projects/improvements. These should get included in the implementation plan so that they may be eligible for 319 funding. CDM Smith will work with stakeholders to include projects that have already been identified in the implementation plan.

Abel A. Haile
Manager, Planning (TMDL) Unit
Illinois Environmental Protection Agency
Watershed Management Section
Bureau of Water
1021 North Grand Ave. East
P.O. Box 19276
Springfield, IL 62794-9276

April 7, 2017

Via email: Abel.Haile@illinois.gov

Dear Mr. Haile:

Thank you for conducting the public meeting on the Total Maximum Daily Load and Load Reduction Strategy for Lake Lou Yaeger Watershed in Litchfield on March 7, 2017. The management and protection of lake quality are of primary concern to us as homeowners on Lake Lou Yaeger, residents who are supplied drinking water from Lake Lou Yaeger, and advocates for clean water.

As discussed at the meeting, erosion of shorelines, farmland, hillsides, etc resulting in high total suspended solids is an ongoing problem since the lake was developed. The extensive watershed has numerous areas that can provide siltation to the lake and will be a challenge to address.

The land surrounding the water in LLY is owned by the City of Litchfield and leased to homeowners and campers at designated sites. Although erosion prevention measures are recommended in leases, there is no enforcement or assistance to stabilize shorelines and property. It is encouraging that the city has applied for a grant that can facilitate homeowners and landowners with the costs of stabilizing land in their area.

Litchfield considers the lake to be a valuable resource and revenue generator for the city. A new subdivision of 60 homes on the lake has been mapped out and there are plans to increase recreational attractions. There are coves that are so full of silt that many residents cannot use their docks or navigate their shoreline. Many studies of Lake Lou Yaeger have been done in the past with potential solutions, but the city has never invested in any recommended siltation management program.

The drainage into LLY is extensive as shown by a recent observation. There was approximately 4 inches of rain in the last 3 weeks that raised the water level 4 feet from the winter drawdown of 4 feet. Is the location of where drainage tiles empty into LLY known or the ditches and gullies that carry the tile water to the lake? This information is currently unknown. Are there streambank stabilization areas at critical points? If critical areas have been identified locally, the information will be included in the Stage 3 report/implementation plan. Have there been turbidity studies after rains on the feeder creeks like West Fork Shoal Creek, Blue Grass Creek, Shop Creek, and Threemile Branch? Currently unknown.

Is there a record of where there are best management practices in place? Filter strips, terracing, and grassed waterways were addressed as potential deterrents to erosion. Is no till crop production utilized in the LLY watershed? Are there any sediment control basins in LLY that are functional? We will work with County SWCD reps and local stakeholders to document this information in the Stage 3 report.

LLY also has chemical impairment with excessive phosphorus. What is your best estimate of the source? In general, elevated levels of phosphorus in streams can result from fertilizer use, animal wastes and wastewater, and the use of phosphate detergents. Sources identified by Illinois EPA on the 303(d) list include Agriculture, Internal Nutrient Recycling, Runoff from forest/grassland/parkland. Septic systems and municipal treatment plant effluent also contribute phosphorus loading to Lake Lou Yaeger. Is phosphate in automatic dishwashing soap like Cascade and Finish outlawed in Illinois? Yes, since 2010. There is a golf course in Raymond that could be one sources of extra phosphorus. The implementation plan will include lawn fertilization recommendations to reduce nutrient runoff. What are the specific phosphate compounds that farmers might apply to their fields?

Were any biological studies performed on LLY like a survey of fish, invertebrates, and aquatic plants? Are there any records of dissolved oxygen in the 3 areas that were examined? Lake Lou Yaeger is sampled ever 5 years by Illinois EPA through the Intensive Basin Survey program. The Illinois EPA website describes data collected during Intensive Basin Surveys: "Water chemistry and biological (fish and macroinvertebrate) data along with qualitative and quantitative instream habitat information including stream discharge are collected to characterize stream segments within the basin, identify water quality conditions, and evaluate aquatic life use impairment. Fish tissue contaminant and sediment chemistry sampling are also conducted to screen for the accumulation of toxic substances." It should be noted that in the most recent assessment, the lake itself is shown to be in full use support for public water supply and was not listed for impairment caused by low dissolved oxygen. Your help and efforts are appreciated and very important for LLY improvement. Looking forward to hearing from you in the future.

Sincerely,

Jim and Mary Ellen DeClue
366 Westlake Trail
Litchfield, IL 62056
jwdmed@consolidated.net

cc: Steve Dougherty, Mayor of Litchfield
Ray Kellenberger, Alderman Ward 4
Dave Hollo, Alderman-Lake